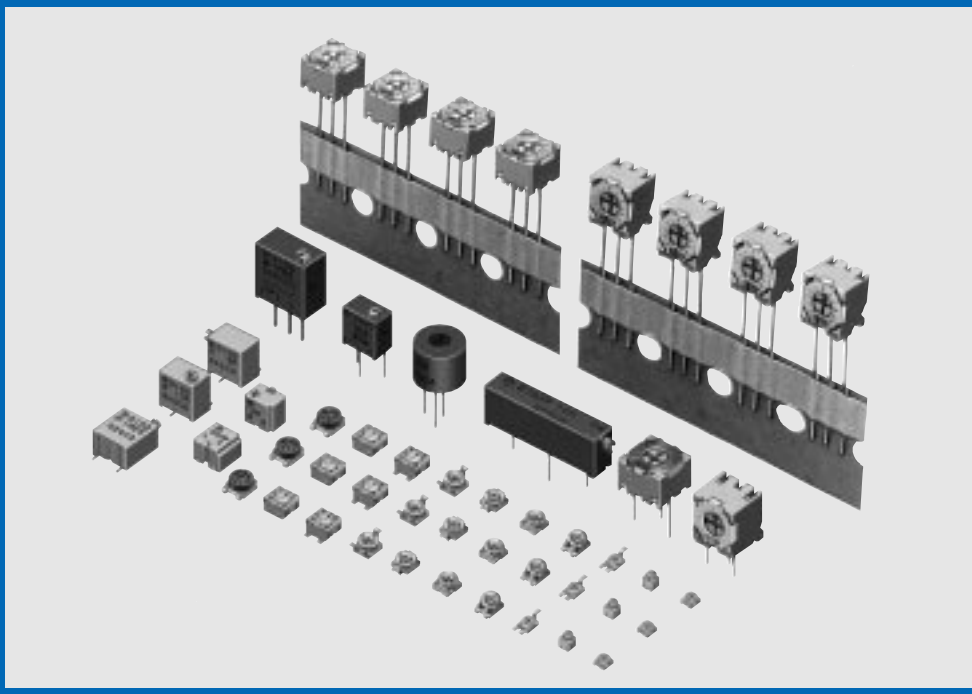
Trimmer Potentiometers

TRIMMER POTENTIO-METERS



GLOBAL PART NUMBERS
JUNE 2001

muRata Innovator in Electronics
Murata Manufacturing Co., Ltd.

Cat.No.R50E-10

CONTENTS

Part Numbering (The structure of the "Global Part Numbers" that have been adopted since June 2001 and the meaning of each code are described herein. If you have any questions about details, inquire at your usual Murata sales office or distributor.)

Trimmer Potentiometers

(Global Part Number) **PV** ❶ **Z3** ❷ **A** ❸ **103** ❹ **A01** ❺ **R00** ❻

❶Product ID

Product ID	
PV	Trimmer Potentiometers

❷Series

❸Lead Type /Adjustment Direction

Code	Series	Code	Lead Type/ Adjustment Direction
Z2	2mm Size	**A**	Top
		K	Rear
Z3	3mm Size	**A**	Top
		K	Rear
S3	3mm Size with Stopper Low-profile	**A**	Top
A3	3mm Size	**A**	Top
M4	Closed 4mm Size	**A**	Top
F2	Closed 2mm Size	**A**	Top
G3	Closed 3mm Size	**A**	Top, J-hook
		G	Top, Gull-wing
G5	SMD 11-turns 5 Size	**A**	Top
		H	Side
01	SMD 12-turns	**P**	Side
		W	Top
		X	Side
C6	Single-turn Closed Type 6mm Size	**A**	Top, Triangle
		D	Top, Triangle
		E	Side , Triangle
		G	Side , Triangle
		H	Side , Triangle
		M	Top, Inline
		Q	Side , Inline
32	Single-turn Closed Type 6mm Size	**H**	Top, Triangle
		P	Top, Triangle
		R	Top, Inline
		N	Side , Triangle
		T	Side , Triangle
		S	Side , Triangle
34	Single-turn Closed Type	**F**	Top, Triangle
		P	Top, Triangle
		H	Side , Triangle
		X	Side , Triangle
		W	Side , Inline
12	4-turn Closed Type	**H**	Top, Triangle
		P	Top, Triangle
		T	Side , Triangle
		S	Side , Triangle
22	22-turn Closed Type	**L**	Side
		S	Side , Inline
		Y	Side , Triangle
23	15-turn Closed Type	**P**	Side , Triangle
		Y	Side , Triangle
36	25-turn Closed Type	**W**	Top, Inline
		Y	Top, Triangle
		P	Side , Triangle
		X	Side , Inline
		Z	Side , Triangle
37	12-turn Closed Type	**W**	Top, Triangle
		Y	Top, Inline
		P	Side , Triangle
		X	Side , Triangle
		Z	Side , Inline

❹All Resistance

Expressed by three figures. The unit is ohm. The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

Ex.)

Code	All Resistance
100	100ohm
102	1000ohm
104	100000ohm (=100kohm)

❺Individual Specification Code

Code	Series	Individual Specification Code
A01	—	Standard
B01	**PVZ3**	Heat-resitance Type
B01	**PVM4**	High-liability Type
A31	**PV36/PV37**	Radial Taping
A04	**PVC6**	Radial Taping
A11	**PVF2**	Starndard Type (Resistance Change Characteristics : Lenear)
A41	**PVF2**	Starndard Type (Resistance Change Characteristics : Log curve)
A81	**PVF2**	Starndard Type (Resistance Change Characteristics : Log curve)
A51	**PVF2**	Starndard Type (Resistance Change Characteristics : Log-log curve)
A91	**PVF2**	Starndard Type (Resistance Change Characteristics : Log-log curve)

❻Packaging

Code	Packaging
A00	Ammo Pack
B00	Bulk
M00*	Magazine
R00	Reel

***** M02 for PV01 series

Selection Guide of Trimmer Potentiometers

Start

Mounting Method

Surface Mount

Insertion to PCB

Sealed Construction

What-like Construction?

Open Construction

Sealed Construction

Direction of Adjustment?

Top Adjustment

Side Adjustment

2mm size Single Turn

PVZ2A

PVZ2K

2mm size Single Turn

PVF2

with rotational stop

3mm size Single Turn

PVZ3A

PVZ3K

PVS3

with rotational stop

PVA3

3mm size Single Turn

PVG3A

PVG3G

with rotational stop

4mm size Single Turn

PVM4

with rotational stop

5mm size 11 Turns

PVG5

Single Turn

PVC6A/D/M with rotational stop

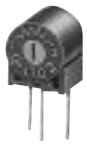
Single Turn

PVC6E/G/H/Q with rotational stop

4 Turns

PV12H/P

4 Turns



PV12T/S

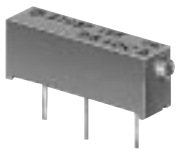
12 Turns

PV37W/Y

12 Turns

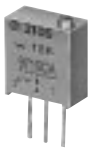
PV37P/X/Z

15 Turns



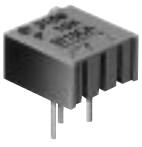
PV23P/Y

25 Turns



PV36W/Y

25 Turns



PV36P/X/Z

Carbon Resistive Element type

Cermet Resistive Element type

Trimmer Potentiometers

Chip Open Type 2mm Size PVZ2 Series

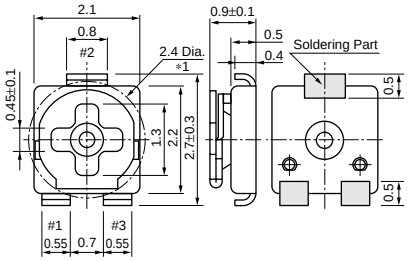
■ Features

1. Ultra-small and thin external dimensions of 2.1(W)x2.7(L)x1.0 max.(T)mm.
2. Au plated termination achieve a high density P.C.B. mounting.
3. Cross-shaped driver slot allows for in-process automatic adjustment and it provides superior adjustability.
4. Two pieces parts construction achieve low cost and excellent quality.
5. Special resin substrate allow high peak temperature for reflow soldering.

■ Applications

1. Pick-up module
2. LCD
3. Cellular-phone
4. PHS
5. Pager
6. DVC
7. Digital camera
8. Portable audio,etc

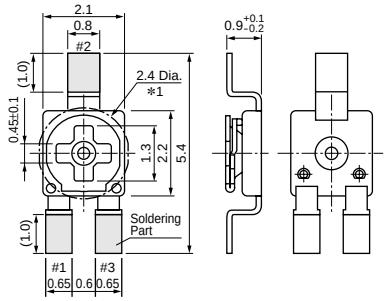
PVZ2A



*1 Driver Plate Rotation Area :
Please do not place any components which height is more than 0.7mm within this area.

in mm
Tolerance : ±0.2

PVZ2K



*1. Driver Plate Rotation Area :
Please do noto place any components which high is more than 0.7mm within this area.

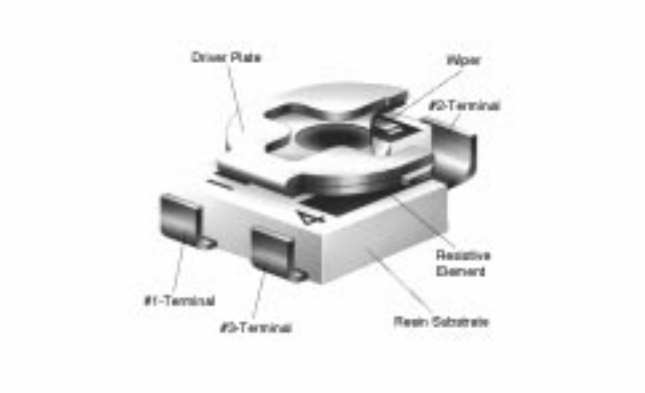
in mm
Tolerance : ±0.2

Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVZ2□501A01	0.1(50°C)	Reflow	1(240°±10°)	500ohm ±30%	±500
PVZ2□102A01	0.1(50°C)	Reflow	1(240°±10°)	1k ohm ±30%	±500
PVZ2□202A01	0.1(50°C)	Reflow	1(240°±10°)	2k ohm ±30%	±500
PVZ2□302A01	0.1(50°C)	Reflow	1(240°±10°)	3k ohm ±30%	±500
PVZ2□502A01	0.1(50°C)	Reflow	1(240°±10°)	5k ohm ±30%	±500
PVZ2□103A01	0.1(50°C)	Reflow	1(240°±10°)	10k ohm ±30%	±500
PVZ2□203A01	0.1(50°C)	Reflow	1(240°±10°)	20k ohm ±30%	±500
PVZ2□303A01	0.1(50°C)	Reflow	1(240°±10°)	30k ohm ±30%	±500
PVZ2□503A01	0.1(50°C)	Reflow	1(240°±10°)	50k ohm ±30%	±500
PVZ2□104A01	0.1(50°C)	Reflow	1(240°±10°)	100k ohm ±30%	±500
PVZ2□204A01	0.1(50°C)	Reflow	1(240°±10°)	200k ohm ±30%	±500
PVZ2□304A01	0.1(50°C)	Reflow	1(240°±10°)	300k ohm ±30%	±500
PVZ2□504A01	0.1(50°C)	Reflow	1(240°±10°)	500k ohm ±30%	±500
PVZ2□105A01	0.1(50°C)	Reflow	1(240°±10°)	1M ohm ±30%	±500

The blank column is filled with the code of adjustment direction A(top) or K(rear).

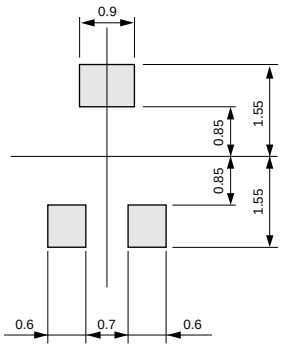
■ Construction

PVZ2A



■ Standard Land Pattern

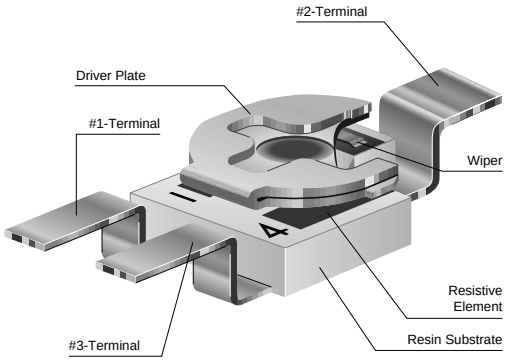
PVZ2A



(in mm Tolerance : ±0.1)

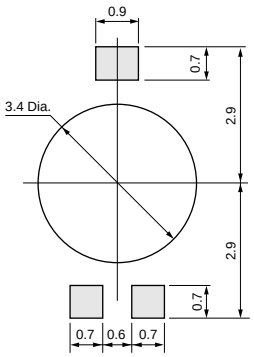
■ Construction

PVZ2K



■ Standard Land Pattern

PVZ2K



(in mm Tolerance : ±0.1)

■ Characteristics

Humidity Exposure	Res. Change : +10, -2%
High Temperature Exposure	Res. Change : R≦100kohm…+2, -10% 100kohm<R…+2, -15%
Humidity Load Life	Res. Change : ±10%
Load Life	Res. Change : R≦100kohm…+2, -10% 100kohm<R…+2, -15%
Temperature Cycle	Res. Change : ±5%
Temperature Coefficient of Resistance	±500ppm/°C
Rotational Life	Res. Change : ±10% (10 cycles)

1

PVZ2 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

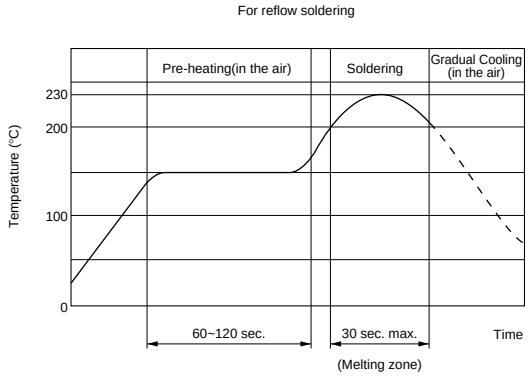
■ Notice (Rating)

1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.

■ Notice (Soldering and Mounting)

1. Soldering
   (1) Reflow soldering and Soldering Iron are available. Can not be soldered using the flow soldering method. If you use the flow soldering method, the trimmer potentiometer may not function.
   (2) Use our standard land dimension. Excessive land area causes displacement due to effect of the surface tension of the solder. Insufficient land area leads to insufficient soldering strength of the chip.
   (3) Standard soldering condition
   (a) Reflow soldering : Refer to the standard temperature profile.
   (b) Soldering iron:
   >Temperature of tip : 260 C. max.
   >Soldering time : 3 sec. max.
   >Diameter : 1mm dia. max.
   Before using other soldering conditions than those listed above, please consult with Murata factory representative prior to using. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer potentiometer may deviate from the specified characteristics.
   (4) Apply the appropriate amount of solder paste. The thickness of solder paste should be printed from 100micro m to 150micro m and the dimension of land pattern should be used Murata's standard land pattern at reflow soldering. Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause the bridging between the terminals.
   (5) The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
2. Mounting
   (1) Do not apply excessive force (preferable 4.9N (Ref.;500gf)max.), when the trimmer potentiometer is mounted to the PCB.
   (2) Do not warp and/or bend PC board to prevent trimmer potentiometer from breakage.
   (3) In chip placers, the recommended size of the cylindrical pick-up nozzle should be outer dimension 1.5mm-1.8mm dia. and inner dimension 1.3mm dia..
3. Cleaning
   (1) In case there is flux on the resistive element, clean sufficiently by cleaning solvents and remove all residual flux perfectly.
   (2) Isopropyl-alcohol and Ethyl-alcohol are applicable solvent for cleaning. If you use any other types of solvents, please consult with Murata factory representative prior to using.

■ Reflow Soldering Standard Profile



■ Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot.We recommend the below screwdriver.
   *Recommended screwdriver for manual adjustment
   Murata P/N : KMDR090
2. Don't apply more than 4.9N(Ref.;500gf) of twist and stress after mounted onto PCB to prevent contact intermittence.If excessive force is applied, the trimmer potentiometer may not function.
3. Please use within the effective rotational angle.
   The potentiometer dose not have a mechanical stop for over rotation. In case out of effective rotational angle, the trimmer potentiometer may not function.
4. When using a lock paint to fix slot position, please consult with Murata factory representative prior to using to prevent corrosion and contact intermittence.

■ Notice (Other)

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Trimmer Potentiometers

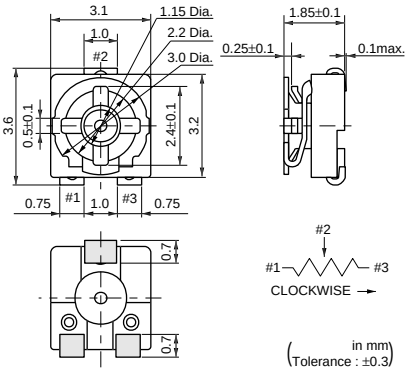
Chip Open Type 3mm Size PVZ3/PVS3/PVA3 Series

PVZ3 Series

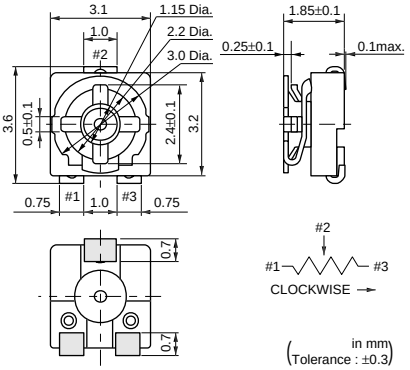
■ Features

1. Excellent solderability characteristics are achieved via special plating techniques on each termination.
2. Specially designed substrate prevents wicking of flux onto the top of the part body.
3. Enlarged bottom termination enhance soldering strength while reducing the nocessary land area required promoting high-density PCB mounting.
4. Funnel shaped adjustment slot allows for in-process automatic adjustment.
5. Flat surface is provided for smooth pick and place. (PVZ3K only)
6. Heat-Resistant type is available.(PVZ3AxxxB01)
7. The standard position of driver plate is adjusted at the center normally, but another position is also available.
8. This product meets Pb-free.

PVZ3A



PVZ3K



■ Applications

1. Optical pick up
2. Cordless telephones
3. CD players
4. FDD
5. Motor
6. CD-ROMs
7. Car stereos
8. TFT-LCD TV sets
9. Headphone stereos

Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVZ3□201A01	0.1(50°C)	Reflow	1(230°±10°)	200ohm ±30%	±500
PVZ3□301A01	0.1(50°C)	Reflow	1(230°±10°)	300ohm ±30%	±500
PVZ3□501A01	0.1(50°C)	Reflow	1(230°±10°)	500ohm ±30%	±500
PVZ3□102A01	0.1(50°C)	Reflow	1(230°±10°)	1k ohm ±30%	±500
PVZ3□202A01	0.1(50°C)	Reflow	1(230°±10°)	2k ohm ±30%	±500
PVZ3□302A01	0.1(50°C)	Reflow	1(230°±10°)	3k ohm ±30%	±500
PVZ3□502A01	0.1(50°C)	Reflow	1(230°±10°)	5k ohm ±30%	±500
PVZ3□103A01	0.1(50°C)	Reflow	1(230°±10°)	10k ohm ±30%	±500
PVZ3□203A01	0.1(50°C)	Reflow	1(230°±10°)	20k ohm ±30%	±500
PVZ3□303A01	0.1(50°C)	Reflow	1(230°±10°)	30k ohm ±30%	±500
PVZ3□503A01	0.1(50°C)	Reflow	1(230°±10°)	50k ohm ±30%	±500
PVZ3□104A01	0.1(50°C)	Reflow	1(230°±10°)	100k ohm ±30%	±500
PVZ3□204A01	0.1(50°C)	Reflow	1(230°±10°)	200k ohm ±30%	±500
PVZ3□304A01	0.1(50°C)	Reflow	1(230°±10°)	300k ohm ±30%	±500
PVZ3□504A01	0.1(50°C)	Reflow	1(230°±10°)	500k ohm ±30%	±500
PVZ3□105A01	0.1(50°C)	Reflow	1(230°±10°)	1M ohm ±30%	±500
PVZ3□205A01	0.1(50°C)	Reflow	1(230°±10°)	2M ohm ±30%	±500
PVZ3□201B01	0.1(50°C)	Reflow	1(230°±10°)	200ohm ±30%	±500
PVZ3□301B01	0.1(50°C)	Reflow	1(230°±10°)	300ohm ±30%	±500
PVZ3□501B01	0.1(50°C)	Reflow	1(230°±10°)	500ohm ±30%	±500
PVZ3□102B01	0.1(50°C)	Reflow	1(230°±10°)	1k ohm ±30%	±500
PVZ3□202B01	0.1(50°C)	Reflow	1(230°±10°)	2k ohm ±30%	±500

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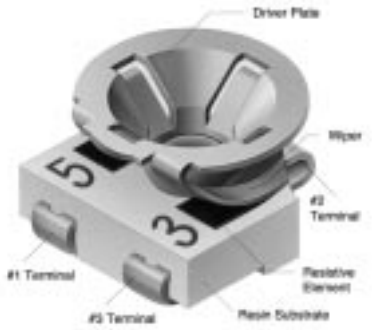
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVZ3□302B01	0.1(50°C)	Reflow	1(230°±10°)	3k ohm ±30%	±500
PVZ3□502B01	0.1(50°C)	Reflow	1(230°±10°)	5k ohm ±30%	±500
PVZ3□103B01	0.1(50°C)	Reflow	1(230°±10°)	10k ohm ±30%	±500
PVZ3□203B01	0.1(50°C)	Reflow	1(230°±10°)	20k ohm ±30%	±500
PVZ3□303B01	0.1(50°C)	Reflow	1(230°±10°)	30k ohm ±30%	±500
PVZ3□503B01	0.1(50°C)	Reflow	1(230°±10°)	50k ohm ±30%	±500
PVZ3□104B01	0.1(50°C)	Reflow	1(230°±10°)	100k ohm ±30%	±500
PVZ3□204B01	0.1(50°C)	Reflow	1(230°±10°)	200k ohm ±30%	±500
PVZ3□304B01	0.1(50°C)	Reflow	1(230°±10°)	300k ohm ±30%	±500
PVZ3□504B01	0.1(50°C)	Reflow	1(230°±10°)	500k ohm ±30%	±500
PVZ3□105B01	0.1(50°C)	Reflow	1(230°±10°)	1M ohm ±30%	±500
PVZ3□205B01	0.1(50°C)	Reflow	1(230°±10°)	2M ohm ±30%	±500

The blank column is filled with the code of adjustment direction A(top) or K(rear).
The last three digits express the individual specification codes. A01 for standard type and B01 for high-resistant type.

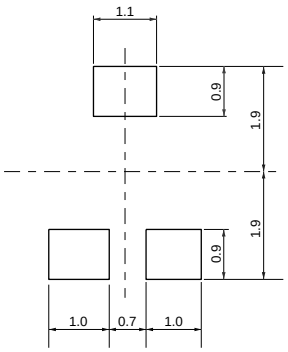
■ Construction

PVZ3A



■ Standard Land Pattern

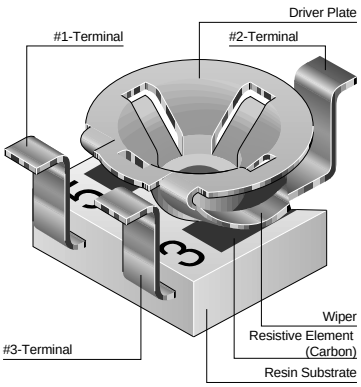
PVZ3A



in mm (Tolerance : ±0.1)

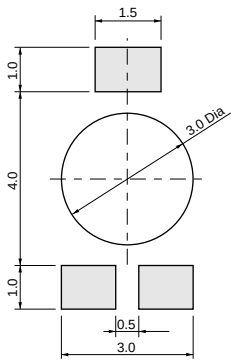
■ Construction

PVZ3K



■ Standard Land Pattern

PVZ3K



in mm (Tolerance : ±0.1)

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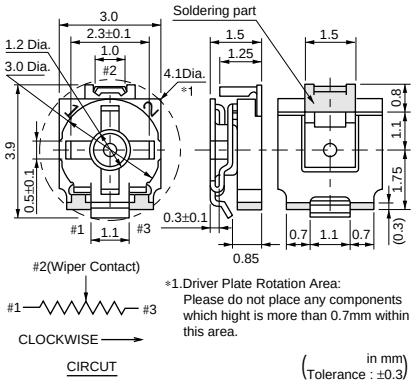
■ Characteristics

Humidity Exposure	Res. Change : +10, -2%
High Temperature Exposure	Res. Change : R≦100kohm…+2, -10% 100kohm<R…+2, -15%
Humidity Load Life	Res. Change : ±10%
Load Life	Res. Change : R≦100kohm…+2, -10% 100kohm<R…+2, -15%
Temperature Cycle	Res. Change : ±5%
Temperature Coefficient of Resistance	±500ppm/°C
Rotational Life	Res. Change : ±10% (10 cycles)

PVS3 Series



■ Features

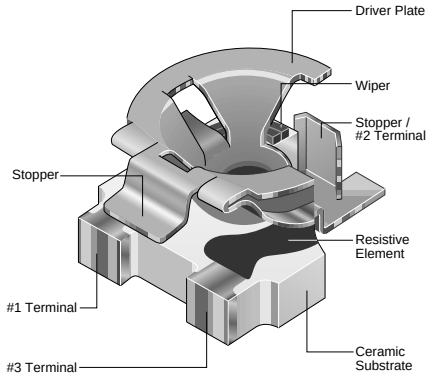
1. Funnel shaped slot allows for in-process automatic adjustment and it provides superior adjustability.
2. 3mm miniature package lead a high density PCB mounting.
3. Plated termination achieve a high resistance to solder leaching.
4. Available for adjusting by screwdrivers on the market.

■ Applications

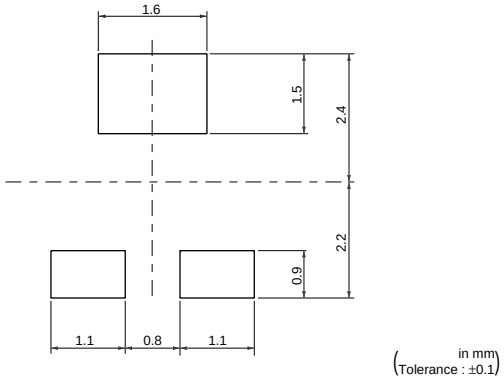
1. Camcorders
2. Video disk players
3. TFT-LCD TV sets
4. Headphone stereos
5. Cordless telephones
6. Micro-motors
7. Optical cameras

Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVS3A101A01	0.1(70°C)	Reflow	1(270°±10°)	100ohm ±25%	±250
PVS3A201A01	0.1(70°C)	Reflow	1(270°±10°)	200ohm ±25%	±250
PVS3A301A01	0.1(70°C)	Reflow	1(270°±10°)	300ohm ±25%	±250
PVS3A501A01	0.1(70°C)	Reflow	1(270°±10°)	500ohm ±25%	±250
PVS3A102A01	0.1(70°C)	Reflow	1(270°±10°)	1k ohm ±25%	±250
PVS3A202A01	0.1(70°C)	Reflow	1(270°±10°)	2k ohm ±25%	±250
PVS3A302A01	0.1(70°C)	Reflow	1(270°±10°)	3k ohm ±25%	±250
PVS3A502A01	0.1(70°C)	Reflow	1(270°±10°)	5k ohm ±25%	±250
PVS3A103A01	0.1(70°C)	Reflow	1(270°±10°)	10k ohm ±25%	±250
PVS3A203A01	0.1(70°C)	Reflow	1(270°±10°)	20k ohm ±25%	±250
PVS3A303A01	0.1(70°C)	Reflow	1(270°±10°)	30k ohm ±25%	±250
PVS3A503A01	0.1(70°C)	Reflow	1(270°±10°)	50k ohm ±25%	±250
PVS3A104A01	0.1(70°C)	Reflow	1(270°±10°)	100k ohm ±25%	±250
PVS3A204A01	0.1(70°C)	Reflow	1(270°±10°)	200k ohm ±25%	±250
PVS3A304A01	0.1(70°C)	Reflow	1(270°±10°)	300k ohm ±25%	±250
PVS3A504A01	0.1(70°C)	Reflow	1(270°±10°)	500k ohm ±25%	±250
PVS3A105A01	0.1(70°C)	Reflow	1(270°±10°)	1M ohm ±25%	±250
PVS3A205A01	0.1(70°C)	Reflow	1(270°±10°)	2M ohm ±25%	±250

■ Construction



■ Standard Land Pattern



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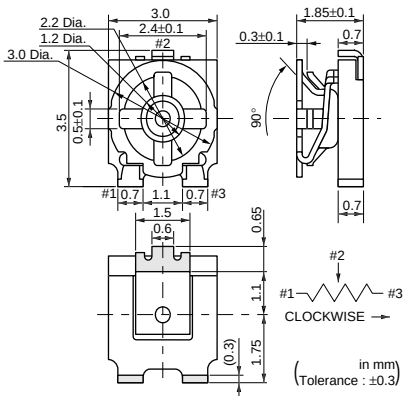
■ Characteristics

Humidity Exposure	Res. Change : ±3%
High Temperature Exposure	Res. Change : ±3%
Humidity Load Life	Res. Change : ±3%
Load Life	Res. Change : ±3%
Temperature Cycle	Res. Change : ±3%
Temperature Coefficient of Resistance	±250ppm/˚C
Rotational Life	Res. Change : ±10% (10 cycles)

PVA3 Series



■ Features

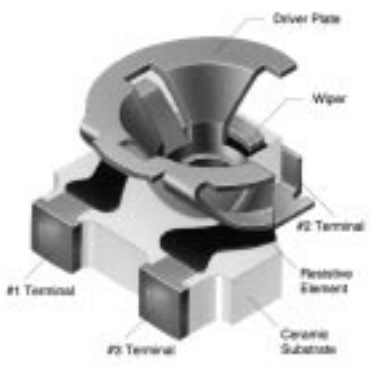
1. Funnel shaped slot allows for in-process automatic adjustment and it provides superior adjustability.
2. 3mm miniature package lead a high density PCB mounting.
3. Plated termination achieve a high resistance to solder leaching.
4. Available for adjusting by screwdrivers on the market.
5. Recommended for both reflow and flow soldering method.(Need cleaning for flow soldering method)

■ Applications

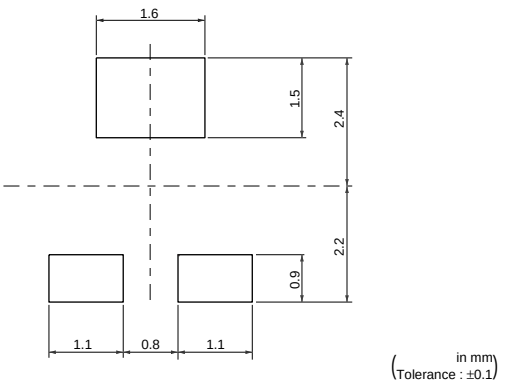
1. Camcorders
2. Video disk players
3. TFT-LCD TV sets
4. Headphone stereos
5. Cordless telephones
6. Micro-motors
7. Optical cameras

Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVA3A101A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	100ohm ±25%	±250
PVA3A201A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	200ohm ±25%	±250
PVA3A301A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	300ohm ±25%	±250
PVA3A501A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	500ohm ±25%	±250
PVA3A102A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	1k ohm ±25%	±250
PVA3A202A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	2k ohm ±25%	±250
PVA3A302A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	3k ohm ±25%	±250
PVA3A502A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	5k ohm ±25%	±250
PVA3A103A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	10k ohm ±25%	±250
PVA3A203A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	20k ohm ±25%	±250
PVA3A303A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	30k ohm ±25%	±250
PVA3A503A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	50k ohm ±25%	±250
PVA3A104A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	100k ohm ±25%	±250
PVA3A204A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	200k ohm ±25%	±250
PVA3A304A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	300k ohm ±25%	±250
PVA3A504A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	500k ohm ±25%	±250
PVA3A105A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	1M ohm ±25%	±250
PVA3A205A01	0.1(70°C)	Flow/Reflow	1(270°±10°)	2M ohm ±25%	±250

■ Construction



■ Standard Land Pattern



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■ Characteristics

Humidity Exposure	Res. Change : ±3%
High Temperature Exposure	Res. Change : ±3%
Humidity Load Life	Res. Change : ±3%
Load Life	Res. Change : ±3%
Temperature Cycle	Res. Change : ±3%
Temperature Coefficient of Resistance	±250ppm/˚C
Rotational Life	Res. Change : ±10% (10 cycles)

PVZ3/PVS3/PVA3 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

■ Notice (Rating)

1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.
4. If the trimmer potentiometer is used in DC and high humidity condition, please connect wiper(#2) for plus and resistive element (#1 or #3) for minus.

■ Notice (Soldering and Mounting)

1. Soldering
   (1) (a)Reflow soldering : Refer to the standard temperature profile.
   (b)Soldering iron:
   *PVZ3xxxA01, PVZ3KxxxA01, PVA3, PVS3 series
   >Temperature of tip : 260deg. C. max.
   >Soldering time : 3 sec. max.
   >Diameter : 1mm dia. max.
   >Wattage of iron : 30W max.
   *PVZ3xxxB01 series
   >Temperature of tip : 310deg. C max.
   >Soldering time : 5 sec. max.
   >Diameter : 1mm dia. max.
   >Wattage of iron : 30W max.
   Before using other soldering conditions than those listed above, please consult with Murata factory representative prior to using. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer potentiometer may deviate from the specified characteristics.
   (2) Flow slodering is available for PVA3 series.
   For PVZ3A, PVZ3K and PVS3, do not use flow soldering method (dipping).
   If you use the flow soldering method, the trimmer potentiometer may not function.
   (3) The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
   (4) Apply the appropriate amount of solder paste.
   The thickness of solder paste should be printed from 150micro m to 200micro m(PVZ3K series should be printed from 100micro m to 150micro m) and the dimension of land pattern should be used Murata's standard land pattern at reflow soldering.
   Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause the bridging between the terminals.
2. Mounting
   (1) Use our standard land dimension. Excessive land area causes displacement due to effect of the surface tension of the solder. Insufficient land area leads to insufficient soldering strength of the chip.
   (2) Do not apply excessive force(preferable 4.9N (Ref.;500gf)max.), when the trimmer potentiometer is mounted to the PCB.
   (3) Do not warp and/or bend PC board to prevent trimmer potentiometer from breakage.
   (4) In chip placers, the recommended size of the cylindrical pick-up nozzle should be outer dimension 2.5-2.8mm dia. and inner dimension 2mm dia..
3. Cleaning
   (1) In case there is flux on the resistive element, clean sufficiently by cleaning solvents and

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PVZ3/PVS3/PVA3 Series Notice

Continued from the preceding page.

remove all residual flux perfectly.

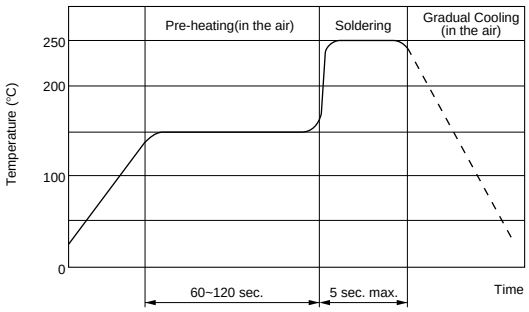
(2) Isopropyl-alcohol and Ethyl-alcohol are applicable solvent for cleaning. If you use any other types of solvents, please consult with Murata factory representative prior to using.

2

■ Flow Soldering Standard Profile

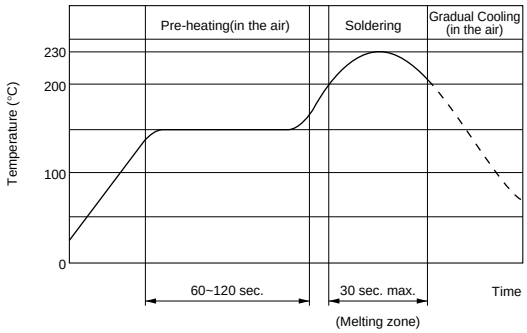
PVA3 Series Only

For flow soldering



■ Reflow Soldering Standard Profile

For reflow soldering



■ Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot. We recommend the below screwdrivers.
   *Recommended screwdriver for manual adjustment
   <PVZ3/PVA3 series>
   VESSEL MFG.:NO.9000+1.7x30
   (Murata P/N : KMDR080)
   <PVZ3/PVS3/PVA3 series>
   TORAY MFG.:SA-2225
   (Murata P/N : KMDR070)
   *Recommended screwdriver for automatic adjustment
   TORAY MFG.:JB-2225
   (Murata P/N : KMBT070)
2. Don't apply more than 4.9N(Ref.;500gf) of twist and stress after mounted onto PCB to prevent contact intermittence.If excessive force is applied, the trimmer potentiometer may not function.
3. For PVZ3 and PVA3series, please use within the effective rotational angle.
   The potentiometer dose not have a mechanical stop for over rotation. In case out of effective rotational angle, the trimmer potentiometer may not function.
4. When using a lock paint to fix slot position, please consult with Murata factory representative prior to using to prevent corrosion and contact intermittence.

■ Notice (Other)

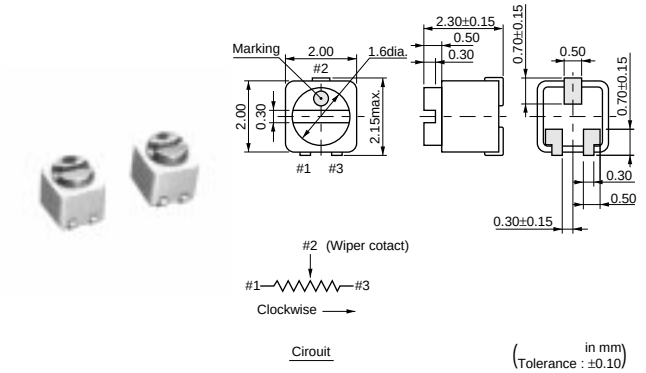
1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Trimmer Potentiometers

Chip Closed Type 2mm Size PVF2 Series

■ Features

1. Ultra-compact size of "2 x 2 x 2.3mm".
2. A sealed structure prevents liquids (water, cleaning liquid, sweat, etc.) from entering.
3. As for the resistance change characteristics, both a log curve type and linear type are available.
4. A rotation service life of 100 cycles is quaranteed.
5. Can be automatically mounted using a chip placer, as well as mounted using reflow soldering.



■ Applications

1. Hearing aids
2. Ultra-compact sensors or the like
3. Applications requiring ultra-compactness, and a sealed structure.

Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVF2A501A11	0.001(50°C)	Reflow	1(210°±10°)	500ohm ±30%	±500
PVF2A102A11	0.001(50°C)	Reflow	1(210°±10°)	1k ohm ±30%	±500
PVF2A202A11	0.001(50°C)	Reflow	1(210°±10°)	2k ohm ±30%	±500
PVF2A502A11	0.001(50°C)	Reflow	1(210°±10°)	5k ohm ±30%	±500
PVF2A103A11	0.001(50°C)	Reflow	1(210°±10°)	10k ohm ±30%	±500
PVF2A203A11	0.001(50°C)	Reflow	1(210°±10°)	20k ohm ±30%	±500
PVF2A503A11	0.001(50°C)	Reflow	1(210°±10°)	50k ohm ±30%	±500
PVF2A104A11	0.001(50°C)	Reflow	1(210°±10°)	100k ohm ±30%	±500
PVF2A204A11	0.001(50°C)	Reflow	1(210°±10°)	200k ohm ±30%	±500
PVF2A504A11	0.001(50°C)	Reflow	1(210°±10°)	500k ohm ±30%	±500
PVF2A105A11	0.001(50°C)	Reflow	1(210°±10°)	1M ohm ±30%	±500
PVF2A102A41	0.001(50°C)	Reflow	1(210°±10°)	1k ohm ±30%	±500
PVF2A202A41	0.001(50°C)	Reflow	1(210°±10°)	2k ohm ±30%	±500
PVF2A502A41	0.001(50°C)	Reflow	1(210°±10°)	5k ohm ±30%	±500
PVF2A103A41	0.001(50°C)	Reflow	1(210°±10°)	10k ohm ±30%	±500
PVF2A203A41	0.001(50°C)	Reflow	1(210°±10°)	20k ohm ±30%	±500
PVF2A503A41	0.001(50°C)	Reflow	1(210°±10°)	50k ohm ±30%	±500
PVF2A104A41	0.001(50°C)	Reflow	1(210°±10°)	100k ohm ±30%	±500
PVF2A204A41	0.001(50°C)	Reflow	1(210°±10°)	200k ohm ±30%	±500
PVF2A504A41	0.001(50°C)	Reflow	1(210°±10°)	500k ohm ±30%	±500
PVF2A102A51	0.001(50°C)	Reflow	1(210°±10°)	1k ohm ±30%	±500
PVF2A202A51	0.001(50°C)	Reflow	1(210°±10°)	2k ohm ±30%	±500
PVF2A502A51	0.001(50°C)	Reflow	1(210°±10°)	5k ohm ±30%	±500
PVF2A103A51	0.001(50°C)	Reflow	1(210°±10°)	10k ohm ±30%	±500
PVF2A203A51	0.001(50°C)	Reflow	1(210°±10°)	20k ohm ±30%	±500
PVF2A503A51	0.001(50°C)	Reflow	1(210°±10°)	50k ohm ±30%	±500
PVF2A104A51	0.001(50°C)	Reflow	1(210°±10°)	100k ohm ±30%	±500
PVF2A204A51	0.001(50°C)	Reflow	1(210°±10°)	200k ohm ±30%	±500
PVF2A504A51	0.001(50°C)	Reflow	1(210°±10°)	500k ohm ±30%	±500
PVF2A102A81	0.001(50°C)	Reflow	1(210°±10°)	1k ohm ±30%	±500
PVF2A202A81	0.001(50°C)	Reflow	1(210°±10°)	2k ohm ±30%	±500
PVF2A502A81	0.001(50°C)	Reflow	1(210°±10°)	5k ohm ±30%	±500
PVF2A103A81	0.001(50°C)	Reflow	1(210°±10°)	10k ohm ±30%	±500
PVF2A203A81	0.001(50°C)	Reflow	1(210°±10°)	20k ohm ±30%	±500

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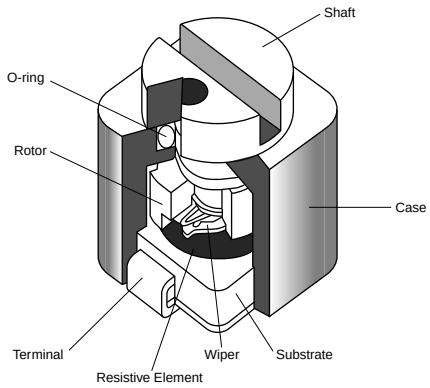
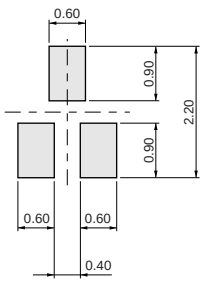
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVF2A503A81	0.001(50°C)	Reflow	1(210°±10°)	50k ohm ±30%	±500
PVF2A104A81	0.001(50°C)	Reflow	1(210°±10°)	100k ohm ±30%	±500
PVF2A204A81	0.001(50°C)	Reflow	1(210°±10°)	200k ohm ±30%	±500
PVF2A504A81	0.001(50°C)	Reflow	1(210°±10°)	500k ohm ±30%	±500
PVF2A102A91	0.001(50°C)	Reflow	1(210°±10°)	1k ohm ±30%	±500
PVF2A202A91	0.001(50°C)	Reflow	1(210°±10°)	2k ohm ±30%	±500
PVF2A502A91	0.001(50°C)	Reflow	1(210°±10°)	5k ohm ±30%	±500
PVF2A103A91	0.001(50°C)	Reflow	1(210°±10°)	10k ohm ±30%	±500
PVF2A203A91	0.001(50°C)	Reflow	1(210°±10°)	20k ohm ±30%	±500
PVF2A503A91	0.001(50°C)	Reflow	1(210°±10°)	50k ohm ±30%	±500
PVF2A104A91	0.001(50°C)	Reflow	1(210°±10°)	100k ohm ±30%	±500
PVF2A204A91	0.001(50°C)	Reflow	1(210°±10°)	200k ohm ±30%	±500
PVF2A504A91	0.001(50°C)	Reflow	1(210°±10°)	500k ohm ±30%	±500

The last three digits express the individual specification codes for Resistant Curve. Please refer to Resistant Curve below for each characteristics.

■ Construction



■ Standard Land Pattern



(in mm Tolerance : ±0.10)

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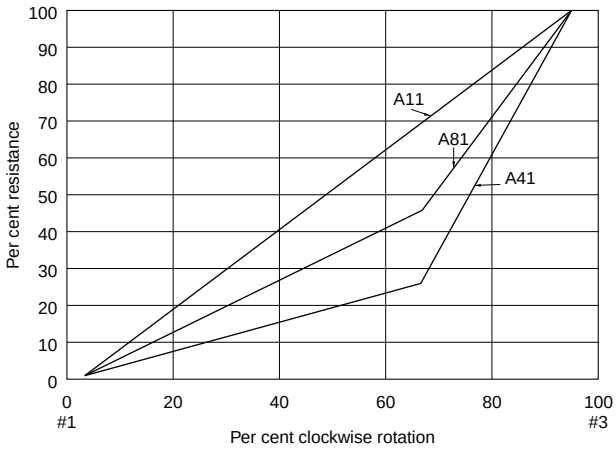
■ Characteristics

Temperature Cycle	ΔTR ±5%
Humidity	ΔTR ±15, -2%
Vibration	ΔV.S.S. ±5%
Shock (100G)	ΔV.S.S. ±5%
Temperature Load Life	ΔTR +2, -10%
Low Tamperature Exposure	ΔTR ±3%
Rotational Life (100 cycles)	ΔTR ±10%

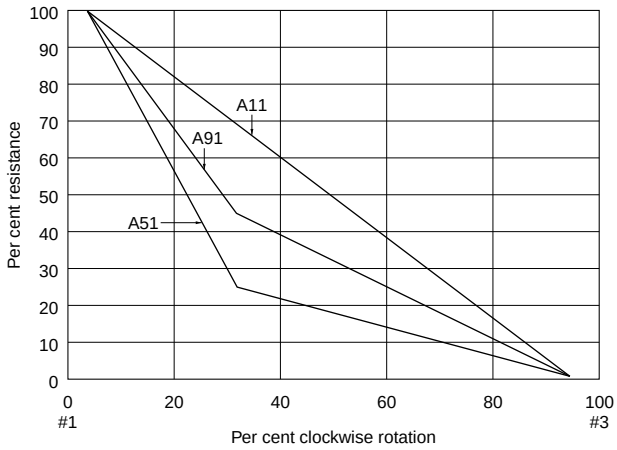
ΔTR: Total Resistance Change
ΔV.S.S. : Voltage Setting Stability

■ Resistance Curve

Linea·log. curve (Measured from terminal 1 to 2)



Linea·log. log. curve (Measured from terminal 2 to 3)



3

PVF2 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

■ Notice (Rating)

1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.
4. If the trimmer potentiometer is used in DC and high humidity condition, please connect wiper(#2) for plus and resistive element (#1 or #3) for minus.

■ Notice (Soldering and Mounting)

1. Soldering
   (1) Standard solder iron condition
   >Temperature of tip : 260 C. max.
   >Soldering time : 3 sec. max.
   >Diameter : 1mm dia. max.
   >Wattage of iron : 30W max.
   Before using other soldering conditions than those listed above, please consult with Murata factory representative prior to using. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer potentiometer may deviate from the specified characteristics.
   (2) Use our standard land dimension. Excessive land area causes displacement due to effect of the surface tension of the solder. Insufficient land area leads to insufficient soldering strength of the chip.
   (3) The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
   (4) Can not be soldered using the flow soldering method. If you use the flow soldering method, the trimmer potentiometer may not function.
2. Mounting
   (1) Use our standard land dimension. Excessive land area causes displacement due to effect of the surface tension of the solder. Insufficient land area leads to insufficient soldering strength of the chip.
   (2) Do not apply excessive force (preferable 4.9N (Ref.;500gf)max.), when the trimmer potentiometer is mounted to the PCB.
   (3) Do not warp and/or bend PC board to prevent trimmer potentiometer from breakage.
3. Cleaning
   (1)Isopropyl-alcohol and Ethyl-alcohol are applicable solvent for cleaning. If you use any other types of solvents, please consult with Murata factory representative prior to using.
   (2)The total cleaning time by cold dipping, vaper and ultrasonic washing (conditions as below) method shall be less than 3 minutes.
   (3)For ultra-sonic cleaning, the available condition is as follows.
   >Power : 600W(67liter) max.
   >Frequency : 28kHz
   >Temperature : Ambient temperature
   Due to the ultra-sonic cleaning equipment peculiar self resonance point and the cleaning compatibility usually depends on the jig construction and/or the cleaning condition such as the depth of immersion, please check the cleaning equipment to determine the suitable conditions.
   If the trimmer potentiometer is cleaned by other conditions,the trimmer potentiometer may be

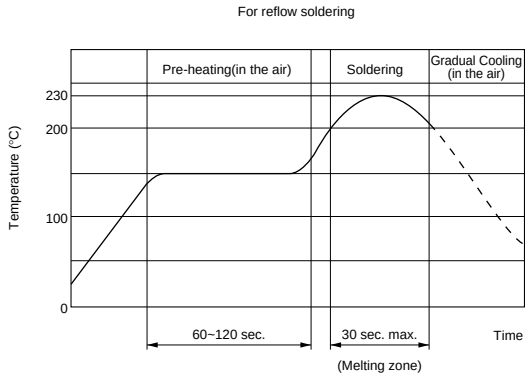
Continued on the following page.

PVF2 Series Notice

Continued from the preceding page.

damaged.

■ Reflow Soldering Standard Profile



■ Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot.We recommend the below screwdriver.
   *Recommended screwdriver for manual adjustment
   Murata P/N : KMDR140
   We can supply above screwdrivers.
   If you place order, please nominate Murata P/N.
2. Don't apply more than 4.9N(Ref.;500gf) of twist and stress after mounted onto PCB to prevent contact intermittence. If excessive force is applied, the trimmer potentiometer may not function.
3. The rotational torque at the position of the adjustment range should not exceed the stop strength.
4. When using a lock paint to fix slot position, please use adhesive resin without chlorine or sulfur (Three-bond "1401series").

■ Notice (Other)

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Trimmer Potentiometers

Chip Closed Type 3mm Size PVG3 Series

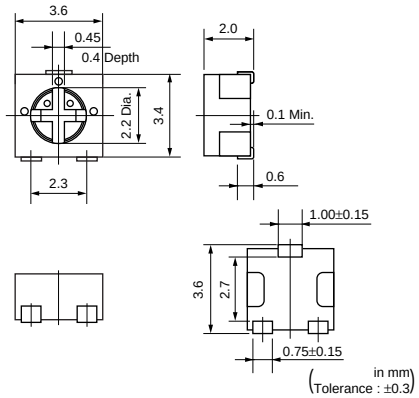
■ Features

1. Sealed construction protects the internal from dust and liquid, which achieves stable performance.
2. Driver plate with cross-slot is suitable for automatic adjustment.
3. Rotor with large diameter and deep groove improves driver insertion.
4. Regarding the terminal shape, both J-lead and gull wing type are available as standard ones.
5. 3mm and 4mm land pattern can be used without change. (Gull wing is suitable for 4mm size land pattern.)
6. Heat resistance performance enables high temperature peak re-flow soldering.
7. The lead terminals are plated with Sn, which achieves Pb free.

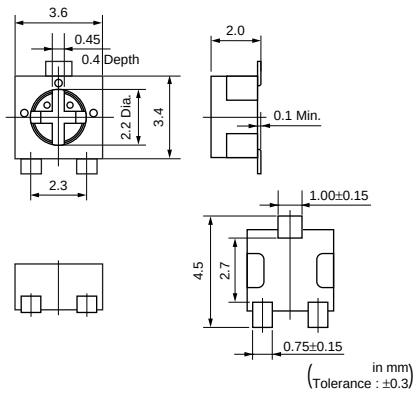
■ Applications

1. Small sensors
2. Optical Transceiver Module
3. Copier
4. Printer
5. Compact Power Supply
6. Wireless Radio module

PVG3A



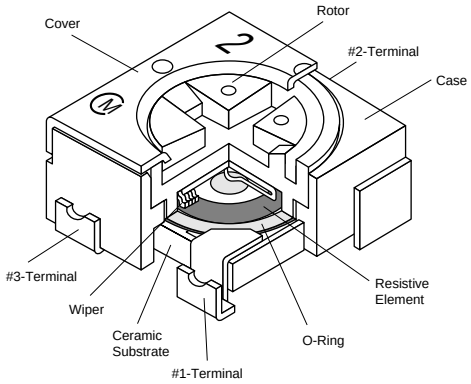
PVG3G



Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVG3□100A01	0.25(70°C)	Reflow	1(210°±10°)	10ohm ±20%	±250
PVG3□200A01	0.25(70°C)	Reflow	1(210°±10)	20ohm ±20%	±100
PVG3□500A01	0.25(70°C)	Reflow	1(210°±10°)	50ohm ±20%	±100
PVG3□101A01	0.25(70°C)	Reflow	1(210°±10°)	100ohm ±20%	±100
PVG3□201A01	0.25(70°C)	Reflow	1(210°±10°)	200ohm ±20%	±100
PVG3□501A01	0.25(70°C)	Reflow	1(210°±10°)	500ohm ±20%	±100
PVG3□102A01	0.25(70°C)	Reflow	1(210°±10°)	1k ohm ±20%	±100
PVG3□202A01	0.25(70°C)	Reflow	1(210°±10°)	2k ohm ±20%	±100
PVG3□502A01	0.25(70°C)	Reflow	1(210°±10°)	5k ohm ±20%	±100
PVG3□103A01	0.25(70°C)	Reflow	1(210°±10°)	10k ohm ±20%	±100
PVG3□203A01	0.25(70°C)	Reflow	1(210°±10°)	20k ohm ±20%	±100
PVG3□503A01	0.25(70°C)	Reflow	1(210°±10°)	50k ohm ±20%	±100
PVG3□104A01	0.25(70°C)	Reflow	1(210°±10°)	100k ohm ±20%	±100
PVG3□204A01	0.25(70°C)	Reflow	1(210°±10°)	200k ohm ±20%	±100
PVG3□504A01	0.25(70°C)	Reflow	1(210°±10°)	500k ohm ±20%	±100
PVG3□105A01	0.25(70°C)	Reflow	1(210°±10°)	1M ohm ±20%	±100
PVG3□205A01	0.25(70°C)	Reflow	1(210°±10°)	2M ohm ±20%	±100

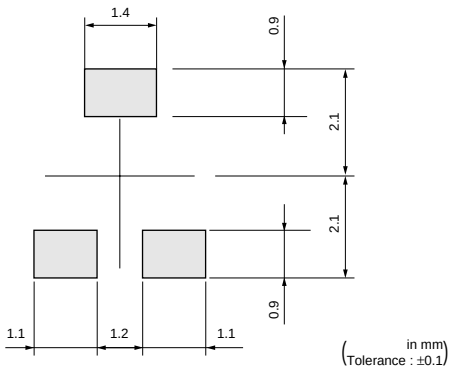
The blank column is filled with the code of adjustment direction and lead type A(top, J-hook) or G(top, gull-wing).

■ Construction

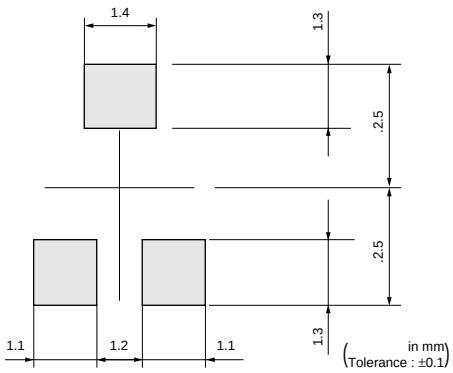


■ Standard Land Pattern

PVG3A



PVG3G



■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S	±1%
Humidity	ΔTR	±2%
	ΔV.S.S	±1%
	IR	10Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S	±1%
Temperature Load Life	ΔTR	±3% or 3ohm max., whichever is greater
	ΔV.S.S	±1%
Low Temperature Exposure	ΔTR	±2%
	ΔV.S.S	±2%
High Temperature Exposure	ΔTR	±3%
	ΔV.S.S	±2%
Rotational Life (100cycles)	ΔTR	±3% or 3ohm max., whichever is greater

ΔTR : Total Resistance Change
ΔV.S.S : Voltage Setting Stability
IR : Insulation ResistanceR

4

PVG3 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

■ Notice (Rating)

1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.

■ Notice (Soldering and Mounting)

1. Soldering
   (1) Standard soldering condition
   (a) Reflow soldering : Refer to the standard temperature profile.
   (b) Soldering iron
   >Temperature of tip : 260 C. max.
   >Soldering time : 3 sec. max.
   >Diameter of tip : 2mm dia. max.
   >Wattage of iron : 30W max.
   Before using other soldering conditions more than those listed above, please consult with Murata factory representative prior to using.
   If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer potentiometer may deviate from the specified characteristics.
   (2) Can not be soldered using the flow soldering method. If you use the flow soldering method, the trimmer potentiometer may not function.
   (3) The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
   (4) Apply the appropriate amount of solder paste. If the amount of solder paste applied to the land is insufficient, the required adhesive strength cannot be obtained. If an excessive amount of solder paste is applied, solder bridging or flux overflow to the resistive element surface can occur.
2. Mounting
   (1) Use our standard land dimension. Excessive land area causes displacement due to effect of the surface tension of the solder. Insufficient land area leads to insufficient soldering strength of the chip.
   (2) Do not apply excessive force(preferable 4.9N (Ref.;500gf)max.), when the trimmer potentiometer is mounted to the PCB.
   (3) Do not warp and/or bend PC board to prevent trimmer potentiometer from breakage.
   (4) In chip placers, the size of the cylindrical pick-up nozzle should be outer dimension 2.5-2.8mm dia. and inner dimension 2.0-2.5mm dia..
3. Cleaning
   (1) Isopropyl-alcohol and Ethyl-alcohol are applicable solvent for cleaning. If you use any other types of solvents, please consult with Murata factory representative prior to using.
   (2) Less than 3 minutes of total cleaning time by dipping, vapor and ultra-sonic method.
   (3) In case of ultra-sonic cleaning method, cleaning condition should be as follows.
   (a)Power : 600W(67lit.) max.
   (b)Frequency : 28kHz
   (c)Temperature : Ambient temperature
   Due to ultra-sonic cleaning equipment peculiar self resonance point and cleaning compatibility usually depends on the jig construction and/or the cleaning condition such as the depth of immersion, please check the cleaning equipment to determine the suitable conditions.
   If the condition is not suitable, the trimmer potentiometer may deviate from specified

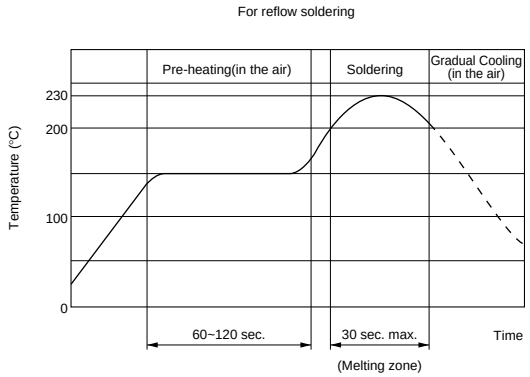
Continued on the following page.

PVG3 Series Notice

Continued from the preceding page.

characteristics.

■ Reflow Soldering Standard Profile



■ Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot.
   *Recommended screwdriver for manual adjustment
   TORAY INDUSTRIES,INC. : SA-2225
   (Murata P/N : KMDR070)
   *Recommended screwdriver bit for automatic adjustment
   TORAY INDUSTRIES,INC. : JB-2225
   (Mutata P/N : KMBT070)
   We can supply above screwdrivers.
   If you place order, please nominate Murata P/N.
2. Don't apply more than 9.8N(Ref.;1kgf) of twist and stress after mounted onto PCB to prevent contact intermittence.
3. When adjusting with an adjustment tool, the applied force to the adjustment screw should not exceed 4.9N (Ref.;500gf). If excessive force is applied, the trimmer potentiometer may not function due to damage.
4. When using a lock paint to fix slot position, please use adhesive resin without chlorine or sulfur (Three-bond "1401series").

■ Notice (Other)

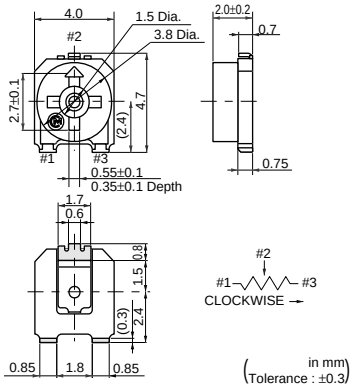
1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Trimmer Potentiometers

Chip Closed Type 4mm Size PVM4 Series

■ Fetures

1. Available for flow and reflow soldering method while maintaining unique sealed construction.
2. Simple construction by 3 piece parts achieve high reliability.
3. Available for cleaning after soldering.
4. Plated termination achieve a high resistance to solder leaching.
5. High grade version is available (PVM4AxxxB01).



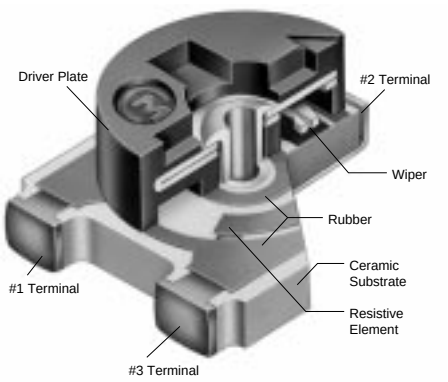
■ Applications

1. FDDs
2. HDDs
3. Measuring equipments
4. Encorders
5. Professional use cameras

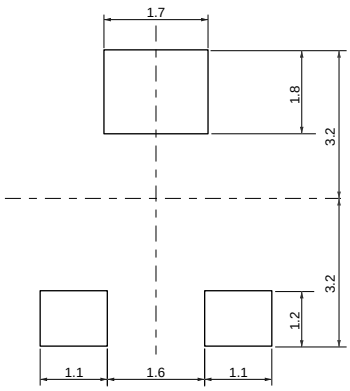
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVM4A201A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	200ohm ±25%	±250
PVM4A301A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	300ohm ±25%	±250
PVM4A501A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	500ohm ±25%	±250
PVM4A102A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	1k ohm ±25%	±250
PVM4A202A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	2k ohm ±25%	±250
PVM4A302A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	3k ohm ±25%	±250
PVM4A502A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	5k ohm ±25%	±250
PVM4A103A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	10k ohm ±25%	±250
PVM4A203A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	20k ohm ±25%	±250
PVM4A303A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	30k ohm ±25%	±250
PVM4A503A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	50k ohm ±25%	±250
PVM4A104A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	100k ohm ±25%	±250
PVM4A204A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	200k ohm ±25%	±250
PVM4A304A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	300k ohm ±25%	±250
PVM4A504A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	500k ohm ±25%	±250
PVM4A105A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	1M ohm ±25%	±250
PVM4A205A01	0.1(70°C)	Flow/Reflow	1(240°±10°)	2M ohm ±25%	±250
PVM4A101B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	100ohm ±20%	±150
PVM4A201B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	200ohm ±20%	±100
PVM4A301B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	300ohm ±20%	±100
PVM4A501B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	500ohm ±20%	±100
PVM4A102B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	1k ohm ±20%	±100
PVM4A202B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	2k ohm ±20%	±100
PVM4A302B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	3k ohm ±20%	±100
PVM4A502B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	5k ohm ±20%	±100
PVM4A103B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	10k ohm ±20%	±100
PVM4A203B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	20k ohm ±20%	±100
PVM4A303B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	30k ohm ±20%	±100
PVM4A503B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	50k ohm ±20%	±100
PVM4A104B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	100k ohm ±20%	±150
PVM4A204B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	200k ohm ±20%	±150
PVM4A304B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	300k ohm ±20%	±150
PVM4A504B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	500k ohm ±20%	±150
PVM4A105B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	1M ohm ±20%	±150
PVM4A205B01	0.25(70°C)	Flow/Reflow	1(240°±10°)	2M ohm ±20%	±150

The last three digits express the individual specification codes. A01 for standard type and B01 for high-liability type.

■ Construction



■ Standard Land Dimension



(in mm Tolerance : ±0.1)

■ Characteristics

Item	**PVM4A01□□□A01**	**PVM4A01□□□B01**
Humidity Exposure	Res. Change : ±3%	Res. Change : ±2%
High Temperature Exposure	Res. Change : ±3%	Res. Change : ±2%
Humidity Load Life	Res. Change : ±3%	Res. Change : ±3%
Temperature Load Life	Res. Change : ±3%	Res. Change : ±3%
Temperature Cycle	Res. Change : ±3%	Res. Change : ±2%
Rotational Life	Res. Change : ±10% (20 cycles)	Res. Change : ±5% (100 cycles)

PVM4 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

■ Notice (Rating)

1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.

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■ Notice (Soldering and Mounting)

1. Soldering
   (1) Can be soldered by reflow soldering method, flow soldering method, and soldering iron.(Incase of flow soldering, it is necessary to clean after soldering.)
   (2) Use our standard land dimension. Excessive land area causes displacement due to effect of the surface tension of the solder. Insufficient land area leads to insufficient soldering strength of the chip.
   (3) Standard soldering condition
   (a) Reflow and flow soldering : Refer to the standard temperature profile.
   (b) Soldering iron:
   >Temperature of tip : 260 C. max.
   >Soldering time : 3 sec. max.
   >Diameter : 2mm dia. max.
   Before using other soldering conditions than those listed above, please consult with Murata factory representative prior to using. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer potentiometer may deviate from the specified characteristics.
   (4) Apply the appropriate amount of solder paste. The thickness of solder paste should be printed from 100micro m to 150micro m and the dimension of land pattern should be used Murata's standard land pattern at reflow soldering. Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause the bridging between the terminals.
   (5) The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
2. Mounting
   (1) Do not apply excessive force (preferable 9.8N (Ref.;1kgf)max.), when the trimmer potentiometer is mounted to the PCB.
   (2) Do not warp and/or bend PC board to prevent trimmer potentiometer from breakage.
   (3) In chip placers, the recommended size of the cylindrical pick-up nozzle should be outer dimension 4.0mm dia. and inner dimension 2.0mm dia..
3. Cleaning
   (1) Isopropyl alcohol and Ethyl alcohol are available material for cleaning.
   For other materials, please consult with Murata factory representative prior to using.
   (2) The total cleaning time by cold dipping method shall be less than 5 minutes.
   The total cleaning time by hot dipping method shall be less than 2 minutes.
   The total cleaning time by ultrasonic washing (conditions as below) method shall be less than 1 minutes.
   In case of the mixed conditions with hot dipping and ultrasonic washing, the cleaning time by hot dipping shall be less than 1 minutes and the cleaning time by ultrasonic washing shall be less than 1 minutes. In case of the mixed conditions

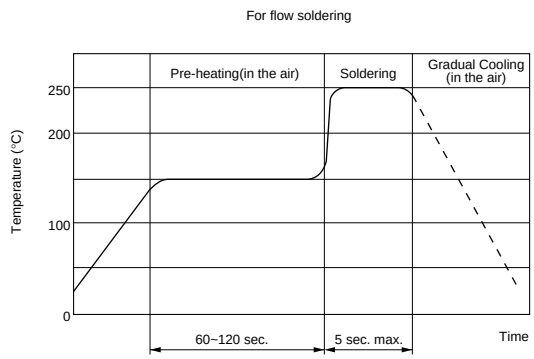
Continued on the following page.

PVM4 Series Notice

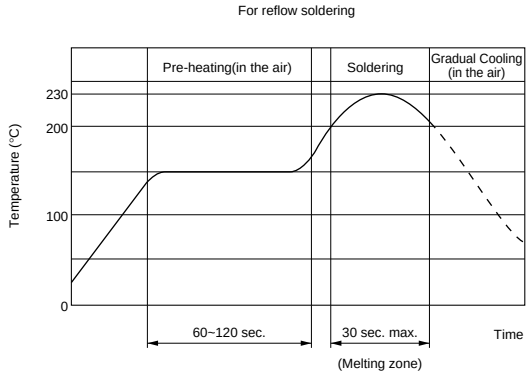
Continued from the preceding page.

with hot dipping, ultrasonic washing and vaper, the cleaning time by hot dipping shall be less than 1 minutes, the cleaning time by ultrasonic washing shall be less than 30 seconds and the cleaning time by vaper shall be less than 30 seconds. If the trimmer potentiometer is cleaned by other conditions, the sealing construction may be damaged.
Due to the ultra-sonic cleaning equipment peculiar self resonance point and the cleaning compatibility usually depends on the jig construction and/or the cleaning condition such as the depth of immersion, please check the cleaning equipment to determine the suitable conditions. If the trimmer potentiometer is cleaned by other conditions,the trimmer potentiometer may be damaged.

■ Flow Soldering Standard Profile



■ Reflow Soldering Standard Profile



5

■ Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot. We recommend the below screwdriver.
   *Recommended screwdriver for manual adjustment
   VESSEL MFG.:NO.9000-2.6x30
   (Murata P/N : KMDR120)
   We can supply above screwdrivers. If you place order, please nominate Murata P/N.
2. Don't apply more than 4.9N(Ref.;500gf) of twist and stress after mounted onto PCB to prevent contact intermittence. If excessive force is applied, the trimmer potentiometer may not function.
3. Please use within the effective rotational angle. The potentiometer dose not have a mechanical stop for over rotation. In case out of effective rotational angle, the trimmer potentiometer may not function.
4. When using a lock paint to fix slot position, please use adhesive resin without chlorine or sulfur (Three-bond "1401series").

■ Notice (Other)

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Trimmer Potentiometers

Chip Closed Type Multi-turn Type PVG5/PV01 Series

PVG5 Series

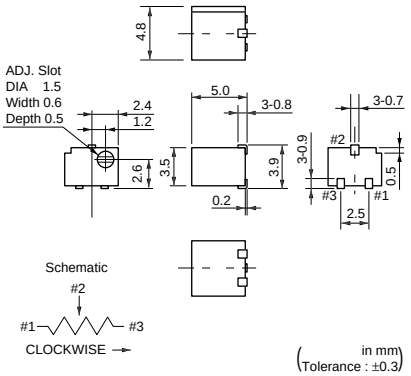
■ Features

1. High resolution resulting from 11-turns design enables precise adjustment.
2. 5mm miniature size lead a high density PCB mounting.
3. Compatible with VPS reflow soldering method.
4. Compatible with ultrasonic cleaning.
5. Clutch mechanism prevents excessive wiper rotation.

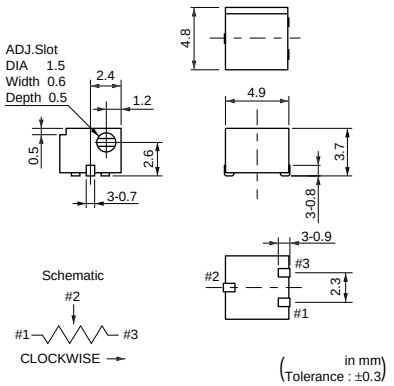
■ Applications

1. Measuring instruments
2. Sensors
3. CPUs
4. Industrial machines

PVG5A



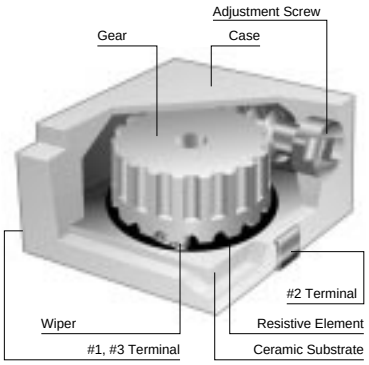
PVG5H



Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVG5□100A01	0.25(70°C)	Reflow	11	10ohm ±10%	±200
PVG5□200A01	0.25(70°C)	Reflow	11	20ohm ±10%	±200
PVG5□500A01	0.25(70°C)	Reflow	11	50ohm ±10%	±200
PVG5□101A01	0.25(70°C)	Reflow	11	100ohm ±10%	±200
PVG5□201A01	0.25(70°C)	Reflow	11	200ohm ±10%	±100
PVG5□501A01	0.25(70°C)	Reflow	11	500ohm ±10%	±100
PVG5□102A01	0.25(70°C)	Reflow	11	1k ohm ±10%	±100
PVG5□202A01	0.25(70°C)	Reflow	11	2k ohm ±10%	±100
PVG5□502A01	0.25(70°C)	Reflow	11	5k ohm ±10%	±100
PVG5□103A01	0.25(70°C)	Reflow	11	10k ohm ±10%	±100
PVG5□203A01	0.25(70°C)	Reflow	11	20k ohm ±10%	±100
PVG5□253A01	0.25(70°C)	Reflow	11	25k ohm ±10%	±100
PVG5□503A01	0.25(70°C)	Reflow	11	50k ohm ±10%	±100
PVG5□104A01	0.25(70°C)	Reflow	11	100k ohm ±10%	±100
PVG5□204A01	0.25(70°C)	Reflow	11	200k ohm ±10%	±100
PVG5□254A01	0.25(70°C)	Reflow	11	250k ohm ±10%	±100
PVG5□504A01	0.25(70°C)	Reflow	11	500k ohm ±10%	±100
PVG5□105A01	0.25(70°C)	Reflow	11	1M ohm ±10%	±100
PVG5□205A01	0.25(70°C)	Reflow	11	2M ohm ±10%	±100

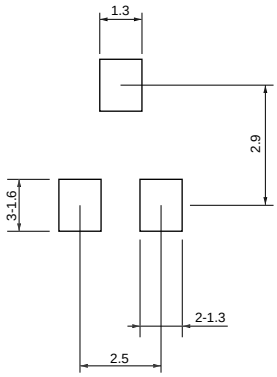
The blank column is filled with the code of adjustment direction A(top) or H(side).

■ Construction



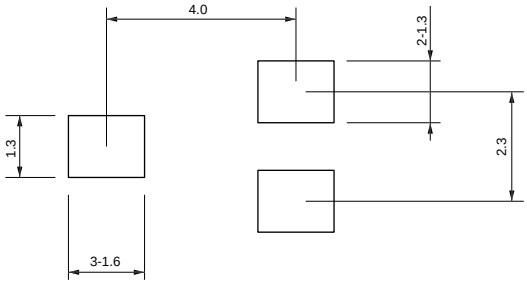
■ Standard Land Pattern

PVG5A



(in mm Tolerance : ±0.1)

PVG5H



(in mm Tolerance : ±0.1)

■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	10Mohm min.
Vibration	ΔTR	±1%
	ΔV.S.S.	±1%
Shock	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±3% or 3ohm max., whichever is greater
	ΔV.S.S.	±1%
Low Tamperature Exposure	ΔTR	±1%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (100 cycles)	ΔTR	±3% or 3ohm max., whichever is greater

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

6

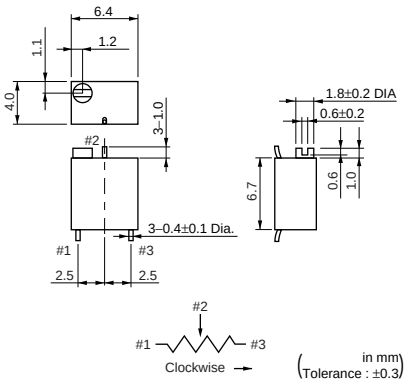
PV01 Series

■ Features

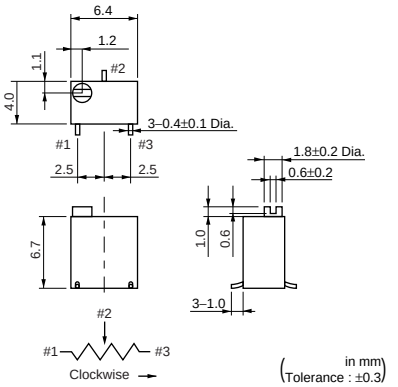
1. High resolution, resulting from 12-turns design enables precise adjustment.
2. Compatible with VPS reflow soldering method.
3. Small size (6.35x6.35x4.3mm).
4. Compatible with ultrasonic cleaning.
5. Clutch mechanism prevents excessive wiper rotation.

■ Applications

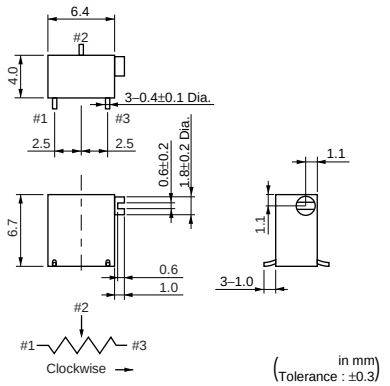
1. Measuring instruments
2. Facsimile machines
3. CPUs
4. PPCs
5. Printers
6. Sensors



PV01P



PV01W



PV01X

Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV01□100A01	0.25(85°C)	Reflow	12	10ohm ±10%	±100
PV01□200A01	0.25(85°C)	Reflow	12	20ohm ±10%	±100
PV01□500A01	0.25(85°C)	Reflow	12	50ohm ±10%	±100
PV01□101A01	0.25(85°C)	Reflow	12	100ohm ±10%	±100
PV01□201A01	0.25(85°C)	Reflow	12	200ohm ±10%	±100
PV01□501A01	0.25(85°C)	Reflow	12	500ohm ±10%	±100
PV01□102A01	0.25(85°C)	Reflow	12	1k ohm ±10%	±100
PV01□202A01	0.25(85°C)	Reflow	12	2k ohm ±10%	±100
PV01□502A01	0.25(85°C)	Reflow	12	5k ohm ±10%	±100
PV01□103A01	0.25(85°C)	Reflow	12	10k ohm ±10%	±100
PV01□203A01	0.25(85°C)	Reflow	12	20k ohm ±10%	±100
PV01□253A01	0.25(85°C)	Reflow	12	25k ohm ±10%	±100
PV01□503A01	0.25(85°C)	Reflow	12	50k ohm ±10%	±100
PV01□104A01	0.25(85°C)	Reflow	12	100k ohm ±10%	±100
PV01□204A01	0.25(85°C)	Reflow	12	200k ohm ±10%	±100
PV01□254A01	0.25(85°C)	Reflow	12	250k ohm ±10%	±100

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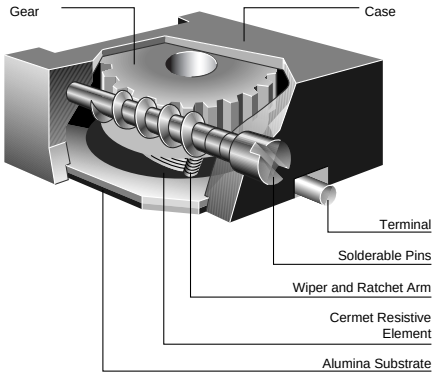
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV01□504A01	0.25(85°C)	Reflow	12	500k ohm ±10%	±100
PV01□105A01	0.25(85°C)	Reflow	12	1M ohm ±10%	±100

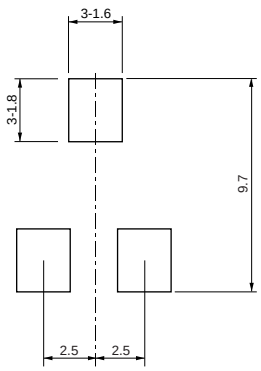
The blank column is filled with the code of adjustment direction P(side), W(top) or X(rear).
Magazine packaging is standard for PV01 series.

■ Construction



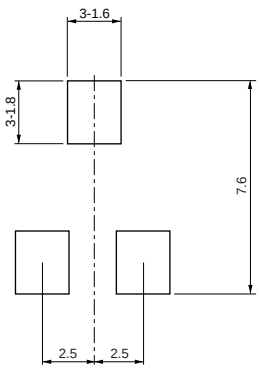
■ Standard Land Dimension

PV01P



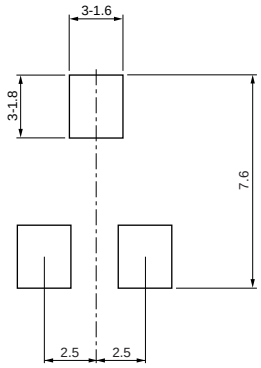
(in mm, Tolerance : ±0.1)

PV01W



(in mm, Tolerance : ±0.1)

PV01X



(in mm, Tolerance : ±0.1)

Continued on the following page.

Continued from the preceding page.

■ Characteristics

Temperature Cycle	ΔTR	±1%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±2%
	ΔV.S.S.	±2%
Low Tamperature Exposure	ΔTR	±1%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±2%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

6

PVG5/PV01 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

■ Notice (Rating)

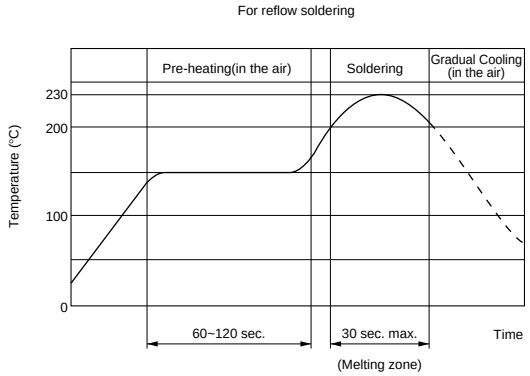
1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.

■ Notice (Soldering and Mounting)

1. Soldering
   (1) Standard soldering condition
   (a) Reflow and flow soldering :
   Refer to the standard temperature profile.
   (b) Soldering iron :
   >Temperature of tip : 260 C. max.
   >Soldering time : 3 sec. max.
   >Diameter : 2mm dia. max.
   >Wattage of iron : 30W max.
   Before using other soldering conditions than those listed above, please consult with Murata factory representative prior to using. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer capacitor may deviate from the specified characteristics.
   (2) Can not be soldered using the flow soldering method. If you use the flow soldering method, the trimmer potentiometer may not function.
   (3) The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
   (4) Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause the bridging between the terminals.
2. Mounting
   (1) Use our standard land dimension. Excessive land area causes displacement due to effect of the surface tension of the solder. Insufficient land area leads to insufficient soldering strength of the chip.
   (2) Do not apply excessive force (preferable 9.8N (Ref.;1kgf)max.), when the trimmer potentiometer is mounted to the PCB.
   (3) Do not warp and/or bend PC board to prevent trimmer potentiometer from breakage.
   (4) In chip placers, the recommended size of the cylindrical pick-up nozzle should be outer dimension 4.0mm dia. and inner dimension 2.0mm dia..
3. Cleaning
   (1) Isopropyl-alcohol and Ethyl-alcohol are applicable solvent for cleaning. If you use any other types of solvents, please consult with Murata factory representative prior to using.
   (2) The total cleaning time by cold dipping, vaper and ultrasonic washing (conditions as below) method shall be less than 3 minutes.
   (3) For ultra-sonic cleaning, the available condition is as follows.
   >Power : 600W(67liter) max.
   >Frequency : 28kHz
   >Temperature : Ambient temperature
   Due to the ultra-sonic cleaning equipment peculiar self resonance point and the cleaning compatibility usually depends on the jig construction and/or the cleaning condition such as the depth of immersion, please check the cleaning equipment to determine the suitable conditions.
   If the trimmer potentiometer is cleaned by other conditions,the trimmer potentiometer may be damaged.

PVG5/PV01 Series Notice

■ Reflow Soldering Standard Profile



■ Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot. We recommend the below screwdrivers.
   *Recommended screwdriver for manual adjustment
   <PVG5 series>
   VESSEL MFG. : NO.9000-1.3x30
   (Murata P/N : KMDR130)
   <PV01 series>
   VESSEL MFG. : NO.9000-1.8x30
   (Murata P/N : KMDR110)
   We can supply above screwdrivers.
   If you place order, please nominate Murata P/N.
2. Don't apply more than 9.8N(Ref.;1kgf) of twist and stress after mounted onto PCB to prevent contact intermittence. If excessive force is applied, the trimmer potentiometer may not function.
3. When adjusting with a screwdriver, do not apply excessive force(preferable 4.9N(Ref;500gf) max.)
4. When using a lock paint to fix slot position, please use adhesive resin without chlorine or sulfur (Three-bond "1401series").

■ Notice (Other)

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Trimmer Potentiometers

Lead Closed Single-turn Type PVC6/PV32/PV34 Series

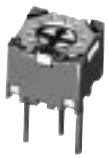
PVC6 Series

■ Features

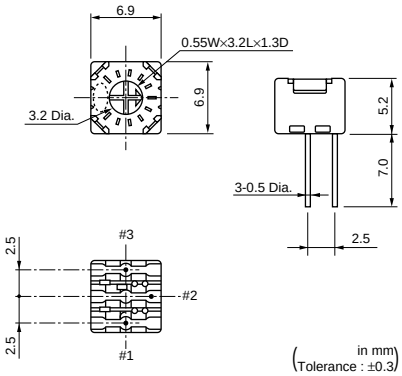
1. Enlarged rotor provides superior adjustability.
2. 11-scales are easy to see adjustment position.
3. Colored rotor provides superior adjustability.
4. Funnel shaped rotor allows for in-process automatic adjustment and it provides superior adjustability.
5. Available for "Zero" plus adjustment tool using.
6. Available for ultrasonic cleaning after soldering.

■ Applications

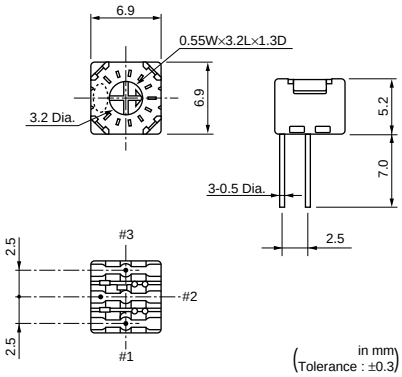
1. DY
2. CRT display
3. Professional cameras
4. CATV
5. FAX
6. Power supply
7. Printers
8. Sensors
9. Industrial machines

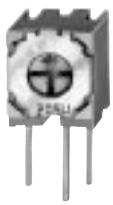


PVC6A

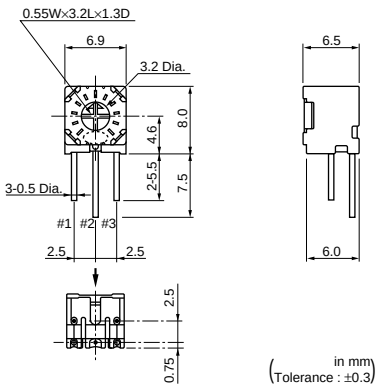


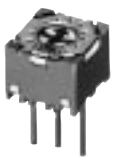
PVC6D



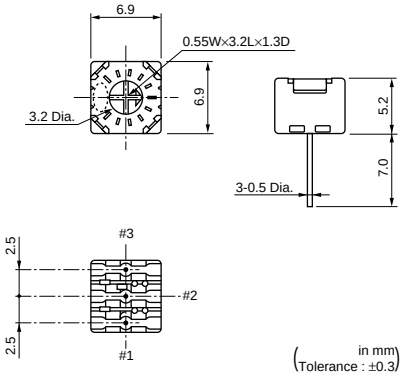


PVC6E

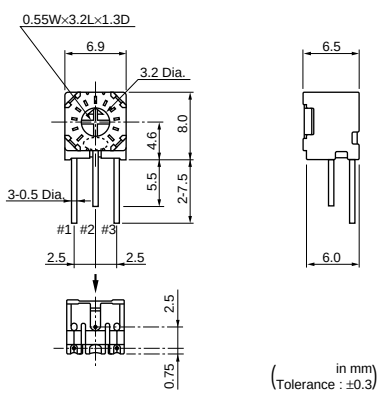




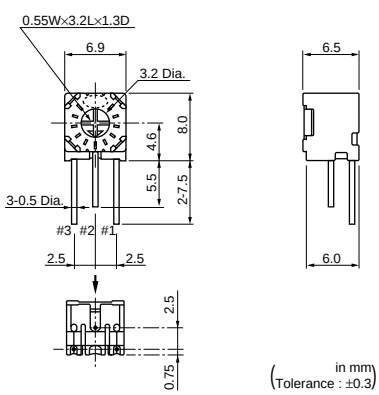
PVC6M



PVC6H



PVC6G



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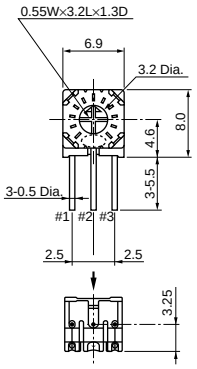
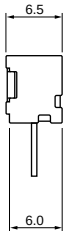
PVC6Q





in mm
(Tolerance : ±0.3)

Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVC6□100A01	0.5(70°C)	Soldering Iron	1(240°±5°)	10ohm ±10%	±100
PVC6□200A01	0.5(70°C)	Soldering Iron	1(240°±5°)	20ohm ±10%	±100
PVC6□250A01	0.5(70°C)	Soldering Iron	1(240°±5°)	25ohm ±10%	±100
PVC6□500A01	0.5(70°C)	Soldering Iron	1(240°±5°)	50ohm ±10%	±100
PVC6□101A01	0.5(70°C)	Soldering Iron	1(240°±5°)	100ohm ±10%	±100
PVC6□201A01	0.5(70°C)	Soldering Iron	1(240°±5°)	200ohm ±10%	±100
PVC6□251A01	0.5(70°C)	Soldering Iron	1(240°±5°)	250ohm ±10%	±100
PVC6□501A01	0.5(70°C)	Soldering Iron	1(240°±5°)	500ohm ±10%	±100
PVC6□102A01	0.5(70°C)	Soldering Iron	1(240°±5°)	1k ohm ±10%	±100
PVC6□202A01	0.5(70°C)	Soldering Iron	1(240°±5°)	2k ohm ±10%	±100
PVC6□252A01	0.5(70°C)	Soldering Iron	1(240°±5°)	2.5k ohm ±10%	±100
PVC6□502A01	0.5(70°C)	Soldering Iron	1(240°±5°)	5k ohm ±10%	±100
PVC6□103A01	0.5(70°C)	Soldering Iron	1(240°±5°)	10k ohm ±10%	±100
PVC6□203A01	0.5(70°C)	Soldering Iron	1(240°±5°)	20k ohm ±10%	±100
PVC6□253A01	0.5(70°C)	Soldering Iron	1(240°±5°)	25k ohm ±10%	±100
PVC6□503A01	0.5(70°C)	Soldering Iron	1(240°±5°)	50k ohm ±10%	±100
PVC6□104A01	0.5(70°C)	Soldering Iron	1(240°±5°)	100k ohm ±10%	±100
PVC6□204A01	0.5(70°C)	Soldering Iron	1(240°±5°)	200k ohm ±10%	±100
PVC6□254A01	0.5(70°C)	Soldering Iron	1(240°±5°)	250k ohm ±10%	±100
PVC6□504A01	0.5(70°C)	Soldering Iron	1(240°±5°)	500k ohm ±10%	±100
PVC6□105A01	0.5(70°C)	Soldering Iron	1(240°±5°)	1M ohm ±10%	±100
PVC6□205A01	0.5(70°C)	Soldering Iron	1(240°±5°)	2M ohm ±10%	±100
PVC6□505A01	0.5(70°C)	Soldering Iron	1(240°±5°)	5M ohm ±10%	±100
PVC6□100A04	0.5(70°C)	Soldering Iron	1(240°±5°)	10ohm ±10%	±100
PVC6□200A04	0.5(70°C)	Soldering Iron	1(240°±5°)	20ohm ±10%	±100
PVC6□250A04	0.5(70°C)	Soldering Iron	1(240°±5°)	25ohm ±10%	±100
PVC6□500A04	0.5(70°C)	Soldering Iron	1(240°±5°)	50ohm ±10%	±100
PVC6□101A04	0.5(70°C)	Soldering Iron	1(240°±5°)	100ohm ±10%	±100
PVC6□201A04	0.5(70°C)	Soldering Iron	1(240°±5°)	200ohm ±10%	±100
PVC6□251A04	0.5(70°C)	Soldering Iron	1(240°±5°)	250ohm ±10%	±100
PVC6□501A04	0.5(70°C)	Soldering Iron	1(240°±5°)	500ohm ±10%	±100
PVC6□102A04	0.5(70°C)	Soldering Iron	1(240°±5°)	1k ohm ±10%	±100
PVC6□202A04	0.5(70°C)	Soldering Iron	1(240°±5°)	2k ohm ±10%	±100
PVC6□252A04	0.5(70°C)	Soldering Iron	1(240°±5°)	2.5k ohm ±10%	±100
PVC6□502A04	0.5(70°C)	Soldering Iron	1(240°±5°)	5k ohm ±10%	±100
PVC6□103A04	0.5(70°C)	Soldering Iron	1(240°±5°)	10k ohm ±10%	±100
PVC6□203A04	0.5(70°C)	Soldering Iron	1(240°±5°)	20k ohm ±10%	±100
PVC6□253A04	0.5(70°C)	Soldering Iron	1(240°±5°)	25k ohm ±10%	±100
PVC6□503A04	0.5(70°C)	Soldering Iron	1(240°±5°)	50k ohm ±10%	±100
PVC6□104A04	0.5(70°C)	Soldering Iron	1(240°±5°)	100k ohm ±10%	±100
PVC6□204A04	0.5(70°C)	Soldering Iron	1(240°±5°)	200k ohm ±10%	±100
PVC6□254A04	0.5(70°C)	Soldering Iron	1(240°±5°)	250k ohm ±10%	±100
PVC6□504A04	0.5(70°C)	Soldering Iron	1(240°±5°)	500k ohm ±10%	±100
PVC6□105A04	0.5(70°C)	Soldering Iron	1(240°±5°)	1M ohm ±10%	±100

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Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PVC6□205A04	0.5(70°C)	Soldering Iron	1(240°±5°)	2M ohm ±10%	±100
PVC6□505A04	0.5(70°C)	Soldering Iron	1(240°±5°)	5M ohm ±10%	±100

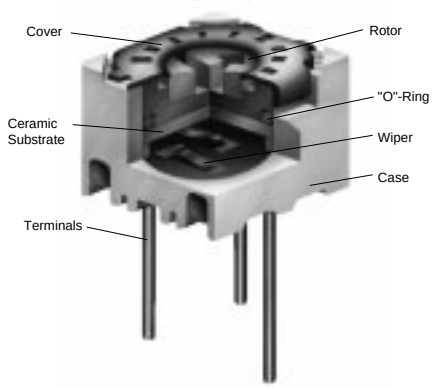
Operating Temperature Range: -55 to 125 °C

The blank column is filled with the code of adjustment direction and lead type (A, D, E, G, H, M and Q).

The order quantity should be an integral multiple of the "Minimum Quantity" .

The last three digits express the individual specification codes. A01 for standard type and A04 for radial taping type(PVC6M/PVC6Q series only).

■ Construction



■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	ΔV.S.S.	±1%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±2%
	ΔV.S.S.	±2%
Low Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±4%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

PV32 Series

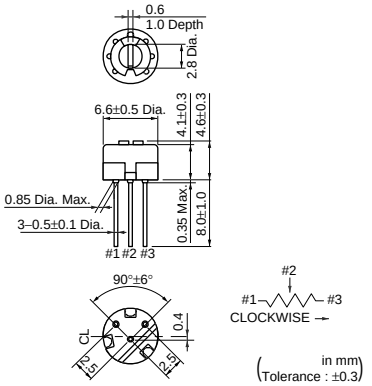
■ Features

1. 6 standard terminal styles.
2. Compatible with ultrasonic cleaning.
3. Single-turn cermet : 6.6mm round.
4. 6mm miniature size.
5. Flammability : UL94V-0

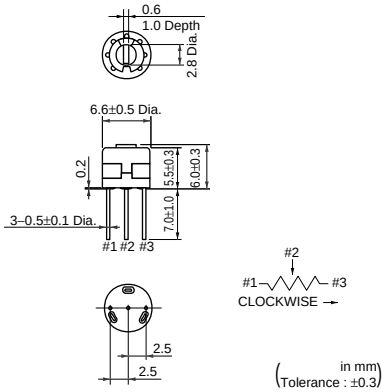
■ Applications

1. TVs
2. HDTVs
3. Professional cameras
4. CATV
5. Facsimile machines
6. Printers
7. CPUs
8. Sensors
9. Switching power supplies

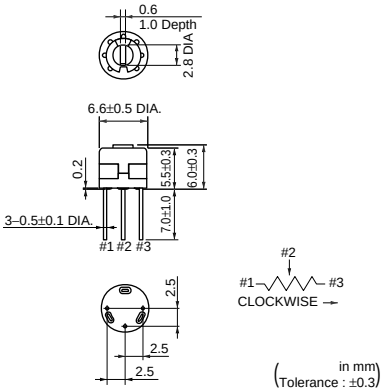
PV32H



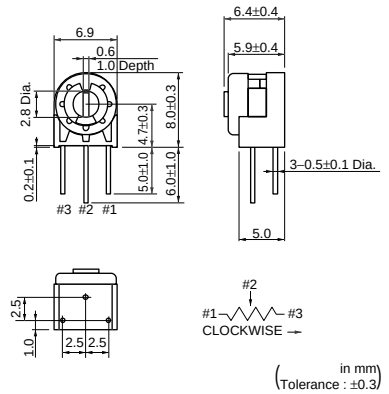
PV32R



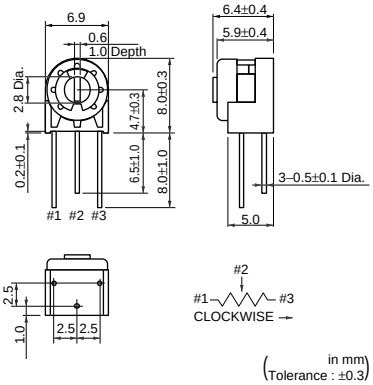
PV32P



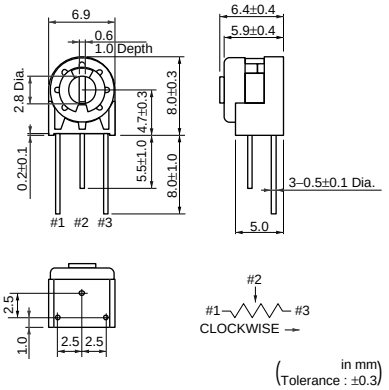
PV32N



PV32S



PV32T



Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV32□100A01	0.5(70°C)	Soldering Iron	1(230°±5°)	10ohm ±20%	±100
PV32□200A01	0.5(70°C)	Soldering Iron	1(230°±5°)	20ohm ±20%	±100
PV32□250A01	0.5(70°C)	Soldering Iron	1(230°±5°)	25ohm ±20%	±100

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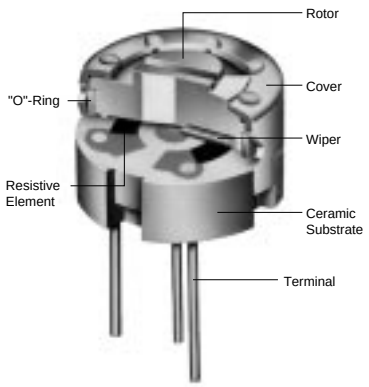
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV32□500A01	0.5(70°C)	Soldering Iron	1(230°±5°)	50ohm ±20%	±100
PV32□101A01	0.5(70°C)	Soldering Iron	1(230°±5°)	100ohm ±20%	±100
PV32□201A01	0.5(70°C)	Soldering Iron	1(230°±5°)	200ohm ±20%	±100
PV32□251A01	0.5(70°C)	Soldering Iron	1(230°±5°)	250ohm ±20%	±100
PV32□501A01	0.5(70°C)	Soldering Iron	1(230°±5°)	500ohm ±20%	±100
PV32□102A01	0.5(70°C)	Soldering Iron	1(230°±5°)	1k ohm ±20%	±100
PV32□202A01	0.5(70°C)	Soldering Iron	1(230°±5°)	2k ohm ±20%	±100
PV32□252A01	0.5(70°C)	Soldering Iron	1(230°±5°)	2.5k ohm ±20%	±100
PV32□502A01	0.5(70°C)	Soldering Iron	1(230°±5°)	5k ohm ±20%	±100
PV32□103A01	0.5(70°C)	Soldering Iron	1(230°±5°)	10k ohm ±20%	±100
PV32□203A01	0.5(70°C)	Soldering Iron	1(230°±5°)	20k ohm ±20%	±100
PV32□253A01	0.5(70°C)	Soldering Iron	1(230°±5°)	25k ohm ±20%	±100
PV32□503A01	0.5(70°C)	Soldering Iron	1(230°±5°)	50k ohm ±20%	±100
PV32□104A01	0.5(70°C)	Soldering Iron	1(230°±5°)	100k ohm ±20%	±100
PV32□204A01	0.5(70°C)	Soldering Iron	1(230°±5°)	200k ohm ±20%	±100
PV32□254A01	0.5(70°C)	Soldering Iron	1(230°±5°)	250k ohm ±20%	±100
PV32□504A01	0.5(70°C)	Soldering Iron	1(230°±5°)	500k ohm ±20%	±100
PV32□105A01	0.5(70°C)	Soldering Iron	1(230°±5°)	1M ohm ±20%	±100
PV32□205A01	0.5(70°C)	Soldering Iron	1(230°±5°)	2M ohm ±20%	±100
PV32□505A01	0.5(70°C)	Soldering Iron	1(230°±5°)	5M ohm ±20%	±100

Operating Temperature Range: -55 to 125 °C

The blank column is filled with the code of adjustment direction and lead type (H, P, R, N, S and T).

The order quantity should be an integral multiple of the "Minimum Quantity" .

■ Construction



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■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±2%
	ΔV.S.S.	±2%
Low Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±4%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

7

PV34 Series

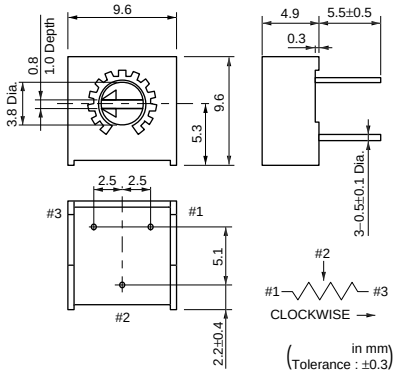
■ Features

1. Single-turn, cermet construction in 9.6mm square.
2. Flammability : UL94V-0
3. Compatible with ultrasonic cleaning.

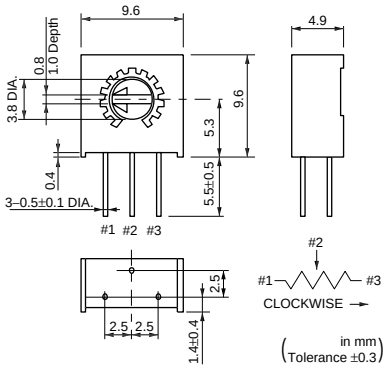
■ Applications

1. TVs
2. HDTVs
3. Professional cameras
4. CATV
5. Facsimile machines
6. Printers
7. CPUs
8. Sensors
9. Switching power supplies

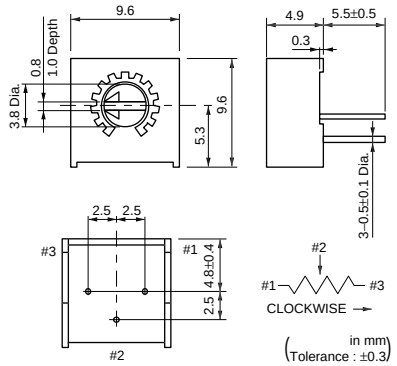
PV34F



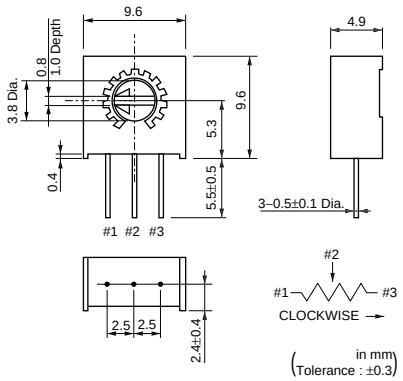
PV34H



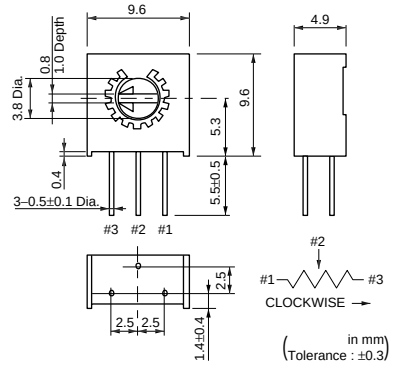
PV34P



PV34W



PV34X



Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV34□100A01	0.5(70°C)	Soldering Iron	1(280°±15°)	10ohm ±10%	±100
PV34□200A01	0.5(70°C)	Soldering Iron	1(280°±15°)	20ohm ±10%	±100
PV34□500A01	0.5(70°C)	Soldering Iron	1(280°±15°)	50ohm ±10%	±100
PV34□101A01	0.5(70°C)	Soldering Iron	1(280°±15°)	100ohm ±10%	±100
PV34□201A01	0.5(70°C)	Soldering Iron	1(280°±15°)	200ohm ±10%	±100
PV34□501A01	0.5(70°C)	Soldering Iron	1(280°±15°)	500ohm ±10%	±100
PV34□102A01	0.5(70°C)	Soldering Iron	1(280°±15°)	1k ohm ±10%	±100
PV34□202A01	0.5(70°C)	Soldering Iron	1(280°±15°)	2k ohm ±10%	±100
PV34□502A01	0.5(70°C)	Soldering Iron	1(280°±15°)	5k ohm ±10%	±100
PV34□103A01	0.5(70°C)	Soldering Iron	1(280°±15°)	10k ohm ±10%	±100
PV34□203A01	0.5(70°C)	Soldering Iron	1(280°±15°)	20k ohm ±10%	±100
PV34□253A01	0.5(70°C)	Soldering Iron	1(280°±15°)	25k ohm ±10%	±100
PV34□503A01	0.5(70°C)	Soldering Iron	1(280°±15°)	50k ohm ±10%	±100
PV34□104A01	0.5(70°C)	Soldering Iron	1(280°±15°)	100k ohm ±10%	±100
PV34□204A01	0.5(70°C)	Soldering Iron	1(280°±15°)	200k ohm ±10%	±100
PV34□254A01	0.5(70°C)	Soldering Iron	1(280°±15°)	250k ohm ±10%	±100

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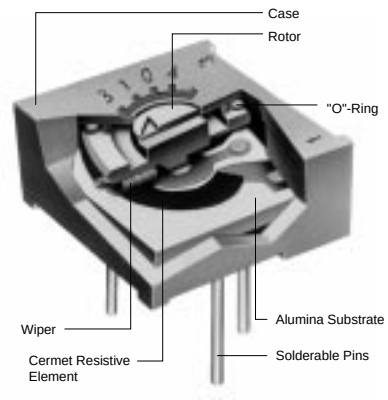
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV34□504A01	0.5(70°C)	Soldering Iron	1(280°±15°)	500k ohm ±10%	±100
PV34□105A01	0.5(70°C)	Soldering Iron	1(280°±15°)	1M ohm ±10%	±100
PV34□205A01	0.5(70°C)	Soldering Iron	1(280°±15°)	2M ohm ±10%	±100

Operating Temperature Range: -55 to 125 °C

The blank column is filled with the code of adjustment direction and lead type (F, H, P, X and W).

The order quantity should be an integral multiple of the "Minimum Quantity" .

■ Construction



■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±2%
	ΔV.S.S.	±2%
Low Tamperature Exposure	ΔTR	±1%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±3%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

7

PVC6/PV32/PV34 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

■ Notice (Rating)

1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.

■ Notice (Soldering and Mounting)

1. Soldering
   (1)Standard soldering condition
   (a)Flow soldering :
   >Pre-haeting temp. : 80-100 C.
   >Soldering temp. : 260 C. max.
   >Soldering time : 3 sec. max.
   (b)Soldering iron :
   >Temperature of tip : 300 C. max.
   >Soldering time : 3 sec. max.
   >Wattage of iron : 40W max.
   Before using other soldering conditions than those listed above, please consult with Murata factory representative prior to using. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer potentiometer may deviate from the specified characteristics.
   (2)To minimize mechanical stress when adjusting, the trimmer potentiometer shall be mounted onto PCB without gap.
   (3)The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
2. Mounting
   (1)Use PCB hole to meet the pin of the trimmer potentiometer. If the trimmer potentiometer instools into insufficient PCB hole, the trimmer potentimeter may be damaged by mechanical stress.
   (2)Do not apply excessive force (preferable 9.8N (Ref.;1kgf)max.), when the trimmer potentiometer is mounted to the PCB.
3. Cleaning
   (1)Isopropyl-alcohol and Ethyl-alcohol are applicable solvent for cleaning. If you use any other types of solvents, please consult with Murata factory representative prior to using.
   (2)The total cleaning time by cold dipping, vaper and ultrasonic washing(conditions as below) method shall be less than 3 minutes.
   (3)For ultra-sonic cleaning, the available condition is as follows.
   >Power : 600W(67liter) max.
   >Frequency : 28kHz
   >Temperature : Ambient temperature
   Due to the ultra-sonic cleaning equipment peculiar self resonance point and the cleaning compatibility usually depends on the jig construction and/or the cleaning condition such as the depth of immersion, please check the cleaning equipment to determine the suitable conditions. If the trimmer potentiometer is cleaned by other conditions, the trimmer potentiometer may be damaged.

PVC6/PV32/PV34 Series Notice

■ Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot. We recommend the below screwdrivers.
   *Recommended screwdriver for manual adjustment
   <PVC6 series>
   VESSEL MFG. : NO.9000+0x30
   (Murata P/N : KMDR150)
   TORAY INDUSTRIES, INC. : SA-2225
   (Murata P/N : KMDR070)
   <PV32/34 series>
   VESSEL MFG. : NO.9000-1.8x30
   (Murata P/N : KMDR110)
   *Recommended screwdriver bit for automatic adjustment
   <PVC6 series>
   VESSEL MFG. : NO.CA-10
   (Murata P/N : KMBT090)
   TORAY INDUSTRIES, INC. : JB-2225
   (Murata P/N : KMBT070)
   We can supply above screwdrivers.
   If you place order, please nominate Murata P/N.
2. Don't apply more than 9.8N(Ref.;1kgf) of twist and stress after mounted onto PCB to prevent contact intermittence. If excessive force is applied, the trimmer potentiometer may not function.
3. When adjusting with an adjustment tool, the applied force to the adjustment screw should not exceed 4.9N(Ref.;500gf). If excessive force is applied, the trimmer potentiometer may not function due to damage.
4. The rotational torque at the position of the adjustment range should not exceed the stop strength.
5. When using a lock paint to fix slot position, please use adhesive resin without chlorine or sulfur (Three-bond "1401series").

■ Notice (Other)

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Trimmer Potentiometers

Lead Closed Multi-turn Type PV12/PV37/PV23/PV22/PV36 Series

PV12 Series

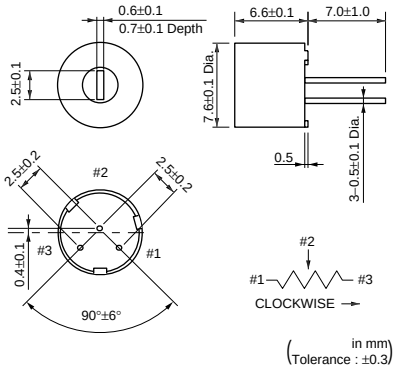
■ Features

1. Cermet with 4-turns construction in 7.6mm round.
2. Unique planetary drive enables precise wiper setting.
3. Clutch mechanism prevents excessive wiper rotation.
4. Compatible with ultrasonic cleaning.

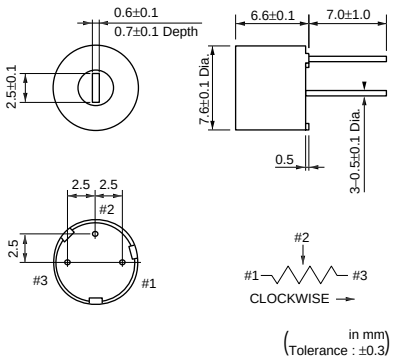
■ Applications

1. Measuring instruments
2. Facsimile machines
3. CPUs
4. PPCs
5. Printers
6. Sensors

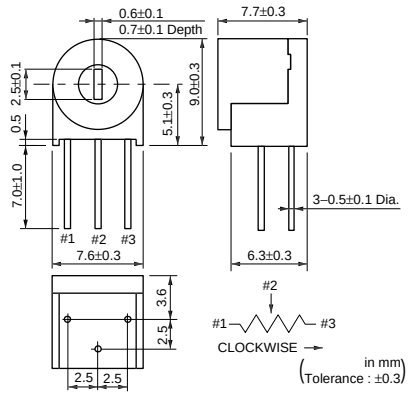
PV12H



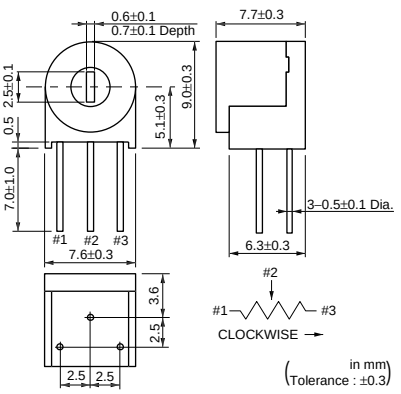
PV12P



PV12S



PV12T



Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV12□100A01	0.5(70°C)	Soldering Iron	4	10ohm ±10%	±100
PV12□200A01	0.5(70°C)	Soldering Iron	4	20ohm ±10%	±100
PV12□500A01	0.5(70°C)	Soldering Iron	4	50ohm ±10%	±100
PV12□101A01	0.5(70°C)	Soldering Iron	4	100ohm ±10%	±100
PV12□201A01	0.5(70°C)	Soldering Iron	4	200ohm ±10%	±100
PV12□501A01	0.5(70°C)	Soldering Iron	4	500ohm ±10%	±100
PV12□102A01	0.5(70°C)	Soldering Iron	4	1k ohm ±10%	±100
PV12□202A01	0.5(70°C)	Soldering Iron	4	2k ohm ±10%	±100
PV12□502A01	0.5(70°C)	Soldering Iron	4	5k ohm ±10%	±100
PV12□103A01	0.5(70°C)	Soldering Iron	4	10k ohm ±10%	±100

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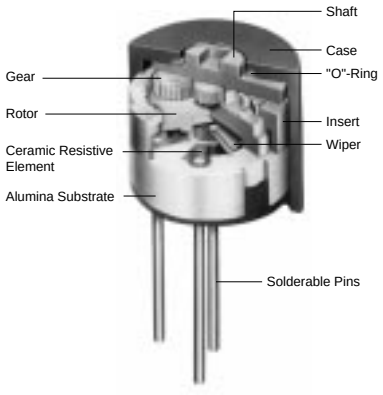
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV12□203A01	0.5(70°C)	Soldering Iron	4	20k ohm ±10%	±100
PV12□503A01	0.5(70°C)	Soldering Iron	4	50k ohm ±10%	±100
PV12□104A01	0.5(70°C)	Soldering Iron	4	100k ohm ±10%	±100
PV12□204A01	0.5(70°C)	Soldering Iron	4	200k ohm ±10%	±100
PV12□504A01	0.5(70°C)	Soldering Iron	4	500k ohm ±10%	±100
PV12□105A01	0.5(70°C)	Soldering Iron	4	1M ohm ±10%	±100
PV12□205A01	0.5(70°C)	Soldering Iron	4	2M ohm ±10%	±100

Operating Temperature Range: -55 to 125 °C

The blank column is filled with the code of adjustment direction and lead type (H, P, T and S).

The order quantity should be an integral multiple of the "Minimum Quantity" .

■ Construction



■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±3%
	ΔV.S.S.	±2%
Low Tamperature Exposure	ΔTR	±3%
	ΔV.S.S.	±1.5%
High Tamperature Exposure	ΔTR	±3%
	ΔV.S.S.	±1.5%
Rotational Life (200 cycles)	ΔTR	±3%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

8

PV37 Series

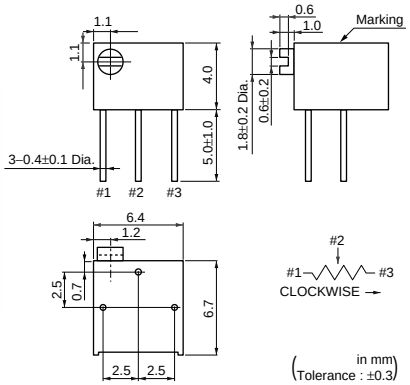
■ Features

1. High resolution, 12-turns cermet.
2. Listed on the QPL for style RJ26 per MIL-R-22097.
3. Small size (6.35x6.35x4.3mm).
4. Compatible with ultrasonic cleaning.
5. Clutch mechanism prevents excessive wiper rotation.

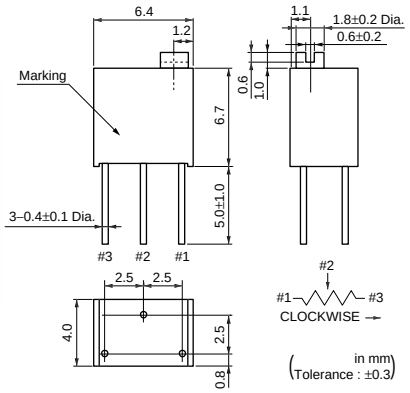
■ Applications

1. Measuring instruments
2. Facsimile machines
3. CPUs
4. PPCs
5. Printers
6. Sensors

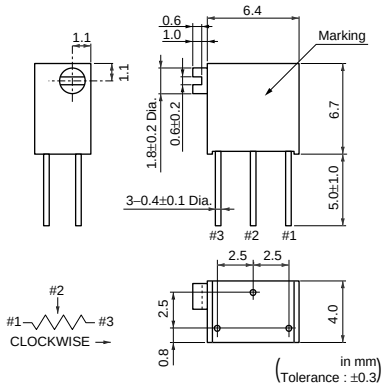
PV37P



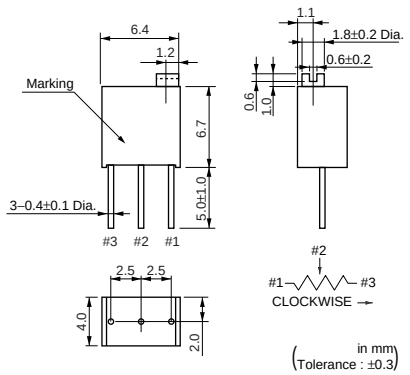
PV37W



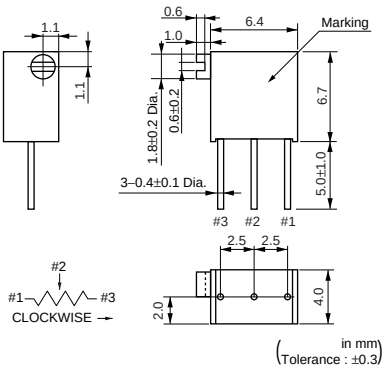
PV37X



PV37Y



PV37Z



Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV37□100A01	0.25(85°C)	Soldering Iron	12	10ohm ±10%	±100
PV37□200A01	0.25(85°C)	Soldering Iron	12	20ohm ±10%	±100
PV37□500A01	0.25(85°C)	Soldering Iron	12	50ohm ±10%	±100
PV37□101A01	0.25(85°C)	Soldering Iron	12	100ohm ±10%	±100
PV37□201A01	0.25(85°C)	Soldering Iron	12	200ohm ±10%	±100
PV37□501A01	0.25(85°C)	Soldering Iron	12	500ohm ±10%	±100
PV37□102A01	0.25(85°C)	Soldering Iron	12	1k ohm ±10%	±100
PV37□202A01	0.25(85°C)	Soldering Iron	12	2k ohm ±10%	±100
PV37□502A01	0.25(85°C)	Soldering Iron	12	5k ohm ±10%	±100
PV37□103A01	0.25(85°C)	Soldering Iron	12	10k ohm ±10%	±100
PV37□203A01	0.25(85°C)	Soldering Iron	12	20k ohm ±10%	±100
PV37□253A01	0.25(85°C)	Soldering Iron	12	25k ohm ±10%	±100
PV37□503A01	0.25(85°C)	Soldering Iron	12	50k ohm ±10%	±100
PV37□104A01	0.25(85°C)	Soldering Iron	12	100k ohm ±10%	±100
PV37□204A01	0.25(85°C)	Soldering Iron	12	200k ohm ±10%	±100
PV37□254A01	0.25(85°C)	Soldering Iron	12	250k ohm ±10%	±100

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Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV37□504A01	0.25(85°C)	Soldering Iron	12	500k ohm ±10%	±100
PV37□105A01	0.25(85°C)	Soldering Iron	12	1M ohm ±10%	±100
PV37□205A01	0.25(85°C)	Soldering Iron	12	2M ohm ±10%	±100
PV37□100A31	0.25(85°C)	Soldering Iron	12	10ohm ±10%	±100
PV37□200A31	0.25(85°C)	Soldering Iron	12	20ohm ±10%	±100
PV37□500A31	0.25(85°C)	Soldering Iron	12	50ohm ±10%	±100
PV37□101A31	0.25(85°C)	Soldering Iron	12	100ohm ±10%	±100
PV37□201A31	0.25(85°C)	Soldering Iron	12	200ohm ±10%	±100
PV37□501A31	0.25(85°C)	Soldering Iron	12	500ohm ±10%	±100
PV37□102A31	0.25(85°C)	Soldering Iron	12	1k ohm ±10%	±100
PV37□202A31	0.25(85°C)	Soldering Iron	12	2k ohm ±10%	±100
PV37□502A31	0.25(85°C)	Soldering Iron	12	5k ohm ±10%	±100
PV37□103A31	0.25(85°C)	Soldering Iron	12	10k ohm ±10%	±100
PV37□203A31	0.25(85°C)	Soldering Iron	12	20k ohm ±10%	±100
PV37□253A31	0.25(85°C)	Soldering Iron	12	25k ohm ±10%	±100
PV37□503A31	0.25(85°C)	Soldering Iron	12	50k ohm ±10%	±100
PV37□104A31	0.25(85°C)	Soldering Iron	12	100k ohm ±10%	±100
PV37□204A31	0.25(85°C)	Soldering Iron	12	200k ohm ±10%	±100
PV37□254A31	0.25(85°C)	Soldering Iron	12	250k ohm ±10%	±100
PV37□504A31	0.25(85°C)	Soldering Iron	12	500k ohm ±10%	±100
PV37□105A31	0.25(85°C)	Soldering Iron	12	1M ohm ±10%	±100
PV37□205A31	0.25(85°C)	Soldering Iron	12	2M ohm ±10%	±100

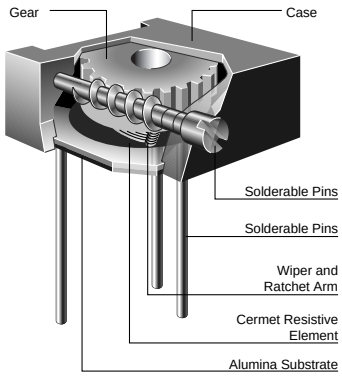
Operating Temperature Range: -55 to 125 °C

The blank column is filled with the code of adjustment direction and lead type (P, X, Y, W and Z).

The order quantity should be an integral multiple of the "Minimum Quantity" .

The last three digits express the individual specification codes. A01 for standard type and A31 for radial taping type(PV37Y/PV37Z series only).

■ Construction



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■ Characteristics

Temperature Cycle	ΔTR	±1%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±2%
	ΔV.S.S.	±2%
Low Tamperature Exposure	ΔTR	±1%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±2%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

PV23 Series

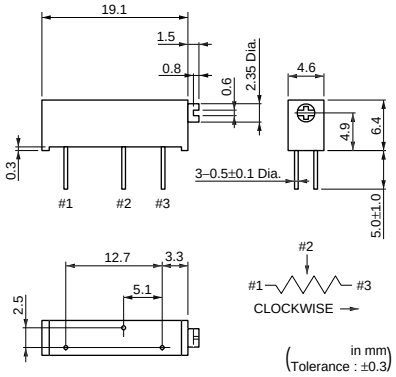
■ Features

1. Recommended for applications requiring side adjustment.
2. Rectangular parallelepiped, 15-turns, space saving design (4.6x6.4x19.1mm).
3. Compatible with ultrasonic cleaning.
4. Clutch mechanism prevents excessive wiper rotation.

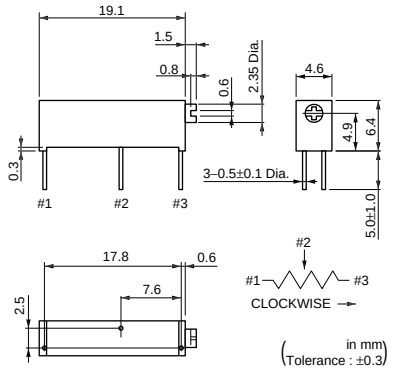
■ Applications

1. Measuring instruments
2. Facsimile machines
3. CPUs
4. PPCs
5. Printers
6. Sensors

PV23P



PV23Y



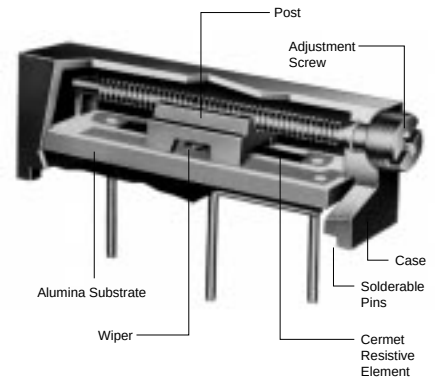
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV23□100A01	0.75(70°C)	Soldering Iron	15	10ohm ±10%	±100
PV23□200A01	0.75(70°C)	Soldering Iron	15	20ohm ±10%	±100
PV23□500A01	0.75(70°C)	Soldering Iron	15	50ohm ±10%	±100
PV23□101A01	0.75(70°C)	Soldering Iron	15	100ohm ±10%	±100
PV23□201A01	0.75(70°C)	Soldering Iron	15	200ohm ±10%	±100
PV23□501A01	0.75(70°C)	Soldering Iron	15	500ohm ±10%	±100
PV23□102A01	0.75(70°C)	Soldering Iron	15	1k ohm ±10%	±100
PV23□202A01	0.75(70°C)	Soldering Iron	15	2k ohm ±10%	±100
PV23□502A01	0.75(70°C)	Soldering Iron	15	5k ohm ±10%	±100
PV23□103A01	0.75(70°C)	Soldering Iron	15	10k ohm ±10%	±100
PV23□203A01	0.75(70°C)	Soldering Iron	15	20k ohm ±10%	±100
PV23□503A01	0.75(70°C)	Soldering Iron	15	50k ohm ±10%	±100
PV23□104A01	0.75(70°C)	Soldering Iron	15	100k ohm ±10%	±100
PV23□204A01	0.75(70°C)	Soldering Iron	15	200k ohm ±10%	±100
PV23□504A01	0.75(70°C)	Soldering Iron	15	500k ohm ±10%	±100
PV23□105A01	0.75(70°C)	Soldering Iron	15	1M ohm ±10%	±100
PV23□205A01	0.75(70°C)	Soldering Iron	15	2M ohm ±10%	±100

Operating Temperature Range: -55 to 125 °C

The blank column is filled with the code of adjustment direction and lead type (P and Y).

The order quantity should be an integral multiple of the "Minimum Quantity" .

■ Construction



■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (50G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±3%
	ΔV.S.S.	±1%
Low Tamperature Exposure	ΔTR	±1%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±3%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

8

PV22 Series

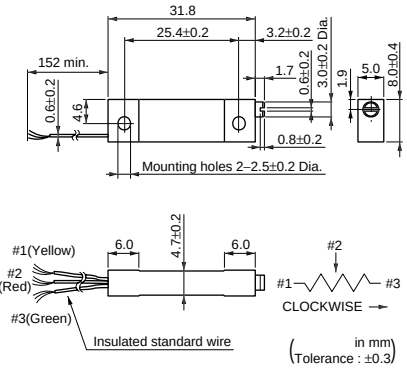
■ Features

1. Recommended for applications requiring side adjustment.
2. High power rating(1W at 70 C.), 22-turns.
3. Compatible with ultrasonic cleaning.
4. Clutch mechanism prevents excessive wiper rotation.

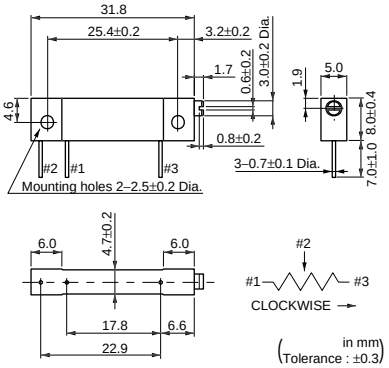
■ Applications

1. Measuring instruments
2. Facsimile machines
3. CPUs
4. PPCs
5. Printers
6. Sensors

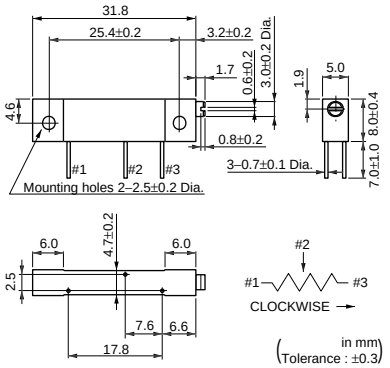
PV22L



PV22S



PV22Y



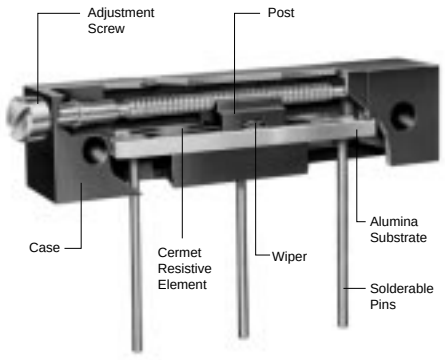
Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV22□100A01	1.0(70°C)	Soldering Iron	22	10ohm ±10%	±100
PV22□200A01	1.0(70°C)	Soldering Iron	22	20ohm ±10%	±100
PV22□500A01	1.0(70°C)	Soldering Iron	22	50ohm ±10%	±100
PV22□101A01	1.0(70°C)	Soldering Iron	22	100ohm ±10%	±100
PV22□201A01	1.0(70°C)	Soldering Iron	22	200ohm ±10%	±100
PV22□501A01	1.0(70°C)	Soldering Iron	22	500ohm ±10%	±100
PV22□102A01	1.0(70°C)	Soldering Iron	22	1k ohm ±10%	±100
PV22□202A01	1.0(70°C)	Soldering Iron	22	2k ohm ±10%	±100
PV22□502A01	1.0(70°C)	Soldering Iron	22	5k ohm ±10%	±100
PV22□103A01	1.0(70°C)	Soldering Iron	22	10k ohm ±10%	±100
PV22□203A01	1.0(70°C)	Soldering Iron	22	20k ohm ±10%	±100
PV22□503A01	1.0(70°C)	Soldering Iron	22	50k ohm ±10%	±100
PV22□104A01	1.0(70°C)	Soldering Iron	22	100k ohm ±10%	±100
PV22□204A01	1.0(70°C)	Soldering Iron	22	200k ohm ±10%	±100
PV22□504A01	1.0(70°C)	Soldering Iron	22	500k ohm ±10%	±100
PV22□754A01	1.0(70°C)	Soldering Iron	22	750k ohm ±10%	±100
PV22□105A01	1.0(70°C)	Soldering Iron	22	1M ohm ±10%	±100
PV22□205A01	1.0(70°C)	Soldering Iron	22	2M ohm ±10%	±100

Operating Temperature Range: -55 to 150 °C

The blank column is filled with the code of adjustment direction and lead type (L, S and Y).

The order quantity should be an integral multiple of the "Minimum Quantity" .

■ Construction



■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (50G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±3%
	ΔV.S.S.	±1%
Low Tamperature Exposure	ΔTR	±1%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±3%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

8

PV36 Series

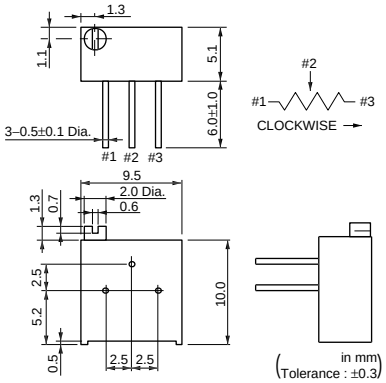
■ Features

1. 25-turns, cermet, square, 9.5mm package
2. 5 terminal styles, top and side adjustment
3. Compatible with ultrasonic cleaning
4. Clutch mechanism presents excessive wiper rotation

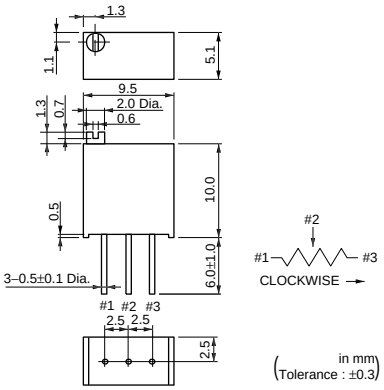
■ Applications

1. Measuring instruments
2. Facsimile machines
3. CPUs
4. PPCs
5. Printers
6. Sensors

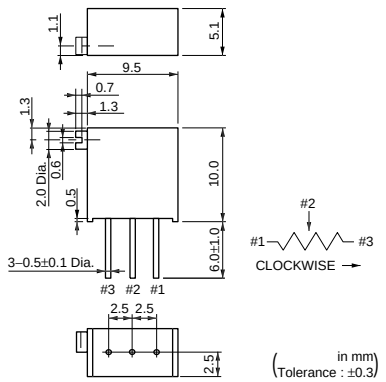
PV36P



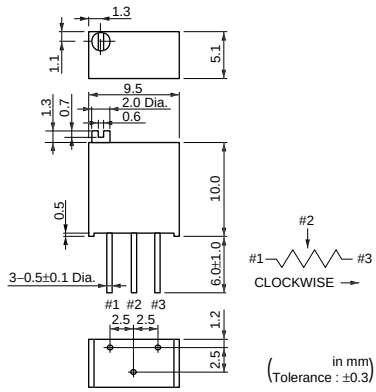
PV36W



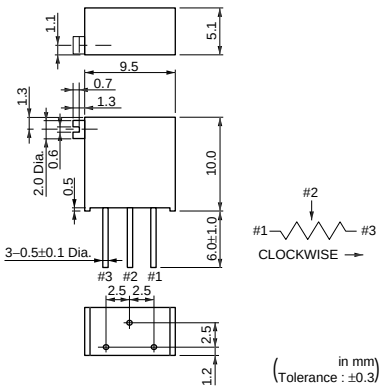
PV36X



PV36Y



PV36Z



Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV36□100A01	0.5(70°C)	Soldering Iron	25	10ohm ±10%	±100
PV36□200A01	0.5(70°C)	Soldering Iron	25	20ohm ±10%	±100
PV36□500A01	0.5(70°C)	Soldering Iron	25	50ohm ±10%	±100
PV36□101A01	0.5(70°C)	Soldering Iron	25	100ohm ±10%	±100
PV36□201A01	0.5(70°C)	Soldering Iron	25	200ohm ±10%	±100
PV36□501A01	0.5(70°C)	Soldering Iron	25	500ohm ±10%	±100
PV36□102A01	0.5(70°C)	Soldering Iron	25	1k ohm ±10%	±100
PV36□202A01	0.5(70°C)	Soldering Iron	25	2k ohm ±10%	±100
PV36□502A01	0.5(70°C)	Soldering Iron	25	5k ohm ±10%	±100
PV36□103A01	0.5(70°C)	Soldering Iron	25	10k ohm ±10%	±100
PV36□203A01	0.5(70°C)	Soldering Iron	25	20k ohm ±10%	±100
PV36□253A01	0.5(70°C)	Soldering Iron	25	25k ohm ±10%	±100
PV36□503A01	0.5(70°C)	Soldering Iron	25	50k ohm ±10%	±100
PV36□104A01	0.5(70°C)	Soldering Iron	25	100k ohm ±10%	±100
PV36□204A01	0.5(70°C)	Soldering Iron	25	200k ohm ±10%	±100
PV36□254A01	0.5(70°C)	Soldering Iron	25	250k ohm ±10%	±100

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Part Number	Power Rating (W)	Soldering Method	Number of Turns (Effective Rotation Angle)	Total Resistance Value	TCR (ppm/°C)
PV36□504A01	0.5(70°C)	Soldering Iron	25	500k ohm ±10%	±100
PV36□105A01	0.5(70°C)	Soldering Iron	25	1M ohm ±10%	±100
PV36□205A01	0.5(70°C)	Soldering Iron	25	2M ohm ±10%	±100
PV36□100A31	0.5(70°C)	Soldering Iron	25	10ohm ±10%	±100
PV36□200A31	0.5(70°C)	Soldering Iron	25	20ohm ±10%	±100
PV36□500A31	0.5(70°C)	Soldering Iron	25	50ohm ±10%	±100
PV36□101A31	0.5(70°C)	Soldering Iron	25	100ohm ±10%	±100
PV36□201A31	0.5(70°C)	Soldering Iron	25	200ohm ±10%	±100
PV36□501A31	0.5(70°C)	Soldering Iron	25	500ohm ±10%	±100
PV36□102A31	0.5(70°C)	Soldering Iron	25	1k ohm ±10%	±100
PV36□202A31	0.5(70°C)	Soldering Iron	25	2k ohm ±10%	±100
PV36□502A31	0.5(70°C)	Soldering Iron	25	5k ohm ±10%	±100
PV36□103A31	0.5(70°C)	Soldering Iron	25	10k ohm ±10%	±100
PV36□203A31	0.5(70°C)	Soldering Iron	25	20k ohm ±10%	±100
PV36□253A31	0.5(70°C)	Soldering Iron	25	25k ohm ±10%	±100
PV36□503A31	0.5(70°C)	Soldering Iron	25	50k ohm ±10%	±100
PV36□104A31	0.5(70°C)	Soldering Iron	25	100k ohm ±10%	±100
PV36□204A31	0.5(70°C)	Soldering Iron	25	200k ohm ±10%	±100
PV36□254A31	0.5(70°C)	Soldering Iron	25	250k ohm ±10%	±100
PV36□504A31	0.5(70°C)	Soldering Iron	25	500k ohm ±10%	±100
PV36□105A31	0.5(70°C)	Soldering Iron	25	1M ohm ±10%	±100
PV36□205A31	0.5(70°C)	Soldering Iron	25	2M ohm ±10%	±100

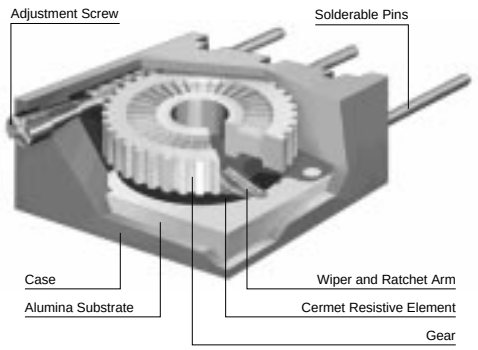
Operating Temperature Range: -55 to 125 °C

The blank column is filled with the code of adjustment direction and lead type (P, X, Y, W and Z).

The order quantity should be an integral multiple of the "Minimum Quantity" .

The last three digits express the individual specification codes. A01 for standard type and A31 for radial taping type(PV36W/PV36X series only).

■ Construction



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■ Characteristics

Temperature Cycle	ΔTR	±2%
	ΔV.S.S.	±1%
Humidity	ΔTR	±2%
	IR	100Mohm min.
Vibration (20G)	ΔTR	±1%
	ΔV.S.S.	±1%
Shock (100G)	ΔTR	±1%
	ΔV.S.S.	±1%
Temperature Load Life	ΔTR	±3%
	ΔV.S.S.	±1%
Low Tamperature Exposure	ΔTR	±2%
	ΔV.S.S.	±1%
High Tamperature Exposure	ΔTR	±3%
	ΔV.S.S.	±1%
Rotational Life (200 cycles)	ΔTR	±3%

ΔTR : Total Resistance Change
ΔV.S.S. : Voltage Setting Stability
IR : Insulation Resistance

PV12/PV37/PV23/PV22/PV36 Series Notice

■ Notice (Operating and Storage Conditions)

1. Store that the temperature is -10 to +40 C. and the relative humidity is 30-85%RH.
2. Do not store in or near corrosive gases.
3. Use within six months after delivery.
4. Open the package just before using.
5. Do not store under direct sunlight.
6. The trimmer potentiometer should not be used under the following environmental conditions:
   If you use the trimmer potentiometer in an environment other these listed below, please consult with Murata factory representative prior to using.
   (1)Corrosive gaseous atmosphere.
   (Ex. Chloring gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxie gas, etc)
   (2)In liquid.
   (Ex. Oil, Medical liquid, Organic solvent, etc)
   (3)Dusty / dirty atmosphere.
   (4)Direct sunlight.
   (5)Static voltage nor electric/magnetic fields.
   (6)Direct sea breeze.
   (7)Other variations of the above.

■ Notice (Rating)

1. When using with partial load(rheostat), minimize the power depend on the resistance value.
2. The maximum input voltage to a trimmer potentiometer should not exceed (P•R)^1/2 or the maximum operating voltage, whichever is smaller.
3. The maximum input current to a trimmer potentiometer should not exceed (P/R)^1/2 or the allowable wiper current, whichever is smaller.

■ Notice (Soldering and Mounting)

1. Soldering
   (1)Standard soldering condition
   (a)Flow soldering :
   >Pre-haeting temp. : 80-100 C.
   >Soldering temp. : 260 C. max.
   >Soldering time : 3 sec. max.
   (b)Soldering iron :
   >Temperature of tip : 300 C. max.
   >Soldering time : 3 sec. max.
   >Wattage of iron : 40W max.
   Before using other soldering conditions than those listed above, please consult with Murata factory representative prior to using. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer potentiometer may deviate from the specified characteristics.
   (2)To minimize mechanical stress when adjusting, the trimmer potentiometer shall be mounted onto PCB without gap.
   (3)The soldering iron should not come in contact with the case of the trimmer potentiometer. If such contact does occur, the trimmer potentiometer may be damaged.
2. Mounting
   (1)Use PCB hole to meet the pin of the trimmer potentiometer. If the trimmer potentiometer instools into insufficient PCB hole, the trimmer potentimeter may be damaged by mechanical stress.
   (2)Do not apply excessive force (preferable 9.8N (Ref.;1kgf)max.), when the trimmer potentiometer is mounted to the PCB.
3. Cleaning
   (1)Isopropyl-alcohol and Ethyl-alcohol are applicable solvent for cleaning. If you use any other types of solvents, please consult with Murata factory representative prior to using.
   (2)The total cleaning time by cold dipping, vaper and ultrasonic washing(conditions as below) method shall be less than 3 minutes.
   (3)For ultra-sonic cleaning, the available condition is as follows.
   >Power : 600W(67liter) max.
   >Frequency : 28kHz
   >Temperature : Ambient temperature
   Due to the ultra-sonic cleaning equipment peculiar self resonance point and the cleaning compatibility usually depends on the jig construction and/or the cleaning condition such as the depth of immersion, please check the cleaning equipment to determine the suitable conditions. If the trimmer potentiometer is cleaned by other conditions, the trimmer potentiometer may be damaged.

PV12/PV37/PV23/PV22/PV36 Series Notice

■ Notice (Handling)

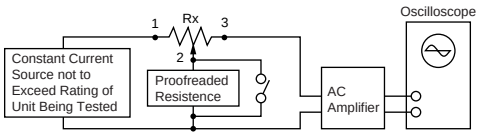
1. Use suitable screwdrivers that fit comfortably in driver slot. We recommend the below screwdrivers.
 *Recommended screwdriver for manual adjustment
 VESSEL MFG. : NO.9000-1.8x30
 (Murata P/N : KMDR110)
 We can supply above screwdrivers.
 If you place order, please nominate Murata P/N.
2. Don't apply more than 9.8N(Ref.;1kgf) of twist and stress after mounted onto PCB to prevent contact intermittence. If excessive force is applied, the trimmer potentiometer may not function.
3. When adjusting with an adjustment tool, the applied force to the adjustment screw should not exceed 4.9N(Ref.;500gf). If excessive force is applied, the trimmer potentiometer may not function due to damage.
4. When using a lock paint to fix slot position, please use adhesive resin without chlorine or sulfur (Three-bond "1401series").

■ Notice (Other)

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Murata connot guarantee trimmer potentiometer integrity when used under conditions other than those specified in this document.

Chip Open Type and PVM4A_A01 Series Specifications and Test Methods

The tests and measurements shall be conducted under the condition of 15 to 35°C of temperature, 25 to 75% of relative humidity and 86 to 106 kpa of atmospheric pressure unless otherwise specified. In case when entertained a doubt in judgment obtained from results measured in accordance with the above mentioned conditions, the tests and measurements shall be conducted under the condition of 25±2°C of temperature and, 45 to 55% of relative humidity and 86 to 106 kpa of atmospheric pressure.

<table>
<tr><th>No.</th><th>Item</th><th>Test Methods</th></tr>
<tr><td>1</td><td>Total Resistance</td><td>Measure total resistance between the resistance element and terminals (terminals #1 and #3) with the contact arm positioned against a stop. The positioning of the contact arm and terminal shall be the same for subsequent total resistance measurements on the same device.
Use the test voltage specified in Table-1 for total resistance measurements. This voltage shall be used whenever a subsequent total resistance measurement is made.
<table><tr><th>Total resistance, Nominal (ohm)</th><th>Maximum Test Voltage (V)</th></tr><tr><td>10≦R≦100</td><td>1.0</td></tr><tr><td>100<R≦1k</td><td>3.0</td></tr><tr><td>1k<R≦10k</td><td>10.0</td></tr><tr><td>10k<R≦100k</td><td>30.0</td></tr><tr><td>100k<R</td><td>100.0</td></tr></table>Table-1 Total resistance test voltage</td></tr>
<tr><td>2</td><td>Residual Resistanc</td><td>Position the contact arm at the extreme counterclockwise limit of mechanical travel and measure the resistance between the contact arm and the corresponding end terminal. Then, position the contact arm at the extreme clockwise limit of mechanical travel and measure the resistance between the contact arm and the corresponding end terminal. During this test, take suitable precautions to ensure that the rated current of the resistance element is not exceeded.</td></tr>
<tr><td>3</td><td>Contact Resistance</td><td>Contact resistance variation shall be measured with the measuring circuit shown in below, or its equivalent. The operating wiper shall be rotated in both directions through 90% of the actual effective-electrical travel for a total of 6 cycles.
The rate of rotation of the operating wiper shall be such that the wiper completes 1 countin determining whether or not a contact resistance variation is observed at least twice in the same location. The test current shall follow the value given in Table-2 unless otherwise limited by the power rating.
<table><tr><th>Standard total resistance R (ohm)</th><th>Test Current</th></tr><tr><td>100≦R<10k</td><td>10mA Max.</td></tr><tr><td>10k≦R<100k</td><td>1mA Max.</td></tr><tr><td>100≦R</td><td>100μA Max.</td></tr></table>Table-2 Test current for CRV
 

Rx : Trimmer Potentiometer
Oscilloscope bandwidth :100Hz to 50kHz
Figure-1 CRV measuring circuit</td></tr>
<tr><td>4</td><td>Humidity Exposure</td><td>The wiper contact point shall be pre-setted at about 50% position of effective rotational angle. After that, the potentiometer shall be placed in a chamber at 40±2°C and 90 - 95% without loading for 500±12 hours.
The resistance value shall be measured after keeping the potentiometer in a room for 5±1/6 hours.</td></tr>
<tr><td>5</td><td>High Temperature Exposure</td><td>The wiper contact point shall be pre-setted at about 50% position of effective rotational angle. After that, the potentiometer shall be placed in a chamber at 70±2°C without loading for 500±12 hours. The resistance value shall be measured after keeping the potentiometer in a room for 1.5±1/6 hours.</td></tr>
<tr><td>6</td><td>Humidity Load Life</td><td>The wiper contact point shall be pre-setted at about 50% position of effective rotational angle. After that, the potentiometer shall be placed in a chamber at 40±2°C and 90 - 95% with loading the 1/2 rated voltage between #1 and #2 terminals, intermittently 1.5 hours ON and 0.5 hours OFF for 1000±12hours.
The resistance value shall be measured after keeping the potentiometer in a room for 5±1/6 hours.</td></tr>
<tr><td>7</td><td>Load Life</td><td>The wiper contact point shall be pre-setted at about 50% position of effective rotational angle. After that, the potentiometer shall be placed in a chamber at 70±2°C (50±2°C for PVZ)with loading the 1/2 rated voltage between #1 and #2 terminals, intermittently 1.5 hours ON and 0.5 hours OFF for 1000±12 hours. The resistance value shall be measured after keeping the potentiometer in a room for 1.5±1/6 hours.</td></tr>
<tr><td>8</td><td>Temperature Cycle</td><td>The wiper contact point shall be pre-setted at about 50% position of effective rotational angle. After that, the potentiometer shall be subjected to Table-3,Table-4 temperature for 5 cycles. The resistance value shall be measured after keeping the potentiometer in a room for 1.5±10 minutes.
<table><tr><td>Sequence</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Temp.(°C)</td><td>-25±3</td><td>+25±2</td><td>+85±3</td><td>+25±2</td></tr><tr><td>Time(min.)</td><td>30±3</td><td>10Max.</td><td>30±3</td><td>10Max.</td></tr></table>Table-3 PVZ
<table><tr><td>Sequence</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Temp.(°C)</td><td>-55±3</td><td>+25±2</td><td>+125±3</td><td>+25±2</td></tr><tr><td>Time(min.)</td><td>30±3</td><td>10Max.</td><td>30±3</td><td>10Max.</td></tr></table>Table-4 PVA3/PVS3/PVM4A□□□A01</td></tr>
</table>

Continued on the following page.

Chip Open Type and PVM4A_A01 Series Specifications and Test Methods

Continued from the preceding page.

No.	Item	Test Methods
9	Temperature Coefficient of Resistance	The trimmer potentiometer shall be subjected to the following each temperature(see Table-5,Table-6) for 30 to 45 minutes. The resistance value shall be measured in the chamber. $TCR=\frac{R_2-R_1}{R_1(T_2-T_1)}\times 10^6$ (ppm/°C) T_1 : Reference temperature in degrees celsius T_2 : Test temperature in degrees celsius R_1 : Resistance at reference temperature in ohm R_2 : Resistance at test temperature in ohm

Sequence	1*	2	3*	4
Temp.(°C)	+25±2	-25±3	+25±2	+85±3

Note)*:Norm Temp.

Table-5 PVZ

Sequence	1	2	3*	4
Temp.(°C)	+25±2	-55±3	+25±2	+125±3

Table-6 PVA3/PVS3/PVM4A□□□A01

Chip Closed Type/Closed Lead Type Specifications and Test Methods

The following describes trimmer potentiometer testing conducted by Murata Manufacturing Co., Ltd. in accordance with MIL-R-22097 (Military specification for variable resistors, non-wirewound) and MIL-STD-202 (Test methods for electronic and electrical component parts).

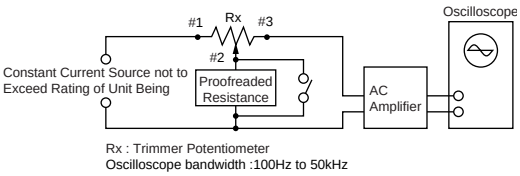
<table>
<tr><th>No.</th><th>Item</th><th>Test Methods</th></tr>
<tr><td>1</td><td>Total Resistance</td><td>Measure total resistance between the resistance element and terminals (#1 and #3) with the contact arm positioned against a stop. The positioning of the contact arm and terminal shall be the same for subsequent total resistance measurements on the same device. Use the test voltage specified in Table-1 for total resistance measurements. This voltage shall be used for all subsequent total resistance measurements.
<table>
<tr><th>Total resistance, Nominal (ohm)</th><th>Maximum Test Voltage (V)</th></tr>
<tr><td>10≦R≦100</td><td>1.0</td></tr>
<tr><td>100<R≦1k</td><td>3.0</td></tr>
<tr><td>1k<R≦10k</td><td>10.0</td></tr>
<tr><td>10k<R≦100k</td><td>30.0</td></tr>
<tr><td>100k<R</td><td>100.0</td></tr>
</table>
Table-1 Total resistance test voltage</td></tr>
<tr><td>2</td><td>Residual Resistance</td><td>Position the contact arm at the extreme counterclockwise limit of mechanical travel and measure the resistance between the contact arm and the corresponding end terminal. Then, position the contact arm at the extreme clockwise limit of mechanical travel and measure the resistance between the contact arm and the corresponding end terminal. During this test, take suitable precautions to ensure that the rated current of the resistance element is not exceeded.</td></tr>
<tr><td>3</td><td>Contact Resistance Variation</td><td>Contact resistance variation shall be measured with the measuring circuit shown in Figure-1, or its equivalent. The adjustment rotor(screw) shall be rotated in both directions through 90% of the actual effective-electrical rotational angle(number of turns) for a total of 6 cycles. Only the last 3 cycles shall count in determining whether or not a contact resistance variation is observed at least twice in the same location, exclusive of the roll-on or roll-off points where the contact arm moves from the termination, on or off, the resistance element. The rate of rotation of the adjustment rotor(screw) shall be such that the adjustment rotor (screw)completes 1 cycle for 5 seconds minimum to 2 minutes maximum. The test current used shall follow the value given in Table-2 unless otherwise limited by power rating.
<table>
<tr><th>Standard total resistance R (ohm)</th><th>Test current</th></tr>
<tr><td>R≦100</td><td>20mA</td></tr>
<tr><td>100<R<500</td><td>10mA</td></tr>
<tr><td>500≦R<1k</td><td>4mA</td></tr>
<tr><td>1k≦R<2k</td><td>2mA</td></tr>
<tr><td>2k≦R<50k</td><td>1mA</td></tr>
<tr><td>50k≦R<200k</td><td>200μA</td></tr>
<tr><td>200k≦R<1M</td><td>100μA</td></tr>
<tr><td>1M≦R<2M</td><td>50μA</td></tr>
<tr><td>2M≦R</td><td>30μA</td></tr>
</table>
Table-2 Test current for CRV


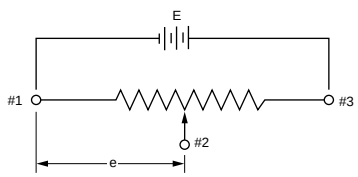
Figure-1 CRV measuring circuit</td></tr>
<tr><td>4</td><td>Temperature Coefficient of Resistance</td><td>The trimmer potentiometer shall be subjected to the following each temperature (see Table-3) for 30-45 minutes. Temperature coefficient of resistance shall be applied to the following formula.
$$TCR=\frac{R_2-R_1}{R_1(T_2-T_1)}\times 10^6\ (ppm/°C)$$
T_1 : Reference temperature in degrees celsius
T_2 : Test temperature in degrees celsius
R_1 : Resistance at reference temperature ohm
R_2 : Resistance at test temperature in ohm
<table>
<tr><th>Sequence</th><th>1*</th><th>2</th><th>3</th><th>4*</th><th>5</th><th>6</th></tr>
<tr><td>Temperature(°C)</td><td>+25</td><td>-15</td><td>Min. operating temperature</td><td>+25</td><td>+65</td><td>Max. operating temperature</td></tr>
</table>
Note) * : Reference temperature
Table-3 Test temperatures</td></tr>
<tr><td>5</td><td>Voltage Setting Stability</td><td>The wiper shall be set at approximately 40% of the actual effective-electrical rotational angle(number of turns). An adequate DC test potential shall be applied between the terminal #1 and the terminal #3. The voltage between the terminal #1 and the terminal #3, and the voltage between the terminal #1 and the terminal #2, shall be measured and applied to the following formula.
$$\text{Voltage setting stability}=\left(\frac{e'}{E}-\frac{e}{E}\right)\times 100\ (\%)$$
e : Before test
(The voltage between the terminal #1 and the terminal #2)
e': After test
(The voltage between the terminal #1 and the terminal #2)
E: The voltage between the terminal #1 and the terminal #3


Figure-2</td></tr>
</table>

Continued on the following page.

Chip Closed Type/Closed Lead Type Specifications and Test Methods

Continued from the preceding page.

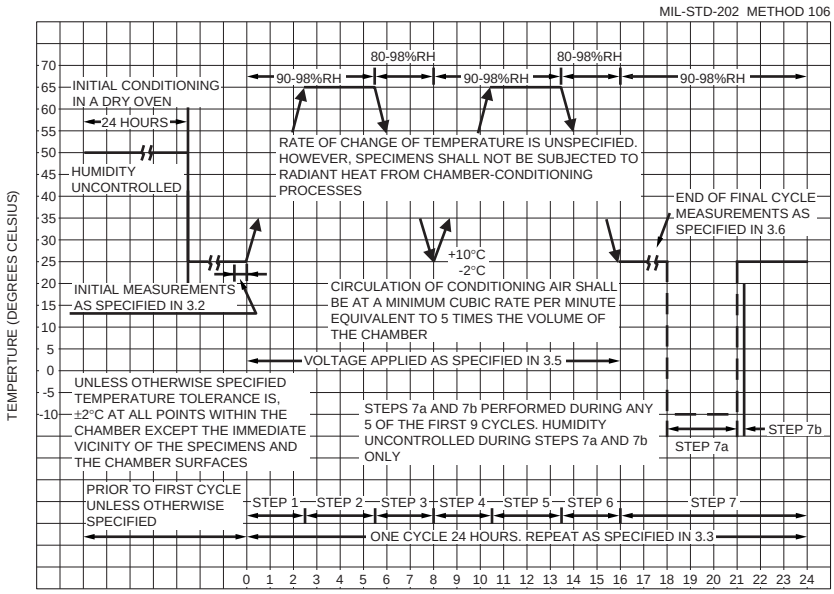
<table>
<tr><th>No.</th><th>Item</th><th>Test Methods</th></tr>
<tr><td>6</td><td>Temperature Cycle</td><td>The trimmer potentiometer shall be subjected to Table-4 temperature for 5 cycles. The trimmer potentiometer shall be removed from the chamber, and maintained at a temperature of 25±5°C for 1~2 hours.
<table>
<tr><td colspan="2">Sequence</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td rowspan="3">Temp. (°C)</td><td>PV□□ series</td><td rowspan="2">-55±3</td><td rowspan="3">+25±2</td><td>+125±3</td><td rowspan="3">+25±2</td></tr>
<tr><td>PV22 series</td><td>+150±3</td></tr>
<tr><td>PVF2 series</td><td>-25±3</td><td>+60±3</td></tr>
<tr><td colspan="2">Time (min.)</td><td>30</td><td>5 max.</td><td>30</td><td>5 max.</td></tr>
</table>
Table-4 One cycle of temperature cycle.</td></tr>
<tr><td>7</td><td>Humidity</td><td>1) PVC6, PV12, PV32, PV34 PVM4A□□□B01series
The trimmer potentiometer shall be placed in a chamber at a temperature of 40±2°C and a humidity of 90~95% without loading for 250±8 hours. The trimmer potentiometer shall be removed from the chamber, and maintained at a temperature of 25±5°C for 5±1/6 hours.
2) PVF2series
The trimmer potentiometer shall be placed in a chamber at 60±2°C and 90~95% without loading for 1000±12 hours. The trimmer potentiometer shall be removed from the chamber, and maintained at a temperature of 25±5°C for 5±1/6 hours
2) PVG3, PVG5, PV01, PV22, PV23, PV36, PV37series
The trimmer potentiometer shall be subjected Figure-3 the programmed humidity environment for 10 cycle. The trimmer potentiometer shall be removed from the chamber, and maintained at a temperature of 25±5°C for 5±1/2 hours.


Figure-3</td></tr>
<tr><td>8</td><td>Vibration</td><td>1) PV□□ series
The trimmer potentiometer shall be vibrated throughout the frequency range at the 20G level. A complete frequency range, 10Hz to 2000Hz and back, shall be made within 15 minutes for a total of 4 sweeps in each of the three axis direction for a total of 12 sweeps.
2) PVF2 series
The trimmer potentiometer shall be subjected to vibration at 0.3 inch amplitude. The frequency shall be varied uniformly between the approximate limits of 10 Hz and 55Hz. This motion shall be applied for preiod of 2 hours in each of 3 mutually perpendicular direction (total of 6 hours).</td></tr>
<tr><td>9</td><td>Shock</td><td>1) PV□□ series
The trimmer potentiometer shall be shocked at the 100G(50G for PV22 and PV23series) level and shall be subjected to 4 shocks in each of the three axis direction for a total of 12 shocks.
2) PVM4A□□□B01series
The trimmer potentiometer shall be shocked at the 100G level and shall be subjected to 3 shocks in each of the six axis direction for a total of 18 shocks.</td></tr>
<tr><td>10</td><td>Temperature Road Life</td><td>Full rated continuous working voltage not exceeding the maximum rated voltage shall be applied intermittently between the terminal #1 and the terminal #3 of the trimmer potentiometer, 1.5 hours on and 0.5 hours off, for a total of 1000±12 hours, at a temperature of 70±2°C(85±2°C for PV01 and PV37series, 50±2°C for PVF2series). The trimmer potentiometer shall be removed from the chamber, and maintained at a temperature of 25±5°C for 1 to 2 hours.</td></tr>
<tr><td>11</td><td>High Temperature Exposure (Except for PVF2)</td><td>The trimmer potentiometer shall be placed in a camber at a temperature of 125±3°C(150±3°C for PV12series) 250±8 hours without loading. The trimmer potentiometer shall be removed from the camber, and maintained at a temperature of 25±5°C for 1 to 2 hours.</td></tr>
<tr><td>12</td><td>Low Temperature Exposure (Except for PVF2 and PVM4A□□□B01)</td><td>The trimmer potentiometer shall be placed in a camber at a temperature of -55±3°C for 1 hours without loading. Full rated continuous working voltage not exceeding the maximum rated voltage shall be applied for 45 minutes. The trimmer potentiometer shall be removed from the chamber, and maintained at a temperature of 25±5°C for approximately 24 hours.</td></tr>
</table>

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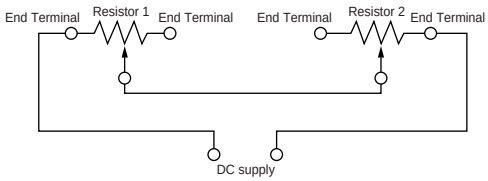
Chip Closed Type/Closed Lead Type Specifications and Test Methods

Continued from the preceding page.

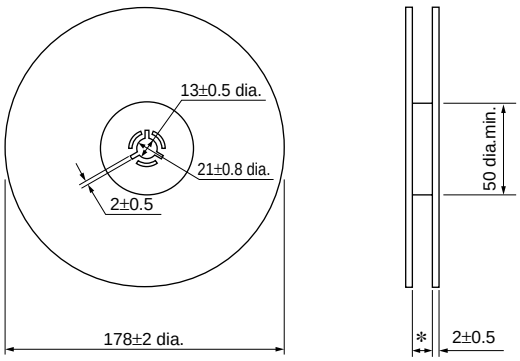
No.	Item	Test Methods
13	Low Temperature Operation (Only for PVF2 and PVM4A□□□B01)	The trimmer potentiometer shall be placed in a camber at a temperature of -25±3°C(-55±3°C for PVM4A□□□ B01series) 48±4 hours without loading. The trimmer potentiometer shall be removed from the chamber, and maintained at a temperature of 25±5°C for 5±1/6 hours
14	Rotational Life	1)PV□□ series Full rated continuous working voltage not exceeding the maximum rated voltage shall be applied with the circuit shown in the figure. The adjustment rotor(screw) shall be continuously cycled through not less than 90% of effective-electrical rotational angle(number of turns), at the rate of 1 cycle for 5 seconds minimum to 2.5 a minutes maximum for total of 200 cycles.  Figure-4 2) PVG3, PVG5series The adjustment rotor(screw) shall be continuously cycled though not less than 90% of effective- electrical rotational angle(number of turns), at the rate of 1 cycle for 5 seconds minimum to 2.5 minutes maximum for a total of 50 (100 for PVG5) cycles, without loading. 3) PVF2, PVM4A□□□B01series The wiper shall be rotated over 90% of the effective rotational angle without loading at a speed of 10 cycles per minute, for 100 cycles continuously.

Packaging

■ Minimum Quantity

Part Number	Minimum Quantity (pcs.)				
	ø180mm reel	ø330mm reel	Ammo Pack	Magazine	Bulk
PVZ2A	3000	12000	—	—	1000
PVZ2K	3000	—	—	—	1000
PVZ3A	2000	8000	—	—	1000
PVZ3K	1500	—	—	—	1000
PVS3	2500	8000	—	—	500
PVA3	2000	8000	—	—	500
PVG3	1000	—	—	—	500
PVM4	500	3000	—	—	500
PVF2A	500	—	—	—	100
PVG5A	250	—	—	—	50
PVG5H	500	—	—	—	50
PV01W	—	—	—	70	—
PV01P/X	—	—	—	60	—
PVC6A/D/G/H/E	—	—	—	50	50
PVC6M/Q	—	—	1000	50	50
PV34	—	—	—	—	100
PV32	—	—	—	—	100
PV23/12	—	—	—	—	50
PV22	—	—	—	—	30
PV36/37	—	—	1000	—	50

■ Dimensions of Reel



✻ 10±1.5 (8mm Width) — PVZ2A, PVZ3A, PVS3, PVA3, PVF2
14±1.5 (12mm Width) — PVG5H, PVG3, PVZ2K, PVZ3K, PVM4
18±1.5 (16mm Width) — PVG5A

(in mm)

Continued on the following page.

Packaging

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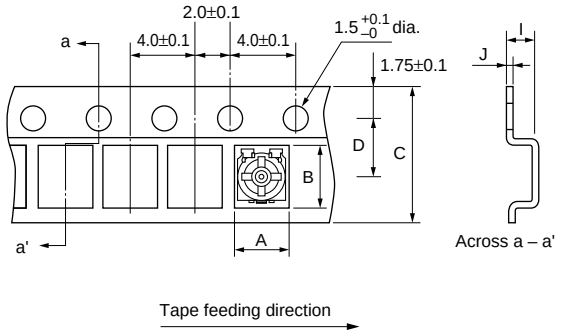
■ Dimensions of Plastic Tape

PVZ2 / PVZ3 / PVA3 / PVS3 / PVF2



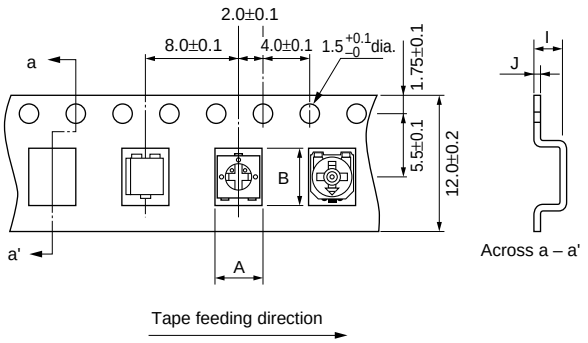
Part Number	A	B	C	D	I	J
PVZ2A	2.4±0.1	3.1±0.1	8.0±0.2	3.5±0.1	1.1±0.1	0.2±0.1
PVZ2K		5.7±0.1	12.0±0.1	5.5±0.1		0.3±0.1
PVZ3A/PVA3	3.3±0.2	3.8±0.2	8.0±0.2	3.5±0.1	1.95±0.1	0.2±0.1
PVZ3K		5.8±0.2	12.0±0.2	5.5±0.1	2.3±0.1	0.3±0.1
PVS3		4.1±0.2	8.0±0.2	3.5±0.1	1.6±0.1	0.2±0.1
PVF2	2.3±0.2	2.3±0.2			2.3±0.1	0.3±0.1

• The side containing terminals #1 and #3 faces the plastic tape pilot holes.

(in mm)

■ Dimensions of Plastic Tape

PVG3 / PVM4 / PVG5H



Part Number	A	B	I	J
PVG3A	4.0±0.1	4.0±0.1	2.1±0.1	0.3±0.1
PVG3G		4.9±0.1		
PVM4	5.4±0.2	5.5±0.2	2.15±0.1	0.3±0.1
PVG5H	5.4±0.2	5.8±0.2	4.0±0.1	0.4±0.1

• The side containing terminals #1 and #3 faces the plastic tape pilot holes. (except PVG3)

(in mm)

Continued on the following page.

Packaging

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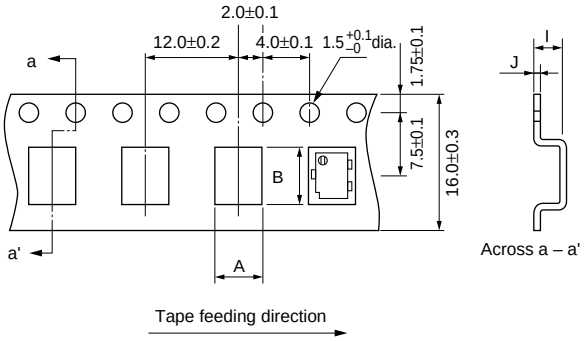
■ Dimensions of Plastic Tape

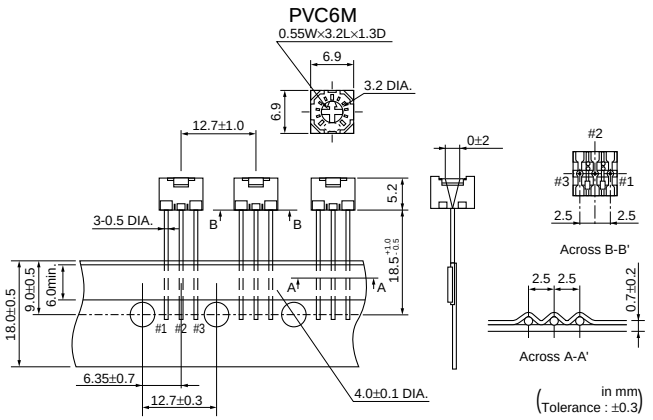
PVG5A

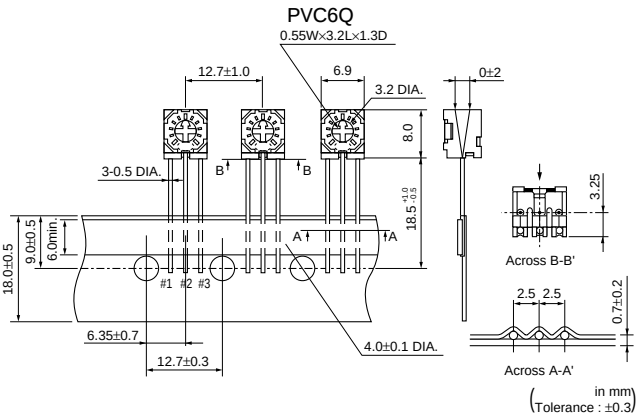


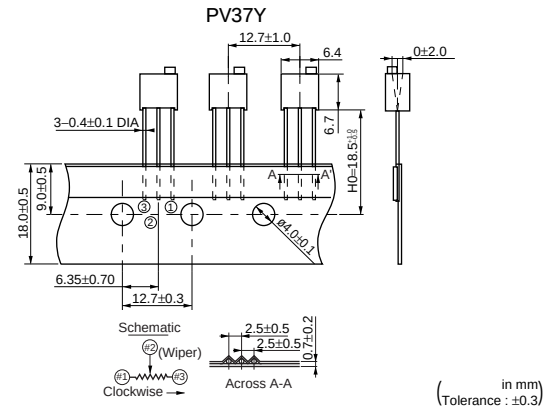
Part Number	A	B	I	J
PVG5A	4.3±0.2	5.4±0.2	5.4±0.1	0.4±0.1

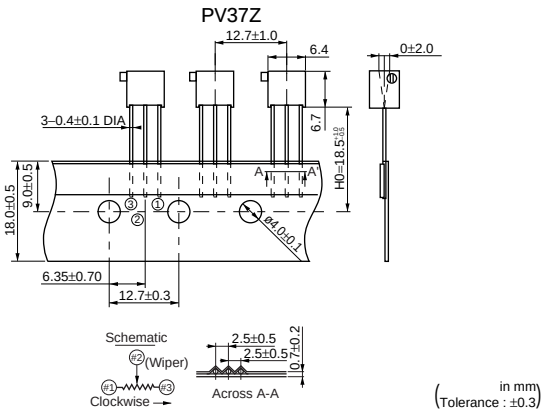
(in mm)

■ Dimensions of Radial Taping









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Packaging

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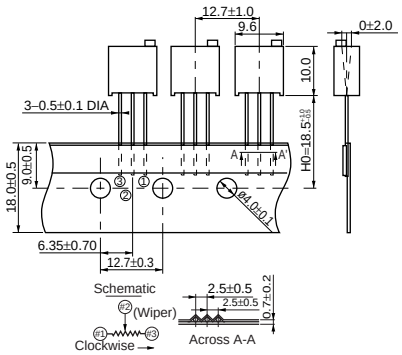
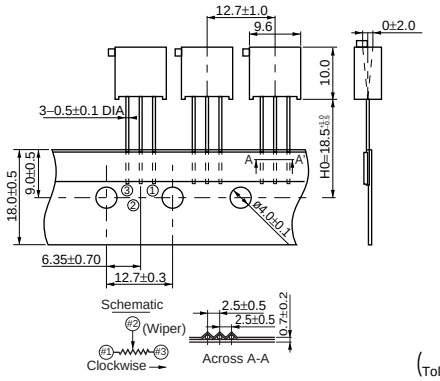
■ Dimensions of Radial Taping

PV36W



in mm
(Tolerance : ±0.3)

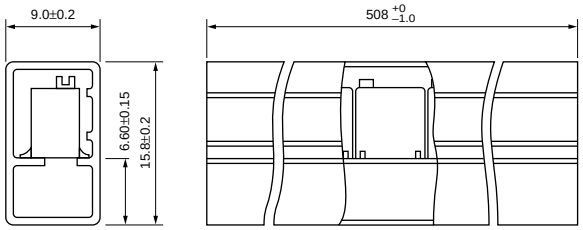
PV36X



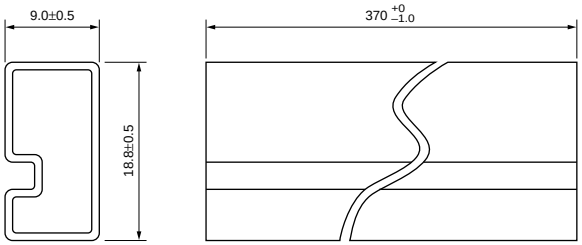
in mm
(Tolerance : ±0.3)

■ Dimensions of Magazine Packaging

PV01

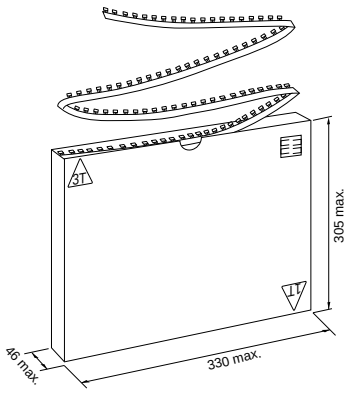


PVC6



(in mm)

■ Dimensions of Ammo Pack



(in mm)

Packaging

■ Recommendable adjustment tools

Trimmer Potentiometer Series	Manufactures	Model Number	MURATA Model Number	Blade
PVZ2	MURATA MFG.	KMDR090	KMDR090	– Minus (Raund edge)
PVZ3	VESSEL MFG.	No.9000+1.7X30	KMDR080	+ Cross
	TORAY INDUSTRIES. INC.	SA-2225	KMDR070	– Minus (Raund edge)
PVA3	VESSEL MFG.	No.9000+1.7X30	KMDR080	+ Cross
	TORAY INDUSTRIES. INC.	SA-2225	KMDR070	– Minus (Raund edge)
PVS3	TORAY INDUSTRIES. INC.	SA-2225	KMDR070	– Minus (Raund edge)
PVG3	TORAY INDUSTRIES. INC.	SA-2225	KMDR070	– Minus (Raund edge)
PVM4	VESSEL MFG.	No.9000–2.6X30	KMDR120	– Minus
PVF2	MURATA MFG.	KMDR140	KMDR140	– Minus
PVG5	VESSEL MFG.	No.9000–1.3X30	KMDR130	– Minus
	FUTABA TOOL MFG.	DA54		– Minus
PVC6	VESSEL MFG.	No.9000+0X30	KMDR150	+ Cross
	TORAY INDUSTRIES. INC.	SA-2225	KMDR070	– Minus (Raund edge)
others	VESSEL MFG.	No.9000–1.8X30	KMDR110	– Minus
	FUTABA TOOL MFG.	DA55		– Minus

■ For Automatic Adjustment

Trimmer Potentiometer Series	Manufactures	Model Number	MURATA Model Number	Blade
PVZ3 **PVA3** **PVS3** **PVG3**	TORAY INDUSTRIES. INC.	JB-2225	KMBT070	– Minus (Raund edge)
PVC6	VESSEL MFG.	No.CA-10	KMBT090	+ Cross
	TORAY INDUSTRIES. INC.	JB-2225	KMBT070	– Minus (Raund edge)

Qualified Standards

The products listed here has been produced by the QS9000 and ISO9002 certified factory

MURATA FACTORY	Qualified Date	Standard	Qualified Number
Kanazu Murata Mfg.Co.,Ltd.	JUNE.1.1998	UNDERWRITERS LABORATORIES INC.	A6734

∗ No ODCs (Ozone Depleting Chemicals) are used on Murata's all trimmer potentiometers

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