

THIRD ANGLE PROJECTION

ALL DIMENSIONS ARE IN MILLIMETERS.

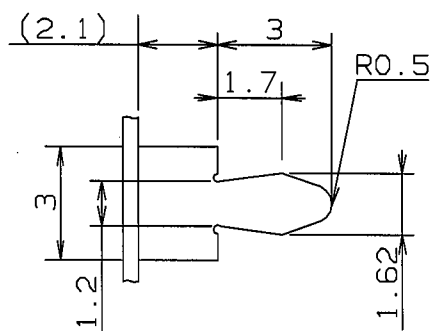
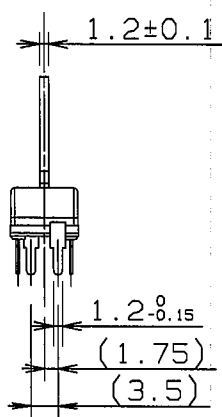
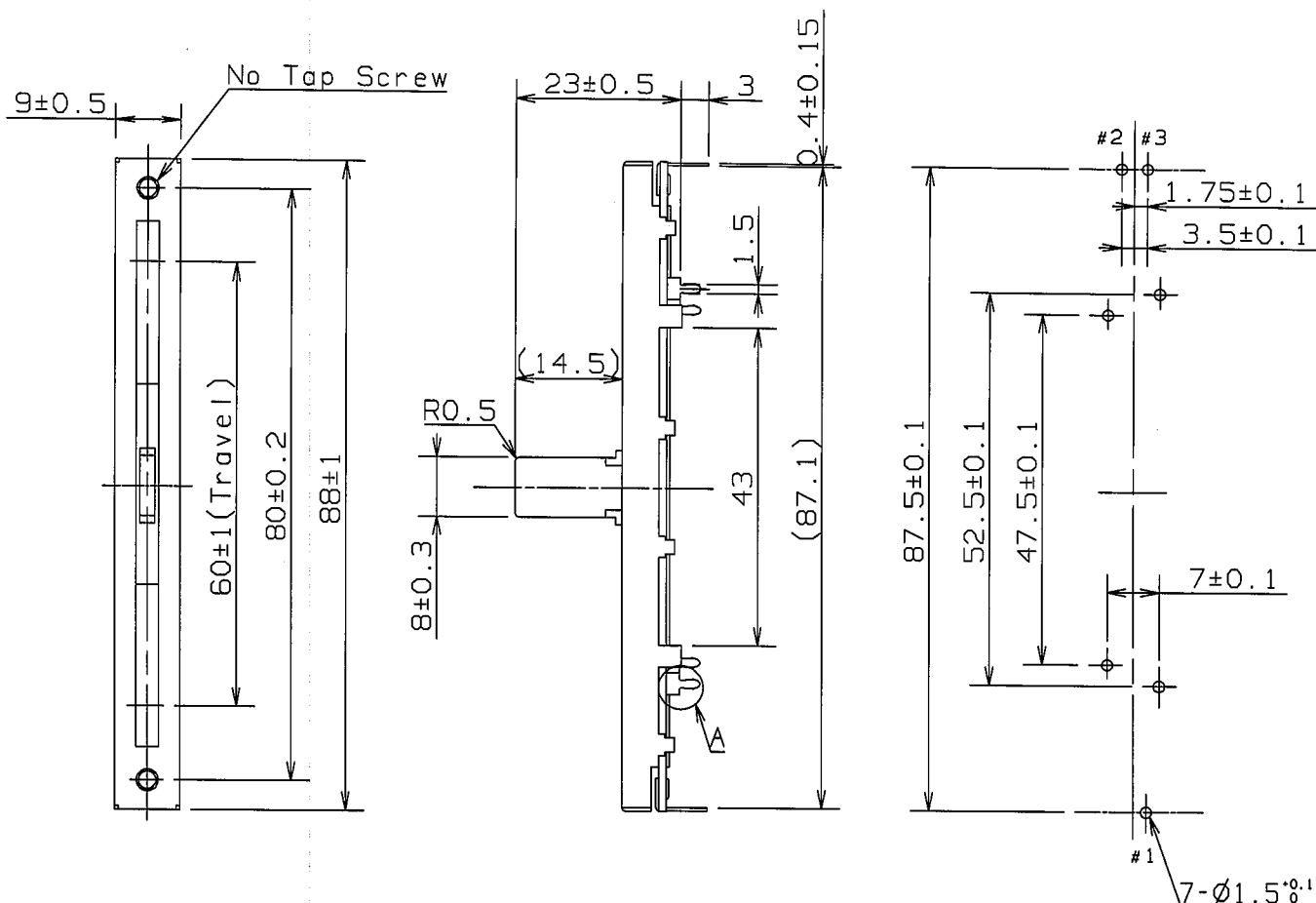
DO NOT SCALE DRAWING

General dimension tolerance : ± 0.5

() Dimension is for reference only.

P.C.B piercing plan

Component side



Part A

DESIGN	SITI	13.05.09	NAME			
DRAW	SITI	13.05.09	VARIABLE RESISTOR	ISSUE	REVISIONS	DATE
CHECK	<i>[Signature]</i>	15/5/09	TYPE NO.	DRAWING NO.		
APPROVAL	<i>[Signature]</i>	16/5/09	EVA NE3 R15 B14	RV-M-EVA-2009005		
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Scope :

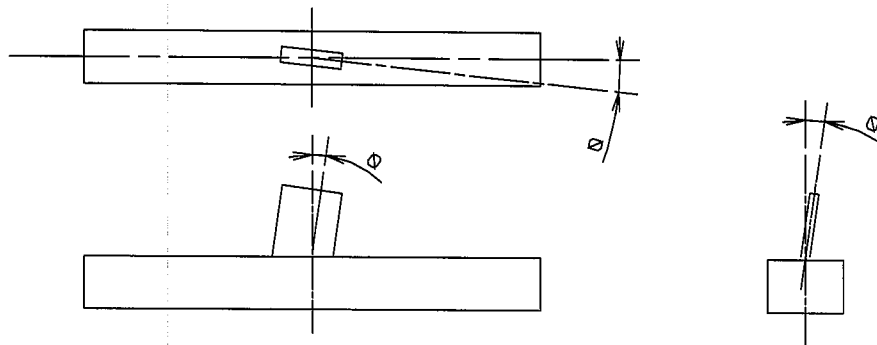
1) Control shown is designed in reference with our specification.

Electrical Specification

- 1) Total nominal resistance : $10k\Omega \pm 20\%$
- 2) Taper : Our code "B"
- 3) Maximum Attenuation : 70dB min.
- 4) Maximum voltage : AC 30 V
- 5) Noise level : Less than 82mV (from both ends to 5mm point and boundary between silver and carbon)
Less than 47mV (other part)
- 6) Insulation resistance : 50 M Ω min. (DC 500 V)
- 7) Withstand voltage : A.C 300 V for 1 min between terminal and cover
between terminal and lever

Mechanical Specification

- 1) Sliding Travel : 60mm $\pm$ 1mm
- 2) Sliding force : 0.1N to 1N At slide speed 100mm/3sto4s.
(At temperature: 20°C)
- 3) Lever stop strength : 50 Nmin. (At 5 mm point from top of metal housing)
- 4) Lever angle : $\theta = \pm 2^\circ \text{max.}$



- 5) Lever deviation : Shall be within 0.7mm from center line of both the side holes on the cover
- 6) Lever wobble : 0.75 mm max
Lever wobble at 10 mm from top of metal housing will be less than 0.75mm (each side) for both brush stroke and perpendicular direction when a force of 25mN.m is applied to lever.
- 7) Lever pull-push strength : No breakage nor marked deformation of lever shall occur when a static force of 50 N is applied to lever perpendicular direction to cover.
- 8) Lever side push strength : No breakage nor marked deformation of lever shall occur after applying a static force of 20 N to lever at 5mm point from top of metal housing perpendicular direction to brush stroke direction.
- 9) Terminal strength : Shall satisfy the electrical specification after soldering.
(temperature 350 $^\circ$ $\pm$ 5 $^\circ$ C, time 3 $\pm$ 0.5 sec max)

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Slide life specification (30,000 Turns)

- 1) Total nominal resistance : $\pm 15\%$ max. (from initial value)
- 2) Noise level : 100mV max.
- 3) Slide force : 0.05 N to 1.5 N at slide speed 100mm/3s to 4s.
(At temperature : 20°C)
- 4) Lever wobble : Shall be less than 1mm.
(At 5mm point from top of metal housing)

Others

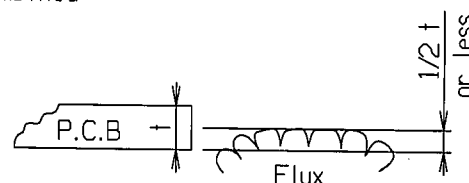
- 1) Operating temperature : -10°C ~ +60°C
- 2) Marking : (1) Our identification mark  (2) Nominal resistance value.
(3) Date code (4) Taper code (5) Your part No.
(6) MAL(MALAYSIA)/VN(VIETNAM) (Packing case only)
- 3) Precaution for handling: Please avoid to use potentiometer under the atmosphere of any sort of gas such as SO₂, NH₃ etc.
- 4) Item not included in these specification are in accordance with JIS-C-6443.
- 5) Manufacturing site : (1) Panasonic Electronic Devices Malaysia Sdn.Bhd.
(2) Panasonic Electronic Devices Vietnam Co.,Ltd.

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Soldering conditions

- 1) When dipping in solder apply the flux by the foaming method under the conditions mentioned below :-

Specific gravity of flux : 0.83 ± 0.05
 Flux foaming time : Within 5 sec.
 Flux foaming level : $1/2 t$ or less



- 2) After flux application, sufficiently dry the flux by preheating under the condition mentioned below :-

Temperature : $90 \sim 100^\circ\text{C}$ (Ambient temperature)
 Time : $50 \sim 70$ sec.

- 3) Soldering should be performed at $260^\circ\text{C} \pm 5^\circ\text{C}$ (Lead free solder)
 Immersion time 5 ± 1 sec. (Allowed 2 time but cool down first before conducting again.)
 Maximum resistance variation from initial $\pm 5\%$

Over 90% of the immersion surface shall be covered with solder
 (Use alloy composition 3% Ag, 0.5% Cu, balance Sn for test condition.)

- 4) Hand soldering should be performed at $350^\circ \pm 5^\circ\text{C}$ for 3 ± 0.5 sec.

- 5) P.C.B condition

Thickness : $t = 1.6\text{mm}$
 Material : Phenol laminated plate with single copper plating.
 Pierced hole diameter : Please refer P.C.B piercing plan in the dimensional drawing.

Please avoid washing after soldering, it may cause electrical contact failure by flux.

If condition 1) ~ 5) are satisfied, there will be no problem such as flux sucked up from terminals and electrical contact.
 But care should be taken in the case of wiring such as jumper wire near the VR body where flux is detained.

Whisker test conditions

Whisker test (terminals):

- Test shall be done in condition of mounting on P.C.B ($t=1.6\text{mm}$)
 Humidity $60 \pm 2^\circ\text{C}$, RH $90 \sim 95\%$ for 350 ± 10 hrs. Outbreak of whisker length after test $200 \mu\text{m}$ maximum.
- Normal condition room temperature for a period of 6 months minimum, whisker outbreak distance $200 \mu\text{m}$ maximum.

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Prohibitions and precautions for handling

1) Prohibited items on fire and smoking.

Absolutely avoid use of a product beyond its rated range because doing so may cause a fire. If misuse or abnormal use may result in conditions in which the product is used out of its rated range, take proper measures such as current interruption using a protective circuit.

The grade of non flammability for resin used in product is "94HB", which is based on UL94 Standards (flammability test for plastic materials). Prohibit use in location where a spreading fire may be generated or prepare against a spreading fire.

2) For use in equipment for which is safety requested.

Although care is taken to ensure the product quality, inferior characteristics, short circuits, and open circuits are some problems that might be generated. To design a equipment which places maximum emphasis on safety, review the affect of any single fault of a product in advance and perform virtuality fail safe design to ensure maximum safety by:

- . Preparing a protective circuit or a protective device to improve system safety, and set.
- . Preparing a redundant circuit to improve system safety so that the single fault of a product does not cause a dangerous situation.

3) Reliability.

- . The item designed mainly correspond to JIS (Japan Industrial Standard) on the reliability conditions.

- . Operating temperature range:

Use in the range of -10°C to +60°C

- . Preservative temperature range:

Store in the range of -10°C to +70°C

- . Storage condition.

Do not store the product high temperatures and/ or high humidity, or in a location where corrosive gas may be generated. Store the product at room temperature and room humidity in a packed condition. Use them within a maximum of 6 months. Check the date of manufacture on the package box and apply the "first-in-first-out" rule. If unpacked product must be store as inventory. Store them in a polyethylene bag to keep out air.

Handling of approval specification.

- . This specification form specify for this item only. Please perform your approval test in actual equipment conditions beforehand.

- . Please return one copy of this specification form with your approval stamp or signature to us.

Otherwise, it might be happened that the item cannot be supplied.

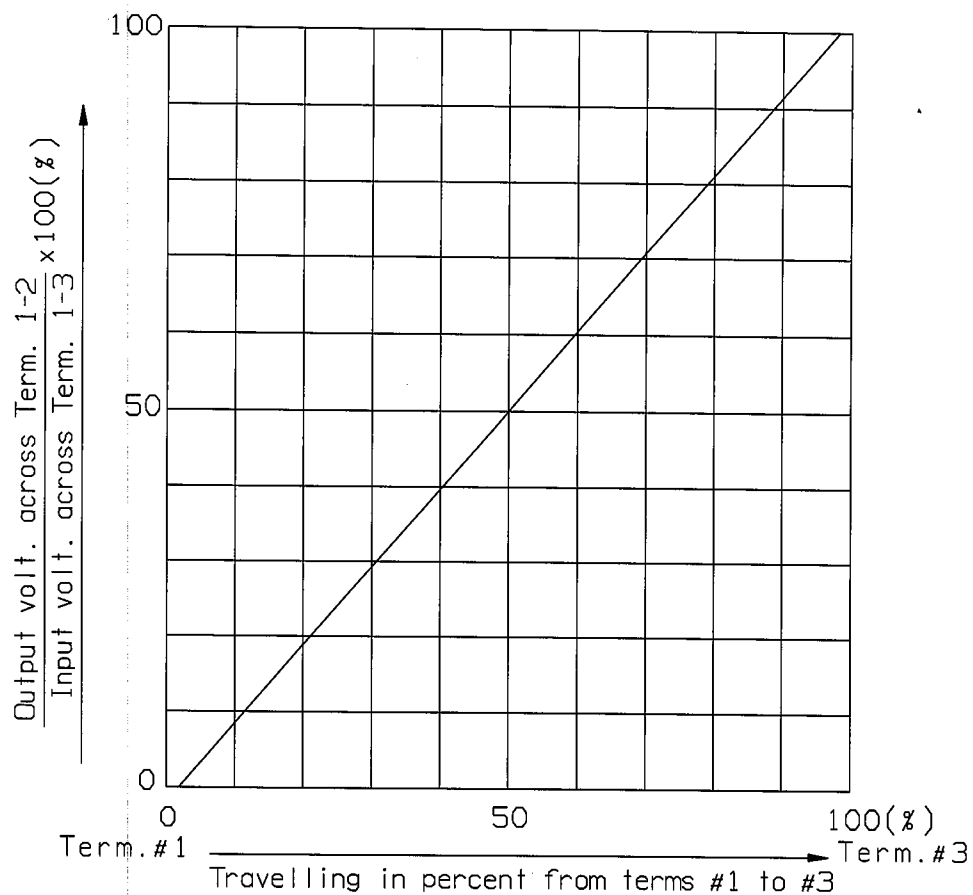
The terms to return back to us after receipt of this product specification shall be one year from the issued date. In case more than one year past, please request us new specifications again before ordering this product.

- . Writings in this specification form are subject to change through precautions.

Information of Chemical Substance and Environmental Hazardous Substances.

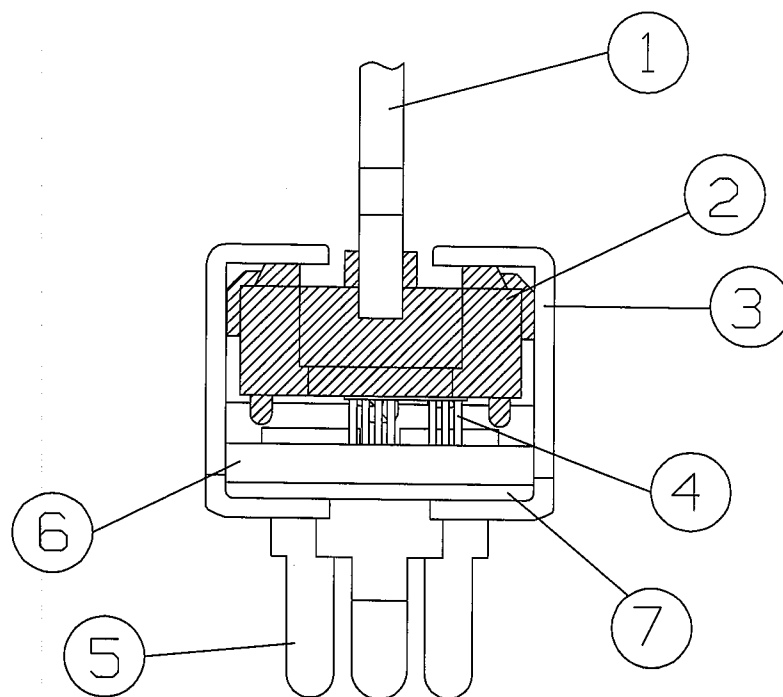
- . This product has not been manufactured with any ozone depleting chemical controlled under the Montreal Protocol.
- . This product complies with the RoHS Directive Restriction of the use of certain Hazardous Substance in electrical and electronic equipments. (DIRECTIVE2002/95/EC).
- . All materials used in this part are registered material under the Law Concerning the Examination and Regulation of Manufacture etc. or Chemical Substances.

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STANDARD DESIGN OF TAPER B

	Percent Voltage at 50% point
Tolerance	40 ~ 60 %

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CROSS SECTIONAL DRAWING

No.	Part name	Material	Finish & other
1	Lever	Zinc plated steel sheet	Cr6+ free
2	Molded base	Polyacetal molding resin	
3	cover	Nickel plated steel sheet	
4	Brush	Nickel silver plate	
5	Terminal	Cold rolled steel sheet	Tin plating (Sn 100%)
6	Resistance element	Phenol laminated plate	
7	Mounting metal	Zn-Sn-Ni steel sheet	

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