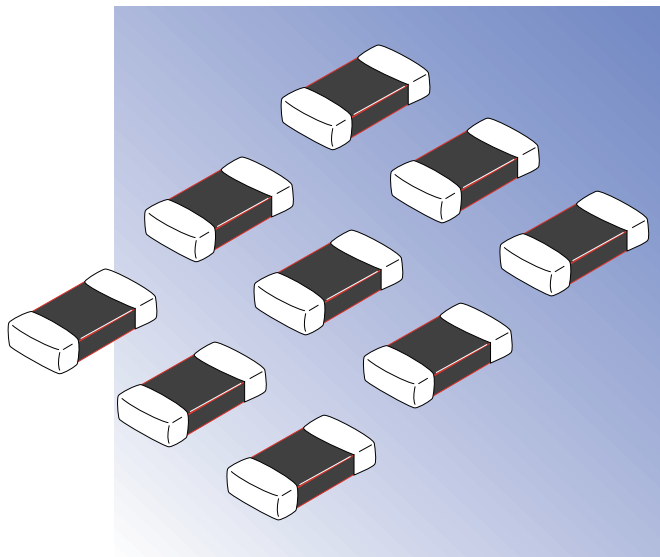


DIA NTC THERMISTORS

Surface Mount



MMC
ELECTRONICS

A Subsidiary of

MITSUBISHI
MITSUBISHI MATERIALS

99.8.06

SMD Type NTC Thermistors

Using our company's unique materials, product design, and manufacturing technologies, we have been able to produce smaller and increasingly higher precision surface mount thermistors. This has enabled us to create a full line of parts to meet various characteristic and size requirements.

High Precision type TH Series



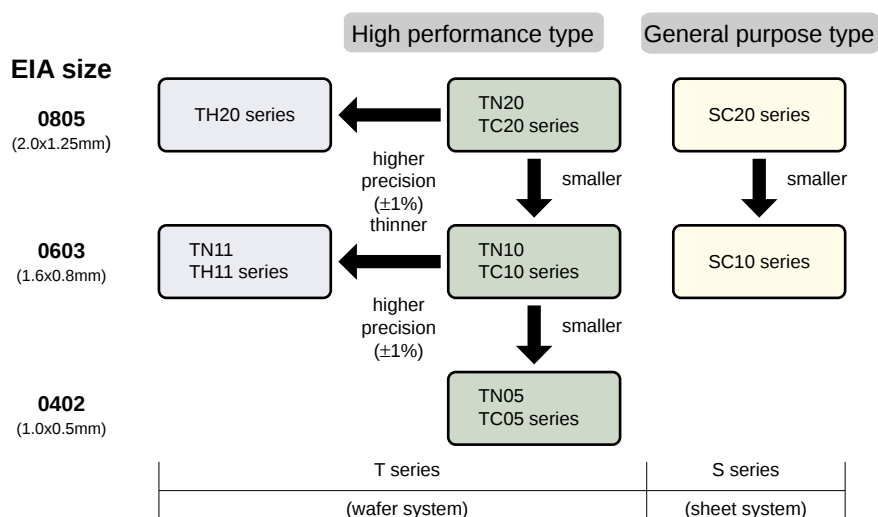
High Reliability type TN•TC Series



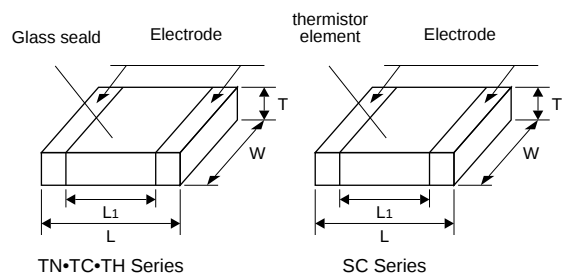
Low Cost type SC Series



Product Lineup

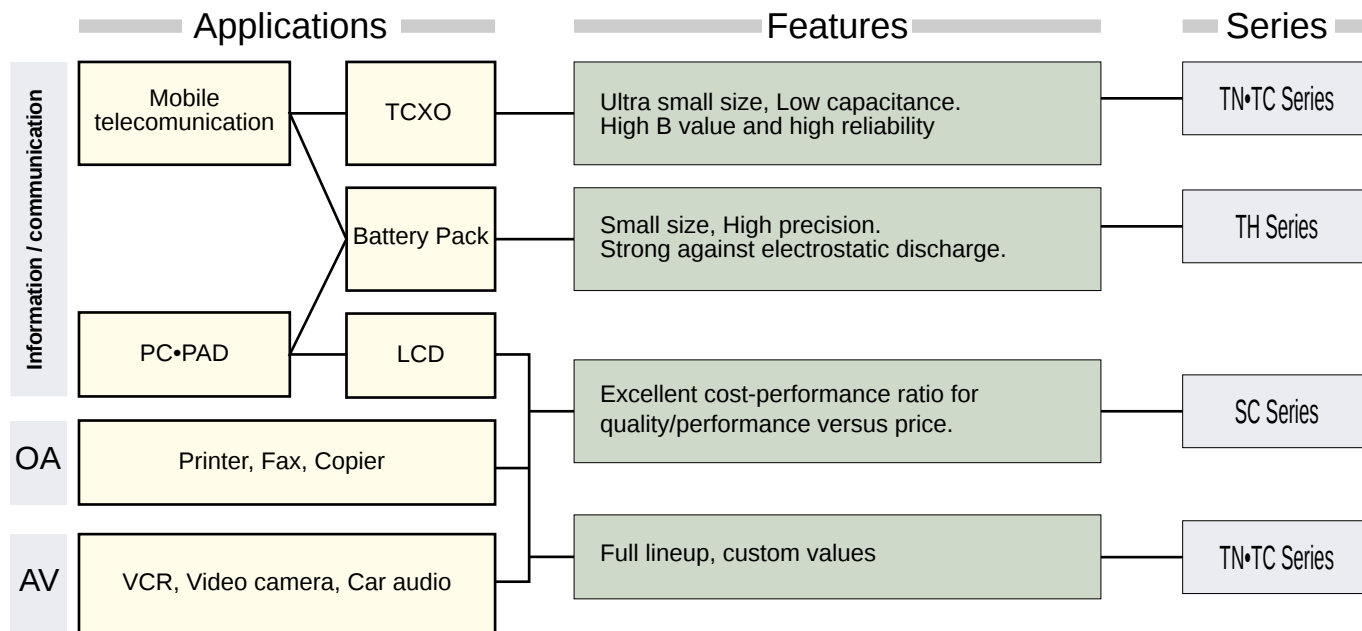


Dimensions



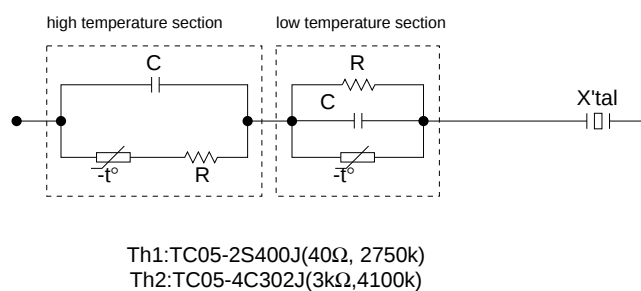
Series	L	W	T	L ₁
TN•TC05	1.00±0.15	0.50 ^{+0.05} _{-0.10}	0.50 ^{+0.05} _{-0.10}	0.20min.
TN•TC•SC10	1.60±0.15	0.80±0.15	0.95max.	0.30min.
TN•TH11	1.60±0.15	0.80±0.15	0.70max.	0.30min.
TN•TC•TH•SC20	2.00±0.20	1.25±0.20	1.25max.	0.40min.
TN23	2.00±0.20	1.45±0.20	1.25max.	0.40min.

Applications and Features

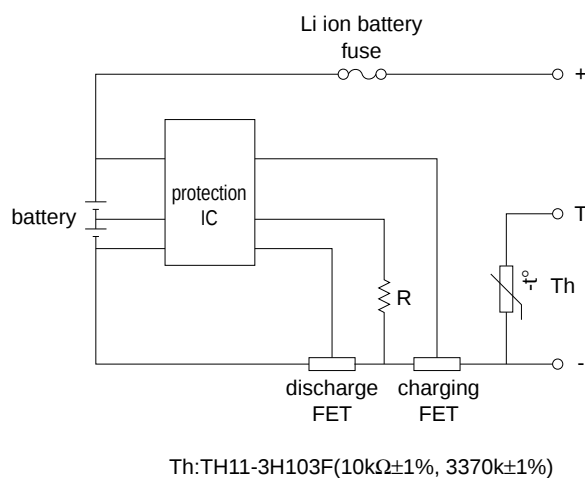


Sample Circuits

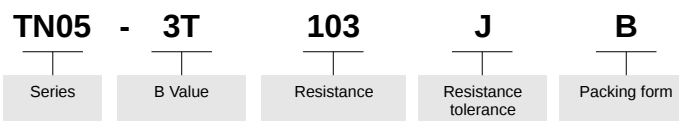
•TCXO



•Battery Pack



Part Number



Style

Series	Type	Termination	Operating temperature range	Resistance range
TN05, TC05	SMD Chip	Solder plated	-40°C~+125°C	40Ω~2MΩ
TN11, TC11, TH11				1.8kΩ~150kΩ
TN10, TC10				30Ω~150kΩ
TN20, TN23, TC20, TH20				30Ω~2MΩ
SC10				30Ω~2.2kΩ
SC20				100Ω~150kΩ
MN18, MH18	MELF		-40°C~+150°C	2kΩ~150kΩ

B Value

The B value of the thermistor is determined by the material composition. B values in this catalog are shown over two temperature ranges, R_{25/50} and R_{25/85}.

Resistance

Resistance value at 25°C is expressed in ohms. First two digits are significant and the last digit is the numbers of zeros following.

Resistance Tolerance

Code	F	G	H	J	K	L
Resistance tolerance	±1%	±2%	±3%	±5%	±10%	±15%
B Value tolerance	===== ±1% ===== ===== ±3% ===== ===== ±5% =====					

Packing Form

Code	Packing form	Packing Qty.	Related series
B	Bulk	500&200	All types
T	Paper taping	4,000	TN11, TC11, TH11, TN10, TC10, TN20, TC20, TH20, SC20, SC10
P	Plastic taping	2,000	TN23, MN18, MH18
R	Paper taping	10,000	TN05, TC05

*For nickel or solder plating

(example) Nickel plated part :GA13-3H103**

Solder plated part:GA13Z3H103**

Place a "Z" in place of the "-"(hyphen)when ordering solder plated parts.

Please note solder plated parts have a maximum heat resistances of 150°C.



Characteristics

- Dimensions 1.0x0.5x0.55max(mm)
- Resistance tolerance $\pm 5\%, \pm 10\%$ (R25)
- B value tolerance $\pm 3\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation $2.4\text{mW}/^{\circ}\text{C}$
- Power Rating 240mW

Features

- Ultra small size.
- Suitable for TCXO applications because of the low capacitance.
- Corresponding to the high B value.(TC05 Series)
- Solder plated terminations for easy mounting.
- Glass sealed body for high reliability.
- Full lineup for various applications.

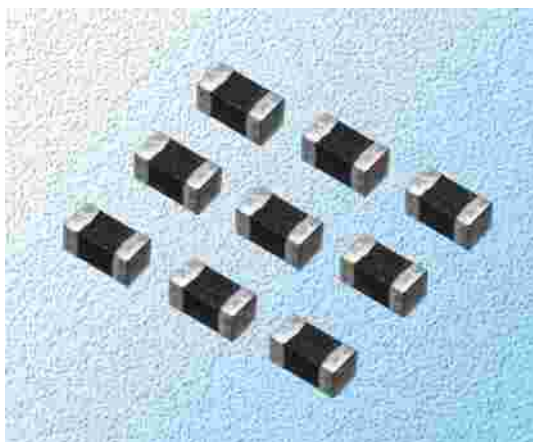
Value

TN05 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
3C102**	1.0k Ω	3,110K	3,124K	3V223**	22k Ω	3,900K	3,989K
3E152**	1.5k Ω	3,200K	3,214K	3N333**	33k Ω	3,650K	3,725K
3G222**	2.2k Ω	3,290K	3,298K	3I473**	47k Ω	3,400K	3,490K
3H302**	3.0k Ω	3,370K	3,375K	3J683**	68k Ω	3,450K	3,492K
3I332**	3.3k Ω	3,420K	3,425K	3K803**	80k Ω	3,500K	3,543K
3L472**	4.7k Ω	3,530K	3,528K	3L104**	100k Ω	3,540K	3,578K
3N682**	6.8k Ω	3,670K	3,657K	3M154**	150k Ω	3,620K	3,668K
3T103**	10k Ω	3,820K	3,792K	4W205**	2M Ω	4,950K	4,984K
4B153**	15k Ω	4,030K	3,985K				

TC05 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
2S400**	40 Ω	2,750K	2,769K	4C202**	2.0k Ω	4,100K	4,048K
2S101**	100 Ω	2,750K	2,769K	4C302**	3.0k Ω	4,100K	4,048K
2S151**	150 Ω	2,750K	2,769K				



Characteristics

- Dimensions 1.6x0.8x0.95max(mm)
- Resistance tolerance $\pm 5\%$, $\pm 10\%$ (R25)
- B value tolerance $\pm 3\%$, $\pm 5\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation 3.0mW/ $^{\circ}\text{C}$
- Power Rating 300mW

Features

- Suitable for TCXO applications because of the low capacitance.
- Corresponding to the high B value.(TC10 Series)
- Solder plated terminations for easy mounting.
- Glass sealed body for high reliability.
- Full lineup for various applications.

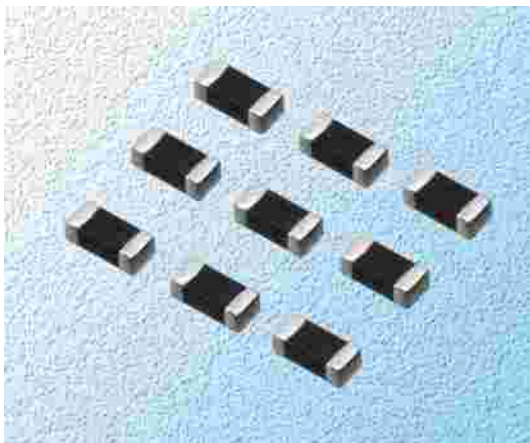
Value

TN10 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
2D300**	30 Ω	2,150K	2,115K	3K222**	2.2k Ω	3,500K	3,499K
2E400**	40 Ω	2,200K	2,292K	3N332**	3.3k Ω	3,650K	3,633K
2F500**	50 Ω	2,250K	2,279K	3S472**	4.7k Ω	3,750K	3,750K
2H680**	68 Ω	2,350K	2,380K	3V682**	6.8k Ω	3,900K	3,868K
2R101**	100 Ω	2,700K	2,724K	4C103**	10k Ω	4,100K	4,048K
2S121**	120 Ω	2,750K	2,769K	3U153**	15k Ω	3,850K	3,870K
2T151**	150 Ω	2,800K	2,813K	3K223**	22k Ω	3,500K	3,643K
2V221**	220 Ω	2,900K	2,901K	3J333**	33k Ω	3,450K	3,494K
3A331**	330 Ω	3,000K	3,025K	3K473**	47k Ω	3,500K	3,537K
3C471**	470 Ω	3,100K	3,125K	3M683**	68k Ω	3,600K	3,645K
3D681**	680 Ω	3,150K	3,181K	3R104**	100k Ω	3,700K	3,743K
3F102**	1k Ω	3,250K	3,260K	3S154**	150k Ω	3,750K	3,797K
3I152**	1.5k Ω	3,400K	3,399K				

TC10 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
2R270**	27 Ω	2,700K	2,724K	3I122**	1.2k Ω	3,400K	3,399K
2S400**	40 Ω	2,750K	2,769K	3V152**	1.5k Ω	3,900K	3,868K
2S500**	50 Ω	2,750K	2,769K	3K182**	1.8k Ω	3,500K	3,499K
2R820**	82 Ω	2,700K	2,724K	3V202**	2k Ω	3,900K	3,868K
2S101**	100 Ω	2,750K	2,769K	4C202**	2k Ω	4,100K	4,048K
2V181**	180 Ω	2,900K	2,901K	4C272**	2.7k Ω	4,100K	4,048K
3F821**	820 Ω	3,250K	2,260K	4C302**	3k Ω	4,100K	4,048K



Characteristics

- Dimensions 1.6x0.8x0.70max(mm)
- Resistance tolerance $\pm 5\%$, $\pm 10\%$ (R25)
- B value tolerance $\pm 3\%$, $\pm 5\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation $3.0\text{mW}/^{\circ}\text{C}$
- Power Rating 300mW

Features

- Small and Thin size.
- Suitable for TCXO applications because of the low capacitance.
- Corresponding to the high B value.(TC**Series)
- Solder plated terminations for easy mounting.
- Glass sealed body for high reliability.
- Full lineup for various applications.

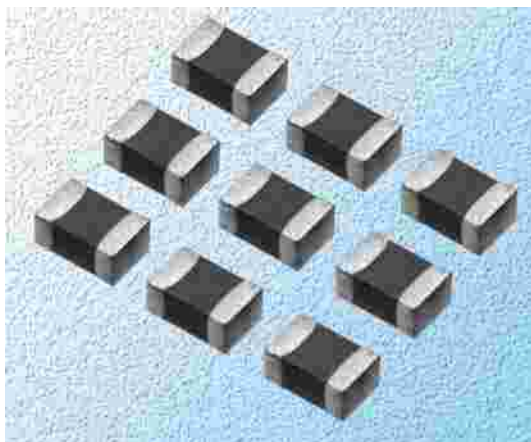
Value

TN11 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
3H103**	10k Ω	3,370K	3,876K	3K683**	68k Ω	3,500K	3,534K
3V103**	10k Ω	3,910K	3,876K	3M104**	100k Ω	3,590K	3,628K
4C153**	15k Ω	4,110K	4,053K	4H104**	100k Ω	4,360K	4,360K
3T223**	22k Ω	3,820K	3,841K	3R154**	150k Ω	3,680K	3,723K
3J473**	47k Ω	3,440K	3,481K				

TC11 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
4G182**	1.8k Ω	4,300K	4,254K	4G222**	2.2k Ω	4,300K	4,254K
4G202**	2.0k Ω	4,300K	4,254K				



Characteristics

- Dimensions 2.0x1.25x1.25max(mm)
- Resistance tolerance $\pm 5\%, \pm 10\%$ (R25)
- B value tolerance $\pm 3\%, \pm 5\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation 5.0mW/ $^{\circ}\text{C}$
- Power Rating 500mW

Features

- Suitable for TCXO applications because of the low capacitance.
- Corresponding to the high B value.(TC20 Series)
- Solder plated terminations for easy mounting.
- Glass sealed body for high reliability.
- Full lineup for various applications.

Value

TN20 Series

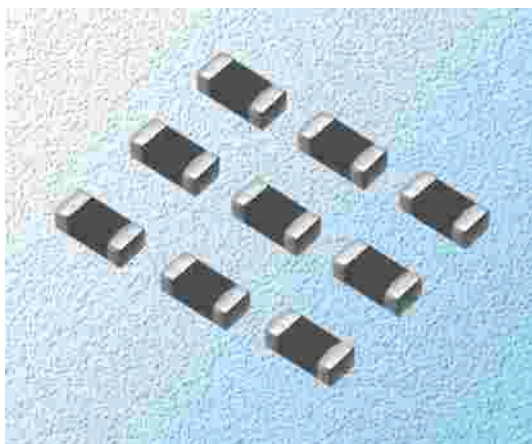
TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
2G400**	40 Ω	2,300K	2,304K	3W472**	4.7k Ω	3,950K	3,909K
2I500**	50 Ω	2,400K	2,450K	4C682**	6.8k Ω	4,100K	4,044K
2I560**	56 Ω	2,400K	2,450K	3H103**	10k Ω	3,370K	3,489K
2N680**	68 Ω	2,650K	2,673K	3V103**	10k Ω	3,924K	3,914K
2S101**	100 Ω	2,750K	2,758K	3N153**	15k Ω	3,650K	3,694K
2T151**	150 Ω	2,800K	2,813K	3S223**	22k Ω	3,750K	3,786K
2V221**	220 Ω	2,900K	2,917K	3W303**	30k Ω	3,950K	3,991K
3A331**	330 Ω	3,000K	2,019K	3T333**	33k Ω	3,800K	3,839K
3C471**	470 Ω	3,100K	3,120K	3U473**	47k Ω	3,850K	3,894K
3E681**	680 Ω	3,200K	3,218K	3N683**	68k Ω	3,650K	3,690K
3E102**	1k Ω	3,200K	3,221K	3R803**	80k Ω	3,700K	3,743K
3I152**	1.5k Ω	3,400K	3,403K	4C104**	100k Ω	4,100K	4,141K
3K202**	2k Ω	3,500K	3,469K	4D154**	150k Ω	4,150K	4,195K
3S332**	3.3k Ω	3,750K	3,731K	5A205**	2M Ω	5,000K	5,043K

TN23 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
2G300**	30 Ω	2,300K	2,304K

TC20 Series

TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value	TYPE	R25 Resistance	B25/50 B Value	B25/85 B Value
2S400**	40 Ω	2,750K	2,758K	4C302**	3.0k Ω	4,100K	4,044K



Characteristics

TH11 Series

- Dimensions 1.6x0.8x0.70max(mm)
- Resistance tolerance $\pm 1\%$, $\pm 2\%$, $\pm 3\%$ (R25)
- B value tolerance $\pm 1\%$, $\pm 2\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation $3.0\text{mW}/^{\circ}\text{C}$
- Power Rating 300mW

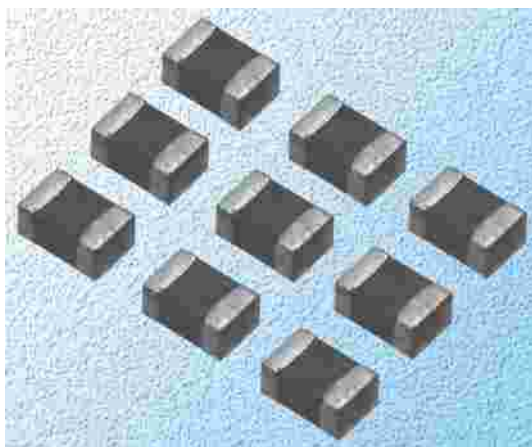
Features

- High Precision type.($\pm 1\%$)
- Strong against electrostatic discharge.
- Suitable for battery pack application.(Li-ion, Ni-MH etc)
- Solder plated terminations for easy mounting.
- Glass sealed body for high reliability

Value

TH11 Series

Type	R25 Resistance	B25/50 B Value	B25/85 B Value	Type	R25 Resistance	B25/50 B Value	B25/85 B Value
3H103**	10k Ω	3,370K	3,876K	3K683**	68k Ω	3,500K	3,534K
3V103**	10k Ω	3,910K	3,876K	3M104**	100k Ω	3,590K	3,628K
4C153**	15k Ω	4,110K	4,053K	4H104**	100k Ω	4,360K	4,360K
3T223**	22k Ω	3,820K	3,841K	3R154**	150k Ω	3,680K	3,723K
3J473**	47k Ω	3,440K	3,481K				



Characteristics

TH20 Series

- Dimensions 2.0x1.25x1.25max(mm)
- Resistance tolerance $\pm 1\%$, $\pm 2\%$, $\pm 3\%$ (R25)
- B value tolerance $\pm 1\%$, $\pm 2\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation $5.0\text{mW}/^{\circ}\text{C}$
- Power Rating 500mW

Features

- High Precision type.($\pm 1\%$)
- Strong against electrostatic discharge.
- Suitable for battery pack application.(Li-ion, Ni-MH etc)
- Solder plated terminations for easy mounting.
- Glass sealed body for high reliability

Value

TH20 Series

Type	R25 Resistance	B25/50 B Value	B25/85 B Value	Type	R25 Resistance	B25/50 B Value	B25/85 B Value
3H103**	10k Ω	3,370K	3,489K	3M503**	50k Ω	3,590K	3,628K
3V103**	10k Ω	3,924K	3,914K	3R803**	80k Ω	3,700K	3,743K
3W303**	30k Ω	3,950K	3,991K	3S104**	100k Ω	3,760K	3,806K



Characteristics

SC10 Series

- Dimensions 1.6x0.8x0.95max(mm)
- Resistance tolerance $\pm 10\%$ (R25)
- B value tolerance $\pm 3\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation $3.0\text{mW}/^{\circ}\text{C}$
- Power Rating 300mW

Features

- Excellent in cost-performances such as quality, performance, price.
- Solder plated terminations for easy mounting.

Value

SC10 Series

Type	R25 Resistance	B25/50 B Value	B25/85 B Value	Type	R25 Resistance	B25/50 B Value	B25/85 B Value
3F300**	30 Ω	3,250K	3,190K	4C222**	2.2k Ω	4,100K	4,048K



Characteristics

SC20 Series

- Dimensions 2.0x1.25x1.25max(mm)
- Resistance tolerance $\pm 10\%$ (R25)
- B value tolerance $\pm 3\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Heat Dissipation $5.0\text{mW}/^{\circ}\text{C}$
- Power Rating 500mW

Features

- Excellent in performances with low cost and high quality.
- Solder plated terminations for easy mounting.
- Full lineup for various applications.

Value

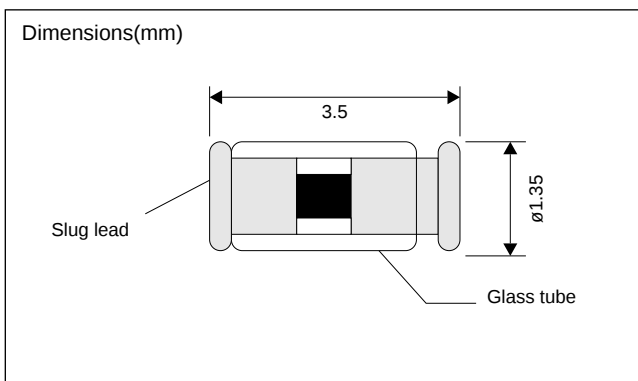
SC20 Series

Type	R25 Resistance	B25/50 B Value	B25/85 B Value	Type	R25 Resistance	B25/50 B Value	B25/85 B Value
3E101**	100 Ω	3,200K	3,279K	3K472**	4.7k Ω	3,500K	3,541K
3E151**	150 Ω	3,200K	3,279K	3K682**	6.8k Ω	3,500K	3,541K
3E221**	220 Ω	3,200K	3,279K	3I103**	10k Ω	3,400K	3,517K
3E331**	330 Ω	3,200K	3,279K	3J153**	15k Ω	3,440K	3,472K
3E471**	470 Ω	3,200K	3,279K	3K223**	22k Ω	3,500K	3,541K
3E681**	680 Ω	3,200K	3,279K	3M333**	33k Ω	3,590K	3,634K
3K102**	1.0k Ω	3,500K	3,541K	3R473**	47k Ω	3,680K	3,729K
3K152**	1.5k Ω	3,500K	3,541K	3S683**	68k Ω	3,760K	3,814K
3K222**	2.2k Ω	3,500K	3,541K	3U104**	100k Ω	3,850K	3,908K
3K332**	3.3k Ω	3,500K	3,541K	3W154**	150k Ω	3,940K	4,006K

Please consult us for availability of non-standard items.



[High Temp. range type]



MN18 Series (standard type)

Characteristics

- Dimensions 3.5xØ1.35(mm)
- Resistance tolerance $\pm 3\%$, $\pm 5\%$ (R25)
- B value tolerance $\pm 3\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +150^{\circ}\text{C}$
- Heat Dissipation 2.0mW/ $^{\circ}\text{C}$
- Power Rating 250mW

Value

Type	R25 Resistance	B25/50 B Value	B25/85 B Value	Type	R25 Resistance	B25/50 B Value	B25/85 B Value
3G202**	2k Ω	3,470K	3,507K	3Y303**	30k Ω	3,900K	3,951K
3G302**	3k Ω	3,470K	3,507K	6H503**	50k Ω	3,770K	3,820K
3G502**	5k Ω	3,470K	3,507K	3U104**	100k Ω	3,965K	4,038K
3H103**	10k Ω	3,465K	3,502K	3U154**	150k Ω	3,965K	4,038K
6E203**	20k Ω	3,965K	4,016K				

Features

- Suitable for high temperature applications.
- Excellent choice for harsh environments.

MH18 Series (precision type)

Characteristics

- Dimensions 3.5xØ1.35(mm)
- Resistance tolerance $\pm 1\%$, $\pm 2\%$, $\pm 3\%$ (R25)
- B value tolerance $\pm 1\%$ (B25/50)
- Termination Solder plated nickel barrier
- Operating temperature range $-40^{\circ}\text{C} \sim +150^{\circ}\text{C}$
- Heat Dissipation 2.0mW/ $^{\circ}\text{C}$
- Power Rating 250mW

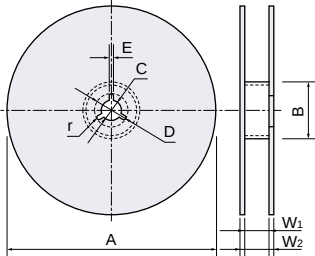
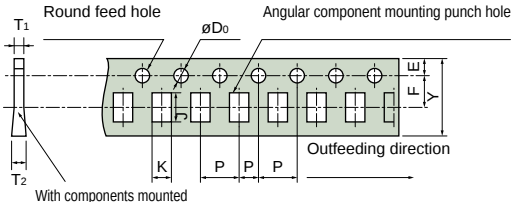
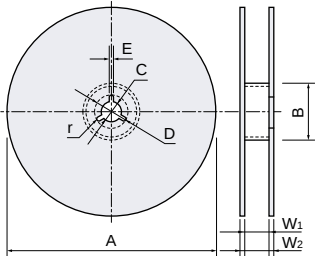
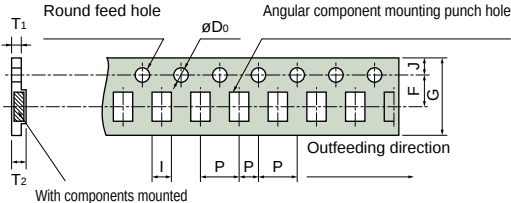
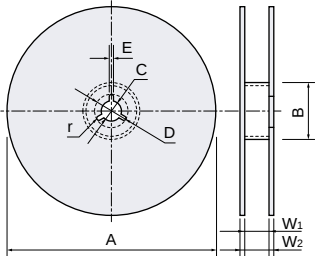
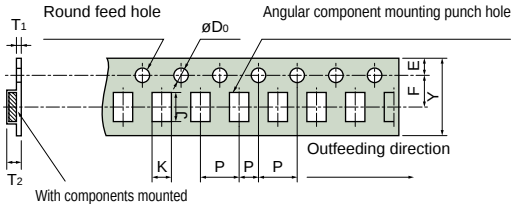
Value

Type	R25 Resistance	B25/50 B Value	B25/85 B Value	Type	R25 Resistance	B25/50 B Value	B25/85 B Value
3G202**	2k Ω	3,470K	3,507K	3Y303**	30k Ω	3,900K	3,951K
3G302**	3k Ω	3,470K	3,507K	6H503**	50k Ω	3,770K	3,820K
3G502**	5k Ω	3,470K	3,507K	3U104**	100k Ω	3,965K	4,038K
3H103**	10k Ω	3,465K	3,502K	3U154**	150k Ω	3,965K	4,038K
6E203**	20k Ω	3,965K	4,016K				

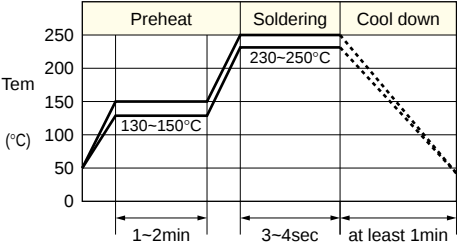
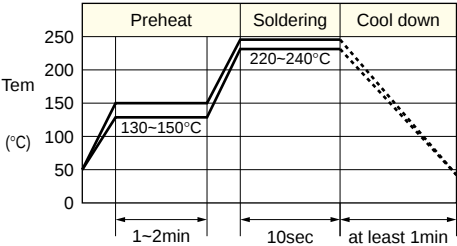
Features

- High Precision type.($\pm 1\%$)
- Suitable for high temperature applications.
- Excellent choice for harsh environments.

Unit:mm

Packing Code	Related Series	Packing Qty.	Packing Form																																																
B	All Types	500&200	Poly Bag 																																																
R	TN05 TC05	10,000	<table><tr><th>code</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>W₁</th><th>W₂</th><th>r</th></tr><tr><td>RRM08B</td><td>ø180 +0 -3</td><td>ø60 +1 -0</td><td>ø13.0 ±0.2</td><td>R10.5 ±0.4</td><td>2.0 ±0.5</td><td>9.0 ±0.3</td><td>11.4 ±1.0</td><td>0.5</td></tr></table> <table><tr><th>K</th><th>J</th><th>Y</th><th>F</th><th>E</th><th>P₁</th></tr><tr><td>0.62 ±0.10</td><td>1.15 ±0.10</td><td>8.0 ±0.3</td><td>3.50 ±0.05</td><td>1.75 ±0.10</td><td>2.0 ±0.1</td></tr><tr><th>P₂</th><th>P₀</th><th>D₀</th><th>T₁</th><th>T₂</th><th>hole</th></tr><tr><td>2.00 ±0.05</td><td>4.0 ±0.1</td><td>ø1.5 +0.1 -0</td><td>0.8 ma</td><td>0.9 ma</td><td>square punch</td></tr></table>	code	A	B	C	D	E	W ₁	W ₂	r	RRM08B	ø180 +0 -3	ø60 +1 -0	ø13.0 ±0.2	R10.5 ±0.4	2.0 ±0.5	9.0 ±0.3	11.4 ±1.0	0.5	K	J	Y	F	E	P ₁	0.62 ±0.10	1.15 ±0.10	8.0 ±0.3	3.50 ±0.05	1.75 ±0.10	2.0 ±0.1	P ₂	P ₀	D ₀	T ₁	T ₂	hole	2.00 ±0.05	4.0 ±0.1	ø1.5 +0.1 -0	0.8 ma	0.9 ma	square punch						
code	A	B	C	D	E	W ₁	W ₂	r																																											
RRM08B	ø180 +0 -3	ø60 +1 -0	ø13.0 ±0.2	R10.5 ±0.4	2.0 ±0.5	9.0 ±0.3	11.4 ±1.0	0.5																																											
K	J	Y	F	E	P ₁																																														
0.62 ±0.10	1.15 ±0.10	8.0 ±0.3	3.50 ±0.05	1.75 ±0.10	2.0 ±0.1																																														
P ₂	P ₀	D ₀	T ₁	T ₂	hole																																														
2.00 ±0.05	4.0 ±0.1	ø1.5 +0.1 -0	0.8 ma	0.9 ma	square punch																																														
T	TN11 TC11 TH11 TN10 TC10 TN20 TC20 TH20 SC10 SC20	4,000	<table><tr><th>code</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>W₁</th><th>W₂</th><th>r</th></tr><tr><td>RRM08B</td><td>ø180 +0 -3</td><td>ø60 +1 -0</td><td>ø13.0 ±0.2</td><td>R10.5 ±0.4</td><td>2.0 ±0.5</td><td>9.0 ±0.3</td><td>11.4 ±1.0</td><td>0.5</td></tr></table> <table><tr><th>I</th><th>H</th><th>G</th><th>F</th><th>J</th><th>P₁</th></tr><tr><td>1.65 ±0.2</td><td>2.4 ±0.2</td><td>8.0 ±0.3</td><td>3.50 ±0.05</td><td>1.75 ±0.10</td><td>4.0 ±0.1</td></tr><tr><td>1.1 (±0.2)</td><td>1.9 (±0.2)</td><td></td><td></td><td></td><td></td></tr><tr><th>P₂</th><th>P₀</th><th>D₀</th><th>T₁</th><th>T₂</th><th>hole</th></tr><tr><td>2.00 ±0.05</td><td>4.0 ±0.1</td><td>ø1.5 +0.1 -0</td><td>1.1 ma</td><td>1.1 ma</td><td>square punch</td></tr></table> †Measurements in () are for TN11•TN10•TC10.	code	A	B	C	D	E	W ₁	W ₂	r	RRM08B	ø180 +0 -3	ø60 +1 -0	ø13.0 ±0.2	R10.5 ±0.4	2.0 ±0.5	9.0 ±0.3	11.4 ±1.0	0.5	I	H	G	F	J	P ₁	1.65 ±0.2	2.4 ±0.2	8.0 ±0.3	3.50 ±0.05	1.75 ±0.10	4.0 ±0.1	1.1 (±0.2)	1.9 (±0.2)					P ₂	P ₀	D ₀	T ₁	T ₂	hole	2.00 ±0.05	4.0 ±0.1	ø1.5 +0.1 -0	1.1 ma	1.1 ma	square punch
code	A	B	C	D	E	W ₁	W ₂	r																																											
RRM08B	ø180 +0 -3	ø60 +1 -0	ø13.0 ±0.2	R10.5 ±0.4	2.0 ±0.5	9.0 ±0.3	11.4 ±1.0	0.5																																											
I	H	G	F	J	P ₁																																														
1.65 ±0.2	2.4 ±0.2	8.0 ±0.3	3.50 ±0.05	1.75 ±0.10	4.0 ±0.1																																														
1.1 (±0.2)	1.9 (±0.2)																																																		
P ₂	P ₀	D ₀	T ₁	T ₂	hole																																														
2.00 ±0.05	4.0 ±0.1	ø1.5 +0.1 -0	1.1 ma	1.1 ma	square punch																																														
P	TN23 MN18 MH18	2,000	<table><tr><th>code</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>W₁</th><th>W₂</th><th>r</th></tr><tr><td>RRM08B</td><td>ø180 +0 -3</td><td>ø60 +1 -0</td><td>ø13.0 ±0.2</td><td>R10.5 ±0.4</td><td>2.0 ±0.5</td><td>9.0 ±0.3</td><td>11.4 ±1.0</td><td>0.5</td></tr></table> <table><tr><th>K</th><th>J</th><th>Y</th><th>F</th><th>E</th><th>P₁</th></tr><tr><td>1.7 ±0.2</td><td>4.1 ±0.2</td><td>8.0 ±0.3</td><td>3.55 ±0.1</td><td>1.5 ±0.1</td><td>4.0 ±0.1</td></tr><tr><td>1.85 (±0.2)</td><td>2.4 (±0.2)</td><td></td><td>3.5 (±0.05)</td><td>1.75 (±0.1)</td><td></td></tr><tr><th>P₂</th><th>P₀</th><th>D₀</th><th>T₁</th><th>T₂</th><th>hole</th></tr><tr><td>2.00 ±0.05</td><td>4.0 ±0.1</td><td>ø1.5 +0.1 -0</td><td>0.5 max 0.6 (max)</td><td>2.0 max 2.5 (max)</td><td>square emboss</td></tr></table> †Measurements in () are for TN23.	code	A	B	C	D	E	W ₁	W ₂	r	RRM08B	ø180 +0 -3	ø60 +1 -0	ø13.0 ±0.2	R10.5 ±0.4	2.0 ±0.5	9.0 ±0.3	11.4 ±1.0	0.5	K	J	Y	F	E	P ₁	1.7 ±0.2	4.1 ±0.2	8.0 ±0.3	3.55 ±0.1	1.5 ±0.1	4.0 ±0.1	1.85 (±0.2)	2.4 (±0.2)		3.5 (±0.05)	1.75 (±0.1)		P ₂	P ₀	D ₀	T ₁	T ₂	hole	2.00 ±0.05	4.0 ±0.1	ø1.5 +0.1 -0	0.5 max 0.6 (max)	2.0 max 2.5 (max)	square emboss
code	A	B	C	D	E	W ₁	W ₂	r																																											
RRM08B	ø180 +0 -3	ø60 +1 -0	ø13.0 ±0.2	R10.5 ±0.4	2.0 ±0.5	9.0 ±0.3	11.4 ±1.0	0.5																																											
K	J	Y	F	E	P ₁																																														
1.7 ±0.2	4.1 ±0.2	8.0 ±0.3	3.55 ±0.1	1.5 ±0.1	4.0 ±0.1																																														
1.85 (±0.2)	2.4 (±0.2)		3.5 (±0.05)	1.75 (±0.1)																																															
P ₂	P ₀	D ₀	T ₁	T ₂	hole																																														
2.00 ±0.05	4.0 ±0.1	ø1.5 +0.1 -0	0.5 max 0.6 (max)	2.0 max 2.5 (max)	square emboss																																														

Recommended Soldering Conditions

Name	Soldering conditions
TN05 TC05 TN11 TC11 TH11 TN10 TC10 TN20 TC20 TN23 TH20 SC10 SC20 MN18 MH18 (Solder plated parts)	Flow soldering conditions  The graph shows a temperature profile for flow soldering. The y-axis is Temperature (°C) from 0 to 250. The x-axis is time. The profile has three phases: Preheat (1~2min) at 130~150°C, Soldering (3~4sec) at 230~250°C, and Cool down (at least 1min) from 250°C to 50°C. A dotted line indicates the cooling path. 1)Please keep the surface of the terminations within the time and temperature values shown in the chart. 2)Please keep temperature differences to within 100°C. Reflow soldering conditions  The graph shows a temperature profile for reflow soldering. The y-axis is Temperature (°C) from 0 to 250. The x-axis is time. The profile has three phases: Preheat (1~2min) at 130~150°C, Soldering (10sec) at 220~240°C, and Cool down (at least 1min) from 250°C to 50°C. A dotted line indicates the cooling path. 1)Please keep the surface of the terminations within the time and temperature values shown in the chart. 2)Please keep temperature differences to within 100°C.



MMC Electronics America Inc.

1365 Wiley Road, Suite #149, Schaumburg, IL 60173

Tel: (847)490-0222 Fax: (847)490-0218

www.mmea.com

A Subsidiary of

