SBB 4-Terminal Shunt Resistors

Features

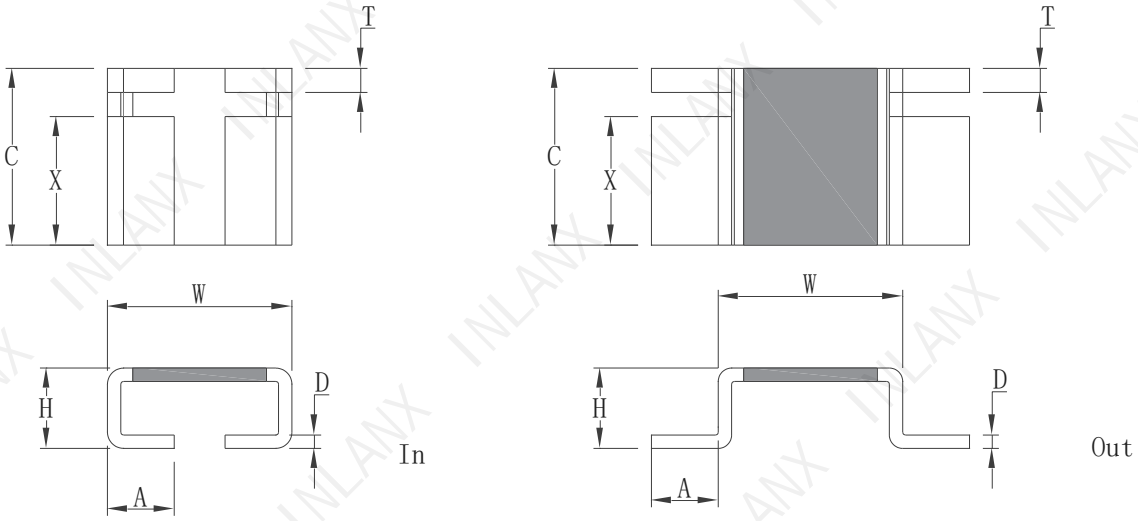
- Tolerance: ±5%, ±2%, ±1%, ±0.5%
- Operating temperature: -65°C~170°C
- Electron-beam welding; pulse applications
- Inductance <3nH; TCR ±50, ±75ppm/°C
- RoHS; AEC-Q200; custom specifications



Applications

Frequency-conversion and servo drives; high-current battery management; automotive electronic control and oil-pump drives; DC/DC and DC/AC power modules; automatic control; industrial instruments.

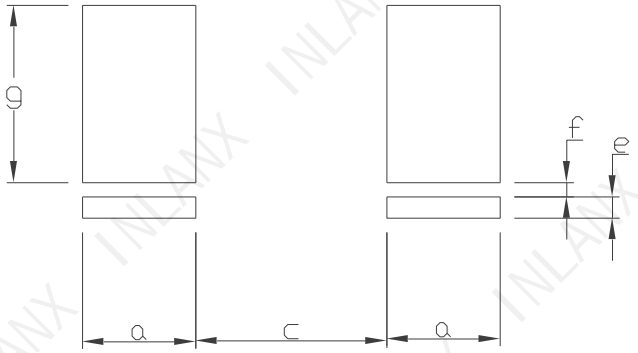
Dimensions and PCB Layout • mm



Type	Form	W	A	C	X	T	H	Tolerance (mΩ)
SBB-M/K	In	6.9±0.3	2.5±0.2	6.6±0.3	4.8±0.4	0.9±0.1	3±0.5	0.2-5
SBB-M/K	Out	6.9±0.3	2.5±0.2	6.6±0.3	4.8±0.4	0.9±0.1	3±0.5	0.2-5

Recommended Pad Dimensions • mm

Solder pad type	a	c	e	f	g
In	2.9	2	0.9	0.8	5.6
Out	4	5.5	0.9	0.8	5.6



Outward-Lead Electrical Specifications

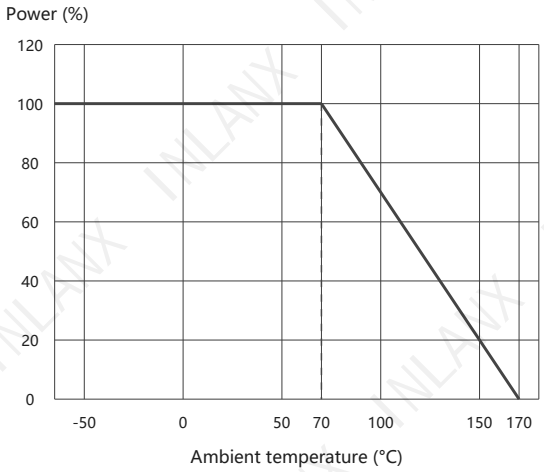
Size	Element Material	Resistance (mΩ)	Rthi (℃/W)	D±0.1 (mm)	TCR (ppm/℃)	P70 ℃ (W)
Out	M	0.2	3	1.05	±75	5
Out	M	0.3	4	1.06	±75	10
Out	M	0.5	6	0.67	±75	8
Out	M	0.7	8	0.48	±75	7
Out	M	1	13	0.33	±75	6
Out	K	1.5	13	0.67	±50	5
Out	K	2	16	0.47	±50	5
Out	K	3	19	0.34	±50	5
Out	K	4	-	0.4	±50	4
Out	K	5	-	0.4	±50	3

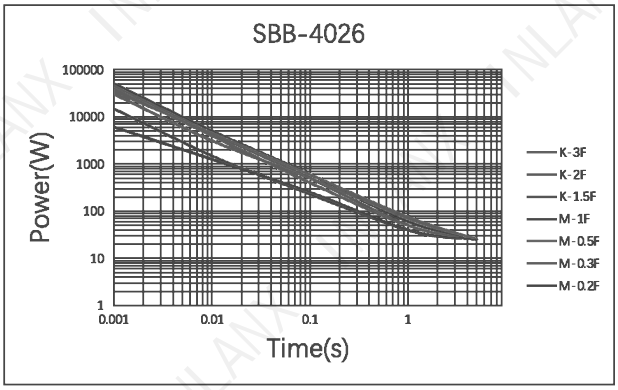
Inward-Lead Electrical Specifications

Size	Element Material	Resistance (mΩ)	Rthi (℃/W)	D±0.1 (mm)	TCR (ppm/℃)	P70 ℃ (W)
In	M	0.3	4	0.40	±75	10
In	M	0.5	5	0.67	±75	8
In	M	1	10	0.33	±75	6
In	K	2	14	0.50	±50	5
In	K	3	19	0.34	±50	5
In	K	4	-	0.4	±50	4
In	K	5	-	0.4	±50	3

TCR test range: 20°C~120°C. Some products can be below 20ppm/°C; refer to SBBP. D±0.1mm is the thickness for the corresponding resistance.

Power Derating and Pulse Characteristics



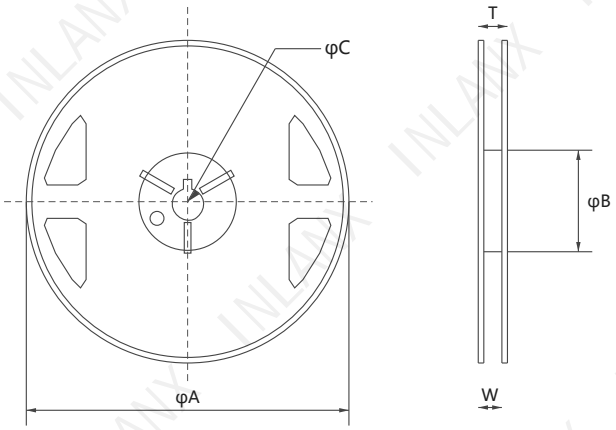


Endurance Tests

Test item	Test conditions	Reference	Limit
Temperature Cycling	1000 Cycles(-55℃to +125℃)	JESD22 Method JA-104	±0.5%
High Temperature Exposure	100hrs.@T=170℃.Unpowered.	MIL-STD-202 Method 108	±0.5%
Biased Humidity	1000hrs 85℃/85%RH。Note:Specified conditions:10% of operating power.	MIL-STD-202 Method 103	±0.5%
Operational Life	Condition D Steady State TA=125℃at rated power.	MIL-STD-202 Method 108	±0.5%
Solderability	245℃±5℃,5s±0.5s	J-STD-002C	95% Coverage Minimum

Size	A±0.1	B±0.1	W±0.3	E±0.3	F±0.1	P0±0.1	P1±0.1	P2±0.1	D0±0.1	T±0.1	Quantity (pcs)
In	7.5	8	16	1.75	7.35	6	12	12	1.5	3.8	1000
Out	7.5	12.1	24	1.75	12.2	6	12	12	1.5	3.5	1000

Reel Specifications • mm



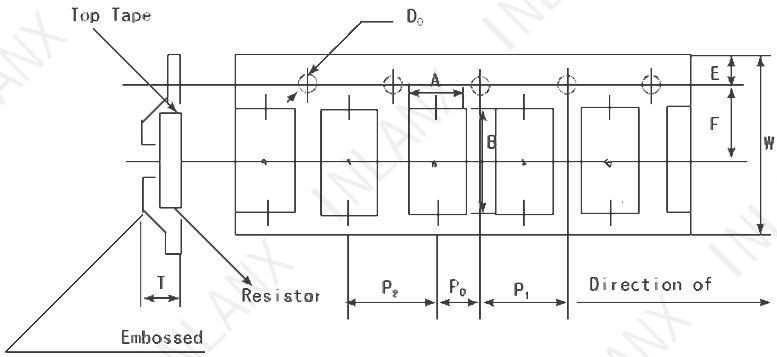
Endurance and Test Requirements

Test item	Test conditions	Reference	Limit
Vibration	5 g's for 20 min, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB .031" thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.	MIL-STD-202 Method 204	±0.5%
Resistance to Soldering Heat	260℃±5℃，10s±1s	MIL-STD-202 Method 210	±0.5%
Short Time Overload	5×Rated power for 5 s	MIL-STD-202 Method 301	±0.5%
Mechanical Shock	1) Pulse waveform: Half-Sine pulse. 2) Accelerate peak: 100g. 3) Pulse duration: 6ms. 4) Orientation & Shock time: ±X, ±Y, ±Z; 3 times each orientation, total 18 times	MIL-STD- 202H Method 213	±0.5%
ESD	1) Direct Contact (DC): ±6kV; 2) Air Discharge (AD): ±12kV, ±16kV, ±25kV;	AEC-Q200- 002 REV-B,	±0.5%
Board Flex	1) PCB board size(H×W×T): 100mm ×40mm ×1.6mm. 2) Press tool: r = 340mm, Width = 20mm. 3) Deformation displacement: 2mm. 4) Duration: 60 (+5) s.	AEC-Q200- 005 REV A,	±0.5%
Terminal Strength	1) Press tool: A pointed thruster with a radius of 0.5 mm. 2) Shear force: 17.7N. 3) Duration: 60 (+1) seconds.	AEC-Q200- 006 REV A	±0.5%
Flame Retardance	1) Test current: 100%, 115%, 130%, 150% (rated current). 2) Test duration: 1h. The following constitutes a failure: 1) A flame over 3.0 seconds duration; 2) An explosion; 3) A temperature above 350℃sustained for over 10 seconds.	AEC-Q200- 001 REV B	>10s for 350℃
Resistance to Solvents	1) Solvent a: 1 part (by volume) of isopropyl alcohol reagent grade and 3 parts (by volume) of a mixture of 80% (by volume) of kerosene and 20% (by volume) ethylbenzene. 2) Solvent c: 9 parts (by volume) of D-limonene and 1 part of surfactant. 3) Solvent d: 42 parts (by volume) of water 1 part (by volume) of propylene glycol monomethyl ether 1 part (by volume) of monoethanolamine.	MIL-STD- 202H Method 215	There was no missing, faded, smeared, blurred, or shifted (dislodged) with the marks. There was no crack, separation, crazing, swelling, softening, degradation on the samples.

Marking

R001 1%: 1mΩ, ±1%; 0m50 1%: 0.5mΩ, ±1%; R001F: 1mΩ, F=±1%.

Embossed Tape Specifications • mm



Size	In	Out
φA	330	330
φB	100	100
φC	13	13
W	16.5	24.5
T	21	29

Ordering Information

Field	Codes and description
Type	SBB
Material	M: Manganin; K: Karma
Resistance	1：1mΩ
Tolerance	J: ±5%; G: ±2%; F: ±1%; D: ±0.5%
Lead form	y: Out; n: In

Standard measuring conditions: 20±2°C, 65±5%RH. When the judgment is unambiguous, measurements may be made at 5~35°C and 45~85%RH.