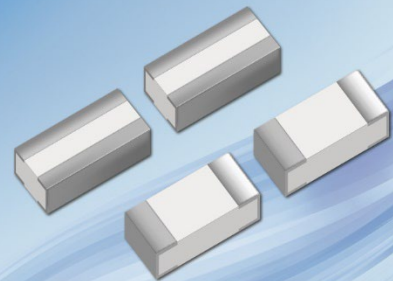




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PRODUCT DATASHEET



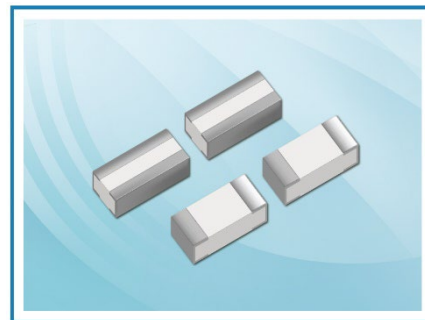
SMTB Surface Mount Thermal Bridge Devices

Chip Series

SMTB Series Surface Mount Thermal Bridge Devices

Description

Polytronics SMTB series surface mount thermal bridge is an electrically insulative, but thermal conductive device. The substrate material is made by aluminum nitride with thermal conductivity of 170 W/mK. The device enables engineers to dissipate heat quickly to another trace or ground for solving the hot spot issue, or simply bring thermal balance across the board. Standard SMT chip design not only eliminate the traditional complex heat dissipation designs, it also provides the flexibility to design it as an optional add-on.



Features

- High thermal conductivity AlN substrate (170 W/mK)
- High insulation resistance between terminals
- Low capacitance
- Halogen free and lead free
- RoHS compliant

Application

- Power converters
- Switching power supplies
- Amplifiers
- Synthesizers
- High wattage diodes
- Filters

Environmental Compliance

Regulation	Standard
 RoHS	2011/65/EU
 Halogen Free	IEC 61249-2-21:2003

Electrical Characteristics

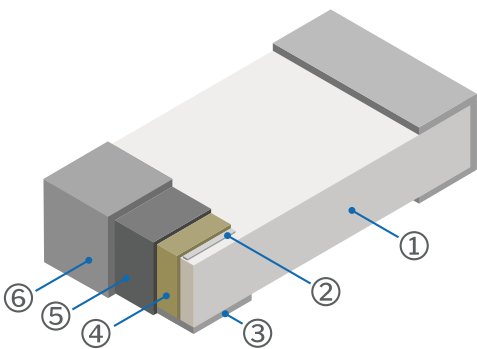
Part Number	Thermal resistance (°C/W), $T_R^\dagger$	Thermal conductance (mW/°C), $T_C^\ddagger$	Capacitance (pF, 5MHz)	Dielectric Withstanding Voltage (kV _{AC} at 60Hz RMS)	Substrate Material & Thermal Conductivity
SMTB0603P50S	20	50	0.07	> 1.5	Aluminum nitride, 170 W/mK
SMTB0508P50S	6	160	0.15	> 1.5	
SMTB0612P63S	4	250	0.26	> 1.5	
SMTB1206P63S	16	63	0.07	> 3.0	
SMTB1225P63S	4	250	0.26	> 1.5	
SMTB2512P63S	16	63	0.07	> 5.0	

$^\dagger T_R = L \div [k (H \times W)]$, $k = 170 \text{ W/mK}$ (the thermal conductivity of AlN)

$^\ddagger T_C = 1 \div T_R$

Physical Specifications

SMTB Series Surface Mount Thermal Bridge Devices

Construction and Materials	① Aluminum nitride substrate ② Top inner electrode ③ Bottom inner electrode ④ Side inner electrode ⑤ Nickel barrier ⑥ Sn solder coating 
Solderability	MIL-STD-202
Soldering Parameters	Reflow Solder: 260°C, 30 seconds max.

Environmental Specifications

Operating Temperature	-55°C to 155°C
Storage Temperature	-55°C to 155°C

Part Number System

SMTB 06 12 P 63 S - □□

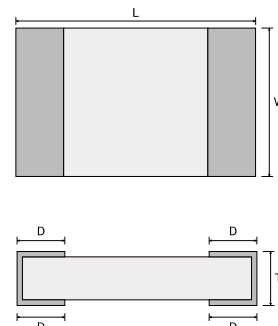
Optional code	□□
Standard chip device	S
Thickness, 50=0.50mm, 63=0.635mm	63
Polytronics Symbol	P
Device Dimension in 1/100 inch, terminal side	12
Device Dimension in 1/100 inch	06
Surface-Mount Thermal Bridge	SMTB

SMTB Series Surface Mount Thermal Bridge Devices

Physical Dimensions (mm.)

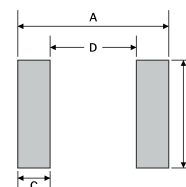
Dimensions (mm)

Part Number	L	W	T	D
SMTB0603P50S	1.60±0.13	0.80±0.13	0.55±0.13	0.40±0.13
SMTB0508P50S	1.25±0.13	2.00±0.13	0.55±0.13	0.40±0.13
SMTB0612P63S	1.60±0.13	3.20±0.13	0.70±0.13	0.40±0.13
SMTB1206P63S	3.20±0.13	1.60±0.13	0.70±0.13	0.50±0.13
SMTB1225P63S	3.20±0.13	6.40±0.13	0.70±0.13	0.60±0.13
SMTB2512P63S	6.40±0.13	3.20±0.13	0.70±0.13	0.60±0.13



Recommended Solder Pad Dimension (mm)

Part Number	A	B	C	D
SMTB0603P50S	2.40	1.00	0.81	0.78
SMTB0508P50S	2.00	2.30	0.85	0.30
SMTB0612P63S	2.60	3.50	1.00	0.60
SMTB1206P63S	4.20	1.80	1.05	2.10
SMTB1225P63S	4.50	7.00	1.25	2.00
SMTB2512P63S	8.10	3.40	1.55	5.00



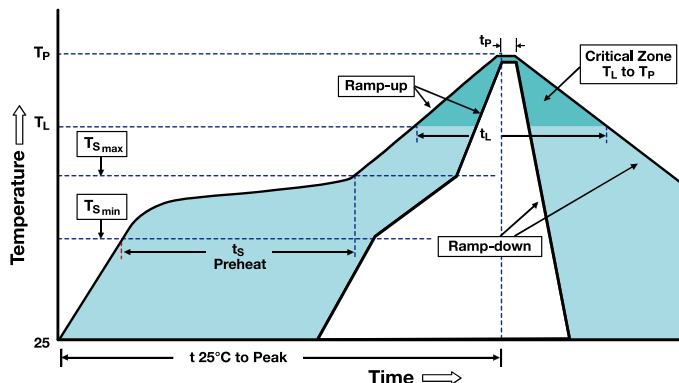
Reliability Test

Item	Test Condition / Methods	Requirement	Test Reference
Solderability	245±5°C for 3 seconds.	>95% coverage No visual damage	JIS-C-5201-1 4.17 IEC-60115-1 4.17
Terminal Strength (SMD)	Pressurizing force for 60 seconds 0603: 9.8N 0508/0612/1206/1225/2512: 19.6N	No visual damage	AEC-Q200-006
Bending Strength	Bending once for 5 seconds D of 0603 = 5mm D of 0508 / 0612 / 1206 = 3mm D of 1225 / 2512 = 2mm	No visual damage	JIS-C-5201-1 4.33 IEC-60115-1 4.33
Temperature Cycling	1000 Cycles (-55°C to +125°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme.	No visual damage	JIS-C-5201-1 4.19 IEC-60115-1 4.19

SMTB Series Surface Mount Thermal Bridge Devices

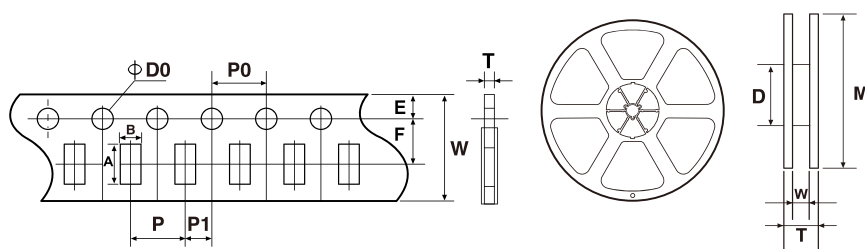
Soldering Parameters

Reflow Soldering	Pb-free assembly
Average Ramp-Up Rate ($T_{s_{max}}$ to T_P)	3°C/second max.
Preheat	
-Temperature Min ($T_{s_{min}}$)	150°C
-Temperature Max ($T_{s_{max}}$)	200°C
-Time ($T_{s_{min}}$ to $T_{s_{max}}$)	60-120 seconds
Time maintained above:	
-Temperature (T_L)	217°C
-Time (t_L)	60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_P)	20 seconds max.
Ramp-Down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.



Tape & Reel Specification (mm.)

Devices are packaged per EIA481 and EIA-2 standard



Paper tape measurements

Size	A	B	W	F	E	P	P0	P1	D0	T
0603	1.05±0.20	1.80±0.20	8.0±0.20	3.5±0.05	1.75±0.10	4.0±0.10	4.0±0.10	2.0±0.05	1.5±0.10	0.60±0.10
0508	1.55±0.20	2.30±0.20	8.0±0.20	3.5±0.05	1.75±0.10	4.0±0.10	4.0±0.10	2.0±0.05	1.5±0.10	0.75±0.10
0612	1.90±0.20	3.05±0.20	8.0±0.20	3.5±0.05	1.75±0.10	4.0±0.10	4.0±0.10	2.0±0.05	1.5±0.10	0.75±0.10
1206	1.90±0.20	3.50±0.20	8.0±0.20	3.5±0.05	1.75±0.10	4.0±0.10	4.0±0.10	2.0±0.05	1.5±0.10	0.75±0.10

Plastic tape measurements

Size	A	B	W	F	E	P	P0	P1	D0	T
1225	3.40±0.2	6.70±0.2	12±0.1	5.5±0.05	1.75±0.1	4.0±0.10	4.0±0.10	2.0±0.05	1.5±0.10	0.85±0.15
2512	3.40±0.2	6.70±0.2	12±0.1	5.5±0.05	1.75±0.1	4.0±0.10	4.0±0.10	2.0±0.05	1.5±0.10	0.85±0.15

Reel measurements

Size	M	T	D
0603/0508/0612/1206	178.0±2.0	11.5±2.0	60±1.0
1225/2512	178.0±2.0	16.0±2.0	60±1.0

Packaging Quantity

SMTB Series Surface Mount Thermal Bridge Devices

Part Number	Tape & Reel Quantity
SMTB0603P50S	5000
SMTB0508P50S	5000
SMTB0612P63S	5000
SMTB1206P63S	5000
SMTB1225P63S	4000
SMTB2512P63S	4000

Disclaimer

- Caution: Operation beyond the specified rating may result in damage and possible arching.
- Customers should evaluate and test the properties of thermal bridge devices independently to verify and ensure that their individual applications will be met.
- Specifications and data are subject to change without notice.