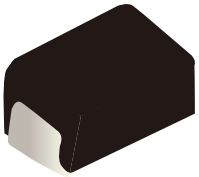
FEATURES

- Fast response, instantly clamping the transient over voltage.
- High surge current handling capability.
- High energy absorption capability.
- Low clamping voltages, providing better surge protection.
- Low capacitance values, providing digital switching circuitryprotection.



5650

APPLICATIONS

- Universal Serial Bus (USB).
- Mobile communication.
- Computer/DSP product.
- Video and audio ports.
- Portable/Hand-Held Products.
- Data, Diagnostic I/O ports.

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Unit
Maximum allowable continuous AC voltage	V_{RMS}	420.0	V
Maximum allowable continuous DC voltage	V_{DC}	560.0	V
Varistor voltage Measured*1	V_B	680(±10%)	V
Typical capacitance value measured*2	C	290	pF
Typical capacitance value tolerance		±40	%
Maximum clamping voltage measured*3	V_C	1120	V
Maximum peak current (8/20μs)*4	I_P	4500	A
Maximum Energy Absorption 10/1000μs	E	200	J
Response time	T_{rise}	<20	ns
Leakage current at V_{DC} (At initial state)	I_L	<30	μA
Leakage current at V_{DC} (After reliability Test)	I_{LA}	<100	μA
Operating ambient temperature		-40~+125	°C
Storage temperature		-40~+150	°C
Reflow temperature profile(Recommend)		260	°C

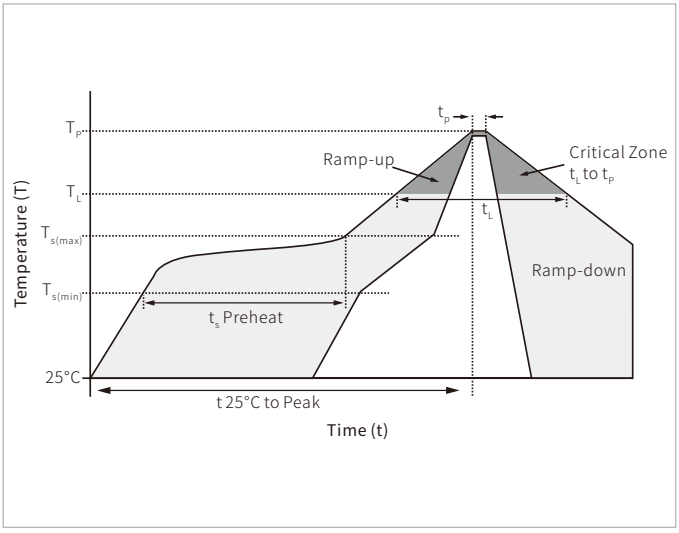
*1 The breakdown voltage was measured at 1 mA
*2 Typical capacitance value measured at 1KHz
*3 The Clamping voltage was measured at 8*20us standard current,5650(20A)
*4 The surge current was tested at 8/20 μs waveform

ENVIROMENTAL RELIABILITY TEST

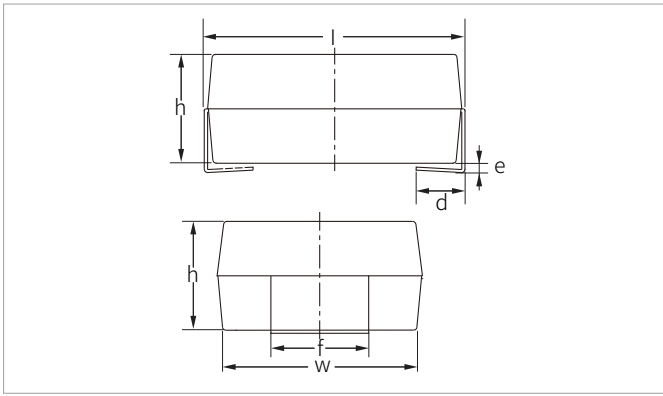
Characteristic	Test method and description			
High Temperature Storage	The specimen shall be subjected to 125°C for 1000 hours in a thermostatic bath without load and then stored at room temperature and humidity for 1 to 2 hours. The change of varistor voltage shall be within 10%			
Temperature Cycle	The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and humidity for one two hours. The change of varistor voltage shall be within 10%and mechanical damage shall be examined.	Step	Temperature	Period
		1	-40±3°C	30min±3
		2	Room Temperature	1~2hours
		3	125±2°C	30min±3
		4	Room Temperature	1~2hours
High Temperature Load	After being continuously applied the maximum allowable voltage at 85°C for 1000hours, the specimen shall be stored at room temperature and humidity for one or hours, the change of varistor voltage shall be within 10%			
Damp Heat Load/ Humidity Load	The specimen should be subjected to 40°C,90 to 95%RH environment, and the maximum allowable voltage applied for 1000 hours, then stored at room temperature and humidity for one or two hours. The change of varistor voltage shall be within 10%			
Low Temperature Storage	The specimen should be subjected to -40°C, without load for 1000 hours and then stored at room temperature for one two hours. The change of varistor voltage shall be within 10%.			

SOLDERING RECOMMENDATIONS

Reflow Condition		Lead–free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

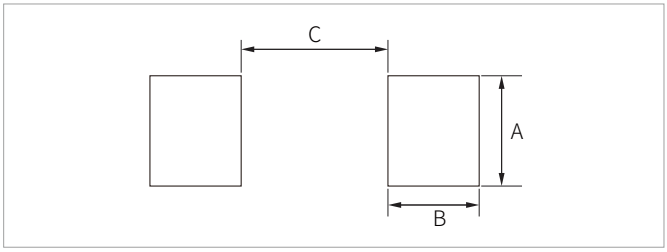


PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
l	14.0	14.5	0.551	0.571
w	11.9	12.1	0.469	0.476
h	4.5	4.8	0.177	0.189
d	1.2	1.8	0.047	0.071
e	0	0.3	0	0.012
f	2.7	3.3	0.106	0.130

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		3.5			0.138	
B		2.2			0.087	
C		108			0.425	

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SMV5650-681H	5650	800PCS	13”

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