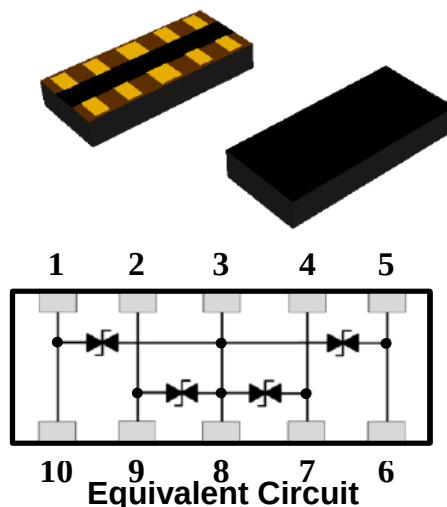


Surface Mount Polymeric ESD Suppressor

Description:

KPESD2510AV12 four channel array polymeric ESD suppressor provide ESD protection for high-speed differential bus interfaces. This protection is a result of its ultra-low capacitance (0.05pF) that is well suited for HDMI1.3/1.4、USB3.0 ESD protection applications, and it can be used to meet the ESD immunity requirements of IEC61000-4-2 (15KV air, 8KV contact discharge).



Features:

- The best ESD protection for high speed, low voltage applications (e.g. HDMI1.4/2.0、USB3.0、eSATA)
- RoHS compliant and halogen free
- Ultra low capacitance, 0.05 pF (typ.)
- Low leakage current (<10nA)
- Fast response time (<1ns)
- Bi-directional, four (4) channel array
- Surface mount
- MSL 1

Materials Information

RoHS Compliant

Halogen Free

RoHS

HF

Applications:

- HDTV/Smart TV
- Set-Top Box
- Laptop/Desktop Computer
- High Definition Multimedia Interface (HDMI)
- USB 3.0
- Lightning and Thunder Bolt Interface

Caution: This component is designed for signal line protection only, not intended to be used on power lines or for power bus applications.

General Characteristics

Parameter	Value	Unit
Contact Discharge Voltage Per IEC61000-4-2	8K	V
Air Discharge Voltage Per IEC61000-4-2	15K	V
Operating Temperature	-55 to +125	°C
Storage Temperature	-40 to +85	°C

Electrical Characteristics ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Continuous Operating Voltage	V_{DC}	---	---	---	12	V
Trigger Voltage	V_T	IEC61000-4-2 8KV contact discharge	---	450	---	V
Clamping Voltage	V_C	IEC61000-4-2 8KV contact discharge	---	40	---	V
Leakage Current	I_L	DC 12V shall be applied on component	---	---	10	nA
Capacitance	C_P	Measured at 10MHz	---	0.05	---	pF
ESD Pulse Withstand	Pulses	IEC61000-4-2 8KV contact discharge	1000	---	---	---

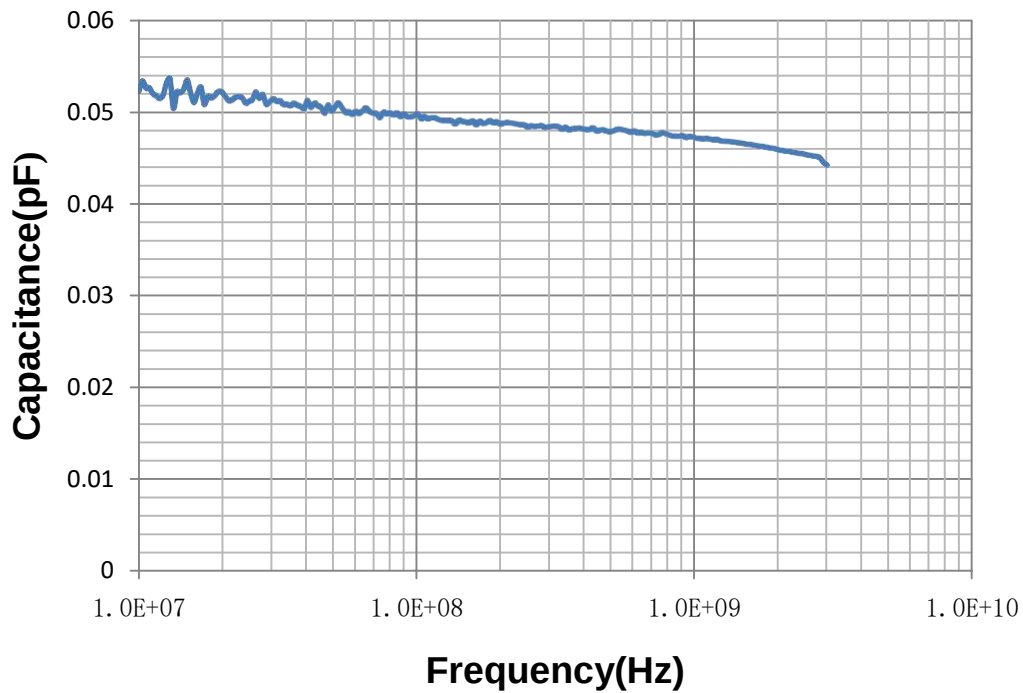
Notes:

1. Trigger and clamping voltage are measured per IEC 61000-4-2, 8KV contact discharge method.
2. After reliability tests such as high Temp storage, Temp cycles, continuous ESD strike etc, the maximum leakage current is less than 1uA.

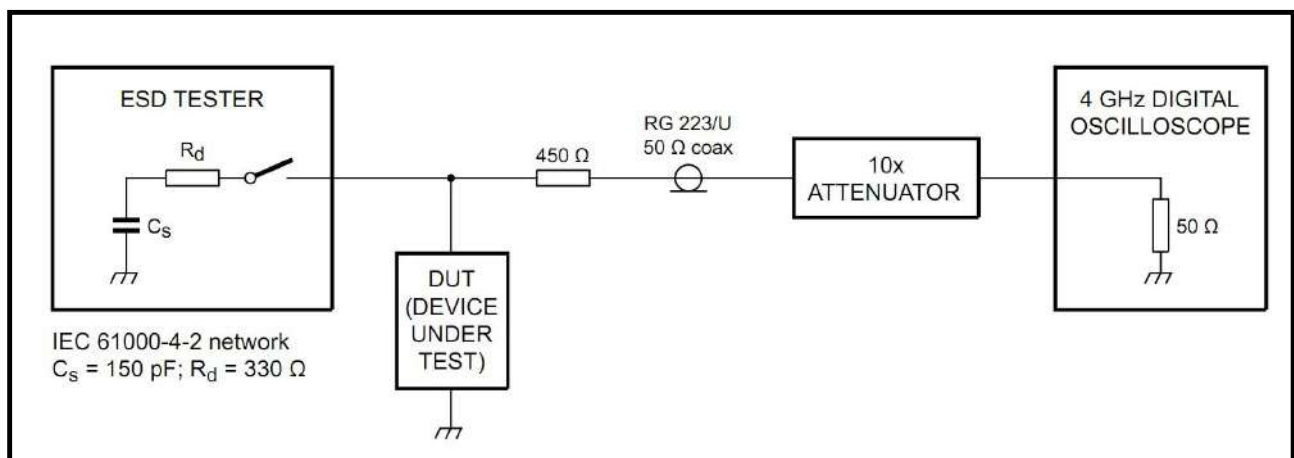
Environmental Specifications

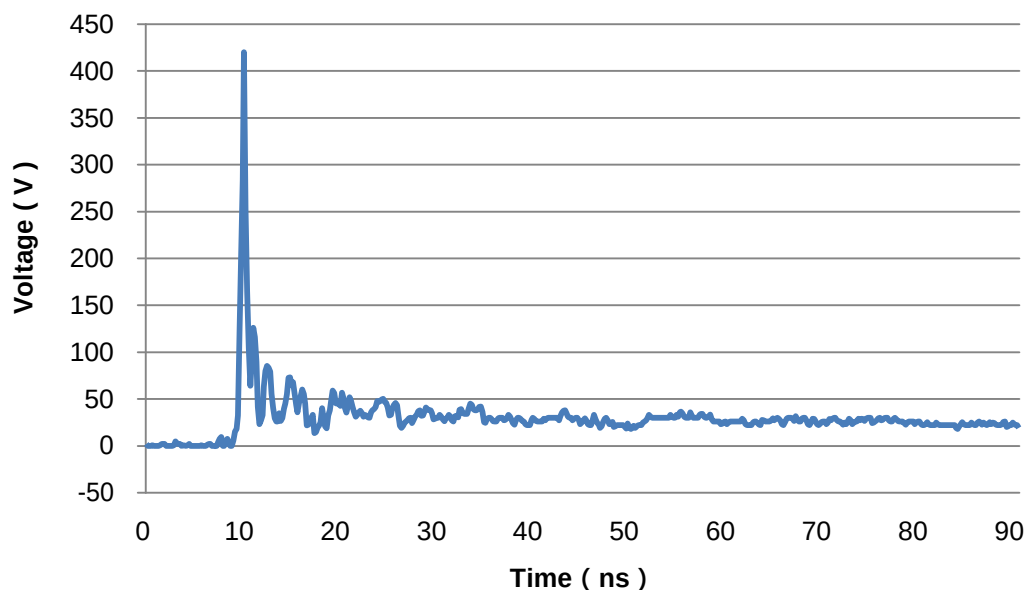
	Solder Heat	Solderability	Preconditioning	Thermal Shock	Bias Humidity Test
Test Conditions	1. 150°C, 4H; 2. 260°C, 10s, 1 Times	245°C, 5s	1. 125°C, 24H; 2. 85°C, 85%RH, 162H; 3. 260°C Reflow, 3 Times	-55°C—125°C, 30min dwell, 1000cycles	85°C, 85%RH, V_{DC} , 1000H
Pass/Fail Criteria	90% Coverage	95% Coverage	$I_L \leq 10\text{nA}$	$I_L \leq 10\text{nA}$	$I_L \leq 10\text{nA}$
	Bias Heat Test	Bias Low Temp Test	Vibration	Mechanical Shock	Solvent Resistance
Test Conditions	125°C, V_{DC} , 1000H	-55°C, V_{DC} , 1000H	10Hz-50Hz-10HZ, 2hrs each in X-Y-Z axis	1500G, 0.5ms, X-Y-Z axis 3 times	IPA, ultrasonic 300s
Pass/Fail Criteria	$I_L \leq 10\text{nA}$	$I_L \leq 10\text{nA}$	No Physical Damage $I_L \leq 10\text{nA}$	No Physical Damage $I_L \leq 10\text{nA}$	No Physical Damage $I_L \leq 10\text{nA}$

Typical Device Capacitance VS. Frequency



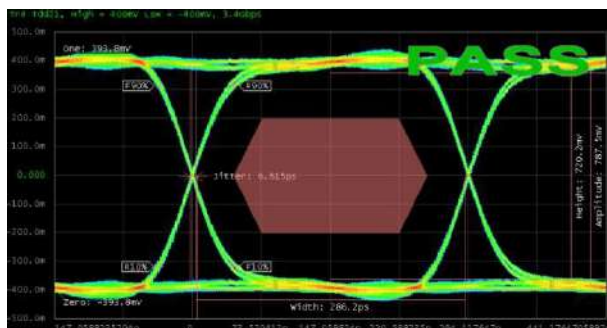
Typical ESD Response (IEC 61000-4-2, 8KV contact discharge)



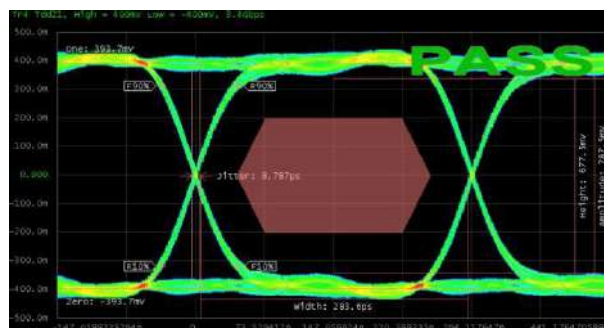


Eye Diagram Measurement

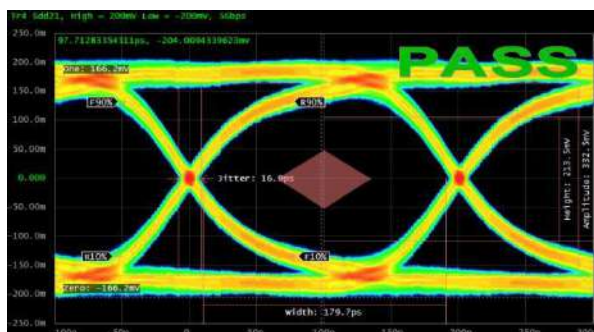
HDMI1.4 Mask at 3.4 Gb/s
without PESD



HDMI1.4 Mask at 3.4 Gb/s
with PESD



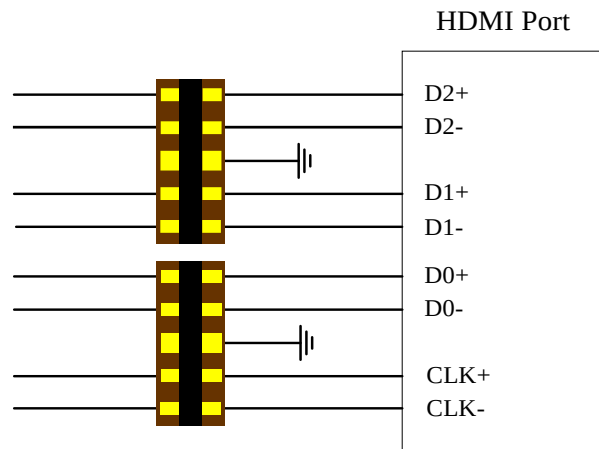
USB3.0 Mask at 5.0 Gb/s
without PESD



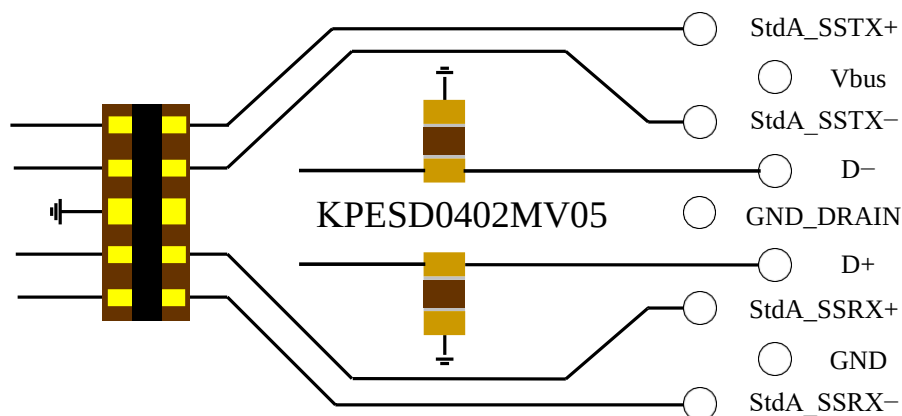
USB3.0 Mask at 5.0 Gb/s
with PESD



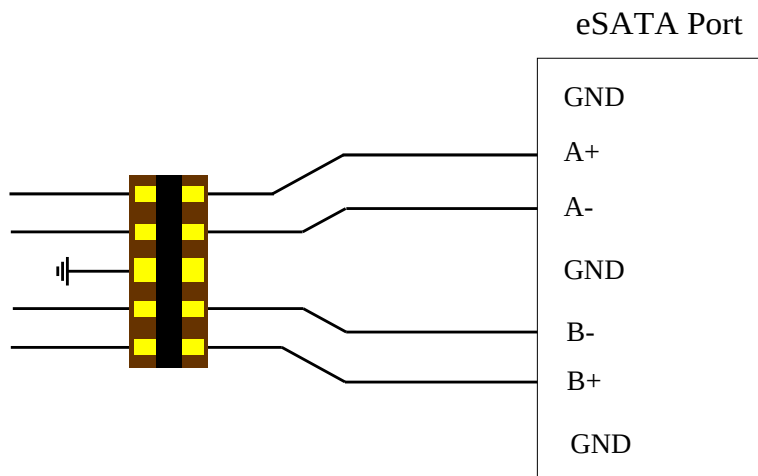
ESD Protection for HDMI



ESD Protection for USB 3.0 Type A

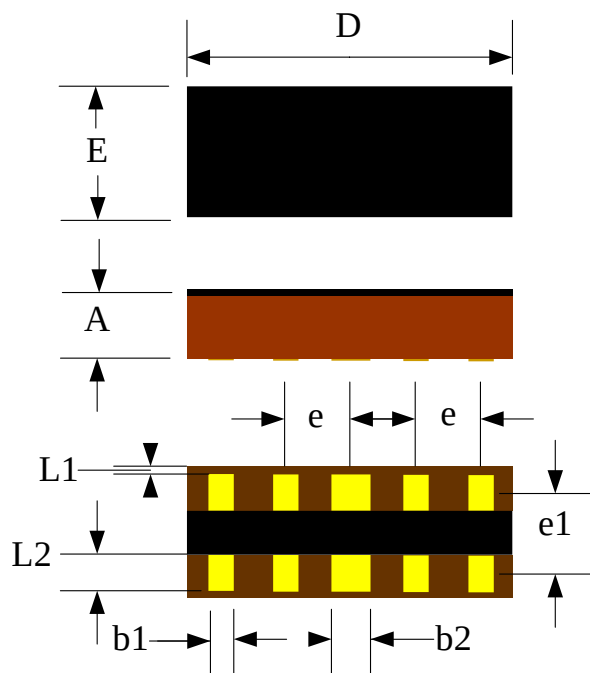


ESD Protection for eSATA



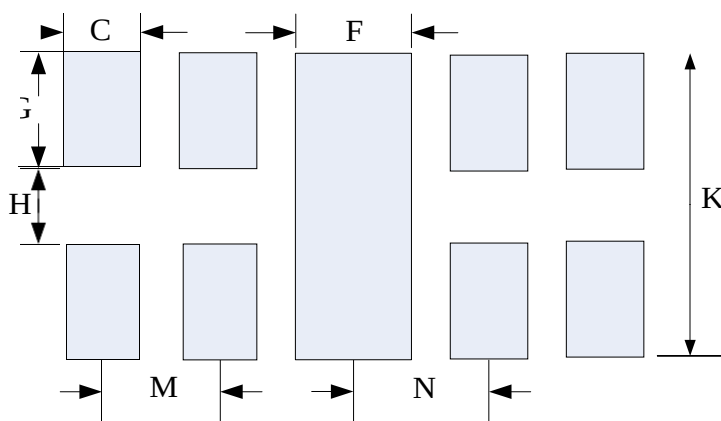
Package Dimension

Package outline



Dimension	Unit: Millimeters		
	Min.	Typ.	Max.
A	0.40	0.50	0.60
b1	0.10	0.20	0.30
b2	0.20	0.30	0.40
D	2.40	2.50	2.60
E	0.90	1.00	1.10
e	0.40	0.50	0.60
e1	0.50	0.60	0.70
L1	0.04	0.05	0.06
L2	0.20	0.30	0.40

Recommended Solder Pad Footprint

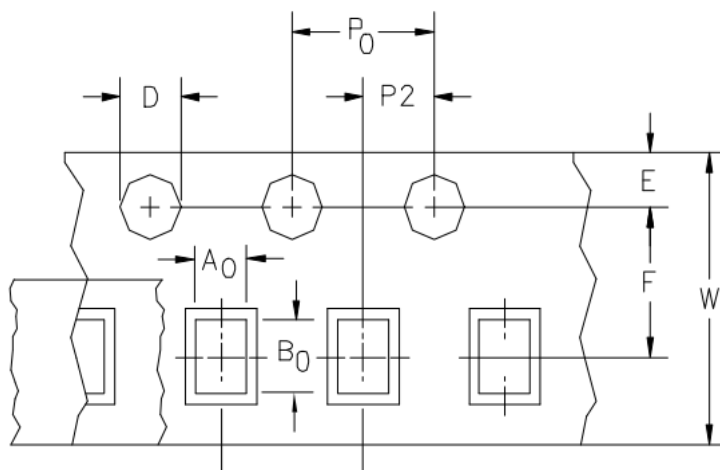


Dimension	Unit: Millimeters		
	Min.	Typ.	Max.
C	0.20	0.25	0.30
F	0.35	0.40	0.45
G	0.55	0.60	0.65
H	0.25	0.30	0.35
K	1.40	1.50	1.60
M	0.45	0.50	0.55
N	0.45	0.50	0.55

Taping Specification

1. Tape Dimension

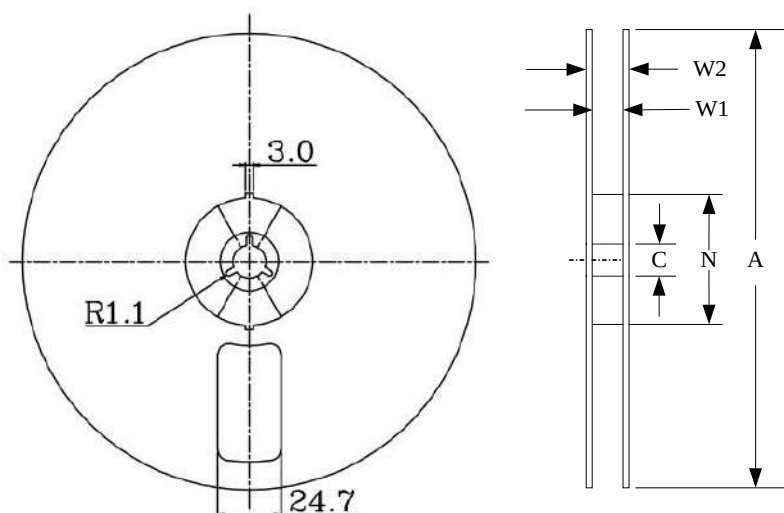
Unit: Millimeters



P_0	P_2	D	B_0	A_0	E	F	W
4.00 ± 0.10	2.00 ± 0.05	$\emptyset 1.50 \pm 0.10$	2.70 ± 0.05	1.23 ± 0.05	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30

2. Reel Dimension

Unit: Millimeters



A	N Min.	C	$W2$ Max.	$W1$ Min.	$W1$ Max.
178.0 ± 2.0	50.0	13.0 ± 0.2	14.4	8.4	9.9

Part Numbering

KPESD 2510 AV 12

Product Series

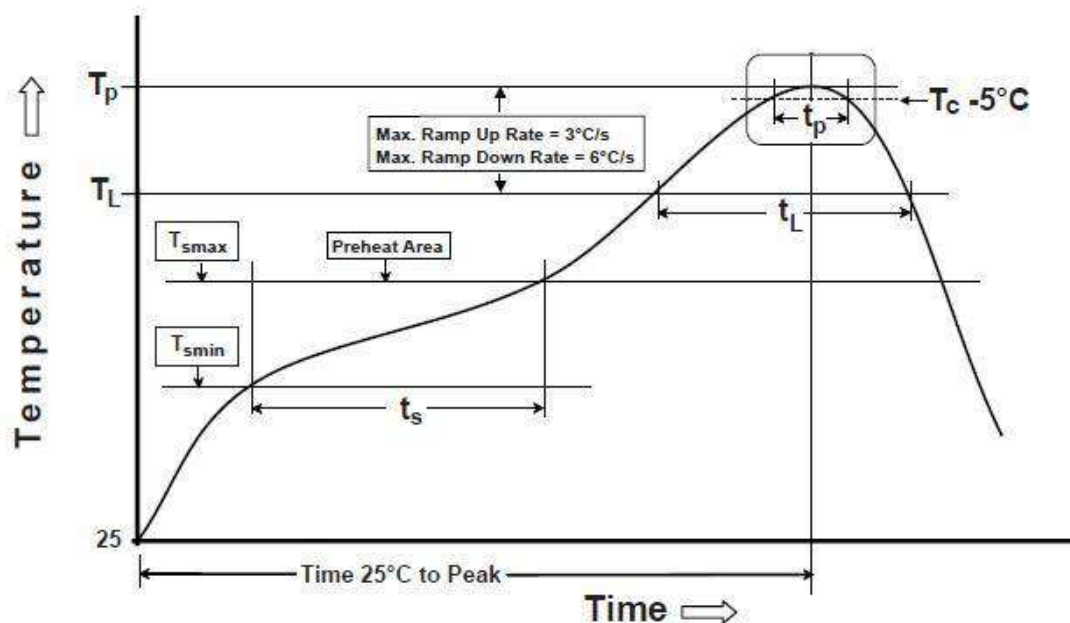
2.5x1.0mm

footprint size

Operating Voltage Designator

Product Version

Soldering Parameters



Profile Feature	Pb-Free Assembly
Pre Heat	
Temperature Min (T_{smin})	150 °C
Temperature Max (T_{smax})	200 °C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up Rate (T_L to T_p)	3 °C/second max.
Liquidus temperature (T_L)	217 °C
Time (t_L) maintained above T_L	60-150 seconds
Peak package body temperature (T_p)	260 ^{+0/-5} °C
Time (t_p)* within 5 °C of the specified classification temperature (T_c)	30* seconds
Ramp-down Rate (T_p to T_L)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.
* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.	