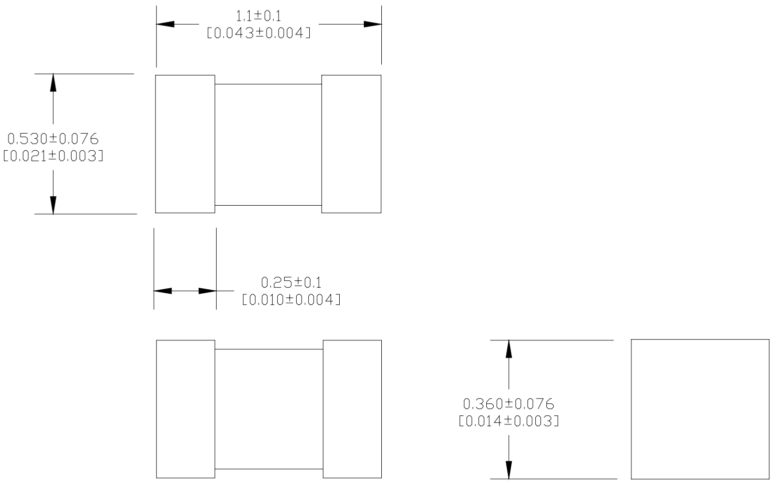
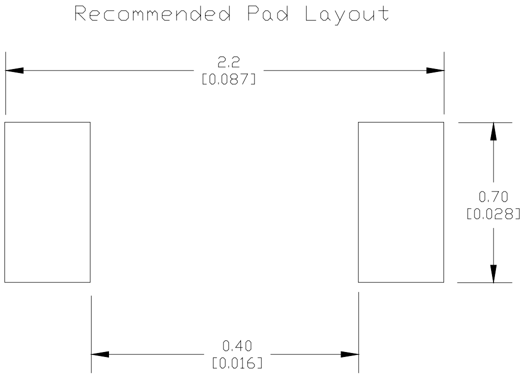
Product specifications

Part number[4]	Rated voltage (V_{dc}) maximum	Clamping voltage[1] (V) typical	Trigger voltage[2] (V) typical	Capacitance @ 1 MHz (pF) typical	Capacitance @ 1 MHz (pF) maximum	Attenuation change (0–6 GHz) (dB) typical	Leakage current @ 12 V_{dc} (nA) typical	ESD capability IEC61000-4-2 Direct discharge (kV) typical	ESD capability IEC61000-4-2 Air discharge (kV) typical	ESD pulse withstand[3] typical
0402ESDA-MLP	30	35	300	0.05	0.15	-0.2	<0.1	8	15	>1000

1. Clamping voltage: Per IEC61000-4-2, Level 4 waveform (8 kV direct 30 A) measured 30 ns after initial pulse.
2. Trigger voltage: Trigger measurement made using Transmission Line Pulse (TLP) method.
3. Minor shifting in characteristics may be observed over multiple ESD pulses at very rapid rate.
4. Part Number Definition: 0402ESDA-MLP
   0402ESDA= Product code and size
   -MLP= Form designation

Dimensions—mm [in]





Design considerations

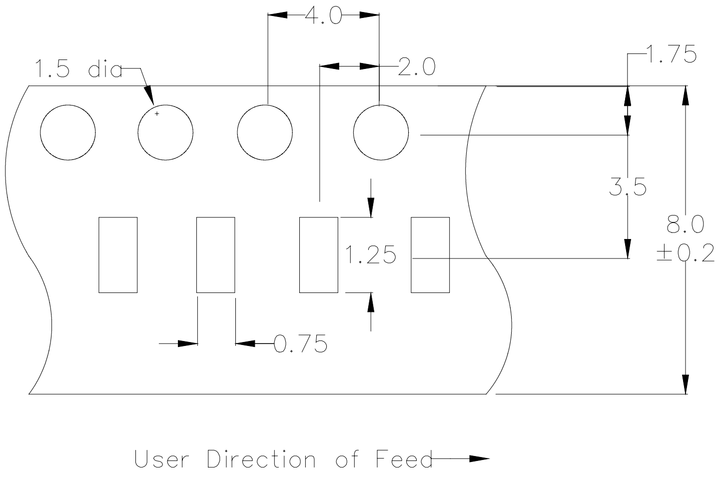
The location in the circuit for the 0402ESDA-MLP has to be carefully determined. For better performance, the device should be placed as close to the signal input as possible and ahead of any other component. Due to the high current associated with an ESD event, it is recommended to use a "0-stub" pad design (pad directly on the signal/data line and second pad directly on common ground).

Environmental data

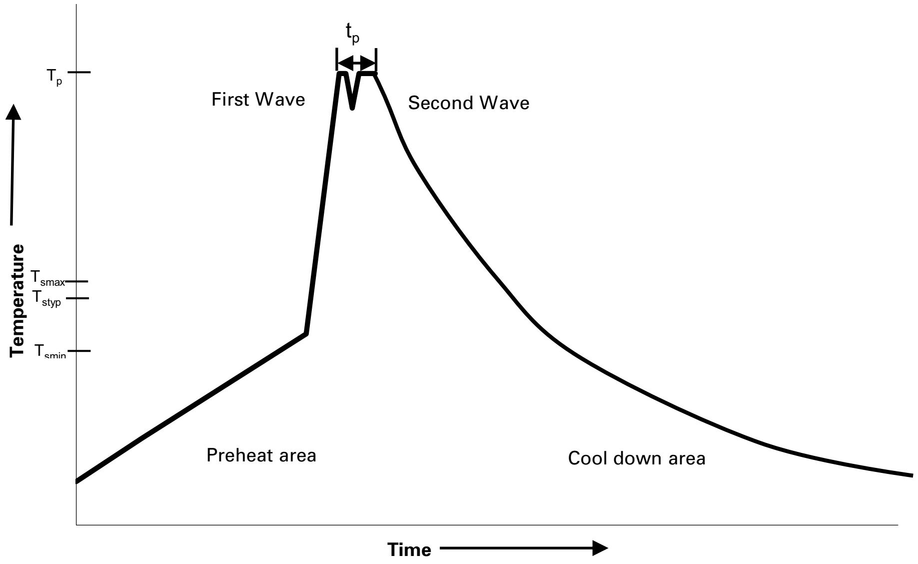
Operating temperature: - 55 °C to +125 °C
Storage temperature (component): - 55 °C to +125 °C
Load humidity: 12 VDC per EIA/IS- 722 +85 °C, 85% relative humidity for 1000 hours
Thermal shock: 10 cycles, - 55 °C to +125 °C, 30 minute dwell time
Moisture resistance: MIL-STD-202G, method 106G, 10 cycles
Mechanical shock: EIA/IS- 722 paragraph 4.9
Mechanical vibration: EIA/IS- 722 paragraph 4.10
Resistance to solvent: EIA/IS- 722 paragraph 4.11

Packaging information—mm

Supplied in tape-and-reel packaging, 10,000 parts per reel, 7” diameter reel.



Wave solder profile



Reference EN 61760-1:2006

Profile feature		**Standard SnPb solder**	**Lead (Pb) free solder**
Preheat	• Temperature min. (T_{smin})	100 °C	100 °C
	• Temperature typ. (T_{styp})	120 °C	120 °C
	• Temperature max. (T_{smax})	130 °C	130 °C
	• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	70 seconds
Δ preheat to max Temperature		150 °C max.	150 °C max.
Peak temperature (Tp)*		235 °C – 260 °C	250 °C – 260 °C
Time at peak temperature (t_p)		10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate		~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25 °C to peak temperature		4 minutes	4 minutes

Manual solder

+350 °C, 4-5 seconds (by soldering iron), generally manual hand soldering is not recommended.

Solder reflow profile

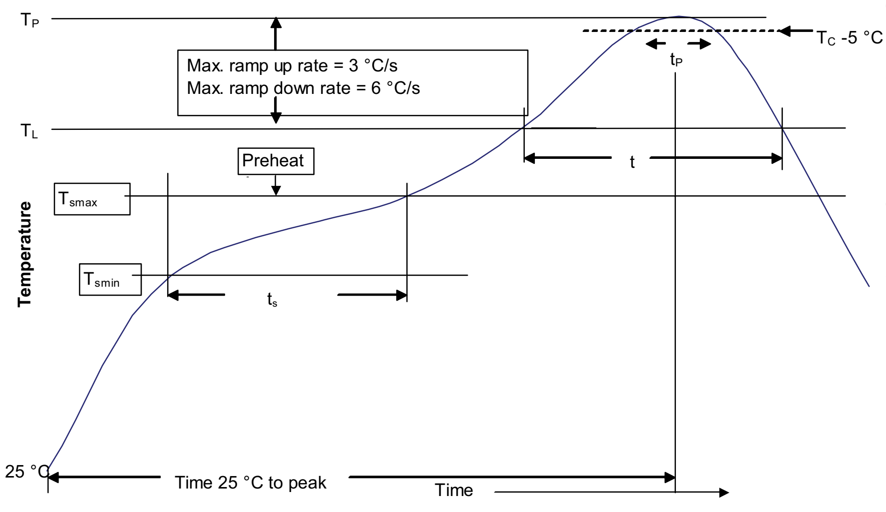


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm)	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference JDEC J-STD-020

Profile feature		Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	• Temperature min. (T_{smin})	100 °C	150 °C
	• Temperature max. (T_{smax})	150 °C	200 °C
	• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp up rate T_{smax} to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time at liquidous (t_L)		183 °C 60-150 Seconds	217 °C 60-150 Seconds
Peak package body temperature (T_P)*		Table 1	Table 2
Time (t_p)** within 5 °C of the specified classification temperature (T_c)		20 seconds**	30 seconds**
Average ramp-down rate (T_p to T_{smax})		6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature		6 minutes max.	8 minutes max.

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

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