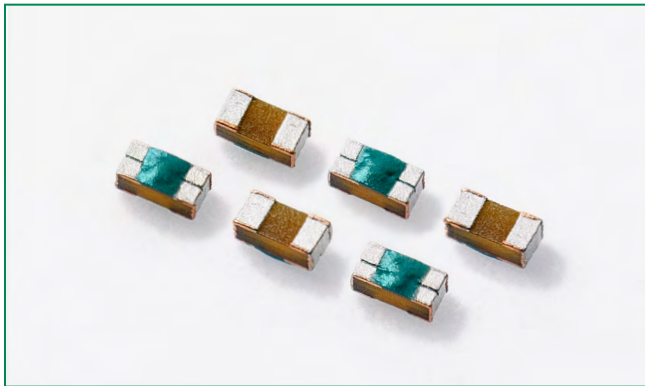


PGB2 0201 Series



Equivalent Circuits



Product Characteristics

Part Number	Lines Protected	Component Package
PGB2010201KR	1	0201

Description

PULSE-GUARD® ESD Suppressors help protect sensitive electronic equipment against electrostatic discharge (ESD).

They use polymer composite materials to suppress fast-rising ESD transients (as specified in IEC 61000-4-2), while adding virtually no capacitance to the circuit.

They supplement the on-chip protection of integrated circuitry and are best suited for low-voltage, high-speed applications where low capacitance is important to ensure minimal interference of data signal integrity.

The new and ultra-small surface mount PGB2 0201 series offers a RoHS Compliant, Halogen Free, and 100% Lead Free circuit protection alternative.

Features

- Lead-free, Halogen-free and RoHS compliant
- Ultra-low capacitance
- Low leakage current
- Fast response time
- One line of protection
- Bi-directional
- Withstands multiple ESD strikes
- Compatible with pick-and-place processes

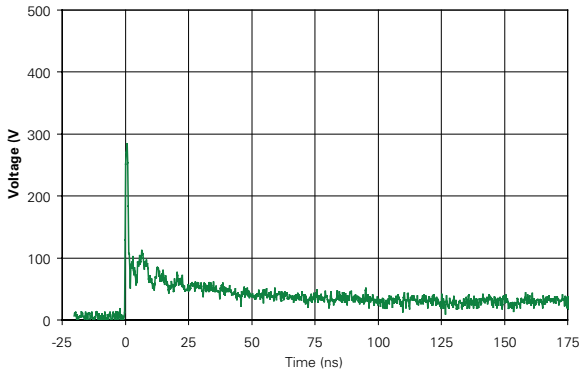
Applications

- HDTV Hardware
- Laptop/Desktop Computer
- Network Hardware
- HDMI/USB 3.0
- Computer Peripherals
- Digital Camera
- External Storage
- Set-Top Box

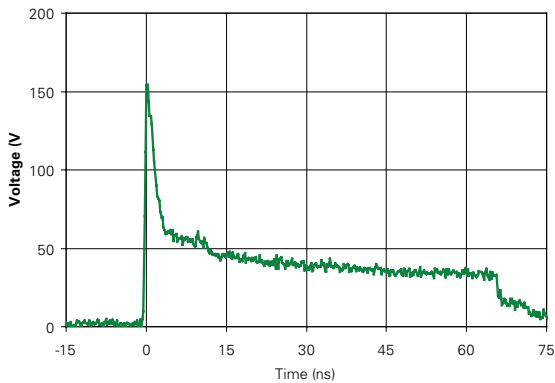
Electrical Characteristics

Specification	PGB2010201	Notes
ESD Capability: IEC 61000-4-2 Direct Discharge (typical) IEC 61000-4-2 Air Discharge (typical)	8kV 10kV - 15kV	The ESD capability measured by direct and air discharge method is subject to testing equipment and conditions. Numerous factors could affect the reliability and reproducibility of the direct and air discharge test results.
Trigger Voltage (typical) Clamping Voltage (typical)	400V 55V	Measured per IEC 61000-4-2 8kV Direct Discharge Method
Rated Voltage (maximum)	12VDC, max	
Capacitance (typical)	0.07 pF, typical	Measured at 250 MHz
Response Time	<1nS	Measured per IEC 61000-4-2 8kV Direct Discharge Method
Leakage Current (typical)	<1nA	Measured at 12 VDC
ESD Pulse Withstand	1000 pulses min	Some shifting in characteristics may occur when tested over multiple pulses at a very rapid rate

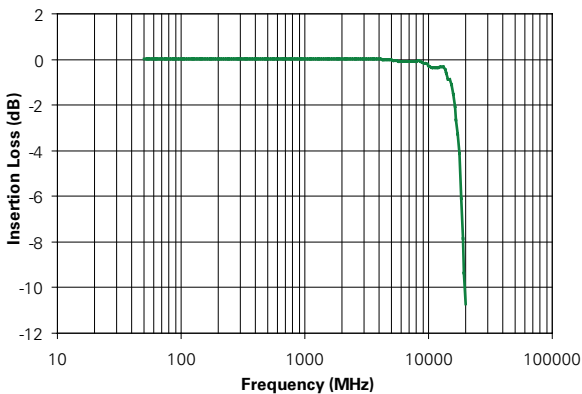
Typical ESD Response Curve (8 kV IEC 61000-4-2 Direct Discharge)



Typical TLP Response Curve (500 V Direct Discharge)

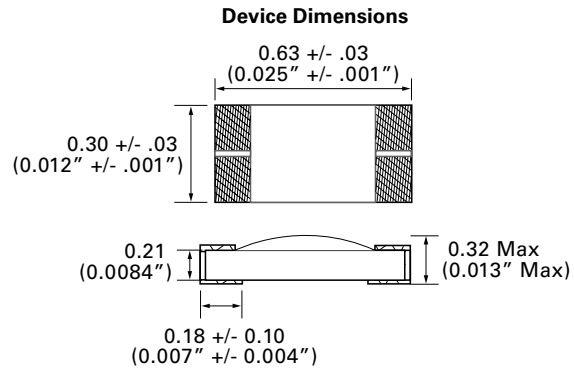


Typical Insertion Loss

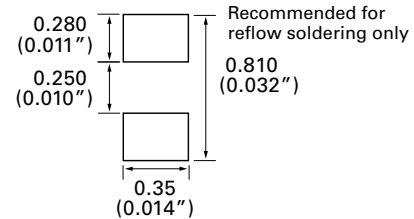


Dimensions

Dimensions: mm (inch)



Recommended Soldering Pad Layout



Part Numbering System

PGB2 01 0201 KR

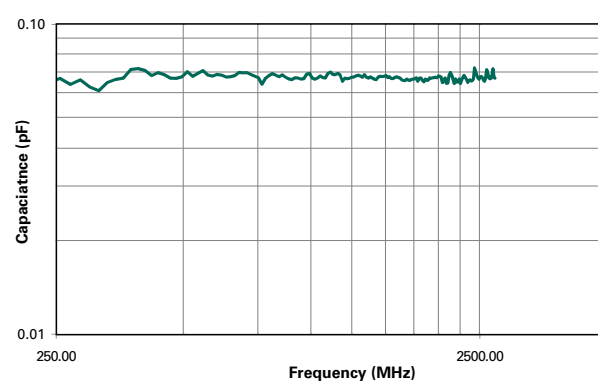
LEAD-FREE HALOGEN-FREE PULSE-GUARD® ESD SUPPRESSORS

QUANTITY & PACKAGING CODE:
KR = 10,000 pieces

LINES PROTECTED:
01 = 1 line

DEVICE SIZE CODE:
0201 = 0201 (0603)

Typical Device Capacitance



Physical Specifications

Materials	Body: Epoxy / Glass Substrate Terminations: Cu/Ni/Sn
Device Weight	0.349 mg
Solderability	MIL-STD-202, Method 208
Soldering Parameters	Wave solder - 260°C, 10 seconds maximum Reflow solder - 260°C, 30 seconds maximum

Design Consideration

Because of the fast rise-time of the ESD transient, proper placement of PULSE-GUARD® suppressors are a key design consideration to achieving optimal ESD suppression.

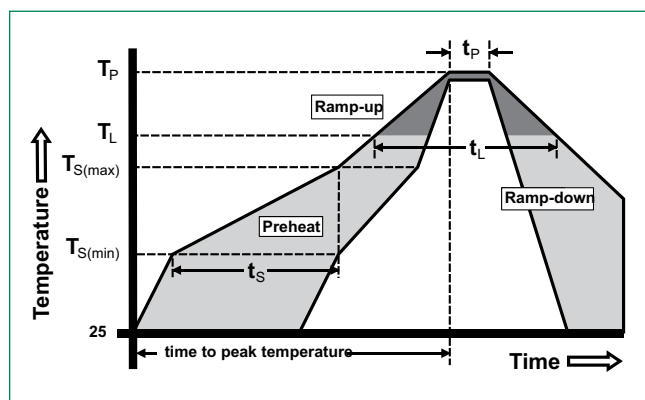
The devices should be placed on the circuit board as close to the source of the ESD transient as possible. Install PULSE-GUARD® suppressors (connected from signal/data line to ground) directly behind the connector so that they are the first board-level circuit component encountered by the ESD transient.

Environmental Specifications

Operating Temperature	-65°C to +125°C
Biased Humidity: Biased Heat:	40°C, 95% RH, 1000 hours 85°C, 1000 hours
Thermal Shock	MIL-STD-202, Method 107, -65°C to 125°C, 30 min. cycle, 10 cycles
Vibration	MIL-STD-202, Method 201
Chemical Resistance	MIL-STD-202, Method 215
Solder Leach Resistance and Terminal Adhesion	IPC/EIA J-STD-002

Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (min to max) (t_s)	60 – 180 seconds
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
	-Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		10 – 30 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max



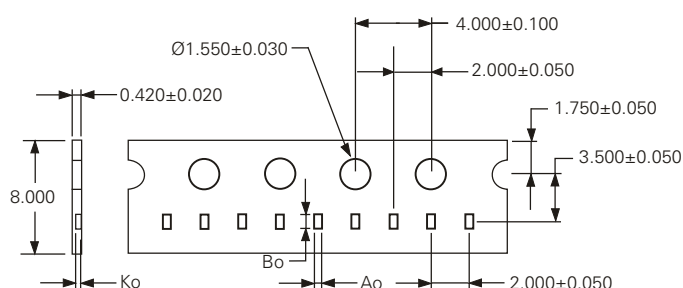
Notes:

- PGB2 Series recommended for reflow soldering only
- Recommended profile based on IPC/JEDEC J-STD-020C
- For recommended soldering pad layout dimensions, please refer to Dimensions section of this data sheet

Packaging

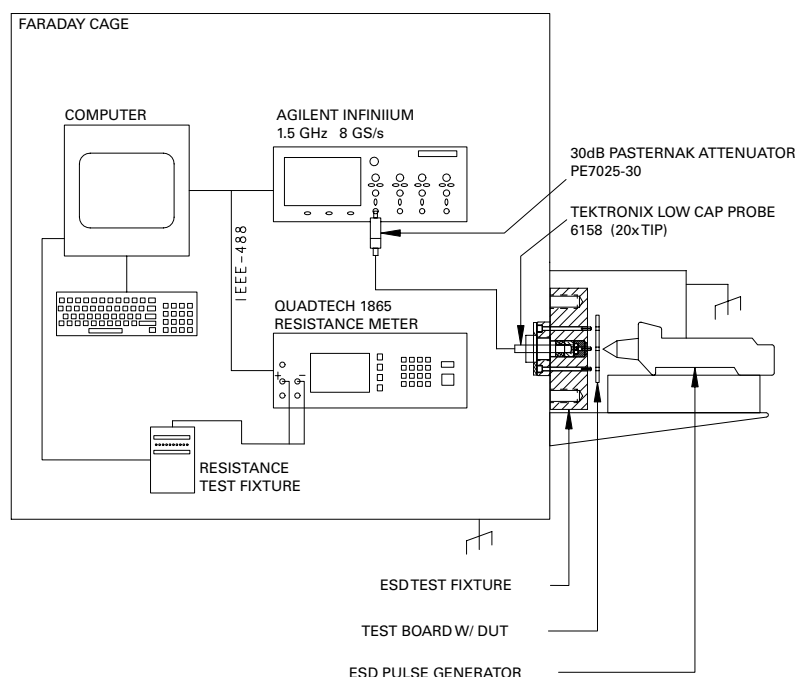
Part Number	Quantity & Packaging Code	Quantity	Packaging Option	Packaging Specification
PGB2010201	KR	10000	Tape & Reel (7" reel)	Carrier Tape: 8mm, paper Reel: 7" (178mm) reel

Tape and Reel Specifications



Description	0201 Series (mm)
A ₀ - Pocket Width	0.360±0.020
B ₀ - Pocket Height	0.680±0.020
K ₀ - Pocket Depth	0.300±0.020

Typical ESD Pulse Test Setup



Notes:

- QuadQuadTech 1865 High Resistance Meter: Measures insulation resistance values
- KeyTek MiniZap ESD simulator with IEC tip: Simulates 8kV, direct discharge ESD event per IEC 61000-4-2
- Faraday cage: Shields the acquisition equipment from the electromagnetic fields generated by the simulator
- Agilent 2.25 GHz 54846A Oscilloscope: Records the voltage waveform from the device under test
- Tektronix 6158 probe with 30dB attenuator: Transmits the waveform from the device to the oscilloscope