

**ULTRA LOW CAPACITANCE ESD PROTECTION COMPONENT****DESCRIPTION**

The P0603V24 is an ultra low capacitance ESD component designed to protect very high-speed data interfaces. The device has a typical capacitance of only 0.05pF (I/O to GND) and is compatible with the ESD immunity requirements of IEC61000-4-2.

**FEATURES**

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- Low Leakage Current: 0.10 $\mu$ A
- Fast Response Time
- Protects One Bidirectional Line
- Ultra Low Capacitance: 0.05 pF (Typical)
- RoHS Compliant
- REACH Compliant

**APPLICATIONS**

- HDMI
- DVI
- Display Port
- Unified Display Interface (UDI)
- Mobile Display Digital Interface (MDDI)
- Gigabit Ethernet
- USB2.0 & USB3.0
- IEEE 1394 Interface

**MECHANICAL CHARACTERISTICS**

- 0603 Package
- Approximate Weight: 0.44 milligrams
- Lead-Free Plating
- Solder Reflow Temperature:
  - Lead-Free - Sn/Ag/Cu, 96/3.5/0.5: 260-270°C
- 8mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

**PIN CONFIGURATION**

**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

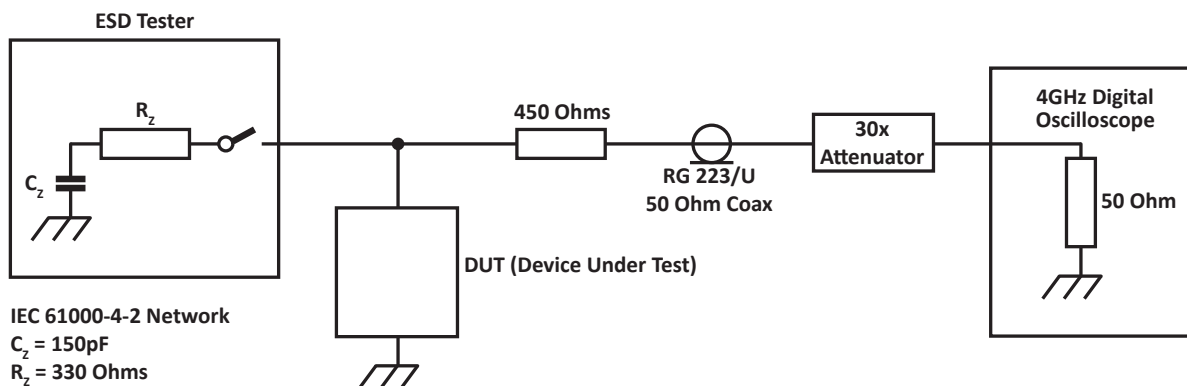
PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	$T_A$	-40 to 90	°C
Storage Temperature	$T_{STG}$	-55 to 125	°C
Solder Temperature - 10s	$T_L$	260	°C

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

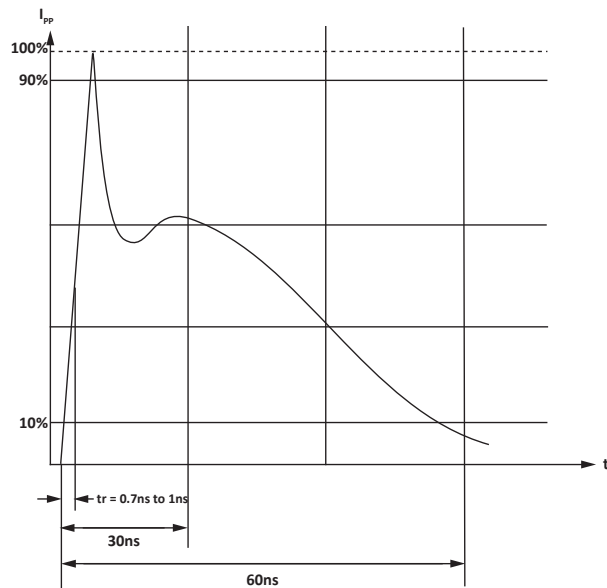
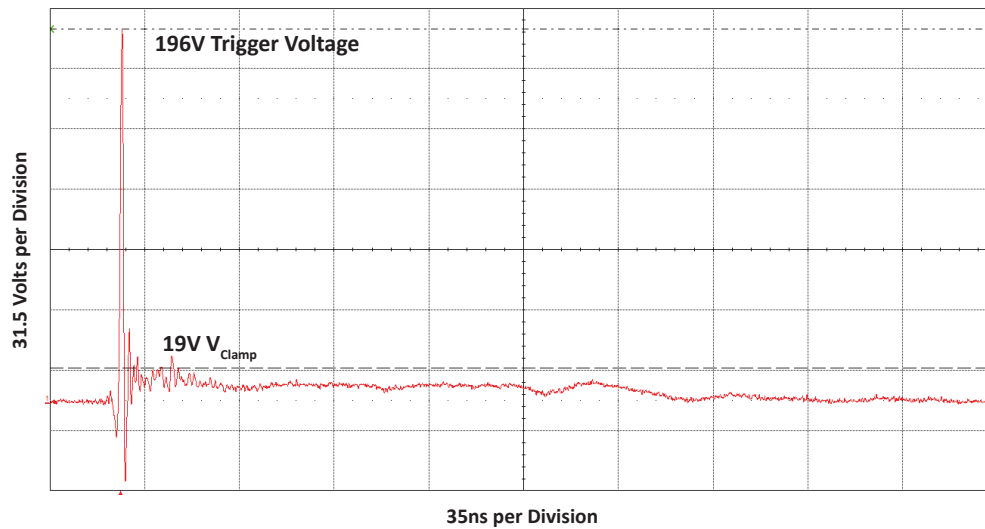
PART NUMBER	RATED STAND-OFF VOLTAGE $V_{WM}$ VOLTS	TYPICAL TRIGGER VOLTAGE (Note 1) $V_T$ VOLTS	TYPICAL CLAMPING VOLTAGE (Note 1) $V_C$ VOLTS	MAXIMUM LEAKAGE CURRENT (Note 2) @ $V_{WM}$ $I_D$ $\mu A$	TYPICAL CAPACITANCE @ 0V, 1MHz $C_J$ pF
P0603V24	24.0	350	35.0	0.10	0.05

**NOTES**

1. Trigger and Clamping Voltage are measured per IEC 61000-4-2, 8kV contact discharge method.
2. After reliability tests such as high temperature storage, temp cycle, continuous ESD strikes, the maximum leakage current is less than 10 $\mu A$ .

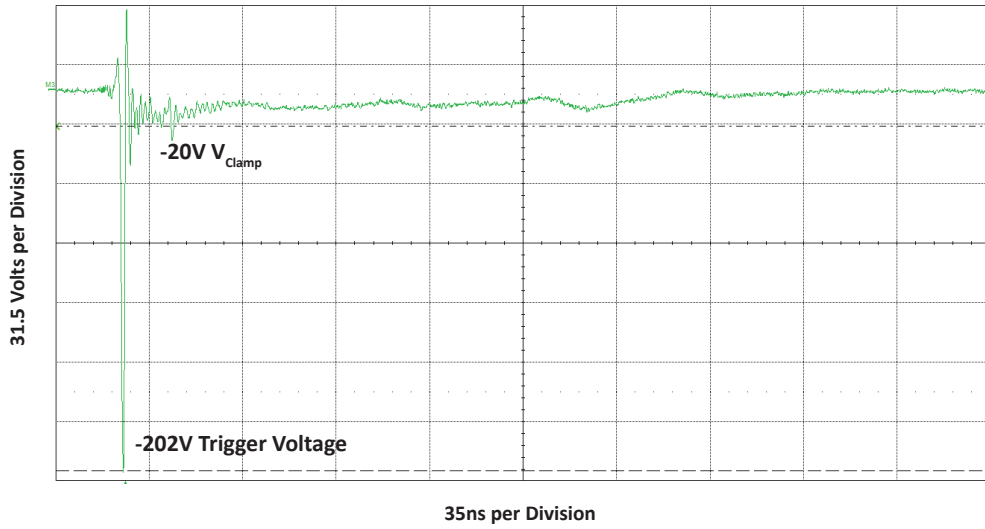
**FIGURE 1  
ESD CLAMPING TEST**


## TYPICAL DEVICE CHARACTERISTICS

**FIGURE 2**  
TYPICAL ESD WAVEFORM**FIGURE 3**  
8kV POSITIVE CLAMPING WAVEFORM

**TYPICAL DEVICE CHARACTERISTICS**

**FIGURE 3**  
**8kV NEGATIVE CLAMPING WAVEFORM**



## SOLDER REFLOW INFORMATION

PRINTED CIRCUIT BOARD RECOMMENDATIONS	
PARAMETER	VALUE
Pad Size on PCB	0.275mm
Pad Shape	Rectangular
Pad Definition	Non-Solder Mask Defined Pads
Solder Mask Opening	0.325mm
Solder Stencil Thickness	0.150mm
Solder Stencil Aperture Opening (Laser cut, 5% tapered walls)	0.330mm
Solder Paste Type	No Clean
Pad Protective Finish	OSP (Entek Cu Plus 106A)
Tolerance - Edge To Corner Ball	±50µm
Solder Ball Side Coplanarity	±20µm
Maximum Dwell Time Above Liquidous (183°C)	60 seconds
Soldering Maximum Temperature	270°C

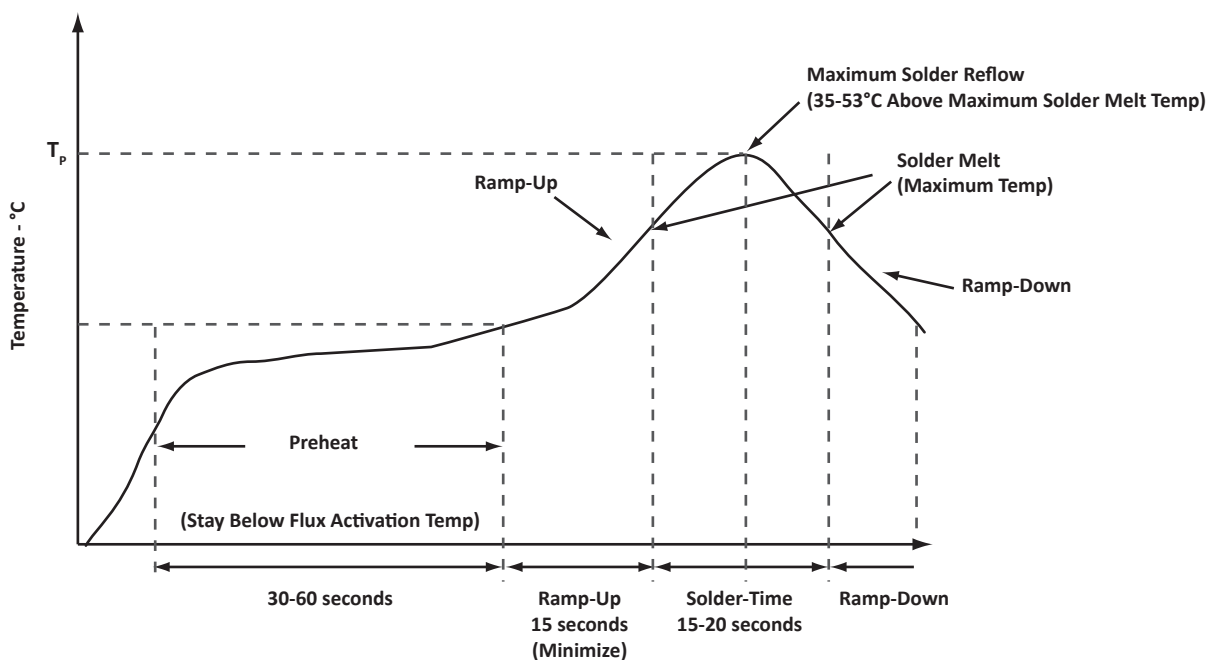
### REQUIREMENTS

Temperature:

$T_p$  for Lead-Free (Sn/Ag/Cu): 260-270°C

$T_p$  for Tin-Lead: 240-245°C

Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area and plating.

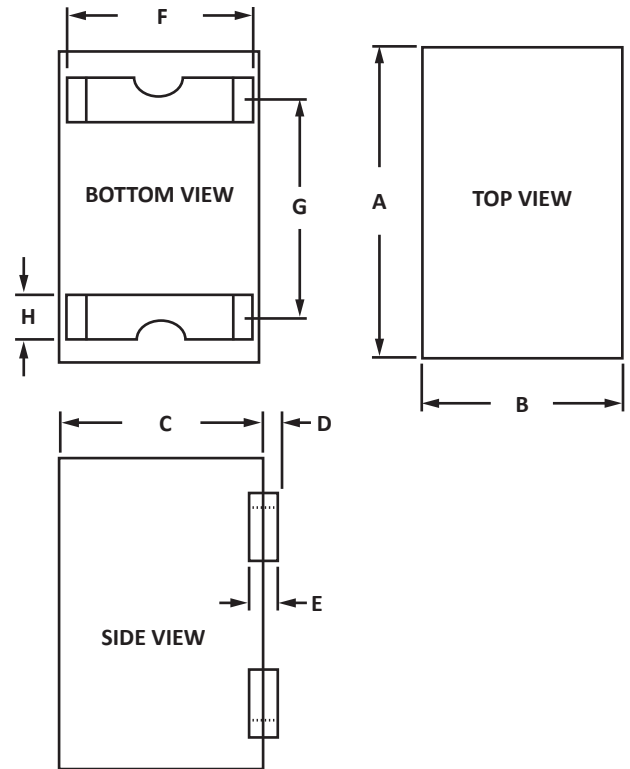


**0603 PACKAGE INFORMATION**
**OUTLINE DIMENSIONS**

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.45	1.75	0.057	0.079
B	0.70	0.95	0.028	0.037
C	0.43	0.63	0.017	0.025
D	0.00	0.05	0.00	0.002
E	0.125 REF		0.005 REF	
F	0.70	0.80	0.028	0.031
G	1.30 BSC		0.051 BSC	
H	0.45	0.55	0.018	0.022

**NOTES**

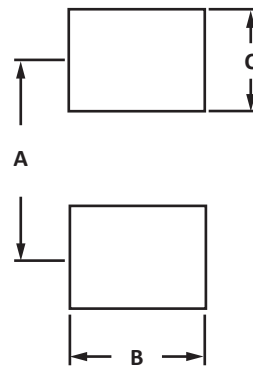
1. Controlling dimension: millimeters.

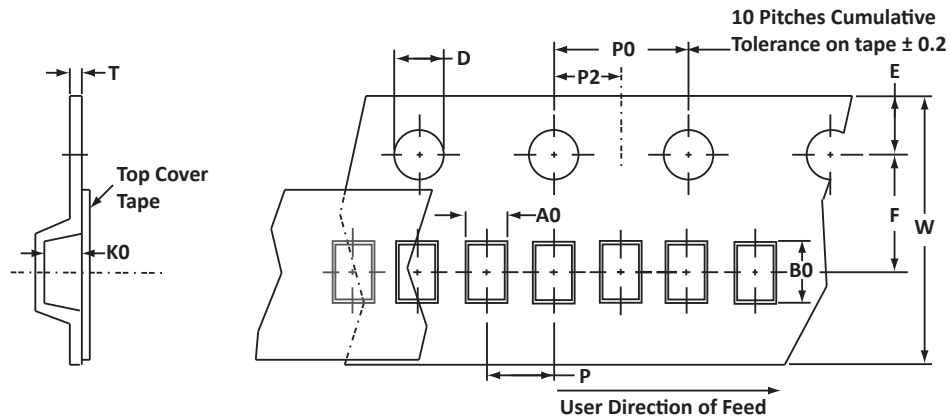

**PAD LAYOUT DIMENSIONS**

DIM	MILLIMETERS	INCHES
	NOM	NOM
A	1.35	0.053
B	0.95	0.037
C	0.65	0.026

**NOTES**

1. Controlling dimension: millimeters



**TAPE AND REEL**

**SPECIFICATIONS**

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	1.10 ± 0.05	1.90 ± 0.10	0.70 ± 0.05	1.55 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	2.00 ± 0.05	0.25

**NOTES**

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T710 = 7" Reel - 10,000 pieces per 8mm tape.

**ORDERING INFORMATION**

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
P0603V24	N/A	-T710	10,000	7"	N/A

This device is only available in a Lead-Free configuration.

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 25 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products. ProTek Devices is ISO 9001:2015 certified.

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