

## Description

The AU0521M1 is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line. The AU0521M1 complies with the IEC 61000-4-2 (ESD) with  $\pm 30$  kV air and  $\pm 30$  kV contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free 0402 package. The small size and high ESD surge protection make AU0521M1 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

## Features

- Ultra small package: 1.0x0.6x0.5mm
- Protects one data or power line
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- 2-pin leadless package
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test  
Air discharge:  $\pm 30$ kV  
Contact discharge:  $\pm 30$ kV
  - IEC61000-4-5 (Lightning) 8A (8/20 $\mu$ s)
- RoHS Compliant

## Mechanical Characteristics

- Package: 0402
- Lead Finish: Sn
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

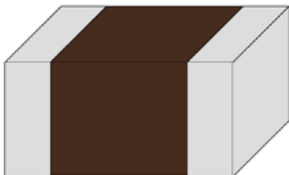
## Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- Audio Players
- Keypads, Side Keys, LCD Displays

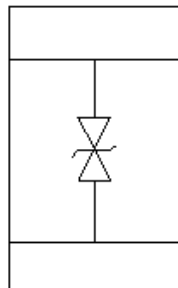
## Ordering Information

Part Number	Packaging	Reel Size
AU0521M1	10000/Tape & Reel	7 inch

## Dimensions and Pin Configuration



Package Outline



Circuit Schematic

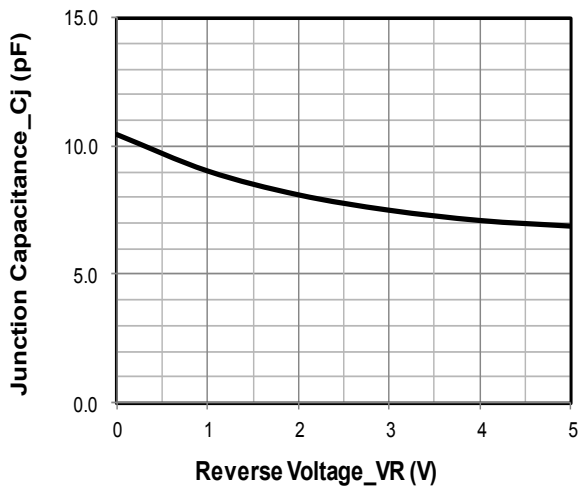
**Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ )	Ppk	100	W
Peak Pulse Current (8/20 $\mu\text{s}$ )	I <sub>PP</sub>	8	A
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	$\pm 30$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 30$	
Operating Temperature Range	T <sub>J</sub>	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	$^{\circ}\text{C}$

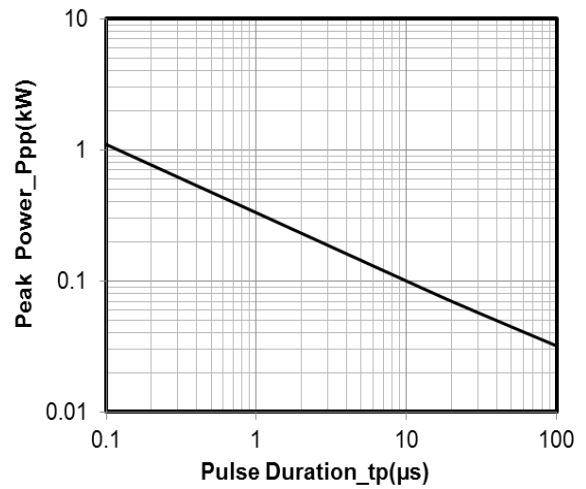
**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>			5	V	
Breakdown Voltage	V <sub>BR</sub>	5.8		7.5	V	I <sub>T</sub> = 1mA
Reverse Leakage Current	I <sub>R</sub>			0.2	$\mu\text{A}$	V <sub>RWM</sub> = 5V
Clamping Voltage	V <sub>C</sub>			8	V	I <sub>PP</sub> = 1A
Clamping Voltage	V <sub>C</sub>			12	V	I <sub>PP</sub> = 8A
Junction Capacitance	C <sub>J</sub>		10		pF	V <sub>R</sub> = 0V, f = 1MHz

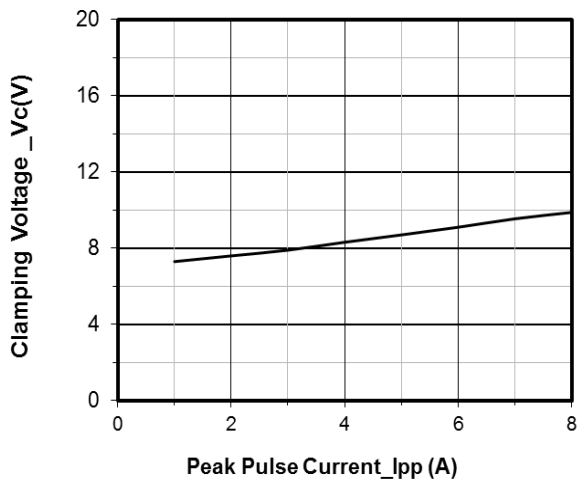
**Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)**



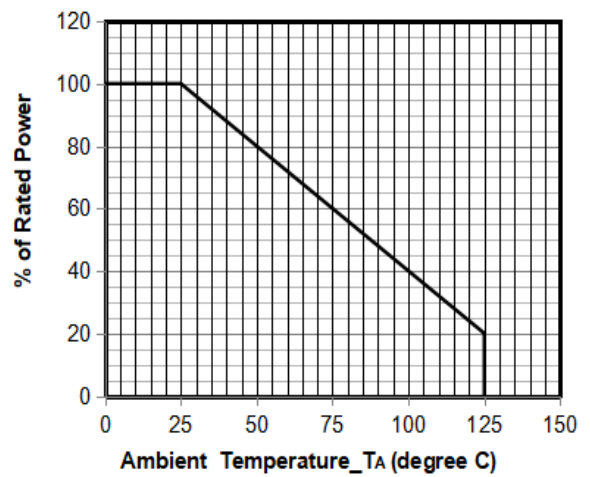
**Junction Capacitance vs. Reverse Voltage**



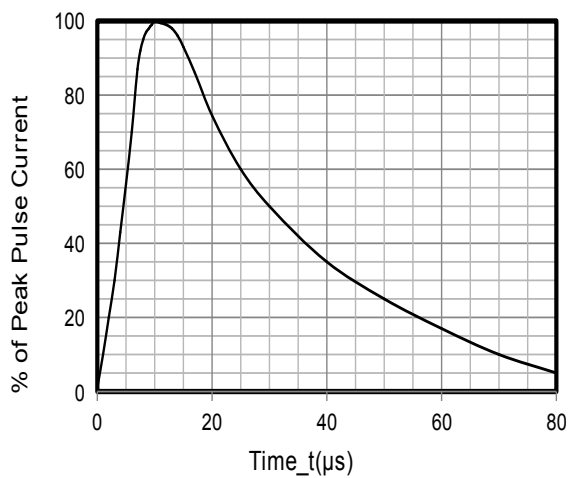
**Peak Pulse Power vs. Pulse Time**



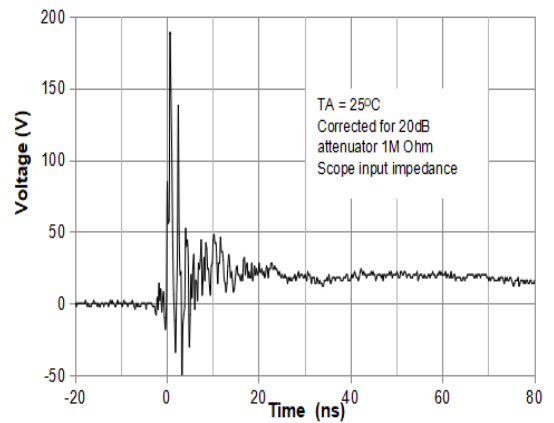
**Clamping Voltage vs. Peak Pulse Current ( $t_p = 8/20\mu\text{s}$ )**



**Power Derating Curve**

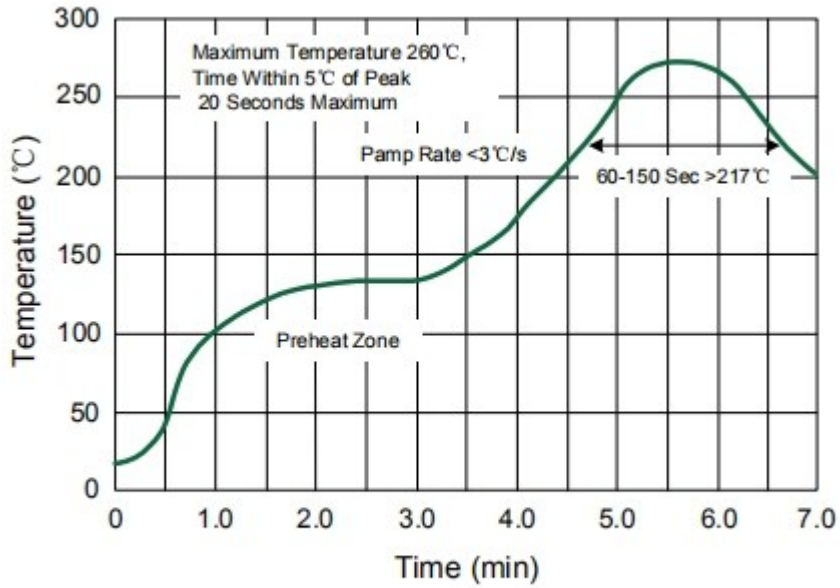


**8 X 20μs Pulse Waveform**

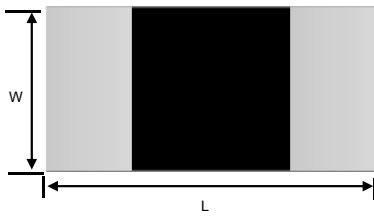
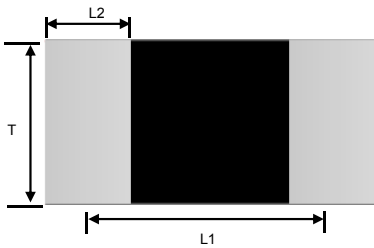


**ESD Clamping Voltage  
8 kV Contact per IEC61000-4-2**

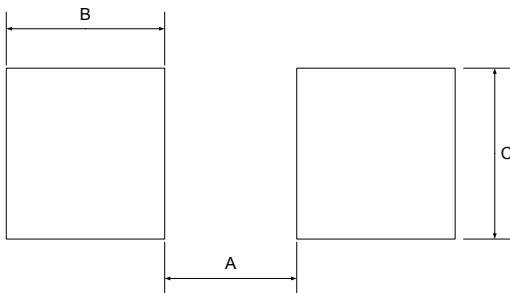
## Re-flow Solder Profile



## **Lead-free Re-flow Solder Profile**

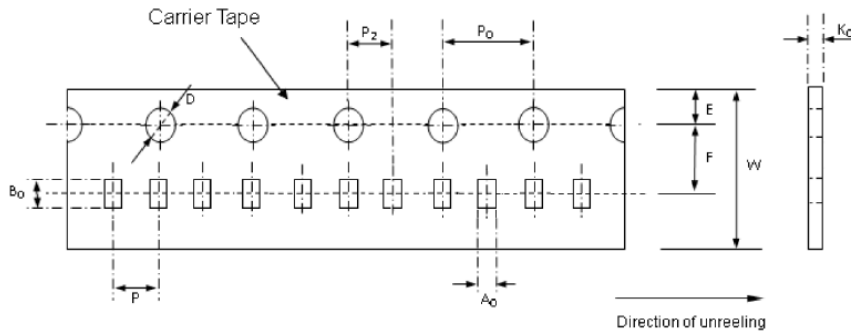
**0402 Package Outline Drawing**

**Top**

**Side View**

SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
W	0.45	0.55	0.65	0.018	0.022	0.026
L	0.95	1.00	1.05	0.038	0.040	0.042
T	0.45	0.55	0.65	0.018	0.022	0.026
L1	0.75 BSC			0.030 BSC		
L2	0.15	0.20	0.25	0.006	0.008	0.010

**Suggested Land Pattern**


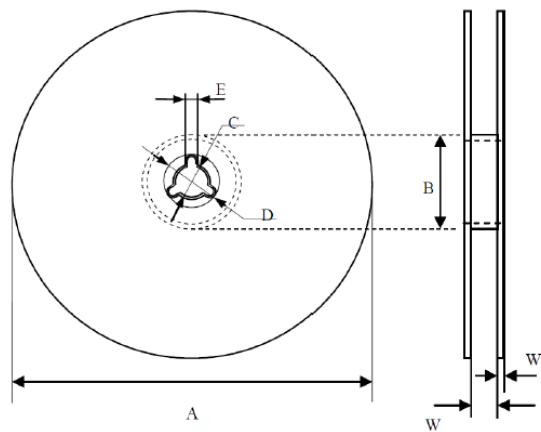
SYM	DIMENSIONS
	MILLIMETERS
A	0.40-0.60
B	0.50-0.70
C	0.60-0.70

## 0402 Tape and Reel Specification



(Unit: mm)

Symbol	$A_0$ $\pm 0.05$	$B_0$ $\pm 0.05$	$K_0$ $\pm 0.05$	$D$ $+0.10$ $-0.05$	$P$ $\pm 0.10$	$P_2$ $\pm 0.10$	$P_0$ $\pm 0.10$	$W$ $\pm 0.10$	$E$ $\pm 0.10$	$F$ $\pm 0.05$
<b>0402</b>	0.70	1.12	0.60	1.50	2.00	2.00	4.00	8.00	1.75	3.50



(Unit: mm)

Symbol	$A$	$B$	$C$	$D$	$E$	$W$	$W_1$
<b>0402</b>	178.0 $\pm 1.0$	60.0 $\pm 0.5$	13.0 $\pm 0.2$	21.0 $\pm 0.2$	2.0 $\pm 0.5$	9.0 $\pm 0.5$	1.5 $\pm 0.1$

## Contact Information

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