

Low Capacitance Bidirectional Single Line TVS Protection Diode

UM5080 DFN2 1.0×0.6
UM5080A DFN2 1.0×0.6

General Description

The UM5080(A) TVS protection diode is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and PDA's. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, lower operating voltage, lower clamping voltage and no device degradation when compared to MLVs. The UM5080(A) TVS protection diode protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. The UM5080(A) is available in DFN2 1.0×0.6 (compatible with SOD923/SOD882/CSP 1.0×0.6) package with working voltages of 5 volt. It gives designer the flexibility to protect bidirectional single line in applications where arrays are not practical. Additionally, it may be "sprinkled" around the board in applications where board space is at a premium. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, ±30kV air, ±30kV contact discharge.

Applications

Cell Phone Handsets and Accessories
 Personal Digital Assistants (PDA's)
 Notebooks, Desktops and Servers
 Portable Instrumentation
 Cordless Phones
 Smart Card
 Digital Cameras
 MP3 Players

Features

Transient protection for data lines to
 IEC 61000-4-2 (ESD) ±30kV (air), ±30kV
 (contact)
 Small package for use in portable electronics
 Suitable replacement for MLV's in ESD protection
 applications
 Bidirectional TVS protection
 Stand off voltages: 5V
 Low leakage current
 Low diode capacitance
 Small Body Outline Dimensions: 1.0mm×0.6mm

Pin Configurations

Top View



Ordering Information

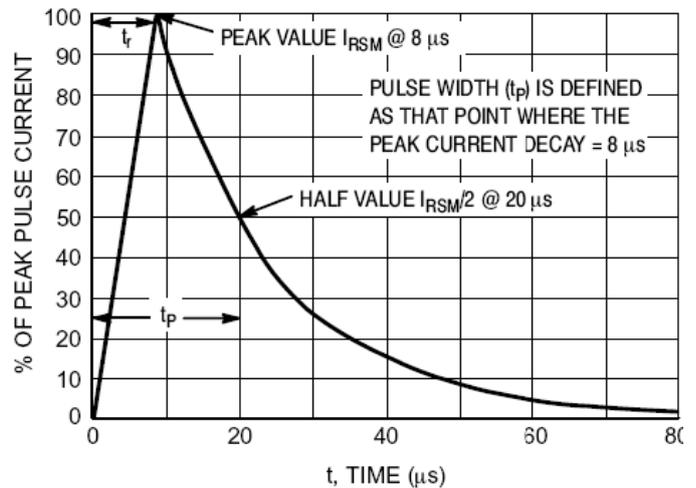
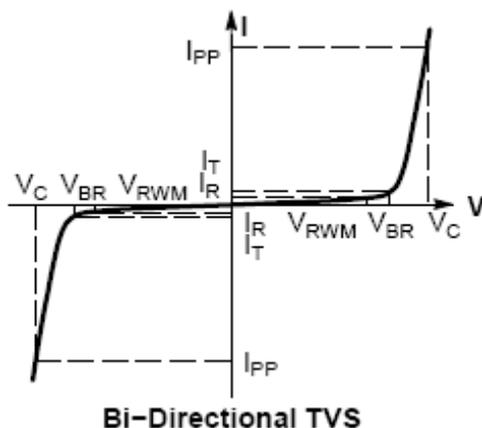
Part Number	Working Voltage	Packaging Type	Channel	Marking Code	Shipping Qty
UM5080	5.0V	DFN2 1.0×0.6mm ²	1	P	5000/7 Inch Tape & Reel
UM5080A	5.0V	DFN2 1.0×0.6mm ²	1	P	8000/7 Inch Tape & Reel

Absolute Maximum Ratings

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20μs)	P _{PK}	140	Watts
Maximum Peak Pulse Current (t=8/20μs)	I _{PP}	11	Amps
Lead Soldering Temperature	T _L	260 (10 sec.)	°C
Operating Temperature	T _J	-55 to +125	°C
Storage Temperature	T _{STG}	-55 to +150	°C

Symbol Definition

PARAMETER	SYMBOL
Maximum Reverse Peak Pulse Current	I _{PP}
Clamping Voltage @ I _{pp}	V _C
Working Peak Reverse Voltage	V _{RWM}
Maximum Reverse Leakage Current @ V _{RWM}	I _R
Breakdown Voltage @ I _T	V _{BR}
Test Current	I _T
Peak Power Dissipation	P _{PK}
Max. Capacitance @ V _R = 0V, f = 1MHz	C _J

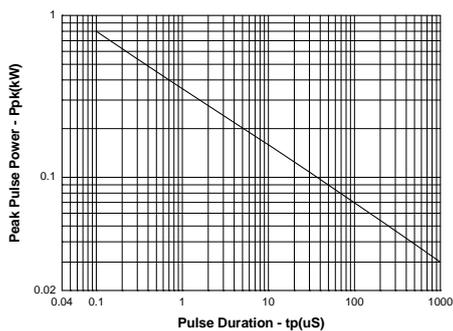


Electrical Characteristics (T=25°C, Device for 5.0V Reverse Stand-off Voltage)

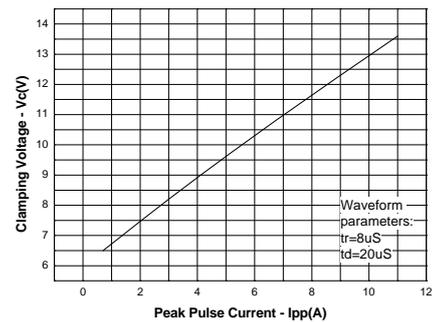
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Reverse Stand-Off Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	6.5		8.5	V
Reverse Leakage Current	I_R	$V_{RWM} = 5V, T=25^\circ C$			1	μA
Clamping Voltage	V_C	$I_{PP} = 5A, t_p = 8/20\mu S$			9.7	V
		$I_{PP} = 11A, t_p = 8/20\mu S$			13.6	
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$		25	40	pF
Junction Capacitance	C_J	$V_R = 2.5V, f = 1MHz$		20	30	pF
Reverse dynamic resistance	$R_{dyn,rev}$	$I_{PP} > 2A$		0.55		Ω
Forward dynamic resistance	$R_{dyn,fwd}$			0.35		

Typical Operating Characteristics

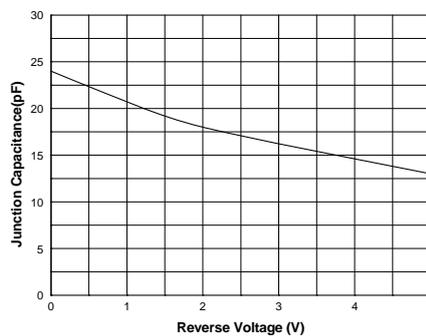
Non-Repetitive Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current



Junction Capacitance vs. Reverse Voltage



Applications Information

Device Connection Options

UM5080(A) ESD protection diode is designed to protect one bidirectional data, I/O or power supply line from the damage caused by ESD and surge pulses. The device is bidirectional and may be used on lines where the signal polarity is above ground and below ground.

Circuit Board Layout Recommendations for Suppression of ESD

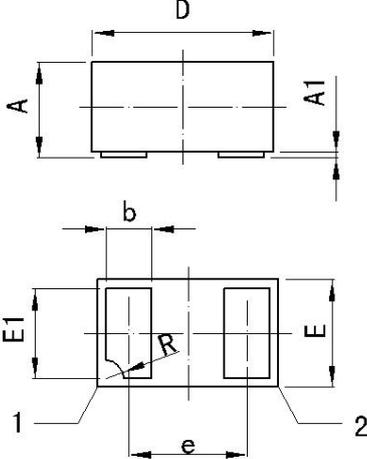
Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

1. Place the TVS near the input terminals or connectors to restrict transient coupling.
2. Minimize the path length between the TVS and the protected line.
3. Minimize all conductive loops including power and ground loops.
4. The ESD transient return path to ground should be kept as short as possible.
5. Never run critical signals near board edges.
6. Use ground planes whenever possible. For multilayer printed-circuit boards, use ground vias.
7. Keep parallel signal paths to a minimum.
8. Avoid running protection conductors in parallel with unprotected conductor.
9. Avoid using shared transient return paths to a common ground point.

Package Information

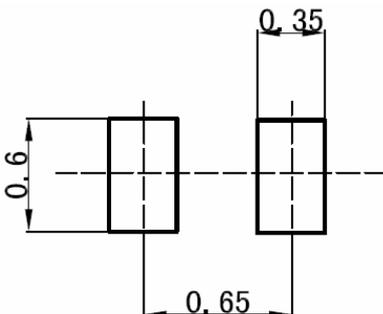
UM5080(A) DFN2 1.0×0.6

Outline Drawing

	<table border="1"> <thead> <tr> <th rowspan="2">Symbol</th> <th colspan="2">millimeters</th> <th colspan="2">Inches</th> </tr> <tr> <th>Min</th> <th>Max</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>0.450</td> <td>0.550</td> <td>0.018</td> <td>0.021</td> </tr> <tr> <td>A1</td> <td>0.000</td> <td>0.050</td> <td>0.000</td> <td>0.002</td> </tr> <tr> <td>b</td> <td>0.190</td> <td>0.300</td> <td>0.007</td> <td>0.012</td> </tr> <tr> <td>D</td> <td>0.950</td> <td>1.075</td> <td>0.037</td> <td>0.042</td> </tr> <tr> <td>E</td> <td>0.550</td> <td>0.675</td> <td>0.022</td> <td>0.027</td> </tr> <tr> <td>E1</td> <td>0.340</td> <td>0.550</td> <td>0.013</td> <td>0.022</td> </tr> <tr> <td>e</td> <td colspan="2">0.650</td> <td colspan="2">0.026</td> </tr> <tr> <td>R</td> <td>0.050</td> <td>0.150</td> <td>0.002</td> <td>0.006</td> </tr> </tbody> </table>				Symbol	millimeters		Inches		Min	Max	Min	Max	A	0.450	0.550	0.018	0.021	A1	0.000	0.050	0.000	0.002	b	0.190	0.300	0.007	0.012	D	0.950	1.075	0.037	0.042	E	0.550	0.675	0.022	0.027	E1	0.340	0.550	0.013	0.022	e	0.650		0.026		R	0.050	0.150	0.002	0.006
	Symbol	millimeters		Inches																																																	
Min		Max	Min	Max																																																	
A	0.450	0.550	0.018	0.021																																																	
A1	0.000	0.050	0.000	0.002																																																	
b	0.190	0.300	0.007	0.012																																																	
D	0.950	1.075	0.037	0.042																																																	
E	0.550	0.675	0.022	0.027																																																	
E1	0.340	0.550	0.013	0.022																																																	
e	0.650		0.026																																																		
R	0.050	0.150	0.002	0.006																																																	
Note: R is Optional.																																																					

DIMENSIONS			
Symbol	MILLIMETERS		
	Min	Max	
A	0.40	-	0.50
A1	0.00	-	0.05
A3	0.125REF		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b	0.20	0.25	0.30
L	0.45	0.50	0.55
e	0.65BSC		

Land Pattern

	<p>NOTES:</p> <ol style="list-style-type: none"> Compound dimension: 1.00×0.60; Unit: mm; General tolerance ±0.025 mm unless otherwise specified; The layout is just for reference.
---	---

Tape and Reel Orientation



IMPORTANT NOTICE

The information in this document has been carefully reviewed and is believed to be accurate. Nonetheless, this document is subject to change without notice. Union assumes no responsibility for any inaccuracies that may be contained in this document, and makes no commitment to update or to keep current the contained information, or to notify a person or organization of any update. Union reserves the right to make changes, at any time, in order to improve reliability, function or design and to attempt to supply the best product possible.

Union Semiconductor, Inc
Add: 2F, No. 3, Lane 647 Songtao Road, Shanghai 201203
Tel: 021-51093966
Fax: 021-51026018
Website: www.union-ic.com