

1.Description

These dual monolithic silicon surge protection diodes are designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. Their dual junction common anode design protects two separate lines using only one package. These devices are ideal for situations where board space is at a premium.

3.Applications

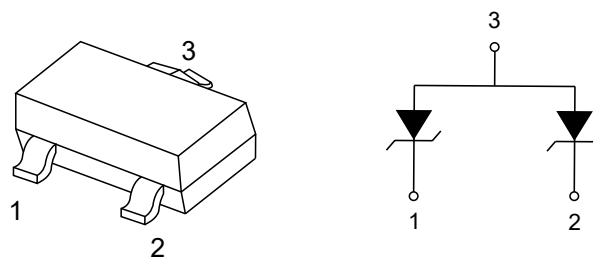
- CASE: Void-Free, Transfer-Molded, Thermosetting Plastic Case
- FINISH: Corrosion Resistant Finish, Easily Solderable
- Package Designed for Optimal Automated Board Assembly

2.Features

- SOT-23 Package Allows Either Two Separate Unidirectional
- Configurations or a Single Bidirectional Configuration
- Working Peak Reverse Voltage Range - 5V to 36V
- Peak Power - 300 Watt (8/20 μ s)
- Low Leakage - 1.0 μ A
- Flammability Rating UL 94 V-0
- These are Pb-Free Devices

- MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°C for 10 Seconds
- Small Package Size for High Density Applications

4.Pinning information



SOT-23



5. Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Peak Power Dissipation @ 20 μ s (Note 1) @ $T_L \leq 25^\circ\text{C}$	P_{PK}	300	W
IEC 61000-4-2 (ESD) Air		± 15	kV
Contact		± 26	kV
IEC 61000-4-4 (EFT)		40	A
IEC 61000-4-5 (Lightning)		12	A
Total Power Dissipation on FR-5 Board (Note 2) @ $T_A = 25^\circ\text{C}$	P_D	225	mW
Derate above 25°C		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Power Dissipation on Alumina Substrate (Note 3) @ $T_A = 25^\circ\text{C}$	P_D	300	mW
Derate above 25°C		2.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Lead Solder Temperature – Maximum (10 Second Duration)	T_L	260	$^\circ\text{C}$

Notes:

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Non-repetitive current pulse per Figure 3
2. FR-5=1.0x0.75x0.62 in.
3. Alumina=0.4x0.3x0.024 in., 99.5% alumina

NOTE: Other voltages may be available upon request



6.Electrical Characteristics(T_A=25°C)

Device*	DEVICE MARKING	V _{RWM}	I _R	V _{BR} , Breakdown Voltage		I _T	V _C @ I _{PP} =1Amp	Max I _{PP} (Note 4)	Typical Capacitance
			@V _{RWM}	(Volts)			(Volts)	(Amps)	(pF)
		(Volts)	(μA)	Min	Max	mA	(Volts)	(Amps)	Pin 1 to 3 @ 0 Volts
SM05T1G	05M	5	10	6.2	7.3	1.0	9.8	17	225
SM12T1G	12M	12	1.0	13.3	15.75	1.0	19	12	95
SM15T1G	15M	15	1.0	16.7	19.6	1.0	24	10	100
SM24T1G	24M	24	1.0	26.7	31.35	1.0	43	5.0	60
SM36T1G	36M	36	1.0	40.0	46.95	1.0	60	4.0	45

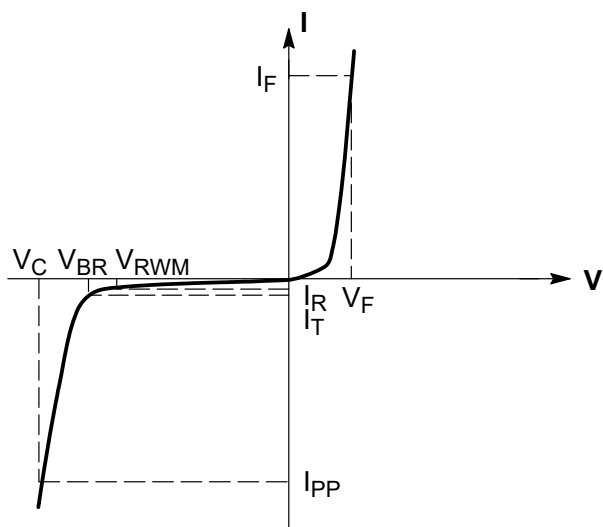
Notes:

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. 8/20 μs pulse waveform per Figure 3



7.Electrical Parameters (Circuit tied to Pins 1 and 3 or 2 and 3)



Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
θV_{BR}	Maximum Temperature Coefficient of V_{BR}
I_F	Forward Current
V_F	Forward Voltage @ I_F
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}



8. Typical characteristic

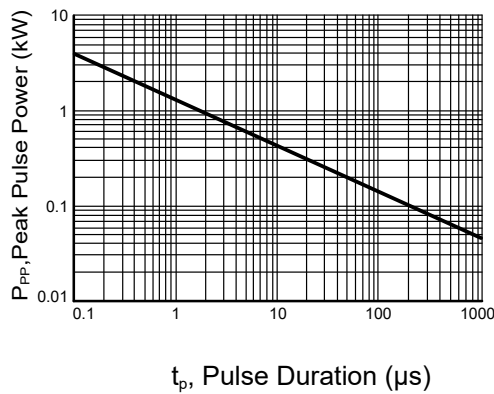


Figure 1: Non-Repetitive Peak Pulse Power versus Pulse Time

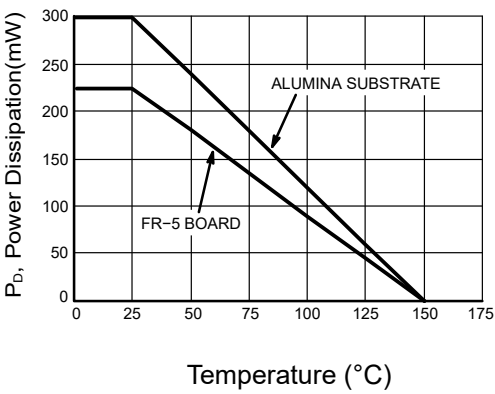


Figure 2: Steady State Power Derating Curve

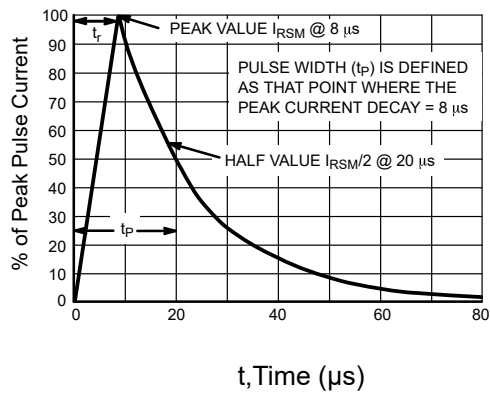


Figure 3: 8/20 μs Pulse Waveform

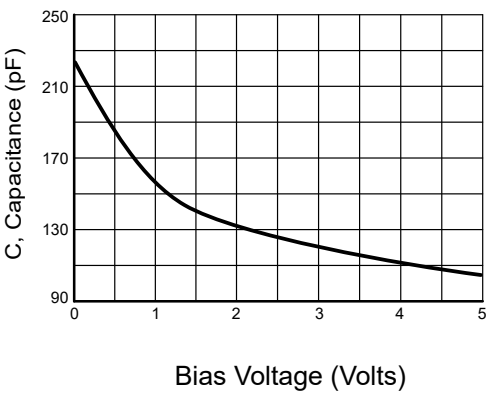


Figure 4: Typical Diode Capacitance (SM05)

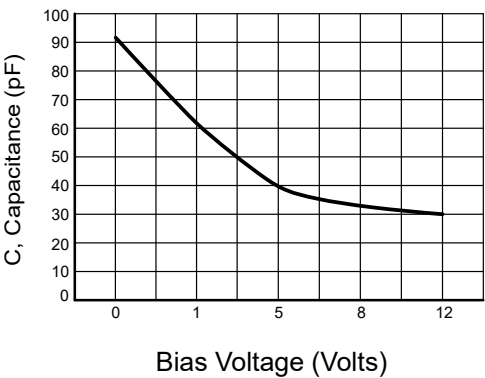
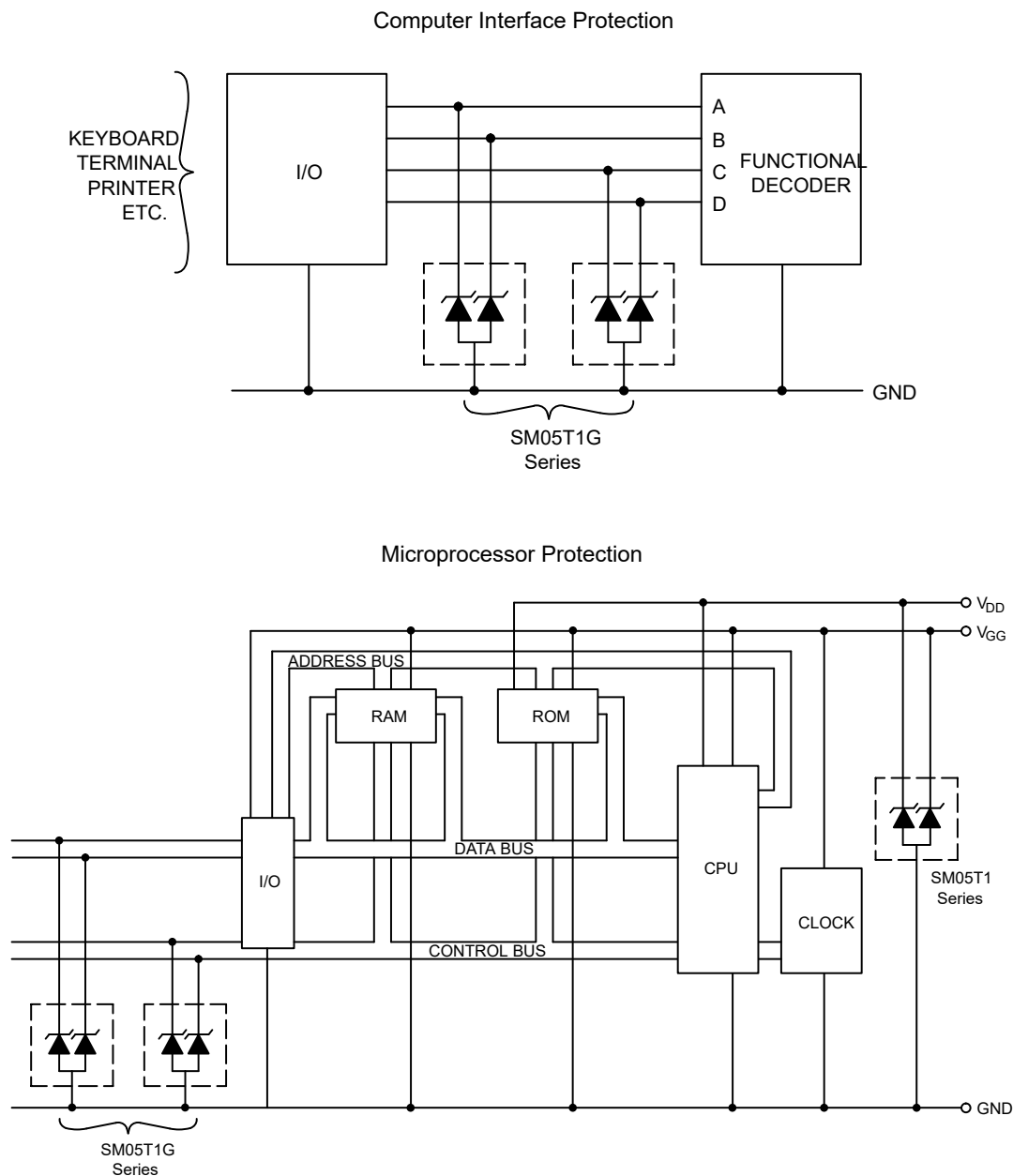


Figure 5: Typical Diode Capacitance (SM12)



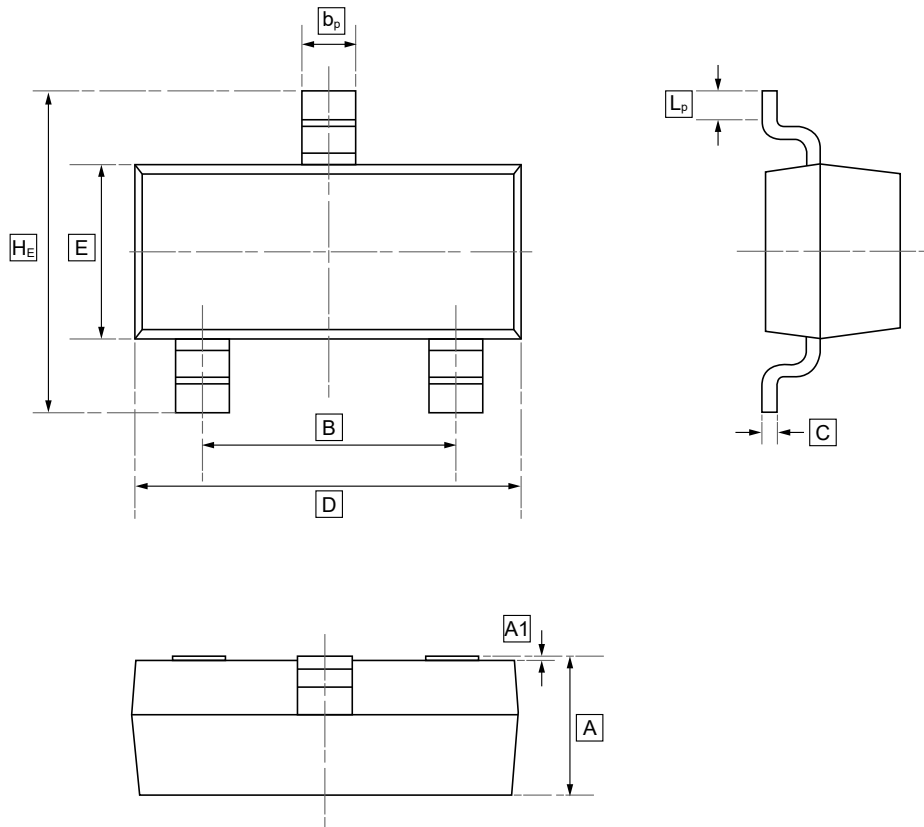
9. Typical Common Anode Applications



A quad junction common anode design in a SOT-23 package protects four separate lines using only one package. This adds flexibility and creativity to PCB design especially when board space is at a premium. Two simplified examples of surge protection applications are illustrated below.



10.SOT-23 Package Outline Dimensions

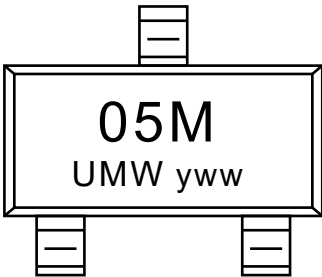


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	b_p	C	D	E	H_E	A1	L_p
Min	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20
Max	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50



11.Ordering information



yww: Batch Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW SM05T1G	05M	SOT-23	3000	Tape and reel
UMW SM12T1G	12M	SOT-23	3000	Tape and reel
UMW SM15T1G	15M	SOT-23	3000	Tape and reel
UMW SM24T1G	24M	SOT-23	3000	Tape and reel
UMW SM36T1G	36M	SOT-23	3000	Tape and reel



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