ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)
UNIDIRECTIONAL
(Circuit tied to pins 1, 2, and 5; Pins 2, 3, and 5; Pins 2, 4, and 5; or Pins 2, 5, and 6) (V_F = 0.9 V Max @ I_F = 10 mA)

	Breakdown Voltage				Max Reverse Leakage Current		Max Zener Impedance (Note 7)	Max Reverse Surge Current	Max Reverse Voltage @ I_{RSM} (Note 6) (Clamping Voltage)	Maximum Temperature Coefficient of V_Z	Capacitance @ 0 Volt Bias, 1 MHz (pF)	
		V_{ZT} (Note 5) (V)		@ I_{ZT}	I_R	V_R						
Device	Min	Nom	Max	(mA)	(nA)	(V)	Z_{ZT} @ I_{ZT} (Ω) (mA)	I_{RSM} (A)	V_{RSM} (V)	(mV/°C)	Min	Max
MMQA5V6T1,T3	5.32	5.6	5.88	1.0	2000	3.0	400	3.0	8.0	1.26	–	–
MMQA6V2T1,T3	5.89	6.2	6.51	1.0	700	4.0	300	2.66	9.0	10.6	–	–
MMQA6V8T1,T3	6.46	6.8	7.14	1.0	500	4.3	300	2.45	9.8	10.9	100	250
MMQA12VT1,T3	11.4	12	12.6	1.0	75	9.1	80	1.39	17.3	14	–	–
MMQA13VT1	12.4	13	13.7	1.0	75	9.8	80	1.29	18.6	15	–	–
MMQA15VT1,T3	14.3	15	15.8	1.0	75	11	80	1.1	21.7	16	–	–
MMQA18VT1,T3	17.1	18	18.9	1.0	75	14	80	0.923	26	19	–	–
MMQA20VT1,T3	19	20	21	1.0	75	15	80	0.84	28.6	20.1	–	–
MMQA21VT1,T3	20	21	22.1	1.0	75	16	80	0.792	30.3	21	–	–
MMQA22VT1,T3	20.9	22	23.1	1.0	75	17	80	0.758	31.7	22	–	–
MMQA24VT1,T3	22.8	24	25.2	1.0	75	18	100	0.694	34.6	25	–	–
MMQA27VT1,T3	25.7	27	28.4	1.0	75	21	125	0.615	39	28	–	–
MMQA33VT1,T3	31.4	33	34.7	1.0	75	25	200	0.504	48.6	37	–	–

1. Non-repetitive current pulse per Figure 5 and derate above T_A = 25°C per Figure 4.
2. Non-repetitive current pulse per Figure 6 and derate above T_A = 25°C per Figure 4.
3. FR-5 = 1.0 x 0.75 x 0.62 in.
4. Alumina = 0.4 x 0.3 x 0.024 in., 99.5% alumina
5. V_Z measured at pulse test current I_T at an ambient temperature of 25°C.
6. Surge current waveform per Figure 5 and derate per Figure 4.
7. Z_{ZT} is measured by dividing the AC voltage drop across the device by the AC current supplied. The specified limits are $I_{Z(AC)}$ = 0.1 $I_{Z(DC)}$, with AC frequency = 1 kHz.

TYPICAL CHARACTERISTICS

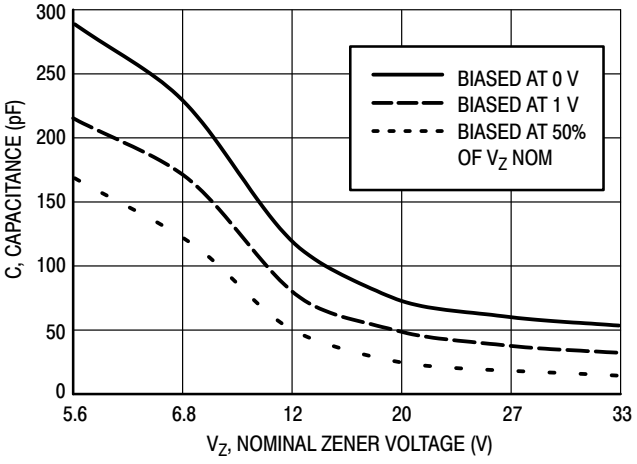


Figure 1. Typical Capacitance

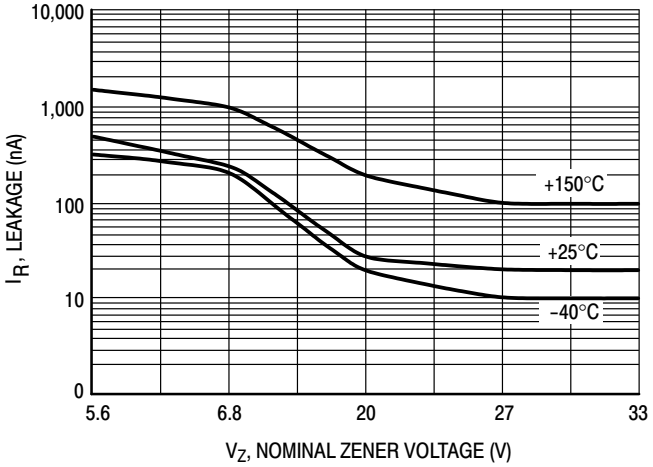


Figure 2. Typical Leakage Current

TYPICAL CHARACTERISTICS

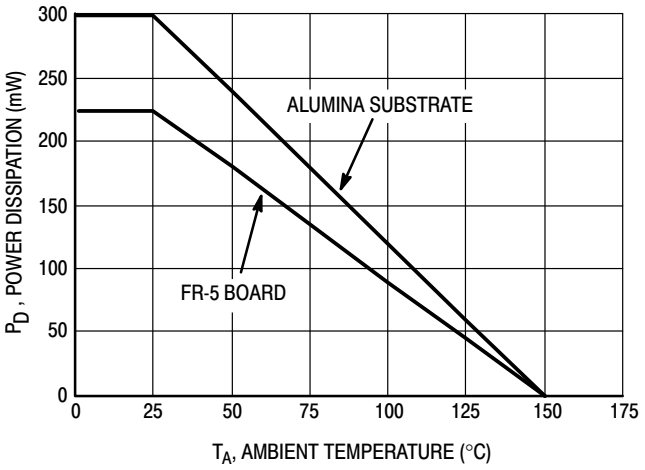


Figure 3. Steady State Power Derating Curve

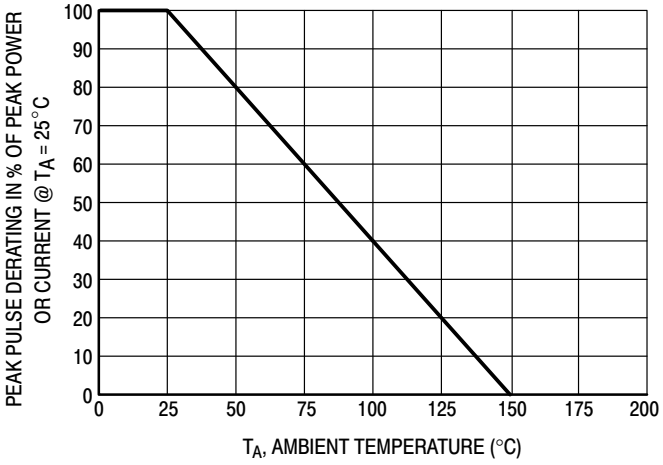


Figure 4. Pulse Derating Curve

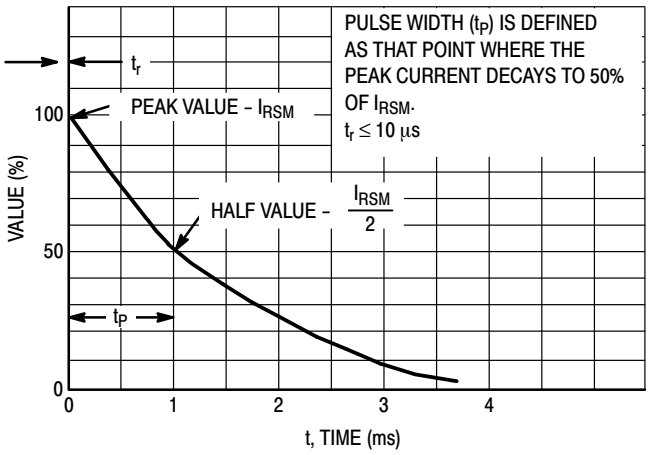


Figure 5. 10 × 1000 μs Pulse Waveform

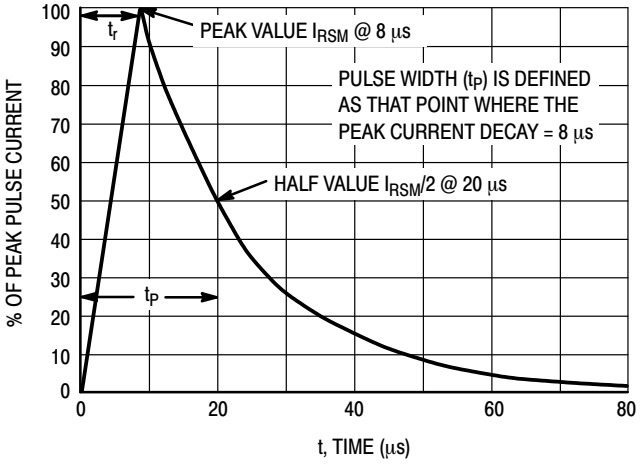


Figure 6. 8 × 20 μs Pulse Waveform

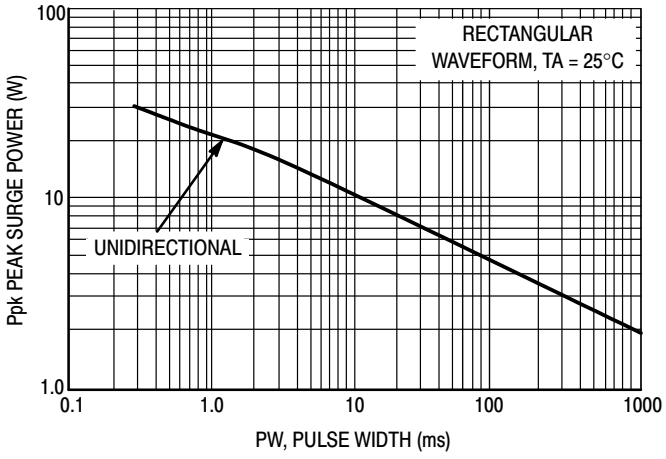


Figure 7. Maximum Non−Repetitive Surge Power, Ppk versus PW

Power is defined as V_{RSM} x I_Z(pk) where V_{RSM} is the clamping voltage at I_Z(pk).

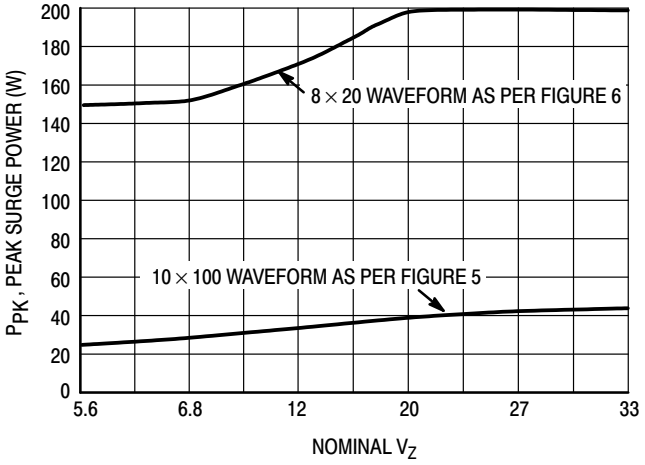
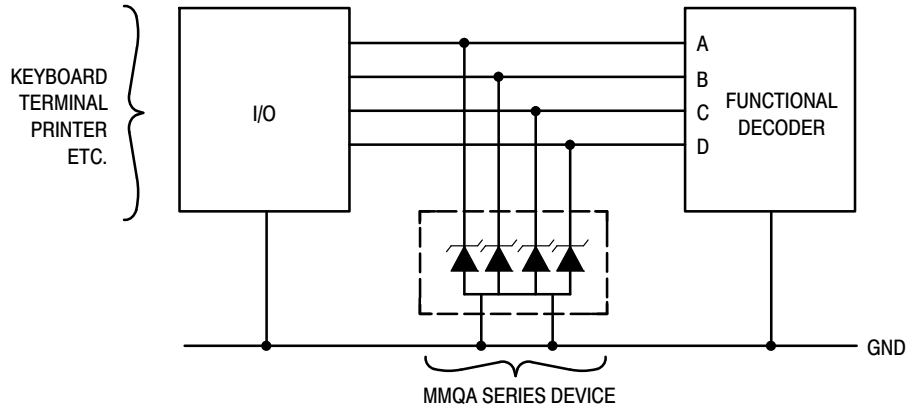


Figure 8. Typical Maximum Non−Repetitive Surge Power, Ppk versus V_{BR}

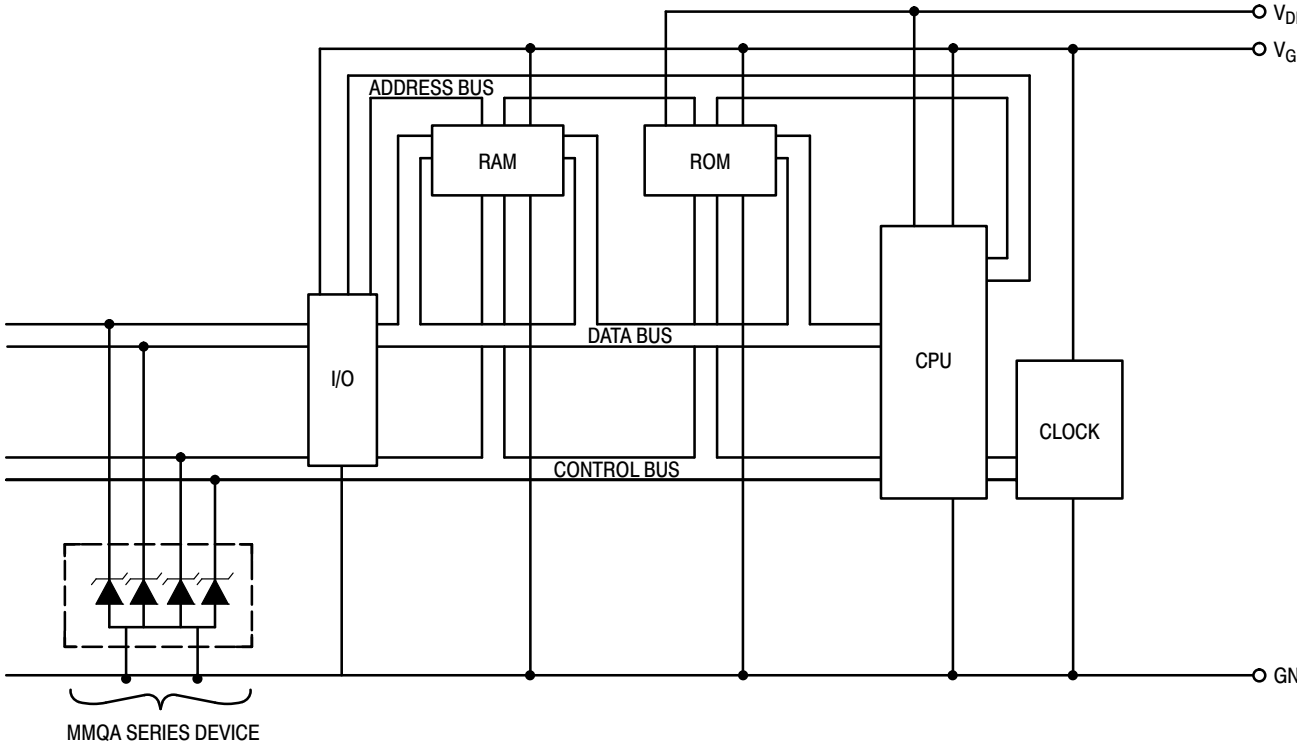
TYPICAL COMMON ANODE APPLICATIONS

A quad junction common anode design in a SC−74 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. A simplified example of MMQA Series Device applications is illustrated below.

Computer Interface Protection



Microprocessor Protection



DEVICE MARKING AND ORDERING INFORMATION

Device*	Device Marking	Package	Shipping†
MMQA5V6T1*	5A6	SC−74	3,000/Tape & Reel
MMQA6V2T1*	6A2	SC−74	3,000/Tape & Reel
MMQA6V2T3*	6A2	SC−74	10,000/Tape & Reel
MMQA6V8T1*	6A8	SC−74	3,000/Tape & Reel
MMQA12VT1*	12A	SC−74	3,000/Tape & Reel
MMQA13VT1*	13A	SC−74	3,000/Tape & Reel
MMQA15VT1*	15A	SC−74	3,000/Tape & Reel
MMQA18VT1*	18A	SC−74	3,000/Tape & Reel
MMQA20VT1*	20A	SC−74	3,000/Tape & Reel
MMQA20VT3*	20A	SC−74	10,000/Tape & Reel
MMQA21VT1*	21A	SC−74	3,000/Tape & Reel
MMQA22VT1*	22A	SC−74	3,000/Tape & Reel
MMQA24VT1*	24A	SC−74	3,000/Tape & Reel
MMQA27VT1*	27A	SC−74	3,000/Tape & Reel
MMQA27VT3*	27A	SC−74	10,000/Tape & Reel
MMQA33VT1*	33A	SC−74	3,000/Tape & Reel

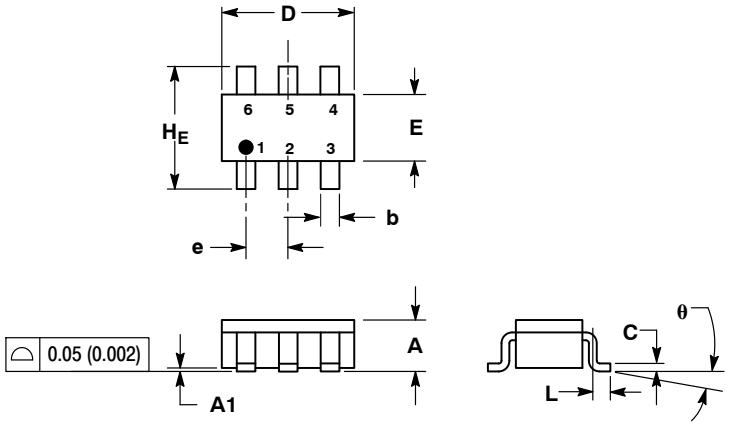
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.
*The “G” suffix indicates Pb−Free package available.

Mechanical Characteristics:
CASE: Void-free, transfer-molded, thermosetting plastic case.
FINISH: Corrosion resistant finish, easily solderable.
Package designed for optimal automated board assembly.
Small package size for high density applications.
Available in 8 mm Tape and Reel.
Use the Device Number to order the 7 inch/3,000 unit reel.
Replace the “T1” with “T3” in the Device Number to order the 13 inch/10,000 unit reel.

MMQA Quad Common Anode Series

PACKAGE DIMENSIONS

SC−74
CASE 318F−05
ISSUE M

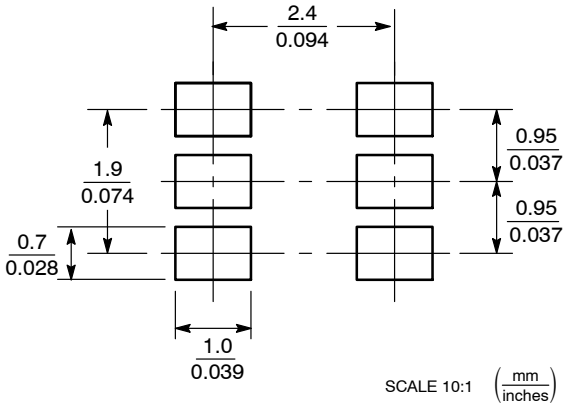


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318F−01, −02, −03, −04 OBSOLETE. NEW STANDARD 318F−05.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.37	0.50	0.010	0.015	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
H_E	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	–	10°	0°	–	10°

STYLE 1:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. ANODE
6. CATHODE

SOLDERING FOOTPRINT*



*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

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Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5773−3850

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

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