

ULTRA LOW CAPACITANCE MULTI-LINE STEERING DIODE ARRAY



SO-14 PACKAGE

DESCRIPTION

The MMAD Series are low distortion steering diodes. These devices are intended for use in high frequency analog or digital data I/O ports for protection against Electrostatic Discharge (ESD) and Electrical Fast Transients (EFT). The MMAD Series is connected between rail-to-rail voltage bus or rail-to-ground for clamping and diverting overvoltage transients for the protection of sensitive network interface circuits.

This series provides low capacitance, which insures signal integrity up to 900MHz, while complete isolation between adjacent diodes keeps cross-talk to a minimum. The MMAD Series is available in a SO-14 package and meets the IEC 61000-4-2, IEC 61000-4-4 and IEC 61000-4-5 requirements.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 12A, 8/20 μ s - Level 1(Line-Gnd) & Level 2(Line-Line)
- 500 Milliwatt Continuous Power Dissipation
- Monolithic Design
- ESD Protection > 25 kilovolts
- Protects up to 7 to 10 I/O Lines
- Working Voltage > 50 Volts
- Low Leakage Current < 0.1 μ A
- Ultra Low Capacitance: 5pF per Diode
- RoHS Compliant
- REACH Compliant

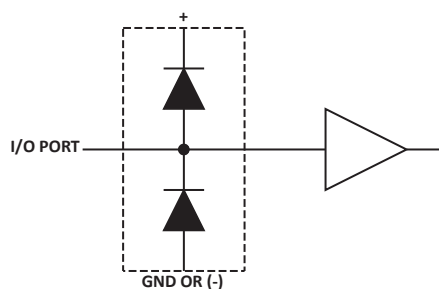
APPLICATIONS

- High Frequency Data Lines
- RS-232 & RS-422 Interface Networks
- Ethernet 10/100 Base T
- Computer I/O Ports

MECHANICAL CHARACTERISTICS

- Molded JEDEC SO-14 Package
- Approximate Weight: 0.15 grams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
- 16mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

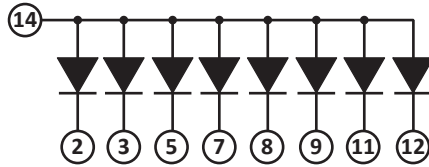
CIRCUIT DIAGRAM



Does Not Apply to the MMAD1109

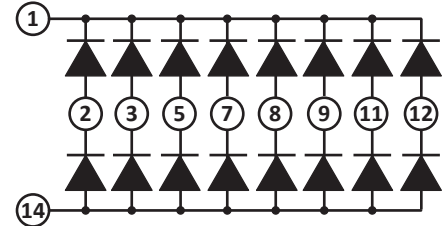
PIN IDENTIFICATION AND CONFIGURATION

MMAD1106



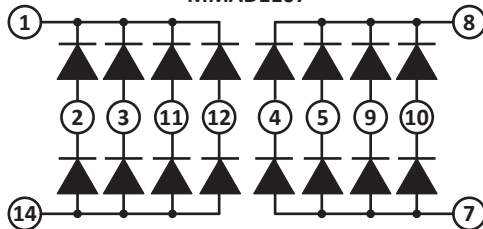
8 Diode Common Anode Array
 NC Pins 1, 4, 6, 10 & 13
 8 Lines of Protection

MMAD1103



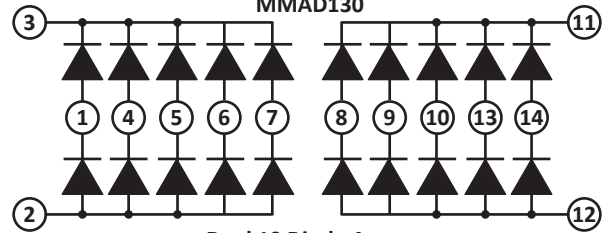
16 Diode Array
 NC Pins 4, 6, 10 & 13
 8 Lines of Protection

MMAD1107



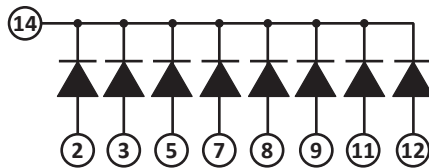
Dual 8 Diode Array
 NC Pins 6 & 13
 8 Lines of Protection

MMAD130



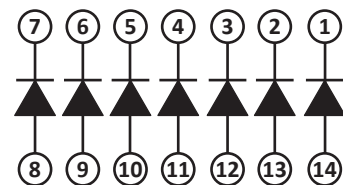
Dual 10 Diode Array
 10 Lines of Protection

MMAD1105



8 Diode Common Cathode Array
 NC Pins 1, 4, 6, 10 & 13
 8 Lines of Protection

MMAD1109



7 Lines of Protection

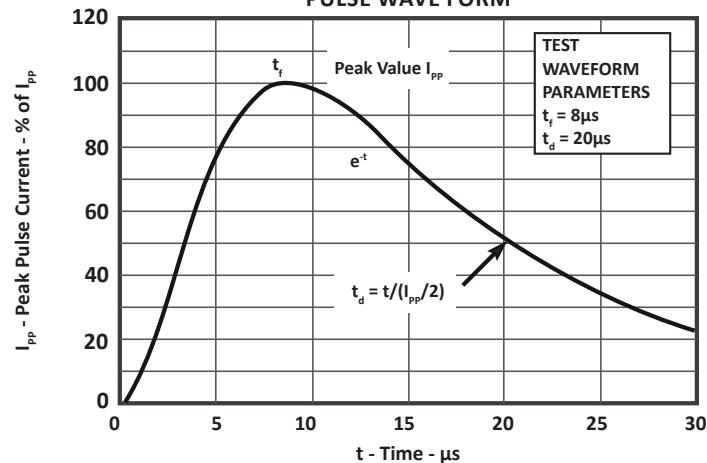
TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER | SYMBOL | VALUE | UNITS |
|--|-----------|------------|------------|
| Continuous Power Dissipation | P_{PK} | 500 | Milliwatts |
| Continuous Forward Current (Single Diode) | I_P | 400 | mA |
| Repetitive Peak Forward Current @ $t_p = 5\mu s$, $F = 50kHz$ | I_{FRM} | 700 | mA |
| Operating Temperature | T_A | -55 to 150 | °C |
| Storage Temperature | T_{STG} | -55 to 150 | °C |

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| PART NUMBER | REPETITIVE PEAK REVERSE VOLTAGE | MAXIMUM FORWARD PEAK PULSE CURRENT | MAXIMUM FORWARD VOLTAGE | MAXIMUM REVERSE LEAKAGE CURRENT | MAXIMUM CAPACITANCE (Per Diode) |
|-------------|------------------------------------|------------------------------------|---------------------------|-------------------------------------|---------------------------------|
| | @ 10 μA V_{RRM} VOLTS | @ 8/20 μs I_{FM} AMPS | @ 100mA V_F VOLTS | V_{RRM} @ 40V I_R μA | @ 4V, 1MHz C_j pF |
| MMAD1103 | 50 | 12 | 1.2 | 0.1 | 5 |
| MMAD1105 | 50 | 12 | 1.2 | 0.1 | 5 |
| MMAD1106 | 50 | 12 | 1.2 | 0.1 | 5 |
| MMAD1107 | 50 | 12 | 1.2 | 0.1 | 5 |
| MMAD1109 | 50 | 12 | 1.2 | 0.1 | 5 |
| MMAD130 | 50 | 12 | 1.2 | 0.1 | 5 |

 FIGURE 1
 PULSE WAVE FORM


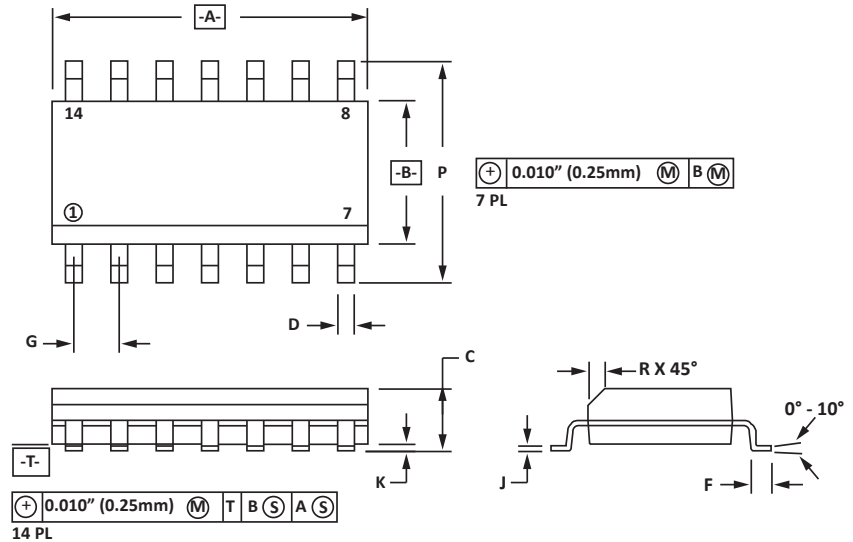
SO-14 PACKAGE INFORMATION

OUTLINE DIMENSIONS

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 8.55 | 8.75 | 0.337 | 0.344 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.054 | 0.068 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.40 | 1.25 | 0.016 | 0.049 |
| G | 1.27 BSC | | 0.05 BSC | |
| J | 0.18 | 0.25 | 0.007 | 0.009 |
| K | 0.10 | 0.25 | 0.004 | 0.008 |
| P | 5.80 | 6.20 | 0.229 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |

NOTES

- T = Seating plane and datum surface.
- Dimensions "A" and "B" are datum.
- Dimensions "A" and "B" do not include mold protrusion.
- Maximum mold protrusion is 0.015" (0.380mm) per side.
- Dimensioning and tolerances per ANSI Y14.5M, 1982.
- Dimensions are exclusive of mold flash and metal burrs.

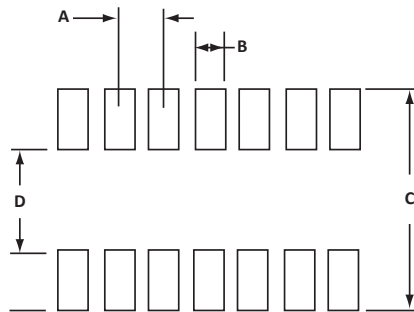


PAD LAYOUT DIMENSIONS

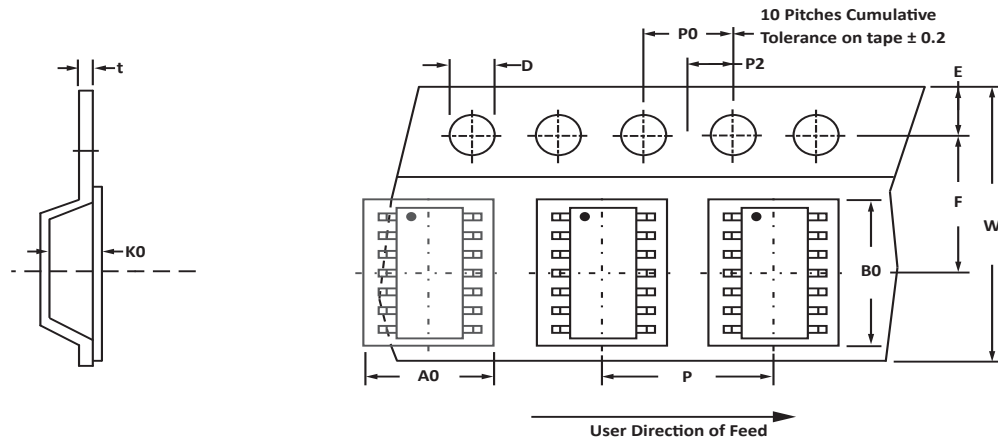
| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.14 | 1.40 | 0.045 | 0.055 |
| B | 0.64 | 0.89 | 0.025 | 0.035 |
| C | 6.22 | - | 0.245 | - |
| D | 3.94 | 4.17 | 0.155 | 0.165 |
| E | 1.02 | 1.27 | 0.040 | 0.050 |

NOTES

- Controlling dimension: inches.



TAPE AND REEL



SPECIFICATIONS

| REEL DIA. | TAPE WIDTH | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | tmax |
|------------|------------|-------------|------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|------|
| 178mm (7") | 16mm | 6.50 ± 0.10 | 9.5 ± 0.10 | 2.10 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 16.00 ± 0.30 | 4.00 ± 0.12 | 2.00 ± 0.10 | 4.00 ± 0.10 | 0.25 |

NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 1,000 pieces per 16mm tape.
- Suffix - T13 = 13" Reel - 2,500 pieces per 16mm tape.
- Bulk product shipped in tubes of 55 pieces per tube.
- Marking on Part - part number, date code, logo and pin one defined by dot on top of package.

Package outline per document number 06006.R3 10/09

ORDERING INFORMATION

| BASE PART NUMBER (xx = Voltage) | LEADFREE SUFFIX | TAPE SUFFIX | QTY/REEL | REEL SIZE | TUBE QTY |
|------------------------------------|-----------------|-------------|----------|-----------|----------|
| MMADxxxx | -LF | -T7 | 1,000 | 7" | 55 |
| MMADxxxx | -LF | -T13 | 2,500 | 13" | 55 |

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

COMPANY INFORMATION

COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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