



# Switching Diode Array Steering Diode TVS Array™

## DESCRIPTION

These low capacitance diode arrays are multiple, discrete, isolated junctions fabricated by a planar process and mounted in a 14-Pin DIP package for use as steering diodes protecting up to eight I/O ports from ESD, EFT, or surge by directing them either to the positive side of the power supply line or to ground (see figure 1). An external TVS diode may be added between the positive supply line and ground to prevent overvoltage on the supply rail. They may also be used in fast switching core-driver applications. This includes computers and peripheral equipment such as magnetic cores, thin-film memories, plated-wire memories, etc., as well as decoding or encoding applications. These arrays offer many advantages of integrated circuits such as high-density packaging and improved reliability. This is a result of fewer pick and place operations, smaller footprint, smaller weight, and elimination of various discrete packages that may not be as user friendly in PC board mounting. They are available with either Tin-Lead plating terminations or as RoHS Compliant with annealed matte-Tin finish.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

## FEATURES

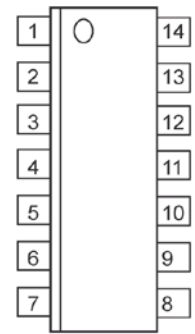
- 14 diode array protects 8 lines
- Molded 14-Pin dual-in-line package
- UL 94V-0 flammability classification
- Low capacitance 1.5 pF per diode
- Switching speeds less than 5 ns
- Discrete diode elements offer optimum isolation
- IEC 61000-4 compatible:
  - 61000-4-2 (ESD): Air 15 kV, contact – 8 kV
  - 61000-4-4 (EFT): 40 A – 5/50 ns
  - 61000-4-5 (surge): 12 A, 8/20  $\mu$ s
- RoHS compliant device is available

## APPLICATIONS / BENEFITS

- Low capacitance steering diode protection for high frequency data lines
- Ideal for:
  - RS-232 & RS-422 Interface Networks.
  - Ethernet: 10 Base T
  - Computer I / O Ports
  - LAN
  - Switching Core Drivers



14 Pin Package



Top Viewing Pin Layout

### MSC – Lawrence

6 Lake Street,  
Lawrence, MA 01841  
Tel: 1-800-446-1158 or  
(978) 620-2600  
Fax: (978) 689-0803

### MSC – Ireland

Gort Road Business Park,  
Ennis, Co. Clare, Ireland  
Tel: +353 (0) 65 6840044  
Fax: +353 (0) 65 6822298

### Website:

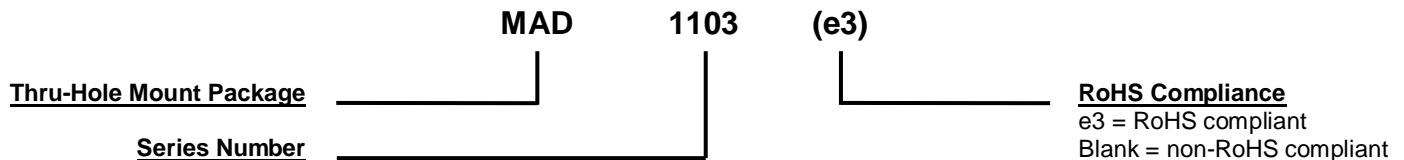
[www.microsemi.com](http://www.microsemi.com)

**MAXIMUM RATINGS**

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	$T_J$ and $T_{STG}$	-55 to +150	°C/W
Peak Working Reverse Voltage	$V_{RWM}$	75	V
Repetitive Peak Forward Current (one diode)	$I_{FRM}$	400	mA
Forward Surge Current	@ 8.3 ms	2	A
	@ 8/20 $\mu$ s	12	
Rated Average Power dissipation (total)	$P_{M(AV)}$	1500	mW
Solder Temperature @ 10 s	$T_{SP}$	260	°C

**MECHANICAL and PACKAGING**

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0 flammability classification
- TERMINALS: Tin-lead or RoHS compliant annealed matte-tin plating solderable per MIL-STD-750 method 2026
- MARKING: MSC logo, MAD1103 or MAD1103e3 and date code. Pin #1 is to the left of the dot or indent on top of package.
- DELIVERY OPTION: Carrier tube. Consult factory for quantities
- WEIGHT: Approximately 0.997 grams
- See [Package Dimensions](#) on last page.

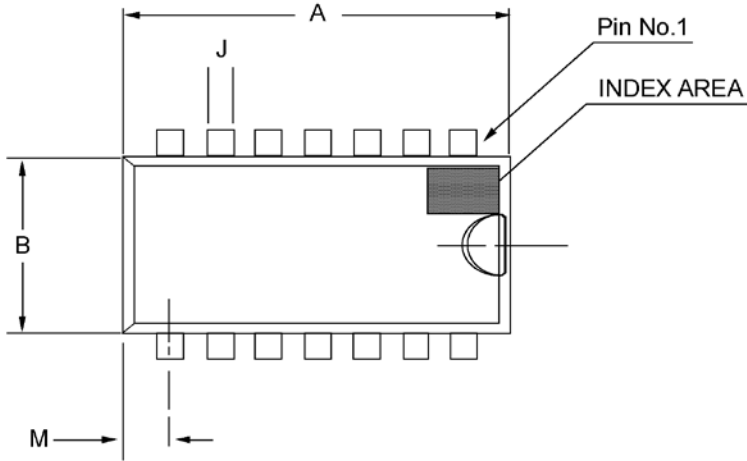
**PART NOMENCLATURE**

**SYMBOLS & DEFINITIONS**

Symbol	Definition
$C_T$	Total Capacitance: The total small signal capacitance between the diode terminals of a complete device.
$I_R$	Reverse Current: The dc current flowing from the external circuit into the cathode terminal at the specified voltage $V_R$ .
$V_{(BR)}$	Breakdown Voltage: The voltage across the device at a specified current $I_{(BR)}$ in the breakdown region.
$V_F$	Forward Voltage: A positive dc anode-cathode voltage the device will exhibit at a specified forward current.
$V_{RWM}$	Working Peak Reverse Voltage: The peak voltage excluding all transient voltages (ref JESD282-B). Also sometimes known historically as PIV.

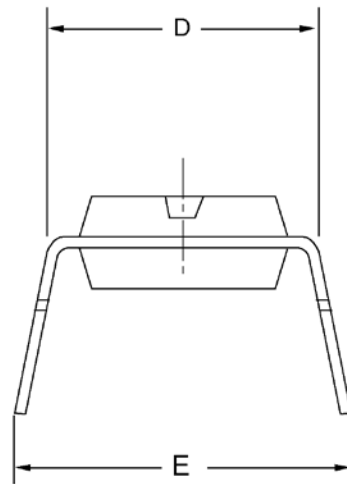
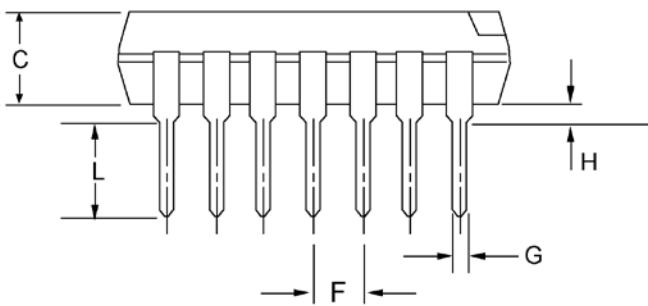
**ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise stated**

PART NUMBER	BREAKDOWN VOLTAGE	LEAKAGE CURRENT		LEAKAGE CURRENT		CAPACITANCE	REVERSE RECOVERY TIME	FORWARD VOLTAGE	FORWARD VOLTAGE
	$V_{(BR)}$	$I_R$	$I_R$	$I_R$	$I_R$	$C$	$t_{rr}$	$V_F$	$V_F$
	@ $I_{(BR)} = 100 \mu A$	$T_A = 25 \text{ }^\circ C$	$T_A = 150 \text{ }^\circ C$	$T_A = 150 \text{ }^\circ C$	$T_A = 150 \text{ }^\circ C$	@ 0 V		$I_F = 10 \text{ mA}$	$I_F = 100 \text{ mA}$
	V	$\mu A$	$\mu A$	$\mu A$	$\mu A$	pF	ns	V	V
	MIN	MAX	@ $V_R$	MAX	@ $V_R$	TYP	MAX	MAX	MAX
MAD1103 MAD1103e3	90	0.200	20	300	20	1.5	5.0	1.00	1.20

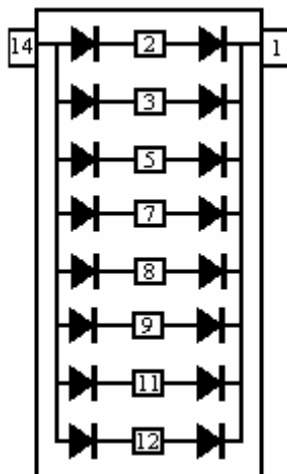
**PACKAGE DIMENSIONS**



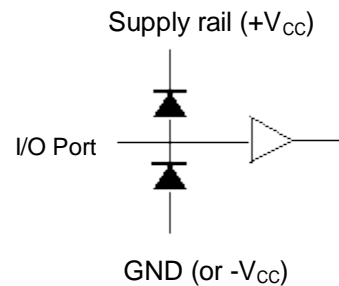
Ref.	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
<b>A</b>	0.746	0.754	18.95	19.15
<b>B</b>	0.246	0.254	6.248	6.452
<b>C</b>	0.126	0.134	3.200	3.404
<b>D</b>	0.300	0.325	7.619	8.255
<b>E</b>	0.320	0.370	8.128	9.398
<b>F</b>	0.098	0.102	2.489	2.591
<b>G</b>	0.016	0.020	0.406	0.508
<b>H</b>	0.015	0.040	0.381	1.016
<b>J</b>	0.058	0.062	1.473	1.575
<b>L</b>	0.121	0.129	3.073	3.277
<b>M</b>	0.25 REF		0.635 REF	



**CIRCUIT**



CONFIGURATION



STEERING DIODE APPLICATION