

## MRF SERIES REED RELAYS

### Special Applications



#### DESCRIPTION

The MRF series represents the smallest surface mount relay in the world. Designed to dramatically reduce board space requirements, the MRF series uses less than 50 mm<sup>2</sup> of PCB area. The MRF8 was specifically designed for passing high frequency signals. Its small size reduces the switch-to-shield capacitance, enabling the relay to pass frequencies approaching 3 GHz with minimal distortion and insertion loss. In addition, the small size makes it ideal for fast digital pulse applications in which minimal rise times through the relay are necessary.

The MRF series was developed using a new patent pending process that ensures long lasting (200 million operations at signal level) and reliable operation after undergoing the stress of IR reflow or vapor phase processes. The relays are available in standard lead configurations, J-bend or Gull Wing. They can also be ordered on tape and reel for automatic insertion equipment.

#### FEATURES

- Surface mount relay
- Ability to pass 3 GHz
- Rise time <50 psec.
- 50Ω characteristic impedance
- Fast digital pulse application
- Gull or "J" lead available
- Patent pending design
- Compatible with IR & vapor phase soldering
- Low profile
- Low capacitance

#### APPLICATIONS

- IC testers
- Mixed signal testers
- High-frequency communication
- High bandpass feedback applications
- Telecom
- Security

#### RATINGS (@ 25°C)

Parameter	Min	Typ	Max	Unit
Switching Voltage			100	Volts
Carry Current			0.5	Amps
Switching Current			0.25	Amps
Contact Rating			3.0	Watts

(See detailed specifications for more information.)

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### SPECIFICATIONS

All parameters are at 25°C unless otherwise stated.  
Operate voltage, release voltage, and coil resistance will change by 0.4%/°C as ambient temperature varies.

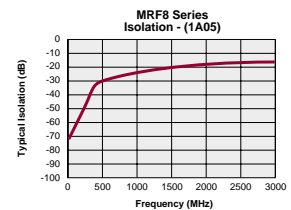
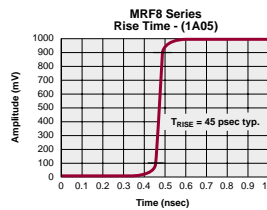
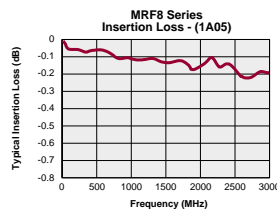
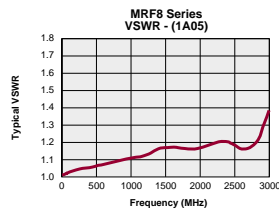
**MRF4**  
1-Form-A

**MRF 8**  
1-Form-A  
Coaxial shield  
High Frequency

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	MIN	TYP	MAX	UNITS
<b>Contact Ratings</b>									
Switching Voltage	Max DC/PeakAC Resistive	VL	-	-	100	-	-	100	Volts
Switching Current	Max DC/PeakAC Resistive	IL	-	-	0.25	-	-	0.25	Amps
Carry Current	Max DC/PeakAC Resistive	IC	-	-	0.5	-	-	0.5	Amps
Contact Rating	Max DC/PeakAC Resistive	-	-	-	3	-	-	3	Watts
Life Expectancy	Signal Level 1.0 V 10mA	-	-	200	-	-	200	-	$\times 10^6$ Ops
	Rated Loads (consult factory)	-	-	-	-	-	-	-	$\times 10^6$ Ops
Static Contact Resistance	50mV, 10mA	CR	-	-	150	-	-	150	mΩ
Dynamic Contact Resistance	.5V, 50mA at 100Hz, after 1.5 msec	DCR	-	-	200	-	-	200	mΩ
Contact Material		-	-	Ru	-	-	Ru	-	-
<b>Relay Specifications</b>									
Insulation Resistance	Between all isolated pins at 100V, 25°C, 40% RH	IR	$10^{11}$	$10^{13}$	-	$10^{11}$	$10^{13}$	-	Ω
Capacitance	Across Open Contacts	-	-	0.2	-	-	0.2	-	pF
	Open Contact to Coil/Sheild	-	-	1	-	-	0.8	1	pF
Dielectric Strength	Between Contacts	-	150	-	-	150	-	-	VDC/Peak AC
	Contacts to Shield	-	N/A	-	-	150	-	-	VDC/Peak AC
	Contacts/Shield to Coil	-	1000	-	-	500	-	-	VDC/Peak AC
Operate Time, including bounce	At Nominal Coil Voltage 10Hz Square Wave	TOP	-	200	-	-	200	-	μs
Release Time	Zener-Diode Suppression	TREL	-	50	-	-	50	-	μs
<b>Environmental Ratings</b>									
Storage Temperature		TA	-55	-	+100	-55	-	+100	°C
Operating Temperature		TO	-40	-	+85	-40	-	+85	°C
Soldering Temperature <sup>(1)</sup>		-	-	-	+265	-	-	+265	°C
Vibration Resistance	10Hz - 5Hz Reed = 5Hz - 2000Hz	G	-	-	20	-	-	20	Gs
Shock Resistance	11±1ms, 1/2 Sine Wave	S	-	-	50	-	-	50	Gs
Weight		-	-	0.7	-	-	0.7	-	grams

(1) Can withstand up to a one minute immersion in a surface mount soldering process.

### PERFORMANCE GRAPHS



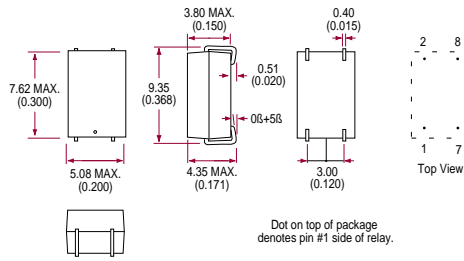
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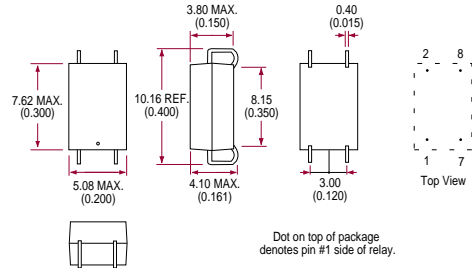
DIMENSIONS  
mm  
(inches)

### MECHANICAL DIMENSIONS

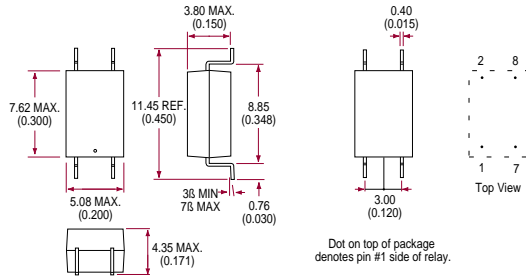
**MRF4 J Lead**  
(Lead Option -02)



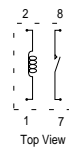
**MRF4 J Lead**  
(Lead Option -22)



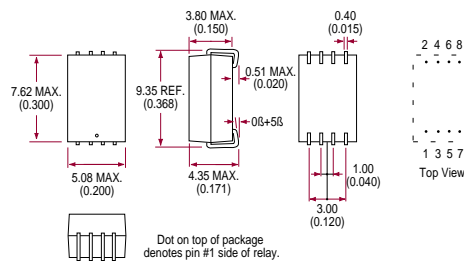
**MRF4 Gull Wing**  
(Lead Option -01)



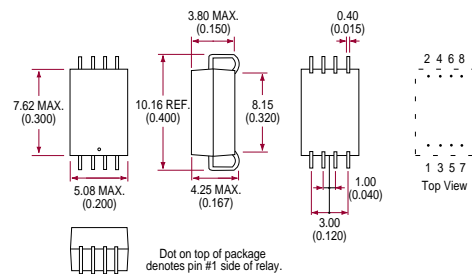
**MRF4**



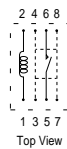
**MRF8 J Lead**  
(Lead Option -02)



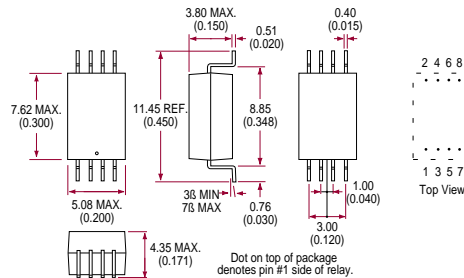
**MRF8 J Lead**  
(Lead Option -22)



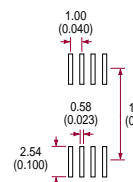
**MRF8**



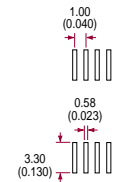
**MRF8 Gull Wing**  
(Lead Option -01)



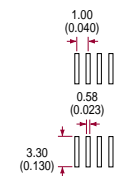
**MRF8 Gull Wing**  
(Lead Option -01)



**MRF8 J Lead**  
(Lead Option -22)



**MRF8 J Lead**  
(Lead Option -02)



USA 1-877-4REMTECH Europe 32-11-300868 Japan 81-3-3667-3302 Ext. 2419

HongKong/China/Korea 852-2880-6773 Taiwan 886-2-2726-2177 Singapore/Far East 65-296-

## MRF SERIES REED RELAYS

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#### COIL SPECIFICATIONS

Units	Coil Voltage			Coil Resistance			Operate Voltage			Release Voltage		
	Volts			$\Omega$			Volts			Volts		
Conditions				$\pm 10\%$ (25°C)			Must operate by (25°C)			Must release by (25°C)		
Part #	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
MRF41A05XXX		5	7	157	175	193			3.75	0.4		
MRF81A05XXX		5	7	157	175	193			3.75	0.4		

#### ORDERING INFORMATION

A complete part number is represented by the digits below.  
For example, MRF41A05 is a model 4 MRF relay with a contact form of 1A and coil voltage of 5V.

