

MF3053



DESCRIPTION

The MF3053 consists of a GaAs infrared emitting diode optically coupled to a light activated bilateral triac. It is designed for use with a discrete power triac in the control of resistive and inductive loads operating in 110 to 240 VAC lines.

They are packaged in Mini Flat Package.

FEATURES

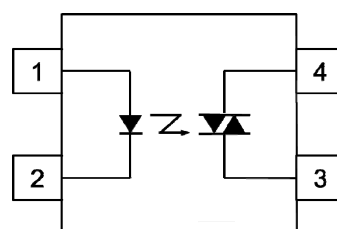
- Non Zero Crossing (Random Phase)
- High Peak Repetitive Off-state Voltage
 V_{DRM} 600V
- High Critical Rate of Rise of Off-state Voltage
 dv/dt 1000V/ μ s minimum
- Isolation Voltage 3750V_{RMS}
- Wide Operating Temperature Range
-55°C to 115°C
- Pb Free and RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

- Solenoid / Valve Controls
- Lamp Ballasts
- Light Dimming Controls
- AC Motor Drivers
- Temperature Controls
- Solid State Relays

ORDER INFORMATION

- Available in 3K Reels



- 1 Anode
- 2 Cathode
- 3 Main Terminal
- 4 Main Terminal

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

Forward Current	50mA
Reverse Voltage	6V
Power dissipation	70mW

Output

Off-state Output Terminal Voltage	600V
ON-state RMS Current	
$T_A = 25^\circ\text{C}$	70mA
$T_A = 70^\circ\text{C}$	40mA
Peak Repetitive Surge Current (PW = 1ms, 120pps)	1A
Power Dissipation	300mW

Total Package

Isolation Voltage	3750V _{RMS}
Total Power Dissipation	330mW
Operating Temperature	-55 to 115 °C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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MF3053

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 20\text{mA}$		1.15	1.5	V
Reverse Current	I_R	$V_R = 6\text{V}$			10	μA

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak Off-state Current Either Direction	I_{DRM}	$V_{\text{DRM}} = 400\text{V}$ Note 1		10	100	nA
Peak On-state Voltage Either Direction	V_{TM}	$I_{\text{TM}} = 100\text{mA Peak}$		1.7	3	V
Critical Rate of Rise of Off-state Voltage	dv/dt	Note 2	1000			V/ μs

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input Trigger Current to Latch Output, Either Direction	I_{FT}	Main Terminal Voltage = 3V Note 3			5	mA
Holding Current Either Direction	I_H			250		μA
Turn-on Time	t_{ON}	$V_O = 6 \rightarrow 4\text{V},$ $R_L = 100\Omega,$ $I_F = \text{Rated } I_F \times 1.5$		30	100	μs

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	RH = 40% - 60%, $t = 1 \text{ min}$ Note 4	3750			V_{RMS}

Note 1 : Test Voltage must be applied within dv/dt rating

Note 2 : Static dv/dt

Note 3 : Guaranteed to trigger at an I_F value less than or equal to max I_{FT}

Note 4 : Short between Anode and Cathode and Short between the Main Terminals pins

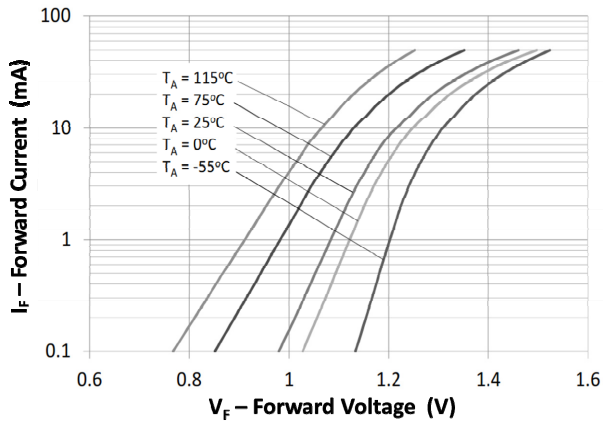


Fig 1 Forward Current vs Forward Voltage

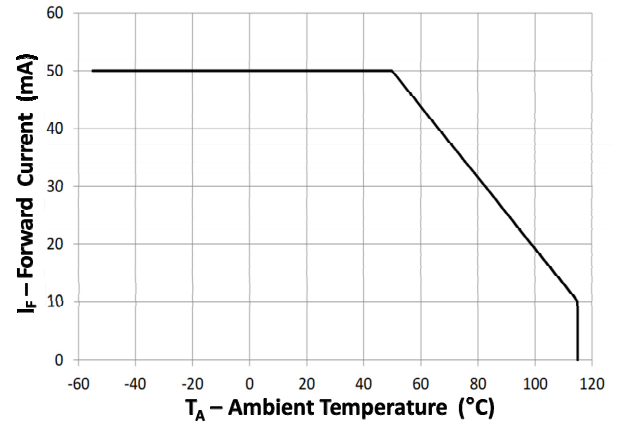


Fig 2 Forward Current vs Ambient Temperature

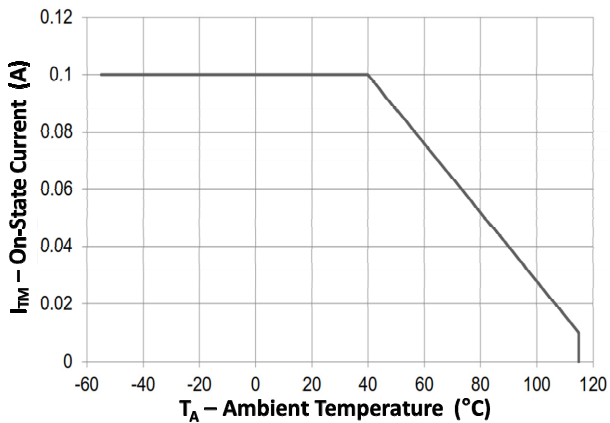


Fig 3 On-State Current vs Ambient Temperature

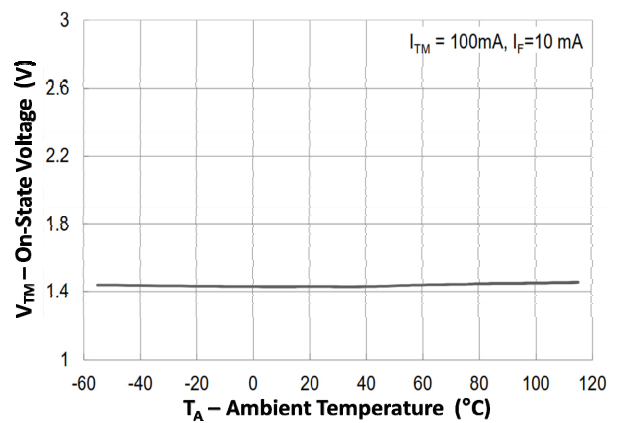


Fig 4 On-State Voltage vs Ambient Temperature

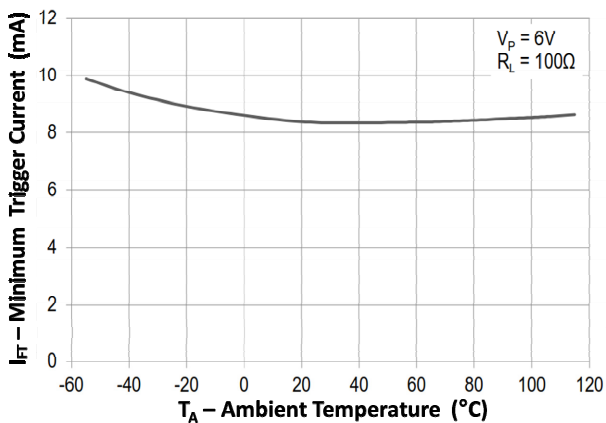


Fig 5 Minimum Trigger Current vs Ambient Temperature

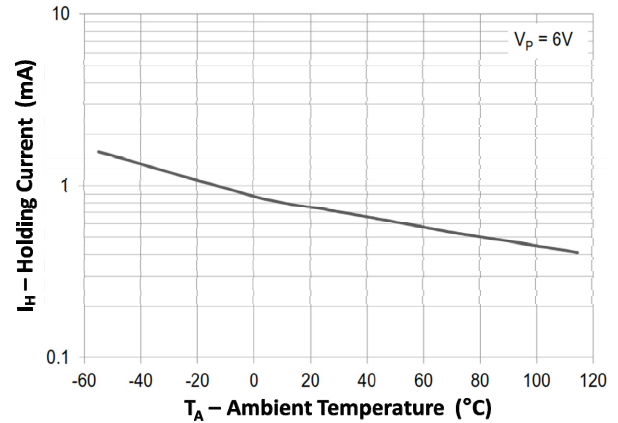


Fig 6 Holding Current vs Ambient Temperature

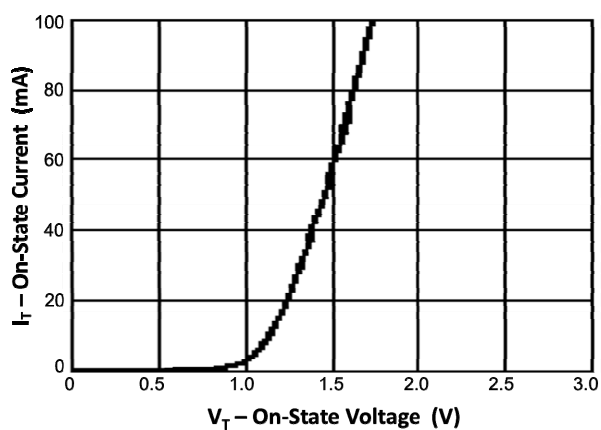


Fig 7 On-State Current vs On-State Voltage

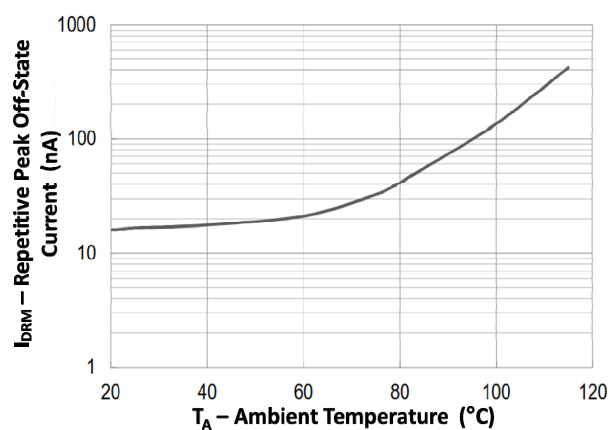


Fig 8 Repetitive Peak Off-State Current vs Ambient Temperature



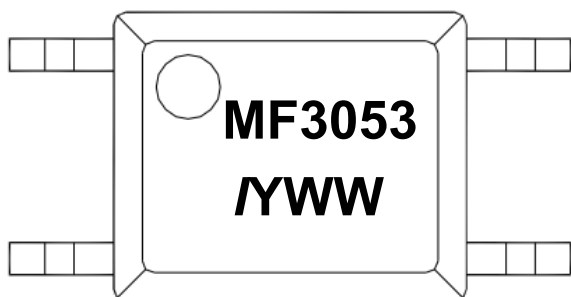
ISOCOM
COMPONENTS

MF3053

ORDER INFORMATION

MF3053			
After PN	PN	Description	Packing quantity
None	MF3053	Surface Mount Tape & Reel	3000 pcs per reel

DEVICE MARKING



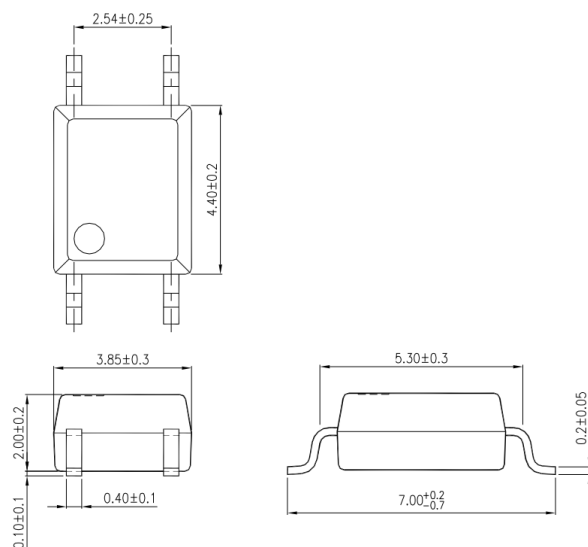
MF3053 denotes Device Part Number
/ denotes Isocom
Y denotes 1 digit Year code
WW denotes 2 digit Week code



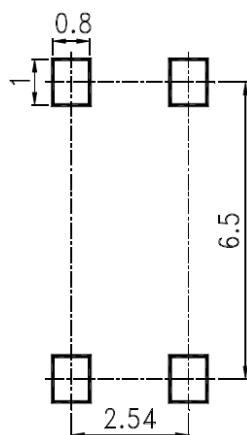
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PACKAGE DIMENSIONS (mm)



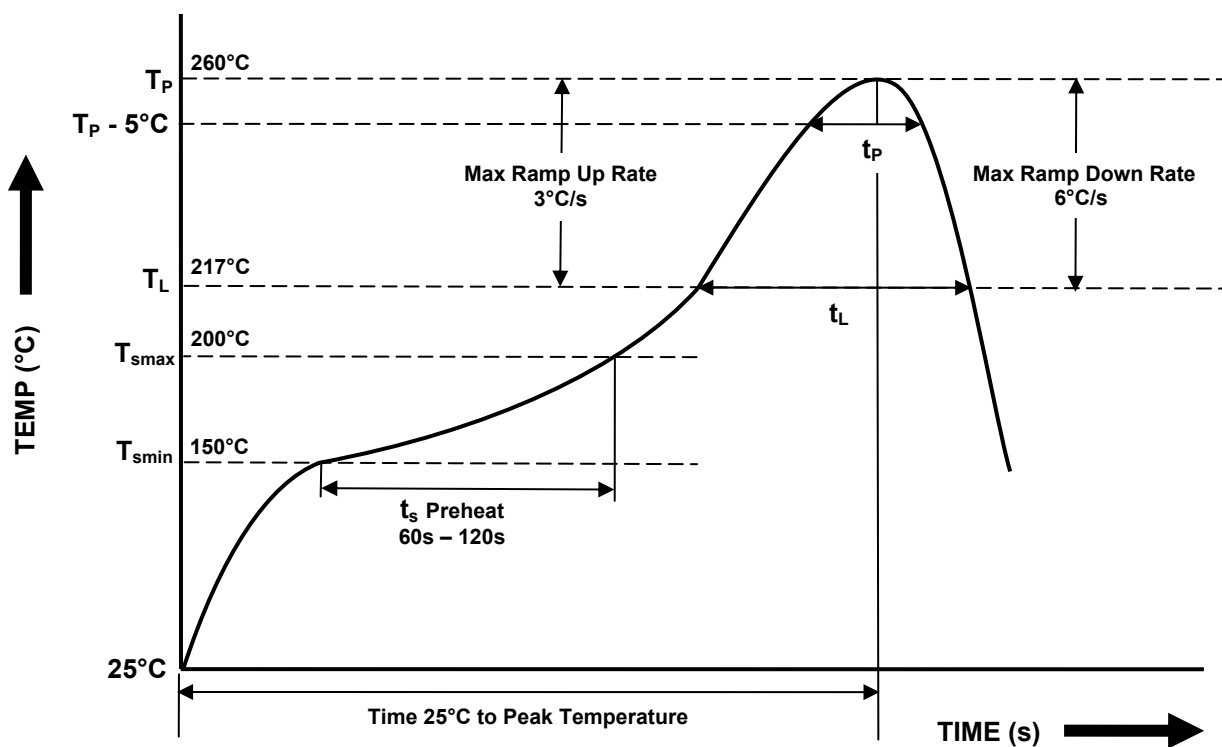
RECOMMENDED PAD LAYOUT (mm)





IR REFLOW SOLDERING TEMPERATURE PROFILE

(One Time Reflow Soldering is Recommended)

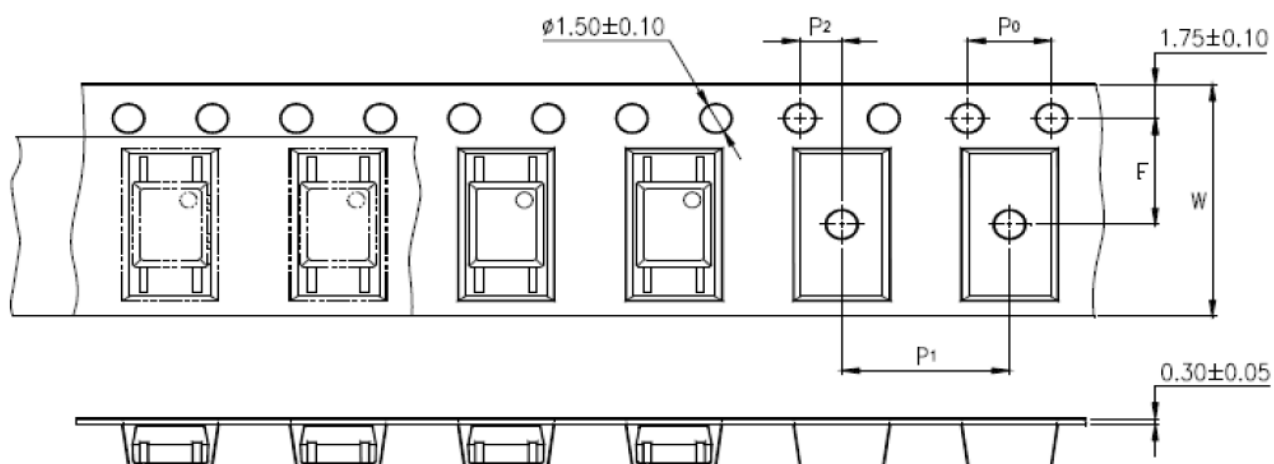


Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s – 120s
Soldering Zone - Peak Temperature (T_P) - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature ($T_P - 5^\circ\text{C}$) - Time maintained above T_L (t_L) - Ramp Up Rate (T_L to T_P) - Ramp Down Rate (T_P to T_L)	260°C 217°C 30s 60s – 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T_{smax} to T_P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max

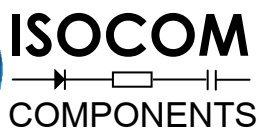


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TAPE AND REEL PACKAGING (mm)



Description	Symbol	Dimension mm (inch)
Tape Width	W	12 ± 0.3 (0.47)
Pitch of Sprocket Holes	P_0	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	5.5 ± 0.1 (0.217)
	P_2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P_1	8 ± 0.1 (0.315)



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- When requiring a device for any "specific" application, please contact our sales for advice.
- The contents described herein are subject to change without prior notice.
- Do not immerse device body in solder paste.

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