



MF3009, MF301x, MF302x, MF305x

DESCRIPTION

The MF3009, MF301x, MF302x and MOC305x series of devices consist of a GaAs infrared emitting diode optically coupled to a light activated bilateral triac. They are designed for use with a discrete power triac in the control of resistive and inductive loads operating in 110 to 240 VAC lines.

FEATURES

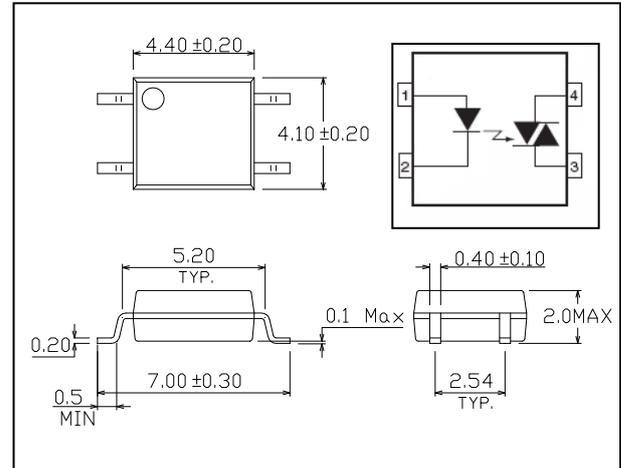
- Non Zero Crossing (Random Phase)
- V_{DRM}
MF3009 250V
MF301x 250V
MF302x 400V
MF305x 600V
- Isolation Voltage 3750V_{RMS}
- Wide Operating Temperature Range
-40°C to 110°C
- Pb Free and RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

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

ORDER INFORMATION

- Available in Tape & Reel



ABSOLUTE MAXIMUM RATINGS

Input

Forward Current	60mA
Reverse Voltage	6V
Power dissipation	100mW

Output

Off-state Output Terminal Voltage	
MOC3009	250V
MOC301x	250V
MOC302x	400V
MOC305x	600V
On-state Current	70mA _{RMS}
Peak Repetitive Surge Current	1A
Power Dissipation	300mW

Total Package

Isolation Voltage	3750V _{RMS}
Operating Temperature	-40 to 110 °C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 10\text{mA}$		1.2	1.5	V
Reverse Leakage Current	I_R	$V_R = 6\text{V}$			10	μA

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak Off-state Current	I_{DRM}	$V_{\text{DRM}} = \text{Rated } V_{\text{DRM}}$ $I_F = 0\text{mA}$ (Note 1)			100	nA
Peak Blocking Voltage	V_{DRM}	$I_{\text{DRM}} = 100\text{nA}$ MF3009 MF3010 / MF3011 / MF3012 MF3020 / MF3021 MF3022 / MF3023 MF3051 / MF3052			250 250 400 600	V
On-state Voltage	V_{TM}	$I_{\text{TM}} = 100\text{mA (peak)}$, $I_F = \text{Rated } I_{\text{FT}}$			2.5	V
Critical Rate of Rise of Off-state Voltage	dv/dt	$I_F = 0\text{mA}$ MF3009 MF3010 / MF3011 / MF3012 MF3020 / MF3021 MF3022 / MF3023 MF3051 / MF3052	1000	10		V/ μs



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

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input Trigger Current	I_{FT}	$V_{TM} = 3V$ MF3009 / MF3020 MF3010 / MF3021 / MF3051 MF3011 / MF3022 / MF3052 MF3012 / MF3023 (Note 2)			30 15 10 5	mA
Holding Current (either direction)	I_H			3	5	mA
Input to Output Isolation Voltage	V_{ISO}	(note 3)	3750			V_{RMS}

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

Note 2 : Guaranteed to trigger at an I_F value less than or equal to max I_{FT} ,
recommended I_F lies between Rated I_{FT} to Absolute Max I_F .

Note 3 : Measured with input leads shorted together and output leads shorted together.



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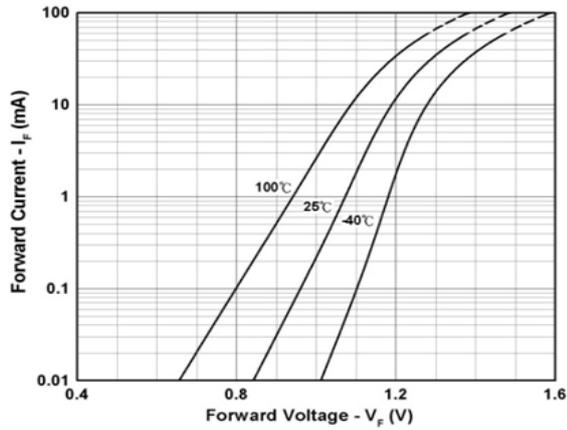


Fig 1 Forward Current vs Forward Voltage

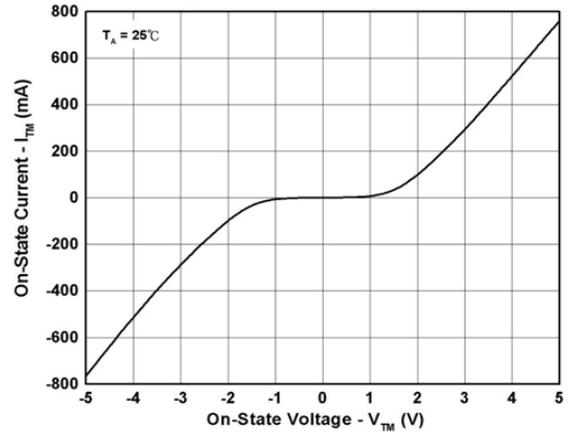


Fig 2 On-State Characteristics

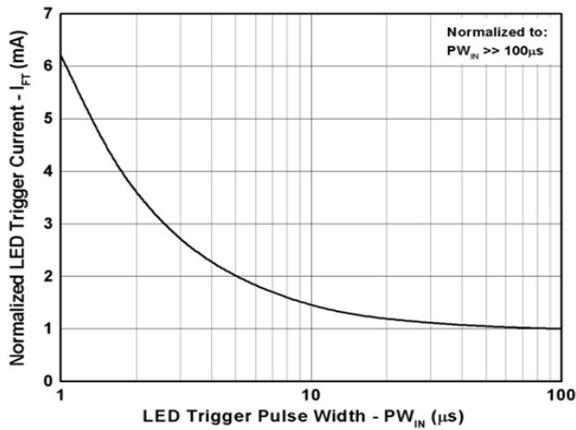


Fig 3 Normalized LED Trigger Current vs Trigger Pulse Width

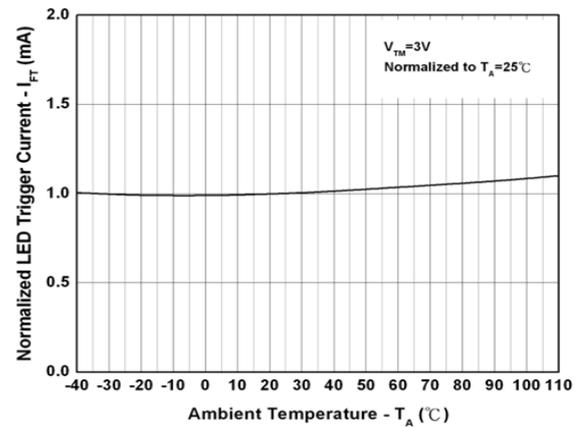


Fig 4 Normalized LED Trigger Current vs Ambient Temperature

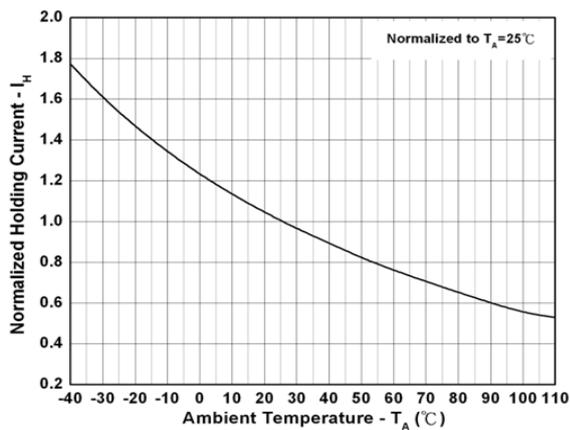


Fig 5 Normalized Holding Current vs Ambient Temperature

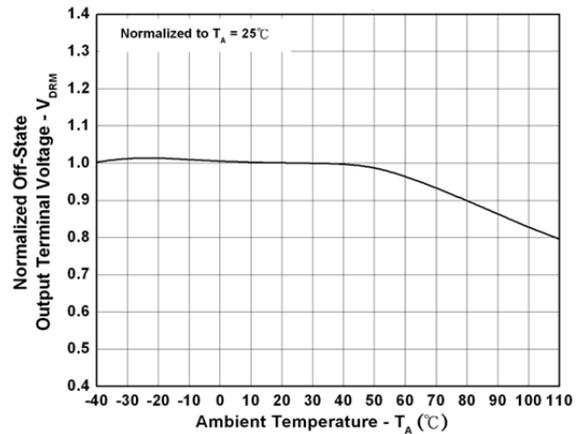


Fig 6 Normalized Off-State Output Terminal Voltage vs Ambient Temperature



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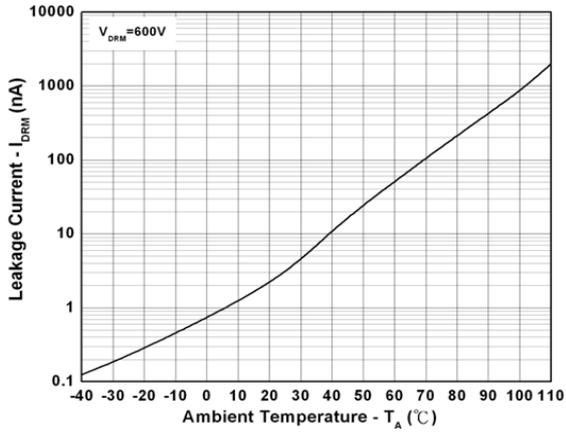
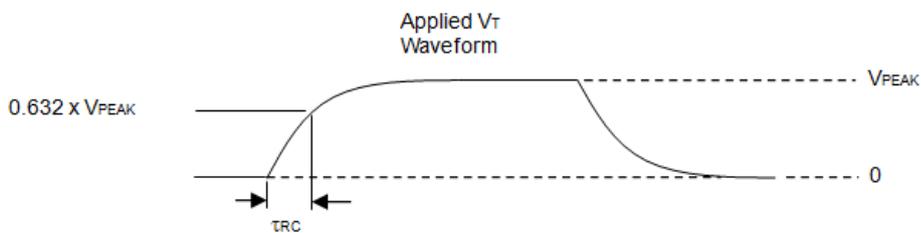
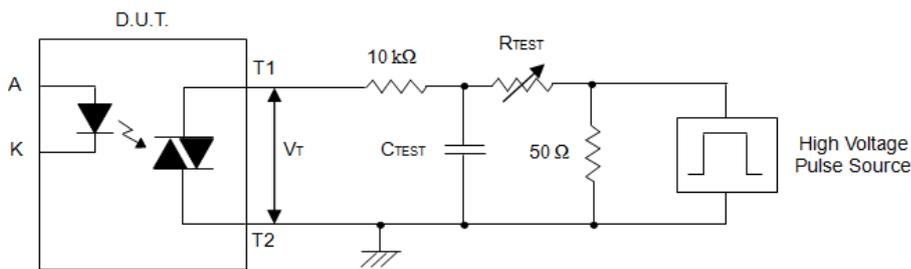


Fig 7 Leakage Current vs Ambient Temperature



$$\frac{dv}{dt} = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

Fig 8 Static dv/dt Test Circuit

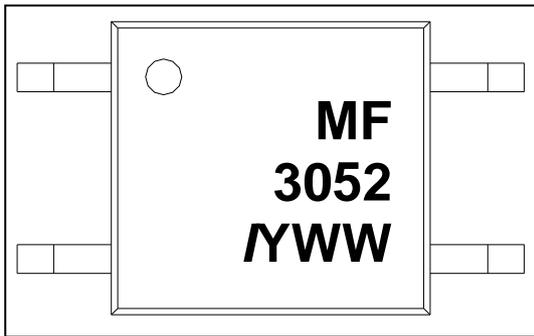


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ORDER INFORMATION

IS281			
After PN	PN	Description	Packing quantity
None	MF3009 MF3010, MF3011, MF3012 MF3020, MF3021, MF3022, MF3023 MF3051, MF3052,	Surface Mount Tape & Reel	3000 pcs per reel

DEVICE MARKING

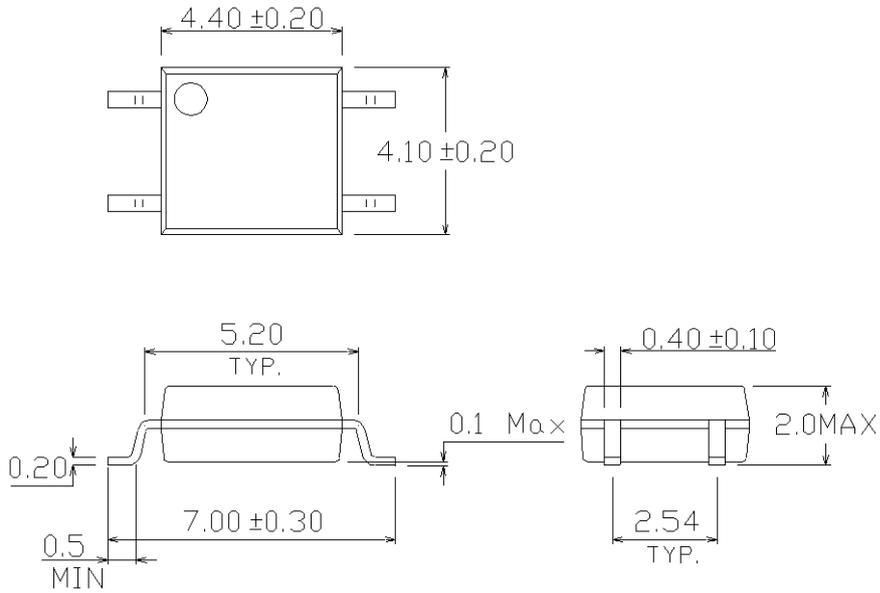


MF3063 denotes Device Part Number where "MF3052" is used as example
I denotes Isocom
Y denotes 1 digit Year code
WW denotes 2 digit Week code

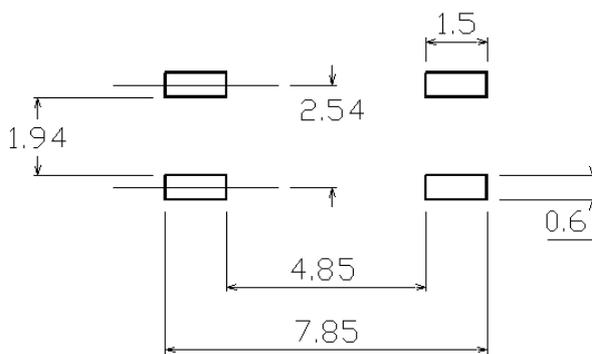


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PACKAGE DIMENSIONS (mm)



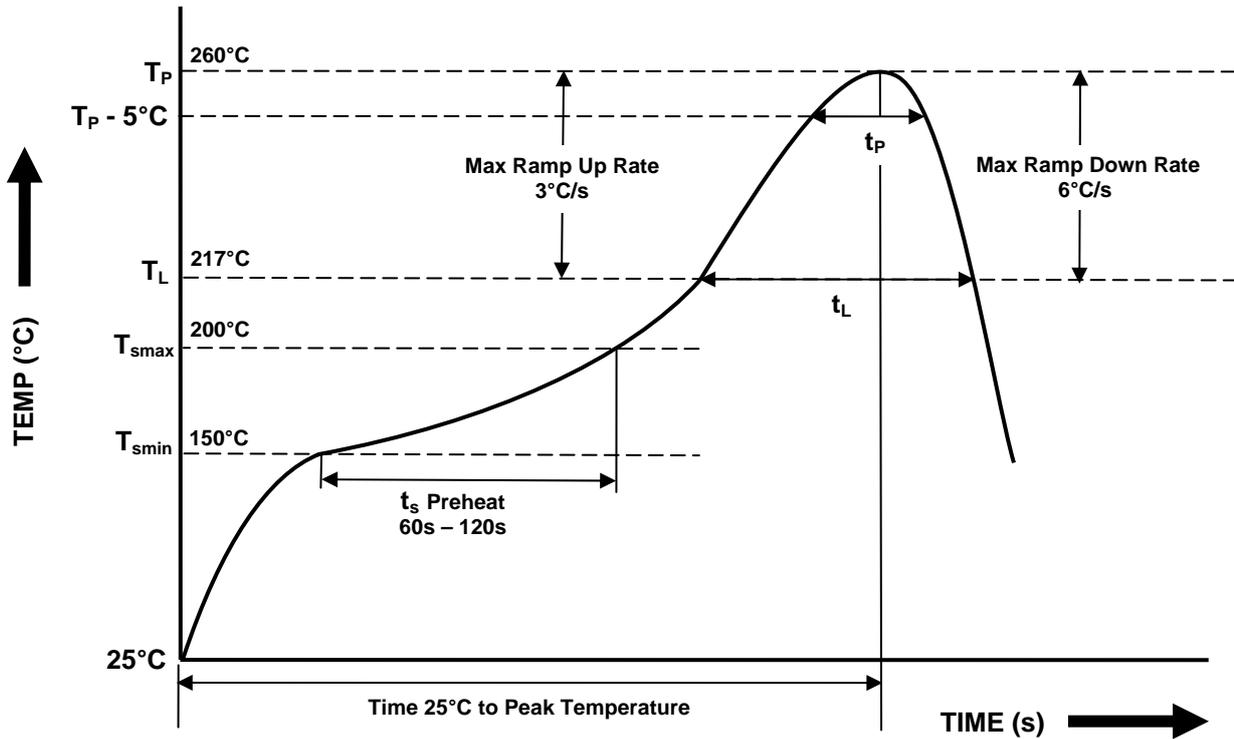
RECOMMENDED PAD LAYOUT (mm)





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IR REFLOW SOLDERING TEMPERATURE PROFILE
(One Time Reflow Soldering is Recommended)

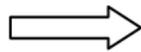
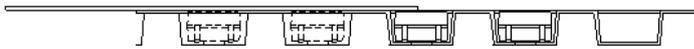
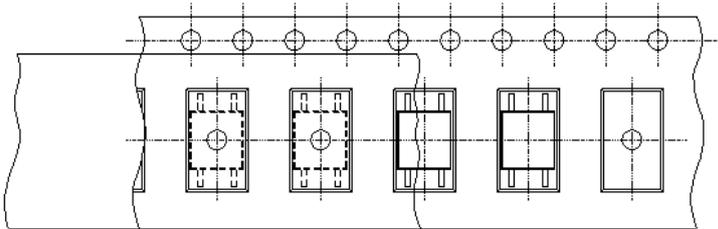


Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s – 120s
Soldering Zone - Peak Temperature (T_P) - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature ($T_P - 5^\circ\text{C}$) - Time maintained 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

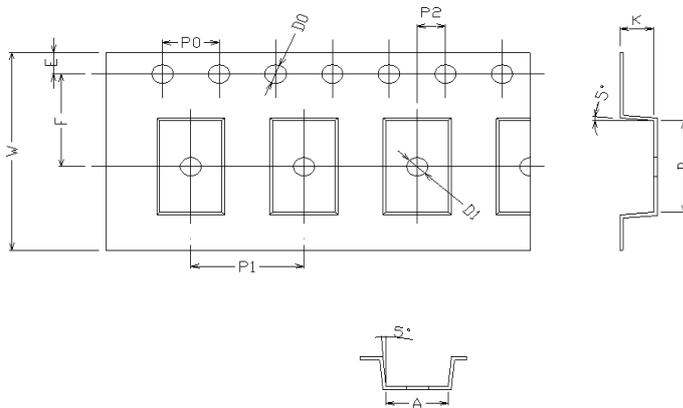


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TAPE AND REEL PACKAGING (mm)



Direction of feed from reel



Dimension No.	A	B	Do	D1	E	F
mm	4.4 ± 0.1	7.4 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.1

Dimension No.	Po	P1	P2	t	W	K
mm	4.0 ± 0.15	8.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	16.0 ± 0.2	2.4 ± 0.1

