

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

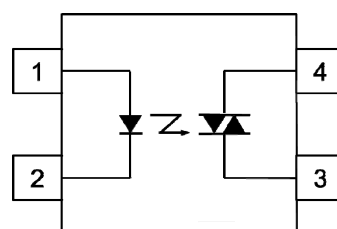
- Non Zero Crossing (Random Phase)
- High Peak Repetitive Off-state Voltage
 V_{DRM} 600V
- High Critical Rate of Rise of Off-state Voltage
 dv/dt 1000V/ μ s minimum
- Isolation Voltage 3750V_{RMS}
- Wide Operating Temperature Range
-55°C to 115°C
- Pb Free and RoHS Compliant
- Safety Approvals Pending

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 |

ISOCOM COMPONENTS 2004 LTD

Unit 25B, Park View Road West, Park View Industrial Estate
 Hartlepool, Cleveland, TS25 1PE, United Kingdom
 Tel : +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
 e-mail : sales@isocom.co.uk
<http://www.isocom.com>

ISOCOM COMPONENTS ASIA LTD

Hong Kong Office,
 Block A, 8/F, Wah Hing Industrial mansion,
 36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong.
 Tel : +852 2995 9217 Fax : +852 8161 6292
 e-mail : sales@isocom.com.hk

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

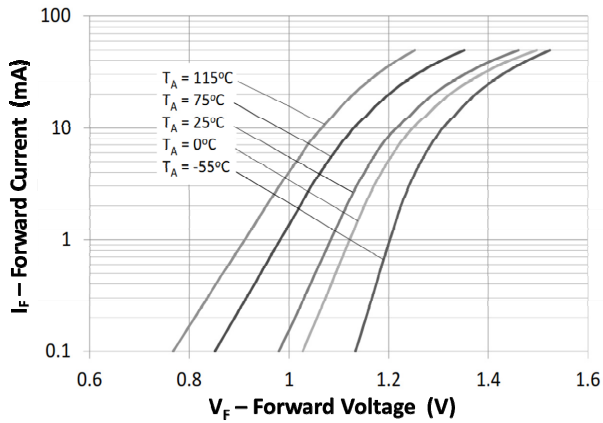


Fig 1 Forward Current vs Forward Voltage

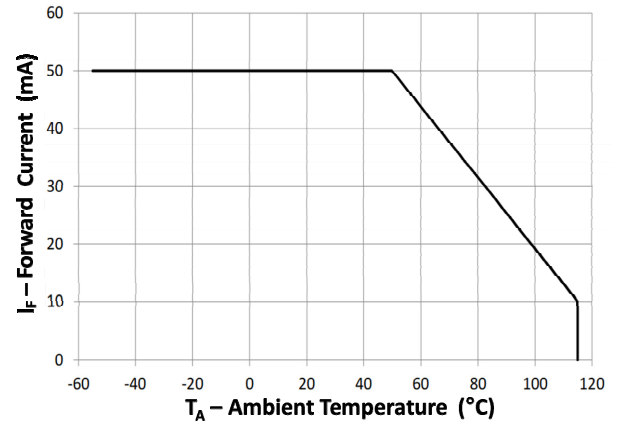


Fig 2 Forward Current vs Ambient Temperature

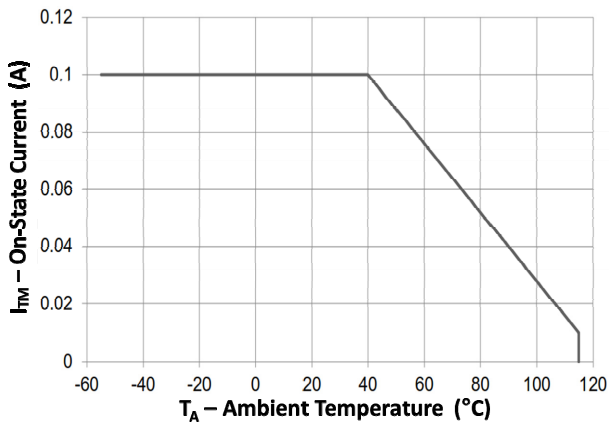


Fig 3 On-State Current vs Ambient Temperature

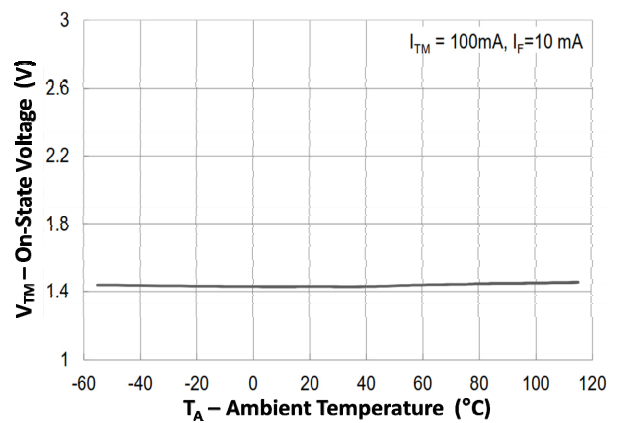


Fig 4 On-State Voltage vs Ambient Temperature

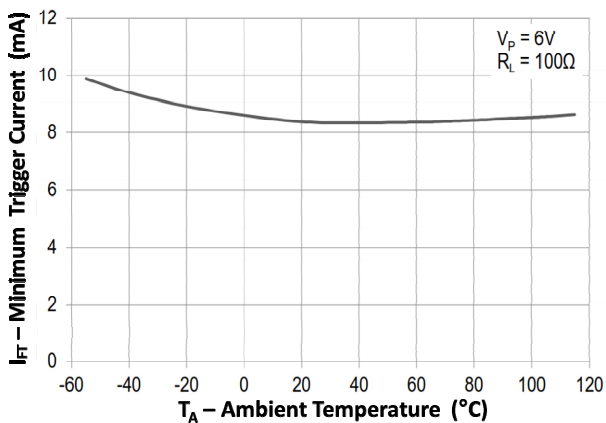


Fig 5 Minimum Trigger Current vs Ambient Temperature

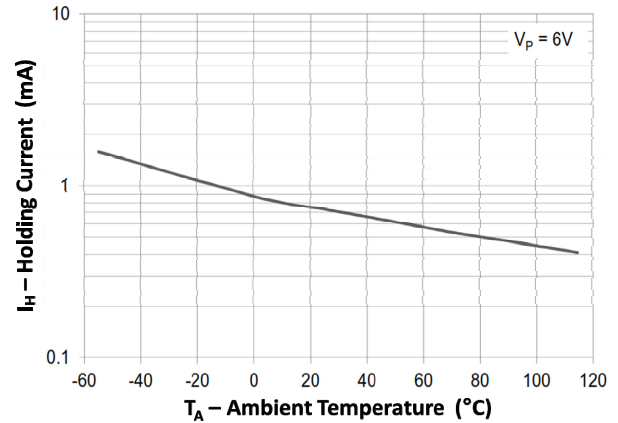


Fig 6 Holding Current vs Ambient Temperature

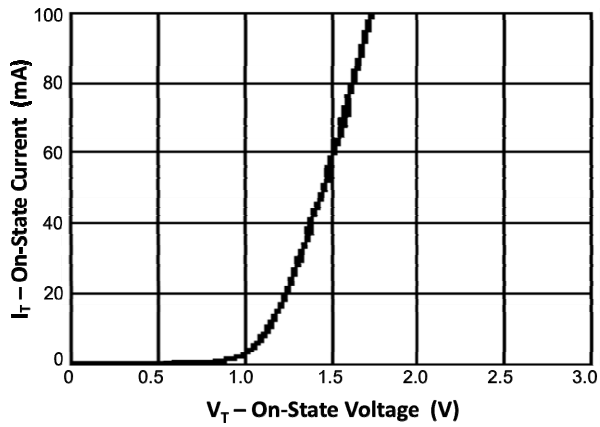


Fig 7 On-State Current vs On-State Voltage

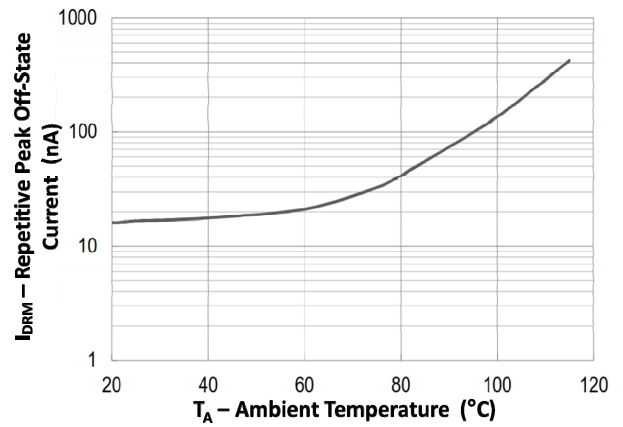


Fig 8 Repetitive Peak Off-State Current vs Ambient Temperature



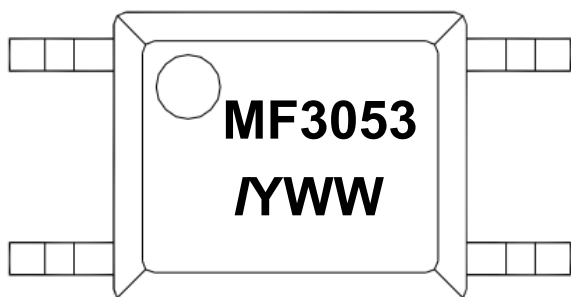
ISOCOM
COMPONENTS

MF3053

ORDER INFORMATION

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

DEVICE MARKING



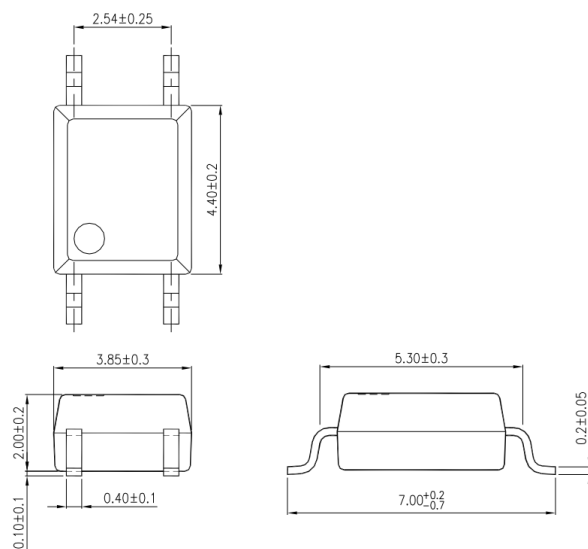
MF3053 denotes Device Part Number
/ denotes Isocom
Y denotes 1 digit Year code
WW denotes 2 digit Week code



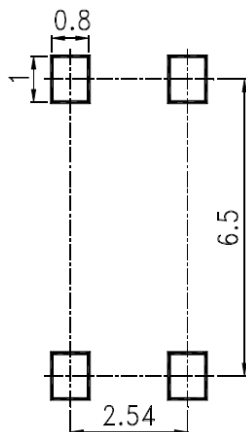
ISOCOM
COMPONENTS

MF3053

PACKAGE DIMENSIONS (mm)



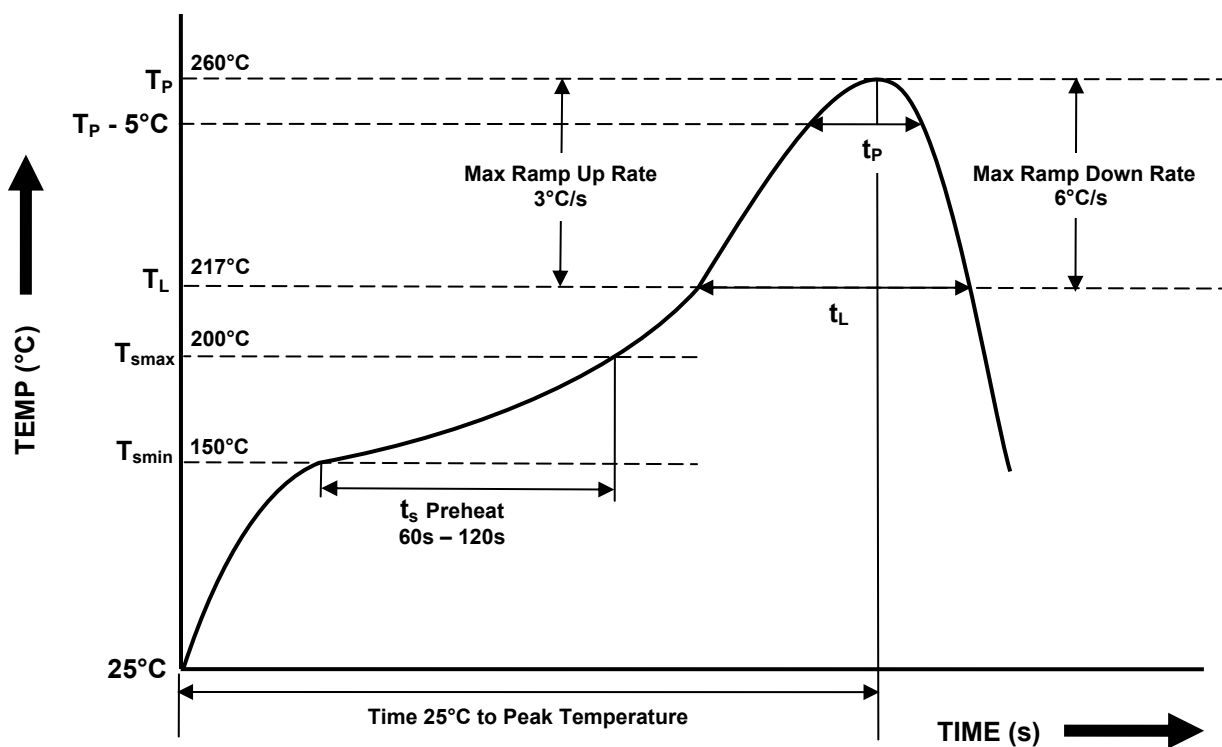
RECOMMENDED PAD LAYOUT (mm)





IR REFLOW SOLDERING TEMPERATURE PROFILE

(One Time Reflow Soldering is Recommended)

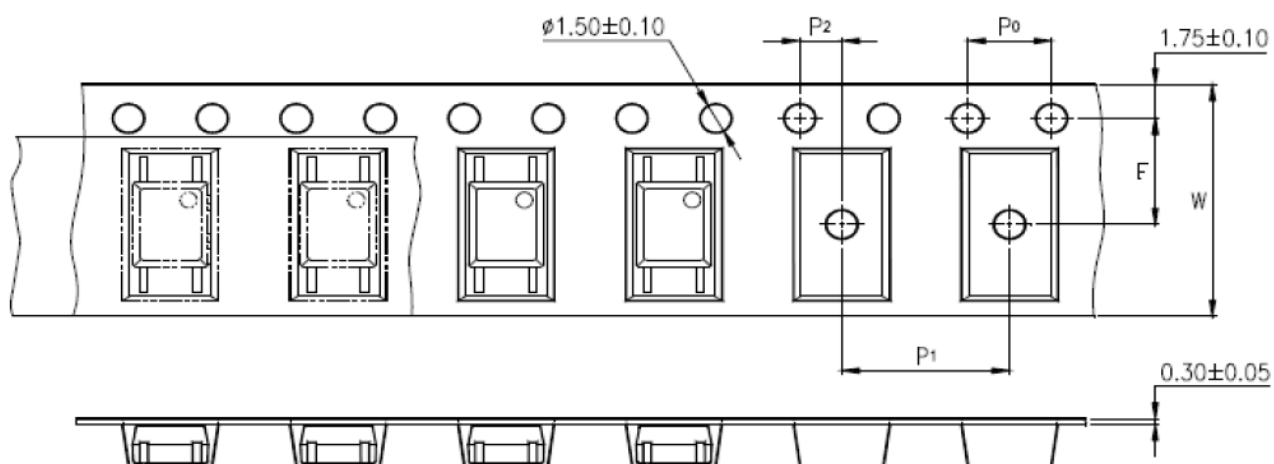


| Profile Details | Conditions |
|--|---|
| Preheat <ul style="list-style-type: none">- Min Temperature (T_{smin})- Max Temperature (T_{smax})- Time T_{smin} to T_{smax} (t_s) | 150°C 200°C 60s – 120s |
| Soldering Zone <ul style="list-style-type: none">- Peak Temperature (T_P)- Liquidous Temperature (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 |



MF3053

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) |



MF3053

NOTES :

- Isocom is continually improving the quality, reliability, function or design and Isocom reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/application where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc., please contact our sales representatives.
- 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.

DISCLAIMER

ISOCOM is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing ISOCOM products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such ISOCOM products could cause loss of human life, bodily injury or damage to property.

In developing your designs, please ensure that ISOCOM products are used within specified operating ranges as set forth in the most recent ISOCOM products specifications.

___ The ISOCOM products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These ISOCOM products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation Instruments, traffic signal instruments, combustion control instruments, medical Instruments, all types of safety devices, etc.. Unintended Usage of ISOCOM products listed in this document shall be made at the customer's own risk.

___ Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

___ The products described in this document are subject to the foreign exchange and foreign trade laws.

___ The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by ISOCOM Components for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of ISOCOM Components or others.

___ The information contained herein is subject to change without notice.