# FODM3051，FODM3052，FODM3053 <br> 4－Pin Full Pitch Mini－Flat Package Random Phase Triac Driver Output Optocouplers 

## Features

■ Compact 4－pin surface mount package（2．4 mm maximum standoff height）
－Peak blocking voltage－600V
－Guaranteed static dv／dt of $1000 \mathrm{~V} / \mu \mathrm{s}$
－Available in tape and reel quantities of 500 and 2500
■ Applicable to Infrared Ray reflow（ $230^{\circ} \mathrm{C}$ max， 30 seconds．）
－BSI，CSA and VDE certifications pending
■ UL（File\＃E90700）certified

## Applications

－Solenoid／valve controls
Interfacing microprocessors to 115 and 240 Vac peripherals
－Temperature controls
－Solid state relays
－Lamp ballast
－Static AC power switch
－Motor control
■ Incandescent lamp dimmers

## Description

The FODM305X series consists of a galium arsenide diode driving a silicon bilateral switch housed in a compact 4－pin mini－ flat package．The lead pitch is 2.54 mm ．The FODM305X series isolates low voltage logic from 115 and 240 Vac lines to provide random phase control of high current triacs or thyristors．It also features greatly enhanced static dv／dt capability to ensure stable switching performance of inductive loads．

## Package Dimensions



Absolute Maximum Ratings ( $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Units |
| :---: | :---: | :---: | :---: |
| TOTAL PACKAGE |  |  |  |
| Storage Temperature | $\mathrm{T}_{\text {STG }}$ | -40 to +125 | ${ }^{\circ} \mathrm{C}$ |
| Junction Temperature | $\mathrm{T}_{\mathrm{J}}$ | 125 | ${ }^{\circ} \mathrm{C}$ |
| Operating Temperature | TopR | -40 to +100 | ${ }^{\circ} \mathrm{C}$ |
| EMITTER |  |  |  |
| Continuous Forward Current | $\mathrm{I}_{\mathrm{F} \text { (avg) }}$ | 60 | mA |
| Peak Forward Current (1 $\mu \mathrm{s}$ pulse, 300 pps .) | $\mathrm{I}_{\mathrm{F}(\mathrm{pk})}$ | 1 | A |
| Reverse Input Voltage | $\mathrm{V}_{\mathrm{R}}$ | 3 | V |
| Power Dissipation <br> (No derating required over operating temp. range) | $\mathrm{P}_{\mathrm{D}}$ | 100 | mW |
| DETECTOR |  |  |  |
| On-State RMS Current | $\mathrm{I}_{\text {T(RMS) }}$ | 70 | mA (RMS) |
| Off-State Output Terminal Voltage | $\mathrm{V}_{\text {DRM }}$ | 600 | V |
| Power Dissipation <br> (No derating required over operating temp. range) | $\mathrm{P}_{\mathrm{D}}$ | 250 | mW |

Electrical Characteristics ( $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ Unless otherwise specified)

## Individual Component Characteristics

| Parameter | Test Conditions | Symbol | Device | Min | Typ* | Max | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| EMITTER |  |  |  |  |  |  |  |
| Input Forward Voltage | $\mathrm{I}_{\mathrm{F}}=10 \mathrm{~mA}$ | $\mathrm{V}_{\mathrm{F}}$ | All |  | 1.20 | 1.5 | V |
| Reverse Leakage Current | $\mathrm{V}_{\mathrm{R}}=3 \mathrm{~V}$ | $\mathrm{I}_{\mathrm{R}}$ | All |  | 0.01 | 100 | $\mu \mathrm{A}$ |
| DETECTOR |  |  |  |  |  |  |  |
| Peak Blocking Current Either Direction | $\mathrm{V}_{\text {DRM }}=600 \mathrm{~V}, \mathrm{I}_{\mathrm{F}}=0$ (note 1) | IDRM | All |  | 3 | 100 | nA |
| Peak On-State Voltage Either Direction | $\mathrm{I}_{\text {TM }}=100 \mathrm{~mA}$ peak | $\mathrm{V}_{\text {TM }}$ | All |  | 2.0 | 2.5 | V |
| Critical Rate of Rise of Off-State Voltage | $\mathrm{I}_{\mathrm{F}}=0$ (Figure 8, note 2) | dV/dt | All | 1000 |  |  | V/ $/ \mathrm{s}$ |

Transfer Characteristics $\left(\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}\right.$ Unless otherwise specified)

| DC Characteristics | Test Conditions | Symbol | Device | Min | Typ* | Max | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LED Trigger Current | Main Terminal Voltage $=3 \mathrm{~V}($ note 3$)$ | $\mathrm{I}_{\mathrm{FT}}$ | FODM3051 |  |  | 15 | mA |
|  |  |  | FODM3052 |  |  | 10 |  |
|  |  |  | FODM3053 |  |  | 5 |  |
| Holding Current, Either Direction |  | $\mathrm{I}_{\mathrm{H}}$ | All |  | 300 |  | $\mu \mathrm{A}$ |

## Isolation Characteristics ( $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ Unless otherwise specified)

| Characteristic | Test Conditions | Symbol | Device | Min | Typ* | Max | Unit |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Steady State Isolation Voltage | $\mathrm{t}=1$ Minute | $\mathrm{V}_{\text {ISO }}$ | All | 3750 |  |  | $\mathrm{~V}(\mathrm{RMS})$ |

* All typicals at $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$


## Note

1. Test voltage must be applied within dv/dt rating.
2. This is static dv/dt. See Figure 1 for test circuit. Commutating dv/dt is function of the load-driving thyristor(s) only.
3. All devices are guaranteed to trigger at an $I_{F}$ value less than or equal to max $\mathrm{I}_{\mathrm{FT}}$. Therefore, recommended operating $\mathrm{I}_{\mathrm{F}}$ lies between max $\mathrm{I}_{\mathrm{FT}}$ ( 15 mA for FODM3051, 10 mA for FODM3052, 5 mA for FODM3053) and absolute $\mathrm{max} \mathrm{I}_{\mathrm{F}}(60 \mathrm{~mA}$ ).

## Typical Performance Curves





Fig. 5 LED Current Required to Trigger vs. LED Pulse Width





Figure 8. Static dv/dt Test Circuit

Ordering Information

| Option | Description |
| :---: | :---: |
| V | VDE Approved |
| R1 | Tape and Reel (500 units) |
| R2 | Tape and Reel (2500 units) |
| R3 | Tape and Reel (500 units; unit $180^{\circ}$ rotated) |
| R4 | Tape and Reel (2500 units; unit $180^{\circ}$ rotated) |
| R1V | Tape and Reel (500 units) and VDE Approved |
| R2V | Tape and Reel (2500 units) and VDE Approved |
| R3V | Tape and Reel (500 units; unit $180^{\circ}$ rotated) and VDE Approved |
| R4V | Tape and Reel (2500 units; unit $180^{\circ}$ rotated) and VDE Approved |

## Marking Information

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## Footprint Drawing for PCB Layout



- Peak reflow temperature: $230^{\circ} \mathrm{C}$ (package surface temperature) for 30 seconds
- Time of temperature higher than $210^{\circ} \mathrm{C}$ : 60 seconds or less
- One time soldering reflow is recommended

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| :---: | :---: | :---: | :---: | :---: |
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