

MOC306x



DESCRIPTION

The MOC306x Series are optically coupled isolators consisting of a Gallium Arsenide infrared emitting diode coupled with a monolithic silicon detector performing the functions of a zero crossing bilateral triac mounted in a standard 6 pin dual-in-line package.

FEATURES

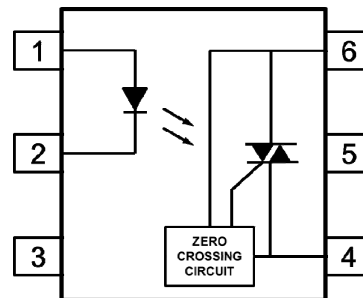
- Zero Voltage Crossing
- Triac Driver Output
- High V_{DRM} minimum 600V
- High Critical Rate of Rise of Off-State Voltage dv/dt minimum 600V/ μ s
- Isolation Voltage 5000V_{RMS}
- RoHS Compliant
- UL File No. E91231 Package System "TT"
- VDE File No. 40028086

APPLICATIONS

- Solenoid / Valve Controls
- Light Controls
- AC Motor Drivers
- Temperature Controls
- AC Motor Starters
- Solid State Relays

ORDER INFORMATION

- Add Suffix "X" for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel



- 1 Anode
- 2 Cathode
- 3 NC
- 4 Main Terminal 1
- 5 Substrate, (Do not Connect)
- 6 Main Terminal 2

ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$ unless otherwise specified.

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 |
| Junction Temperature | 125°C |
| Power dissipation | 120mW |

Output

| | |
|--|----------------------|
| Off State Output Terminal Voltage | 600V |
| On State RMS Current | 100mA _{RMS} |
| Peak Repetitive Surge Current (Pulse Width 100 μ s, 120pps) | 1.0A |
| Junction Temperature | 125°C |
| Power Dissipation | 150mW |

Total Package

| | |
|----------------------------------|----------------------|
| Isolation Voltage | 5000V _{RMS} |
| Total Power Dissipation | 250mW |
| Operating Temperature | -40 to 100°C |
| Storage Temperature | -55 to 150°C |
| Lead Soldering Temperature (10s) | 260°C |

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MOC306x

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

INPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------|--------|---------------------|-----|------|-----|---------------|
| Forward Voltage | V_F | $I_F = 20\text{mA}$ | | 1.2 | 1.4 | V |
| Reverse Current | I_R | $V_R = 6\text{V}$ | | 0.05 | 10 | μA |

OUTPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--|------------------|---|------|------|-----|------------------|
| Peak Off-state Current Either Direction | I_{DRM} | $V_{\text{DRM}} = 600\text{V}$ $I_F = 0\text{mA}$ Note 1 | | | 500 | nA |
| Peak Blocking Voltage Either Direction | V_{DRM} | $I_{\text{DRM}} = 500\text{nA}$ | 600 | | | V |
| On-state Voltage Either Direction | V_{TM} | $I_{\text{TM}} = 100\text{mA (peak)}$ | | | 3.0 | V |
| Critical Rate of Rise of Off-state Voltage (Static dv/dt) | dv/dt | $I_F = 0\text{mA},$ $V_{\text{in}} = 240\text{V}_{\text{RMS}}$ | 1000 | | | V/ μs |

COUPLED

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---|-----------------|---|-----|------|---------------------|---------------|
| Input Trigger Current Either Direction | I_{FT} | $V_{\text{TM}} = 3\text{V}$ Note 2 MOC3060 MOC3061 MOC3062 MOC3063 | | | 30 15 10 5 | mA |
| Holding Current Either Direction | I_{H} | | | 400 | | μA |



MOC306x

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ZERO CROSSING CHARACTERISTICS

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------------------|------------|--|-----|------|-----|---------------|
| Inhibit Voltage | V_{INH} | $I_F = \text{Rated } I_{FT}$, MT1-MT2 Voltage above which device will not trigger | | 5 | 20 | V |
| Leakage Current at Inhibit State | I_{DRM2} | $I_F = \text{Rated } I_{FT}$, $V_{DRM} = 600\text{V}$, Off-state | | | 500 | μA |

ISOLATION

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------------|-----------|-------------------------------------|------|------|-----|-----------|
| Isolation Voltage Input-Output | V_{ISO} | RH = 40 to 60%, t = 1 min Note 3 | 5000 | | | 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.

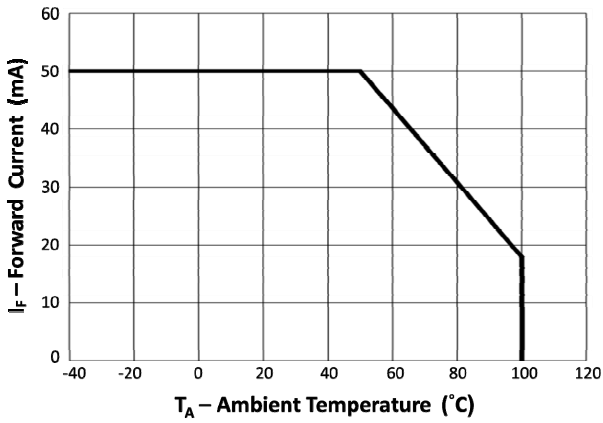


Fig 1 Forward Current vs Ambient Temperature

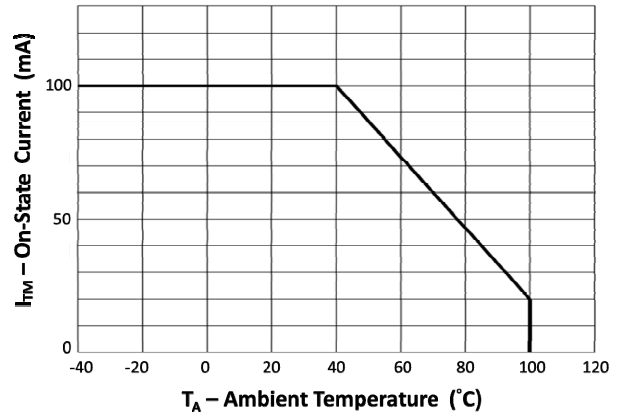


Fig 2 On-State Current vs Ambient Temperature

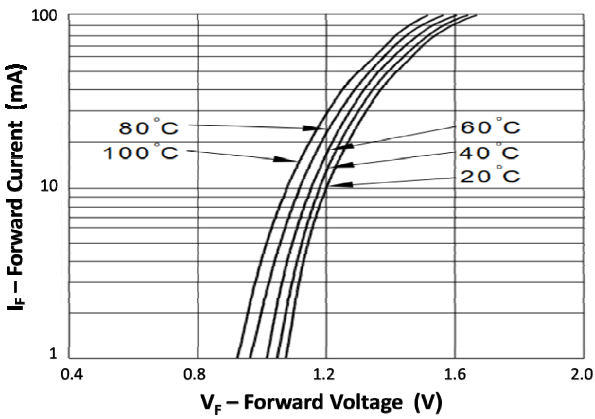


Fig 3 Forward Current vs Forward Voltage

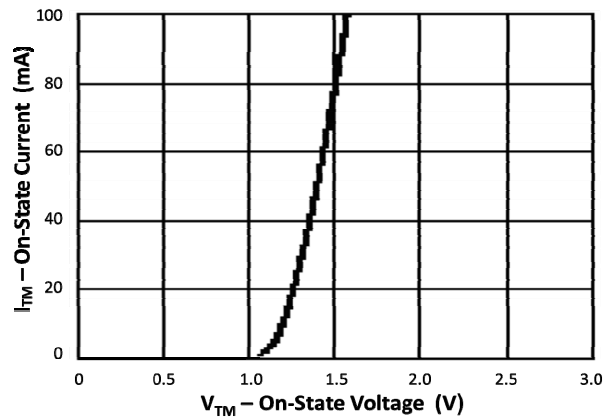


Fig 4 On-state Current vs On-State Voltage

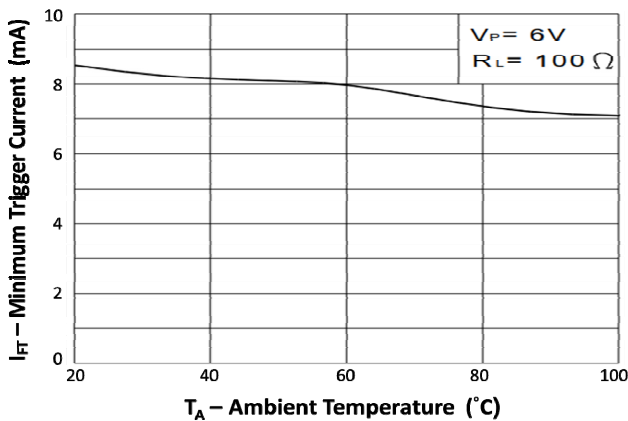


Fig 5 Minimum Trigger Current vs Ambient Temperature

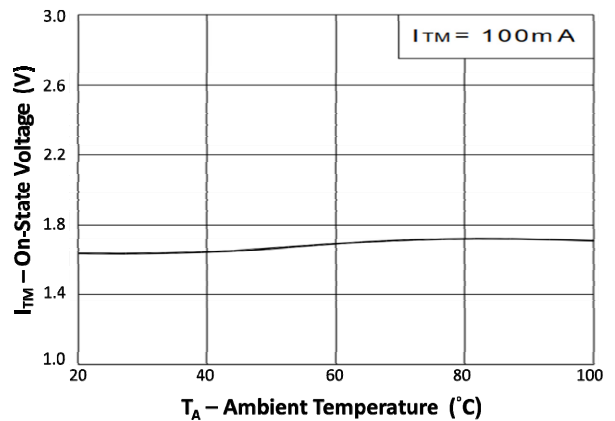


Fig 6 On-State Voltage vs Ambient Temperature

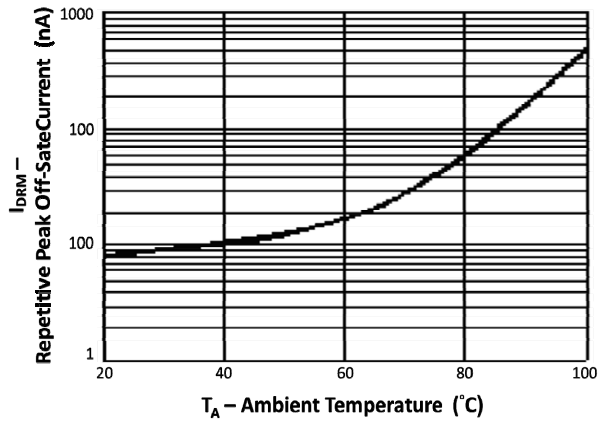


Fig 7 Repetitive Peak Off-State Current vs Ambient Temperature

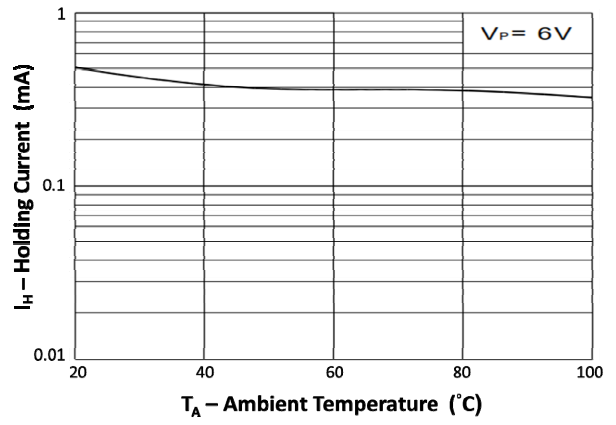


Fig 8 Holding Current vs Ambient Temperature

MOC306x

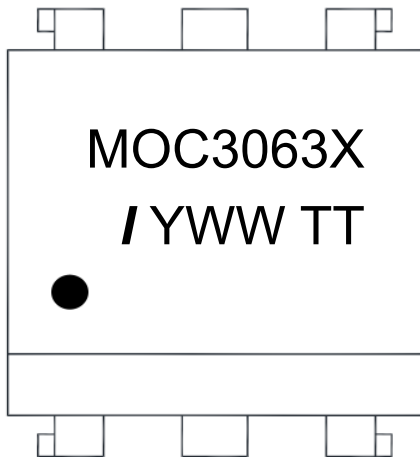
ORDER INFORMATION

| MOC306x (UL Approval) | | | |
|-----------------------|---|---------------------------|-------------------|
| After PN | PN | Description | Packing quantity |
| None | MOC3060, MOC3061, MOC3062, MOC3063 | Standard DIP6 | 65 pcs per tube |
| G | MOC3060G, MOC3061G, MOC3062G, MOC3063G | 10mm Lead Spacing | 65 pcs per tube |
| SM | MOC3060SM, MOC3061SM, MOC3062SM, MOC3063SM | Surface Mount | 65 pcs per tube |
| SMT&R | MOC3060SMT&R, MOC3061SMT&R, MOC3062SMT&R, MOC3063SMT&R | Surface Mount Tape & Reel | 1000 pcs per reel |

| MOC306x (UL and VDE Approvals) | | | |
|--------------------------------|---|---------------------------|-------------------|
| After PN | PN | Description | Packing quantity |
| None | MOC3060X, MOC3061X, MOC3062X, MOC3063X | Standard DIP6 | 65 pcs per tube |
| G | MOC3060XG, MOC3061XG, MOC3062XG, MOC3063XG | 10mm Lead Spacing | 65 pcs per tube |
| SM | MOC3060XSM, MOC3061XSM, MOC3062XSM, MOC3063XSM | Surface Mount | 65 pcs per tube |
| SMT&R | MOC3060XSMT&R, MOC3061XSMT&R, MOC3062XSMT&R, MOC3063XSMT&R | Surface Mount Tape & Reel | 1000 pcs per reel |

DEVICE MARKING

Example : MOC3063X



MOC3063X Denotes Device Part Number

/ denotes Isocom

Y denotes 2 digit Year code

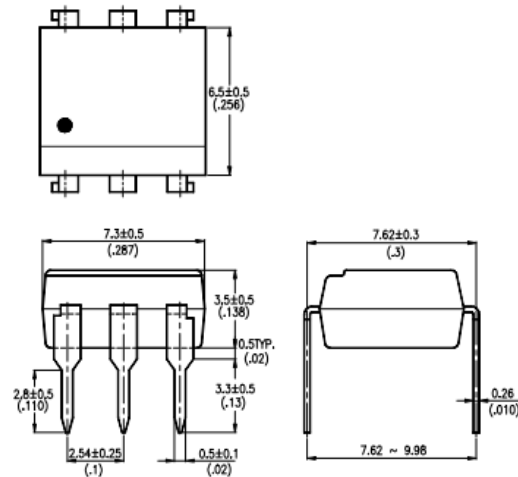
WW denotes 2 digit Week code

TT UL Package System Code

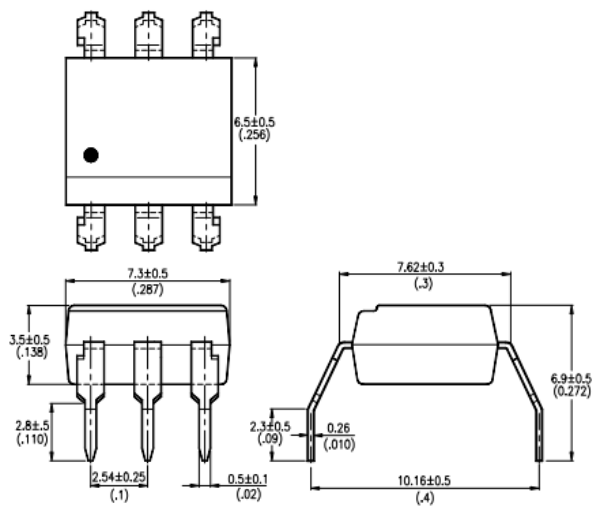
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PACKAGE DIMENSIONS in mm (inch)

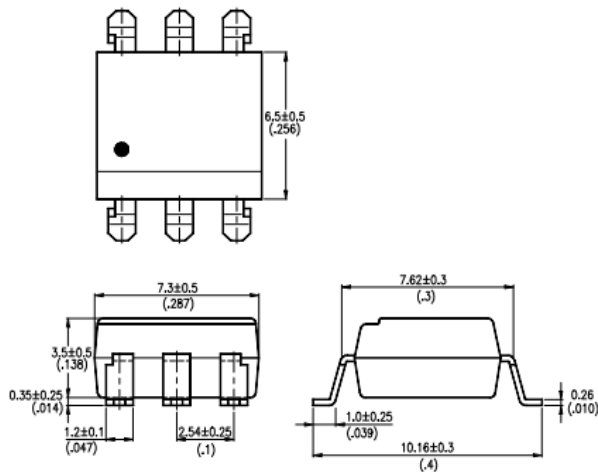
DIP



G Form

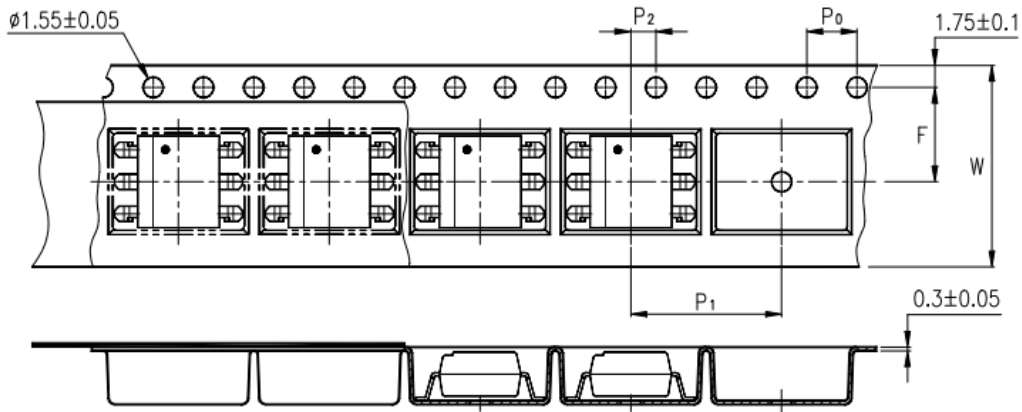


SMD



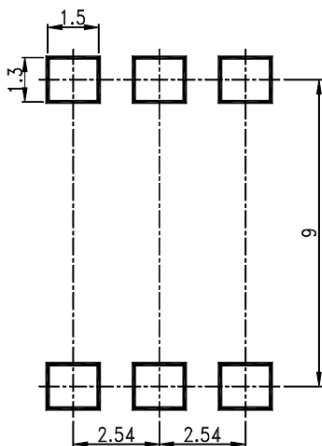
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TAPE AND REEL PACKAGING

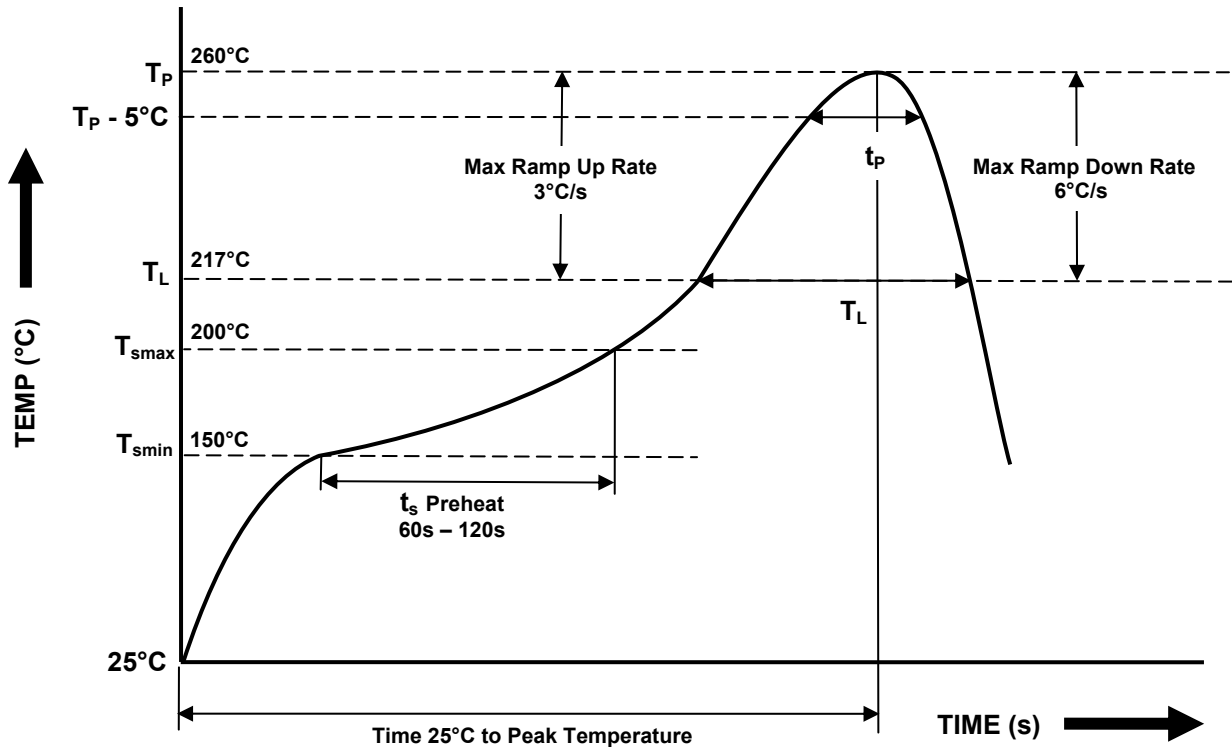


| Description | Symbol | Dimension mm (inch) |
|---|----------------|------------------------|
| Tape Width | W | 16 ± 0.3 (0.63) |
| Pitch of Sprocket Holes | P ₀ | 4 ± 0.1 (0.15) |
| Distance of Compartment to Sprocket Holes | F | 7.5 ± 0.1 (0.295) |
| | P ₂ | 2 ± 0.1 (0.079) |
| Distance of Compartment to Compartment | P ₁ | 12 ± 0.1 (0.47) |

RECOMMENDED PAD LAYOUT for SMD (mm)



IR REFLOW SOLDERING TEMPERATURE PROFILE
One Time Reflow Soldering is Recommended.
Do not immerse device body in solder paste.



| 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) - Time at Peak Temperature - Liquidous Temperature (T _L) - Time within 5°C of Actual Peak Temperature (T _P - 5°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 10s max 217°C 30s max 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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