ISOCOM COMPONENTS

MOC3081 / MOC3082 / MOC3083

DESCRIPTION

The MOC3081, MOC3082 and MOC3083 are optically coupled isolators consisting of a Gallium Arsenide infrared emitting diode coupled with a light activated silicon bilateral switch performing the functions of a zero crossing bilateral triac.

These devices are mounted in a standard 6 pin dual-in-line package.

FEATURES

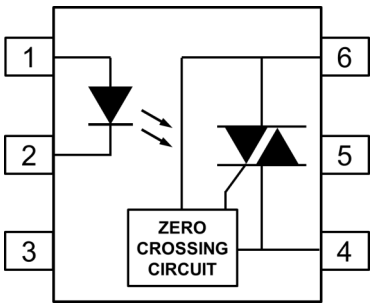
- Zero Voltage Crossing
- High Repetitive Peak Off-state Voltage V_{DRM} : minimum 800V
- High Critical Rate of Rise of Off-state Voltage dv/dt : minimum 1000V/µs
- High Isolation Voltage between Input and Output Viso : 5000Vrms
- RoHS Compliant
- UL File No. E91231
- VDE File No. 40019393

APPLICATIONS

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

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
5 Substrate (Do not Connect)
6 Main Terminal

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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	120mW
Junction Temperature	125°C
Output	
Off State Output Terminal Voltage	800V
On State RMS Current	100mA
Peak Repetitive Surge Current (Pulse width = 1ms, 120pps)	1A
Power Dissipation	300mW
Junction Temperature	125°C
Total Package	
Isolation Voltage	5000V_{RMS}
Total Power Dissipation	330mW
Operating Temperature	-40 to 110°C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{AC}			480	V_{AC}
Forward Current	I_F				mA
MOC3081		22.5	25	30	
MOC3082		15	20	30	
MOC3083		7.5	10	30	
Operating Temperature	T_A	−25		85	°C

NOTE :

Recommended operating conditions are given as a design guideline to obtain expected performance of the device.

Each item is an independent guideline.

Please also refer to specified characteristics in this document.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F = 20mA		1.2	1.4	V
Reverse Current	I_R	V_R = 6V		0.05	10	µA

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Peak Off-state Current Either Direction	I_{DRM}	V_{DRM} = 800V I_F = 0mA Note 1			500	nA
On-State Voltage Either Direction	V_{TM}	I_{TM} = 100mA (Peak)			3.0	V
Critical Rate of Rise of Off-State Voltage	dv/dt	I_F = 0mA V_{IN} = 240V_{RMS}	1000			V/µs

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input Trigger Current Either Direction	I_{FT}	Main Terminal Voltage = 3V Note 2 MOC3081 MOC3082 MOC3083			 15 10 5	mA
Holding Current Either Direction	I_H			200		µA

Note 1 : Test Voltage must be applied within static 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.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

ZERO CROSSING CHARACTERISTICS

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

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	AC 1 minute, RH 40 to 60%	5000			V_{RMS}

Measured with input leads shorted together and output leads shorted together.

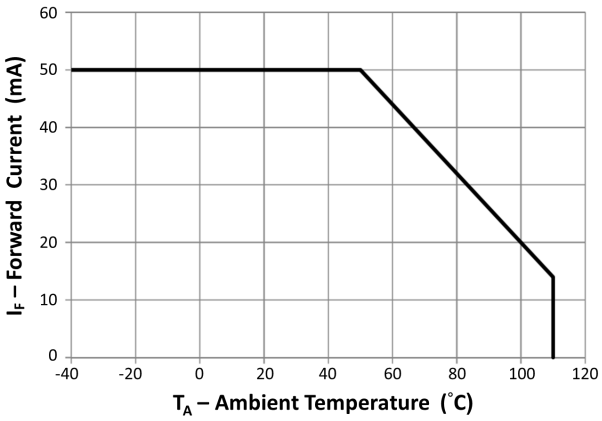


Fig 1 Forward Current vs Ambient Temperature

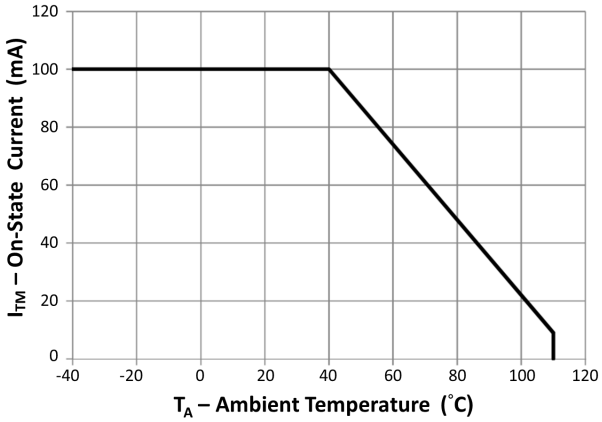


Fig 2 On-State Current vs Ambient Temperature

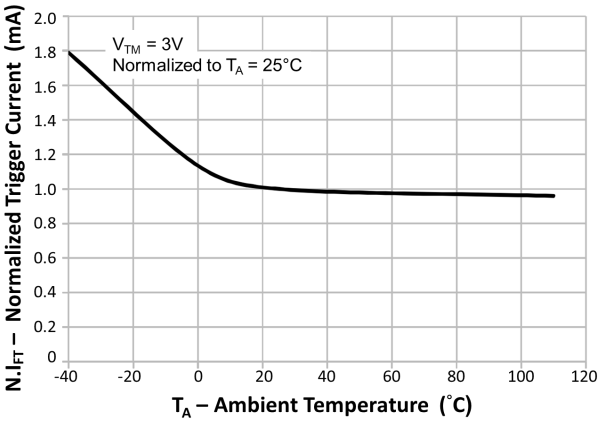


Fig 3 Normalized Trigger Current vs Ambient Temperature

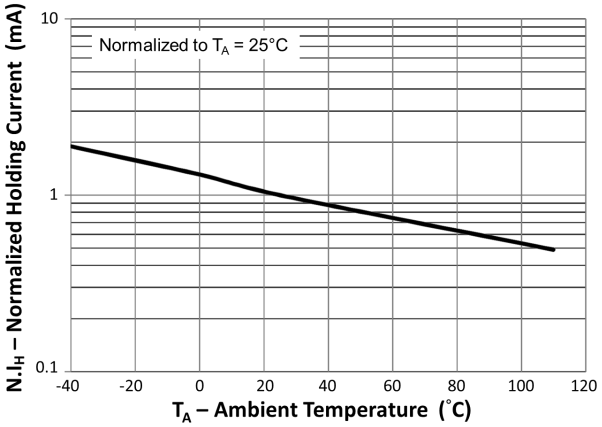


Fig 4 Normalized Holding Current vs Ambient Temperature

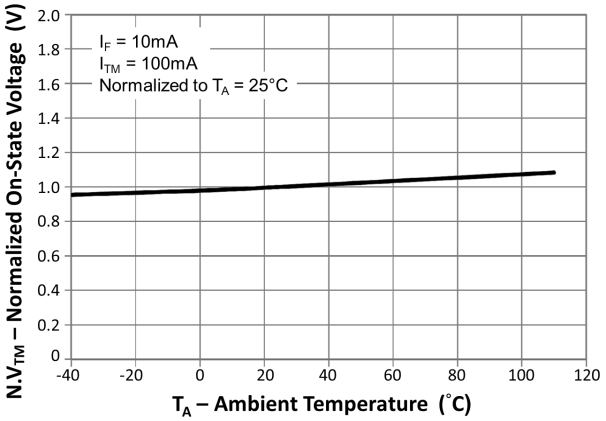


Fig 5 Normalized On-State Voltage vs Ambient Temperature

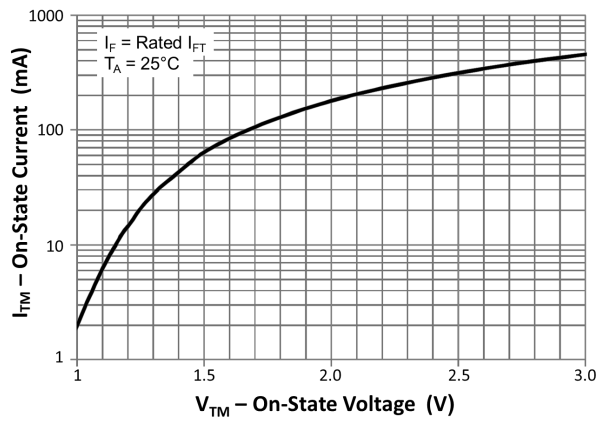


Fig 6 On-State Current vs On-State Voltage

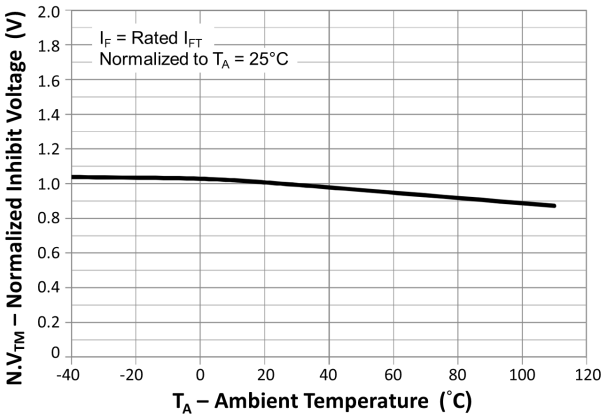


Fig 7 Normalized Inhibit Voltage vs Ambient Temperature

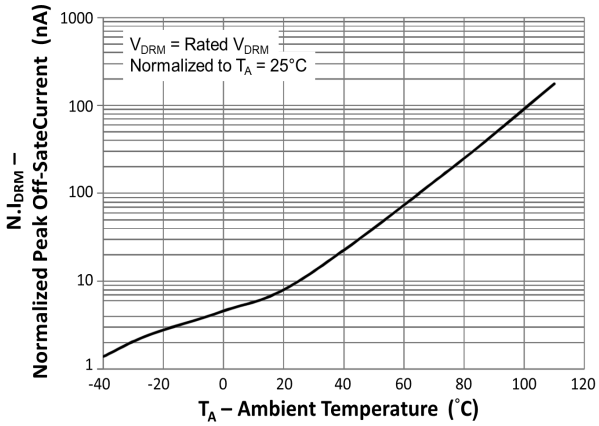


Fig 8 Normalized Peak Off-State Current vs Ambient Temperature

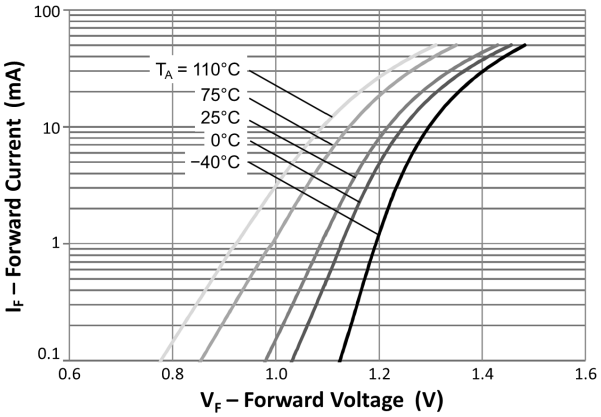


Fig 9 Forward Current vs Forward Voltage

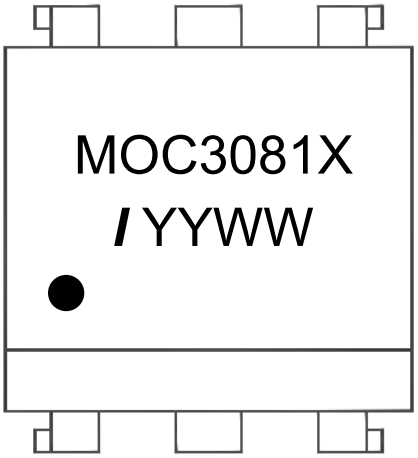
ORDER INFORMATION

MOC3081 / MOC3082 / MOC3083 (UL Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	MOC3081, MOC3082, MOC3083	Standard DIP6	65 pcs per tube
G	MOC3081G, MOC3082G MOC3083G	10mm Lead Spacing	65 pcs per tube
SM	MOC3081SM, MOC3082SM MOC3083SM	Surface Mount	65 pcs per tube
SMT&R	MOC3081SMT&R MOC3082SMT&R MOC3083SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

MOC3081X / MOC3082X / MOC3083X (UL and VDE Approvals)			
After PN	**PN**	**Description**	**Packing quantity**
None	MOC3081X, MOC3082X MOC3083X	Standard DIP6	65 pcs per tube
G	MOC3081XG, MOC3082XG MOC3083XG	10mm Lead Spacing	65 pcs per tube
SM	MOC3081XSM, MOC3082XSM MOC3083XSM	Surface Mount	65 pcs per tube
SMT&R	MOC3081XSMT&R MOC3082XSMT&R MOC3083XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

DEVICE MARKING

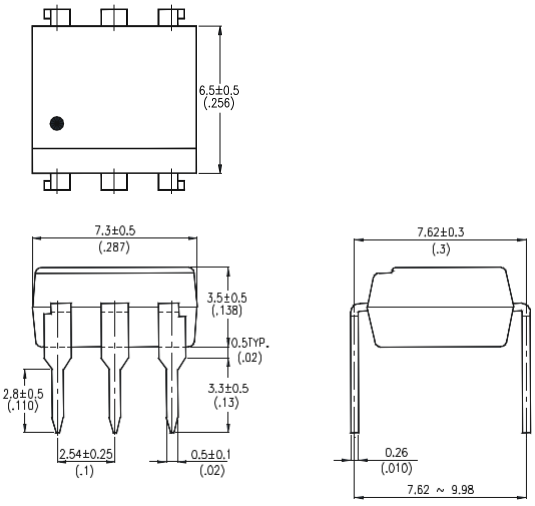
Example : MOC3081X



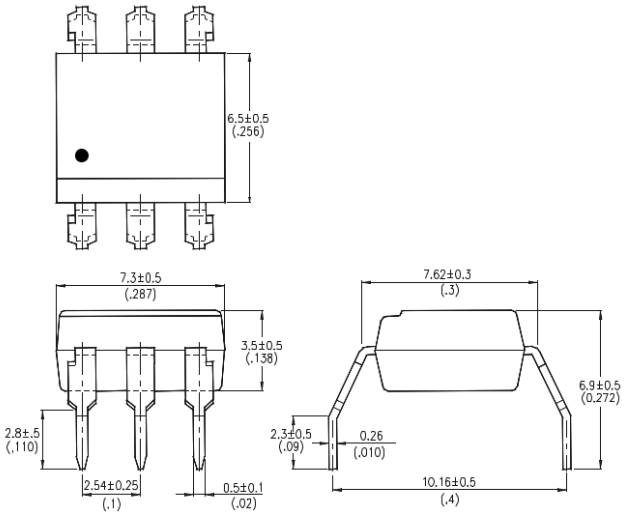
MOC3081X	denotes Device Part Number
I	denotes Isocom
YY	denotes 2 digit Year code
WW	denotes 2 digit Week code

PACKAGE DIMENSIONS in mm (inch)

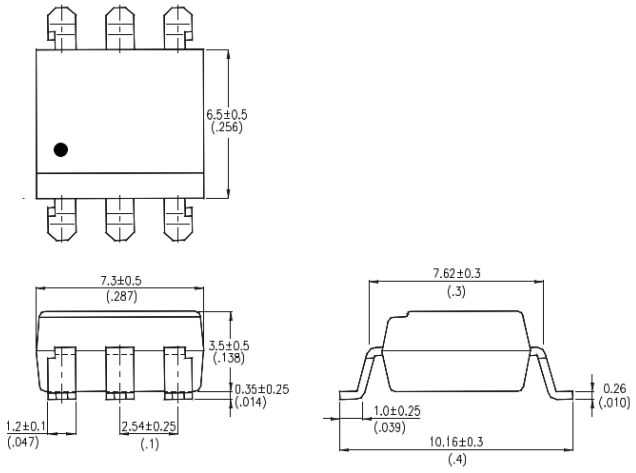
DIP



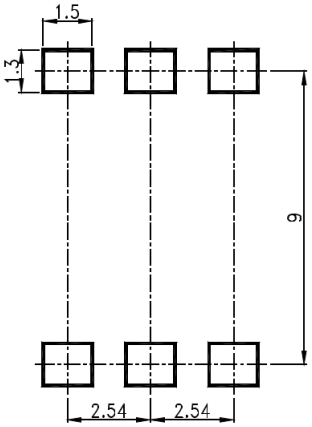
G Form



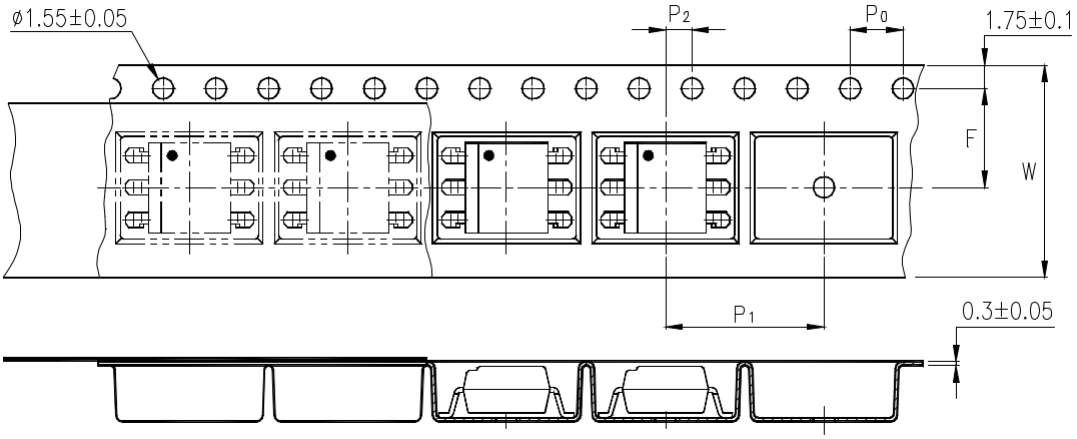
SMD



RECOMMENDED PAD LAYOUT FOR SMD (mm)



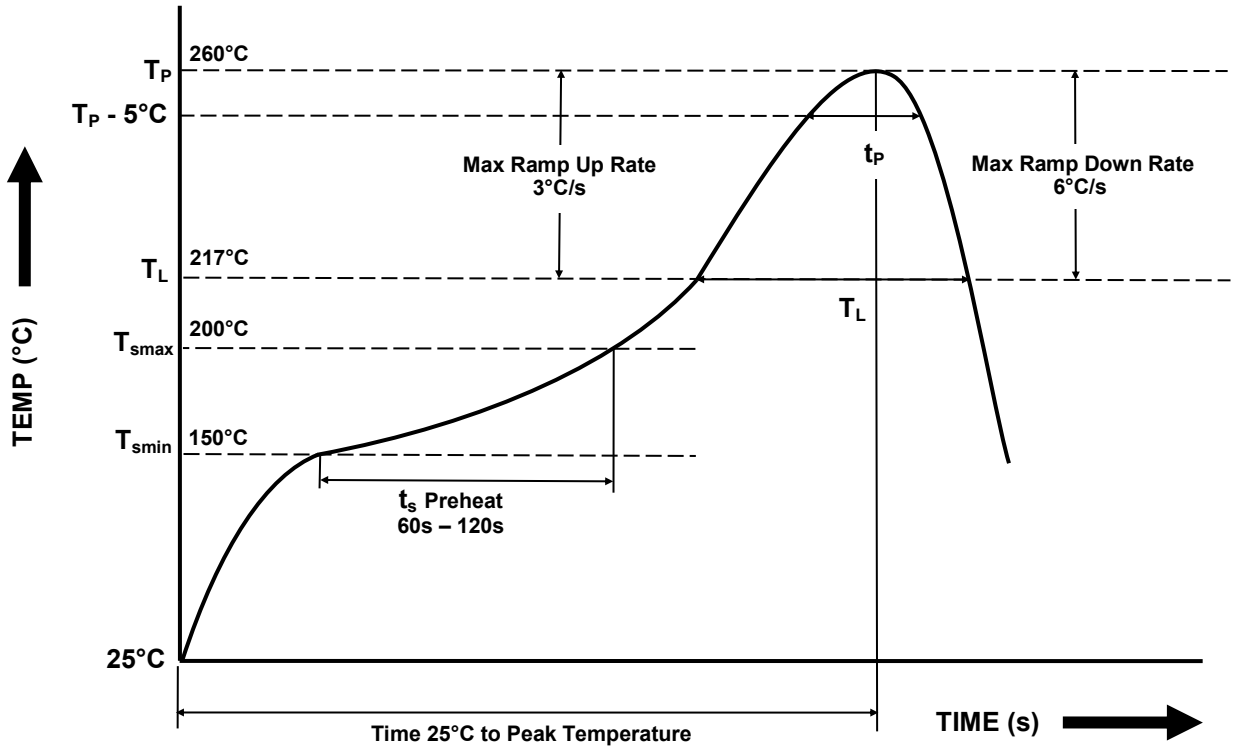
TAPE AND REEL PACKAGING



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 (0.472)

IR REFLOW SOLDERING TEMPERATURE PROFILE

Note : 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

ISOCOM COMPONENTS

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