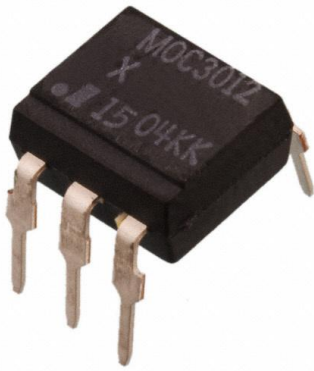


# MOC3081 Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	MOC3081-DG
Manufacturer	<a href="#">Isocom Components 2004 LTD</a>
Manufacturer Product Number	MOC3081
Description	6PIN ZERO CROSSING TRIAC OUTPUT,
Detailed Description	Optoisolator Triac Output 5300Vrms 1 Channel 6-D IP

This model MOC3081 is available at DiGi Electronics.

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## Purchase and inquiry

Manufacturer Product Number:

MOC3081

Series:

MOC308

Output Type:

Triac

Number of Channels:

1

Voltage - Off State:

800 V

Current - LED Trigger (I<sub>ft</sub>) (Max):

15mA

Current - Hold (I<sub>h</sub>):

400µA (Typ)

Voltage - Forward (V<sub>f</sub>) (Typ):

1.2V

Operating Temperature:

-30°C ~ 100°C

Package / Case:

6-DIP (0.300", 7.62mm)

Approval Agency:

VDE

Manufacturer:

Isocom Components 2004 LTD

Product Status:

Active

Zero Crossing Circuit:

Yes

Voltage - Isolation:

5300Vrms

Static dV/dt (Min):

600V/µs

Current - On State (I<sub>t</sub> (RMS)) (Max):

100 mA

Turn On Time:

-

Current - DC Forward (I<sub>f</sub>) (Max):

50 mA

Mounting Type:

Through Hole

Supplier Device Package:

6-DIP

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.49.8000

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



**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

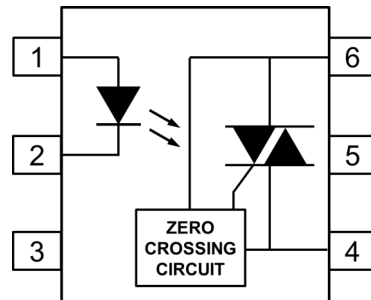
- Zero Voltage Crossing
- High Repetitive Peak Off-state Voltage  
 $V_{DRM}$  : minimum 800V
- High Critical Rate of Rise of Off-state Voltage  
 $dv/dt$  : minimum 1000V/ $\mu$ s
- High Isolation Voltage between Input and Output  
Viso : 5000Vrms
- RoHS Compliant
- UL File No. E91231
- VDE File No. 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 ( $T_A = 25^\circ\text{C}$ )

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	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 <sub>RMS</sub>
Total Power Dissipation	330mW
Operating Temperature	-40 to 110°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 Mansions  
36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong  
Tel : +852 2995 9217 Fax : +852 8161 6292  
e-mail : sales@isocom.com.hk



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## MOC3081 / MOC3082 / MOC3083

### Recommended Operating Conditions

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

**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.



## MOC3081 / MOC3082 / MOC3083

### 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	$\mu\text{A}$

#### OUTPUT

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

#### COUPLED

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

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  $I_{\text{FT}}$ .

Recommended  $I_F$  lies between Rated  $I_{\text{FT}}$  to Absolute Max  $I_F$ .


**ISOCOM**  
 COMPONENTS

**MOC3081 / MOC3082 / MOC3083**
**ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise specified)**
**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	$I_{DRM2}$	$I_F = \text{Rated } I_{FT}$ $V_{DRM} = \text{Rated } V_{DRM}$ Off-state			500	$\mu\text{A}$

**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.



MOC3081 / MOC3082 / MOC3083

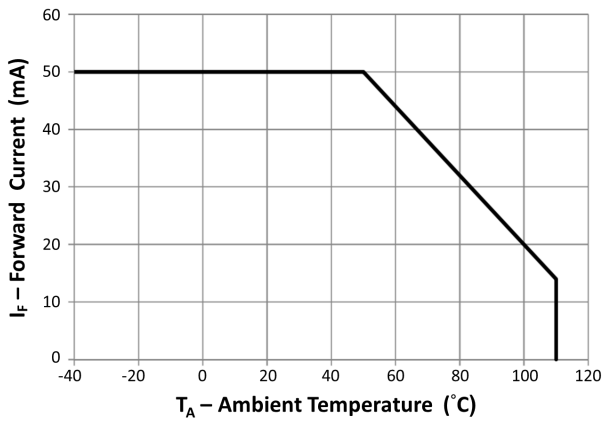


Fig 1 Forward Current vs Ambient Temperature

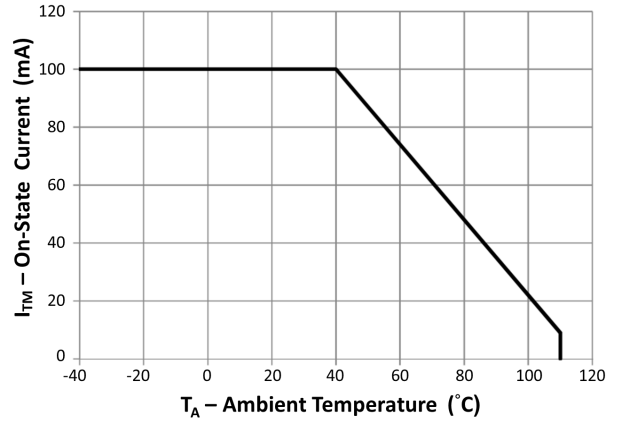


Fig 2 On-State Current vs Ambient Temperature

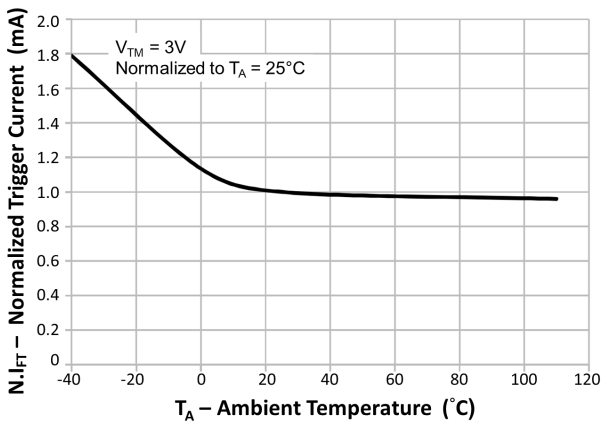


Fig 3 Normalized Trigger Current vs Ambient Temperature

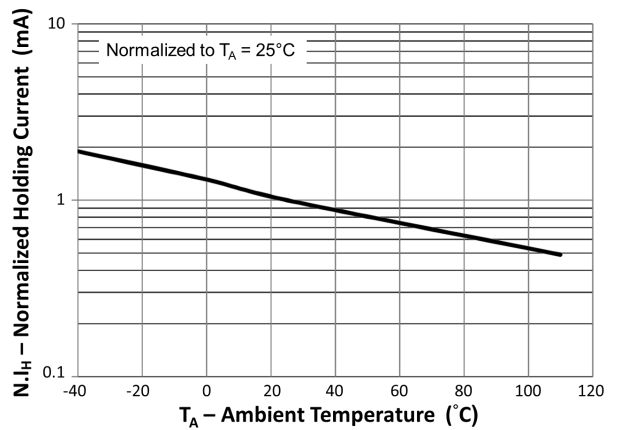


Fig 4 Normalized Holding Current vs Ambient Temperature

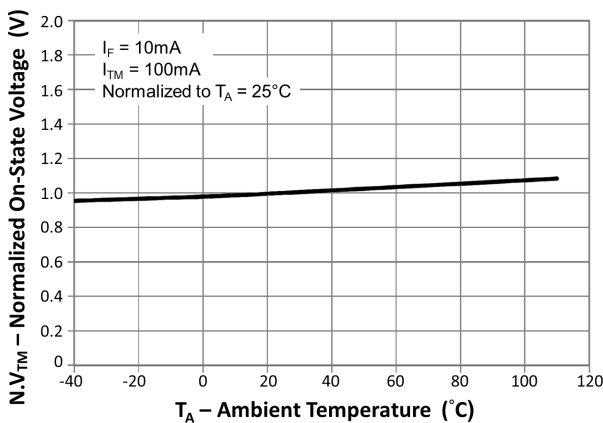


Fig 5 Normalized On-State Voltage vs Ambient Temperature

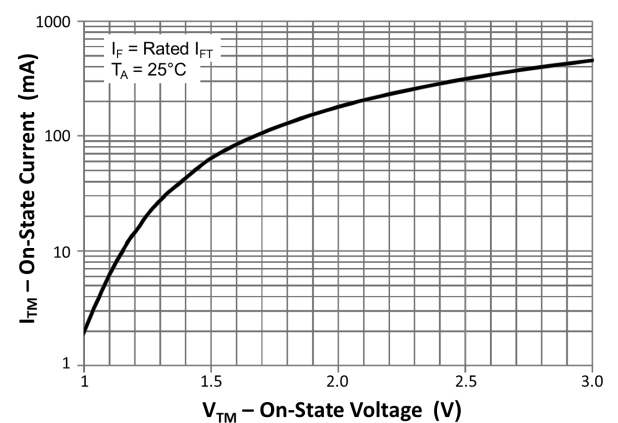


Fig 6 On-State Current vs On-State Voltage



MOC3081 / MOC3082 / MOC3083

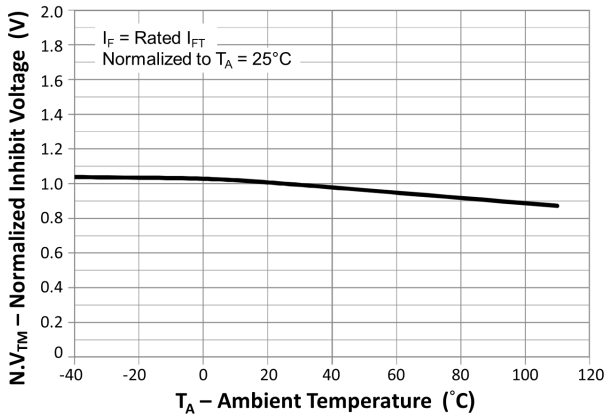


Fig 7 Normalized Inhibit Voltage vs Ambient Temperature

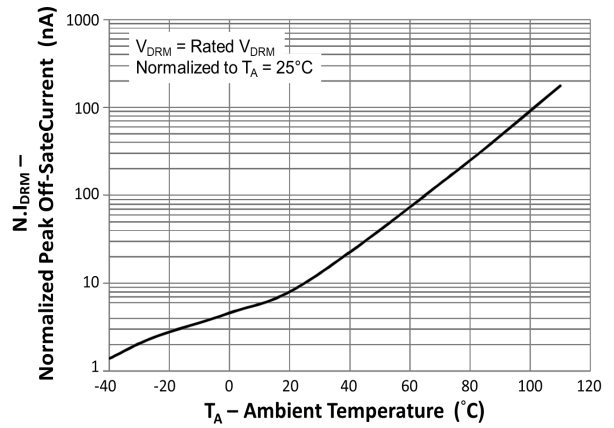


Fig 8 Normalized Peak Off-State Current vs Ambient Temperature

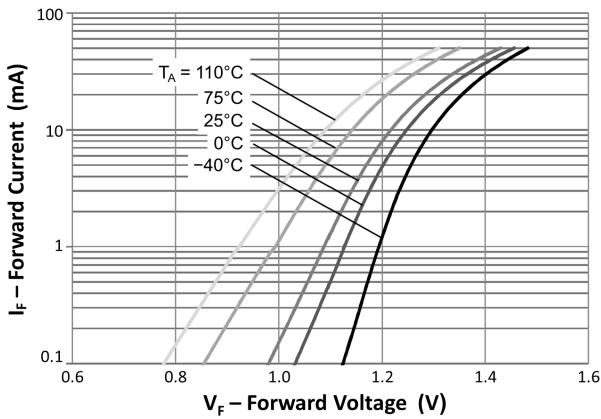


Fig 9 Forward Current vs Forward Voltage



## MOC3081 / MOC3082 / MOC3083

### 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

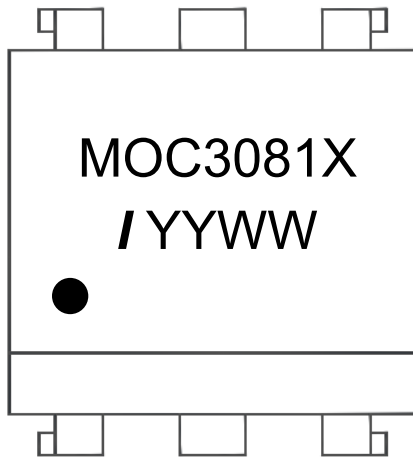
MOC3081X / MOC3082X / MOC3083X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	MOC3081X, MOC3082X MOC3083X	Standard DIP6	65 pcs per tube
G	MOC3081XG, MOC3082XG MOC3083XG	10mm Lead Spacing	65 pcs per tube
SM	MOC3081XSM, MOC3082XSM MOC3083XSM	Surface Mount	65 pcs per tube
SMT&R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



**MOC3081 / MOC3082 / MOC3083**

**DEVICE MARKING**

**Example : MOC3081X**



MOC3081X denotes Device Part Number

/ denotes Isocom

YY denotes 2 digit Year code

WW denotes 2 digit Week code

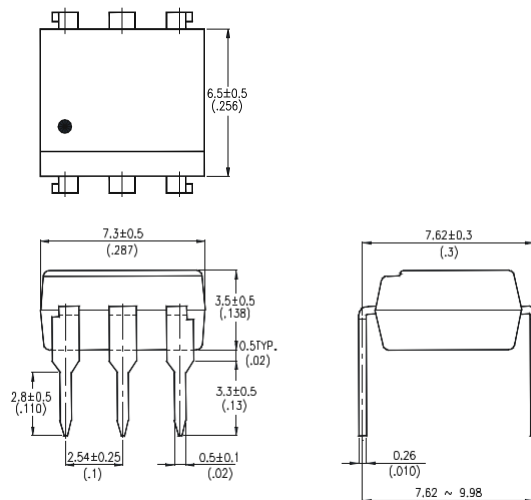


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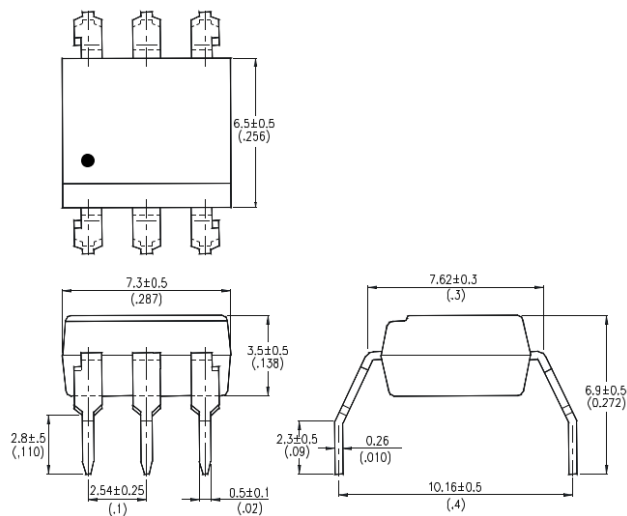
**MOC3081 / MOC3082 / MOC3083**

**PACKAGE DIMENSIONS in mm (inch)**

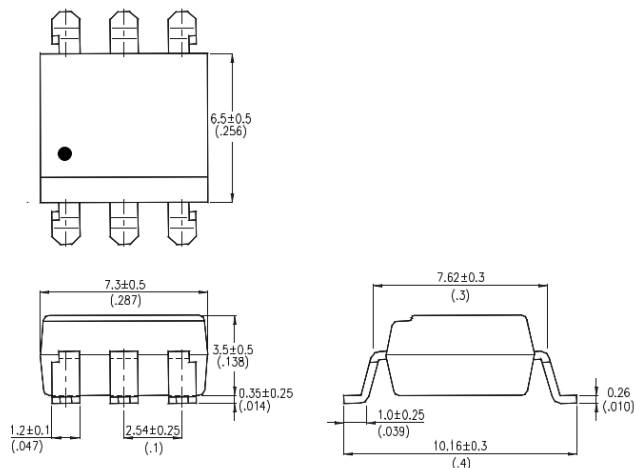
**DIP**



**G Form**



**SMD**

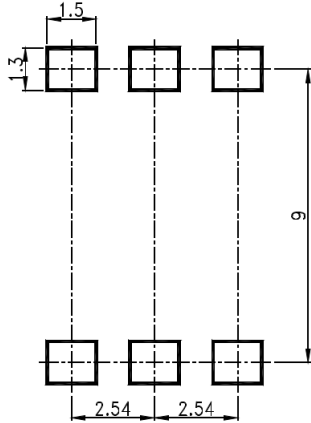




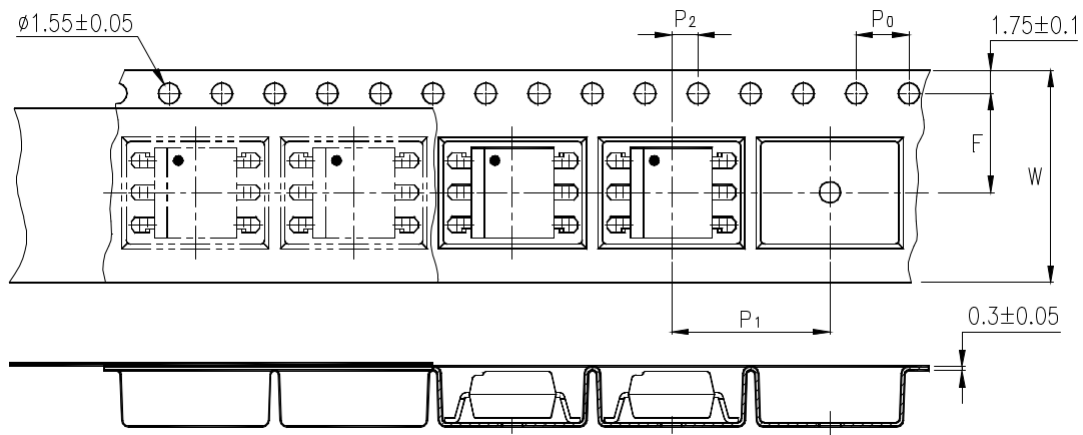
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## MOC3081 / MOC3082 / MOC3083

### RECOMMENDED PAD LAYOUT FOR SMD (mm)



### TAPE AND REEL PACKAGING



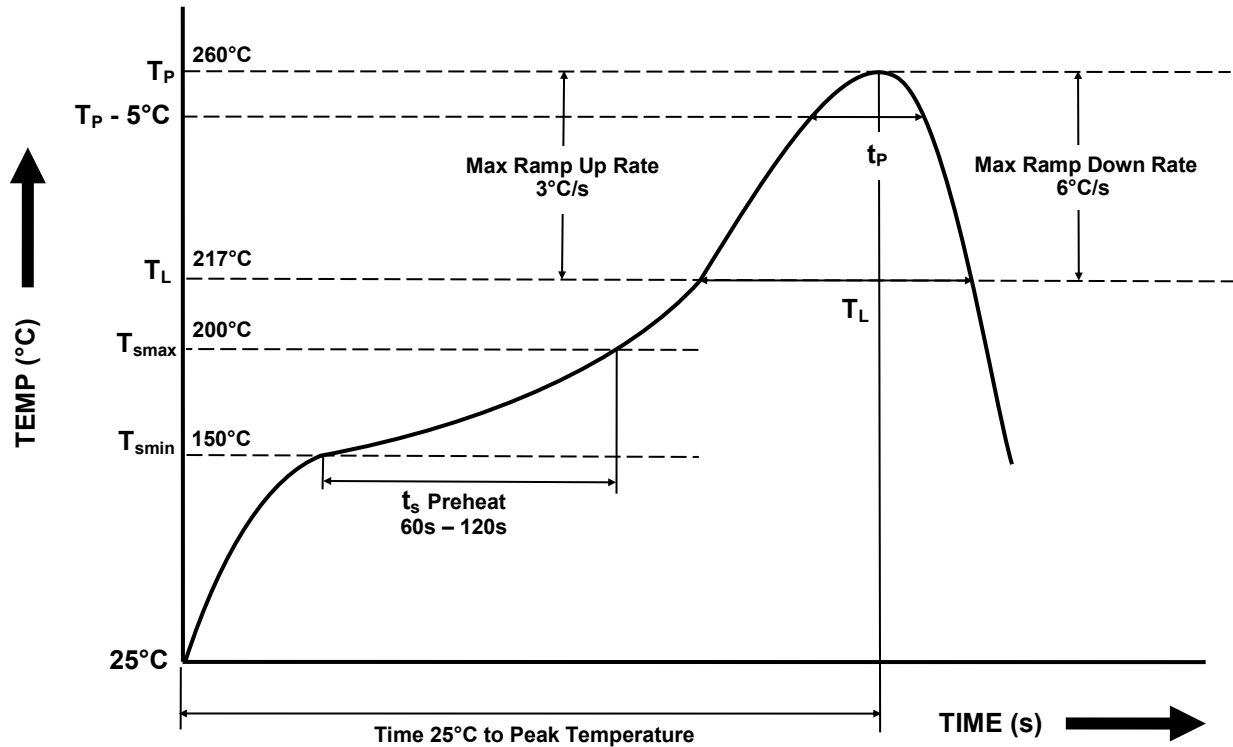
Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P <sub>0</sub>	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P <sub>2</sub>	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P <sub>1</sub>	12 ± 0.1 (0.472)


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**MOC3081 / MOC3082 / MOC3083**
**IR REFLOW SOLDERING TEMPERATURE PROFILE**

Note : One Time Reflow Soldering is Recommended.

Do Not Immerse Device Body in Solder Paste.



Profile Details	Conditions
<b>Preheat</b> - Min Temperature ( $T_{SMIN}$ ) - Max Temperature ( $T_{SMAX}$ ) - Time $T_{SMIN}$ to $T_{SMAX}$ ( $t_s$ )	150°C 200°C 60s - 120s
<b>Soldering Zone</b> - Peak Temperature ( $T_P$ ) - Time at Peak Temperature - 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 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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