

产品规格书

Product specification



可控硅光耦

OPTOCOUPLER

MOC30XXM(ZC)

THYRISTOR OUTPUT

晶体管光耦

可控硅光耦

达林顿光耦

高速光耦

施密特触发器

IPM驱动光耦

固态继电器

IGBT驱动光耦

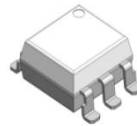
深圳市美特光电子有限公司

SHENZHEN MATELIGHT ELECTRONICS CO.,LTD

www.matelight.cn Q

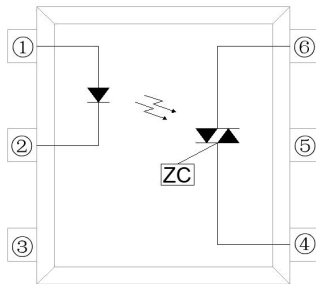
Data Sheet

MOC30XXM(ZC) Series

DC Input 6-Pin
Zero-Cross Photo TRIAC Optocoupler

Description

The MOC303XM, MOC304XM, MOC306XM and MOC308XM series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon random-phase photo triac in a plastic DIP6 package with different lead forming options.



PIN Configuration

- ① Anode
- ② Cathode
- ③ NC
- ④ Terminal
- ⑤ Substrate
- ⑥ Terminal

Features

- DC input with zero-cross photo triac output
- High input-output isolation voltage (Viso=5000Vrms)
- Creepage distance >7.00mm
- Operating temperature up to +110°C
- RoHS REACH compliance
- Compliance Halogen Free
- MSL Level 1
- UL approved No. UL-US-2331693-0
- VDE approved No. 40058674
- CQC approved No. CQC23001411967

Applications

- Solenoid/valve controls
- Solid state relays
- Lighting controls
- Motor controls
- Temperature controls
- Static AC power switches

Data Sheet

MOC30XXM(ZC) Series

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	60	mA
	Junction Temperature	T_j	125	$^{\circ}\text{C}$
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	100	mW
Output 输出端	Off-state Output Terminal Voltage	MOC303XM	250	V
		MOC304XM	400	V
		MOC306XM	600	V
		MOC308XM	800	V
	Peak Repetitive Surge Current PW=100 μ s, 120pps	I_{TSM}	1	A
	On-State RMS Current	$I_{T(RMS)}$	100	mA
	Junction Temperature	T_j	125	$^{\circ}\text{C}$
	Output Power Dissipation	P_o	300	mW
Total Power Dissipation	P_{TOT}	400	mW	
Isolation Voltage*1	V_{ISO}	5000	V _{rms}	
Peak Isolation Voltage	V_{IORM}	890	V _{peak}	
Transient Isolation Voltage	V_{IOTM}	5000	V _{peak}	
Operating Temperature	T_{OPR}	-40~100	$^{\circ}\text{C}$	
Storage Temperature	T_{STG}	-55~150	$^{\circ}\text{C}$	
Soldering Temperature*2	T_{SOL}	260	$^{\circ}\text{C}$	

*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

*2 For 10 seconds

Data Sheet

MOC30XXM(ZC) Series

Electro-Optical Characteristics ($T_a=25^\circ\text{C}$)

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	V_F	---	1.24	1.4	V	$I_F=10\text{mA}$
Reverse Current	I_R	---	---	10	μA	$V_R=6\text{V}$
Input Capacitance	C_{in}	---	8.5	250	pF	$V=0, f=1\text{kHz}$

Output

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Peak Off-state Current, Either Direction	I_{DRM}	---	---	100	nA	$V_{DRM}=\text{Rated}$ $V_{DRM},$ $I_F=10\text{T}$
Peak On-state Current, Either Direction	V_{TM}	---	1.59	2.50	V	$I_{TM}=100\text{mA}$
Critical Rate of Rise of Off-state Voltage	dV/dt	1000	---	---	V/us	$V_{PEAK}=\text{Rated}$ V_{DRM}

Transfer Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition $I_F=I_{FT}$
Holding Current	I_H	---	237	---	μA	$I_{TM}=2\text{mA}$
Isolation Resistance	R_{IO}	5×10^{10}	---	---	Ω	$V_{IO}=500\text{Vdc},$ 40~60% R.H.
Floating Capacitance	C_{IO}	---	0.4	1.0	pF	$V_{IO}=0, f=1\text{MHz}$

Data Sheet

MOC30XXM(ZC) Series

LED Trigger Current

Binning		Symbol	Min.	Typ.	Max.	Unit	Condition
LED Trigger Current	MOC3031M	IFT	---	---	15	mA	Terminal Voltage = 3V $I_{TM}=100mA$
	MOC3041M						
	MOC3061M						
	MOC3081M						
	MOC3032M	IFT	---	---	10	mA	
	MOC3042M						
	MOC3062M						
	MOC3082M						
	MOC3033M	IFT	---	---	5	mA	
	MOC3043M						
	MOC3063M						
	MOC3083M						

* Typical values at $T_a = 25^{\circ}C$

Data Sheet

MOC30XXM(ZC) Series

Typical Electro-Optical Characteristics Curves

Fig.1 Forward Current vs. Forward Voltage

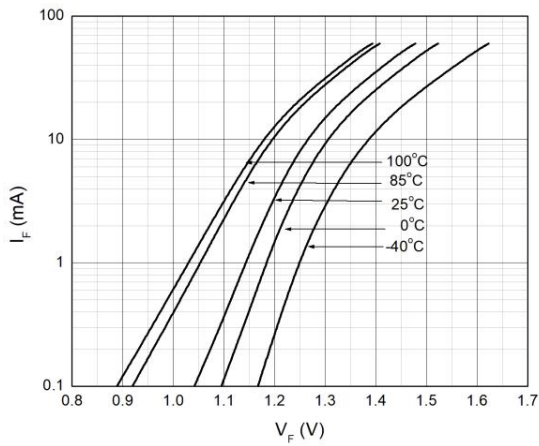


Fig. 2 Forward Current vs. Ambient Temperature

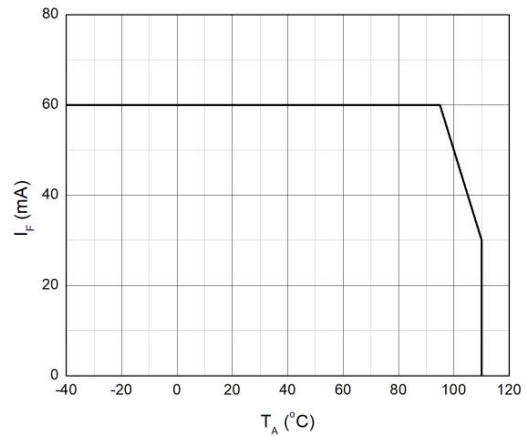


Fig.3 On-state Terminal Current vs. Ambient Temperature

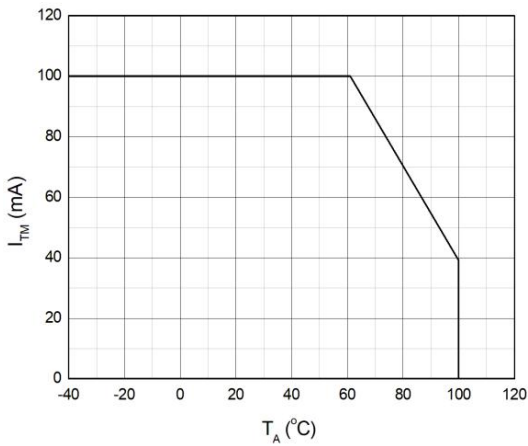
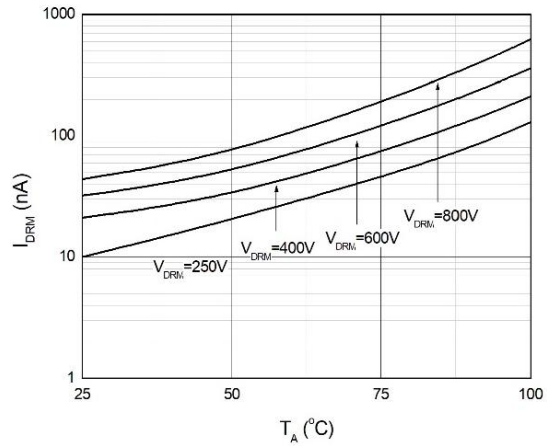


Fig. 4 Off-state Terminal Current vs. Ambient Temperature



Data Sheet

MOC30XXM(ZC) Series

Typical Electro-Optical Characteristics Curves

Fig.5 Normalized Off-state Terminal Voltage vs. Ambient Temperature

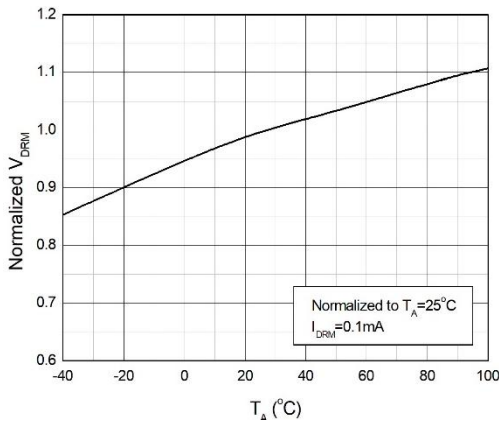


Fig.6 Normalized Trigger Current vs. LED Trigger Pulse Width

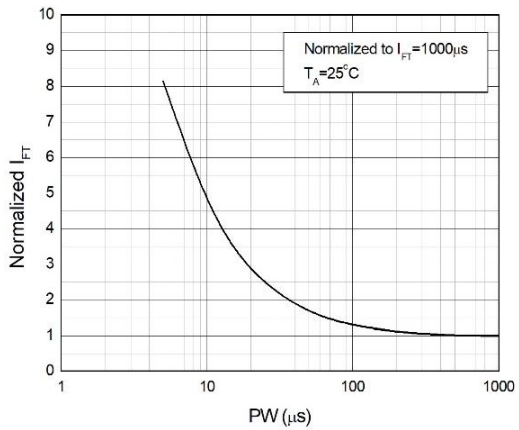


Fig.7 Normalized Trigger Current vs. Ambient Temperature

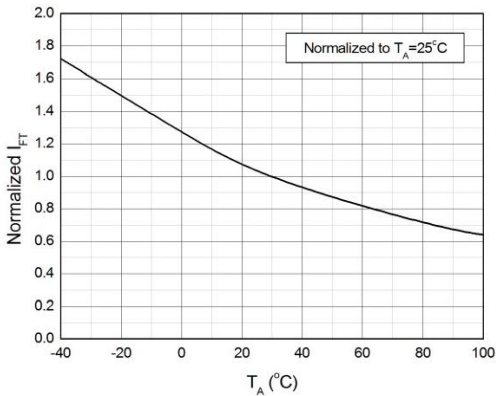


Fig.8 On-state Terminal Voltage vs. Ambient Temperature

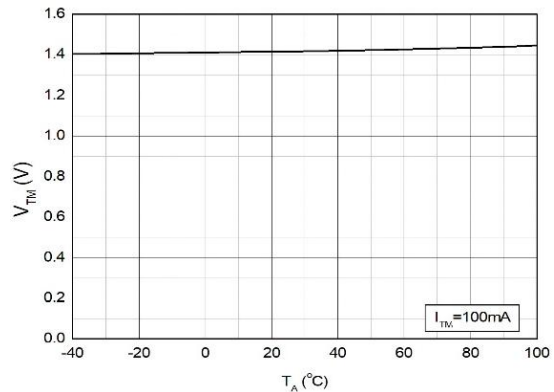


Fig.9 On-state Terminal Voltage vs. On-state Terminal Current

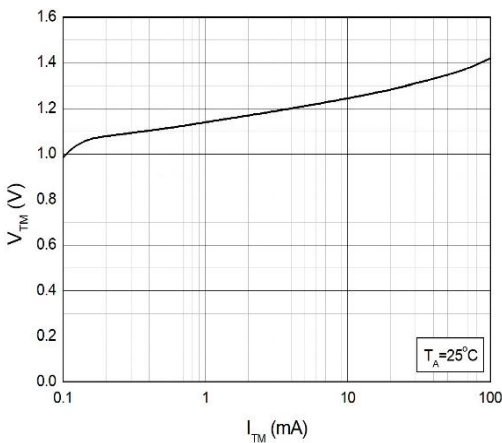
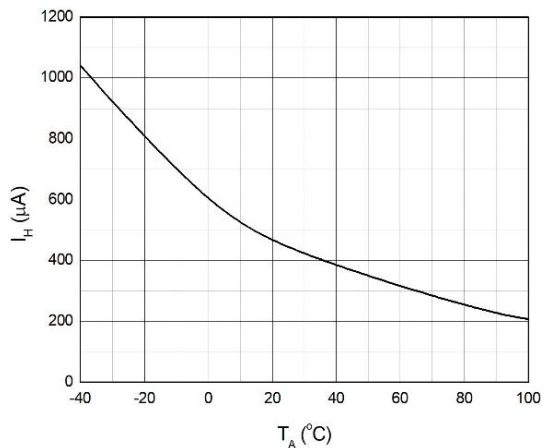


Fig.10 Holding Current vs. Ambient Temperature



Data Sheet

MOC30XXM(ZC) Series

Typical Electro-Optical Characteristics Curves

Fig.11 Normalized Inhibit Voltage vs. Ambient Temperature

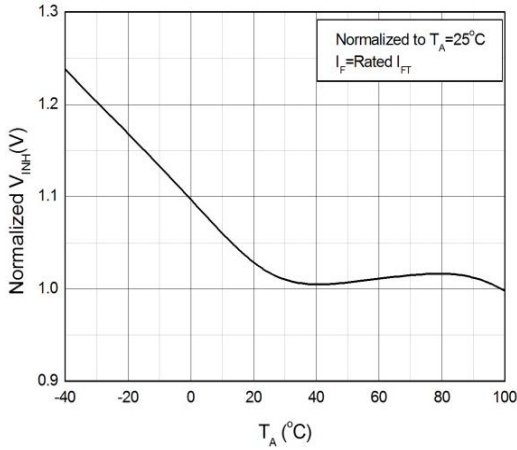


Fig. 12 12 Normalized Leakage in Inhibit State vs. Ambient Temperature

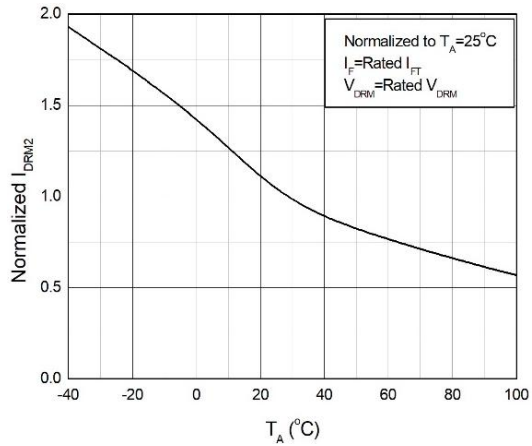


Fig.13 Turn On Time vs. Forward Current

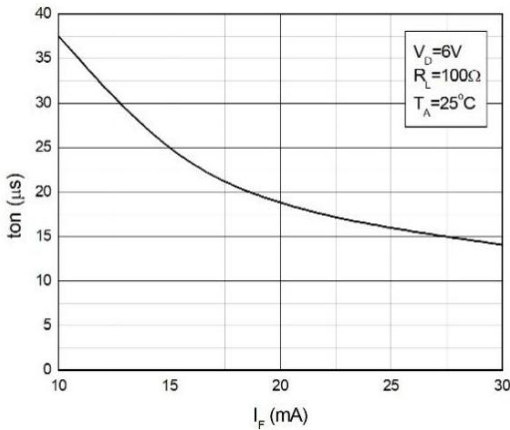


Fig. 14 Turn On Time vs. Ambient Temperature

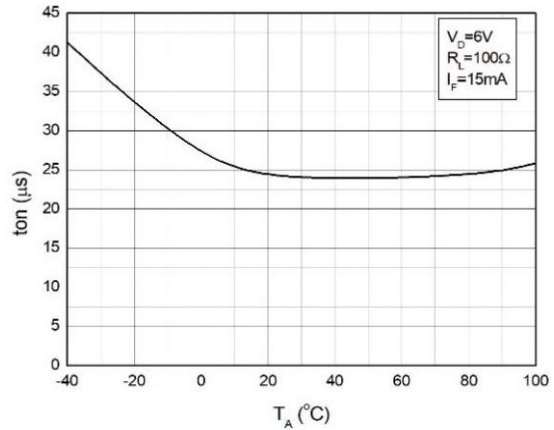


Fig.15 Test Circuits of Turn On Time

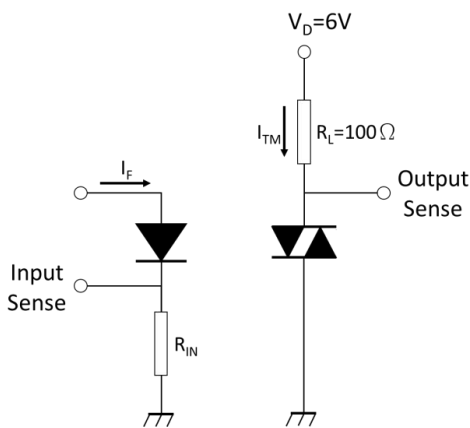
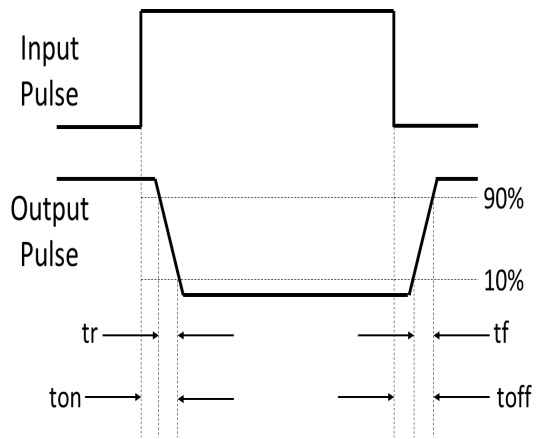


Fig.16 Waveforms of Turn On Time



Data Sheet

MOC30XXM(ZC) Series

Typical Electro-Optical Characteristics Curves

Fig.17 Test Circuits of dV/dt

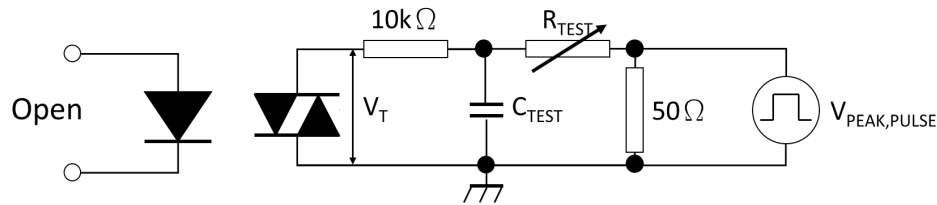
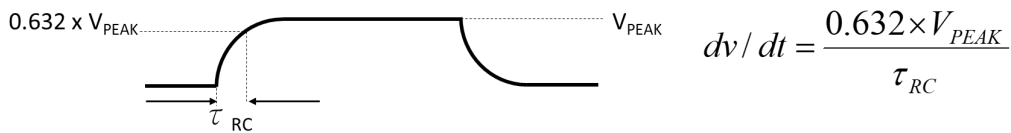


Fig.18 Waveforms of dV/dt

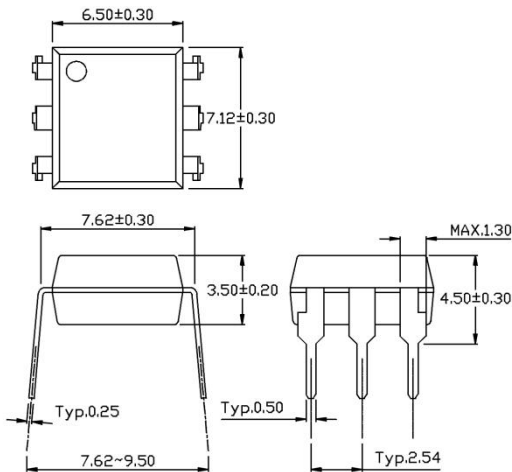


Data Sheet

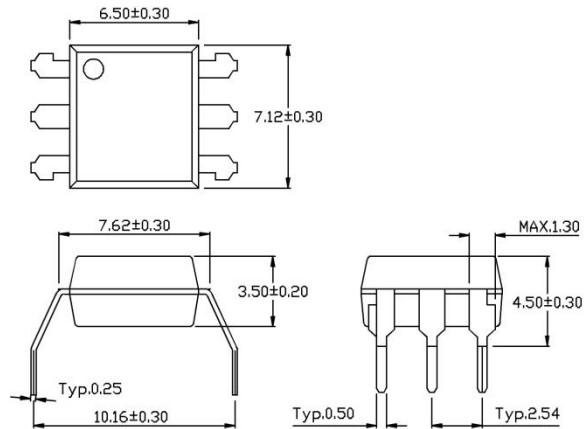
MOC30XXM(ZC) Series

Package e Dimension (Unit: mm)

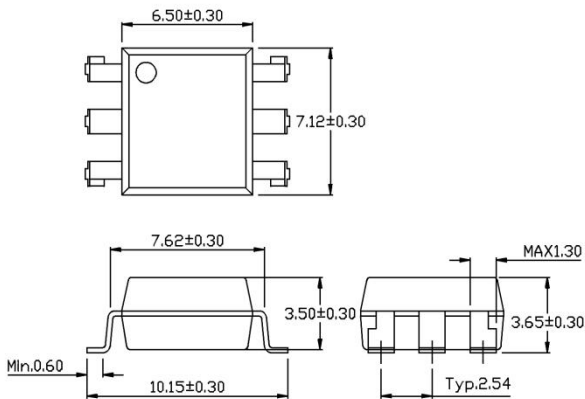
1. Standard DIP – Through Hole (DIP Type)



2. Gullwing Lead Forming – Through Hole (M Type)



3. Surface Mount Lead Forming (S1 Type)



Notes:

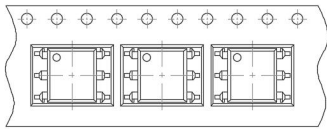
1. All dimensions are in millimeters.
2. Tolerances dimensions $\pm 0.3\text{mm}$ unless otherwise specified.

Data Sheet

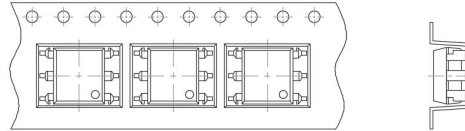
MOC30XXM(ZC) Series

Packing Specification Tape & Reel Packing Specifications

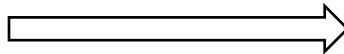
T1



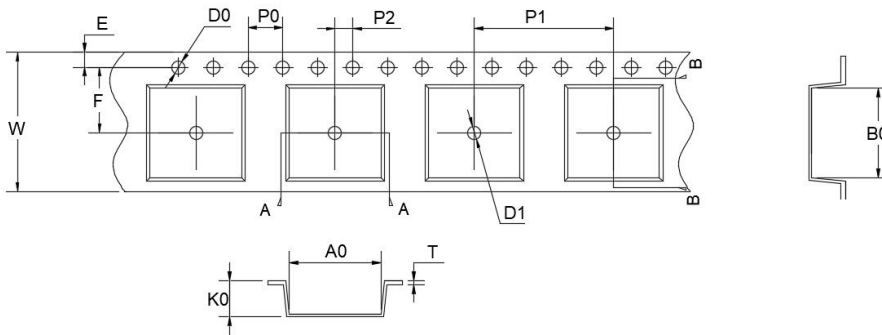
T2



Direction of feed from reel



Tape Dimensions



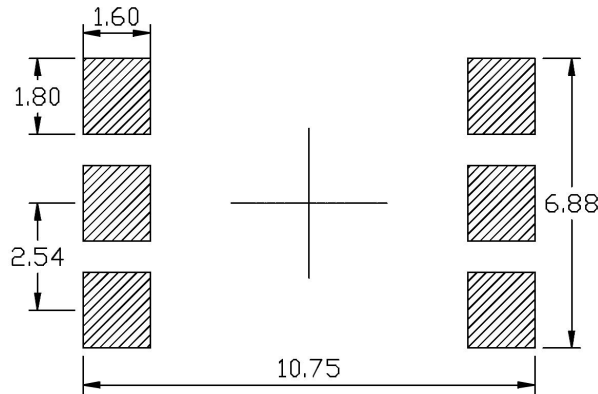
Dimension No.	A0	B0	D0	D1	E	F
Dimension (mm) S1	10.50±0.10	7.50±0.10	1.5±0.10	1.50+0.10	1.75±0.10	7.50±0.10
Dimension No.	P0	P1	P2	t	W	K0
Dimension (mm) S1	4.00±0.10	16.00±0.10	2.00±0.10	0.50±0.05	16.00±0.30	3.90±0.10

Data Sheet

MOC30XXM(ZC) Series

Recommended Foot Print for Surface Mount Device (Unit: mm)

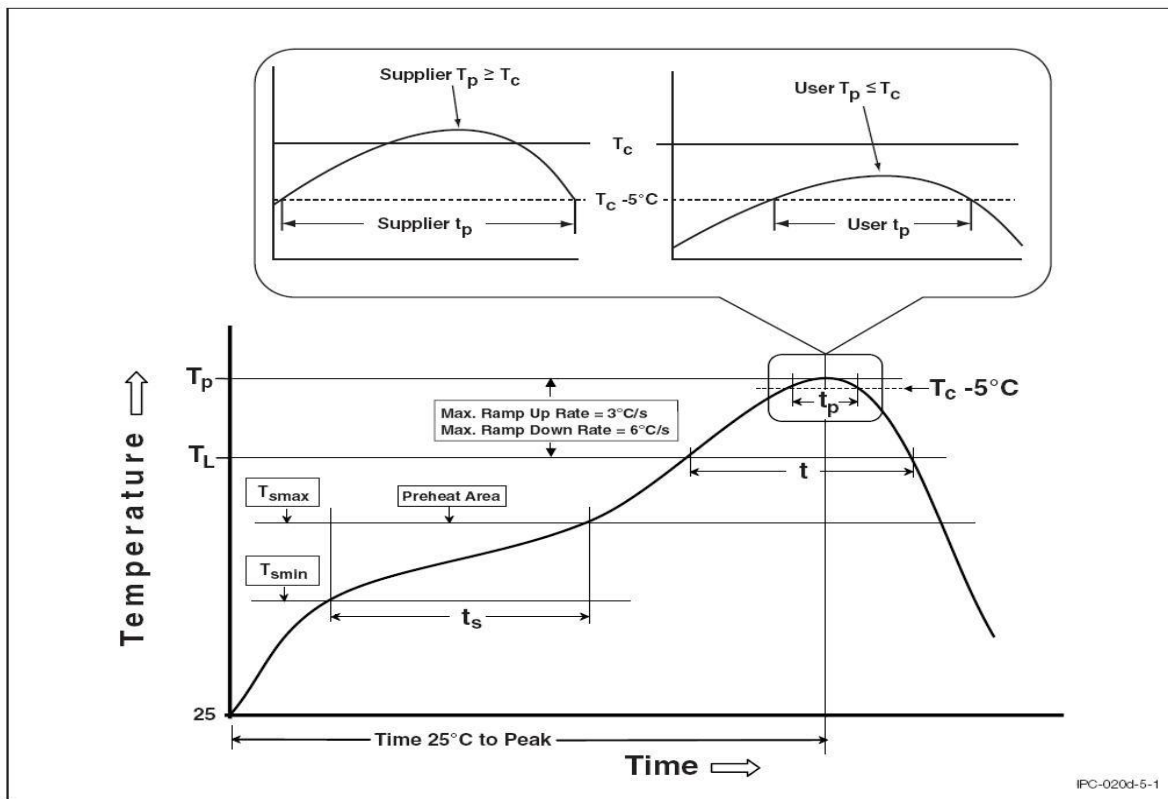
For S1 option



Precautions for Use

1. Soldering Condition

Maximum Body Case Temperature Profile For Evaluation of Reflow Profile



IPC-0204-5-1

Data Sheet

MOC30XXM(ZC) Series

1. Soldering Condition (cont.)

Preheat	Condition
Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 sec
Average Ramp-Up Rate (T_{smax} to T_p)	3 °C/sec max
Other	Condition
Liquidus Temperature (T_L)	217 °C
Time Above Liquidus Temperature (T_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5°C / T_c$	30 sec
Ramp- Down Rate From Peak Temperature	6°C /sec max
Time 25°C to Peak Temperature	8 minutes max
Max. Reflow Times	3 times

Data Sheet

MOC30XXM(ZC) Series

Order Information

Part Number

MOC30(X1)(X2)(X3)-VW(Y)(Z)

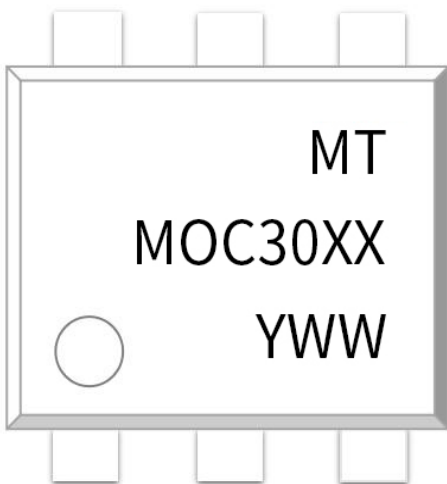
Note:

- X1 – Customer code (3,4,6,8)
- X2 – Trigger Current code (1,2,3)
- X3 – Customer code (or None)
- V – VDE Option (V or None)
- W– Colloid color (W: White colloid, None: Black colloid)
- Y – Lead Form Option (M/S1//None)
- Z – Tape and Reel Packaging form (T1/T2/None)

Lead form Option	Description	Packing Quantity
D	Standard DIP-4	65 units per tube
M	Wide lead bend (0.4 inch spacing)	65 units per tube
S1	Surface mount profile	1000 units per reel

Device Marking

Note:



- MOC Denotes MATELIGHT Optoelectronic Technologies
- 30X Denotes Device Number
- X Denotes Customer code (3,4,6,8)
- Y Denotes Trigger Current code (1,2,3)
- WW Denotes 1 digit Year code
- V Denotes 2 digit Week code
- Denotes VDE (optional)