



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

MOC3071M, MOC3072M

6-Pin DIP Random-Phase Triac Driver Optocoupler (800 Volt Peak)

The MOC3071M and MOC3072M consist of a GaAs infrared emitting diode optically coupled to a non-zero-crossing silicon bilateral AC switch (triac). These devices isolate low voltage logic from 240 V_{AC} lines to provide random phase control of high current triacs or thyristors. These devices feature greatly enhanced static dv/dt capability to ensure stable switching performance of inductive loads.

Features

- Excellent I_{FT} Stability—IR Emitting Diode Has Low Degradation
- 800 V Peak Blocking Voltage
- Safety and Regulatory Approvals
 - UL1577, 4,170 VAC_{RMS} for 1 Minute
 - DIN EN/IEC60747-5-5 (pending approval)

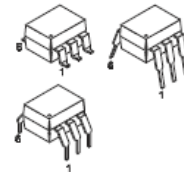
Typical Applications

- Solenoid/Valve Controls
- Lamp Ballasts
- Static AC Power Switch
- Interfacing Microprocessors to 240 V_{AC} Peripherals
- Solid State Relay
- Incandescent Lamp Dimmers
- Temperature Controls
- Motor Controls



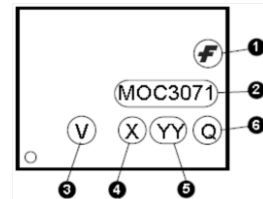
ON Semiconductor®

www.onsemi.com



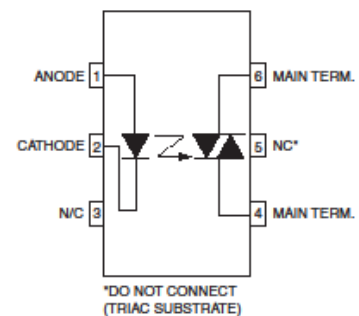
MDIP 6L WHITE

MARKING DIAGRAM



- | | |
|------------|------------------------------|
| 1. F | = Fairchild Logo |
| 2. MOC3071 | = Specific Device Code |
| 3. V | = DIN EN/IEC60747-5-5 Option |
| 4. X | = One-Digit Year Code |
| 5. YY | = Two-Digit Work Week |
| 6. Q | = Assembly Package Code |

PIN CONNECTIONS



ORDERING INFORMATION

See detailed ordering and shipping information page 9 of this data sheet.

MOC3071M, MOC3072M

SAFETY AND INSULATIONS RATINGS

As per DIN EN/IEC 60747-5-5 (pending approval), this optocoupler is suitable for "safe electrical insulation" only within the safety limit data. Compliance with the safety ratings shall be ensured by means of protective circuits.

Parameter		Characteristics
Installation Classifications per DIN VDE 0110/1.89 Table 1, For Rated Mains Voltage	< 150 VRMS	I–IV
	< 300 VRMS	I–IV
Climatic Classification		40/85/21
Pollution Degree (DIN VDE 0110/1.89)		2
Comparative Tracking Index		175

Symbol	Parameter	Value	Unit
V _{PR}	Input-to-Output Test Voltage, Method A, V _{IORM} × 1.6 = V _{PR} , Type and Sample Test with t _m = 10 s, Partial Discharge < 5 pC	1360	V _{peak}
	Input-to-Output Test Voltage, Method B, V _{IORM} × 1.875 = V _{PR} , 100% Production Test with t _m = 1 s, Partial Discharge < 5 pC	1594	V _{peak}
V _{IORM}	Maximum Working Insulation Voltage	850	V _{peak}
V _{IOTM}	Highest Allowable Over-Voltage	6000	V _{peak}
	External Creepage	≥ 7	mm
	External Clearance	≥ 7	mm
	External Clearance (for Option TV, 0.4" Lead Spacing)	≥ 10	mm
DTI	Distance Through Insulation (Insulation Thickness)	≥ 0.5	mm
R _{IO}	Insulation Resistance at T _S , V _{IO} = 500 V	> 10 ⁹	Ω

MOC3071M, MOC3072M

MAXIMUM RATINGS (Note 1)

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

Symbol	Parameters	Value	Unit
Total Device			
T_{STG}	Storage Temperature	-40 to +150	$^\circ\text{C}$
T_{OPR}	Operating Temperature	-40 to +85	$^\circ\text{C}$
T_J	Junction Temperature Range	-40 to +100	$^\circ\text{C}$
T_{SOL}	Lead Solder Temperature	260 for 10 seconds	$^\circ\text{C}$
P_D	Total Device Power Dissipation at 25°C Ambient	330	mW
	Derate Above 25°C	4.4	mW/ $^\circ\text{C}$
Emitter			
I_F	Continuous Forward Current	60	mA
V_R	Reverse Voltage	3	V
P_D	Total Power Dissipation at 25°C Ambient	100	mW
	Derate Above 25°C	1.33	mW/ $^\circ\text{C}$
Detector			
V_{DRM}	Off-State Output Terminal Voltage	800	V
I_{TSM}	Peak Non-Repetitive Surge Current (Single Cycle 60 Hz Sine Wave)	1	A
P_D	Total Power Dissipation at 25°C Ambient	300	mW
	Derate Above 25°C	4	mW/ $^\circ\text{C}$

- Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

MOC3071M, MOC3072M

ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.

INDIVIDUAL COMPONENT CHARACTERISTICS

Symbol	Parameters	Test Conditions	Min.	Typ.	Max.	Unit
EMITTER						
V _F	Input Forward Voltage	I _F = 10 mA		1.18	1.50	V
I _R	Reverse Leakage Current	V _R = 3 V		0.05	100	μA
DETECTOR						
I _{DRM}	Peak Blocking Current, Either Direction	V _{DRM} = 800 V, I _F = 0 (Note 2)		10	200	nA
V _{TM}	Peak On-State Voltage, Either Direction	I _{TM} = 100 mA peak, I _F = 0		2.2	2.5	V
dv/dt	Critical Rate of Rise of Off-State Voltage	I _F = 0, V _{DRM} = 800 V)	1000			V/μs

TRANSFER CHARACTERISTICS

Symbol	DC Characteristics	Test Conditions	Device	Min.	Typ.	Max.	Unit
I _{FT}	LED Trigger Current, Either Direction	Main Terminal Voltage = 3 V (Note 3)	MOC3071M			15	mA
			MOC3072M			10	
I _H	Holding Current, Either Direction		All		540		μA

ISOLATION CHARACTERISTICS

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
V _{ISO}	Input-Output Isolation Voltage (Note 4)	f = 60 Hz, t = 1 Minute	4170			VAC _{RMS}
R _{ISO}	Isolation Resistance	V _{I-O} = 500 V _{DC}		10 ¹¹		Ω
C _{ISO}	Isolation Capacitance	V = 0 V, f = 1 MHz		0.2		pF

- Test voltage must be applied within dv/dt rating.
- All devices are guaranteed to trigger at an I_F value less than or equal to max I_{FT}. Therefore, the recommended operating I_F lies between maximum I_{FT} (15 mA for MOC3071M, 10 mA for MOC3072M) and absolute maximum I_F (60 mA).
- Isolation voltage, V_{ISO}, is an internal device dielectric breakdown rating. For this test, pins 1 and 2 are common, and pins 4, 5 and 6 are common.

TYPICAL CHARACTERISTICS

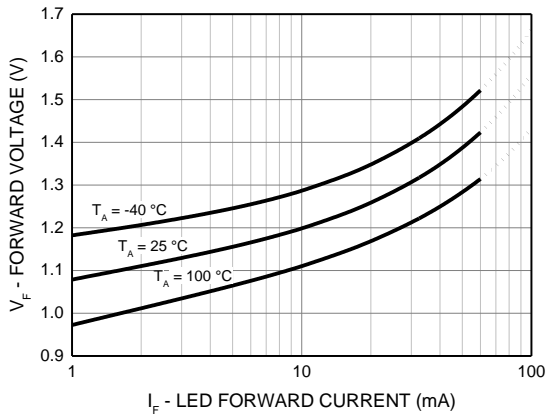


Figure 1. LED Forward Voltage vs. Forward Current

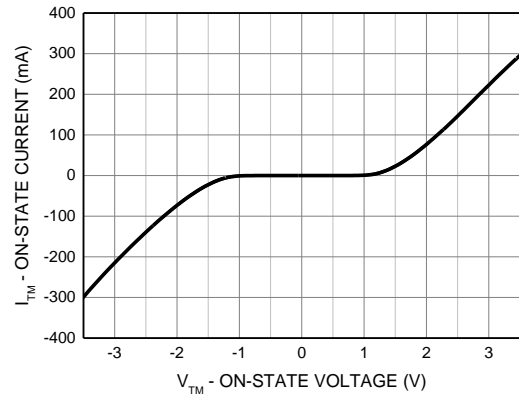


Figure 2. On-State Characteristics

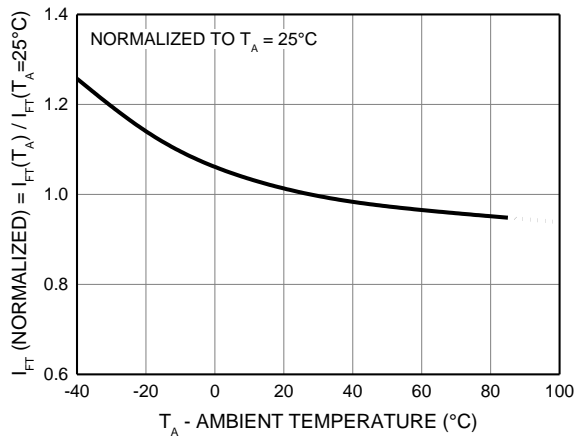


Figure 3. LED Trigger Current vs. Ambient Temperature

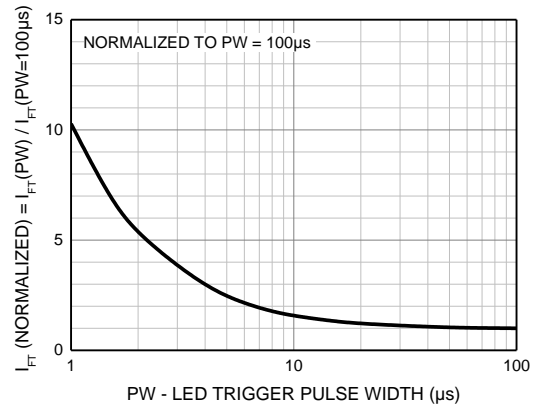


Figure 4. LED Trigger Current vs. LED Pulse Width

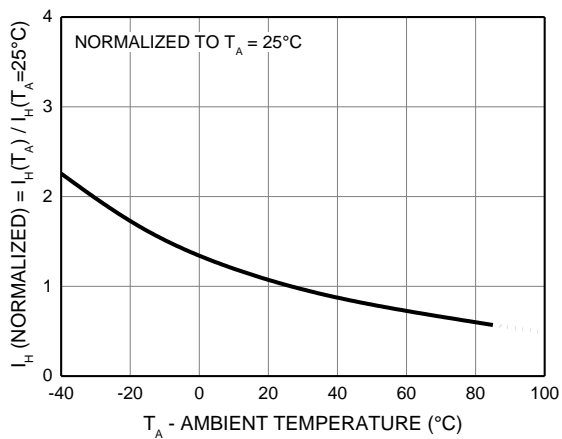


Figure 5. Holding Current vs. Ambient Temperature

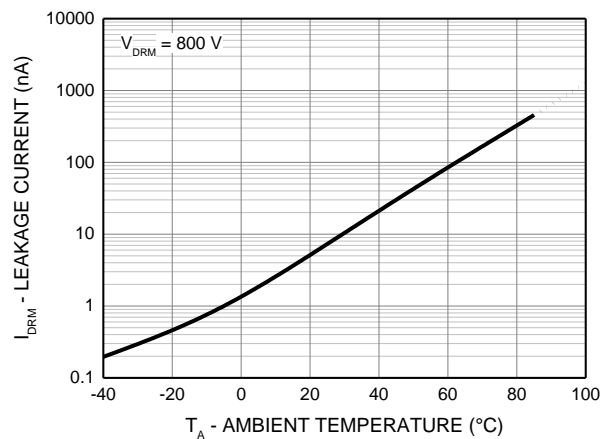


Figure 6. Leakage Current vs. Ambient Temperature

APPLICATIONS INFORMATION

Basic Triac Driver Circuit

The random phase triac drivers MOC3071M and MOC3072M can allow snubberless operations in applications where load is resistive and the external generated noise in the AC line is below its guaranteed dv/dt withstand capability. For these applications, a snubber circuit is not necessary when a noise insensitive power triac is used. Figure 7 shows the circuit diagram. The triac driver is directly connected to the triac main terminal 2 and a series resistor R which limits the current to the triac driver. Current limiting resistor R must have a minimum value which restricts the current into the driver to maximum 1 A.

The power dissipation of this current limiting resistor and the triac driver is very small because the power triac carries the load current as soon as the current through driver and current limiting resistor reaches the trigger current of the power triac. The switching transition times for the driver is only one micro second and for power triacs typical four micro seconds.

Triac Driver Circuit for Noisy Environments

When the transient rate of rise and amplitude are expected to exceed the power triacs and triac drivers maximum ratings a snubber circuit as shown in Figure 8 is recommended. Fast transients are slowed by the R-C snubber and excessive amplitudes are clipped by the Metal Oxide Varistor MOV.

Triac Driver Circuit for Extremely Noisy Environments

As specified in the noise standards IEEE472 and IEC255-4.

Industrial control applications do specify a maximum transient noise dv/dt and peak voltage which is superimposed onto the AC line voltage. In order to pass this environment noise test a modified snubber network as shown in Figure 9 is recommended.

LED Trigger Current versus Temperature

Recommended operating LED control current I_F lies between the guaranteed I_{FT} and absolute maximum I_F . Figure 3 shows the increase of the trigger current when the device is expected to operate at an ambient temperature below 25°C. Multiply the datasheet guaranteed I_{FT} with the normalized I_{FT} shown on this graph and an allowance for LED degradation over time.

Example:

$$I_{FT} = 10 \text{ mA, LED degradation factor} = 20\%$$

$$I_F \text{ at } -40^\circ\text{C} = 10 \text{ mA} \times 1.25 \times 120\% = 15 \text{ mA}$$

LED Trigger Current vs. Pulse Width

Random phase triac drivers are designed to be phase controllable. They may be triggered at any phase angle within the AC sine wave. Phase control may be accomplished by an AC line zero cross detector and a variable pulse delay generator which is synchronized to the zero cross detector. The same task can be accomplished by a microprocessor which is synchronized to the AC zero crossing. The phase controlled trigger current may be a very short pulse which saves energy delivered to the input LED. LED trigger pulse currents shorter than 100 μs must have increased amplitude as shown on Figure 4. This graph shows the dependency of the trigger current I_{FT} versus the pulse width. I_{FT} in this graph is normalized in respect to the minimum specified I_{FT} for static condition, which is specified in the device characteristic. The normalized I_{FT} has to be multiplied with the devices guaranteed static trigger current.

Example:

$$I_{FT} = 10 \text{ mA, Trigger PW} = 4 \mu\text{s}$$

$$I_F (\text{pulsed}) = 10 \text{ mA} \times 3 = 30 \text{ mA}$$

Minimum LED Off Time in Phase Control Applications

In phase control applications, one intends to be able to control each AC sine half wave from 0° to 180°. Turn on at 0° means full power and turn on at 180° means zero power. This is not quite possible in reality because triac driver and triac have a fixed turn on time when activated at zero degrees. At a phase control angle close to 180° the driver's turn on pulse at the trailing edge of the AC sine wave must be limited to end 200 μs before AC zero cross as shown in Figure 10. This assures that the triac driver has time to switch off. Shorter times may cause loss of control at the following half cycle.

Static dv/dt

Critical rate of rise of off-state voltage or static dv/dt is a triac characteristic that rates its ability to prevent false triggering in the event of fast rising line voltage transients when it is in the off-state. When driving a discrete power triac, the triac driver optocoupler switches back to off-state once the power triac is triggered. However, during the commutation of the power triac in application where the load is inductive, both triacs are subjected to fast rising voltages. The static dv/dt rating of the triac driver optocoupler and the commutating dv/dt rating of the power triac must be taken into consideration in snubber circuit design to prevent false triggering and commutation failure.

MOC3071M, MOC3072M

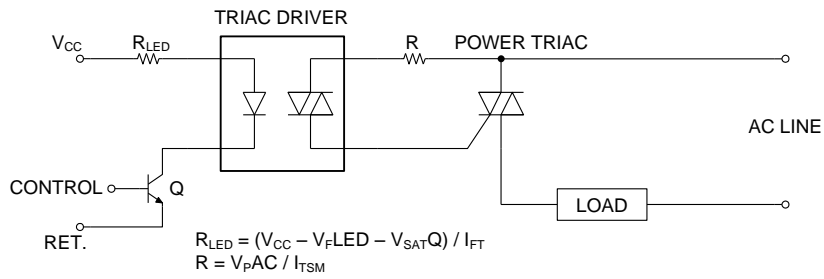


Figure 7. Basic Driver Circuit

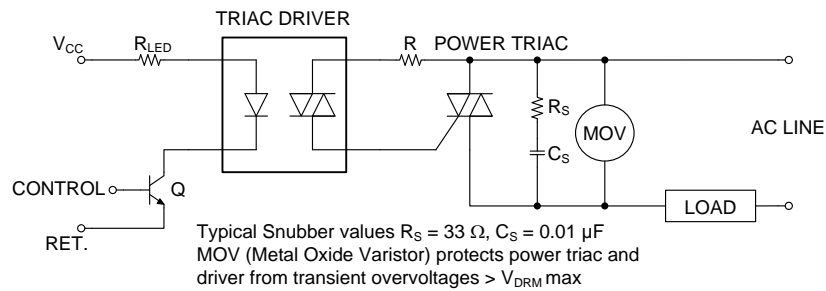


Figure 8. Triac Driver Circuit for Noisy Environments

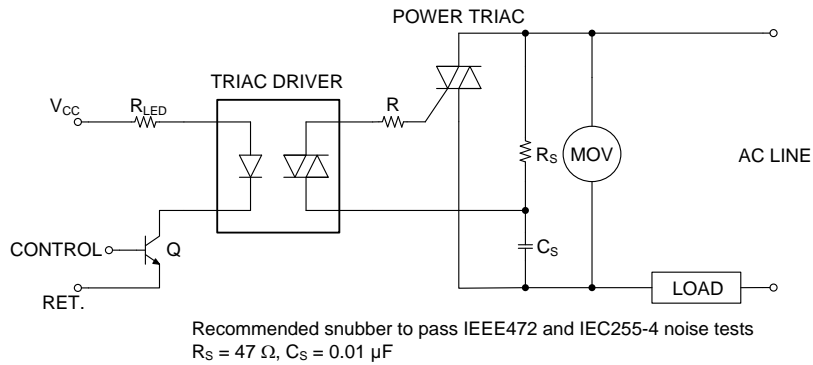


Figure 9. Triac Driver Circuit for Extremely Noisy Environments

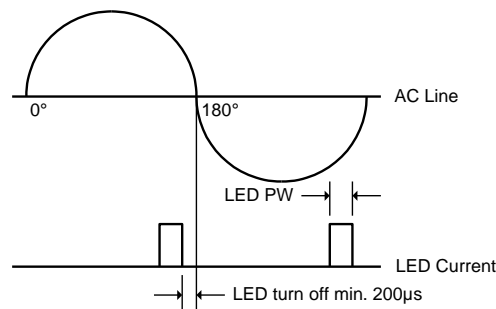
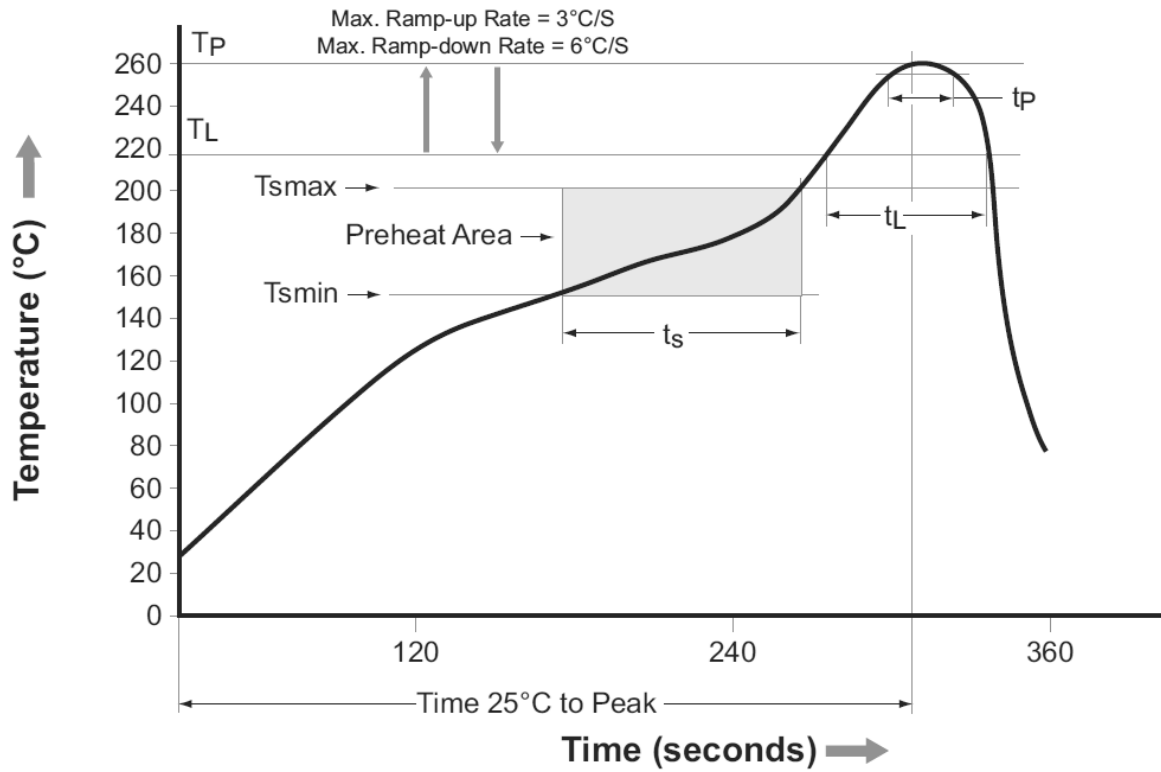


Figure 10. Minimum Time for LED Turn Off to Zero Crossing

REFLOW PROFILE



Profile Feature	Pb-Free Assembly Profile
Temperature Minimum (T_{smin})	150°C
Temperature Maximum (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60 seconds to 120 seconds
Ramp-up Rate (T_L to T_P)	3°C/second maximum
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60 seconds to 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second maximum
Time 25°C to Peak Temperature	8 minutes maximum

Figure 11. Reflow Profile

MOC3071M, MOC3072M

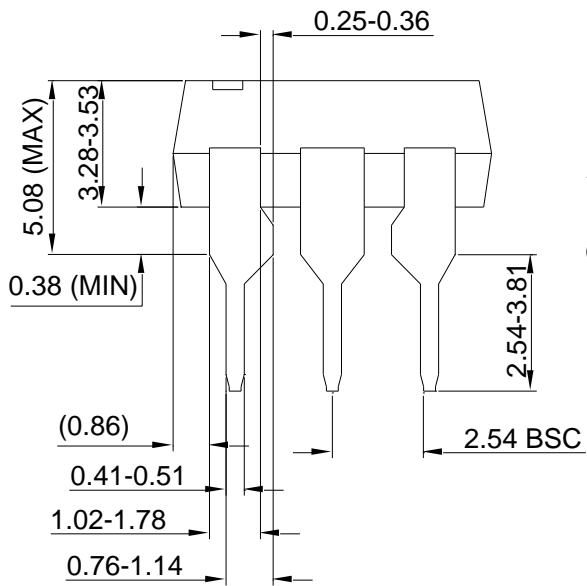
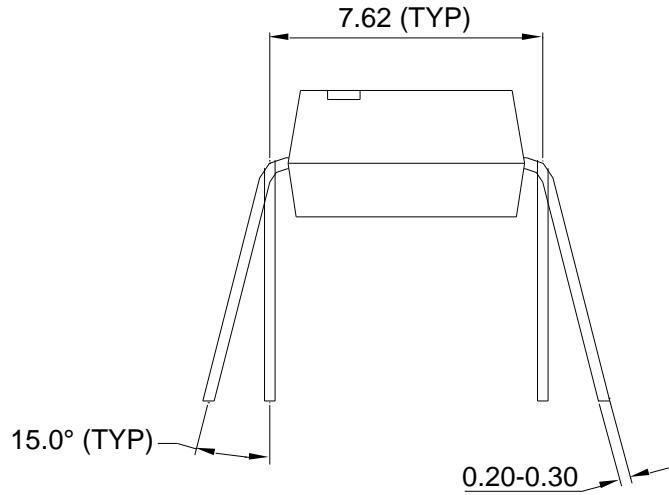
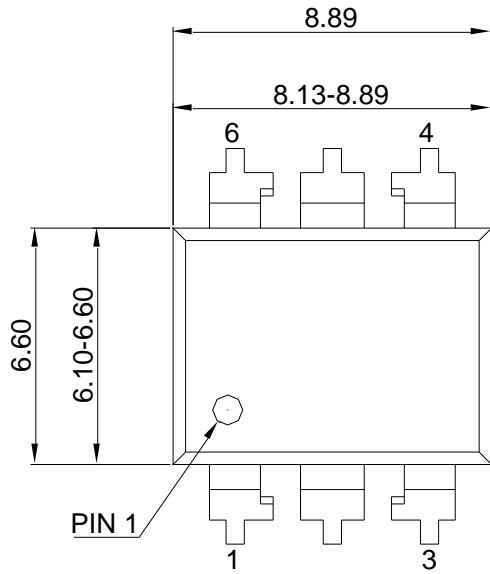
ORDERING INFORMATION (Note 5)

Device	Package	Shipping
MOC3071M	DIP 6-Pin	Tube (50 Units)
MOC3071SM	SMT 6-Pin (Lead Bend)	Tube (50 Units)
MOC3071SR2M	SMT 6-Pin (Lead Bend)	Tape and Reel (1000 Units)
MOC3071VM	DIP 6-Pin, DIN EN/IEC60747-5-5 Option (pending approval)	Tube (50 Units)
MOC3071SVM	SMT 6-Pin (Lead Bend), DIN EN/IEC60747-5-5 Option (pending approval)	Tube (50 Units)
MOC3071SR2VM	SMT 6-Pin (Lead Bend), DIN EN/IEC60747-5-5 Option (pending approval)	Tape and Reel (1000 Units)
MOC3071TVM	DIP 6-Pin, 0.4" Lead Spacing, DIN EN/IEC60747-5-5 Option (pending approval)	Tube (50 Units)

5. The product orderable part number system listed in this table also applies to the MOC3072M product families.

MOC3071M, MOC3072M

PACKAGING DIMENSIONS

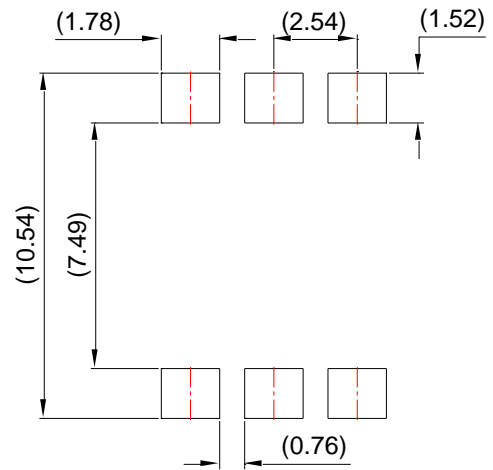
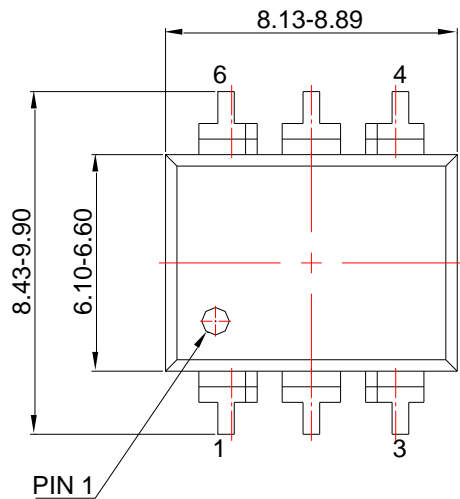


NOTES:

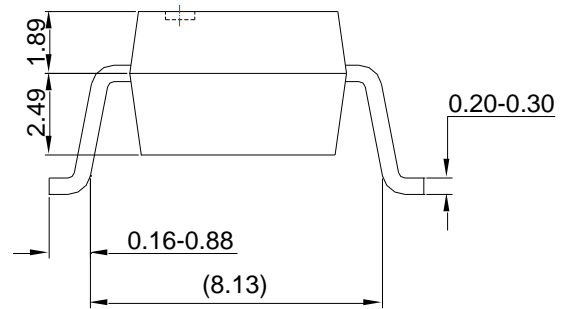
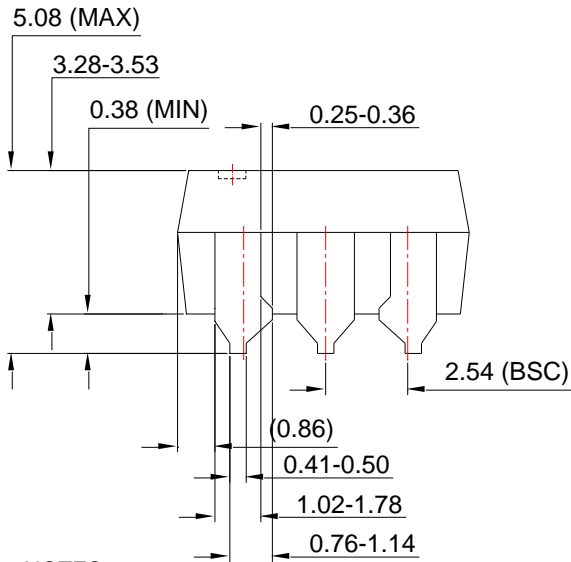
- A) NO STANDARD APPLIES TO THIS PACKAGE.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSION
- D) DRAWING FILENAME AND REVISION: MKT-N06BREV4.

6 LEAD MDIP OPTO WHITE 0.3" WIDE

MOC3071M, MOC3072M



LAND PATTERN RECOMMENDATION

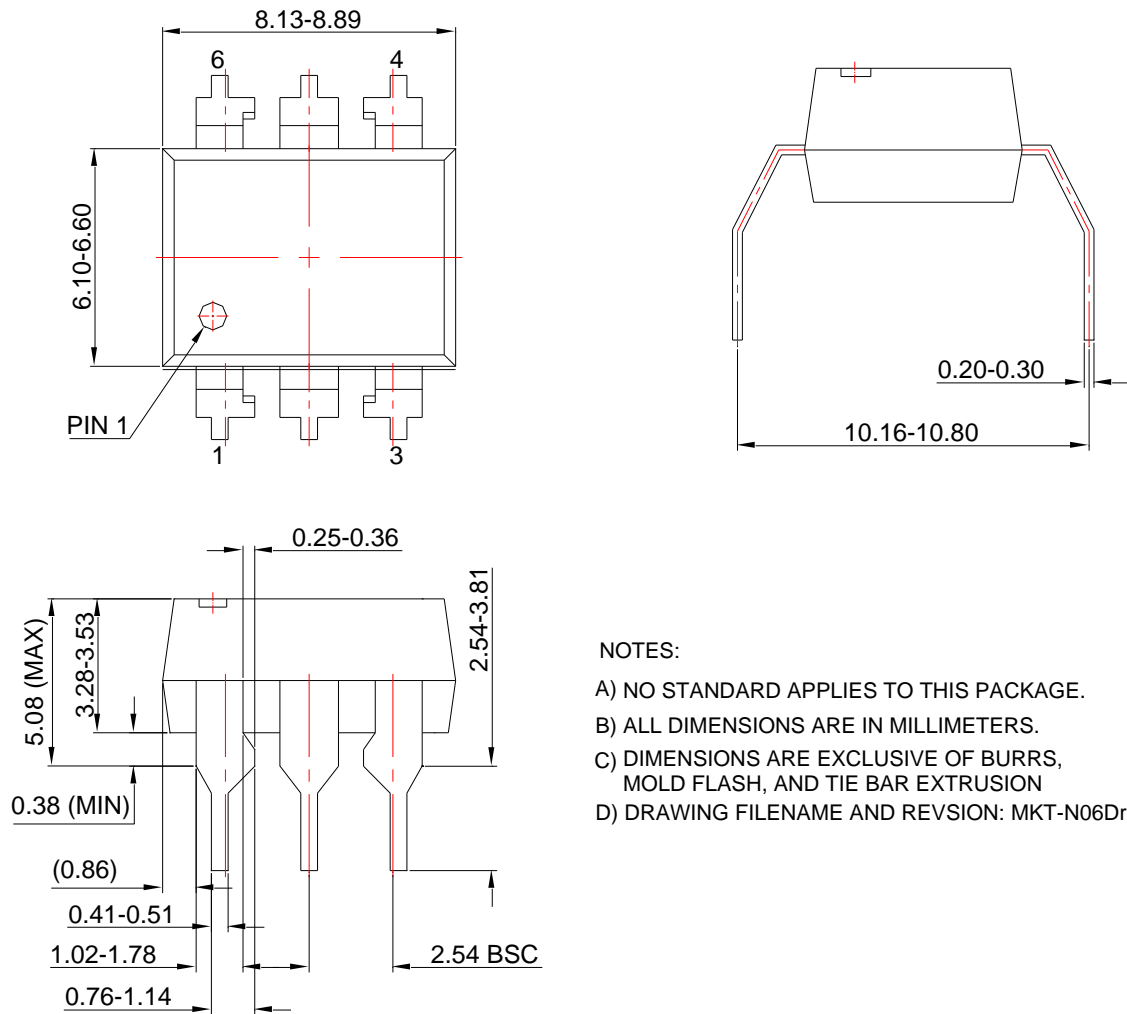


NOTES:

- A) NO STANDARD APPLIES TO THIS PACKAGE.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSION
- D) DRAWING FILENAME AND REVISION : MKT-N06CREV4.

6-LEAD MDIP OPTO WHITE SURFACE MOUNT FORM

MOC3071M, MOC3072M



NOTES:

- A) NO STANDARD APPLIES TO THIS PACKAGE.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSION
- D) DRAWING FILENAME AND REVISION: MKT-N06Drev4

6 LEAD MDIP OPTO WHITE 0.4" LEAD SPACING

MOC3071M, MOC3072M

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA

Phone: 303-675-2175 or 800-344-3860 Toll Free
USA/Canada

Fax: 303-675-2176 or 800-344-3867 Toll Free
USA/Canada

Email: orderlit@onsemi.com

N. American Technical Support: 800-282-
9855 Toll Free

USA/Canada.

**Europe, Middle East and Africa Technical
Support:**

Phone: 421 33 790 2910

Japan Customer Focus Center

Phone: 81-3-5817-1050

ON Semiconductor Website:

www.onsemi.com

Order Literature:

<http://www.onsemi.com/orderlit>

For additional information, please contact
your local
Sales Representative

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910

Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local
Sales Representative

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ON Semiconductor:](#)

[MOC3071M](#) [MOC3071SM](#)



**Стандарт
Электрон
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331