



Is Now Part of



ON Semiconductor®

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



May 2016

MOCD207M, MOCD208M, MOCD211M, MOCD213M, MOCD217M 8-pin SOIC Dual-Channel Phototransistor Output Optocoupler

Features

- Closely Matched Current Transfer Ratios
- Minimum BV_{CEO} of 70 V Guaranteed
 - MOCD207M, MOCD208M
- Minimum BV_{CEO} of 30 V Guaranteed
 - MOCD211M, MOCD213M, MOCD217M
- Low LED Input Current Required for Easier Logic Interfacing
 - MOCD217M
- Convenient Plastic SOIC-8 Surface Mountable Package Style, with 0.050" Lead Spacing
- Safety and Regulatory Approvals:
 - UL1577, 2,500 VAC_{RMS} for 1 Minute
 - DIN-EN/IEC60747-5-5, 565 V Peak Working Insulation Voltage

Applications

- Feedback Control Circuits
- Interfacing and Coupling Systems of Different Potentials and Impedances
- General Purpose Switching Circuits
- Monitor and Detection Circuits

Description

These devices consist of two gallium arsenide infrared emitting diodes optically coupled to two monolithic silicon phototransistor detectors, in a surface mountable, small outline, plastic package. They are ideally suited for high-density applications, and eliminate the need for through-the-board mounting.

Schematic

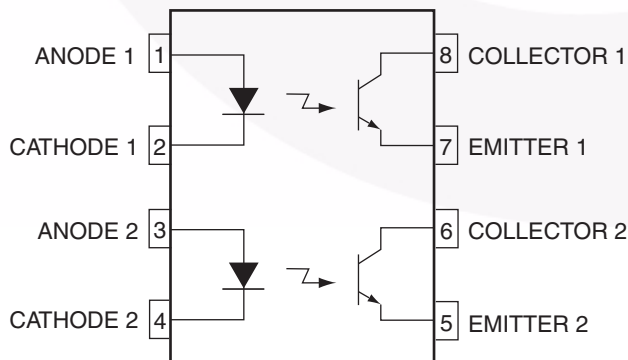


Figure 1. Schematic

Package Outline

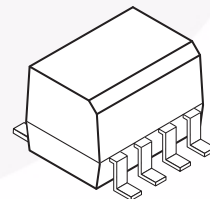


Figure 2. Package Outline

Safety and Insulation Ratings

As per DIN EN/IEC 60747-5-5, 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 V _{RMS}	I–IV
	< 300 V _{RMS}	I–III
Climatic Classification		55/100/21
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	904	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	1060	V _{peak}
V _{IORM}	Maximum Working Insulation Voltage	565	V _{peak}
V _{IOTM}	Highest Allowable Over-Voltage	4000	V _{peak}
	External Creepage	≥ 4	mm
	External Clearance	≥ 4	mm
DTI	Distance Through Insulation (Insulation Thickness)	≥ 0.4	mm
T _S	Case Temperature ⁽¹⁾	150	°C
I _{S,INPUT}	Input Current ⁽¹⁾	200	mA
P _{S,OUTPUT}	Output Power ⁽¹⁾	300	mW
R _{IO}	Insulation Resistance at T _S , V _{IO} = 500 V ⁽¹⁾	> 10 ⁹	Ω

Note:

1. Safety limit values – maximum values allowed in the event of a failure.

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. $T_A = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Rating	Value	Unit
TOTAL DEVICE			
T_{STG}	Storage Temperature	-40 to +125	$^\circ\text{C}$
T_A	Ambient Operating Temperature	-40 to +100	$^\circ\text{C}$
T_J	Junction Temperature	-40 to +125	$^\circ\text{C}$
T_{SOL}	Lead Solder Temperature	260 for 10 seconds	$^\circ\text{C}$
P_D	Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$	240	mW
	Derate Above 25°C	2.94	mW/ $^\circ\text{C}$
EMITTER			
I_F	Continuous Forward Current	60	mA
I_F (pk)	Forward Current – Peak (PW = 100 μs , 120 pps)	1.0	A
V_R	Reverse Voltage	6.0	V
P_D	LED Power Dissipation @ $T_A = 25^\circ\text{C}$	90	mW
	Derate Above 25°C	0.8	mW/ $^\circ\text{C}$
DETECTOR			
I_C	Continuous Collector Current	150	mA
V_{CEO}	Collector-Emitter Voltage MOCD207M, MOCD208M, MOCD213M	70	V
	MOCD211M, MOCD217M	30	V
V_{ECO}	Emitter-Collector Voltage	7	V
P_D	Detector Power Dissipation @ $T_A = 25^\circ\text{C}$	150	mW
	Derate Above 25°C	1.76	mW/ $^\circ\text{C}$

Electrical Characteristics

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

Symbol	Parameter	Device	Test Conditions	Min.	Typ.	Max.	Unit
EMITTER							
V_F	Input Forward Voltage	MOCD217M	$I_F = 1\text{ mA}$		1.05	1.3	V
		MOCD213M	$I_F = 10\text{ mA}$		1.15	1.5	V
		MOCD207M, MOCD208M, MOCD211M	$I_F = 30\text{ mA}$		1.25	1.5	V
I_R	Reverse Leakage Current	All	$V_R = 6\text{ V}$		0.001	100	μA
C_{IN}	Input Capacitance	All			18		pF
DETECTOR							
I_{CEO}	Collector-Emitter Dark Current	All	$V_{CE} = 10\text{ V}, T_A = 25^\circ\text{C}$		1.0	50	nA
			$V_{CE} = 10\text{ V}, T_A = 100^\circ\text{C}$		1.0		μA
BV_{CEO}	Collector-Emitter Breakdown Voltage	MOCD211M, MOCD217M	$I_C = 100\text{ }\mu\text{A}$	30	100		V
		MOCD207M, MOCD208M, MOCD213M	$I_C = 100\text{ }\mu\text{A}$	70	100		V
BV_{ECO}	Emitter-Collector Breakdown Voltage	All	$I_E = 100\text{ }\mu\text{A}$	7	10		V
C_{CE}	Collector-Emitter Capacitance	All	$f = 1.0\text{ MHz}, V_{CE} = 0$		7		pF
COUPLED							
CTR	Collector-Output Current	MOCD207M	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	100		200	%
		MOCD208M	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	40		125	%
		MOCD211M	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	20			%
		MOCD213M	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	100			%
		MOCD217M	$I_F = 1\text{ mA}, V_{CE} = 5\text{ V}$	100			%
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	MOCD207M, MOCD208M, MOCD211M, MOCD213M	$I_C = 2\text{ mA}, I_F = 10\text{ mA}$			0.4	V
		MOCD217M	$I_C = 100\text{ }\mu\text{A}, I_F = 1\text{ mA}$			0.4	V
t_{on}	Turn-On Time	All	$I_C = 2\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\text{ }\Omega$ (Figure 8)		7.5		μs
t_{off}	Turn-Off Time	All	$I_C = 2\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\text{ }\Omega$ (Figure 8)		5.7		μs
t_r	Rise Time	All	$I_C = 2\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\text{ }\Omega$ (Figure 8)		3.2		μs
t_f	Fall Time	All	$I_C = 2\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\text{ }\Omega$ (Figure 8)		4.7		μs

Electrical Characteristics

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

Isolation Characteristics

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
V_{ISO}	Input-Output Isolation Voltage	$t = 1 \text{ Minute}$	2500			$V_{AC_{RMS}}$
C_{ISO}	Isolation Capacitance	$V_{I-O} = 0 \text{ V}, f = 1 \text{ MHz}$		0.2		pF
R_{ISO}	Isolation Resistance	$V_{I-O} = \pm 500 \text{ VDC}, T_A = 25^\circ\text{C}$	10^{11}			Ω



Typical Performance Curves

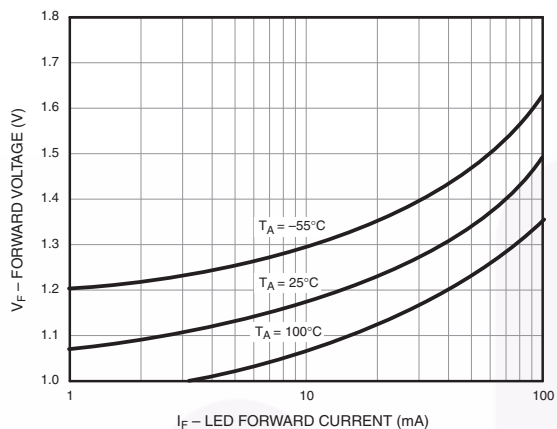


Figure 3. LED Forward Voltage vs. Forward Current

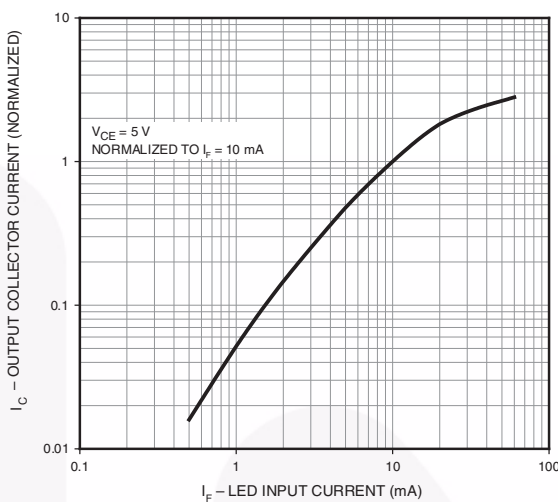


Figure 4. Output Current vs. Input Current

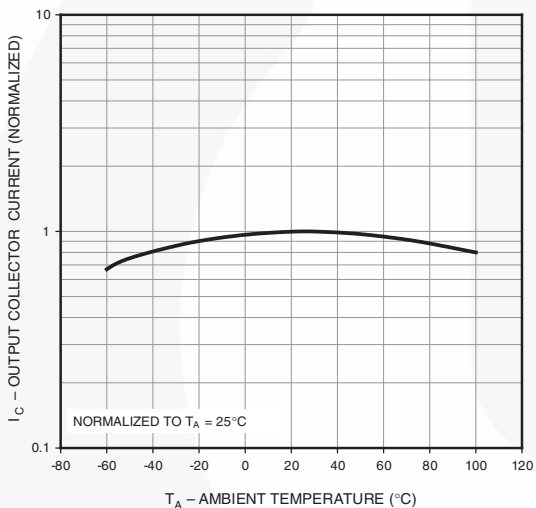


Figure 5. Output Current vs. Ambient Temperature

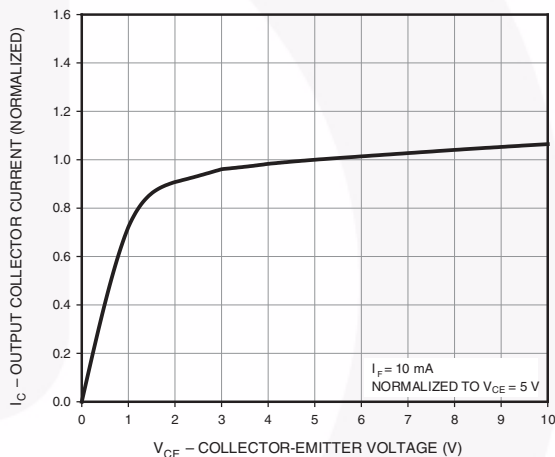


Figure 6. Output Current vs. Collector-Emitter Voltage

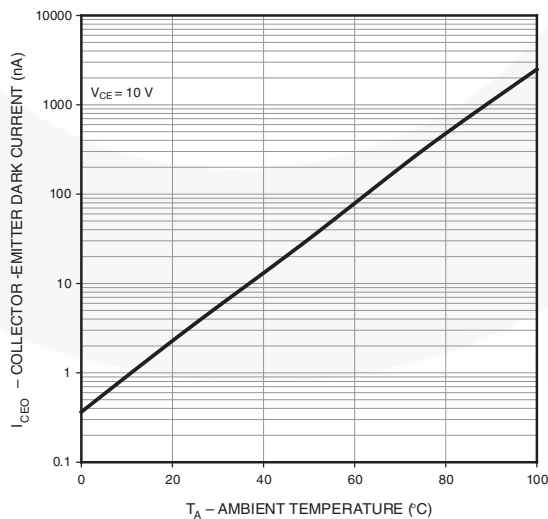


Figure 7. Dark Current vs. Ambient Temperature

Switching Time Test Circuit and Waveforms



Figure 8. Switching Time Test Circuit and Waveforms



Reflow Profile



Figure 9. 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})	60–120 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)	60–150 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

Ordering Information⁽²⁾

Part Number	Package	Packing Method
MOCD207M	Small Outline 8-Pin	Tube (100 Units)
MOCD207R2M	Small Outline 8-Pin	Tape and Reel (2500 Units)
MOCD207VM	Small Outline 8-Pin, DIN EN/IEC60747-5-5 Option	Tube (100 Units)
MOCD207R2VM	Small Outline 8-Pin, DIN EN/IEC60747-5-5 Option	Tape and Reel (2500 Units)

Note:

2. The product orderable part number system listed in this table also applies to the MOCD208M, MOCD211M, MOCD213M, and MOCD217M products.

Marking Information



Figure 10. Top Mark

Table 1. Top Mark Definitions

1	Fairchild Logo
2	Device Number
3	DIN EN/IEC60747-5-5 Option (only appears on component ordered with this option)
4	One-Digit Year Code, e.g., "4"
5	Digit Work Week, Ranging from "01" to "53"
6	Assembly Package Code



NOTES:

- A) NO STANDARD APPLIES TO THIS PACKAGE
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS.
- D) LANDPATTERN STANDARD: SOIC127P600X175-8M.
- E) DRAWING FILENAME: MKT-M08Erev5





TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

- AccuPower™
- AttitudeEngine™
- Awinda®
- AX-CAP®*
- BitSiC™
- Build it Now™
- CorePLUS™
- CorePOWER™
- CROSSVOL™
- CTL™
- Current Transfer Logic™
- DEUXPEED®
- Dual Cool™
- EcoSPARK®
- EfficientMax™
- ESBC™
- F**™
- Fairchild®
- Fairchild Semiconductor®
- FACT Quiet Series™
- FACT®
- FastvCore™
- FETBench™
- FPS™
- F-PFS™
- FRFET®
- Global Power ResourceSM
- GreenBridge™
- Green FPS™
- Green FPS™ e-Series™
- Gmax™
- GTO™
- IntelliMAX™
- ISOPLANAR™
- Making Small Speakers Sound Louder and Better™
- MegaBuck™
- MICROCOUPLER™
- MicroFET™
- MicroPak™
- MicroPak2™
- MillerDrive™
- MotionMax™
- MotionGrid®
- MTi®
- MTx®
- MVN®
- mWSaver®
- OptoHiT™
- OPTOLOGIC®
- OPTOPLANAR®
- ®
- Power Supply WebDesigner™
- PowerTrench®
- PowerXS™
- Programmable Active Droop™
- QFET®
- QS™
- Quiet Series™
- RapidConfigure™
- ™
- Saving our world, 1mW/W/kW at a time™
- SignalWise™
- SmartMax™
- SMART START™
- Solutions for Your Success™
- SPM®
- STEALTH™
- SuperFET®
- SuperSOT™-3
- SuperSOT™-6
- SuperSOT™-8
- SupreMOS®
- SyncFET™
- Sync-Lock™
- SYSTEM GENERAL®*
- TinyBoost®
- TinyBuck®
- TinyCalc™
- TinyLogic®
- TINYOPTO™
- TinyPower™
- TinyPWM™
- TinyWire™
- TranSiC™
- TriFault Detect™
- TRUECURRENT®*
- μSerDes™
- SerDes®
- UHC®
- Ultra FRFET™
- UniFET™
- VcX™
- VisualMax™
- VoltagePlus™
- XS™
- Xsens™
- 仙童®

* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. TO OBTAIN THE LATEST, MOST UP-TO-DATE DATASHEET AND PRODUCT INFORMATION, VISIT OUR WEBSITE AT [HTTP://WWW.FAIRCHILDSEMI.COM](http://www.fairchildsemi.com). FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

AUTHORIZED USE

Unless otherwise specified in this data sheet, this product is a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability. This product may not be used in the following applications, unless specifically approved in writing by a Fairchild officer: (1) automotive or other transportation, (2) military/aerospace, (3) any safety critical application – including life critical medical equipment – where the failure of the Fairchild product reasonably would be expected to result in personal injury, death or property damage. Customer's use of this product is subject to agreement of this Authorized Use policy. In the event of an unauthorized use of Fairchild's product, Fairchild accepts no liability in the event of product failure. In other respects, this product shall be subject to Fairchild's Worldwide Terms and Conditions of Sale, unless a separate agreement has been signed by both Parties.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Terms of Use

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

Rev. I77

Mouser Electronics

Authorized Distributor

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

[Fairchild Semiconductor:](#)

[MOCD208M](#) [MOCD208R2M](#)