

Small Outline Optoisolators

Transistor Output (Low Input Current)

These devices consist of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon phototransistor detector, 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.

- Convenient Plastic SOIC-8 Surface Mountable Package Style
- Low LED Input Current Required, for Easier Logic Interfacing
- • Standard SOIC-8 Footprint, with 0.050" Lead Spacing
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- High Input-Output Isolation of 3000 Vac (rms) Guaranteed
- • UL Recognized The #E90700, Volume 2

Ordering Information:

- •To obtain MOC215, 216, 217 in Tape and Reel, add R2 suffix to device numbers:
 R2 = 2500 units on 13" reel
- To obtain MOC215, 216, 217 in quantities of 50 (shipped in sleeves) No Suffix

Marking Information:

- MOC215 = 215
- MOC216 = 216
- • MOC217 = 217

Applications:

- Low power Logic Circuits
- Interfacing and coupling systems of different potentials and impedances
- · Telecommunications equipment
- Portable electronics

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

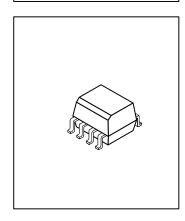
Rating	Symbol	Value	Unit
INPUT LED			
Forward Current — Continuous	lF	60	mA
Forward Current — Peak (PW = 100 μs, 120 pps)	IF(pk)	1.0	Α
Reverse Voltage	٧ _R	6.0	V
LED Power Dissipation @ T _A = 25°C Derate above 25°C	PD	90 0.8	mW mW/°C

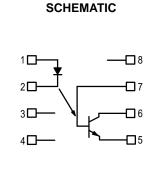
OUTPUT TRANSISTOR

Collector–Emitter Voltage	VCEO	30	V
Collector–Base Voltage	VCBO	70	V
Emitter–Collector Voltage	VECO	7.0	V
Collector Current — Continuous	IC	150	mA
Detector Power Dissipation @ T _A = 25°C Derate above 25°C	P _D	150 1.76	mW mW/°C

MOC215 MOC216 MOC217

SMALL OUTLINE OPTOISOLATORS TRANSISTOR OUTPUT





- 1. LED ANODE
- 2. LED CATHODE
- 3. NO CONNECTION
- 4. NO CONNECTION
- 5. EMITTER
- 6. COLLECTOR
- 7. BASE
- 8. NO CONNECTION

Value

0.2

Unit

Symbol



MAXIMUM RATINGS — continued ($T_A = 25^{\circ}C$ unless otherwise noted)

Rating

TOTAL DEVICE						
Input–Output Isolation Voltage ^(1,2) (60 Hz, 1.0 sec. duration)			VISO	30	000	Vac(rms)
Total Device Power Dissipation @ Total Device Power Dissipation Device Power De	A = 25°C		PD	P _D 250 2.94		mW mW/°C
Ambient Operating Temperature Ran	nge(3)		TA	–45 to	+100	°C
Storage Temperature Range(3)			T _{stg}	–45 to	+125	°C
Lead Soldering Temperature (1/16" f	from case, 10 sec. duration)		_	20	60	°C
ELECTRICAL CHARACTERISTIC	CS (T _A = 25°C unless otherwise	e noted)(4)		-		
Character	istic	Symbol	Min	Typ ⁽⁴⁾	Max	Unit
INPUT LED						
Forward Voltage (I _F = 1.0 mA)		٧F	_	1.05	1.3	V
Reverse Leakage Current (V _R = 6.0	V)	I _R	_	0.1	100	μА
Capacitance		С	_	18	_	pF
OUTPUT TRANSISTOR						
Collector–Emitter Dark Current	$(V_{CE} = 5.0 \text{ V}, T_{A} = 25^{\circ}\text{C})$	I _{CEO} 1	_	1.0	50	nA
	$(V_{CE} = 5.0 \text{ V}, T_{A} = 100^{\circ}\text{C})$	ICEO2	_	1.0	_	μА
Collector–Emitter Breakdown Voltag	V(BR)CEO	30	90	_	V	
Emitter-Collector Breakdown Voltag	e (I _E = 100 μA)	V(BR)ECO	7.0	7.8	_	V
Collector-Emitter Capacitance (f = 1	C _{CE}	_	7.0	_	pF	
COUPLED						
Output Collector Current (IF = 1.0 mA, V _{CE} = 5.0 V)	MOC215 MOC216 MOC217	I _C (CTR) ⁽⁵⁾	200 (20) 500 (50) 1.0 (100)	500(50) 800 (80) 1.3 (130)	_ _ _	μΑ (%) μΑ (%) mA (%)
Collector–Emitter Saturation Voltage	V _{CE(sat)}	_	0.35	0.4	V	
Turn-On Time ($I_C = 2.0 \text{ mA}, V_{CC} =$	ton	_	7.5	_	μs	
Turn-Off Time ($I_C = 2.0 \text{ mA}, V_{CC} =$	t _{off}	_	5.7	_	μs	
Rise Time ($I_C = 2.0 \text{ mA}$, $V_{CC} = 10 \text{ V}$	t _r	_	3.2	_	μs	
Fall Time ($I_C = 2.0 \text{ mA}$, $V_{CC} = 10 \text{ V}$,	R _L = 100 Ω)	tf	_	4.7	_	μs
Input-Output Isolation Voltage (f = 6	0 Hz, $t = 1.0 \text{ sec.})^{(1,2)}$	VISO	3000	_	_	Vac(rms)
Isolation Resistance (V _{I-O} = 500 V)	(2)	RISO	10 ¹¹	_		Ω
	(-)					

CISO

- 1. Input-Output Isolation Voltage, V_{ISO}, is an internal device dielectric breakdown rating.
- 2. For this test, pins 1 and 2 are common, and pins 5, 6 and 7 are common.
- 3. Refer to Quality and Reliability Section in Opto Data Book for information on test conditions.
- 4. Always design to the specified minimum/maximum electrical limits (where applicable).
- 5. Current Transfer Ratio (CTR) = $I_C/I_F \times 100\%$.

Isolation Capacitance $(V_{I-O} = 0, f = 1.0 \text{ MHz})(2)$



TYPICAL CHARACTERISTICS

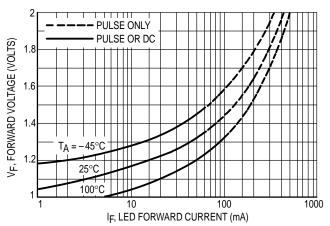


Figure 1. LED Forward Voltage versus Forward Current

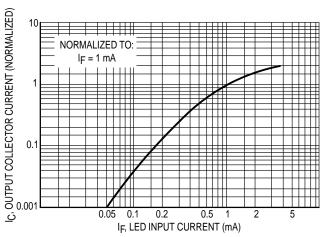


Figure 2. Output Current versus Input Current

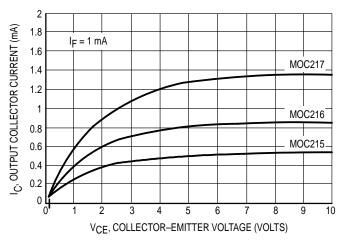


Figure 3. Output Current versus Collector–Emitter Voltage

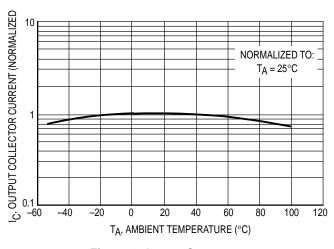


Figure 4. Output Current versus Ambient Temperature

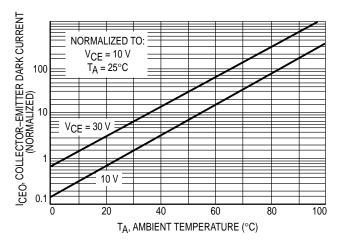


Figure 5. Dark Current versus Ambient Temperature

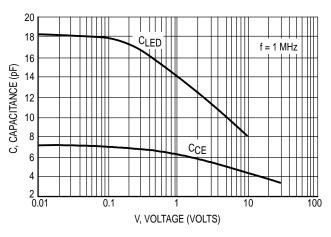
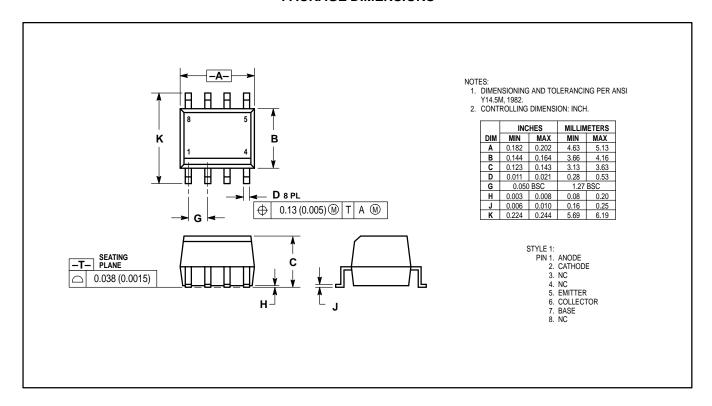


Figure 6. Capacitance versus Voltage



PACKAGE DIMENSIONS





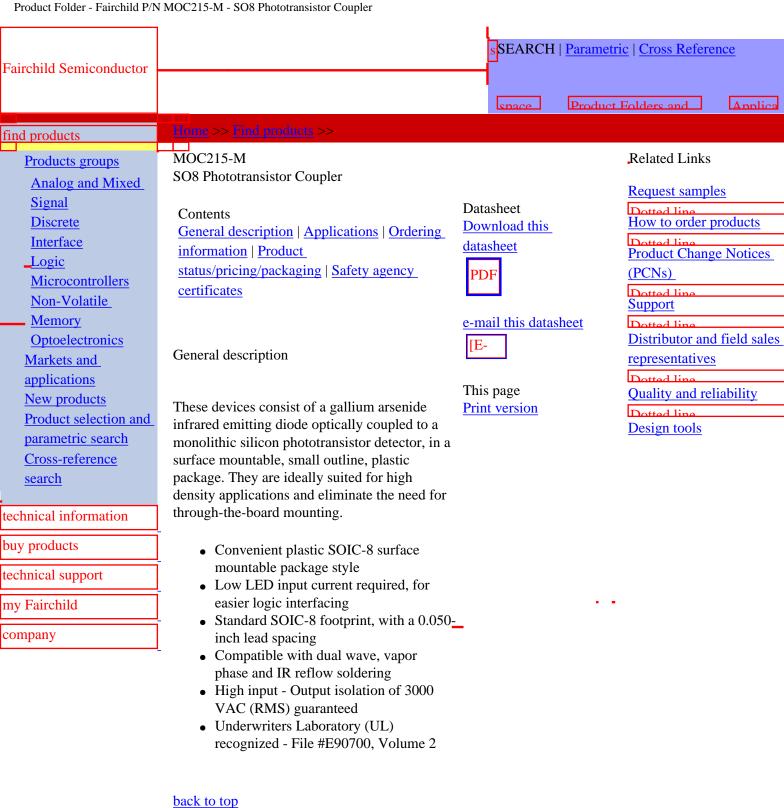
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- 2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



Applications

- Low power logic circuits
- Interfacing and coupling systems of different potentials and impedances
- Telecommunications equipment
- Portable electronics

Ordering information

The following options can be ordered with this part:

Option	Order Entry Identifier	Description
R1	R1	Surface-Mount Lead Bend Tape and Reel (500-pc reel)
R2	R2	Surface-Mount Lead Bend Tape and Reel (2500-pc reel)

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Product status/pricing/packaging

Product	Product status	Pricing*	Package type	Leads	Packing method
MOC215-M	Full Production	\$0.264	SOIC	8	RAIL
MOC215R1-M	Full Production	\$0.273	SOIC	8	TAPE REEL
MOC215R2-M	Full Production	\$0.273	SOIC	8	TAPE REEL

^{* 1,000} piece Budgetary Pricing

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Safety agency certificates

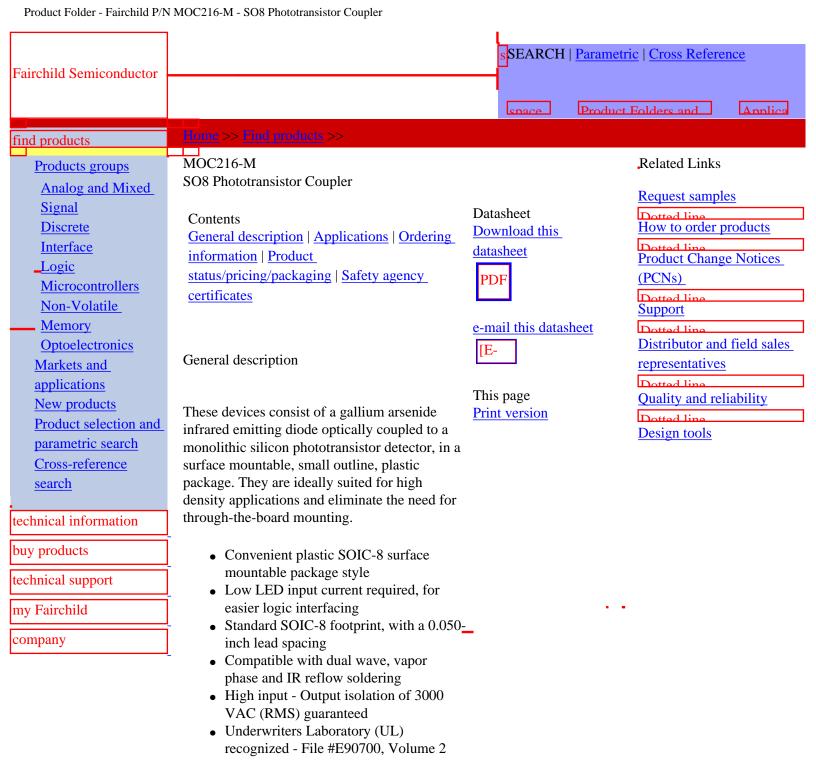
Cetificate		Agency		
8460,8461 (171 K)	BSI	British Standards Institution		
136616 (161 K)	VDE	VDE Pruf-und Zertifizierungsinstitut		
E90700, Vol. 2 (254 K)	UL	Underwriters Laboratories Inc.		

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Product status/pricing/packaging

Product	Product status	Pricing*	Package type	Leads	Packing method
MOC216-M	Full Production	\$0.281	SOIC	8	RAIL
MOC216R1-M	Full Production	\$0.291	SOIC	8	TAPE REEL
MOC216R2-M	Full Production	\$0.291	SOIC	8	TAPE REEL

^{* 1,000} piece Budgetary Pricing

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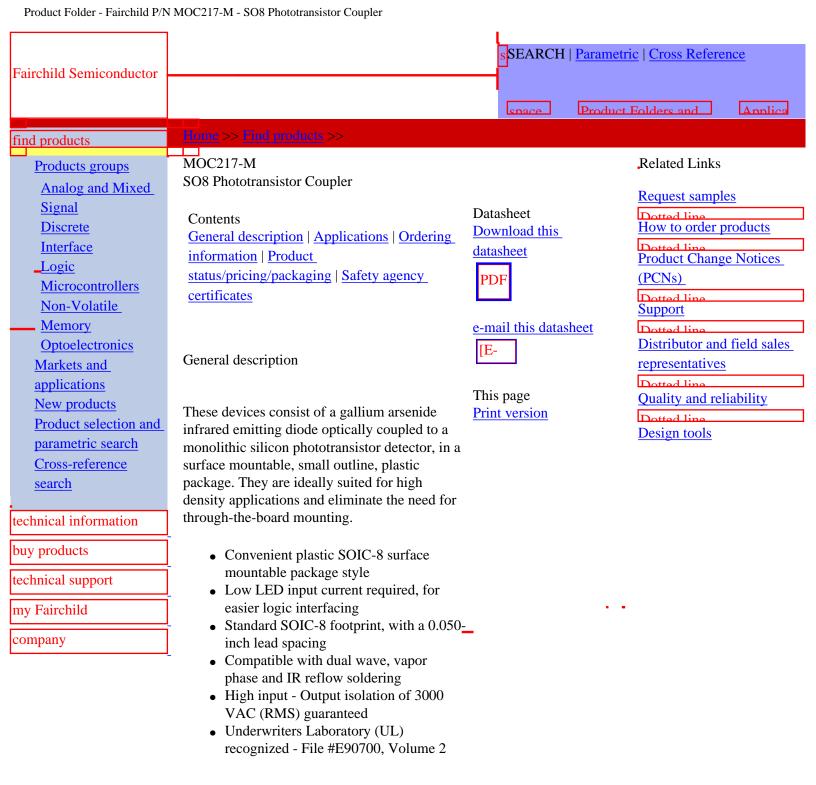
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MOC217R1-M	Full Production	\$0.291	SOIC	8	TAPE REEL
MOC217R2-M	Full Production	\$0.291	SOIC	8	TAPE REEL

^{* 1,000} piece Budgetary Pricing

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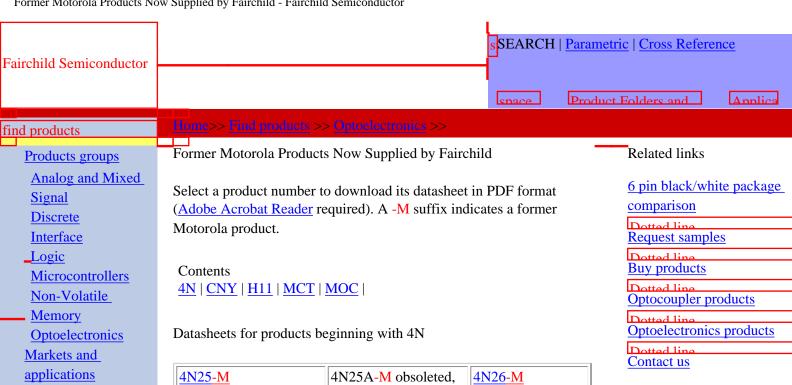
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4N25-M	4N25A-M obsoleted, no replacement	4N26-M
4N27-M	4N28-M	4N29-M replaced by 4N29
4N29A-M replaced by 4N29	4N30-M replaced by 4N30	4N31-M replaced by 4N31
4N32-M replaced by 4N32	4N33-M replaced by 4N33	4N35-M
4N36-M	4N37-M	4N38-M replaced by 4N38
4N38A-M replaced by 4N38		

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<u>H11A1-M</u>	H11AA1-M replaced by H11AA1	H11AA2-M replaced by H11AA2

H11AA3-M replaced by H11AA3	H11AA4-M replaced by H11AA4	<u>H11AV1-M</u>
H11AV1A-M	H11AV2-M	H11AV2A-M
H11B1-M replaced by H11B1	H11B3-M replaced by H11B3	H11D1-M replaced by H11D1
H11D2-M replaced by H11D2	H11G1-M replaced by H11G1	H11G2-M replaced by H11G2
H11G3-M replaced by H11G3	H11L1-M	H11L2-M
H11L3-M		

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Datasheets for products beginning with MCT

MCT2-M	MCT2E-M	

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Datasheets for products beginning with MOC

MOC205-M	MOC206-M	MOC207-M
MOC208-M	MOC211-M	MOC212-M
<u>MOC213-M</u>	MOC215-M	MOC216-M
MOC217-M	MOC223-M	MOC256-M
MOC3010-M	MOC3011-M	MOC3012-M
MOC3020-M	MOC3021-M	MOC3022-M
MOC3023-M	MOC3031-M	MOC3032-M
MOC3033-M	MOC3041-M	MOC3042-M
MOC3043-M	MOC3051-M	MOC3052-M
MOC3061-M	MOC3062-M	MOC3063-M
MOC3081-M	MOC3081-M	MOC3083-M
MOC3162-M	MOC3163-M	MOC5007-M
MOC5008-M	MOC5009-M	MOC8030-M replaced by MOC8030

Former Motorola Products Now Supplied by Fairchild - Fairchild Semiconductor

MOC8050-M replaced by MOC8050	MOC8080-M replaced by MOC8080	MOC8100-M
MOC8204-M replaced by MOC8204	MOCD207-M	MOCD208-M
MOCD211-M	MOCD213-M	MOCD217-M
MOCD223-M		

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