FAIRCHILD
SEMICONDUCTOR™

Small Outline Optoisolators
Transistor Output (Low Input Current)

MOC215
MOC216
MOC217

SMALL OUTLINE OPTOISOLATORS TRANSISTOR OUTPUT

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 File #E90700, Volume 2

Ordering Information:

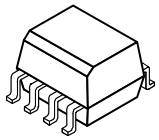
- •To obtain MOC215, 216, 217 in Tape and Reel, add R2 suffix to device numbers: R2 = 2500 units on 13″ reel
- •To obtain MOC215, 216, 217 in quantities of 50 (shipped in sleeves) — No Suffix

Marking Information:

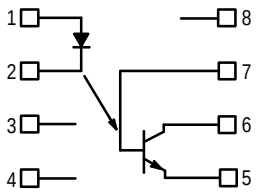
- • MOC215 = 215
- • MOC216 = 216
- • MOC217 = 217

Applications:

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



SCHEMATIC



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

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

Rating	Symbol	Value	Unit
INPUT LED			
Forward Current — Continuous	I_F	60	mA
Forward Current — Peak (PW = 100 µs, 120 pps)	I_F(pk)	1.0	A
Reverse Voltage	V_R	6.0	V
LED Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	90 0.8	mW mW/°C
OUTPUT TRANSISTOR			
Collector–Emitter Voltage	V_{CEO}	30	V
Collector–Base Voltage	V_{CBO}	70	V
Emitter–Collector Voltage	V_{ECO}	7.0	V
Collector Current — Continuous	I_C	150	mA
Detector Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	150 1.76	mW mW/°C

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

Rating	Symbol	Value	Unit
TOTAL DEVICE			
Input–Output Isolation Voltage(1,2) (60 Hz, 1.0 sec. duration)	V_{ISO}	3000	Vac(rms)
Total Device Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	250 2.94	mW mW/°C
Ambient Operating Temperature Range(3)	T_A	–45 to +100	°C
Storage Temperature Range(3)	T_{stg}	–45 to +125	°C
Lead Soldering Temperature (1/16″ from case, 10 sec. duration)	—	260	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)(4)

Characteristic		Symbol	Min	Typ(4)	Max	Unit
INPUT LED						
Forward Voltage (I_F = 1.0 mA)		V_F	—	1.05	1.3	V
Reverse Leakage Current (V_R = 6.0 V)		I_R	—	0.1	100	μA
Capacitance		C	—	18	—	pF
OUTPUT TRANSISTOR						
Collector–Emitter Dark Current	(V_{CE} = 5.0 V, T_A = 25°C)	$I_{CEO}1$	—	1.0	50	nA
	(V_{CE} = 5.0 V, T_A = 100°C)	$I_{CEO}2$	—	1.0	—	μA
Collector–Emitter Breakdown Voltage (I_C = 100 μA)		$V_{(BR)CEO}$	30	90	—	V
Emitter–Collector Breakdown Voltage (I_E = 100 μA)		$V_{(BR)ECO}$	7.0	7.8	—	V
Collector–Emitter Capacitance (f = 1.0 MHz, V_{CE} = 0)		C_{CE}	—	7.0	—	pF
COUPLED						
Output Collector Current (I_F = 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)	— — —	μA (%) μA (%) mA (%)
Collector–Emitter Saturation Voltage (I_C = 100 μA, I_F = 1.0 mA)		$V_{CE(sat)}$	—	0.35	0.4	V
Turn–On Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)		t_{on}	—	7.5	—	μs
Turn–Off Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)		t_{off}	—	5.7	—	μs
Rise Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)		t_r	—	3.2	—	μs
Fall Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)		t_f	—	4.7	—	μs
Input–Output Isolation Voltage (f = 60 Hz, t = 1.0 sec.)(1,2)		V_{ISO}	3000	—	—	Vac(rms)
Isolation Resistance ($V_{I–O}$ = 500 V)(2)		R_{ISO}	10^{11}	—	—	Ω
Isolation Capacitance ($V_{I–O}$ = 0, f = 1.0 MHz)(2)		C_{ISO}	—	0.2	—	pF

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 x 100%.

TYPICAL CHARACTERISTICS

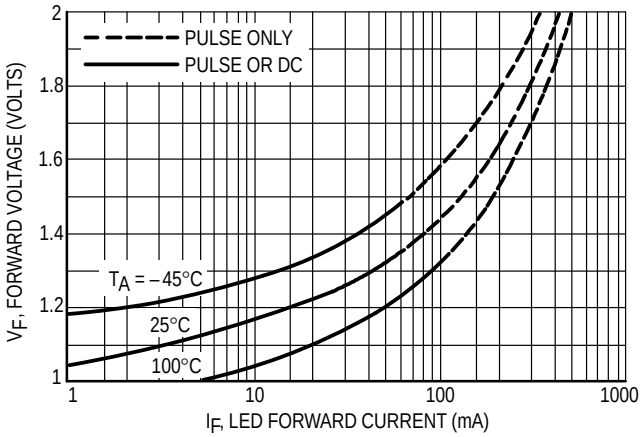


Figure 1. LED Forward Voltage versus Forward Current

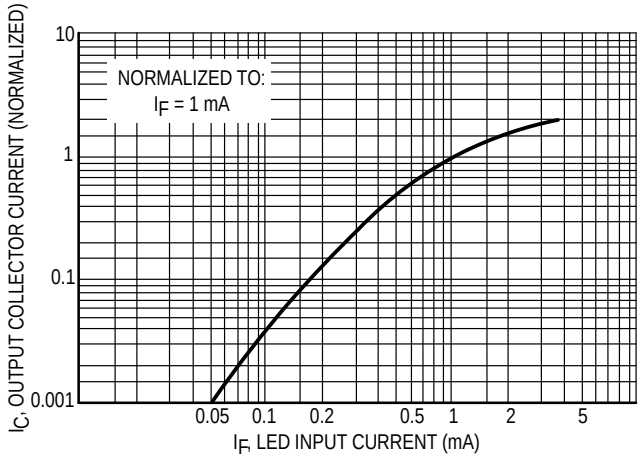


Figure 2. Output Current versus Input Current

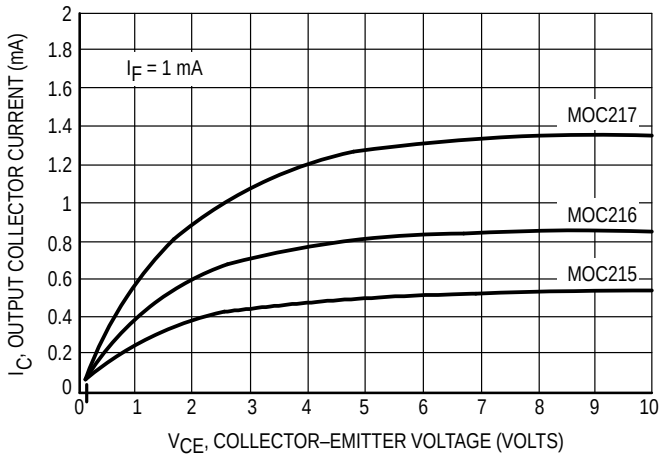


Figure 3. Output Current versus Collector–Emitter Voltage

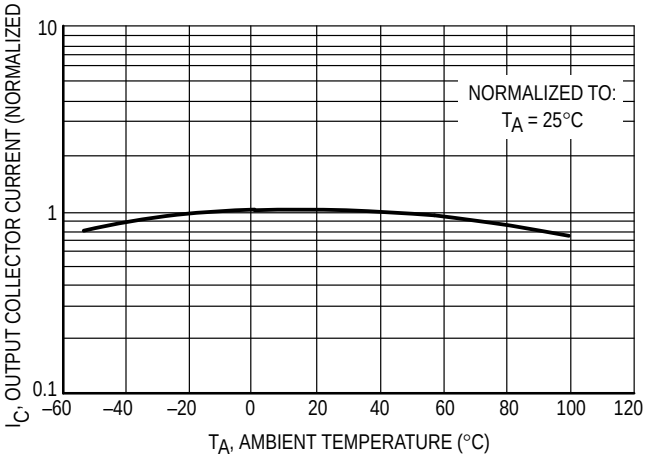


Figure 4. Output Current versus Ambient Temperature

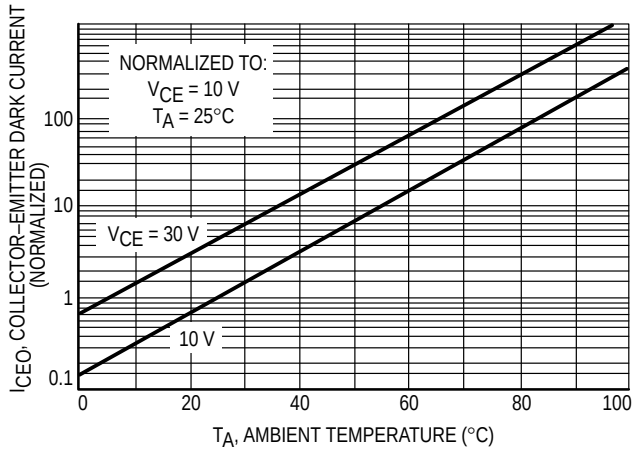


Figure 5. Dark Current versus Ambient Temperature

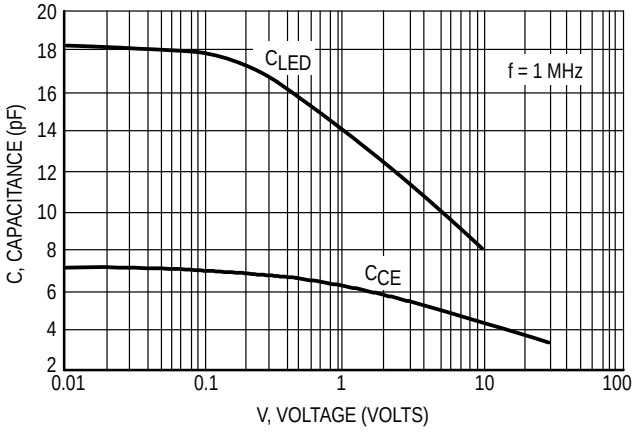
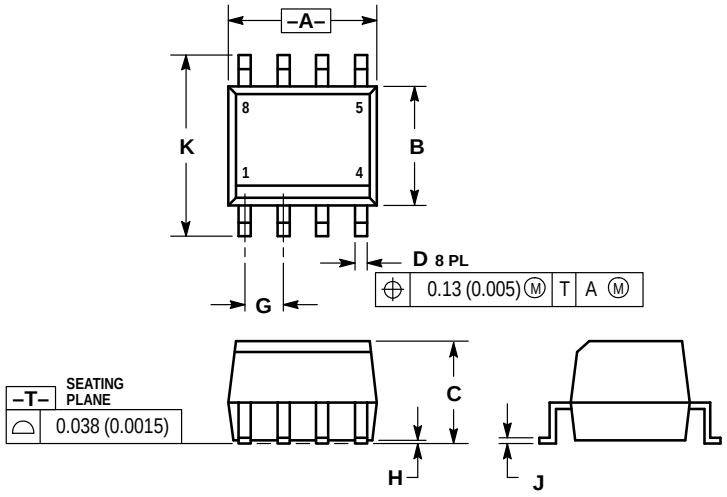


Figure 6. Capacitance versus Voltage

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.182	0.202	4.63	5.13
B	0.144	0.164	3.66	4.16
C	0.123	0.143	3.13	3.63
D	0.011	0.021	0.28	0.53
G	0.050 BSC		1.27 BSC	
H	0.003	0.008	0.08	0.20
J	0.006	0.010	0.16	0.25
K	0.224	0.244	5.69	6.19

STYLE 1:
PIN 1. ANODE
2. CATHODE
3. NC
4. NC
5. EMITTER
6. COLLECTOR
7. BASE
8. NC

FAIRCHILD
SEMICONDUCTOR™

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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.

MOC215-M
SO8 Phototransistor Coupler

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General description

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 a 0.050-inch lead spacing
- Compatible with dual wave, vapor phase and IR reflow soldering
- High input - Output isolation of 3000 VAC (RMS) guaranteed
- Underwriters Laboratory (UL) recognized - File #E90700, Volume 2

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Applications

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

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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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SO8 Phototransistor Coupler

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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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Former Motorola Products Now Supplied by Fairchild

Select a product number to download its datasheet in PDF format (Adobe Acrobat Reader required). A -M suffix indicates a former Motorola product.

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4N32-M replaced by 4N32	4N33-M replaced by 4N33	4N35-M
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H11L3-M		

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MOC3023-M	MOC3031-M	MOC3032-M
MOC3033-M	MOC3041-M	MOC3042-M
MOC3043-M	MOC3051-M	MOC3052-M
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MOC3081-M	MOC3081-M	MOC3083-M
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