

MOC211
MOC212
MOC213

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
- Standard SOIC-8 Footprint, with .050" Lead Spacing
- Shipped in Tape and Reel, which Conforms to EIA Standard RS481A
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- High Input-Output Isolation of 2500 Vac (rms) Guaranteed
- UL Recognized 

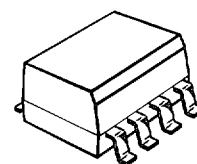
Ordering Information:

- To obtain MOC211, 212, 213 in Tape and Reel, add R1 or R2 suffix to device numbers as follows:
R1-500 units on 7" reel
R2-2500 units on 13" reel
- To obtain MOC211, 212, 213 in quantities of 75 (shipped in sleeves) — No Suffix

Marking Information:

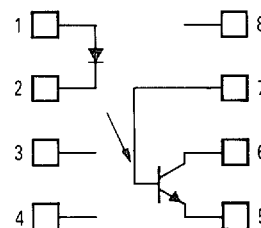
- MOC211 = M211
- MOC212 = M212
- MOC213 = M213

**SMALL OUTLINE
OPTOISOLATORS
TRANSISTOR OUTPUT**



CASE 846-01
PLASTIC

SCHEMATIC



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

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

Rating	Symbol	Value	Unit
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INPUT LED

Forward Current — Continuous	I_F	60	mA
Forward Current — Peak (PW = 100 μs , 120 pps)	$I_F(\text{pk})$	1.0	A
Reverse Voltage	V_R	6.0	V
LED Power Dissipation ($\alpha T_A = 25^\circ\text{C}$ Derate above 25°C)	P_D	90 0.8	mW mW/ $^\circ\text{C}$

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 ($\alpha T_A = 25^\circ\text{C}$ Derate above 25°C)	P_D	150 1.76	mW mW/ $^\circ\text{C}$

(continued)



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

Rating	Symbol	Value	Unit
TOTAL DEVICE			
Input-Output Isolation Voltage (1) (60 Hz, 1.0 sec. duration)	V_{ISO}	2500	Vac(rms)
Total Device Power Dissipation ($\alpha T_A = 25^\circ\text{C}$ Derate above 25°C)	P_D	150 2.94	mW mW/ $^\circ\text{C}$
Ambient Operating Temperature Range	T_A	-55 to +100	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$
Lead Soldering Temperature (1/16" from case, 10 sec. duration)	—	260	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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INPUT LED

Forward Voltage ($I_F = 10\text{ mA}$)	V_F	—	1.15	1.5	V
Reverse Leakage Current ($V_R = 6.0\text{ V}$)	I_R	—	0.1	100	μA
Capacitance	C	—	18	—	pF

OUTPUT TRANSISTOR

Collector-Emitter Dark Current ($V_{CE} = 10\text{ V}$, $T_A = 25^\circ\text{C}$)	I_{CEO1}	—	1.0	50	nA
	I_{CEO2}	—	1.0	—	μA
Collector-Emitter Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$)	$V_{(BR)CEO}$	30	90	—	V
Emitter-Collector Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$)	$V_{(BR)ECO}$	7.0	7.8	—	V
Collector-Emitter Capacitance ($f = 1.0\text{ MHz}$, $V_{CE} = 0$)	C_{CE}	—	7.0	—	pF

COUPLED

Output Collector Current ($I_F = 10\text{ mA}$, $V_{CE} = 10\text{ V}$)	MOC211	I_C	2.0	6.5	—	mA
	MOC212		5.0	9.0	—	
	MOC213		10	14	—	
Collector-Emitter Saturation Voltage ($I_C = 2.0\text{ mA}$, $I_F = 10\text{ mA}$)	$V_{CE(sat)}$	—	0.15	0.4	—	V
Turn-On Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$)	t_{on}	—	7.5	—	—	μs
Turn-Off Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$)	t_{off}	—	5.7	—	—	μs
Rise Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$)	t_r	—	3.2	—	—	μs
Fall Time ($I_C = 2.0\text{ mA}$, $V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$)	t_f	—	4.7	—	—	μs
Isolation Voltage ($f = 60\text{ Hz}$, $t = 1.0\text{ sec.}$)	V_{ISO}	2500	—	—	—	Vac(rms)
Isolation Resistance ($V_{I-O} = 500\text{ V}$)	R_{ISO}	10^{11}	—	—	—	Ω
Isolation Capacitance ($V_{I-O} = 0$, $f = 1.0\text{ MHz}$)	C_{ISO}	—	0.2	—	—	pF

(1) Input-Output Isolation Voltage, V_{ISO} , is an internal device dielectric breakdown rating. For this test, pins 1 and 2 are common, and pins 5, 6 and 7 are common.

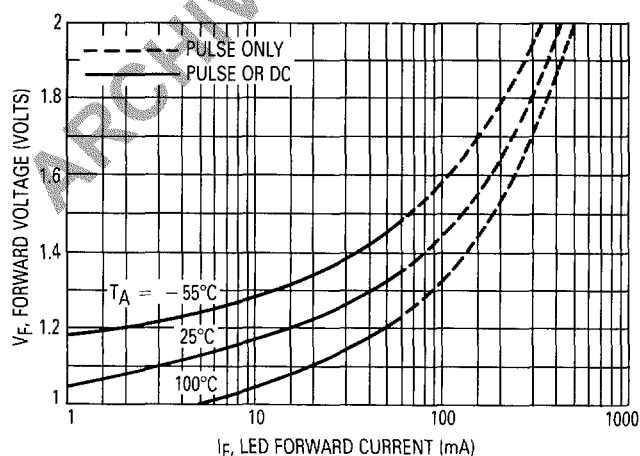
TYPICAL CHARACTERISTICS

Figure 1. LED Forward Voltage versus Forward Current

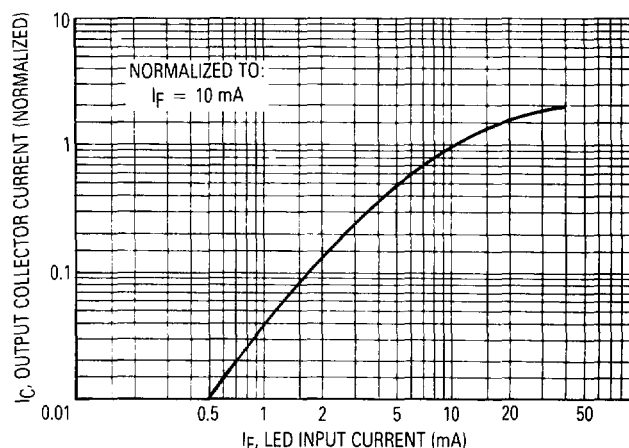


Figure 2. Output Current versus Input Current

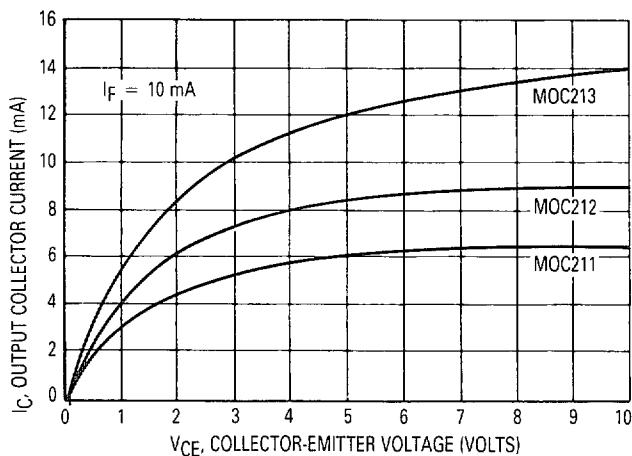


Figure 3. Output Current versus Collector-Emitter Voltage

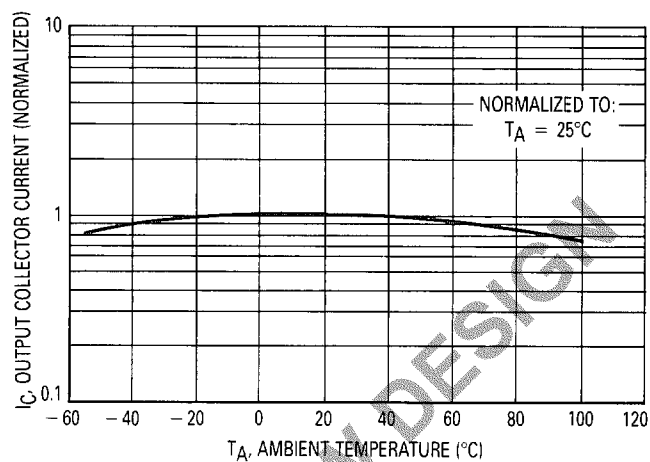


Figure 4. Output Current versus Ambient Temperature

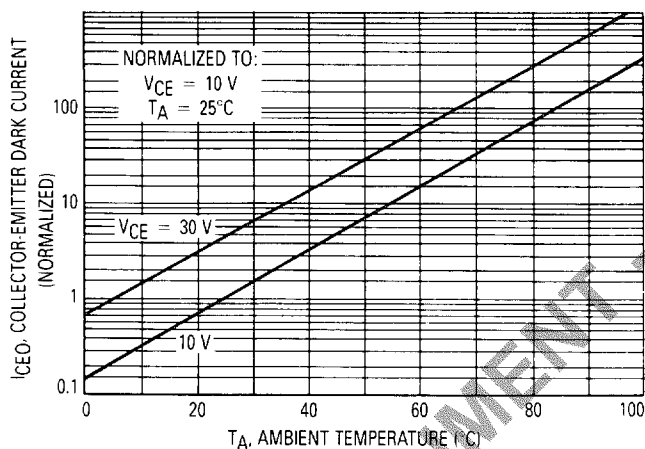


Figure 5. Dark Current versus Ambient Temperature

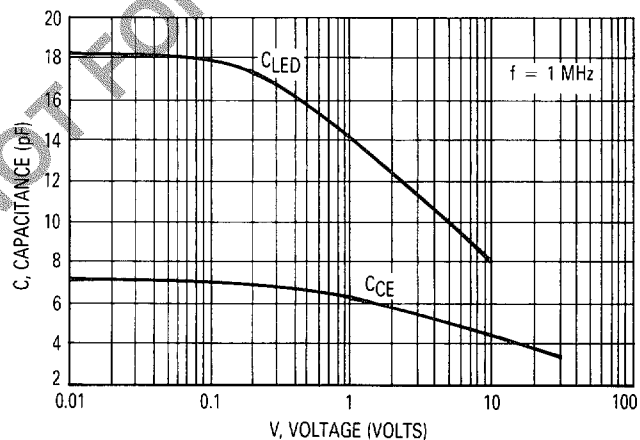
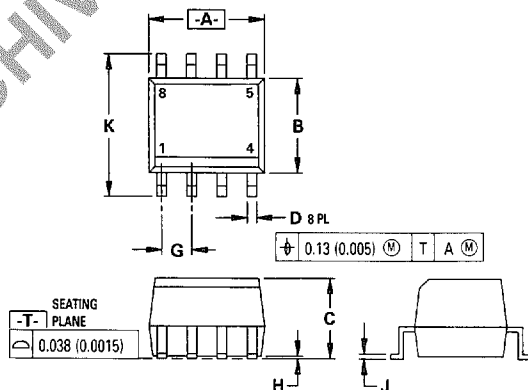


Figure 6. Capacitance versus Voltage

OUTLINE DIMENSIONS

CASE 846-01



NOTES:

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

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

STYLE 1:

- PIN 1. ANODE
- CATHODE
- NC
- NC
- EMITTER
- COLLECTOR
- BASE
- NC

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MOTOROLA

MOC211 • MOC212 • MOC213