Dual Channel Small Outline Optoisolators

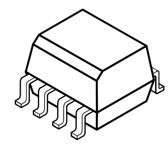
Transistor Output (Low Input Current)

MOCD217

[CTR = 100% Min]

Motorola Preferred Device

DUAL CHANNEL SMALL OUTLINE OPTOISOLATOR TRANSISTOR OUTPUT



CASE 846–01, STYLE 3
PLASTIC

The MOCD217 device consists of two gallium arsenide infrared emitting diodes optically coupled to two monolithic silicon phototransistor detectors, in a surface mountable, small outline, plastic package. It is ideally suited for high density applications and eliminates the need for through–the–board mounting.

- Dual Channel Coupler
- Convenient Plastic SOIC–8 Surface Mountable Package Style
- Low Input Current (Specified @ 1 mA)
- Minimum $V_{(BR)CEO}$ of 30 Volts Guaranteed
- Standard SOIC–8 Footprint, with 0.050″ 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 3000 Vac (rms) Guaranteed
- Meets U.L. Regulatory Requirements, File #E54915

Ordering Information:

- To obtain MOCD217 in tape and reel, add R2 suffix to device number as follows:
  R2 = 2500 units on 13″ reel
- To obtain MOCD217 in quantities of 50 (shipped in sleeves) — no suffix

Marking Information:

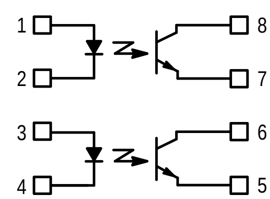
- MOCD217 = D217

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

NOTE: Thickness through insulation between input and output is ≥ 0.5 mm.

SCHEMATIC



1. ANODE 1
2. CATHODE 1
3. ANODE 2
4. CATHODE 2
5. EMITTER 2
6. COLLECTOR 2
7. EMITTER 1
8. COLLECTOR 1

Preferred devices are Motorola recommended choices for future use and best overall value.

MOTOROLA

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	–55 to +100	°C
Storage Temperature Range(3)	T_{stg}	–55 to +150	°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_{CEO1}	—	1.0	50	nA
	(V_{CE} = 5.0 V, T_A = 100°C)	I_{CEO2}	—	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)	MOCD217	I_C (CTR)(5)	1.0 (100)	1.3 (130)	—	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, 2, 3 and 4 are common, and pins 5, 6, 7 and 8 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

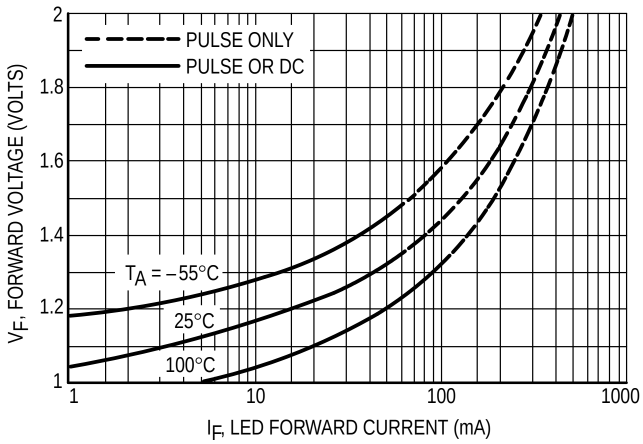


Figure 1. LED Forward Voltage versus Forward Current

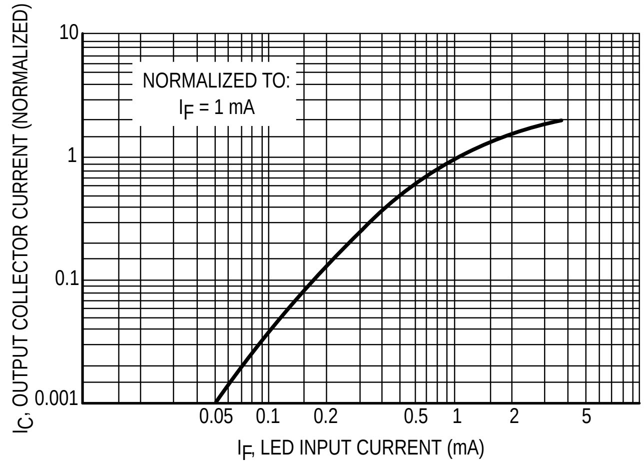


Figure 2. Output Current versus Input Current

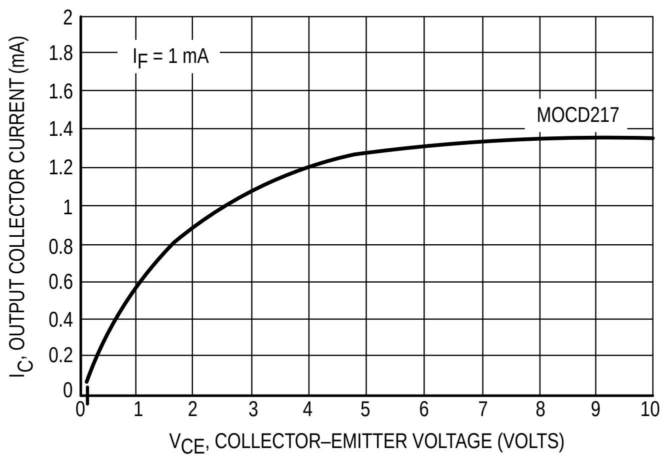


Figure 3. Output Current versus Collector–Emitter Voltage

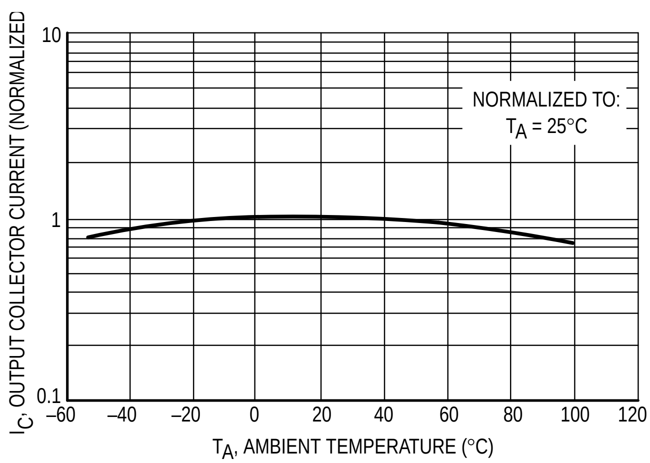


Figure 4. Output Current versus Ambient Temperature

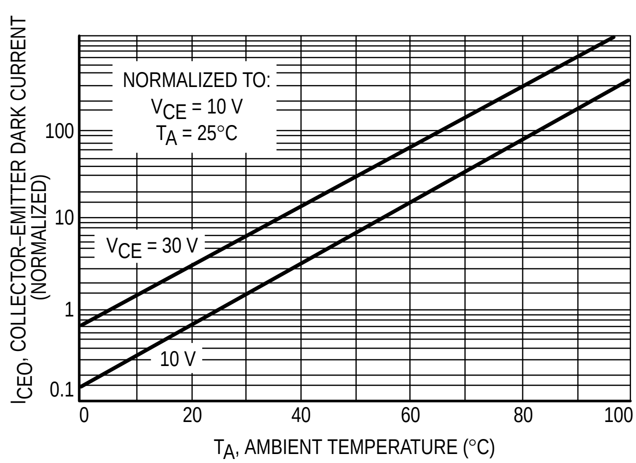


Figure 5. Dark Current versus Ambient Temperature

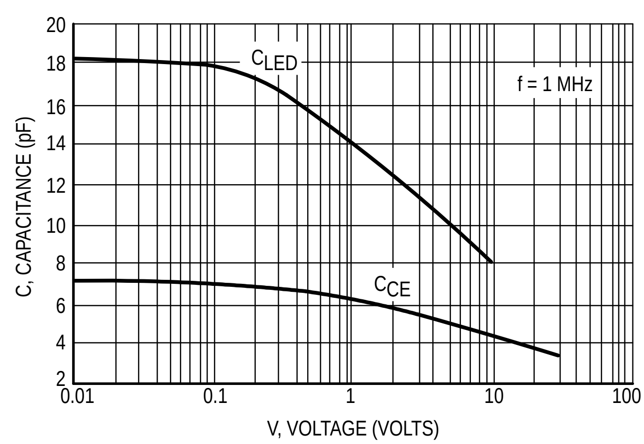
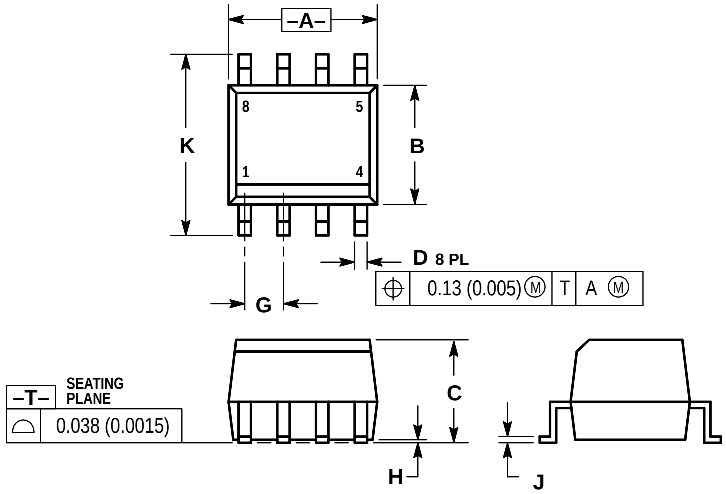


Figure 6. Capacitance versus Voltage

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

CASE 846–01
ISSUE B
SO–8 SMALL OUTLINE OPTOISOLATOR

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