Dual Channel Small Outline Optoisolator

Transistor Output

This 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
- Minimum Current Transfer Ratio 100% with Input Current of 10 mA
- Minimum V_{(BR)CEO} of 70 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 MOCD213 in tape and reel, add R2 suffix to device number as follows:
 R2 = 2500 units on 13" reel
- To obtain MOCD213 in quantities of 50 (shipped in sleeves) no suffix

Marking Information:

MOCD213 = D213

Applications:

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

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	٧R	6.0	V	
LED Power Dissipation @ T _A = 25°C Derate above 25°C	PD	90 0.8	mW mW/°C	
OUTPUT TRANSISTOR			•	

OUTPUT TRANSISTOR

Collector–Emitter Voltage	VCEO	70	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	PD	150 1.76	mW mW/°C

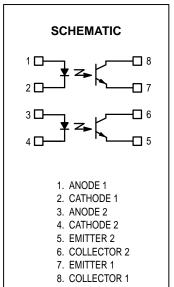
NOTE: Thickness through insulation between input and output is ≥ 0.5 mm.

MOCD213

[CTR = 100% Min]

DUAL CHANNEL SMALL OUTLINE OPTOISOLATOR TRANSISTOR OUTPUT







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

Rating		Symbol	Va	lue	Unit
TOTAL DEVICE			•	•	
Input–Output Isolation Voltage(1,2) (60 Hz, 1.0 sec. duration)		V _{ISO}	30	000	Vac(rms)
Total Device Power Dissipation @ T _A = 25°C Derate above 25°C		PD		50 94	mW mW/°C
Ambient Operating Temperature Range(3)		TA	–55 to	+100	°C
Storage Temperature Range(3)	Storage Temperature Range ⁽³⁾		–55 to	+150	°C
Lead Soldering Temperature (1/16" from case, 10 sec. duration)		T _{Stg} –55 to +150 — 260		60	°C
ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwis	se noted)(4)				
Characteristic	Symbol	Min	Тур(4)	Max	Unit
INPUT LED	•				
Forward Voltage (I _F = 30 mA)	VF	_	1.2	1.55	V
Reverse Leakage Current (V _R = 6.0 V)	I _R	_	0.1	100	μΑ
Capacitance	С	_	18	_	pF
OUTPUT TRANSISTOR					
Collector–Emitter Dark Current (V _{CE} = 10 V, T _A = 25°C)	I _{CEO} 1	_	1.0	50	nA
$(V_{CE} = 10 \text{ V}, T_{A} = 100^{\circ}\text{C})$	I _{CEO} 2	_	1.0	_	μΑ
Collector–Emitter Breakdown Voltage (I _C = 100 μA)	V(BR)CEO	70	120	_	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 MOCD213 (I _F = 10 mA, V _{CE} = 5 V)	I _C (CTR) ⁽⁵⁾	10 (100)	1	_	mA (%)
Collector–Emitter Saturation Voltage (I _C = 2.0 mA, I _F = 10 mA)	VCE(sat)	_	0.15	0.4	V
Turn–On Time (I _C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)	ton	_	3.0	_	μs
Turn–Off Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)	t _{off}	_	2.8	_	μs
Rise Time (I _C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)	t _r	_	1.6	_	μs
Fall Time (I _C = 2.0 mA, V _{CC} = 10 V, R _L = 100 Ω)	t _f	_	2.2	_	μs
(4.0)					

V<u>ISO</u>

RISO

CISO

3000

1011

0.2

- 1. Input–Output Isolation Voltage, $V_{\mbox{\scriptsize ISO}}$, 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%.

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

Isolation Resistance $(V_{I-O} = 500 \text{ V})(2)$

Input–Output Isolation Voltage (f = 60 Hz, t = 1.0 sec)(1,2)

Vac(rms)

Ω

pF

TYPICAL CHARACTERISTICS

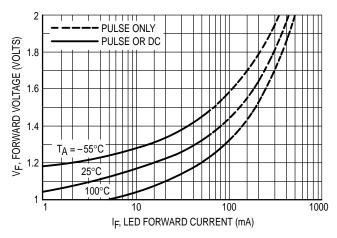


Figure 1. LED Forward Voltage versus Forward Current

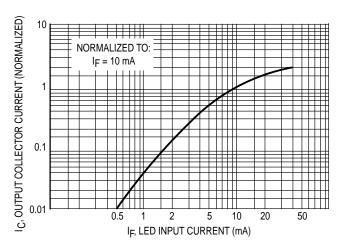


Figure 2. Output Current versus Input Current

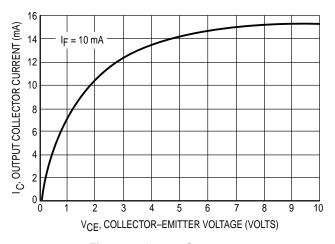


Figure 3. Output Current versus Collector–Emitter Voltage

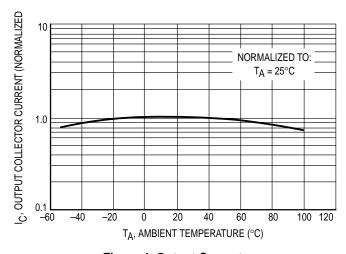


Figure 4. Output Current versus
Ambient Temperature

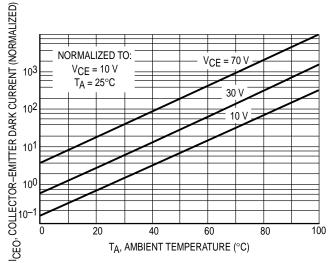


Figure 5. Dark Current versus Ambient Temperature

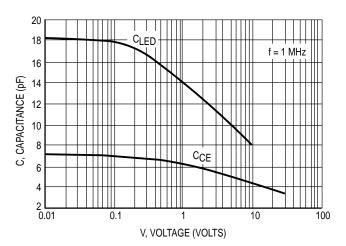
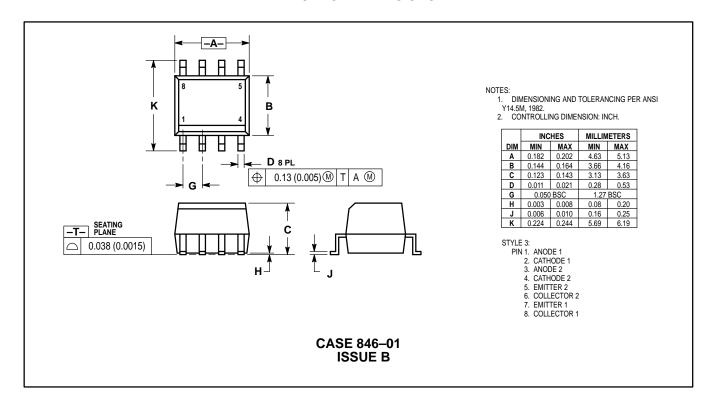


Figure 6. Capacitance versus Voltage

PACKAGE DIMENSIONS



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How to reach us:

USA/EUROPE: Motorola Literature Distribution; P.O. Box 20912: Phoenix. Arizona 85036. 1–800–441–2447

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244–6609 INTERNET: http://Design=NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, Toshikatsu Otsuki, 6F Seibu–Butsuryu–Center, 3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 03–3521–8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298



