Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

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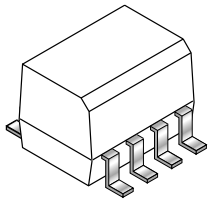
FAIRCHILD
SEMICONDUCTOR®

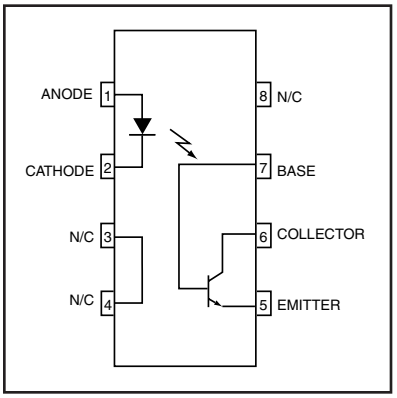
SMALL OUTLINE OPTOCOUPLERS TRANSISTOR OUTPUT

MOC211-M MOC212-M MOC213-M

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.





FEATURES

- UL Recognized (File #E90700, volume 2)
- VDE Recognized (File #136616) (add option 'V' for VDE approval, e.g., MOC211V-M)
- Convenient Plastic SOIC-8 Surface Mountable Package Style
- Standard SOIC-8 Footprint, with 0.050" Lead Spacing
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- High Input-Output Isolation of 2500 $V_{AC(rms)}$ Guaranteed
- Minimum BV_{CEO} of 30V guaranteed

APPLICATIONS

- General Purpose Switching Circuits
- Interfacing and coupling systems of different potentials and impedances
- Regulation Feedback Circuits
- Monitor and Detection Circuits

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise specified)

Rating	Symbol	Value	Unit
EMITTER			
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
DETECTOR			
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector Voltage	V_{ECO}	7.0	V
Collector-Base Voltage	V_{CBO}	70	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
TOTAL DEVICE			
Input-Output Isolation Voltage (1,2,3) (f = 60 Hz, t = 1 min.)	V_{ISO}	2500	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	T_A	-40 to +100	°C
Storage Temperature Range	T_{stg}	-40 to +150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ**	Max	Unit
EMITTER						
Input Forward Voltage	(I_F = 10 mA)	V_F	—	1.15	1.5	V
Reverse Leakage Current	(V_R = 6.0 V)	I_R	—	0.001	100	µA
Input Capacitance		C_{IN}	—	18	—	pF
DETECTOR						
Collector-Emitter Dark Current	(V_{CE} = 10 V, T_A = 25°C) (V_{CE} = 10 V, T_A = 100°C)	I_{CEO1} I_{CEO2}	— —	1.0 1.0	50 —	nA µA
Collector-Emitter Breakdown Voltage	(I_C = 100 µA)	BV_{CEO}	30	90	—	V
Emitter-Collector Breakdown Voltage	(I_E = 100 µA)	BV_{ECO}	7.0	7.8	—	V
Collector-Emitter Capacitance	(f = 1.0 MHz, V_{CE} = 0)	C_{CE}	—	7.0	—	pF
COUPLED						
Collector-Output Current[4] MOC211-M MOC212-M MOC213-M	(I_F = 10 mA, V_{CE} = 10 V)	CTR	20 50 100	65 90 140	— — —	%
Isolation Surge Voltage[1,2,3]	(60 Hz AC Peak, 1 min.)	V_{ISO}	2500	—	—	Vac(rms)
Isolation Resistance[2]	(V = 500 V)	R_{ISO}	10^{11}	—	—	Ω
Collector-Emitter Saturation Voltage	(I_C = 2.0 mA, I_F = 10 mA)	$V_{CE\ (sat)}$	—	0.15	0.4	V
Isolation Capacitance[2]	(V = 0 V, f = 1 MHz)	C_{ISO}	—	0.2	—	pF
Turn-On Time	(I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω) (Fig. 6)	t_{on}	—	7.5	—	µs
Turn-Off Time	(I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω) (Fig. 6)	t_{off}	—	5.7	—	µs
Rise Time	(I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω) (Fig. 6)	t_r	—	3.2	—	µs
Fall Time	(I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω) (Fig. 6)	t_f	—	4.7	—	µs

** Typical values at T_A = 25°C

1. Isolation Surge 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. V_{ISO} rating of 2500 $V_{AC(rms)}$ for t = 1 min. is equivalent to a rating of 3,000 $V_{AC(rms)}$ for t = 1 sec.
4. Current Transfer Ratio (CTR) = I_C/I_F x 100%.

Fig. 1 LED Forward Voltage vs. Forward Current

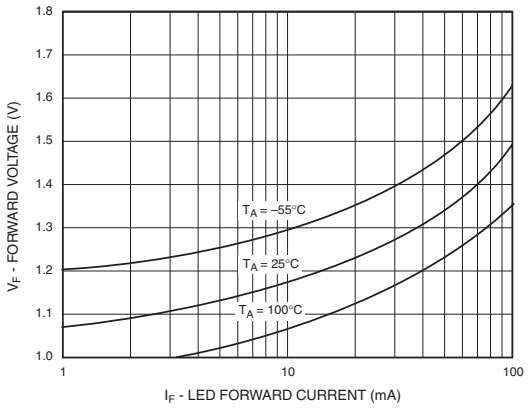


Fig. 2 Output Curent vs. Input Current

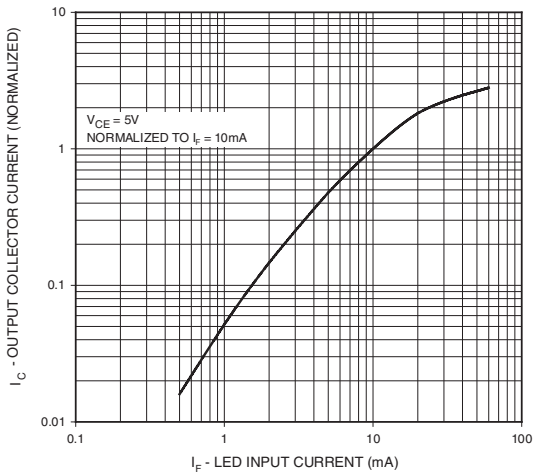


Fig. 3 Output Current vs. Ambient Temperature

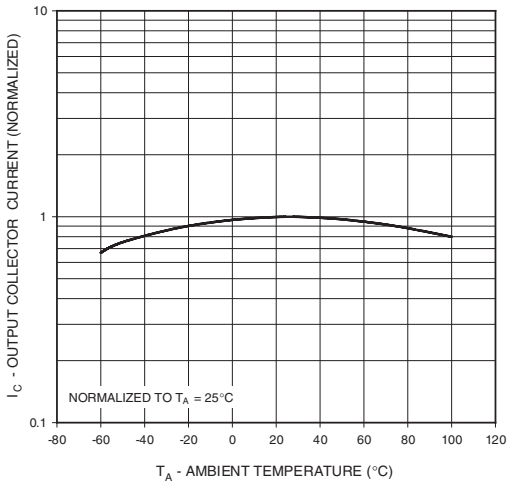


Fig. 4 Output Current vs. Collector - Emitter Voltage

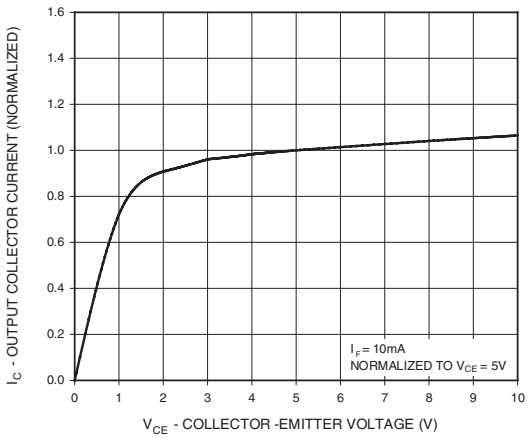
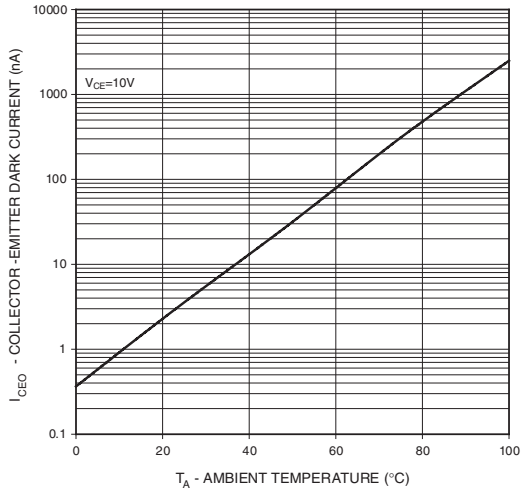


Fig. 5 Dark Current vs. Ambient Temperature



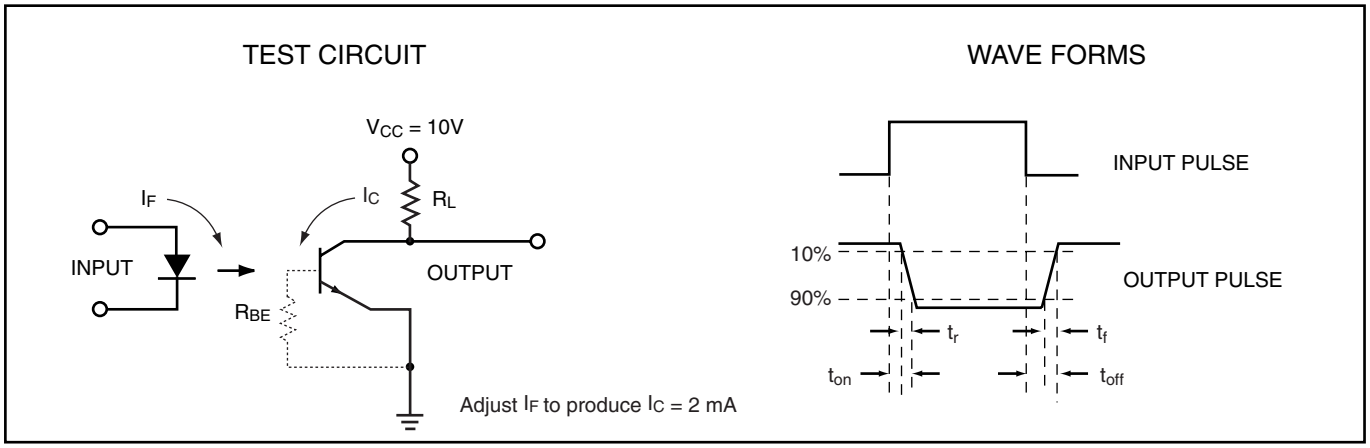
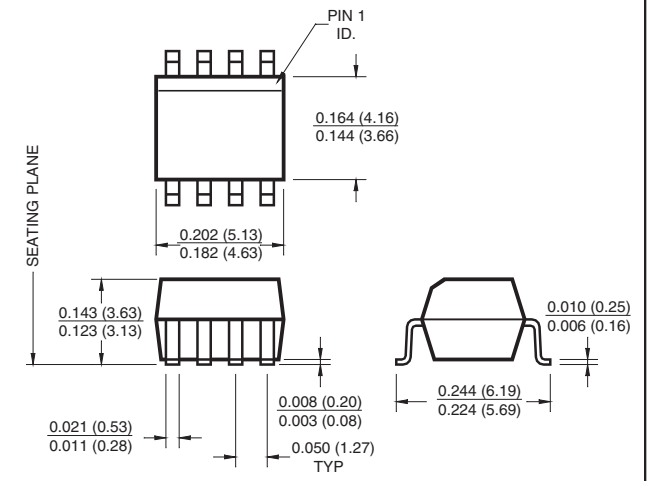


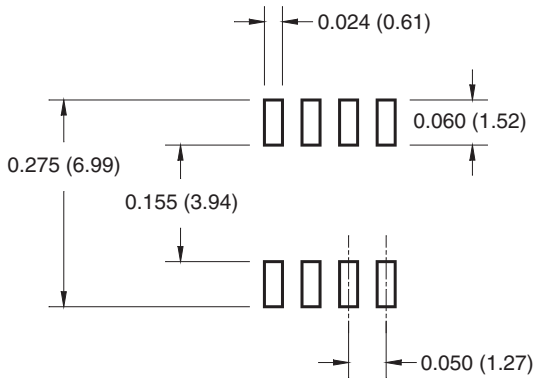
Figure 6. Switching Time Test Circuit and Waveforms

Package Dimensions (Surface Mount)



Lead Coplanarity : 0.004 (0.10) MAX

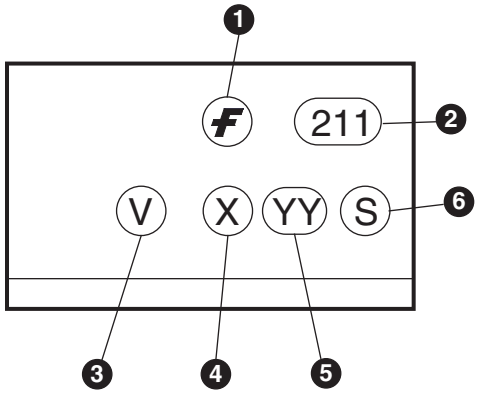
8-Pin Small Outline



ORDERING INFORMATION

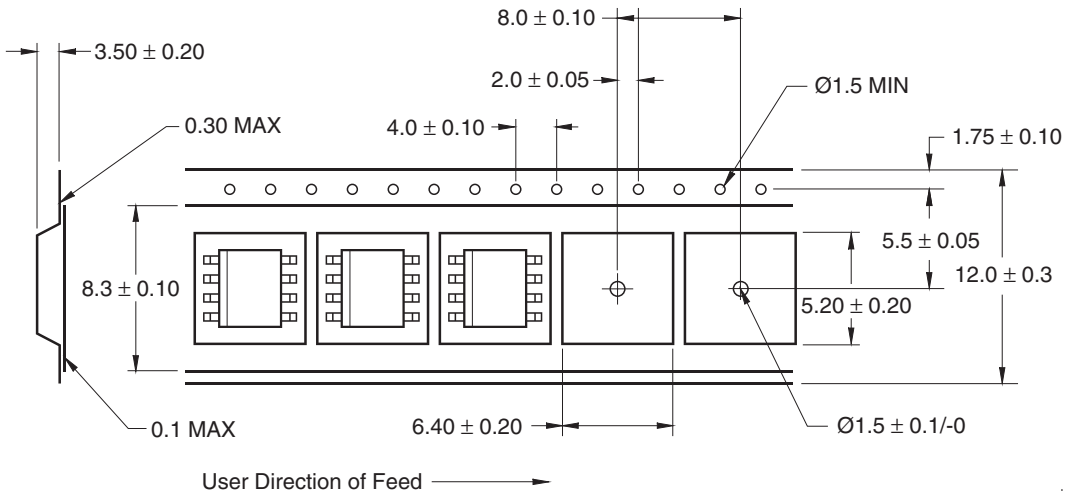
Option	Order Entry Identifier	Description
V	V	VDE 0884
R1	R1	Tape and reel (500 units per reel)
R1V	R1V	VDE 0884, Tape and reel (500 units per reel)
R2	R2	Tape and reel (2500 units per reel)
R2V	R2V	VDE 0884, Tape and reel (2500 units per reel)

MARKING INFORMATION

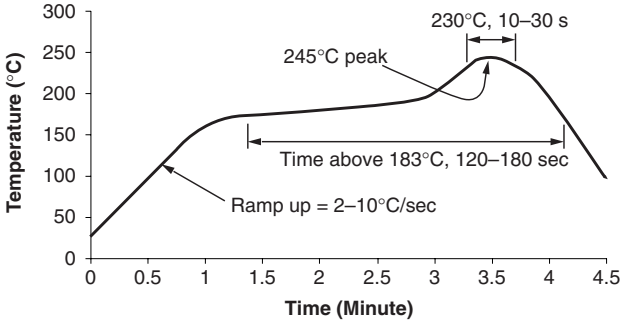


Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code, e.g., ‘3’
5	Two digit work week ranging from ‘01’ to ‘53’
6	Assembly package code

Carrier Tape Specifications



Reflow Profile



- Peak reflow temperature: 245°C (package surface temperature)
- Time of temperature higher than 183°C for 120–180 seconds
- One time soldering reflow is recommended

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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.