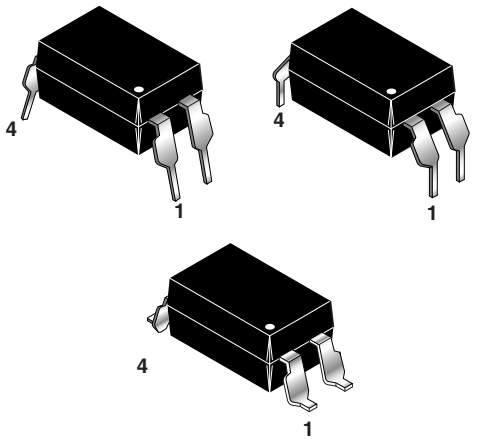
FAIRCHILD
SEMICONDUCTOR®

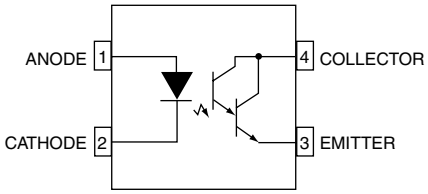
4-PIN PHOTODARLINGTON OPTOCOUPLER

H11B815

PACKAGE



SCHEMATIC



DESCRIPTION

The H11B815 consists of a gallium arsenide infrared emitting diode driving a silicon Darlington phototransistor in a 4-pin dual in-line package.

FEATURES

- Compact 4-pin package
- Current Transfer Ratio: 600% minimum (at I_F = 1 mA)
- High isolation voltage between input and output (5300 VRMS)
- UL recognized (File # E90700)

APPLICATIONS

- Power Supply Monitors
- Relay Contact Monitor
- Telephone/Telegraph Line Receiver
- Twisted Pair Line Receiver
- Digital Logic/Digital Logic

ABSOLUTE MAXIMUM RATINGS (No derating required up to 85°C)

Parameter	Symbol	Value	Units
TOTAL DEVICE			
Storage Temperature	T_{STG}	-55 to +150	°C
Operating Temperature	T_{OPR}	-55 to +100	°C
Lead Solder Temperature	T_{SOL}	260 for 10 sec	°C
Total Device Power Dissipation @ T_A = 25°C	P_D	250	mW
EMITTER			
DC/Average Forward Input Current	I_F	80	mA
Reverse Input Voltage	V_R	6	V
Forward Current - Peak (1µs pulse, 300pps)	I_F(pk)	1	A
LED Power Dissipation @ T_A = 25°C	P_D	140	mW
Derate above 25°C		1.33	mW/°C
DETECTOR			
Collector-Emitter Voltage	V_{CEO}	35	V
Emitter-Collector Voltage	V_{ECO}	6	V
Continuous Collector Current	I_C	200	mA
Detector Power Dissipation @ T_A = 25°C	P_D	200	mW
Derate above 25°C		2.0	mW/°C

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

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameter	Test Conditions	Symbol	Min	Typ**	Max	Unit
EMITTER						
Input Forward Voltage	(I_F = 20 mA)	V_F		1.2	1.50	V
Reverse Leakage Current	(V_R = 6.0 V)	I_R		0.001	10	µA
DETECTOR						
Collector-Emitter Breakdown Voltage	(I_C = 1.0 mA, I_F = 0)	BV_{CEO}	35	60		V
Emitter-Collector Breakdown Voltage	(I_E = 100 µA, I_F = 0)	BV_{ECO}	6	8		V
Collector-Emitter Dark Current	(V_{CE} = 10 V, I_F = 0)	I_{CEO}		0.005	1	µA
Capacitance	(V_{CE} = 0 V, f = 1 MHz)	C_{CE}		8		pF

TRANSFER CHARACTERISTICS

DC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Current Transfer Ratio, Collector-Emitter	(I_F = 1 mA, V_{CE} = 2 V)	CTR	600		7,500	%
Saturation Voltage	(I_F = 20 mA, I_C = 5 mA)	$V_{CE(sat)}$		0.8	1.0	V
Rise Time (non saturated)	(I_C = 10 mA, V_{CE} = 2 V, R_L = 100V)	t_r			300	µs
Fall Time (non saturated)	(I_C = 10 mA, V_{CE} = 2 V, R_L = 100V)	t_f			250	µs

ISOLATION CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Input-Output Isolation Voltage	(I_{I-O} [1 µA, 1 min.)	V_{ISO}	5300			Vac(rms)
Isolation Resistance	(V_{I-O} = 500 VDC)	R_{ISO}	10^{11}			Ω
Isolation Capacitance	(V_{I-O} = &, f = 1 MHz)	C_{ISO}		0.5		pf

** All typicals at TA = 25°C

Typical Performance Curves

Fig. 1 Normalized Current Transfer Ratio vs. Forward Current

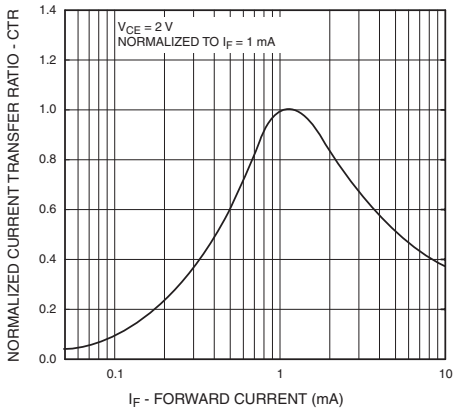


Fig. 2 Normalized Current Transfer Ratio vs. Ambient Temperature

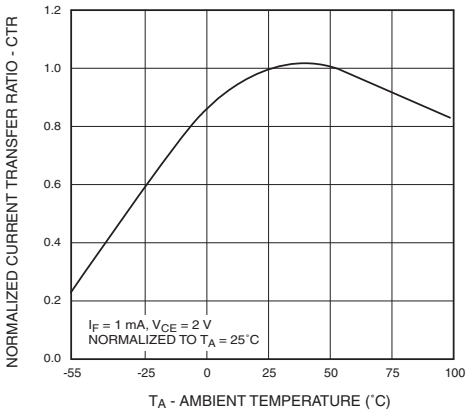


Fig. 3 Normalized Collector Current vs. Collector Emitter Voltage

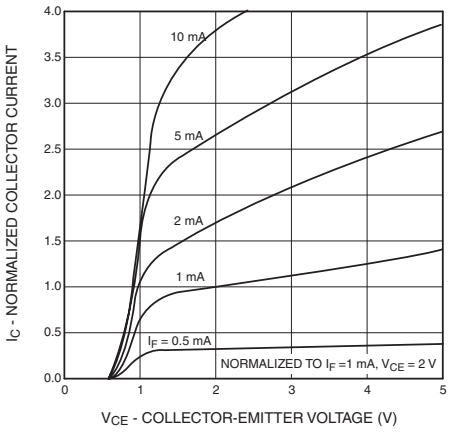


Fig. 4 Collector-Emitter Dark Current vs. Ambient Temperature

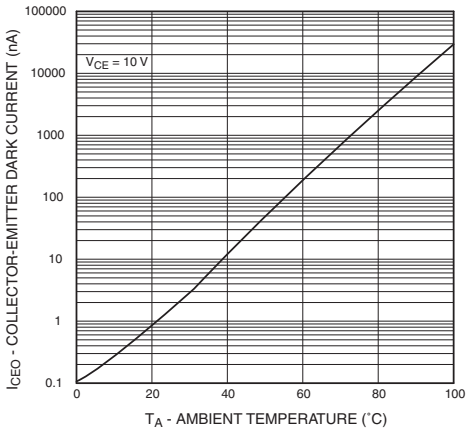
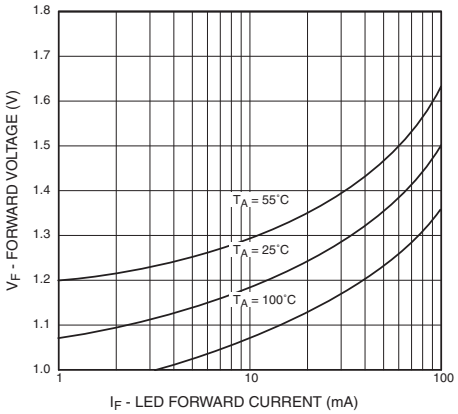
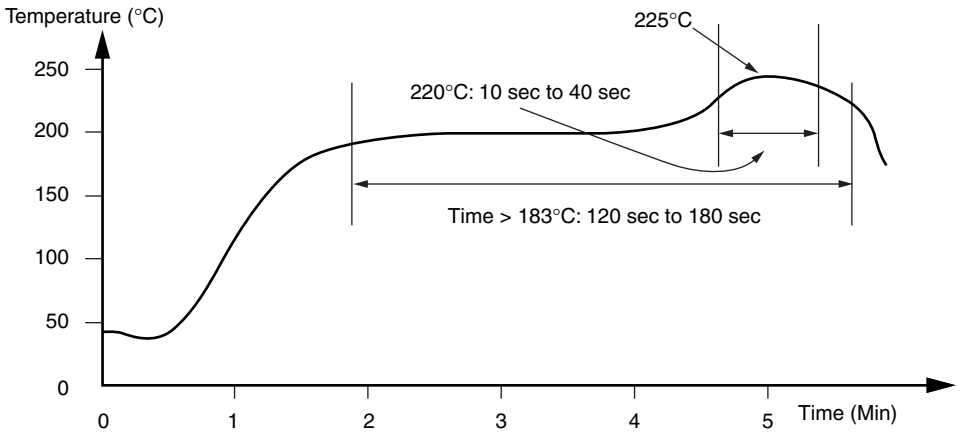


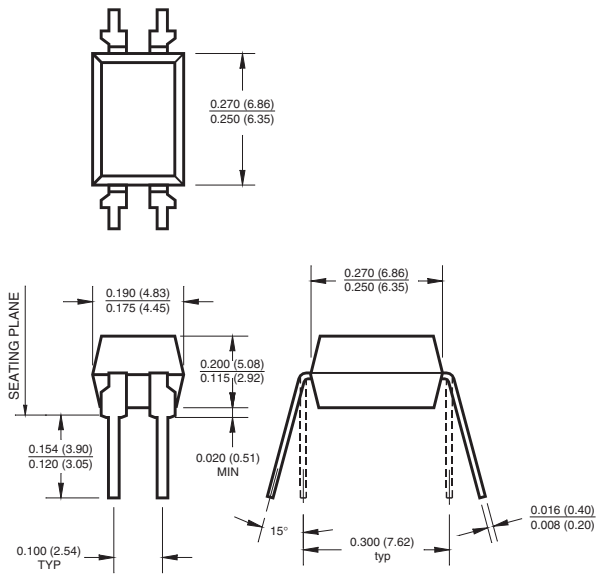
Fig. 5 LED Forward Voltage vs. Forward Current



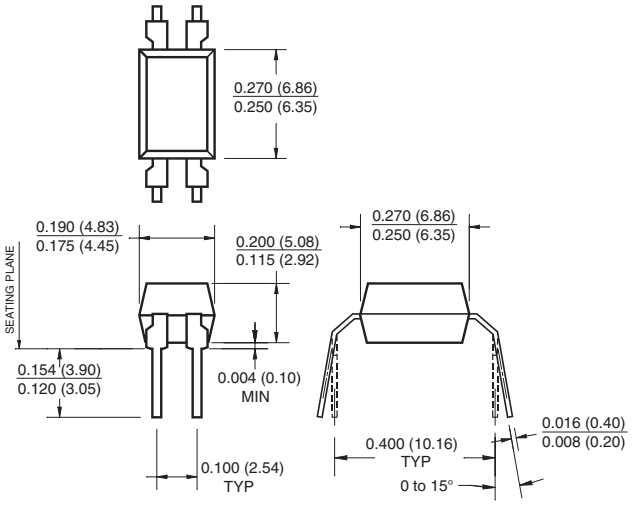
Recommended Thermal Reflow Profile for Surface Mount DIP Package



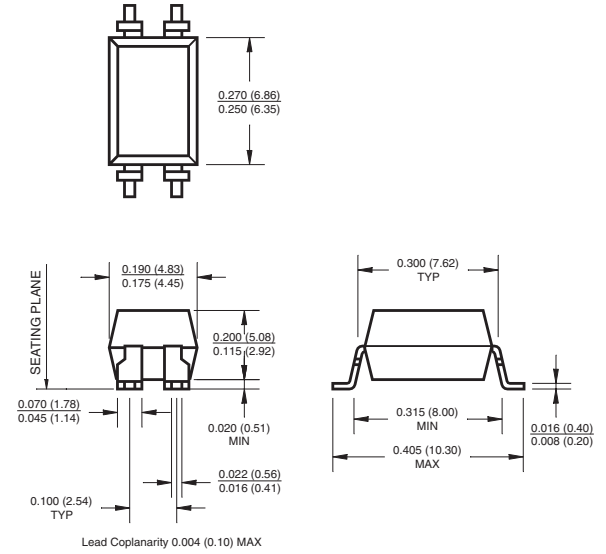
Package Dimensions (Through Hole)



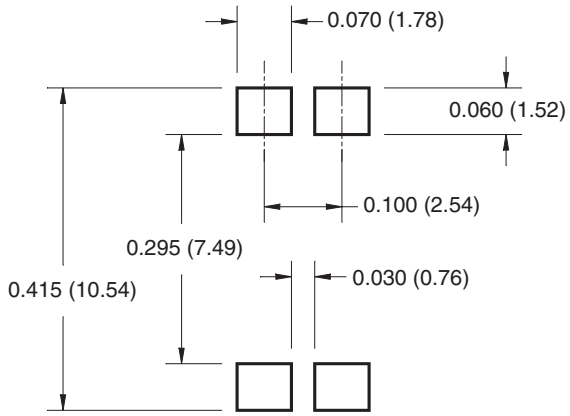
Package Dimensions (0.4" Lead Spacing)



Package Dimensions (Surface Mount)



PCB Footprint Layout

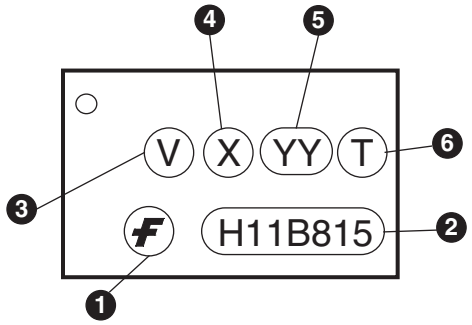


NOTE
All dimensions are in inches (millimeters)

ORDERING INFORMATION

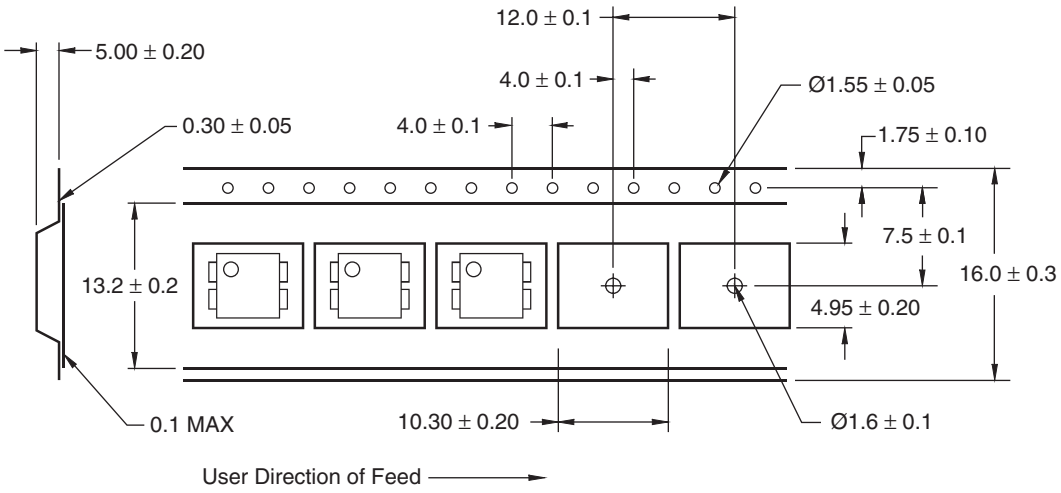
Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
W	.W	0.4" Lead Spacing
300	.300	VDE 0884
300W	.300W	VDE 0884, 0.4" Lead Spacing
3S	.3S	VDE 0884, Surface Mount
3SD	.3SD	VDE 0884, Surface Mount, Tape & Reel

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
5	Two digit work week ranging from ‘01’ to ‘53’
6	Assembly package code

Carrier Tape Specifications



NOTE
All dimensions are in millimeters

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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.