

H11B815

4-Pin Photodarlington Optocoupler

Description

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

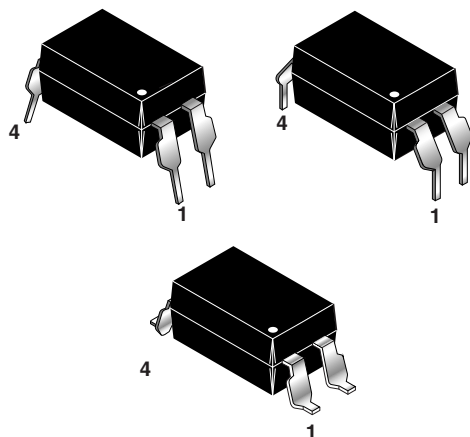
Features

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

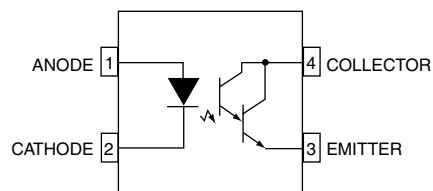
Applications

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

Package



Schematic



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	50	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	70	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	80	mA
Detector Power Dissipation @ T _A = 25°C	P _D	150	mW
Derate above 25°C		2.0	mW/°C

Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless otherwise specified.)**Individual Component Characteristics**

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

Transfer Characteristics

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

Isolation Characteristics

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Input-Output Isolation Voltage	($I_{I-O} [1 \mu\text{A}, 1 \text{ min.}]$)	V_{ISO}	5000			Vac(rms)
Isolation Resistance	($V_{I-O} = 500 \text{ VDC}$)	R_{ISO}	10^{11}			Ω
Isolation Capacitance	($V_{I-O} = \&$, $f = 1 \text{ MHz}$)	C_{ISO}		0.5		pf

** All typicals at $T_A = 25^\circ\text{C}$

Typical Performance Curves

Fig. 1 Normalized Current Transfer Ratio vs. Forward Current

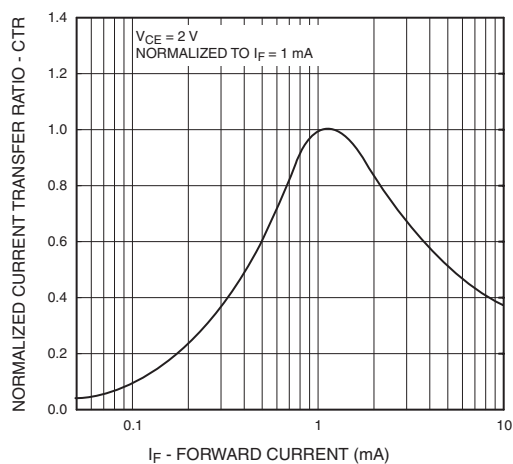


Fig. 2 Normalized Current Transfer Ratio vs. Ambient Temperature

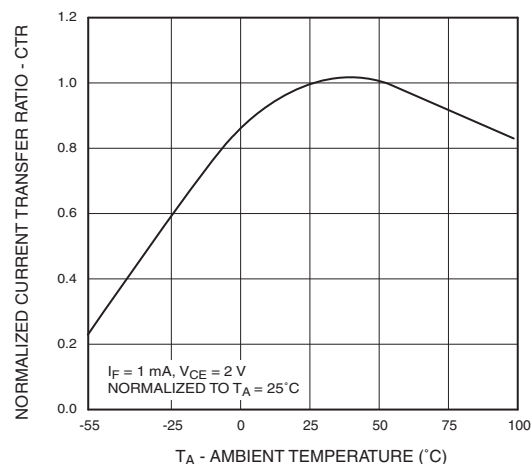


Fig. 3 Normalized Collector Current vs. Collector Emitter Voltage

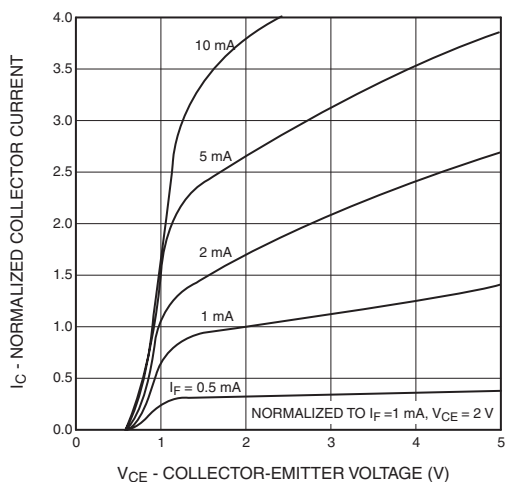


Fig. 4 Collector-Emitter Dark Current vs. Ambient Temperature

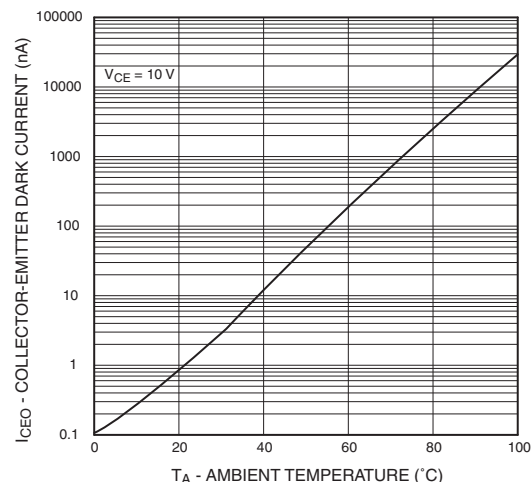
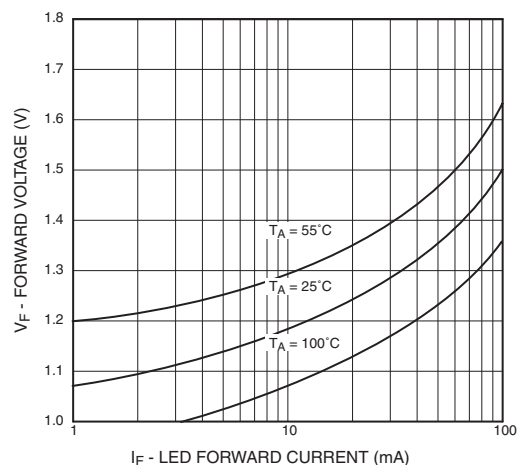
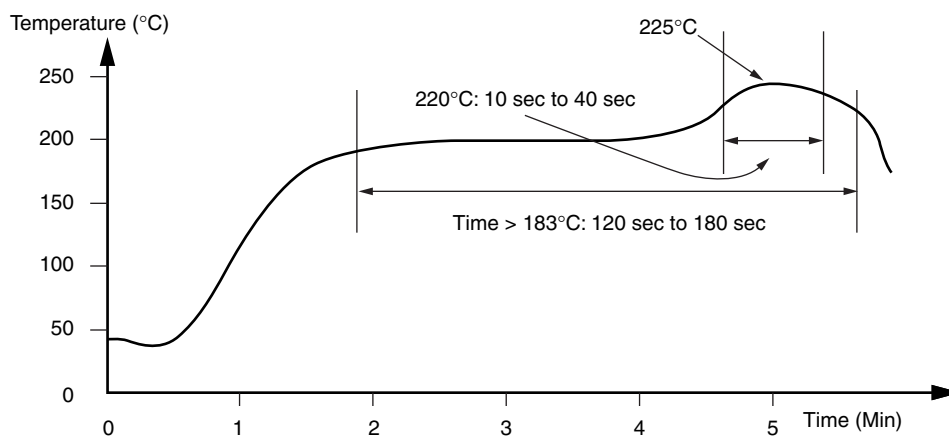
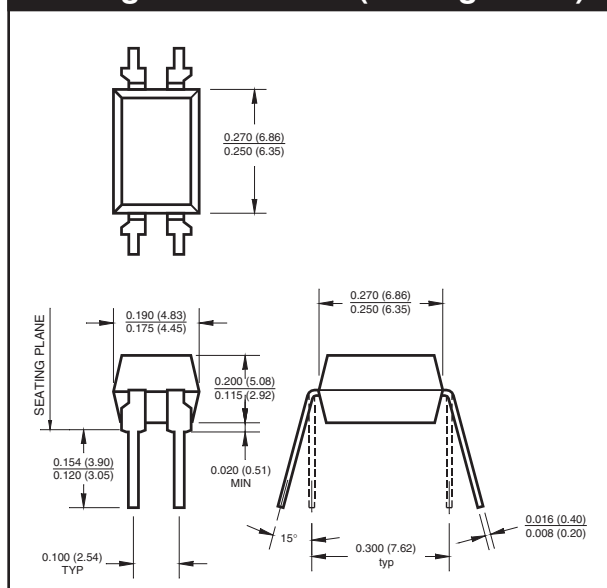


Fig. 5 LED Forward Voltage vs. Forward Current

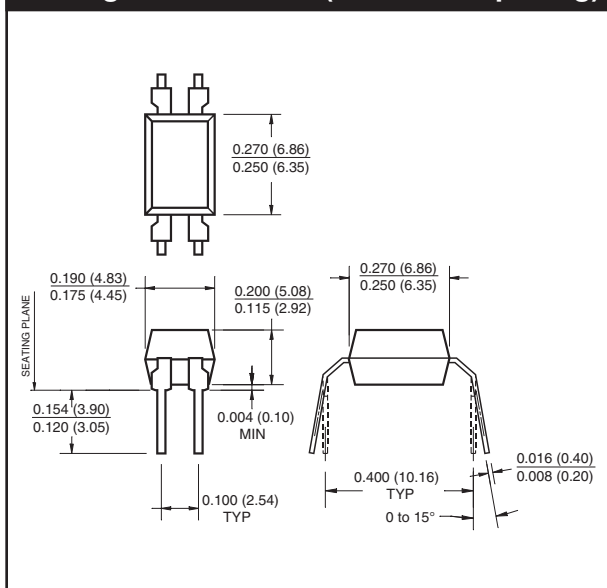


Recommended Thermal Reflow Profile for Surface Mount DIP Package

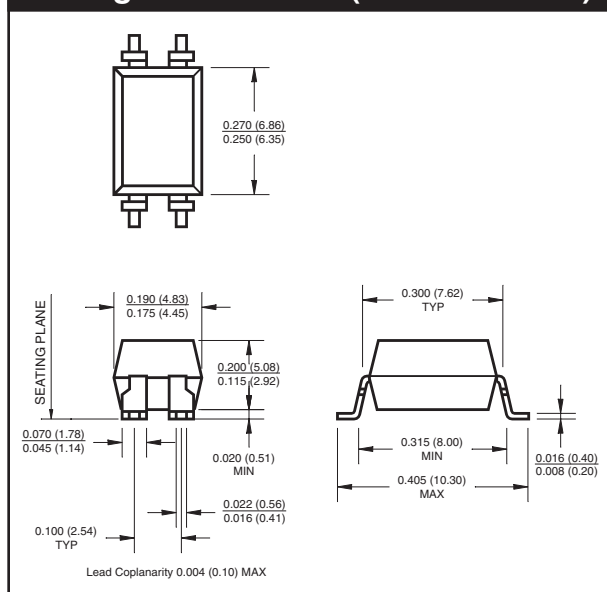
Package Dimensions (Through Hole)



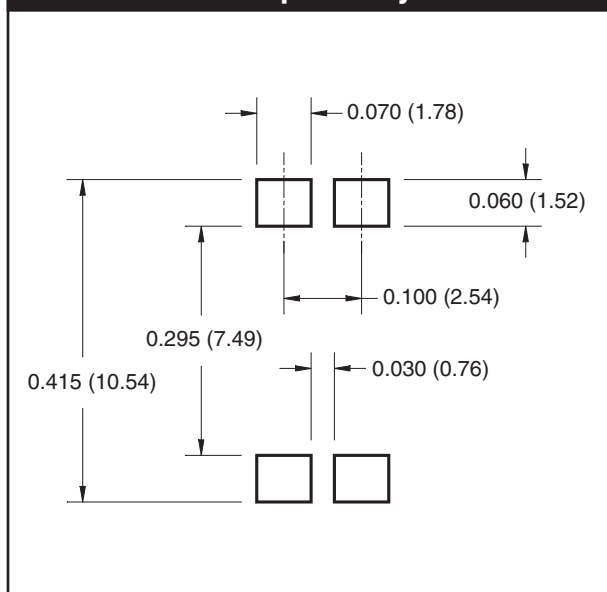
Package Dimensions (0.4" Lead Spacing)



Package Dimensions (Surface Mount)



PCB Footprint Layout



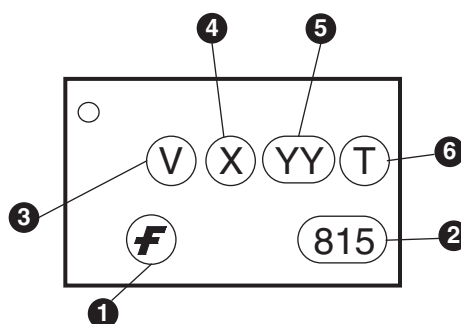
NOTE

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



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Rev. 116