

DESCRIPTION

The H11GX series are photodarlington-type optically coupled optocouplers. These devices have a gallium arsenide infrared emitting diode coupled with a silicon darlington connected phototransistor which has an integral base-emitter resistor to optimize elevated temperature characteristics.

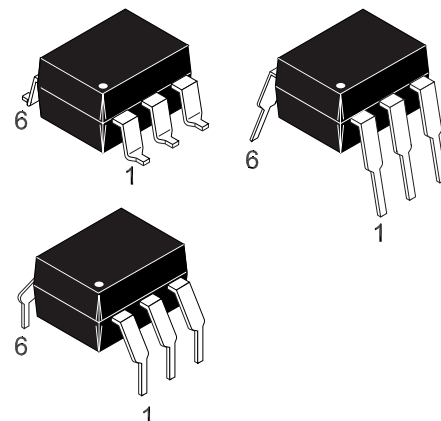
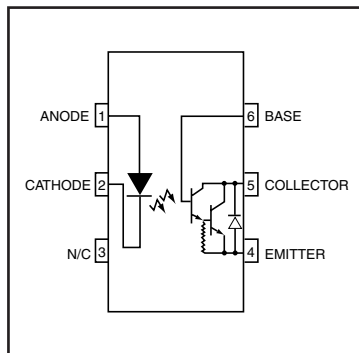
**H11G1
H11G2
H11G3**

FEATURES

- High BV_{CEO}
 - Minimum 100 V for H11G1
 - Minimum 80 V for H11G2
 - Minimum 55 V for H11G3
- High sensitivity to low input current
Minimum 500 percent CTR at $I_F = 1$ mA
- Low leakage current at elevated temperature
(maximum 100 μ A at 80°C)
- Underwriters Laboratory (UL) recognized File# E90700

APPLICATIONS

- CMOS logic interface
- Telephone ring detector
- Low input TTL interface
- Power supply isolation
- Replace pulse transformer



NOTE

All dimensions are in inches (millimeters)

ABSOLUTE MAXIMUM RATINGS

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	260	mW
Derate above 25°C		3.5	mW/°C
Input-Output Isolation Voltage	V _{ISO}	5300	Vac(rms)
EMITTER			
Forward Input Current	I _F	60	mA
Reverse Input Voltage	V _R	6.0	V
Forward Current - Peak (1μs pulse, 300pps)	I _{F(pk)}	3.0	A
LED Power Dissipation @ T _A = 25°C	P _D	100	mW
Derate above 25°C		1.8	mW/°C
DETECTOR			
Collector-Emitter Voltage	V _{CEO}	100	V
H11G1			
H11G2			
H11G3			
Detector Power Dissipation @ T _A = 25°C	P _D	200	mW
Derate above 25°C		2.67	mW/°C

H11G1, H11G2, H11G3

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

INDIVIDUAL COMPONENT CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
EMITTER							
Forward Voltage	(I _F = 10 mA)	V _F	ALL		1.3	1.50	V
Forward Voltage Temp. Coefficient		$\frac{\Delta V_F}{\Delta T_A}$	ALL		-1.8		mV/°C
Reverse Breakdown Voltage	(I _R = 10 µA)	BV _R	ALL	3.0	25		V
Junction Capacitance	(V _F = 0 V, f = 1 MHz)	C _J	ALL		50		pF
	(V _F = 1 V, f = 1 MHz)		ALL		65		pF
Reverse Leakage Current	(V _R = 3.0 V)	I _R	ALL		0.001	10	µA
DETECTOR							
Breakdown Voltage Collector to Emitter	(I _C = 1.0 mA, I _F = 0)	BV _{CEO}	H11G1	100			V
			H11G2	80			
			H11G3	55			
Collector to Base	(I _C = 100 µA)	BV _{CBO}	H11G1	100			
			H11G2	80			
			H11G3	55			
Emitter to Base		BV _{EBO}	ALL	7	10		
Leakage Current Collector to Emitter	(V _{CE} = 80 V, I _F = 0)	I _{CEO}	H11G1			100	nA
	(V _{CE} = 60 V, I _F = 0)		H11G2				
	(V _{CE} = 30 V, I _F = 0)		H11G3				
	(V _{CE} = 80 V, I _F = 0, T _A = 80°C)		H11G1			100	µA
	(V _{CE} = 60 V, I _F = 0, T _A = 80°C)		H11G2				

TRANSFER CHARACTERISTICS

DC Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
EMITTER							
Current Transfer Ratio Collector to Emitter	(I _F = 10 mA, V _{CE} = 1 V)	CTR	H11G1/2	100 (1000)			mA (%)
	(I _F = 1 mA, V _{CE} = 5 V)		H11G1/2	5 (500)			
			H11G3	2 (200)			
Saturation Voltage	(I _F = 16 mA, I _C = 50 mA)	V _{CE (SAT)}	H11G1/2		0.85	1.0	V
	(I _F = 1 mA, I _C = 1 mA)		H11G1/2		0.75	1.0	
	(I _F = 20 mA, I _C = 50 mA)		H11G3		0.85	1.2	

TRANSFER CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
SWITCHING TIMES							
Turn-on Time	(R _L = 100 Ω, I _F = 10 mA)	t _{on}	ALL		5		µs
Turn-off Time	(V _{CE} = 5 V) Pulse Width ≤ 300 µs, f ≤ 30 Hz)	t _{off}	ALL		100		

** All typical values at T_A = 25°C

Fig. 1 Output Current vs. Input Current

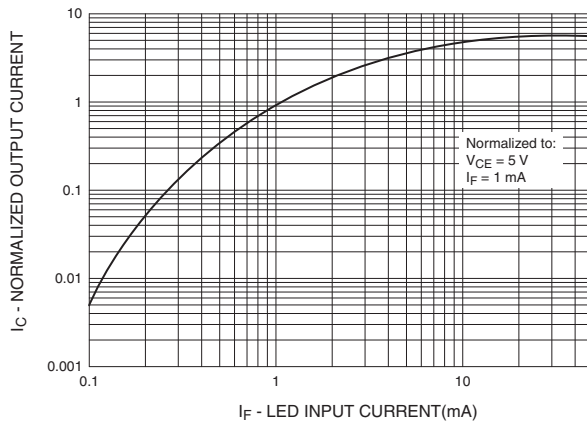


Fig. 2 Normalized Output Current vs. Temperature

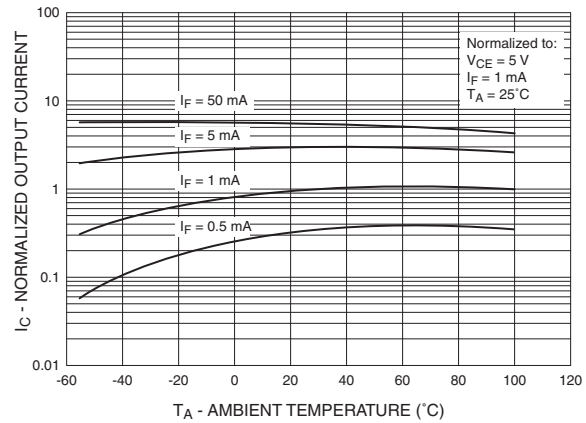


Fig. 3 Output Current vs. Collector - Emitter Voltage

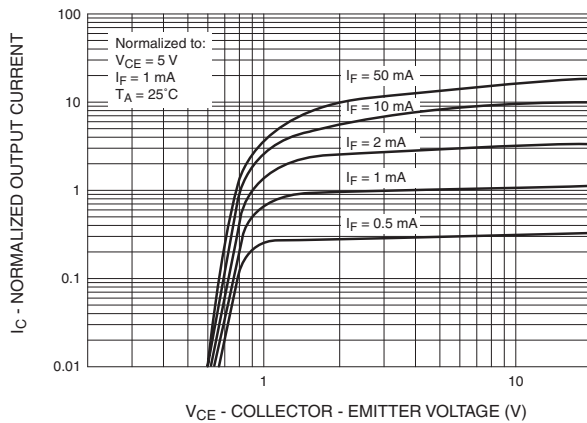


Fig. 4 Collector-Emitter Dark Current vs. Ambient Temperature

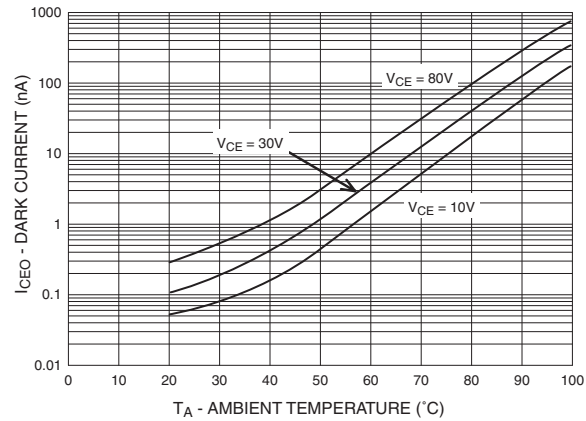
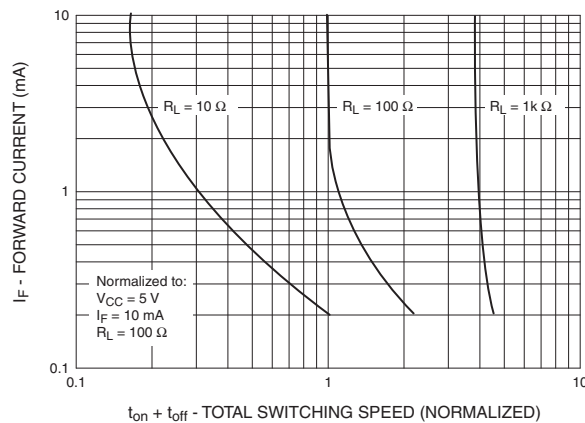
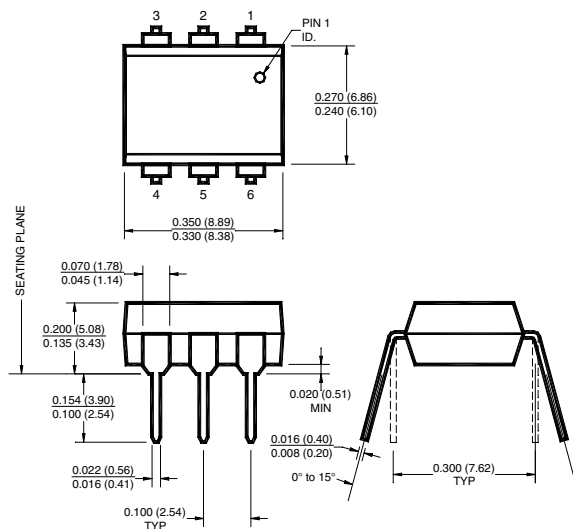


Fig. 5 Input Current vs. Total Switching Speed (Typical Values)

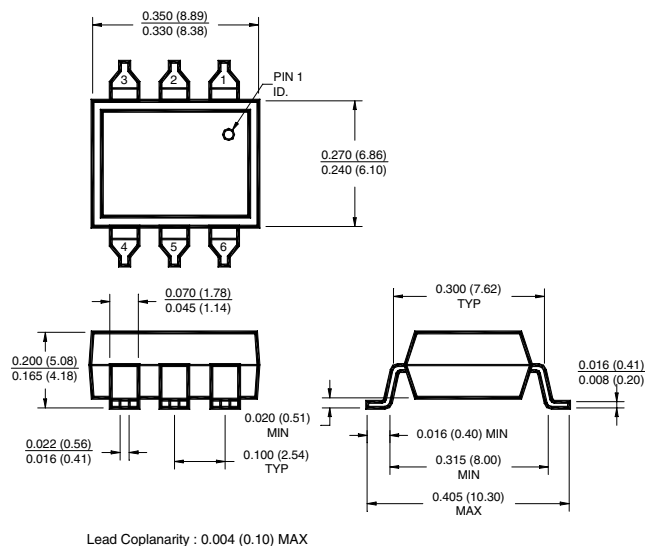


H11G1, H11G2, H11G3

Package Dimensions (Through Hole)

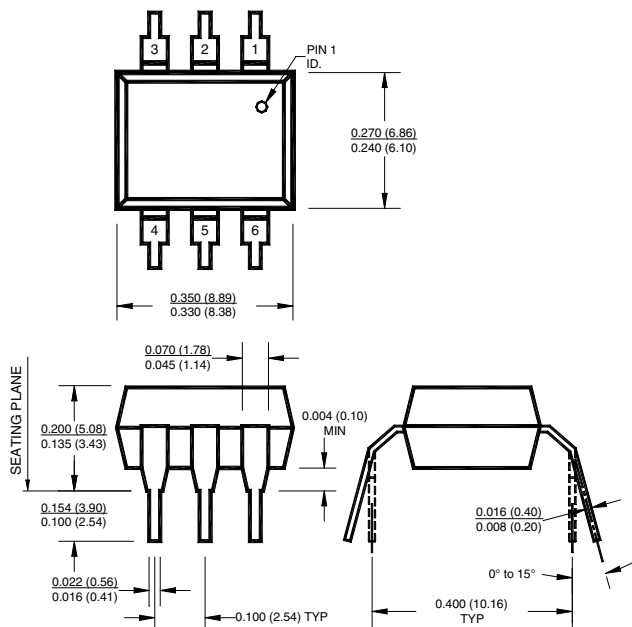


Package Dimensions (Surface Mount)

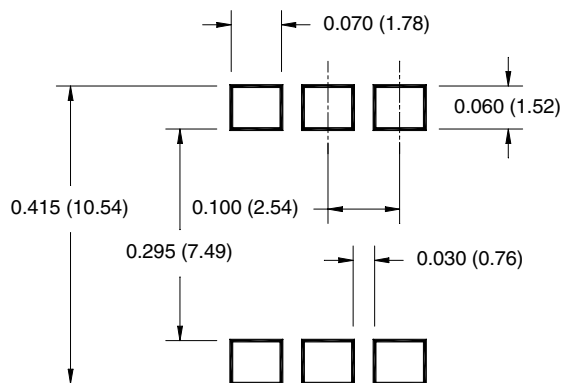


Lead Coplanarity : 0.004 (0.10) MAX

Package Dimensions (0.4"Lead Spacing)



Recommended Pad Layout for Surface Mount Leadform



NOTE

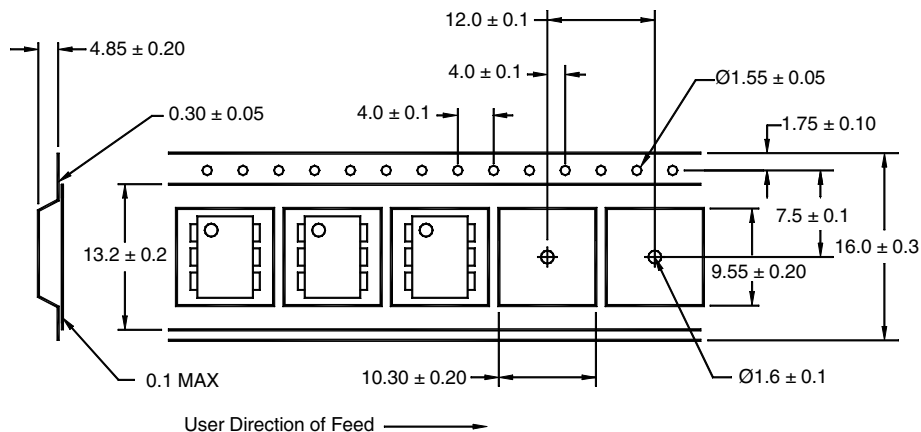
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H11G1, H11G2, H11G3

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

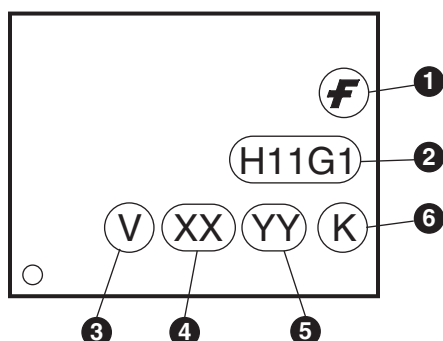
QT Carrier Tape Specifications ("D" Taping Orientation)



NOTE

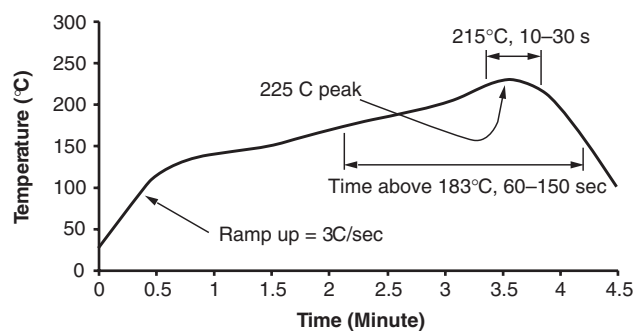
All dimensions are in millimeters

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	Two digit year code, e.g., '03'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

Reflow Profile (Black Package, No Suffix)



- Peak reflow temperature: 225°C (package surface temperature)
- Time of temperature higher than 183°C for 60-150 seconds
- One time soldering reflow is recommended

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EnSigna™	i-Lo™	OCX™	RapidConfigure™	TruTranslation™
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PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
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