

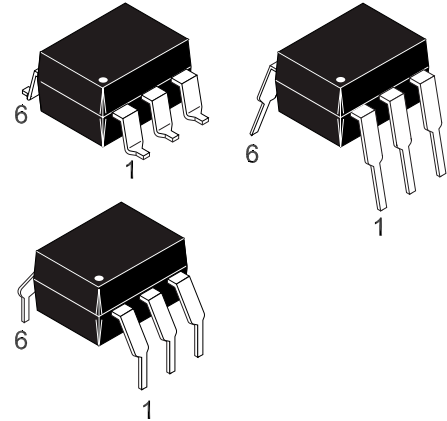
**H11G1  
H11G2  
H11G3**

## 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.

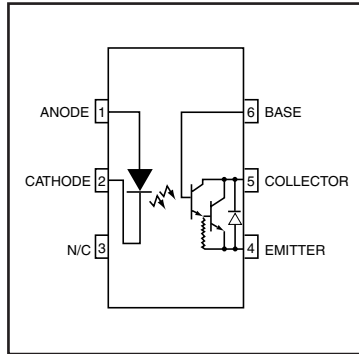
## FEATURES

- 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  $\mu$ 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
<b>TOTAL DEVICE</b>			
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 @ $T_A = 25^\circ\text{C}$	$P_D$	260	mW
Derate above 25°C		3.5	mW/°C
Input-Output Isolation Voltage	$V_{ISO}$	5300	Vac(rms)
<b>EMITTER</b>			
Forward Input Current	$I_F$	60	mA
Reverse Input Voltage	$V_R$	6.0	V
Forward Current - Peak (1 $\mu$ s pulse, 300pps)	$I_{F(pk)}$	3.0	A
LED Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	100	mW
Derate above 25°C		1.8	mW/°C
<b>DETECTOR</b>			
Collector-Emitter Voltage	$V_{CEO}$	100	V
H11G1			
H11G2			
H11G3	55		
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	200	mW
Derate above 25°C		2.67	mW/°C

## H11G1, H11G2, H11G3

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C Unless otherwise specified.)

#### INDIVIDUAL COMPONENT CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
<b>EMITTER</b>							
Forward Voltage	(I <sub>F</sub> = 10 mA)	V <sub>F</sub>	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 <sub>R</sub> = 10 μA)	BV <sub>R</sub>	ALL	3.0	25		V
Junction Capacitance	(V <sub>F</sub> = 0 V, f = 1 MHz)	C <sub>J</sub>	ALL		50		pF
	(V <sub>F</sub> = 1 V, f = 1 MHz)		ALL		65		pF
Reverse Leakage Current	(V <sub>R</sub> = 3.0 V)	I <sub>R</sub>	ALL		0.001	10	μA
<b>DETECTOR</b>							
Breakdown Voltage Collector to Emitter	(I <sub>C</sub> = 1.0 mA, I <sub>F</sub> = 0)	BV <sub>CEO</sub>	H11G1	100			V
			H11G2	80			
			H11G3	55			
Collector to Base	(I <sub>C</sub> = 100 μA)	BV <sub>CBO</sub>	H11G1	100			V
			H11G2	80			
			H11G3	55			
Emitter to Base		BV <sub>EBO</sub>	ALL	7	10		
Leakage Current Collector to Emitter	(V <sub>CE</sub> = 80 V, I <sub>F</sub> = 0)	I <sub>CEO</sub>	H11G1			100	nA
	(V <sub>CE</sub> = 60 V, I <sub>F</sub> = 0)		H11G2				
	(V <sub>CE</sub> = 30 V, I <sub>F</sub> = 0)		H11G3				
	(V <sub>CE</sub> = 80 V, I <sub>F</sub> = 0, T <sub>A</sub> = 80°C)		H11G1			100	μA
	(V <sub>CE</sub> = 60 V, I <sub>F</sub> = 0, T <sub>A</sub> = 80°C)		H11G2				

#### TRANSFER CHARACTERISTICS

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

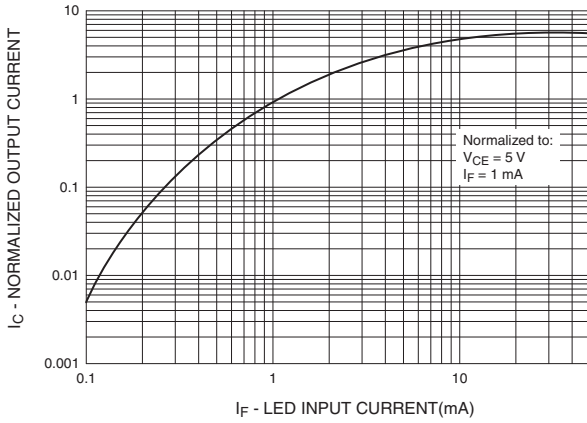
#### TRANSFER CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
<b>SWITCHING TIMES</b>							
Turn-on Time	(R <sub>L</sub> = 100 Ω, I <sub>F</sub> = 10 mA)	t <sub>on</sub>	ALL		5		μs
Turn-off Time	(V <sub>CE</sub> = 5 V) Pulse Width ≤ 300 μs, f ≤ 30 Hz)	t <sub>off</sub>	ALL		100		

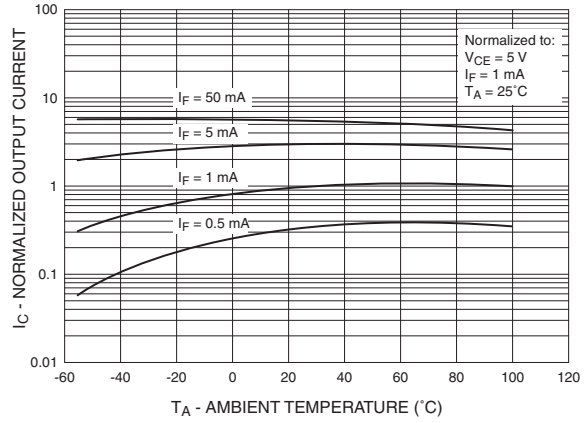
\*\* All typical values at T<sub>A</sub> = 25°C

**H11G1, H11G2, H11G3**

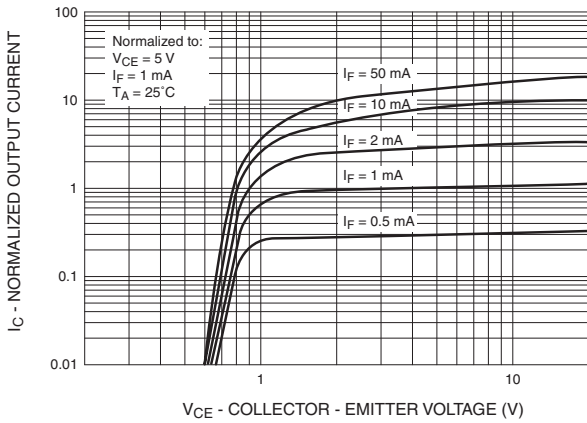
**Fig. 1 Output Current vs. Input Current**



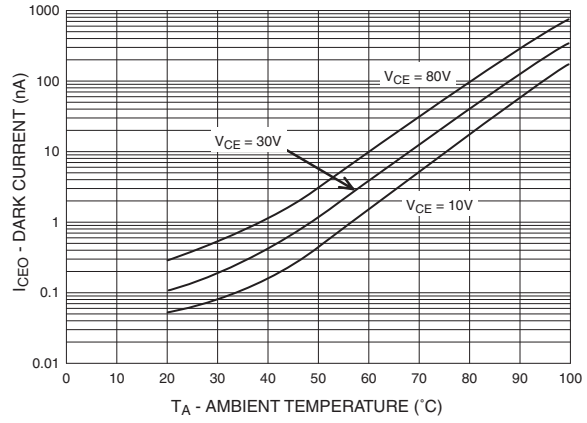
**Fig. 2 Normalized Output Current vs. Temperature**



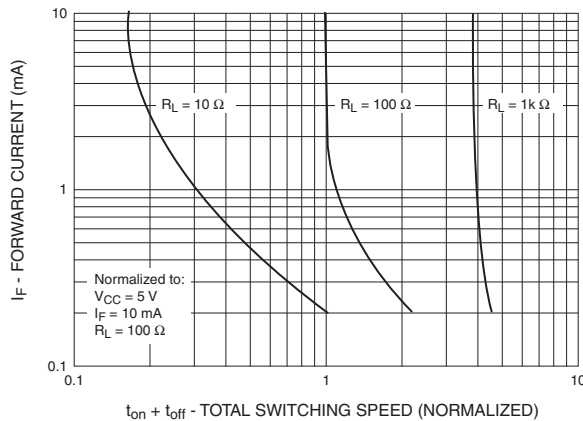
**Fig. 3 Output Current vs. Collector - Emitter Voltage**



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

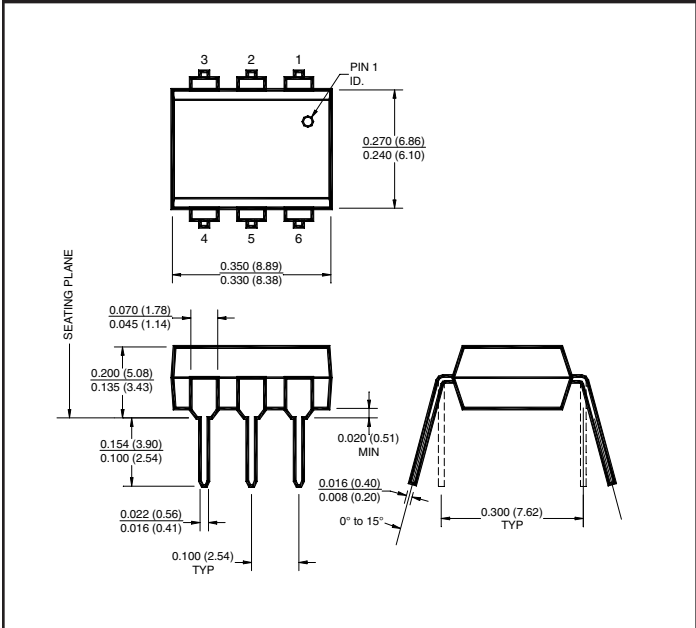


**Fig. 5 Input Current vs. Total Switching Speed (Typical Values)**

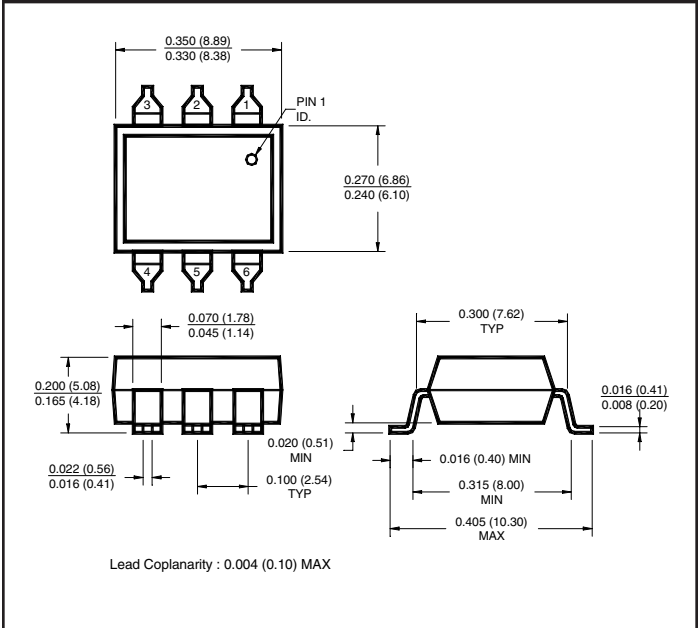


**H11G1, H11G2, H11G3**

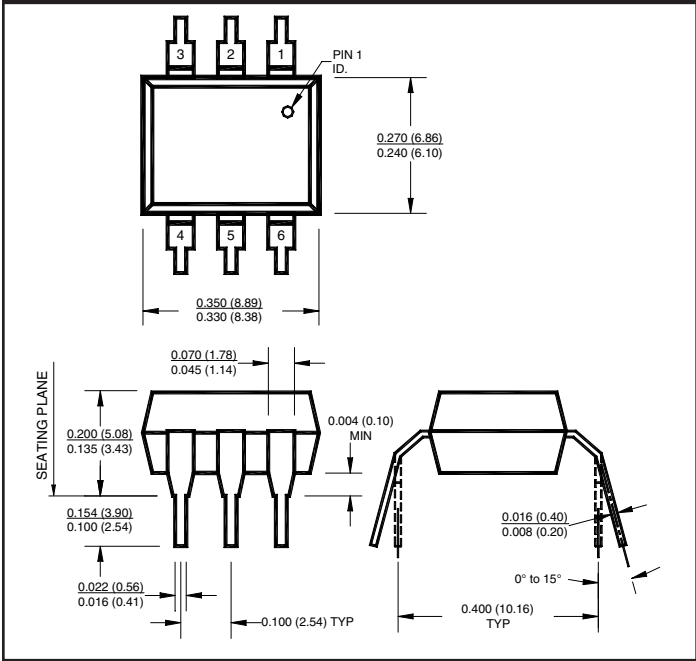
**Package Dimensions (Through Hole)**



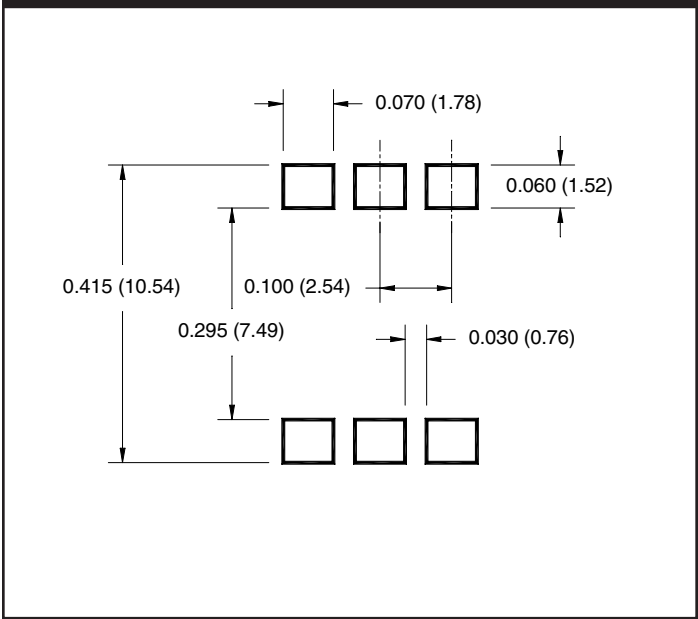
**Package Dimensions (Surface Mount)**



**Package Dimensions (0.4" Lead Spacing)**



**Recommended Pad Layout for Surface Mount Leadform**



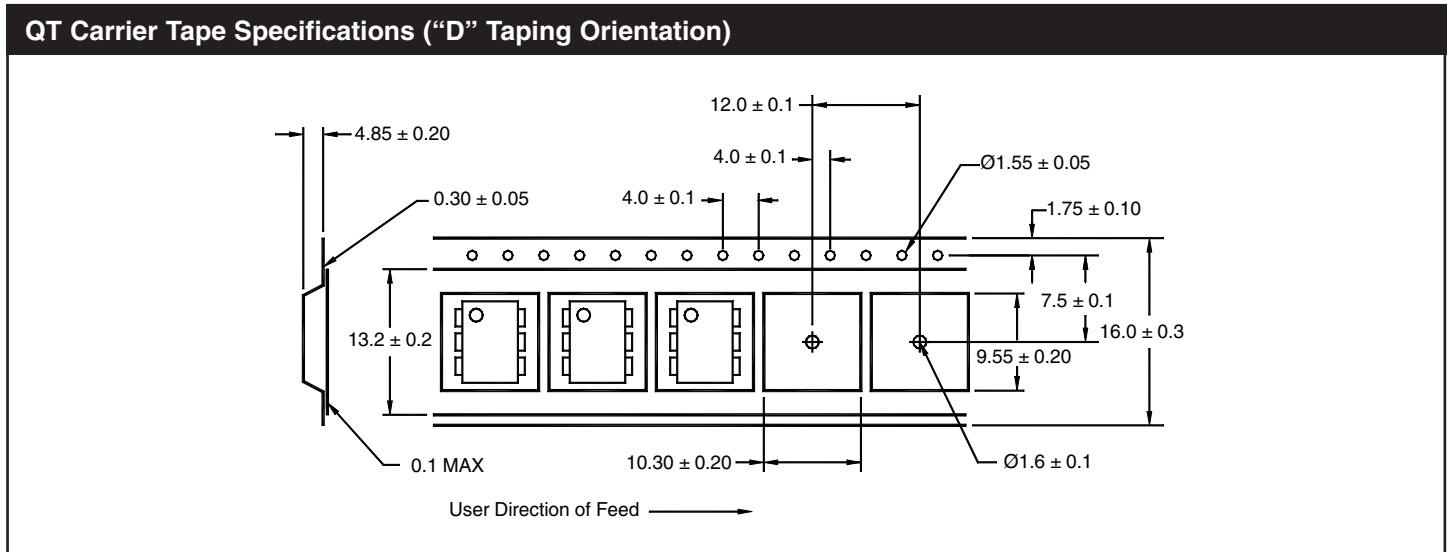
**NOTE**

All dimensions are in inches (millimeters)

**H11G1, H11G2, H11G3**

## ORDERING INFORMATION

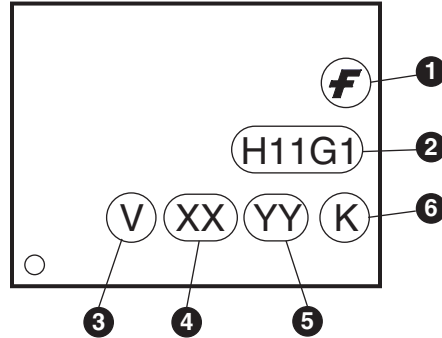
Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
W	.W	0.4" Lead Spacing
300	.300	VDE 0884
300W	.300W	VDE 0884, 0.4" Lead Spacing
3S	.3S	VDE 0884, Surface Mount
3SD	.3SD	VDE 0884, Surface Mount, Tape & Reel



**NOTE**

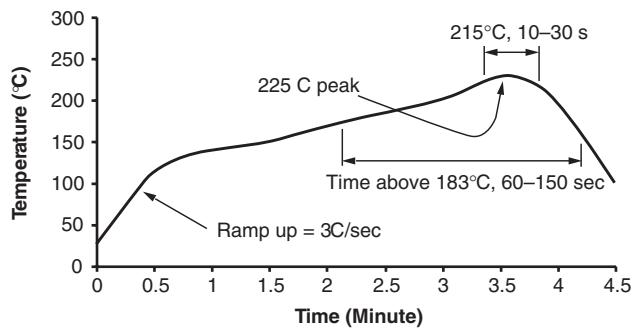
All dimensions are in millimeters

**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™
FACT™	ImpliedDisconnect™	OCXPro™	RapidConnect™	UHC™
FACT Quiet Series™		OPTOLOGIC®	μSerDes™	UltraFET®
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Datasheet Identification	Product Status	Definition
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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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