



# THE DATASHEET OF H11G3S



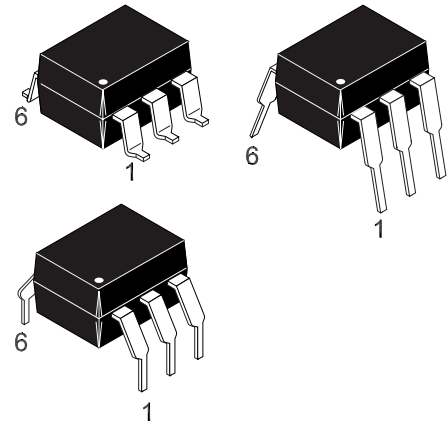
**H11G1  
H11G2  
H11G3**

## 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.

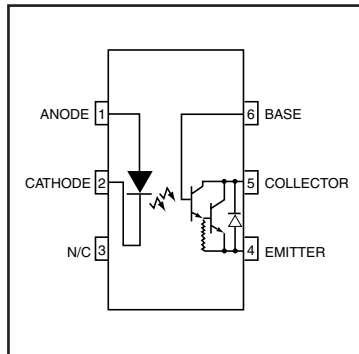
## FEATURES

- 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)

<b>ABSOLUTE MAXIMUM RATINGS</b>			
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** ( $T_A = 25^\circ\text{C}$  Unless otherwise specified.)

**INDIVIDUAL COMPONENT CHARACTERISTICS**

Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
<b>EMITTER</b>							
Forward Voltage	( $I_F = 10\text{ mA}$ )	$V_F$	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	( $I_R = 10\text{ }\mu\text{A}$ )	$BV_R$	ALL	3.0	25		V
Junction Capacitance	( $V_F = 0\text{ V}, f = 1\text{ MHz}$ )	$C_J$	ALL		50		pF
	( $V_F = 1\text{ V}, f = 1\text{ MHz}$ )		ALL		65		pF
Reverse Leakage Current	( $V_R = 3.0\text{ V}$ )	$I_R$	ALL		0.001	10	$\mu\text{A}$
<b>DETECTOR</b>							
Breakdown Voltage Collector to Emitter	( $I_C = 1.0\text{ mA}, I_F = 0$ )	$BV_{CEO}$	H11G1	100			V
			H11G2	80			
			H11G3	55			
Collector to Base	( $I_C = 100\text{ }\mu\text{A}$ )	$BV_{CBO}$	H11G1	100			
			H11G2	80			
			H11G3	55			
Emitter to Base		$BV_{EBO}$	ALL	7	10		
Leakage Current Collector to Emitter	( $V_{CE} = 80\text{ V}, I_F = 0$ )	$I_{CEO}$	H11G1			100	nA
	( $V_{CE} = 60\text{ V}, I_F = 0$ )		H11G2				
	( $V_{CE} = 30\text{ V}, I_F = 0$ )		H11G3				
	( $V_{CE} = 80\text{ V}, I_F = 0, T_A = 80^\circ\text{C}$ )		H11G1			100	$\mu\text{A}$
	( $V_{CE} = 60\text{ V}, I_F = 0, T_A = 80^\circ\text{C}$ )		H11G2				

**TRANSFER CHARACTERISTICS**

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

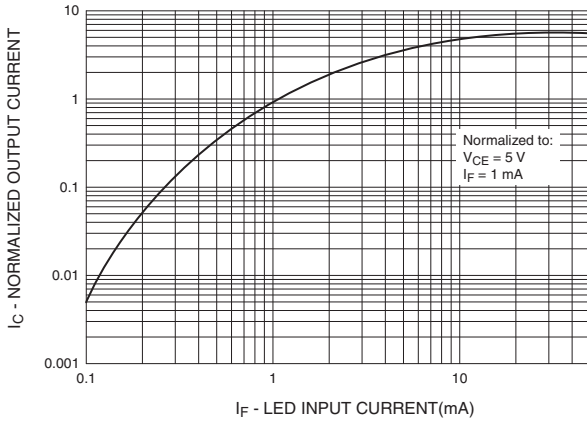
**TRANSFER CHARACTERISTICS**

Characteristic	Test Conditions	Symbol	Device	Min	Typ**	Max	Unit
<b>SWITCHING TIMES</b>							
Turn-on Time	( $R_L = 100\text{ }\Omega, I_F = 10\text{ mA}$ )	$t_{on}$	ALL		5		$\mu\text{s}$
Turn-off Time	( $V_{CE} = 5\text{ V}$ ) Pulse Width $\leq 300\text{ }\mu\text{s}, f \leq 30\text{ Hz}$ )	$t_{off}$	ALL		100		

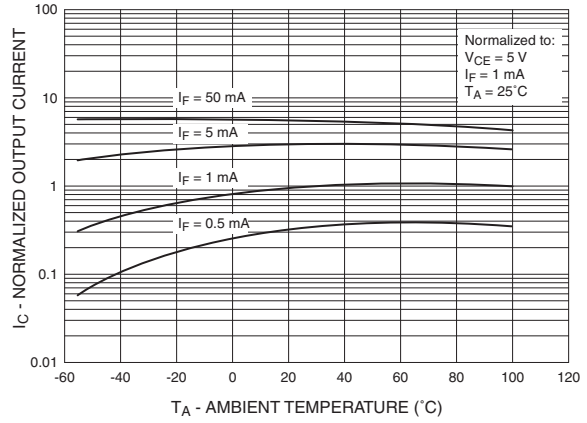
\*\* All typical values at  $T_A = 25^\circ\text{C}$

**H11G1, H11G2, H11G3**

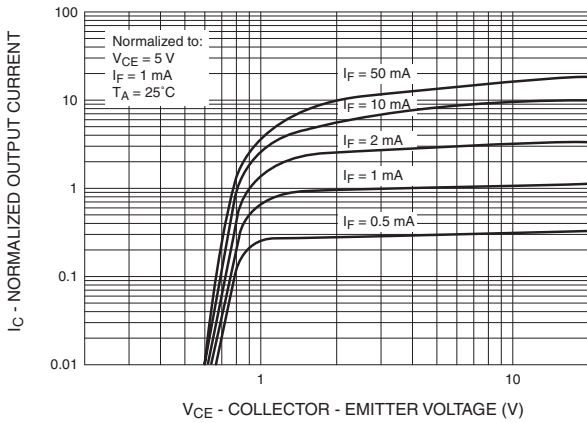
**Fig. 1 Output Current vs. Input Current**



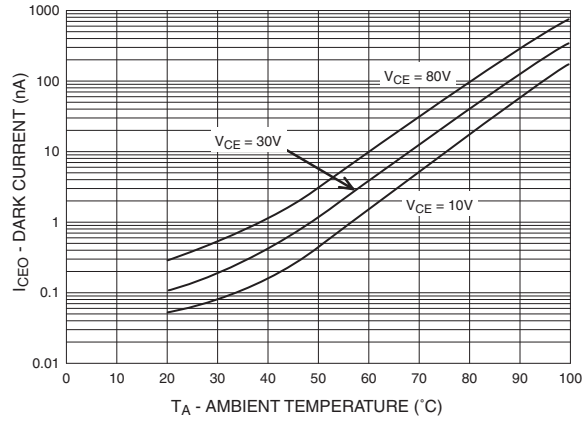
**Fig. 2 Normalized Output Current vs. Temperature**



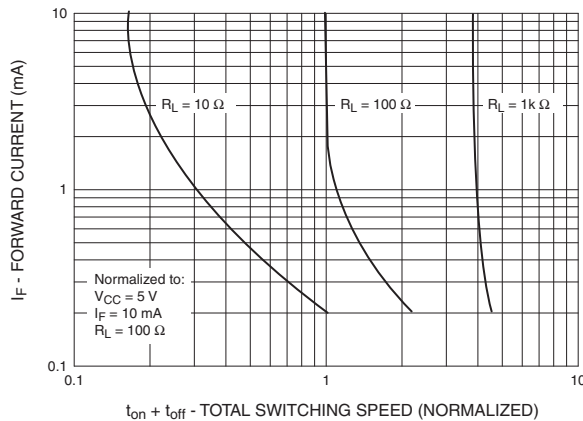
**Fig. 3 Output Current vs. Collector - Emitter Voltage**



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



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

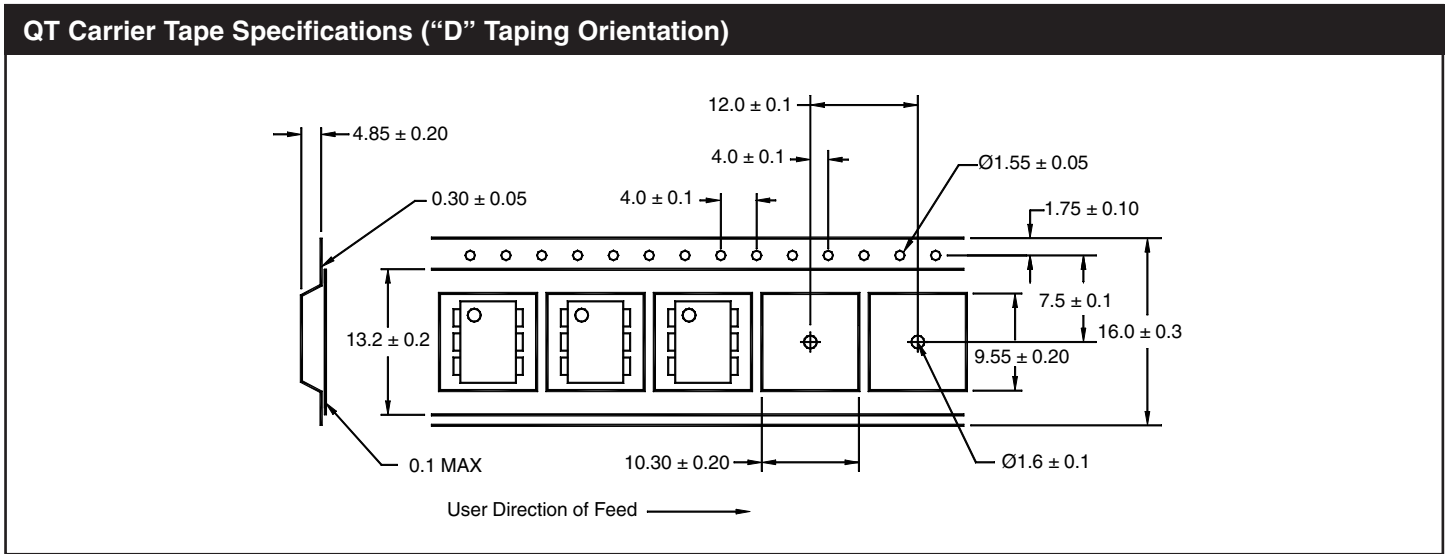




H11G1, H11G2, H11G3

## 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

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