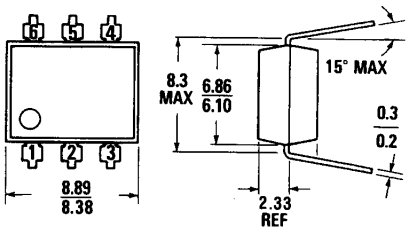
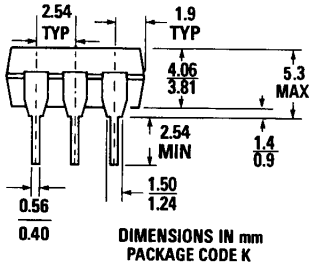
QT OPTOELECTRONICS

HIGH VOLTAGE PHOTODARLINGTON OPTOCOUPLERS

H11G1
H11G2

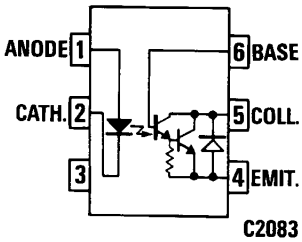
PACKAGE DIMENSIONS





DIMENSIONS IN mm
PACKAGE CODE K

ST1603A



Equivalent Circuit

DESCRIPTION

The H11G1 and H11G2 are the photodarlington-type optically coupled optoisolators. Both 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 100V for H11G1
  Minimum 80V for H11G2
- High sensitivity to low input current—Minimum 500 percent CTR at I_F=1 mA
- Low leakage current at elevated temperature (maximum 100 μA 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

ABSOLUTE MAXIMUM RATINGS

TOTAL PACKAGE

Storage temperature ..... −55°C to 150°C
Operating temperature ..... −55°C to 100°C
Lead temperature
(soldering, 10 sec) ..... 260°C
Total package power dissipation at 25°C
(LED plus detector) ..... 260 mW
Derate linearly from 25°C ..... 3.5 mW/°C
Isolation voltage ..... 7500 VAC PEAK

INPUT DIODE

Forward DC current ..... 60 mA
Reverse voltage ..... 6 V
Peak forward current
(1 μs pulse, 300 pps) ..... 3.0 A
Power dissipation 25°C ambient ..... 100 mW
Derate linearly from 25°C ..... 1.8 mW/°C

OUTPUT TRANSISTOR

Power dissipation @ 25°C ..... 200 mW
Derate linearly from 25°C ..... 2.67 mW/°C
Collector to emitter voltage
H11G1 ..... 100 V
H11G2 ..... 80 V

ELECTRO-OPTICAL CHARACTERISTICS (25°C Temperature Unless Otherwise Specified)

INDIVIDUAL COMPONENT CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward voltage	V_F		1.3	1.50	V	I_F=10 mA
Forward voltage temp. coefficient	$\frac{\Delta V_F}{\Delta T_A}$	−1.8		mV/°C		
Reverse breakdown voltage	BV_R	3.0	25		V	I_R=10 μA
Junction capacitance	C_J		50		pF	V_F=0 V, f=1 MHz
			65		pF	V_F=1 V, f=1 MHz
Reverse leakage current	I_R		0.35	10	μA	V_R=3.0 V
OUTPUT DARLINGTON						
Breakdown voltage Collector to emitter	BV_{CEO}					
H11G1		100			V	I_C=1.0 mA; I_F=0
H11G2		80			V	
Collector to base	BV_{CBO}					
H11G1		100			V	I_C=100 μA
H11G2		80			V	
Emitter to base	BV_{EBO}	7	10		V	I_E=100 μA, I_F=0
Leakage current Collector to emitter	I_{CEO}					
H11G1				100	nA	V_{CE}=80V, I_F=0
H11G2				100	nA	V_{CE}=60V, I_F=0
H11G1				100	μA	V_{CE}=80V, I_F=0, T_A=80°C
H11G2				100	μA	V_{CE}=60V, I_F=0, T_A=80°C

TRANSFER CHARACTERISTICS

DC CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Current Transfer Ratio, collector to emitter	CTR					
H11G1/2		1000			%	I_F=10 mA; V_{CE}=1 V
H11G1/2		500			%	I_F=1 mA; V_{CE}=5 V
Saturation voltage	$V_{CE(SAT)}$		0.85	1.0	V	I_F=16 mA; I_C=50 mA
			0.75	1.0	V	I_F=1 mA; I_C=1 mA

TRANSFER CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
SWITCHING TIMES						
Turn-on time	t_{on}		5		μs	R_L=100Ω; I_F=10 mA
Turn-off time	t_{off}		100		μs	V_{CE}=5V Pulse width ≤ 300 μsec, f ≤ 30 Hz

TYPICAL ELECTRICAL CHARACTERISTIC CURVES

(25°C Free Air Temperature Unless Otherwise Specified) (Cont'd)

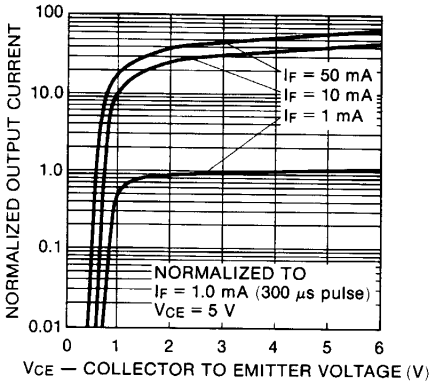


Fig. 3. Output Characteristics

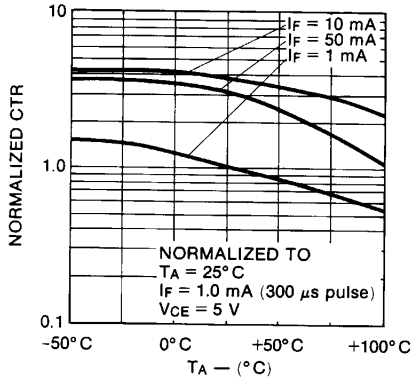


Fig. 4. Normalized CTR vs. Temperature

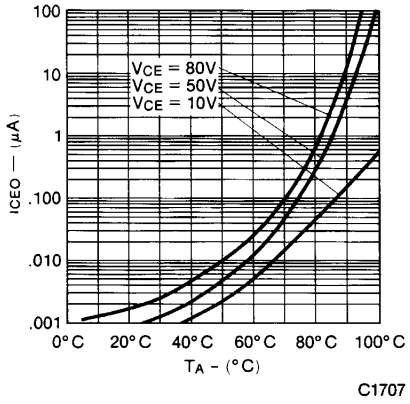


Fig. 5. Dark Current vs. Temperature

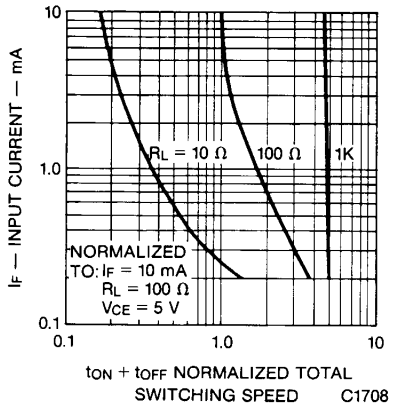


Fig. 6. Switching Speed

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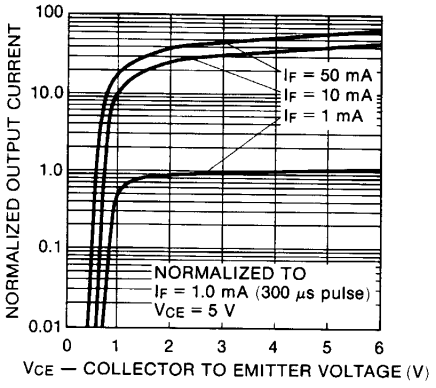

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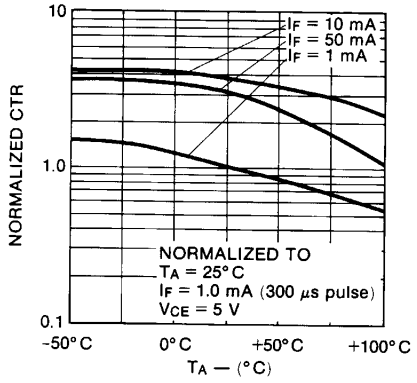

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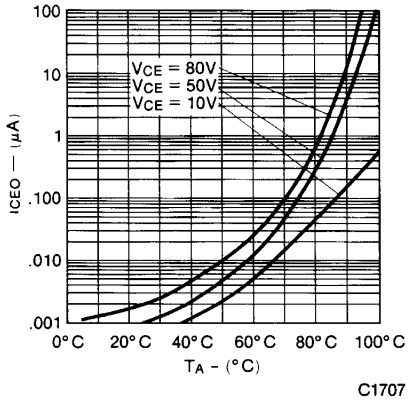

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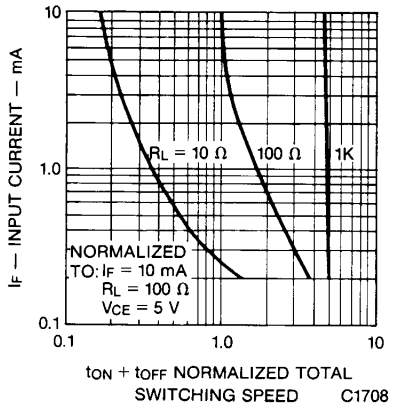

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