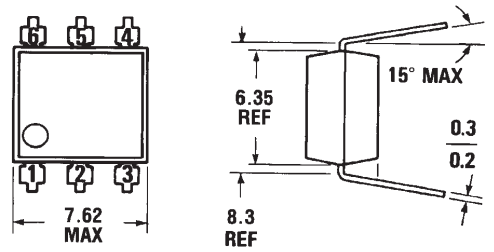
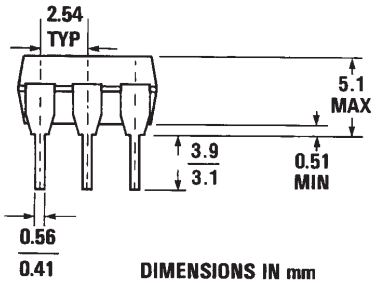
QT OPTOELECTRONICS

AC INPUT/PHOTOTRANSISTOR OPTOCOUPLERS

H11AA1 H11AA3
H11AA2 H11AA4

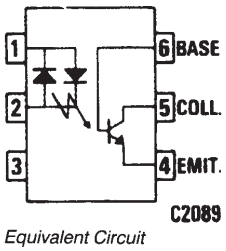
PACKAGE DIMENSIONS





DIMENSIONS IN mm
PACKAGE CODE E

ST1603-02



Equivalent Circuit

DESCRIPTION

The H11AAX family of devices has two GaAs emitters connected in inverse parallel driving a single silicon phototransistor output.

FEATURES

- Bi-polar emitter input
- Built-in reverse polarity input protection
- UL recognized (File #E90700)

APPLICATIONS

- AC line monitor
- Unknown polarity DC sensor
- Telephone line interface

ABSOLUTE MAXIMUM RATINGS

TOTAL PACKAGE

Power dissipation	350 mW
Derate linearly from 25°C	4.6 mW
Storage temperature	−55°C to 150°C
Operating temperature	−55°C to 100°C
Lead temperature (soldering, 10 sec)	260°C

INPUT DIODE

Forward current	100 mA
Peak forward current (1 μs pulse, 300 pps)	±1.0 A
Power dissipation	200 mW
Derate linearly from 25°C	2.6 mW/°C

OUTPUT TRANSISTOR

Power dissipation	300 mW
Derate linearly from 25°C	4.0 mW/°C

INDIVIDUAL COMPONENT CHARACTERISTICS (T_A=25°C Unless Otherwise Specified)

CHARACTERISTIC	SYMBOL	DEVICE	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE							
Forward voltage	V_F	ALL		1.2	1.5	V	I_F=±10 mA
Forward voltage coefficient	$\Delta V_F/\Delta T_A$	ALL		−1.9		mV/°C	I_F=2 mA
Junction capacitance	C_J	ALL		80		pF	V_F=0 V, f=1 MHz
OUTPUT TRANSISTOR							
Breakdown voltage							
Collector to emitter	BV_{CEO}	ALL	30			V	I_C=1 mA, I_F=0
Collector to base	BV_{CBO}	ALL	70			V	I_C=100 μA, I_F=0
Emitter to base	BV_{EBO}	ALL	5			V	I_E=100 μA, I_F=0
Emitter to collector	BV_{ECO}	ALL	7			V	I_E=100 μA, I_F=0
Leakage current	I_{CEO}	H11AA1,3,4			50	nA	V_{CE}=10 V, I_F=0
	I_{CEO}	H11AA2			200	nA	V_{CE}=10 V, I_F=0
Capacitance							
Collector to emitter	C_{CE}	ALL		10		pF	V_{CE}=0, f=1 MHz
Collector to base	C_{CB}	ALL		80		pF	V_{CE}=0, f=1 MHz
Emitter to base	C_{EB}	ALL		15		pF	V_{CE}=0, f=1 MHz

TRANSFER CHARACTERISTICS (T_A=25°C Unless Otherwise Specified)

CHARACTERISTIC	SYMBOL	DEVICE	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Current transfer (Collector-Emitter)	CTR_{CE}	H11AA4	100			%	I_F=±10 mA, V_{CE}=10 V
		H11AA3	50				I_F=±10mA, V_{CE}=10 V
		H11AA1	20				I_F=±10mA, V_{CE}=10 V
		H11AA2	10				I_F=±10mA, V_{CE}=10 V
Current transfer ratio symmetry		ALL	0.33		3.0		I_F=±10 mA, V_{CE}=10 V Fig. 6
Saturation voltage (Collector-Emitter)	$V_{CE}SAT$	ALL			0.4	V	I_F=±10 mA, I_{CE}=0.5 mA
		H11AA3,4		0.4		V	I_F=±16 mA, I_{CE}=2.0 mA

ISOLATION CHARACTERISTICS (T_A=25°C Unless Otherwise Specified)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Package capacitance input/output	C_{I-O}		0.7		pF	V_{I-O}=0, f=1 MHz
Withstand insulation test voltage	V_{ISO}	5300			$V_{AC(RMS)}$	I_{I-O}≤1 μA, 1 minute
Insulation resistance	R_{ISO}	10^{11}			Ohms	V_{I-O}=500 V

ELECTRICAL CHARACTERISTIC CURVES (T_A=25°C Unless Otherwise Specified)

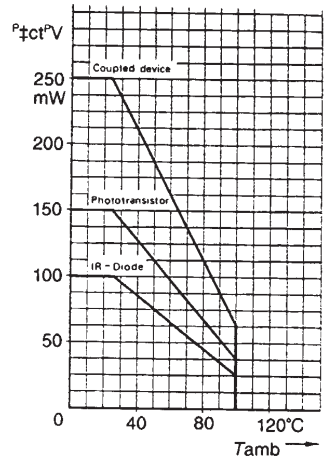


Fig. 1.

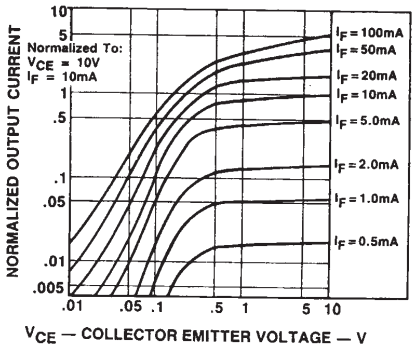


Fig. 2. Transfer Characteristics

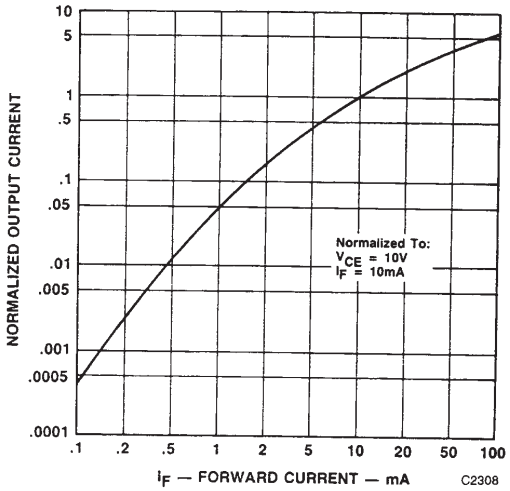


Fig. 3. Input Current vs. Output Current

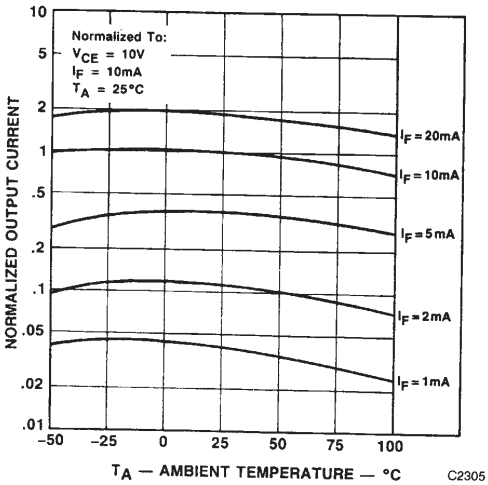


Fig. 4. Output Current vs. Temperature

ELECTRICAL CHARACTERISTIC CURVES (T_A=25°C Unless Otherwise Specified) (Cont'd)

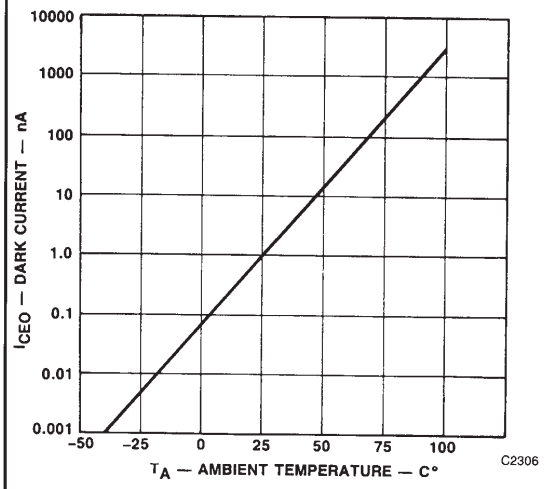


Fig. 5 Dark Current vs. Temperature

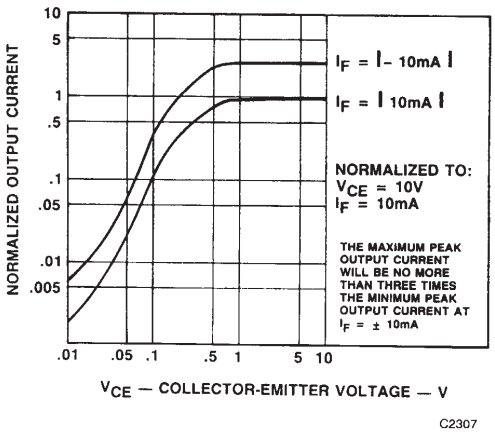


Fig. 6. Output Symmetry Characteristics

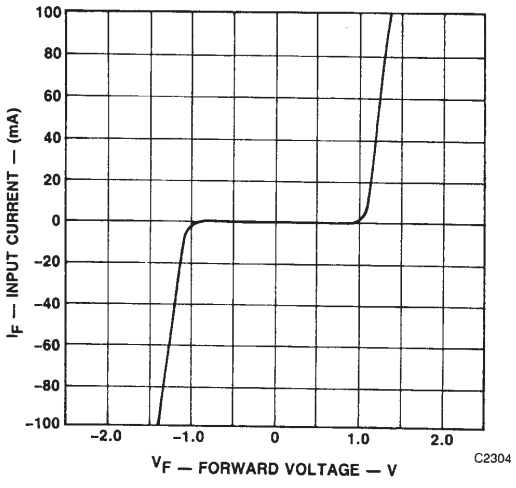


Fig. 7.