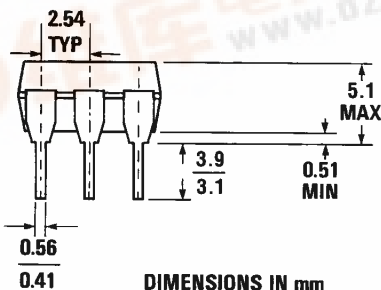
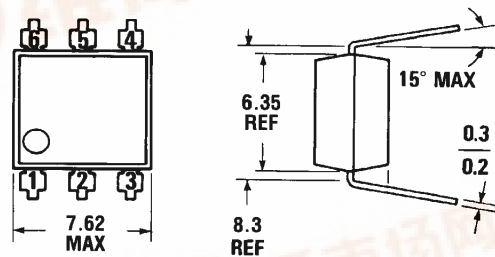




AC INPUT/PHOTOTRANSISTOR OPTOCOUPLERS

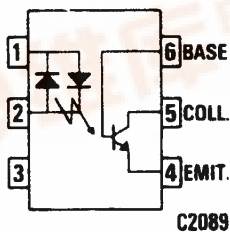
**H11AA1 H11AA3
H11AA2 H11AA4**

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 μ s 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



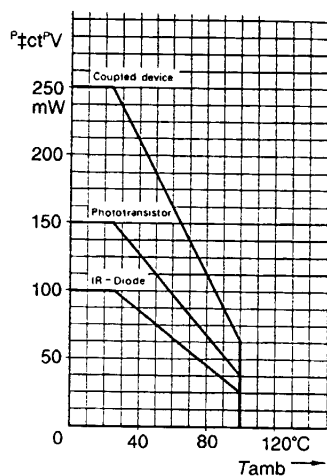
AC INPUT/PHOTOTRANSISTOR OPTOCOUPERS

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	ΔV _F /ΔT _A	ALL		-1.9		mV/°C	I _F = 2 mA
Junction capacitance	C _J	ALL		80		pF	V _r = 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 _{EEO}	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 _{CE0}	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 = ±10 mA, V _{CE} = 10 V
		H11AA1	20				I _F = ±10 mA, V _{CE} = 10 V
		H11AA2	10				I _F = ±10 mA, 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

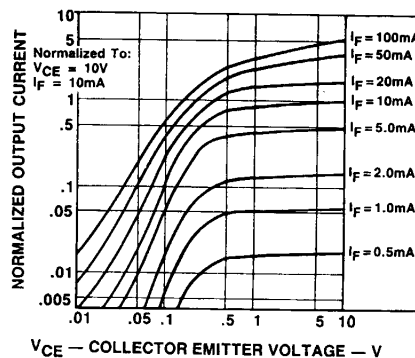
ISOLATION CHARACTERISTICS (T _A =25°C Unless Otherwise Specified)						
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Package capacitance input/output	C _{i-o}		0.7		pF	V _{i-o} =0, f=1 MHz
Withstand insulation test voltage	V _{iso}	5300			V _{AC(RMS)}	I _{i-o} ≤1 μA, 1 minute
Insulation resistance	R _{iso}	10 ¹¹			Ohms	V _{i-o} =500 V

ELECTRICAL CHARACTERISTIC CURVES ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)



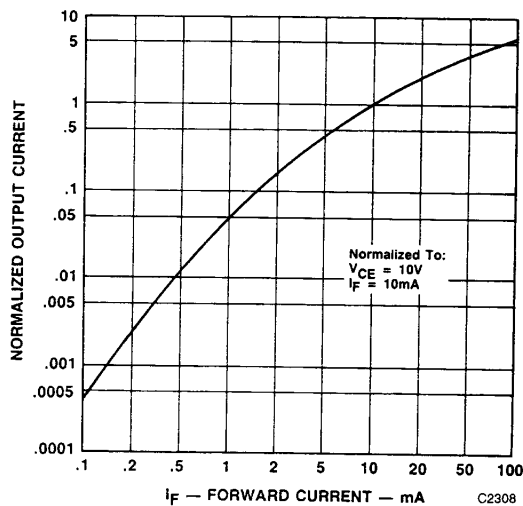
C2303

Fig. 1.



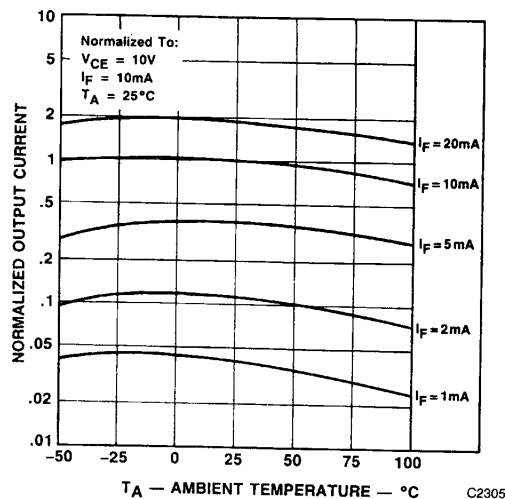
C2309

Fig. 2. Transfer Characteristics



C2308

Fig. 3. Input Current vs.
Output Current



C2305

Fig. 4. Output Current vs.
Temperature

ELECTRICAL CHARACTERISTIC CURVES ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified) (Cont'd)

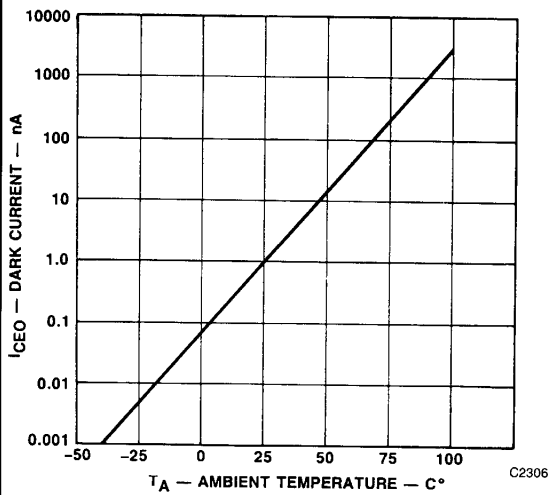


Fig. 5 Dark Current vs. Temperature

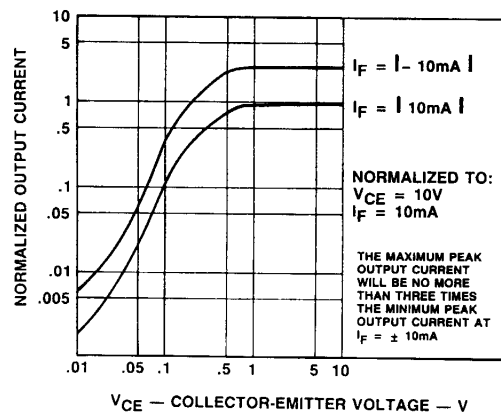


Fig. 6. Output Symmetry Characteristics

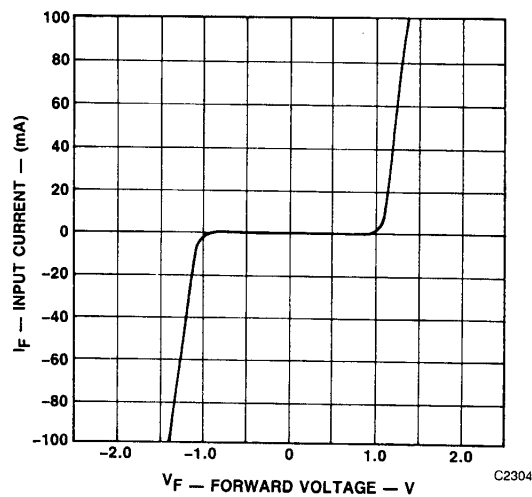


Fig. 7.