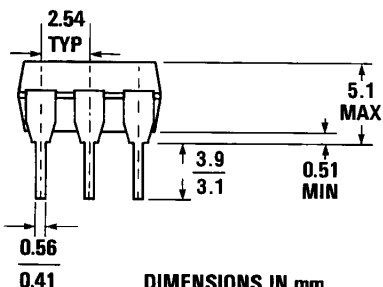
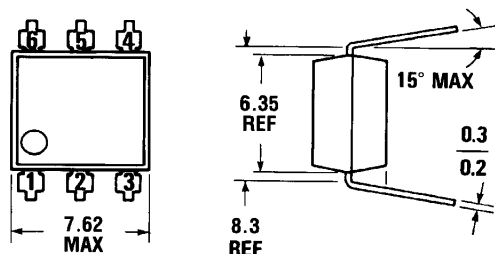




AC INPUT/PHOTOTRANSISTOR OPTOCOUPLEDERS

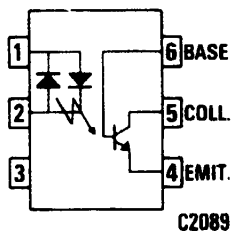
**H11AA1 H11AA3
H11AA2 H11AA4**

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

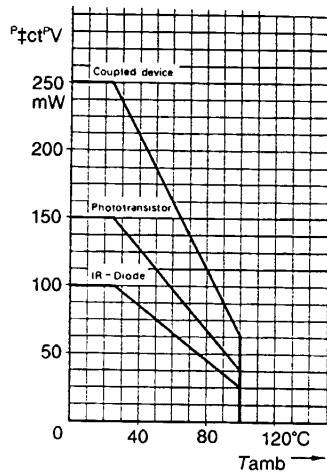
Power dissipation	300 mW
Derate linearly from 25°C	4.0 mW/°C

INDIVIDUAL COMPONENT CHARACTERISTICS ($T_A=25^\circ\text{C}$ Unless Otherwise Specified)							
CHARACTERISTIC	SYMBOL	DEVICE	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE							
Forward voltage	V_F	ALL		1.2	1.5	V	$I_F = \pm 10 \text{ mA}$
Forward voltage coefficient	$\Delta V_F / \Delta T_A$	ALL		-1.9		mV/ $^\circ\text{C}$	$I_F = 2 \text{ mA}$
Junction capacitance	C_j	ALL		80		pF	$V_F = 0 \text{ V}$, $f = 1 \text{ MHz}$
OUTPUT TRANSISTOR							
Breakdown voltage							
Collector to emitter	BV_{CEO}	ALL	30			V	$I_C = 1 \text{ mA}$, $I_F = 0$
Collector to base	BV_{CBO}	ALL	70			V	$I_C = 100 \mu\text{A}$, $I_F = 0$
Emitter to base	BV_{EBO}	ALL	5			V	$I_E = 100 \mu\text{A}$, $I_F = 0$
Emitter to collector	BV_{ECO}	ALL	7			V	$I_E = 100 \mu\text{A}$, $I_F = 0$
Leakage current	I_{CEO}	H11AA1,3,4			50	nA	$V_{CE} = 10 \text{ V}$, $I_F = 0$
	I_{CEO}	H11AA2			200	nA	$V_{CE} = 10 \text{ V}$, $I_F = 0$
Capacitance							
Collector to emitter	C_{CE}	ALL		10		pF	$V_{CE} = 0$, $f = 1 \text{ MHz}$
Collector to base	C_{CB}	ALL		80		pF	$V_{CE} = 0$, $f = 1 \text{ MHz}$
Emitter to base	C_{EB}	ALL		15		pF	$V_{CE} = 0$, $f = 1 \text{ MHz}$

TRANSFER CHARACTERISTICS ($T_A=25^\circ\text{C}$ Unless Otherwise Specified)							
CHARACTERISTIC	SYMBOL	DEVICE	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Current transfer (Collector-Emitter)	CTR_{CE}	H11AA4	100			%	$I_F = \pm 10 \text{ mA}$, $V_{CE} = 10 \text{ V}$
		H11AA3	50				$I_F = \pm 10 \text{ mA}$, $V_{CE} = 10 \text{ V}$
		H11AA1	20				$I_F = \pm 10 \text{ mA}$, $V_{CE} = 10 \text{ V}$
		H11AA2	10				$I_F = \pm 10 \text{ mA}$, $V_{CE} = 10 \text{ V}$
Current transfer ratio symmetry		ALL	0.33		3.0		$I_F = \pm 10 \text{ mA}$, $V_{CE} = 10 \text{ V}$ Fig. 6
Saturation voltage (Collector-Emitter)	$V_{CE\text{SAT}}$	ALL			0.4	V	$I_F = \pm 10 \text{ mA}$, $I_{CE} = 0.5 \text{ mA}$
		H11AA3,4		0.4		V	$I_F = \pm 16 \text{ mA}$, $I_{CE} = 2.0 \text{ mA}$

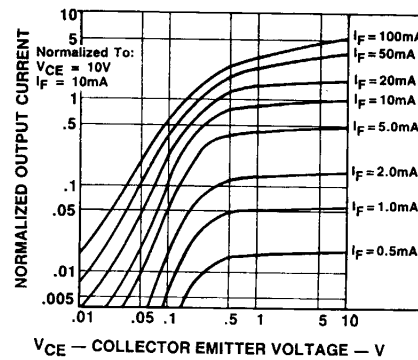
ISOLATION CHARACTERISTICS ($T_A=25^\circ\text{C}$ Unless Otherwise Specified)							
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS	
Package capacitance input/output	C_{i-o}		0.7		pF	$V_{i-o} = 0$	$f = 1 \text{ MHz}$
Withstand insulation test voltage	V_{ISO}	5300			$V_{AC(RMS)}$	$I_{i-o} \leq 1 \mu\text{A}$	1 minute
Insulation resistance	R_{ISO}	10^{11}			Ohms	$V_{i-o} = 500 \text{ V}$	

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



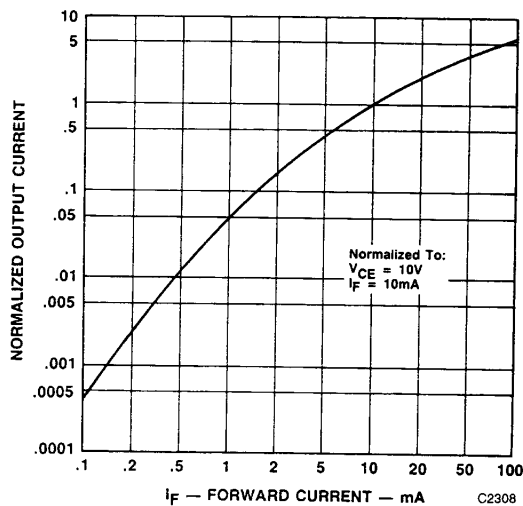
C2303

Fig. 1.



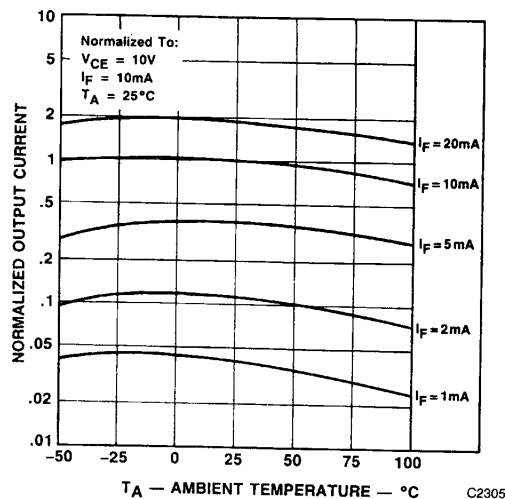
C2309

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)

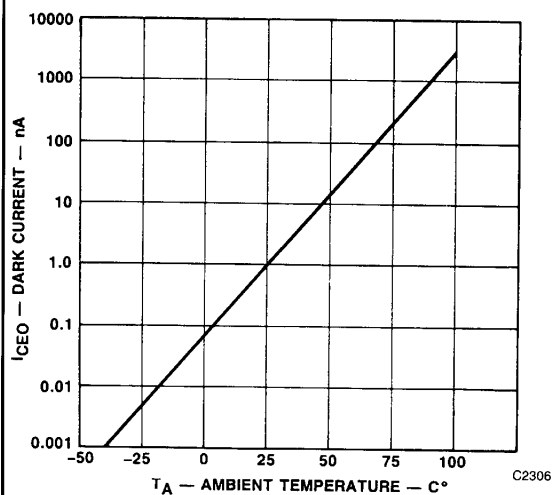


Fig. 5 Dark Current vs. Temperature

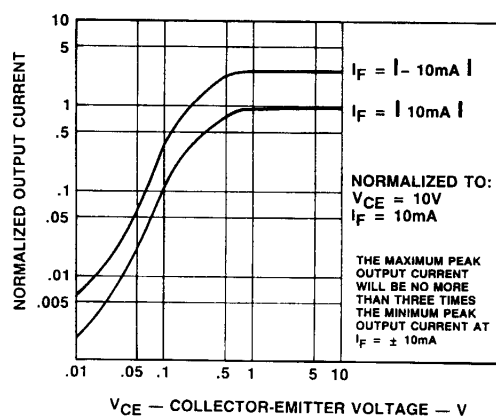


Fig. 6. Output Symmetry Characteristics

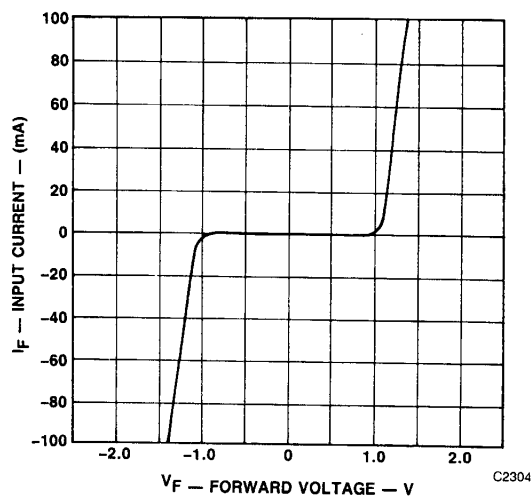


Fig. 7.