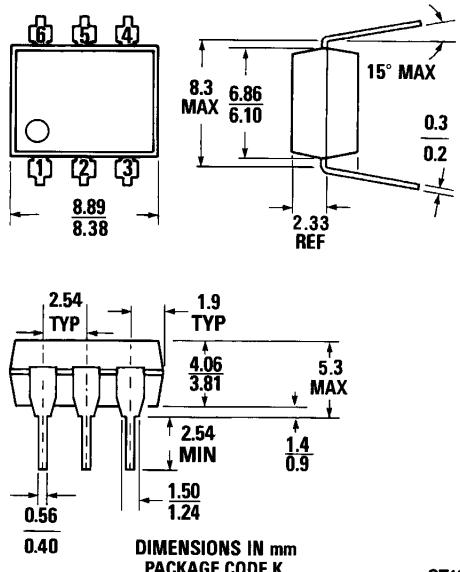




PHOTOTRANSISTOR OPTOCOUPLES

**H11A1 H11A2 H11A3
H11A4 H11A5**

PACKAGE DIMENSIONS



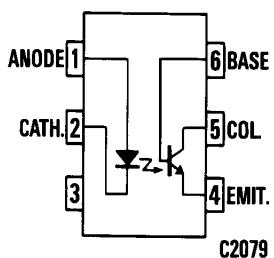
ST1603A

DESCRIPTION

The H11A series consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor in a dual in-line package.

FEATURES

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs
- Appliance sensor systems
- Industrial controls
- Underwriters Laboratory (UL) recognized—File #E90700



Equivalent Circuit

ABSOLUTE MAXIMUM RATINGS

TOTAL PACKAGE

Storage temperature -55°C to 150°C
Operating temperature -55°C to 100°C
Lead solder temperature 260°C for 10 sec

INPUT DIODE

Power dissipation (25°C ambient) 100 mW
Derate linearly (above 25°C ambient) ... $1.33 \text{ mW}/^{\circ}\text{C}$
Continuous forward current 60 mA
Peak forward current (1 μs pulse, 300pps) 3 A
Reverse voltage 3 V

DETECTOR

Power dissipation (at 25°C ambient) 150 mW
Derate linearly (above 25°C) $2.0 \text{ mW}/^{\circ}\text{C}$
 V_{CEO} 30 V
 V_{CBO} 70 V
 V_{ECO} 7 V
Continuous collector current 100 mA



PHOTOTRANSISTOR OPTOCOUPLES

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

INDIVIDUAL COMPONENT CHARACTERISTICS

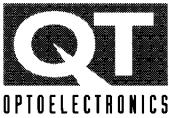
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward voltage	V_F		1.1	1.5	V	$I_F = 10 \text{ mA}$
Reverse leakage current	I_R			10	μA	$V_R = 3 \text{ V}$
Capacitance	C		50		pF	$V = 0 \text{ V}, f = 1 \text{ MHz}$
OUTPUT DETECTOR						
Breakdown voltage Collector to emitter	BV_{CEO}	30			V	$I_C = 10 \text{ mA}, I_F = 0$
Breakdown voltage Collector to base	BV_{CBO}	70			V	$I_C = 100 \mu\text{A}, I_F = 0$
Breakdown voltage Emitter to Collector	BV_{ECO}	7			V	$I_E = 100 \mu\text{A}, I_F = 0$
Collector dark current	I_{CEO}	5	50	nA		$V_{CE} = 10 \text{ V}, I_F = 0$
Capacitance	C	2			pF	$V_{CE} = 10 \text{ V}, f = 1 \text{ MHz}$

TRANSFER CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
DC current transfer ratio (H11A1)	I_C	5.0			mA	$I_F = 10 \text{ mA}, V_{CE} = 10 \text{ V}$
(H11A2)	I_C	2.0			mA	$I_F = 10 \text{ mA}, V_{CE} = 10 \text{ V}$
(H11A3)	I_C	2.0			mA	$I_F = 10 \text{ mA}, V_{CE} = 10 \text{ V}$
(H11A4)	I_C	1.0			mA	$I_F = 10 \text{ mA}, V_{CE} = 10 \text{ V}$
(H11A5)	I_C	3.0			mA	$I_F = 10 \text{ mA}, V_{CE} = 10 \text{ V}$
Saturation voltage	$V_{CE(SAT)}$		0.1	0.4	V	$I_F = 10 \text{ mA}, I_C = 0.5 \text{ mA}$
Rise/fall time	t_{rf}	2			μs	$I_{CE} = 2 \text{ mA}, V_{CE} = 10 \text{ V}, R_L = 100\Omega$
Rise/fall time	t_{rf}	300			ns	$I_{CB} = 50 \mu\text{A}, V_{CB} = 10 \text{ V}, R_i = 100\Omega$

ISOLATION CHARACTERISTICS

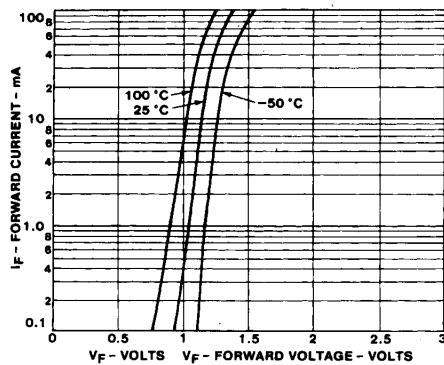
Surge isolation voltage	V_{ISO}	7500	V_{Peak}	1 Minute
Surge isolation voltage	V_{ISO}	5300	V_{RMS}	1 Minute
Isolation resistance	R_{ISO}	10^{11}	ohms	$V_{IO} = 500 \text{ VDC}$
Isolation capacitance	C_{ISO}	2	pF	$V_{IO} = 0, f = 1 \text{ MHz}$



PHOTOTRANSISTOR OPTOCOUPLES

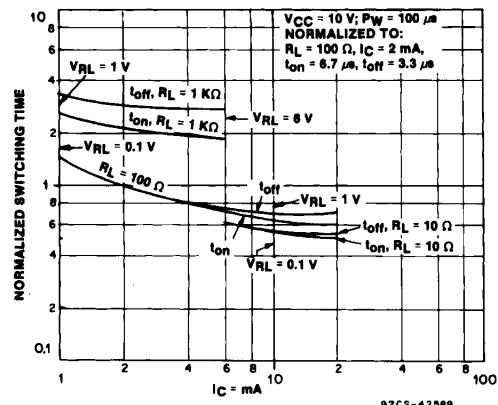
**H11A1 H11A2 H11A3
H11A4 H11A5**

TYPICAL CHARACTERISTICS



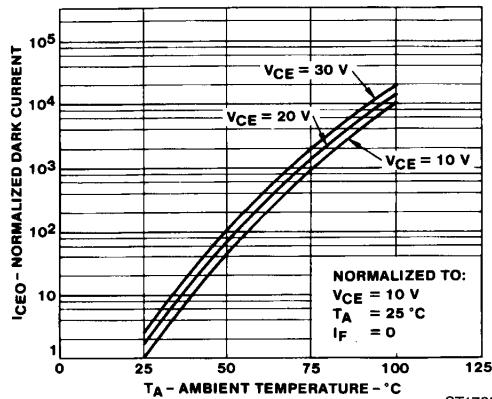
ST1723

1. Input Characteristics



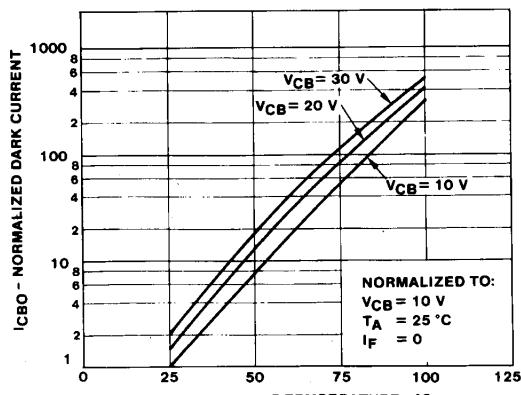
92CS-42589 ST1724

2. Switching Speed vs. Collector Current
(Not Saturated)



ST1725

3. Dark I_{CEO} Current vs. Temperature



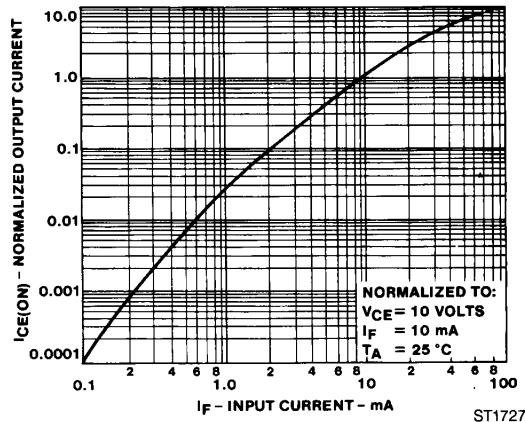
ST1726

4. I_{CBO} vs. Temperature

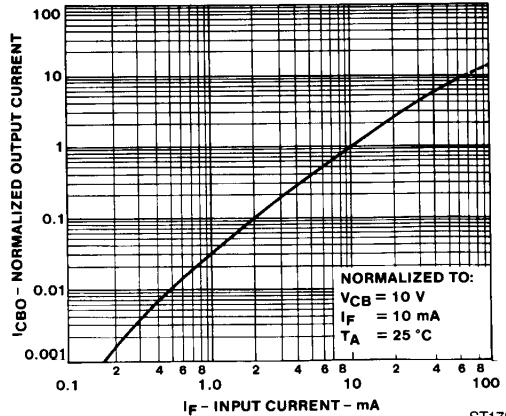


PHOTOTRANSISTOR OPTOCOUPERS

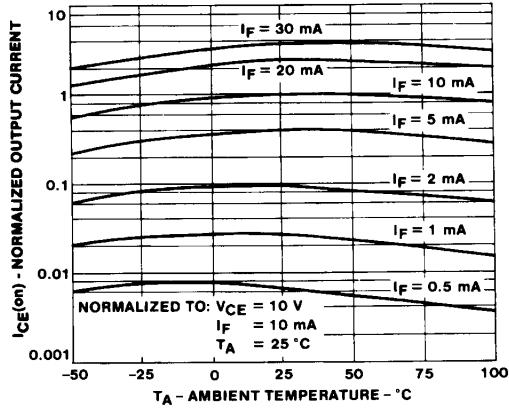
TYPICAL CHARACTERISTICS



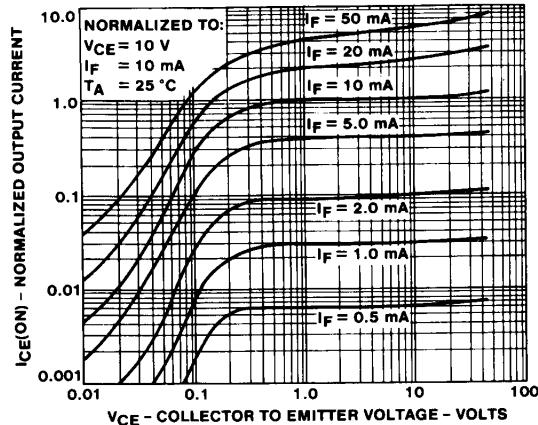
5. Output Current vs. Input Current



6. Output Current — Collector To Base
vs. Input Current



7. Output Current vs. Temperature



8. Output Characteristics