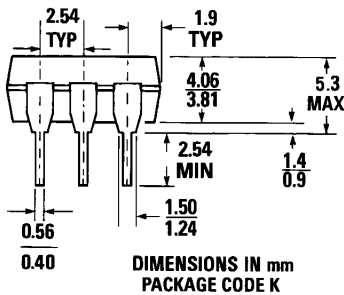
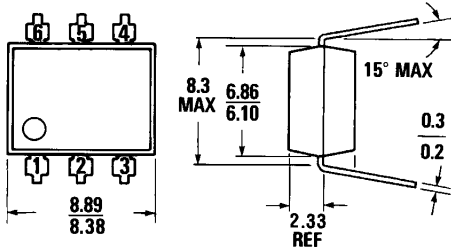
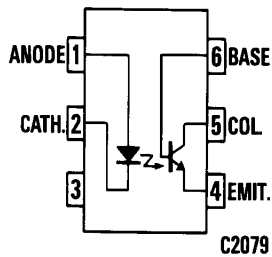


**H11A1 H11A2 H11A3  
H11A4 H11A5**

**PACKAGE DIMENSIONS**



ST1603A



Equivalent Circuit

**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

**ABSOLUTE MAXIMUM RATINGS**

**TOTAL PACKAGE**

Storage temperature . . . . .  $-55^{\circ}\text{C}$  to  $150^{\circ}\text{C}$   
 Operating temperature . . . . .  $-55^{\circ}\text{C}$  to  $100^{\circ}\text{C}$   
 Lead solder temperature . . . . .  $260^{\circ}\text{C}$  for 10 sec

**INPUT DIODE**

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

**DETECTOR**

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



## PHOTOTRANSISTOR OPTOCOUPLEDERS

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

#### INDIVIDUAL COMPONENT CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
<b>INPUT DIODE</b>						
Forward voltage	$V_F$		1.1	1.5	V	$I_F = 10 \text{ mA}$
Reverse leakage current	$I_R$			10	$\mu\text{A}$	$V_R = 3 \text{ V}$
Capacitance	C		50		pF	$V = 0 \text{ V}, f = 1 \text{ MHz}$
<b>OUTPUT DETECTOR</b>						
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	$V_{CE} = 10 \text{ V}, f = 1 \text{ MHz}$

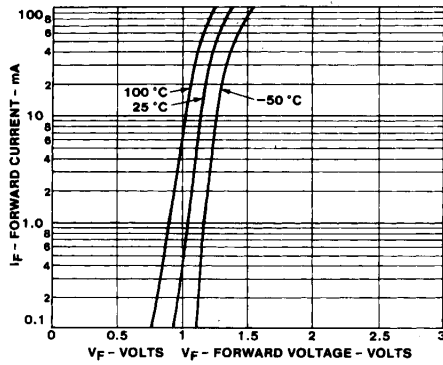
#### TRANSFER CHARACTERISTICS

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		$\mu\text{s}$	$I_{CE} = 2 \text{ mA}, V_{CE} = 10 \text{ V}, R_L = 100\Omega$
Rise/fall time	$t_{rf}$		300		ns	$I_{CB} = 50 \mu\text{A}, V_{CB} = 10 \text{ V}, R_L = 100\Omega$

#### ISOLATION CHARACTERISTICS

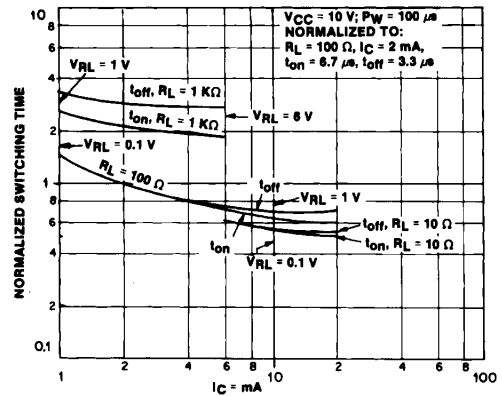
Surge isolation voltage	$V_{ISO}$	7500			$V_{Peak}$	1 Minute
Surge isolation voltage	$V_{ISO}$	5300			$V_{RMS}$	1 Minute
Isolation resistance	$R_{ISO}$	$10^{11}$			ohms	$V_{IO} = 500 \text{ VDC}$
Isolation capacitance	$C_{ISO}$			2	pF	$V_{IO} = 0, f = 1 \text{ MHz}$

**TYPICAL CHARACTERISTICS**



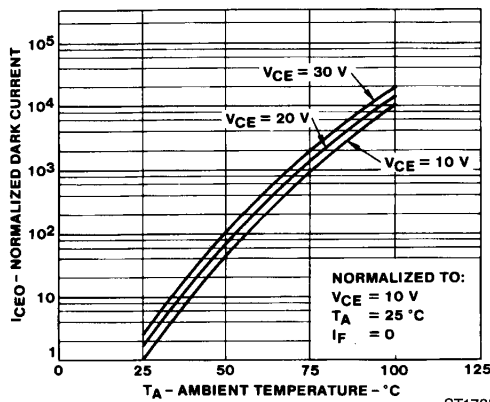
1. Input Characteristics

ST1723



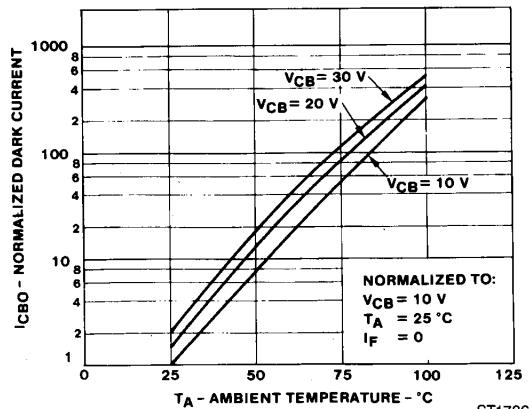
2. Switching Speed vs. Collector Current (Not Saturated)

ST1724



3. Dark  $I_{CEO}$  Current vs. Temperature

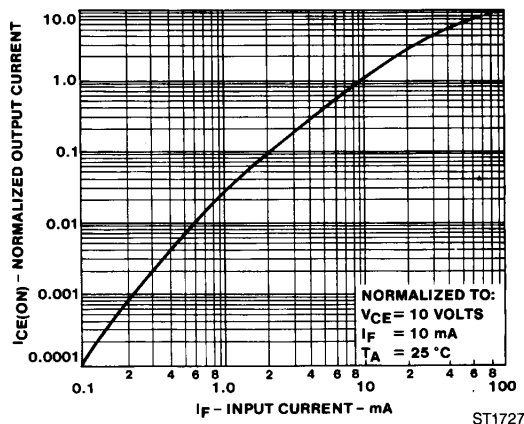
ST1725



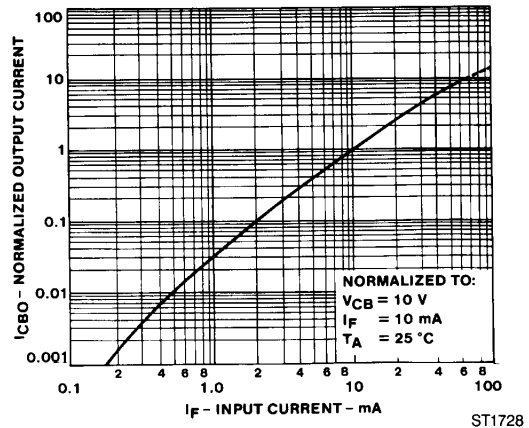
4.  $I_{CBO}$  vs. Temperature

ST1726

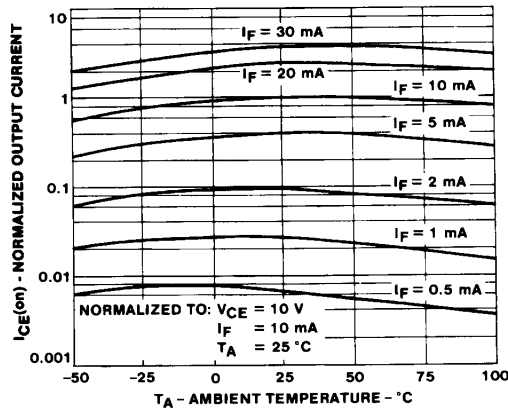
**TYPICAL CHARACTERISTICS**



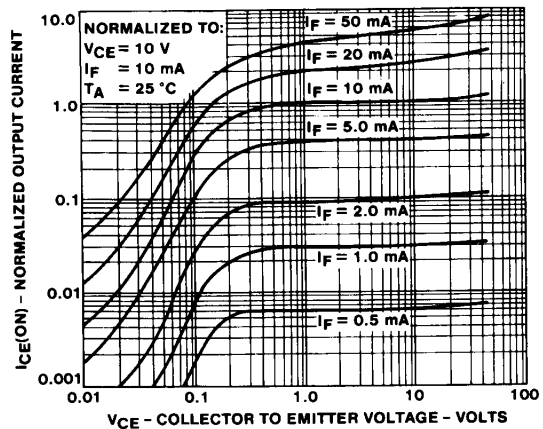
5. Output Current vs. Input Current



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



7. Output Current vs. Temperature



8. Output Characteristics