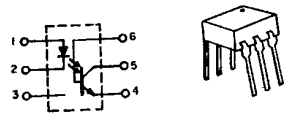
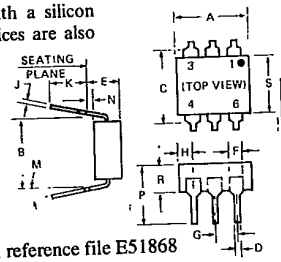
Photon Coupled Isolator H11A520-H11A550-H11A5100

Ga As Infrared Emitting Diode & NPN Silicon Photo-Transistor

The GE Solid State H11A520, H11A550 and H11A5100 consist of a gallium arsenide, infrared emitting diode coupled with a silicon photo-transistor in a dual in-line package. These devices are also available in surface-mount packaging.





FEATURES:

- High isolation voltage, 5000V minimum.
- GE unique patented glass isolation construction.
- High efficiency liquid epitaxial IRED.
- High humidiy resistant silicone encapsulation.
- Fast switching speeds.

UL Covered under U.L. component recognition program, reference file E51868

SYMBOL	MILLIMETERS MIN.	MILLIMETERS MAX.	INCHES MIN	INCHES MAX.	NOTES
A	8 38	8 89	330	350	
B	7.62 REF		300 REF.		1
C	–	8 64	–	340	2
D	.406	.508	016	020	
E	–	5 08	–	200	3
F	1 01	1 78	040	070	
G	2 28	2 80	090	110	
H	–	2 16	–	085	4
J	203	.305	008	012	
K	2 54	–	.100	–	
M	–	15	–	15	
N	381	–	.015	–	
P	–	9 53	–	.375	
R	2 92	3.43	.115	.135	
S	6 10	6 86	240	270	

NOTES
1 INSTALLED POSITION LEAD CENTERS
2 OVERALL INSTALLED DIMENSION
3 THESE MEASUREMENTS ARE MADE FROM THE SEATING PLANE
4. FOUR PLACES

absolute maximum ratings: (25°C) (unless otherwise specified)

INFRARED EMITTING DIODE		
Power Dissipation – T_A = 25°C	*100	milliwatts
Forward Current (Continuous)	60	milliamps
Forward Current (Peak) (Pulse width 1 μsec, 300 pps)	3	amperes
Reverse Voltage	6	volts

*Derate 1.33mW/°C above 25°C.

PHOTO-TRANSISTOR		
Power Dissipation – T_A = 25°C	**300	milliwatts
V_{CEO}	30	volts
V_{CBO}	70	volts
V_{EBO}	7	volts
Collector Current (Continuous)	100	milliamps

**Derate 4.0mW/°C above 25°C.

TOTAL DEVICE

Storage Temperature -55 to 150°C.
Operating Temperature -55 to 100°C.
Lead Soldering Time (at 260°C) 10 seconds.
Surge Isolation Voltage (Input to Output).
$5656V_{(peak)}$ $4000V_{(RMS)}$
Steady-State Isolation Voltage (Input to Output).
$5300V_{(DC)}$ $3750V_{(RMS)}$

individual electrical characteristics (25°C) (unless otherwise specified)

INFRARED EMITTING DIODE	MIN.	MAX.	UNITS
Forward Voltage – V_F (I_F = 10mA)	.8	1.5	volts
Forward Voltage – V_F (I_F = 10mA) T_A = -55°C	.9	1.7	volts
Forward Voltage – V_F (I_F = 10mA) T_A = +100°C	.7	1.4	volts
Reverse Current – I_R (V_R = 6V)	–	10	microamps
Capacitance – C_J (V = O, f = 1 MHz)	–	100	picofarads

PHOTO-TRANSISTOR	MIN.	TYP.	MAX.	UNITS
Breakdown Voltage – $V_{(BR)CEO}$ (I_C = 10mA, I_F = O)	30	–	–	volts
Breakdown Voltage – $V_{(BR)CBO}$ (I_C = 100μA, I_F = O)	70	–	–	volts
Breakdown Voltage – $V_{(BR)EBO}$ (I_E = 100μA, I_F = O)	7	–	–	volts
Collector Dark Current – I_{CEO} (V_{CE} = 10V, I_F = O)	–	5	50	nano-amps
Collector Dark Current – I_{CEO} (V_{CE} = 10V, I_F = O) T_A = 100°C	–	–	500	micro-amps
Capacitance – C_{CE} (V_{CE} = 10V, f = 1MHz)	–	2	–	pico-farads

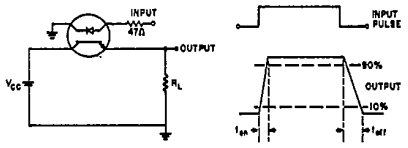
VDE Approved to 0883/6.80 0110b Certificate # 35025

T-41-83

coupled electrical characteristics (25°C) (unless otherwise specified)

		MIN.	TYP.	MAX.	UNITS
DC Current Transfer Ratio (I_F = 10mA, V_{CE} = 10V)	H11A5100	100	–	–	%
	H11A550	50	–	–	%
	H11A520	20	–	–	%
Saturation Voltage – Collector to Emitter (I_F = 20mA, I_C = 2mA)		–	–	0.4	volts
Isolation Resistance (Input to Output Voltage = 500V_{DC}. See Note 1)		100	–	–	gigaohms
Input to Output Capacitance (Input to Output Voltage = O, f = 1 MHz. See Note 1)		–	–	2.0	picofarads
Turn-On Time – t_{on} (V_{CC} = 10V, I_C = 2mA, R_L = 100Ω). (See Figure 1)		–	5	10	microseconds
Turn-Off Time – t_{off} (V_{CC} = 10V, I_C = 2mA, R_L = 100Ω). (See Figure 1)		–	5	10	microseconds

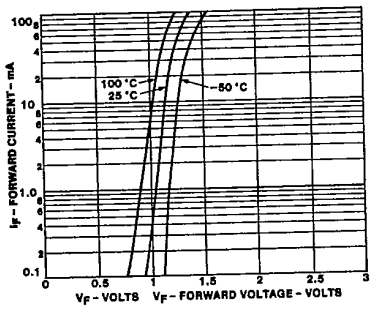
NOTE 1:
Tests of input to output isolation current resistance, and capacitance are performed with the input terminals (diode) shorted together and the output terminals (transistor) shorted together.



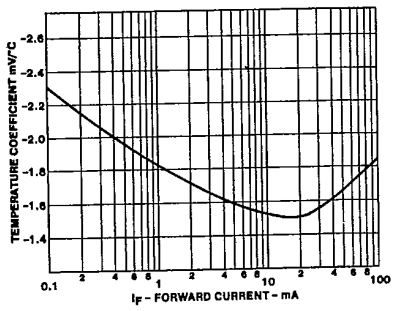
Adjust Amplitude of Input Pulse for Output (I_C) of 2mA

10

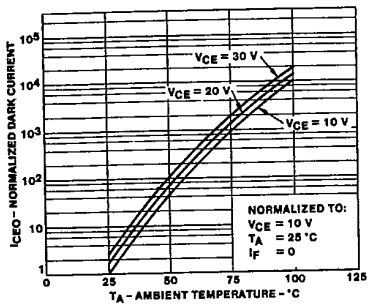
TYPICAL CHARACTERISTICS



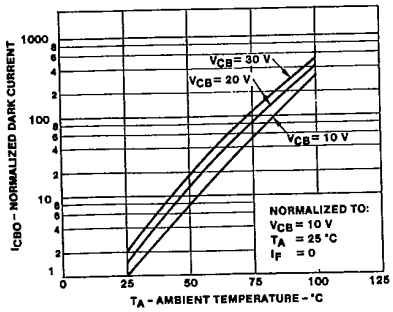
1. INPUT CHARACTERISTICS



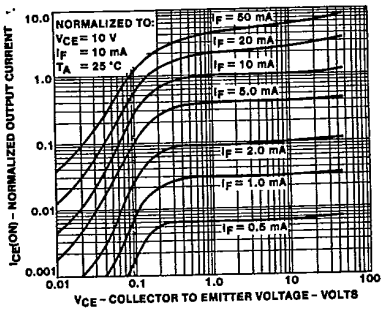
2. OUTPUT CURRENT VS INPUT CURRENT



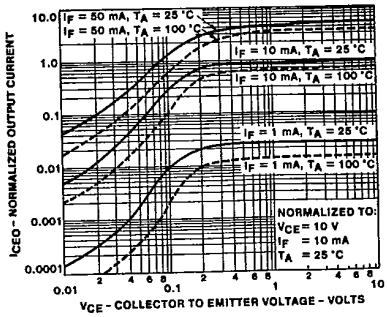
3. DARK I_{CEO} CURRENT VS TEMPERATURE



4. OUTPUT CURRENT VS TEMPERATURE



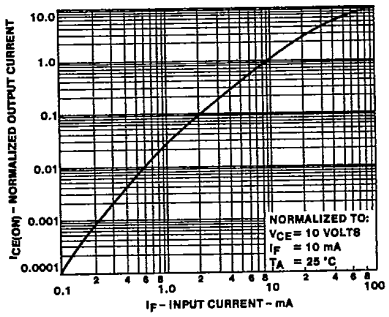
5. OUTPUT CHARACTERISTICS



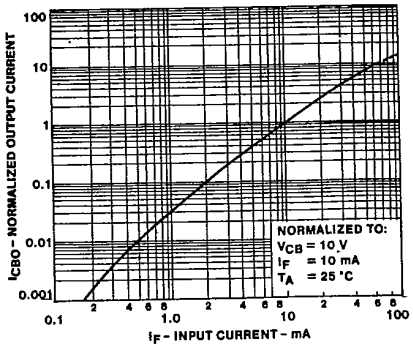
6. OUTPUT CURRENT VS BASE EMITTER RESISTANCE

T-41-83

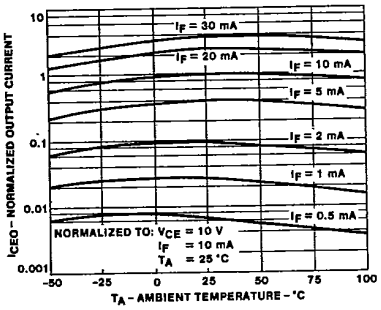
TYPICAL CHARACTERISTICS



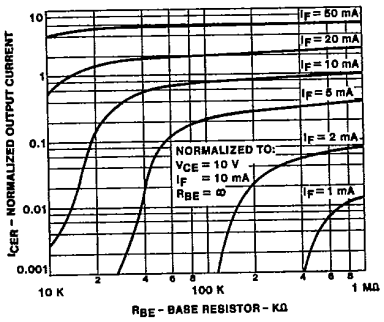
7. OUTPUT CURRENT VS. INPUT CURRENT



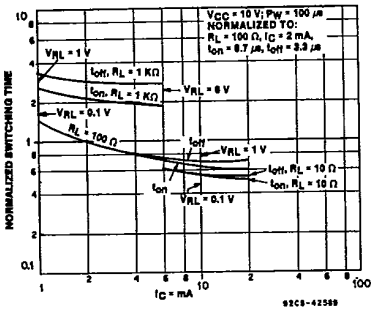
8. OUTPUT CURRENT — COLLECTOR-TO-BASE VS. INPUT CURRENT



9. OUTPUT CURRENT VS. TEMPERATURE

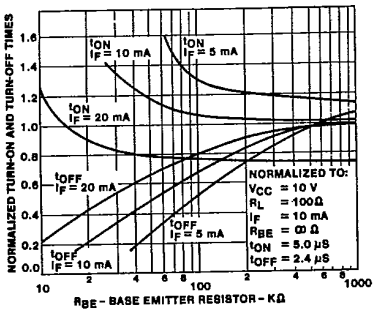


10. OUTPUT CURRENT VS. BASE EMITTER RESISTANCE



SWITCHING SPEED VS. COLLECTOR CURRENT (NOT SATURATED)

11. SWITCHING SPEED VS. COLLECTOR CURRENT (NOT SATURATED)



12. SWITCHING TIME VS. R_{BE}

10