

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 humidity resistant silicone encapsulation.
- Fast switching speeds.

Covered under U.L. component recognition program, reference file E51868
absolute maximum ratings: (25°C) (unless otherwise specified)

INFRARED EMITTING DIODE

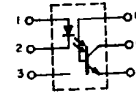
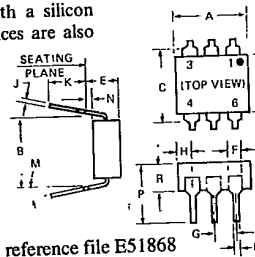
Power Dissipation — $T_A = 25^\circ\text{C}$	*100	milliwatts
Forward Current (Continuous)	60	milliamperes
Forward Current (Peak) (Pulse width 1 μsec , 300 pps)	3	amperes
Reverse Voltage	6	volts

*Derate 1.33mW/°C above 25°C.

PHOTO-TRANSISTOR

Power Dissipation — $T_A = 25^\circ\text{C}$	**300	milliwatts
V_{CEO}	30	volts
V_{CBO}	70	volts
V_{EBO}	7	volts
Collector Current (Continuous)	100	milliamperes

**Derate 4.0mW/°C above 25°C.



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	8.38	8.89	330	350	1
B	7.62 REF.		300 REF.		2
C	—	8.64	—	340	2
D	.406	.508	.016	.020	3
E	—	5.08	—	200	3
F	1.01	1.78	.040	.070	
G	2.28	2.80	.090	.110	4
H	—	2.16	—	.085	
J	2.03	.305	.008	.012	
K	2.54	—	.100	—	
L	—	.15	—	.15	
M	3.81	—	.15	—	
N	—	.93	—	.375	
P	—	—	—	.135	
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

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	PHOTO-TRANSISTOR	MIN.	TYP.	MAX.	UNITS
Forward Voltage — V_F ($I_F = 10\text{mA}$)	.8	1.5	volts	Breakdown Voltage — $V_{(BR)CEO}$ ($I_C = 10\text{mA}$, $I_F = 0$)	30	—	—	volts
Forward Voltage — V_F ($I_F = 10\text{mA}$) $T_A = -55^\circ\text{C}$	.9	1.7	volts	Breakdown Voltage — $V_{(BR)CBO}$ ($I_C = 100\mu\text{A}$, $I_F = 0$)	70	—	—	volts
Forward Voltage — V_F ($I_F = 10\text{mA}$) $T_A = +100^\circ\text{C}$	.7	1.4	volts	Breakdown Voltage — $V_{(BR)EBO}$ ($I_E = 100\mu\text{A}$, $I_F = 0$)	7	—	—	volts
Reverse Current — I_R ($V_R = 6\text{V}$)	—	10	microamps	Collector Dark Current — I_{CEO} ($V_{CE} = 10\text{V}$, $I_F = 0$)	—	5	50	nano-amps
Capacitance — C_j ($V = 0, f = 1\text{MHz}$)	—	100	picofarads	Collector Dark Current — I_{CEO} ($V_{CE} = 10\text{V}$, $I_F = 0$) $T_A = 100^\circ\text{C}$	—	—	500	micro-amps
				Capacitance — C_{CE} ($V_{CE} = 10\text{V}$, $f = 1\text{MHz}$)	—	2	—	pico- farads

VDE Approved to 0883/6.80 0110b Certificate # 35025

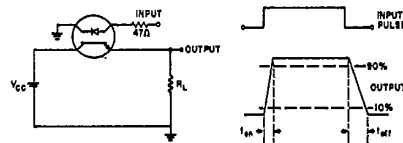
coupled electrical characteristics (25°C) (unless otherwise specified)

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		MIN.	TYP.	MAX.	UNITS
DC Current Transfer Ratio ($I_F = 10\text{mA}$, $V_{CE} = 10\text{V}$)	H11A5100	100	—	—	%
	H11A550	50	—	—	%
	H11A520	20	—	—	%
Saturation Voltage — Collector to Emitter ($I_F = 20\text{mA}$, $I_C = 2\text{mA}$)		—	—	0.4	volts
Isolation Resistance (Input to Output Voltage = $500V_{DC}$. See Note 1)		100	—	—	gigaohms
Input to Output Capacitance (Input to Output Voltage = 0, $f = 1\text{MHz}$. See Note 1)		—	—	2.0	picoFarads
Turn-On Time — t_{on} ($V_{CC} = 10\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$). (See Figure 1)		—	5	10	microseconds
Turn-Off Time — t_{off} ($V_{CC} = 10\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$). (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.

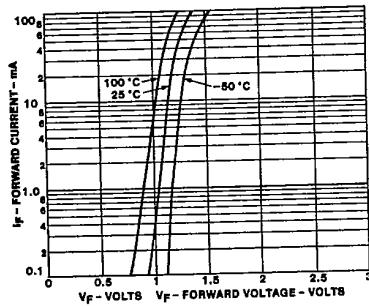


Adjust Amplitude of Input Pulse for Output (I_C) of 2mA

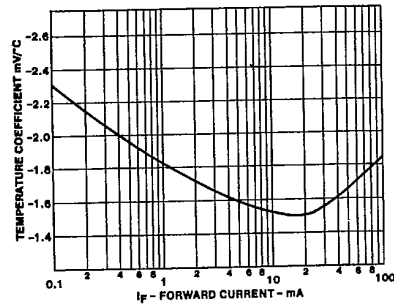
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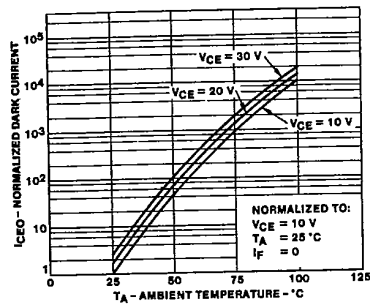
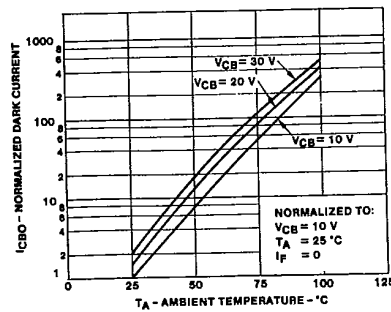
TYPICAL CHARACTERISTICS



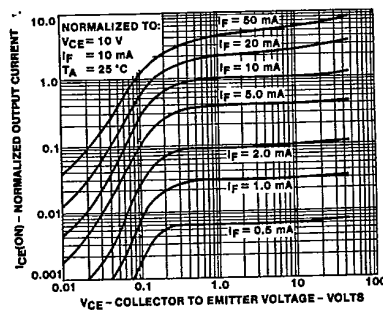
1. INPUT CHARACTERISTICS



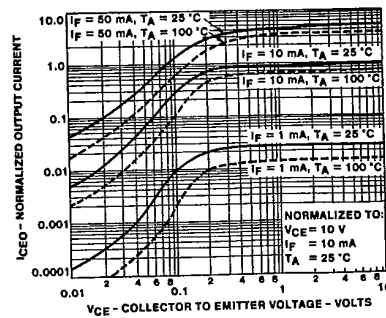
2. OUTPUT CURRENT VS INPUT CURRENT

3. DARK I_{CEO} CURRENT VS TEMPERATURE

4. OUTPUT CURRENT VS TEMPERATURE

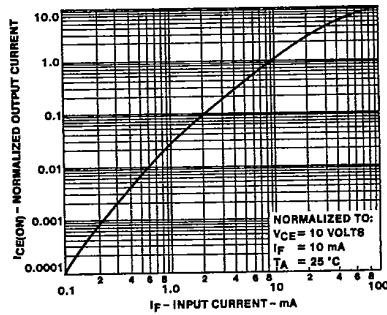


5. OUTPUT CHARACTERISTICS

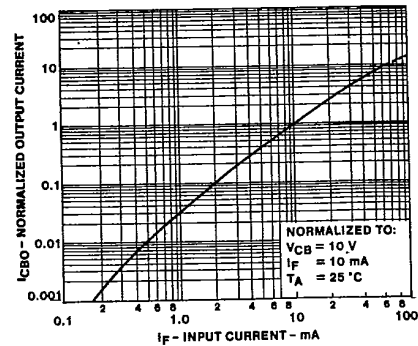
6. OUTPUT CURRENT VS BASE
EMITTER RESISTANCE

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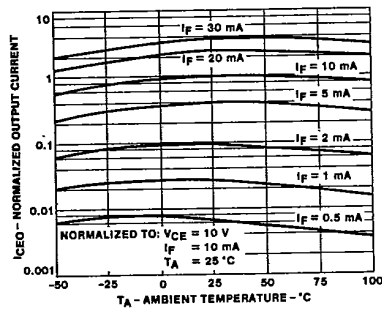
TYPICAL CHARACTERISTICS



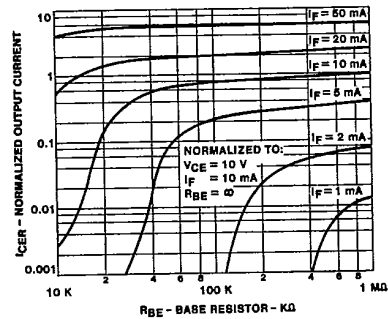
7. OUTPUT CURRENT VS. INPUT CURRENT



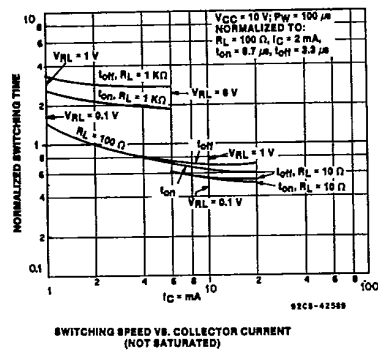
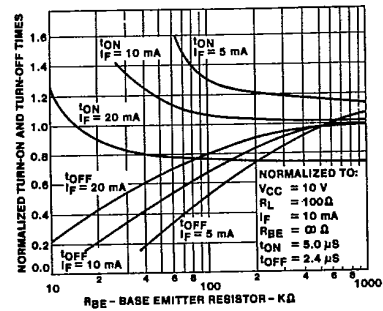
8. OUTPUT CURRENT — COLLECTOR-TO-BASE VS. INPUT CURRENT



9. OUTPUT CURRENT VS. TEMPERATURE



10. OUTPUT CURRENT VS. BASE EMITTER RESISTANCE

11. SWITCHING SPEED VS. COLLECTOR CURRENT
(NOT SATURATED)12. SWITCHING TIME VS. R_{BE}

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