

# Photon Coupled Isolator H24B1-H24B2

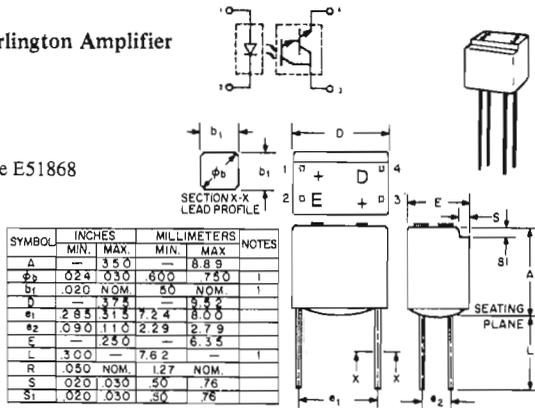
## Ga As Infrared Emitting Diode & NPN Silicon Photo-Darlington Amplifier

The GE Solid State H24B series consists of a gallium arsenide infrared emitting diode coupled with a silicon Darlington connected phototransistor. The devices are housed in a low-cost plastic package with lead spacing compatible with dual-in-line package.

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

### absolute maximum ratings: (25°C)

TOTAL DEVICE			
Storage Temperature	T <sub>STG</sub>	-55°C to +85°C	
Operating Temperature	T <sub>J</sub>	-55°C to +85°C	
Lead Soldering Temperature (5 seconds maximum)	T <sub>L</sub>	260°C	
Surge Isolation Voltage (Input to Output). 6000V <sub>(peak)</sub>		4242V <sub>(RMS)</sub>	
Steady-State Isolation Voltage (Input to Output). 5300V <sub>(peak)</sub>		3750V <sub>(RMS)</sub>	



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	—	3.50	—	8.89	
Φ <sub>2</sub>	0.24	0.30	6.00	7.50	1
b <sub>1</sub>	0.20	NOM	5.0	NOM	1
D	—	3.75	—	9.42	
e <sub>1</sub>	2.85	3.15	7.24	8.00	
e <sub>2</sub>	0.90	1.10	2.29	2.79	
E	—	2.50	—	6.35	
L	3.00	—	7.62	—	1
R	0.50	NOM	1.27	NOM	
S	0.20	0.30	5.0	7.5	
S <sub>1</sub>	0.20	0.30	5.0	7.5	

NOTE  
1. FOUR LEADS: LEAD DIMENSIONS CONTROLLED BETWEEN .050" (1.27MM) FROM THE SEATING PLANE AND THE END OF THE LEADS

INFRARED EMITTING DIODE		(EMITTER)	
Power Dissipation	P <sub>E</sub>	*100	mW
Forward Current (Continuous)	I <sub>F</sub>	60	mA
Forward Current (Peak) (Pulse Width ≤ 1 μs PRR ≤ 300 pps)	I <sub>F</sub>	3	A
Reverse Voltage	V <sub>R</sub>	4	V

\*Derate 1.67 mW/°C above 25°C ambient.

DARLINGTON CONNECTED PHOTOTRANSISTOR (DETECTOR)			
Power Dissipation	P <sub>D</sub>	**150	mW
Collector Current (Continuous)	I <sub>C</sub>	100	mA
Collector-Emitter Voltage	V <sub>CEO</sub>	30	V
Emitter-Collector Voltage	V <sub>ECO</sub>	7	V

\*\*Derate 2.5 mW/°C above 25°C ambient.

### individual electrical characteristics (25°C)

EMITTER	MIN.	TYP.	MAX.	UNITS
Reverse Breakdown Voltage V <sub>(BR)R</sub> @I <sub>R</sub> = 10 μA	4	—	—	V
Forward Voltage V <sub>F</sub> @I <sub>F</sub> = 60 mA	—	—	1.7	V
Reverse Current I <sub>R</sub> @V <sub>R</sub> = 3V	—	—	1.0	μA
Capacitance C <sub>i</sub> @V = 0, f = 1 MHz	—	30	—	pF

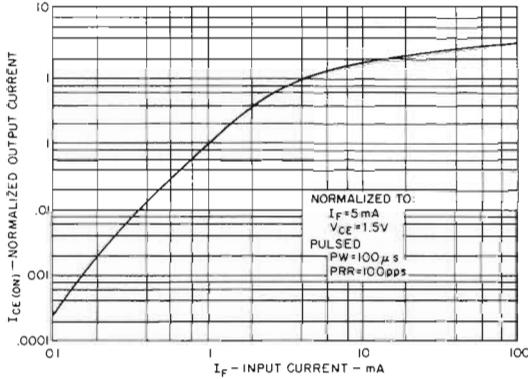
DETECTOR	MIN.	TYP.	MAX.	UNITS
Breakdown Voltage V <sub>(BR)CEO</sub> @I <sub>C</sub> = 1 mA, I <sub>F</sub> = 0	30	—	—	V
Breakdown Voltage V <sub>(BR)ECO</sub> @I <sub>E</sub> = 100 μA, I <sub>F</sub> = 0	7	—	—	V
Collector Dark Current I <sub>CEO</sub> @V <sub>CE</sub> = 10V, I <sub>F</sub> = 0	—	5	100	nA
Capacitance C <sub>ce</sub> @V <sub>CE</sub> = 5V, f = 1MHz	—	5	—	pF

### coupled electrical characteristics (25°C)

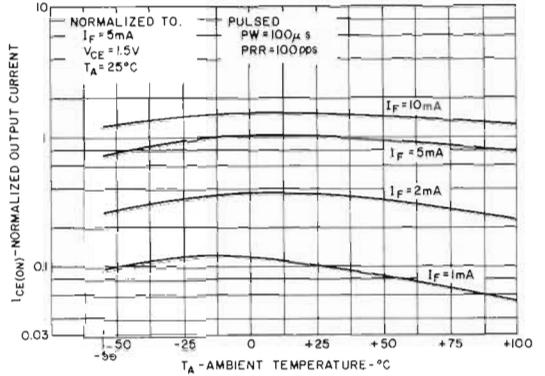
		MIN.	TYP.	MAX.	UNITS
CTR	— DC Current Transfer Ratio (I <sub>F</sub> = 5mA, V <sub>CE</sub> = 1.5V)	H24B1	1000	—	%
		H24B2	400	—	%
V <sub>CE(sat)</sub>	— Saturation Voltage — Collector to Emitter (I <sub>F</sub> = 5mA, I <sub>C</sub> = 2mA)	—	0.8	1.0	V
R <sub>IO</sub>	— Isolation Resistance (Input to Output Voltage = 500V <sub>DC</sub> ) †	100	—	—	GΩ
C <sub>io</sub>	— Input to Output Capacitance (Input to Output Voltage = 0, f = 1MHz) †	—	0.5	—	pF
t <sub>on</sub>	— Turn-On Time — (V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA, R <sub>L</sub> = 100Ω)	—	105	—	μs
t <sub>off</sub>	— Turn-Off Time — (V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA, R <sub>L</sub> = 100Ω)	—	60	—	μs
t <sub>on</sub>	— Turn-On Time — (V <sub>CC</sub> = 5V, I <sub>F</sub> = 10mA, R <sub>L</sub> = 1.0KΩ)	—	10	—	μs
t <sub>off</sub>	— Turn-Off Time — (V <sub>CC</sub> = 5V, I <sub>F</sub> = 10mA, R <sub>L</sub> = 1.0KΩ)	—	700	—	μs

† Measured with input diode leads shorted together, and output detector leads shorted together.

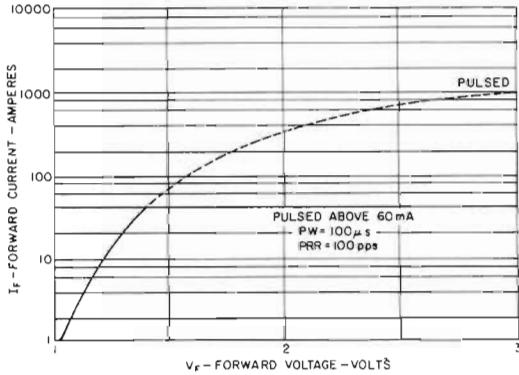
TYPICAL CHARACTERISTICS



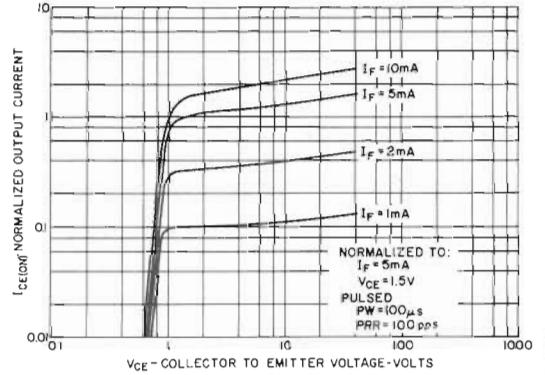
1. OUTPUT CURRENT VS. INPUT CURRENT



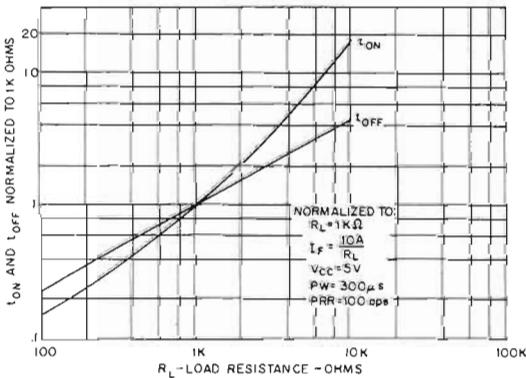
2. OUTPUT CURRENT VS. TEMPERATURE



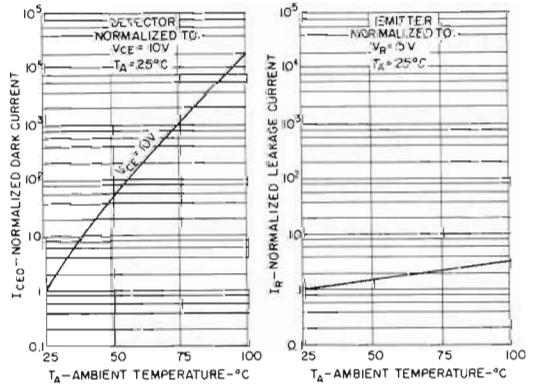
3. INPUT CHARACTERISTICS



4. OUTPUT CHARACTERISTICS



5. SWITCHING SPEED VS. R<sub>L</sub>



6. LEAKAGE CURRENTS VS. TEMPERATURE