



# SOLID STATE OPTOELECTRONICS

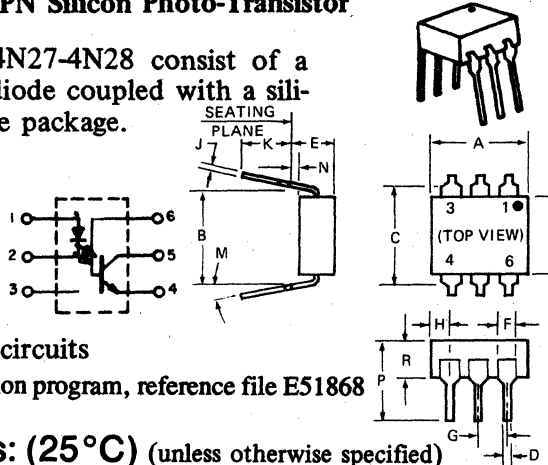
## Photon Coupled Isolator 4N25-4N25A-4N26-4N27-4N28

Ga As Infrared Emitting Diode & NPN Silicon Photo-Transistor

The General Electric 4N25-4N26-4N27-4N28 consist of a gallium arsenide infrared emitting diode coupled with a silicon photo transistor in a dual in-line package.

### FEATURES:

- Fast switching speeds
- High DC current transfer ratio
- High isolation resistance
- 2500 volts isolation voltage
- I/O compatible with integrated circuits



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	8.38	8.89	.330	.350	1
B	7.62 REF.		.300 REF.		
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	4
H	—	2.16	—	.085	
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.

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

† Parameters are JEDEC registered values.

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

† Storage Temperature -55 to 150°C. Operating Temperature -55 to 100°C. Lead Soldering Time (at 260°C) 10 seconds.

INFRARED EMITTING DIODE		PHOTO-TRANSISTOR	
† Power Dissipation	*150 milliwatts	† Power Dissipation	**150 milliwatts
† Forward Current (Continuous)	80 milliamps	† V <sub>CEO</sub>	30 volts
† Forward Current (Peak) (Pulse width 300 μsec 2% duty cycle)	3 ampere	† V <sub>CBO</sub>	70 volts
† Reverse Voltage	3 volts	† V <sub>ECO</sub>	7 volts
		Collector Current (Continuous)	100 milliamps
	*Derate 2.0mW/°C above 25°C ambient.		**Derate 2.0mW/°C above 25°C ambient.

† Total device dissipation @ 24-25°C. P<sub>D</sub> 250mW.

† Derate 3.3 mW/°C above 25°C ambient.

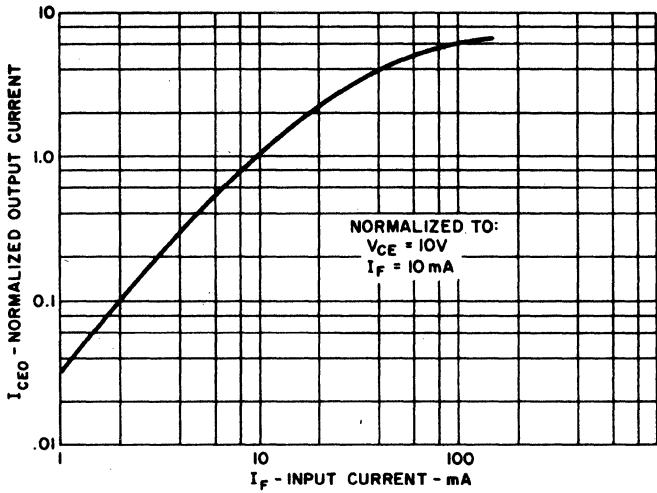
### individual electrical characteristics (25°C)

INFRARED EMITTING DIODE	TYP.	MAX.	UNITS	PHOTO-TRANSISTOR	MIN.	TYP.	MAX.	UNITS
† Forward Voltage (I <sub>F</sub> = 10 mA)	1.1	1.5	volts	† Breakdown Voltage - V <sub>(BR)CEO</sub> (I <sub>C</sub> = 1mA, I <sub>F</sub> = 0)	30	—	—	volts
† Reverse Current (V <sub>R</sub> = 3V)	—	100	microamps	† Breakdown Voltage - V <sub>(BR)CBO</sub> (I <sub>C</sub> = 100μA, I <sub>F</sub> = 0)	70	—	—	volts
Capacitance V = 0, f = 1 MHz	50	—	picofarads	† Breakdown Voltage - V <sub>(BR)ECO</sub> (I <sub>E</sub> = 100μA, I <sub>F</sub> = 0)	7	—	—	volts
				† Collector Dark Current I <sub>CEO</sub> 4N25-27 (V <sub>CE</sub> = 10V, I <sub>F</sub> = 0)	—	5	50	nanoamps
				4N28	—	—	100	nanoamps
				† Collector Dark Current - I <sub>CBO</sub> (V <sub>CB</sub> = 10V, I <sub>F</sub> = 0)	—	2	20	nanoamps

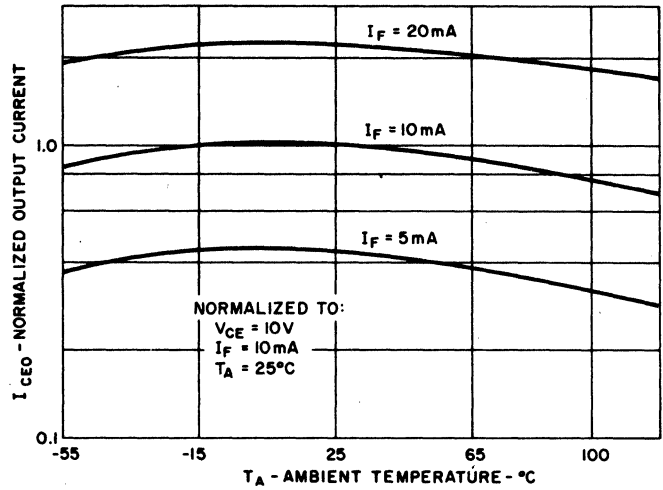
### coupled electrical characteristics (25°C)

	MIN.	TYP.	MAX.	UNITS
† DC Current Transfer Ratio (I <sub>F</sub> = 10mA, V <sub>CE</sub> = 10V) 4N25, 4N25A, 4N26, 4N27, 4N28	20	—	—	%
† Saturation Voltage - Collector - Emitter (I <sub>F</sub> = 50mA, I <sub>C</sub> = 2 mA)	—	0.1	0.5	volts
Resistance - IRED to Photo-Transistor (@ 500 volts)	—	100	—	gigaohms
Capacitance - IRED to Photo-Transistor (@ 0 volts, f = 1 MHz)	—	1	—	picofarad
† Isolation Voltage - voltage @ 60 Hz with the input terminals (diode) shorted together and the output terminals (transistor) shorted together.	4N25	2500	—	volts (peak)
	4N26, 4N27	1500	—	volts (peak)
	4N28	500	—	volts (peak)
	4N25A	1775	—	volts (RMS) (1 sec.)
Rise/Fall Time (V <sub>CE</sub> = 10V, I <sub>CE</sub> = 2mA, R <sub>L</sub> = 100Ω)	—	2	—	microseconds
Rise/Fall Time (V <sub>CB</sub> = 10V, I <sub>CB</sub> = 50μA, R <sub>L</sub> = 100Ω)	—	300	—	nanoseconds

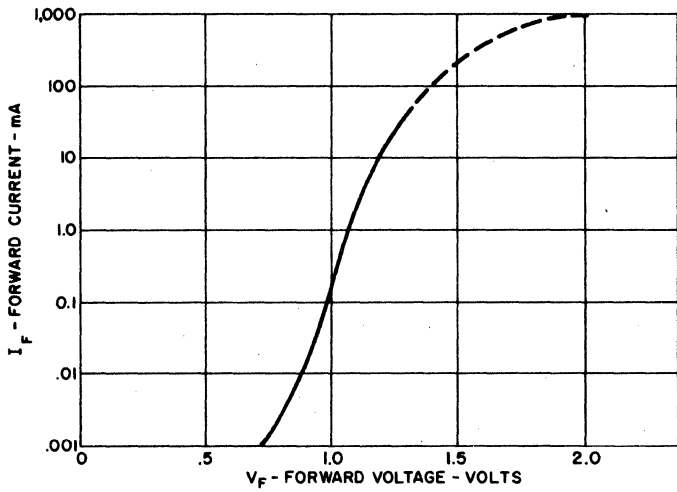
† VDE Approved to 0883/6.80 0110b Certificate# 35025



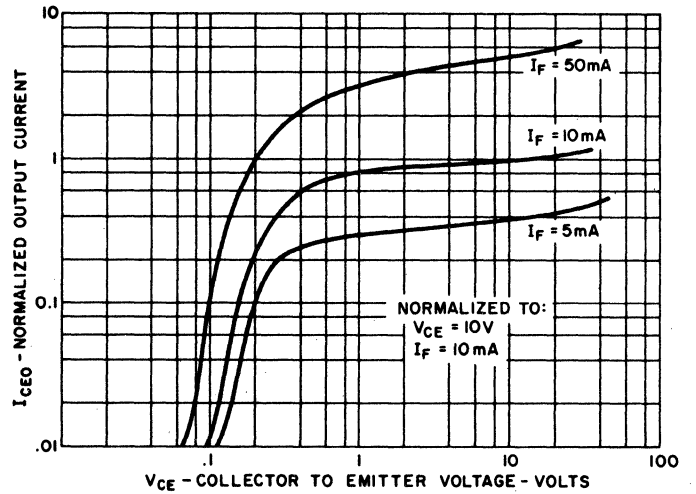
OUTPUT CURRENT VS INPUT CURRENT



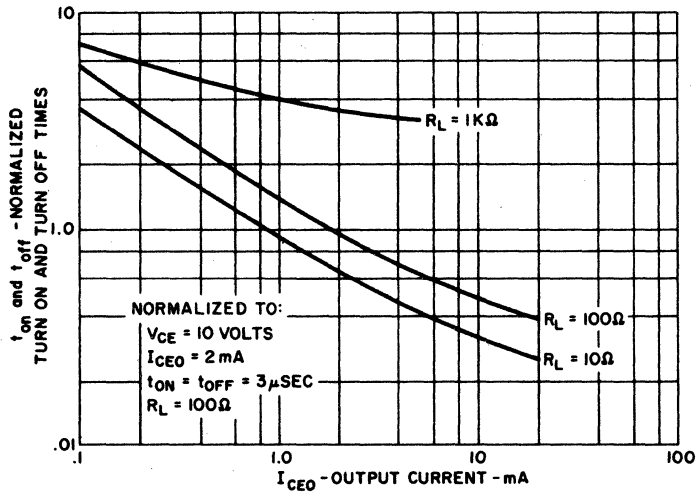
OUTPUT CURRENT VS TEMPERATURE



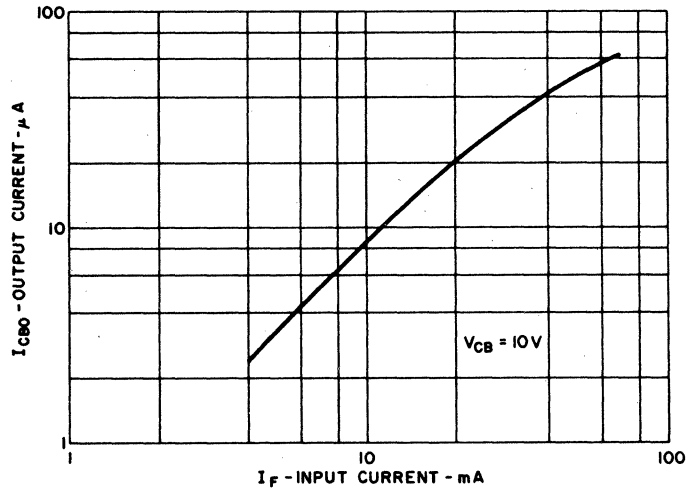
INPUT CHARACTERISTICS



OUTPUT CHARACTERISTICS



SWITCHING TIMES VS OUTPUT CURRENT



OUTPUT CURRENT ( $I_{CBO}$ ) VS INPUT CURRENT