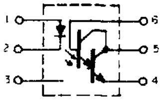
4N29, 4N29A, 4N30, 4N31, 4N32, 4N32A, 4N33

Optoisolator GaAs Infrared Emitting Diode and NPN Silicon Photo-Darlington Amplifier

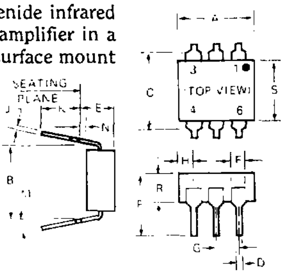
The 4N29 through 4N33 devices consist of a gallium arsenide infrared emitting diode coupled with a silicon photo-Darlington amplifier in a dual-in-line package. These devices are also available in surface mount packaging.



FEATURES:

- High DC current transfer ratio
- High isolation resistance
- Meets or exceeds all JEDEC registered specifications
- I/O compatible with integrated circuits

†Parameters are JEDEC registered values.



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			PHOTO TRANSISTOR		
†Power Dissipation	*150	milliwatts	†Power Dissipation	**150	milliwatts
†Forward Current (Continuous)	80	milliamps	†V_{CEO}	30	volts
†Forward Current (Peak) (Pulse width 300µsec 2% duty cycle)	3	ampere	†V_{CBO}	30	volts
†Reverse Voltage	3	volts	†V_{EBO}	5	volts
			Collector Current (Continuous)	100	milliamps
*Derate 2.0mW/°C above 25°C ambient			**Derate 2.0mW/°C above 25°C ambient		

TOTAL DEVICE	
Storage Temperature -55 to 150°C Operating Temperature -55 to 100°C Lead Soldering Time (at 260°C) 10 seconds Power Dissipation @ $T_A = 25°C$, P_D 250mW Derate 3.3mW/°C above 25°C ambient	Surge Isolation Voltage (Input to Output) 3535V(peak) 2500V(RMS) Steady-State Isolation Voltage (Input to Output) 3180V(peak) 2250V(RMS)

individual electrical characteristics (25°C)

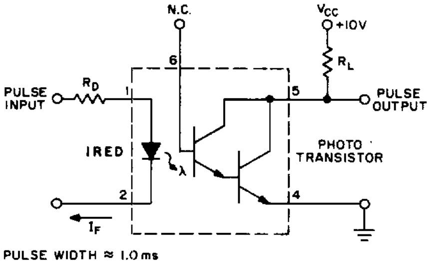
INFRARED EMITTING DIODE	TYP.	MAX.	UNITS	PHOTO DARLINGTON	MIN.	TYP.	MAX.	UNITS
†Forward Voltage - V_F ($I_F = 10mA$)	1.2	1.5	volts	†Breakdown Voltage - $V_{(BR)CBO}$ ($I_C = 100µA$, $I_F = 0$)	30	-	-	volts
				†Breakdown Voltage - $V_{(BR)CEO}$ ($I_C = 1mA$, $I_F = 0$)	30	-	-	volts
†Reverse current - I_R ($V_R = 3V$)	-	100	microamps	†Breakdown Voltage - $V_{(BR)EBO}$ ($I_E = 100µA$, $I_F = 0$)	5	-	-	volts
Capacitance - C_J ($V = 0$, $f = 1MHz$)	50	-	picofarads	†Collector Dark Current - I_{CEO} ($V_{CE} = 10V$, $I_F = 0$)	-	-	100	nanoamps

coupled electrical characteristics (25°C)

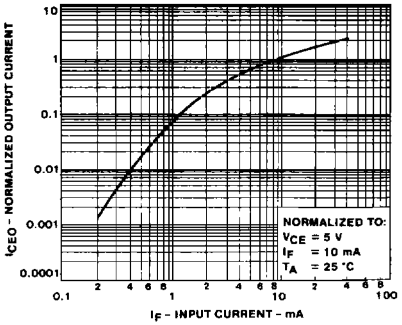
		MIN.	TYP.	MAX.	UNITS
†Collector Output Current ($I_F = 10mA$, $V_{CE} = 10V$)	4N32, 4N32A, 4N33	50	-	-	mA
	4N29, 4N29A, 4N30	10	-	-	mA
	4N31	5	-	-	mA
†Saturation Voltage - Collector - Emitter	4N29, 29A, 30, 32, 32A, 33	-	-	0.1	volts
($I_F = 50mA$, $I_C = 2mA$)	4N31	-	-	1.2	volts
Resistance - IRED to Photo-Transistor (@ 500 volts)		-	100	-	gigaohms
Capacitance - IRED to Photo-Transistor (@ 0 volts, f = 1MHz)		-	1	-	picofarad
†Switching Speeds ($I_C = 50mA$, $I_F = 200mA$					
Turn-On Time - t_{on}		-	-	5	microseconds
Turn-Off Time - t_{off}	4N29, 4N29A, 4N30, 4N31	-	-	40	microseconds
Turn-Off Time - t_{off}	4N32, 4N32A, 4N33	-	-	100	microseconds

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

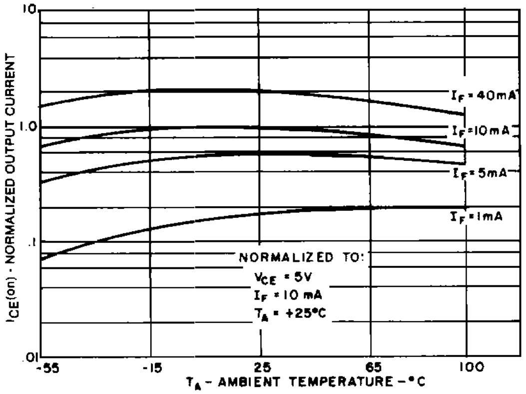
VDE Approved to 0883/6.80 0110b Certificate #35025



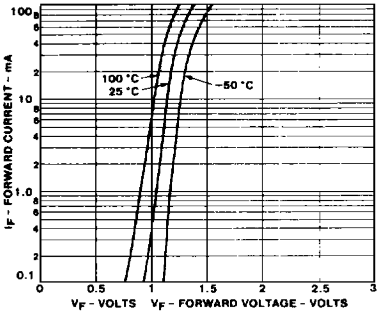
SWITCHING TIME TEST CIRCUIT



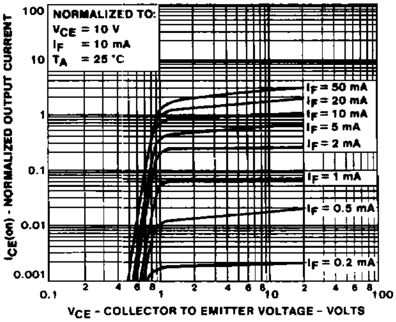
OUTPUT CURRENT VS INPUT CURRENT



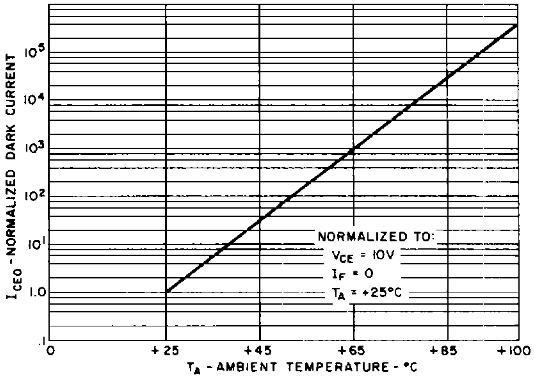
OUTPUT CURRENT VS TEMPERATURE



INPUT CHARACTERISTICS



OUTPUT CHARACTERISTICS



NORMALIZED DARK CURRENT VS TEMPERATURE