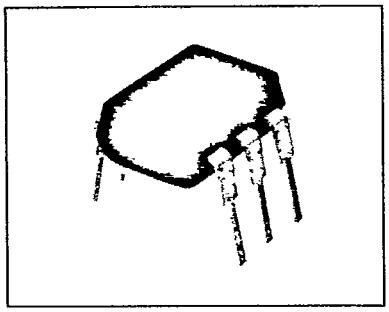
SIEMENS

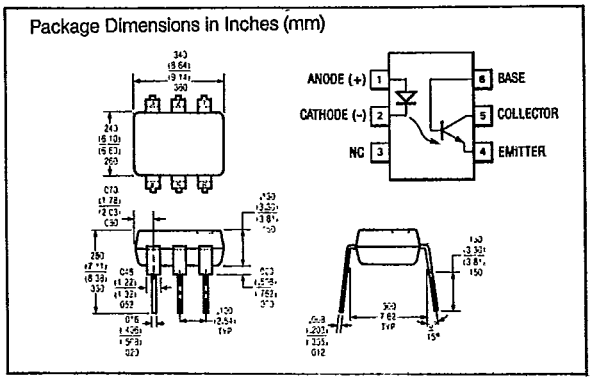
T-41-83

4N25/4N26 4N27/4N28

PHOTOTRANSISTOR OPTOCOUPLER



Package Dimensions in Inches (mm)



FEATURES

- I/O Compatible with Integrated Circuits
- 0.5 pF Coupling Capacitance
- Underwriters Lab Approval #E52744
- VDE Approvals 0883/6.80, 0804/1.83

DESCRIPTION

The 4N25, 4N26, 4N27, and 4N28 are optically coupled isolated pairs, each consisting of a Gallium Arsenide infrared LED and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output. They can be used to replace relays and transformers in many digital interface applications. They have excellent frequency response when used in analog applications.

Maximum Ratings

Gallium Arsenide LED
- Power Dissipation at 25°C ..... 150 mW
- Derate Linearly from 25°C ..... 2.0 mW/°C
- Continuous Forward Current ..... 80 mA
- Forward Current Peak (1µs pulse, 300 pps) ..... 3.0 A
- Peak Reverse Voltage ..... 3.0 V

Detector (Silicon Phototransistor)
- Power Dissipation at 25°C ..... 150 mW
- Derate Linearly from 25°C ..... 2.0 mW/°C
- Collector-Emitter Breakdown Voltage (BV_{CEO}) ..... 30 V
- Emitter-Collector Breakdown Voltage (BV_{ECO}) ..... 7.0 V
- Collector-Base Breakdown Voltage (BV_{CBO}) ..... 70 V

Package
- Total Package Dissipation at 25°C Ambient (equal power in each element) ..... 250 mW
- Derate Linearly from 25°C ..... 3.3 mW/°C
- Isolation Test Voltage in Accordance with DIN57883/6.80 ... 3750 VAC/5300 VDC
- Creepage Path ..... 8 mm min.
- Clearance Path ..... 7 mm min.
- Tracking Index According to VDE 0303 ..... KB100/A

Storage Temperature ..... −55 to +150°C
Operating Temperature ..... −55 to +100°C
Lead Soldering Time at 260 °C ..... 10 sec

Electrical Characteristics (T_{amb} = 25°C)

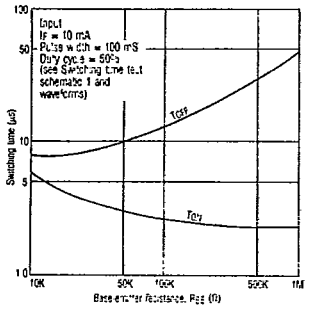
Parameter	Min	Typ	Max	Unit	Test Condition
Gallium Arsenide LED					
*Forward Voltage		1.3	1.5	V	I_F = 50 mA
*Reverse Current		0.1	100	µA	V_R = 3.0 V
Capacitance		100		pF	V_R = 0
Phototransistor Detector					
H_{FE}		150			V_{CE} = 5.0 V
*BV_{CEO}	30			V	I_C = 1 mA
*BV_{ECO}	7			V	I_E = 100 µA
*BV_{CBO}	70			V	I_C = 100 µA
*I_{CEO} (dark)					
4N25,					
4N26, 4N27		5	50	nA	V_{CE} = 10 V
4N28		10	100	nA	(base open)
*I_{CBO} (dark)		2	20	nA	V_{CB} = 10 V (emitter open)
Collector-Emitter Capacitance		2		pF	V_{CE} = 0
Coupled Characteristics					
*DC Current Transfer Ratio					
4N25, 4N26	0.2	0.5			I_F = 10 mA, V_{CE} = 10 V
4N27, 4N28	0.1	0.3			I_F = 10 mA, V_{CE} = 10 V
Capacitance, Input to Output		0.5		pF	
Breakdown Voltage					
*4N25	2500			V	Peak, 60 Hz
*4N26, 4N27	1500			V	Peak, 60 Hz
*4N28	500			V	Peak, 60 Hz
UL Qualified for	7500			VDC	
*Resistance, Input to Output	100			GΩ	
Rise and Fall Times		2		µs	I_F = 10 mA, V_{CE} = 10 V
*Collector-Emitter Saturation Voltage			0.5	V	I_F = 50 mA, I_C = 2.0 mA

*Indicates JEDEC registered values

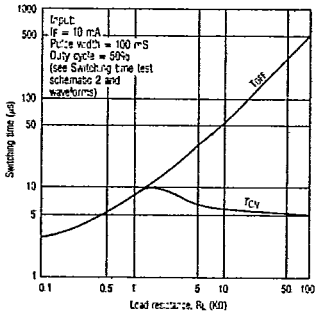
Optocouplers (Optoisolators)

T-41-83

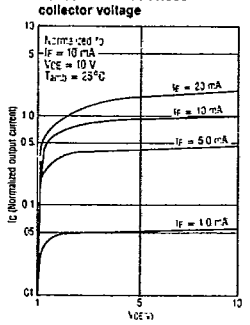
Typical switching characteristics versus base resistance
(Saturated operation)



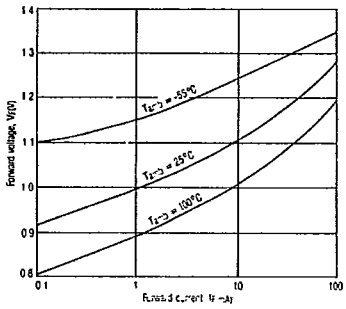
Typical switching times versus load resistance



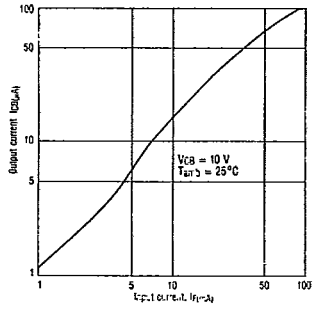
Collector current versus collector voltage



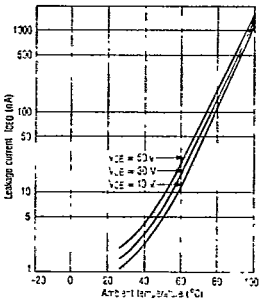
Typical forward voltage versus forward current



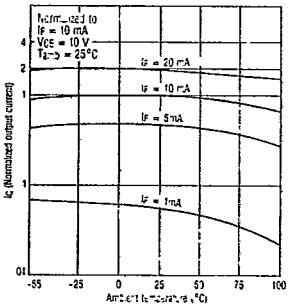
Typical output current (I_{CB}) versus input current



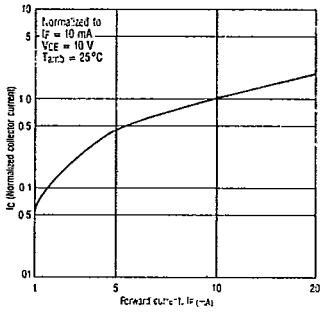
Typical leakage current versus ambient temperature



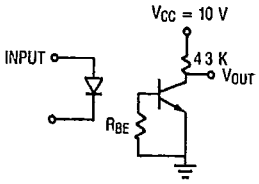
Output current versus temperature



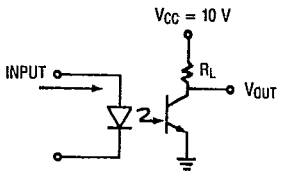
Collector current versus diode forward current



Switching time test schematic and waveforms



Switching time test schematic 1



Switching time test schematic 2