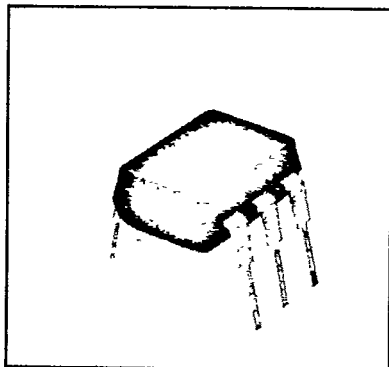


SIEMENS**4N35/4N36/4N37****PHOTOTRANSISTOR
OPTOCOUPLER****T-41-83****FEATURES**

- High Current-Transfer-Ratio (100% Min)
- Standard Dual-In-Line
- 0.5 pF Coupling Capacitance
- Underwriters Lab Approval #E52744
-  VDE Approvals 0883/6.80, 0804/1.83

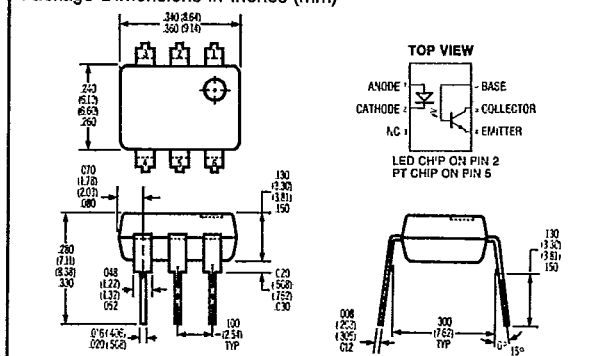
DESCRIPTION

4N35, 4N36, 4N37 are optically coupled pairs employing 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. The 4N35, 4N36, 4N37 can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CRT modulation.

Maximum Ratings

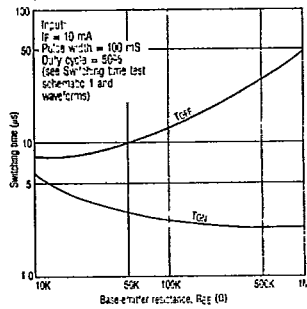
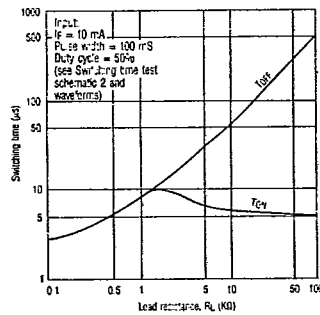
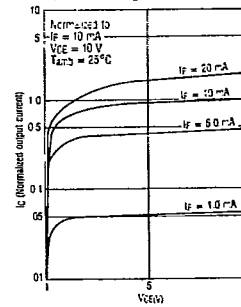
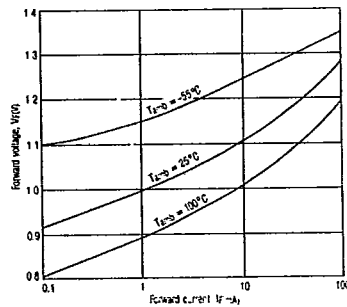
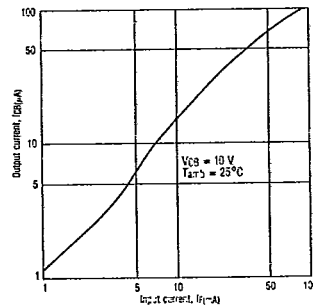
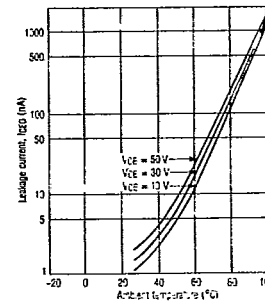
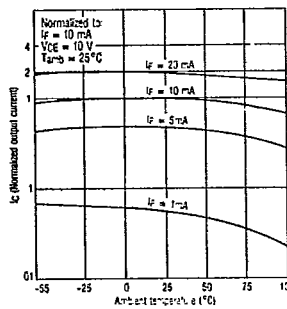
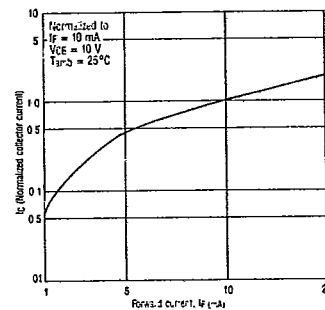
Gallium Arsenide LED	
Power Dissipation at 25°C	100 mW
Derate Linearly from 55°C	1.33 mW/°C
Continuous Forward Current	60 mA
Peak Reverse Voltage	6.0 V
Detector (Silicon Phototransistor)	
Power Dissipation at 25°C	300 mW
Derate Linearly from 25°C	4.0 mW/°C
Collector-Emitter Breakdown Voltage (BV _{CEO})	30 V
Emitter-Collector Breakdown Voltage (BV _{ECO})	7 V
Collector-Base Breakdown Voltage (BV _{CBO})	70 V
Package	
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
Relative Humidity at 85°C	85%

Package Dimensions in Inches (mm)

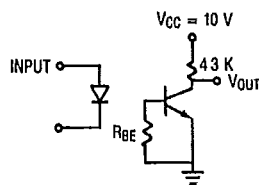
**Electrical Characteristics (T_{amb} = 25°C)**

	Min	Typ	Max	Unit	Conditions
Gallium Arsenide LED					
Forward Voltage*	0.9	1.3	1.5	V	I _F = 10 mA
	0.7		1.7	V	I _F = 10 mA, T _A = -55°C
			1.4	V	I _F = 10 mA, T _A = 100°C
Reverse Current*		.1	10	μA	V _R = 6.0 V
Capacitance		100		pF	V _R = 0, f = 1 MHz
Phototransistor Detector					
H _{FE}	100	150			V _{CE} = 5.0 V, I _C = 100 μA
BV _{CEO} *	30			V	I _E = 1 mA
BV _{CEO} *	7			V	I _E = 100 μA
I _{CEO} (dark)		5	50	nA	V _{CE} = 10 V, I _E = 0
I _{CEO} (dark)*			500	μA	V _{CE} = 30 V, I _E = 0
					T _A = 100°C
BV _{CBO} *	70			V	I _C = 100 μA
Collector-Emitter Capacitance		2		pF	V _{CE} = 0
Coupled Characteristics					
DC Current Transfer Ratio*	100			%	I _F = 10 mA, T _A = 25°C
					V _{CE} = 10 V
DC Current Transfer Ratio*	40			%	I _F = 10 mA, V _{CE} = 10 V
					T _A = 55° to 100°C
Capacitance, Input to Output*		2.5		pF	f = 1.0 MHz
Resistance, Input to Output*		10 ¹¹		Ω	V _{IO} = 500 V
T _{ON} , T _{OFF} *			10	μs	I _C = 2 mA, R _E = 100 Ω
					V _{CC} = 10 V
Collector-Emitter Saturation Voltage V _{CE(sat)} *			0.3	V	I _F = 10 mA, I _C = 0.5 mA
Input to Output Isolation					
Current (Pulse Width = 8 m. sec)*					
4N35		100		μA	V _{IO} = 2500 VRMS
4N36		100		μA	V _{IO} = 1750 VRMS
4N37		100		μA	V _{IO} = 1050 VRMS
4N35/36/37 UL. Qualified for 7500				VDC	

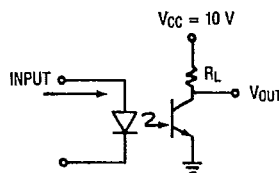
*Indicates JEDEC registered data.

Typical switching characteristics
versus base resistance
(Saturated operation)Typical switching times
versus load resistanceCollector current versus
collector voltageTypical forward voltage
versus forward currentTypical output current (I_{C0})
versus input currentTypical leakage current
versus ambient temperatureOutput current
versus temperatureCollector current versus
diode forward current

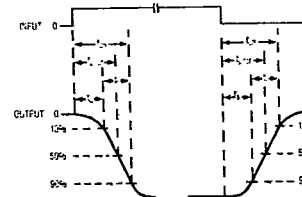
Switching time test schematic and waveforms



Switching time test schematic 1



Switching time test schematic 2

Optocouplers
(Optoisolators)

4N35/4N36/4N37