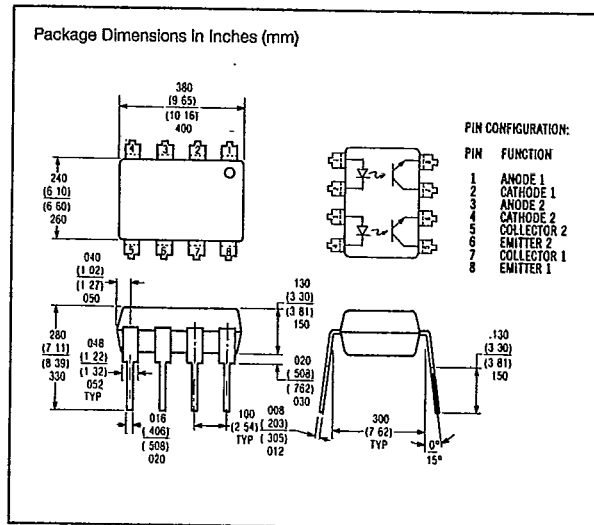
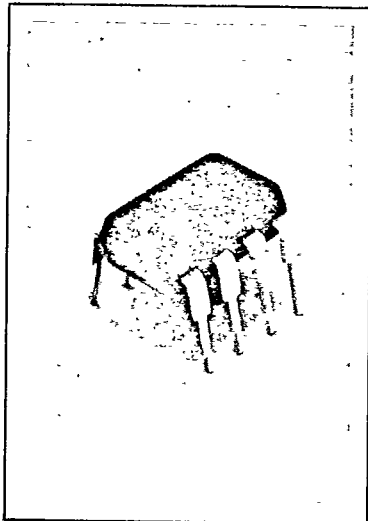


SIEMENS

ILD 610 SERIES

DUAL PHOTOTRANSISTOR OPTOCOUPLER

T-41-83



FEATURES

- Dual Version of SFK 610/611 Series
- High Current Transfer Ratios, 4 Groups
 - ILD 610-1 40 to 80%
 - ILD 610-2 63 to 125%
 - ILD 610-3 100 to 200%
 - ILD 610-4 160 to 320%
- 7500 Volt Isolation
- $V_{CE\ sat} = 0.25 (\leq 0.4)$ Volt
 $I_F = 10$ mA; $I_C = 2.5$ mA
- $V_{CEO} = 70$ Volt
- 100% Burn-In
- UL Approval #52744

DESCRIPTION

The ILD 610 Series is a two-channel optocoupler series for high density applications. Each channel consists of an optically coupled pair 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 ILD 610 Series is the dual version of the SFK 610/611 Series and uses a repetitive pin-out configuration instead of more common alternating pin-out used in most dual couplers.

Maximum Ratings

Emitter (GaAs LED)

Reverse Voltage	V_R	6	V
DC forward current	I_F	60	mA
Surge forward current ($t \leq 10 \mu s$)	I_{FSM}	1.5	A
Total power dissipation	P_{tot}	100	mW

Detector (silicon phototransistor)

Collector-emitter voltage	V_{CEO}	70	V
Collector current	I_C	50	mA
Collector current ($t \leq 1$ ms)	I_{CSM}	100	mA
Total power dissipation	P_{tot}	150	mW

Optocoupler

Storage temperature range	T_{sig}	$-55 \dots +150$	$^{\circ}C$
Ambient temperature range	T_{amb}	$-55 \dots +100$	$^{\circ}C$
Junction temperature	T_J	100	$^{\circ}C$
Soldering temperature (max. 10 sec)	T_{sold}	260	$^{\circ}C$
Isolation test voltage ($t = 1$ sec)	V_{IS}	7500	VDC
		5300	VAC (RMS)
Isolation resistance	R_{ISO}	10^{11}	Ω

* Dip soldering: Insertion depth < 3.6 mm

T-41-83

CHARACTERISTICS @ T_{amb} 25°C			
Emitter (GaAs infrared emitter) Forward voltage ($I_F = 60$ mA) Breakdown voltage ($I_R = 10$ μ A) Reverse current ($V_R = 6$ V) Capacitance ($V_R = 0$ V; $f = 1$ MHz)	V_F V_{BR} I_R C_O	1.25 (≤ 1.65) 30 (≥ 6) 0.01 (≤ 10) 25	V V μ A pF
Detector (silicon phototransistor) Collector—emitter dark current Collector—emitter breakdown voltage Emitter—collector breakdown voltage Capacitance ($V_{CE} = 5$ V; $f = 1$ μ Hz)	I_{CEO} BV_{CEO} BV_{ECO} C_{CE}	2 70 7.5 7	nA V V pF
Coupled Collector—emitter saturation voltage ($I_F = 10$ mA, $I_C = 2.5$ mA) Coupling capacitance	$V_{CE(sat)}$ C_C	0.25 (< 0.40) 0.35	V pF

Group	ILD 610-1	ILD 610-2	ILD 610-3	ILD 610-4	
Current transfer ratio' $I_F = 10$ mA, $V_{CE} = 5$ V	40-80	63-125	100-200	160-320	%
Current transfer ratio' $I_F = 1$ mA, $V_{CE} = 5$ V	13 min.	22 min.	34 min.	56 min.	%
I_{CEO} ($V_{CE} = 10$ V)	2 (≤ 50)	2 (≤ 50)	5 (≤ 100)	5 (≤ 100)	nA

CTR will match within a ratio of 1.7:1

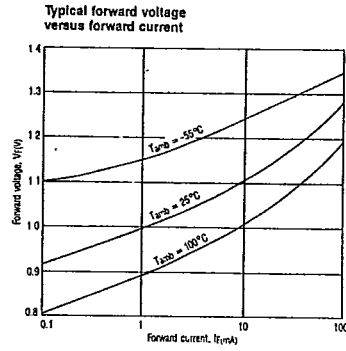
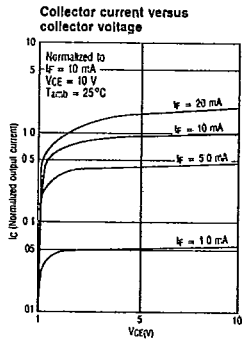
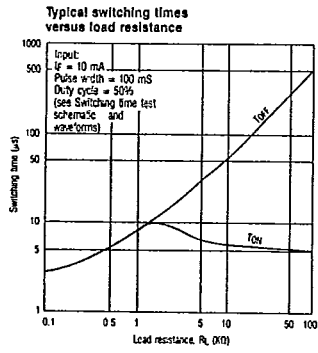
Switching Characteristics**Linear Operation (without saturation) $I_F = 10$ mA, $V_{CC} = 5$ V, $R_C = 75$ Ω**

Group		ILD 610-1	ILD 610-2	ILD 610-3	ILD 610-4	
Turn on time	t_{on}	3.0 (< 5.6)	3.2 (< 5.6)	3.6 (< 5.6)	4.1 (< 5.6)	μ S
Rise time	t_r	2.0 (< 4.0)	2.5 (< 4.0)	2.9 (< 4.0)	3.3 (< 4.0)	μ S
Turn off time	t_{off}	2.3 (< 4.1)	2.9 (< 4.1)	3.4 (< 4.1)	3.7 (< 4.1)	μ S
Fall time	t_f	2.0 (< 3.5)	2.6 (< 3.5)	3.1 (< 3.5)	3.5 (< 3.5)	μ S

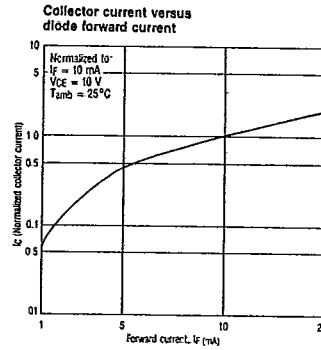
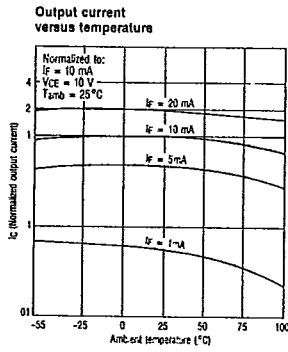
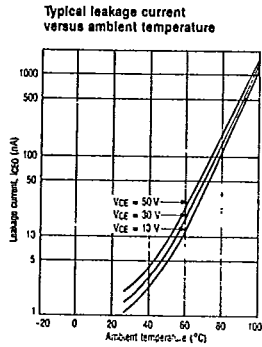
Switching operation (with saturation) $V_{CC} = 5$ V, $R_C = 1$ K Ω

Group		ILD 610-1 $I_F = 20$ mA	ILD 610-2 $I_F = 10$ mA	ILD 610-3 $I_F = 10$ mA	ILD 610-4 $I_F = 5$ mA	
Turn on time	t_{on}	3.0 (< 5.5)	4.3 (< 8.0)	4.6 (< 8.0)	6.0 (< 10.5)	μ S
Rise time	t_r	2.0 (< 4.0)	2.8 (< 6.0)	3.3 (< 6.0)	4.6 (< 8.0)	μ S
Turn off time	t_{off}	18 (< 34)	24 (< 39)	25 (< 39)	25 (< 43)	μ S
Fall time	t_f	11 (< 20)	11 (< 24)	15 (< 24)	15 (< 26)	μ S

Optocouplers
(Optoisolators)



T-41-83



Switching time test schematic and waveforms

