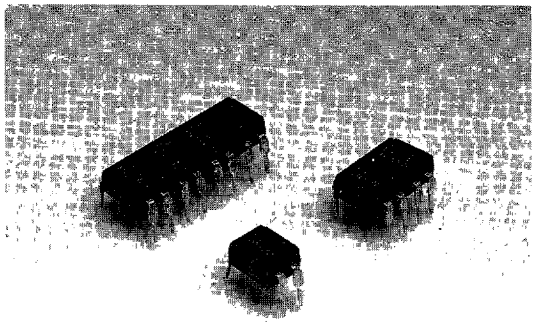
LITEON

High Density Mounting Type Photocoupler

LTV817/LTV827/LTV847

T-41-83

■ FEATURES

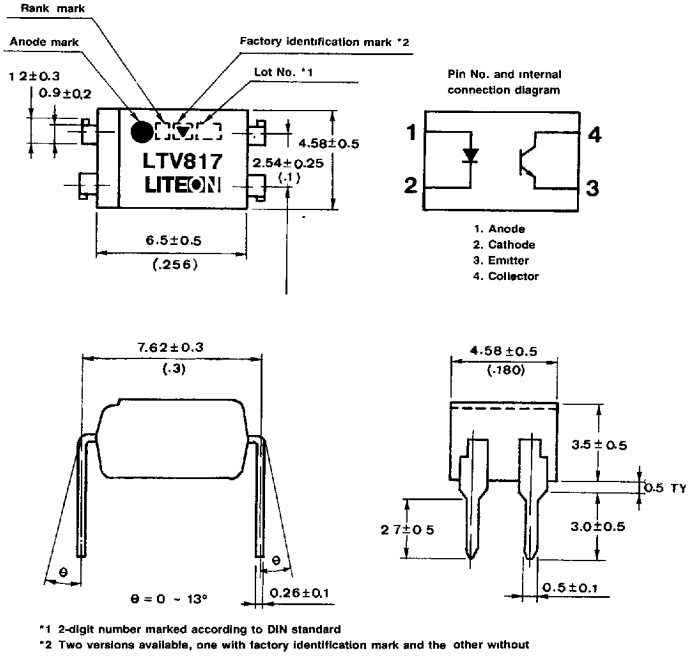


1. Current transfer ratio
   CTR: MIN. 50% at $I_F = 5mA$, $V_{CE} = 5V$
2. High input-output isolation voltage
   (V_{ISO}: 5,000 Vrms)
3. Compact dual-in-line package
   LTV817: 1-channel type, LTV827: 2-channel type
   LTV847: 4-channel type
4. UL. approved (No. E 113898(s))

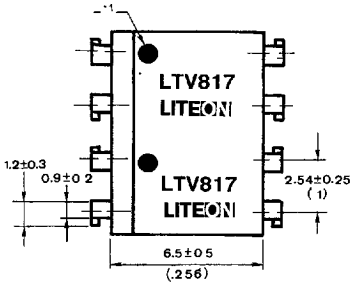
■ APPLICATIONS

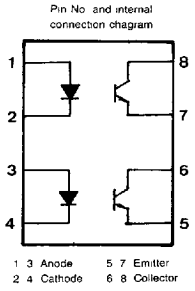
1. Computer terminals
2. System appliances, measuring instruments
3. Registers, copiers, automatic vending machines
4. Electric home appliances such as fan heaters, etc.
5. Medical instruments, physical and chemical equipments.
6. Signal transmission between circuits of different potentials and impedances

■ OUTLINE DIMENSIONS (UNIT: mm)

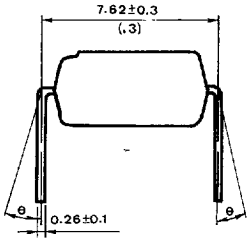


*1 2-digit number marked according to DIN standard
*2 Two versions available, one with factory identification mark and the other without

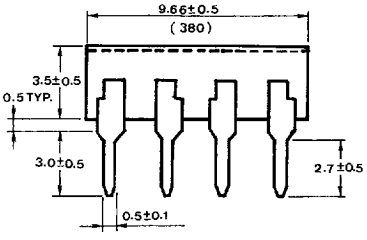




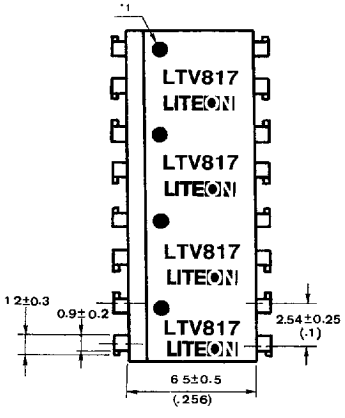
1 3 Anode 5 7 Emitter
2 4 Cathode 6 8 Collector

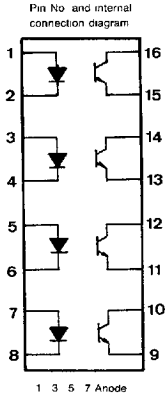


θ = 0 – 13°

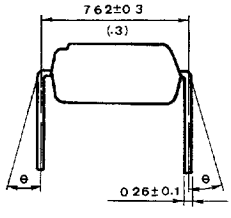


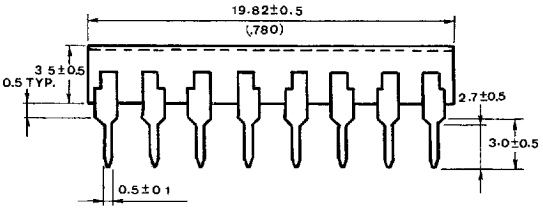
Note *1 Anode mark





1 3 5 7 Anode
2 4 6 8 Cathode
9 11 13 15 Emitter
10 12 14 16 Collector





θ = 0 – 13°

Note *1 Anode mark

■ RATINGS AND CHARACTERISTICS

• Absolute maximum ratings

(Ta = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	70	mW
Output	Collector-emitter voltage	V_{CEO}	35	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_C	50	mA
	Collector power dissipation	P_C	150	mW
Total power dissipation		P_{tot}	200	mW
Operating temperature		T_{opr}	−30 ~ +100	°C
Storage temperature		T_{stg}	−55 ~ +125	°C
*2 Isolation voltage		V_{iso}	5	kVrms
*3 Soldering temperature		T_{sol}	260	°C

*1 Pulse width ≤ 100μs, Duty ratio: 0.001
*2 AC for 1 minute, 40 ~ 60% R.H.
*3 For 10 seconds

• Electro-optical characteristics

(Ta = 25°C)

	Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward voltage	V_F	—	1.2	1.4	V	I_F = 20mA
	Peak forward voltage	V_{FM}	—	—	3.0	V	I_{FM} = 0.5A
	Reverse current	I_R	—	—	10	μA	V_R = 4V
	Terminal capacitance	C_t	—	30	250	pF	V = 0, f = 1kHz
Output	Collector dark current	I_{CEO}	—	—	100	nA	V_{CE} = 20V, I_F = 0, R_{BE} = ∞
	Collector-emitter breakdown voltage	BV_{CEO}	35	—	—	V	I_C = 0.1mA, I_F = 0
	Emitter-collector breakdown voltage	BV_{ECO}	6	—	—	V	I_E = 10μA, I_F = 0
Transfer characteristics	*Collector current	I_C	2.5	—	30	mA	I_F = 5mA, V_{CE} = 5V
	Collector-emitter saturation voltage	V_{CE} (sat)	—	0.1	0 2	V	I_F = 20mA, I_C = 1mA
	Isolation resistance	R_{ISO}	5×10^{10}	10^{11}	—	Ω	500V DC, 40 ~ 60% R.H.
	Floating capacitance	C_f	—	0.6	1.0	pF	V = 0, f = 1 MHz
	Cut-off frequency	f_c	—	80	—	kHz	V_{CE} = 5V, I_C = 2mA R_L = 100Ω, −3dB
	Response time (Rise)	t_r	—	4	18	μs	V_{CE} = 2V, I_C = 2mA, R_L = 100Ω
	Response time (Fall)	t_f	—	3	18	μs	

*CTR = $\frac{IC}{IF} \times 100\%$

■ SUPPLEMENT

• Isolation voltage shall be measured in the following method.

(1) Anode and cathode on input side, collector and emitter on output side shall be shortened individually.
(2) The isolation voltage tester with a zero-cross circuit shall be used.
(3) The waveform of applied voltage shall be a sine wave.
(It is recommended that the isolation voltage shall be measured in insulation oil.)

• Rank table of collector current I_C (for LTV 817 only)

Model No.	Rank mark	I_C (mA)
LTV817A	A	4.0~8.0
LTV817B	B	6.5~13
LTV817C	C	10~20
LTV817D	D	15~30
LTV817	A, B, C, D or No mark	2.5~30

Conditions	$I_F = 5mA$ $V_{CE} = 5V$ $Ta = 25°C$

• Inspection standard

Outgoing inspection standard for LITON products are shown below.
(1) A single sampling plan, normal inspection level II based on MIL-STD-105D is applied. The AQL according to the inspection items are shown below.

Defect	Inspection item	AQL (%)	Judgement criterion
Major defect	• Electrical characteristics • Unreadable marking • Open, short	0 25	Depend on the specification
Minor defect	• Appearance • Dimension	0.4	

Fig. 1 Forward Current vs. Ambient Temperature

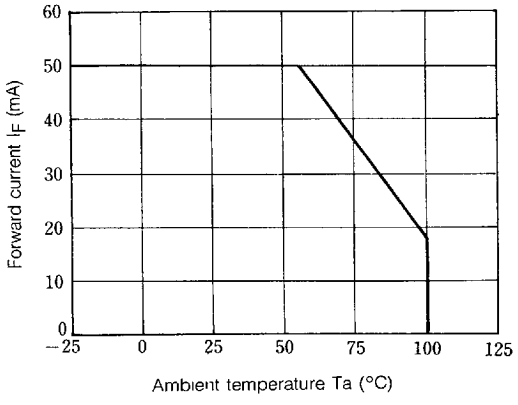


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

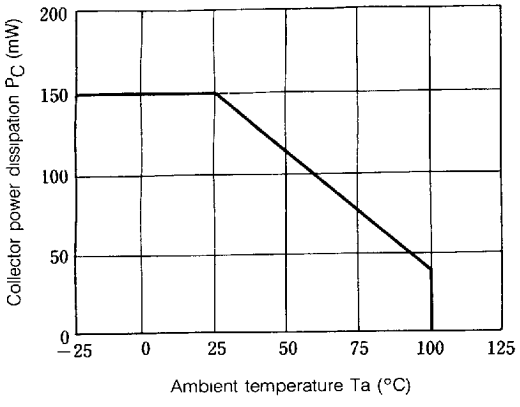


Fig. 3 Peak Forward Current vs. Duty Ratio

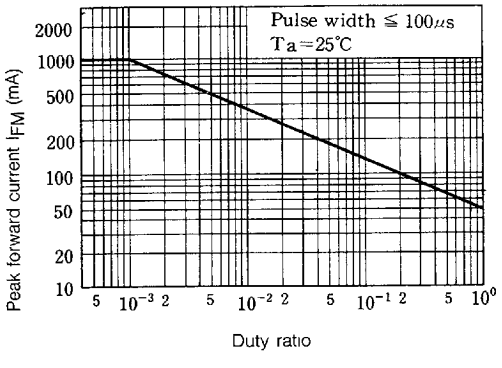


Fig. 4 Current Transfer Ratio vs. Forward Current

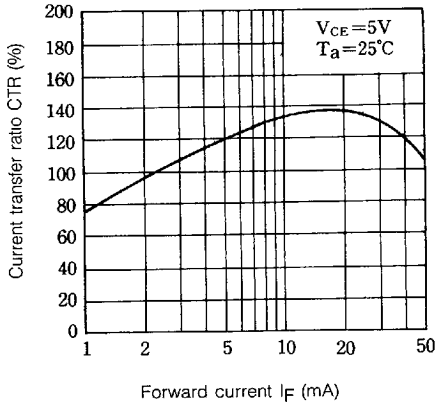


Fig. 5. Forward Current vs. Forward Voltage

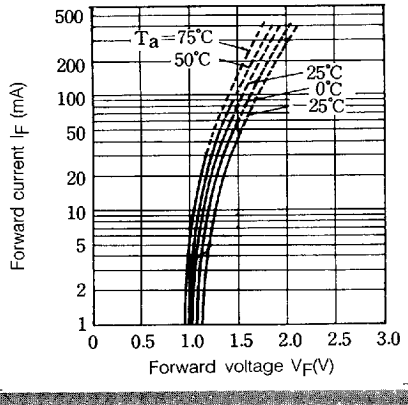


Fig. 6 Collector Current vs. Collector-emitter Voltae

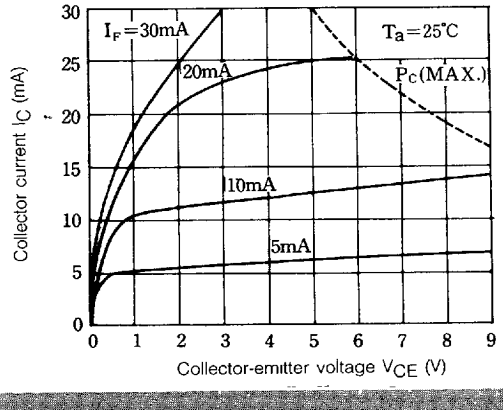


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

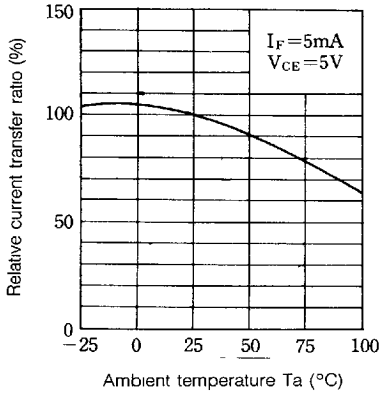


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

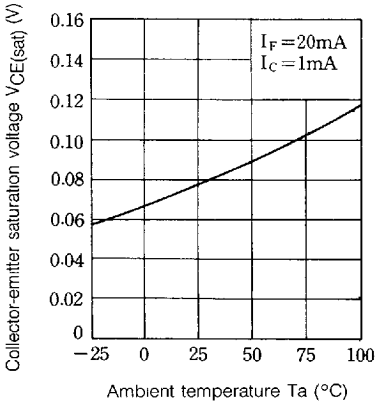


Fig. 9 Collector Dark Current vs. Ambient Temperature

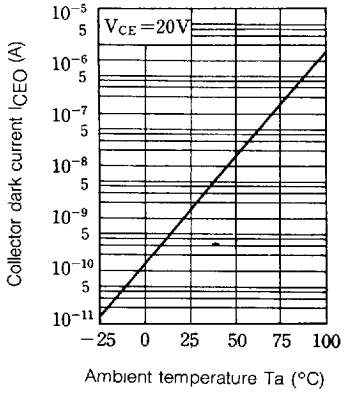


Fig. 10 Response Time vs. Load Resistance

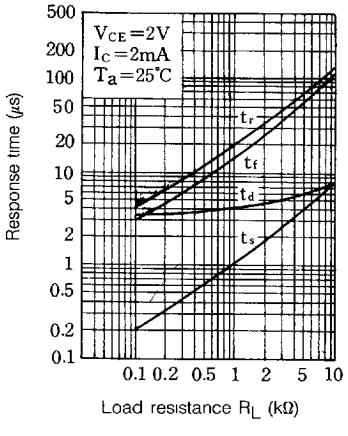


Fig. 11 Frequency Response

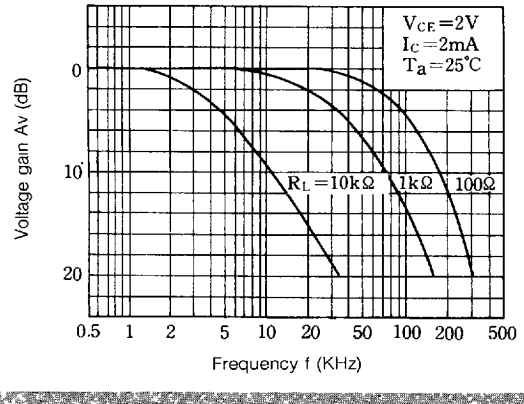
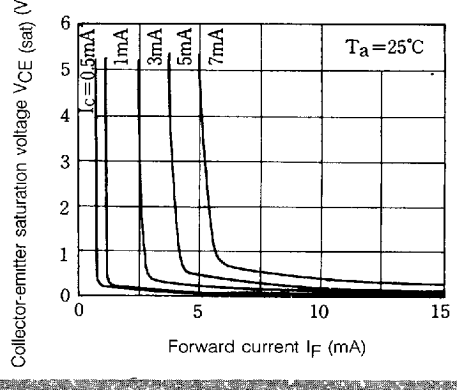
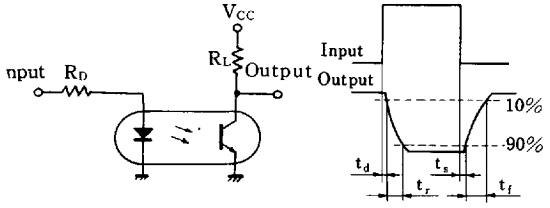


Fig. 12 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Response Time



Test Circuit for Frequency Response