



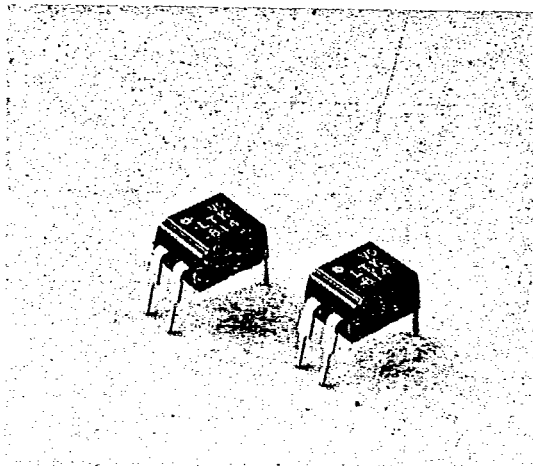
AC Input Type Photocoupler LTK814

FEATURES

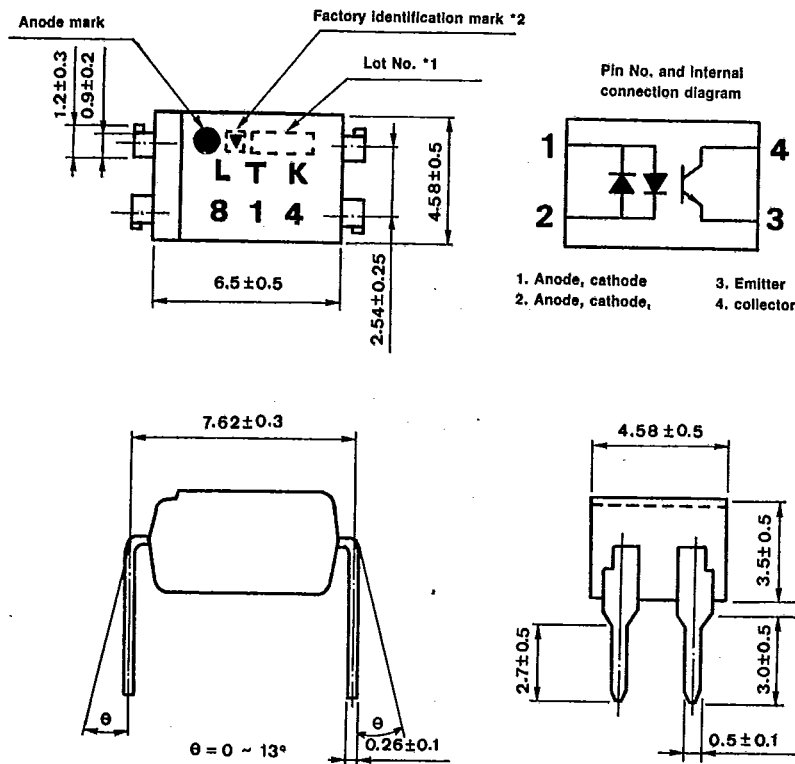
1. AC input response
2. High input-output isolation voltage
(V_{ISO} : 5,000 Vrms)
3. Low collector dark current
(I_{CEO} : MAX. 10^{-7} A at $V_{CE} = 20$ V)
4. Current transfer ratio
CTR: MIN. 20% at $I_F = \pm 1$ mA, $V_{CE} = 5$ V
5. Compact dual-in-line package
6. UL approved (NO. E113898(s))

APPLICATIONS

1. Telephone sets, telephone exchanges
2. Sequence controllers
3. System appliances, measuring instruments
4. 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

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
	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 $\leq 100\mu s$, Duty ratio: 0.001

*2 AC for 1 minute, 40~60% RH

*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	$I_F = \pm 20\text{mA}$
	Peak forward voltage	V_{FM}	—	—	3.0	V	$I_{FM} = \pm 0.5\text{A}$
	Terminal capacitance	C_t	—	50	250	pF	$V = 0, f = 1\text{kHz}$
Output	Collector dark current	I_{CEO}	—	—	100	nA	$V_{CE} = 20\text{V}, I_F = 0$
	Collector-emitter breakdown voltage	BV_{CEO}	35	—	—	V	$I_C = 0.1\text{mA}, I_F = 0$
	Emitter-collector breakdown voltage	BV_{ECO}	6	—	—	V	$I_E = 10\mu\text{A}, I_F = 0$
Transfer characteristics	* Collector current	I_C	0.2	—	3	mA	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$
	Collector-emitter saturation voltage	$V_{CE}(\text{sat})$	—	0.1	0.2	V	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$
	Isolation resistance	R_{ISO}	5×10^{10}	10^{11}	—	Ω	DC500V, 40~60% RH
	Floating capacitance	C_f	—	0.6	1.0	pF	$V = 0, f = 1\text{MHz}$
	Cut-off frequency	f_c	15	80	—	kHz	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$
	Response time (Rise)	t_r	—	4	18	μs	$V_{CE} = 2\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega$
	Response time (Fall)	t_f	—	3	18	μs	

$$*CTR = \frac{I_C}{I_F} \times 100\%$$

■ 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.)

• 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

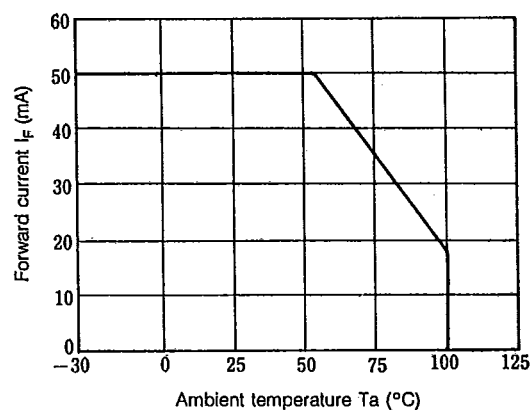


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

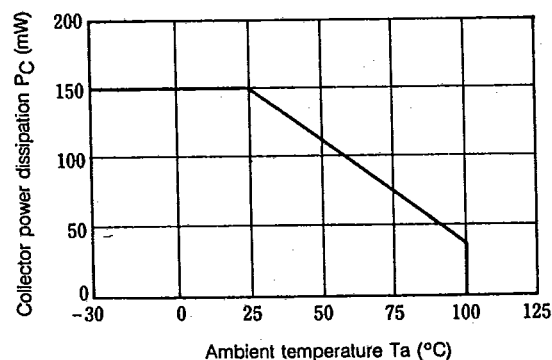


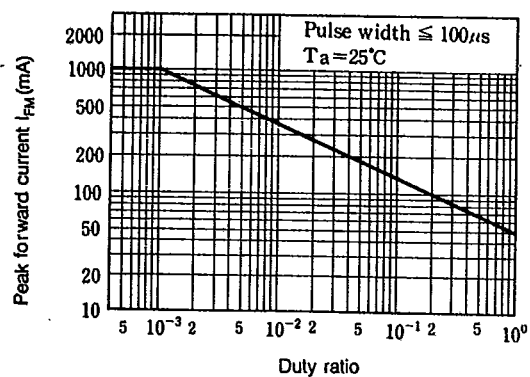
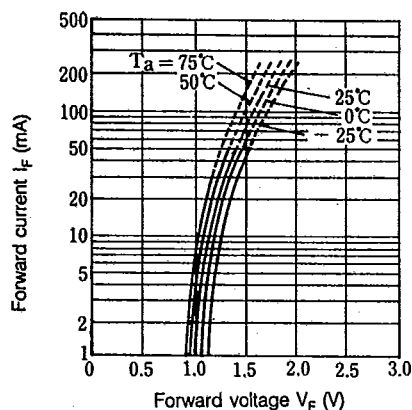
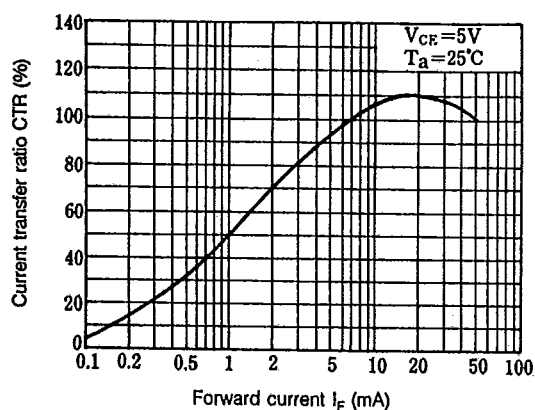
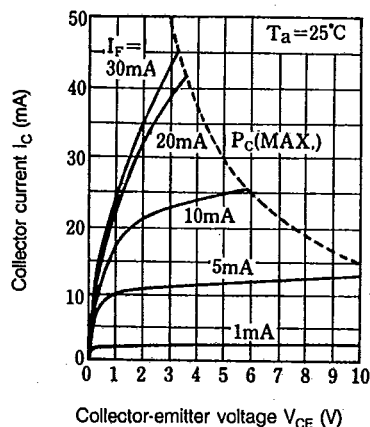
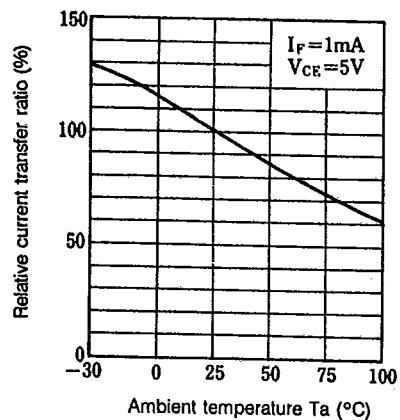
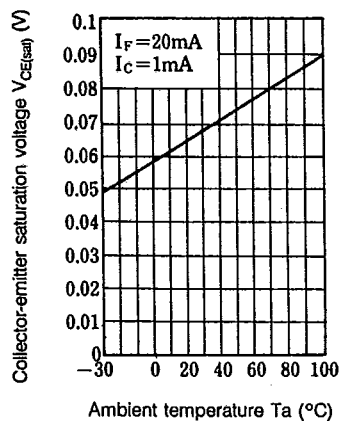
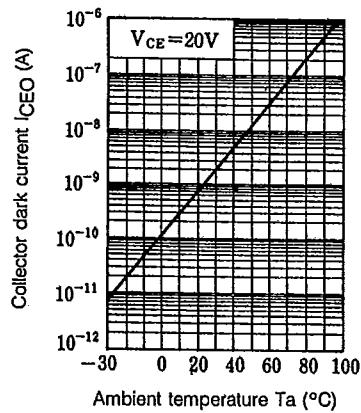
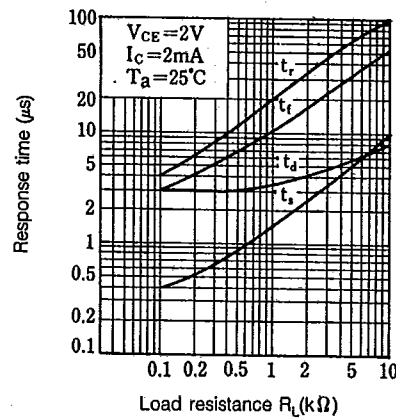
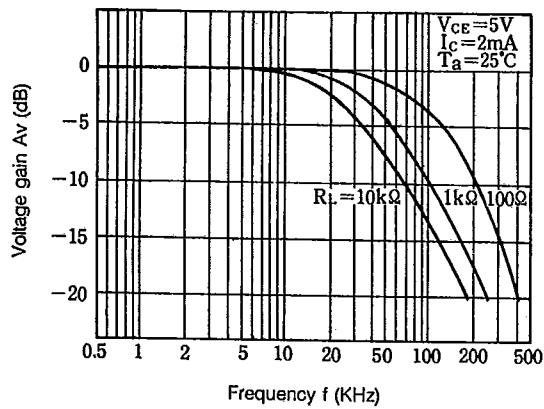
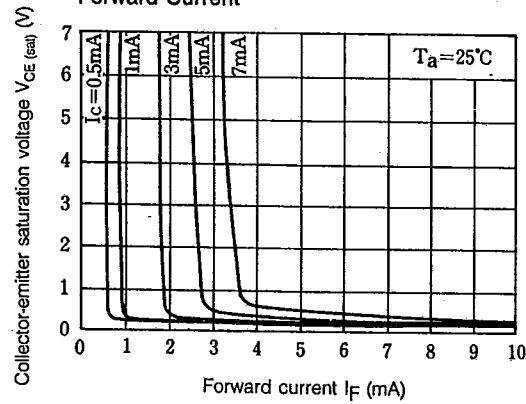
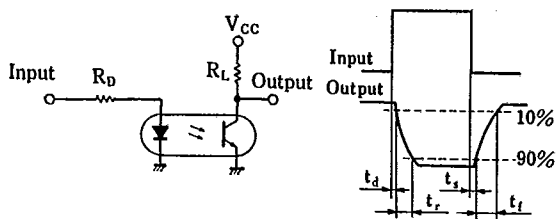
Fig. 3 Peak Forward Current vs. Duty Ratio**Fig. 4** Forward Current vs. Forward Voltage**Fig. 5** Current Transfer Ratio vs. Forward Current**Fig. 6** Collector Current vs. Collector-emitter Voltage**Fig. 7** Relative Current Transfer Ratio vs. Ambient Temperature**Fig. 8** Collector-emitter Saturation 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

