AC Input Type Photocoupler

LTV-814H Series

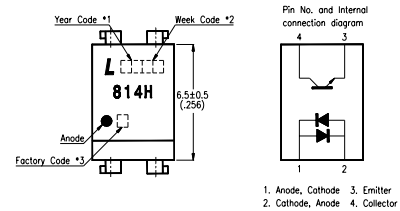
Features

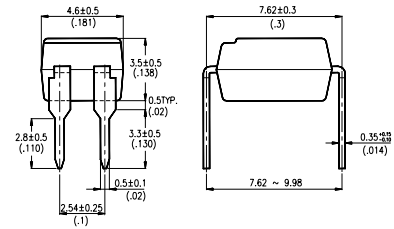
- AC input response
- High input current
  (I_F : MAX. 150mA)
- High input-output isolation voltage:
  (V_{ISO} : 5,000V_{rms})
- Low collector dark current
  (I_{CEO} : MAX. 10^{-7}A at V_{CE}=20V)
- Current transfer ratio
  (CTR : MIN. 20% at I_F= $\pm$ 100mA, V_{CE}=2V)
- Compact dual-in-line package
  LTV814H : 1-channel type
  LTV824H : 2-channel type
  LTV844H : 4-channel type
- UL approved (No. E113898) 814H only
- CSA approved (No. LR91533) 814H only
- VDE approved (No. 094722)
- Options available :
  -Leads with 0.4"(10.16mm)spacing (M Type)
  -Leads bends for surface mounting(S Type)
  -Tape and Reel of Type I for SMD(Add"-TA"Suffix)
  -Tape and Reel of Type II for SMD(Add"-TA1"Suffix)
  -VDE 0884 approvals (Add"-V"Suffix)

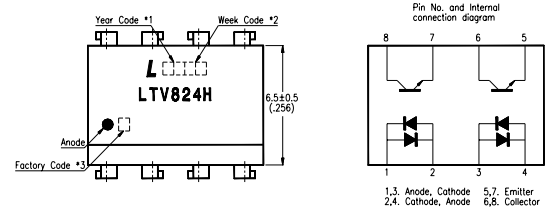
Applications

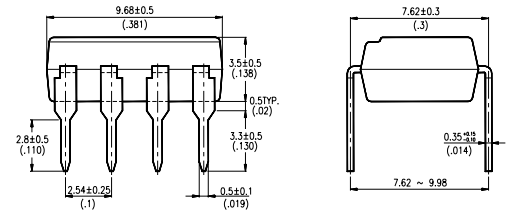
1. Telephone sets, telephone exchangers.
2. System appliances, measuring instruments.
3. Signal transmission between circuits of different potentials and impedances.

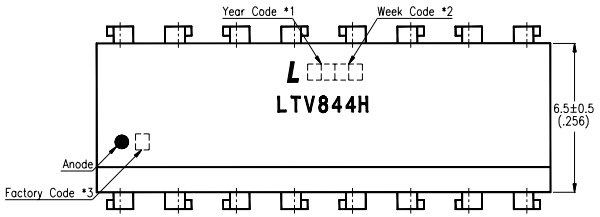
Package Dimensions

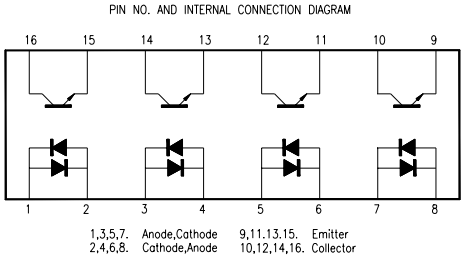


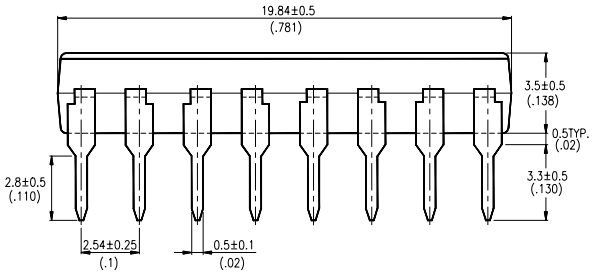


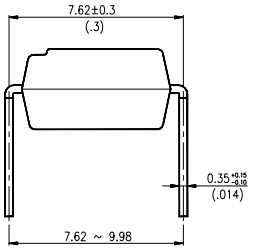












Note:
1.Year date code.
2. 2-digit work week.
3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
4. All dimensions are in millimeters (inches).
5. Tolerance is ± 0.25mm (.010")unless otherwise noted.
6. Specifications are subject to change without notice.

Ordering Information

Part Number	Package	Safety Standard Approval	Application part number
LTV-814H LTV-814HM LTV-814HS LTV-814HS-TA LTV-814HS-TA1	4-pin DIP 4-pin (leads with 0.4" spacing) 4-pin (lead bends for surface mount) 4-pin (tape and reel packaging of type I) 4-pin (tape and reel packaging of type II)	• UL approved • TUV approved • CSA approved • FIMKO approved • NEMKO approved • SEMKO approved • DEMKO approved	LTV-814H
LTV-824H LTV-824HM LTV-824HS LTV-824HS-TA LTV-824HS-TA1	8-pin DIP 8-pin (leads with 0.4" spacing) 8-pin (lead bends for surface mount) 8-pin (tape and reel packaging of type I) 8-pin (tape and reel packaging of type II)		LTV-824H
LTV-844H LTV-844HM LTV-844HS LTV-844HS-TA LTV-844HS-TA1	16-pin DIP 16-pin (leads with 0.4" spacing) 16-pin (lead bends for surface mount) 16-pin (tape and reel packaging of type I) 16-pin (tape and reel packaging of type II)		LTV-844H
LTV814H-V LTV814HM-V LTV814HS-V LTV814HSTA-V LTV814HSTA1-V	4-pin DIP 4-pin (leads with 0.4" spacing) 4-pin (lead bends for surface mount) 4-pin (tape and reel packaging of type I) 4-pin (tape and reel packaging of type II)	• VDE approved	LTV-814H
LTV824H-V LTV824HM-V LTV824HS-V LTV824HSTA-V LTV824HSTA1-V	8-pin DIP 8-pin (leads with 0.4" spacing) 8-pin (lead bends for surface mount) 8-pin (tape and reel packaging of type I) 8-pin (tape and reel packaging of type II)		LTV-824H
LTV844H-V LTV844HM-V LTV844HS-V LTV844HSTA-V LTV844HSTA1-V	16-pin DIP 16-pin (leads with 0.4" spacing) 16-pin (lead bends for surface mount) 16-pin (tape and reel packaging of type I) 16-pin (tape and reel packaging of type II)		LTV-844H

Absolute Maximum Ratings

(Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	± 150	mA
	Power Dissipation	P	230	mW
Output	Collector-Emitter Voltage	V_{CEO}	35	V
	Emitter-Collector Voltage	V_{ECO}	6	V
	Collector Current	I_C	80	mA
	Collector Power Dissipation	P_C	160	mW
Total Power Dissipation		P_{tot}	320	mW
*1.Isolation Voltage		V_{iso}	5,000	V_{rms}
Operating Temperature		T_{opr}	-30~+100	℃
Storage Temperature		T_{stg}	-55~+125	℃
*2.Soldering Temperature		T_{sol}	260	℃

*1. AC for 1 minute, R.H. = 40 ~ 60%

- Isolation voltage shall be measured using the following method.
  (1)Short between anode and cathode on the primary side and between collector, emitter and base on the secondary side.
  (2)The isolation voltage tester with zero-cross circuit shall be used.
  (3)The waveform of applied volttage shall be a sine wave.

*2. For 10 seconds.

Electrical/Optical Characteristics

(Ta=25℃)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	V_F	–	1.4	1.7	V	I_F= ± 100mA
	Terminal Capacitance	C_t	–	50	400	pF	V=0, f=1KHz
Output	Collector Dark Current	I_{CEO}	–	–	100	nA	V_{CE}=20V
	Collector-Emitter Breakdown Voltage	BV_{CEO}	35	–	–	V	I_C=0.1mA
	Emitter-Collector Breakdown Voltage	BV_{ECO}	6	–	–	V	I_E=10 μ A
Transfer Characteristics	Collector Current	I_C	20	–	80	mA	I_F= ± 100mA V_{CE}=2V
	*Current Transfer Ratio	CTR	20	–	80	%	
	Collector-emitter Saturation Voltage	$V_{CE(sat)}$	–	0.1	0.2	V	I_F= ± 100mA, I_C=1mA
	Isolation Resistance	R_{ISO}	5×10^{10}	10^{11}	–	Ω	DC500V, 40~60% R.H.
	Floating Capacitance	C_f	–	0.6	1.0	pF	V=0, f=1MHz
	Cut-off Frequency	f_c	15	80	–	KHz	V_{CE}=5V, I_C=2mA R_L=100 Ω, -3dB
	Response Time (Rise)	t_r	–	4	18	μs	V_{CE}=2V, I_C=2mA R_L=100 Ω
	Response Time (Fall)	t_f	–	3	18	μs	

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

Typical Electrical/Optical Characteristic Curves
(25℃ Ambient Temperature Unless Otherwise Noted)

Fig.1 Forward Current vs. Ambient Temperature

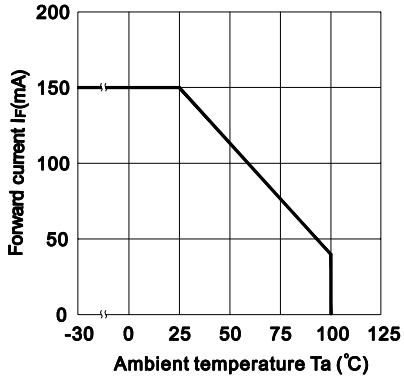


Fig.2 Collector Power Dissipation vs. Ambient Temperature

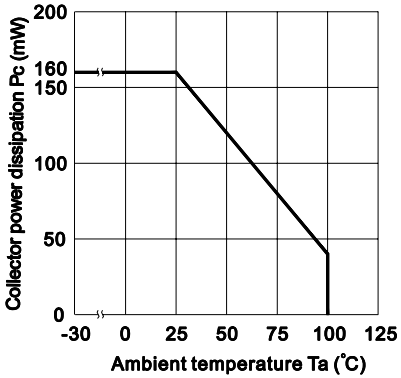


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

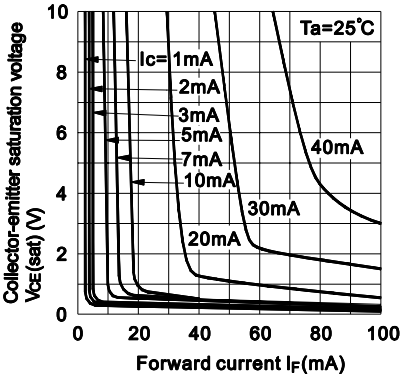


Fig.4 Forward Current vs. Forward Voltage

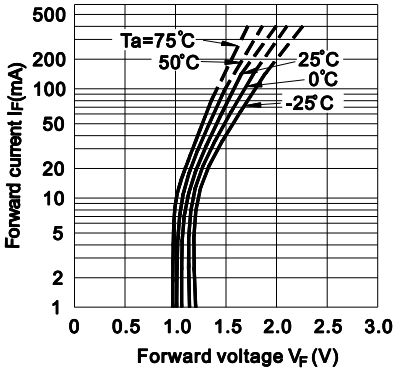


Fig.5 Current Transfer Ratio vs. Forward Current

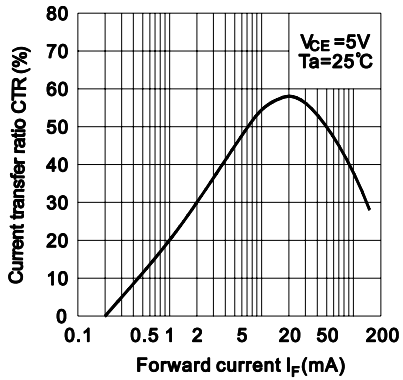
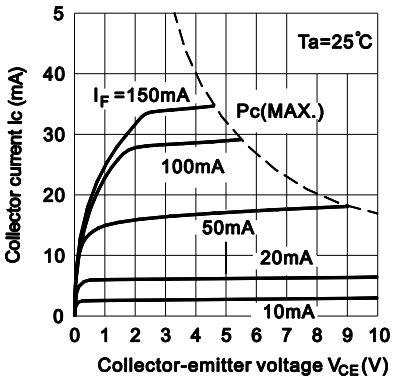


Fig.6 Collector Current vs. Collector-emitter Voltage



PHOTOCOUPLER

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

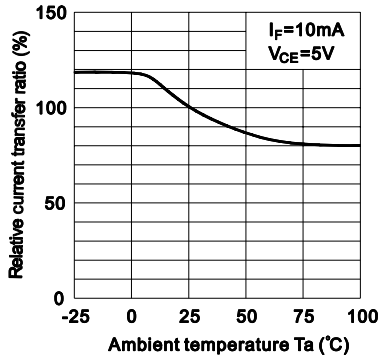


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

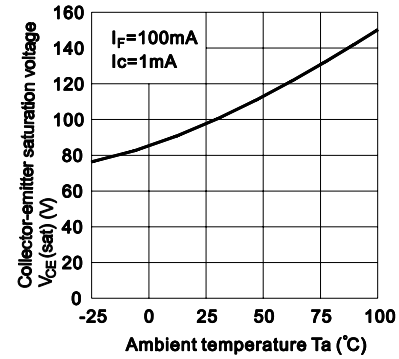


Fig.9 Collector Dark Current vs. Ambient Temperature

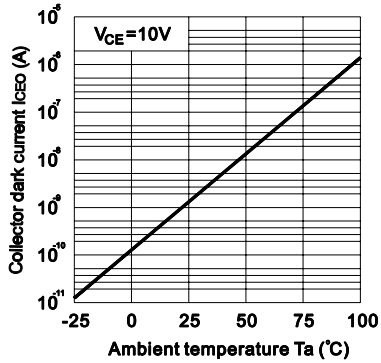


Fig.10 Response Time vs. Load Resistance

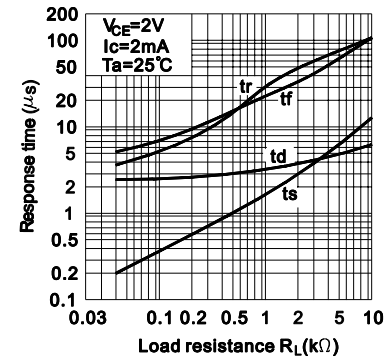
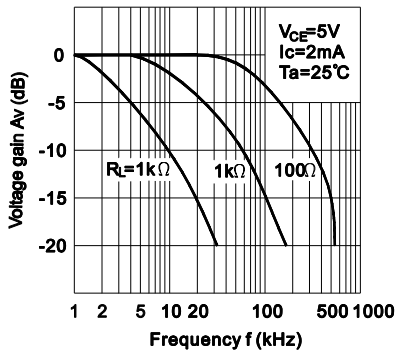
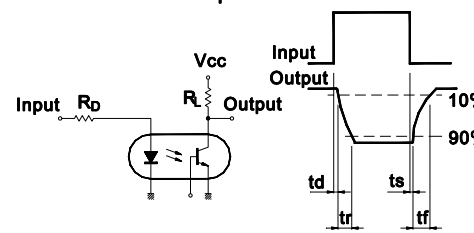


Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response