High Input Current Type Photocoupler

LTV-724F Series

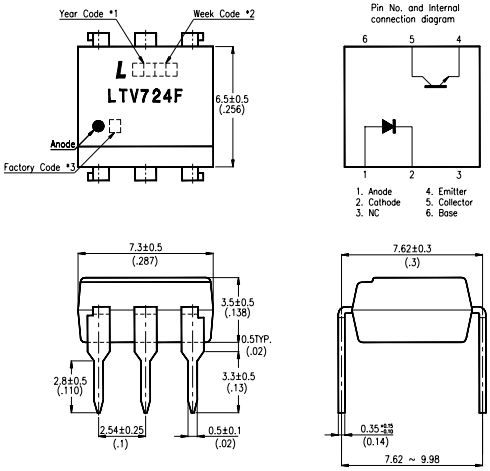
Features

- High isolation voltage between input and output
- High input current (I_F : MAX. 150 mA)
- Low collector dark current
  (I_{CEO} : MAX. 10^{-7}A at VCE = 20V)
- Current transfer ratio
  (CTR : 20% ~ 80% at I_F = 100mA, V_{CE} = 2V)
- High input-output isolation voltage
  (V_{ISO} = 5,000Vrms)
- Response time
  (t_r : TYP. 4 μ s at V_{CE} = 5V, I_C = 2mA, R_L = 100 Ω)
- UL approved (No. E113898)
- CSA approved (No. CA91533-1)
- FIMKO approved (No. 202944)
- NEMKO approved (No. P98101738)
- DEMKO approved (No. 307923)
- SEMKO approved (No. 9833171/01)
- VDE approved (No. 094722)
- Options Available :
  - Leads with 0.4" (10.16mm) Spacing (M Type)
  - Lead 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
2. I/O interfaces for microcomputer
3. System appliances, measuring instruments
4. Signal transmission between circuits of different potentials and impedances

Package Dimensions



Notes :
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.

PHOTOCOUPLER

Ordering Information

Part Number	Package	Safety Standard Approval	Application part number
LTV-724F LTV-724FM LTV-724FS LTV-724FS-TA LTV-724FS-TA1	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)	• UL approved • NEMKO approved • CSA approved • DEMKO approved • FIMKO approved • SEMKO approved	LTV - 724F
LTV724F-V LTV724FM-V LTV724FS-V LTV724FSTA-V LTV724FSTA1-V	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)	• VDE approved	LTV - 724F

Ratings and Characteristics
Absolute Maximum Ratings

(Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	150	mA
	Reverse Voltage	V_R	6	V
	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	Vrms
Operating Temperature		T_{opr}	-25~+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 and emitter on the secondary side.
(2) The isolation voltage tester with zero-cross circuit shall be used.
(3) The waveform of applied voltage 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
	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}	–	–	10^{-7}	A	V_{CE}=20V, I_F=0
	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=10 μA I_F=0
Transfer Characteristics	Collector Current	I_C	20	–	80	mA	I_F=100mA V_{CE}=2V
	*1 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}	1×10^{11}	–	Ω	DC500V 40~60%R.H.
	Floating Capacitance	C_f	–	0.6	1	pF	V=0, f=1MHz
	Cut-off Frequency	f_c	–	100	–	kHz	V_{CE}=5V, I_C=2mA R_L=100 Ω, -3dB
	Response Time (Rise)	t_r	–	4	18	μs	V_{CE}=5V, I_C=2mA R_L=100 Ω
	Response Time (Fall)	t_f	–	3	18	μs	

*1 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

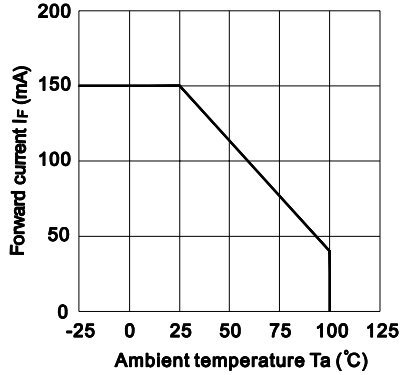


Fig.2 Collector Power Dissipation vs. Ambient Temperature

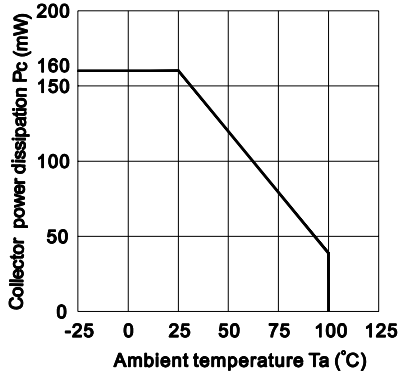


Fig.3 Collector Current vs. Collector-emitter Voltage

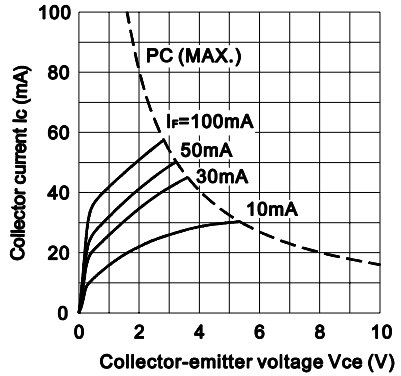


Fig.4 Forward Current vs. Forward Voltage

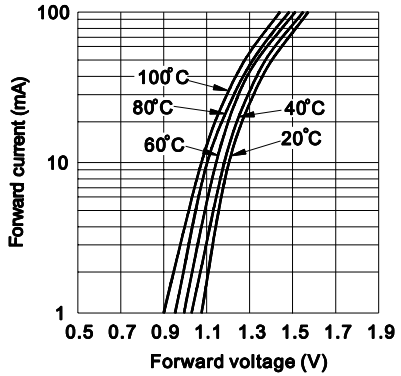


Fig.5 Current Transfer Ratio vs. Forward Current

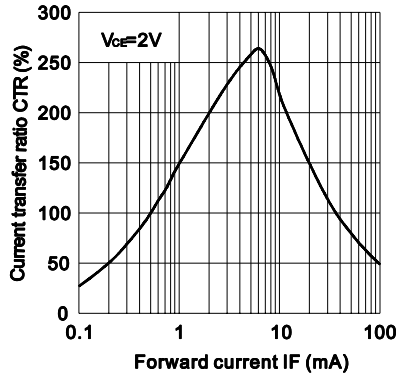
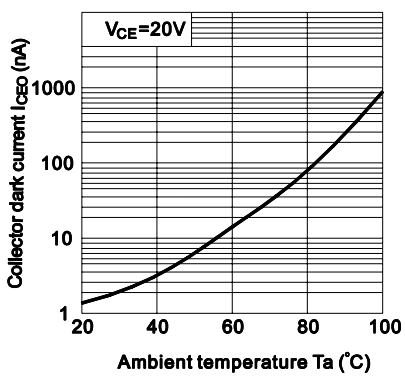


Fig.6 Collector Dark Current vs. Ambient Temperature



PHOTOCOUPLER

Fig.7 Response Time vs. Load Resistance

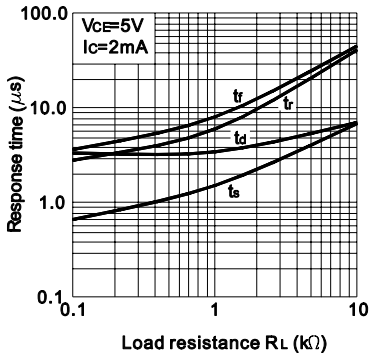


Fig.8 Frequency Response

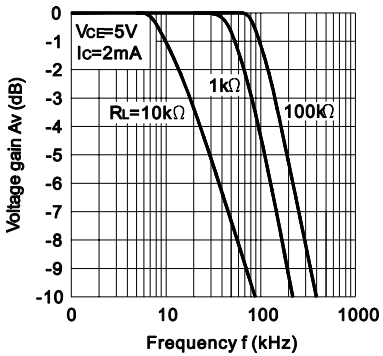
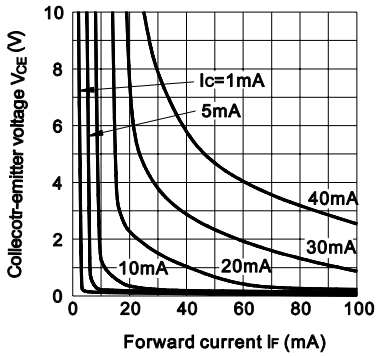
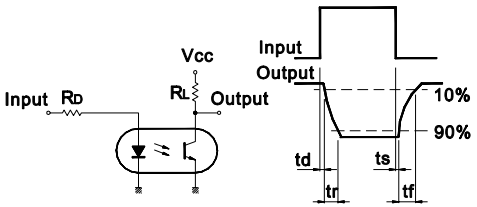


Fig.9 Collector-emitter Voltage vs. Ambient Temperature



Test Circuit for Response Time



Test Circuit for Frequency Response