High Transfer Efficiency AC Input Type Photocoupler

LTV-8141 Series

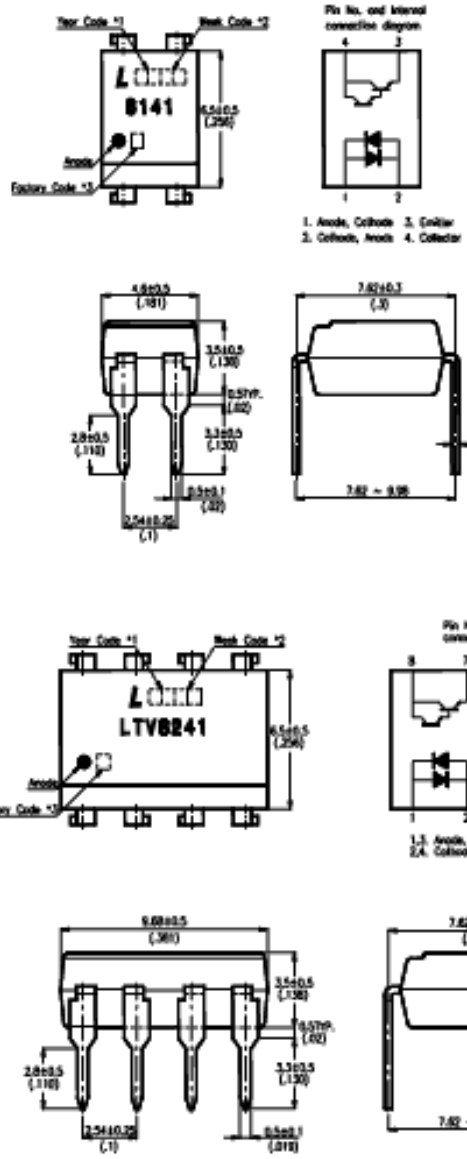
Features

- AC input response
- High current transfer ratio
  (CTR : MIN. 600% at $I_F = \pm$ 1mA, V_{CE}=2V)
- High input-output isolation voltage:
  (V_{ISO} : 5,000V_{rms})
- Compact dual-in-line package
  LTV-8141 : 1-channel type
  LTV-8241 : 2-channel type
  LTV-8441 : 4-channel type
- UL approved (No. E113898)
- TUV approved (No.R9653630)
- CSA approved (No. CA91533-1)
- FIMKO approved (No. 193422)
- NEMKO approved (No. P96103013)
- DEMKO approved (No. 303986)
- SEMKO approved (No. 9646047/01-30)
- 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)

Applications

1. System appliances, measuring instruments.
2. Industrial robots.
3. Copiers, automatic vending machines.
4. Signal transmission between circuits of different potentials and impedances.

Package Dimensions



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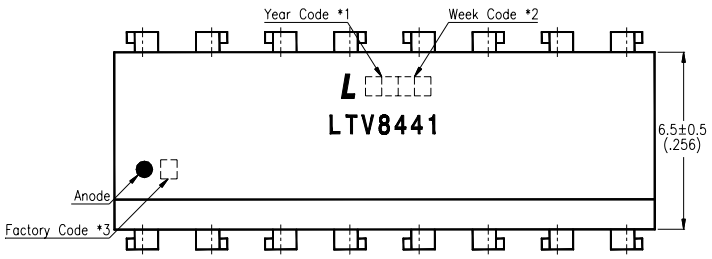

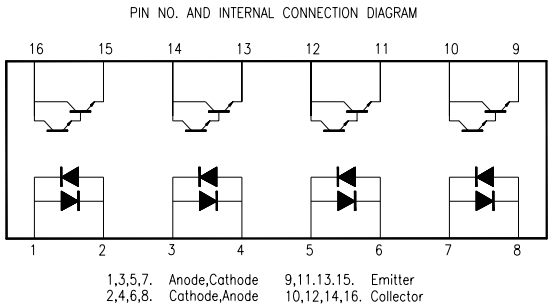

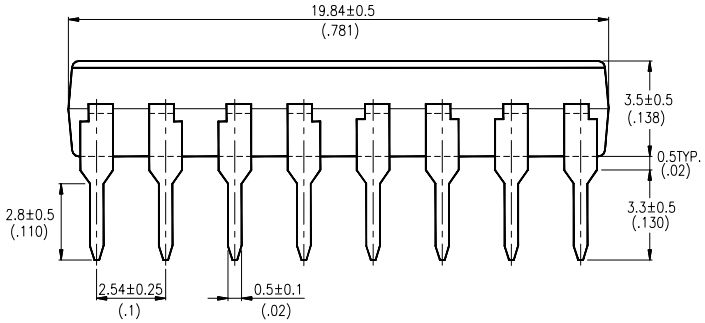

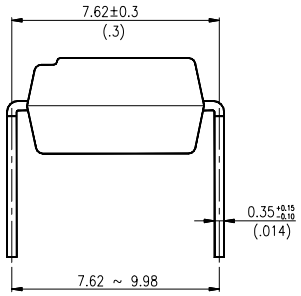

Note:
1.Year date code.
2. 2-digit work week.
3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
4. All dimensions are in millimeters (inches).
5. Tolerance is ± 0.25mm (.010") unless otherwise noted.
6. Specifications are subject to change without notice.

Ordering Information

Part Number	Package	Safety Standard Approval	Application part number
LTV-8141 LTV-8141M LTV-8141S LTV-8141S-TA LTV-8141S-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-8141
LTV-8241 LTV-8241M LTV-8241S LTV-8241S-TA LTV-8241S-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-8241
LTV-8441 LTV-8441M LTV-8441S LTV-8441S-TA LTV-8441S-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-8441
LTV8141-V LTV8141M-V LTV8141S-V LTV8141STA-V LTV8141STA1-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-8141
LTV8241-V LTV8241M-V LTV8241S-V LTV8241STA-V LTV8241STA1-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-8241
LTV8441-V LTV8441M-V LTV8441S-V LTV8441STA-V LTV8441STA1-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-8441

Absolute Maximum Ratings

(Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	± 50	mA
	Power Dissipation	P	70	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	150	mW
Total Power Dissipation		P_{tot}	200	mW
Operating Temperature		T_{opr}	-30~+100	℃
Storage Temperature		T_{stg}	-55~+125	℃
*1.Isolation Voltage		V_{iso}	5	KV_{rms}
*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	–	1.2	1.4	V	I_F= ± 20mA
	Terminal Capacitance	C_t	–	50	250	pF	V=0, f=1KHz
Output	Collector Dark Current	I_{CEO}	–	–	1	μA	V_{CE}=10V
	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	6	–	75	mA	I_F= ± 1mA V_{CE}=2V
	*Current Transfer Ratio	CTR	600	–	7,500	%	
	Collector-emitter Saturation Voltage	$V_{CE(sat)}$	–	0.8	1.0	V	I_F= ± 20mA, I_C=5mA
	Isolation Resistance	R_{ISO}	50	100	–	GΩ	DC500V, 40~60% R.H.
	Floating Capacitance	C_f	–	0.6	1.0	pF	V=0, f=1MHz
	Cut-off Frequency	f_c	1	6	–	KHz	V_{CE}=5V, I_C=2mA R_L=100 Ω, -3dB
	Response Time (Rise)	t_r	–	60	300	μs	V_{CE}=2V, I_C=10mA R_L=100 Ω
	Response Time (Fall)	t_f	–	53	250	μs	

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

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

Fig.1 Forward Current vs. Ambient Temperature

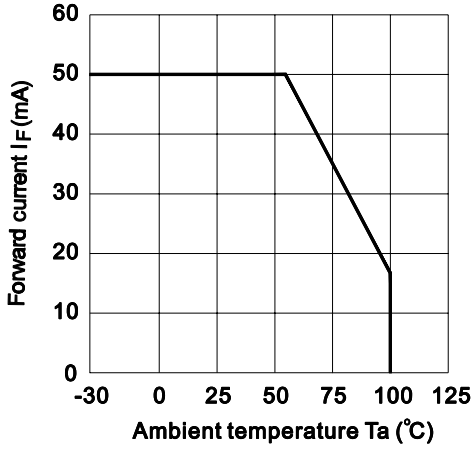


Fig.2 Collector Power Dissipation vs. Ambient Temperature

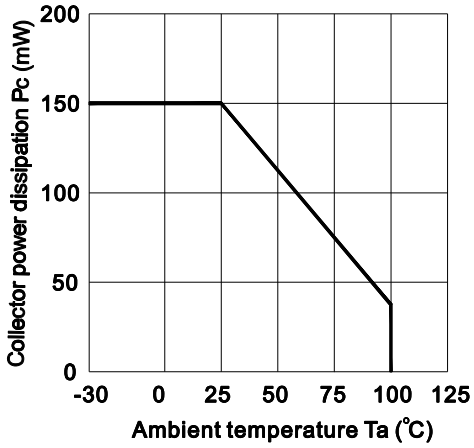


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

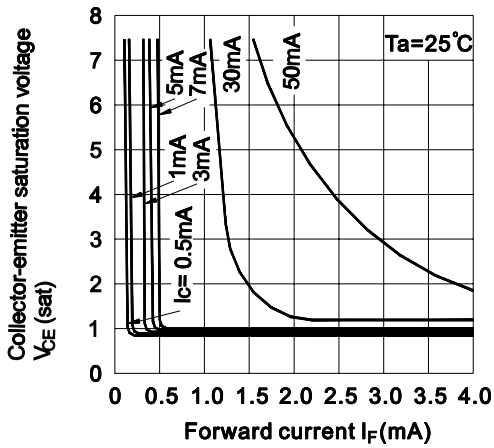


Fig.4 Forward Current vs. Forward Voltage

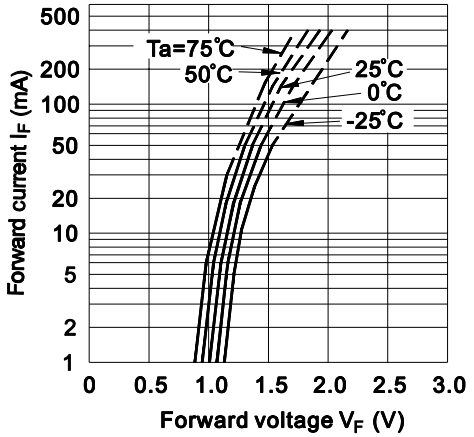


Fig.5 Current Transfer Ratio vs. Forward Current

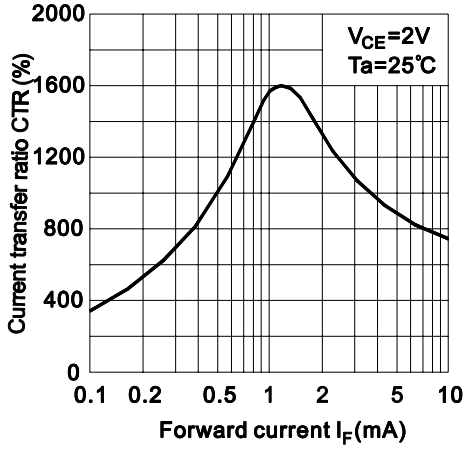


Fig.6 Collector Current vs. Collector-emitter Voltage

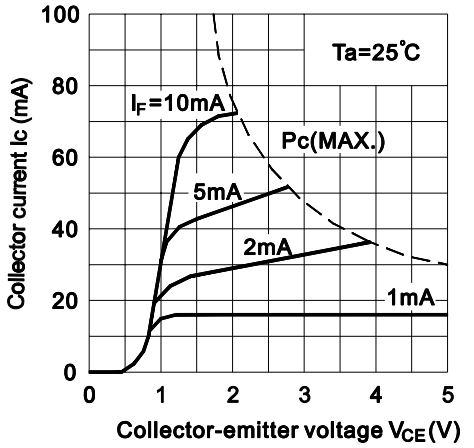


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

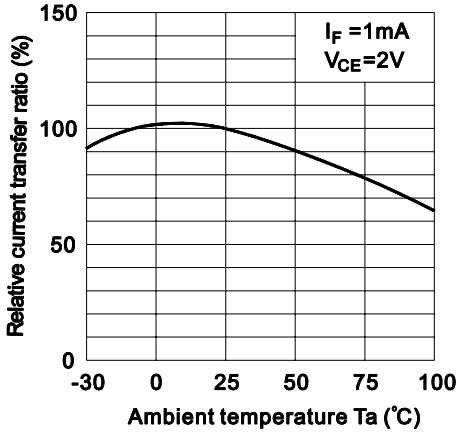


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

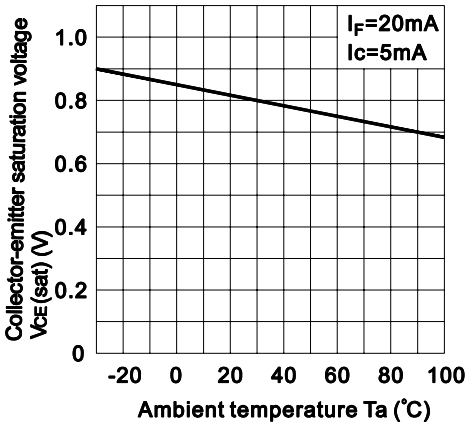


Fig.9 Collector Dark Current vs. Ambient Temperature

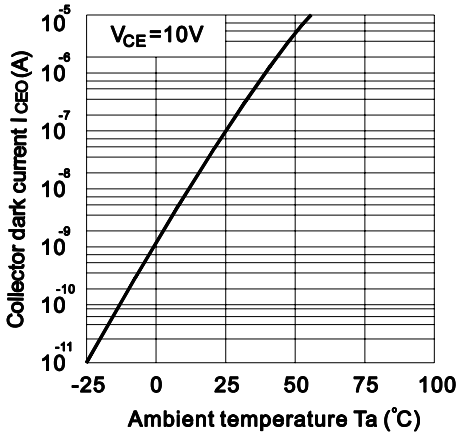


Fig.10 Response Time vs. Load Resistance

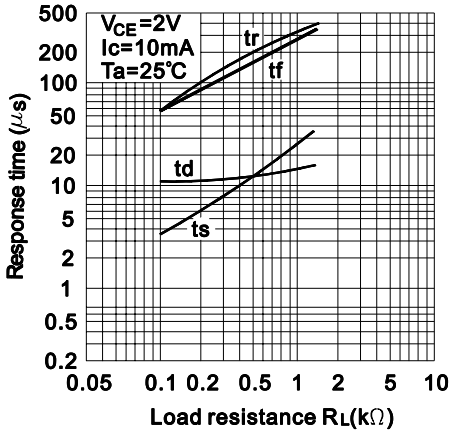
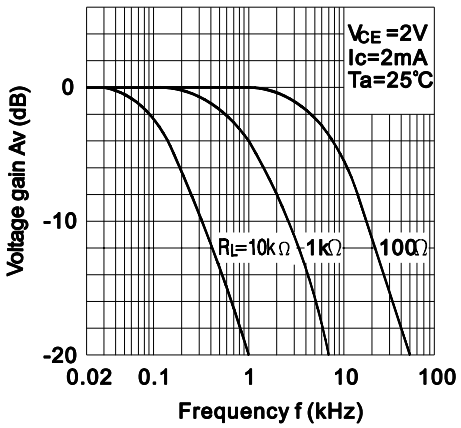
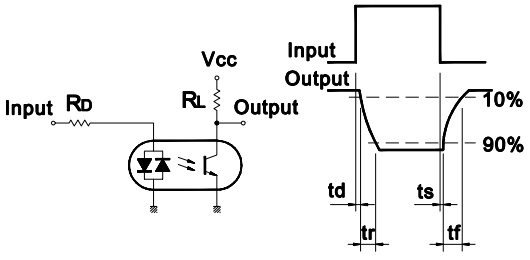


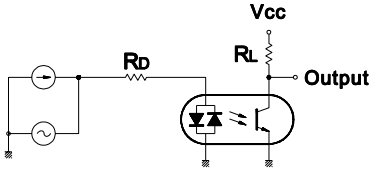
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



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