High Transfer Efficiency Type Photocoupler

LTV815/LTV825/LTV845
LTV815S/LTV825S/LTV845S
LTV815M/LTV825M/LTV845M

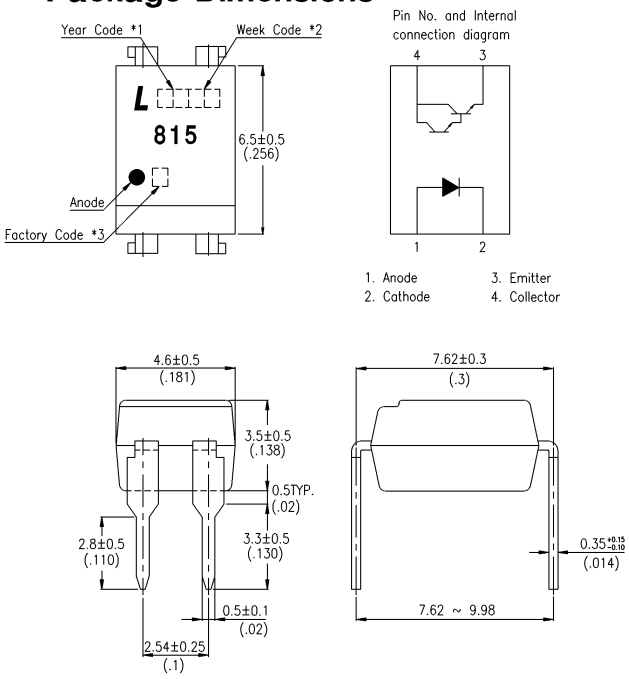
Features

- High current transfer ratio
  (CTR : MIN. 600% at I_F =1mA, V_{CE} = 2V)
- High input-output isolation voltage :
  (Viso : 5,000V_{rms})
- Compact dual-in-line package
  LTV815 : 1-channel type
  LTV825 : 2-channel type
  LTV845 : 4-channel type
- UL approved (No. E113898)
- TUV approved (No. R9653630)
- CSA approved (No. LR91533)
- 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)
  - 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)

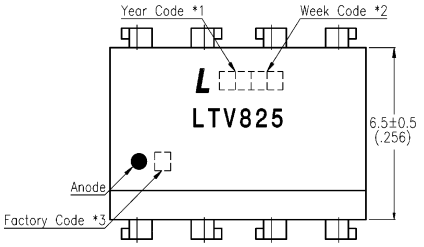
Applications

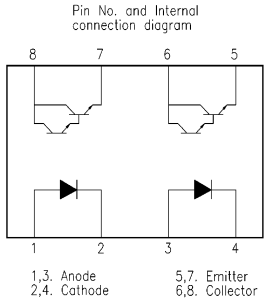
1. Telephone sets, telephone exchangers.
2. Sequence controllers.
3. System appliances, measuring instruments.
4. Signal transmission between circuits of different potentials and impedances.

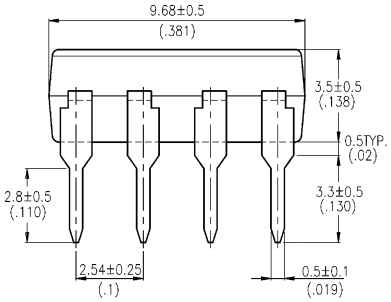
Package Dimensions

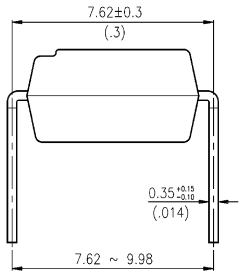


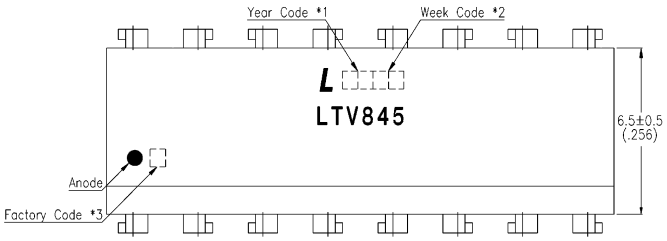
Notes :
1. Year date code.
2. 2-digit work week.
3. Factory code shall be marked (Z : Taiwan, Y : Thailand).
4. All dimensions are in millimeters (inches).
5. Tolerance is ± 0.25mm (.010") unless otherwise noted.
6. Specifications are subject to change without notice.

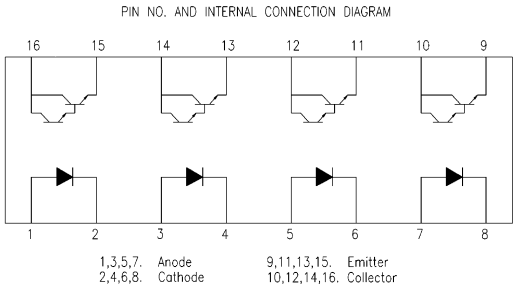

Year Code *1
Week Code *2
LTV825
6.5±0.5
(.256)
Anode
Factory Code *3

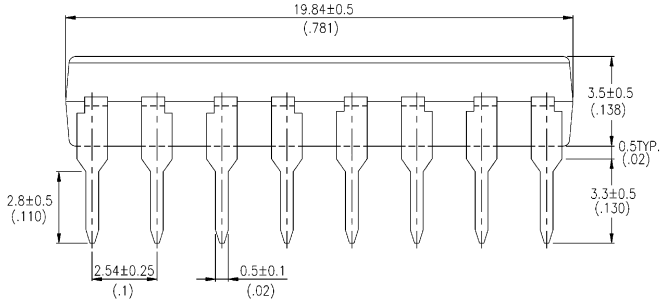

Pin No. and Internal
connection diagram
8 7 6 5
1 2 3 4
1,3. Anode
2,4. Cathode
5,7. Emitter
6,8. Collector

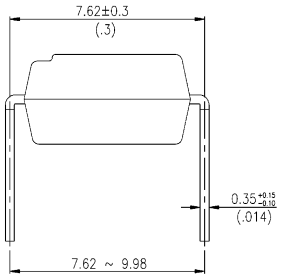

9.68±0.5
(.381)
3.5±0.5
(.138)
0.5TYP.
(.02)
2.8±0.5
(.110)
3.3±0.5
(.130)
2.54±0.25
(.1)
0.5±0.1
(.019)


7.62±0.3
(.3)
0.35 +0.15 −0.10
(.014)
7.62 ~ 9.98


Year Code *1
Week Code *2
LTV845
6.5±0.5
(.256)
Anode
Factory Code *3


PIN NO. AND INTERNAL CONNECTION DIAGRAM
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
1,3,5,7. Anode
2,4,6,8. Cathode
9,11,13,15. Emitter
10,12,14,16. Collector


19.84±0.5
(.781)
3.5±0.5
(.138)
0.5TYP.
(.02)
2.8±0.5
(.110)
3.3±0.5
(.130)
2.54±0.25
(.1)
0.5±0.1
(.02)


7.62±0.3
(.3)
0.35 +0.15 −0.10
(.014)
7.62 ~ 9.98

Absolute Maximum Ratings

(Ta=25 ℃)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	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	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,40 ~ 60%R.H.
  - 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 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	—	1.2	1.4	V	I_F=20mA
	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}	—	—	1	nA	V_{CE}=10V
	Collector-Emitter Breakdown Voltage	BV_{CEO}	35	—	—	V	I_C=0.1mA
	Emitter-Collector Breadown Voltage	BV_{ECO}	6	—	—	V	I_E=10μA
Transfer Characteristics	Collector Current	I_C	6	—	75	mA	I_F=1mA, V_{CE}=2V
	* Current Transfer Ratio	CTR	600	—	7500	%	I_F=1mA, V_{CE}=2V
	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=100Ω, -3dB
	Response Time (Rise)	t_r	—	60	300	μs	V_{CE}=2V, I_C=10mA R_L=100Ω
	Response Time (Fall)	t_f	—	53	250	μs	

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

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

Fig. 1 Forward Current Vs. Ambient Temperature

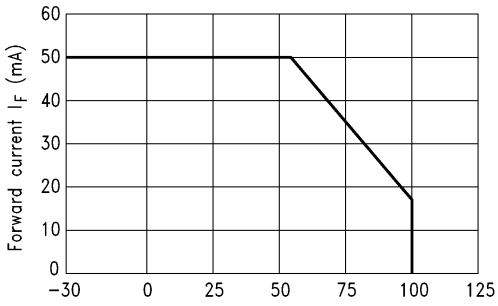


Fig. 2 Collector Power Dissipation Vs. Ambient Temperature

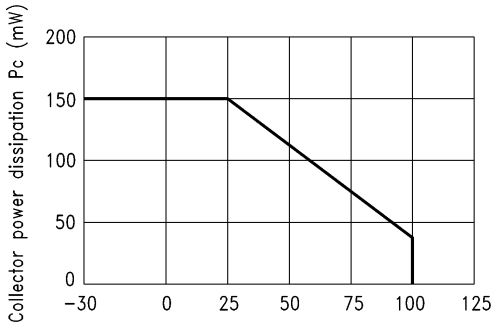


Fig. 3 Collector-emitter Saturation Voltage Vs. Forward Current

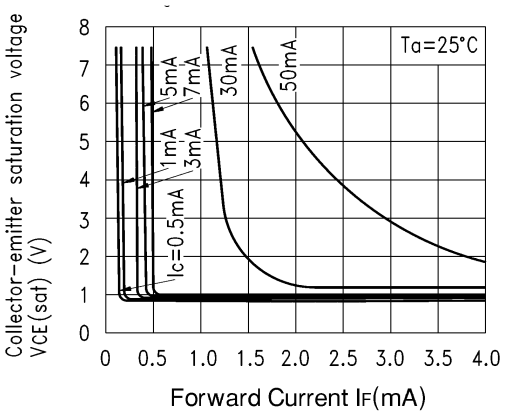


Fig. 4 Forward Current Vs. Forward Voltage

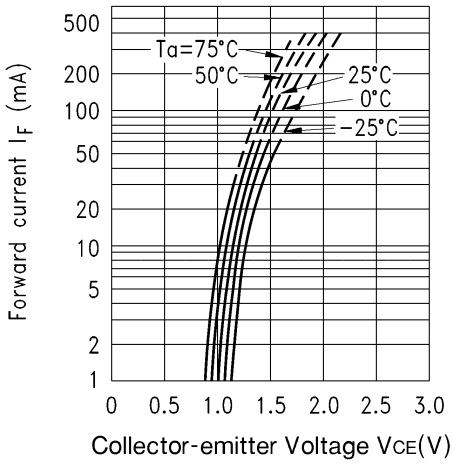


Fig. 5 Current Transfer Ration Vs. Forward Current

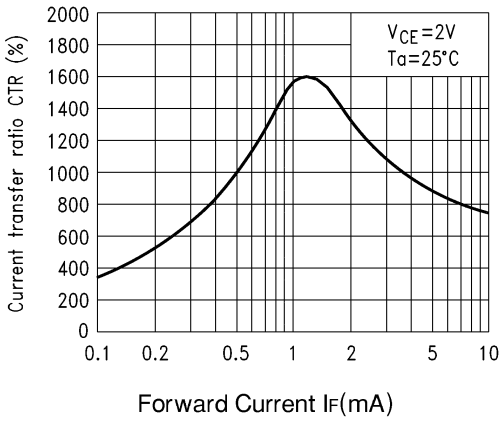


Fig. 6 Collector Current Vs. Collector-emitter Voltage

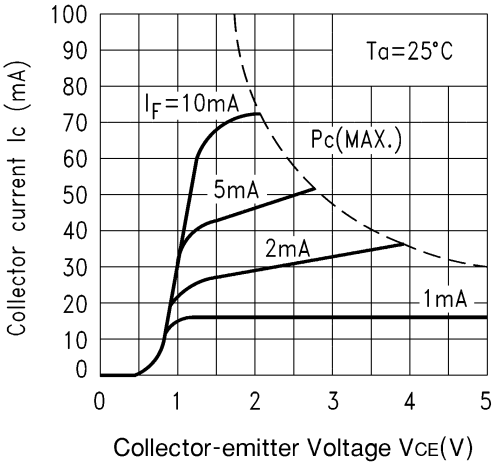


Fig. 7 Relative Current Transfer Ratio Vs. Ambient Temperature

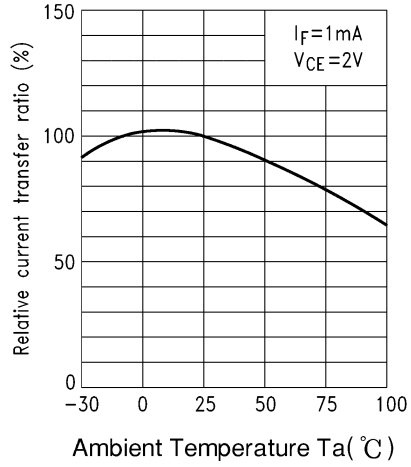


Fig. 8 Collector-emitter Saturation Voltage Vs. Ambient Temperature

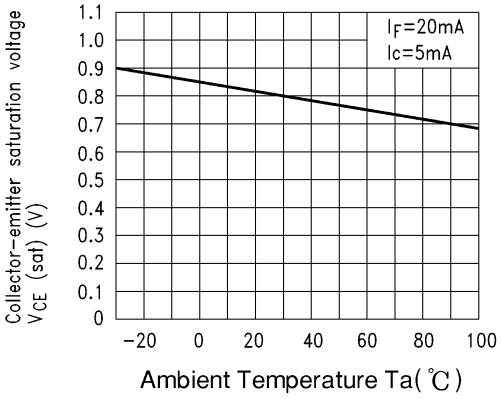


Fig. 9 Collector Dark Current Vs. Ambient Temperature

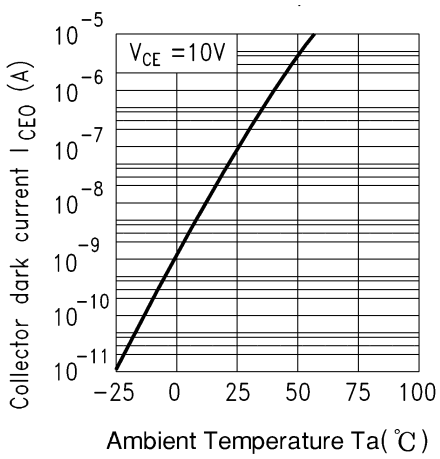


Fig. 10 Response Time Vs. Load Resistance

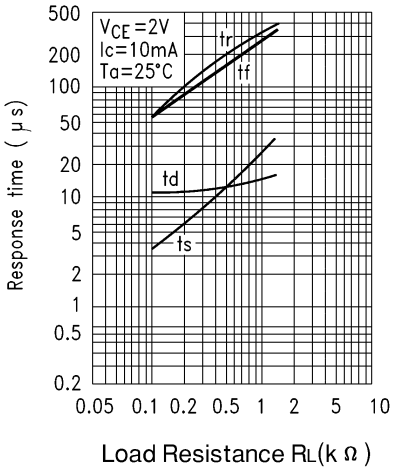
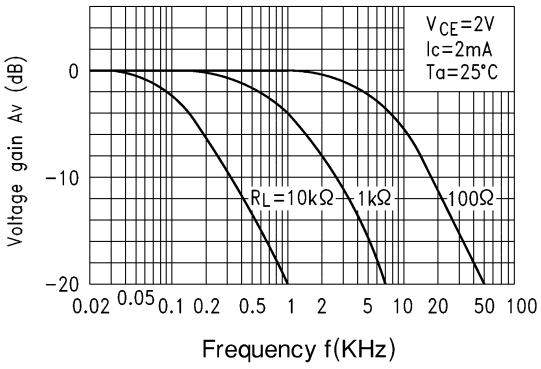
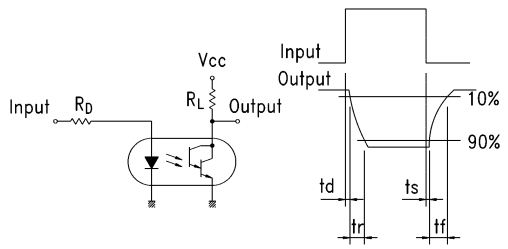


Fig. 11 Frequency Response



Test Circuit For Response Time



Test Circuit For Frequency Response