## **Property of LITE-ON Only**

### **FEATURES**

Lead Free ROHS COMPLIANT

January 2010

\* Current transfer ratio

(CTR: MIN. 50% at  $I_F = 5mA$ ,  $V_{CE} = 5V$ )

\* High input-output isolation voltage

 $(V_{iso} = 5,000 Vrms)$ 

\* Response time

(  $t_r$ : TYP.  $4\mu s$  at  $V_{CE} = 2V$ ,  $I_C = 2mA$ ,  $R_L = 100\Omega$ )

\* Dual-in-line package:

LTV-817: 1-channel type

LTV-827: 2-channel type

LTV-847: 4-channel type

\* Wide lead spacing package:

LTV-817M: 1-channel type

LTV-827M: 2-channel type

LTV-847M: 4-channel type

\* Surface mounting package:

LTV-817S: 1-channel type

LTV-827S: 2-channel type

LTV-847S: 4-channel type

\* Tape and reel packaging:

LTV-817S-TA: 1-channel type

LTV-817S-TA1: 1-channel type

LTV-817S-TP: 1-channel type

LTV-827S-TA1: 2-channel type

\* Safety approval

UL / CSA / FIMKO / NEMKO / DEMKO / SEMKO / VDE\* approved

\*Required "V" ordering option

- \* RoHS compliance
- \*  $\diamondsuit$  Critical characteristic
- \* O Safety or compliance characteristic

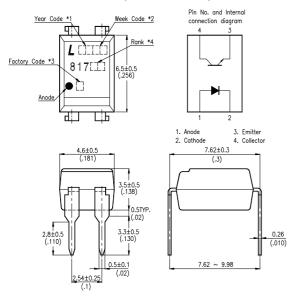
Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series Page: 1 of 15

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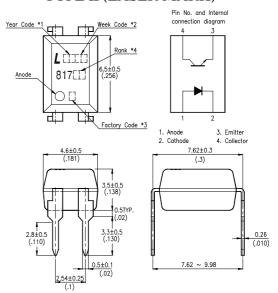
### **OUTLINE DIMENSIONS**

#### LTV-817:

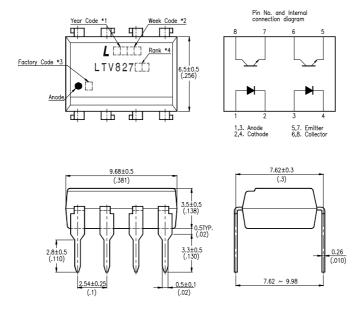
#### TYPE I (INK MARK)



#### TYPE II (LASER MARK)



#### LTV-827:



- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked. (Z : Taiwan, Y : Thailand, X : China-TJ, W : China-CZ)
- \*4. Rank shall be or shall not be marked.

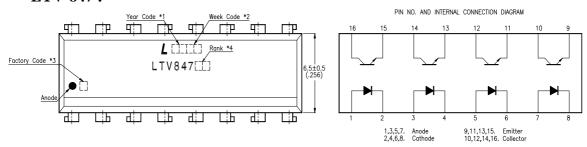
Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

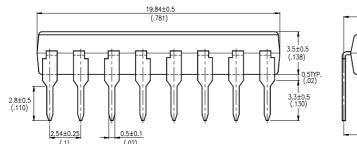
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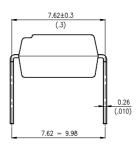
**Property of LITE-ON Only** 

### **OUTLINE DIMENSIONS**

#### LTV-847:



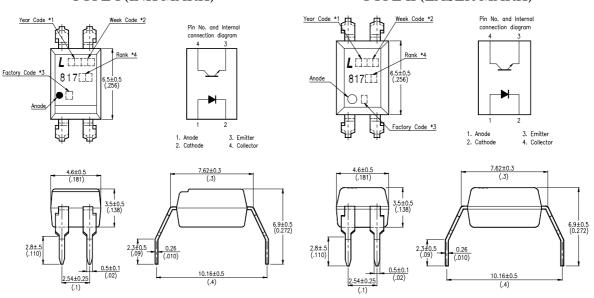




#### LTV-817M:

#### TYPE I (INK MARK)

### TYPE II (LASER MARK)



- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked.

(Z: Taiwan, Y: Thailand, X: China-TJ, W: China-CZ)

\*4. Rank shall be or shall not be marked.

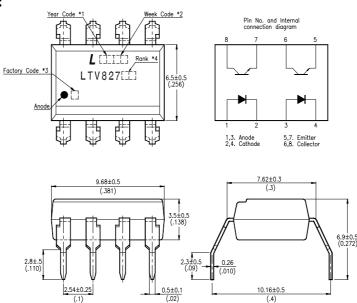
Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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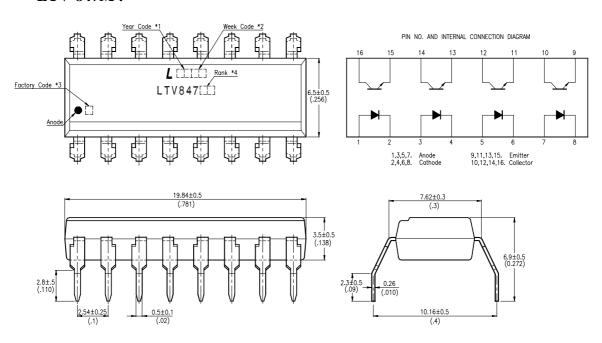
**Property of LITE-ON Only** 

### **OUTLINE DIMENSIONS**

#### LTV-827M:



#### LTV-847M:



- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked.
  - $(Z:Taiwan,\,Y:Thailand,\,X:China-TJ,\,W:China-CZ)$
- \*4. Rank shall be or shall not be marked.

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

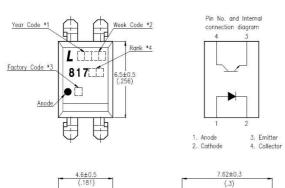
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**Property of LITE-ON Only** 

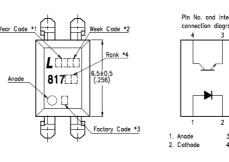
### **OUTLINE DIMENSIONS**

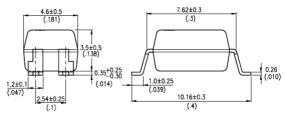
#### LTV-817S:

#### TYPE I (INK MARK)



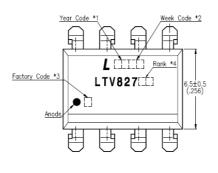
TYPE II (LASER MARK)

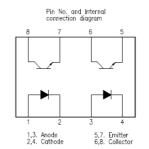


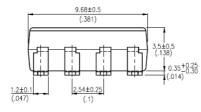


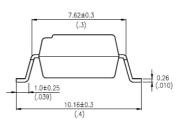
#### 0.35+0.25 (.014) 0.35 + 0.25 (.014) 0.35 + 0.25 (.039) 10.16±0.3 (.4)

#### LTV-827S:









- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked. (Z : Taiwan, Y : Thailand, X : China-TJ, W : China-CZ)
- \*4. Rank shall be or shall not be marked.

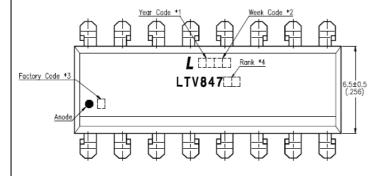
Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

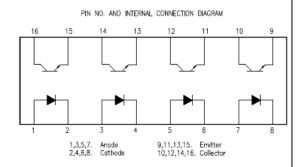
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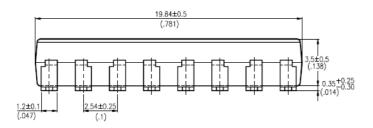
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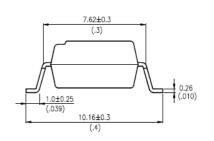
### **OUTLINE DIMENSIONS**

#### LTV-847S:









- \*1. Year date code.
- \*2. 2-digit work week.
- \*3. Factory identification mark shall be marked.

(Z: Taiwan, Y: Thailand, X: China-TJ, W: China-CZ)

\*4. Rank shall be or shall not be marked.

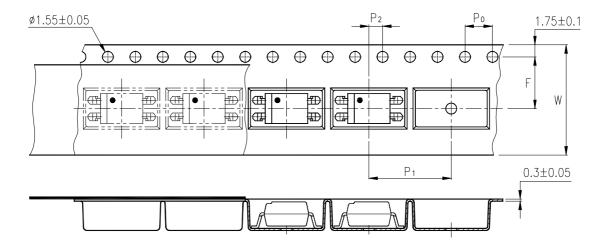
Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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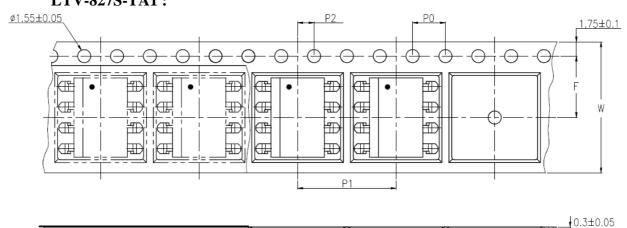
**Property of LITE-ON Only** 

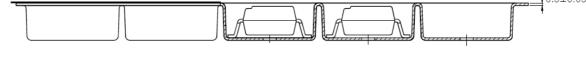
### TAPING DIMENSIONS

### LTV-817S-TA1:



#### LTV-827S-TA1:





Description	Symbol	Dimensions in mm (inches)
Tape wide	W	16 ± 0.3 ( .63 )
Pitch of sprocket holes	P <sub>0</sub>	4 ± 0.1 ( .15 )
Distance of compartment	F	$7.5 \pm 0.1 (.295)$
	P <sub>2</sub>	$2 \pm 0.1 (.079)$
Distance of compartment to compartment	P <sub>1</sub>	12 ± 0.1 ( .472 )

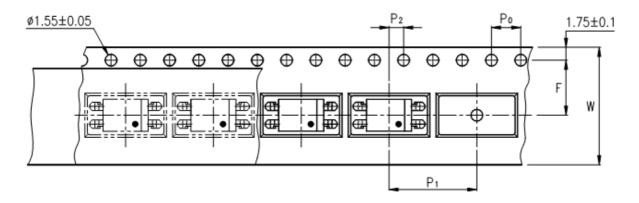
Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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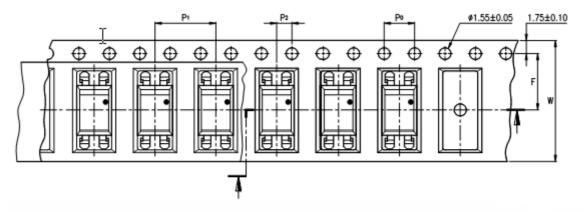
**Property of LITE-ON Only** 

### TAPING DIMENSIONS

#### LTV-817S-TA:



#### LTV-817S-TP:





Description	Symbol	Dimensions in mm (inches)
Tape wide	W	$16 \pm 0.3  (.63)$
Pitch of sprocket holes	P <sub>0</sub>	4 ± 0.1 ( .15 )
Distance of compartment	F	$7.5 \pm 0.1 (.295)$
	P <sub>2</sub>	$2 \pm 0.1 (.079)$
Distance of compartment to compartment	P <sub>1</sub>	12 ± 0.1 ( .472 )

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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# **Property of LITE-ON Only**

### ABSOLUTE MAXIMUM RATING

 $(Ta = 25^{\circ}C)$ 

PARAMETER		SYMBOL	RATING	UNIT
	Forward Current		50	mA
INPUT Reverse Voltage		VR	6	V
	Power Dissipation	P	70	mW
Collector - Emitter Voltage		VCEO	35	V
Emitter - Collector Voltage		Veco	6	V
OUTPUT	Collector Current	Ic	50	mA
Collector Power Dissipation		Pc	150	mW
Total Power Dissipation		P <sub>tot</sub>	200	mW
*1 Isolation Voltage (		Viso	5,000	Vrms
Operating Temperature (LTV- 827 / 847)		Topr	-30 ~ +110	°C
Operating Temperature (LTV-817)		Topr	-30 ~ +110	°C
Storage Temperature		Tstg	-55 ~ +125	°C
*2 Soldering Temperature		Tsol	260	°C

#### \*1. AC For 1 Minute, R.H. = $40 \sim 60\%$

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

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series Page: 9 of 15

**Property of LITE-ON Only** 

# **ELECTRICAL - OPTICAL CHARACTERISTICS**

 $(Ta = 25^{\circ}C)$ 

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS	
	Forward Voltage	$V_{\rm F}$	_	1.2	1.4	V	I <sub>F</sub> =20mA	
INPUT Reverse Current		IR	_	ı	10	μΑ	V <sub>R</sub> =4V	
	Terminal Capacitance	Ct	_	30	250	pF	V=0, f=1KHz	
	Collector Dark Current	Iceo	_	ı	100	nA	Vce=20V, I <sub>F</sub> =0	
OUTPUT	Collector-Emitter Breakdown Voltage	BVCEO	35		_	V	Ic=0.1mA I <sub>F</sub> =0	
Emitter-Collector Breakdown Voltage		BVeco	6	_	_	V	I <sub>E</sub> =10μA I <sub>F</sub> =0	
	Collector Current	Ic	2.5	_	30	mA	I <sub>F</sub> =5mA	
	*1 Current Transfer Ratio $\diamondsuit$	Ratio 🔷 CTR 50 — 600 %		%	V <sub>CE</sub> =5V			
	Collector-Emitter Saturation Voltage	VCE(sat)	_	0.1	0.2	V	I <sub>F</sub> =20mA I <sub>C</sub> =1mA	
TRANSFER CHARACTERISTICS	Isolation Resistance	Riso	5×10 <sup>10</sup>	1×10 <sup>11</sup>	_	Ω	DC500V 40 ~ 60% R.H.	
CHARACTERISTICS	Floating Capacitance	$\mathbf{C}_{\mathrm{f}}$	_	0.6	1	pF	V=0, f=1MHz	
Cut-Off Free	Cut-Off Frequency	fc	_	80	_	kHz	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA R <sub>L</sub> =100Ω, -3dB	
	Response Time (Rise)		_	4	18	μs	Vce=2V, Ic=2mA	
	Response Time (Fall)	$\mathbf{t}_{\mathrm{f}}$	_	3	18	μs	R <sub>L</sub> =100Ω	

\*1 CTR = 
$$\frac{I_C}{I_F} \times 100\%$$

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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# RANK TABLE OF CURRENT TRANSFER RATIO CTR

MODEL NO.	RANK MARK	CTR (%)	
	L	50 ~ 100	
	A	80 ~ 160	
I TV 017	В	130 ~ 260	
LTV-817	С	200 ~ 400	
	D	300 ~ 600	
	L or A or B or C or D	50 ~ 600	
LTV-827	No Bin	50~600	
	В	130 ~ 260	
	С	200 ~ 400	
	ВС	130~400	
	CD	200~600	
LTV-847	No Bin	50~600	
	BC	130~400	
	CD	200~600	

	$I_F = 5 \text{ mA}$
CONDITIONS	$V_{CE} = 5 V$
	Ta = 25 °C

Part No.: LTV-817 / 827 / 847 (M, S, S-TA, S-TA1, S-TP) Series

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### **CHARACTERISTICS CURVES**

Fig.1 Forword Current vs. Ambient Temperatute

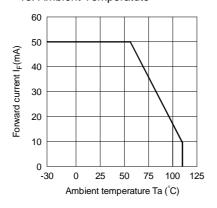


Fig.3 Collector-emitter Saturation Voltage vs. Forward Current

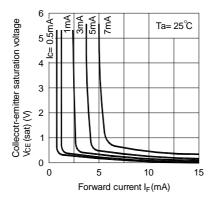


Fig.5 Current Transfer Ratio vs.
Forward Current

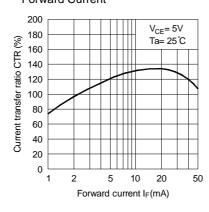


Fig.2 Collector Power Dissiption vs. Ambient Temperature

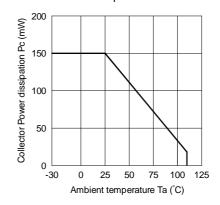


Fig.4 Forward Current vs. Forward Voltage

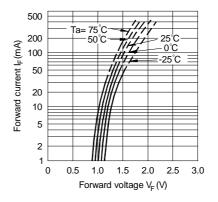
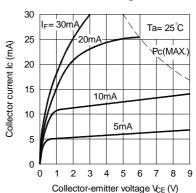


Fig.6 Collector Current vs.
Collector-emitter Voltage



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### **CHARACTERISTICS CURVES**

Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

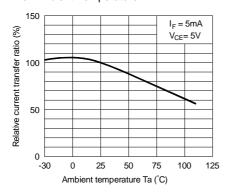


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

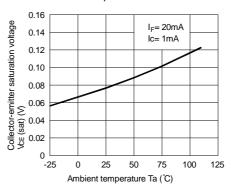


Fig.9 Collector Dark Current vs.
Ambient Temperature

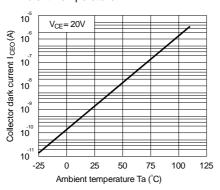


Fig.10 Response Time vs. Load Resistance

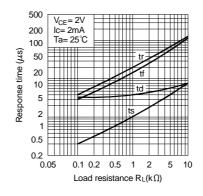
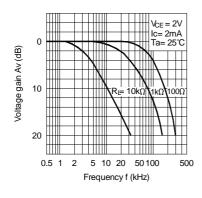
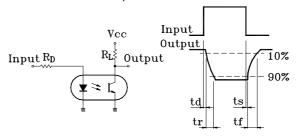


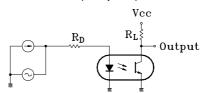
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



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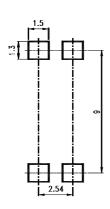
**Property of LITE-ON Only** 

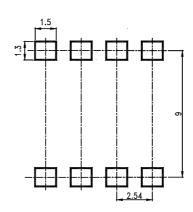
# **RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)**

Unit: mm

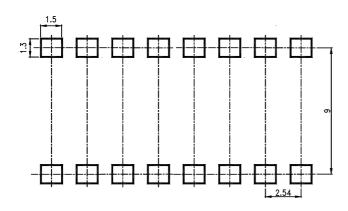
4 PIN







**16 PIN** 



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### **Notes:**

- Lite-On is continually improving the quality, reliability, function or design and Lite-On reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- When requiring a device for any "specific" application, please contact our sales in advice.
- If there are any questions about the contents of this publication, please contact us at your convenience.
- The contents described herein are subject to change without prior notice.

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