



The graphic consists of several overlapping squares in various colors: orange, green, blue, purple, and red. They are arranged to form a stylized letter 'C' shape, with some squares extending beyond the main cluster.

**Photocoupler
Product Data Sheet
LTV-8X7 Series**

Spec No. :DS-70-96-0016
Effective Date: 12/03/2024
Revision: U

LITE-ON DCC
RELEASE

BNS-OD-FC001/A4

Photocoupler LTV-8X7 Series

1. DESCRIPTION

1.1 Features

- Current transfer ratio (CTR : MIN. 50% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High input-output isolation voltage ($V_{iso} = 5,000\text{VRms}$)
- Response time (tr : TYP. $4\mu\text{s}$ at $V_{CC} = 5\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$)
- 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-TA : 2-channel type
 - LTV-827S-TA1 : 2-channel type
- ESD pass HBM 8000V / MM2000V
- Safety approval
 - UL 1577
 - VDE DIN EN60747-5-5 (VDE 0884-5)
 - CSA CA5A
 - CQC GB 4943.1-2022(meet Altitude up to 5000m)
 - Nordic Safety (FIMKO/NEMKO/SEMKO/DEMKO)
 - BSI
- Halogen Free option
- RoHS Compliance
 - All materials be used in device are followed EU RoHS directive (No. 2011/65/EU, and 2015/863).
- MSL class1

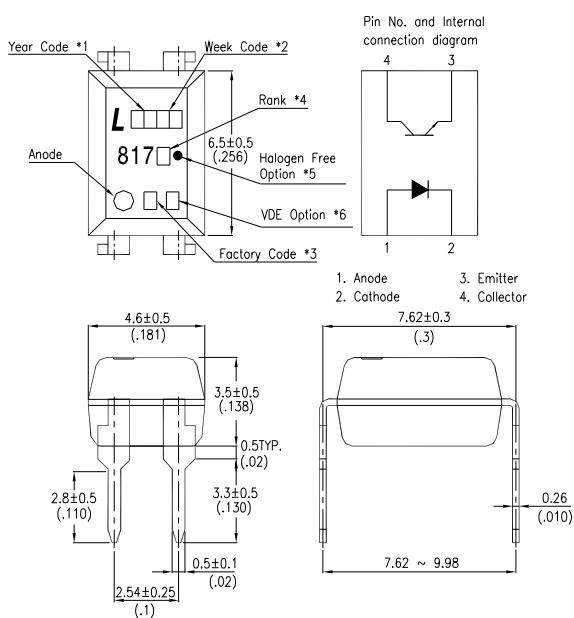
1.2 Applications

- Hybrid substrates that require high density mounting.
- Programmable controllers

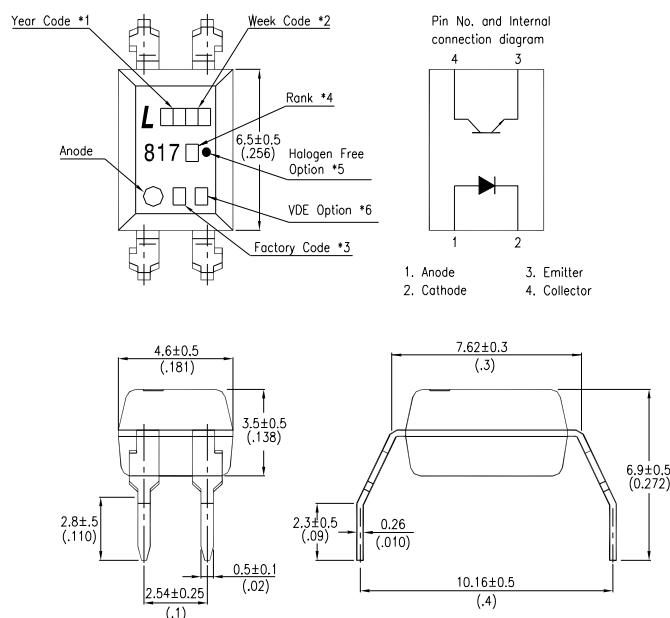
Photocoupler LTV-8X7 Series

2. PACKAGE DIMENSIONS

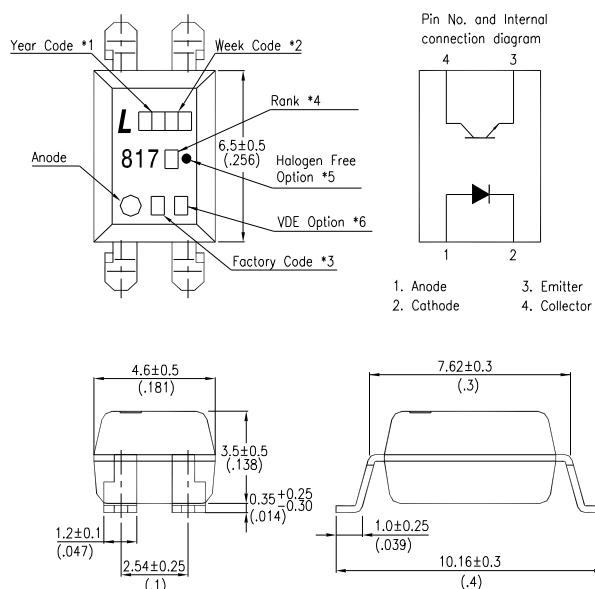
2.1 LTV-817



2.2 LTV-817M



2.3 LTV-817S



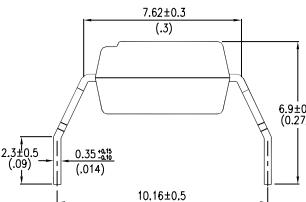
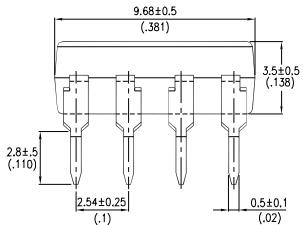
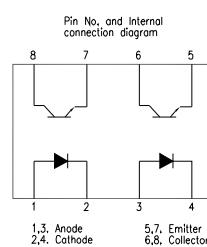
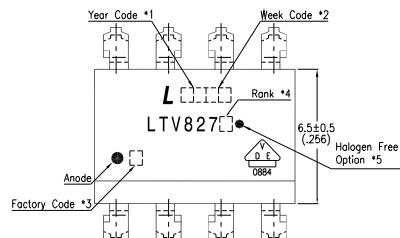
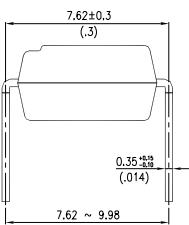
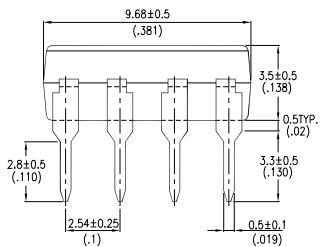
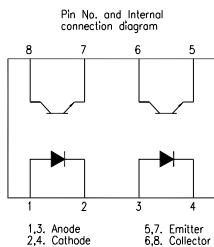
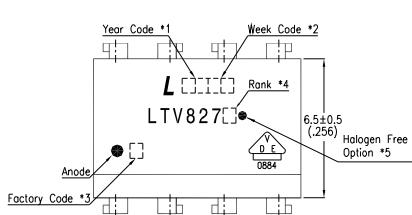
Notes :

1. 2-digit year code, example : 2016 = 16
2. 2-digit work week ranging from '01' to '52'
3. Factory identification mark shall be marked (W: China-CZ, Y: Thailand)
4. Rank shall be or shall not be marked.
5. "●" for halogen free option.
6. "V or 4" for VDE option.

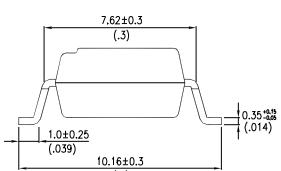
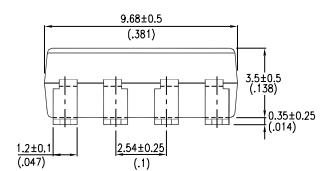
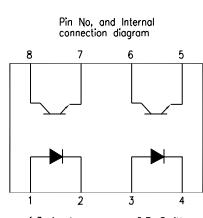
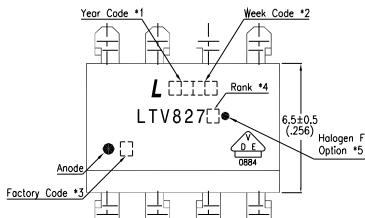
Dimensions in millimeters(inches).

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2.4 LTV-827



2.6 LTV-827S



Notes :

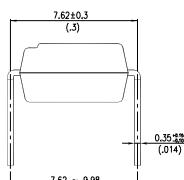
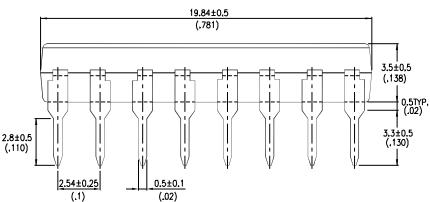
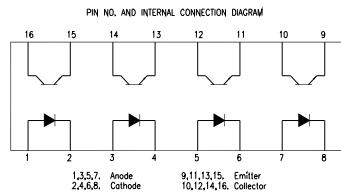
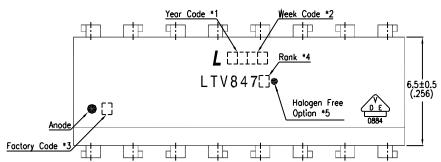
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2. 2-digit work week ranging from '01' to '52'
3. Factory identification mark shall be marked
(W: China-CZ, Y: Thailand)
4. Rank shall be or shall not be marked.
5. "●" for halogen free option.

6. VDE option shall be .

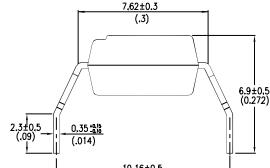
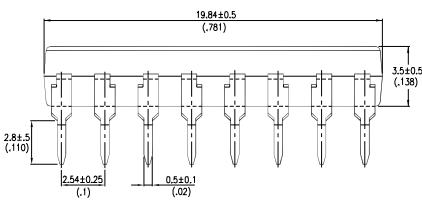
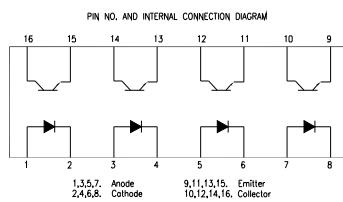
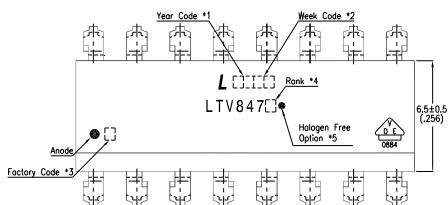
Dimensions in millimeters(inches).

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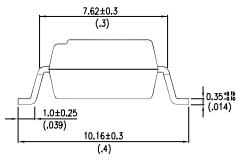
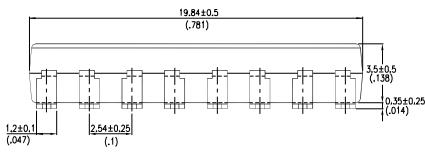
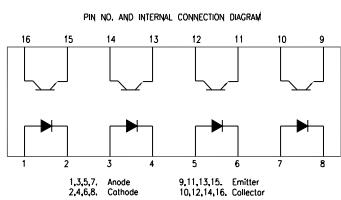
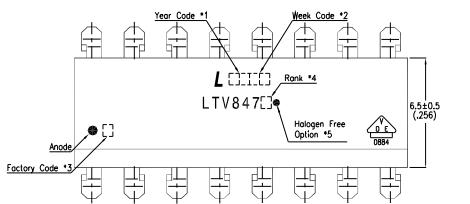
2.7 LTV-847



2.8 LTV-847M



2.9 LTV-847S



Notes :

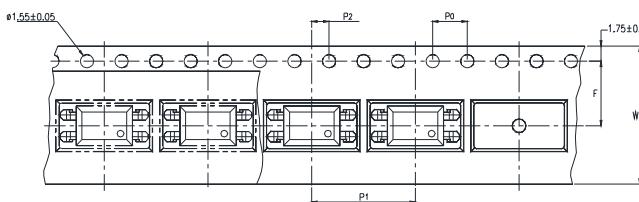
1. 2-digit year code, example : 2016 = 16
2. 2-digit work week ranging from '01' to '52'
3. Factory identification mark shall be marked
(W: China-CZ, Y: Thailand)
4. Rank shall be or shall not be marked.
5. "●" for halogen free option.
6. VDE option shall be .

Dimensions in millimeters(inches).

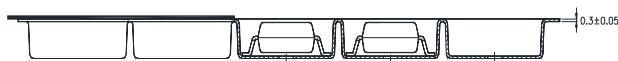
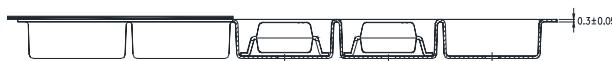
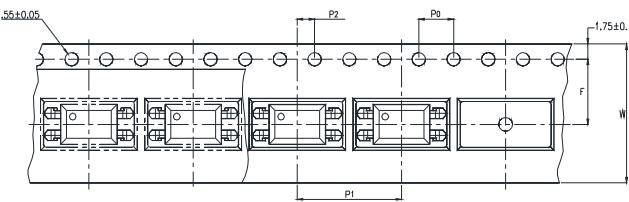
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3. TAPING DIMENSIONS

3.1 LTV-817S-TA



3.2 LTV-817S-TA1



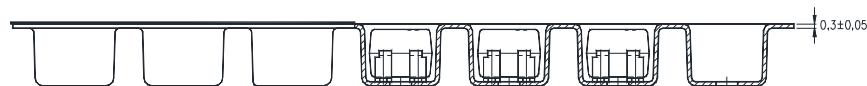
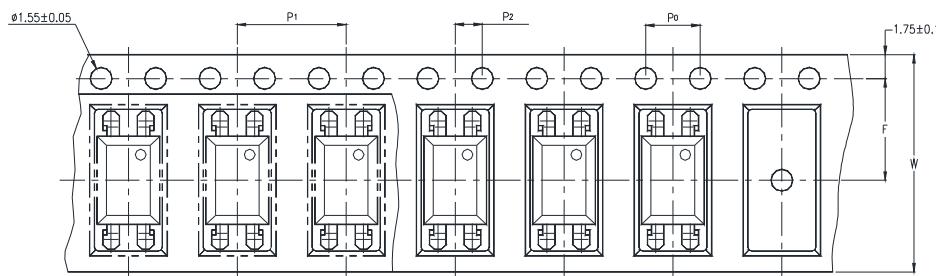
Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (0.63)
Pitch of sprocket holes	P ₀	4±0.1 (0.15)
Distance of compartment	F	7.5±0.1 (0.295)
	P ₂	2±0.1 (0.079)
Distance of compartment to compartment	P ₁	12±0.1 (0.472)

3.3 Quantities Per Reel

Package Type	TA/TA1
Quantities (pcs)	1000

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3.4 LTV-817S-TP



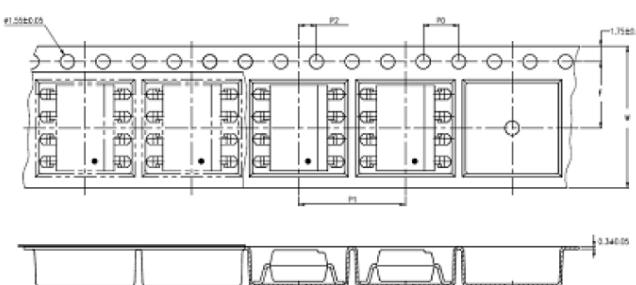
Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (0.63)
Pitch of sprocket holes	P ₀	4±0.1 (0.15)
Distance of compartment	F	7.5±0.1 (0.295)
	P ₂	2±0.1 (0.079)
Distance of compartment to compartment	P ₁	8±0.1 (0.315)

3.5 Quantities Per Reel

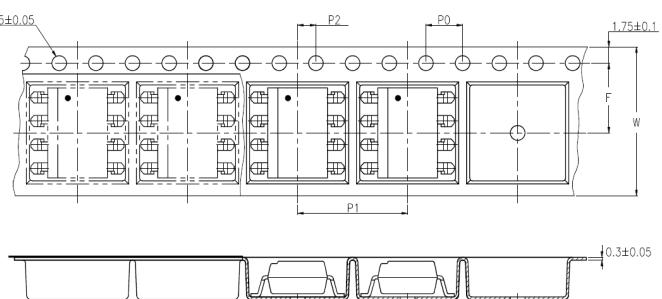
Package Type	TP
Quantities (pcs)	2000

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3.6 LTV-827S-TA



3.7 LTV-827S-TA1



Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (0.63)
Pitch of sprocket holes	P ₀	4±0.1 (0.15)
Distance of compartment	F	7.5±0.1 (0.295)
	P ₂	2±0.1 (0.079)
Distance of compartment to compartment	P ₁	12±0.1 (0.472)

3.8 Quantities Per Reel

Package Type	TA/TA1
Quantities (pcs)	1000

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4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25°C

	Parameter	Symbol	Rating	Unit
Input	Forward Current	I _F	50	mA
	Reverse Voltage	V _R	6	V
	Power Dissipation	P	70	mW
	Peak Forward Current (100μs pulse, 100Hz frequency)	I _{FP}	1	A
	Junction Temperature	T _J	125	°C
Output	Collector - Emitter Voltage	V _{CEO}	35	V
	Emitter - Collector Voltage	V _{ECO}	6	V
	Collector Current	I _C	50	mA
	Junction Temperature	T _J	125	°C
	Collector Power Dissipation	P _C	150	mW
	Total Power Dissipation	P _{tot}	200	mW
1.	Isolation Voltage	V _{iso}	5000	V _{rms}
	Operating Temperature (LTV-827/847)	T _{opr}	-40 ~ +105	°C
	Operating Temperature (LTV-817)	T _{opr}	-55 ~ +110	°C
	Storage Temperature	T _{stg}	-55 ~ +125	°C
2.	Soldering Temperature	T _{sol}	260	°C

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

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4.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Condition
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}	—	—	100	nA	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 _{EBO}	6	—	—	V	I _E =10μA, I _F =0
TRANSFER CHARACTERISTICS	Collector Current	I _C	2.5	—	30	mA	I _F =5mA, V _{CE} =5V
	1. Current Transfer Ratio	CTR	50	—	600	%	
	Collector-Emitter Saturation Voltage	V _{CE(sat)}	—	0.1	0.2	V	I _F =20mA, 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	—	80	—	kHz	V _{CC} =5V, I _C =2mA R _L =100Ω, -3dB
	Response Time (Rise)	tr	—	4	18	μs	V _{CC} =5V, I _C =2mA R _L =100Ω,
	Response Time (Fall)	tf	—	3	18	μs	

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

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5. RANK TABLE OF CURRENT TRANSFER RATIO

	CTR Rank	Min	Max	Condition
LTV-817	L	50	100	$I_F=5mA, V_{CE}=5V, Ta=25^\circ C$
	A	80	160	
	B	130	260	
	C	200	400	
	D	300	600	
	No bin (L or A or B or C or D or no mark)	50	600	
	No bin	50	600	
LTV-827	A	80	160	$I_F=5mA, V_{CE}=5V, Ta=25^\circ C$
	B	130	260	
	C	200	400	
	D	300	600	
	BC	130	400	
	CD	200	600	
	No bin	50	600	
LTV-847	BC	130	400	$I_F=5mA, V_{CE}=5V, Ta=25^\circ C$
	CD	200	600	
	No bin	50	600	

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6. CHARACTERISTICS CURVES(TYPICAL PERFORMANCE)

Fig.1 Forward Current
vs. Ambient Temperature

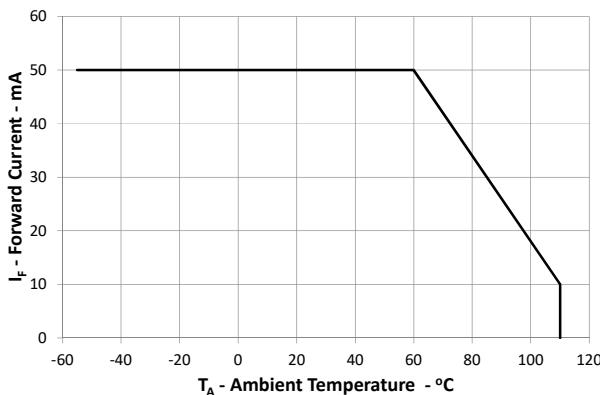


Fig.2 Collector Power Dissipation
vs. Ambient Temperature

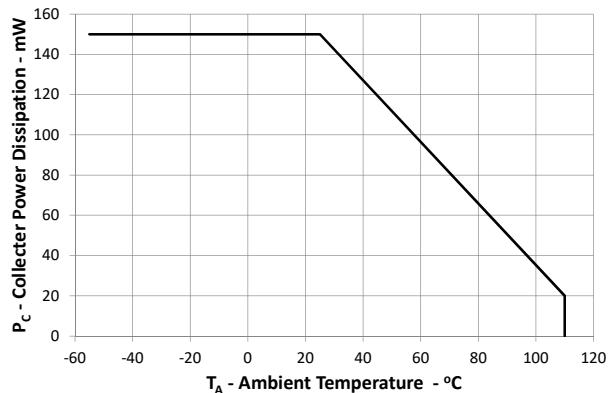


Fig.3 Collector-emitter Saturation
Voltage vs. Forward Current

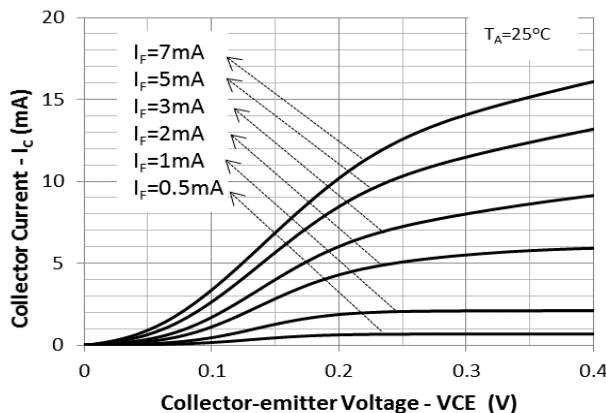


Fig.4 Forward Current vs. Forward
Voltage

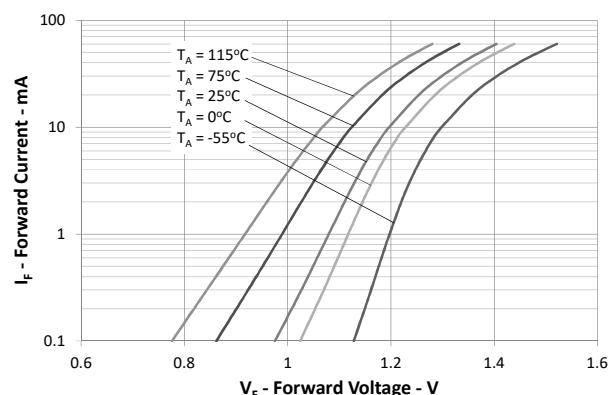


Fig.5 Current Transfer Ratio vs.
Forward Current

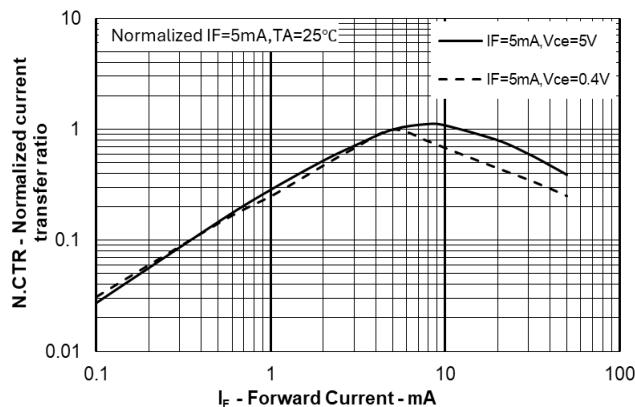
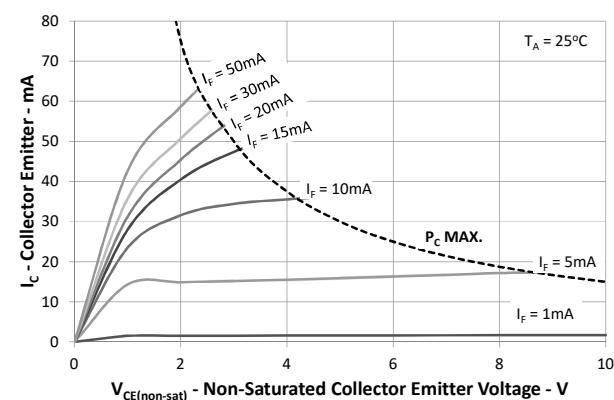


Fig.6 Collector Current vs.
Collector-emitter Voltage



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Fig.7 Relative Current Transfer Ratio
vs. Ambient Temperature

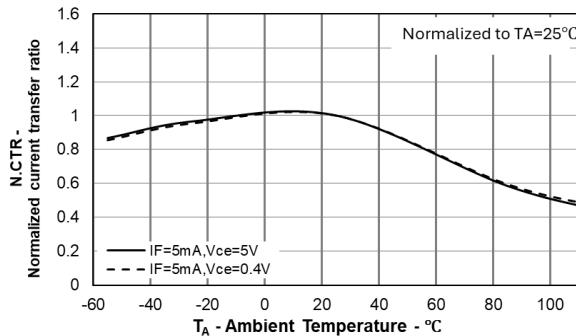


Fig.8 Collector-emitter Saturation Voltage
vs. Ambient Temperature

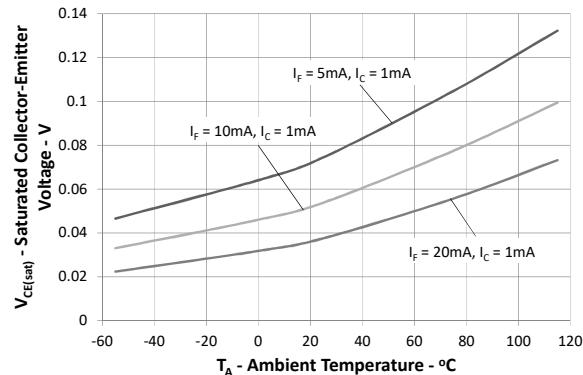


Fig.9 Collector Dark Current vs.
Ambient Temperature

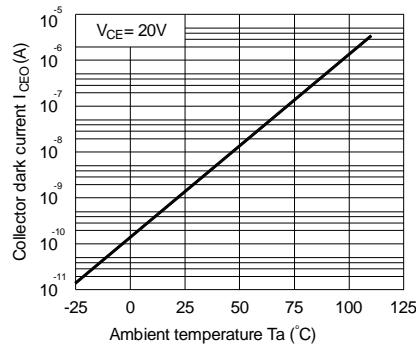


Fig.10 Response Time vs. Load

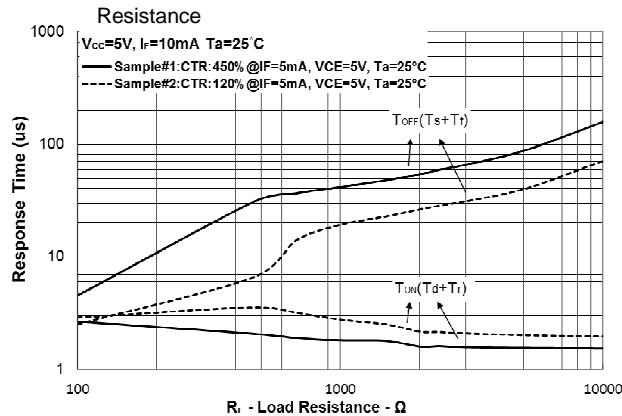
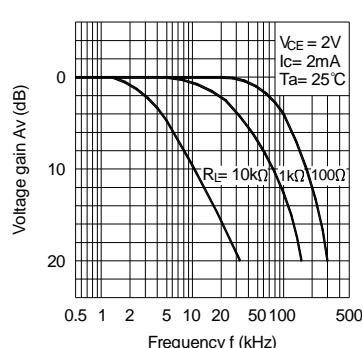
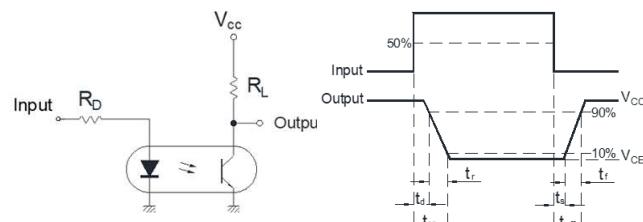


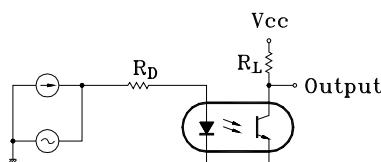
Fig.11 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



Note : The above characteristic curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

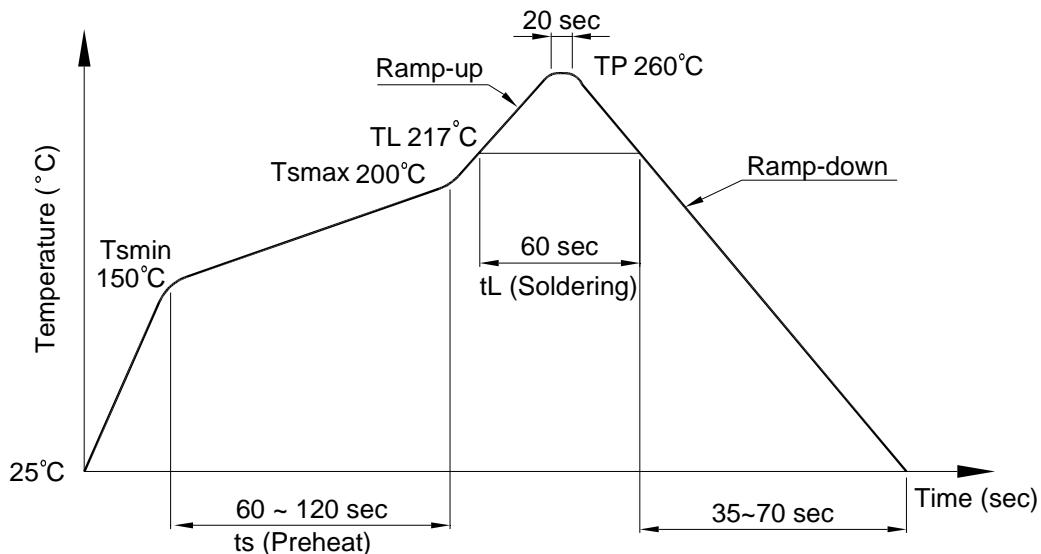
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7. TEMPERATURE PROFILE OF SOLDERING

7.1 IR Reflow soldering (JEDEC-STD-020E compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

Profile item	Conditions
Preheat	
- Temperature Min (T_{Smin})	150°C
- Temperature Max (T_{Smax})	200°C
- Time (min to max) (t_s)	90±30 sec
Soldering zone	
- Temperature (T_L)	217°C
- Time (t_L)	60 sec
Peak Temperature (T_P)	260°C
Ramp-up rate	3°C / sec max.
Ramp-down rate	3~6°C / sec



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7.2 Wave soldering (JEDEC22A111 compliant)

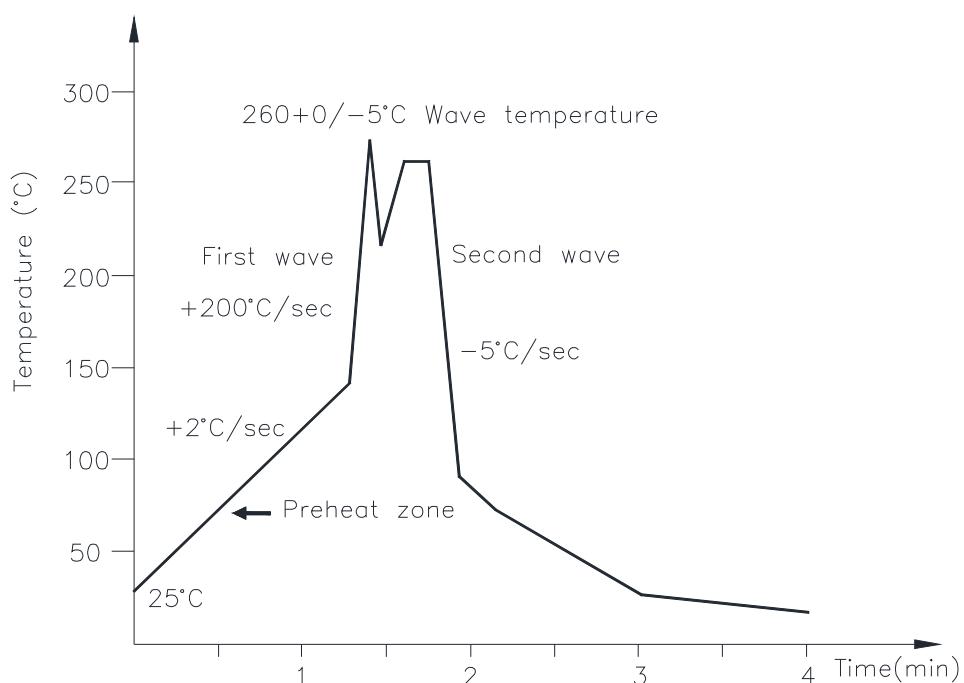
One time soldering is recommended within the condition of temperature.

Temperature: 260+0/-5°C

Time: 10 sec.

Preheat temperature: 25 to 140°C

Preheat time: 30 to 80 sec.



7.3 Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

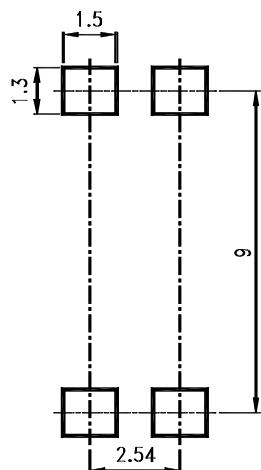
Temperature: 380+0/-5°C

Time: 3 sec max.

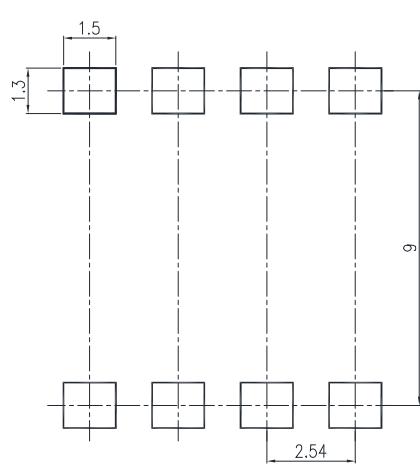
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8. RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

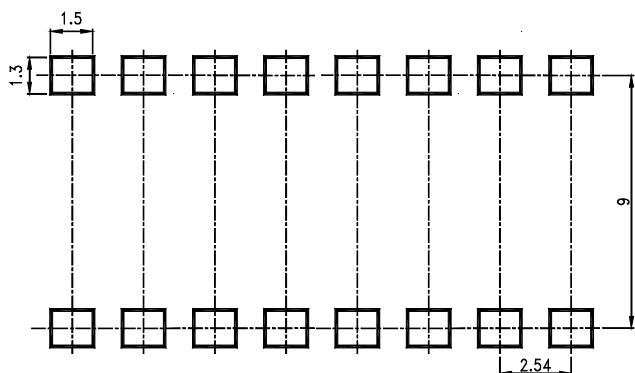
8.1 4 PIN



8.2 8 PIN



8.3 16PIN



Note :

Dimensions in millimeters.

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LTV-8X7 Series

9. Naming rule

LTV-8X7(1)-(2)-(3)-G-(5)

DEVICE PART NUMBER

(1) No suffix = Dual-in-Line package

M = Wide lead spacing package

S = Surface mounting package

(2) TAPING TYPE(TA,TA1,TP or none)

LTV-817S and LTV-827S have tape and reel solution.

Please refer to orientation of taping on Page 5-7

(3) CTR RANK

Please refer to the CTR table on Page 10

(4) Halogen free option

(5) Customer code option

Example : LTV-817S-TA1-A-G

LTV8X7(1)(2)(3)-V-G-(6)

DEVICE PART NUMBER

(1) No suffix = Dual-in-Line package

M = Wide lead spacing package

S = Surface mounting package

(2) TAPING TYPE(TA,TA1,TP or none)

LTV-817S and LTV-827S have tape and reel solution

Please refer to orientation of taping on Page 5-7

(3) CTR RANK

Please refer to the CTR table on Page 10

(4) VDE order option

(5) Halogen free option

(6) Customer code option

Example : LTV817STA1A-V-G

Photocoupler LTV-8X7 Series

10. Notes:

- LiteOn is continually improving the quality, reliability, function or design and LiteOn 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.
- Immerge unit's body in solder paste is not recommended.
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