LITEON®
OPTOELECTRONICS

Photocoupler
Product Data Sheet
LTV-725V
(M, S, S-TA, S-TA1) series

Spec No. :DS-70-99-0015
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LITE-ON DCC

RELEASE

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Data Sheet

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1. DESCRIPTION

1.1 Features

- High collector-emitter voltage (V_{CEO}=300V)
- High input-output isolation voltage (V_{ISO}=5,000Vrms)
- Current transfer ratio (CTR : MIN. 1000% at I_F = 1mA, V_{CE} = 2V)
- Dual-in-line package :
  LTV-725V
- Wide lead spacing package
  LTV-725VM
- Surface mounting package
  LTV-725VS
- Tape and reel packaging
  LTV-725VS-TA, LTV-725VS-TA1
- Safety approval
  * UL approved
  * CSA approved
  * FIMKO approved
  * CQC GB4943.1-2011/GB8898-2011 approved
  * VDE approved
- RoHS Compliance
  All materials be used in device are followed EU RoHS directive (No.2002/95/EC, 2011/65/EU, and 2015/863).
- ESD pass HBM 8000V/MM2000V
- MSL class1

Photocoupler
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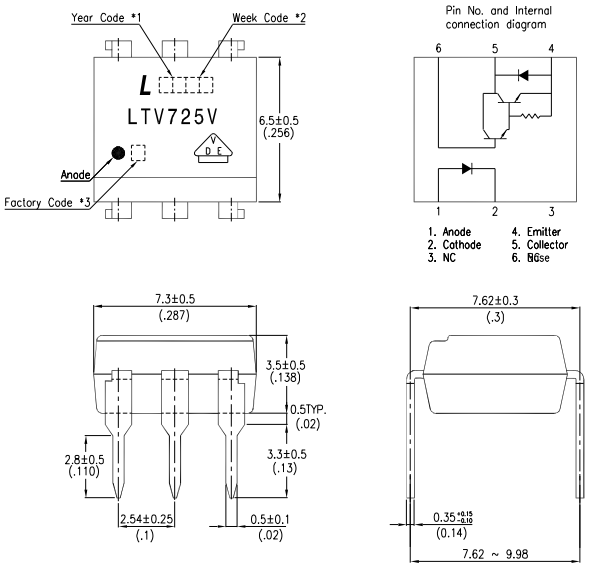
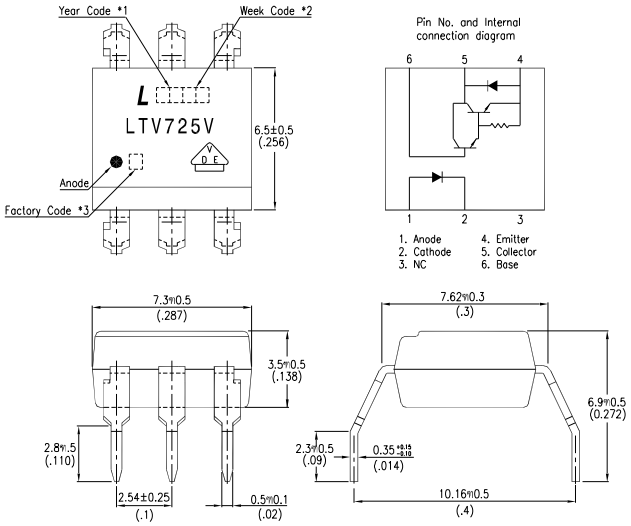
2. PACKAGE DIMENSIONS

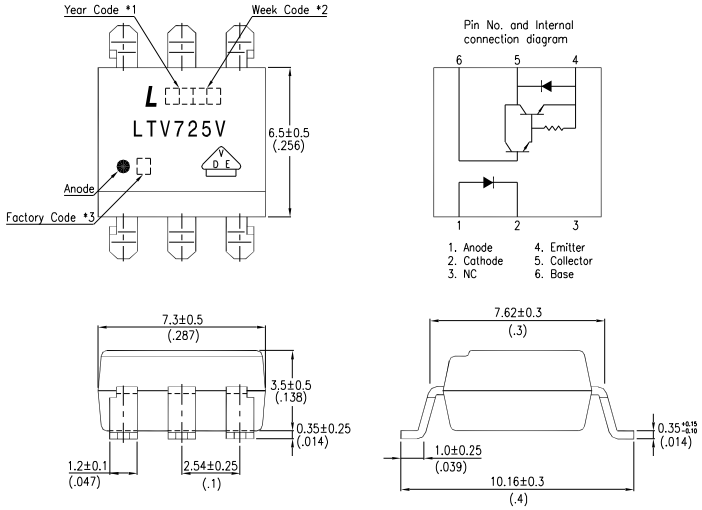
2.1 LTV-725V



2.2 LTV-725V



2.3 LTV-725VS



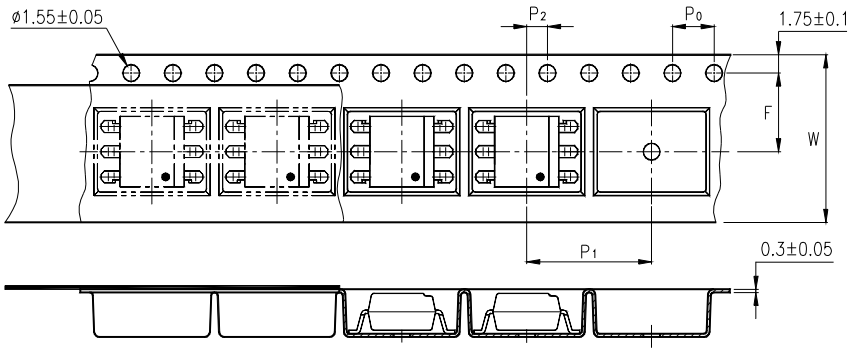
Notes :

1. Year date code.
2. 2-digit work week.
3. Factory identification mark shall be marked (Y: Thailand, W: China-CZ).
4. For VDE option.

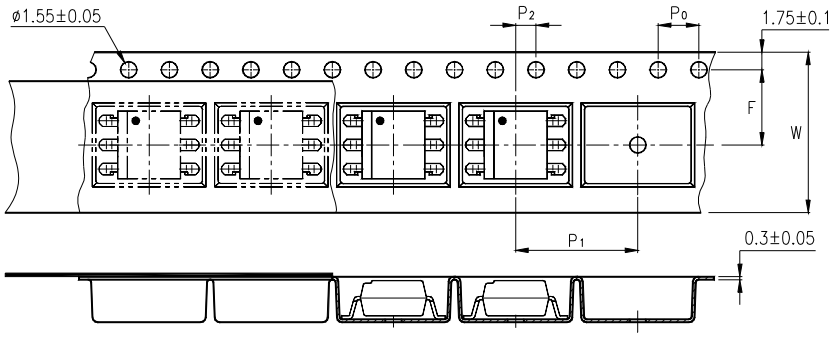
Dimensions in millimeters (inches).

3. TAPING DIMENSIONS

3.1 LTV-725VS-TA



3.2 LTV-725VS-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

4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25℃

	Parameter	Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	70	mW
	Junction Temperature	T_J	125	°C
Output	Collector - Emitter Voltage	V_{CEO}	300	V
	Collector - Base Voltage	V_{CBO}	300	V
	Emitter - Base Voltage	V_{EBO}	6	V
	Emitter - Collector Voltage	V_{ECO}	0.1	V
	Collector Current	I_C	150	mA
	Collector Power Dissipation	P_C	300	mW
	Total Power Dissipation	P_{tot}	350	mW
1.	Isolation Voltage	V_{iso}	5000	V_{rms}
	Operating Temperature	T_{opr}	-25 ~ +100	°C
	Storage Temperature	T_{stg}	-45 ~ +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

4.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25℃

Parameter			Symbol	Min.	Typ.	Max.	Unit	Test Condition
Input		Forward Voltage	V_F	—	1.2	1.4	V	I_F=10mA
		Reverse Current	I_R	—	—	10	μA	V_R=4V
		Terminal Capacitance	C	—	30	250	pF	V=0, f=1MHz
Output		Collector Dark Current	I_{CEO}	—	—	1	μA	V_{CE}=200V, I_F=0
		Collector-Emitter Breakdown Voltage	BV_{CEO}	300	—	—	V	I_C=0.1mA, I_F=0
		Emitter-Collector Breakdown Voltage	BV_{ECO}	0.1	—	—	V	I_E=10μA, I_F=0
Couple		Collector Current	I_C	10	40	150	mA	I_F=1mA, V_{CE}=2V
	1.	Current Transfer Ratio	CTR	1,000	4,000	15,000	%	
		Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	1.2	V	I_F=20mA I_C=100mA
		Isolation Resistance	R_{ISO}	$5x10^{10}$	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	1	7	—	kHz	V_{CE}=2V, I_C=20mA R_L=100Ω, -3dB
		Response Time (Rise)	tr	—	100	300	μs	V_{CE}=2V, I_C=20mA R_L=100Ω
		Response Time (Fall)	t_f	—	20	100	μs	

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

5. CHARACTERISTICS CURVES

Fig.1 Forward Current vs. Ambient Temperature

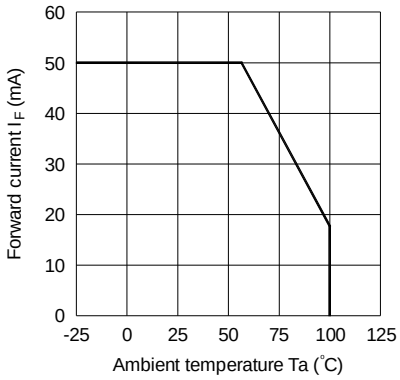


Fig.2 Collector Power Dissipation vs. Ambient Temperature

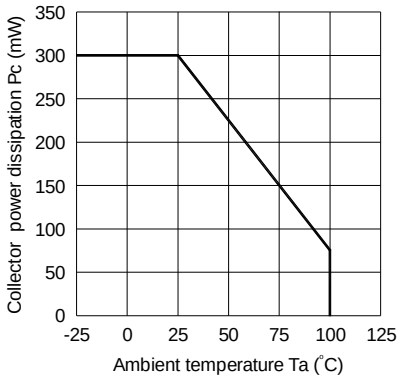


Fig.3 Forward Current vs. Forward Voltage

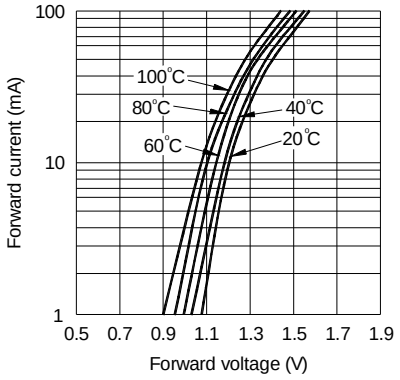


Fig.4 Current Transfer Ratio vs. Forward Current

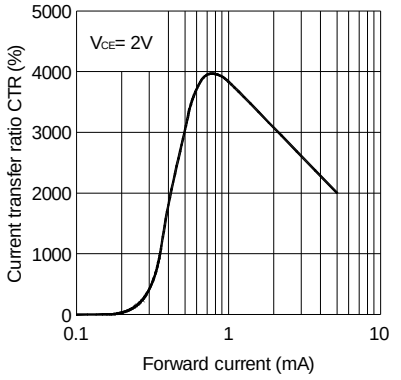


Fig.5 Collector Current vs. Collector-emitter Voltage

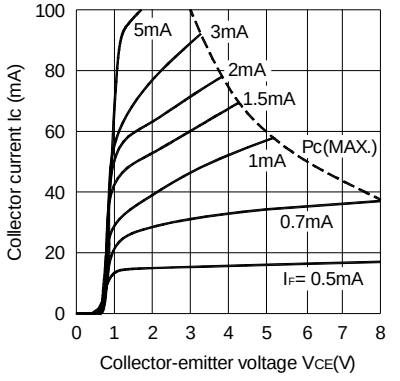


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature

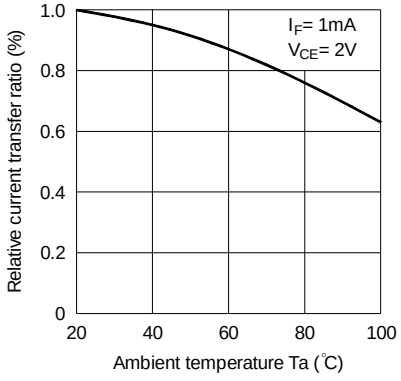


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Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

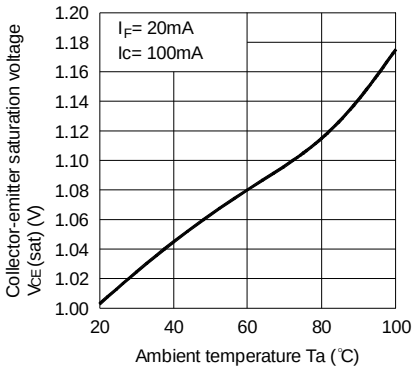


Fig.8 Collector Dark Current vs. Temperature

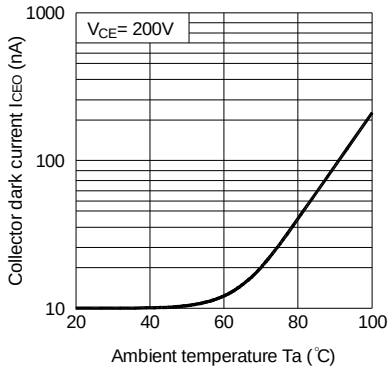


Fig.9 Response Time vs. Load Resistance

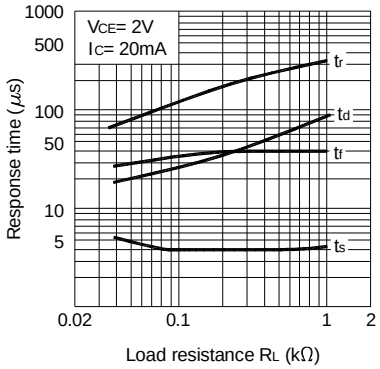
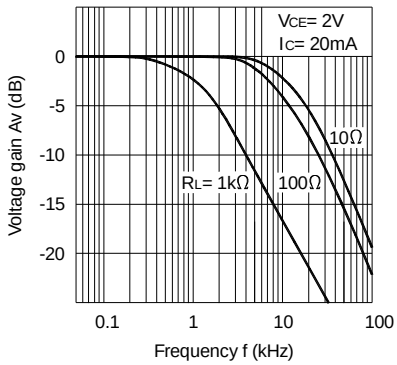
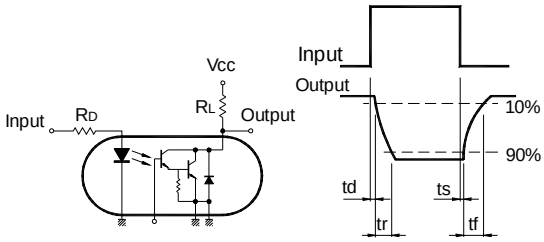


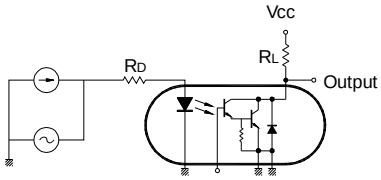
Fig.10 Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response

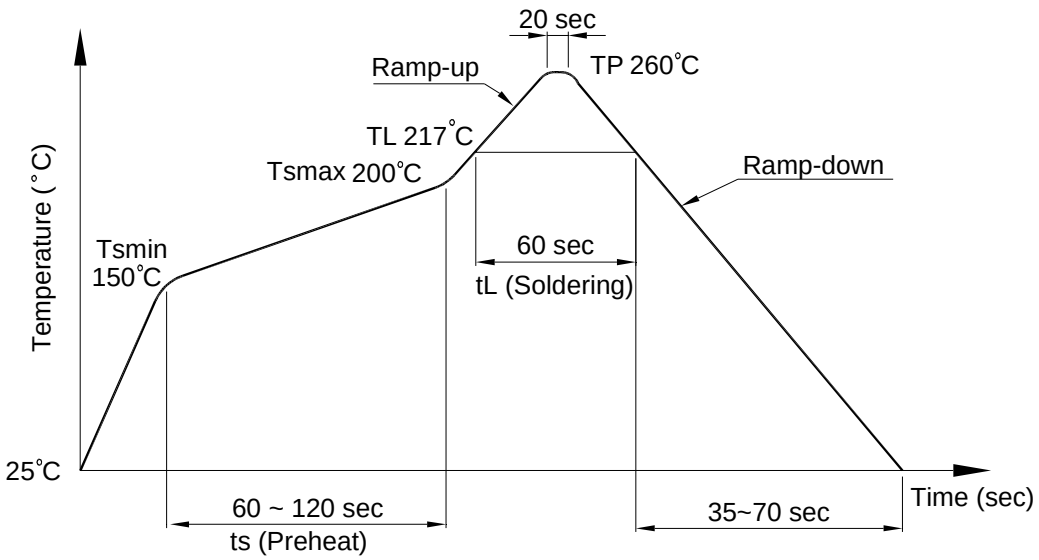


6. TEMPERATURE PROFILE OF SOLDERING

6.1 IR Reflow soldering (JEDEC-STD-020C 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) (ts)	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



6.2 Wave soldering (JEDEC22A111 compliant)

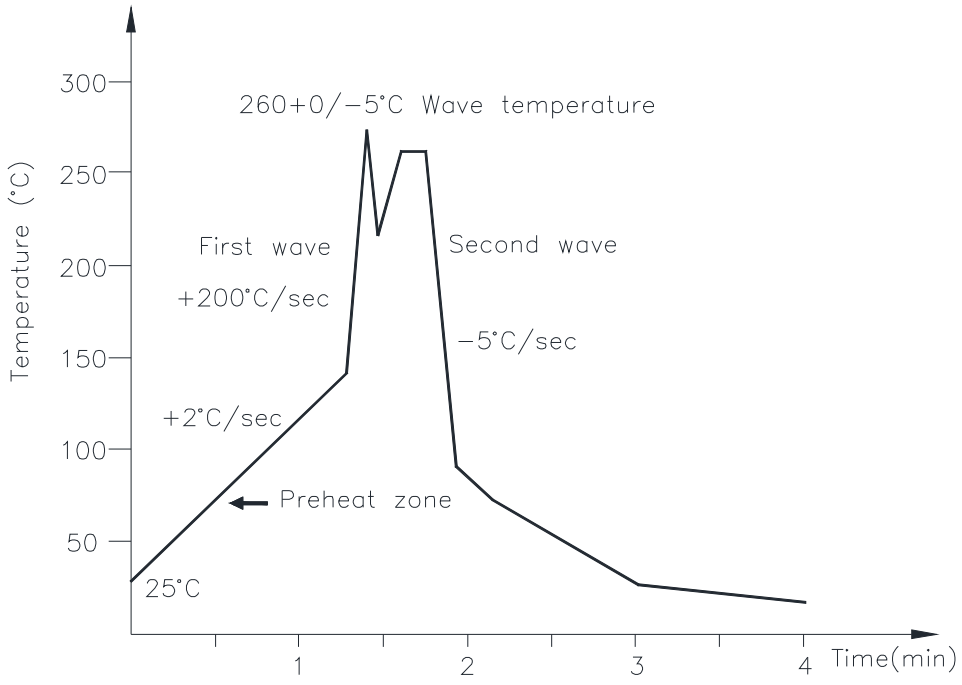
One time soldering is recommended within the condition of temperature.

Temperature: 260+0/-5˚C

Time: 10 sec.

Preheat temperature:25 to 140˚C

Preheat time: 30 to 80 sec.



6.3 Hand soldering by soldering iron

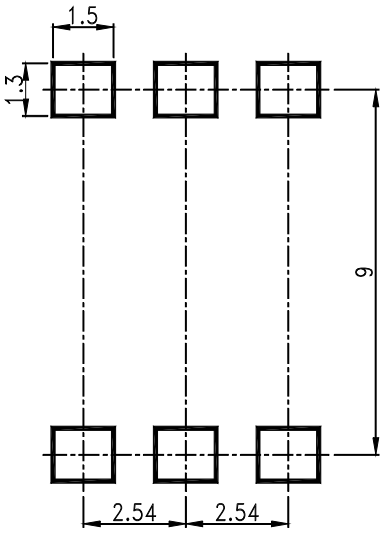
Allow single lead soldering in every single process. One time soldering is recommended.

Temperature: 380+0/-5˚C

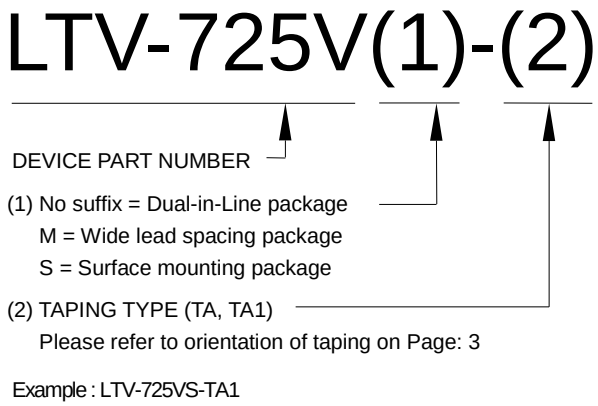
Time: 3 sec max.

7. RECOMMENDED FOOT PRINT PATTERNS (MOUNT PAD)

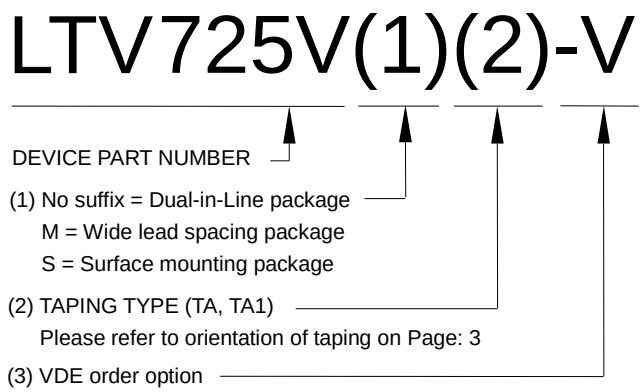
Unit: mm



8. NAMING RULE



Example : LTV-725VS-TA1



Example : LTV725VSTA1-V

9. 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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