LITEON®
OPTOELECTRONICS

Photocoupler

Product Data Sheet

LTV-200

Spec No.: DS70-2011-0108

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Revision: A

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

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Photocouplers
LTV-200 Series

1. DESCRIPTION

The LTV-200/205/206/207/208 consist of a high efficient Gallium Arsenide Infrared LED and a Silicon NPN phototransistor. This design provides excellent isolation between the input and output sides of the Optocoupler. The LTV-200/205/206/207/208 come in a standard SOP8 small outline package for surface mounting which makes it ideally suited for high density application with limited space. A Specific CTR range allows a narrow tolerance in the electrical design of the adjacent circuits.

1.1 Features

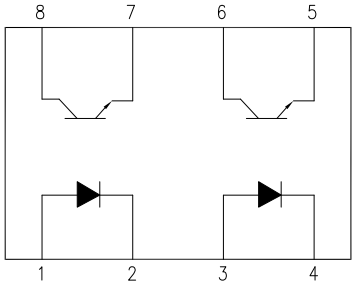
- Two Channel Coupler
- SOP8 surface mountable Package
- Isolation Voltage 3.75KV
- Safety approval: UL & cUL (1577 & CA5A), VDE DIN/EN 60747-5-5

1.2 Applications

- Feedback Control Circuits
- Feedback element in switching mode power supplier
- Monitor & Detection Circuits

1.3 Functional Diagram

Pin No. and Internal connection diagram

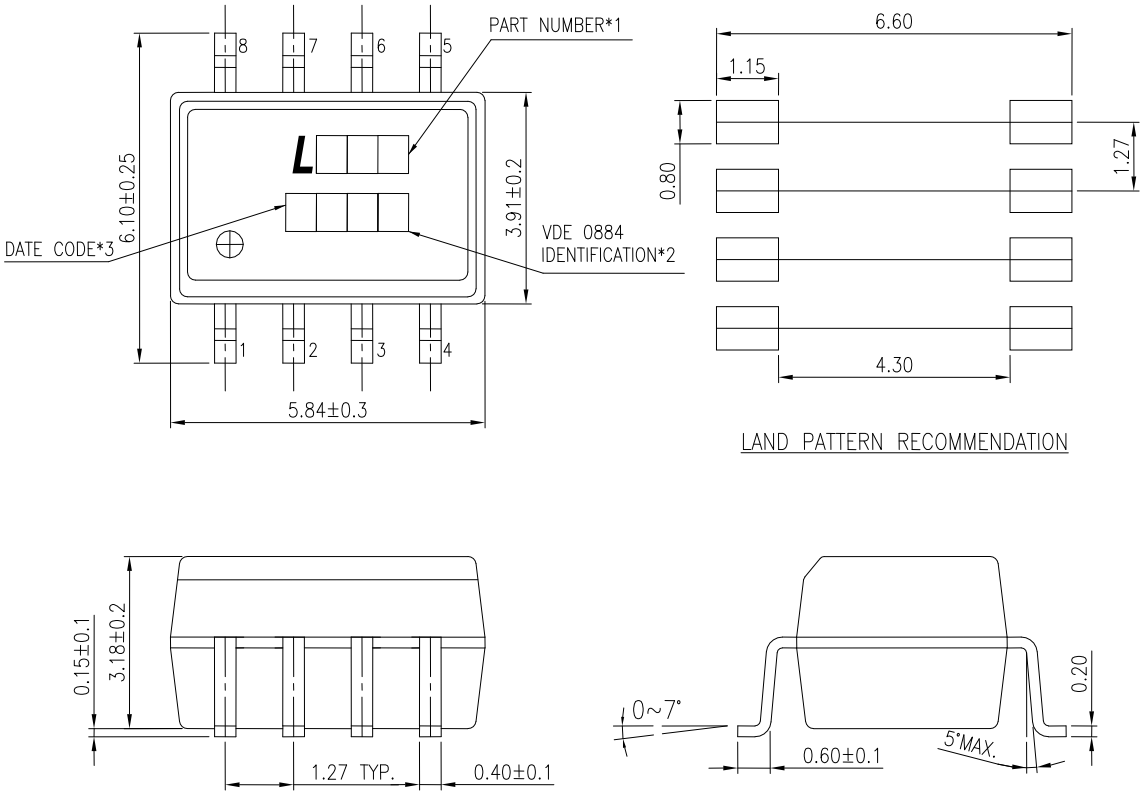


1,3. Anode
2,4. Cathode
5,7. Emitter
6,8. Collector

1.4 Order Information

P/N	Remarks
LTV-200	CTR > 20%, SOP8
LTV-205	CTR 40-80%, SOP8
LTV-206	CTR 63-125%, SOP8
LTV-207	CTR 100-200%, SOP8
LTV-208	CTR > 100%, SOP8

2. PACKAGE DIMENSIONS



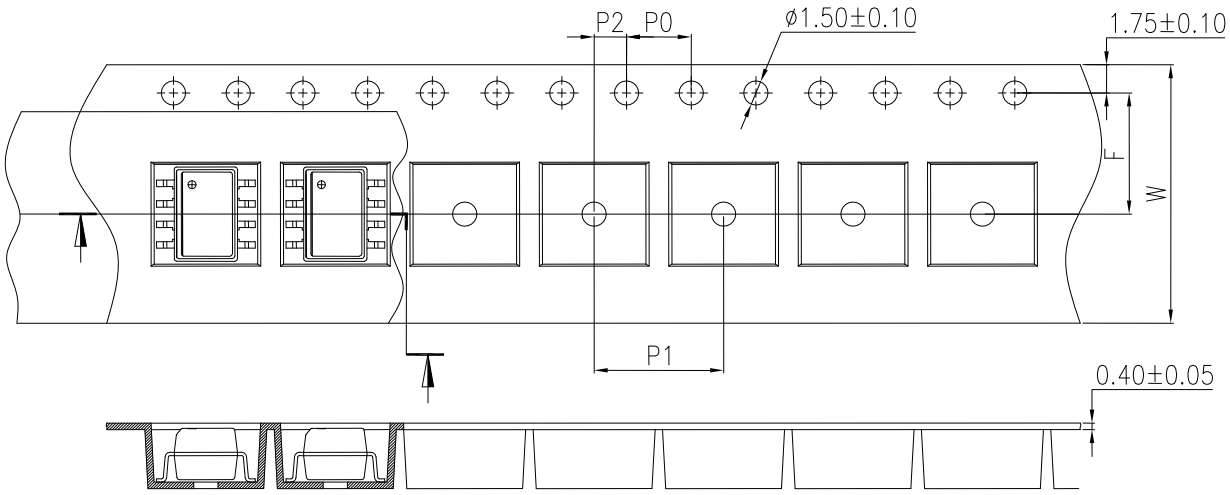
Part No : LTV-200/205/206/207/208

Notes :

1. Part number
2. "V" to represent VDE0884
3. Date code

Dimensions are all in Millimeters.

3. TAPING DIMENSIONS



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 (0.47)

Quantities Per Reel

Package Type	LTV-200 / 205 / 206 / 207 / 208
Quantities (pcs)	2000

4. RATING AND CHARACTERISTICS

4.1 Absolute Maximum Ratings at Ta=25°C *1

	Parameter	Symbol	Rating	Unit
Input	Forward Current	I_F	30	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	50	mW
Output	Collector - Emitter Voltage	V_{CEO}	80	V
	Emitter - Collector Voltage	V_{ECO}	7	V
	Collector Power Dissipation	P_C	125	mW
	Isolation Voltage	V_{iso}	3750	V_{rms}
	Operating Temperature	T_{opr}	-55 ~ +110	°C
	Storage Temperature	T_{stg}	-55 ~ +150	°C
	Soldering Temperature	T_{sol}	260	°C
	Peak Pulse Current, 1us 300pps	Ipeak	1	A

1. Ambient temperature = 25°C, unless otherwise specified. Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

4.2 ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Input						
Forward Voltage	V_F	—	1.2	1.55	V	I_F=10mA
Reverse Current	I_R	—	0.1	100	μA	V_R=6V
Terminal Capacitance	C_t	—	25	—	pF	V_R=0V
Output						
Collector-Emitter Leakage Current	I_{CEO}	—	5	50	nA	V_{CE}=10V, I_F=0mA
Collector-Emitter Breakdown Voltage	BV_{CEO}	80	—	—	V	I_c=10μA
Emitter-Collector Breakdown Voltage	BV_{ECO}	7	—	—	V	I_E=10μA
Corrector-emitter Capacitance	C_{CE}		10		pF	V_{CE}=0V
Coupler						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.4	V	I_F=10mA I_C=2.5mA
Collector Current	I_{C1}	0.13	—	—	mA	I_F=1mA, V_{CE}=5V
	I_{C2}	2	—	20		I_F=10mA, V_{CE}=5V
Input-output Capacitance	C_{IO}	—	0.5	—	pF	
Isolation Test Voltage	V_{ISO}	3750	—	—	V	RH≦50%, t=1min,
Resistance, Input to Output	R_{ISO}	—	10^{12}	—	Ω	V_{I-O}=500V DC.

*All Typical at T_A=25°C

5. RANK TABLE OF CURRENT TRANSFER RATIO CTR

Parameter	Part	Min	Max	Condition
DC Current Transfer Ratio	LTV-200	20		I_F=10mA, V_{CE}=5V, Ta=25°C
	LTV-205	40	80	
	LTV-206	63	125	
	LTV-207	100	200	
	LTV-208	100		
	LTV-205	13		I_F=1mA, V_{CE}=5V, Ta=25°C
	LTV-206	22		
	LTV-207	34		
	LTV-208	100		

6. CHARACTERISTICS CURVES

Figure1. Forward Current vs. Forward Voltage

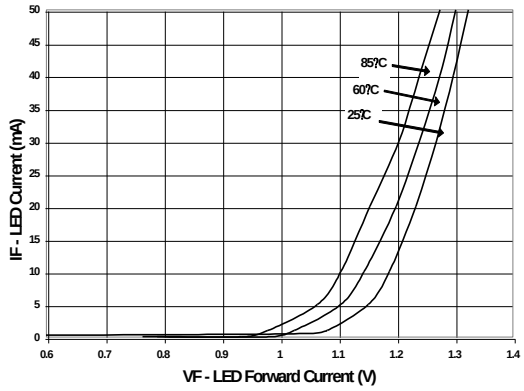


Figure2. Collector-Emitter Voltage vs. Collector Current

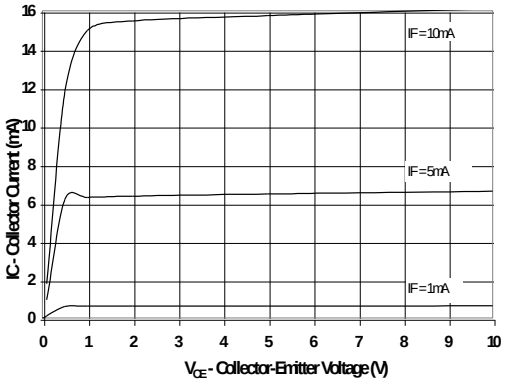


Figure3. CTR vs. Forward Current

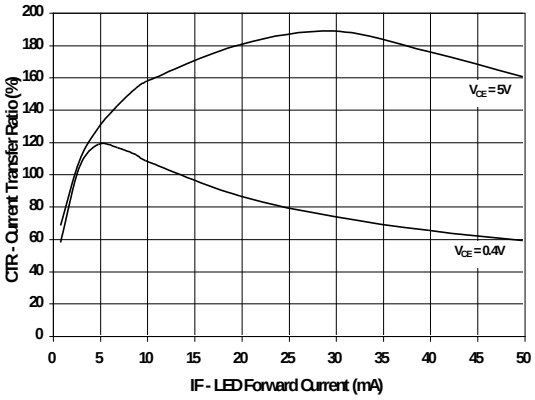


Figure4. Current Transfer Ratio vs. Ambient Temperature

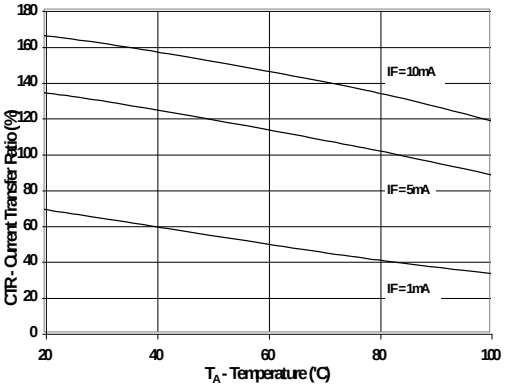


Figure5. Switching Speed vs. Load Resistor

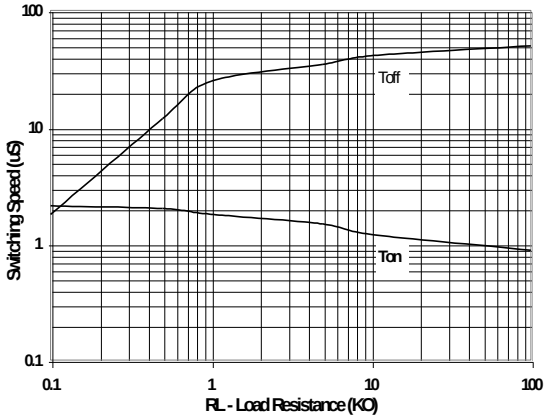


Figure6. Collector Leakage Current vs. Ambient Temperature

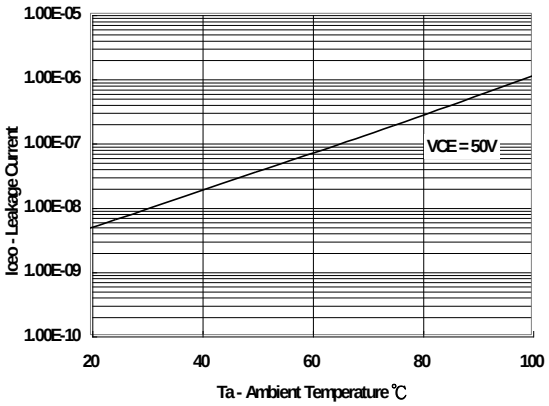
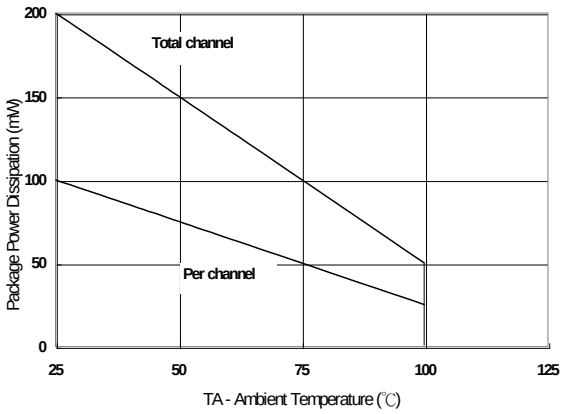


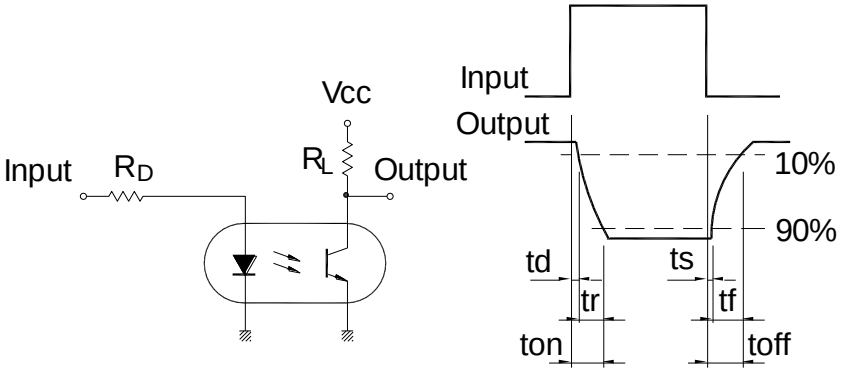
Figure7. Power Dissipation vs. Ambient Temperature



7. Switching Specification

Parameter	Test Condition	Symbol	Min	Typ	Max	Units
Turn-on Time	Ic=2mA, R_L=100Ω Vcc=5V	ton		5		μs
Turn-off Time	Ic=2mA, R_L=100Ω Vcc=5V	toff		4		μs

Test Circuit for Response Time

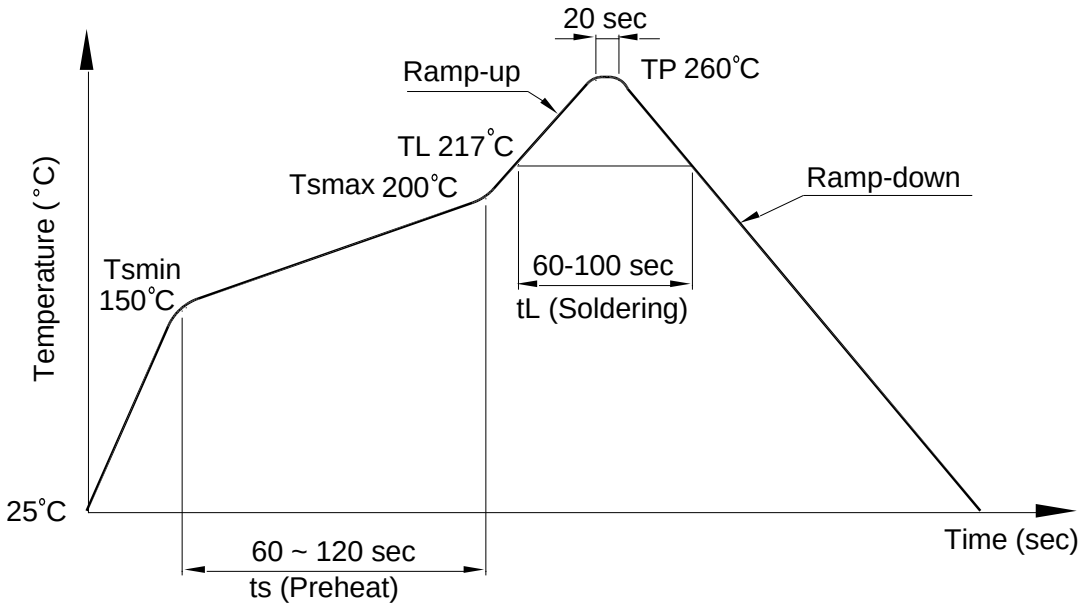


8. TEMPERATURE PROFILE OF SOLDERING

8.1 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 ~100 sec
Peak Temperature (T_P)	260˚C
Ramp-up rate	3˚C / sec max.
Ramp-down rate	3~6˚C / sec



8.2 Wave soldering (JEDEC22A111 compliant)

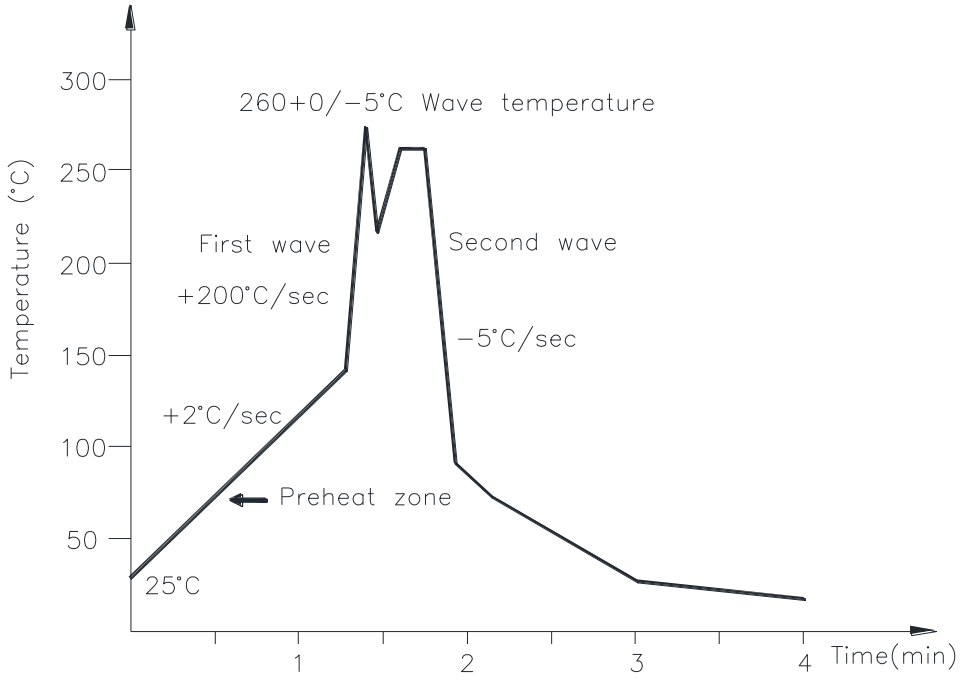
One time soldering is recommended within the condition of temperature.

Temperature: 260+0/-5˚C

Time: 10 sec.

Preheat temperature:25 to 140˚C

Preheat time: 30 to 80 sec.



8.3 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

9. Notes:

Specifications of the products displayed herein are subject to change without notice.

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 instrumentation and application. 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.