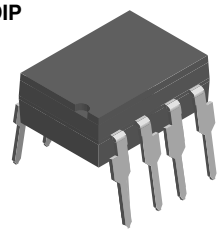
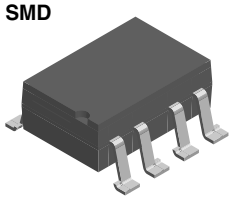
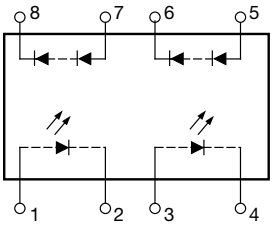
Dual Photovoltaic MOSFET Driver Solid-State Relay

DIP



SMD





FEATURES

- High open circuit voltage
- High short circuit current
- Isolation test voltage 5300 V_{RMS}
- Logic compatible input
- High reliability
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

APPLICATIONS

- High-side driver
- Solid-state relays
- Floating power supply
- Power control
- Data acquisition
- ATE
- Isolated switching

LINKS TO ADDITIONAL RESOURCES

Related Documents | 3D Models | Models | Footprints | Schematics

AGENCY APPROVALS

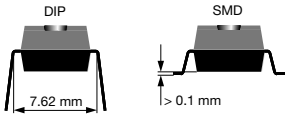
- UL
- cUL
- DIN EN 60747-5-5 (VDE 0884)
- CQC GB4943.1
- CQC GB8898
- FIMKO

DESCRIPTION

The LH1262CB, LH1262CAC photovoltaic MOSFET driver consists of two LEDs optically coupled to two photodiode arrays. The photodiode array provides a floating source with adequate voltage and current to drive high-power MOSFET transistors. Optical coupling provides a high I/O isolation voltage. In order to turn the MOSFET off, an external resistance (gate-to-source) is required for gate discharge.

ORDERING INFORMATION

L	H	1	2	6	2	#	#	#	T	R
PART NUMBER						ELECTR. VARIATION	PACKAGE CONFIG.		TAPE AND REEL	



PACKAGE	UL, cUL, VDE, BSI, CQC, FIMKO
SMD-8	LH1262CAC
SMD-8, tape and reel	LH1262CACTR
DIP-8	LH1262CB

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
SSR				
LED input ratings continuous forward current		I_F	50	mA
LED input ratings reverse voltage	$I_R \leq 10$ µA	V_R	5.0	V
Ambient operating temperature range		T_{amb}	-40 to +85	°C
Storage temperature range		T_{stg}	-40 to +150	°C
Pin soldering time	t = 7.0 s max.	T_S	270	°C

Note

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.

For technical questions, contact: optocoupleranswers@vishay.com

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ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
LED forward voltage	I_F = 10 mA	V_F	1.15	1.26	1.45	V
Detector forward voltage	I_F = 10 µA	$V_{F(PDA)}$	-	14	-	V
Detector reverse voltage	I_R = 2.0 µA	$V_{R(PDA)}$	-	200	-	V
Open circuit voltage (pins 5, 6 or 7, 8)	I_F = 5.0 mA	V_{OC}	10	12.95	15	V
	I_F = 10 mA	V_{OC}	-	13.45	-	V
	I_F = 20 mA	V_{OC}	-	13.92	-	V
Short circuit current (pins 5, 6 or 7, 8)	I_F = 5.0 mA	I_{SC}	1.0	1.6	6.5	µA
	I_F = 10 mA	I_{SC}	2.6	3.4	14	µA
	I_F = 20 mA	I_{SC}	-	6.9	-	µA

Note

- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluations. Typical values are for information only and are not part of the testing requirements.

SWITCHING CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Turn-on time	I_F = 20 mA (1)	t_{on}	-	35	-	µs
Turn-off time	I_F = 20 mA (1)	t_{off}	-	90	-	µs

Note

(1) f = 1.0 kHz, pulse width = 100 µs, load (R_L) = 1.0 MΩ, 15 pF; measured at 90 % rated voltage (t_{on}), 10 % rated voltage (t_{off}). Actuation speed depends upon the external t_{on} and t_{off} circuitry and the capacitance of the MOSFET.

SAFETY AND INSULATION RATINGS				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Climatic classification	According to IEC 68 part 1		40 / 85 / 21	
Pollution degree	According to DIN VDE 0109		2	
Comparative tracking index	Insulation group IIIa	CTI	175	
Maximum rated withstanding isolation voltage	According to UL1577, t = 1 min	V_{ISO}	5300	V_{RMS}
Tested withstanding isolation voltage	According to UL1577, t = 1 s	V_{ISO}	4420	V_{RMS}
Maximum transient isolation voltage	According to DIN EN 60747-5-5	V_{IOTM}	8000	V_{peak}
Maximum repetitive peak isolation voltage	According to DIN EN 60747-5-5	V_{IORM}	890	V_{peak}
Isolation resistance	V_{IO} = 500 V, T_{amb} = 25 °C	R_{IO}	≥ 10^{12}	Ω
	V_{IO} = 500 V, T_{amb} = 100 °C	R_{IO}	≥ 10^{11}	Ω
	V_{IO} = 500 V, T_{amb} = T_S	R_{IO}	≥ 10^9	Ω
Output safety power		P_{SO}	700	mW
Input safety current		I_{SI}	300	mA
Safety temperature		T_S	175	°C
Creepage distance (DIP)	DIP-8		≥ 7	mm
Clearance distance (DIP)			≥ 7	mm
Creepage distance (SMD)	SMD-8		≥ 8	mm
Clearance distance (SMD)			≥ 8	mm
Insulation thickness		DTI	≥ 0.4	mm

Note

- As per IEC 60747-5-5, § 7.4.3.8.2, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

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FUNCTIONAL DESCRIPTION

Figure 1 outlines the IV characteristics of the illuminated photodiode array (PDA). For operation at voltages below V_{OC}, the PDA acts as a nearly constant current source. The actual region of operation depends upon the load.

The amount of current applied to the LED (pins 1 and 2 or 3 and 4) determines the amount of light produced for the PDA. For high temperature operation, more LED current may be required.

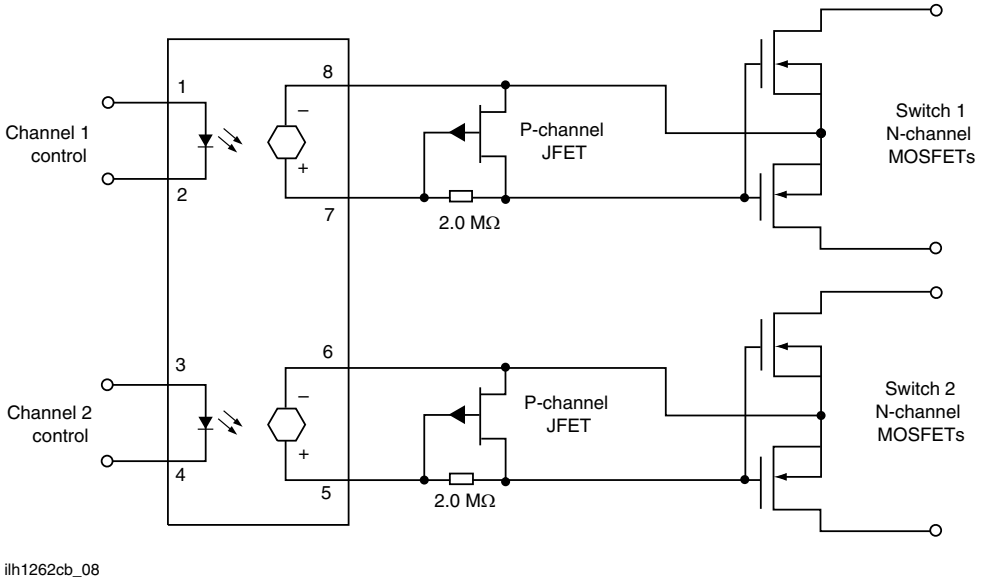

Fig. 1 - Typical Dual Form A Solid-State Relay Application

PACKAGE DIMENSIONS (in millimeters)

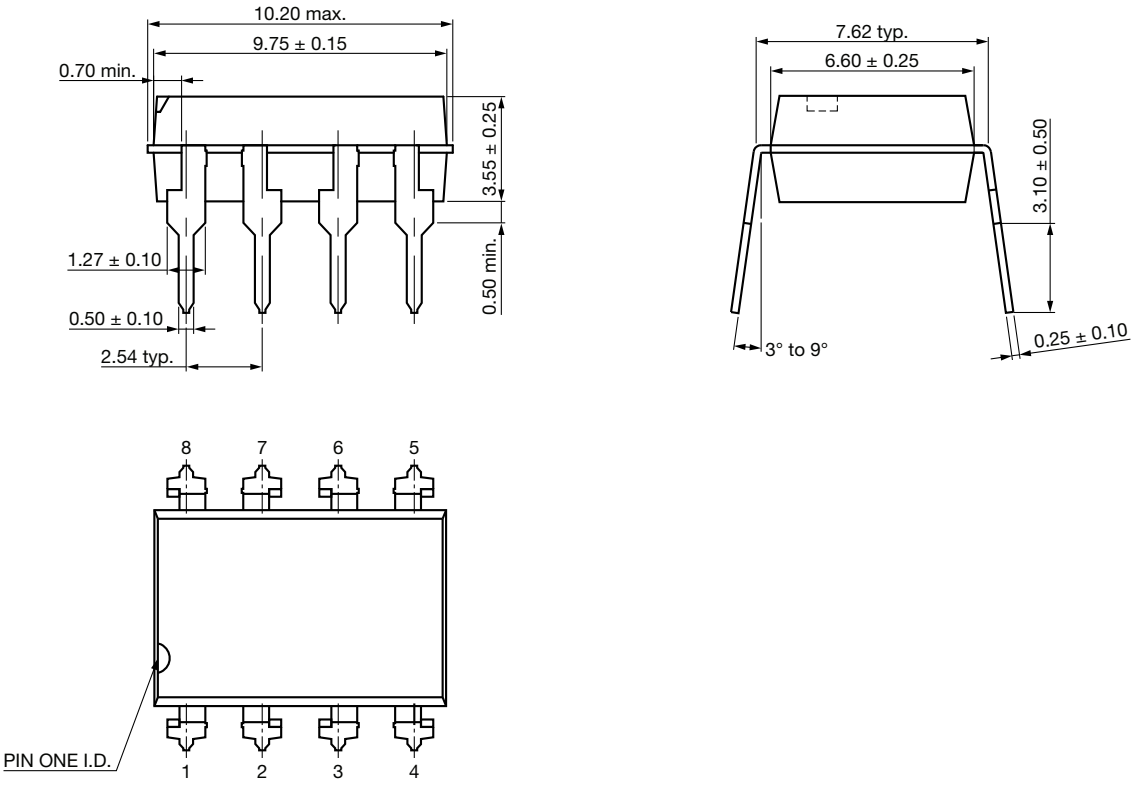

Fig. 2 - DIP-8 Package Drawing

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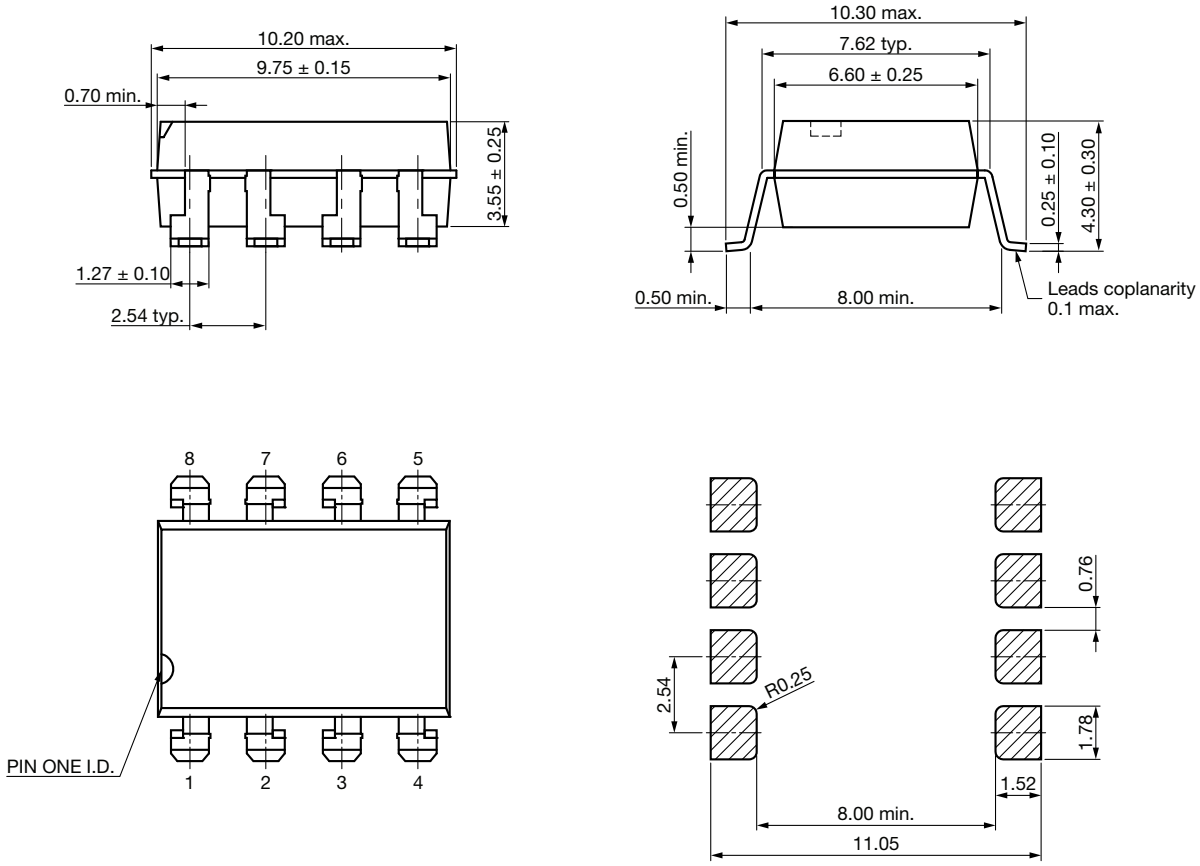

Fig. 3 - SMD-8 Package Drawing

PACKAGE MARKING (example)

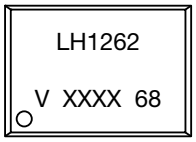

Fig. 4 - LH1262

Notes

- XXXX = LMC (lot marking code)
- VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking

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SOLDER PROFILES

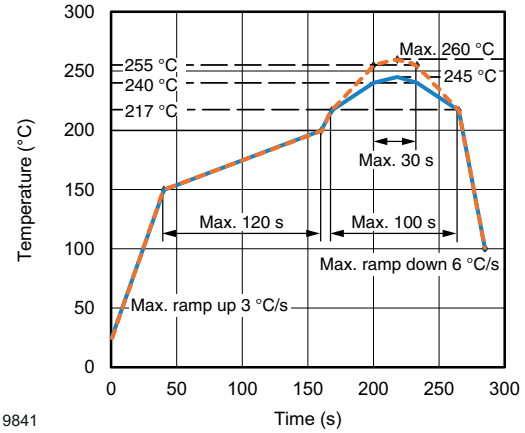

Fig. 5 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020 for SMD Devices

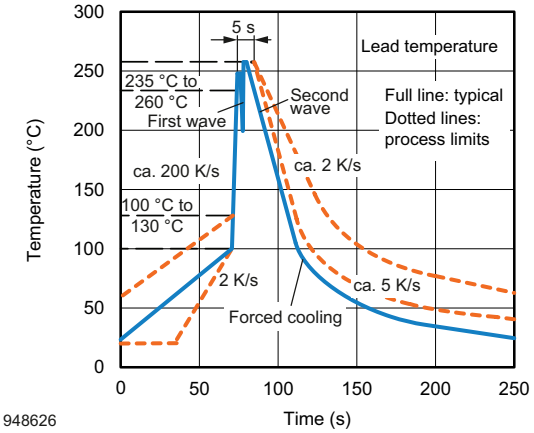

Fig. 6 - Wave Soldering Double Wave Profile
According to J-STD-020 for DIP Devices

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