



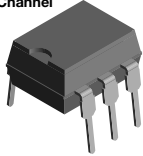
**THE DATASHEET OF
ILD55-X009T**



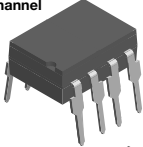


Optocoupler, Photodarlington Output, (Single, Dual, Quad Channel)

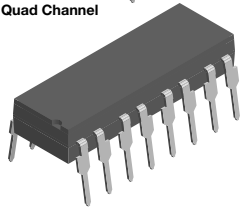
Single Channel



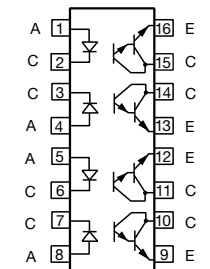
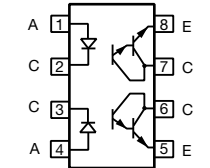
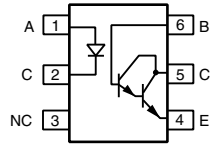
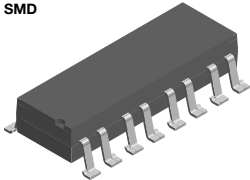
Dual Channel



Quad Channel



SMD



DESCRIPTION

The IL30 single, ILD55 dual, and ILQ30, ILQ31, ILQ55 quad are optically coupled isolators with gallium arsenide infrared emitters and silicon photodarlington sensors. Switching can be achieved while maintaining a high degree of isolation between driving and load circuits, with no crosstalk between channels. These optocouplers can be used to replace reed and mercury relays with advantages of long life, high speed switching and elimination of magnetic fields.

The ILD55 is designed to reduce board space requirements in high density applications.

FEATURES

- 125 mA load current rating
- Fast rise time, 10 μ s
- Fast fall time, 35 μ s
- Single, dual, and quad channel
- Solid state reliability
- Standard DIP packages
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

LINKS TO ADDITIONAL RESOURCES



3D Models



Design Tools



Related Documents

AGENCY APPROVALS

- [UL 1577](#)
- [cUL](#)
- [DIN EN 60747-5-5 \(VDE 0884-5\)](#) (IL30)
- [DIN EN 60747-5-5 \(VDE 0884-5\)](#)
- [BSI](#) (IL30)
- [CQC](#)
- [FIMKO](#) (IL30)
- [FIMKO](#)



ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Forward voltage	$I_F = 20\text{ mA}$	V_F	-	1.25	1.5	V
Reverse current	$V_R = 3\text{ V}$	I_R	-	0.1	10	μA
Capacitance	$V_R = 0\text{ V}$	C_O	-	25		pF
OUTPUT						
Collector emitter breakdown voltage	$I_C = 100\text{ }\mu\text{A}$	BV_{CEO}	30 / 55	-	-	V
Collector emitter leakage current	$V_{CE} = 10\text{ V}, I_F = 0\text{ A}$	I_{CEO}	-	1	100	nA
Collector emitter capacitance	$V_{CE} = 10\text{ V}, f = 1\text{ MHz}$	C_{CE}	-	3.4	-	pF
COUPLER						
Collector emitter saturation voltage	$I_C = 50\text{ mA}, I_F = 50\text{ mA}$	V_{CEsat}	-	0.9	1	V
Capacitance (input to output)		C_{IO}	-	0.5	-	pF

Note

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

CURRENT TRANSFER RATIO ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	IL30	CTR	100	400	-	%
		ILD55	CTR	100	400	-	%
		ILQ30	CTR	100	400	-	%
		ILQ55	CTR	100	400	-	%
		ILQ31	CTR	200	400	-	%

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Rise time	$V_{CC} = 13.5\text{ V}, I_F = 50\text{ mA}, R_L = 100\text{ }\Omega$	t_r	-	10	-	μs
Fall time	$V_{CC} = 13.5\text{ V}, I_F = 50\text{ mA}, R_L = 100\text{ }\Omega$	t_f	-	35	-	μs

SAFETY AND INSULATION RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Climatic classification	According to IEC 68 part 1		55 / 100 / 21	
Comparative tracking index		CTI	175	
Maximum rated withstanding isolation voltage	$t = 1\text{ min}$	V_{ISO}	4420	V_{RMS}
Maximum transient isolation voltage		V_{IOTM}	10 000	V_{peak}
Maximum repetitive peak isolation voltage		V_{IORM}	890	V_{peak}
Isolation resistance	$V_{IO} = 500\text{ V}, T_{amb} = 25\text{ }^{\circ}\text{C}$	R_{IO}	$\geq 10^{12}$	Ω
	$V_{IO} = 500\text{ V}, T_{amb} = 100\text{ }^{\circ}\text{C}$	R_{IO}	$\geq 10^{11}$	Ω
Output safety power		P_{SO}	400	mW
Input safety current		I_{SI}	275	mA
Safety temperature		T_S	175	$^{\circ}\text{C}$
Creepage distance			≥ 7	mm
Clearance distance			≥ 7	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.



TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

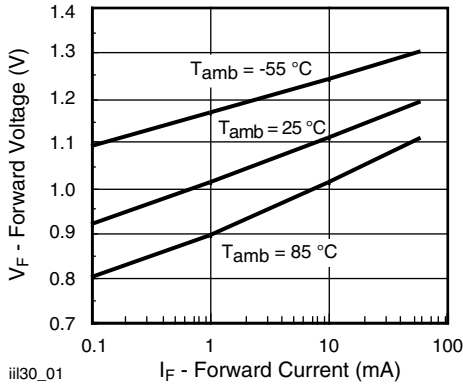


Fig. 1 - Forward Voltage vs. Forward Current

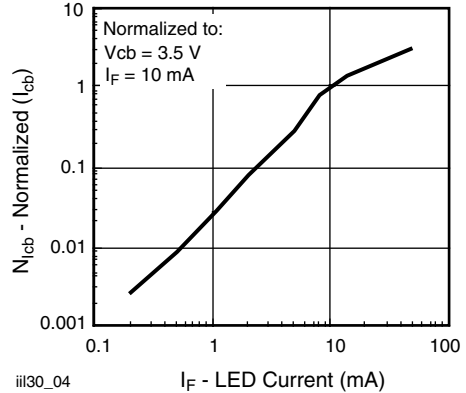


Fig. 4 - Normalized Collector Base Photocurrent vs. LED Current

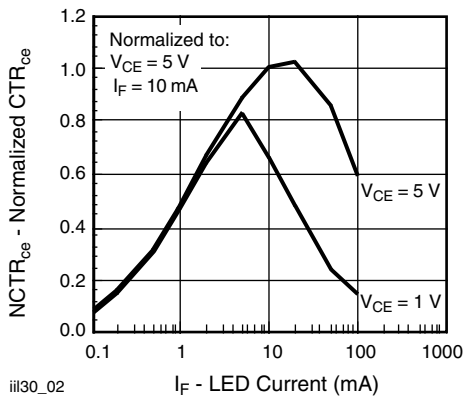


Fig. 2 - Normalized Non-Saturated and Saturated CTR_{CE} vs. LED Current

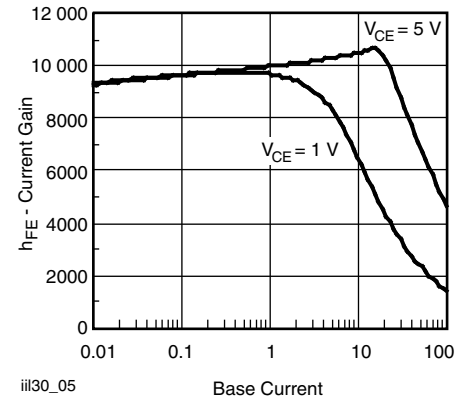


Fig. 5 - h_{FE} Current Gain vs. Base Current

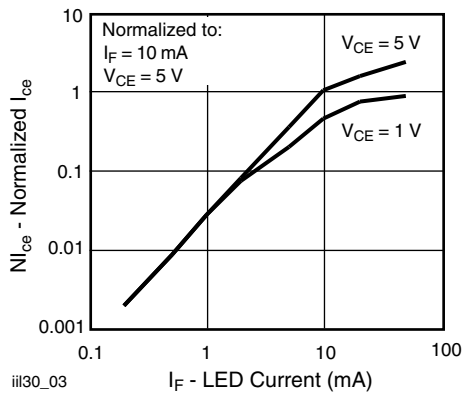


Fig. 3 - Normalized Non-Saturated and Saturated Collector Emitter Current vs. LED Current

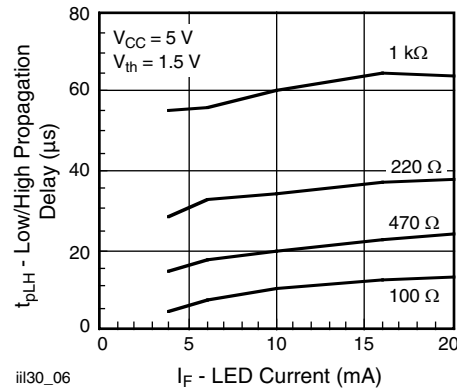


Fig. 6 - Low to High Propagation Delay vs. Collector Load Resistance and LED Current

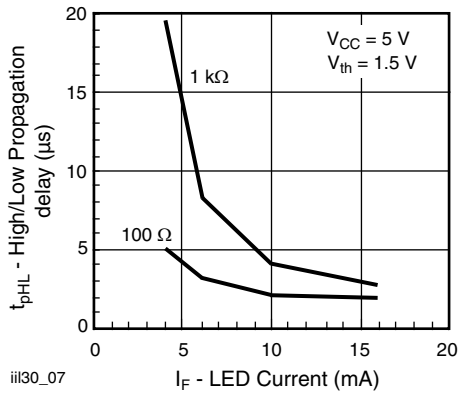
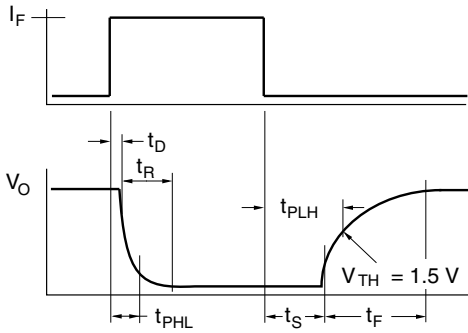
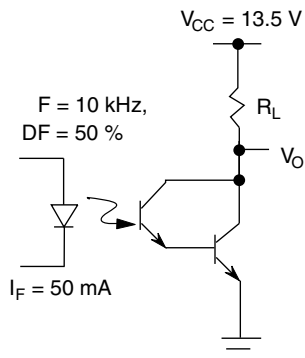


Fig. 7 - High to Low Propagation Delay vs. Collector Load Resistance and LED Current



iii30_08

Fig. 8 - Switching Waveform



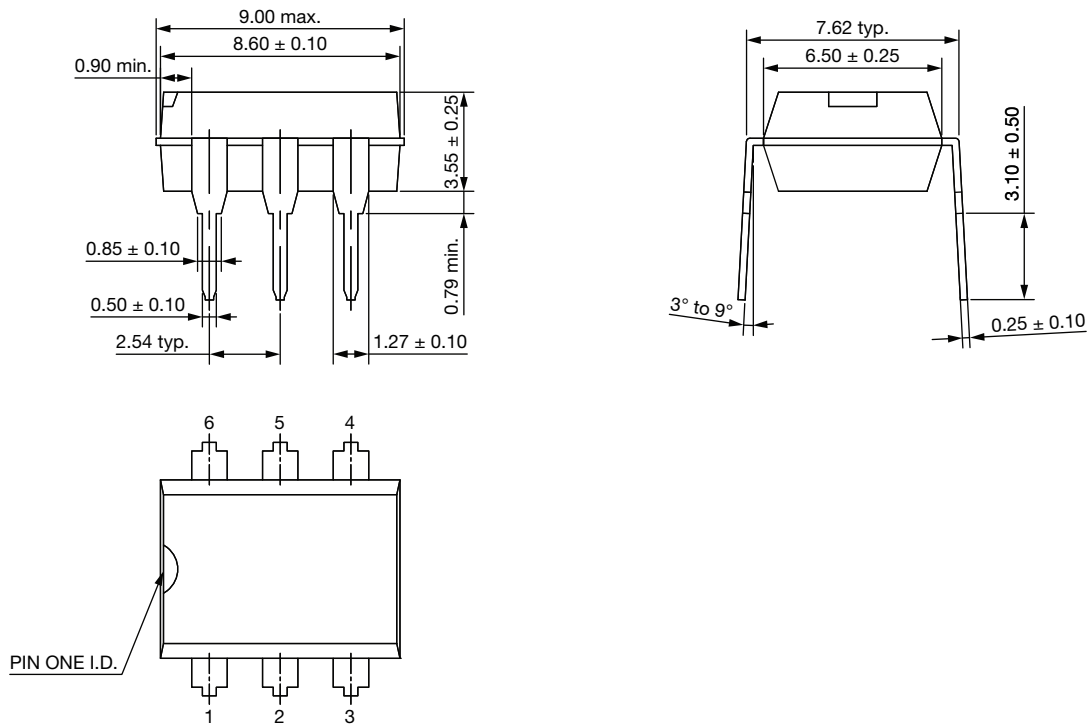
iii30_09

Fig. 9 - Switching Schematic

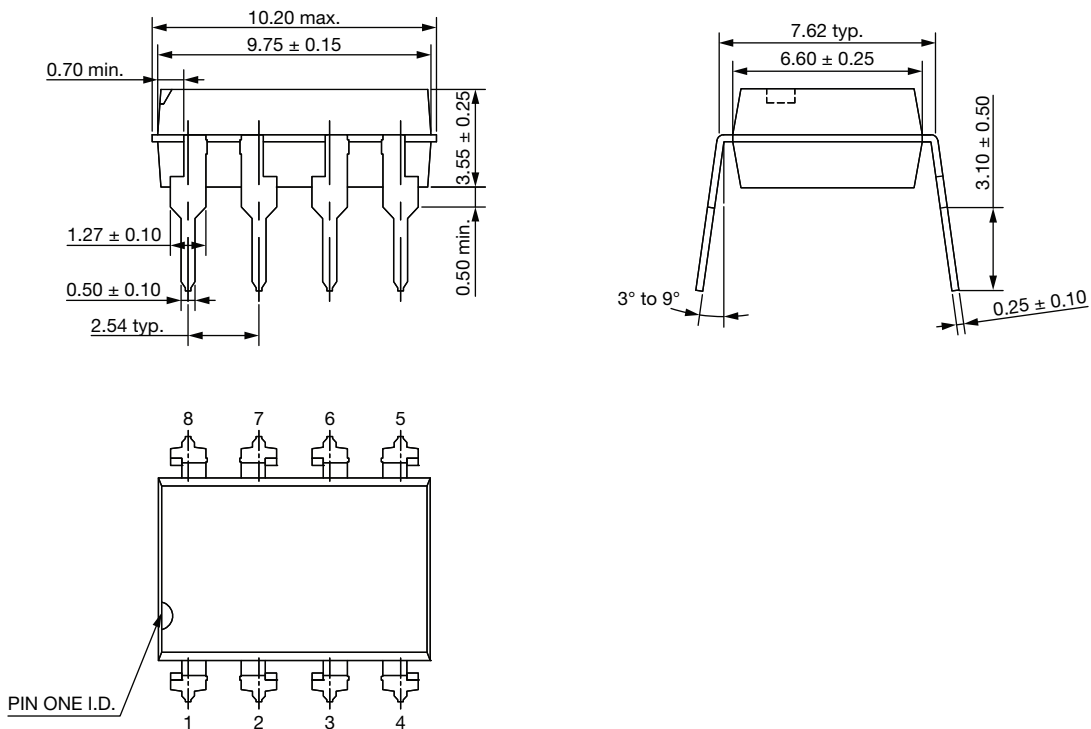


PACKAGE DIMENSIONS in millimeters

DIP-6

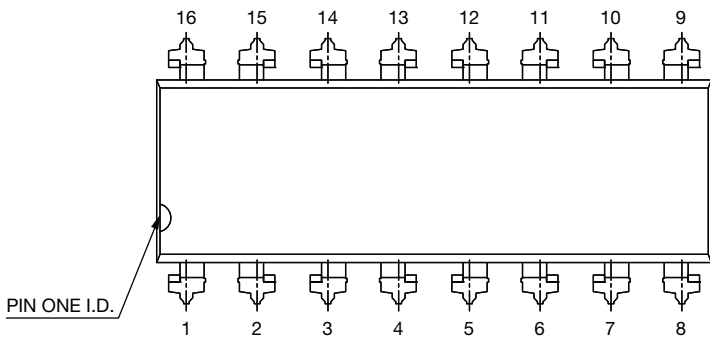
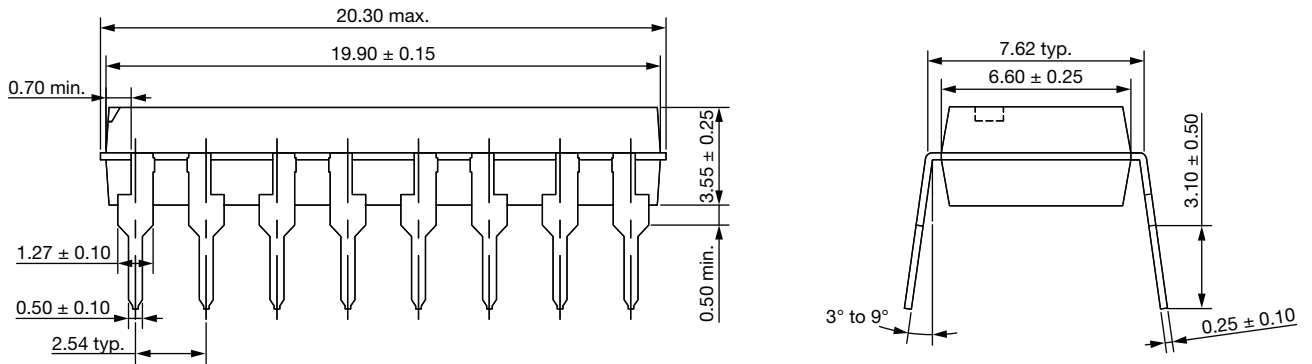


DIP-8

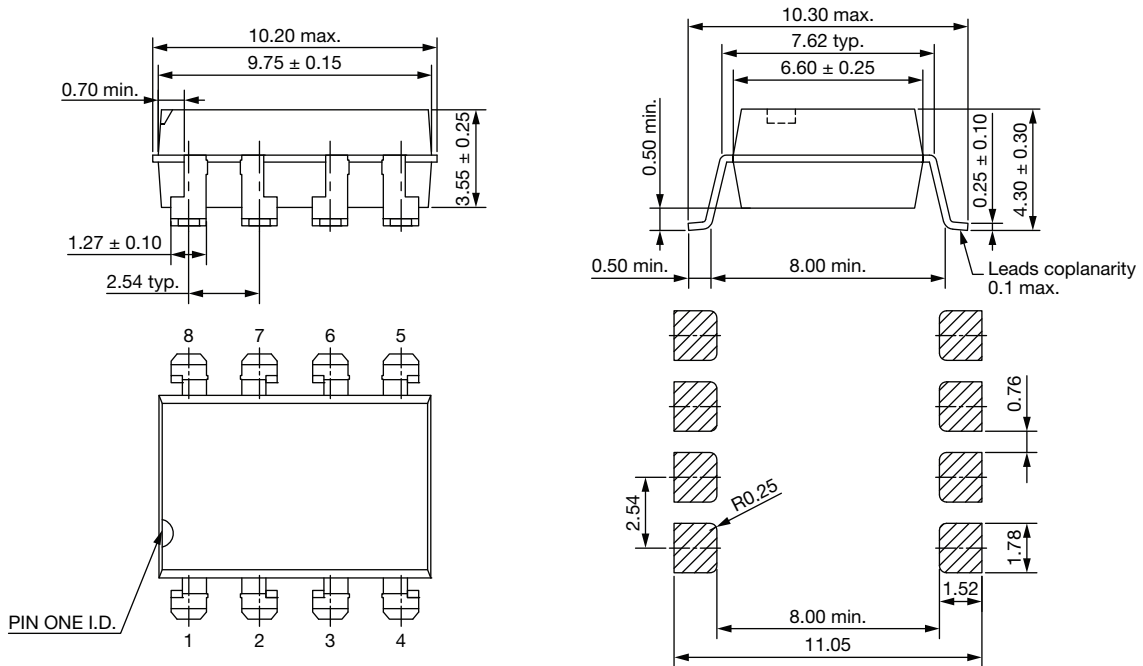




DIP-16

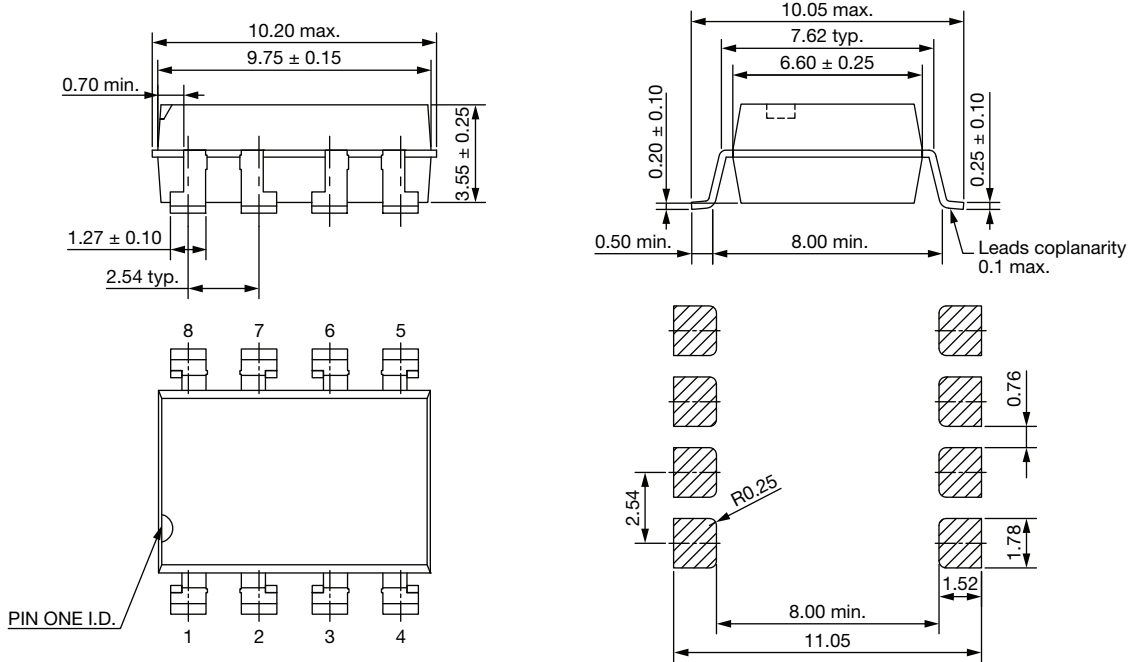


SMD-8, Option 7

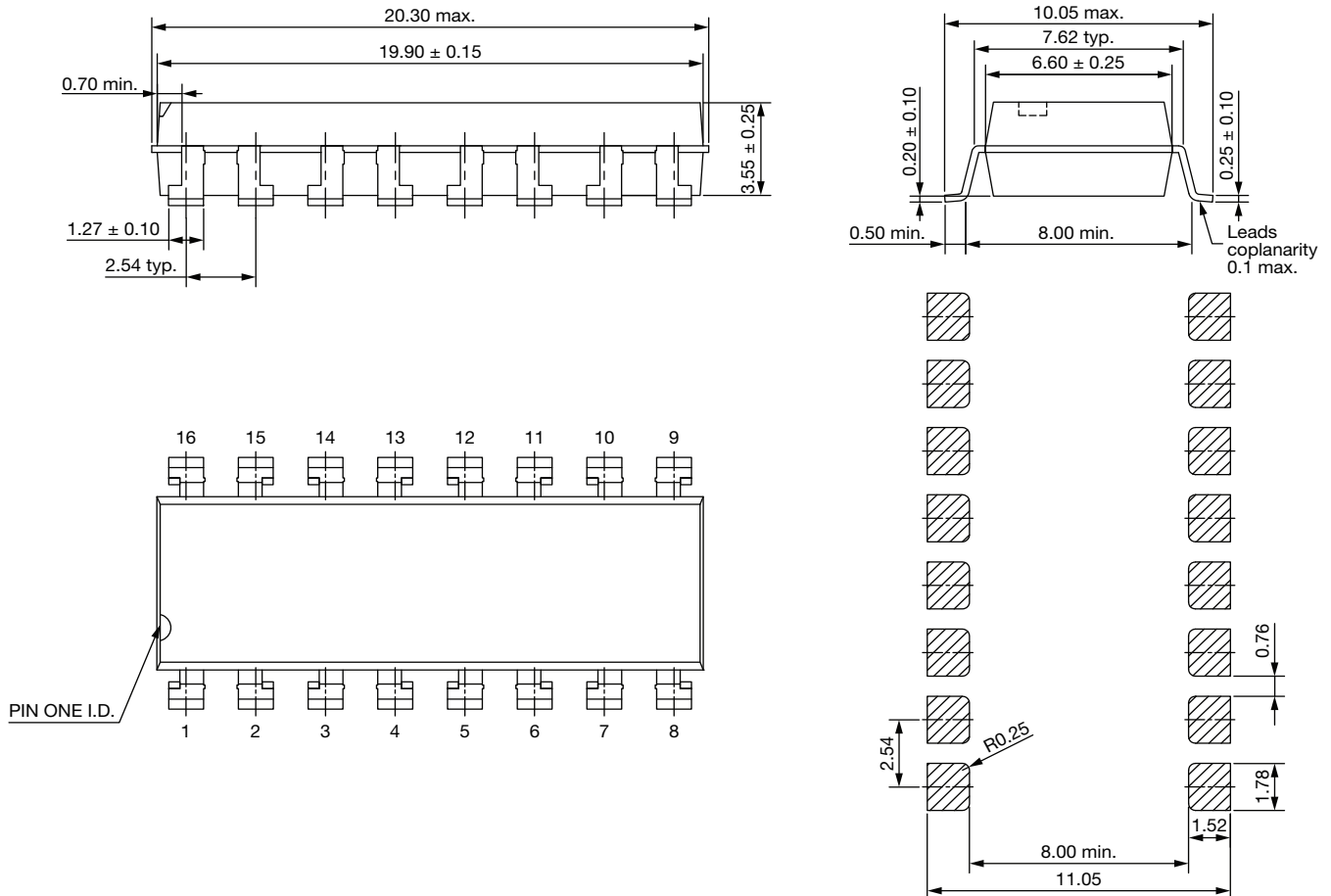




SMD-8, Option 9

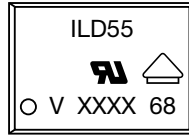


SMD-16, Option 9





PACKAGE MARKING (example)



Notes

- XXXX = LMC (lot marking code)
- Only option 1 and 7 reflected in the package marking
- The 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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