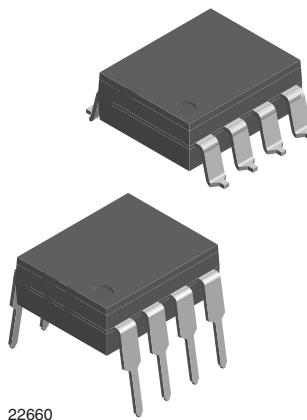
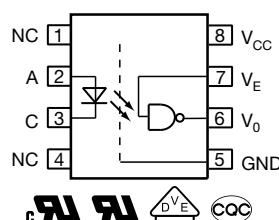


Widebody, High Isolation, High Speed Optocoupler, 10 MBd



22660



DESCRIPTION

Both 10 MBd widebody optocouplers consist of a GaAlAs infrared emitting diode, optically coupled with an integrated photo detector. The detector incorporating an integral Faraday shield provides a high level of noise isolation, required by high power switching applications.

Vishay's 10 MBd widebody couplers feature a high level of isolation distance, exhibiting an external creepage distance of > 10 mm. This makes these parts ideal for applications with working voltages exceeding 1000 V.

FEATURES

- External creepage > 10 mm
- Reinforced isolation
- Internal shield for very high input to output noise isolation
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

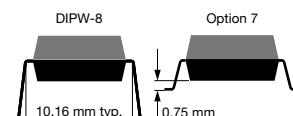
- Solar inverters
- Industrial motor drives
- Welding equipment
- Isolated industrial communication
- Ground loop elimination
- Noise isolation of sensitive circuits

AGENCY APPROVALS

The safety application model number covering all products in this datasheet is VOW137. This model number should be used when consulting safety agency documents.

- UL1577
- cUL
- DIN EN 60747-5-5 (VDE 0884)
- CQC

ORDERING INFORMATION												
V	O	W	#	#	#	#	-	X	0	#	#	T
PART NUMBER						PACKAGE OPTION						
DIP-8, 400 mil, widebody						TAPE AND REEL						
AGENCY CERTIFIED/PACKAGE				CMR (kV/μs)								
VDE, UL, cUL				10				25				
DIP-8, 400 mil, widebody				VOW137-X001				VOW2611-X001				
SMD-8, 400 mil, option 7, widebody				VOW137-X017T				VOW2611-X017T				



TRUTH TABLE		
LED	ENABLE	OUTPUT
On	H	L
Off	H	H
On	L	H
Off	L	H
On	NC	L
Off	NC	H

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Average forward current		I _F	20	mA
Reverse input voltage		V _R	5	V
Enable input voltage		V _E	V _{CC} + 0.5 V	V
Enable input current		I _E	5	mA
Surge current	t = 100 µs	I _{FSM}	200	mA
Input junction temperature		T _J max.	125	°C
Output power dissipation		P _{diss}	35	mW
OUTPUT				
Supply voltage	1 min maximum	V _{CC}	7	V
Output current		I _O	50	mA
Output voltage		V _O	7	V
Output junction temperature		T _J max.	125	°C
Output power dissipation		P _{diss}	85	mW
COPLER				
Isolation voltage	t = 1 min	V _{ISO}	5300	V _{RMS}
Storage temperature		T _{stg}	-55 to +150	°C
Operating temperature		T _{amb}	-40 to +100	°C
Lead solder temperature	for 10 s		260	°C
Solder reflow temperature ⁽¹⁾			260	°C

Notes

- 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 time can adversely affect reliability.

⁽¹⁾ Refer to reflow profile for soldering conditions for surface mounted devices (SMDW). Refer to wave profile for soldering conditions for through hole devices (DIPW).

RECOMMENDED OPERATING CONDITIONS					
PARAMETER	TEST CONDITION	SYMBOL	MIN.	MAX.	UNIT
Operating temperature		T _{amb}	-40	100	°C
Supply voltage		V _{CC}	4.5	5.5	V
Input current low level		I _{FL}	0	250	µA
Input current high level		I _{FH}	5	15	mA
Logic high enable voltage		V _{EH}	2	V _{CC}	V
Logic low enable voltage		V _{EL}	0	0.8	V
Output pull up resistor		R _L	330	4K	Ω
Fanout	R _L = 1 kΩ	N		5	-

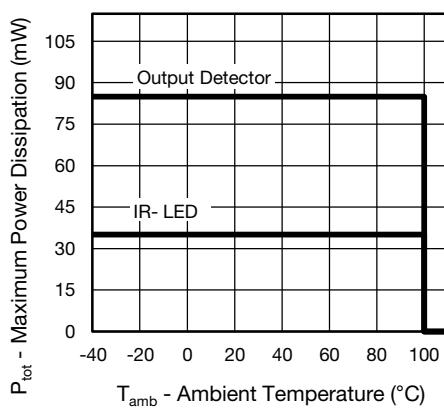


Fig. 1 - Dissipated Power vs. Ambient Temperature

ELECTRICAL CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Input forward voltage	$I_F = 10 \text{ mA}$	V_F	1.1	1.4	1.7	V
Reverse current	$V_R = 5 \text{ V}$	I_R		0.01	10	μA
Input capacitance	$f = 1 \text{ MHz}, V_F = 0 \text{ V}$	C_I		38		pF
OUTPUT						
High level supply current	$V_E = 0.5 \text{ V}, I_F = 0 \text{ mA}$	I_{CCH}		4.3	10	mA
	$V_E = V_{CC}, I_F = 0 \text{ mA}$	I_{CCH}		3.3		mA
Low level supply current	$V_E = 0.5 \text{ V}, I_F = 10 \text{ mA}$	I_{CCL}		4.3	13	mA
	$V_E = V_{CC}, I_F = 10 \text{ mA}$	I_{CCL}		3.3	6	mA
High level output current	$V_E = 2 \text{ V}, V_O = 5.5 \text{ V}, I_F = 250 \mu\text{A}$	I_{OH}		0.02	10	μA
Low level output voltage	$V_E = 2 \text{ V}, I_F = 5 \text{ mA}, I_{OL} (\text{sinking}) = 13 \text{ mA}$	V_{OL}		0.2	0.6	V
Input threshold current	$V_E = 2 \text{ V}, V_O = 0.6 \text{ V}, I_{OL} (\text{sinking}) = 13 \text{ mA}$	I_{TH}		2.4	5	mA
Input-output capacitance	$f = 1 \text{ MHz}, T_{amb} = 25^\circ\text{C}$	C_{IO}		0.9		pF
High level enable current	$V_E = 2 \text{ V}$	I_{EH}		-0.6	-1.6	mA
Low level enable current	$V_E = 0.5 \text{ V}$	I_{EL}		-0.8	-1.6	mA
High level enable voltage		V_{EH}	2			V
Low level enable voltage		V_{EL}			0.8	V

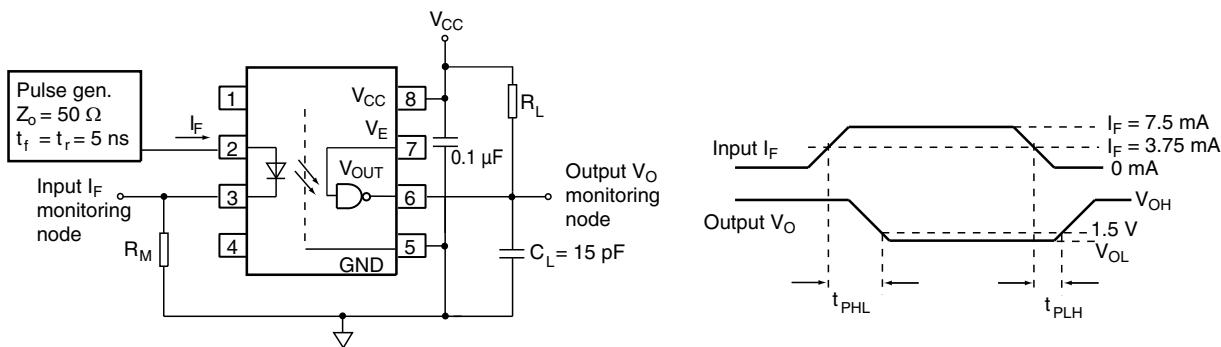
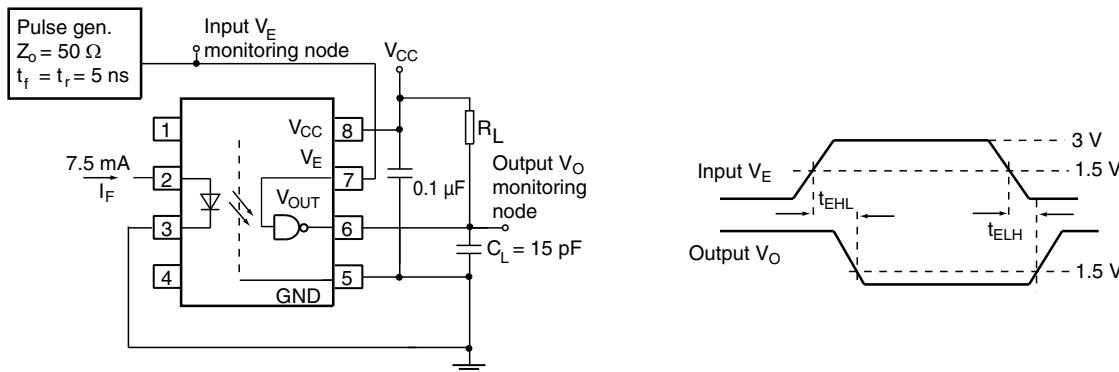
Notes

- Over recommended temperature ($T_{amb} = -40^\circ\text{C}$ to $+100^\circ\text{C}$), $V_{CC} = 5 \text{ V}$, $I_F = 7.5 \text{ mA}$ unless otherwise specified. All typicals at $T_{amb} = 25^\circ\text{C}$, $V_{CC} = 5 \text{ V}$.
- 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.

SWITCHING CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Propagation delay time to high output level	$R_L = 350 \Omega, C_L = 15 \text{ pF}$	t_{PLH}	20	49	100	ns
Propagation delay time to low output level	$R_L = 350 \Omega, C_L = 15 \text{ pF}$	t_{PHL}	25	46	100	ns
Pulse width distortion	$R_L = 350 \Omega, C_L = 15 \text{ pF}$	$ t_{PHL} - t_{PLH} $		3.1	40	ns
Propagation delay skew	$R_L = 350 \Omega, C_L = 15 \text{ pF}$	t_{PSK}		16	40	ns
Output rise time (10 % to 90 %)	$R_L = 350 \Omega, C_L = 15 \text{ pF}$	t_r		14		ns
Output fall time (90 % to 10 %)	$R_L = 350 \Omega, C_L = 15 \text{ pF}$	t_f		7		ns
Propagation delay time of enable from V_{EH} to V_{EL}	$R_L = 350 \Omega, C_L = 15 \text{ pF}, V_{EL} = 0 \text{ V}, V_{EH} = 3 \text{ V}$	t_{ELH}		11		ns
Propagation delay time of enable from V_{EL} to V_{EH}	$R_L = 350 \Omega, C_L = 15 \text{ pF}, V_{EL} = 0 \text{ V}, V_{EH} = 3 \text{ V}$	t_{EHL}		9		ns

Notes

- Over recommended temperature ($T_{amb} = -40^\circ\text{C}$ to $+100^\circ\text{C}$), $V_{CC} = 5 \text{ V}$, $I_F = 7.5 \text{ mA}$ unless otherwise specified. All typicals at $T_{amb} = 25^\circ\text{C}$, $V_{CC} = 5 \text{ V}$.
- 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.


Fig. 2 - Test Circuit for t_{PLH} , t_{PHL} , t_r and t_f

Fig. 3 - Test Circuit for t_{EHL} and t_{ELH}

COMMON MODE TRANSIENT IMMUNITY

PARAMETER	TEST CONDITION	DEVICE	SYMBOL	MIN.	TYP.	MAX.	UNIT
Common mode transient immunity	$ V_{CM} = 1 \text{ kV}$, $V_{CC} = 5 \text{ V}$, $I_F = 0 \text{ mA}$ (1)(2)(3)(4)	VOW137	$ CM_H $	10 000			$\text{V}/\mu\text{s}$
	$ V_{CM} = 1 \text{ kV}$, $V_{CC} = 5 \text{ V}$, $I_F = 0 \text{ mA}$ (1)(2)(5)	VOW2611	$ CM_H $	25 000	40 000		$\text{V}/\mu\text{s}$
	$ V_{CM} = 1 \text{ kV}$, $V_{CC} = 5 \text{ V}$, $I_F = 7.5 \text{ mA}$ (1)(2)(3)(4)	VOW137	$ CM_L $	10 000			$\text{V}/\mu\text{s}$
	$ V_{CM} = 1 \text{ kV}$, $V_{CC} = 5 \text{ V}$, $I_F = 7.5 \text{ mA}$ (1)(2)(5)	VOW2611	$ CM_L $	25 000	40 000		$\text{V}/\mu\text{s}$

Notes

- (1) Over recommended temperature ($T_{amb} = -40^\circ\text{C}$ to $+100^\circ\text{C}$), $V_{CC} = 5 \text{ V}$, $I_F = 7.5 \text{ mA}$ unless otherwise specified. All typicals at $T_{amb} = 25^\circ\text{C}$, $V_{CC} = 5 \text{ V}$.
- (2) 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.
- (3) With pulling V_E to logic high state will improve the CMR performance.
- (4) VOW137 CMTI test circuit refer to figure 4.
- (5) VOW2611 CMTI test circuit refer to figure 5.

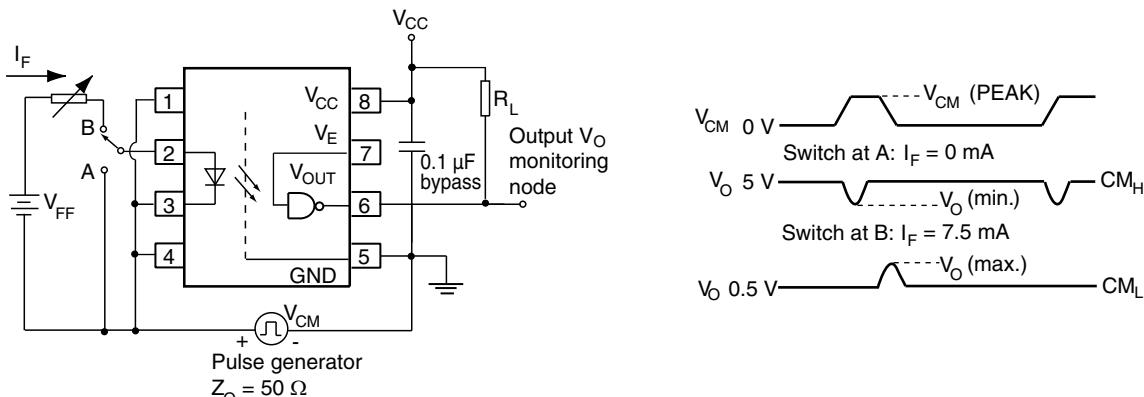


Fig. 4 - VOW137 Test Circuit for Common Mode Transient Immunity

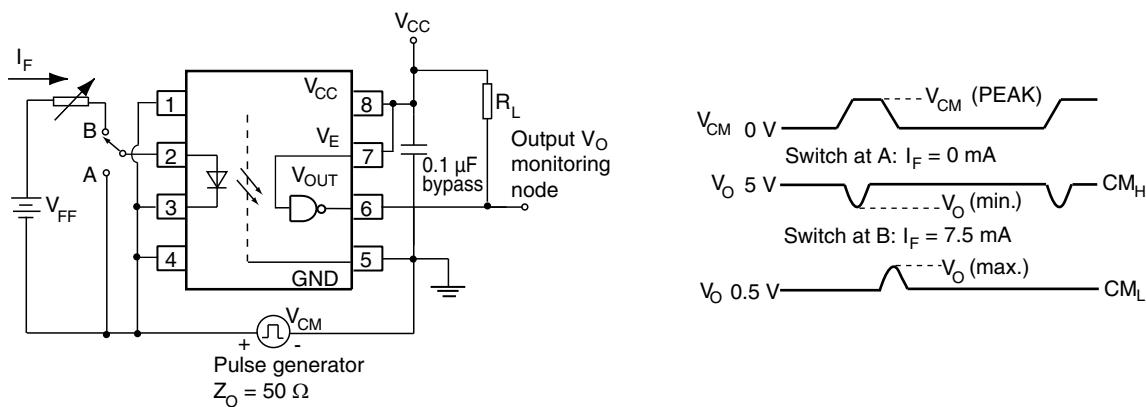


Fig. 5 - VOW2611 Test Circuit for Common Mode Transient Immunity

SAFETY AND INSULATION RATINGS				
PARAMETER		SYMBOL	VALUE	UNIT
MAXIMUM SAFETY RATINGS				
Output safety power		P _{SO}	700	mW
Input safety current		I _{si}	350	mA
Safety temperature		T _S	150	°C
Comparative tracking index		CTI	250	
INSULATION RATED PARAMETERS				
Maximum withstanding isolation voltage t = 1 min		V _{ISO}	5300	V _{RMS}
Maximum transient isolation voltage		V _{IOTM}	8000	V _{peak}
Maximum repetitive peak isolation voltage		V _{IORM}	1414	V _{peak}
Insulation resistance T _{amb} = 25 °C, V _{DC} = 500 V		R _{IO}	≥ 10 ¹²	Ω
Isolation resistance T _{amb} = 100 °C, V _{DC} = 500 V		R _{IO}	≥ 10 ¹¹	Ω
Input to output test voltage, method b V _{IORM} x 1.875 = V _{PR} , 100 % production test with t _M = 1 s, partial discharge < 5 pC		V _{PR}	2651	V _{peak}
Input to output test voltage, method a V _{IORM} x 1.6 = V _{PR} , 100 % production test with t _M = 10 s, partial discharge < 5 pC		V _{PR}	2262	V _{peak}
Climatic classification (according to IEC 68 part 1)			55/100/21	
Environment (pollution degree in accordance to DIN VDE 0109)			2	
Clearance distance (DIP-8, widebody)			≥ 10	mm
Creepage distance (DIP-8, widebody)			≥ 10	mm
Insulation thickness		DTI	≥ 0.4	mm

Note

- As per IEC 60747-5-5, §7.4.3.8.1, 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.

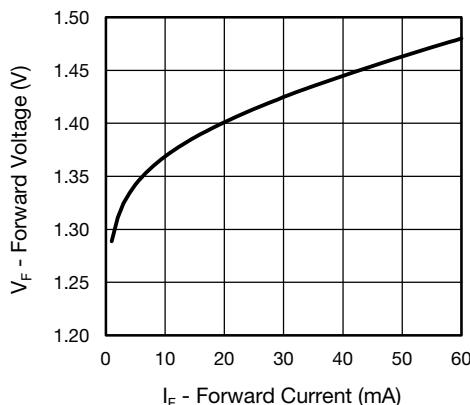
TYPICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)


Fig. 6 - Forward Voltage vs. Forward Current

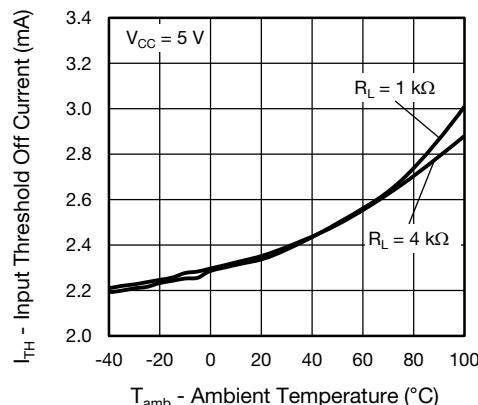


Fig. 9 - Input Threshold Off Current vs. Ambient Temperature

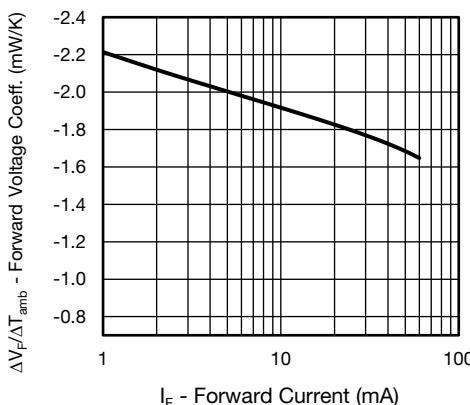


Fig. 7 - Forward Voltage Coefficient vs. Forward Current

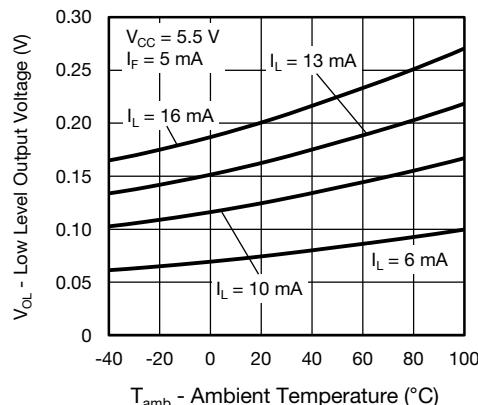


Fig. 10 - Low Level Output Voltage vs. Ambient Temperature

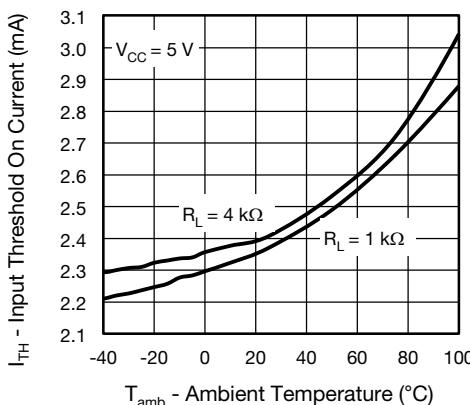


Fig. 8 - Input Threshold On Current vs. Ambient Temperature

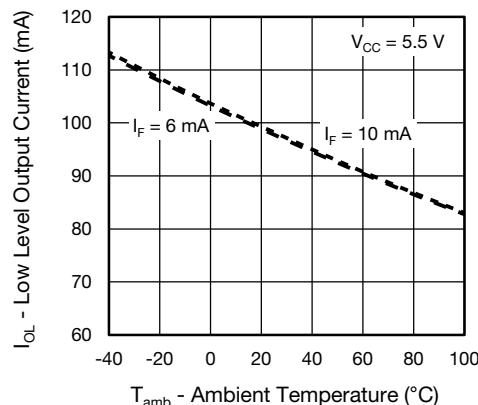


Fig. 11 - Low Level Output Current vs. Ambient Temperature

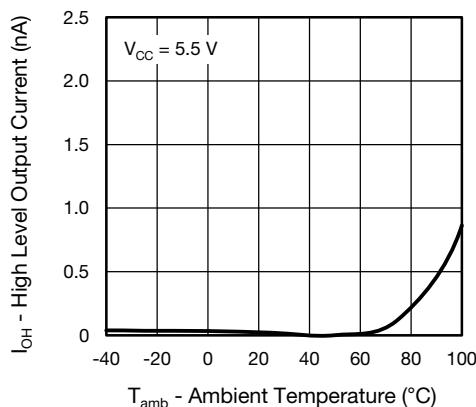


Fig. 12 - High Level Output Current vs. Ambient Temperature

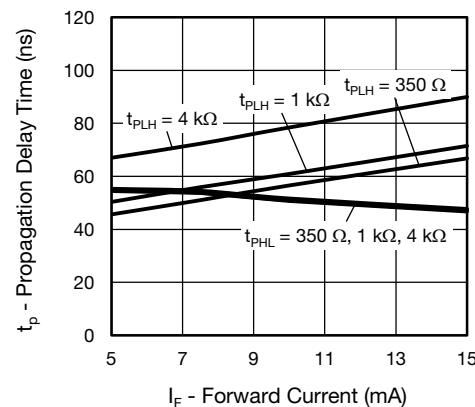


Fig. 15 - Propagation Delay vs. Forward Current

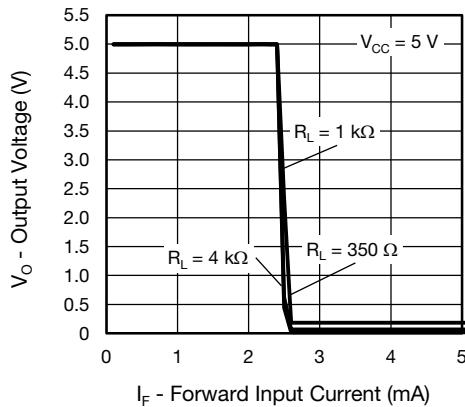


Fig. 13 - Output Voltage vs. Forward Current

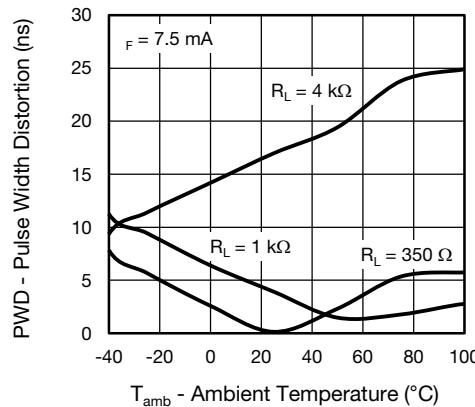


Fig. 16 - Pulse Width Distortion vs. Ambient Temperature

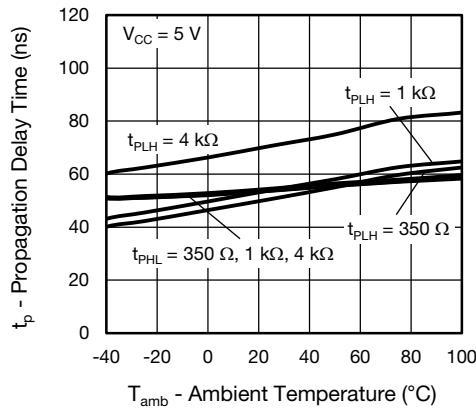


Fig. 14 - Propagation Delay vs. Ambient Temperature

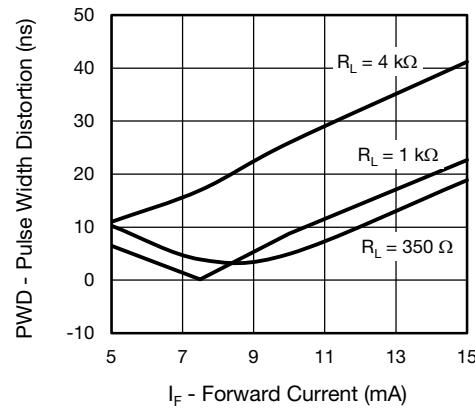


Fig. 17 - Pulse Width Distortion vs. Forward Current

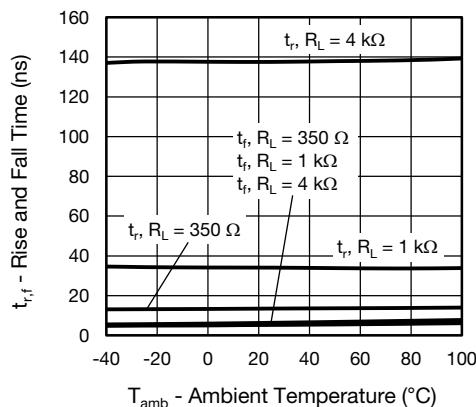


Fig. 18 - Rise and Fall Time vs. Ambient Temperature

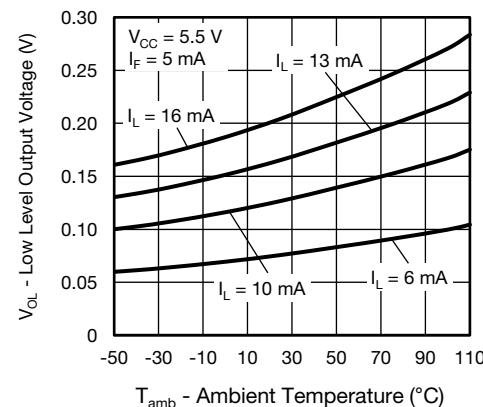


Fig. 21 - Low Level Output Voltage vs. Ambient Temperature

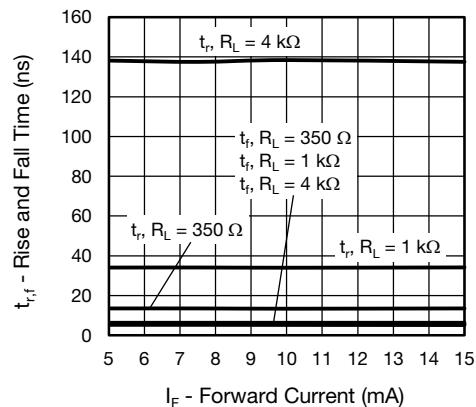


Fig. 19 - Rise and Fall Time vs. Forward Current

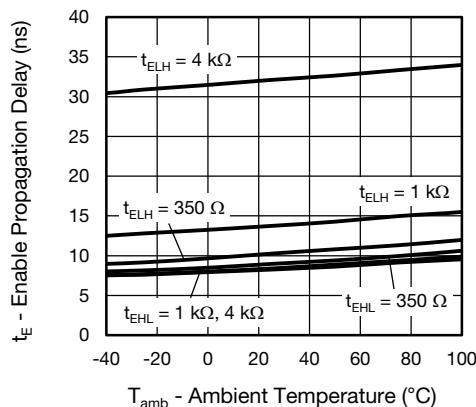
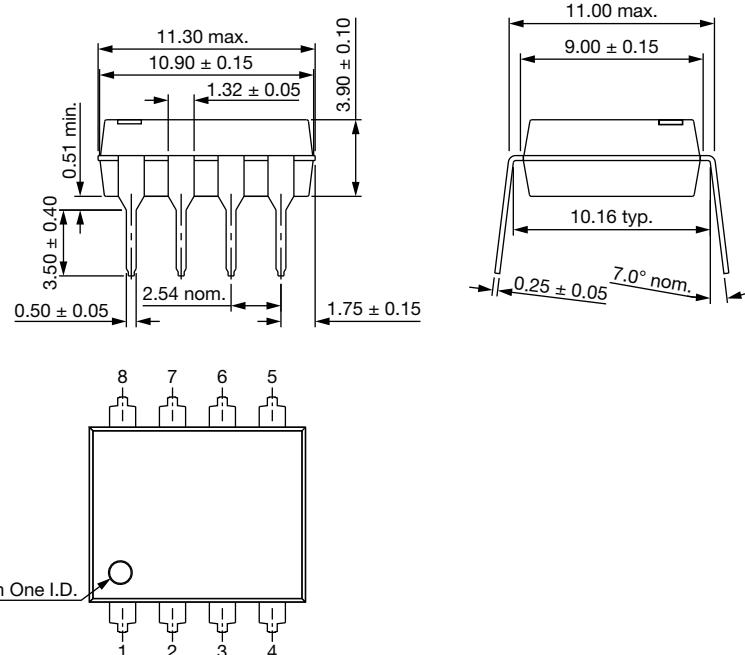


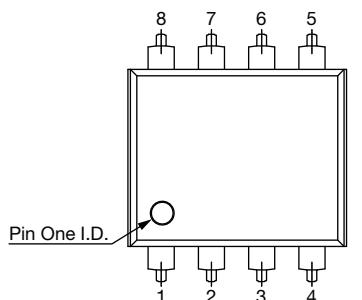
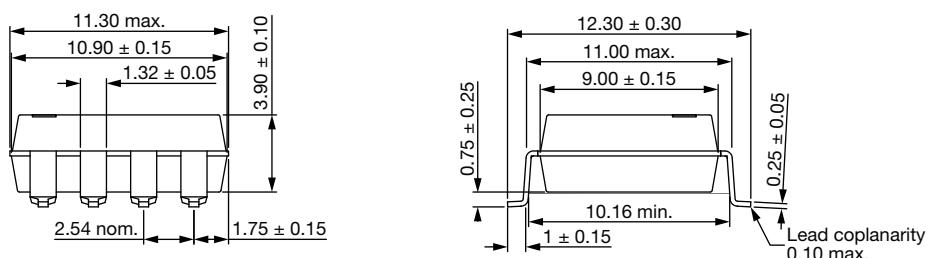
Fig. 20 - Enable Propagation Delay vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters

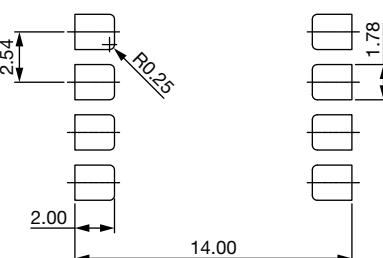
DIP-8, widebody



SMD-8, widebody, (Option 7)



Recommended Footprint



PACKAGE MARKING (Example of VOW137-X017T)



Note

- Tape and reel suffix (T) is not part of the package marking.

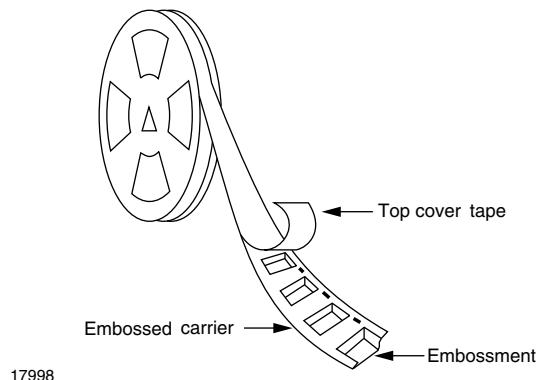
PACKING INFORMATION (Tape and Reel)


Fig. 22 - Tape and Reel Shipping Medium

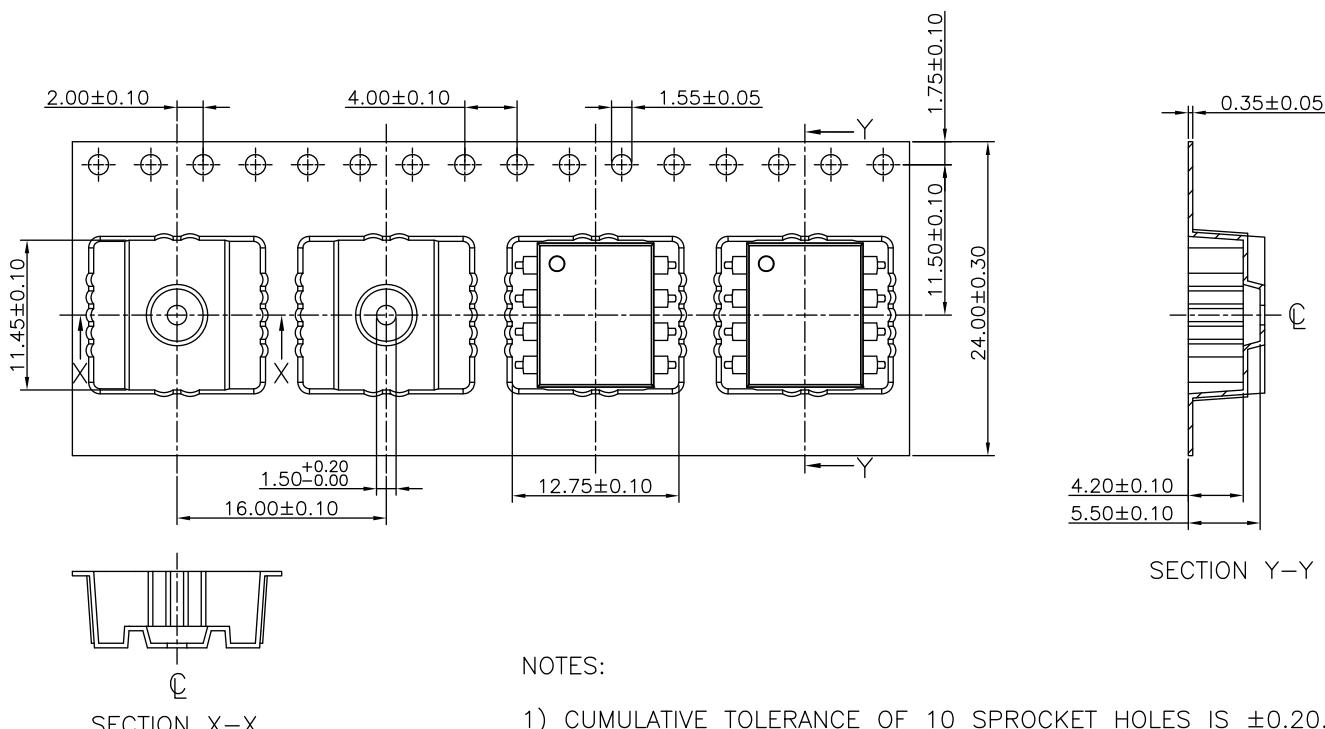
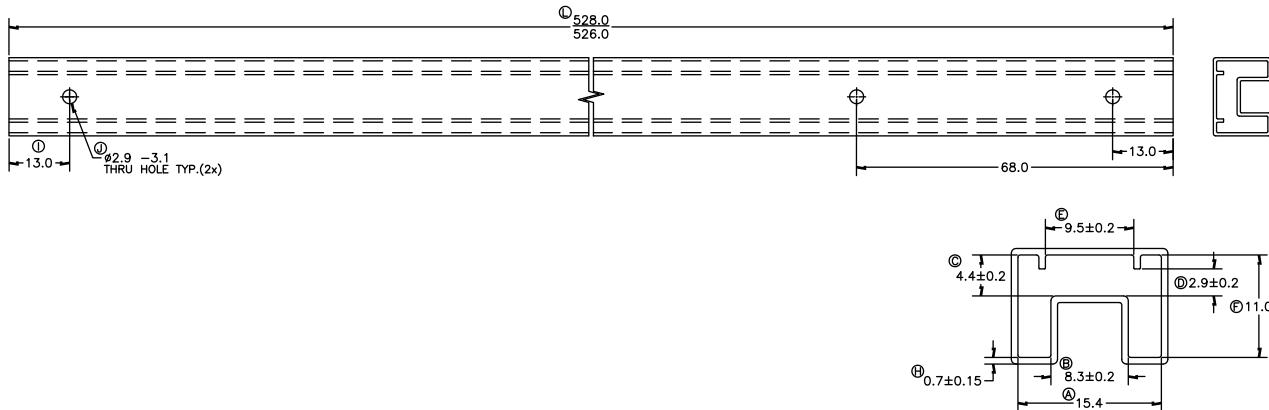


Fig. 23 - Tape and Reel Packing Option 7 (750 parts per reel)

PACKING INFORMATION (Tubes)

DEVICE PER TUBE			
TYPE	UNITS/TUBE	TUBE/BOX	UNITS/BOX
DIP-8, widebody	40	30	1200



TUBE COLOUR:	CLEAR
PRINT COLOUR:	-

1. ALL DIMENSIONS ARE IN MILLIMETERS, U.O.S.

1. ALL TUBE TOLERANCES TO BE ± 0.25 UNLESS OTHERWISE SPECIFIED.
2. ALL RADII AND ANGLES REFERENCE ONLY, UNLESS OTHERWISE SPECIFIED.



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Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.



OCEAN CHIPS

Океан Электроники

Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибутором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибутором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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