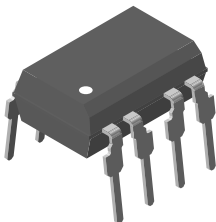


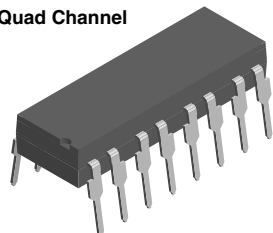


Optocoupler, Phototransistor Output (Multichannel)

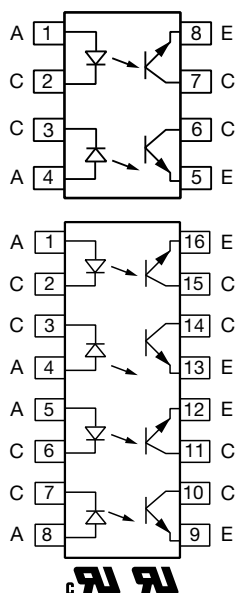
Dual Channel



Quad Channel



H79015-1



DESCRIPTION

The CNY74-2H, CNY74-4H is an optically coupled pair with a GaAlAs infrared LED and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output.

The CNY74-2H, CNY74-4H is especially for driving medium-speed logic, where it may be used to eliminate troublesome ground loop and noise problems. Also it can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CTR modulation.

The CNY74-2H has two isolated channels in a single DIP package; the CNY74-4H has four isolated channels per package.

FEATURES

- CNY74-2H, CNY74-4H TTL compatible
- Transfer ratio, 35 % typical
- Coupling capacitance, 0.5 pF
- Dual and quad channel
- Industry standard DIP packages
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

LINKS TO ADDITIONAL RESOURCES

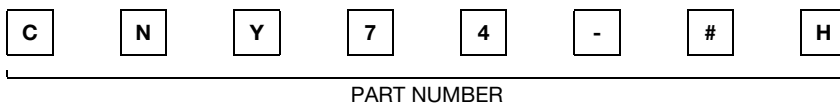


Product Page

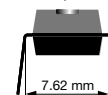
AGENCY APPROVALS

- [UL](#)
- [cUL](#)

ORDERING INFORMATION



DIP-6, DIP-8



AGENCY CERTIFIED/PACKAGE	CTR (%)
UL	50 to 600
DIP-8, dual channel	CNY74-2H
DIP-16, quad channel	CNY74-4H

Note

- Additional options may be possible, please contact sales office



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)					
PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
INPUT					
Peak reverse voltage			V_R	3	V
Forward continuous current			I_F	60	mA
Power dissipation			P_{diss}	100	mW
Derate linearly from 55 %				1.33	mW/ $^{\circ}\text{C}$
OUTPUT					
Collector emitter breakdown voltage			BV_{CEO}	70	V
Emitter collector breakdown voltage			BV_{ECO}	7	V
Power dissipation			P_{diss}	150	mW
Derate linearly from 25 $^{\circ}\text{C}$				2	mW/ $^{\circ}\text{C}$
COUPLER					
Total package dissipation		CNY74-2H	P_{tot}	400	mW
		CNY74-4H	P_{tot}	500	mW
Derate linearly from 25 $^{\circ}\text{C}$		CNY74-2H		5.33	mW/ $^{\circ}\text{C}$
		CNY74-4H		6.67	mW/ $^{\circ}\text{C}$
Storage temperature			T_{stg}	-55 to +150	$^{\circ}\text{C}$
Operating temperature			T_{amb}	-55 to +100	$^{\circ}\text{C}$
Lead soldering time at 260 $^{\circ}\text{C}$				10	s

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.

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	-	1.3	1.5	V
Reverse current	$V_R = 3\text{ V}$	I_R	-	0.1	100	μA
Capacitance	$V_R = 0\text{ V}$	C_O	-	25	-	pF
OUTPUT						
Collector emitter breakdown voltage	$I_C = 1\text{ mA}$	BV_{CEO}	70	-	-	V
Collector emitter leakage current	$V_{CE} = 5\text{ V}$, $I_F = 0\text{ A}$	I_{CEO}	-	-	100	nA
Capacitance collector emitter	$V_{CE} = 0\text{ V}$, $f = 1\text{ Hz}$	C_{CE}	-	10	-	pF
COUPLER						
Saturation voltage, collector emitter	$I_C = 2\text{ mA}$, $I_F = 16\text{ mA}$	V_{CEsat}	-	0.3	0.5	V
Resistance (input to output)		R_{IO}	-	100	-	$\text{G}\Omega$
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						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
DC current transfer ratio	$I_F = 5\text{ mA}$, $V_{CE} = 5\text{ V}$	CTR	50	-	600	%
DC current transfer ratio	$I_F = 10\text{ mA}$, $V_{CE} = 5\text{ V}$	CTR	60	-	-	%

**SWITCHING CHARACTERISTICS**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Delay time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see Fig. 1)	t_d	-	3	-	μs
Rise time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see Fig. 1)	t_r	-	3	-	μs
Fall time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see Fig. 1)	t_f	-	4.7	-	μs
Storage time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see Fig. 1)	t_s	-	0.3	-	μs
Turn-on time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see Fig. 1)	t_{on}	-	6	-	μs
Turn-off time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see Fig. 1)	t_{off}	-	5	-	μs
Turn-on time	$V_S = 5\text{ V}$, $I_C = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$ (see Fig. 2)	t_{on}	-	9	-	μs
Turn-off time	$V_S = 5\text{ V}$, $I_C = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$ (see Fig. 2)	t_{off}	-	18	-	μs

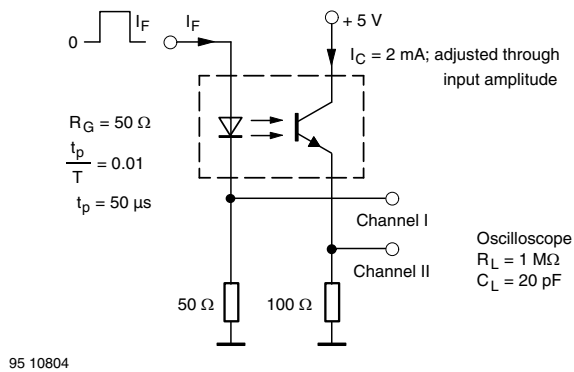


Fig. 1 - Test Circuit, Non-Saturated Operation

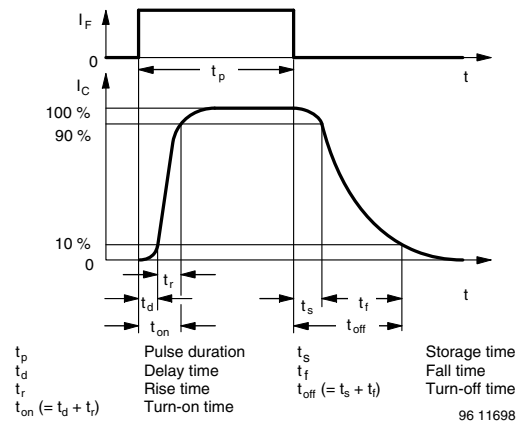


Fig. 3 - Switching Times

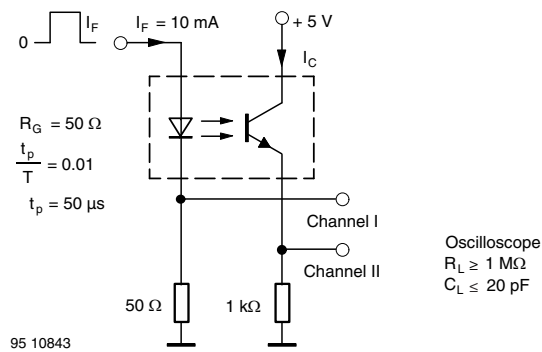


Fig. 2 - Test Circuit, Saturated Operation



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.

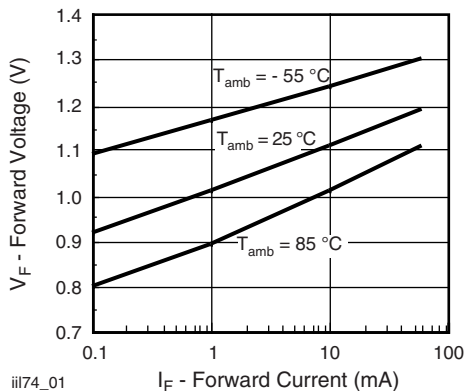
TYPICAL CHARACTERISTICS ($T_{amb} = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified)

Fig. 4 - Forward Voltage vs. Forward Current

Fig. 5 - Normalized Non-Saturated and Saturated CTR vs. LED Current

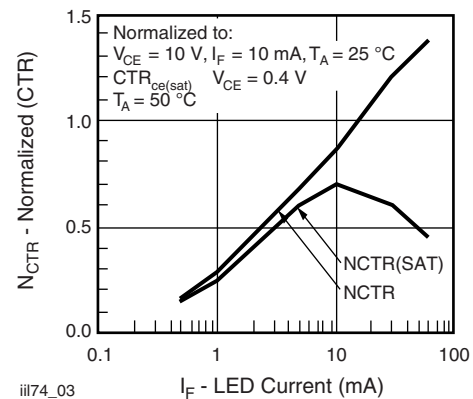
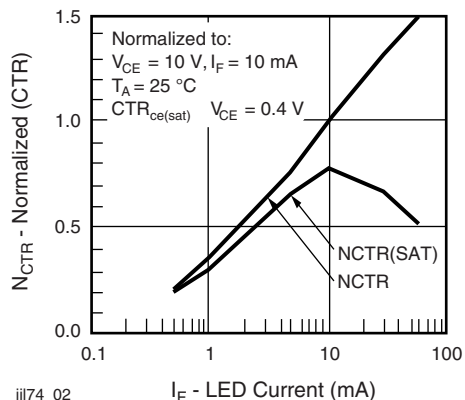


Fig. 6 - Normalized Non-Saturated and Saturated CTR vs. LED Current



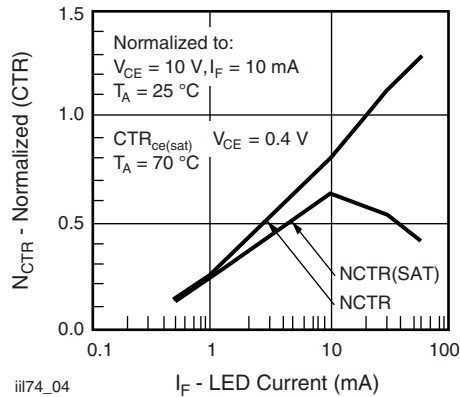


Fig. 7 - Normalized Non-Saturated and Saturated CTR vs. LED Current

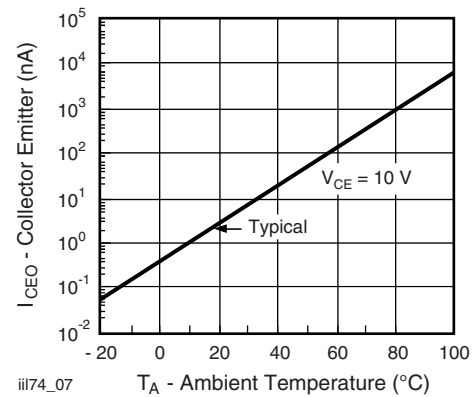


Fig. 10 - Collector Emitter Leakage Current vs. Temperature

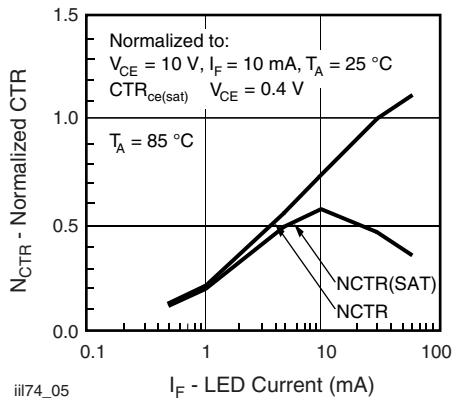


Fig. 8 - Normalized Non-Saturated and Saturated CTR vs. LED Current

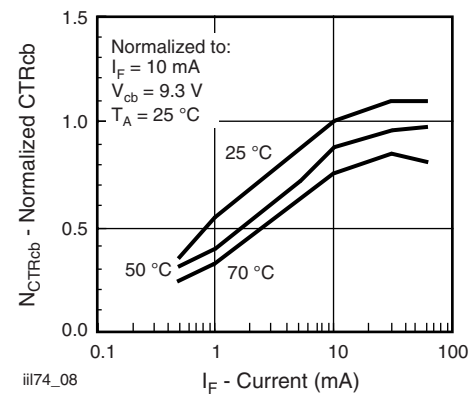
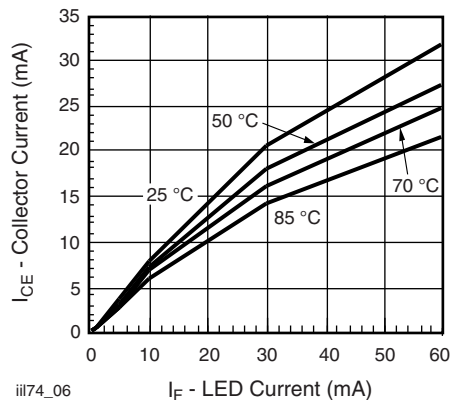
Fig. 11 - Normalized CTR_{cb} vs. LED Current and Temperature

Fig. 9 - Collector Emitter Current vs. Temperature and LED Current

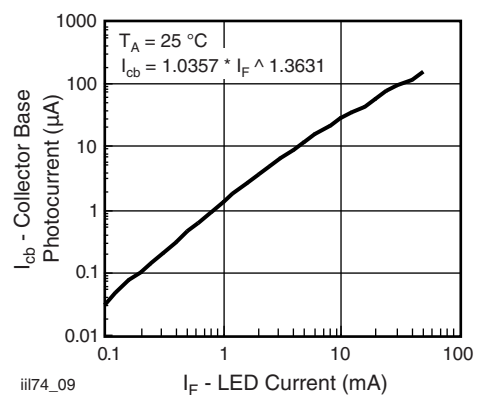


Fig. 12 - Collector Base Photocurrent vs. LED Current

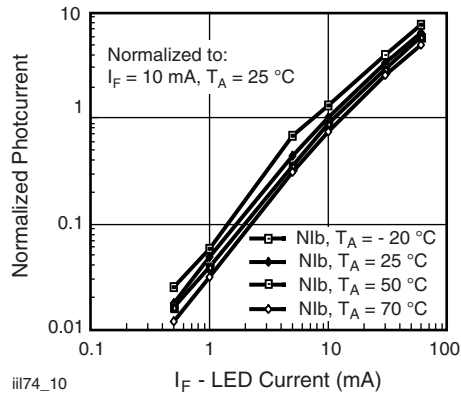
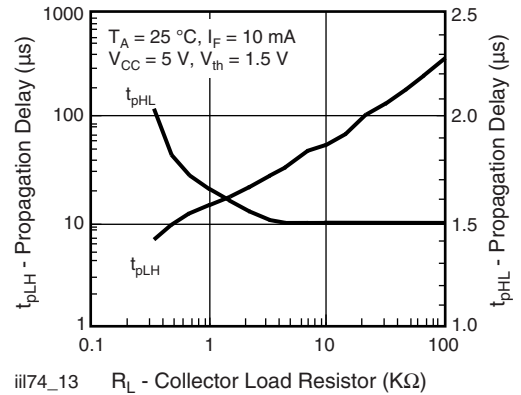
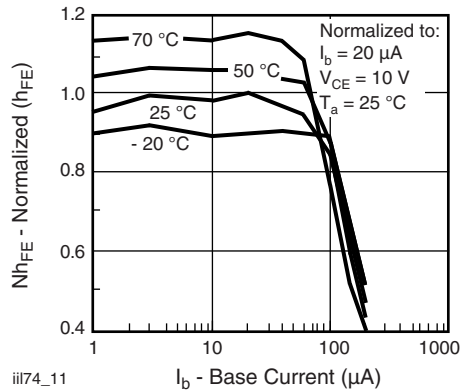
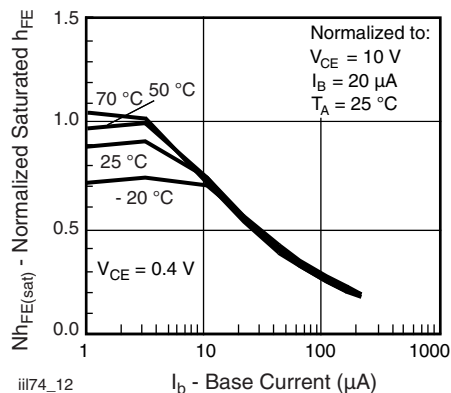
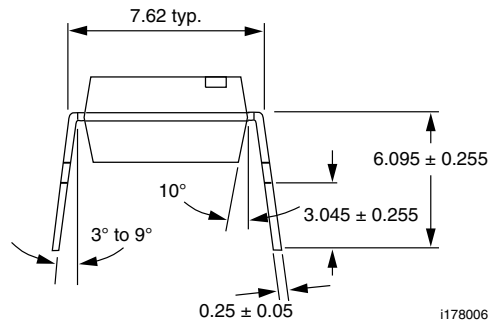
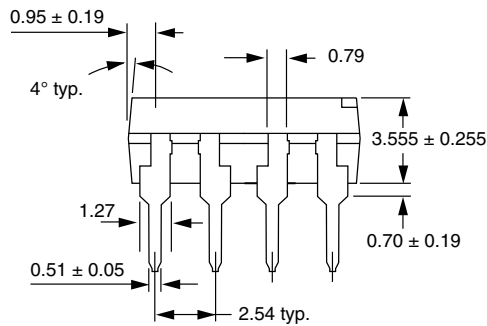
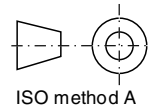
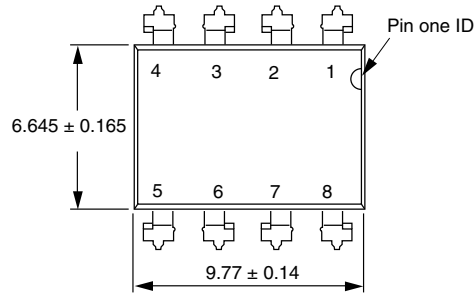
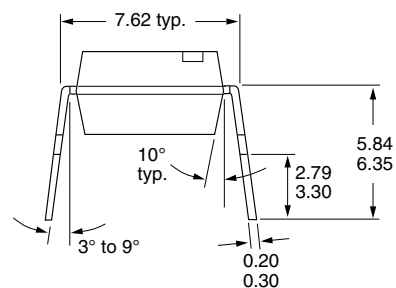
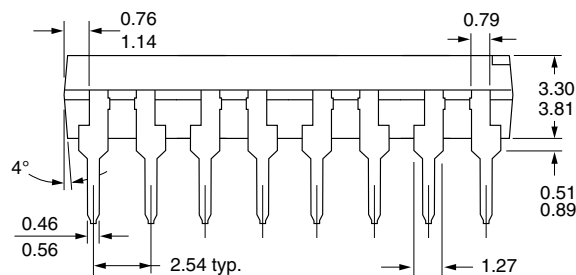
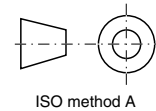
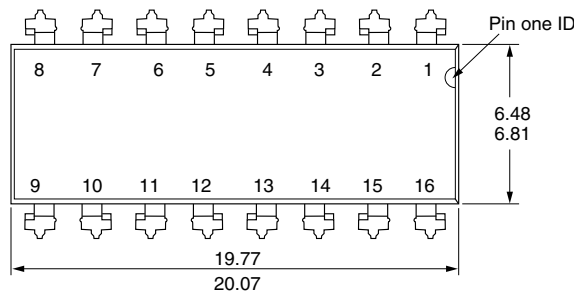
Fig. 13 - Normalized Photocurrent vs. I_F and Temperature

Fig. 16 - Propagation Delay vs. Collector Load Resistor

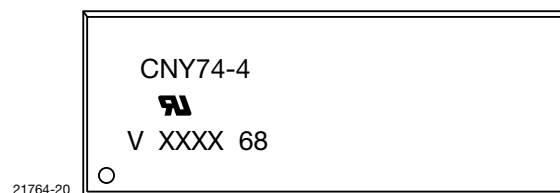
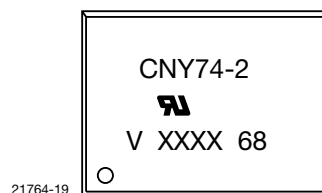
Fig. 14 - Normalized Non-Saturated h_{FE} vs. Base Current and TemperatureFig. 15 - Normalized Saturated h_{FE} vs. Base Current and Temperature

**PACKAGE DIMENSIONS** in millimeters

i178006



i178007

PACKAGE MARKING**Note**

- XXXX = LMC (lot marking code)
- CNY74-2H and CNY74-4H are marked as CNY74-2 and CNY74-4 respectively



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.