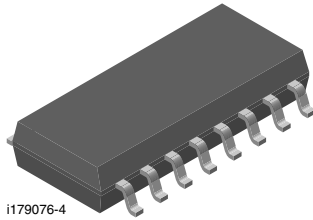
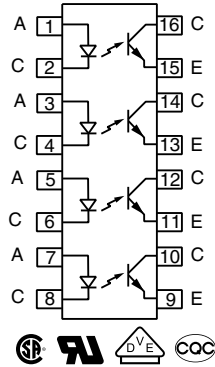


## Optocoupler, Phototransistor Output, Quad Channel, SSOP-16, Half Pitch Mini-Flat Package



i179076-4



### FEATURES

- SSOP (shrink small outline package)
- Isolation test voltage, 3750 V<sub>RMS</sub>
- High collector emitter voltage, V<sub>CEO</sub> = 70 V
- Low saturation voltage
- Fast switching times
- Temperature stable
- Low coupling capacitance
- End stackable, 0.050" (1.27 mm) spacing
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

[Design Tools](#)

[Related Documents](#)

### DESCRIPTION

The SFH6916 has a GaAs infrared emitter, which is optically coupled to a silicon planar phototransistor detector, and is incorporated in a 16 pin 50 mil lead pitch miniflat package. It features a high current transfer ratio, low coupling capacitance, and high isolation voltage.

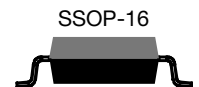
The coupling devices are designed for signal transmission between two electrically separated circuits.

### AGENCY APPROVALS

- [UL1577](#)
- [cUL](#)
- [DIN EN 60747-5-5 \(VDE 0884-5\)](#), available with option 1
- [BSI](#)
- [CQC GB4943.1-2011](#)
- [CQC GB8898-2011](#) (suitable for installation altitude below 2000 m)
- [CSA](#)
- [FIMKO](#)

### ORDERING INFORMATION

S	F	H	6	9	1	6	-	X	0	0	1	T
PART NUMBER								VDE OPTION				TAPE AND REEL



AGENCY CERTIFIED / PACKAGE	CTR (%)
UL, cUL, BSI, CQC, CSA, FIMKO	50 to 300
SSOP-16, quad channel	SFH6916T <sup>(1)</sup>
UL, cUL, VDE (option 1), BSI, CQC, CSA, FIMKO	50 to 300
SSOP-16, quad channel	SFH6916-X001

### Notes

- Additional options may be possible, please contact sales office
- <sup>(1)</sup> Also available in tubes, do not put "T" to the end



<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
Reverse voltage		$V_R$	6	V
DC forward current		$I_F$	50	mA
Surge forward current	$t_p \leq 10\text{ }\mu\text{s}$	$I_{FSM}$	1.5	A
Total power dissipation		$P_{diss}$	80	mW
<b>OUTPUT</b>				
Collector emitter voltage		$V_{CEO}$	70	V
Emitter collector voltage		$V_{ECO}$	7	V
Collector current		$I_C$	50	mA
	$t_p = 1.0\text{ ms}$	$I_C$	100	mA
Total power dissipation per channel		$P_{diss}$	150	mW
<b>COUPLER</b>				
Storage temperature range		$T_{stg}$	-55 to +125	$^{\circ}\text{C}$
Ambient temperature range		$T_{amb}$	-55 to +100	$^{\circ}\text{C}$
Junction temperature		$T_j$	125	$^{\circ}\text{C}$
Soldering temperature <sup>(1)</sup>	Max. 10 s dip soldering distance to seating plane $\geq 1.5\text{ mm}$		260	$^{\circ}\text{C}$
Total power dissipation		$P_{tot}$	250	mW

**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 the time can adversely affect reliability
- <sup>(1)</sup> Refer to reflow profile for soldering conditions for surface mounted devices

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>						
Forward voltage	$I_F = 5\text{ mA}$	$V_F$	-	1.15	1.4	V
Reverse current	$V_R = 6\text{ V}$	$I_R$	-	0.01	10	$\mu\text{A}$
Capacitance	$C_O$	$C_O$	-	8	-	pF
<b>OUTPUT</b>						
Collector emitter leakage current	$V_{CE} = 20\text{ V}$	$I_{CEO}$	-		100	nA
Collector emitter capacitance	$V_{CE} = 5\text{ V}, f = 1\text{ MHz}$	$C_{CE}$	-	6.0	-	pF
<b>COUPLER</b>						
Collector emitter saturation voltage	$I_F = 20\text{ mA}, I_C = 1\text{ mA}$	$V_{CEsat}$	-	0.1	0.4	V
Coupling capacitance	$f = 1\text{ MHz}$	$C_C$	-	1	-	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

<b>CURRENT TRANSFER RATIO</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	$I_F = 5\text{ mA}, V_{CC} = 5\text{ V}$	CTR	50	-	300	%

<b>SWITCHING CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>NON-SATURATED</b>						
Rise time	$I_C = 2\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 100\ \Omega$	$t_r$	-	5.5	-	$\mu\text{s}$
Fall time	$I_C = 2\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 100\ \Omega$	$t_f$	-	7	-	$\mu\text{s}$
Turn-on time	$I_C = 2\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 100\ \Omega$	$t_{on}$	-	9.5	-	$\mu\text{s}$
Turn-off time	$I_C = 2\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 100\ \Omega$	$t_{off}$	-	8.5	-	$\mu\text{s}$
<b>SATURATED</b>						
Turn-on time	$I_F = 10\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 1\text{ k}\Omega$	$t_{on}$	-	3	-	$\mu\text{s}$
Turn-off time	$I_F = 10\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 1\text{ k}\Omega$	$t_{off}$	-	20	-	$\mu\text{s}$

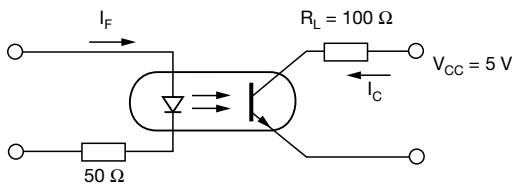


Fig. 1 - Switching Operation (without saturation)

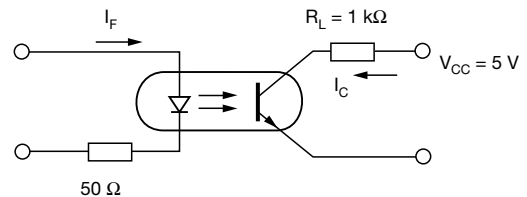


Fig. 2 - Switching Operation (with saturation)

<b>SAFETY AND INSULATION RATINGS</b>				
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	According to UL1577, $t = 1\text{ min}$	$V_{ISO}$	3750	$V_{RMS}$
Maximum transient isolation voltage	According to DIN EN 60747-5-5	$V_{IOTM}$	6000	$V_{peak}$
Maximum repetitive peak isolation voltage	According to DIN EN 60747-5-5	$V_{IORM}$	707	$V_{peak}$
Isolation resistance	$V_{IO} = 500\text{ V}$ , $T_{amb} = 25\text{ }^{\circ}\text{C}$	$R_{IO}$	$\geq 10^{12}$	$\Omega$
	$V_{IO} = 500\text{ V}$ , $T_{amb} = 100\text{ }^{\circ}\text{C}$	$R_{IO}$	$\geq 10^{11}$	$\Omega$
Output safety power		$P_{SO}$	350	mW
Input safety current		$I_{SI}$	200	mA
Safety temperature		$T_S$	175	$^{\circ}\text{C}$
Creepage distance			$\geq 5$	mm
Clearance distance			$\geq 5$	mm
Insulation thickness		DTI	$\geq 0.4$	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)

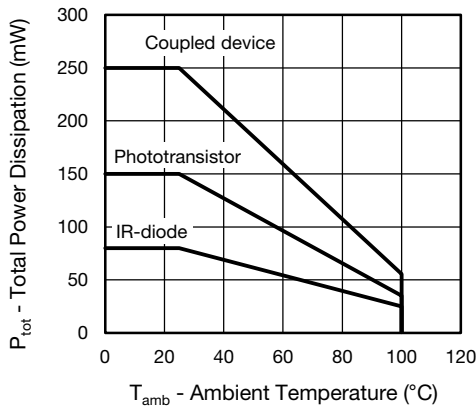


Fig. 3 - Total Power Dissipation vs. Ambient Temperature

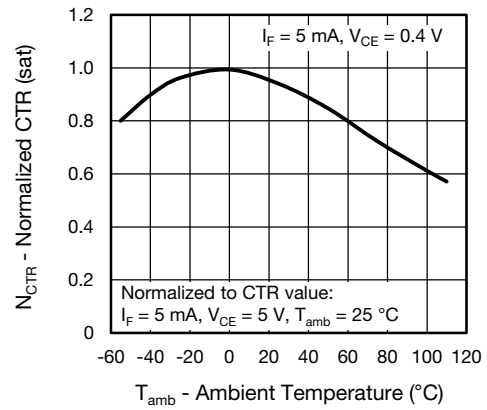


Fig. 6 - Normalized Current Transfer Ratio (saturated) vs. Ambient Temperature

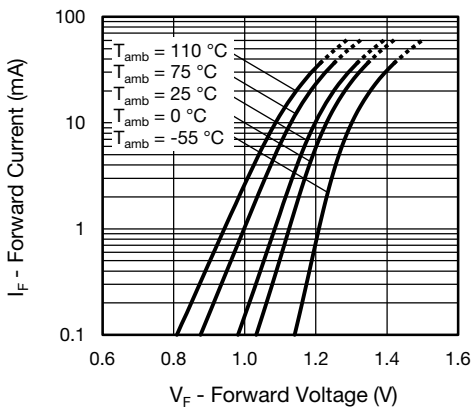


Fig. 4 - Forward Voltage vs. Forward Current

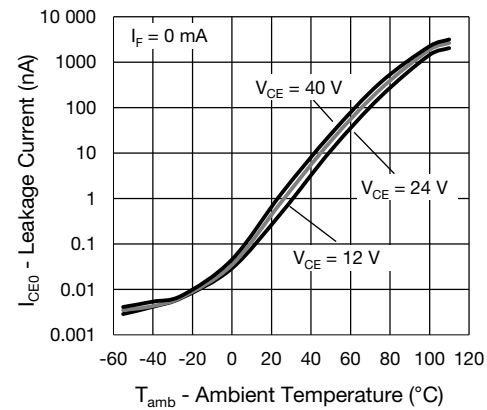


Fig. 7 - Collector Dark Current vs. Ambient Temperature

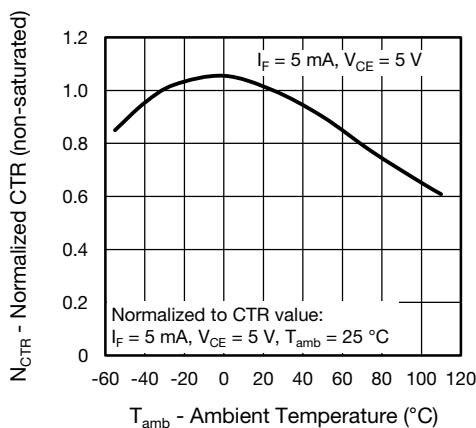


Fig. 5 - Normalized Current Transfer Ratio (non-saturated) vs. Ambient Temperature

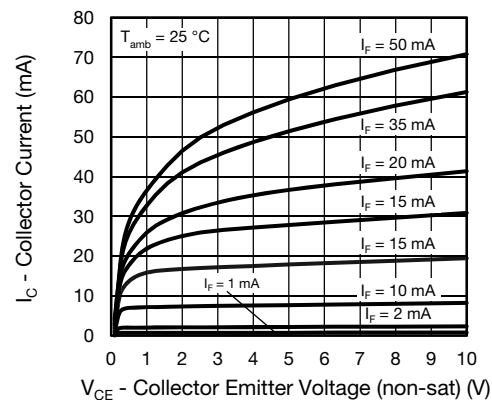


Fig. 8 - Collector Current vs. Collector Emitter Voltage (non-saturated)

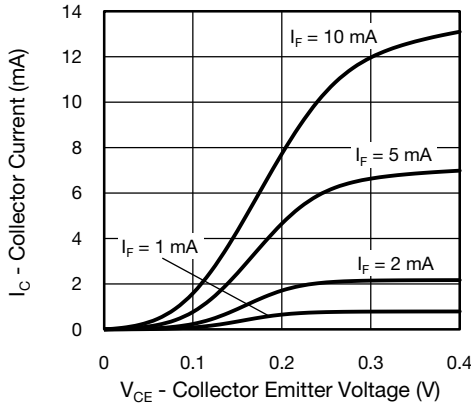


Fig. 9 - Collector Current vs. Collector Emitter Voltage (saturated)

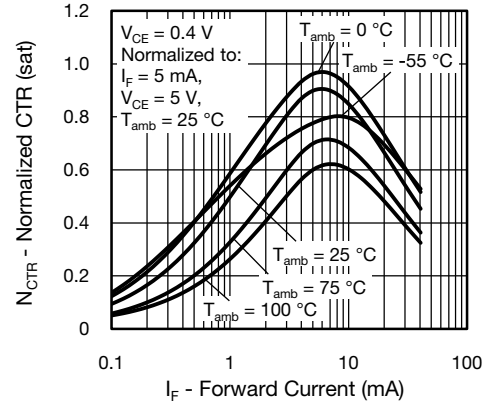


Fig. 12 - Normalized CTR (saturated) vs. Forward Current

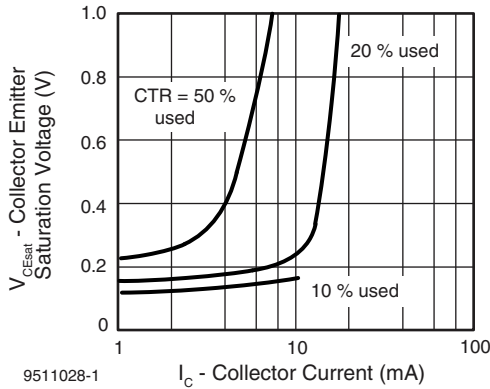


Fig. 10 - Collector Emitter Saturated Voltage vs. Collector Current

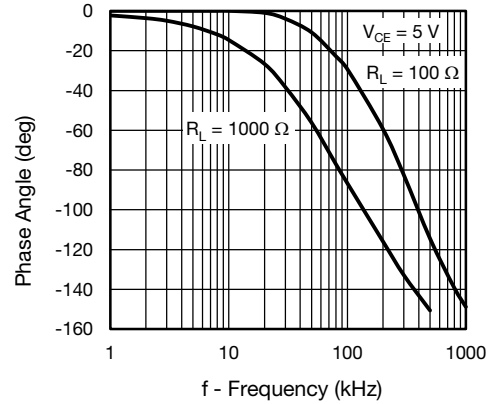


Fig. 13 -  $F_{CTR}$  vs. Phase Angle

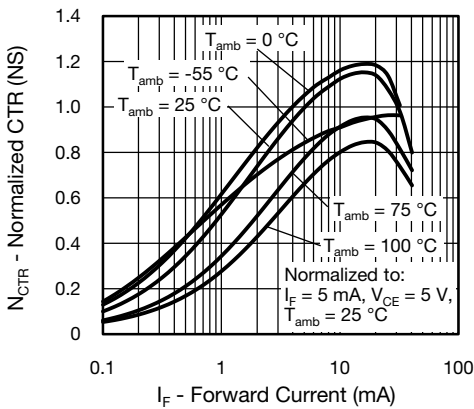


Fig. 11 - Normalized CTR (non-saturated) vs. Forward Current

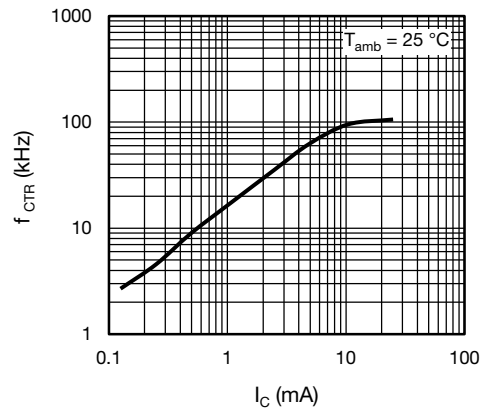


Fig. 14 -  $f_{CTR}$  vs. Collector Current

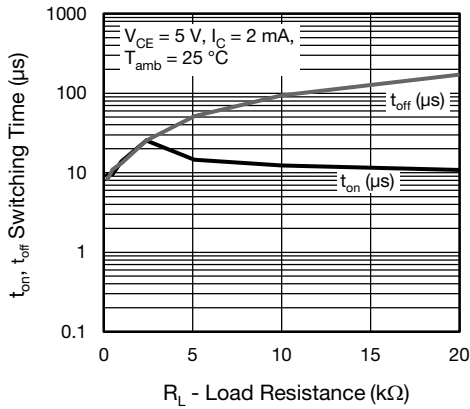
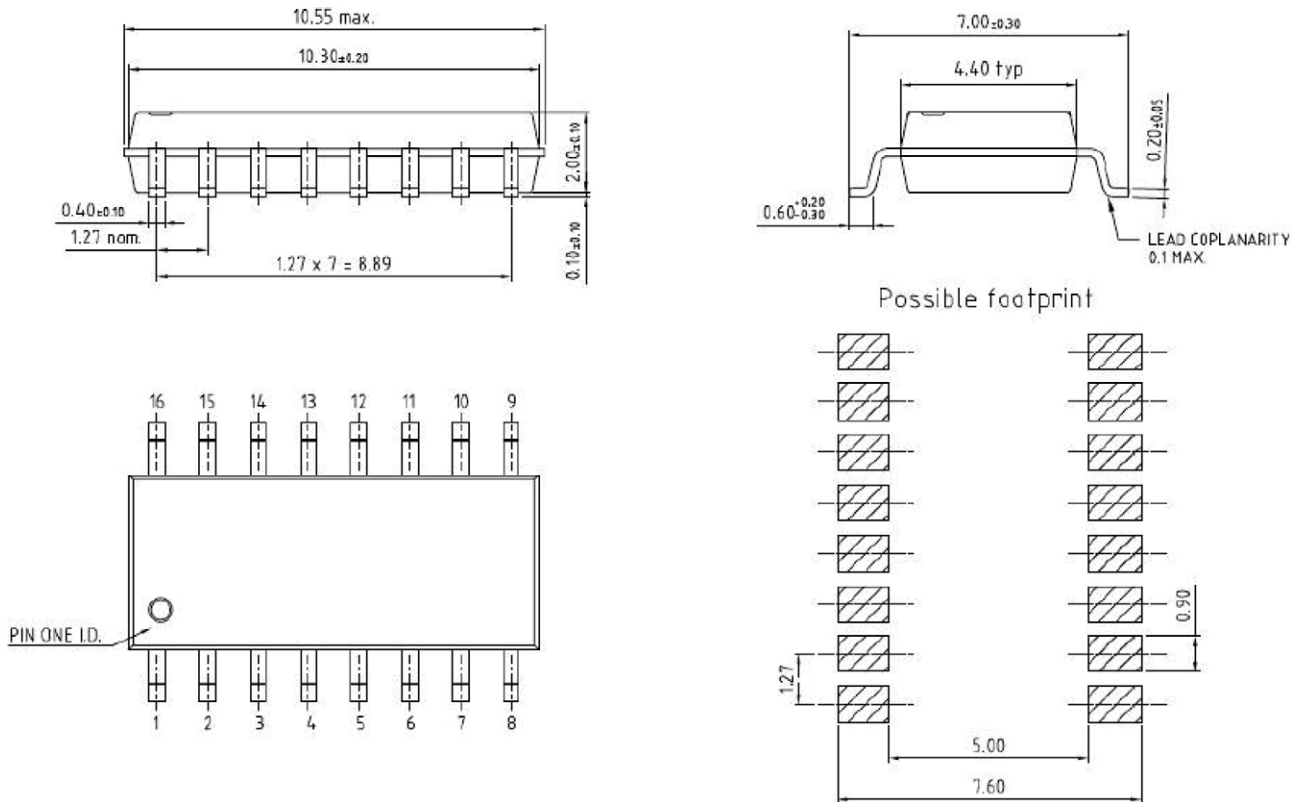
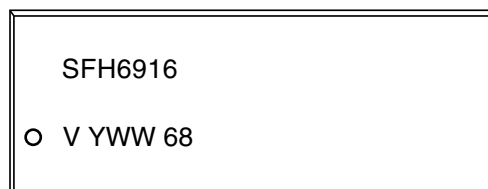


Fig. 15 - Switching Time vs. Load Resistance

**PACKAGE DIMENSIONS** in millimeters



**PACKAGE MARKING**



**TAPE AND REEL PACKAGING** in millimeters

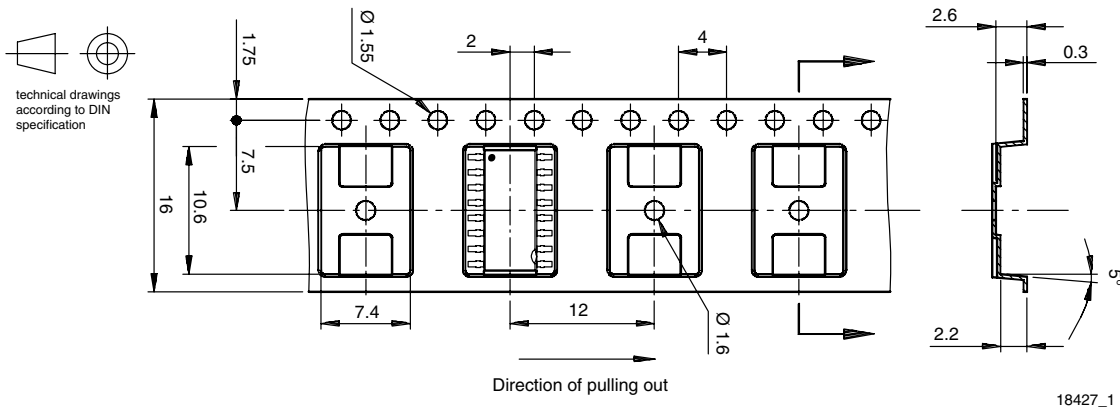


Fig. 16 - 2000 pcs/reel

**SOLDER PROFILE**

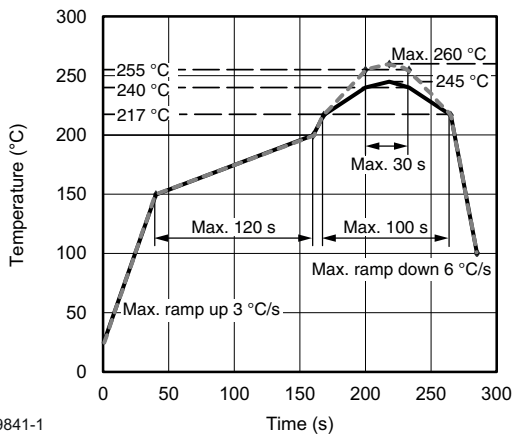


Fig. 17 - Lead (Pb)-free Reflow Solder Profile according to J-STD-020

**HANDLING AND STORAGE CONDITIONS**

ESD level: HBM class 2

Floor life: unlimited

Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ , RH < 85 %

Moisture sensitivity level 1, according to J-STD-020



## **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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. 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.



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Transistor Output Optocouplers](#) category:*

*Click to view products by [Vishay](#) manufacturer:*

Other Similar products are found below :

[LTV-814S-TA](#) [LTV-824HS](#) [LTV-852S](#) [66095-001](#) [6N136-X017T](#) [MCT6-X007](#) [MOC8101-X017T](#) [PS2561A-1-W-A](#) [PS2561B-1-L-A](#)  
[PS2561L-1-V-A](#) [MRF658](#) [IL755-1X007](#) [ILD74-X001](#) [ILQ615-2X017](#) [ILQ615-3X016](#) [LDA102S](#) [LDA110S](#) [PS2561-1-V-W-A](#) [PS2561AL-1-V-A](#) [PS2561L1-1-L-A](#) [PS2701A-1-F3-P-A](#) [PS2801-1-F3-P-A](#) [PS2911-1-L-AX](#) [CNY17-2X017](#) [CNY17-4X001](#) [CNY17-4X017](#) [CNY17F-1X007](#) [CNY17F-2X017](#) [CNY17F-4X001](#) [CNY17G-1](#) [LTV-214](#) [LTV-702VB](#) [LTV-733S](#) [LTV-816S-TA](#) [LTV-825S](#) [TCET1113](#) [TCET2100](#)  
[4N25-X007T](#) [IL215AT](#) [ILD615-1X007](#) [ILQ2-X007](#) [VOS615A-2T](#) [WPPC-A11066AA](#) [WPPC-A11066AD](#) [WPPC-A11084ASS](#) [WPPC-A21068AA](#) [WPPC-D11066AA](#) [WPPC-D21068ED](#) [WPPC-D410616EA](#) [WPPC-D410616ED](#)