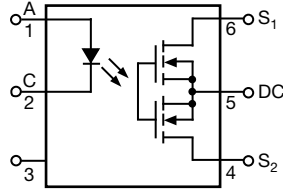
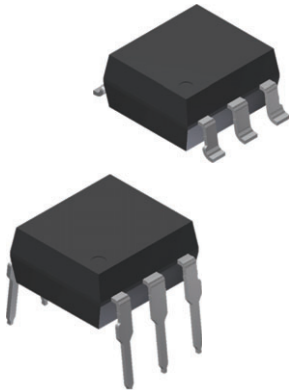


1 Form A Solid-State Relay



FEATURES

- Current limit protection
- Isolation test voltage 5300 V_{RMS}
- Typical R_{ON} 22 Ω
- Load voltage 400 V
- Load current 140 mA / 270 mA
- High surge capability
- Clean bounce free switching
- Low power consumption
- High temperature range
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



DESCRIPTION

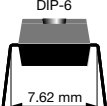
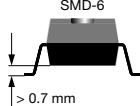
The VOR1142 is an SPST normally open switch (1 form A) that can replace electromechanical relays in many applications. It is constructed using a GaAlAs IRED actuation control and MOSFETs for the switch output.

APPLICATIONS

- General telecom switching
- Metering
- Security equipment
- Instrumentation
- Industrial controls
- Battery management systems
- Automatic measurement equipment

AGENCY APPROVALS

- UL1577, file no. E52744
- DIN EN 60747-5-5 (VDE0884-5)

ORDERING INFORMATION	
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">V</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">O</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">R</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">1</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">1</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">4</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">2</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">#</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">6</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px;">#</div> </div> <p style="text-align: center; margin-top: 5px;">PART NUMBER</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>DIP-6 7.62 mm</p> </div> <div style="text-align: center;">  <p>SMD-6 > 0.7 mm</p> </div> </div> <p style="text-align: center; margin-top: 5px;">PACKAGE CONFIGURATION</p>
PACKAGE	UL, VDE
SMD-6, tape and reel	VOR1142B6T
SMD-6, tube	VOR1142B6
DIP-6, tube	VOR1142A6

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	CONDITION	SYMBOL	VALUE	UNIT
INPUT				
IRED continuous forward current		I_F	50	mA
IRED reverse voltage		V_R	5	V
Input power dissipation		P_{diss}	80	mW
OUTPUT				
DC or peak AC load voltage		V_L	400	V
Continuous load current (AC/DC configuration)		I_L	140	mA
Continuous load current (DC only configuration)		I_L	270	mA
SSR output power dissipation (continuous)		P_{diss}	550	mW
SSR				
Ambient temperature range ⁽¹⁾		T_{amb}	-40 to +100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to +150	$^{\circ}\text{C}$
Soldering temperature	$t = 10\text{ s max.}$	T_{sld}	260	$^{\circ}\text{C}$

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 the time can adversely affect reliability.
- ⁽¹⁾ For continuous negative potential from output side to input side only $85\text{ }^{\circ}\text{C}$ is allowed.

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
IRED forward current, switch turn-on	$I_L = 100\text{ mA}$, $t = 10\text{ ms}$	I_{Fon}	-	0.27	2	mA
IRED forward current, switch turn-off	$V_L = 350\text{ V}$	I_{Foff}	0.05	0.15	-	mA
IRED forward voltage	$I_F = 10\text{ mA}$	V_F	-	1.36	1.5	V
IRED reverse current	$V_R = 5\text{ V}$	I_R	-	-	10	μA
OUTPUT						
On-resistance (AC/DC configuration)	$I_F = 5\text{ mA}$, $I_L = 50\text{ mA}$	R_{ON}	-	22	27	Ω
On-resistance (DC only configuration)	$I_F = 5\text{ mA}$, $I_L = 100\text{ mA}$	R_{ON}	-	5.2	7	Ω
Off-resistance	$I_F = 0\text{ mA}$, $V_L = \pm 100\text{ V}$	R_{OFF}	0.5	5000	-	$\text{G}\Omega$
Off-state leakage current	$I_F = 0\text{ mA}$, $V_L = \pm 100\text{ V}$	I_O	-	< 1	100	nA
	$I_F = 0\text{ mA}$, $V_L = \pm 400\text{ V}$	I_O	-	6	500	nA
Output capacitance (AC/DC configuration)	$I_F = 0\text{ mA}$, $V_L = 1\text{ V}$, 1 MHz	C_O	-	39	-	pF
	$I_F = 0\text{ mA}$, $V_L = 50\text{ V}$, 1 MHz	C_O	-	6	-	pF
Current limit (AC/DC configuration)	$I_F = 5\text{ mA}$, $t = 5\text{ ms}$, $V_L = \pm 6\text{ V}$	I_{limit}	170	300	450	mA
TRANSFER						
Capacitance (input to output)	$V_{ISO} = 1\text{ V}$	C_{IO}	-	0.4	-	pF

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.

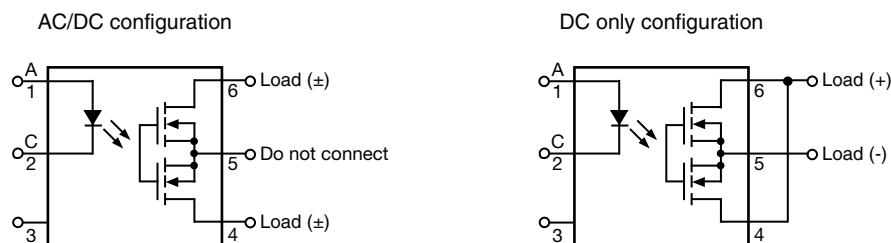
PIN CONFIGURATION


Fig. 1 - Pin Configuration

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	$I_F = 5\text{ mA}$, $I_L = 50\text{ mA}$	t_{on}	-	0.13	0.5	ms
Turn-off time	$I_F = 5\text{ mA}$, $I_L = 50\text{ mA}$	t_{off}	-	0.05	0.2	ms

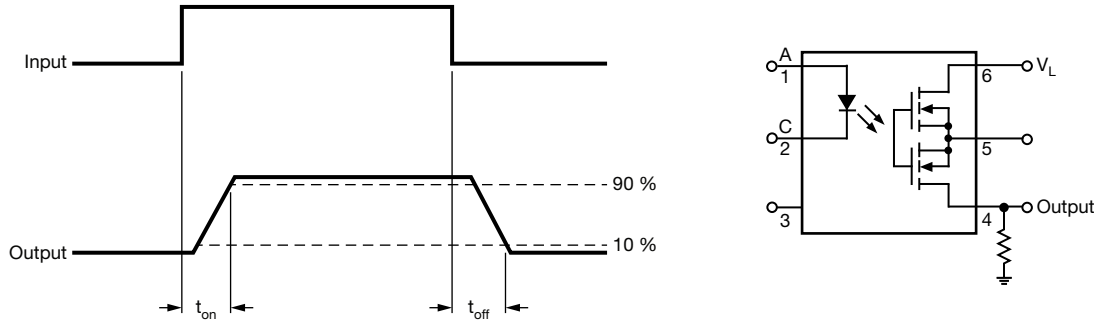


Fig. 2 - Timing Schematic

SAFETY AND INSULATION RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Climatic classification	According to IEC 68 part 1		40/100/21	
Pollution degree	According to DIN VDE 0109		2	
Comparative tracking index	Insulation group IIIa	CTI	175	
Maximum rated withstanding isolation voltage	According to UL1577, $t = 1\text{ min}$	V_{ISO}	5300	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	$V_{IO} = 500\text{ V}$, $T_{amb} = 25\text{ }^{\circ}\text{C}$	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}	720	mW
Input safety current		I_{SI}	240	mA
Safety temperature		T_S	175	$^{\circ}\text{C}$
Creepage distance	DIP-6		≥ 7	mm
Clearance distance	DIP-6		≥ 7	mm
Creepage distance	SMD-6		≥ 8	mm
Clearance distance	SMD-6		≥ 8	mm
Insulation thickness		DTI	≥ 0.4	mm
Input to output test voltage, method B	$V_{IORM} \times 1.875 = V_{PR}$, 100 % production test with $t_M = 1\text{ s}$, partial discharge $< 5\text{ pC}$	V_{PR}	1669	V_{peak}
Input to output test voltage, method A	$V_{IORM} \times 1.6 = V_{PR}$, 100 % sample test with $t_M = 10\text{ s}$, partial discharge $< 5\text{ pC}$	V_{PR}	1424	V_{peak}

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.

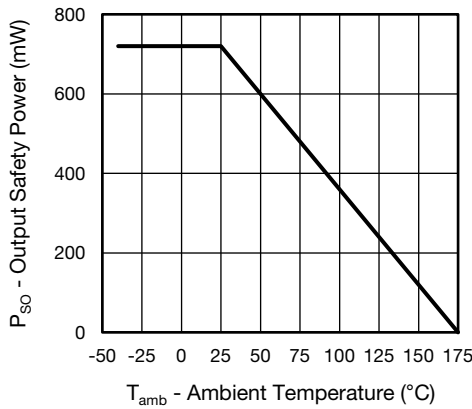


Fig. 3 - Safety Power Dissipation vs. Ambient Temperature

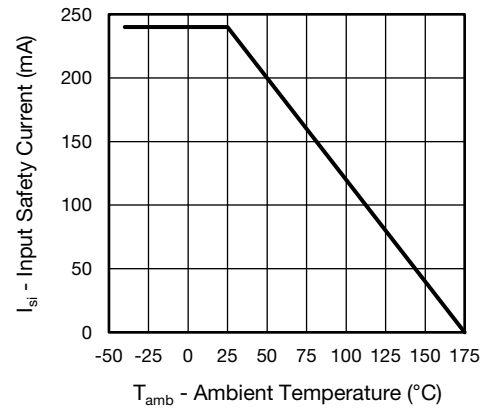


Fig. 4 - Safety Input Current vs. Ambient Temperature

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

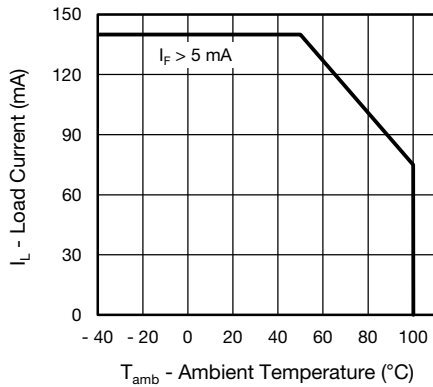


Fig. 5 - Maximum Load Current vs. Ambient Temperature

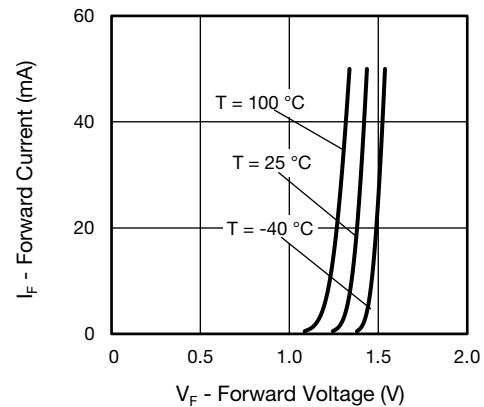


Fig. 7 - Forward Current vs. Forward Voltage

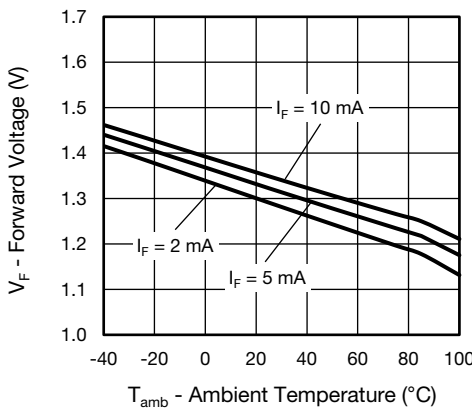


Fig. 6 - Forward Voltage vs. Ambient Temperature

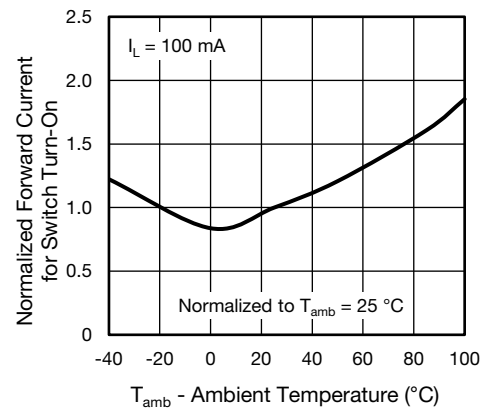


Fig. 8 - Normalized Forward Current for Switch Turn-On vs. Ambient Temperature

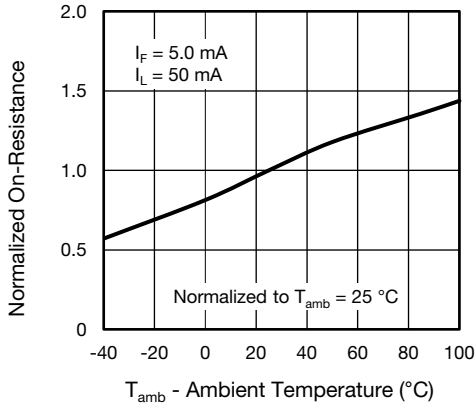


Fig. 9 - Normalized On-Resistance vs. Ambient Temperature

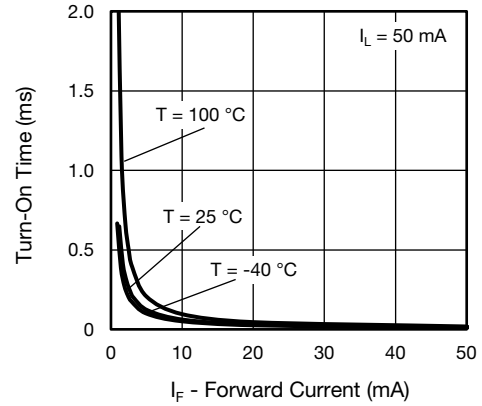


Fig. 12 - Turn-On Time vs. Forward Current

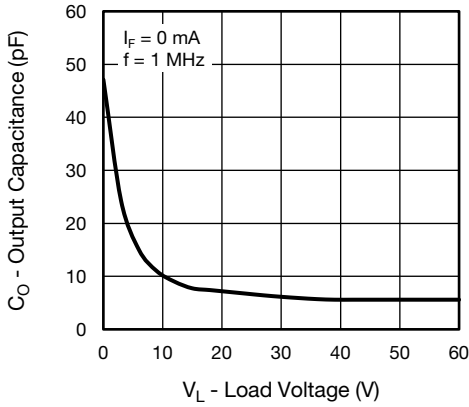


Fig. 10 - Output Capacitance vs. Load Voltage

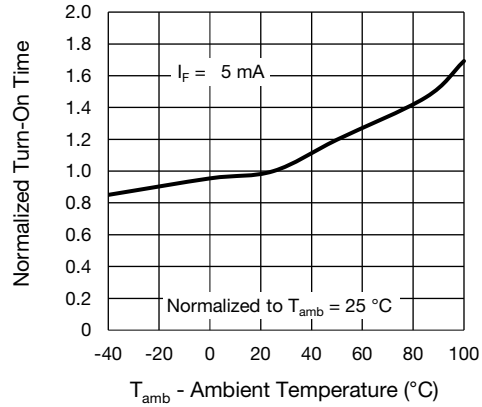


Fig. 13 - Normalized Turn-On Time vs. Ambient Temperature

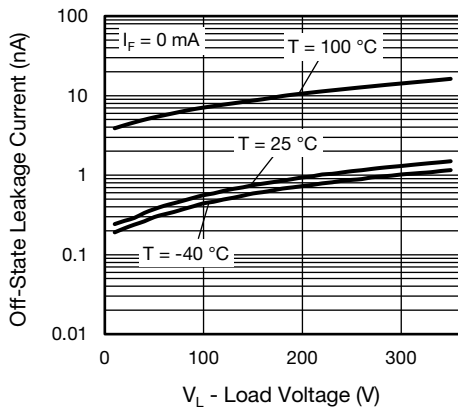


Fig. 11 - Off-State Leakage Current vs. Load Voltage

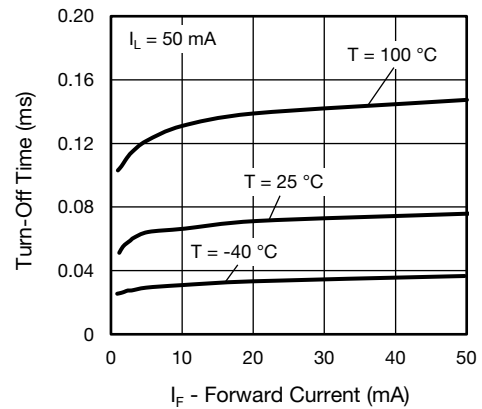


Fig. 14 - Turn-Off Time vs. Forward Current

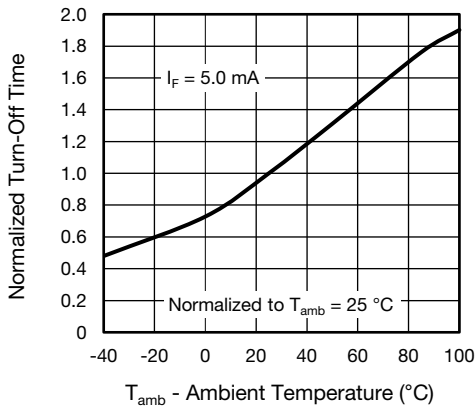
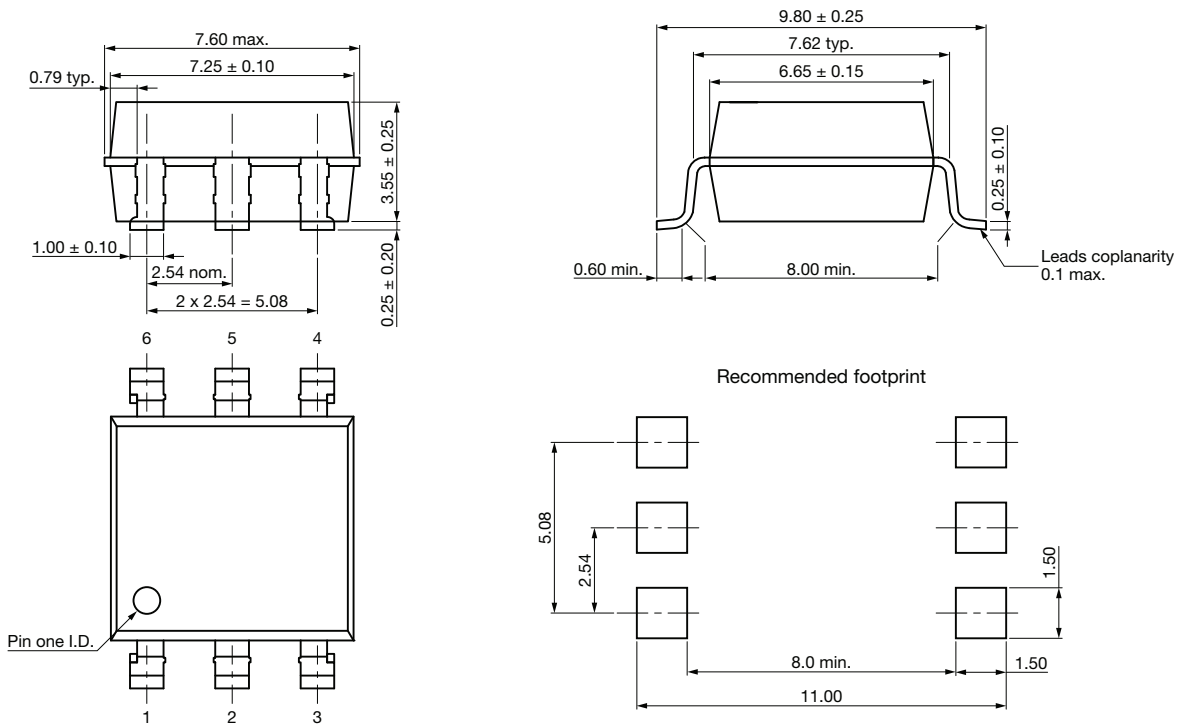


Fig. 15 - Normalized Turn-Off Time vs. Ambient Temperature

PACKAGE DIMENSIONS (in millimeters)

SMD-6



DIP-6

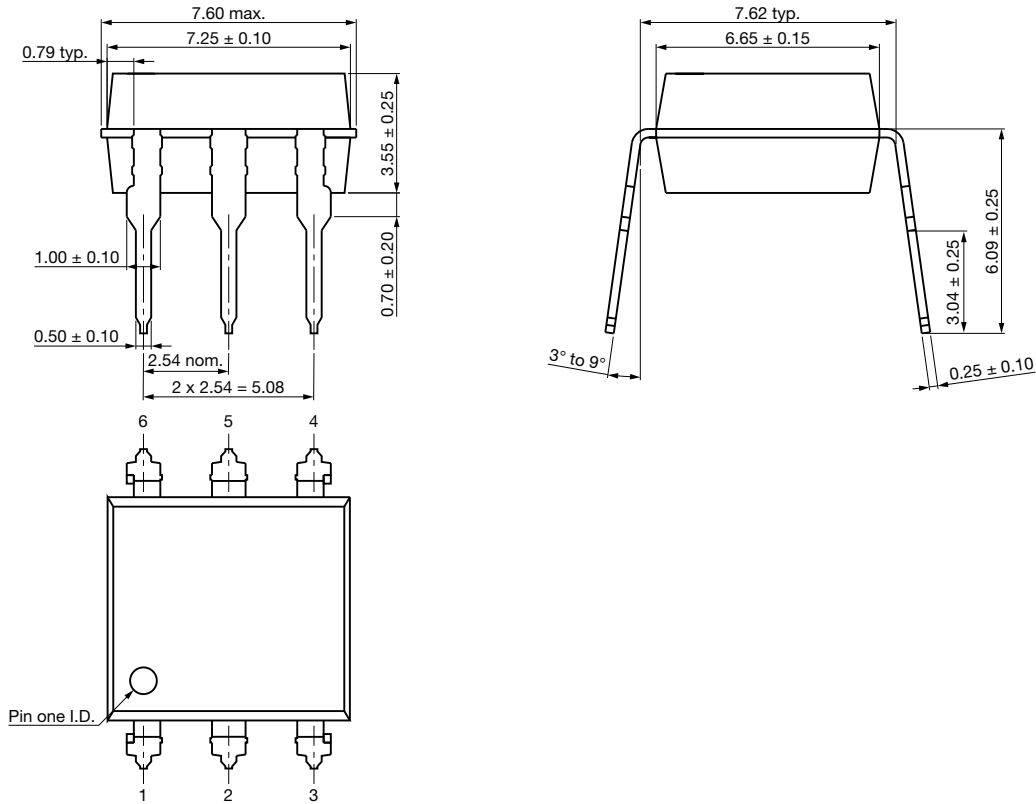


Fig. 16 - Package Drawings

PACKAGE MARKING

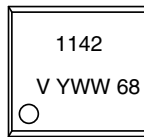
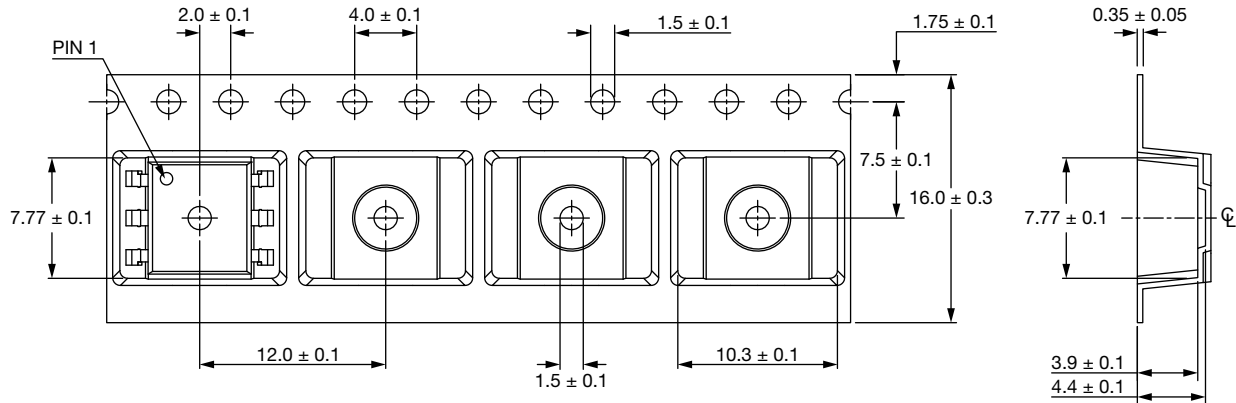


Fig. 17 - VOR1142

Note

- Package configuration (T, A, B) are not part of the package marking.

PACKING INFORMATION (in millimeters)



Note:

- Cumulative tolerance of 10 spocket holes is 0.20 mm

Fig. 18 - Tape and Reel Packing (1000 pieces on reel)

DEVICE PER TUBE			
TYPE	UNITS/TUBE	TUBES/BOX	UNITS/BOX
SMD-6	50	40	2000
DIP-6	50	40	2000

SOLDER PROFILES

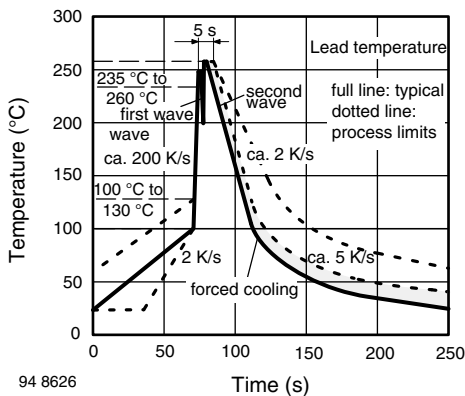


Fig. 19 - Wave Soldering Double Wave Profile According to J-STD-020 for DIP Devices

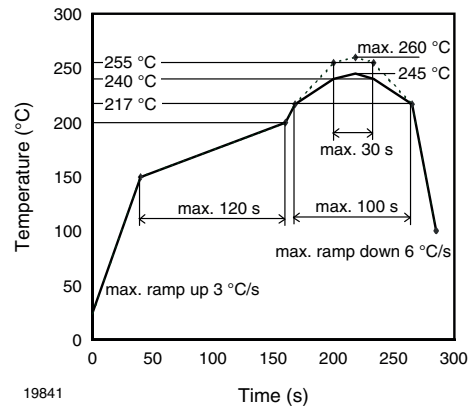


Fig. 20 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020 for SMD Devices

HANDLING AND STORAGE CONDITIONS

ESD level: HBM class 2

Floor life: unlimited

Conditions: T_{amb} < 30 °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.

Material Category Policy

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.

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9