



**THE DATASHEET OF
VOR2142A8**





ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	CONDITIONS	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
Junction temperature		T_j	125	$^{\circ}\text{C}$
OUTPUT				
DC or peak AC load voltage		V_L	400	V
Continuous DC load current at 25 $^{\circ}\text{C}$, one channel		I_L	140	mA
Continuous DC load current at 25 $^{\circ}\text{C}$, two channels		I_L	100	mA
SSR output power dissipation		P_{diss}	550	mW
Junction temperature		T_j	125	$^{\circ}\text{C}$
SSR				
Ambient temperature range		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	$^{\circ}\text{C}$

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						
IRED forward current, switch turn-on	$I_L = 100\text{ mA}$, $t = 10\text{ ms}$	I_{Fon}	-	0.25	2	mA
IRED forward current, switch turn-off	$V_L = \pm 350\text{ V}$	I_{Foff}	0.05	0.15	-	mA
IRED forward voltage	$I_F = 10\text{ mA}$	V_F	-	1.4	1.6	V
IRED reverse current	$V_R = 5\text{ V}$	I_R	-	-	10	μA
OUTPUT						
On-resistance	$I_F = 5\text{ mA}$, $I_L = 50\text{ mA}$	R_{ON}	-	22	27	Ω
Off-resistance	$I_F = 0\text{ mA}$, $V_L = \pm 100\text{ V}$	R_{OFF}	1	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	$I_F = 0\text{ mA}$, $V_L = 1\text{ V}$, 1 MHz	C_O	-	39	-	pF
	$I_F = 0\text{ mA}$, $V_L = 50\text{ V}$, 1 MHz	C_O	-	6	-	pF
TRANSFER						
Capacitance (input to output)	$V_{IO} = 1\text{ V}$	C_{IO}	-	1	-	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.

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

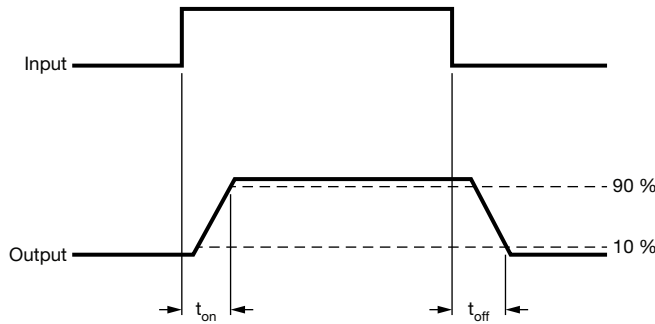
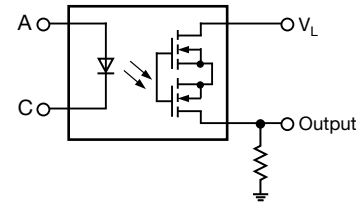


Fig. 1 - Timing Schematic



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 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}	640	mW
Input safety current		I_{SI}	240	mA
Safety temperature		T_S	175	$^{\circ}\text{C}$
Creepage distance	DIP-8		≥ 7	mm
Clearance distance	DIP-8		≥ 7	mm
Creepage distance	SMD-8		≥ 8	mm
Clearance distance	SMD-8		≥ 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.

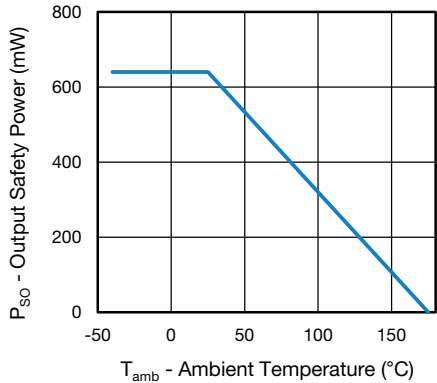


Fig. 2 - Safety Power Dissipation vs. Ambient Temperature

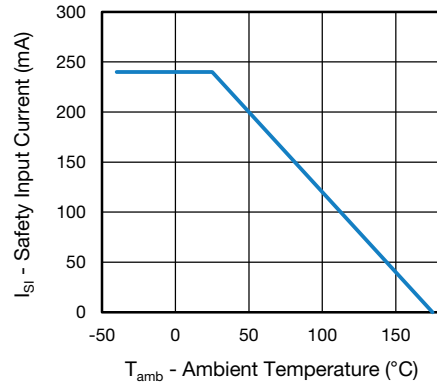


Fig. 3 - Safety Input Current vs. Ambient Temperature

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

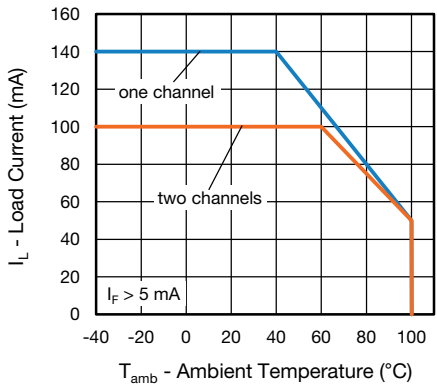


Fig. 4 - Maximum Load Current vs. Ambient Temperature

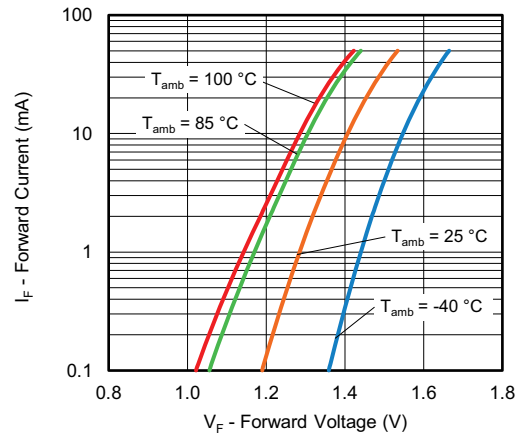


Fig. 6 - Forward Current vs. Forward Voltage

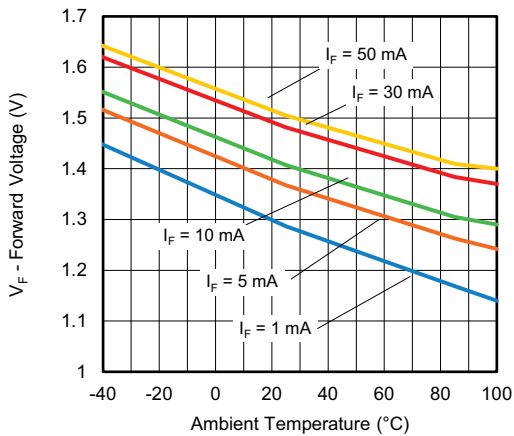


Fig. 5 - Forward Voltage vs. Ambient Temperature

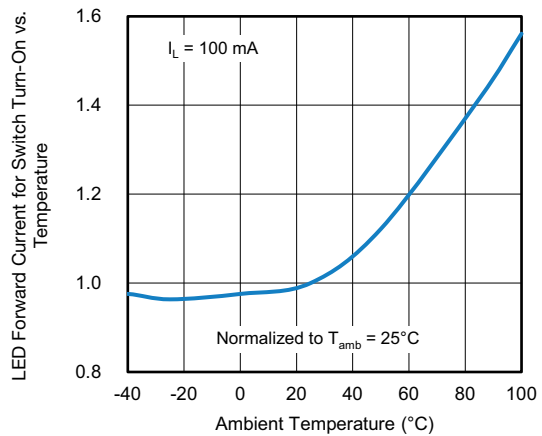


Fig. 7 - Normalized Forward Current for Switch Turn-On vs. Ambient Temperature

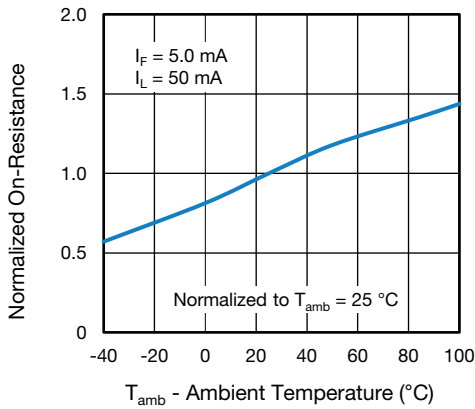


Fig. 8 - Normalized On-Resistance vs. Ambient Temperature

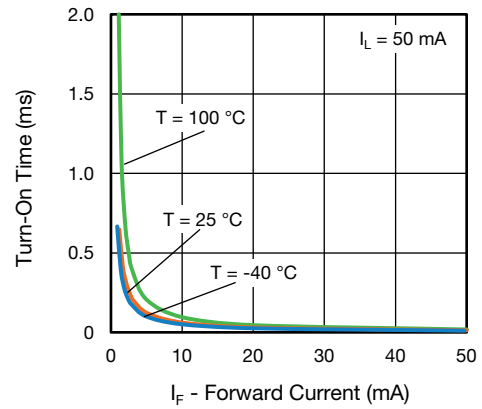


Fig. 11 - Turn-On Time vs. Forward Current

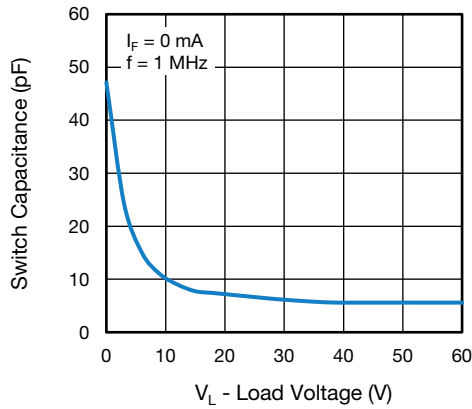


Fig. 9 - Output Capacitance vs. Load Voltage

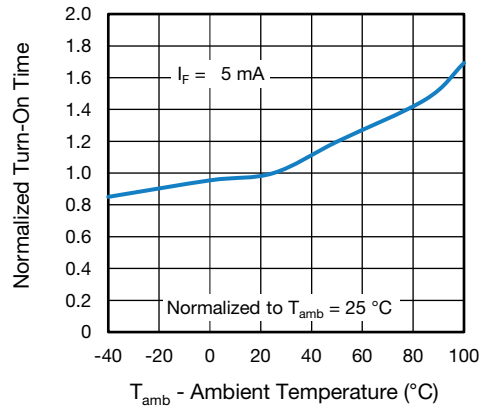


Fig. 12 - Normalized Turn-On Time vs. Ambient Temperature

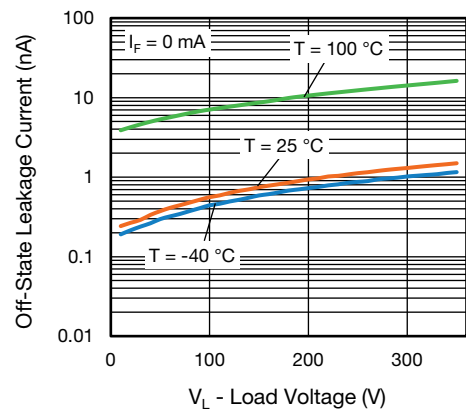


Fig. 10 - Off-State Leakage Current vs. Load Voltage

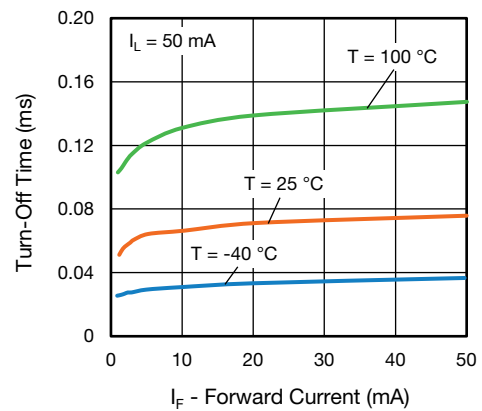


Fig. 13 - Turn-Off Time vs. Forward Current

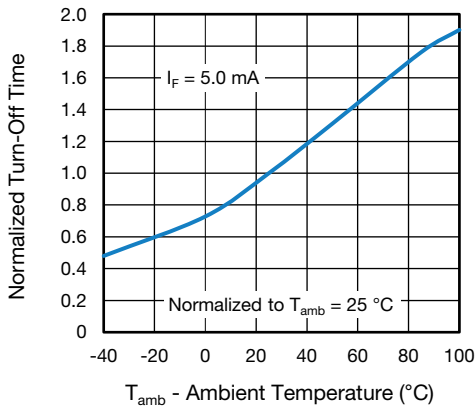
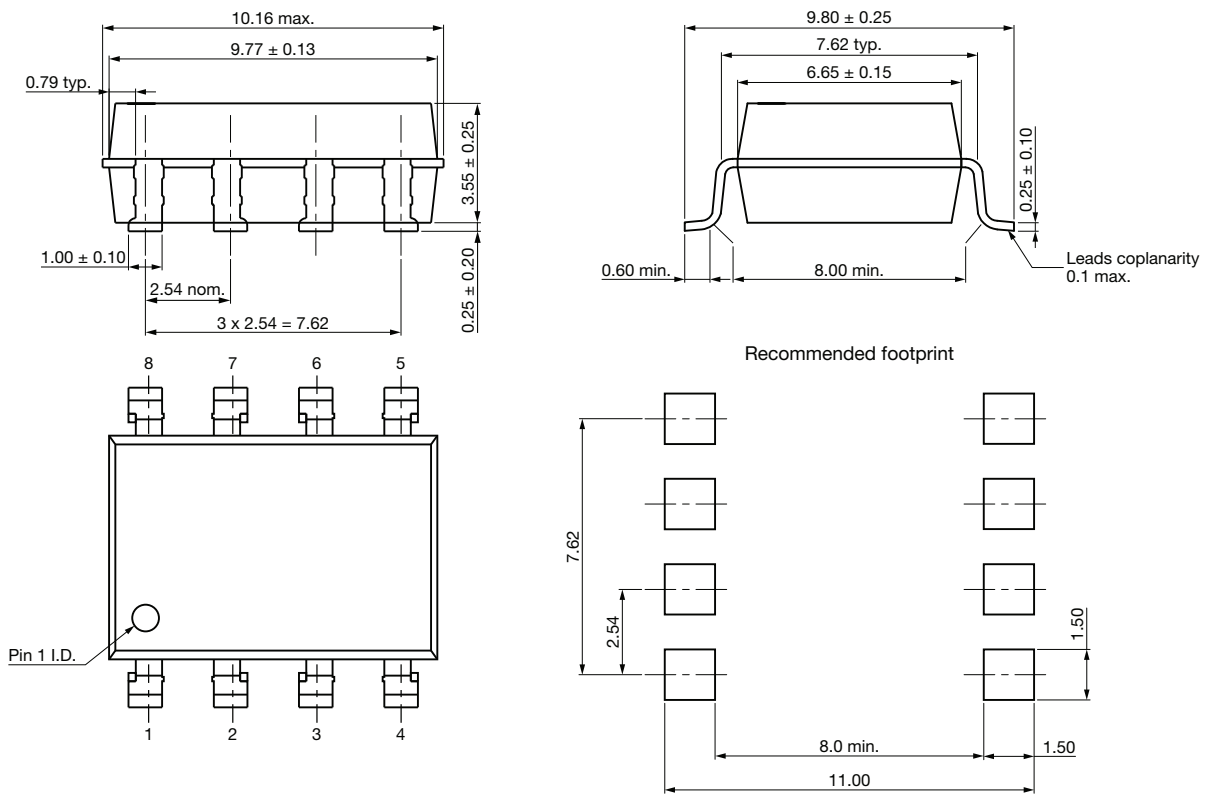


Fig. 14 - Normalized Turn-Off Time vs. Ambient Temperature

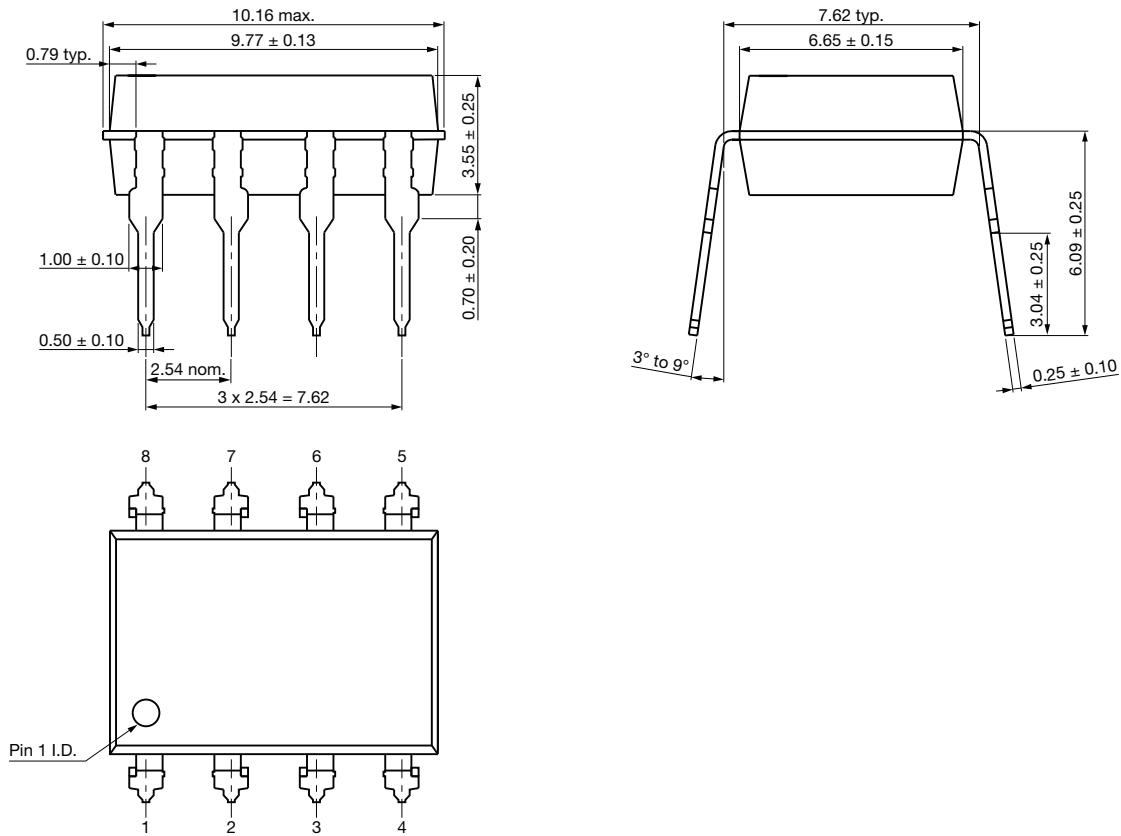
PACKAGE DIMENSIONS (in millimeters)

SMD-8





DIP-8



PACKAGE MARKING (example)

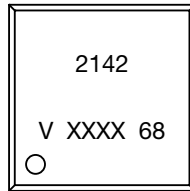


Fig. 15 - VOR2142

Notes

- XXXX = LMC (lot marking code)
- Tape and reel suffix (TR) is not part of the package marking

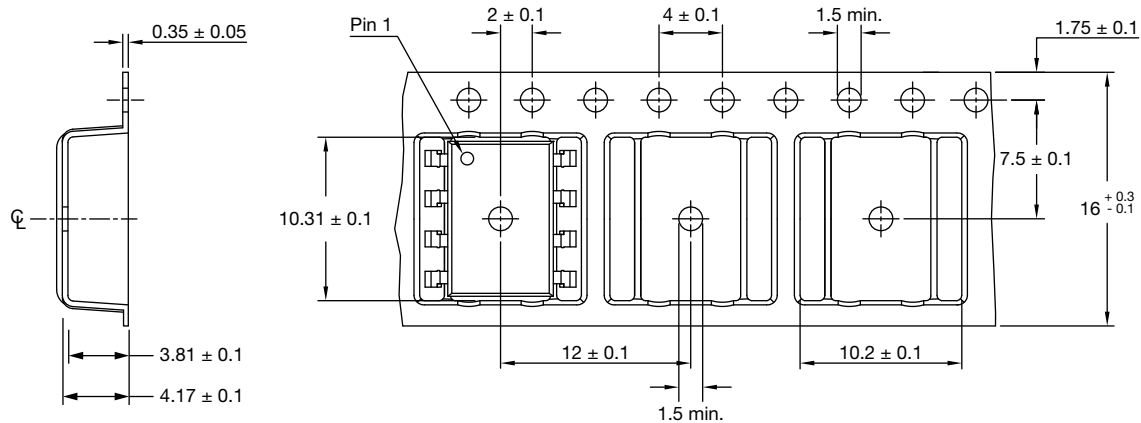
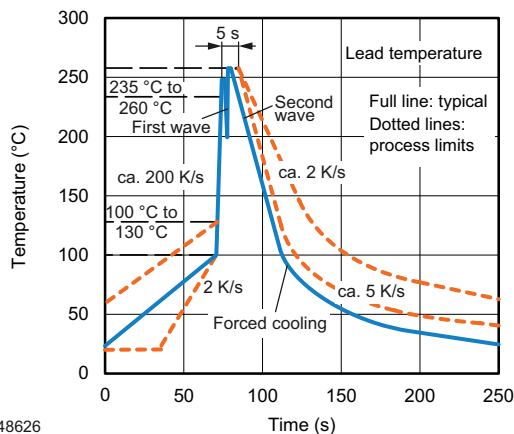
PACKING INFORMATION (in millimeters)


Fig. 16 - Tape and Reel Packing

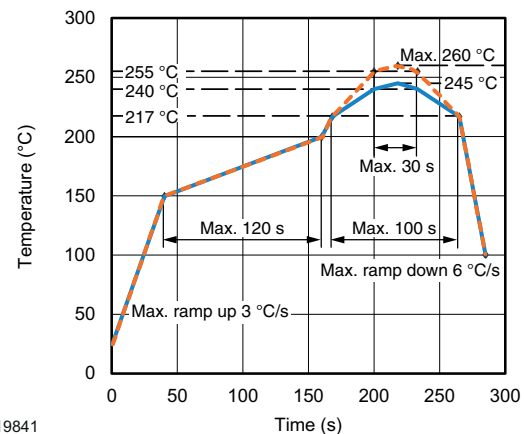
TAPE AND REEL PACKING	
TYPE	UNITS/REEL
SMD-8	1000

TUBE PACKING			
TYPE	UNITS/TUBE	TUBES/BOX	UNITS/BOX
SMD-8	50	40	2000
DIP-8	50	40	2000

SOLDER PROFILES


948626

Fig. 17 - Wave Soldering Double Wave Profile According to J-STD-020 for DIP Devices



19841

Fig. 18 - 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: $T_{amb} < 30\text{ }^{\circ}\text{C}$, RH < 85 %

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



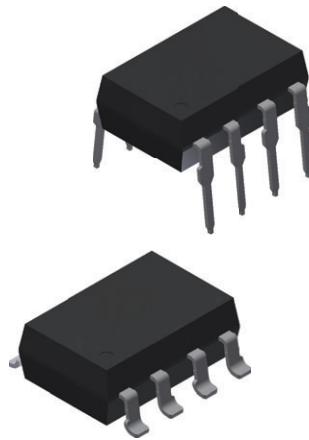
Footprint and Schematic Information for VOR2142

The footprint and schematic symbols for the following parts can be accessed using the associated links. They are available in Eagle, Altium, KiCad, OrCAD / Allegro, Pulsonix, and PADS.

Note that the 3D models for these parts can be found on the Vishay product page.

PART NUMBER	FOOTPRINT / SCHEMATIC
VOR2142A8	www.snapeda.com/parts/VOR2142A8/Vishay/view-part
VOR2142B8	www.snapeda.com/parts/VOR2142B8/Vishay/view-part
VOR2142B8T	www.snapeda.com/parts/VOR2142B8T/Vishay/view-part

For technical issues and product support, please contact optocoupleranswers@vishay.com.





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