ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
INPUT				
Reverse voltage		V_R	6	V
Forward current		I_F	50	mA
Peak surge current	100 µs, 200 pps	I_{FSM}	0.5	A
Power dissipation		P_{diss}	70	mW
OUTPUT				
Peak off-state voltage		V_{DRM}	400	V
RMS on-state current		$I_{T(RMS)}$	0.1	A
Peak non-repetitive surge current	PW = 100 ms, 120 pps	I_{TSM}	1	A
Power dissipation		P_{diss}	300	mW
COUPLER				
Total power dissipation		P_{diss}	330	mW
Storage temperature range		T_{stg}	-55 to +150	°C
Ambient temperature		T_{amb}	-40 to +100	°C
Lead soldering temperature	2 mm from case, t < 10 s	T_{sld}	260	°C
Junction temperature		T_j	125	°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.

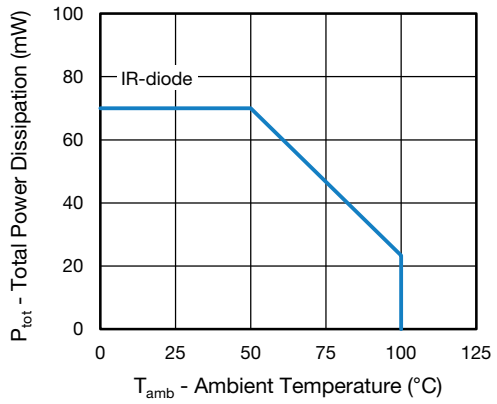

Fig. 1 - Total Power Dissipation vs. Ambient Temperature (IR-Diode)

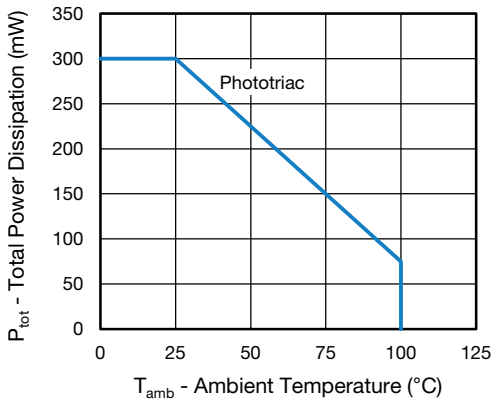

Fig. 2 - Total Power Dissipation vs. Ambient Temperature (Phototriac)

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT							
Forward voltage	I_F = 20 mA		V_F	-	1.3	1.5	V
Reverse voltage	I_R = 10 µA		V_R	6	-	-	V
Reverse current	V_R = 6 V		I_R	-	-	10	µA
Junction capacitance	V_R = 0 V, f = 1 MHz		C_j	-	50	-	pF
OUTPUT							
Peak off-state current, either direction	V_{DRM} = 400 V (1)		I_{DRM}	-	10	100	nA
Peak off-state voltage, either direction	I_{TM} = 100 mA		V_{TM}	-	1.7	3	V
Critical rate of rise of off-state voltage	I_F = 0 A, V_D = 0.67 V_{DRM}		dV/dt_{cr}	100	-	-	V/µs
COUPLER (2)							
Emitting diode trigger current	V_T = 3 V, R_L = 150 Ω	VO3020	I_{FT}	-	15	30	mA
		VO3021	I_{FT}	-	8	15	mA
		VO3022	I_{FT}	-	5	10	mA
		VO3023	I_{FT}	-	3	5	mA
Holding current	I_F = 10 mA, $V_T \geq$ 3 V		I_H	-	200	-	µA

Notes

- 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

(1) Test voltage must be applied within dV/dt ratings

(2) I_{FT} is defined as a minimum trigger current

SAFETY AND INSULATION RATINGS				
PARAMETER		**SYMBOL**	**VALUE**	**UNIT**
MAXIMUM SAFETY RATINGS				
Output safety power		P_{SO}	700	mW
Input safety current		I_{si}	400	mA
Safety temperature		T_S	175	°C
Comparative tracking index		CTI	175	
INSULATION RATED PARAMETERS				
Maximum withstanding isolation voltage		V_{ISO}	5000	V_{RMS}
Maximum transient isolation voltage		V_{IOTM}	8000	V_{peak}
Maximum repetitive peak isolation voltage		V_{IORM}	890	V_{peak}
		V_{IORM}	1140 (1)	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
Climatic classification (according to IEC 68 part 1)			55 / 115 / 21	
Environment (pollution degree in accordance to DIN VDE 0109)			2	
Creepage distance (standard DIP-6)			≥ 7	mm
Creepage distance (400 mil DIP-6)			≥ 8	mm
Clearance distance (standard DIP-6)			≥ 7	mm
Clearance distance (400 mil DIP-6)			≥ 8	mm
Insulation thickness		DTI	≥ 0.4	mm

Notes

- As per DIN EN 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

(1) 400 mil, option 6 only

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

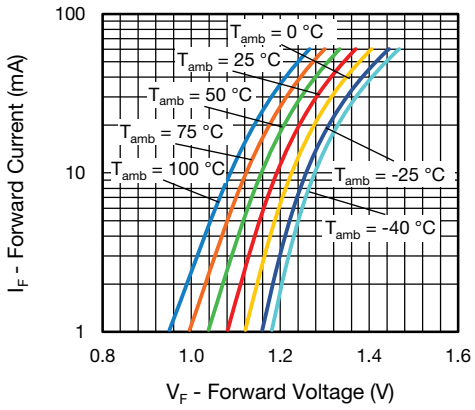

Fig. 3 - Forward Current vs. Forward Voltage

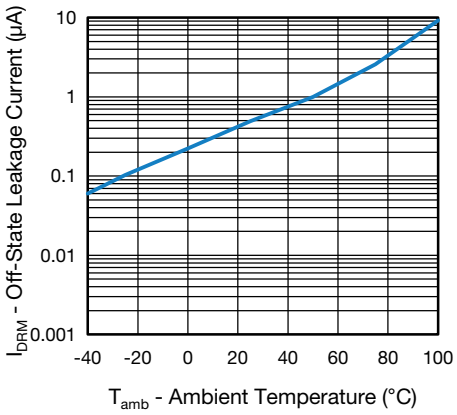

Fig. 6 - Off-State Leakage Current vs. Ambient Temperature

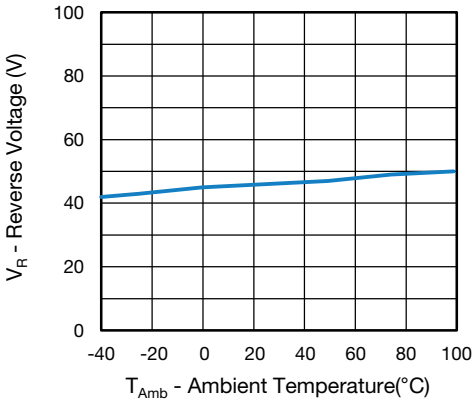

Fig. 4 - Reverse Voltage vs. Ambient Temperature

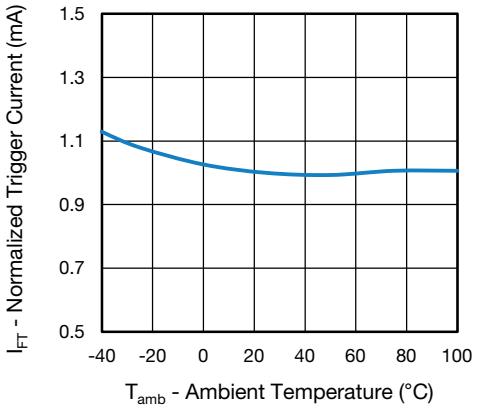

Fig. 7 - Normalized Trigger Current vs. Ambient Temperature

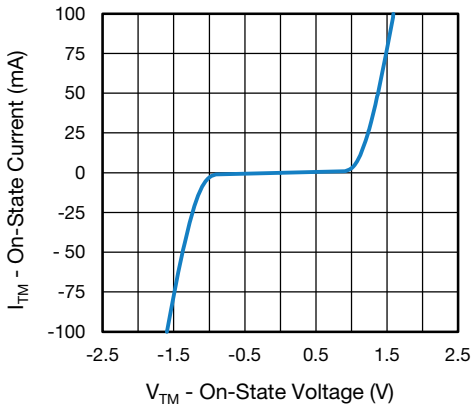

Fig. 5 - On-State Current vs. On-State Voltage

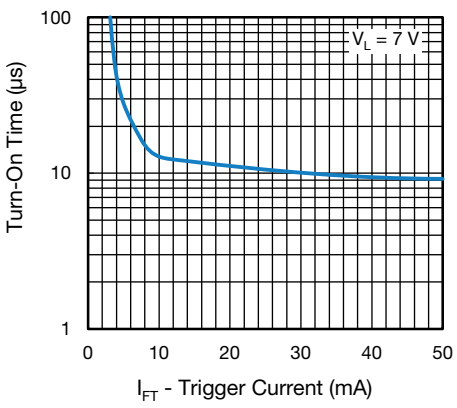

Fig. 8 - Turn-On Time vs. Trigger Current

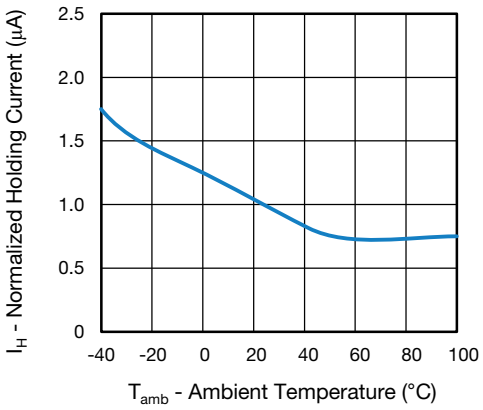

Fig. 9 - Normalized Holding Current vs. Ambient Temperature

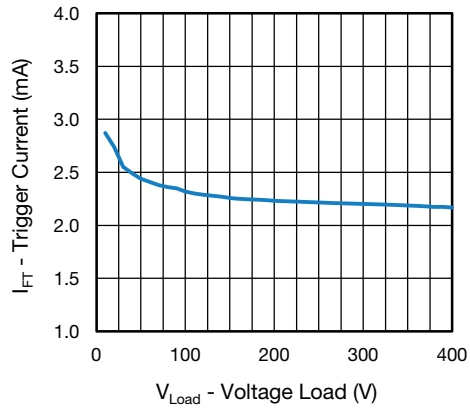

Fig. 12 - Trigger Current vs. Voltage Load

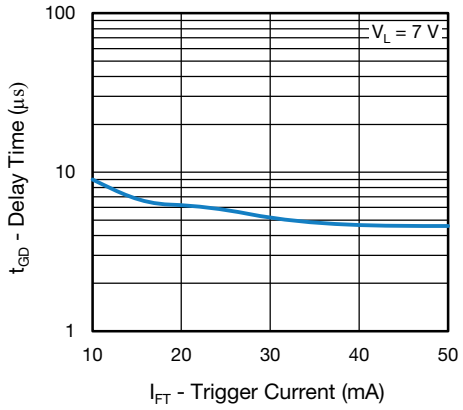

Fig. 10 - Delay Time vs. Trigger Current

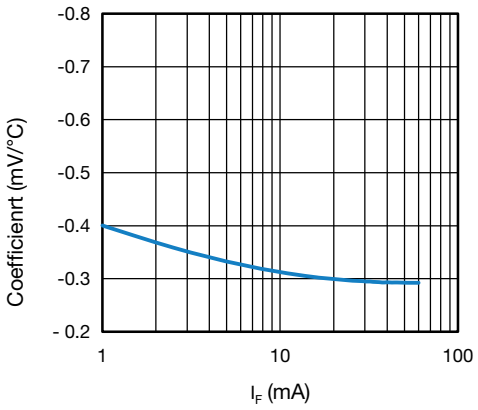

Fig. 13 - Coefficient vs. Forward Current

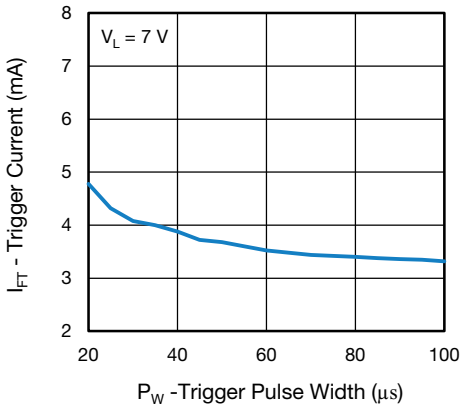

Fig. 11 - Trigger Current vs. Trigger Pulse Width

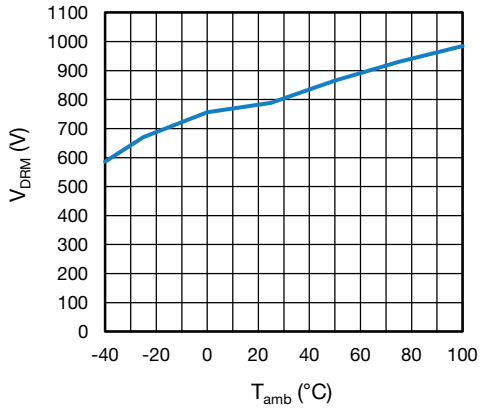

Fig. 14 - Peak Off-State Voltage vs. Ambient Temperature

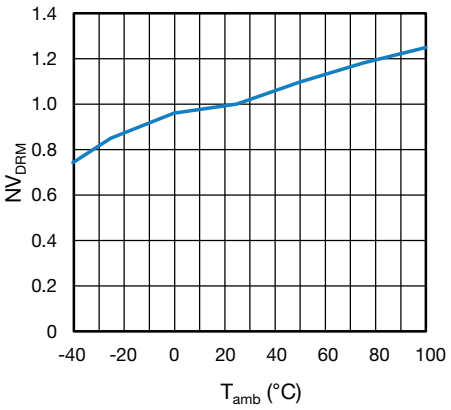

Fig. 15 - Normalized Off-State Voltage M2/M1 vs. Ambient Temperature

PACKAGE DIMENSIONS (in millimeters)

DIP-6

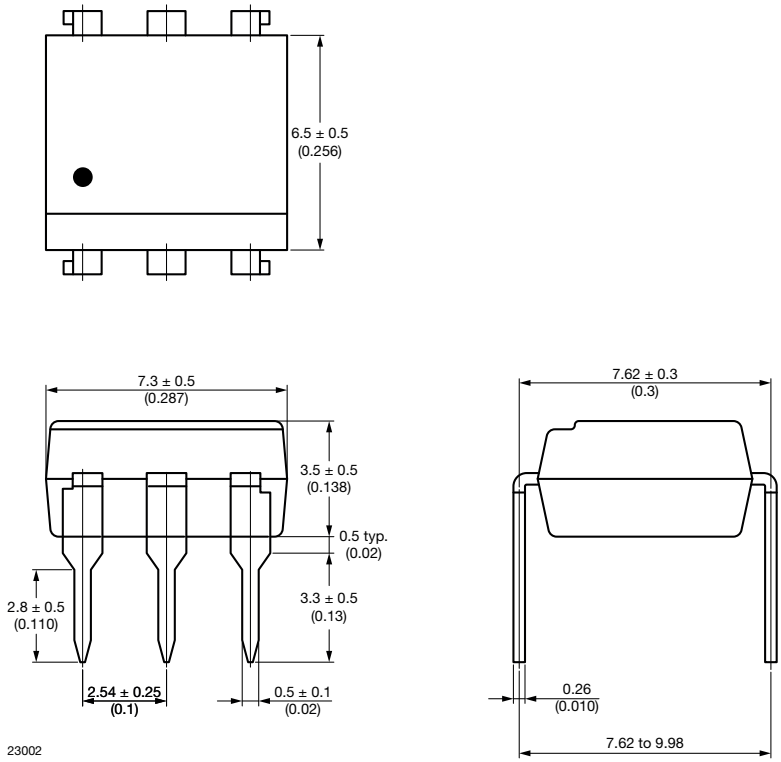

Fig. 16

DIP-6, 400 mil

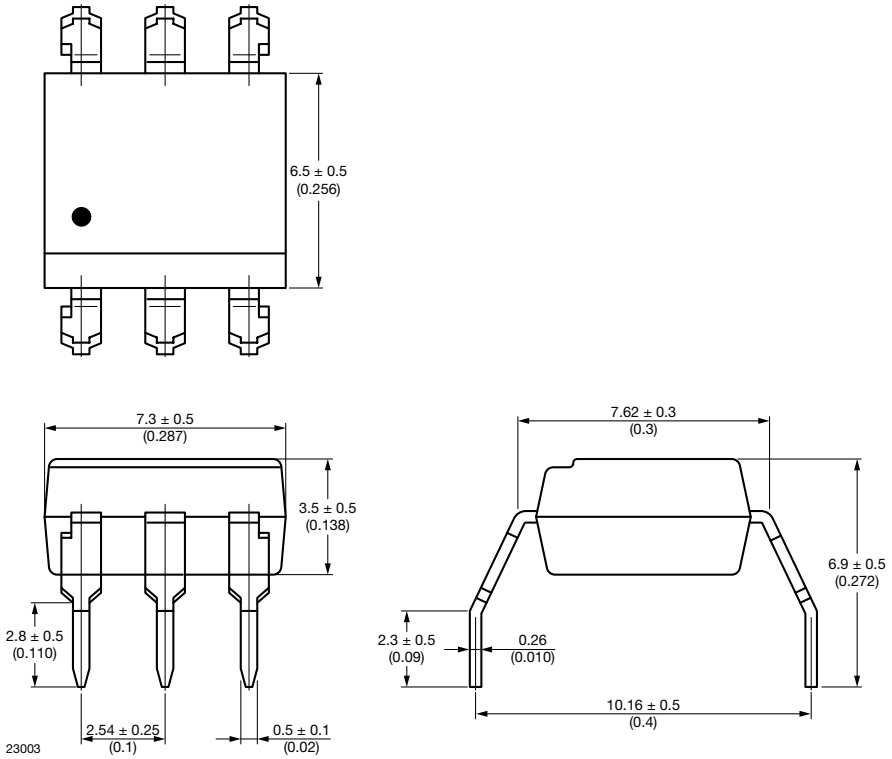

Fig. 17

SMD-6

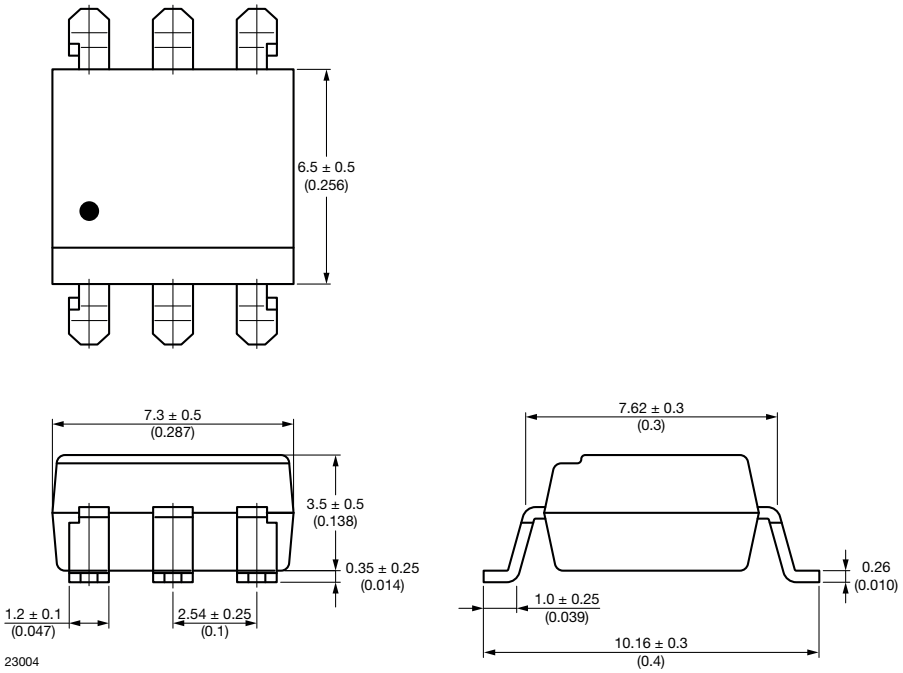

Fig. 18

PACKAGE MARKING

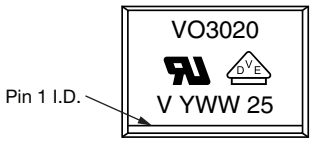

Fig. 19 - Example of VO3020-X017T

Notes

- "YWW" is the date code marking (Y = year code, WW = week code)
- VDE logo is only marked on VDE option parts
- Tape and reel suffix (T) is not part of the package marking

PACKING INFORMATION

DEVICES PER TUBE			
TYPE	**UNITS/TUBE**	**TUBES/BOX**	**UNITS/BOX**
DIP-6	50	40	2000
DIP-6, 400 mil	50	40	2000

SMD-6 Tape

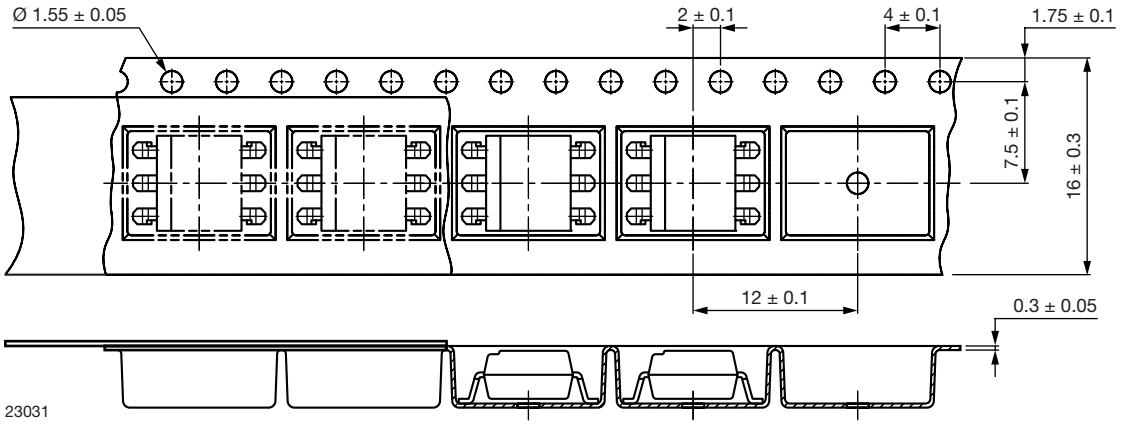

Fig. 20 - Tape and Reel Packaging (1000 pieces on reel)

Reel

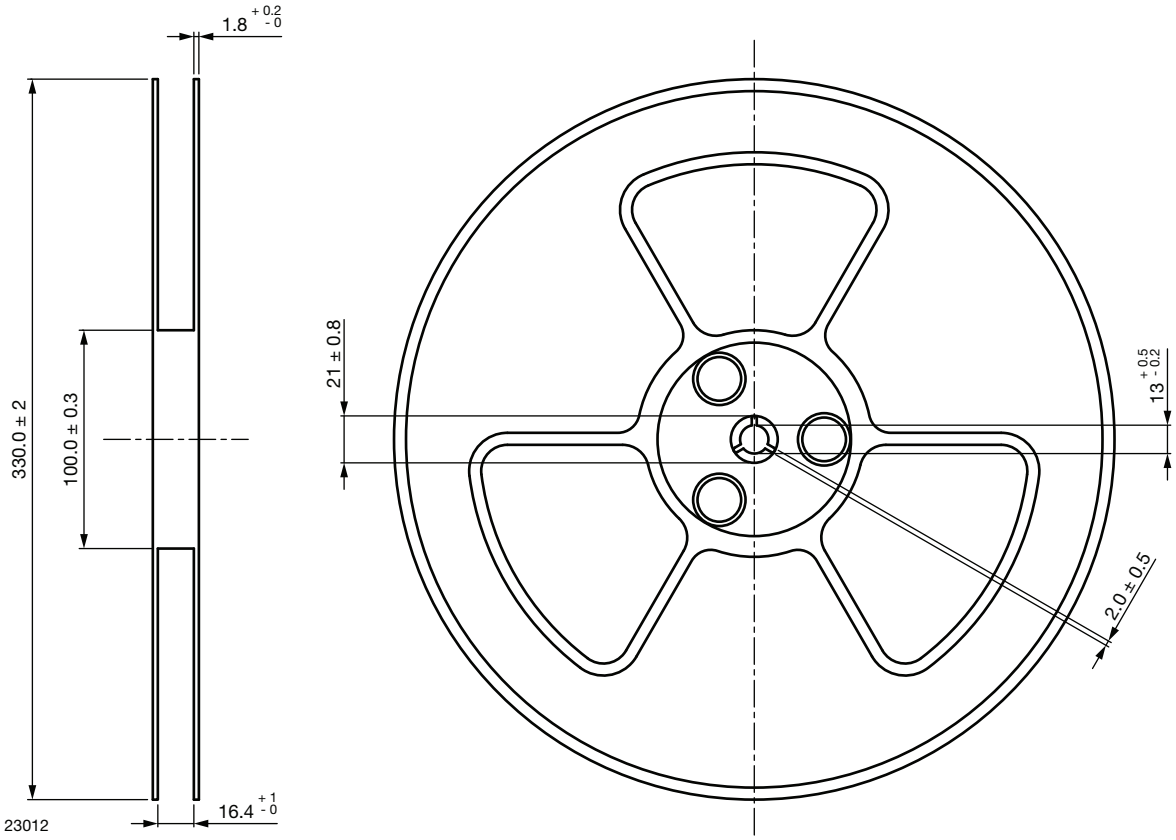

Fig. 21 - Tape and Reel Shipping Medium

REEL DIMENSIONS in millimeters

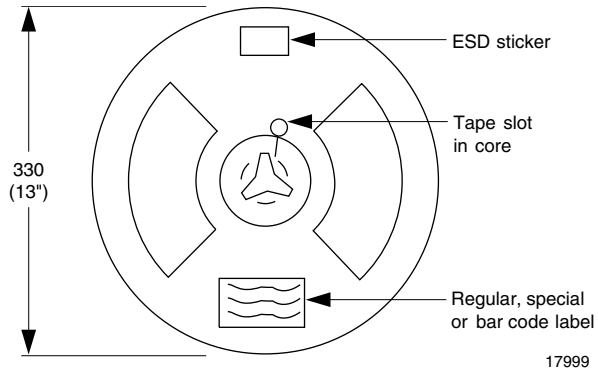

Fig. 22 - Reel Dimensions

SOLDER PROFILES

IR Reflow Soldering (JEDEC® J-STD-020C compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

PROFILE ITEM	CONDITIONS
Preheat	
- Temperature minimum ($T_{S\ min.}$)	150 °C
- Temperature maximum ($T_{S\ max.}$)	200 °C
- Time (min. to max.) (t_S)	90 s ± 30 s
Soldering zone	
- Temperature (T_L)	217 °C
- Time (t_L)	60 s
Peak temperature (T_p)	260 °C
Ramp-up rate	3 °C/s max.
Ramp-down rate	3 °C/s to 6 °C/s

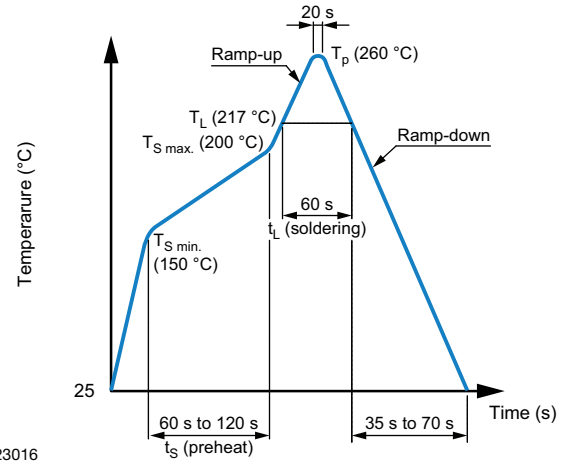

Fig. 1

Wave Soldering (JEDEC JESD22-A111 compliant)

One time soldering is recommended within the condition of temperature.

Temperature: 260 °C + 0 °C / - 5 °C

Time: 10 s

Preheat temperature: 25 °C to 140 °C

Preheat time: 30 s to 80 s

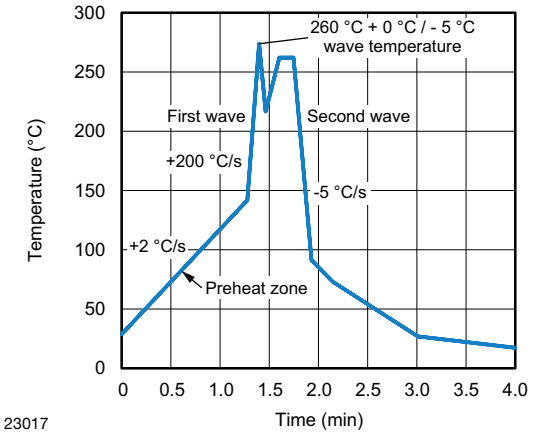

Fig. 2

Hand Soldering by Soldering Iron

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature: 380 °C + 0 °C / - 5 °C

Time: 3 s max.

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

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