High Speed Infrared Emitting Diodes, 940 nm, GaAlAs, MQW

VSMB294008RG



VSMB294008G



FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.8
- Peak wavelength: λ_p = 940 nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: φ = ± 7°
- Low forward voltage
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reserve gullwing
- Package matches with detector VEMD2000X01 series
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

DESCRIPTION

VSMB294008 series are infrared, 940 nm emitting diodes in GaAlAs multi quantum well (MQW) technology with high radiant power and high speed, molded in clear, untinted plastic packages (with lens) for surface mounting (SMD).

APPLICATIONS

- Data transmission
- Miniature light barrier
- Photointerrupters
- Optical switch
- Control and drive circuits
- Shaft encoders

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_P (nm)	t_r (ns)
VSMB294008RG	70	± 7	940	15
VSMB294008G	70	± 7	940	15

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMB294008RG	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMB294008G	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Surge forward current	t_p = 100 µs	I_{FSM}	500	mA
Power dissipation		P_V	160	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +85	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Soldering temperature	according to fig. 10, J-STD-020	T_{sd}	260	°C
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R_{thJA}	250	K/W

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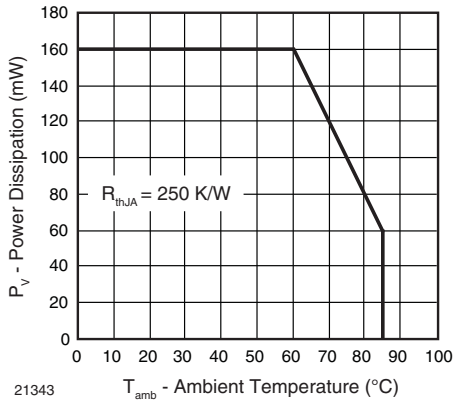


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

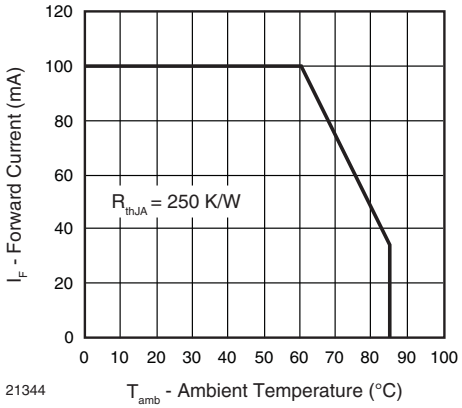


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 100 mA, t_p = 20 ms	V_F	1.15	1.45	1.75	V
	I_F = 500 mA, t_p = 100 µs	V_F	-	1.8	-	V
Temperature coefficient of V_F	I_F = 100 mA	TK_{VF}	-	-0.64	-	mV/K
Reverse current	V_R = 5 V	I_R	-	-	10	µA
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0 mW/cm²	C_J	-	38	-	pF
Radiant intensity	I_F = 100 mA, t_p = 100 µs	I_e	30	70	115	mW/sr
	I_F = 500 mA, t_p = 100 µs	I_e	-	260	-	mW/sr
Radiant power	I_F = 100 mA, t_p = 100 µs	ϕ_e	-	40	-	mW
Temperature coefficient of radiant power	I_F = 100 mA	$TK\phi_e$	-	-0.43	-	%/K
Angle of half intensity		φ	-	± 7	-	deg
Peak wavelength	I_F = 30 mA	λ_p	920	940	960	nm
Spectral bandwidth	I_F = 30 mA	$\Delta\lambda$	-	25	-	nm
Temperature coefficient of λ_p	I_F = 30 mA	$TK\lambda_p$	-	0.25	-	nm/K
Rise time	I_F = 100 mA, 20 % to 80 %	t_r	-	15	-	ns
Fall time	I_F = 100 mA, 20 % to 80 %	t_f	-	15	-	ns
Cut-off frequency	I_{DC} = 70 mA, I_{AC} = 30 mA pp	f_c	-	23	-	MHz

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

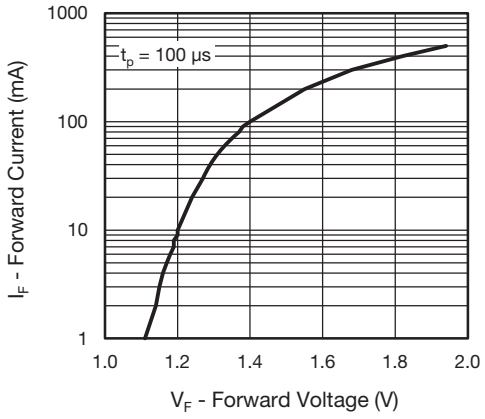


Fig. 3 - Forward Current vs. Forward Voltage

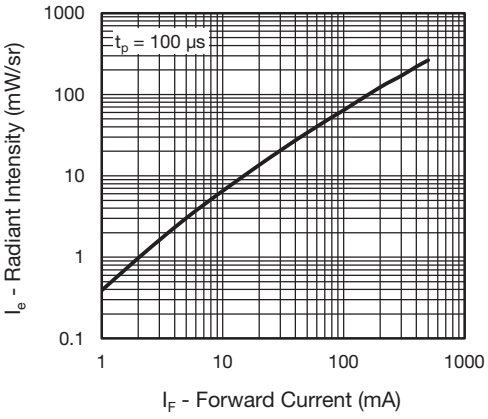


Fig. 6 - Radiant Intensity vs. Forward Current

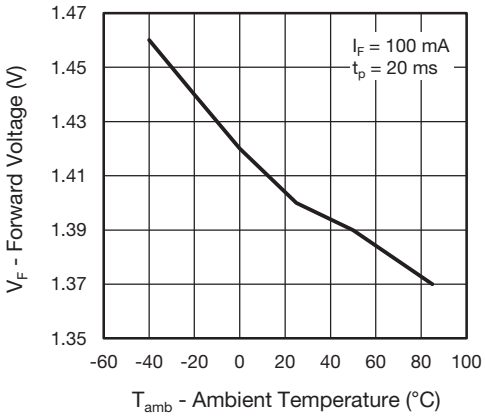


Fig. 4 - Forward Voltage vs. Ambient Temperature

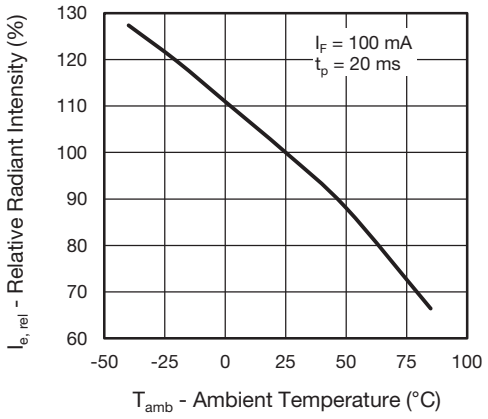


Fig. 7 - Radiant Intensity vs. Ambient Temperature

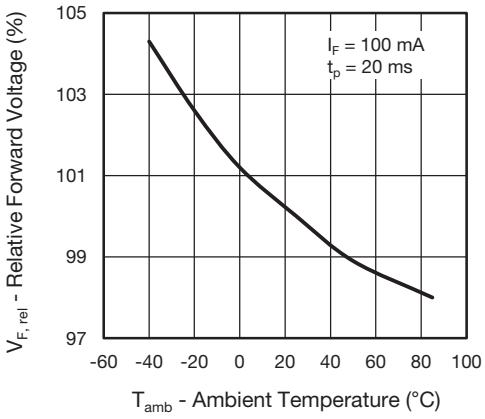


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

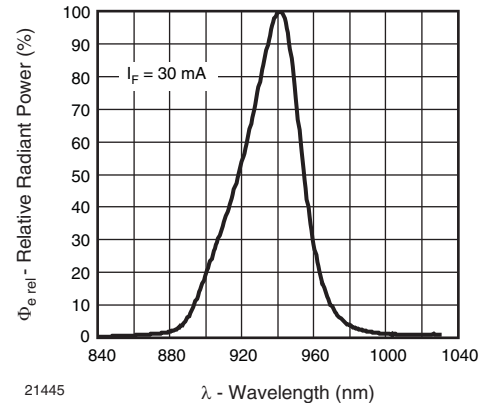


Fig. 8 - Relative Radiant Power vs. Wavelength

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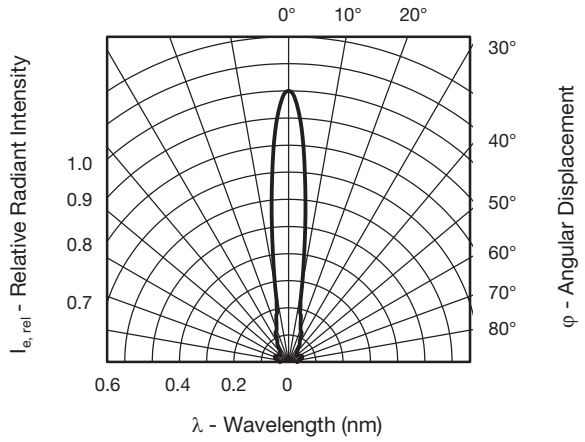


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

SOLDER PROFILE

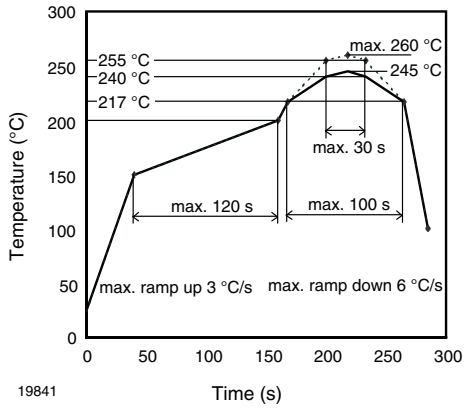


Fig. 10 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

FLOOR LIFE

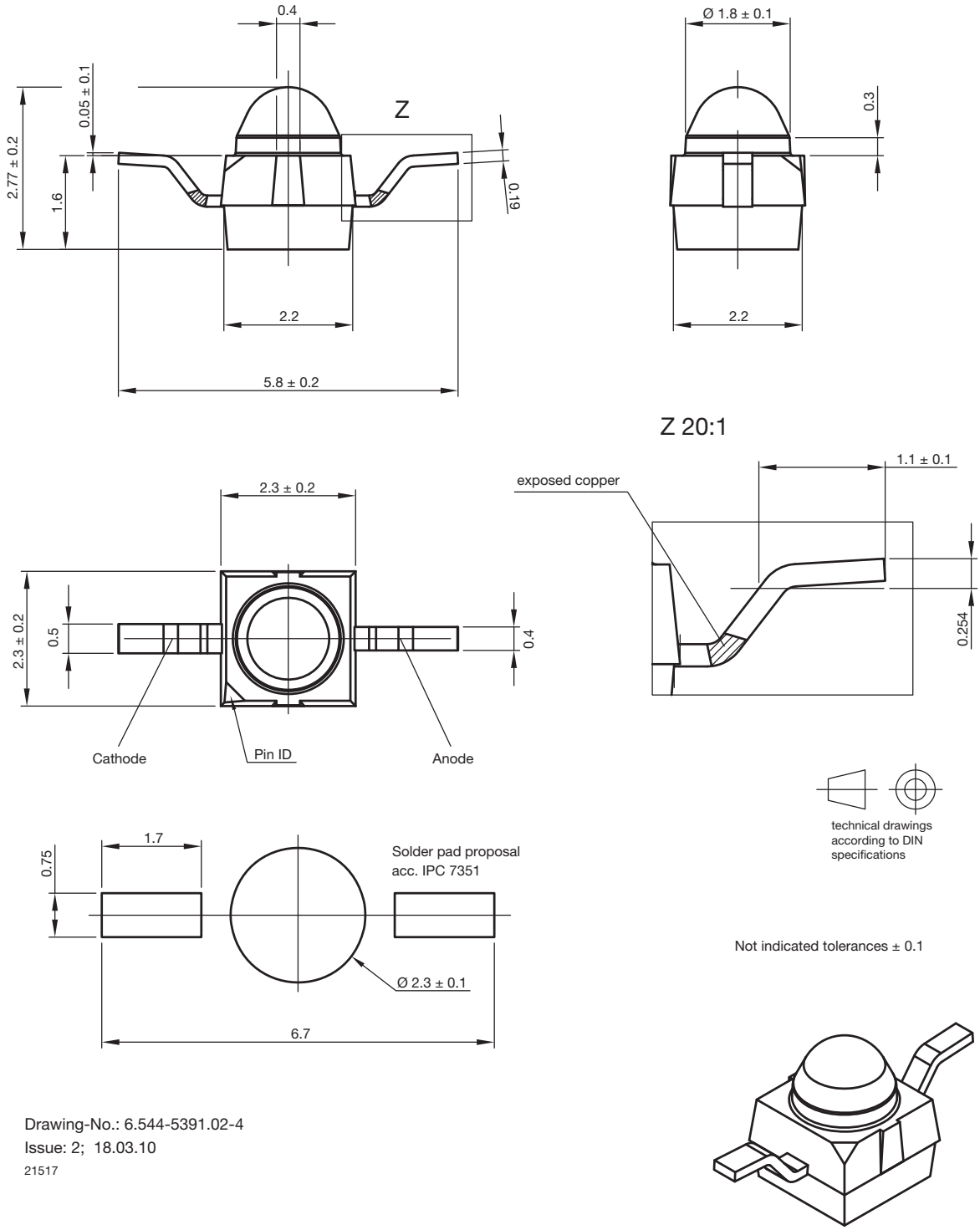
Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:
Floor life: 4 weeks
Conditions: T_{amb} < 30 °C, RH < 60 %
Moisture sensitivity level 2a, acc. to J-STD-020.

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

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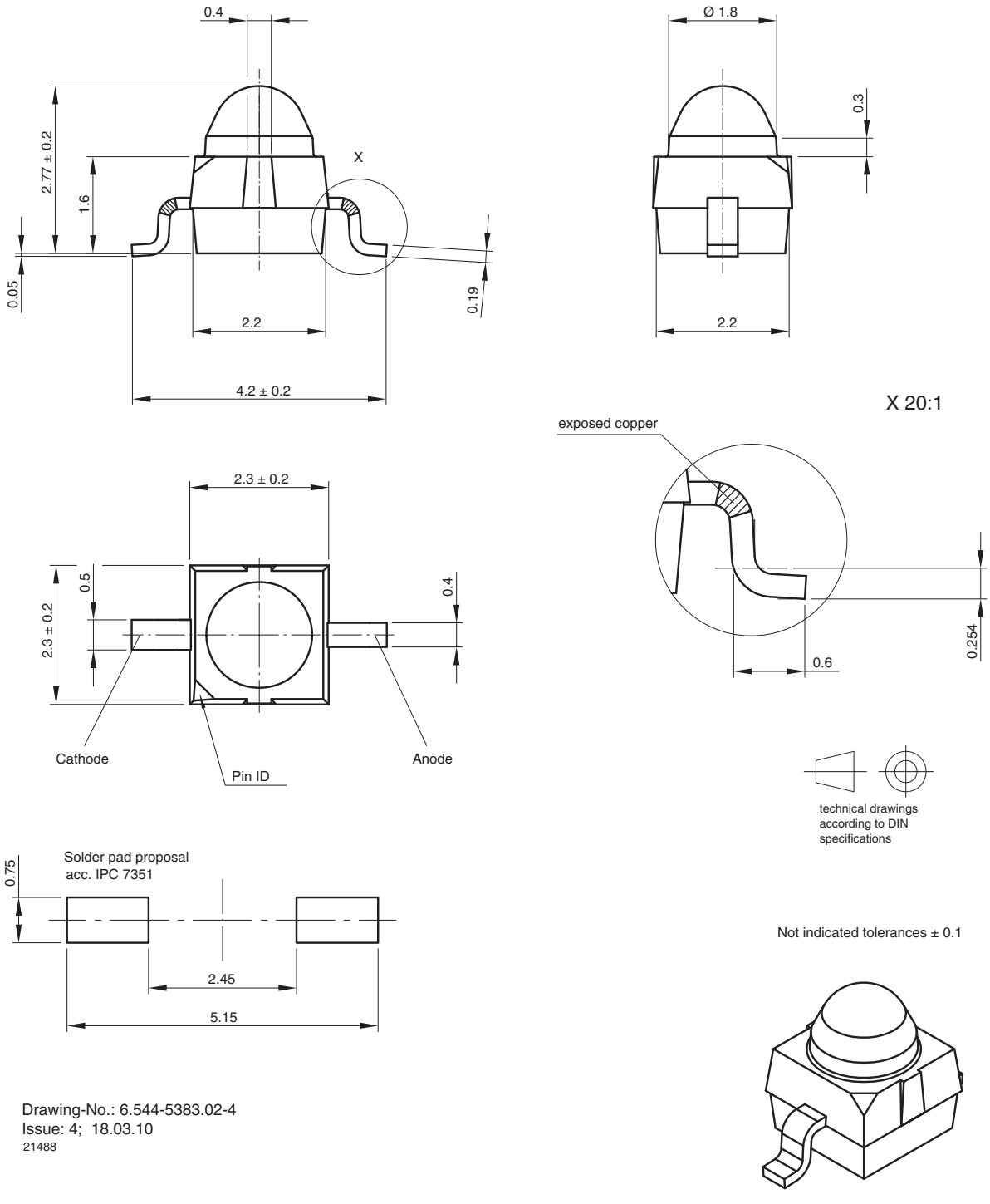
PACKAGE DIMENSIONS in millimeters: **VSMB294008RG**



Drawing-No.: 6.544-5391.02-4
Issue: 2; 18.03.10
21517

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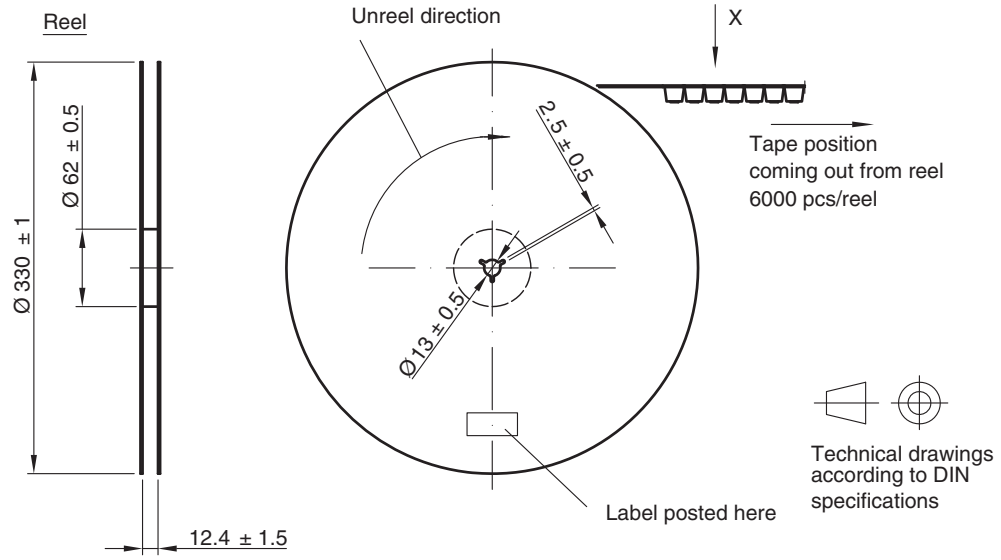
PACKAGE DIMENSIONS in millimeters: **VSMB294008G**



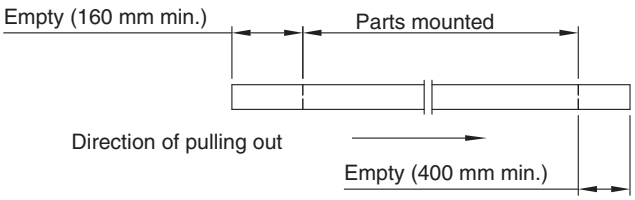
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TAPING AND REEL DIMENSIONS in millimeters: **VSMB294008RG**

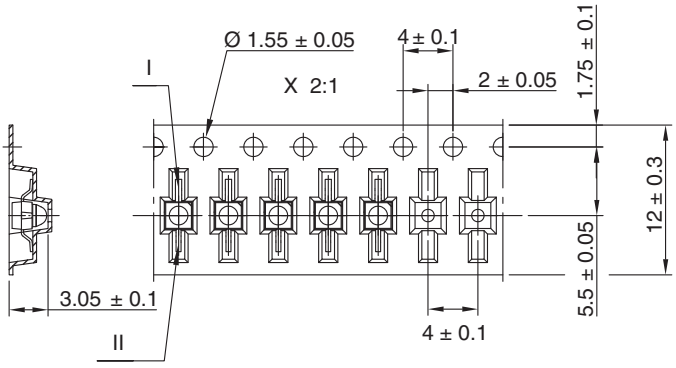


Leader and trailer tape:



Terminal position in tape

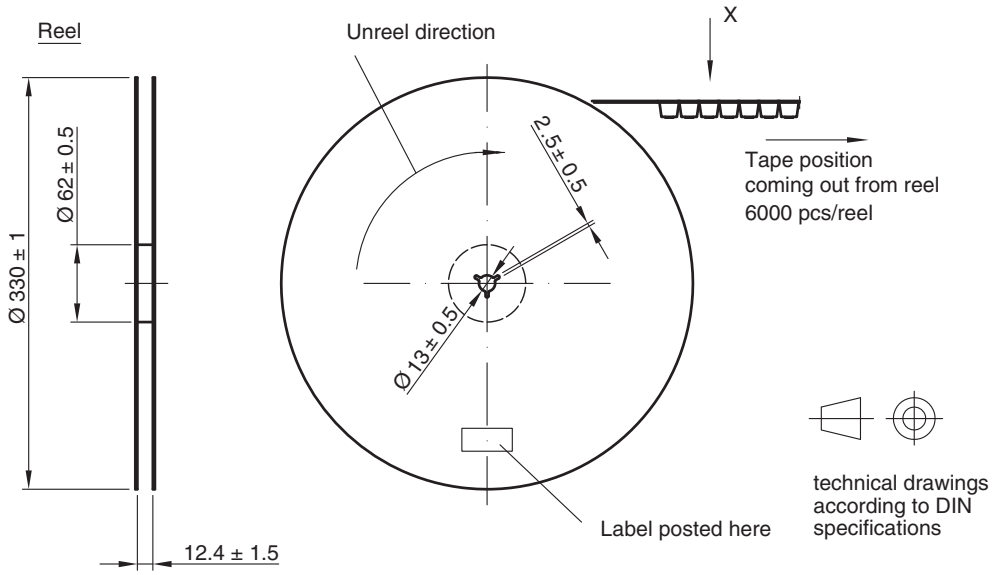
Device	Lead I	Lead II
VEMT2000	Collector	Emitter
VEMT2500		
VEMD2000	Cathode	Anode
VEMD2500		
VSMB2000		
VSMG2000		
VSMY2850RG	Anode	Cathode



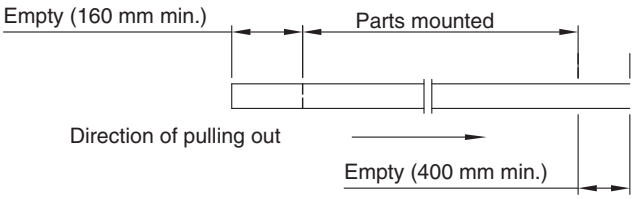
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TAPING AND REEL DIMENSIONS in millimeters: **VSMB294008G**

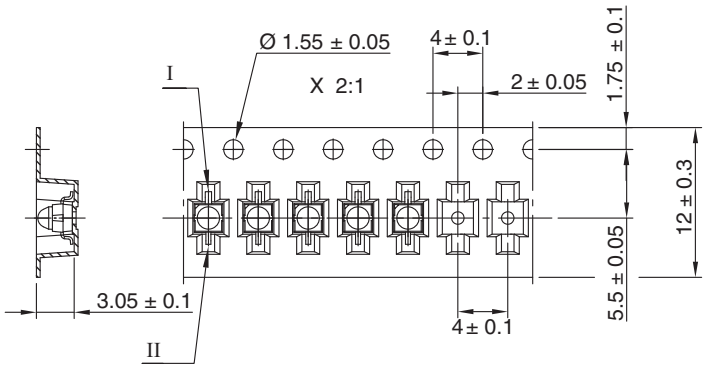


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VEMT2020	Collector	Emitter
VEMT2520		
VSMB2020	Cathode	Anode
VSMG2020		
VEMD2020		
VEMD2520		
VSMY2850G	Anode	Cathode



Drawing-No.: 9.800-5091.01-4
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