

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

VSMB2943RGX01

VSMB2943GX01


DESCRIPTION

VSMB2943X01 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

- IrDA compatible data transmission
- Miniature light barrier
- IR touch panels
- 3D TV
- Photointerrupters
- Optical switch
- Control and drive circuits
- Shaft encoders

FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.55
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 940$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 25^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reserve gullwing
- Package matches with detector VEMD2xx3X01 and VEMT2xx3X01 series
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

e3
RoHS COMPLIANT
HALOGEN FREE
GREEN
(5-2008)

PRODUCT SUMMARY

COMPONENT	I _e (mW/sr)	ϕ (deg)	λ_p (nm)	t _r (ns)
VSMB2943RGX01	20	± 25	940	15
VSMB2943GX01	20	± 25	940	15

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMB2943RGX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMB2943GX01	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
Peak forward current	t _p /T = 0.5, t _p = 100 µs	I _{FM}	200	mA
Surge forward current	t _p = 100 µs	I _{FSM}	1	A
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 figure 9, 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

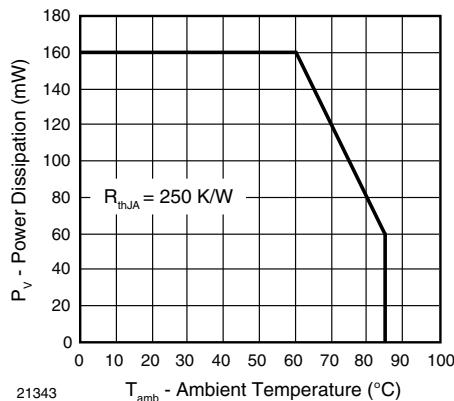


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

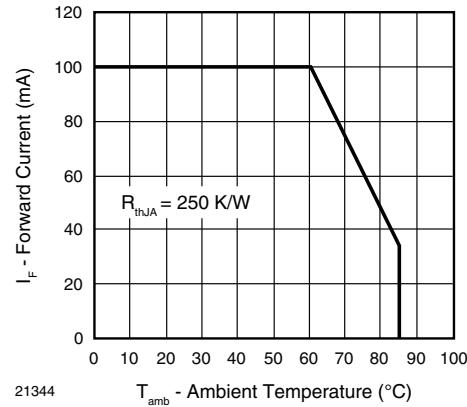


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	V_F	1.15	1.35	1.6	V
	$I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	V_F		2.2		V
Temperature coefficient of V_F	$I_F = 1 \text{ mA}$	TK_{VF}		-1.8		mV/K
	$I_F = 100 \text{ mA}$	TK_{VF}		-1.1		mV/K
Reverse current		I_R	Not designed for reverse operation			
Junction capacitance	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0 \text{ mW/cm}^2$	C_J		70		pF
Radiant intensity	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	I_e	10	20	30	mW/sr
	$I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	I_e		170		mW/sr
Radiant power	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	ϕ_e		40		mW
Temperature coefficient of radiant power	$I_F = 1 \text{ mA}$	$TK\phi_e$		-1.1		%/K
	$I_F = 100 \text{ mA}$	$TK\phi_e$		-0.51		%/K
Angle of half intensity		ϕ		± 25		deg
Peak wavelength	$I_F = 30 \text{ mA}$	λ_p	920	940	960	nm
Spectral bandwidth	$I_F = 30 \text{ mA}$	$\Delta\lambda$		25		nm
Temperature coefficient of λ_p	$I_F = 30 \text{ mA}$	$TK\lambda_p$		0.25		nm/K
Rise time	$I_F = 100 \text{ mA}$, 20 % to 80 %	t_r		15		ns
Fall time	$I_F = 100 \text{ mA}$, 20 % to 80 %	t_f		15		ns
Cut-off frequency	$I_{DC} = 70 \text{ mA}$, $I_{AC} = 30 \text{ mA pp}$	f_c		23		MHz

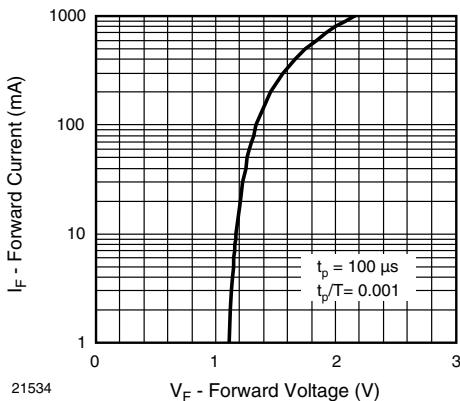
BASIC CHARACTERISTICS ($T_{amb} = 25^{\circ}C$, unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

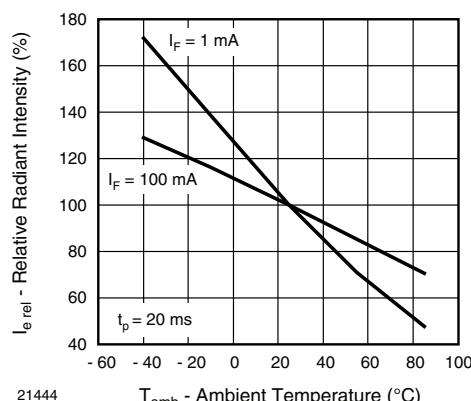


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

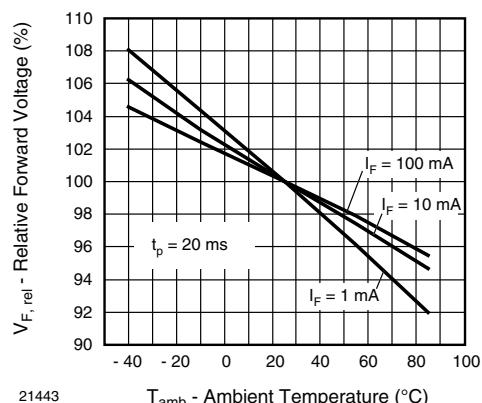


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

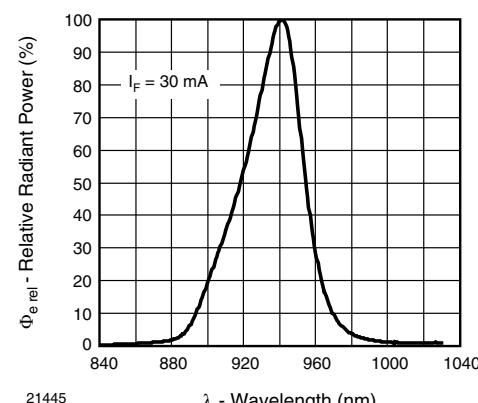


Fig. 7 - Relative Radiant Power vs. Wavelength

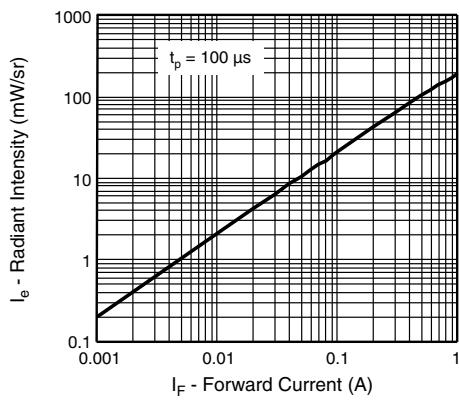


Fig. 5 - Radiant Intensity vs. Forward Current

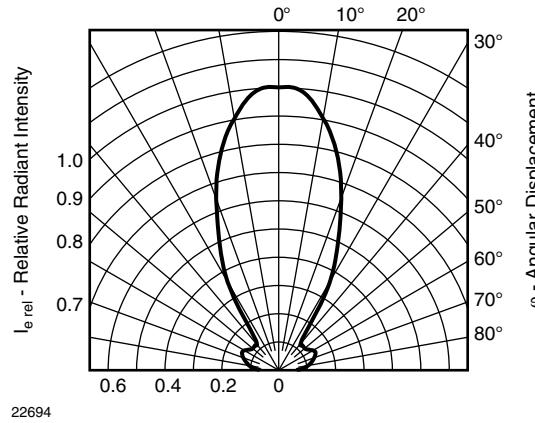


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

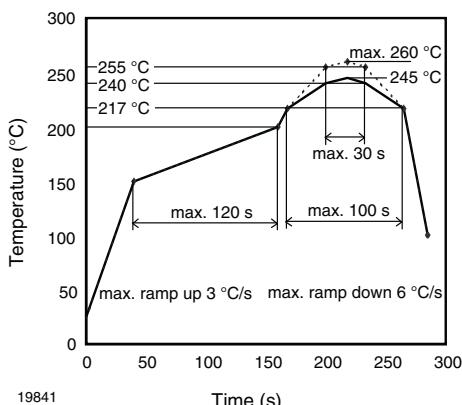
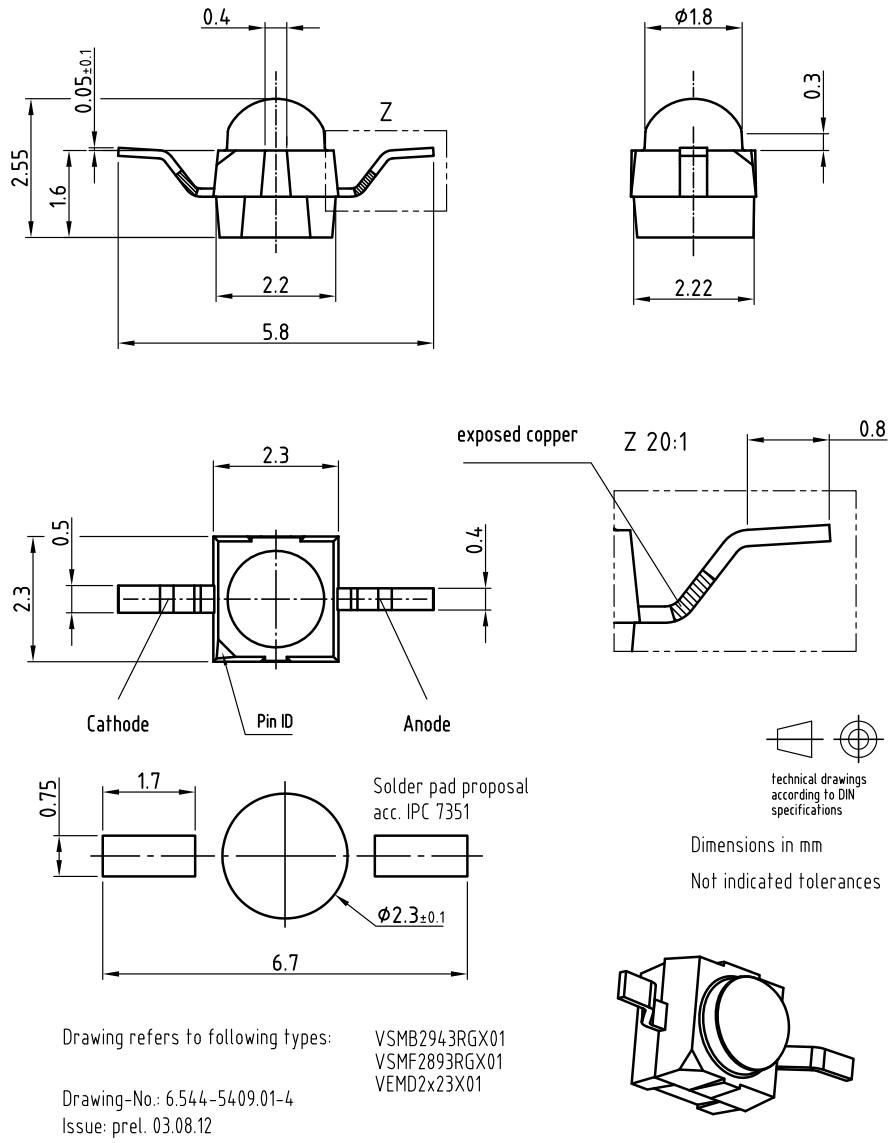
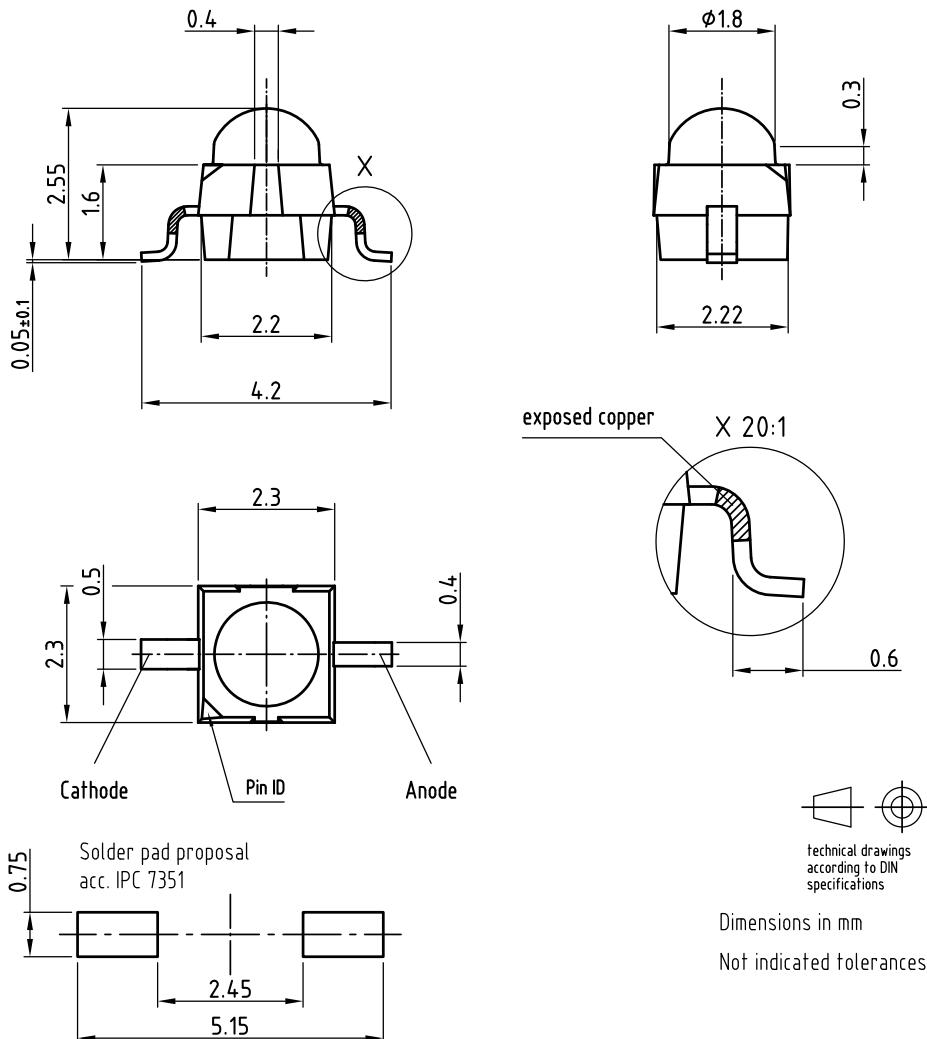
SOLDER PROFILE


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

PACKAGE DIMENSIONS in millimeters: **VSMB2943RG**


PACKAGE DIMENSIONS in millimeters: **VSMB2943G**


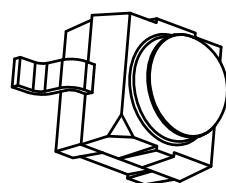
Drawing refers to following types: VSMB2943GX01

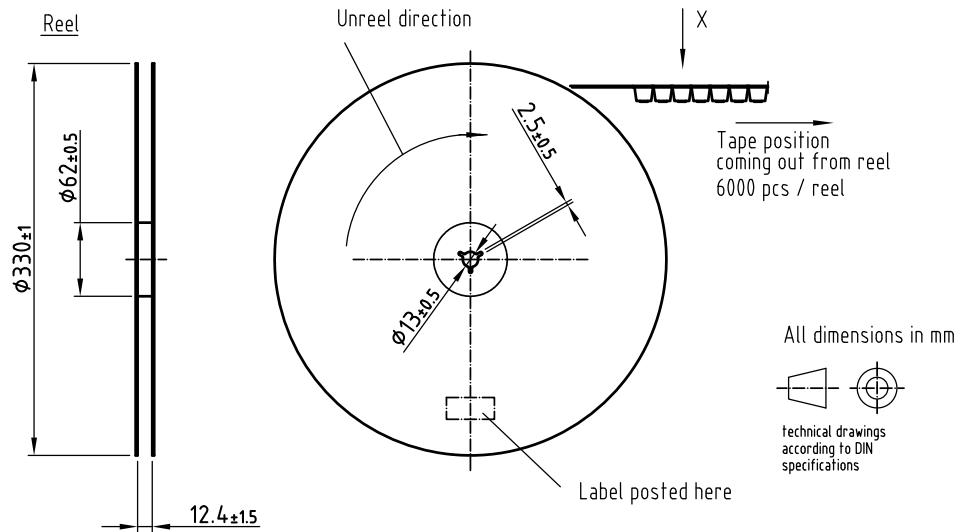
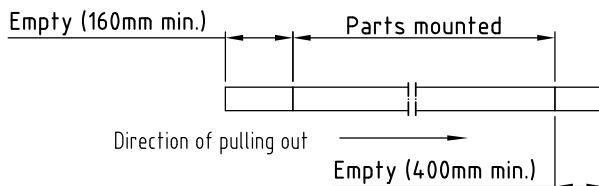
VSMF2893GX01

VEMD2x23X01

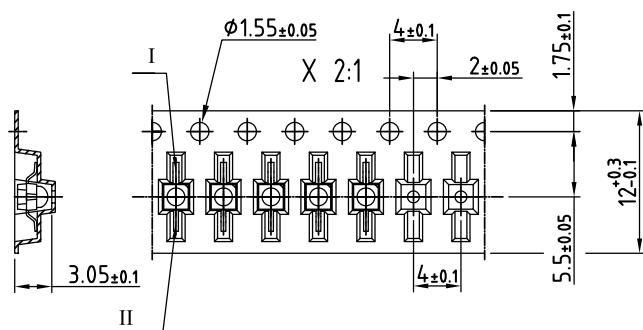
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Issue: prel; 03.08.12



TAPING AND REEL DIMENSIONS in millimeters: **VSMB2943RG**

Leader and trailer tape:

Terminal position in tape

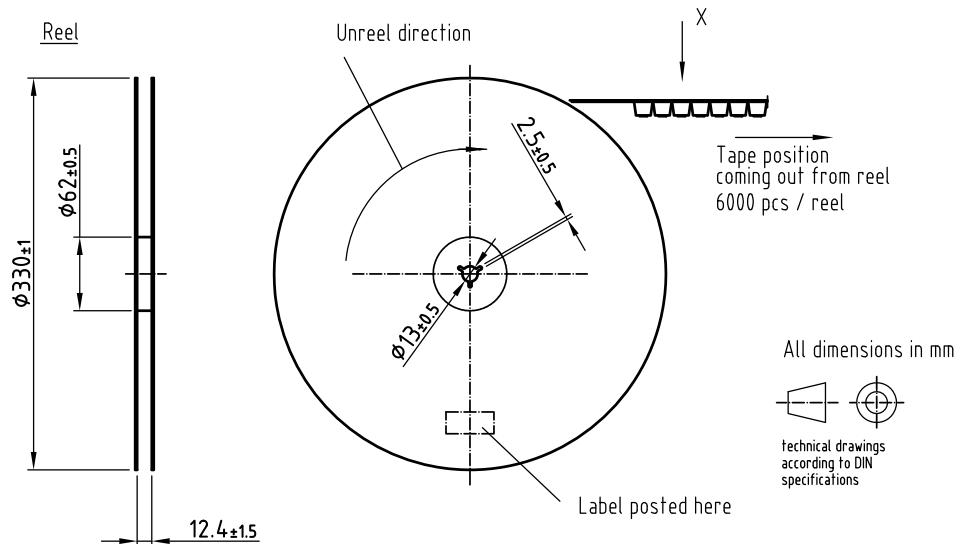
Device	Lead I	Lead II
VSMB2943RGX01		
VSMF2893RGX01	Cathode	Anode
VEMD2x03X01		
VEMT2x03X01	Collector	Emitter
VSMY2853RG	Anode	Cathode



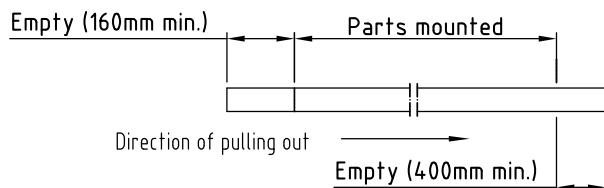
Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5100.02-4
Issue: prel; 03.08.12

TAPING AND REEL DIMENSIONS in millimeters: **VSMB2943G**

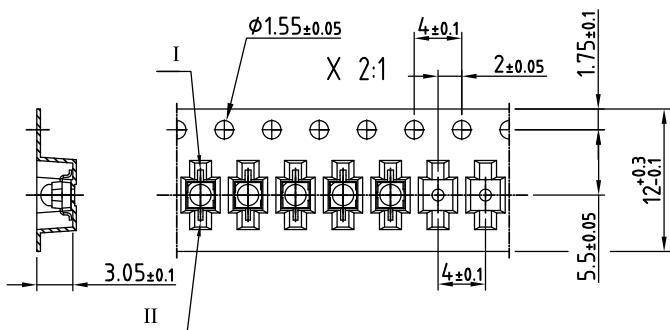


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VSMB2943GX01	Cathode	Anode
VSMF2893GX01		
VEMD2x23X01		
VEMT2x23X01	Collector	Emitter
VSMY2853G	Anode	Cathode



Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5091.21-4
Issue: prel. 03.08.12

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