

High Speed Infrared Emitting Diodes, 850 nm, GaAlAs, DH



DESCRIPTION

VSMG2000X01 series are infrared, 850 nm emitting diodes in GaAlAs (DH) technology with high radiant power and high speed, molded in clear, untinted plastic packages (with lens) for surface mounting (SMD).

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
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 850$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 12^\circ$
- 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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications



APPLICATIONS

- IrDA compatible data transmission
- IR-illumination (CCTV)
- Miniature light barrier
- Photointerrupters
- Optical switch
- Shaft encoders
- IR emitter source for proximity applications

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	ϕ (deg)	λ_p (nm)	t_r (ns)
VSMG2000X01	40	± 12	850	20
VSMG2020X01	40	± 12	850	20

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMG2000X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMG2020X01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA



VSMG2000X01, VSMG2020X01



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ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Peak forward current	$t_p/T = 0.5$, $t_p = 100 \mu s$	I_{FM}	200	mA
Surge forward current	$t_p = 100 \mu s$	I_{FSM}	1	A
Power dissipation		P_V	170	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	Acc. 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

Note

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

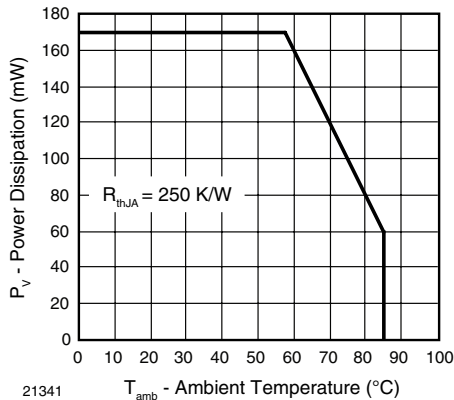


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

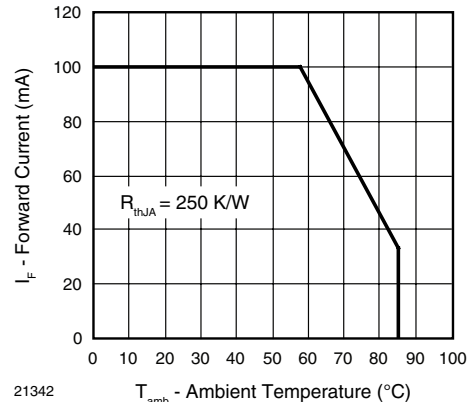


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	V_F	1.25	1.45	1.7	V
	$I_F = 1 \text{ A}$, $t_p = 100 \mu s$	V_F		2.3		V
Temperature coefficient of V_F	$I_F = 1 \text{ mA}$	TK_{V_F}		- 1.8		mV/K
	$I_F = 100 \text{ mA}$	TK_{V_F}		- 1.1		mV/K
Reverse current	$V_R = 5 \text{ V}$	I_R			10	μA
Junction capacitance	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0 \text{ mW/cm}^2$	C_J		125		pF
Radiant intensity	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	I_e	20	40	60	mW/sr
	$I_F = 1 \text{ A}$, $t_p = 100 \mu s$	I_e		350		mW/sr
Radiant power	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	ϕ_e		40		mW
Temperature coefficient of ϕ_e	$I_F = 100 \text{ mA}$	TK_{ϕ_e}		- 0.35		%/K
Angle of half intensity		φ		± 12		deg
Peak wavelength	$I_F = 30 \text{ mA}$	λ_p	830	850	870	nm
Spectral bandwidth	$I_F = 30 \text{ mA}$	$\Delta\lambda$		35		nm
Temperature coefficient of λ_p	$I_F = 30 \text{ mA}$	TK_{λ_p}		0.25		nm/K
Rise time	$I_F = 100 \text{ mA}$, 20 % to 80 %	t_r		20		ns
Fall time	$I_F = 100 \text{ mA}$, 20 % to 80 %	t_f		20		ns
Cut-off frequency	$I_{DC} = 70 \text{ mA}$, $I_{AC} = 30 \text{ mA pp}$	f_c		23		MHz
Virtual source diameter		d		1.5		mm

Note

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

BASIC CHARACTERISTICS

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

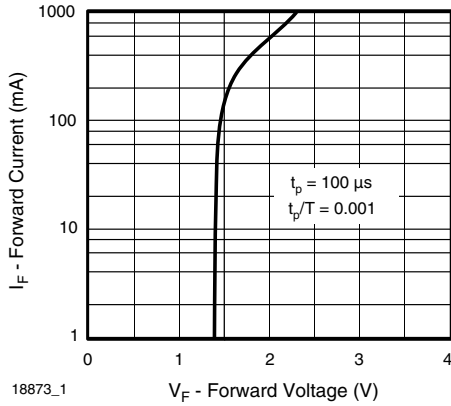


Fig. 3 - Forward Current vs. Forward Voltage

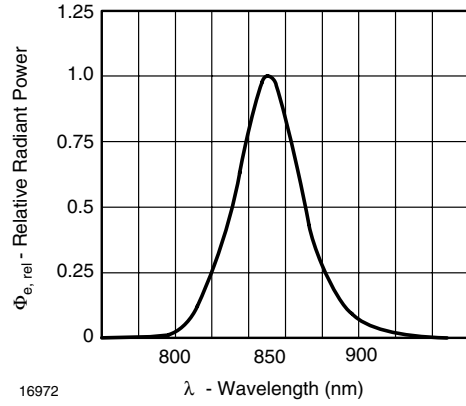


Fig. 6 - Relative Radiant Power vs. Wavelength

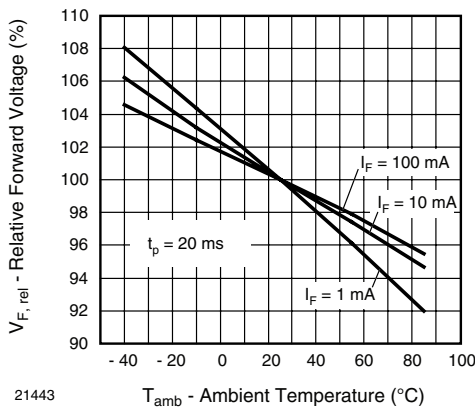


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

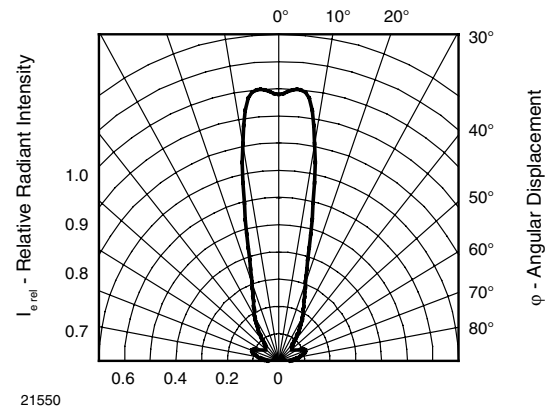


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

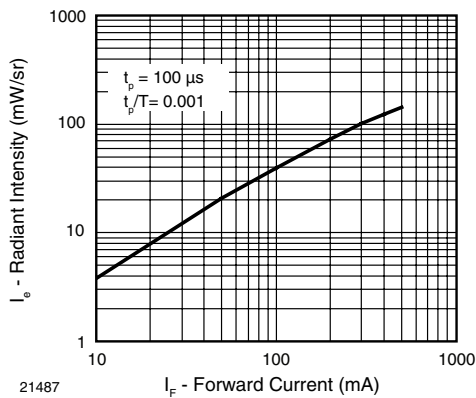


Fig. 5 - Radiant Intensity vs. Forward Current

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SOLDER PROFILE

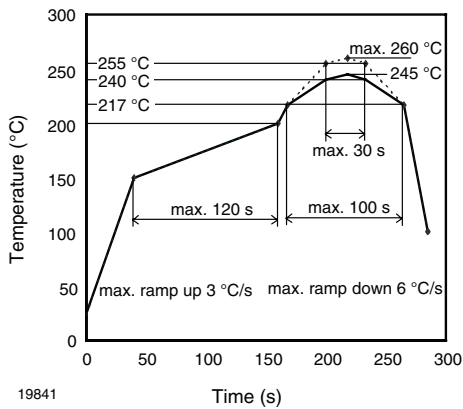


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

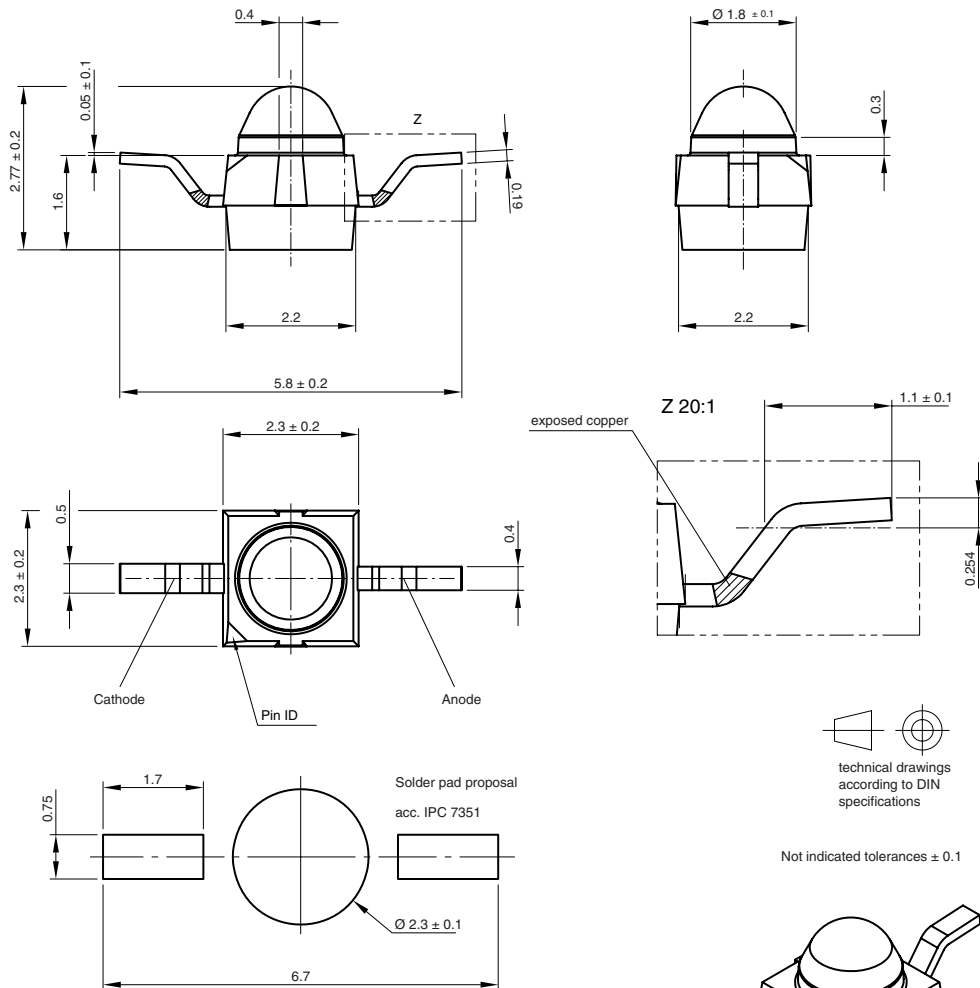
Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

Moisture sensitivity level 2a, acc. to J-STD-020.

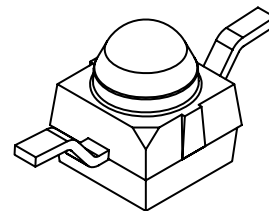
DRYING

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), $RH < 5\%$.

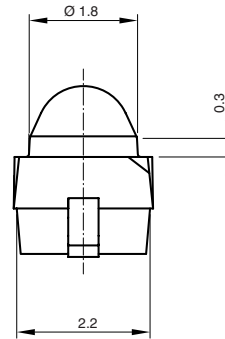
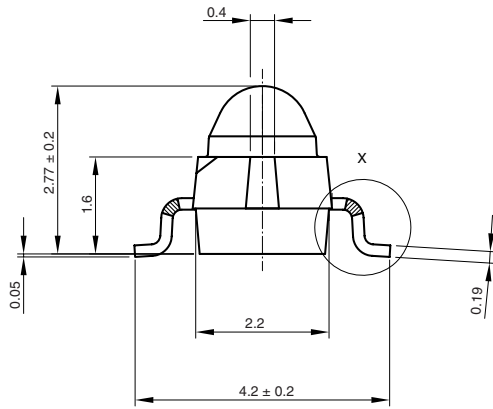
PACKAGE DIMENSIONS in millimeters: VSMG2000



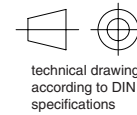
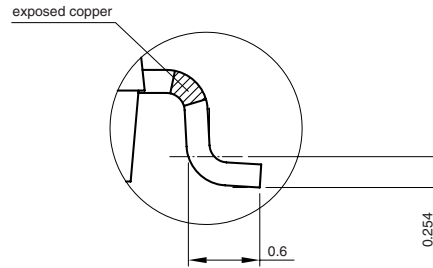
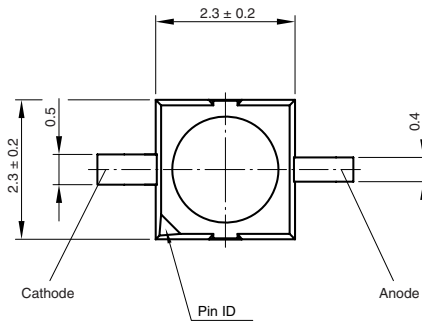
Drawing-No.: 6.544-5391.02-4
Issue: 1; 26.09.08
21517



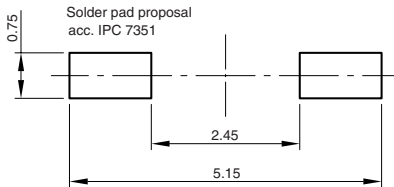
PACKAGE DIMENSIONS in millimeters: **VSMG2020**



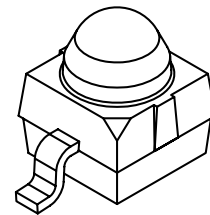
X 20:1



technical drawings
 according to DIN
 specifications



Not indicated tolerances ± 0.1



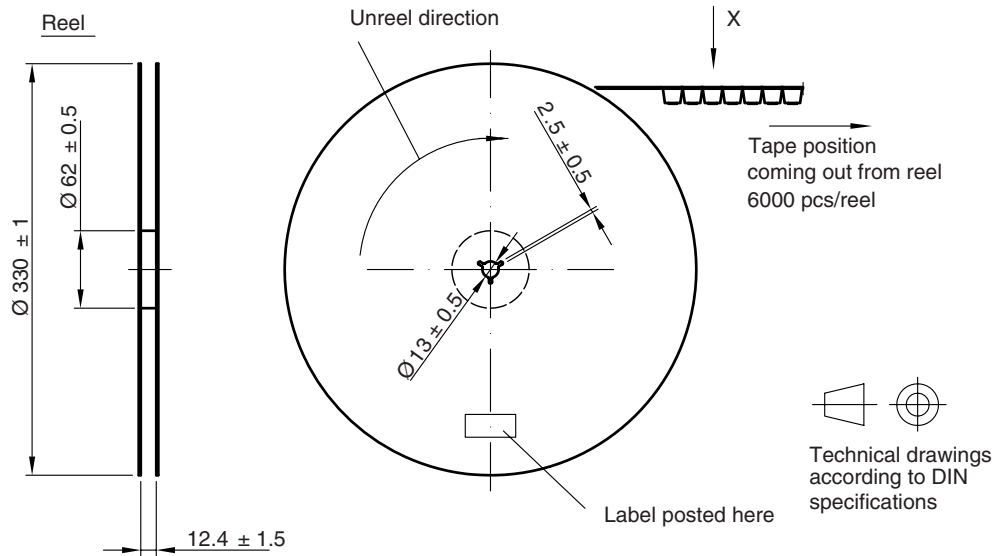
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 Issue: 3; 26.09.08
 21488

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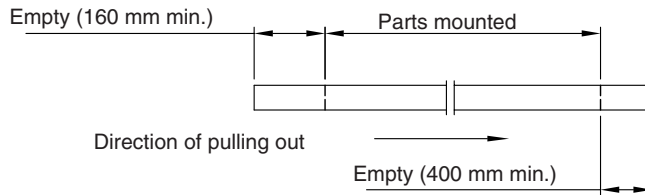


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TAPING AND REEL DIMENSIONS in millimeters: VSMG2000

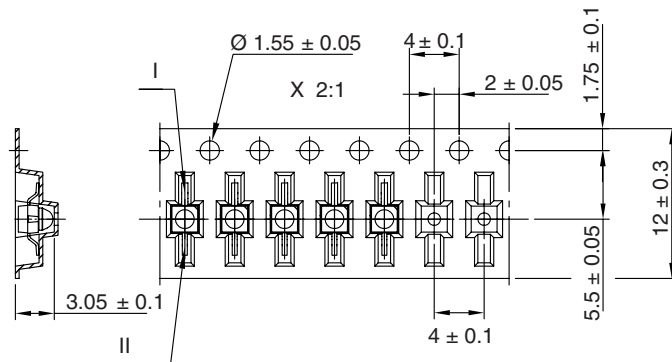


Leader and trailer tape:



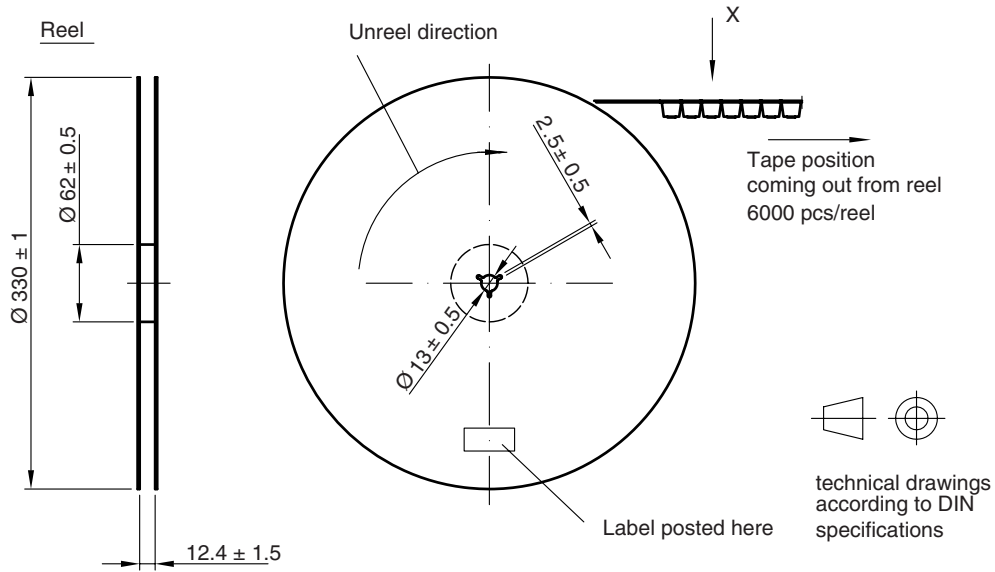
Terminal position in tape

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

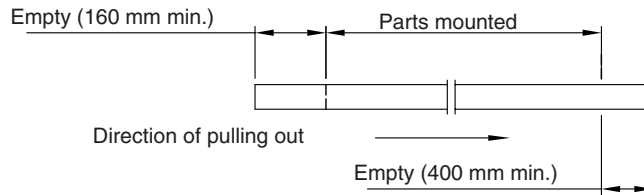


Drawing-No.: 9.800-5100.01-4
Issue: X; 29.04.09
21572

TAPING AND REEL DIMENSIONS in millimeters: VSMG2020

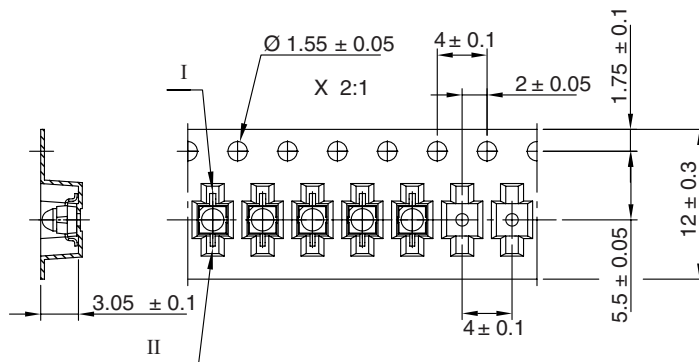


Leader and trailer tape:



Terminal position in tape

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



Drawing-No.: 9.800-5091.01-4

Issue: X; 29.04.09

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