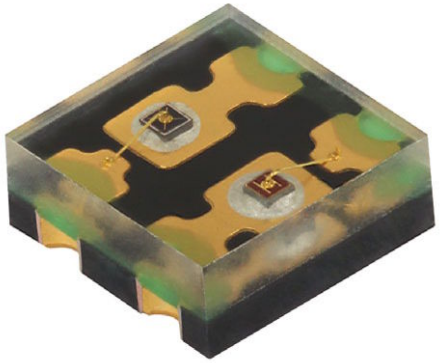
Dual Color Emitting Diodes, 660 nm and 940 nm



FEATURES

- Package type: surface mount
- Package form: square PCB
- Dimensions (L x W x H in mm): 2 x 2 x 0.87
- Peak wavelength: λ_p = 660 nm and 940 nm
- High reliability
- High radiant power
- Angle of half intensity: φ = ± 60°
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

DESCRIPTION

VSMD66694 is a dual color emitting device with 660 nm and 940 nm peak wavelength. The emitters are based on the SurfLight™ technology, providing high radiant power.

APPLICATIONS

- Wearables
- Health monitoring
- Pulse oximetry

PRODUCT SUMMARY

COMPONENT	COLOR	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMD66694	Red	2.3	± 60	660	10
	IR	1.5		940	

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMD66694	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	square PCB

Note

- MOQ: minimum order quantity

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

PARAMETER	TEST CONDITION	SYMBOL	COLOR	VALUE	UNIT
Reverse voltage		V_R		5	V
Forward current		I_F	Red	70	mA
			IR	70	
Peak forward current	t_p/T = 0.1, t_p = 100 µs	I_{FM}	Red	140	mA
			IR	140	
Surge forward current	t_p = 100 µs	I_{FSM}	Red	1	A
			IR	1	
Power dissipation		P_V	Red	161	mW
			IR	119	
Junction temperature		T_j		100	°C
Operating temperature range		T_{amb}		-25 to +85	°C
Storage temperature range		T_{stg}		-25 to +85	°C
Soldering temperature	According fig. 10, J-STD-020	T_{sd}		260	°C
Thermal resistance junction / ambient	J-STD-051	R_{thJA}		390	K/W

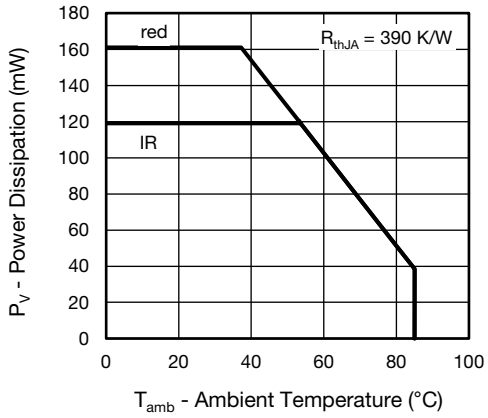


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

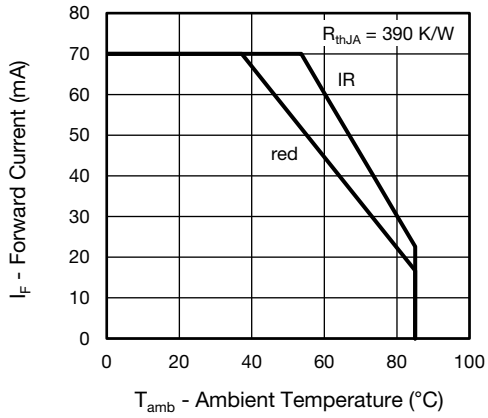
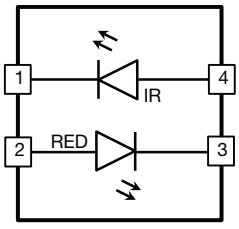


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**SYMBOL**	**COLOR**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 20 mA, t_p = 20 ms	V_F	Red	-	2.0	2.3	V
			IR	-	1.4	1.7	
Temperature coefficient	I_F = 20 mA	TK_{VF}	Red	-	-2.3	-	mV/K
			IR	-	-2.3	-	
Reverse current		I_R	not designed for reverse operation				µA
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0 mW/cm²	C_J	Red	-	7	-	pF
			IR	-	5	-	
Radiant intensity	I_F = 20 mA	I_e	Red	1.9	2.3	-	mW/sr
			IR	0.8	1.5	-	
Radiant power	I_F = 20 mA	ϕe	Red	-	9.5	-	mW
			IR	-	8.5	-	
Angle of half intensity	I_F = 20 mA	φ		-	± 60	-	deg
Peak wavelength	I_F = 20 mA	λ_p	Red	650	660	670	nm
			IR	920	940	960	
Spectral bandwidth	I_F = 20 mA	$\Delta\lambda$	Red	-	20	-	nm
			IR	-	40	-	
Temperature coefficient of λ_p	I_F = 20 mA	$TK_{\lambda p}$	Red	-	0.2	-	nm/K
			IR	-	0.3	-	
Rise time	I_F = 20 mA	t_r	Red	-	10	-	ns
			IR	-	10	-	
Fall time	I_F = 20 mA	t_f	Red	-	10	-	ns
			IR	-	10	-	

CIRCUIT BLOCK DIAGRAM



1	IR LED	IR cathode
2	RED LED	RED anode
3	RED LED	RED cathode
4	IR LED	IR anode

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

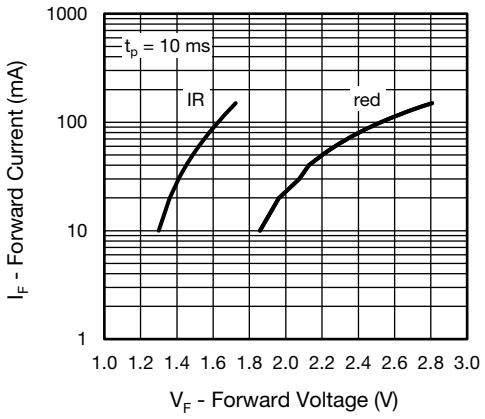


Fig. 3 - Forward Current vs. Forward Voltage

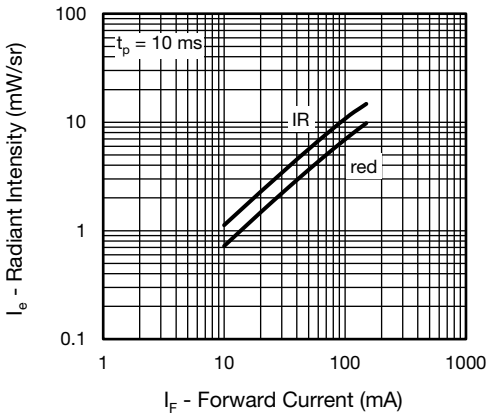


Fig. 6 - Radiant Intensity vs. Forward Current

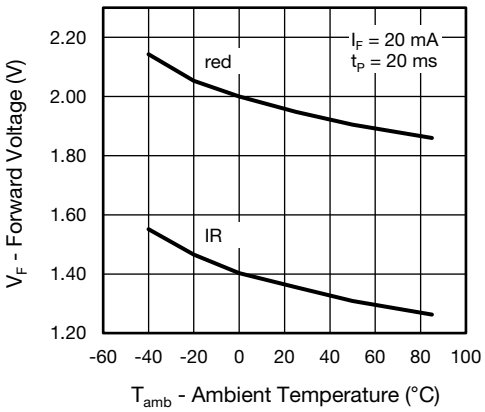


Fig. 4 - Forward Voltage vs. Ambient Temperature

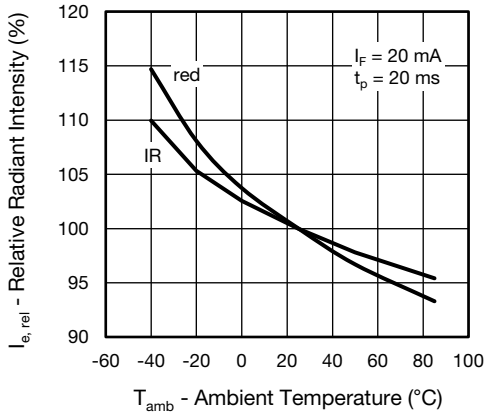


Fig. 7 - Relative Radiant Intensity vs. Ambient Temperature

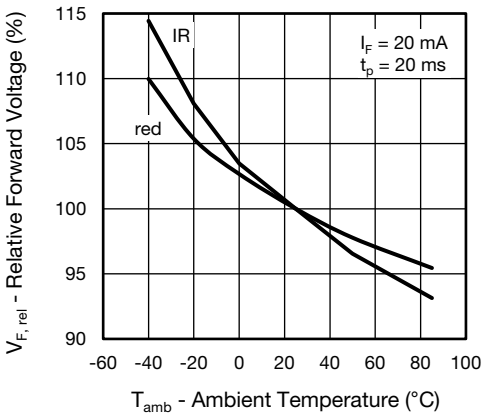


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

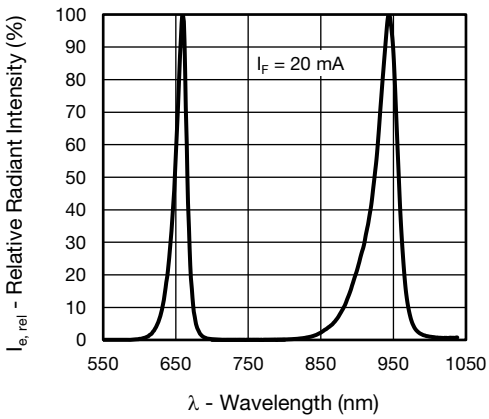


Fig. 8 - Relative Radiant Intensity vs. Wavelength

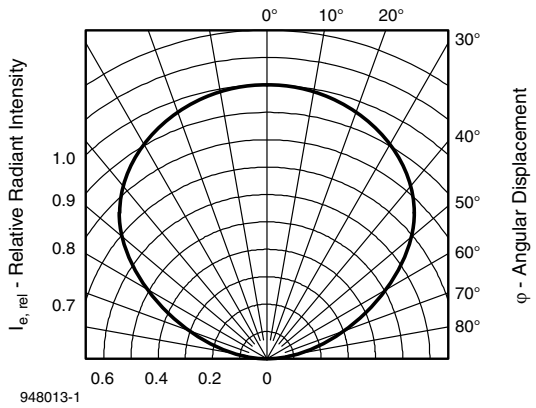


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

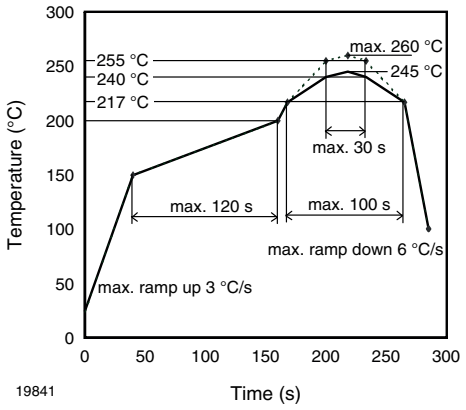


Fig. 10 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

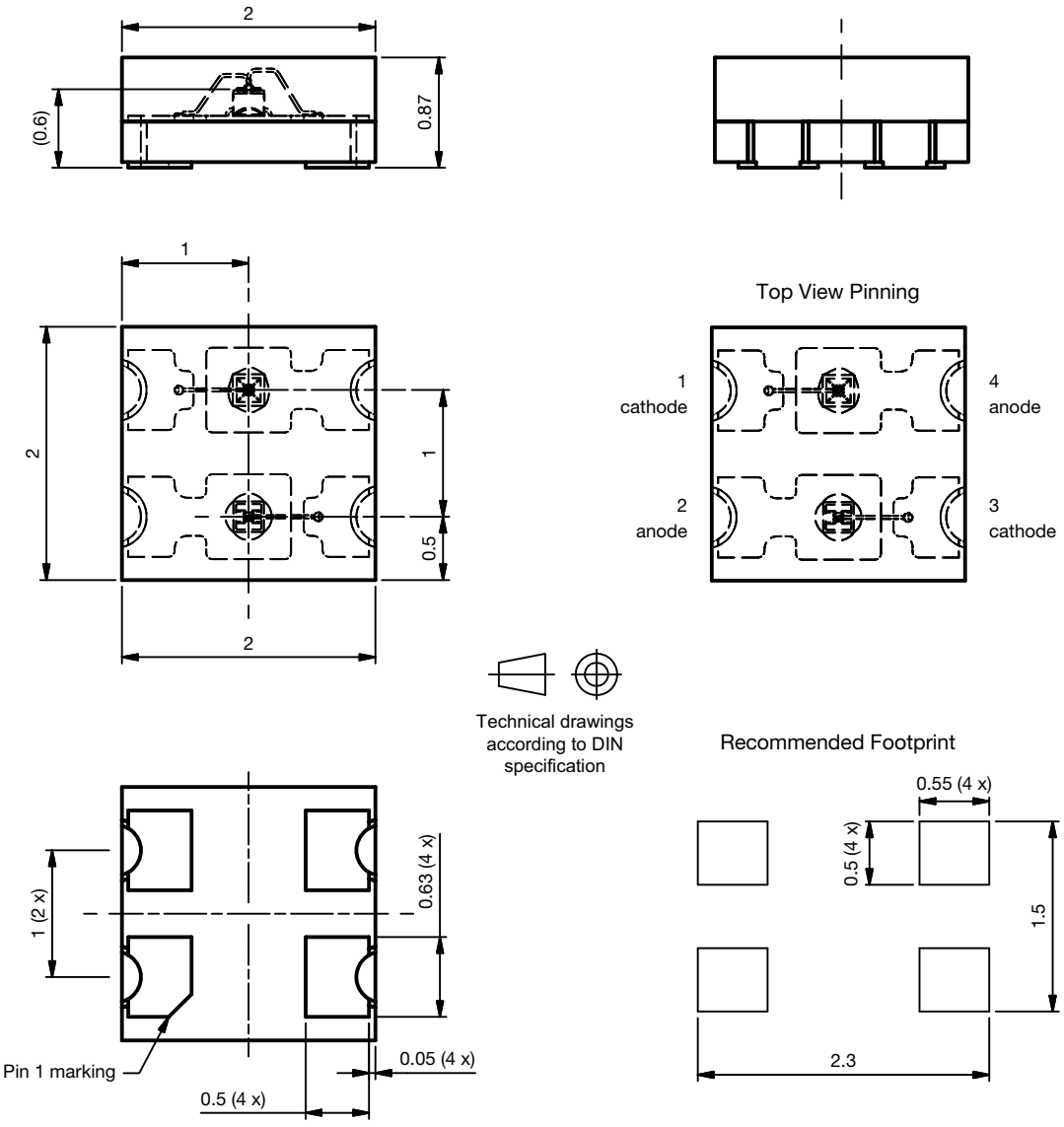
Floor life: 168 h

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

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 %.

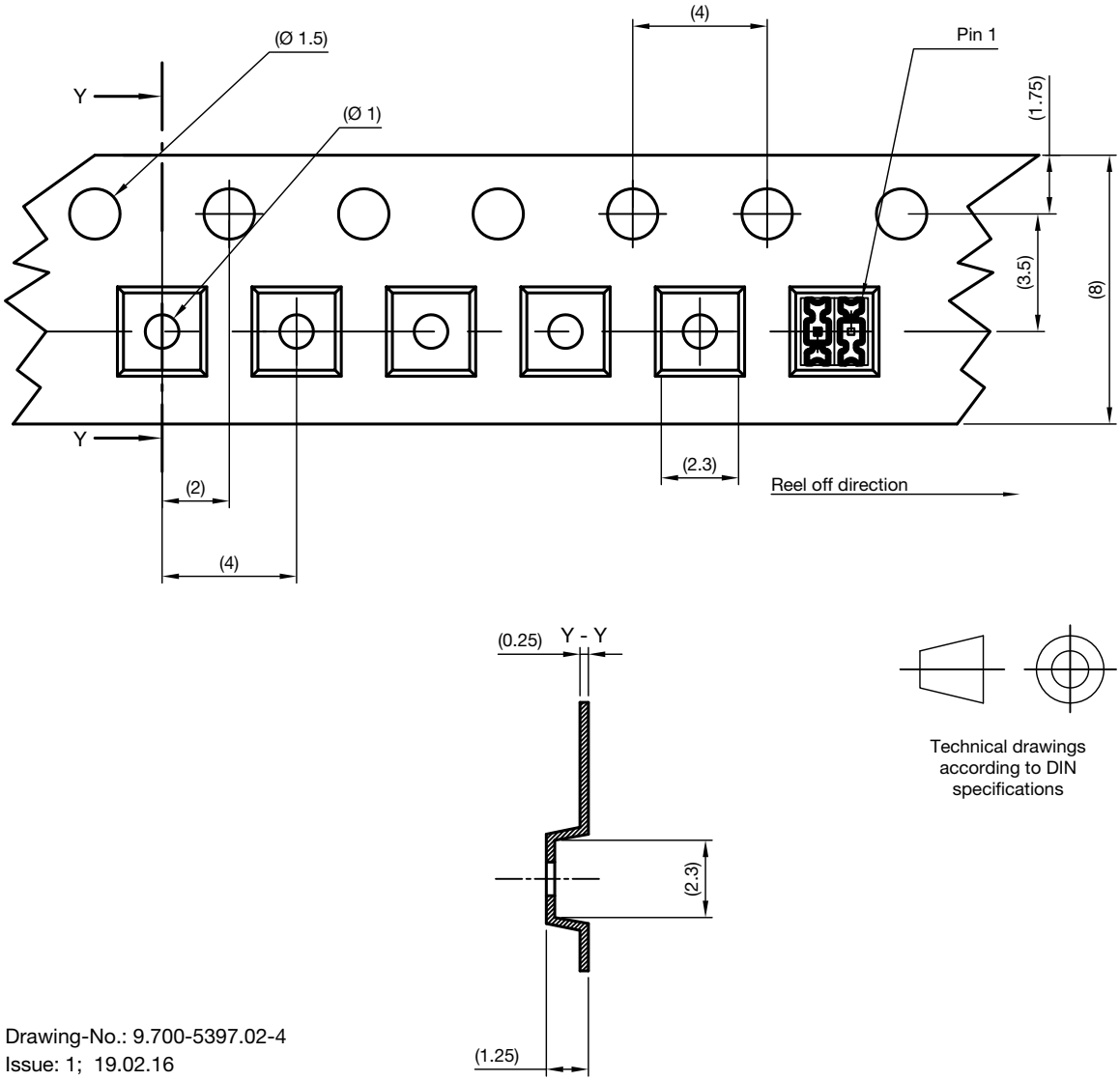
PACKAGE DIMENSIONS in millimeters



Drawing No.: 6.550-5347.01-4
Issue: 1; 19.02.16

Not indicated tolerances ± 0.1

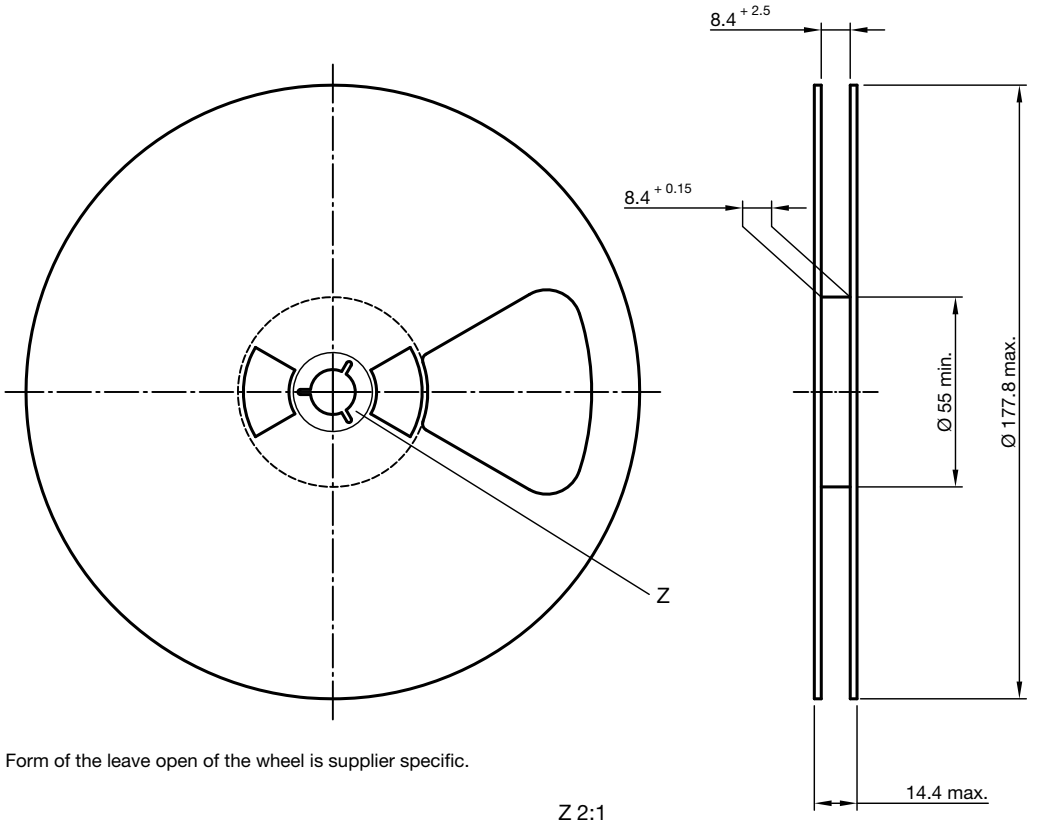
TAPE DIMENSIONS in millimeters



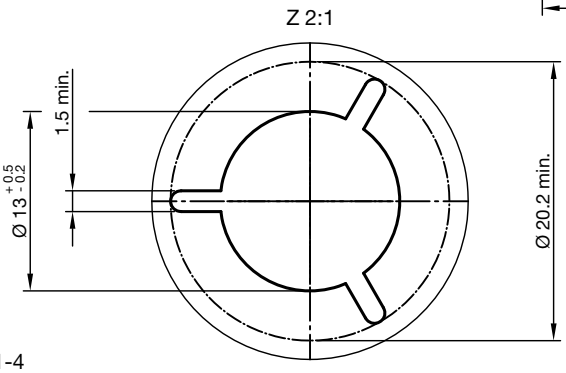
Technical drawings according to DIN specifications

Drawing-No.: 9.700-5397.02-4
Issue: 1; 19.02.16

REEL DIMENSIONS in millimeters



Form of the leave open of the wheel is supplier specific.



technical drawings according to DIN specifications

Drawing-No.: 9.800-5096.01-4
Issue: 4; 08.03.2016

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