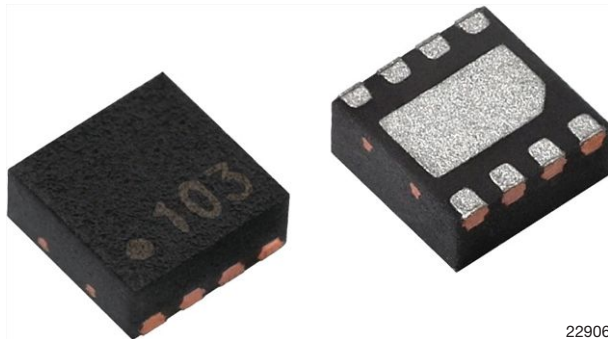


Preamplifier Circuit for IR Remote Control



22906

DESIGN SUPPORT TOOLS

[click logo to get started](#)

MECHANICAL DATA

Pinning:

 1, 4, 5 = N.C., 2 = V_S , 3 = OUT, 6, 8 = GND, 7 = IN

FEATURES

- Carrier-out-function: carrier frequency and burst length accurately correspond to the input signal
- AC coupled response from 20 kHz to 60 kHz; all data formats
- Small QFN package with 2 mm width
- Can be used with either a photodiode or an IR emitter in forward or reverse polarity
- AC coupled input is insensitive to DC photocurrents
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

ESD

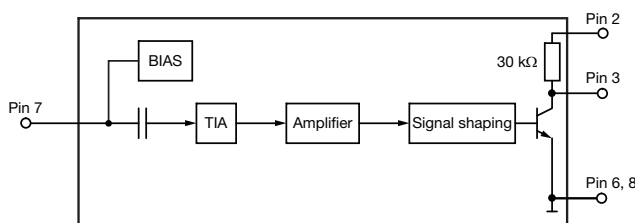
- To maximize the sensitivity, the TIA input pin has minimal ESD protection. Care should be taken never to touch or otherwise expose this pin to an adverse ESD source. The ESD protection conforms to Class 1B

DESCRIPTION

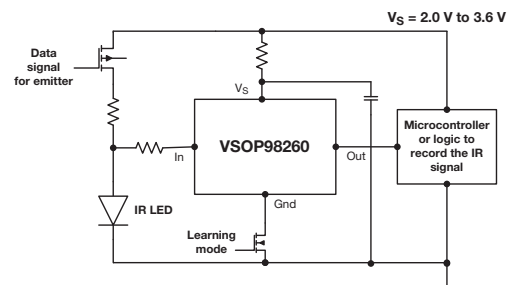
The VSOP98260 is designed for use in an IR learning application together with a photo PIN diode or IR LED as optical detector. It is compatible with all data formats for IR remote control. On the other hand it is immune to current caused by light sources such as tungsten bulbs or fluorescent lamps.

PARTS TABLE	
Carrier frequency	38 kHz
Package	VSOP
Pinning	1, 4, 5 = N.C., 2 = V_S , 3 = OUT, 6, 8 = GND, 7 = IN
Dimensions (mm)	2.0 W x 2.0 H x 0.76 D
Mounting	SMD
Application	Code learning

BLOCK DIAGRAM (simplified)



APPLICATION CIRCUIT



Recommended to minimize the connection distance between the IR LED and the input of the VSOP98260, and if possible to shield this connection to Gnd.

Note

- (1) For further information, see application note, "IC for Code Learning Applications"

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Supply voltage	Pin 2	V_S	-0.3 to +6	V
Supply current	Pin 2	I_S	5	mA
Output voltage	Pin 3	V_O	-0.3 to ($V_S + 0.3$)	V
Output current	Pin 3	I_O	5	mA
Input voltage	Pin 7	V_I	-0.3 to 3.3	V
Input current	Pin 7	I_I	7	mA
Power dissipation	$T_{amb} \leq 85\text{ }^{\circ}\text{C}$	P_{tot}	10	mW
Operating temperature range		T_{amb}	-25 to +85	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-25 to +85	$^{\circ}\text{C}$
ESD stress, HBM	Pin 2, pin 3, MIL-STD-883C	V_{ESD}	2000	V
	Pin 7, MIL-STD-883C	V_{ESD}	500	V
ESD stress, MM	Pin 2, pin 3, MIL-STD-883C	V_{ESD}	200	V
	Pin 7, MIL-STD-883C	V_{ESD}	100	V

Note

- Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect the device reliability.

ELECTRICAL CHARACTERISTICS ($T_{amb} = 5\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage		V_S	2.0	-	3.6	V
Supply current (pin 2)	$I_{IN} = 0, V_S = 5\text{ V}$	I_S	0.55	0.7	0.9	mA
Output voltage low (pin 3)	$I_{OL} = 2\text{ mA}$	V_{OL}	-	-	100	mV
Output voltage high (pin 3)	$I_{OL} = 0$	V_{OH}	$V_S - 0.25$	-	-	V
Internal pull up resistor (pin 2, pin 3)		R_{PU}	-	33	-	k Ω
Max. input DC current	$V_{IN} > 0$	$I_{IN-DCmax.}$	400	-	-	μA
Min. signal detection current	$I_{IN-DC} = 0, f_C = f_{BPF}$	$I_{IN-min.}$	-	40	80	nA
	$I_{IN-DC} = 100\text{ }\mu\text{A}, f_C = f_{BPF}$	$I_{IN-min.}$	-	50	-	nA
Output accuracy	$f_C = 20\text{ kHz to }60\text{ kHz}$, $I_{IN} = 80\text{ nA to }50\text{ }\mu\text{A}$, testsignal see fig. 1, BER $\leq 2\%$	N carrier pulses	input burst length -1 cycle	input burst length	input burst length +1 cycle	counts

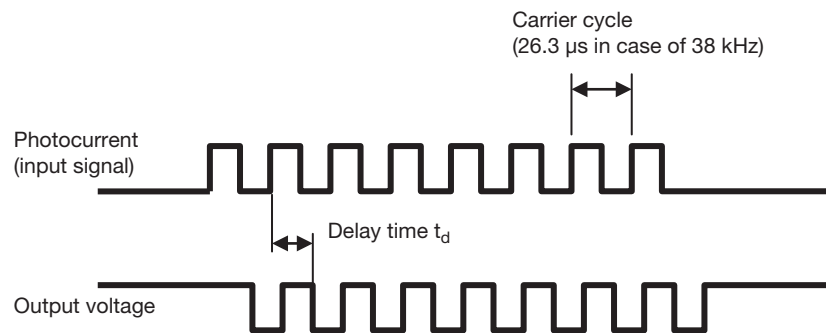
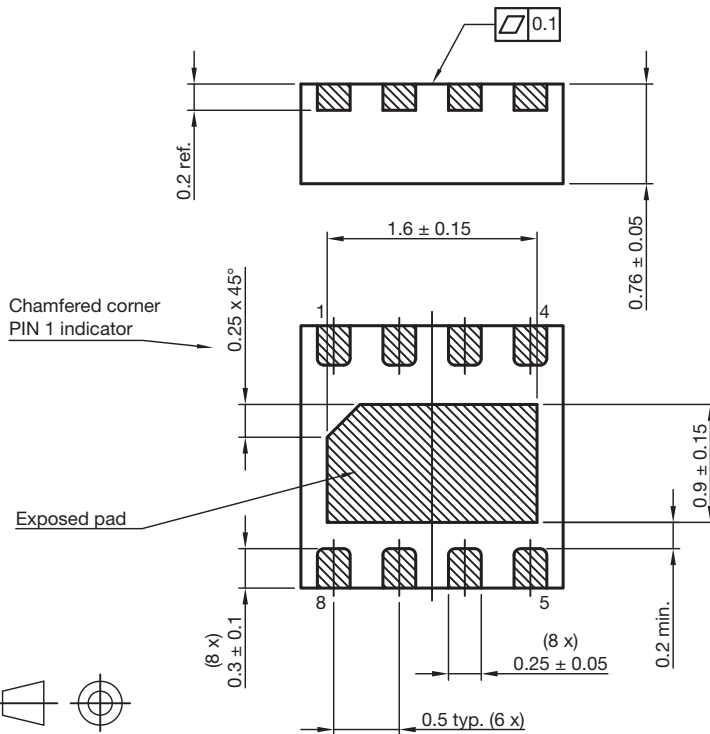
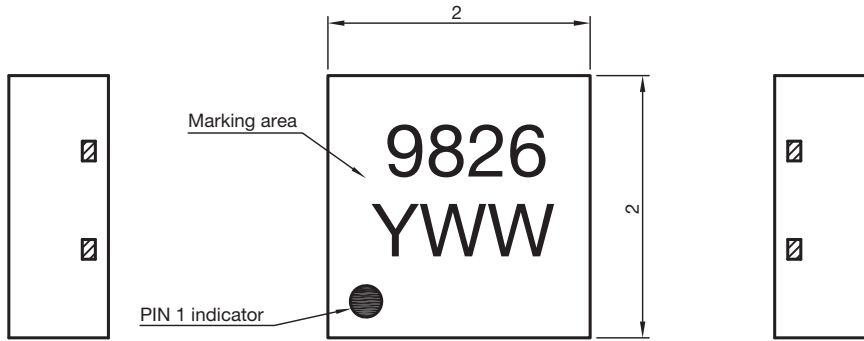


Fig. 1 - Testsignal

PACKAGE DIMENSIONS in millimeters

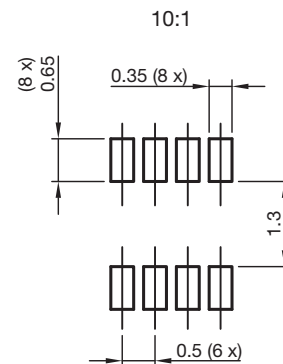


1. Coplanarity (0.1 mm) applies to the exposed pad as well as the exposed terminals.
2. Package dimension does not include mold flash, protrusions, burrs or metal smearing.

Pinning:

1. n.c.
2. V_S
3. Out
4. n.c.
5. n.c.
6. GND
7. IN
8. GND

Proposed hole layout from component side (for reference only)



technical drawings according to DIN specifications

Not indicated tolerances ± 0.1

Drawing-No.: 6.550-5314.04-4
Issue: -, 13.05.16



ASSEMBLY INSTRUCTIONS

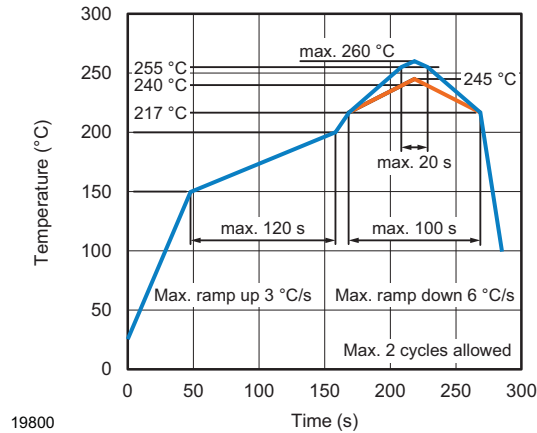
Reflow Soldering

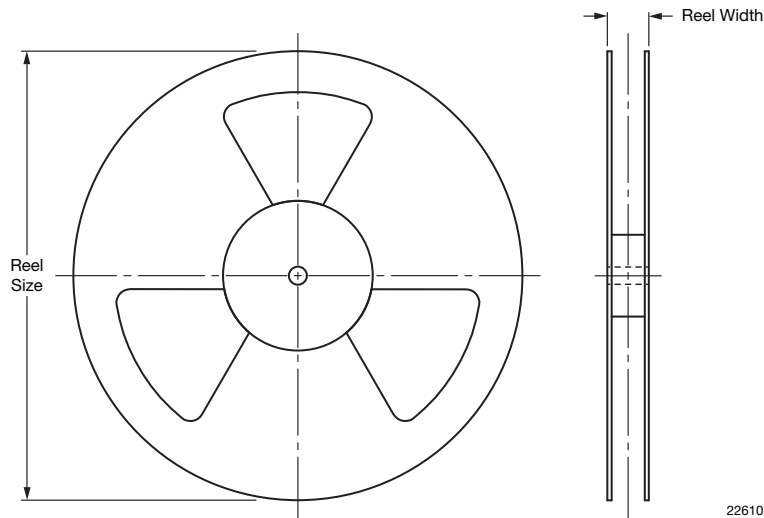
- Set the furnace temperatures for pre-heating and heating in accordance with the reflow temperature profile as shown in the diagram. Exercise extreme care to keep the maximum temperature below 260 °C. The temperature shown in the profile means the temperature at the device surface. Since there is a temperature difference between the component and the circuit board, it should be verified that the temperature of the device is accurately being measured
- Handling after reflow should be done only after the work surface has been cooled off

Manual Soldering

- Use a soldering iron of 25 W or less. Adjust the temperature of the soldering iron below 300 °C
- Finish soldering within 3 s
- Handle products only after the temperature has cooled off.

VISHAY LEAD (PB)-FREE REFLOW SOLDER PROFILE



REEL DIMENSIONS in millimeters


REEL		TRAILER LENGTH (mm)	LEADER LENGTH (mm)	QUANTITY PER REEL
REEL SIZE (inch)	REEL WIDTH (mm)			
7	8.4	160	400	3000

LABEL
Standard bar code labels for finished goods

The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled

with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain Vishay Semiconductor GmbH specific data.

VISHAY SEMICONDUCTOR GMBH STANDARD BAR CODE PRODUCT LABEL (finished goods)		
PLAIN WRITTING	ABBREVIATION	LENGTH
Item-description	-	18
Item-number	INO	8
Selection-code	SEL	3
LOT-/serial-number	BATCH	10
Data-code	COD	3 (YWW)
Plant-code	PTC	2
Quantity	QTY	8
Accepted by	ACC	-
Packed by	PCK	-
Mixed code indicator	MIXED CODE	-
Origin	xxxxxxx+	Company logo
LONG BAR CODE TOP	TYPE	LENGTH
Item-number	N	8
Plant-code	N	2
Sequence-number	X	3
Quantity	N	8
Total length	-	21
SHORT BAR CODE BOTTOM	TYPE	LENGTH
Selection-code	X	3
Data-code	N	3
Batch-number	X	10
Filter	-	1
Total length	-	17



ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the antistatic shielding bag. Electrostatic sensitive devices warning labels are on the packaging.

VISHAY SEMICONDUCTORS STANDARD BAR CODE LABELS

The Vishay Semiconductors standard bar code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.



22645



Tape and Reel Standards for Surface-Mount IR Receiver Modules

Vishay Semiconductor surface-mount IR receivers are packaged on tape and reel. The following specification is based on IEC publication 286, which takes the industrial requirements for automatic insertion into account.

Absolute maximum ratings, mechanical dimensions, optical and electrical characteristics for taped devices are identical to the basic catalog types and can be found in the specifications for untaped devices.

PACKAGING

The tapes of components are available on reels. Each reel is marked with labels which contain the following information:

- Vishay
- Type
- Group
- Tape code, normally part of type name
- Production code
- Quantity

MISSING COMPONENTS

Up to 3 consecutive components may be missing if the gap is followed by at least 6 components. A maximum of 0.5 % of the components per reel quantity may be missing. At least 5 empty positions are present at the start and the end of the tape to enable tape insertion.

Tensile strength of the tape: > 15 N

NUMBER OF COMPONENTS

- A. Panhead: quantity per reel:
 - TT, top view package, 1190 pcs
 - TR, side view package, 1120 pcs
- B. Heimdall: quantity per reel:
 - TT, top view package, 2200 pcs
 - TR, side view package, 2300 pcs
- C. Heimdall without lens: quantity per reel:
 - WTT, top view package, 2200 pcs
 - WTR, side view package, 2300 pcs
- D. Belobog: quantity per reel:
 - TT1, top view package, 1800 pcs
- E. Belobog with shield: quantity per reel:
 - TT1, top view package, 1500 pcs
- F. Minimold DF1P: quantity per reel:
 - DF1P, 1100 pcs
- G. TVCastSMD TR1: quantity per reel:
 - TR1, side view package, 2000 pcs

ORDER DESIGNATION

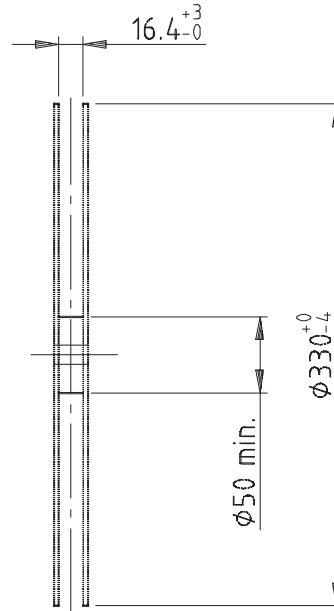
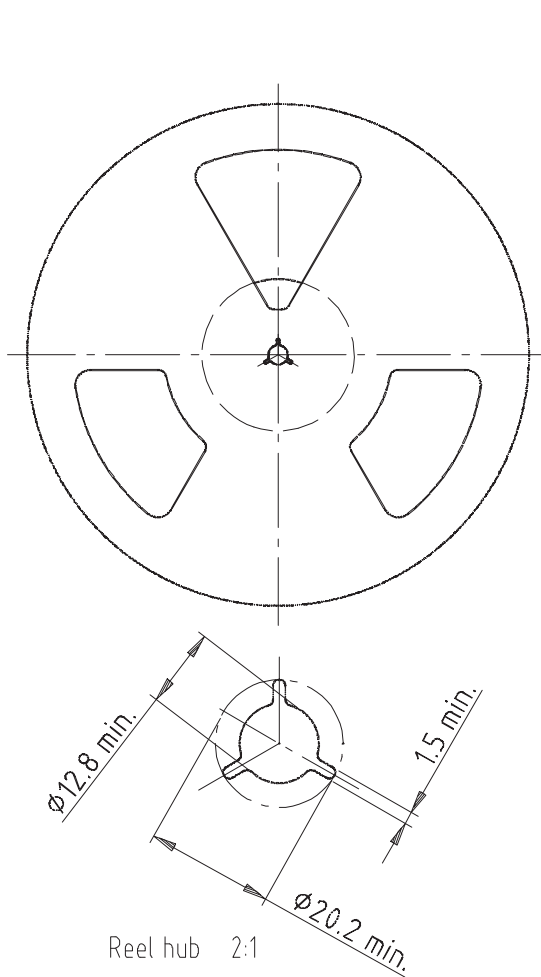
The type designation of the device is extended by TT or TT1 for top view or TR for side view.

Example:

- TSOP6238TR (reel packing)
- TSOP75238TR (reel packing)
- TSOP75338WTT (reel packing)
- TSOP57438TT1 (reel packing)
- TSOP57238HTT1 (reel packing)
- TSOP39438TR1 (reel packing)



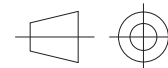
REEL DIMENSIONS FOR PANHEAD, HEIMDALL, AND TVCASTSMD TR in millimeters



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

Dimension acc. to IEC EN 60 286-3

Tape width 16



technical drawings according to DIN specifications

Drawing-No.: 9.800-5052.V2-4

Issue: 1; 07.05.02

16734

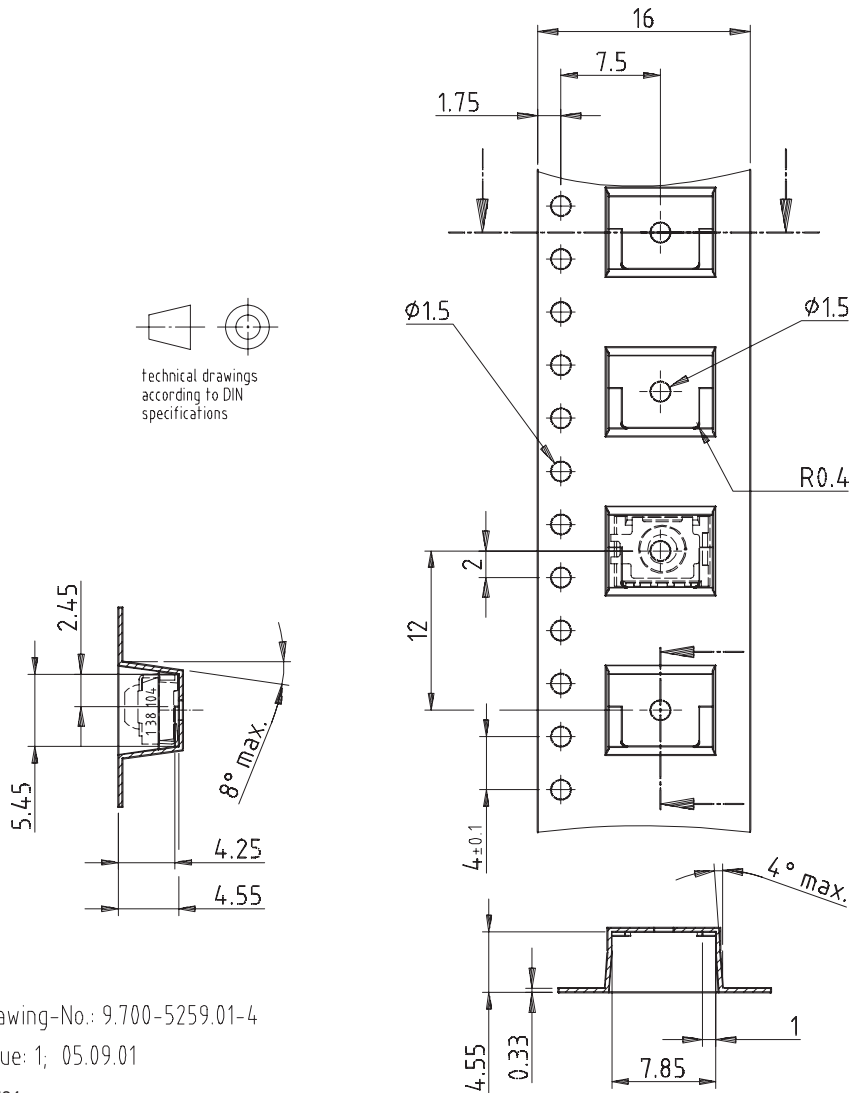
Note

- The body structure of the reel can vary



TAPING VERSION TSOP..TT (TOP VIEW) DIMENSIONS in millimeters

A. Panhead (TSOP36...TT, TSSP...TT, TSOP6...TT, TSOP16...TT, TSOP96...TT)



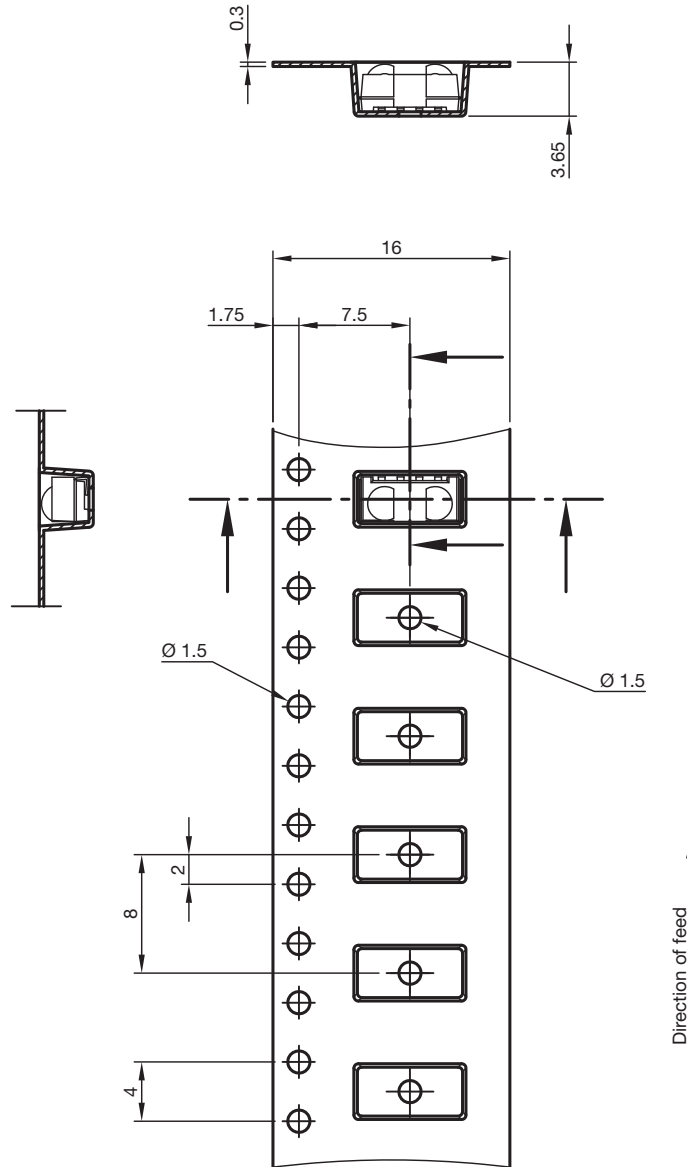
Drawing-No.: 9.700-5259.01-4

Issue: 1; 05.09.01

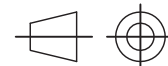
16584

TAPING VERSION TSOP..TT (TOP VIEW) DIMENSIONS in millimeters

B. Heimdall (TSOP75...TT, TSOP77...TT, TSSP77...TT, TSOP15...TT, TSOP95...TT)



Drawing-No.: 9.700-5338.01-4
Issue: 4; 12.06.13

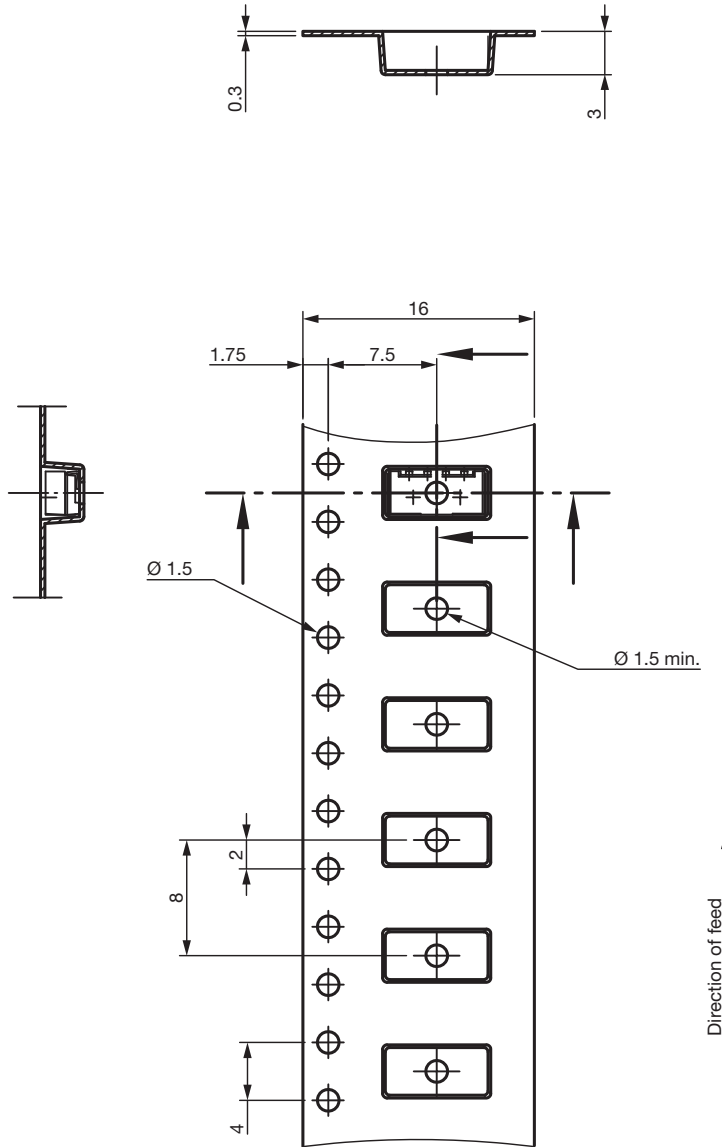


technical drawings
according to DIN
specifications

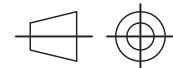


TAPING VERSION TSOP..TT (TOP VIEW) DIMENSIONS in millimeters

C. Heimdall without lens (TSOP75...WTT, TSOP77...WTT, TSSP77...WTT, TSOP15...WTT, TSOP95...WTT)



Drawing-No.: 9.700-5341.01-4
Issue: 3; 06.10.15



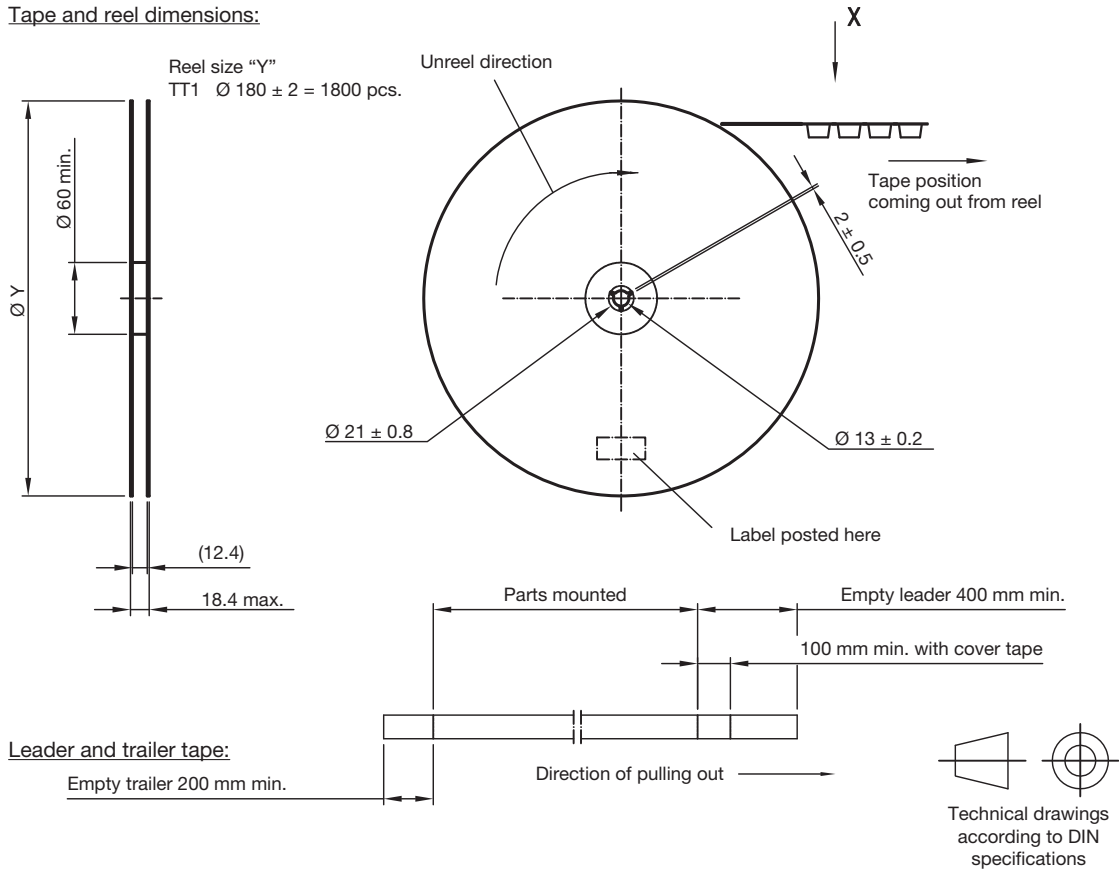
technical drawings
according to DIN
specifications



TAPING VERSION TSOP..TT1 (TOP VIEW) DIMENSIONS in millimeters

D. Belobog (TSOP37...TT1, TSOP57...TT1, TSOP17...TT1, TSOP97...TT1)

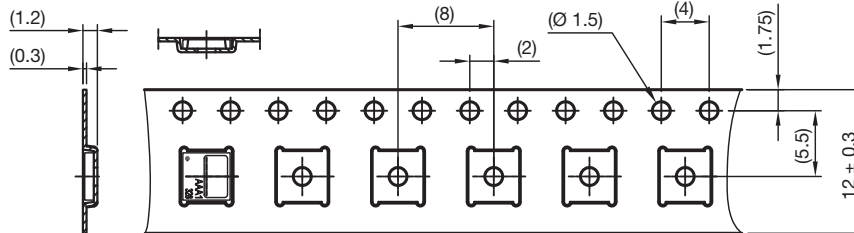
Tape and reel dimensions:



Leader and trailer tape:

Empty trailer 200 mm min.

X 2:1



Drawing-No.: 9.700-5347.01-4
Issue: 2; 07.03.18

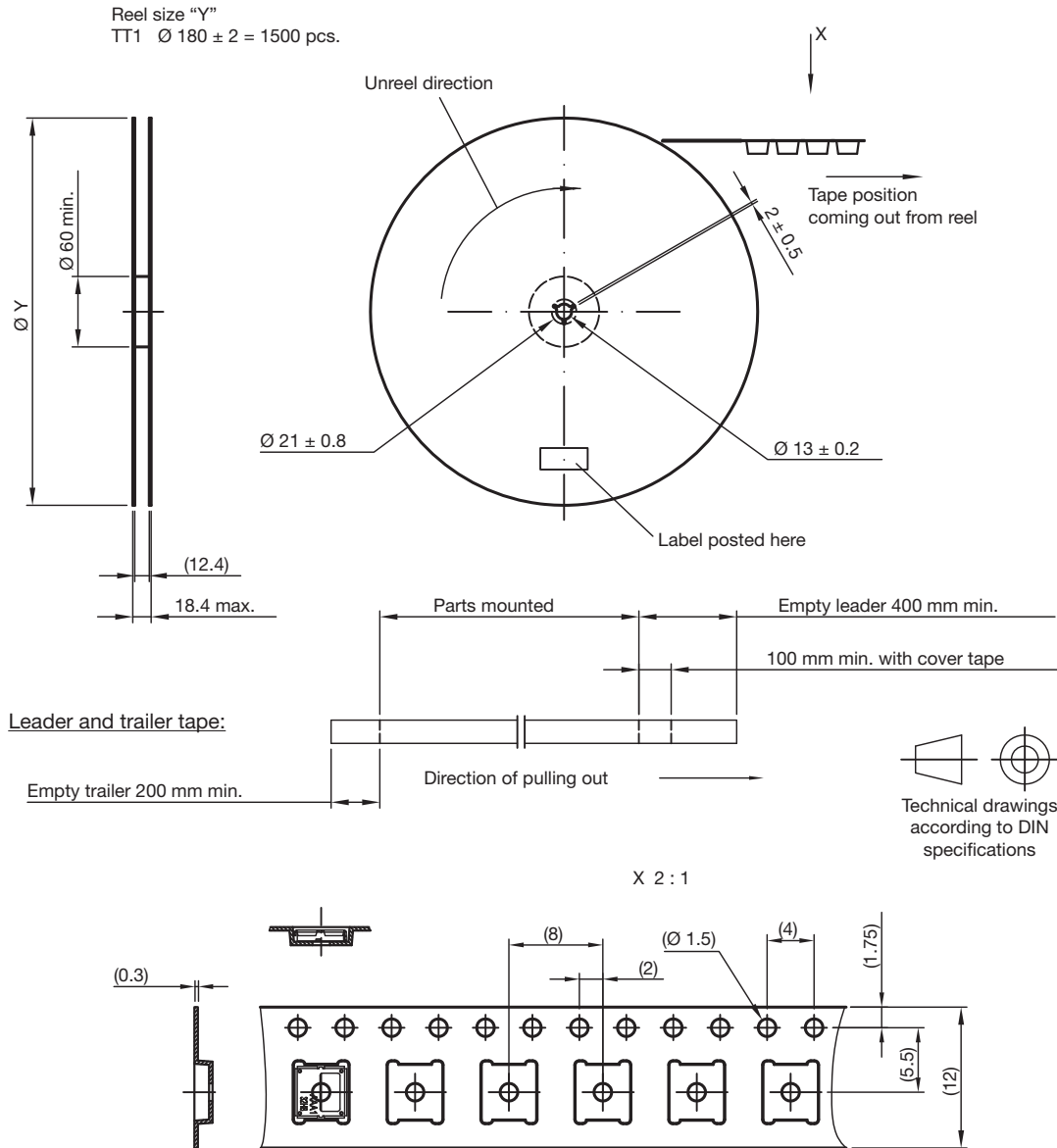
Not indicated tolerances ± 0.1



TAPING VERSION TSOP..TT1 (TOP VIEW) DIMENSIONS in millimeters

E. Belobog with shield (TSOP37...HTT1, TSOP57...HTT1, TSOP17...HTT1, TSOP97...HTT1)

Tape and reel dimensions:



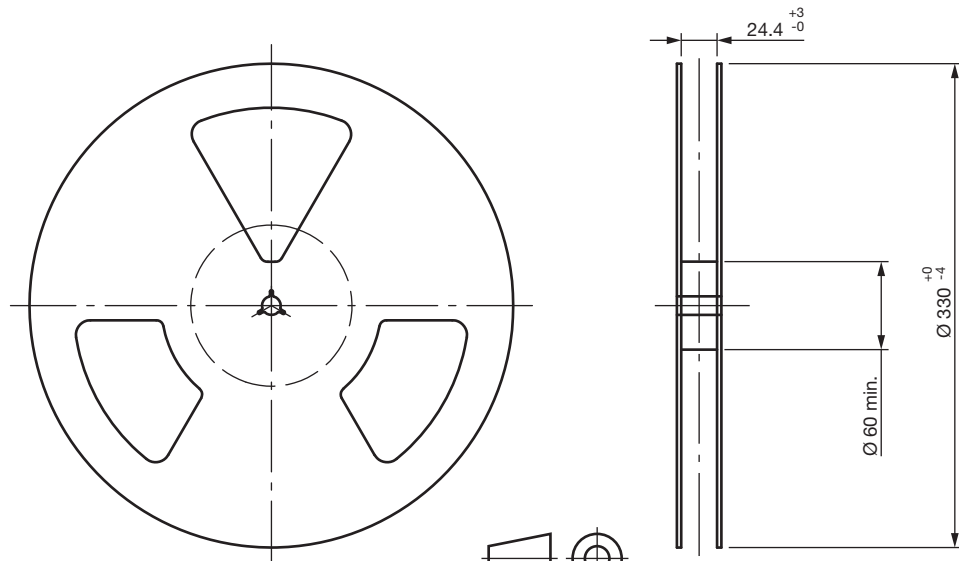
Drawing-No.: 9.700-5380.01-4
Issue: 3; 07.03.18

Not indicated tolerances ± 0.1



TAPING VERSION TSOP..DF1P (SIDE VIEW) DIMENSIONS in millimeters

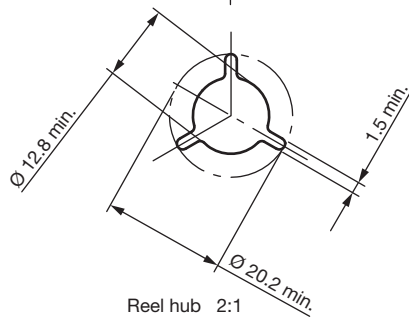
F. Minimold DF1P (TSOP33...DF1P, TSOP53...DF1P, TSOP13...DF1P, TSOP93...DF1P)



Technical drawing according to DIN specifications

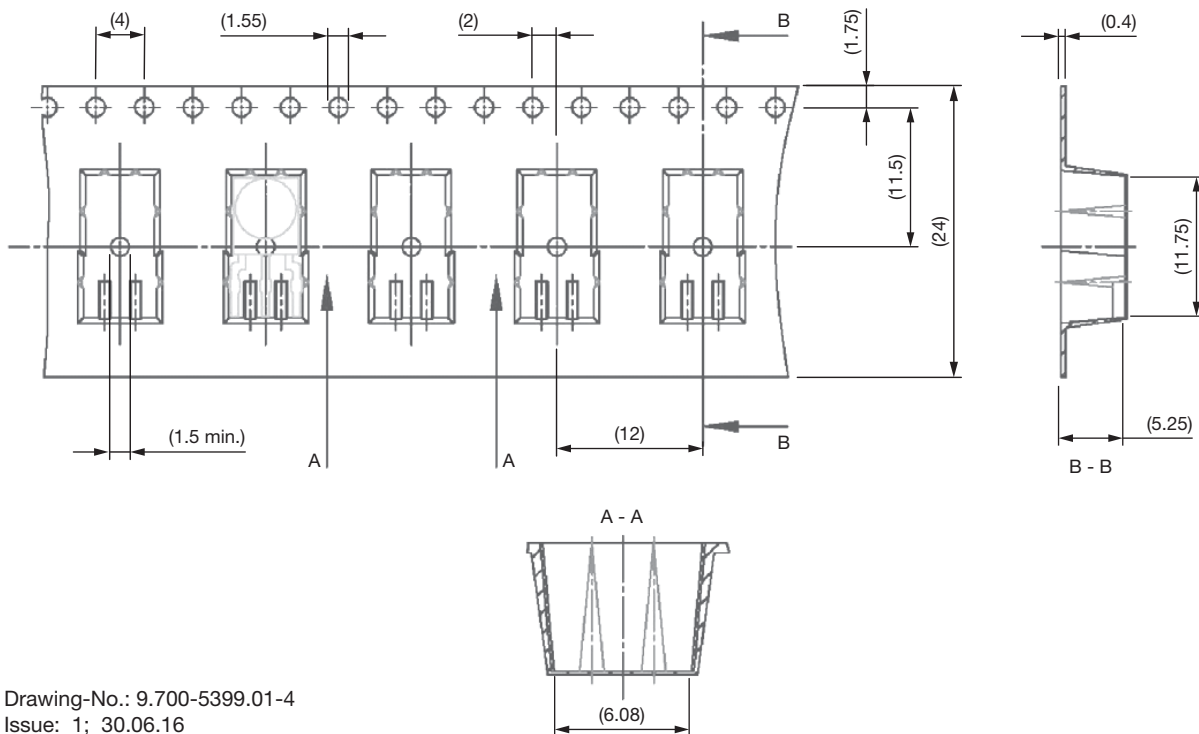
Form of the leave open of the wheel is supplier specific. Dimensions according to IEC EN 60 286-3

Tape width: 24



Reel hub 2:1

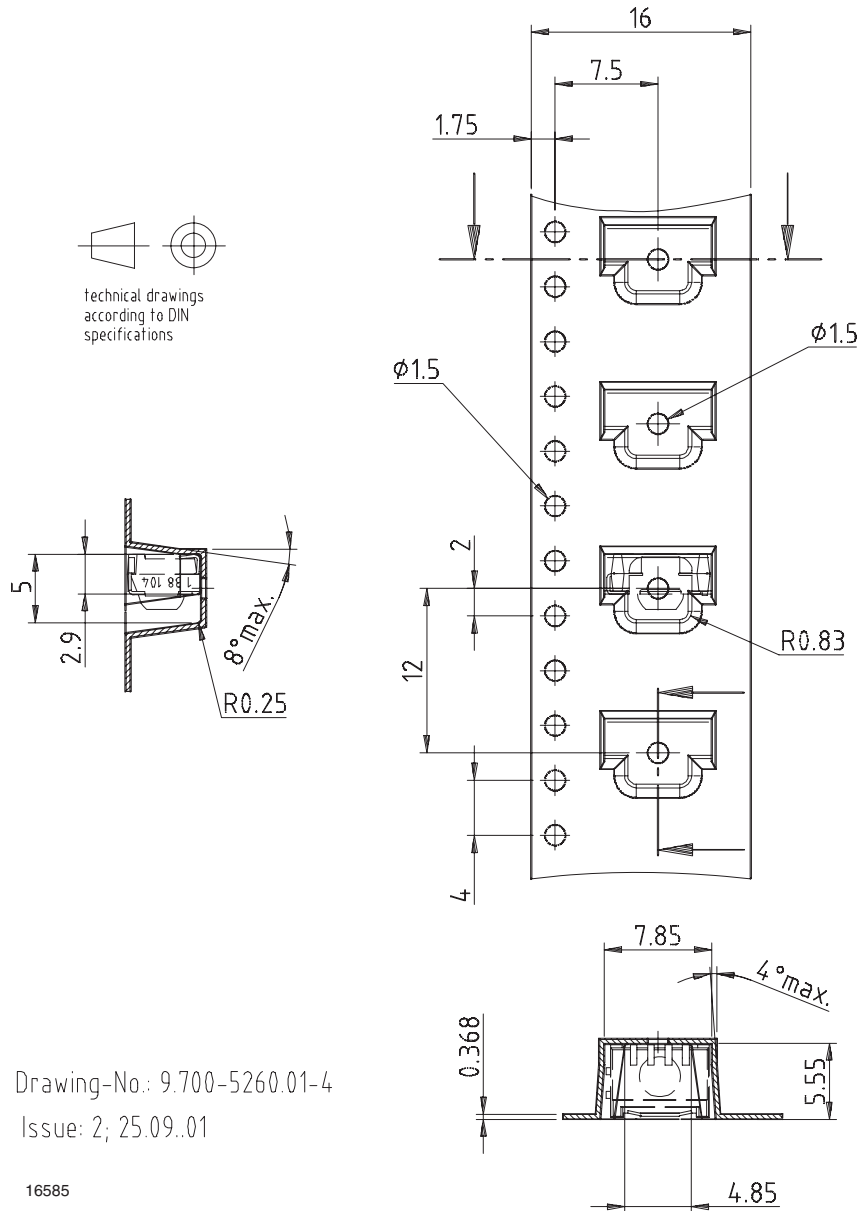
Drawing-No.: 9.800-5052.V3-4
Issue: 1; 17.12.02



Drawing-No.: 9.700-5399.01-4
Issue: 1; 30.06.16

TAPING VERSION TSOP..TR (SIDE VIEW) DIMENSIONS in millimeters

A. Panhead (TSOP36...TR, TSSP6...TR, TSOP6...TR, TSOP16...TR, TSOP96...TR)



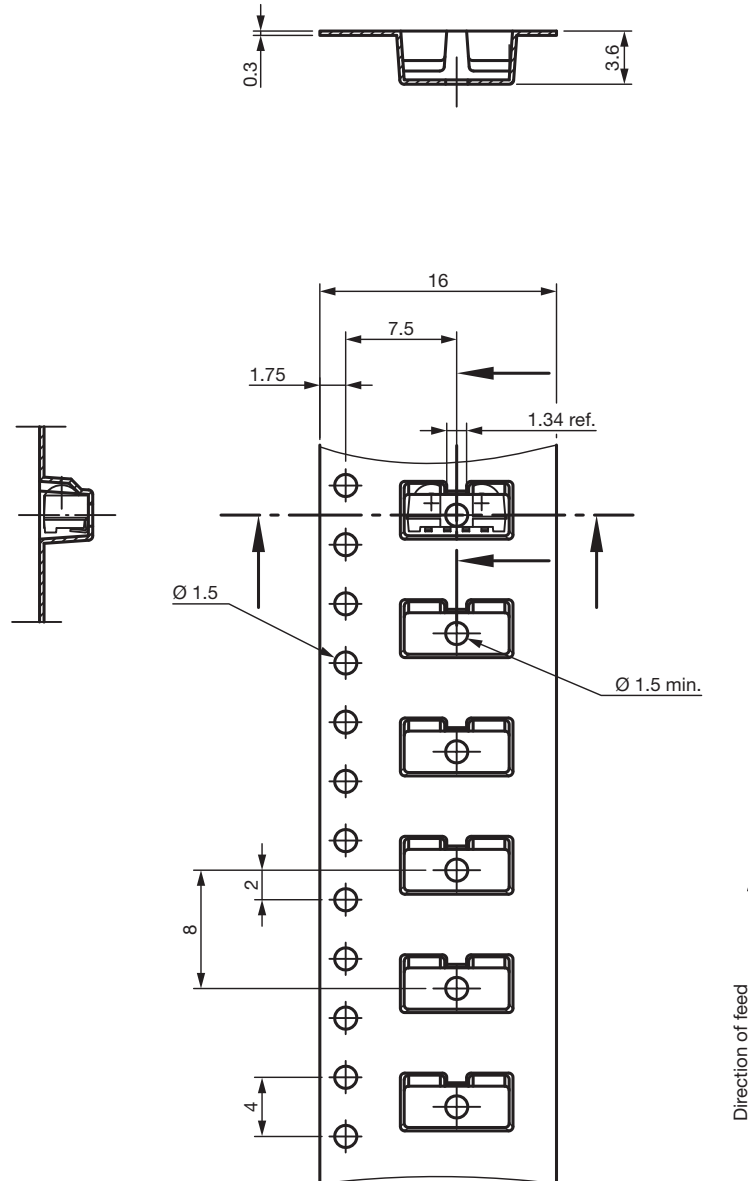
Drawing-No.: 9.700-5260.01-4

Issue: 2; 25.09..01

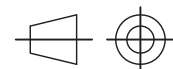
16585

TAPING VERSION TSOP..TR (SIDE VIEW) DIMENSIONS in millimeters

B. Heimdall (TSSP7...., TSOP75...TR, TSOP77...TR, TSSP7....TR, TSOP15...TR, TSOP95...TR)



Drawing-No.: 9.700-5337.01-4
Issue: 2; 06.10.15

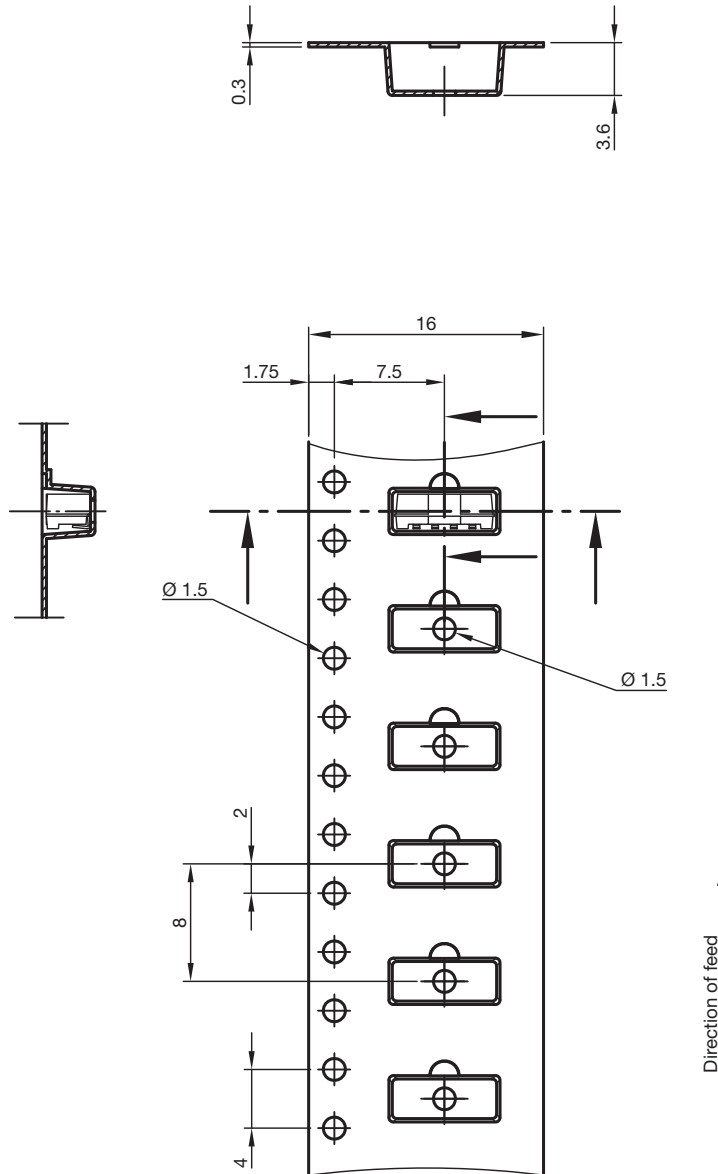


technical drawings
according to DIN
specifications



TAPING VERSION TSOP..TR (SIDE VIEW) DIMENSIONS in millimeters

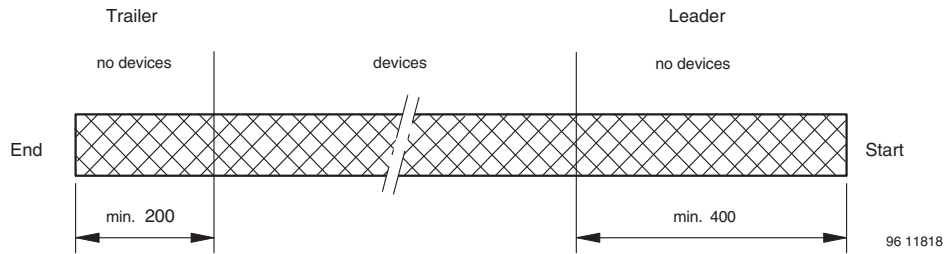
C. Heimdall without lens (TSOP75...WTR, TSOP77...WTR, TSSP...WTR, TSOP15...WTR, TSOP95...WTR)



Drawing-No.: 9.700-5342.01-4
Issue: 2; 12.06.13

technical drawings
according to DIN
specifications

LEADER AND TRAILER DIMENSIONS in millimeters



COVER TAPE REEL STRENGTH

According to DIN EN 60286-3

0.1 N to 1.3 N

300 mm/min. \pm 10 mm/min.

165° to 180° peel angle

LABEL

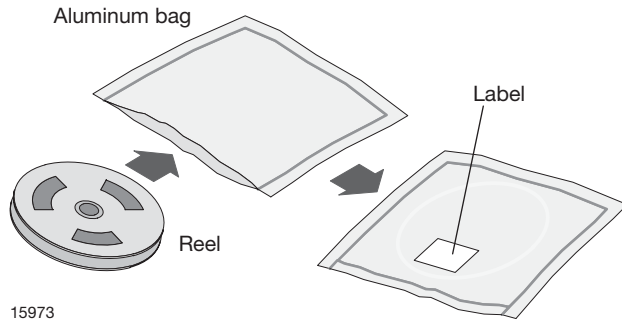
Standard bar code labels for finished goods

The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain Vishay Semiconductor GmbH specific data.

VISHAY SEMICONDUCTOR GmbH STANDARD BAR CODE PRODUCT LABEL (finished goods)		
PLAIN WRITING	ABBREVIATION	LENGTH
Item-description	-	18
Item-number	INO	8
Selection-code	SEL	3
LOT-/serial-number	BATCH	10
Data-code	COD	3 (YWW)
Plant-code	PTC	2
Quantity	QTY	8
Accepted by	ACC	-
Packed by	PCK	-
Mixed code indicator	MIXED CODE	-
Origin	xxxxxxx+	Company logo
LONG BAR CODE TOP	TYPE	LENGTH
Item-number	N	8
Plant-code	N	2
Sequence-number	X	3
Quantity	N	8
Total length	-	21
SHORT BAR CODE TOP	TYPE	LENGTH
Selection-code	X	3
Data-code	N	3
Batch-number	X	10
Filter	-	1
Total length	-	17

DRY PACKAGING

The reel is packed in an anti-humidity bag to protect the devices from absorbing moisture during transportation and storage.



15973

RECOMMENDED METHOD OF STORAGE

Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

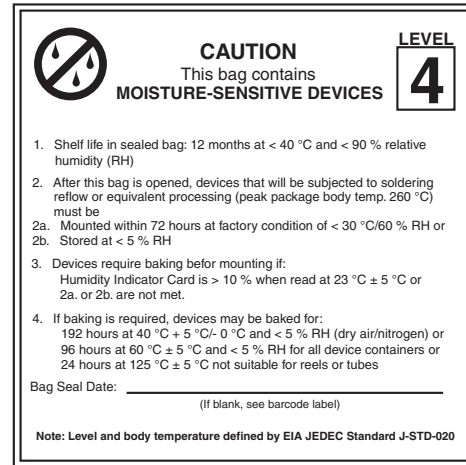
- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 72 h under these conditions moisture content will be too high for reflow soldering.

In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

- 192 h at 40 °C + 5 °C / - 0 °C and < 5 % RH (dry air / nitrogen) or
- 96 h at 60 °C + 5 °C and < 5 % RH for all device containers or
- 24 h at 125 °C + 5 °C not suitable for reel or tubes.

An EIA JEDEC® standard JSTD-020 level 4 label is included on all dry bags.



22522

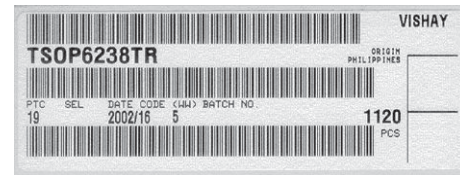
EIA JEDEC standard JSTD-020 level 4 label is included on all dry bags

ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the antistatic shielding bag. Electrostatic sensitive devices warning labels are on the packaging.

VISHAY SEMICONDUCTORS STANDARD BAR CODE LABELS

The Vishay Semiconductors standard bar code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.



16962

OUTER PACKAGING

The sealed reel is packed into a pizza box.

CARTON BOX DIMENSIONS in millimeters			
	THICKNESS	WIDTH	LENGTH
Pizza box (SMD and heimdall) (taping in reels)	50	340	340

22127



Disclaimer

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