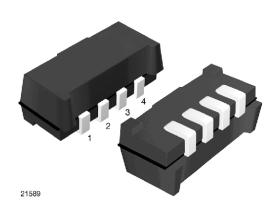


www.vishay.com

Vishay Semiconductors

IR Receiver Modules for Remote Control Systems



DESIGN SUPPORT TOOLS

click logo to get started



MECHANICAL DATA

Pinning:

1, 4 = GND, $2 = V_S$, 3 = OUT

ORDERING CODE EXAMPLE:

Taping:

TSOP77...WTT - top view taped TSOP77...WTR - side view taped

FEATURES

- · Improved immunity against HF and RF noise
- · Continuous data transmission possible
- · Low supply current
- · Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Supply voltage: 2.5 V to 5.5 V
- · Improved immunity against ambient light
- · Capable of side or top view
- Insensitive to supply voltage ripple and noise
- Low profile 2.35 mm
- Material categorization: for definitions of compliance please see www.vishav.com/doc?99912



HALOGEN **FREE** GREEN

DESCRIPTION

The TSOP773..W, TSOP775..W series are miniaturized receiver module for infrared remote control systems. One PIN diode per lens and a preamplifier are assembled on a leadframe, the epoxy lens cap contains an IR filter.

The TSOP773..W series devices are optimized to suppress almost all spurious pulses from Wi-Fi and CFL sources. They may suppress some data signals if continuously transmitted.

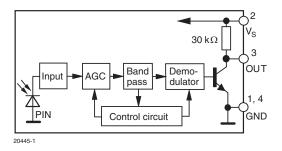
New designs should prefer the TSOP773..W series containing the newer AGC3. The TSOP775..W series are useful to suppress even extreme levels of optical noise, but may also suppress some data signals. Please check compatibility with your codes.

These components have not been qualified according to automotive specifications.

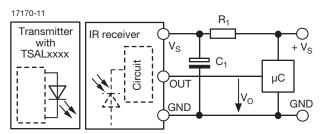
PARTS T	ADLE			
AGC		NOISY ENVIRONMENTS AND SHORT BURSTS (AGC3)	VERY NOISY ENVIRONMENT AND SHORT BURSTS (AGC5	
	30 kHz	TSOP77330W	TSOP77530W	
	33 kHz	TSOP77333W	TSOP77533W TSOP77536W	
Carrier frequency	36 kHz	TSOP77336W (1)		
	38 kHz	TSOP77338W (2)(3)(4)(5)	TSOP77538W	
	40 kHz	TSOP77340W	TSOP77540W	
	56 kHz	TSOP77356W	TSOP77556W	
Package		Heimdal	Il no lens	
Pinning		1, 4 = GND, 2 = V _S , 3 = OUT		
Dimensions (mm)		6.8 W x 3.0 H x 2.35 D		
Mounting		SMD		
Application		Remote control		
Best choice for		(1) MCIR (2) Mitsubishi (3) RECS-80 Code (4) r-map (5) XMP-1, XMP-2		



BLOCK DIAGRAM



APPLICATION CIRCUIT



 R_1 and C_1 recommended to reduce supply ripple for $V_S < 2.8 \text{ V}$

ABSOLUTE MAXIMUM RA	ATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Supply voltage		Vs	-0.3 to +6	V	
Supply current		I _S	5	mA	
Output voltage		Vo	-0.3 to 5.5	V	
Voltage at output to supply		V _S - V _O	-0.3 to (V _S + 0.3)	V	
Output current		Io	5	mA	
Junction temperature		T _i	100	°C	
Storage temperature range		T _{stg}	-25 to +85	°C	
Operating temperature range		T _{amb}	-25 to +85	°C	
Power consumption	T _{amb} ≤ 85 °C	P _{tot}	10	mW	
Soldering temperature	t ≤ 10 s, 1 mm from case	T _{sd}	260	°C	

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 AND	OPTICAL CHARACTERISTICS (T _{amb} = 25	°C, unles	s otherwi	se specif	ied)	
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage		Vs	2.5	-	5.5	V
Cumply assessed	$V_{S} = 5 \text{ V}, E_{V} = 0$	I _{SD}	0.55	0.7	0.9	mA
Supply current	$E_v = 40$ klx, sunlight	I _{SH}	-	0.8	-	mA
Transmission distance	$E_v = 0$, IR diode TSAL6200, $I_F = 250$ mA, test signal see Fig. 1	d	-	40	-	m
Output voltage low	$I_{OSL} = 0.5 \text{ mA}$, $E_e = 0.7 \text{ mW/m}^2$, test signal see Fig. 1	V _{OSL}	ı	-	100	mV
Minimum irradiance	Pulse width tolerance: t_{pi} - 5/ f_o < t_{po} < t_{pi} + 6/ f_o , test signal see Fig. 1	E _{e min.}	-	0.4	0.8	mW/m ²
Maximum irradiance	t_{pi} - 5/f _o < t_{po} < t_{pi} + 6/f _o , test signal see Fig. 1	E _{e max.}	50	-	-	W/m ²
Directivity	Angle of half transmission distance	Ψ1/2	-	± 75	-	deg

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

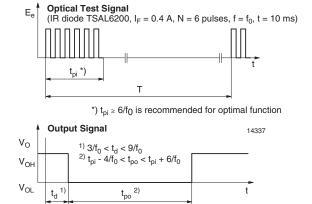


Fig. 1 - Output Active Low

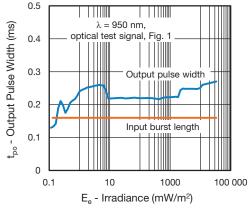


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

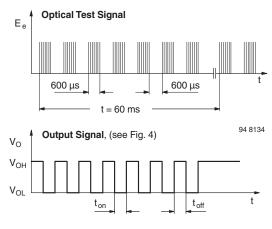


Fig. 3 - Output Function

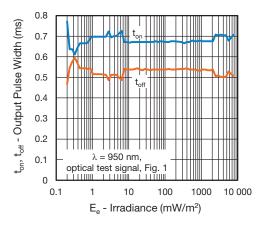


Fig. 4 - Output Pulse Diagram

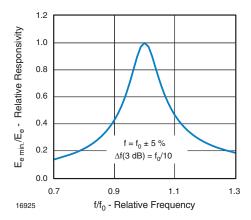


Fig. 5 - Frequency Dependence of Responsivity

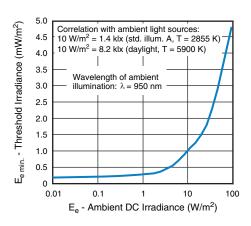


Fig. 6 - Sensitivity in Bright Ambient

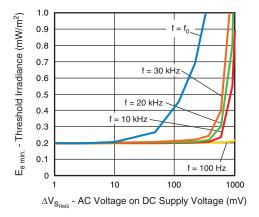


Fig. 7 - Sensitivity vs. Supply Voltage Disturbances

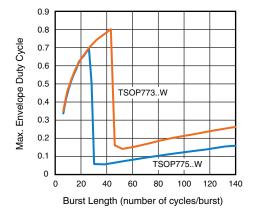


Fig. 8 - Max. Envelope Duty Cycle vs. Burst Length

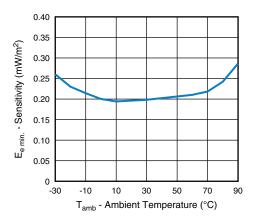


Fig. 9 - Sensitivity vs. Ambient Temperature

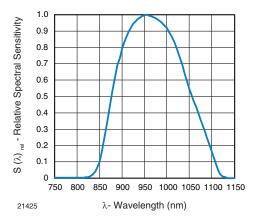


Fig. 10 - Relative Spectral Sensitivity vs. Wavelength

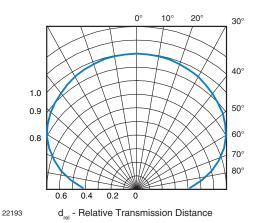


Fig. 11 - Horizontal Directivity

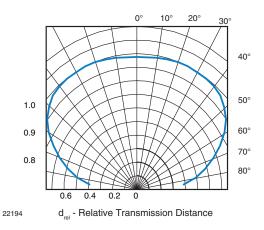


Fig. 12 - Vertical Directivity

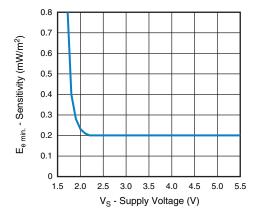


Fig. 13 - Sensitivity vs. Supply Voltage



SUITABLE DATA FORMAT

These products are designed to suppress spurious output pulses due to noise or disturbance signals. Data and disturbance signals can be distinguished by the devices according to carrier frequency, burst length and envelope duty cycle. The data signal should be close to the band-pass center frequency (e.g. 38 kHz) and fulfill the conditions in the table below.

When a data signal is applied to the IR receiver in the presence of a disturbance signal, the sensitivity of the receiver is reduced to insure that no spurious pulses are present at the output. Some examples of disturbance signals which are suppressed are:

- DC light (e.g. from tungsten bulb or sunlight)
- · Continuous signals at any frequency
- Modulated IR signals from common fluorescent lamps (example of noise pattern is shown in Fig. 14 or Fig. 15)
- 2.4 GHz and 5 GHz Wi-Fi

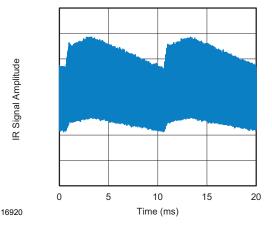


Fig. 14 - IR Disturbance from Fluorescent Lamp With Low Modulation

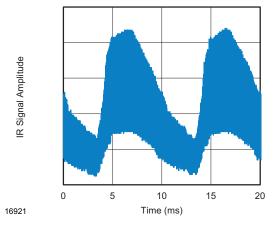


Fig. 15 - IR Disturbance from Fluorescent Lamp With High Modulation

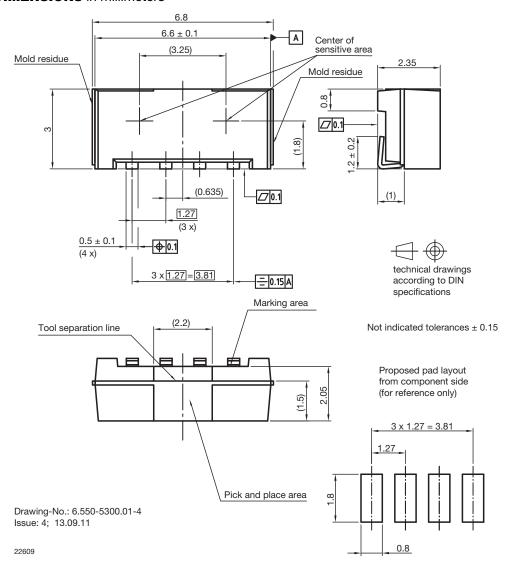
	TSOP773W	TSOP775W
Minimum burst length	6 cycles/burst	6 cycles/burst
After each burst of length a minimum gap time is required of	6 to 35 cycles ≥ 10 cycles	6 to 24 cycles ≥ 10 cycles
For bursts greater than	35 cycles	24 cycles
a minimum gap time in the data stream is needed of	> 4 x burst length	> 25 ms
Maximum number of continuous short bursts/second	2000	2000
MCIR code	Preferred	Yes
XMP-1, XMP-2, code	Preferred	Yes
Suppression of interference from fluorescent lamps	Mild and complex disturbance patterns are suppressed (example: signal pattern of Fig. 14 and Fig. 15)	Critical disturbance patterns are suppressed, e.g. highly dimmed LCDs

Note

For data formats with long bursts (more than 10 carrier cycles) please see the datasheet for TSOP772..W, TSOP774..W



PACKAGE DIMENSIONS in millimeters



ASSEMBLY INSTRUCTIONS

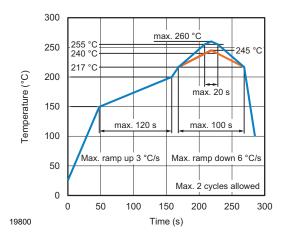
Reflow Soldering

- Reflow soldering must be done within 72 h while stored under a max. temperature of 30 °C, 60 % RH after opening the dry pack envelope
- 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

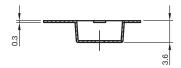
Manual Soldering

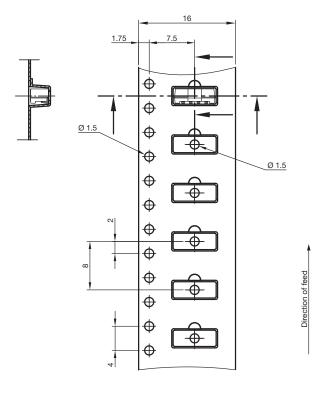
- Use a soldering iron of 25 W or less. Adjust the temperature of the soldering iron below 300 °C
- Finish soldering within 3 s
- · Handle products only after the temperature has cooled off

VISHAY LEAD (Pb)-FREE REFLOW SOLDER PROFILE



TAPING VERSION TSOP..TR DIMENSIONS in millimeters

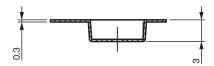


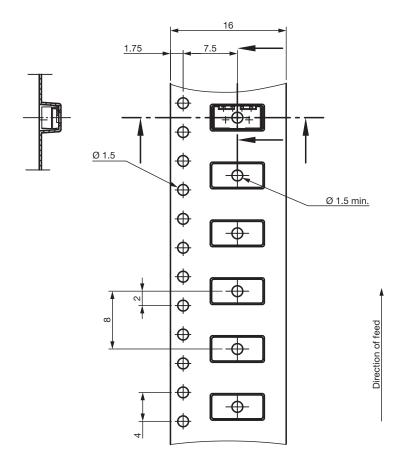


Drawing-No.: 9.700-5342.01-4 Issue: 2; 12.06.13



TAPING VERSION TSOP..TT DIMENSIONS in millimeters



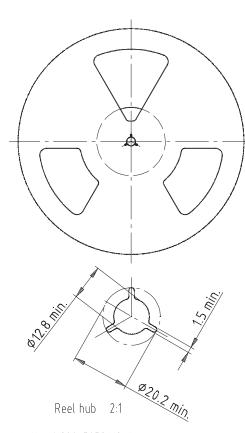


Drawing-No.: 9.700-5341.01-4

Issue: 3; 06.10.15

technical drawings according to DIN specifications

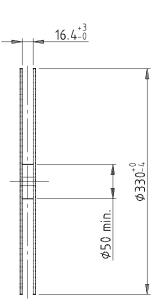
REEL DIMENSIONS in millimeters



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

Issue: 1; 07.05.02

16734



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

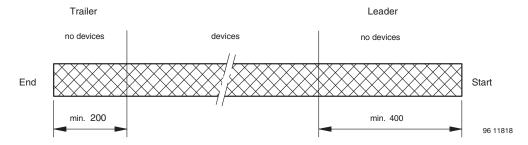
Dimension acc. to IEC EN 60 286-3

Tape width 16



technical drawings according to DIN specifications

LEADER AND TRAILER DIMENSIONS in millimeters



COVER TAPE PEEL STRENGTH

According to DIN EN 60286-3 0.1 N to 1.3 N 300 ± 10 mm/min. 165° to 180° peel angle

LABEL

Standard bar code labels for finished goods

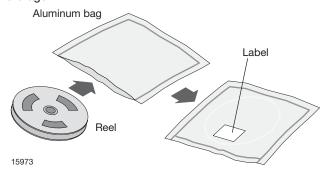
The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain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



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	xxxxxx+	Company logo
Long bar code top	Туре	Length
Item-number	N	8
Plant-code	N	2
Sequence-number	X	3
Quantity	N	8
Total length	-	21
Short bar code bottom	Туре	Length
Selection-code	X	3
Data-code	N	3
Batch-number	X	10
Filter	-	1
Total length	-	17

DRY PACKING

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



FINAL PACKING

The sealed reel is packed into a cardboard box.

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 J-STD-020 level 4 label is included on all dry bags.



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



TSOP773..W, TSOP775..W

Vishay Semiconductors

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 SEMICONDUTORS 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.

BAR CODE PRODUCT LABEL (example)



22178



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)

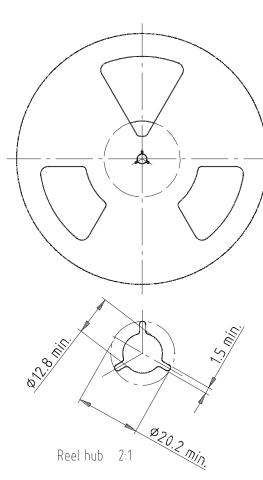
TSOP75338WTT (reel packing)

TSOP57438TT1 (reel packing)

TSOP57238HTT1 (reel packing)

TSOP39438TR1 (reel packing)

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



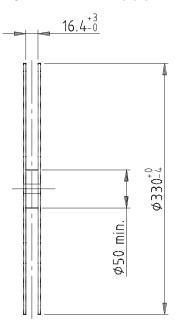
Drawing-No.: 9.800-5052.V2-4

Issue: 1; 07.05.02

16734

Note

• The body structure of the reel can vary



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

Dimension acc. to IEC EN 60 286-3

Tape width 16

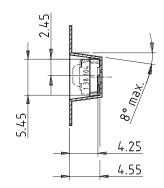


technical drawings according to DIN specifications

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

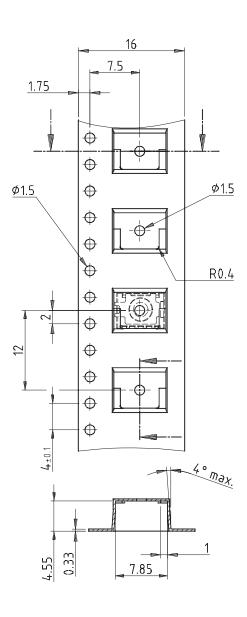
A. Panhead (TSOP36...TT, TSSP....TT, TSOP6...TT, TSOP16...TT, TSOP96...TT)





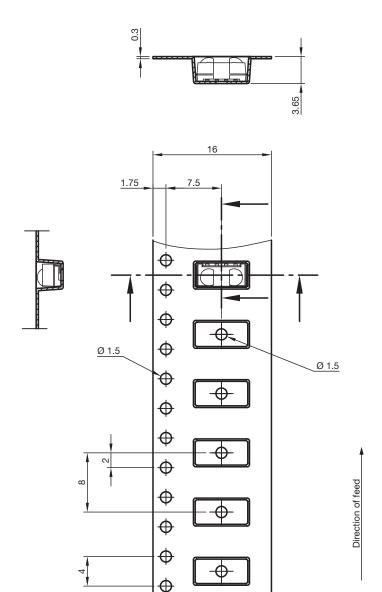
Drawing-No.: 9.700-5259.01-4 Issue: 1; 05.09.01

16584



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

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



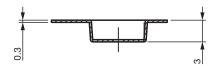
Drawing-No.: 9.700-5338.01-4

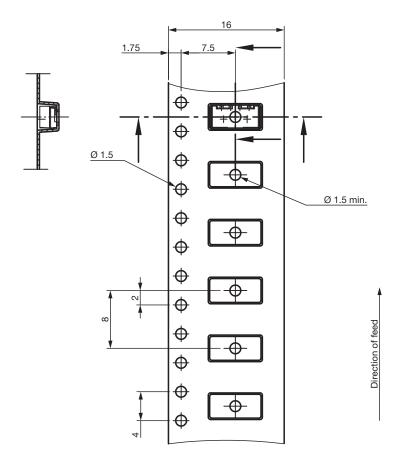
Issue: 4; 12.06.13

technical drawings according to DIN specifications

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

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





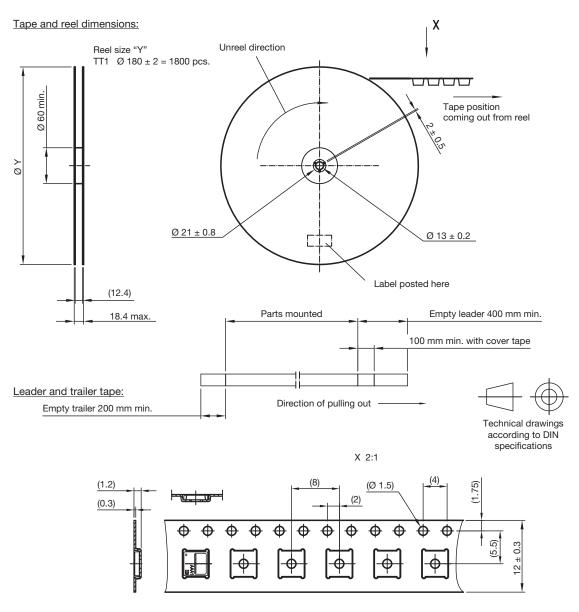
Drawing-No.: 9.700-5341.01-4

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)



Drawing-No.: 9.700-5347.01-4

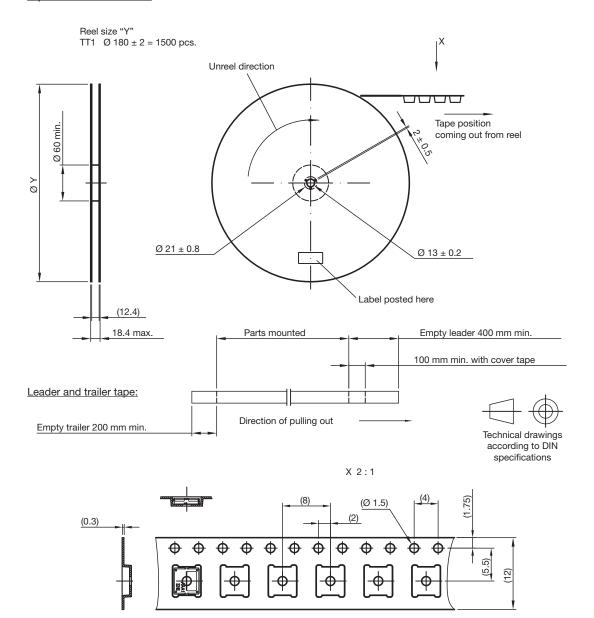
Issue: 2; 07.03.18

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:



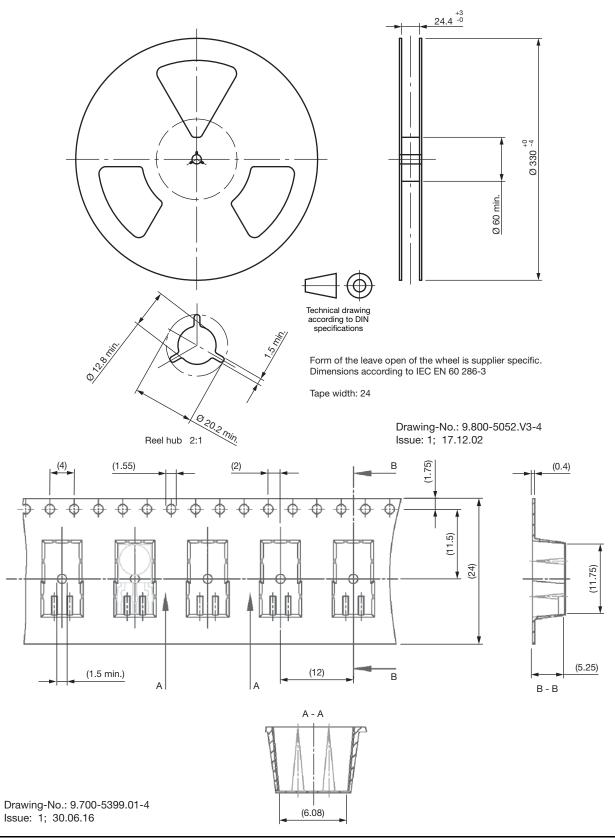
Drawing-No.: 9.700-5380.01-4

Issue: 3; 07.03.18

Not indicated tolerances ± 0.1

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

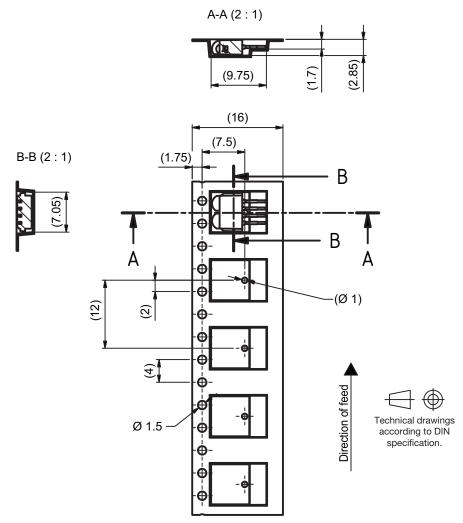
F. Minimold DF1P (TSOP33...DF1P, TSOP53...DF1P, TSOP13...DF1P, TSOP93...DF1P)





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

G. TVCastSMD TR1 (TSOP59...TR1, TSOP39...TR1, TSOP19...TR1, TSOP99...TR1)

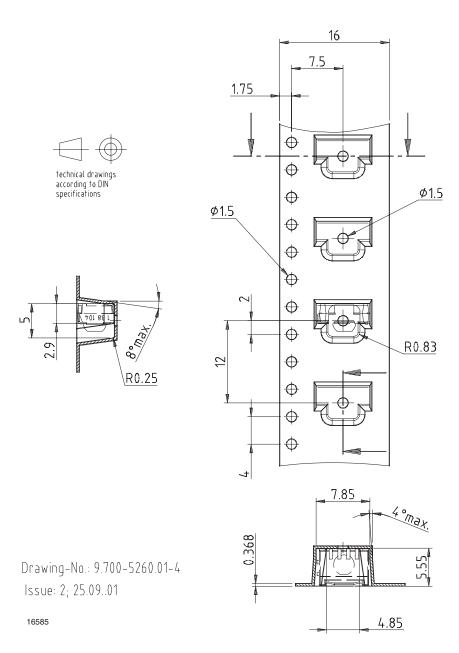


Drawing-No.: GO-100220.10_Z

Issue B: 08.02.17

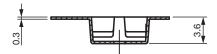
TAPING VERSION TSOP..TR (SIDE VIEW) DIMENSIONS in millimeters

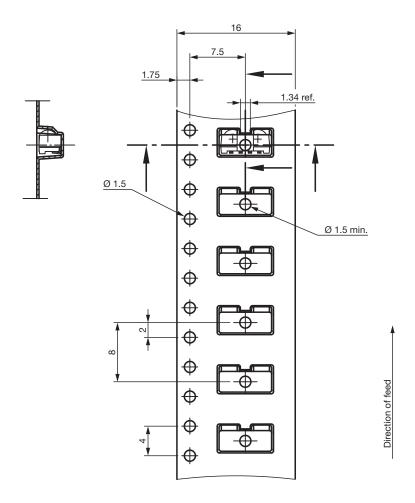
A. Panhead (TSOP36...TR, TSSP6...TR, TSOP6...TR, TSOP16...TR, TSOP96...TR)



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

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





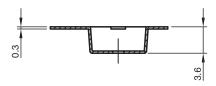
Drawing-No.: 9.700-5337.01-4

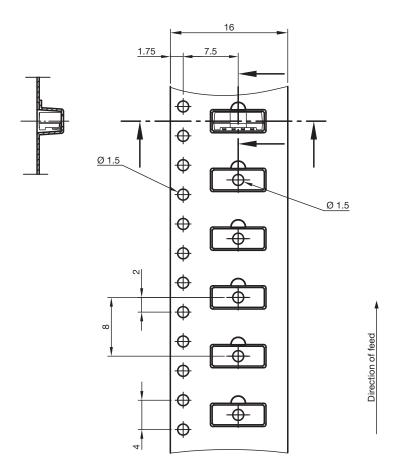
Issue: 2; 06.10.15

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)

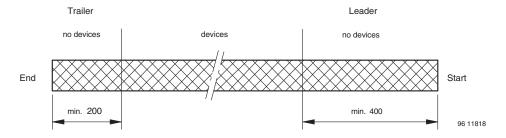




Drawing-No.: 9.700-5342.01-4 Issue: 2; 12.06.13 technical drawings according to DIN specifications



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

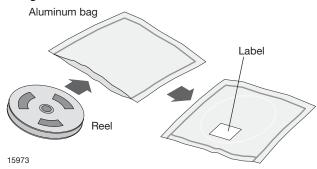
The standard bar code labels are product labels and used for identification of goods. The finished goods are packed in final packing area. The standard packing units are labeled with standard bar code labels before transported as finished goods to warehouses. The labels are on each packing unit and contain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

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.



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.

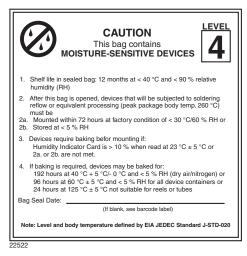
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

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 $^{\!0}\!\!\!\!\!^{^{^{}}}$ standard JSTD-020 level 4 label is included on all dry bags.



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.

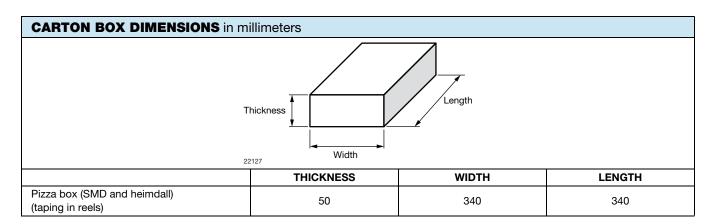
VISHAY SEMICONDUCTORS STANDARD BAR CODE LABELS

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.



OUTER PACKAGING

The sealed reel is packed into a pizza box.





Legal Disclaimer Notice

Vishay

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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов:
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001:
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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