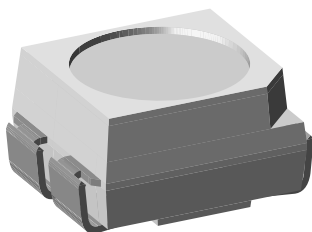


## Bicolor SMD LED



19211

### DESCRIPTION

These devices have been designed to meet the increasing demand for surface mounting technology.

The package of the VLMKG3400 is the PLCC-4.

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.

This SMD device consists of a red and green chip. So it is possible to choose the color in one device.

### PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-4
- Product series: bicolor
- Angle of half intensity:  $\pm 60^\circ$

### FEATURES

- SMD LED with exceptional brightness
- Multicolored
- Luminous intensity categorized
- EIA and ICE standard package
- Compatible with automatic placement equipment
- Compatible with IR reflow, vapor phase and wave soldering processes according to CECC 00802 and J-STD-020
- Available in 8 mm tape
- Low profile package
- Non-diffused lens: Excellent for coupling to light pipes and backlighting
- Low power consumption
- Luminous intensity ratio in one packaging unit  $I_{Vmax}/I_{Vmin.} \leq 1.6$
- Preconditioning according to JEDEC level 2a
- ESD-withstand voltage: Up to 2 kV according to JESD22-A114-B
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- Automotive: Dashboards, switches, and optical indicators
- Telecommunication: Indicator and backlighting in telephone and fax
- Indicator and backlight in office equipment
- Flat backlight for LCDs, switches, and symbols
- General use

### PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I <sub>F</sub> (mA)	WAVELENGTH (nm)			at I <sub>F</sub> (mA)	FORWARD VOLTAGE (V)			at I <sub>F</sub> (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLMKG3400-GS08	Super red	56	-	140	20	627	633	639	20	-	1.9	2.6	20	AlInGaP on GaAs
	Green	35.5	-	90	20	564	570	575	20	-	2.0	2.6	20	AlInGaP on GaAs
VLMKG3400-GS18	Super red	56	-	140	20	627	633	639	20	-	1.9	2.6	20	AlInGaP on GaAs
	Green	35.5	-	90	20	564	570	575	20	-	2.0	2.6	20	AlInGaP on GaAs

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLMKG3400**

PARAMETER	TEST CONDITION		SYMBOL	VALUE	UNIT
Reverse voltage per diode <sup>(1)</sup>	$I_R = 10\text{ }\mu\text{A}$		$V_R$	5	V
DC forward current per diode	$T_{amb} \leq 65\text{ }^{\circ}\text{C}$	1 chip on	$I_F$	30	mA
Surge forward current per diode			$I_{FSM}$	0.1	A
Power dissipation per diode			$P_V$	80	mW
Junction temperature			$T_j$	125	$^{\circ}\text{C}$
Operating temperature range			$T_{amb}$	- 40 to + 100	$^{\circ}\text{C}$
Storage temperature range			$T_{stg}$	- 40 to + 100	$^{\circ}\text{C}$
Thermal resistance junction/ambient	Mounted on PC board (pad size > 16 mm <sup>2</sup> )	1 chip on 2 chips on	$R_{thJA}$	560 780	K/W

**Note**

<sup>(1)</sup> Driving the LED in reverse direction is suitable for short term application

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLMKG3400, SUPER RED**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	$I_F = 20\text{ mA}$	VLMKG3400	$I_V$	56	-	140	mcd
Dominant wavelength	$I_F = 20\text{ mA}$		$\lambda_d$	627	633	639	nm
Peak wavelength	$I_F = 20\text{ mA}$		$\lambda_p$	-	643	-	nm
Angle of half intensity	$I_F = 20\text{ mA}$		$\phi$	-	$\pm 60$	-	deg
Forward voltage	$I_F = 20\text{ mA}$		$V_F$	-	1.9	2.6	V
Reverse current	$V_R = 5\text{ V}$		$I_R$	-	-	10	$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$		$C_j$	-	15	-	pF

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**VLMKG3400, GREEN**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity	$I_F = 20\text{ mA}$	VLMKG3400	$I_V$	35.5	-	90	mcd
Dominant wavelength	$I_F = 20\text{ mA}$		$\lambda_d$	564	570	575	nm
Peak wavelength	$I_F = 20\text{ mA}$		$\lambda_p$	-	572	-	nm
Angle of half intensity	$I_F = 20\text{ mA}$		$\phi$	-	$\pm 60$	-	deg
Forward voltage	$I_F = 20\text{ mA}$		$V_F$	-	2.0	2.6	V
Reverse current	$V_R = 5\text{ V}$		$I_R$	-	-	10	$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$		$C_j$	-	15	-	pF

**CROSSING TABLE**

VISHAY	OSRAM
VLMKG3400	LSGT676

**LUMINOUS INTENSITY CLASSIFICATION AND GROUP COMBINATIONS, VLMKG3400**

		SUPER RED			
		P2 56 mcd to 71 mcd	Q1 71 mcd to 90 mcd	Q2 90 mcd to 112 mcd	R1 112 mcd to 140 mcd
GREEN	N2 35.5 mcd to 45 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400
	P1 45 mcd to 56 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400
	P2 56 mcd to 71 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400
	Q2 710 mcd to 90 mcd	VLMKG3400	VLMKG3400	VLMKG3400	VLMKG3400

**Note**

- Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of  $\pm 11\%$ .  
The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel (there will be no mixing of two groups on each reel).  
In order to ensure availability, single brightness groups will not be orderable.  
In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped in any one reel.  
In order to ensure availability, single wavelength groups will not be orderable.

**COLOR CLASSIFICATION**

GROUP	DOMINANT WAVELENGTH (nm)	
	GREEN	
	MIN.	MAX.
4	564	567
5	566	569
6	568	571
7	570	573
8	572	575

**Note**

- Wavelengths are tested at a current pulse duration of 25 ms.

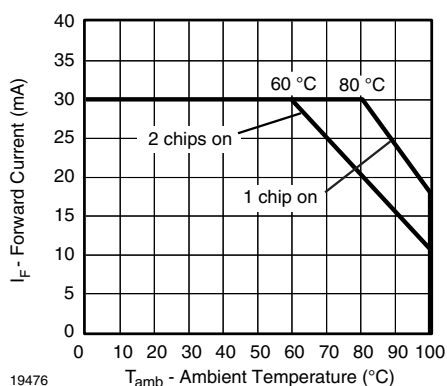
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

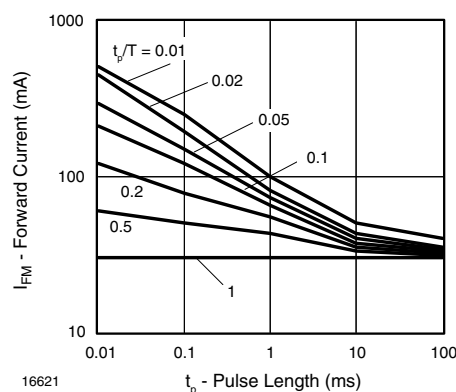


Fig. 2 - Forward Current vs. Pulse Duration

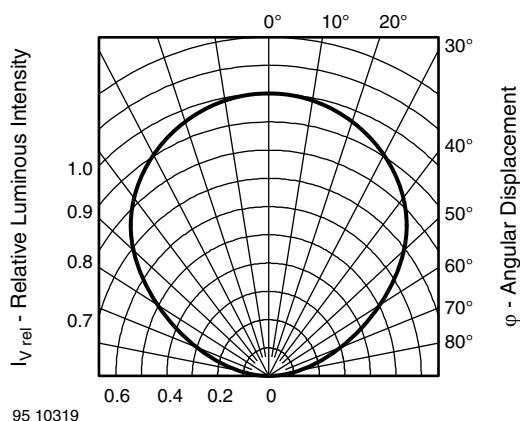


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

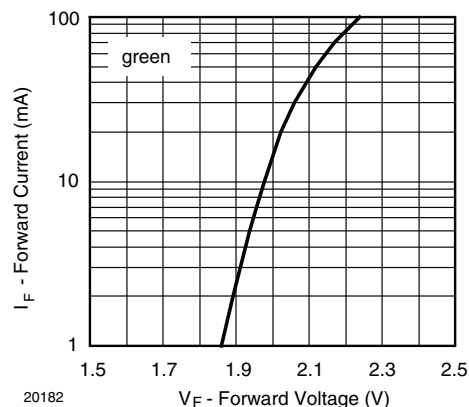


Fig. 6 - Relative Forward Voltage vs. Ambient Temperature

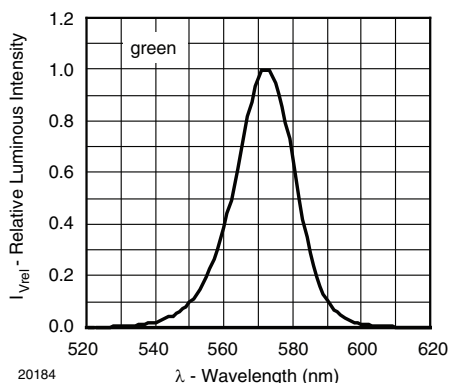


Fig. 4 - Relative Intensity vs. Wavelength

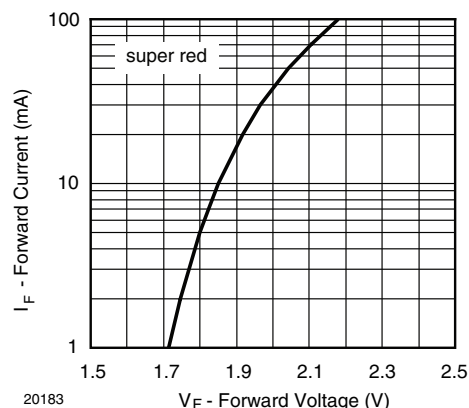


Fig. 7 - Relative Forward Voltage vs. Ambient Temperature

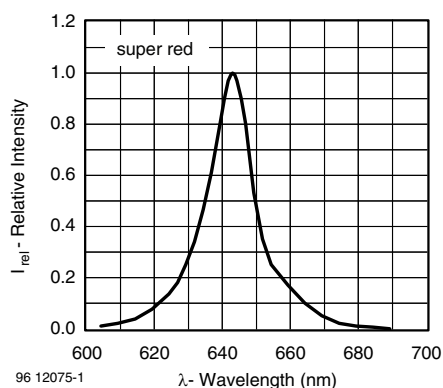


Fig. 5 - Relative Intensity vs. Wavelength

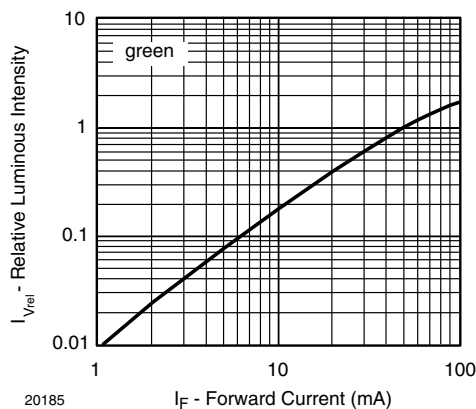


Fig. 8 - Relative Luminous Intensity vs. Forward Current

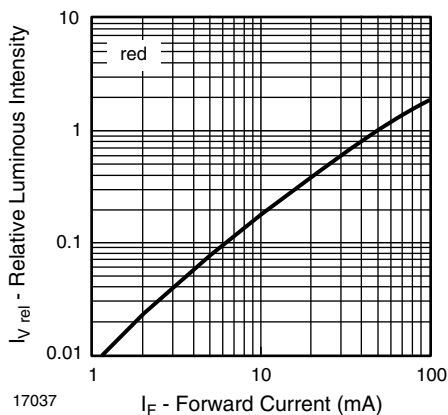


Fig. 9 - Relative Luminous Intensity vs. Forward Current

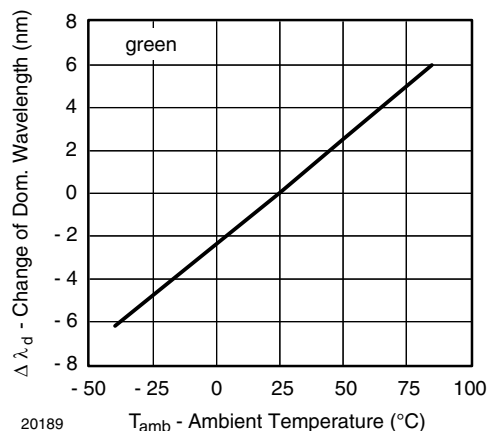


Fig. 12 - Change of Dominant Wavelength vs. Ambient Temperature

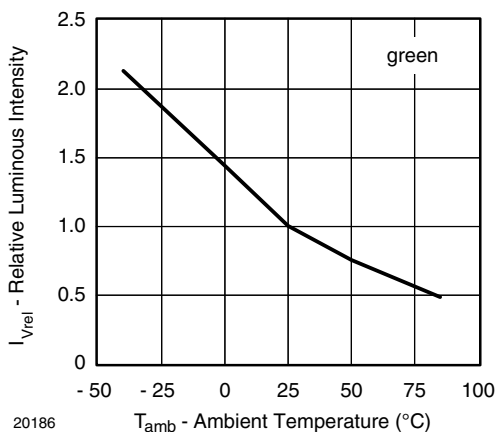


Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature

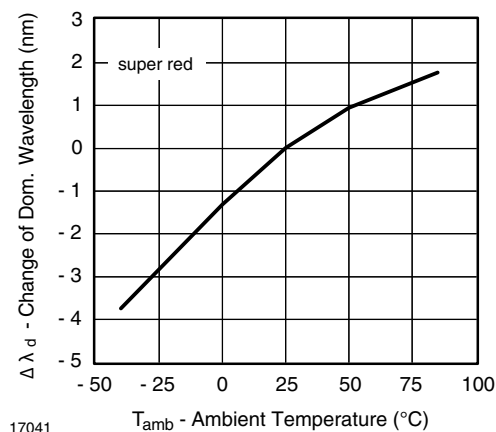


Fig. 13 - Change of Dominant Wavelength vs. Ambient Temperature

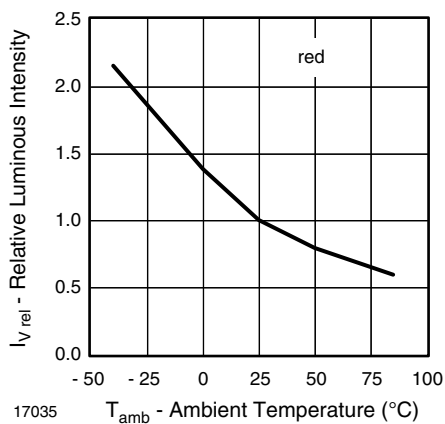


Fig. 11 - Relative Luminous Intensity vs. Ambient Temperature

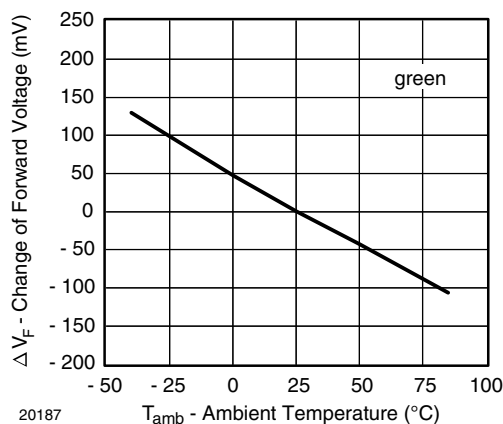


Fig. 14 - Change of Forward Voltage vs. Ambient Temperature

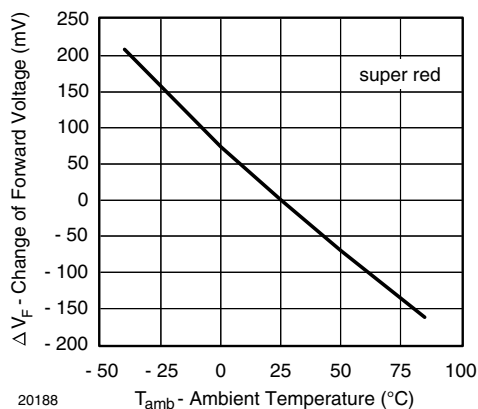
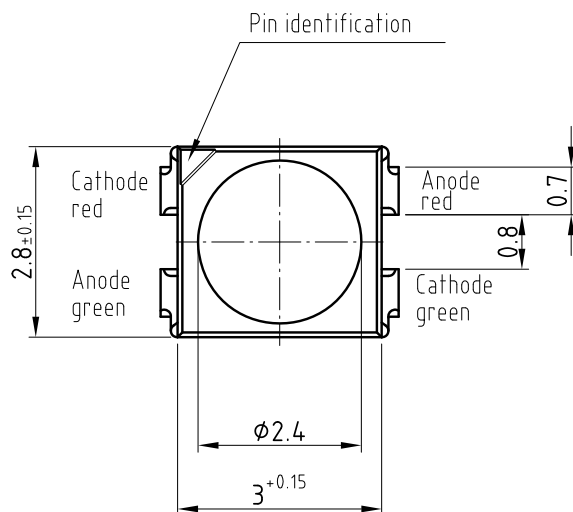
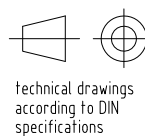
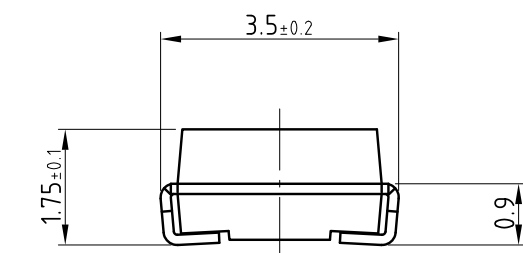
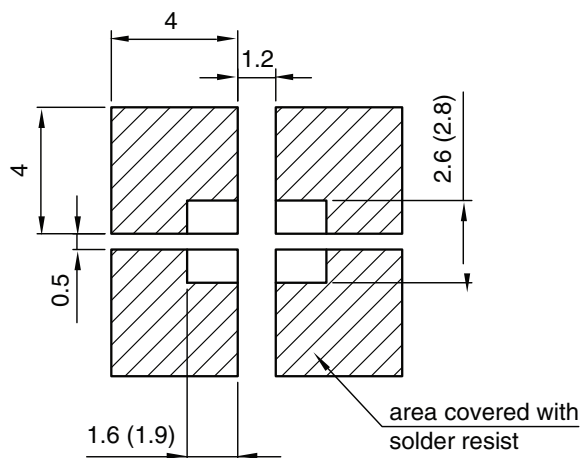


Fig. 15 - Change of Forward Voltage vs. Ambient Temperature

### PACKAGE DIMENSIONS in millimeters



### Mounting Pad Layout



Dimensions: IR and Vaporphase  
(Wave Soldering)

Drawing-No.: 6.541-5057.02-4

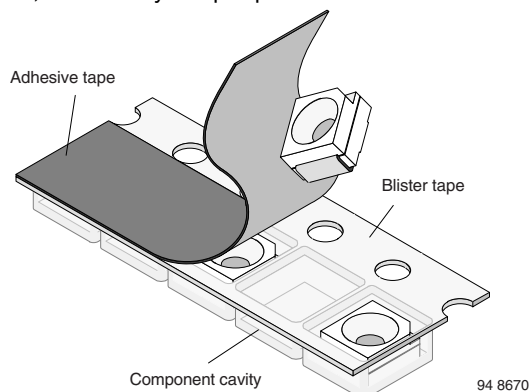
Issue: 2; 30.05.07

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## METHOD OF TAPING/POLARITY AND TAPE AND REEL

### SMD LED (VLM.3 - SERIES)

Vishay's LEDs in SMD packages are available in an antistatic 8 mm blister tape (in accordance with DIN IEC 40 (CO) 564) for automatic component insertion. The blister tape is a plastic strip with impressed component cavities, covered by a top tape.



### REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDS, TAPE OPTION GS18 (= 8000 PCS.) PREFERRED

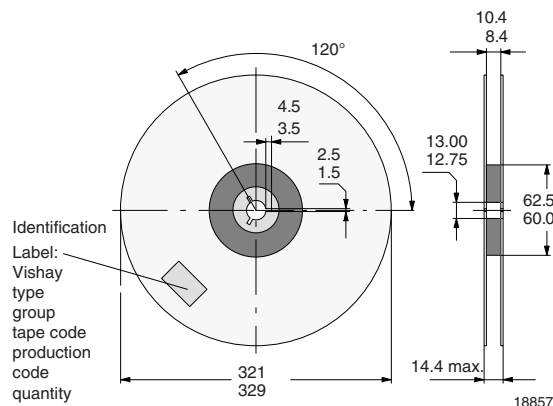


Fig. 18 - Reel Dimensions - GS18

### TAPING OF VLM.3...

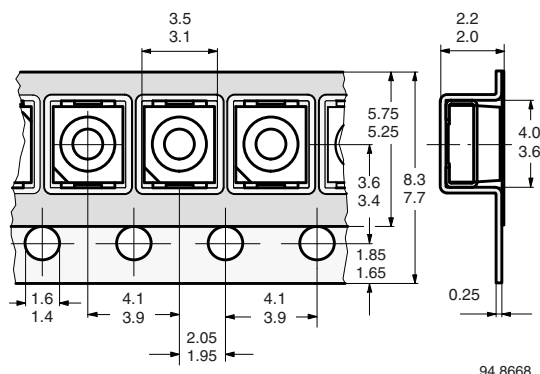


Fig. 16 - Tape Dimensions in mm for PLCC-2

### REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDS, TAPE OPTION GS08 (= 1500 PCS.)

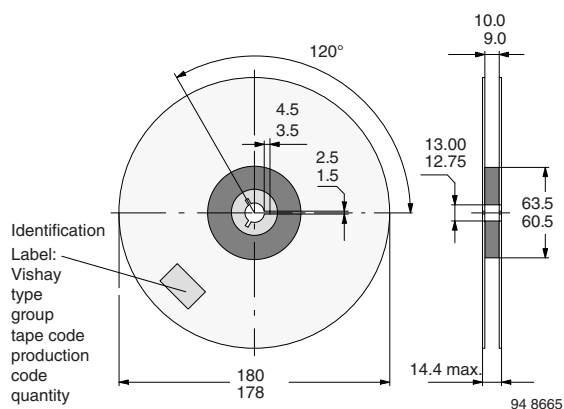


Fig. 17 - Reel Dimensions - GS08

### SOLDERING PROFILE

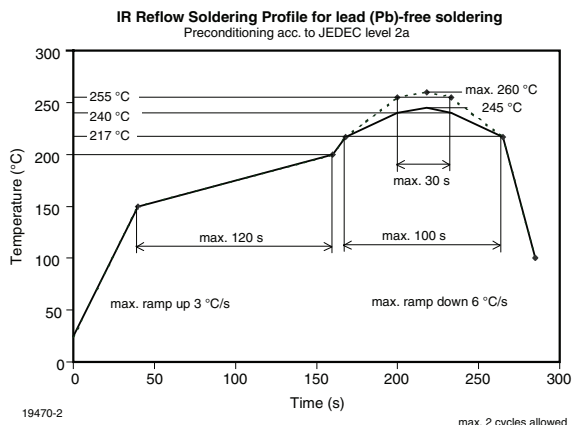


Fig. 19 - Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020)

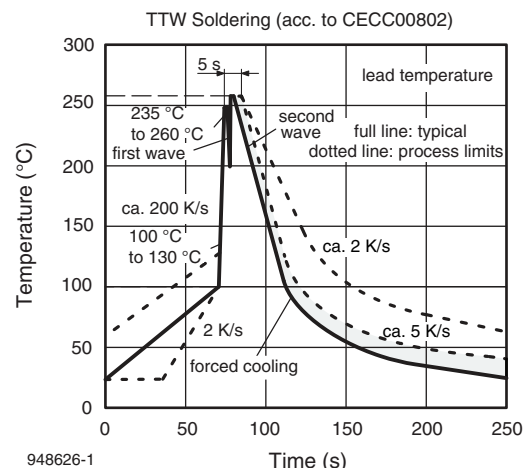
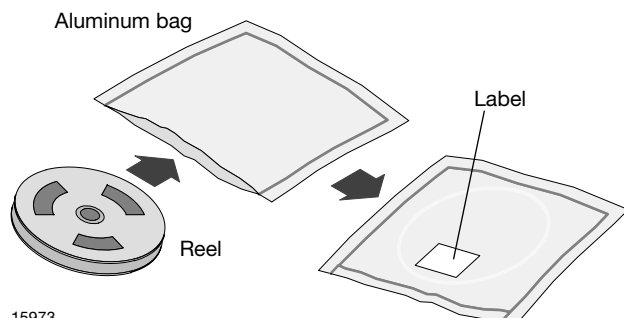


Fig. 20 - Double Wave Soldering of Opto Devices (all Packages)



## 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. A secondary cardboard box is used for shipping purposes.

## 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  $\leq 60\%$  RH max.

After more than 672 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 100 °C + 5 °C not suitable for reel or tubes.

An EIA JEDEC standard JESD22-A112 level 2a label is included on all dry bags.

	<b>CAUTION</b> This bag contains MOISTURE-SENSITIVE DEVICES	<b>LEVEL</b> <b>2a</b>								
<p>1. Shelf life in sealed bag 12 months at &lt;40°C and &lt; 90% relative humidity (RH)</p> <p>2. After this bag is opened devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing (peak package body temp. 260°C) must be:</p> <ul style="list-style-type: none"><li>a) Mounted within <b>672 hours</b> at factory condition of <math>\leq 30^\circ\text{C}/60\%\text{RH}</math> or</li><li>b) Stored at <math>\leq 10\%</math> RH.</li></ul> <p>3. Devices require baking before mounting if:</p> <ul style="list-style-type: none"><li>a) Humidity Indicator Card is &gt;10% when read at <math>23^\circ\text{C} \pm 5^\circ\text{C}</math> or</li><li>b) 2a or 2b is not met.</li></ul> <p>4. If baking is required, devices may be baked for:</p> <table border="0"><tr><td><b>192 hours</b> at <math>40^\circ\text{C} + 5^\circ\text{C}/-0^\circ\text{C}</math> and &lt;5%RH (dry air/nitrogen)</td><td><b>or</b></td></tr><tr><td><b>96 hours</b> at <math>60 \pm 5^\circ\text{C}</math> and &lt;5%RH</td><td>For all device containers</td><td><b>or</b></td></tr><tr><td><b>24 hours</b> at <math>100 \pm 5^\circ\text{C}</math></td><td>Not suitable for reels or tubes</td><td></td></tr></table>			<b>192 hours</b> at $40^\circ\text{C} + 5^\circ\text{C}/-0^\circ\text{C}$ and <5%RH (dry air/nitrogen)	<b>or</b>	<b>96 hours</b> at $60 \pm 5^\circ\text{C}$ and <5%RH	For all device containers	<b>or</b>	<b>24 hours</b> at $100 \pm 5^\circ\text{C}$	Not suitable for reels or tubes	
<b>192 hours</b> at $40^\circ\text{C} + 5^\circ\text{C}/-0^\circ\text{C}$ and <5%RH (dry air/nitrogen)	<b>or</b>									
<b>96 hours</b> at $60 \pm 5^\circ\text{C}$ and <5%RH	For all device containers	<b>or</b>								
<b>24 hours</b> at $100 \pm 5^\circ\text{C}$	Not suitable for reels or tubes									
Bag Seal Date: _____ (If blank, see bar code label)										
Note: LEVEL defined by EIA JEDEC Standard JESD22-A113										

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Example of JESD22-A112 level 2a label

## 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. Electro-static 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.



## Packing and Order Information

### GENERAL INFORMATION

Vishay offers LEDs and 7 Segment Displays with several packing options.

DEVICE	SERIES	BULK	TAPE	BLISTER TAPE	TUBE
7-Segment Display	TD..				x
TELUX	TLW.. VLW..				x
PLCC-2, PLCC-3, PLCC-4	VLM.3..			x	
PLCC-2 Plus	VLM.51..			x	
Reverse Gullwing	VLR..			x	
Pin Hole LED	TL.. VL..	x	x		
Mini	VLM.2..			x	
0603 LED	TLM.10., TLM.11. VLM.10., VLM.11., VLM.13.			x	
0402 LED	VLM.15..			x	
Little Star	VLM.7..			x	

All packing options are classified in terms of brightness (standard), color (optional), or forward voltage (optional). Reference for parameter selection codes is the chapter "Classification of Components", label code is SEL.

### Barcode Label Format

Type: PTC - Assembly Location Code  
 SEL - Parameter Selection Code  
 DC - Date Code  
 BN - Batch Number  
 PCS - Quantity  
 MN - Machine number

### Drypacks

Blister tapes are packed in anti-humidity aluminium bags to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant with moisture indicators. In cases of moisture absorption, the indicators change their color from blue to pink.

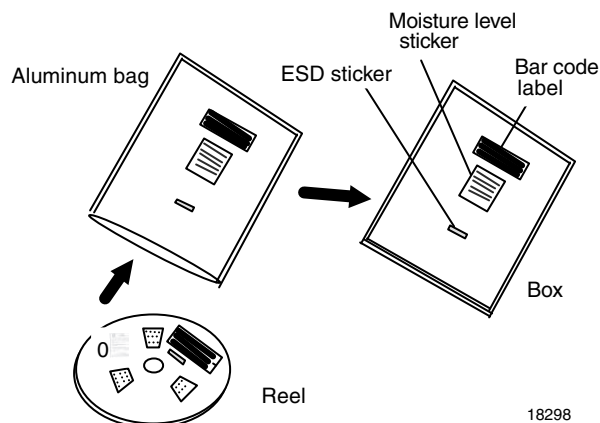
Dry box storage is recommended to prevent the parts from moisture absorption. The following conditions should be preserved if dry boxes are not available.

Storage condition (example for JEDEC level 2, see table 2 "Assembly Instructions"):


- max. 1 year:  
 Temperature: 10 °C to 30 °C  
 Humidity: 60 % RH max.
- unlimited:  
 Temperature: 10 °C to 30 °C  
 Humidity: 20 % RH max.

In case of moisture absorption the device will recover to the former condition by drying under the following recommended conditions:

192 h at 40 °C + 5 °C and < 5 % RH



Example:



**CAUTION**  
This bag contains  
**MOISTURE-SENSITIVE DEVICES**

**LEVEL**  
2

- Shelf life in sealed bag: 12 months at < 40 °C and < 90 % relative humidity (RH)
- After this bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing (peak package body temp. 220 °C) must be:
  - Mounted within 1 year at factory condition of ≤ 30 °C/60 % RH or
  - Stored at ≤ 20 % RH
- Devices require baking before mounting if:  
 Humidity Indicator Card is > 20 % when read at 23 °C ± 5 °C or 2a. or 2b. are not met.
- If baking is required, devices may be baked for:  
 192 hours at 40 °C + 5 °C/- 0 °C and < 5 % RH (dry air/nitrogen) or  
 96 hours at 60 °C ± 5 °C and < 5 % RH for all device containers or  
 24 hours at 100 °C ± 5 °C not suitable for reels or tubes

Bag Seal Date: \_\_\_\_\_  
 (If blank, see barcode label)

Note: Level defined by EIA JEDEC Standard JESD22-A112

19148-1

### Fan Fold Packing

Fan fold box is the standard containment for reel, tube, and bulk. Label format is identical to packing options as described above. Packing might contain tubes or reels with several parameter selection codes. In this case the label code of fan fold packing is SEL000.

Exception:

TELUX fan fold boxes contain one SEL code only.

### Minimum Order Quantity

Packing Options describe the smallest physical packing unit. Vishay Sales representatives can provide information on the Minimum Order Quantity per type.

## 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:  $\geq 15$  N

**Pulling force** in the plane of the tape, at rectangular to the reel:  $\geq 5$  N

### Note

- Shipment in fan-fold packages are standard for radial taped devices.
- Shipments in reel packing are only possible if the customer guarantees the removal of empty reels.
- According to a German packaging decree (Verpackungsverordnung) we are not able to accept the return of reels.

## SPECIFICATION OF PACKING OPTIONS

### Pin Hole LED (TL..., VL...-series)

#### Reel

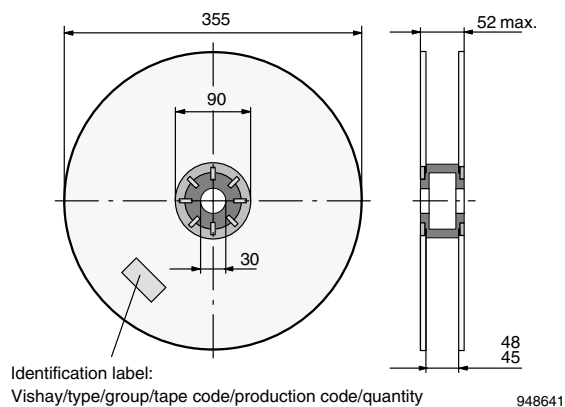


Fig. 1 - Reel Dimensions

#### Tape

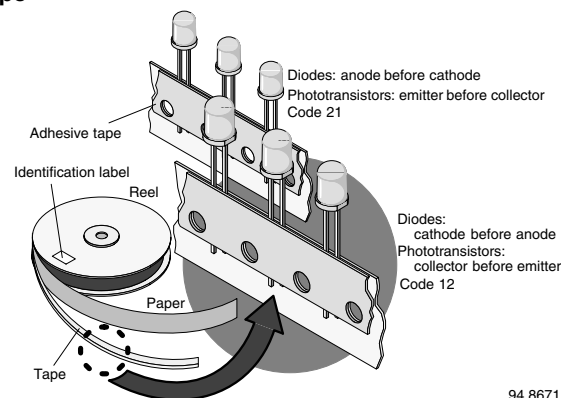


Fig. 2 - LED in Tape

PACKAGE/PACKAGING		QTY
7-Segment Display	7 mm	500 pcs
	10 mm	400 pcs
	13 mm	400 pcs
	Clock Module	384 pcs
TELUX	-	2100 pcs
PLCC-2, PLCC-3, PLCC-4	GS08	7500 (5 x 1500) pcs
	GS18	8000 pcs
PLCC-2 Plus	GS08	1000 pcs
PLCC-2 Ultraviolet	GS08	2000 pcs
RGB	-	2050 pcs
Reverse Gullwing	GS08	2000 pcs
	GS18	8000 pcs
Mini	GS08	3000 pcs
0603 LED	GS08	3000 pcs
0402 LED	GS08	9000 (3 x 3000) pcs
Little Star	GS08	2000 pcs
1.8 mm, 3 mm	Bulk	5000 pcs
	Reel	10 000 (5 x 2000) pcs
	Ammopack	10 000 (5 x 2000) pcs
5 mm	Bulk	4000 pcs
	Reel	5000 (5 x 1000) pcs
	Ammopack	5000 (5 x 1000) pcs
Side View	Bulk	2000 pcs
	Ammopack	5000 (5x1000) pcs

### Ammopack

The tape is folded in concertina arrangement and laid in the cardboard box.

If the components are required with the cathode before the anode (figure 4), the start of the tape should be taken from the side of the box marked "-". If the components are required with the anode before cathode (figure 7), the tape should be taken from the side of the box marked "+".

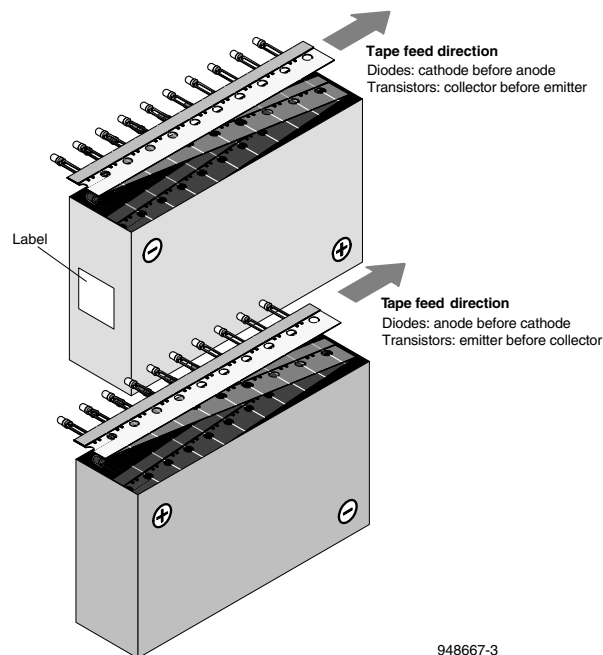


Fig. 3 - Tape Direction

## OPTIONS

### TAPE DIMENSIONS FOR Ø 3 mm STANDARD PACKAGES

**Available Package Variations: 12, Z, 21**

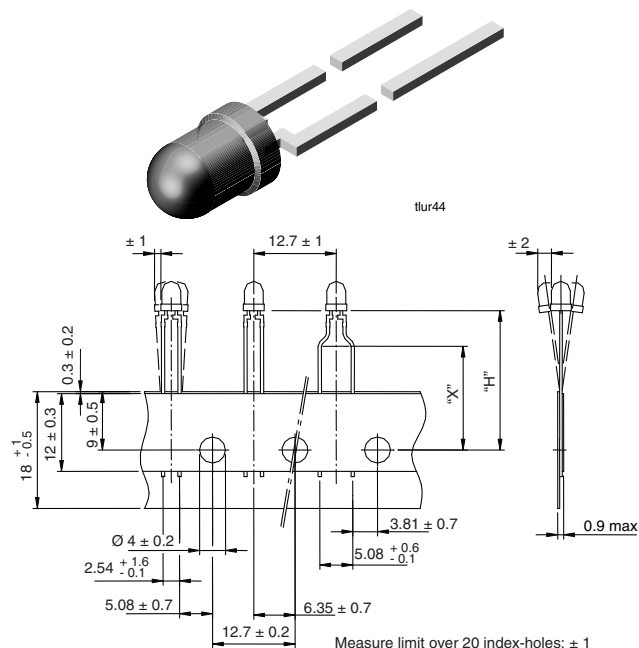
OPTION	DIMENSION “H”	DIMENSION “X”	PREFERENCE
AS	17.3 ± 0.5		Standard
VS	18.5 ± 0.5		
KS	19.7 ± 0.5		
BS	20.0 ± 0.5		
LS	21.0 ± 0.5		
CS	22.0 ± 0.5		
MS	25.5 ± 0.5		Standard
BT	20.0 ± 0.5	16.0 ± 0.5	
DT	21.0 ± 0.5	16.0 ± 0.5	
NT	21.5 ± 0.5	16.0 ± 0.5	
GT	24.0 ± 0.5	16.0 ± 0.5	
HT	24.0 ± 0.5	14.5 ± 0.5	
MT	25.5 ± 0.5	16.0 ± 0.5	

**Explanation:**

12 - cathode leaves first

21 - anode leaves first

Z - ammopack



Quantity per:	Reel (Mat.-no. 1764)
	2000

21885

Fig. 4 - Tape Dimensions Ø 3 mm Devices

## ORDER CODES

The type designation of the device is extended by tape option codes.

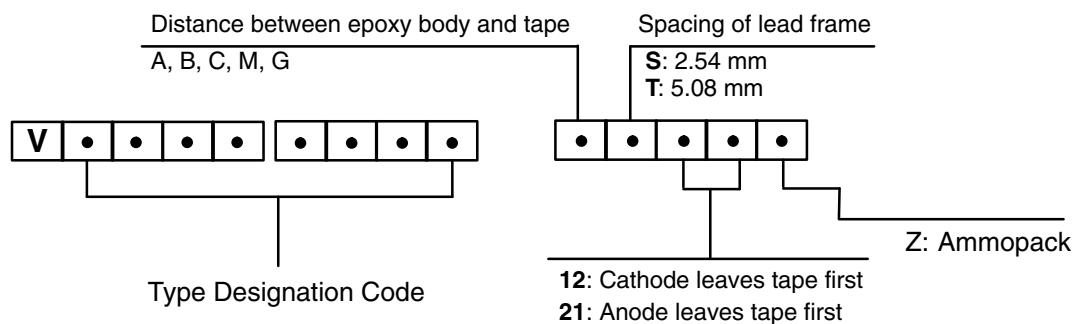


Fig. 5 - Taping Code

**Example:** VLME3100-GS08

TLHE4200-AS21

TLHE4200-ASZ

optional since 1999:

VLMS3100-GS18

### Note

- The new nomenclature for ammpack is ASZ only, without suffix for the LED orientation. The carton box has to be turned to the desired position: “+” for anode first, or “-” for cathode first. AS12Z and AS21Z are still valid for already existing types, BUT NOT FOR NEW DESIGN.

## TAPE DIMENSIONS FOR Ø 5 mm STANDARD PACKAGES

**Available Package Variations: 12, Z, 21**

OPTION	DIMENSION "H"	DIMENSION "X"	PREFERENCE
AS	17.3 ± 0.5		Standard
KS	19.7 ± 0.5		
LS	21.0 ± 0.5		
CS	22.0 ± 0.5		Standard
MS	25.5 ± 0.5		
BT	20.0 ± 0.5	16.0 ± 0.5	
DT	21.0 ± 0.5	16.0 ± 0.5	
NT	21.5 ± 0.5	16.0 ± 0.5	
GT	24.0 ± 0.5	16.0 ± 0.5	
HT	24.0 ± 0.5	14.5 ± 0.5	
MT	25.5 ± 0.5	16.0 ± 0.5	

**Explanation:**

12 - cathode leaves first

21 - anode leaves first

Z - ammopack

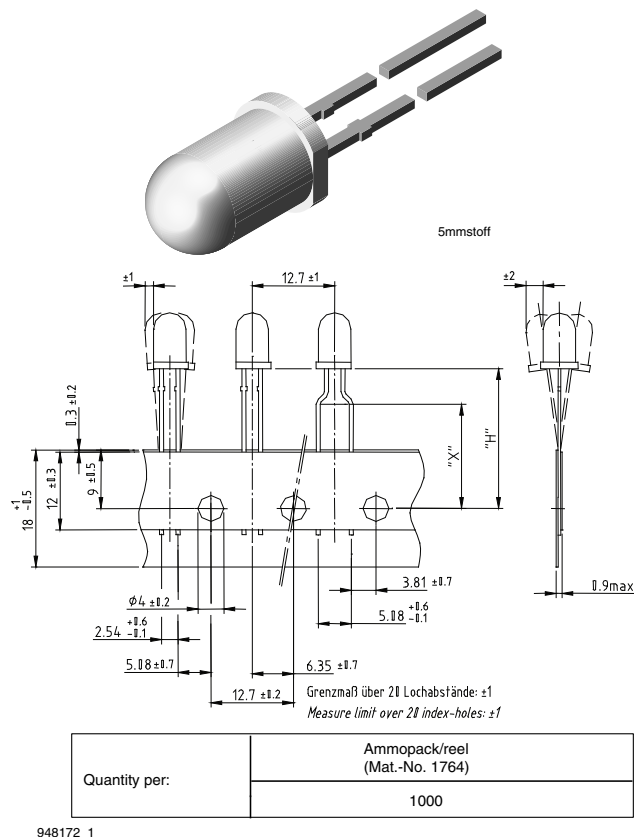


Fig. 6 - Tape Dimensions Ø 5 mm Devices

## ORDER CODES

The type designation of the device is extended by tape option codes.

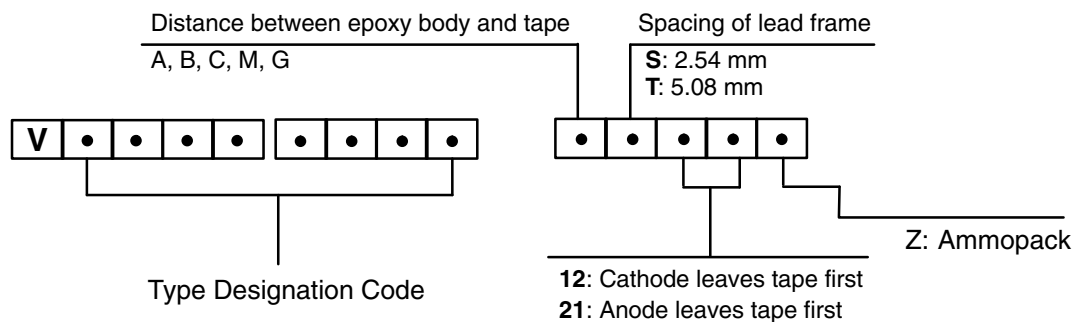


Fig. 7 - Taping Code

**Example:** VLME3100-GS08

TLHE4200-AS21

TLHE4200-ASZ

optional since 1999:

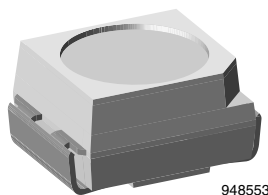
VLMS3100-GS18

### Note

- The new nomenclature for ammpack is ASZ only, without suffix for the LED orientation. The carton box has to be turned to the desired position: “+” for anode first, or “-” for cathode first. AS12Z and AS21Z are still valid for already existing types, BUT NOT FOR NEW DESIGN.

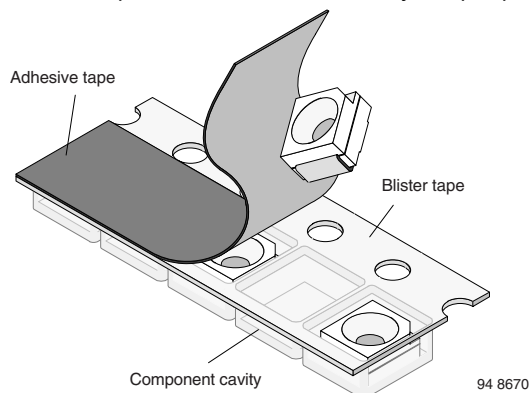


## TAPE DIMENSIONS FOR PLCC-2, PLCC-3, PLCC-4 (VLM.3-SERIES)



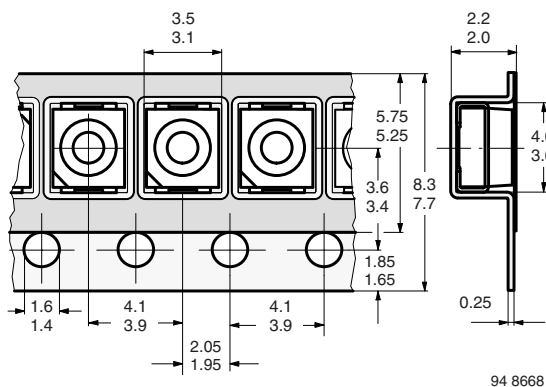
948553

Vishay's LEDs in SMD packages are available in an antistatic 8 mm blister tape (in accordance with DIN IEC 40 (CO) 564) for automatic component insertion. The blister tape is a plastic strip with impressed component cavities, covered by a top tape.



94 8670

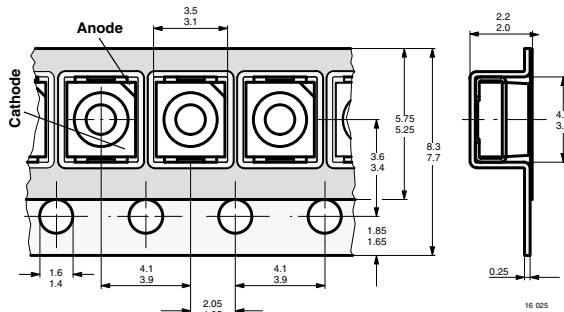
## TAPING OF VLM.3..



94 8668

Fig. 8 - Tape Dimensions in mm for PLCC-2

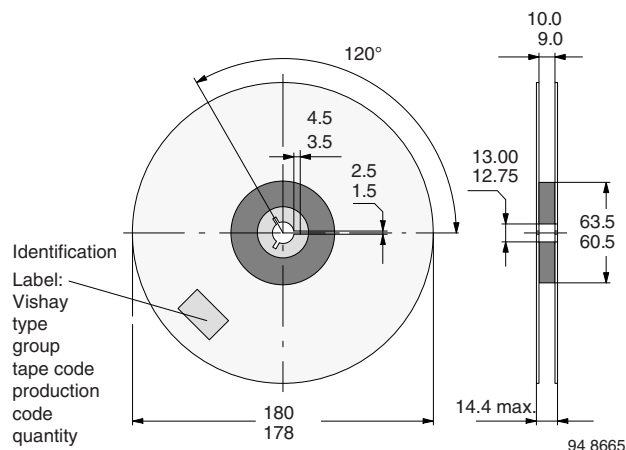
## TAPING OF VLMD3100



16 025

Fig. 9 - Tape Dimensions in mm for PLCC-2

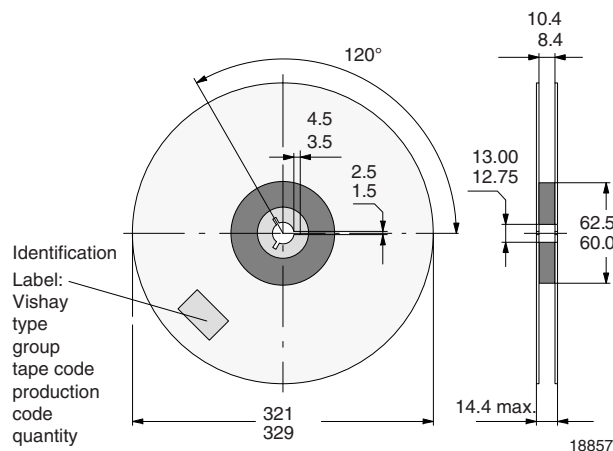
## REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDs, TAPE OPTION GS08 (= 1500 PCS.)



94 8665

Fig. 10 - Reel Dimensions - GS08

## REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDs, TAPE OPTION GS18 (= 8000 PCS.) PREFERRED

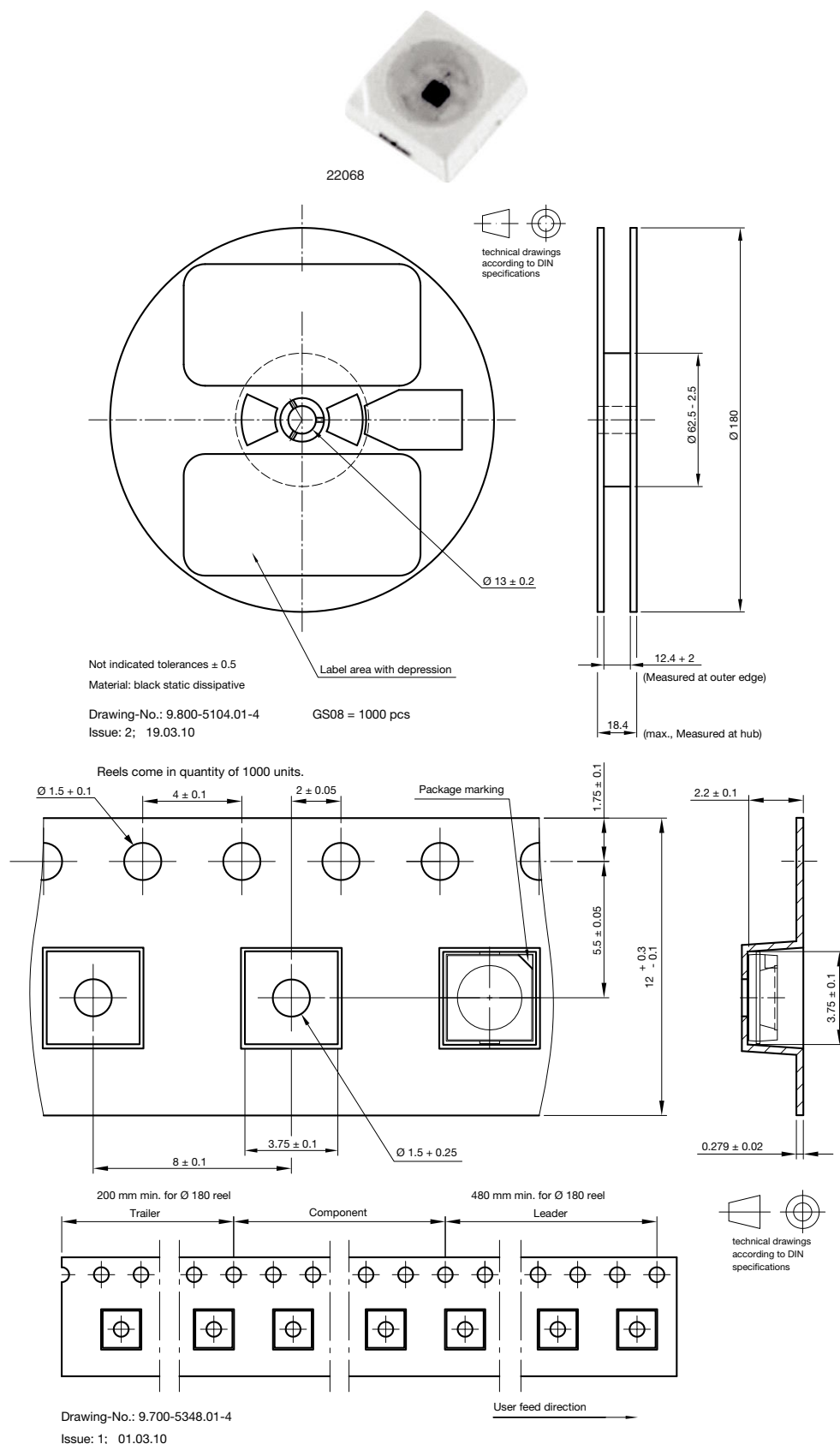


18857

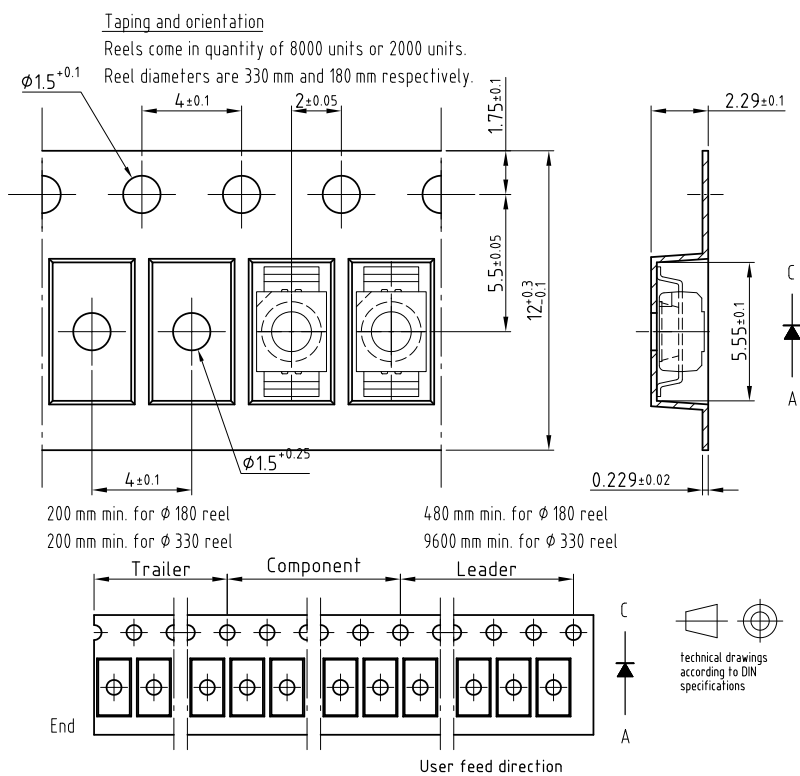
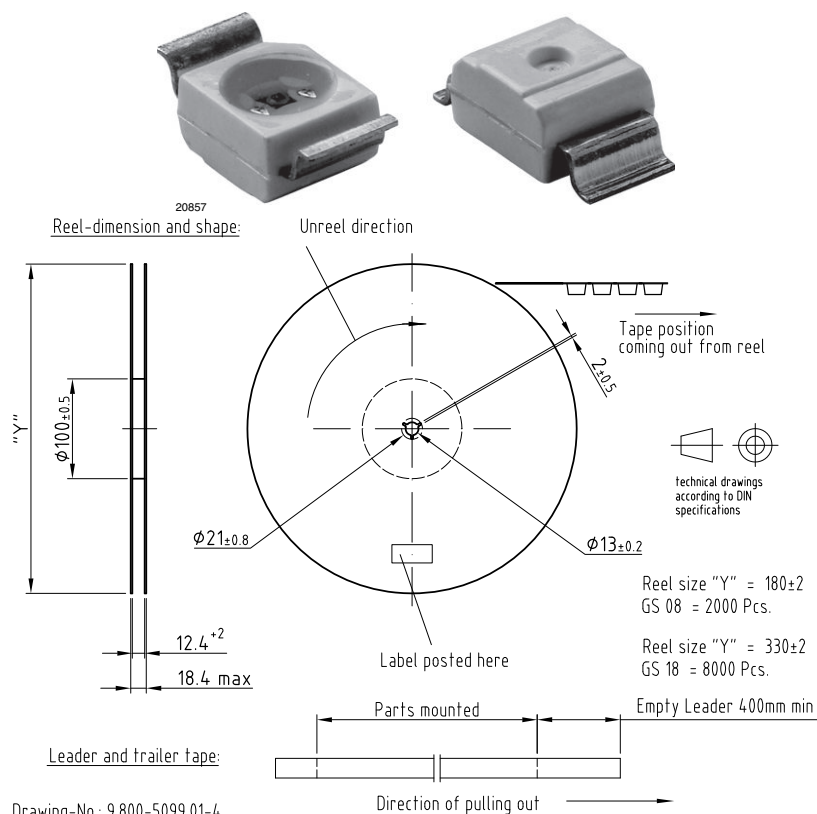
Fig. 11 - Reel Dimensions - GS18



## TAPE DIMENSIONS FOR PLCC-2 PLUS

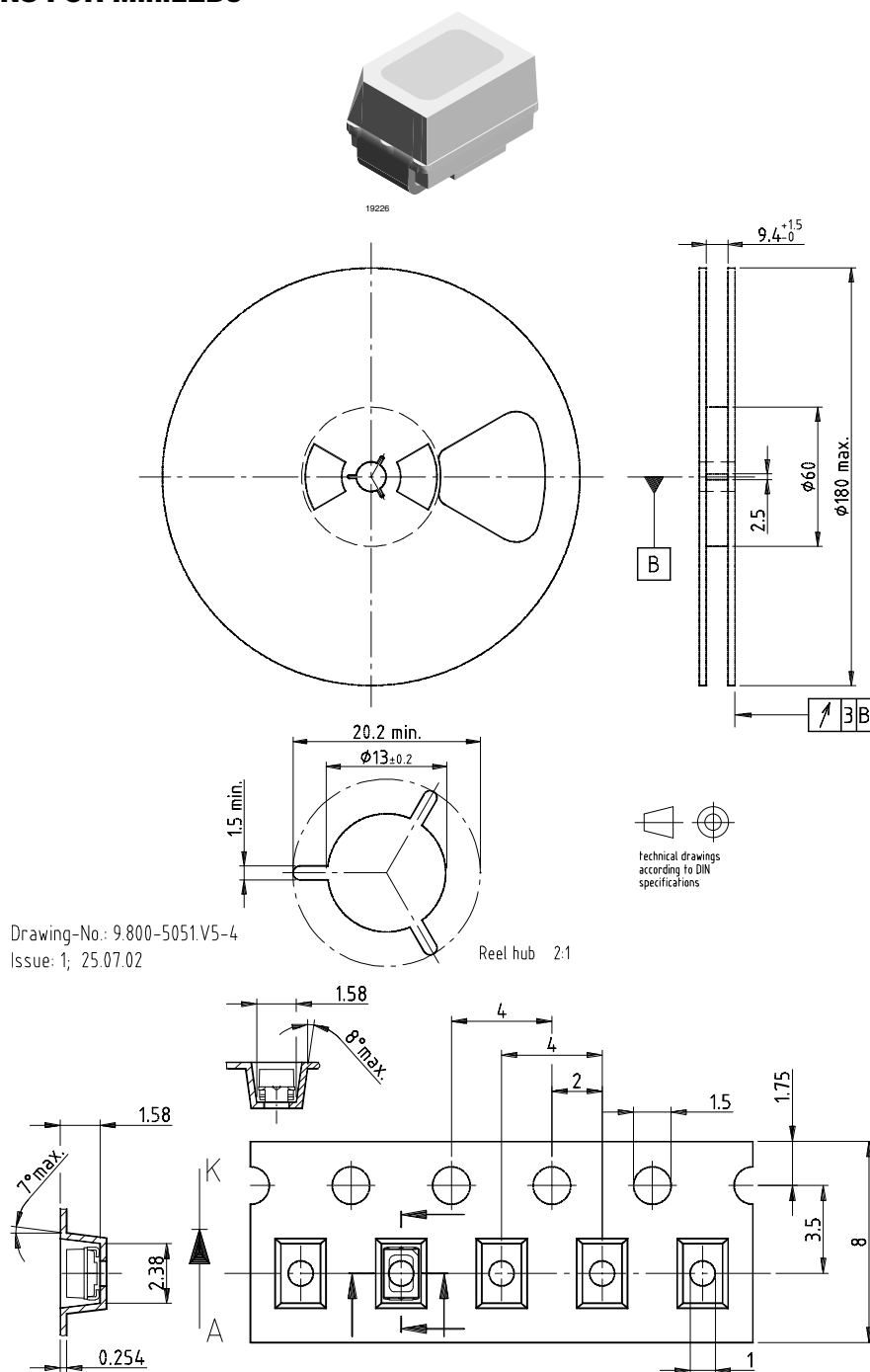


## TAPE DIMENSIONS FOR REVERSE GULLWING





## TAPE DIMENSIONS FOR MiniLEDs



Drawing-No.: 9.800-5051.V5-4  
Issue: 1; 25.07.02

Drawing-No.: 9.700-5266.01-4  
Issue: 1; 05.06.02

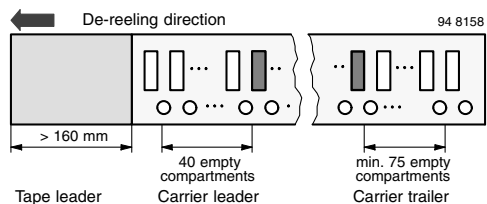


Fig. 12 - Beginning and End of Reel



### MISSING DEVICES

A maximum of 0.5 % of the total number of components per reel may be missing, excluding missing components at the beginning and at the end of the reel. A maximum of three consecutive components may be missing, provided this gap is followed by six consecutive components.

The tape leader is at least 160 mm and is followed by a carrier tape leader with at least 40 empty compartments. The tape leader may include the carrier tape as long as the cover tape is not connected to the carrier tape.

The last component is followed by a carrier tape trailer with at least 75 empty compartments and sealed with cover tape.

### TOP TAPE REMOVAL FORCE

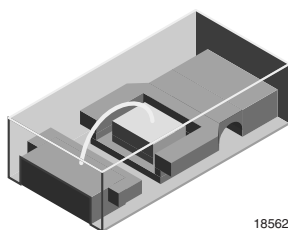
The removal force lies between 0.1 N and 1.0 N at a removal speed of 5 mm/s.

In order to prevent components from popping out of the blisters, the cover tape must be pulled off at an angle of 180 °C with regard to the feed direction.

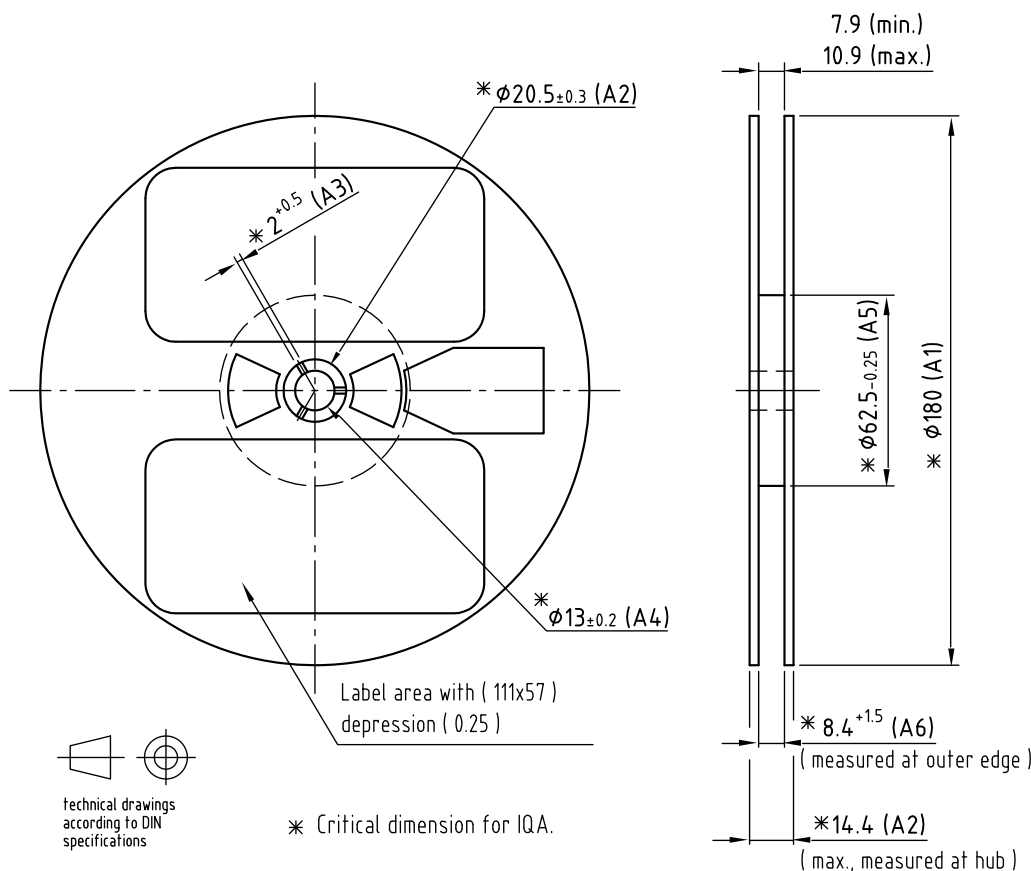
### ORDER CODES

**Example:** VLMG2100-GS08

### TAPE AND REEL DIMENSIONS FOR TLM.10., TLM.11., VLM.11.. 0603 LED LEADFRAME BASED



18562



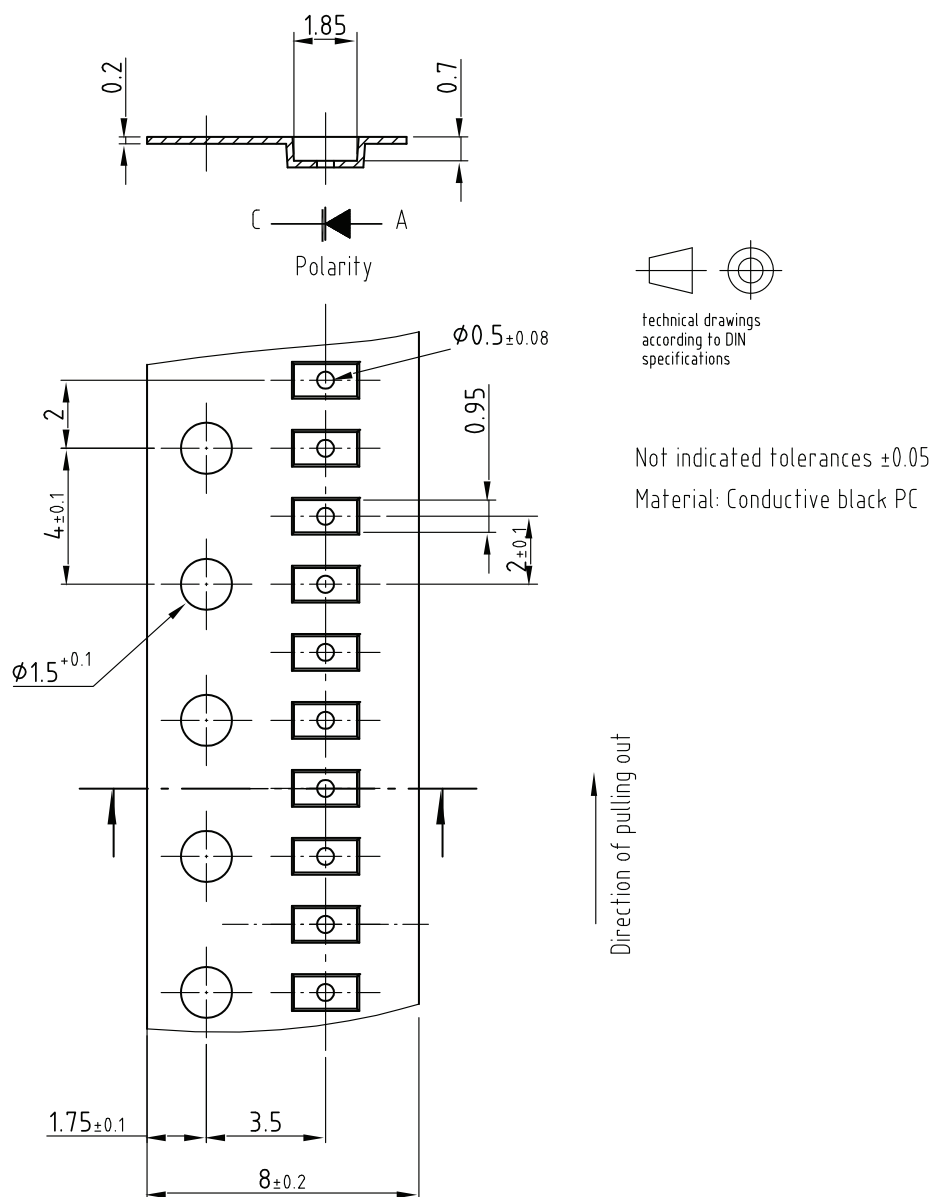
Drawing-No.: 9.800-5086.01-4

Issue: 1; 29.04.04

19043

Not indicated tolerances  $\pm 0.05$

Material: black static dissipative



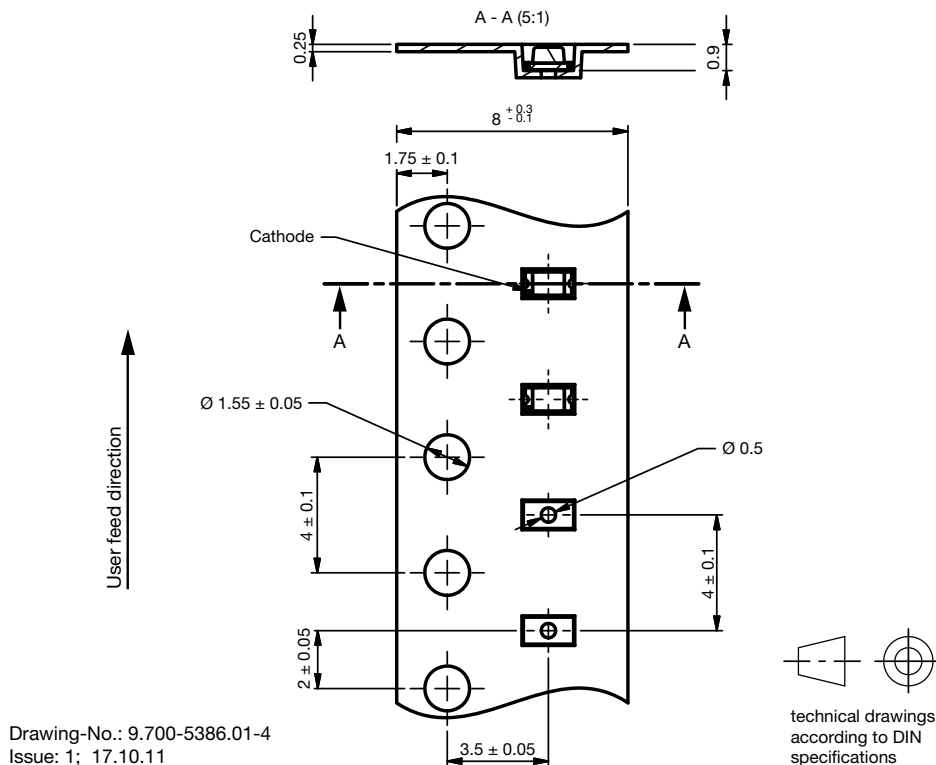
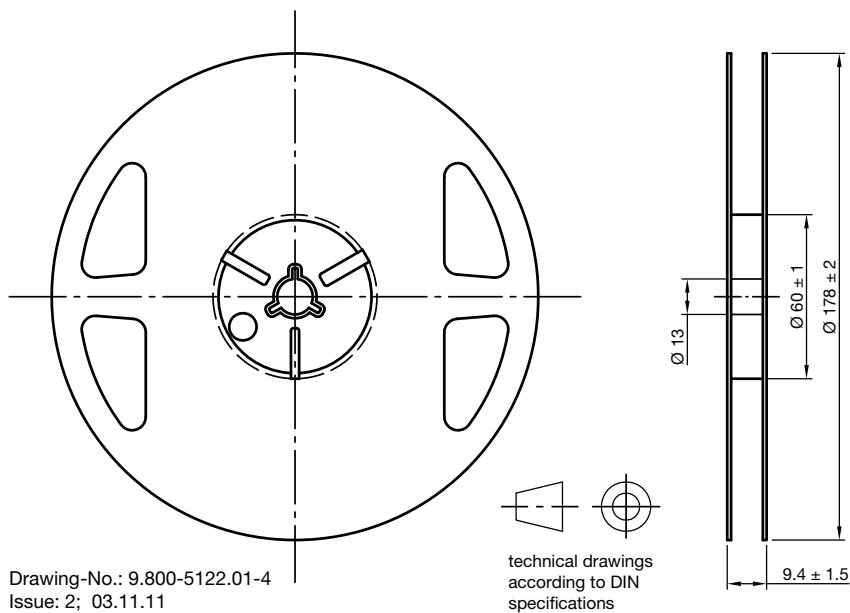
Drawing-No.: 9.700-5290.01-4

Issue: 2; 10.07.06

19044

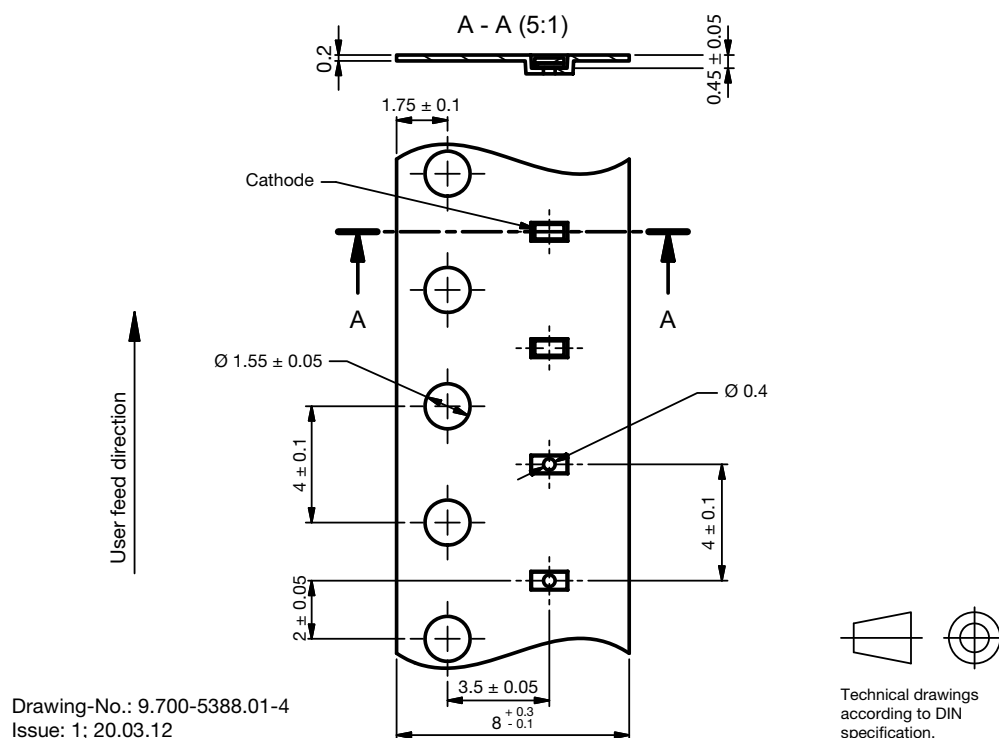
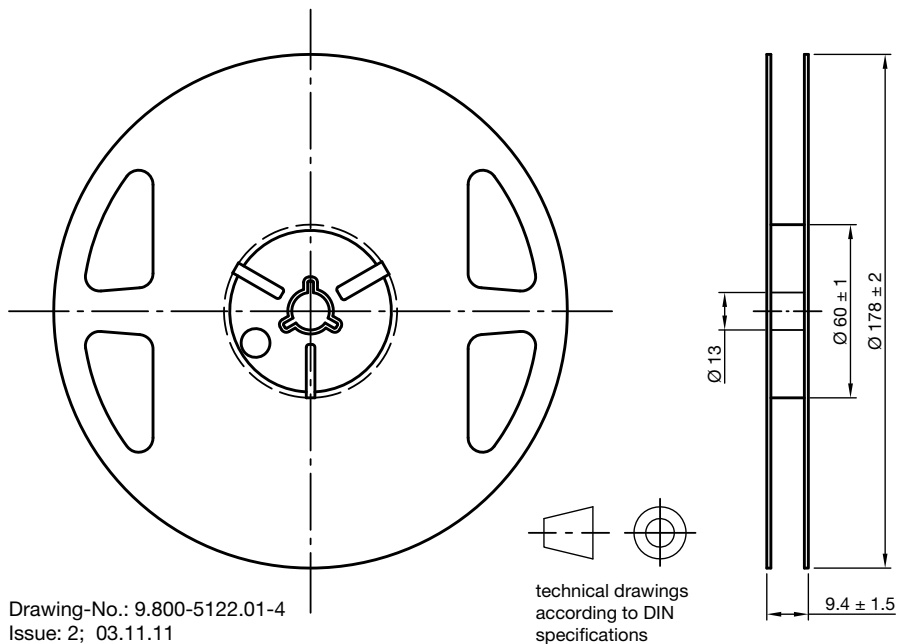
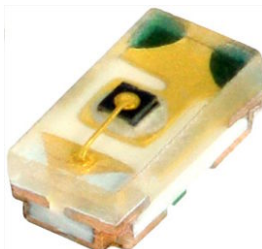


## TAPE AND REEL DIMENSIONS FOR VLM.13.. 0603 LED PCB BASED

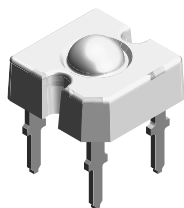




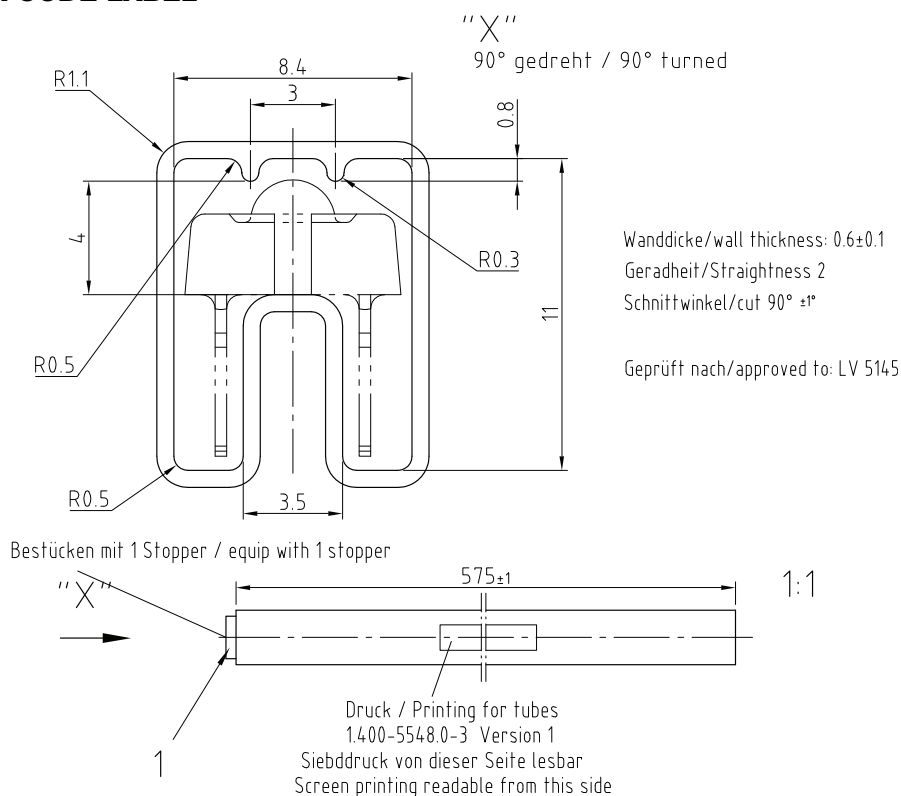
## TAPE AND REEL DIMENSIONS VLM.15.. 0402 LED



## PACKAGING DIMENSIONS FOR TELUX



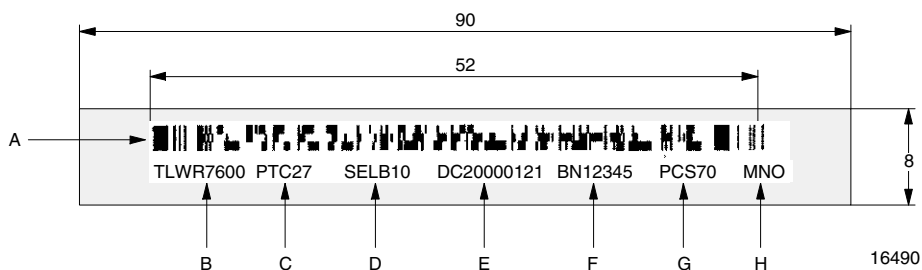
### TUBE WITH BAR CODE LABEL



Drawing-No.: 9.700-5223.0-4  
 Rev. 2; Date: 23.08.99

Fig. 13 - Drawing Proportions not scaled

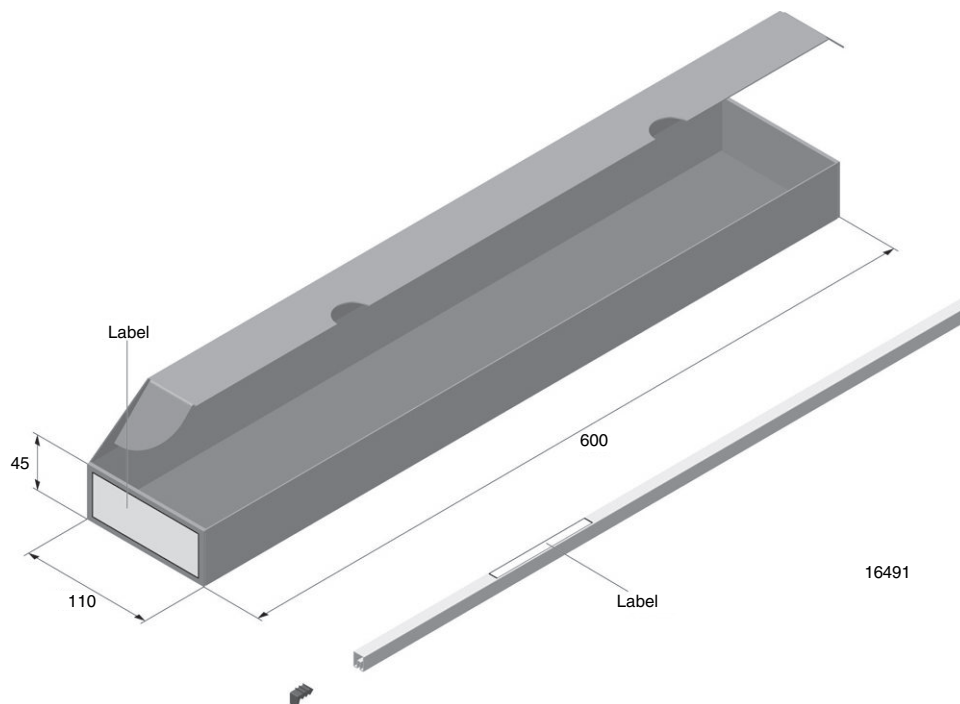
### EXAMPLE FOR TELUX TUBE LABEL



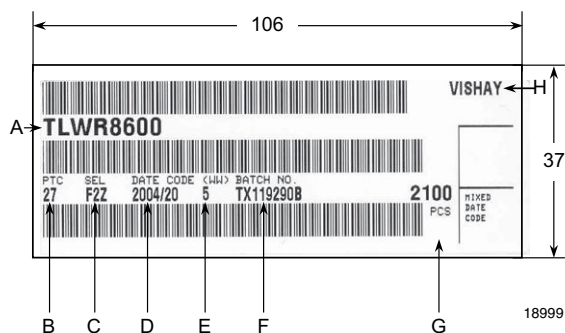
- |  |                   |
|--|-------------------|
| A. Bar code                                  | E. Date code      |
| B. Type of component                         | F. Batch No.      |
| C. Manufacturing plant                       | G. Total quantity |
| D. SEL - Selection Code (Bin)                | H. Company code   |
| Digit 1 - code for Luminous Flux group       |                   |
| Digit 2 - code for Dominant Wavelength group |                   |
| Digit 3 - code for Forward Voltage group     |                   |



## FAN FOLD BOX



## LABEL OF FAN FOLD BOX



- I. Type of component
- J. Manufacturing plant
- K. SEL - Selection Code (Bin)
  - Digit 1 - code for Luminous Flux group
  - Digit 2 - code for Dominant Wavelength group
  - Digit 3 - code for Forward Voltage group
- L. Date Code year/week
- M. Day Code (e. g. 5: Friday)
- N. Batch No.
- O. Total quantity
- P. Company code

### Note

- Any distance between bar code and character is more than 1 mm.



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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

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