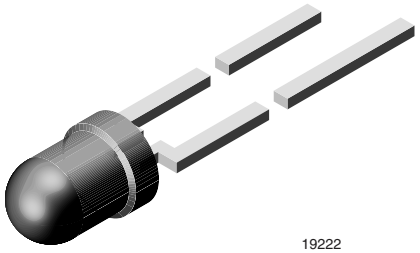
High Efficiency LED in Ø 3 mm Clear Package



19222

FEATURES

- Choice of four bright colors
- Standard Ø 3 mm (T-1) package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Very small viewing angle
- Luminous intensity categorized
- Yellow and green color categorized
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e8

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

DESCRIPTION

The TLH.4900 series was developed for applications where high light output is required.

It is housed in a 3 mm clear plastic package. The small viewing angle of these devices provides a high brightness.

All LEDs are categorized in luminous intensity groups. The green and yellow LEDs are categorized additionally in wavelength groups.

That allows users to assemble LEDs with uniform appearance.

APPLICATIONS

- Status lights
- Off/on indicator
- Background illumination
- Readout lights
- Maintenance lights
- Legend light

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm
- Product series: standard
- Angle of half intensity: ± 16°

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at I_F (mA)	WAVELENGTH (nm)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
TLHR4900	Red	6.3	25	-	10	612	-	625	10	-	2	3	20	GaAsP on GaP
TLHY4900	Yellow	10	26	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHG4900	Green	16	37	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP
TLHG4900-AS12Z	Green	16	37	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
TLHG4900, TLHR4900, TLHY4900

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	6	V
DC forward current	$T_{amb} \leq 60$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	1	A
Power dissipation	$T_{amb} \leq 60$ °C	P_V	100	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +100	°C
Storage temperature range		T_{stg}	-55 to +100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T_{sd}	260	°C
Thermal resistance junction/ambient		R_{thJA}	400	K/W

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLHR4900, RED

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	I_F = 10 mA	I_V	6.3	25	-	mcd
Dominant wavelength	I_F = 10 mA	λ_d	612	-	625	nm
Peak wavelength	I_F = 10 mA	λ_p	-	635	-	nm
Angle of half intensity	I_F = 10 mA	φ	-	± 16	-	deg
Forward voltage	I_F = 20 mA	V_F	-	2	3	V
Reverse voltage	I_R = 10 µA	V_R	6	15	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLHY4900, YELLOW

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	I_F = 10 mA	I_V	10	26	-	mcd
Dominant wavelength	I_F = 10 mA	λ_d	581	-	594	nm
Peak wavelength	I_F = 10 mA	λ_p	-	585	-	nm
Angle of half intensity	I_F = 10 mA	φ	-	± 16	-	deg
Forward voltage	I_F = 20 mA	V_F	-	2.4	3	V
Reverse voltage	I_R = 10 µA	V_R	6	15	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLHG4900, GREEN

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	I_F = 10 mA	I_V	16	37	-	mcd
Dominant wavelength	I_F = 10 mA	λ_d	562	-	575	nm
Peak wavelength	I_F = 10 mA	λ_p	-	565	-	nm
Angle of half intensity	I_F = 10 mA	φ	-	± 16	-	deg
Forward voltage	I_F = 20 mA	V_F	-	2.4	3	V
Reverse voltage	I_R = 10 µA	V_R	6	15	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

LUMINOUS INTENSITY CLASSIFICATION

GROUP	LUMINOUS INTENSITY (mcd)	
	MIN.	MAX.
Q	6.3	12.5
R	10	20
S	16	32
T	25	50
U	40	80
V	63	125

Note

- The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel or bulk (there will be no mixing of two groups on one reel/bulk). 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 on any one reel/bulk. In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION

GROUP	DOM. WAVELENGTH (nm)			
	YELLOW		GREEN	
	MIN.	MAX.	MIN.	MAX.
0				
1	581	584		
2	583	586		
3	585	588	562	565
4	587	590	564	567
5	589	592	566	569
6	591	594	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 °C, unless otherwise specified)

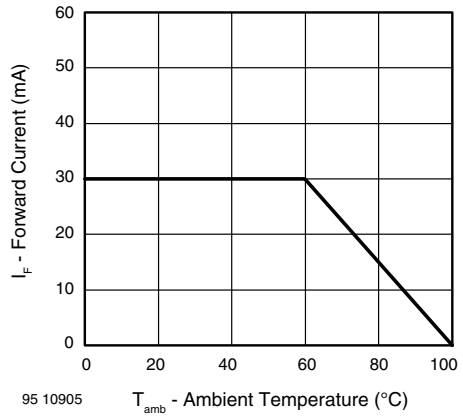


Fig. 1 - Forward Current vs. Ambient Temperature for InGaN

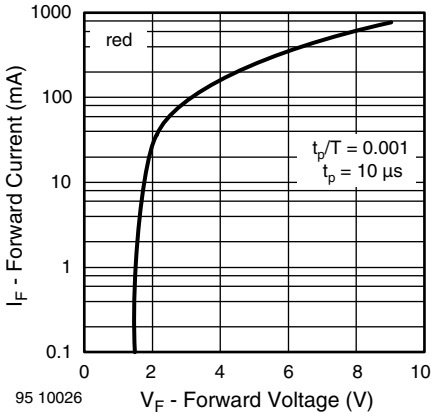


Fig. 4 - Forward Current vs. Forward Voltage

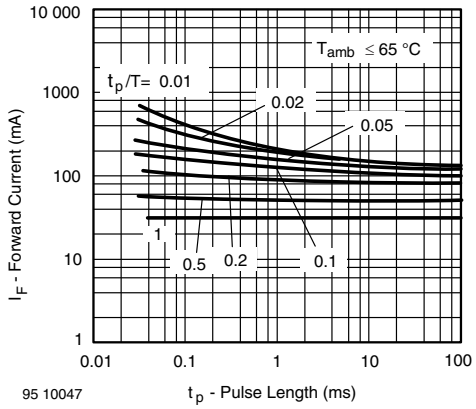


Fig. 2 - Forward Current vs. Pulse Length

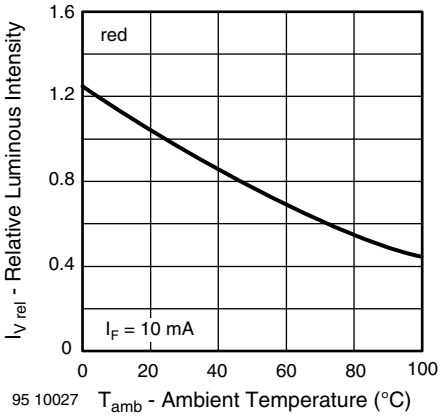


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

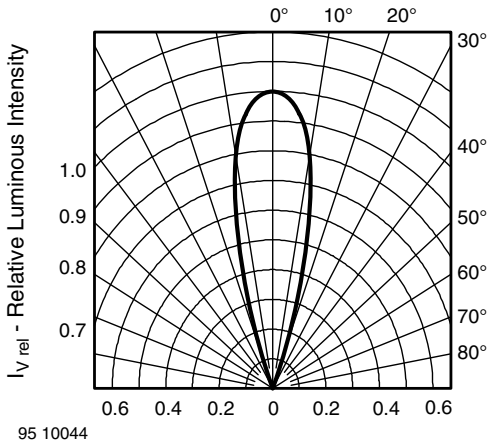


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

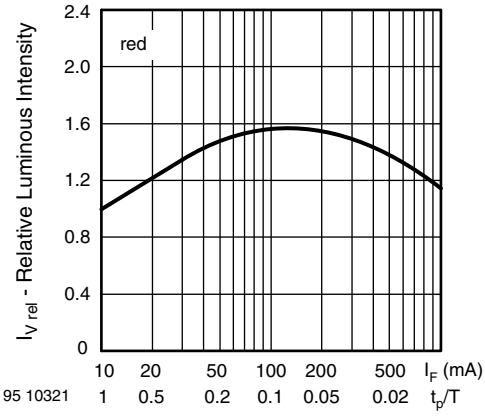


Fig. 6 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

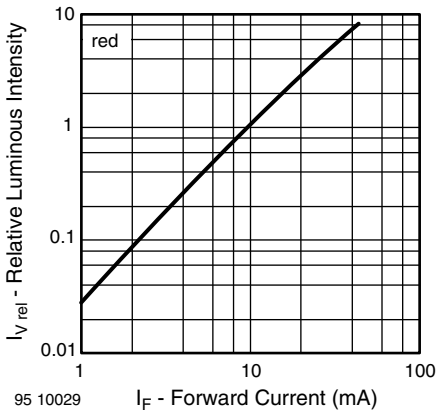


Fig. 7 - Relative Luminous Intensity vs. Forward Current

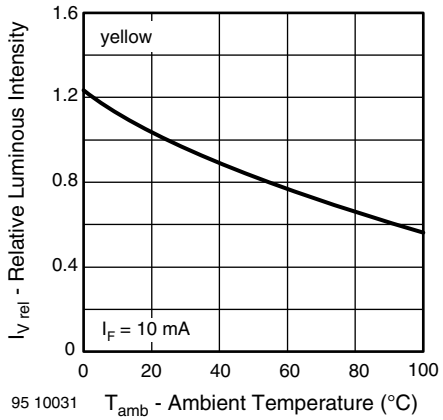


Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature

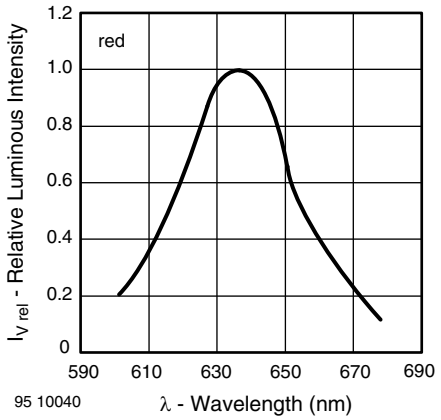


Fig. 8 - Relative Intensity vs. Wavelength

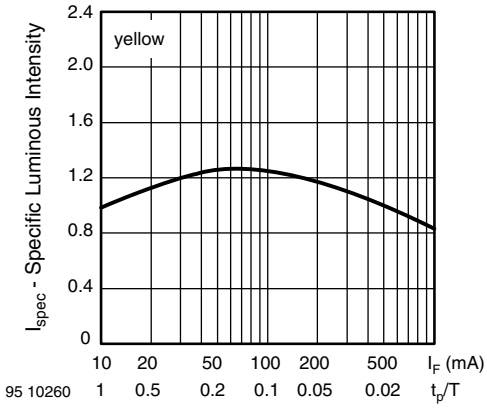


Fig. 11 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

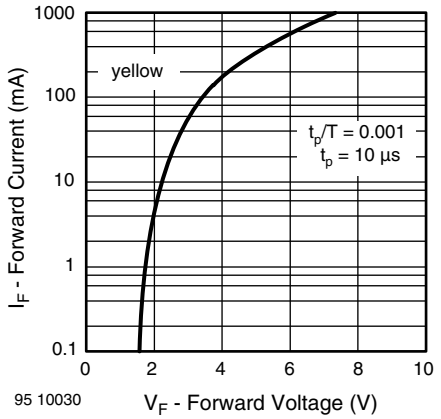


Fig. 9 - Forward Current vs. Forward Voltage

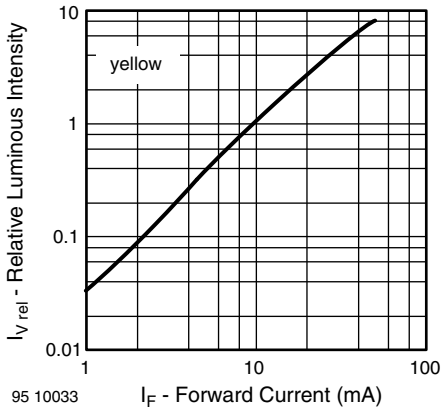


Fig. 12 - Relative Luminous Intensity vs. Forward Current

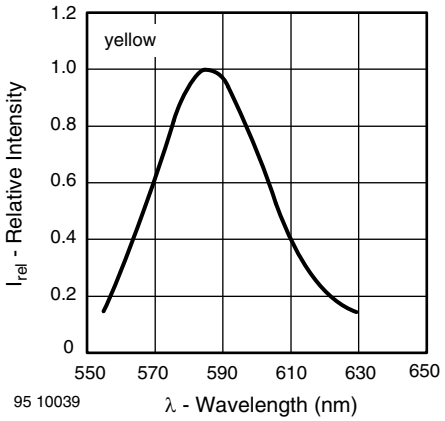


Fig. 13 - Relative Intensity vs. Wavelength

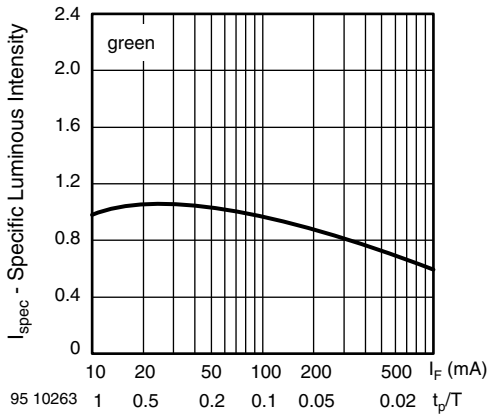


Fig. 16 - Specific Luminous Intensity vs. Forward Current

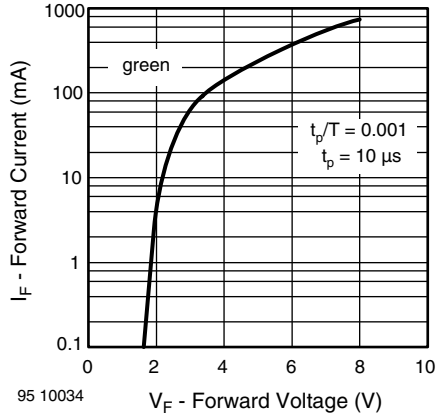


Fig. 14 - Forward Current vs. Forward Voltage

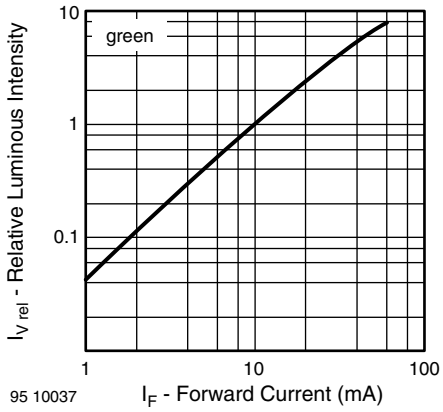


Fig. 17 - Relative Luminous Intensity vs. Forward Current

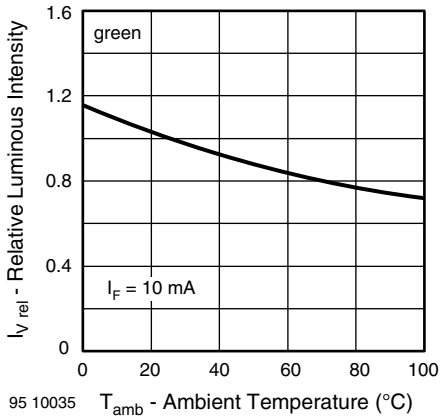


Fig. 15 - Rel. Luminous Intensity vs. Ambient Temperature

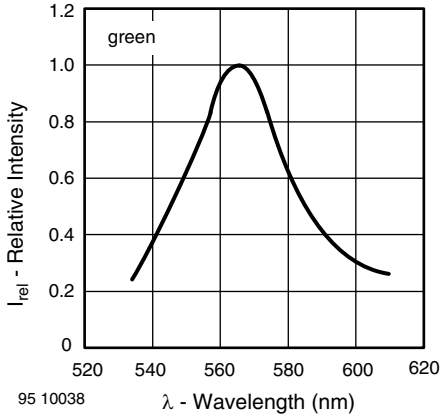
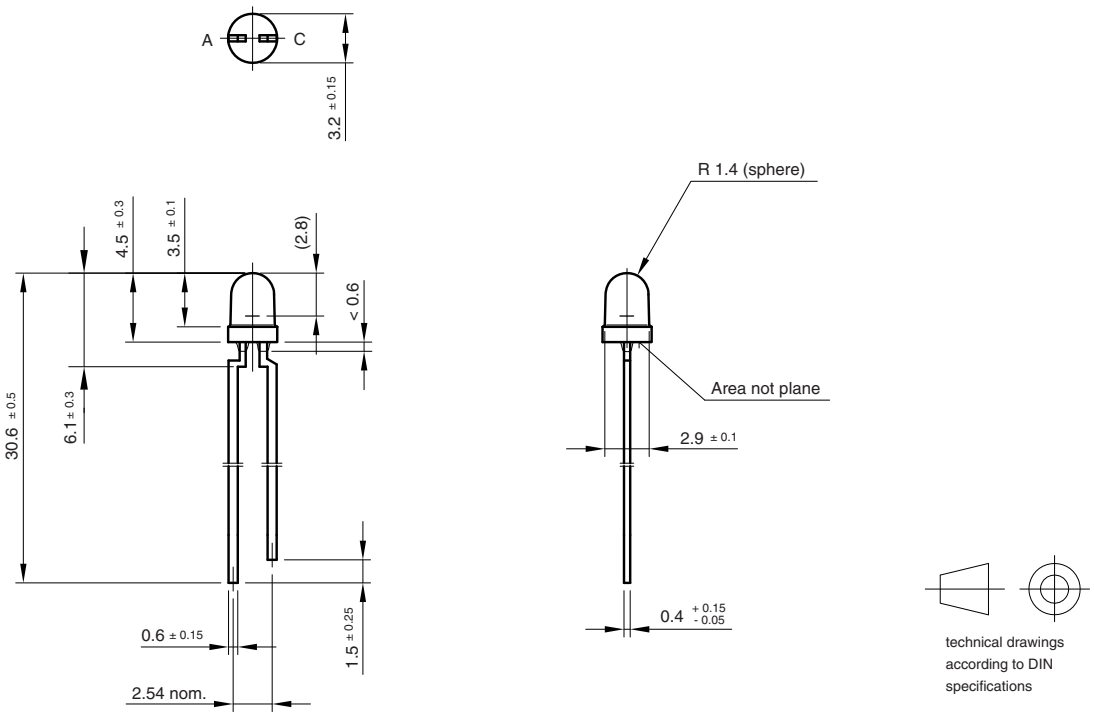


Fig. 18 - Relative Intensity vs. Wavelength

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5255.02-4
Issue: 3; 23.04.98
95 10914

TAPE

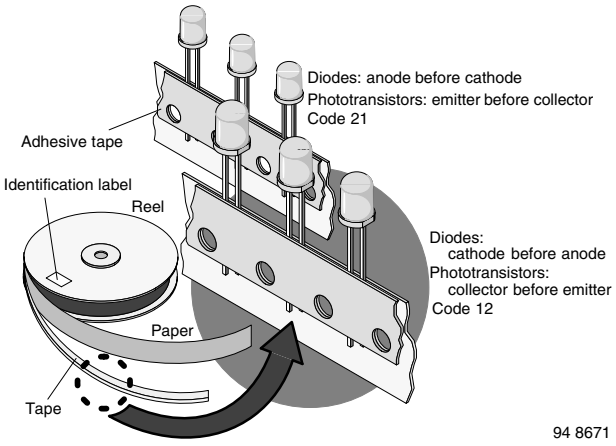


Fig. 19 - LED in Tape

AMMOPACK

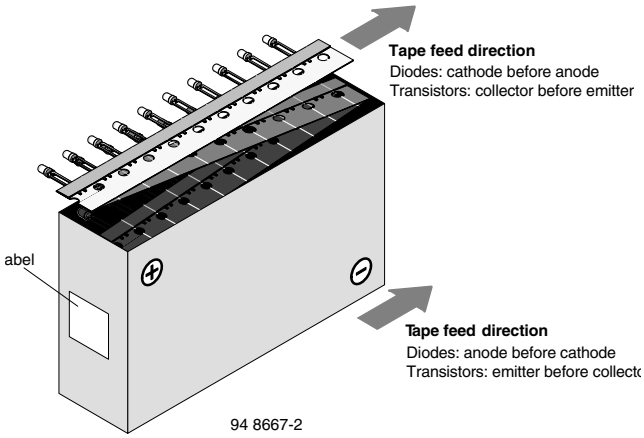
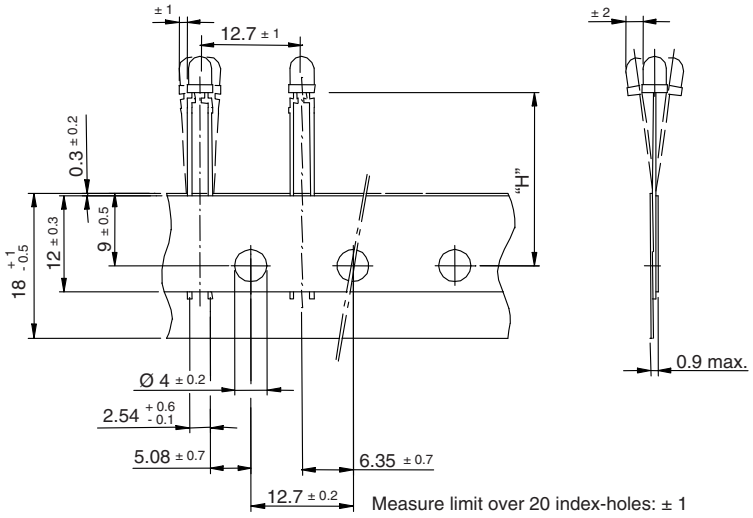


Fig. 20 - Tape Direction

Note

- The new nomenclature for ammopack 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 in millimeters



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

94 8171

Option	Dim. "H" ± 0.5 mm
AS	17.3

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