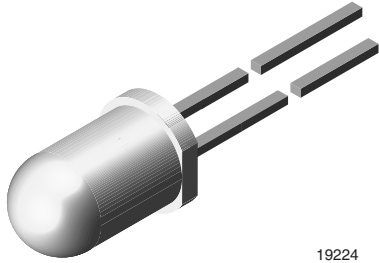




High Efficiency LED in Ø 5 mm Tinted Diffused Package



19224

DESCRIPTION

The TLH.640. series was developed for standard applications like general indicating and lighting purposes.

It is housed in a 5 mm tinted diffused plastic package. The wide viewing angle of these devices provides a high on-off contrast.

Several selection types with different luminous intensities are offered. 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.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 5 mm
- Product series: standard
- Angle of half intensity: $\pm 30^\circ$

FEATURES

- Choice of three bright colors
- Standard T-1 $\frac{3}{4}$ package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Wide viewing angle
- Luminous intensity categorized
- Yellow and green color categorized
- TLH.640. without stand-offs
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

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

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.		
TLHR6400	Red	1.6	10	-	10	612	-	625	10	-	2	3	20	GaAsP on GaP
TLHR6400-CS12Z	Red	1.6	10	-	10	612	-	625	10	-	2	3	20	GaAsP on GaP
TLHR6401	Red	4	12	-	10	612	-	625	10	-	2	3	20	GaAsP on GaP
TLHR6405	Red	6.3	14	-	10	612	-	625	10	-	2	3	20	GaAsP on GaP
TLHR6405-ASZ	Red	6.3	14	-	10	612	-	625	10	-	2	3	20	GaAsP on GaP
TLHY6400	Yellow	1.6	10	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY6400-CS12Z	Yellow	1.6	10	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY6400-MS12Z	Yellow	1.6	10	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY6401	Yellow	4	12	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY6405	Yellow	6.3	14	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHY6405-ASZ	Yellow	6.3	14	-	10	581	-	594	10	-	2.4	3	20	GaAsP on GaP
TLHG6400	Green	1.6	10	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP
TLHG6400-AS12Z	Green	1.6	10	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP
TLHG6400-CS12Z	Green	1.6	10	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP
TLHG6401	Green	4	12	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP
TLHG6401-AS12Z	Green	4	12	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP
TLHG6405	Green	6.3	15	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP
TLHG6405-ASZ	Green	6.3	15	-	10	562	-	575	10	-	2.4	3	20	GaP on GaP



ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) TLHR640., TLHY640., TLHG640.				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V _R	6	V
DC forward current	T _{amb} ≤ 65 °C	I _F	30	mA
Surge forward current	t _p ≤ 10 μs	I _{FSM}	1	A
Power dissipation	T _{amb} ≤ 65 °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-to-ambient		R _{thJA}	350	K/W

OPTICAL AND ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) TLHR640., RED							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	I _F = 10 mA	TLHR6400	I _V	1.6	10	-	mcd
		TLHR6401	I _V	4	12	-	mcd
		TLHR6405	I _V	6.3	14	-	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	-	± 30	-	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.} ≤ 0.5

OPTICAL AND ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) TLHY640., YELLOW							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	I _F = 10 mA	TLHY6400	I _V	1.6	10	-	mcd
		TLHY6401	I _V	4	12	-	mcd
		TLHY6405	I _V	6.3	14	-	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	-	± 30	-	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.} ≤ 0.5

OPTICAL AND ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) TLHG640., GREEN							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ⁽¹⁾	I _F = 10 mA	TLHG6400	I _V	1.6	10	-	mcd
		TLHG6401	I _V	4	12	-	mcd
		TLHG6405	I _V	6.3	15	-	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	-	± 30	-	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.} ≤ 0.5



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

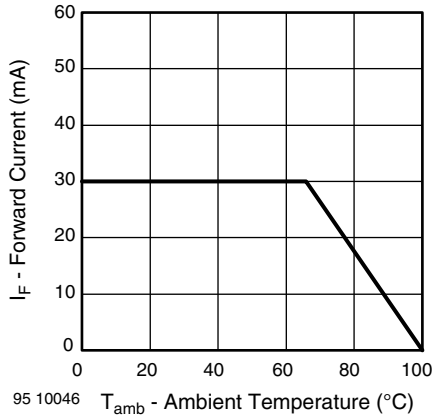


Fig. 1 - Forward Current vs. Ambient Temperature

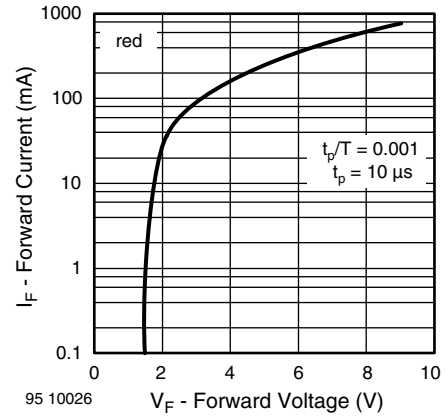


Fig. 4 - Forward Current vs. Forward Voltage

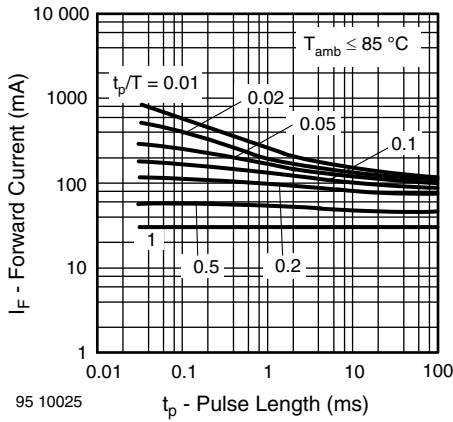


Fig. 2 - Forward Current vs. Pulse Length

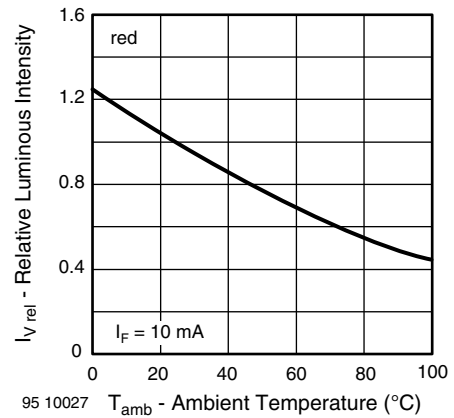


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

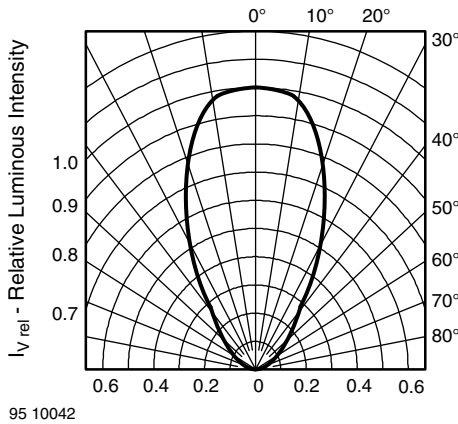


Fig. 3 - Relative Luminous Intensity vs. Angular Displacement

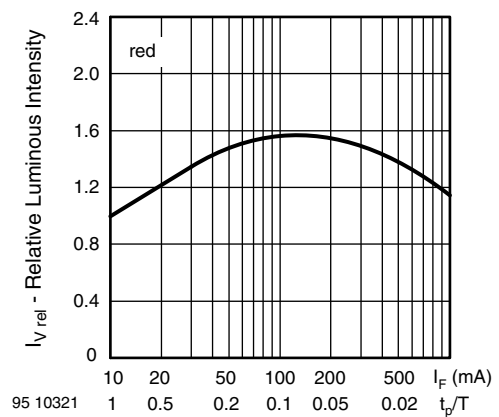


Fig. 6 - Relative Luminous Intensity vs. Forward Current/Duty Cycle



Fig. 7 - Relative Luminous Intensity vs. Forward Current



Fig. 10 - Relative Luminous Intensity vs. Ambient Temperature



Fig. 8 - Relative Intensity vs. Wavelength

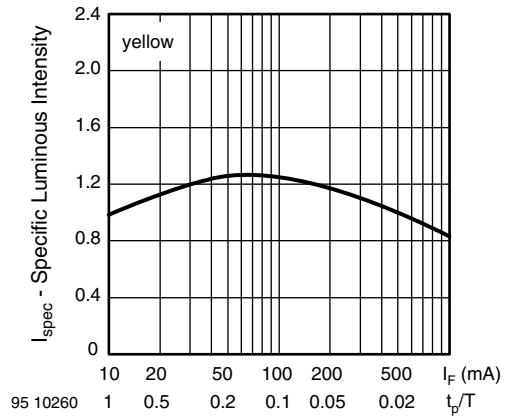


Fig. 11 - Relative Luminous Intensity vs. Forward Current/Duty Cycle



Fig. 9 - Forward Current vs. Forward Voltage

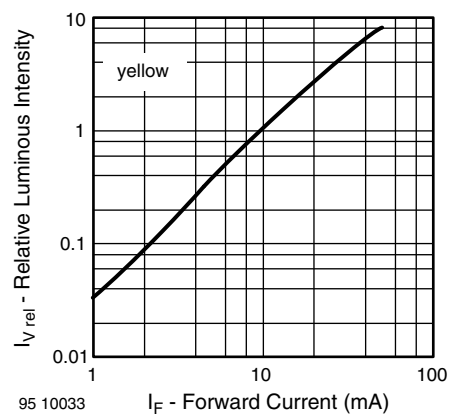


Fig. 12 - Relative Luminous Intensity vs. Forward Current

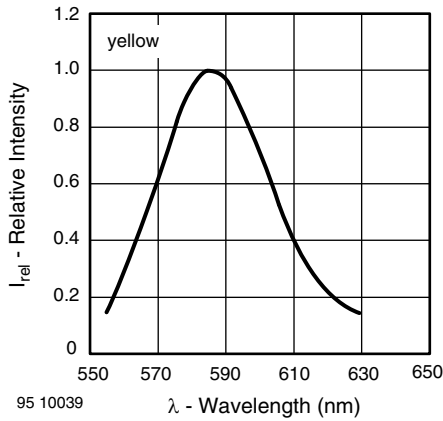


Fig. 13 - Relative Intensity vs. Wavelength

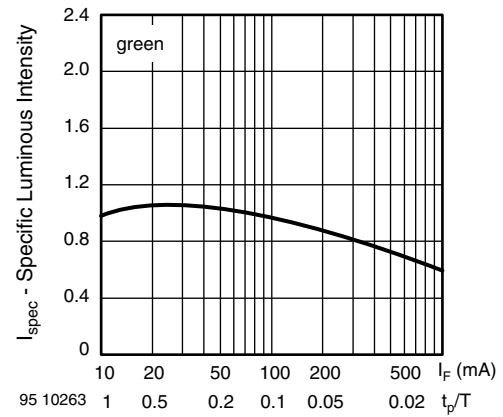


Fig. 16 - Specific Luminous Intensity vs. Forward Current

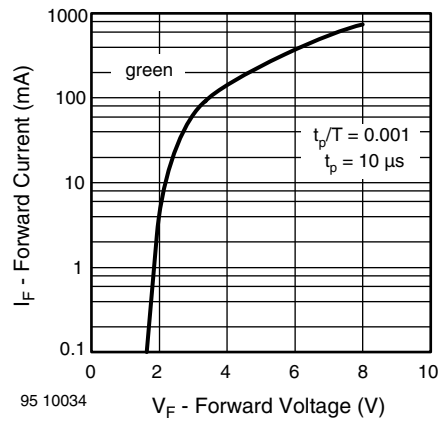


Fig. 14 - Forward Current vs. Forward Voltage

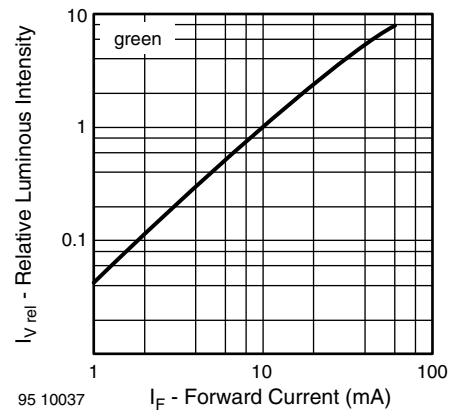


Fig. 17 - Relative Luminous Intensity vs. Forward Current

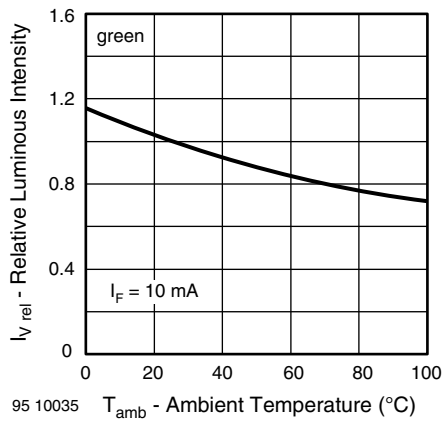


Fig. 15 - Relative Luminous Intensity vs. Ambient Temperature

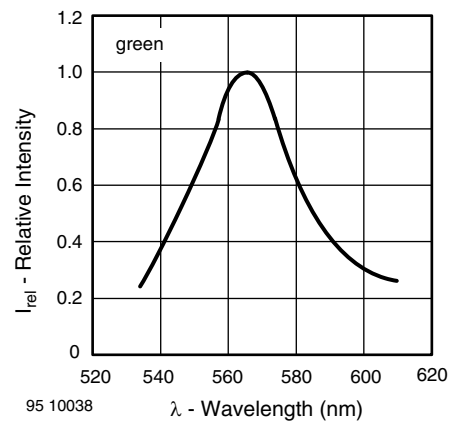
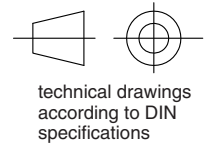
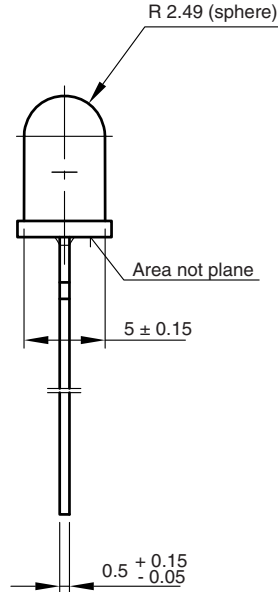
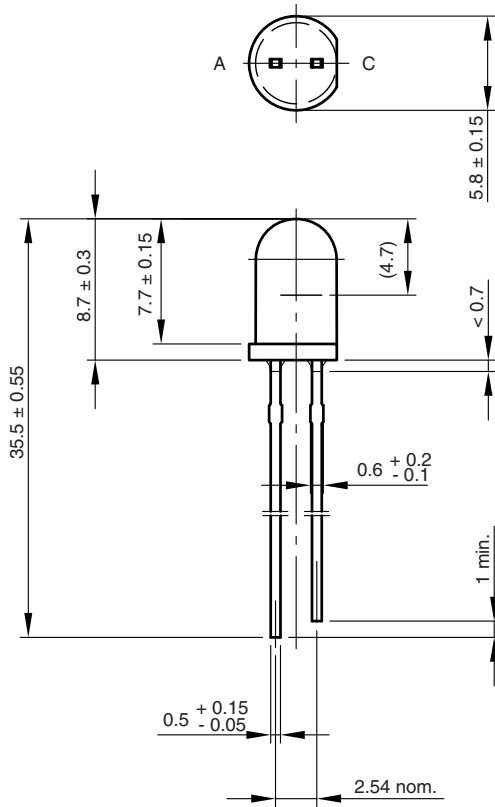


Fig. 18 - Relative Intensity vs. Wavelength



PACKAGE DIMENSIONS in millimeters



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REEL

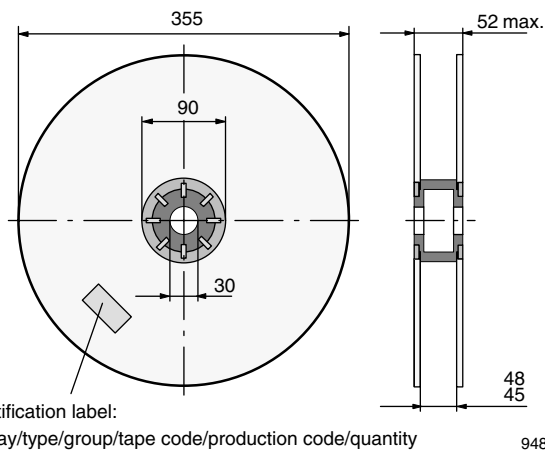


Fig. 19 - Reel Dimensions

TAPE

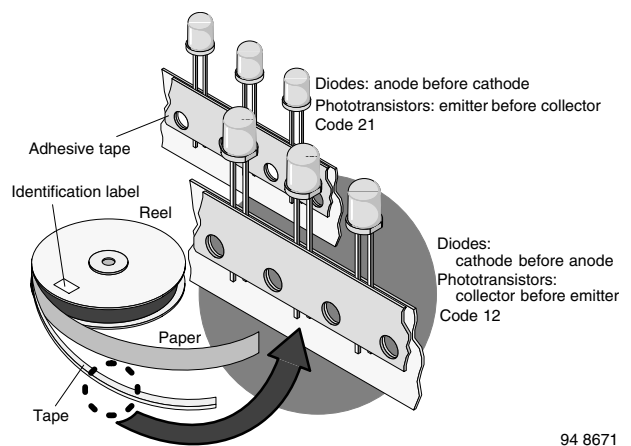
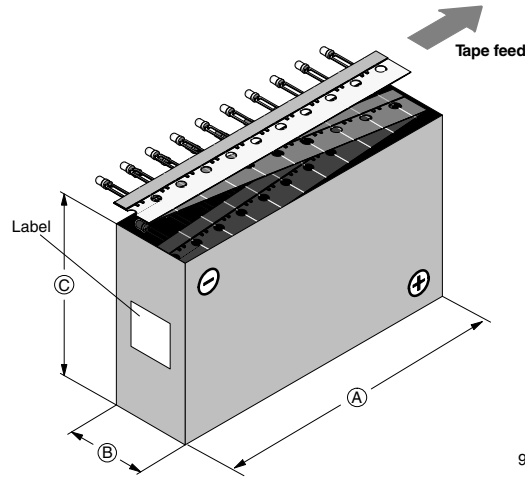


Fig. 20 - LED in Tape

AS12 = cathode leaves tape first

AS21 = anode leaves tape first

AMMOPACK

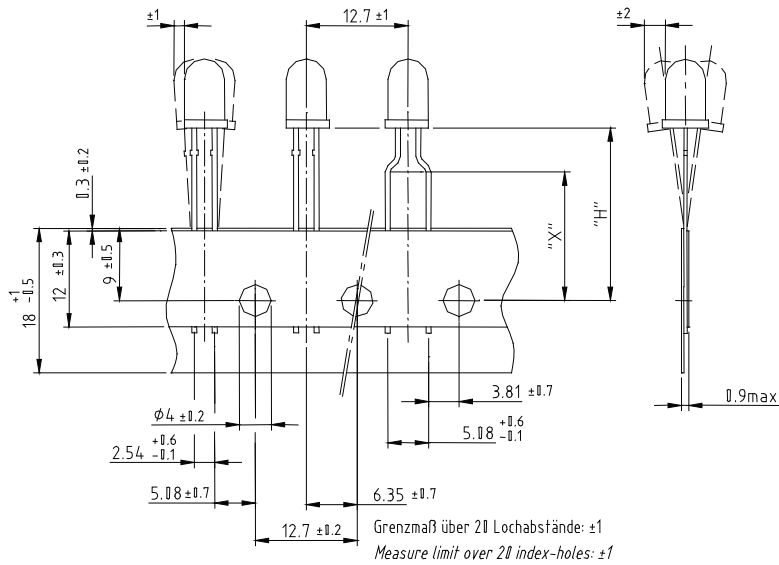


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Note

- The new nomenclature for ammpack is e.g. 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:	Ammopack/reel (Mat.-No. 1764)
	1000

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Option	Dim. "H" ± 0.5 mm	Dim. "X" ± 0.5 mm
AS	17.3	
BT	20.0	16.0
CS	22.0	
MS	25.5	



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