

LW TVSG.VN

TOPLED®

TOPLED, SMT LED with integrated reflector. With our great experience in SMT LED we are able to offer a high quality product for all kind of applications.



Applications

- Cluster, Button Backlighting
- Electronic Equipment
- Gaming, Amusement, Gambling
- Interior Illumination (e.g. Ambient Map)
- White Goods

Features:

- Package: white PLCC-2 package, colored diffused silicone resin
- Chip technology: UX:3
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.33, Cy = 0.3 acc. to CIE 1931 (● white)
- Corrosion Robustness Class: 3B
- ESD: 8 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)

Ordering Information

Type	Luminous Intensity ¹⁾ $I_F = 20 \text{ mA}$ I_v	Ordering Code
LW TVSG.VN-AZBZ-1I7J-1	1500 ... 2800 mcd	Q65111A6050

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min.	-40 °C
		max.	110 °C
Storage Temperature	T_{stg}	min.	-40 °C
		max.	110 °C
Junction Temperature	T_j	max.	125 °C
Forward Current $T_s = 25\text{ °C}$	I_F	min.	3 mA
		max.	50 mA
Surge Current $t \leq 10\text{ }\mu\text{s}$; $D = 0.005$; $T_s = 25\text{ °C}$	I_{FS}	max.	300 mA
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)	V_{ESD}		8kV
Reverse current ²⁾	I_R	max.	200 mA

Characteristics

$I_F = 20 \text{ mA}$; $T_s = 25 \text{ °C}$

Parameter	Symbol		Values
Chromaticity Coordinate	Cx	typ.	0.33
	Cy	typ.	0.3
Viewing angle at 50 % I_v	2ϕ	typ.	120 °
Forward Voltage ³⁾ $I_F = 20 \text{ mA}$	V_F	min.	2.70 V
		typ.	3.05 V
		max.	3.40 V
Reverse voltage (ESD device)	$V_{R \text{ ESD}}$	min.	5 V
Reverse voltage ²⁾ $I_R = 20 \text{ mA}$	V_R	max.	1.2 V
Real thermal resistance junction/ambient ^{4), 5)}	$R_{thJA \text{ real}}$	max.	300 K / W
Real thermal resistance junction/solderpoint ⁴⁾	$R_{thJS \text{ real}}$	max.	140 K / W

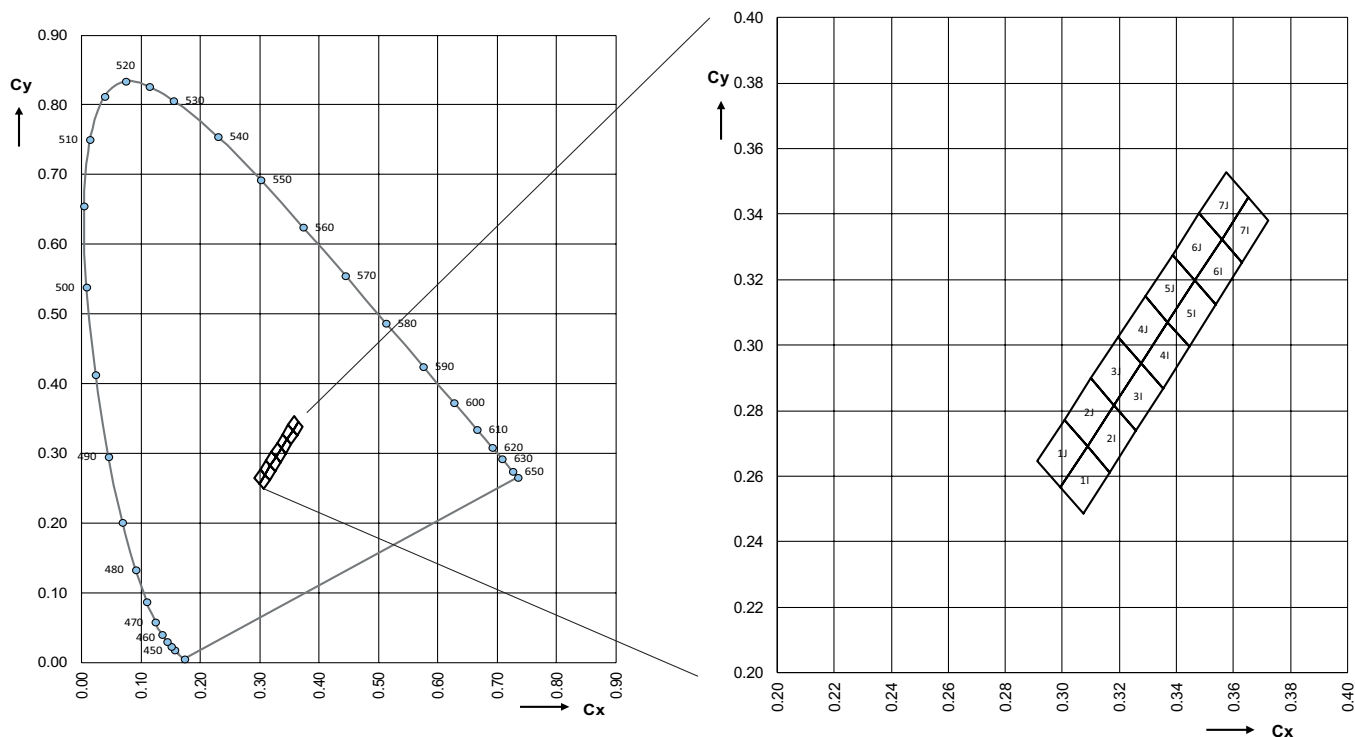
Brightness Groups

Group	Luminous Intensity ¹⁾ $I_F = 20 \text{ mA}$ min. I_v	Luminous Intensity ¹⁾ $I_F = 20 \text{ mA}$ max. I_v	Luminous Flux ⁶⁾ $I_F = 20 \text{ mA}$ typ. Φ_v
AZ	1500 mcd	1800 mcd	4950 mlm
BX	1800 mcd	2100 mcd	5850 mlm
BY	2100 mcd	2400 mcd	6750 mlm
BZ	2400 mcd	2800 mcd	7800 mlm

Forward Voltage Groups

Group	Forward Voltage ³⁾ $I_F = 20 \text{ mA}$ min. V_F	Forward Voltage ³⁾ $I_F = 20 \text{ mA}$ max. V_F
Z4	2.70 V	2.90 V
44	2.90 V	3.10 V
86	3.10 V	3.40 V

Chromaticity Coordinate Groups ⁷⁾



Color Chromaticity Groups

Group	Cx	Cy	Group	Cx	Cy	Group	Cx	Cy
1I	0.2994	0.2565	2J	0.3007	0.2773	4I	0.3276	0.2944
	0.3088	0.2691		0.3101	0.2899		0.3370	0.3071
	0.3166	0.2613		0.3182	0.2818		0.3444	0.2997
	0.3073	0.2486		0.3088	0.2691		0.3352	0.2869
1J	0.2912	0.2647	3I	0.3182	0.2818	4J	0.3196	0.3025
	0.3007	0.2773		0.3276	0.2944		0.3291	0.3150
	0.3088	0.2691		0.3352	0.2869		0.3370	0.3071
	0.2994	0.2565		0.3259	0.2741		0.3276	0.2944
2I	0.3088	0.2691	3J	0.3101	0.2899	5I	0.3370	0.3071
	0.3182	0.2818		0.3196	0.3025		0.3464	0.3197
	0.3259	0.2741		0.3276	0.2944		0.3537	0.3124
	0.3166	0.2613		0.3182	0.2818		0.3444	0.2997

Group	Cx	Cy	Group	Cx	Cy	Group	Cx	Cy
5J	0.3291	0.3150	6J	0.3385	0.3276	7J	0.3480	0.3402
	0.3385	0.3276		0.3480	0.3402		0.3575	0.3528
	0.3464	0.3197		0.3558	0.3324		0.3652	0.3450
	0.3370	0.3071		0.3464	0.3197		0.3558	0.3324
6I	0.3464	0.3197	7I	0.3558	0.3324			
	0.3558	0.3324		0.3652	0.3450			
	0.3630	0.3252		0.3723	0.3380			
	0.3537	0.3124		0.3630	0.3252			

Group Name on Label

Example: AZ-1I-44

Brightness

Color chromaticity

Forward Voltage

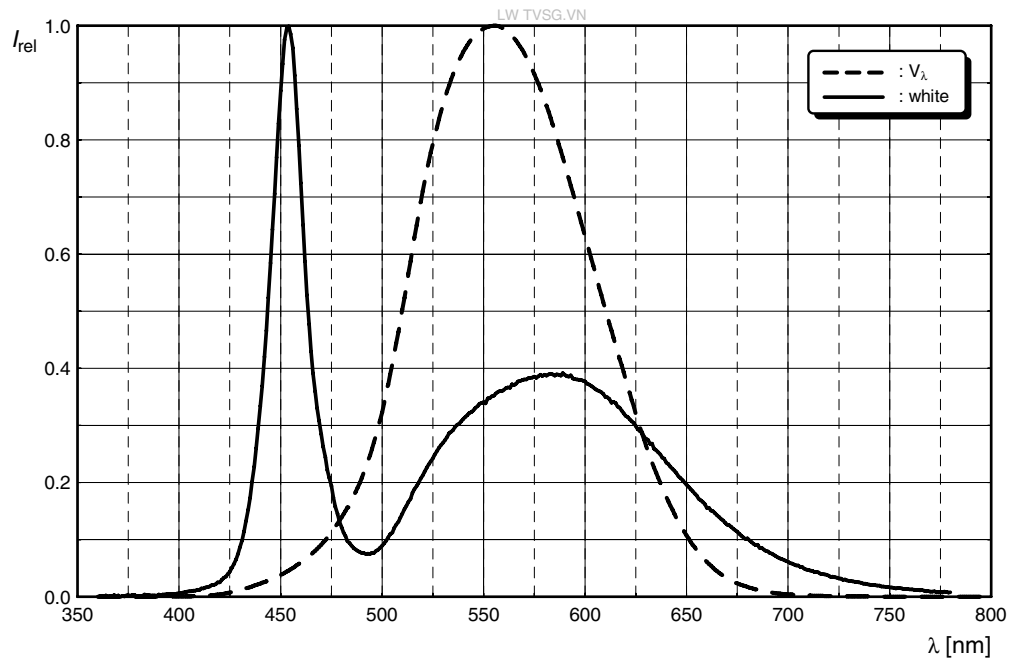
AZ

1I

44

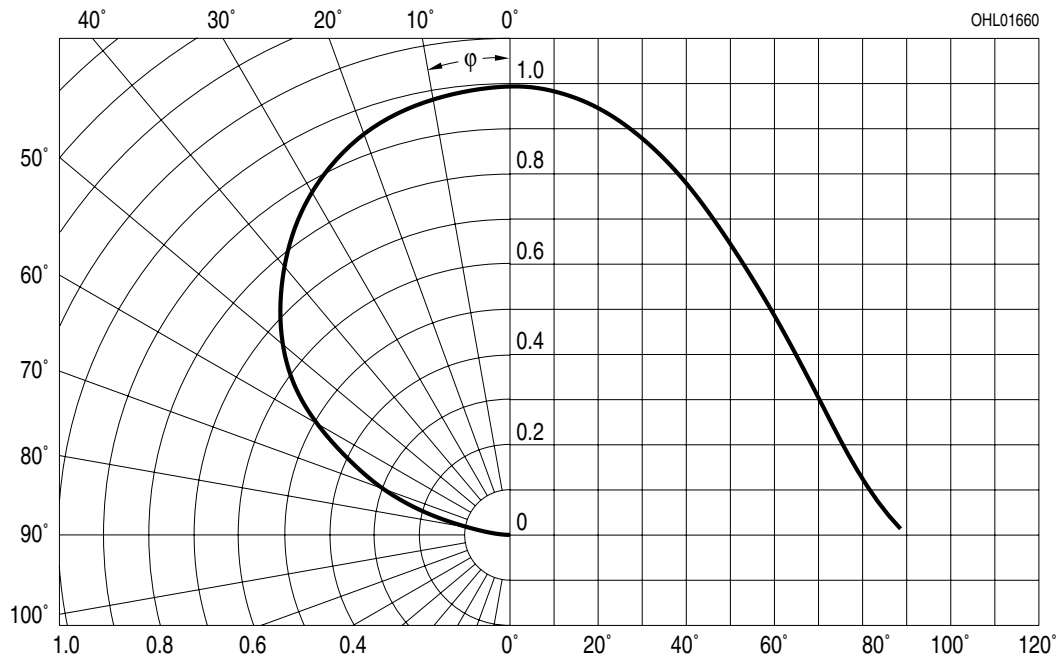
Relative Spectral Emission ⁶⁾

$I_{\text{rel}} = f(\lambda)$; $I_F = 20 \text{ mA}$; $T_S = 25 \text{ °C}$



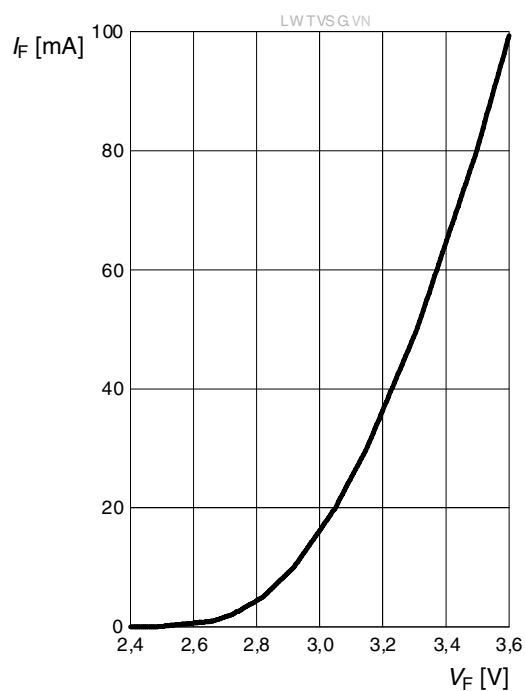
Radiation Characteristics ⁶⁾

$I_{\text{rel}} = f(\phi)$; $T_S = 25 \text{ °C}$

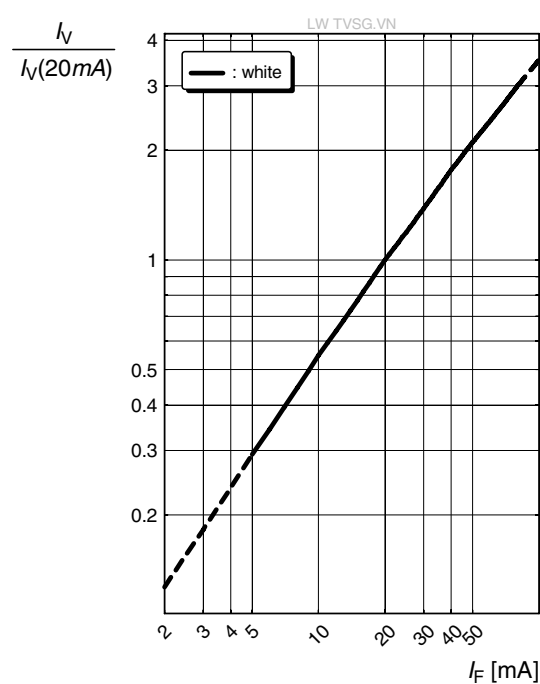


Forward current ^{6), 8)}

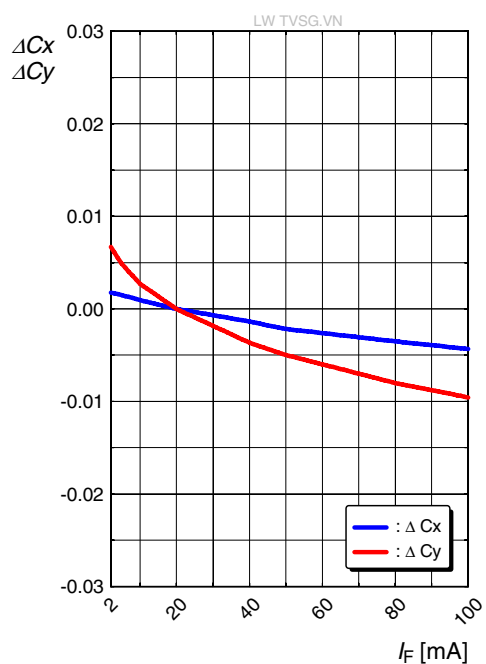
$$I_F = f(V_F); T_S = 25^\circ\text{C}$$

**Relative Luminous Intensity** ^{6), 8)}

$$I_V/I_V(20\text{ mA}) = f(I_F); T_S = 25^\circ\text{C}$$

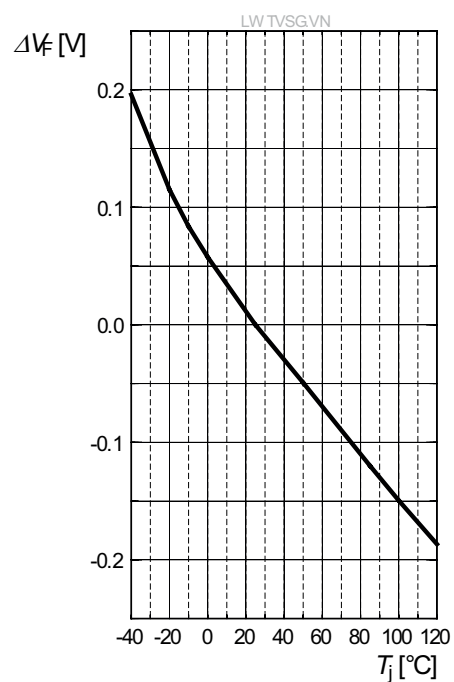
**Chromaticity Coordinate Shift** ⁶⁾

$$\Delta C_x, \Delta C_y = f(I_F); T_S = 25^\circ\text{C}$$



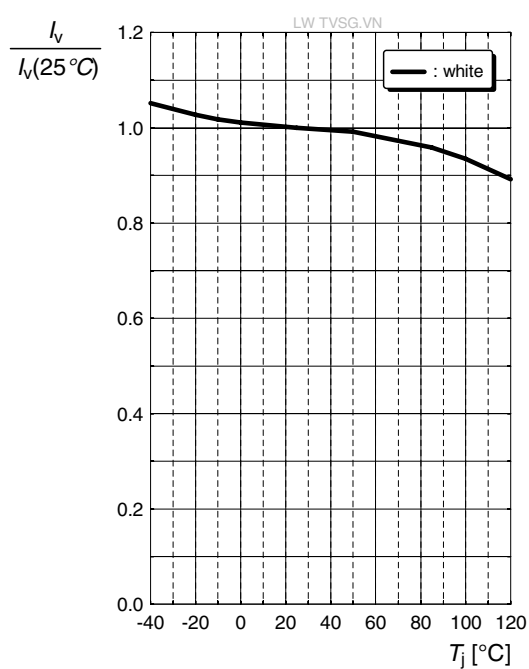
Forward Voltage ⁶⁾

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 20\text{ mA}$$



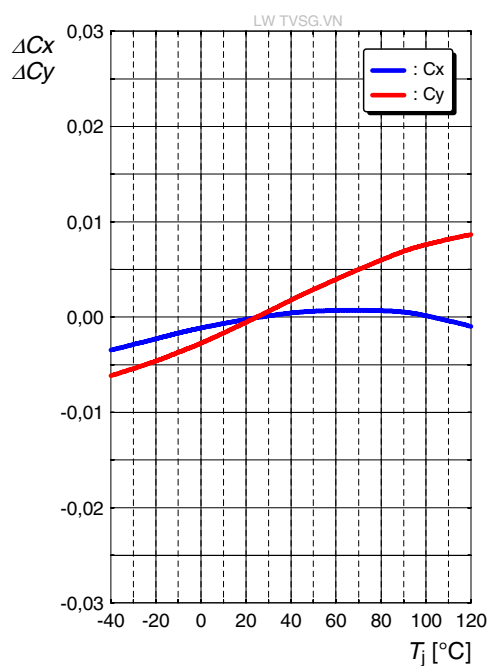
Relative Luminous Intensity ⁶⁾

$$I_V/I_V(25^\circ\text{C}) = f(T_j); I_F = 20\text{ mA}$$



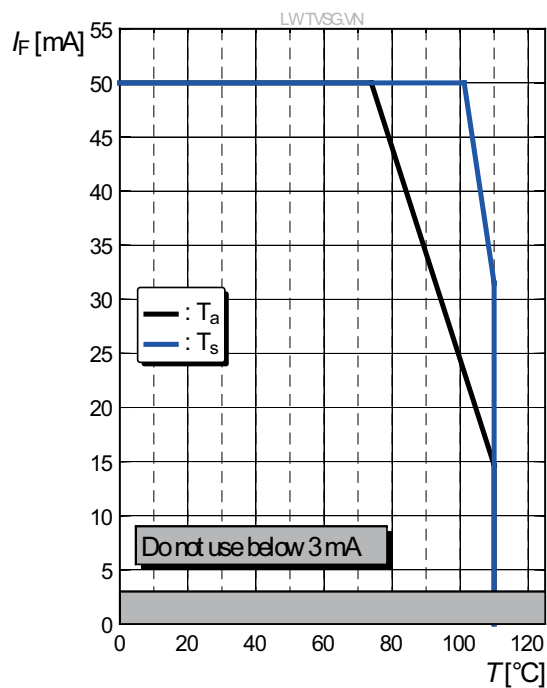
Chromaticity Coordinate Shift ⁶⁾

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 20\text{ mA}$$



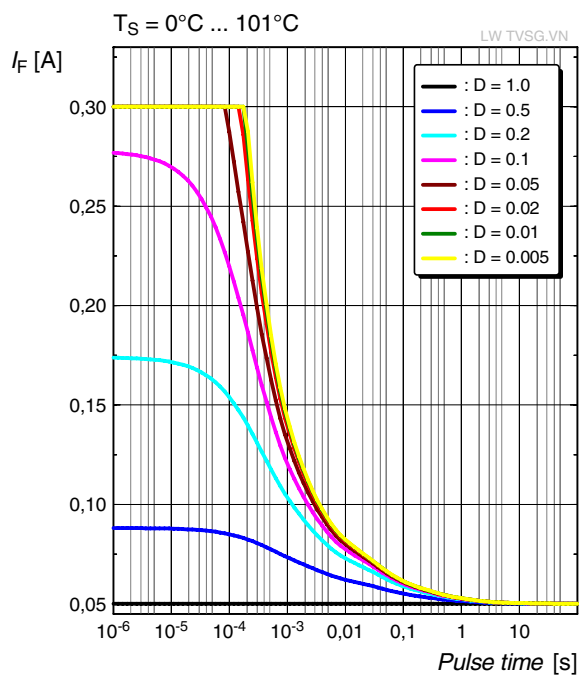
Max. Permissible Forward Current

$$I_F = f(T)$$



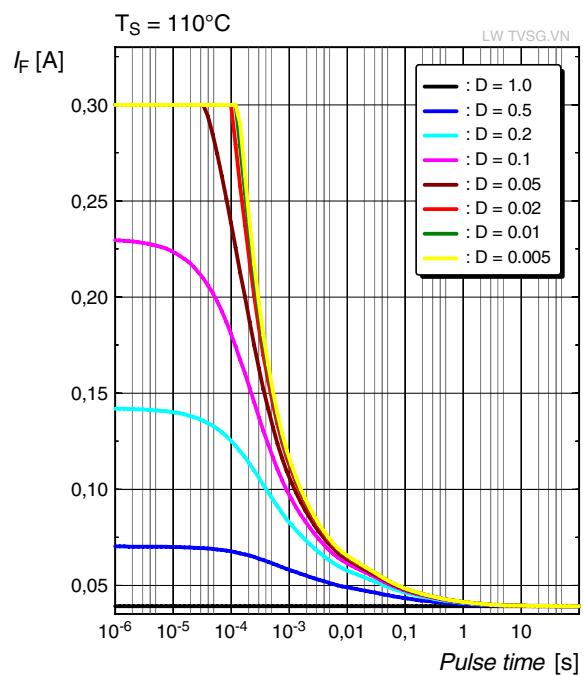
Permissible Pulse Handling Capability

$$I_F = f(t_p); D: \text{Duty cycle}$$

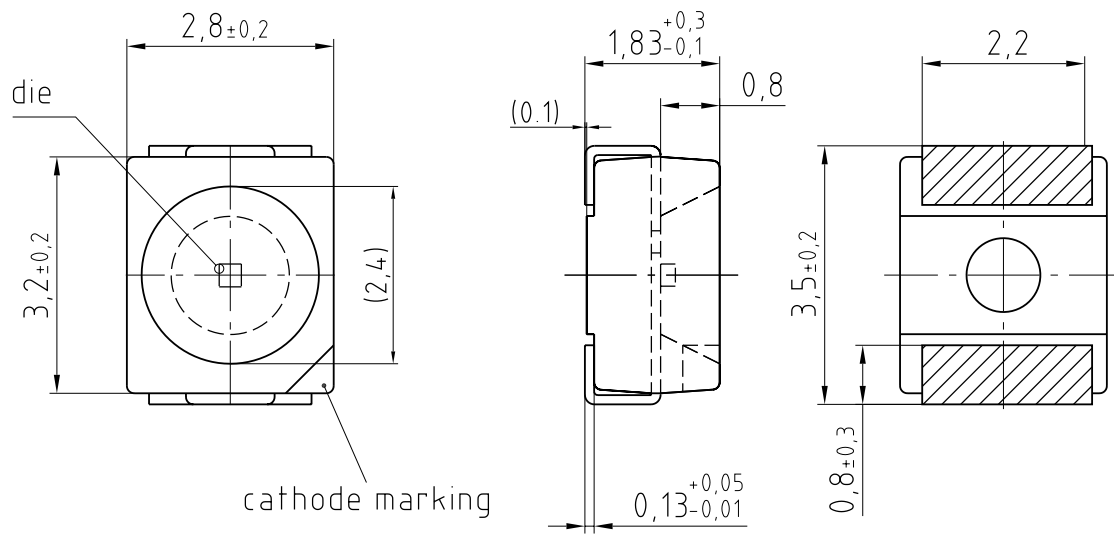


Permissible Pulse Handling Capability

$$I_F = f(t_p); D: \text{Duty cycle}$$



Dimensional Drawing ⁹⁾



general tolerance $\pm 0,1$

lead finish Au



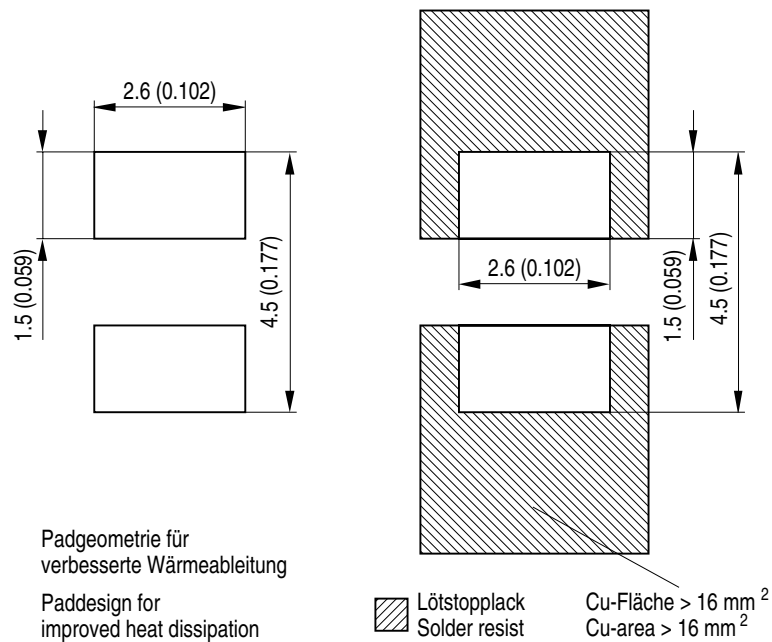
C63062-A4140-A1..-06

Approximate Weight: 33.0 mg

Corrosion test: Class: 3B
Test condition: 40°C / 90 % RH / 15 ppm H₂S / 14 days (stricter then IEC 60068-2-43)

ESD advice: LED is protected by ESD device which is connected in parallel to LED-Chip.

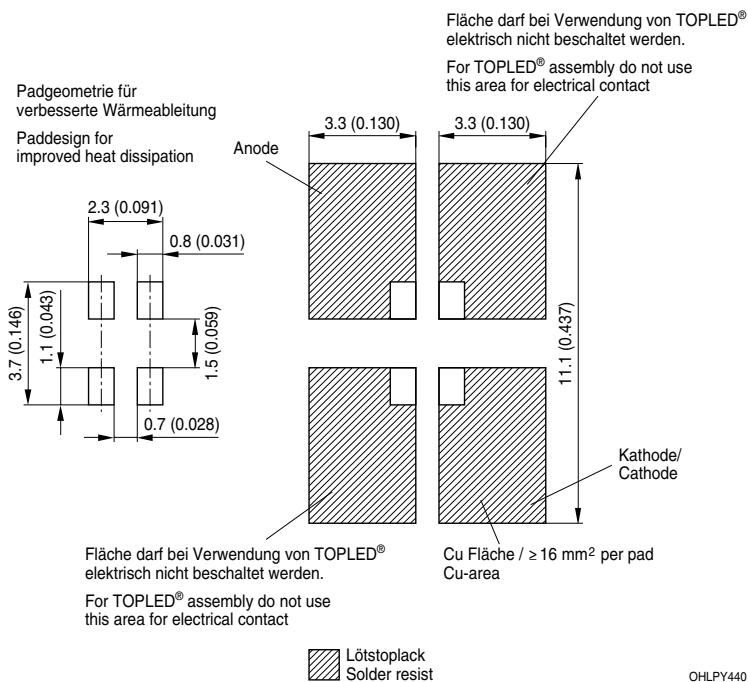
Recommended Solder Pad ⁹⁾



OHLPY970

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning.

Recommended Solder Pad ⁹⁾

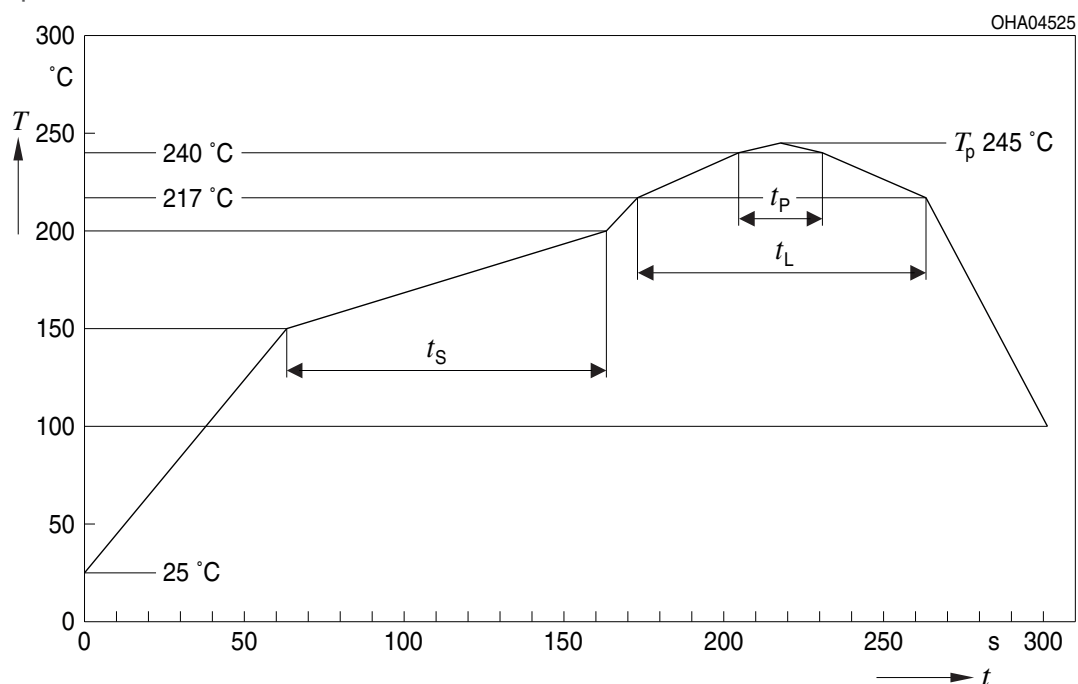


OHLPY440

For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere. Package not suitable for ultra sonic cleaning.

Reflow Soldering Profile

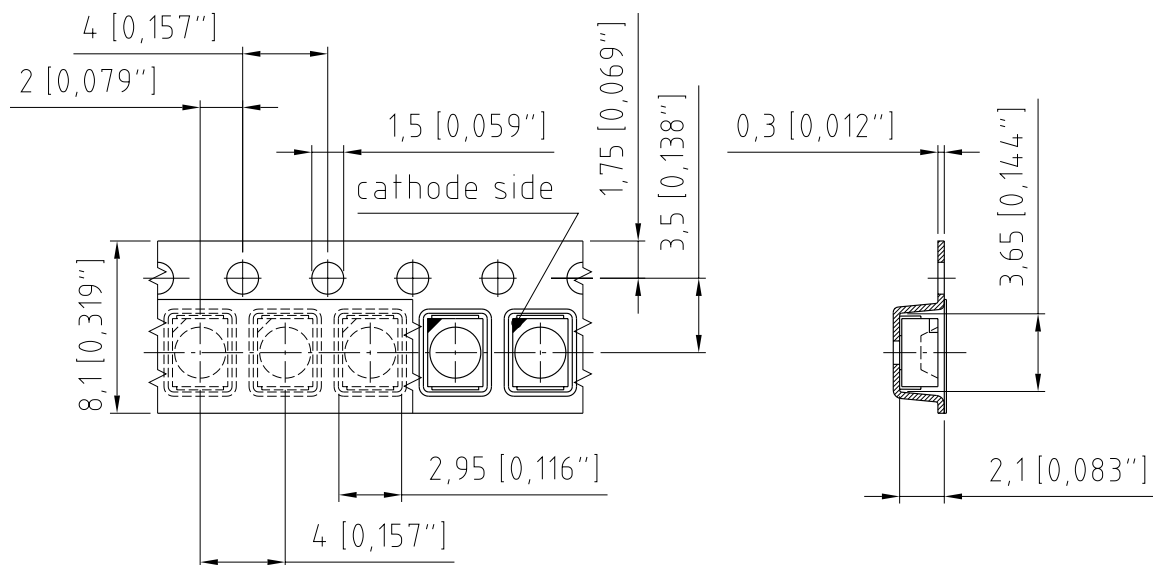
Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat*) 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak*) T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	t_L		80	100	s
Peak temperature	T_p		245	260	°C
Time within 5 °C of the specified peak temperature $T_p - 5$ K	t_p	10	20	30	s
Ramp-down rate* T_p to 100 °C			3	6	K/s
Time 25 °C to T_p				480	s

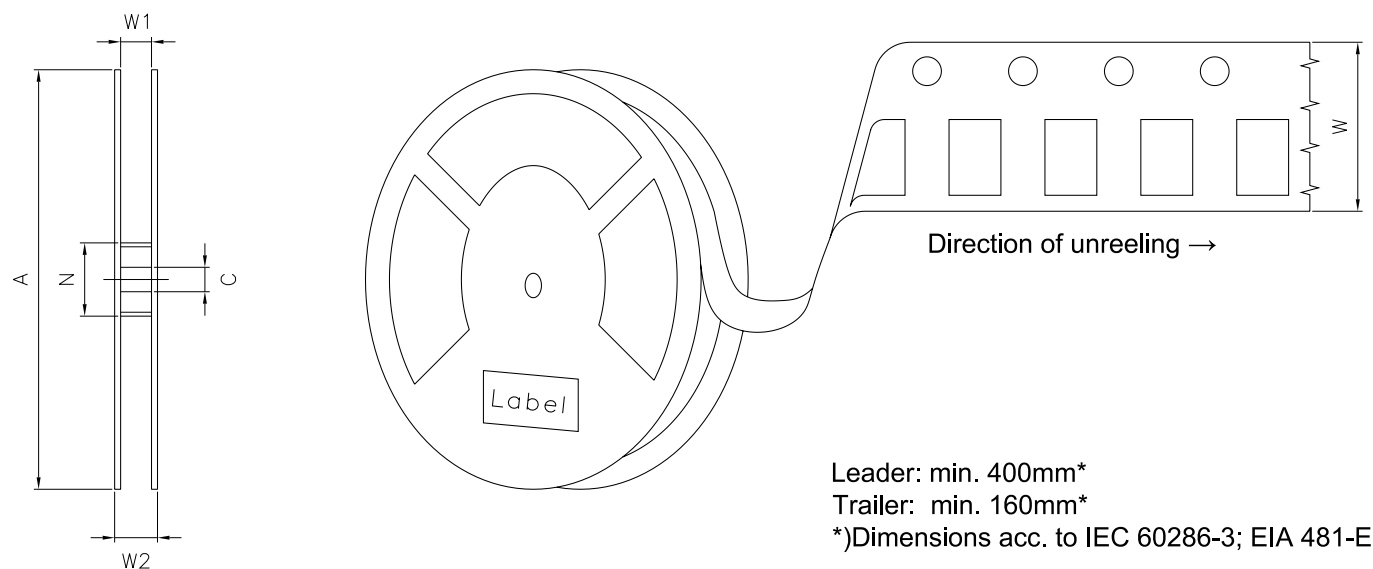
All temperatures refer to the center of the package, measured on the top of the component

* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ¹⁰⁾

C63062-A3863-B3 -02

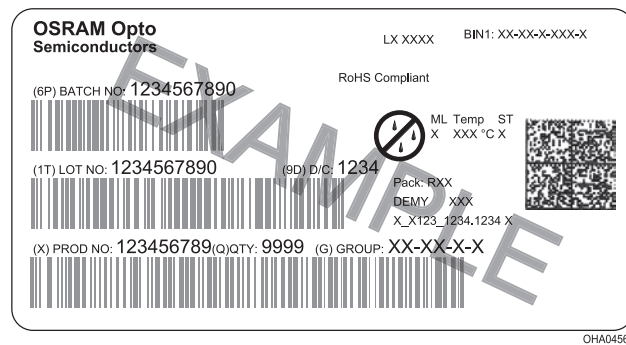
Tape and Reel ¹⁰⁾



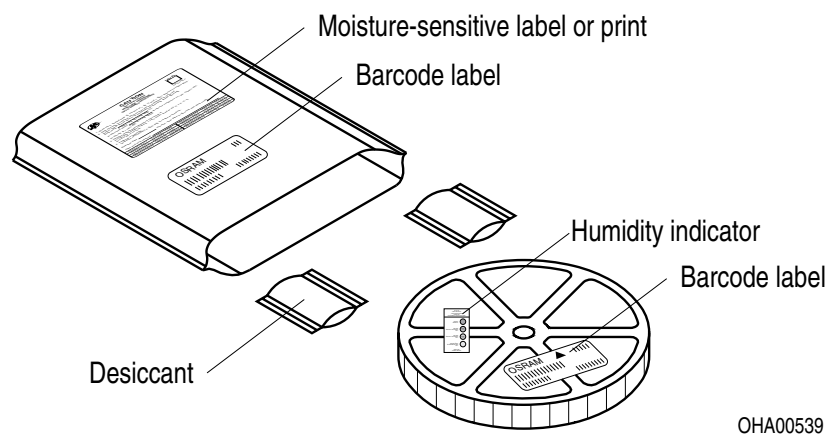
Reel dimensions [mm]

A	W	N _{min}	W ₁	W _{2 max}	Pieces per PU
180 mm	8 + 0.3 / - 0.1	60	8.4 + 2	14.4	2000

Barcode-Product-Label (BPL)

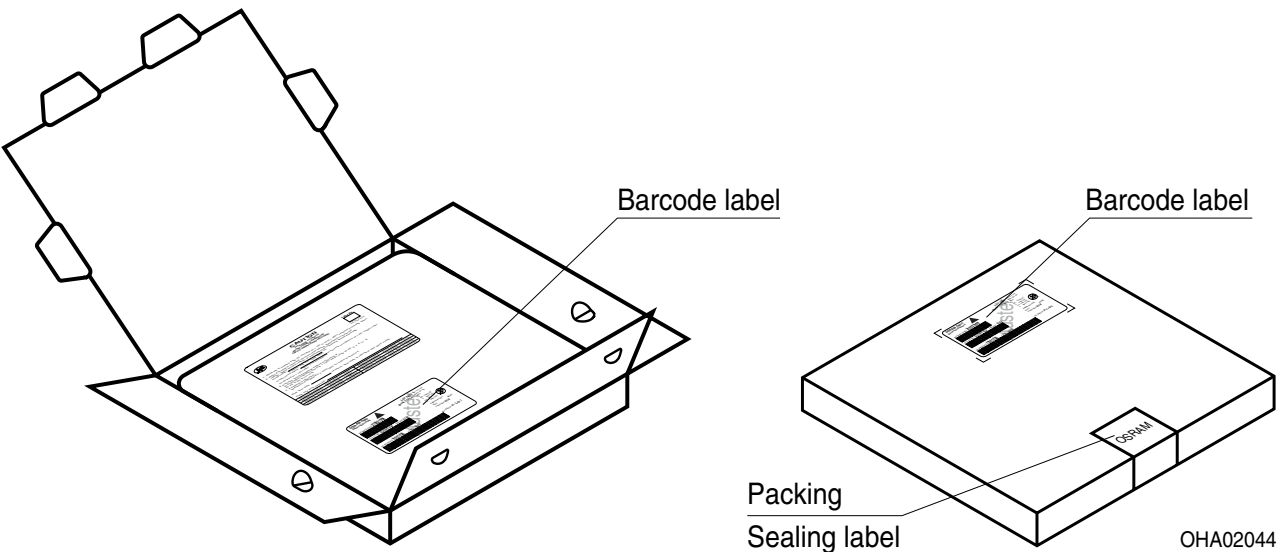


Dry Packing Process and Materials ⁹⁾



Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Transportation Packing and Materials ⁹⁾



Dimensions of transportation box in mm

Width	Length	Height
200 ± 5 mm	195 ± 5 mm	30 ± 5 mm

Type Designation System

Wavelength ($\lambda_{\text{dom typ.}}$)		Emission Color	Color coordinates according CIE 1931/Emission color:			
A:	617 nm	amber	W:	white		
S:	633 nm	super red	UW:	ultra white		
T:	528 nm	true green	CB:	color on demand blue		
Y:	587 nm	yellow	CG:	color on demand green		
O:	606 nm	orange	CL:	color on demand lagune		
G:	570 nm	green	Package Type T: TOPLED			
P:	560 nm	pure green				
R:	625 nm	red				
B:	470 nm	blue				
H:	645 nm	hyper-red				
V:	505 nm	verde green				
L: Light emitting diode						
L	A		T	6	7	6
Lead / Package Properties 6: folded leads 7: reverse gullwing leads T: folded leads, improved corrosion stability (Au-LF), w/o TiO2 jetting V: folded leads and UX:3 w/ improved corrosion stability (Au-LF), TiO2 jetting						
Encapsulant Type / Lens Properties 7: Colorless clear or white volume conversion (resin encapsulation) S: Silicone (with or without diffuser)						
Chip Technology: 1: TSN 3: standard InGaN 4: AlGaAs (RECLD) 5: HOP 2000 6: Standard InGaIP 9: TSN low current B: HOP 2000 C: ATON D: Low cost ThinGaN/ Thinfilm (e.g. 6mil) F: Thinfilm InGaAIP G: ThinGaN(Thinfilm InGaN) (Subcon:Sapphire) K: InGaAIP low current S: standard InGaN low current 0: TSN						

Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the LED specified in this data sheet falls into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Subcomponents of this LED contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize LED exposure to aggressive substances during storage, production, and use. LEDs that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

For further application related informations please visit www.osram-os.com/appnotes

Disclaimer

Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version on the OSRAM OS website.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.

By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Product safety devices/applications or medical devices/applications

OSRAM OS components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.

In case Buyer – or Customer supplied by Buyer– considers using OSRAM OS components in product safety devices/applications or medical devices/applications, Buyer and/or Customer has to inform the local sales partner of OSRAM OS immediately and OSRAM OS and Buyer and /or Customer will analyze and coordinate the customer-specific request between OSRAM OS and Buyer and/or Customer.

Glossary

- 1) **Brightness:** Brightness values are measured during a current pulse of typically 25 ms, with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (acc. to GUM with a coverage factor of $k = 3$).
- 2) **Reverse Operation:** Reverse Operation of 10 hours is permissible in total. Continuous reverse operation is not allowed.
- 3) **Forward Voltage:** The forward voltage is measured during a current pulse of typically 8 ms, with an internal reproducibility of $\pm 0.05\text{ V}$ and an expanded uncertainty of $\pm 0.1\text{ V}$ (acc. to GUM with a coverage factor of $k = 3$).
- 4) **Thermal Resistance:** $R_{th\text{ max}}$ is based on statistic values (6σ).
- 5) **Thermal Resistance:** R_{thJA} results from mounting on PC board FR 4 (pad size 16 mm^2 per pad)
- 6) **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
- 7) **Chromaticity coordinate groups:** Chromaticity coordinates are measured during a current pulse of typically 25 ms, with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (acc. to GUM with a coverage factor of $k = 3$).
- 8) **Characteristic curve:** In the range where the line of the graph is broken, you must expect higher differences between single LEDs within one packing unit.
- 9) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 10) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

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EU RoHS and China RoHS compliant product



此产品符合欧盟 RoHS 指令的要求；
按照中国的相关法规和标准，不含有毒有害物质或元素。



**Стандарт
Электрон
Связь**

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Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

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Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

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