



Green lighting technologies



Tesla **TS13C07-12**

AC LED Package

SPECIFICATION

CHIP-ARRAY-ON-MCPCB TYPE

12V AC LED PACKAGE



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1. Features

Specially designed for direct 12V Alternating Current (AC) applications.

Square board 13.5 mm x 13.5 mm x 1.4mm H

Designed as a driverless dimming MR16 light source

40 Nichia 120lm/w LED chip array on MCPCB provides compact light engine with uniform light output and good thermal properties.

High power: 7.0 W ANSI 3000K, 4000K, 5000K

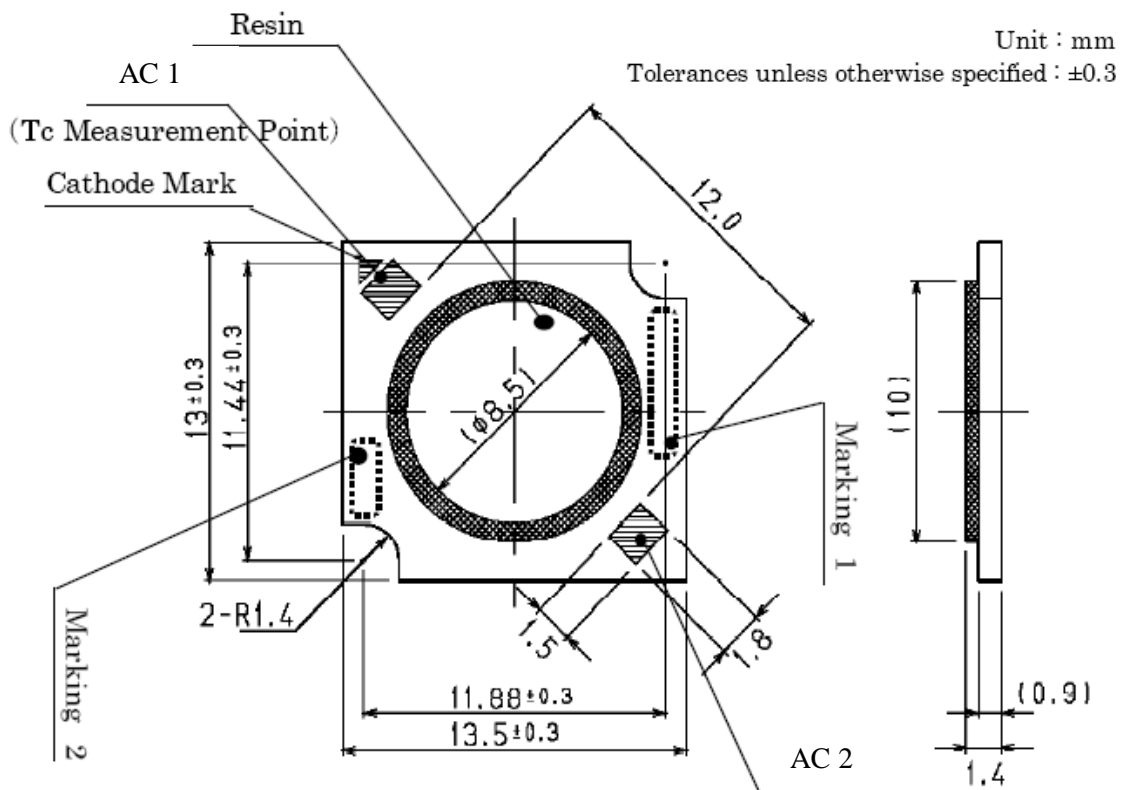
Compliant with RoHS directive

2. Applications

MR16 light engine

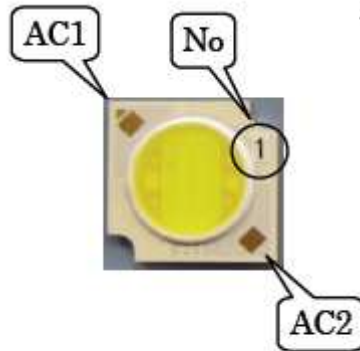
Low Voltage Downlights, Spotlights, track lights

3. Mechanical Dimensions





3. Mechanical Dimensions (Continued)



4. Electrical & Optical Characteristics

ITEM	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
AC Forward Current	I_f	$V_f=12V_{rms}$	mArms	600	650	750
Viewing Angle	$2\theta_{1/2}$		deg		120	
Thermal Resistance	$R_{\theta_{jc}}$	$V_f=12V_{rms}$	$^{\circ}C/W$		4	
General Color Rendering Index	R_a	$V_f=12V_{rms}$		67		85
Power Factor	Pf	$V_f=12V_{rms}$			0.89	
Typical Ballast Resistance	r_b	$V_f=12V_{rms}$	Ω		20	
Luminous Flux (5000K)	Φ	$V_f=12V_{rms}$	lm	510	650	820
Luminous Efficacy (5000K)	η_v	$V_f=12V_{rms}$	lm/w		92	

*Measurement Uncertainty of the Luminous Flux: $\pm 10\%$

*Values given are for specified AC drive voltage, with the nominal ballast resistance at 25°C junction temperature.



5. Absolute Maximum Ratings (@ Ta=25°C)

ITEM	SYMBOL	ABSOLUTE MAXIMUM RATING	UNIT
Power Dissipation	Pd	10	W
A.C. Current	If	800	mArms
Operating Temperature	To	-25 ~ +100	°C
Storage Temperature	Ts	-40 ~ +100	°C
Soldering Temperature(Reflow)	Tsld	N/A	°C
Soldering Temperature(Hand)	Tsld	370	°C

(Thermal Pad Temperature @70°C)

6. CIE Chromaticity Coordinates

Chromaticity coordinates (Condition $V_f=100V_{rms}$ $T_c=25\text{ C}$)

Color rank	x	y	
N1	Center	0.3447	0.3553 (5028K)
	a	0.3551	0.3760
	b	0.3376	0.3616
	c	0.3366	0.3369
	d	0.3515	0.3487

Color rank	x	y	
W1	Center	0.3818	0.3797 (3985K)
	a	0.4006	0.4044
	b	0.3736	0.3874
	c	0.3670	0.3578
	d	0.3898	0.3716

Color rank	x	y	
L1	Center	0.4338	0.4030 (3045K)
	a	0.4562	0.4260
	b	0.4299	0.4165
	c	0.4147	0.3814
	d	0.4373	0.3893

7. Packaging

LED Modules will be packaged in trays for primary protection.

According to the total delivery amount, cardboard boxes will be used to protect the Trays of LED Modules from mechanical shocks during transportation.

The boxes are not water resistant and therefore must be kept away from water and moisture.



8. Cautions

8.1 Moisture Proof Package

When moisture is absorbed into the SMT package it may vaporize and expand during soldering. There is a possibility that this can cause exfoliation of the contacts and affect the optical characteristics of the LEDs. For this reason, a moisture proof package is used to keep moisture to a minimum in the package.

8.2 Storage

Recommended storage environment:

Temperature: 5°C ~ 30°C (41°F ~ 86°F)

Humidity: 60% RH Max.

Use within 7 days after opening sealed vapor/ESD barrier bags.

If LEDs remain unused, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material.

8.3 Soldering

Manual Iron Soldering

Use SN60 solder with silver content.

Use 25W soldering iron at 370°C (698°F) Max for 3 seconds or less.

The soldering time and temperature will vary with different LED thermal dissipation base.

Must not touch top silicone portion of SMD LED by heated soldering iron.

8.4 Heat Generation

Thermal design of the end product is of paramount importance. Heat generated by the LED must be considered in system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the target heat sink. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

The operating current should be derated if ambient temperature is to exceed recommended value in this datasheet.



8.5 Cleaning

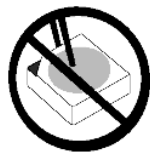
It is recommended that isopropyl alcohol be used as a solvent for cleaning the LEDs. When using other solvents, it should be confirmed beforehand whether the solvents will damage the LED.

Avoid using organic solvents. Surface condition of this device may change when organic solvents such as trichloroethylene or acetone are applied.

Do not clean the LEDs by the ultrasonic method. When it is absolutely necessary, the effect of ultrasonic cleaning on the LEDs depends on factors such as ultrasonic power, baking time and assembled condition. Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.

8.6 Handling Instructions of Silicone Resin LEDs

Mechanical stress on the surface should be minimized as much as possible during handling. Sharp objects of any type should not be used to avoid piercing the sealing compound.



8.7 Other

No responsibility accepted for any damage caused due to use of LEDs at conditions exceeding specifications.

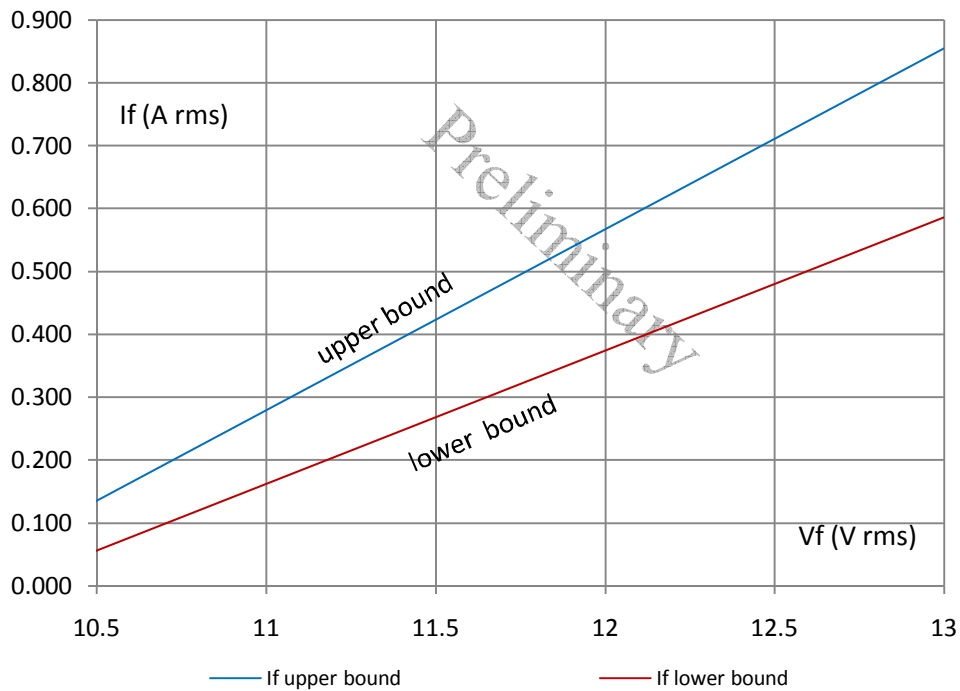
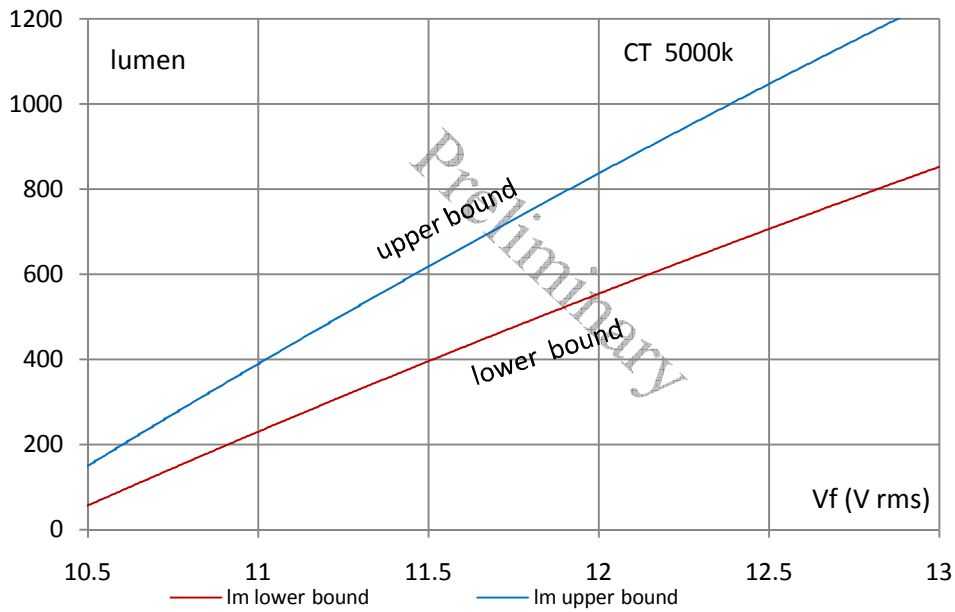
These LEDs are designed and manufactured for use in typical consumer applications. It is recommended to consult us in advance if user's application requires any particular quality or reliability which concerns human life. Examples would be medical equipment, aerospace applications, traffic signals, safety system equipment and so on.

The LED light output is strong enough to injure human eyes. Precautions must be taken to prevent looking directly at the LEDs with unprotected eyes for more than a few seconds.

The appearance and specifications of the product may be modified for improvement without notice.

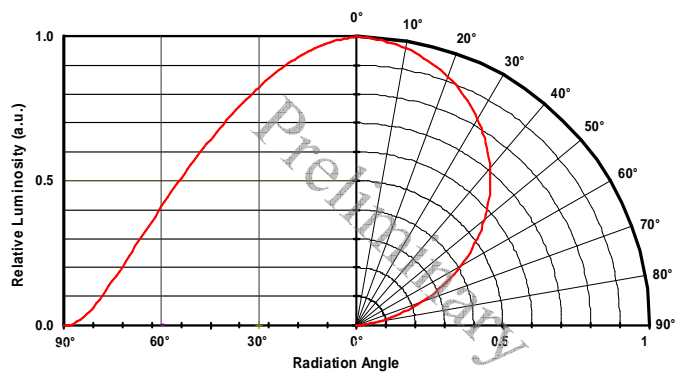
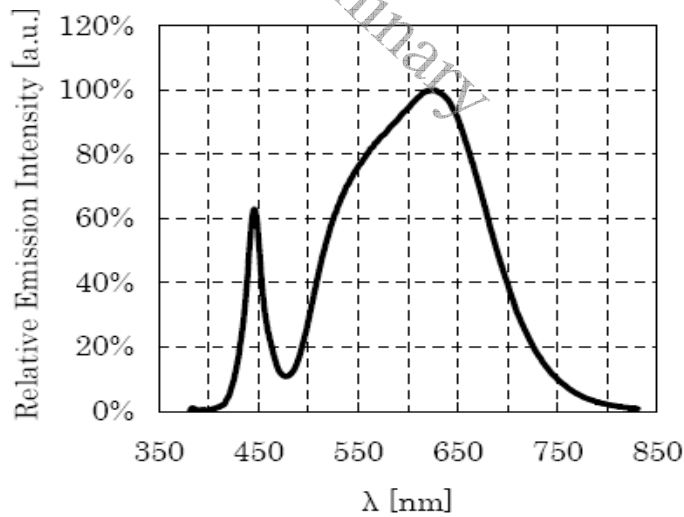
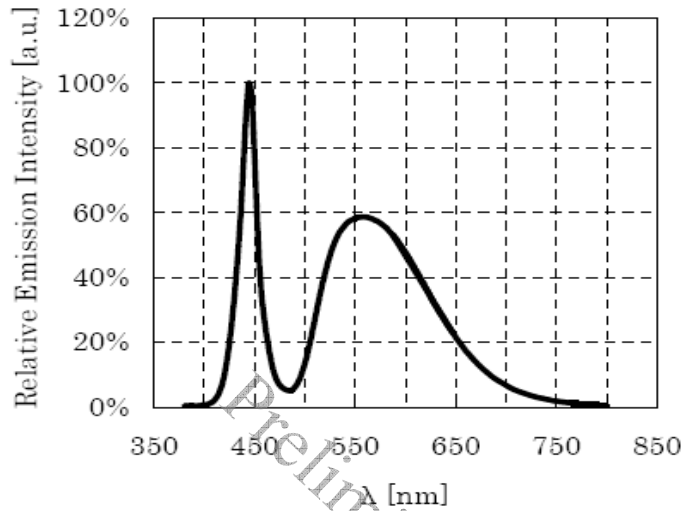


9. Typical Electrical & Optical Characteristic Curves





9. Typical Electrical & Optical Characteristic Curves



10. Reliability and Average Lumen Maintenance

Before releasing new products the manufacturer puts a representative product sample set through an entire suite of qualification tests, including the most stressful test for high power LEDs, the Wet High-Temperature Operating Life (WHTOL) test at 85°C/85%RH for 1000 hours at the specified operating current.

LED lifetime has been extrapolated based on the accumulated operating and accelerated aging data. Based on this data, the manufacturer projects that the LED products will deliver, on average, 70% lumen maintenance at 50,000 hours of operation at the specified operating current, provided that the case temperature is maintained at or below 80°C.