

# SPECIFICATIONS FOR T20 SERIES MONOCHROMATIC LIGHT LED

Model: 2016

Part No: T20\*\*011F-\*\*\*\*\*



### **Features:**

- \* Top view white LED
- \* Thermally Enhanced Package Design
- \* High luminous flux output
- \* High current capability
- \* Compact Package Size
- \* Wide viewing angle
- \* Pb-free Reflow Soldering Application
- \* The product itself will remain within RoHS compliant version

### **Applications**

- \* Interior lighting
- \* Retrofits (replacement)
- \* General lighting
- \* Architectural / Decorative lighting

## Part Numbering System

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X1 X2 X3 X4 X5 X6 X7 X8 X9 X10

Item Number Code	Description	Content
X1	Type code	1S:1010; 1A:1919; 20:2016; 3B:3014; 28:2835 34:3020; 3C:3030; 5C:5050; 7C:7070; 1D:100100; 19: Ceramic 3535; 15: Ceramic 5050; 11: Ceramic 1616.
X2	CCT code	2700K:27; 3000K:30; 4000K:40; 5000K:50; 5700K:57; 6500K:65.
X3	Color Rendering	Ra70:7; Ra80:8; Ra90:9.
X4	No. of serial chip	1-Z.
X5	No. of parallel chip	1-Z.
X6	Component code	A-Z.
X7	Color Code	M:ANSI; F:ERP; R:85°C ANSI; T:105°C ANSI; B:Backlighting; Q:Others; AT:Tospo
X8	Internal code1	\
X9	Internal code2	\
X10	Spare code	\

## Electro Optical Characteristics, IF = 40mA, Tj=25°C

Color	Luminous Flux	
	Typ	Min
RED	5.5	2
YELLOW	5	2
BLUE	2.3	1
GREEN	10	8

\* Tolerance of measurements of the Luminous Flux is  $\pm 7\%$ .

### Absolute Maximum Ratings at Tj=25°C

Item	Symbol	Absolute Maximum Rating		Unit
Forward current	IF	50		mA
Pulse Forward current	IFP	75		mA
Reverse Voltage	VR	5		mW
Power Dissipation	PD	RED	130	mW
		YELLOW	130	
		BLUE	170	
		GREEN	170	
Operating Temperature	Topr	-40~+105		°C
Storage Temperature	Tstg	-40~+85		°C
Junction Temperature	Tj	110		°C
Soldering Temperature	Tsld	Reflow Soldering: 230°C or 260°C for 10sec		

\* Ifp condition with Pulse: Width≤100μs, Duty cycle≤1/10.

\* LED's properties might be different from suggested values like above and below tables if operation condition will be exceeded our parameter range. Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

\* All measurements were made under the standardized environment of Lightning LED.

### Electrical/Optical Characteristics at Tj=25°C

Item	Symbol	Colour	Min	Typ	Max	Unit	Condition
Forward Voltage	VF	RED	-	2.1	2.6	V	IF=40mA
		YELLOW	-	2.3	2.6		
		BLUE	-	2.9	3.4		
		GREEN	-	3.0	3.4		
Reverse Current	IR	RED	-	-	10	μA	VR=5V
		YELLOW					
		BLUE					
		GREEN					
Viewing Angle	2θ1/2	RED	-	120	-	°	IF=40mA
		YELLOW					
		BLUE					
		GREEN					
Electrostatic Discharge	ESD	RED	1000	-	-	V	HBM
		YELLOW	1000	-	-		
		BLUE	1000	-	-		
		GREEN	1000	-	-		

\* Tolerance of measurements of the Forward Voltage is ±0.1V.

\* 2θ1/2 is the off-axis where the luminous intensity is 1/2 of the peak intensity.

## Bin Structure

### Luminous Flux Ranks, IF = 40mA, Tj = 25°C

Luminous Flux		
Code	Min	Max
AA	0	2
AB	2	4
AC	4	6
AD	6	8
AE	8	10
AF	10	14
AG	14	18

\* Tolerance of measurements of the Luminous Flux is  $\pm 7\%$ .

### The main wavelength standard grading, IF = 40mA , Tj = 25°C

Color	Min	Max	Unit 单位
RED	620	625	nm
	625	630	nm
	630	635	nm
YELLOW	585	590	nm
	590	595	nm
	595	600	nm
BLUE	455	460	nm
	460	465	nm
	465	470	nm
GREEN	520	525	nm
	525	530	nm
	530	535	nm

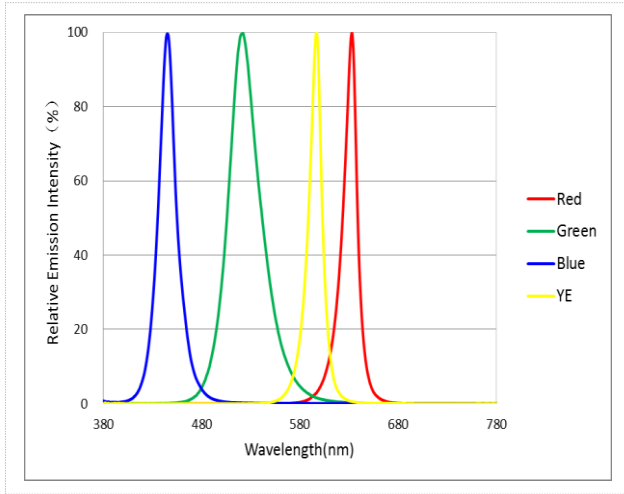
\* Tolerance of measurements of the WD is  $\pm 1\text{nm}$ .

### Forward Voltage Ranks, $I_F = 40\text{mA}$ , $T_j = 25^\circ\text{C}$

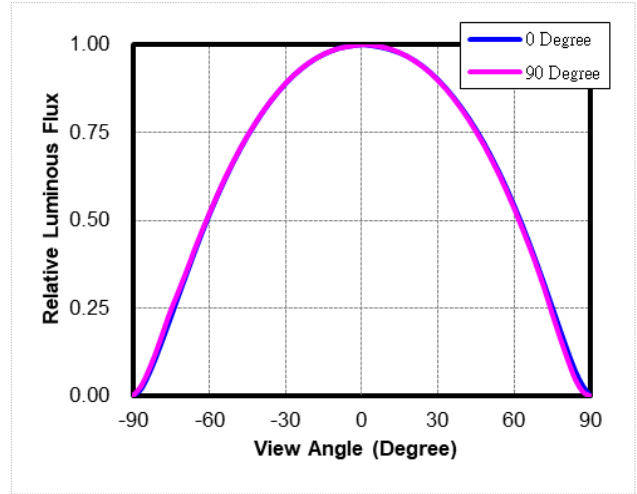
Code	Min	Max	Unit
RED YELLOW	1.8	2.0	V
	2.0	2.2	V
	2.2	2.4	V
	2.4	2.6	V
BLUE GREEN	2.6	2.8	V
	2.8	3.0	V
	3.0	3.2	V
	3.2	3.4	V

\* Tolerance of measurements of the Forward Voltage is  $\pm 0.1\text{V}$ .

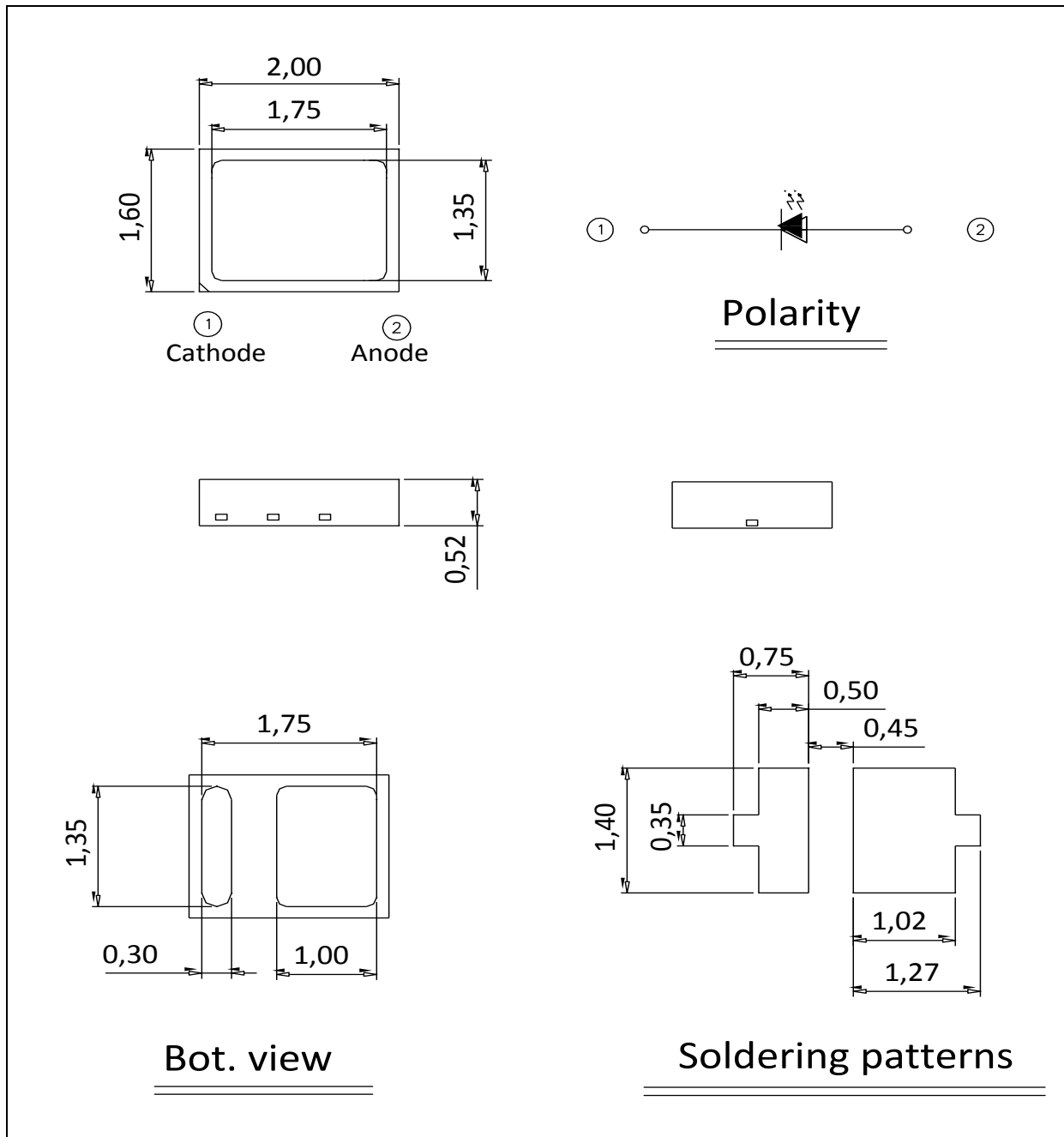
**Fig 1. Color Spectrum, Tj = 25°C**



**Fig 2. Viewing Angle Distribution, Tj = 25°C**



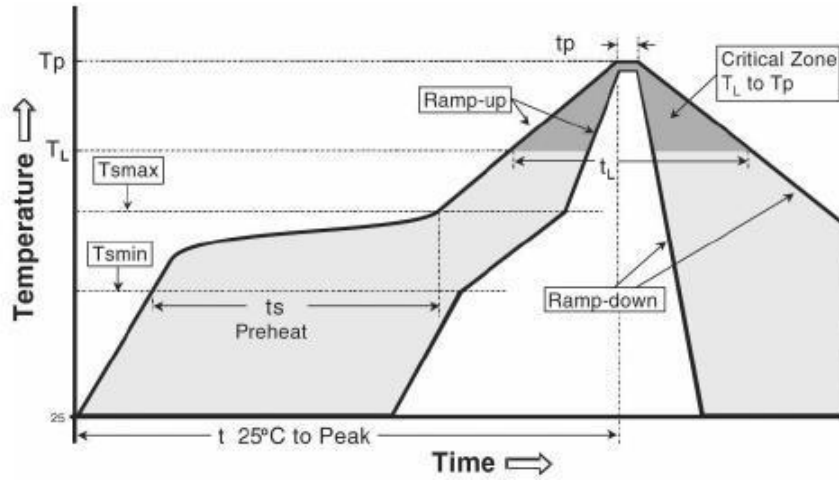
## Package Dimensions



\* The tolerance unless mentioned is  $\pm 0.1\text{mm}$ , unit = mm

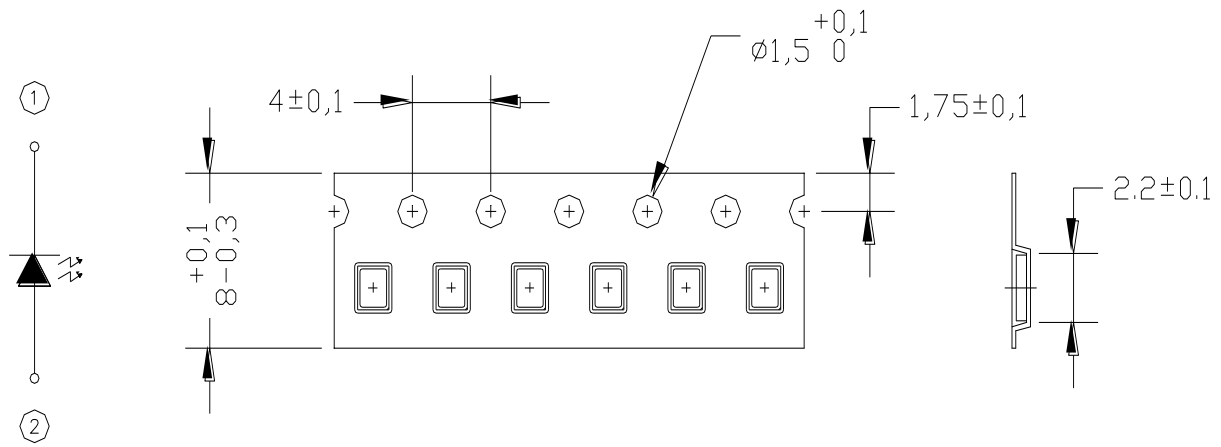


## Reflow Soldering Characteristics



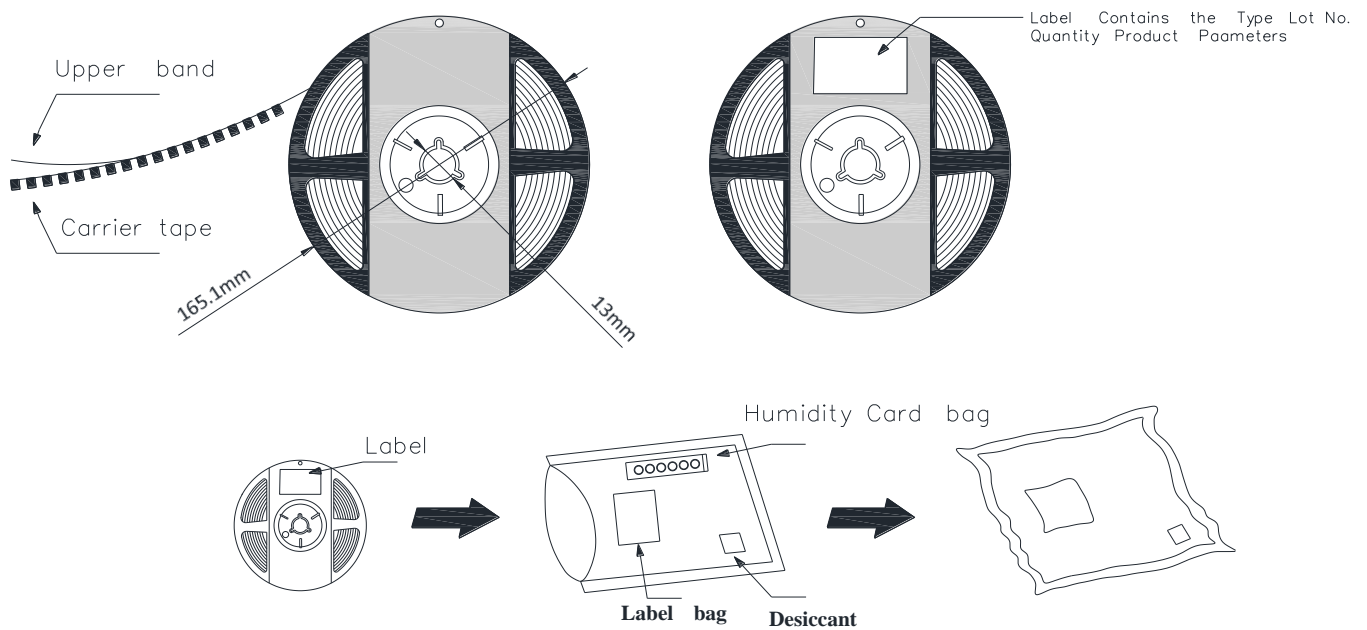
Reflow soldering	
Temperature Min (T Amin)	150° C
Temperature Max (Tsmax)	200° C
Time(ts)from ( T Amin to Tsmax)	60-120 seconds.
Ramp-up rate (TL to Tp)	3° C/seconds max.
Liquidous temperature( TL)	217° C
Time(tL) maintained above TL	60-150 seconds
Peak package body temperature( Tp)	260° C max
Time (tp) within 5° C of the specified classification temperature (Tc).	30 seconds max
Ramp-down rate (Tp to TL)	6° C/second max
Time 25 ° C to peak temperature	8 min max

## Package Dimensions of Tape

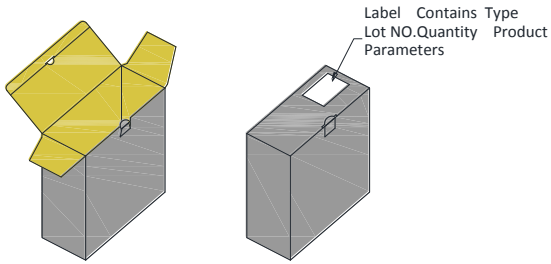


- \* Quantity : Max 5000pcs/Reel
- \* Cumulative Tolerance : Cumulative Tolerance/10 pitches to be  $\pm 0.2$ mm
- \* Package : P/N, Manufacturing data Code No. and Quantity to be indicated on a damp proof Package.
- \* unit = mm

## Package Dimensions of Reel

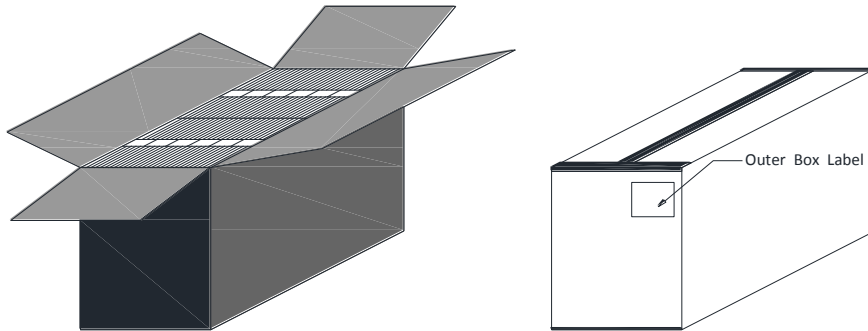


## Package Box



\* Capacity 10 reels per box.

## Outer Box



\* Capacity 30 or 60 reels per box.

## Label

<b>福建天电光电有限公司</b> <b>FUJIAN LIGHTNING OPTOELECTRONIC CO.LTD</b>	
型号Type: T*****_*****	
光通量Φ@ *** mA: *** - *** [LM]	
色区Color Bin@*** mA: ****	
电压Vf@ *** mA: ** - ** [V]	
显指Ra@*** mA: ** (MIN)	
Lot No.: A*****_ *_ *****	
Bin Code: ****	数量QTY:**** PCS

## Caution

1. Reflow soldering is recommended not to be done more than two times. In the case of more than 24 hours passed soldering after first, LEDs will be damaged.
2. Repairs should not be done after the LEDs have been soldered. When repair is unavoidable, suitable tools must be used.
3. Die slug is to be soldered.
4. When soldering, do not put stress on the LEDs during heating.
5. After soldering, do not warp the circuit board.

## Notes on Lightning EMC Series soldering:

1. Recommend to use reflow machine.
2. Recommend to use heating plate soldering.
3. Manual soldering is not recommended.

## Notes on reflow process:

1. To confirm whether the actual temperature curve in the reflow soldering conditions comply with recommended conditions. LEDs are guaranteed for one time reflow.
2. During reflow process do not apply force on LED active area.
3. After reflow process, PCB board should be cooled down before packing or storage.