

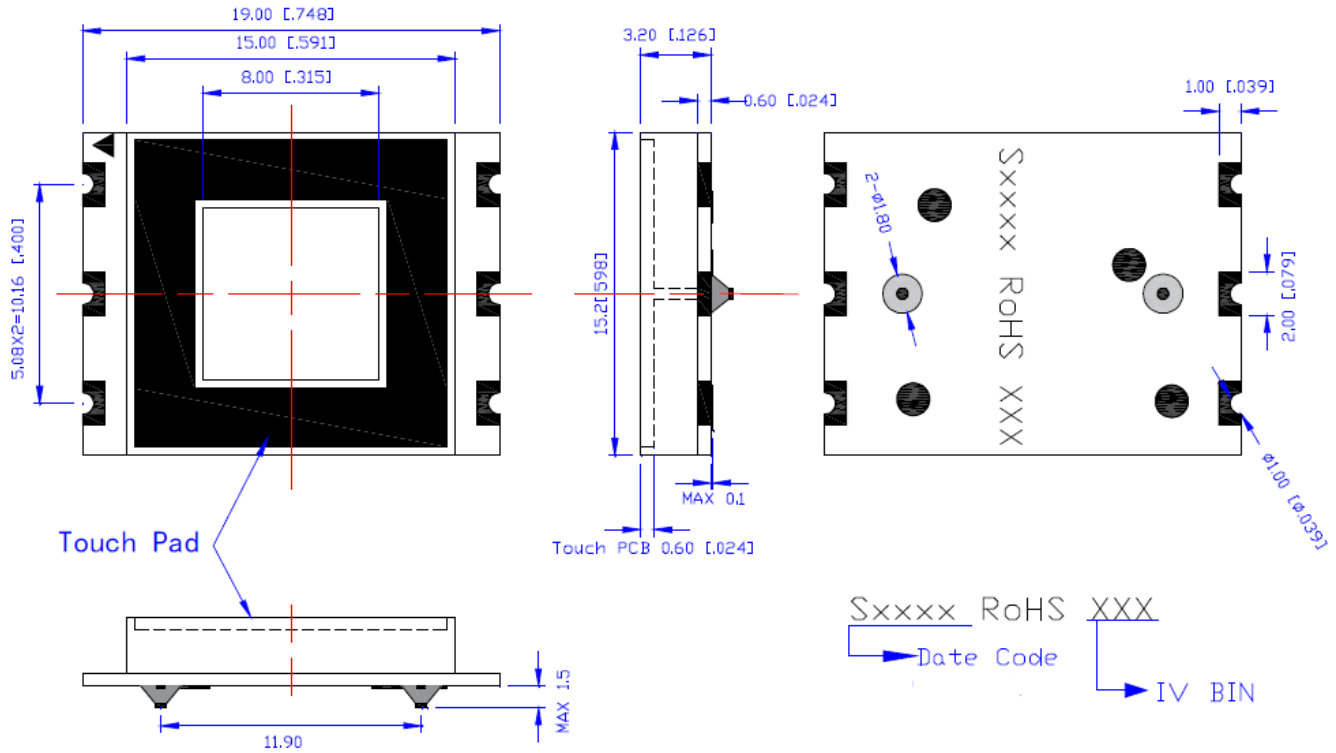


# American Opto Plus LED Corp.

## SMD-CT591QEPCBW

19.0 x 15.2 x 3.2mm RGB SMD Display w/Drive IC

### MECHANICAL DIMENSIONS



- Notes: 1. Dimension in millimeter [inch], tolerance is  $\pm 0.25$  [.010] unless otherwise noted.  
 2. Bending  $\leq$  Length\*1.0%

Chip Material	Emitted color	Segment Resin	Description
AlGaInP	Red	White	Touch Display
InGaN	Green		
InGaN	Blue		

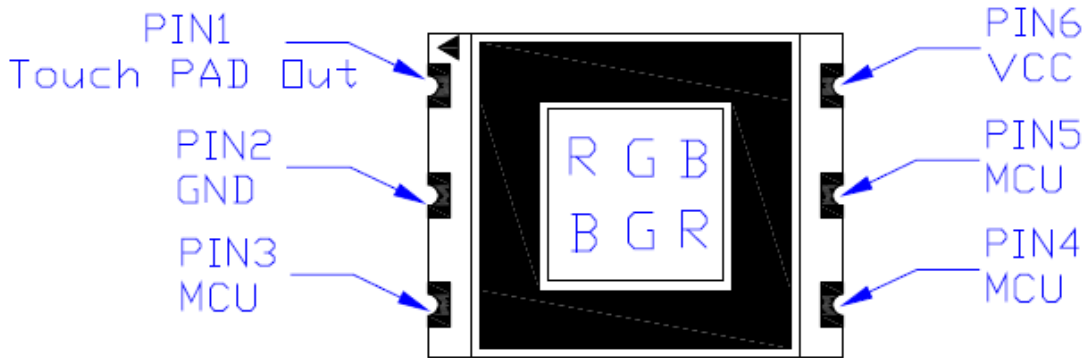


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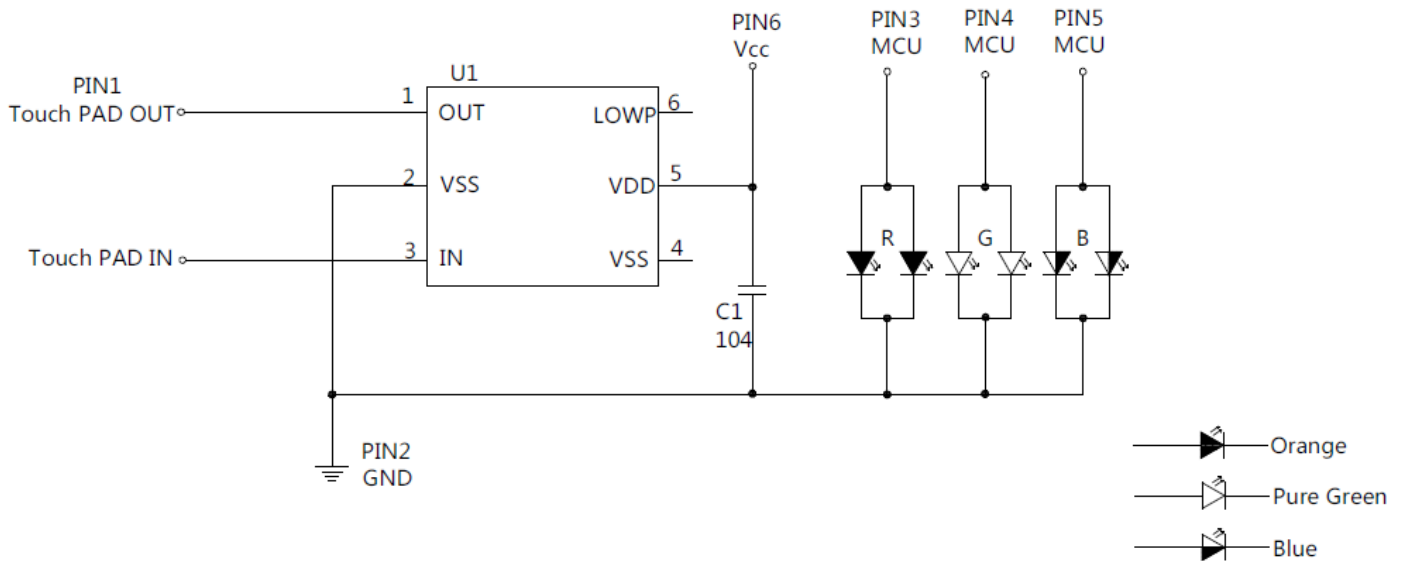
## SMD-CT591QEPCBW

19.0 x 15.2 x 3.2mm RGB SMD Display w/Drive IC

### ALL LIGHT ON SEGMENTS FEATURE & PAD POSITION



### INTERNAL CIRCUIT DIAGRAMS





# American Opto Plus LED Corp.

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### TOUCH IC ELECTRO-OPTICAL CHARACTERISTICS

(Ta=25°C)

Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	-	V <sub>DD</sub>	2.0	-	5.5	V
High Level Input Voltage	V <sub>DD</sub> = 5V	V <sub>IH</sub>	3.5	-	5	V
Low Level Input Voltage	V <sub>DD</sub> = 5V	V <sub>IL</sub>	0	-	1.5	V
Operating Current	V <sub>DD</sub> = 5V No load	I <sub>DD1</sub>	-	16	-	μA
	V <sub>DD</sub> = 3V No load		-	3.5	-	
Operating Current (SLRT = V <sub>DD</sub> )	V <sub>DD</sub> = 5V No load	I <sub>DD2</sub>	-	10.5	-	μA
	V <sub>DD</sub> = 3V No load		-	2.5	-	
Low Level Output Current	V <sub>DD</sub> = 3V V <sub>OL</sub> = 1V	I <sub>OL</sub>	-	30	-	mA
High Level Output Current	V <sub>DD</sub> = 3V V <sub>OH</sub> = 2V	I <sub>OH</sub>	-	80	-	mA

### ABSOLUTE MAXIMUM RATING

(Ta=25°C)

Parameter	Symbol	Color	Rating	Unit
Power Dissipation (Per Dice)	P <sub>D</sub>	R	70	mW
		G	114	
		B	114	
Continuous Forward Current (Per Dice)	I <sub>F</sub>	R	25	mA
		G	30	
		B	30	
Peak Current (Per Dice, duty cycle 1/10,1KHz)	I <sub>FP</sub>	R	90	mA
		G	100	
		B	100	
Derating Liner from 25°C (Per Dice)	ΔI <sub>f</sub> / ΔT	R	0.33	mA / °C
		G	0.4	
		B	0.4	
Reverse Voltage (Per Dice)	V <sub>R</sub>	R G B	5	V
Electrostatic discharge(HBM)	ESD	R	-	V
		G	1000	
		B	1500	
Operating Temp.	T <sub>OPR</sub>	R G B	-40 ~ +105	°C
Storage Temp.	T <sub>STG</sub>	R G B	-40 ~ +105	°C
Hand Soldering Temperature	T <sub>SOL</sub>	R G B	350	°C

Version 1.0 Date: 9-12-2018 Specifications are subject to change without notice.

American Opto Plus LED Corp. 1206 E. Lexington Ave. , Pomona CA 91766 Tel: 909-465-0080 Fax: 909-465-0130 [www.aopled.com](http://www.aopled.com)



American Opto Plus LED Corp.

SMD-CT591QEPCBW

19.0 x 15.2 x 3.2mm RGB SMD Display w/Drive IC

**ELECTRO-OPTICAL CHARACTERISTICS**

**(Ta=25°C)**

Parameter	Symbol	Color	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	VF	R	-	2	2.8	V	IF = 20 mA
		G		3.2	3.8		
		B		3.2	3.8		
Luminous Intensity	IV	R	-	95	-	mcd	IF = 20 mA
		G		550			
		B		130			
Peak Emission Wavelength	$\lambda_p$	R	-	632	-	nm	IF = 20 mA
		G		-			
		B		-			
Dominant Wavelength	$\lambda_D$	R	-	625	-	nm	IF = 20 mA
		G		525			
		B		470			
Spectrum Radiation Bandwidth	$\Delta \lambda$	R	-	20	-	nm	IF = 20 mA
		G		30			
		B		30			
Reverse Current	IR	R	-	-	100	$\mu$ A	VR = 5V
		G			50		
		B			50		
Luminous Intensity Matching Ratio	Iv-m	R G B	-	-	2:1	-	IF = 20 mA



# American Opto Plus LED Corp.

## SMD-CT591QEPCBW

19.0 x 15.2 x 3.2mm RGB SMD Display w/Drive IC

### LUMINOUS GENERAL I<sub>v</sub> BIN GRADE

(I<sub>f</sub> = 20mA)

#### Red

A	B	C	D	E	F	G	H	J	K	L	M
0.155	0.249	0.399	0.640	1.025	1.641	2.627	4.204	6.727	10.764	17.224	27.559
0.248	0.398	0.639	1.024	1.640	2.626	4.203	6.726	10.763	17.223	27.558	44.095
N	P	Q	R	S	T	U	V	W	X	Y	1
44.096	70.555	112.889	180.622	288.997	462.397	739.836	1183.738	1893.982	3030.372	4848.597	7757.756
70.554	112.888	180.622	288.996	462.396	739.835	1183.737	1893.981	3030.371	4848.596	7757.755	12412.409
2	3	4	5	6	7	8	9				
4034.034	19859.858	31775.773	50841.238	81345.982	130153.573	208245.718	333193.149				
19859.857	31775.772	50841.237	81345.981	130153.572	208245.717	333193.148	533109.039				

#### Green

A	B	C	D	E	F	G	H	J	K	L	M
0.155	0.249	0.399	0.640	1.025	1.641	2.627	4.204	6.727	10.764	17.224	27.559
0.248	0.398	0.639	1.024	1.640	2.626	4.203	6.726	10.763	17.223	27.558	44.095
N	P	Q	R	S	T	U	V	W	X	Y	1
44.096	70.555	112.889	180.622	288.997	462.397	739.836	1183.738	1893.982	3030.372	4848.597	7757.756
70.554	112.888	180.622	288.996	462.396	739.835	1183.737	1893.981	3030.371	4848.596	7757.755	12412.409
2	3	4	5	6	7	8	9				
4034.034	19859.858	31775.773	50841.238	81345.982	130153.573	208245.718	333193.149				
19859.857	31775.772	50841.237	81345.981	130153.572	208245.717	333193.148	533109.039				

#### Blue

A	B	C	D	E	F	G	H	J	K	L	M
0.155	0.249	0.399	0.640	1.025	1.641	2.627	4.204	6.727	10.764	17.224	27.559
0.248	0.398	0.639	1.024	1.640	2.626	4.203	6.726	10.763	17.223	27.558	44.095
N	P	Q	R	S	T	U	V	W	X	Y	1
44.096	70.555	112.889	180.622	288.997	462.397	739.836	1183.738	1893.982	3030.372	4848.597	7757.756
70.554	112.888	180.622	288.996	462.396	739.835	1183.737	1893.981	3030.371	4848.596	7757.755	12412.409
2	3	4	5	6	7	8	9				
4034.034	19859.858	31775.773	50841.238	81345.982	130153.573	208245.718	333193.149				
19859.857	31775.772	50841.237	81345.981	130153.572	208245.717	333193.148	533109.039				

1. Unit = mcd
2. Tolerance: ±20%

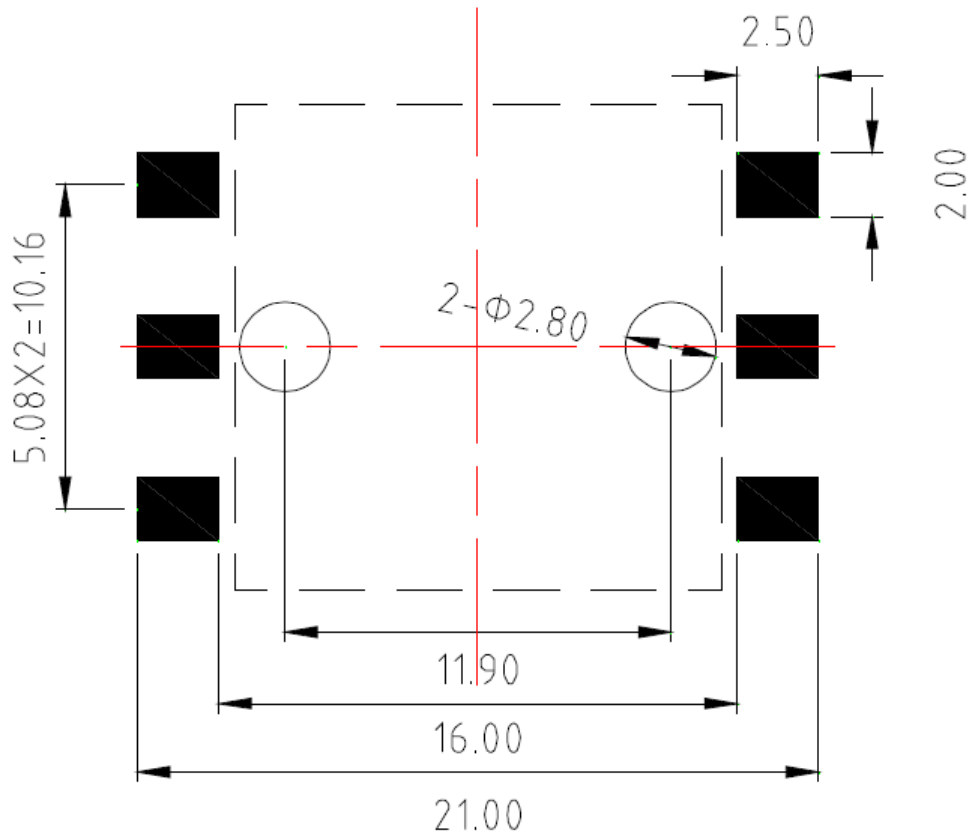


American Opto Plus LED Corp.

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## SOLDERING PAD SIZE





ELECTRICAL/OPTICAL CHARACTERISTICS CURVES –Red

(Ta=25°C)

(Ta = 25°C Unless Otherwise Noted)

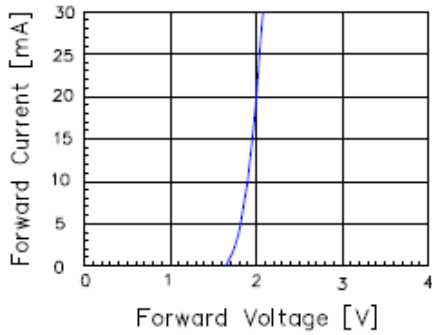


Fig 1. Forward Current vs. Forward Voltage

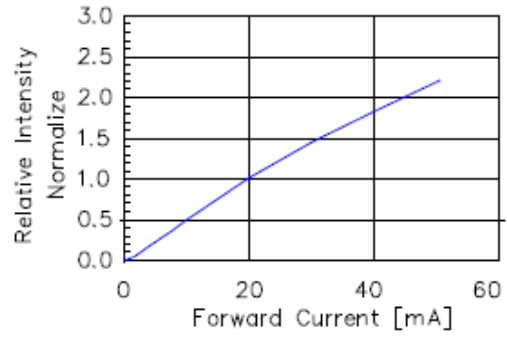


Fig 2. Relative Intensity vs. Forward Current

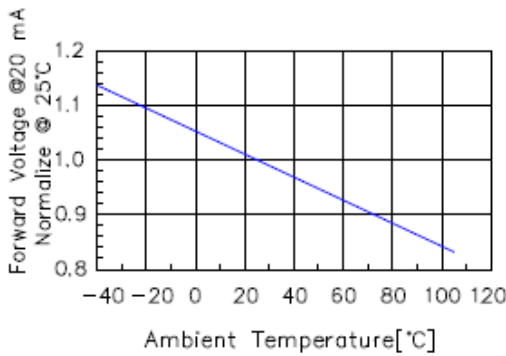


Fig 3. Forward Voltage vs. Temperature

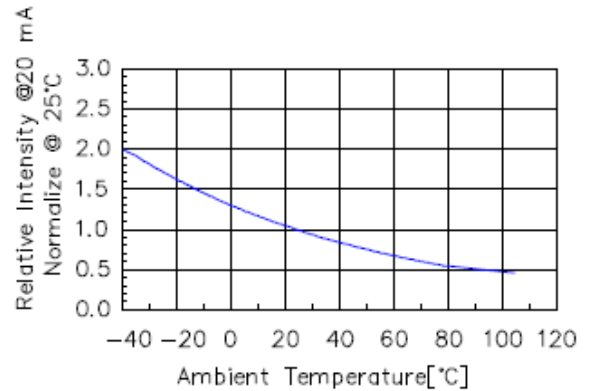


Fig 4. Relative Intensity vs. Temperature

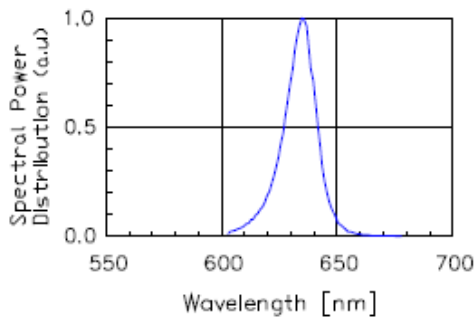


Fig 5. Spectral Power Distribution vs. Wavelength

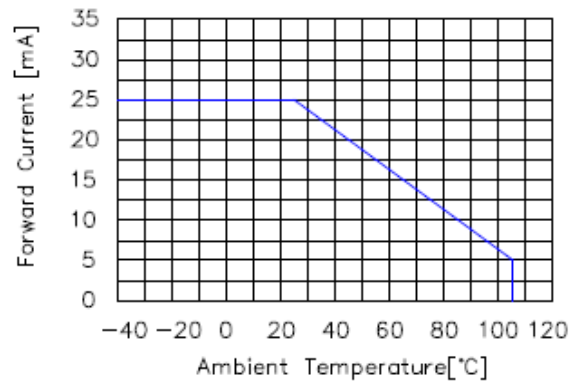


Fig 6. Forward current vs. Temperature



American Opto Plus LED Corp.

SMD-CT591QEGBW

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**ELECTRICAL/OPTICAL CHARACTERISTICS CURVES –Green (Ta=25°C)**

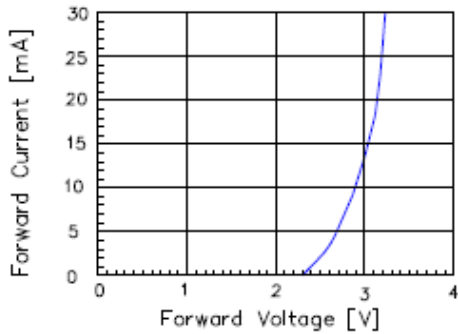


Fig 1. Forward Current vs. Forward Voltage

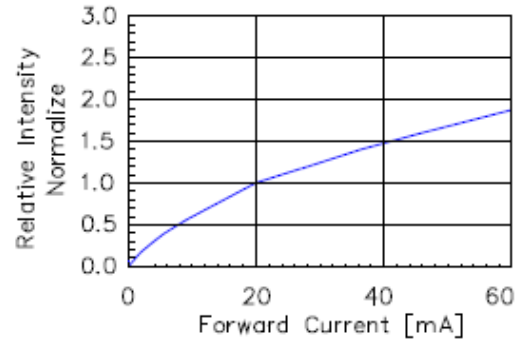


Fig 2. Relative Intensity vs. Forward Current

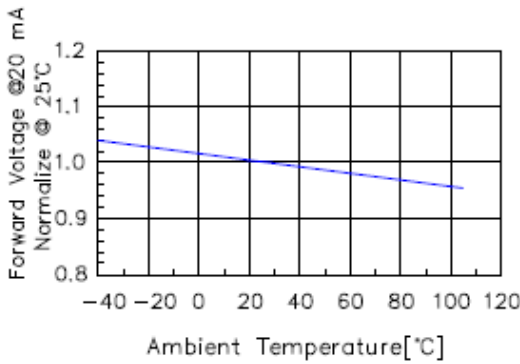


Fig 3. Forward Voltage vs. Temperature

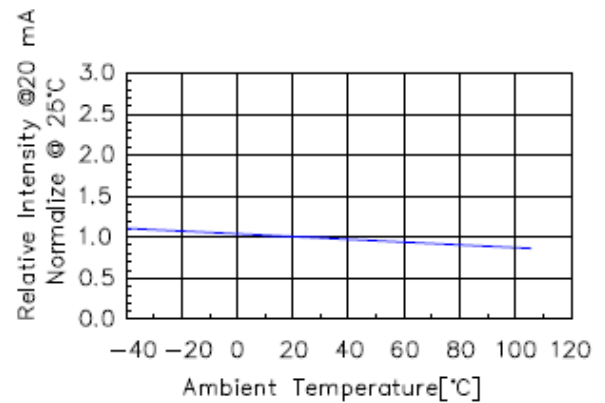


Fig 4. Relative Intensity vs. Temperature

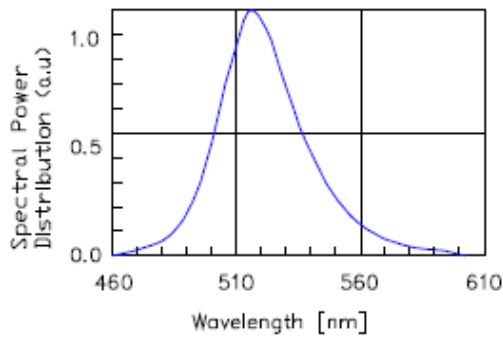


Fig 5. Spectral Power Distribution vs. Wavelength

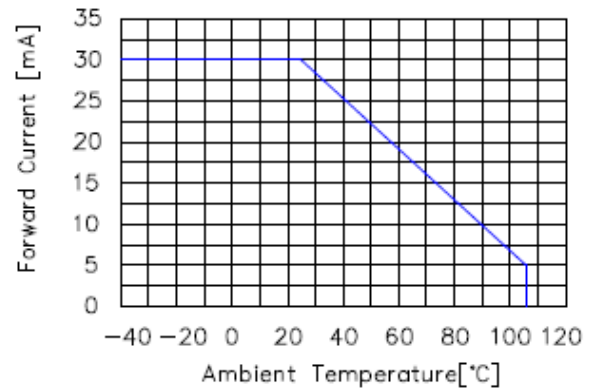


Fig 6. Forward current vs. Temperature





American Opto Plus LED Corp.

SMD-CT591QEGBW

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## ELECTRICAL/OPTICAL CHARACTERISTICS CURVES –Blue (Ta=25°C)

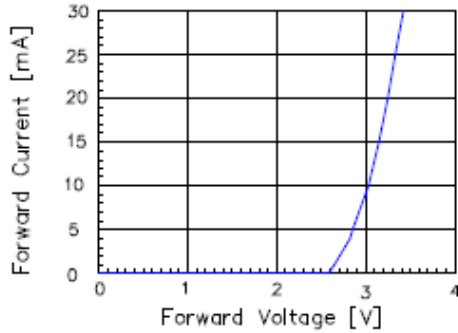


Fig 1. Forward Current vs. Forward Voltage

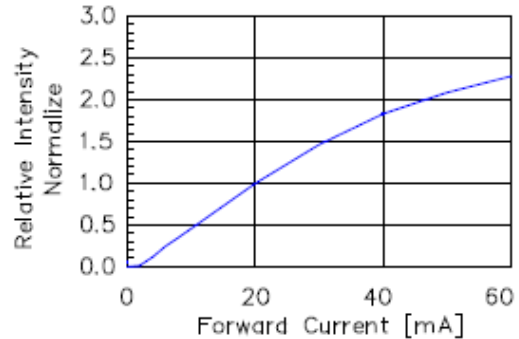


Fig 2. Relative Intensity vs. Forward Current

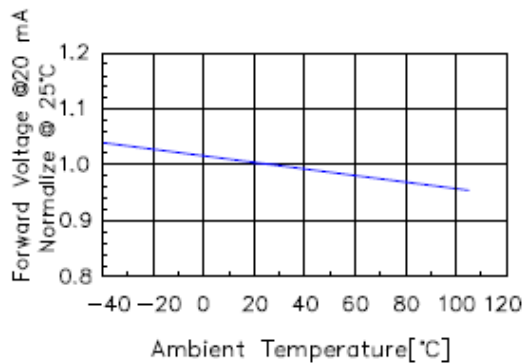


Fig 3. Forward Voltage vs. Temperature

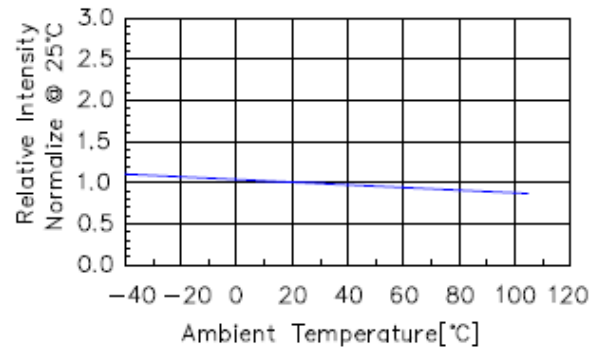


Fig 4. Relative Intensity vs. Temperature

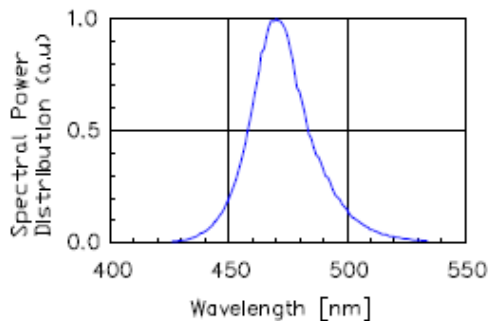


Fig 5. Spectral Power Distribution vs. Wavelength

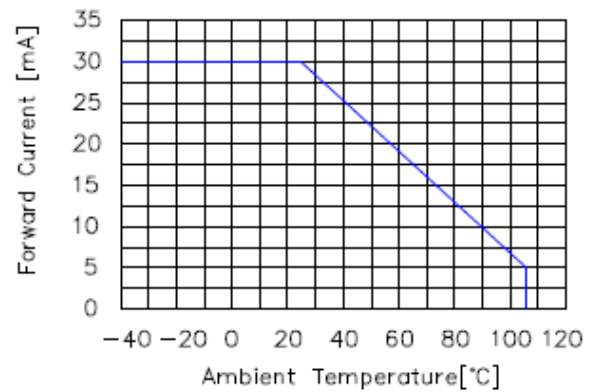


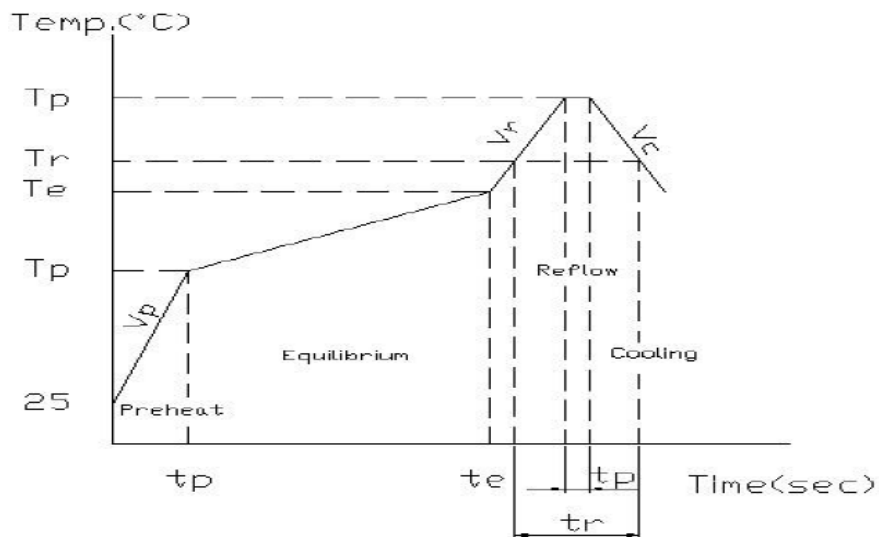
Fig 6. Forward current vs. Temperature



## SOLDERING CHARACTERISTICS

### 1. IR-reflow Condition (Pb free)

Area	Title	Symbol	Min	Max	Unit
(1)Preheat	Ramp-up Rate	$V_P$	1	5	°C/sec
	Temperature	$T_P$	150	-	°C
	Time	$t_p$	-	-	sec
(2)Equilibrium	Ramp-up Rate	$V_E$	-	-	°C/sec
	Temperature	$T_E$	150	200	°C
	Time	$t_e$	60	120	sec
(3)Reflow	Ramp-up Rate	$V_R$	1	5	°C/sec
	Temperature	$T_R$	220	-	°C
	Time	$t_r$	-	60	sec
	Peak Temperature	$T_{RP}$	-	260	°C
	Peak Time	$t_{rp}$	-	10	sec
(4)Cooling	Ramp-down Rate	$V_C$	3	6	°C/sec



### 2. Hand Soldering (Iron Condition)

Soldering Iron: 30W Max

Temperature 350°C Max

Soldering Time: 3 Seconds Max (One Time)

Distance: 1.6mm min (From Seating Plane)

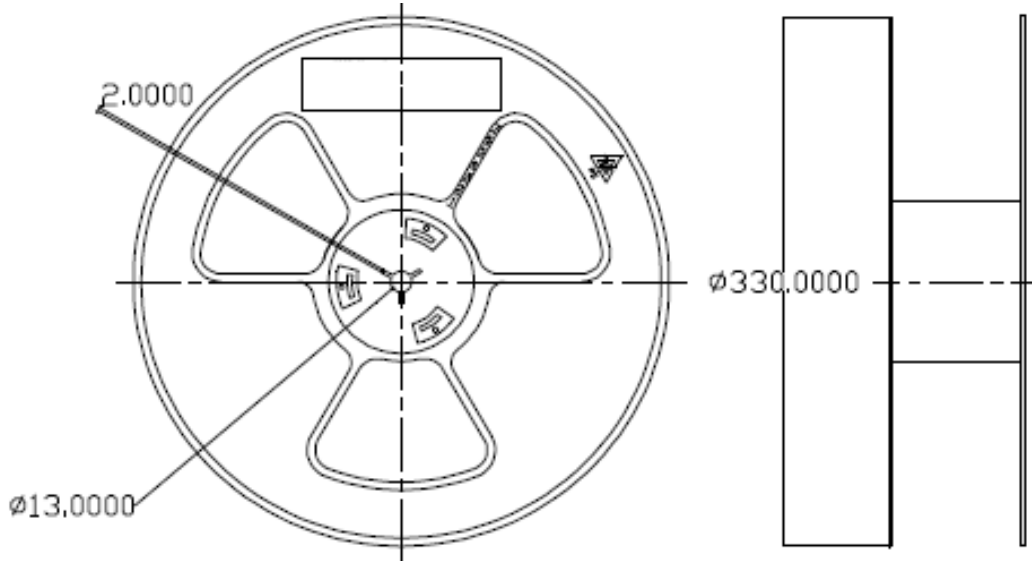


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## SMD-CT591QEPCBW

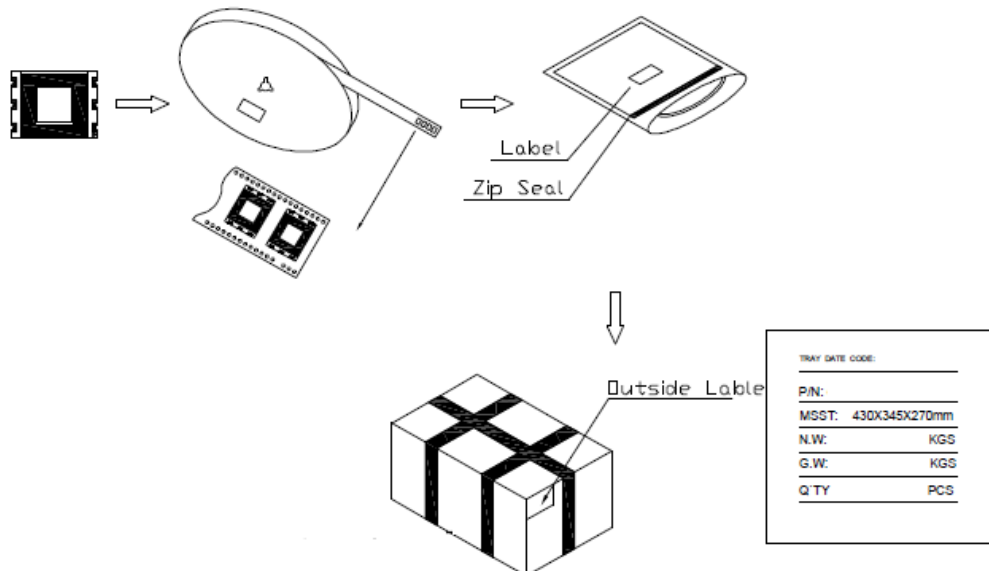
19.0 x 15.2 x 3.2mm RGB SMD Display w/Drive IC

### REEL DIMENSION



Note: 750pcs per reel.

### PACKING AND LABEL SPECIFICATION



TRAY DATE CODE:	_____
P/N:	_____
MSST:	430X345X270mm
N.W:	KGS
G.W:	KGS
QTY:	PCS

Package	Size	Unit	Amount	Unit	Amount	Unit
Reel	Ø330	mm	1	Reel	750	Pcs
Bag	L450*W430		1	Reel	750	
Outer Box	L430*W345*H270		5	Bag	3750	



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## **STORAGE METHOD**

- **Storage Conditions**

A. Before opening the package:

The LEDs should be kept at  $-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$  and RH: 45% ~ 85%. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material (silica gel) is recommended.

B. After opening the package:

The LEDs should be kept at  $\leq 30^{\circ}\text{C}$  and  $\leq 70\%RH$ . The LEDs should be soldered within 168 hours (7) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel).

It is also recommended to return the LEDs to the original moisture proof bag and to reseal the moisture proof bag again.

- If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: more than 24 hours at  $65 \pm 5^{\circ}\text{C}$