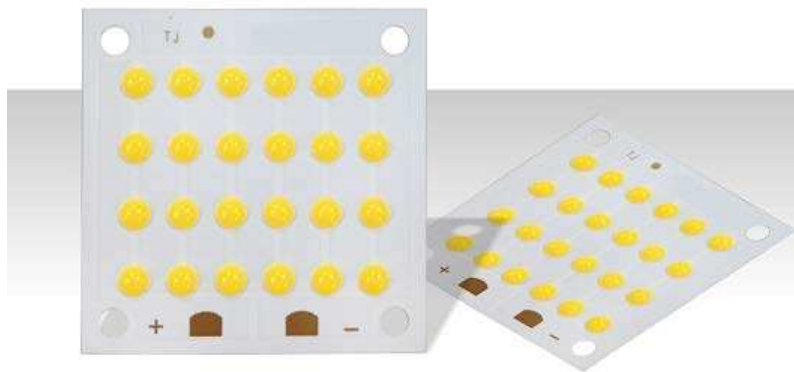


Harvatek COM LEDs Approval Sheet  
**Model No.: HT65 Series**

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## HARVATEK<sup>®</sup> COM- HT65C<sup>1</sup> Series



- Dimension : 42x42mm
- Typical Im : CW 2800lm  
WW 2300lm@1400mA
- Color Temperature : CW/ WW
- CRI : CW>70 WW>80
- Assembly : Screws or thermal conductive double-sided tape

### Table of Contents

Dimensions .....	3
Absolute Maximum Ratings.....	4
Forward Voltage Characteristics .....	5
Operating Current and Luminous Flux Characteristics .....	6

**Note:**

The fifth code represents color temperature

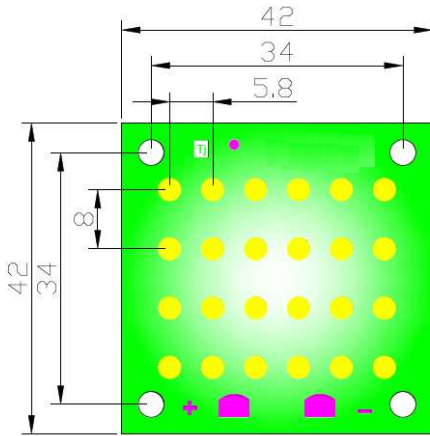
1. C represents Cool White, it can be replaced by Letter N: Neutral White Letter W: Warm White.

Same as below shown.

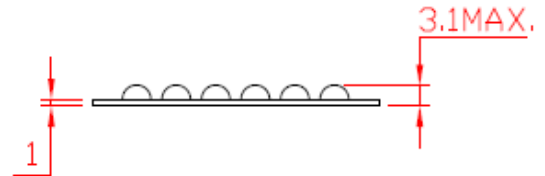
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**Dimensions**

**HT65**



Top View



Front View

<Figure1 Drawing for part no. HT65C, PA65N, HT65W>.

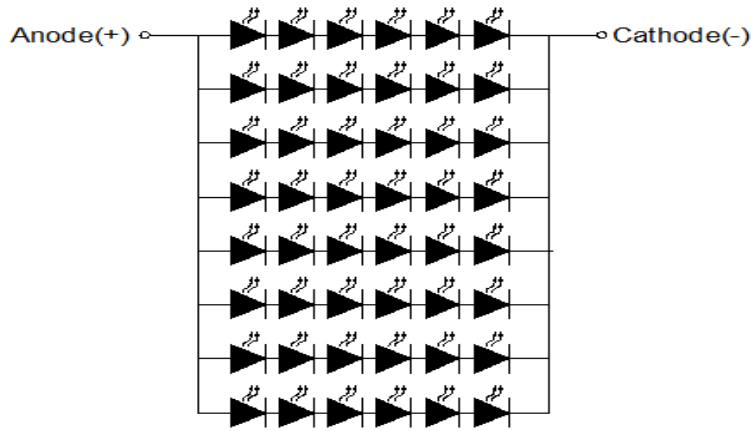
Notes:

1. Solder pads are labeled “+” and “-” to denote positive and negative, respectively.
2. Drawings are not to scale.
3. Drawing dimensions are in millimeters.
4. Unless otherwise specified, tolerances are  $\pm 0.20\text{mm}$ .
5. The optical center of the LED Array is defined by the mechanical center of the array.

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## Circuit Layout

### HT65



## Absolute Maximum Ratings

The following tables describe absolute maximum ratings of HT39 Series. Please refer to circuit layout on previous page for DC forward current & voltage selection.

**Table 1-1**

Parameter	Range	Unit	Symbol
LED Junction Temperature	<85	°C	T <sub>j</sub>
Operating Temperature	(-40 to +100)	°C	
Storage Temperature	(-40 to +120)	°C	
LED Substrate Temperature(Heatsink)	<80	°C	T <sub>s</sub>

**Table 1-2**

Parameter	Product Code		
	HT65 (6S8P)	Unit	Symbol
DC Forward Current <sup>(1)</sup>	1400	mA	I <sub>F</sub>
DC Forward Voltage	18.8	V	V <sub>F</sub>
Reverse Voltage <sup>(2)</sup>	--	V	V <sub>R</sub>

**Notes for Table1-2:**

1. DC forward current should not exceed LED's operating current.
2. LEDs are not designed to be driven in reverse bias.

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## Forward Voltage Characteristics

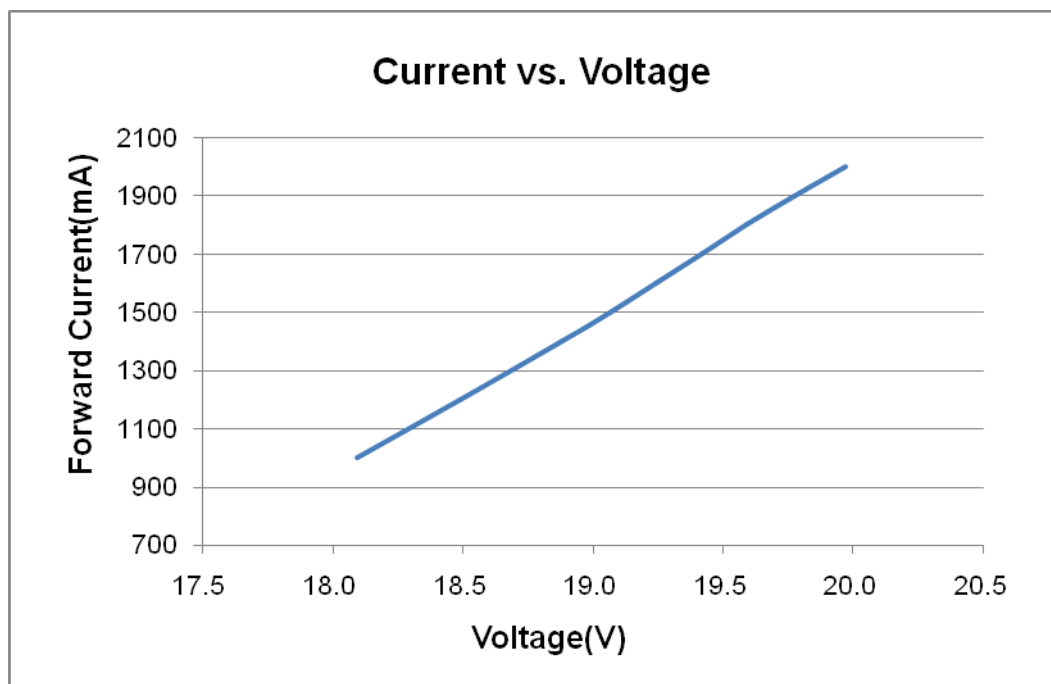
The following table describes forward voltage of HT65 Series. Please note that the all forward voltage range is based on constant driving current. Do not base on the values below to design a constant voltage system.

**Table 2**

P/N	Min. Voltage (V <sub>F</sub> )	Typ. Voltage (V <sub>F</sub> )	Max. Voltage (V <sub>F</sub> )	Unit
HT65	17.4	18.8	20.4	V

**Notes for Table 2:**

Forward voltage is measured with an accuracy of ±10%



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## Operating Current and Luminous Flux Characteristics

The following table describes typical luminous flux at  $T_j=25^\circ\text{C}$  and  $T_j=85^\circ\text{C}$  for HT65 at DC forward current 1000mA ,1200mA, 1400mA and 1800 mA.

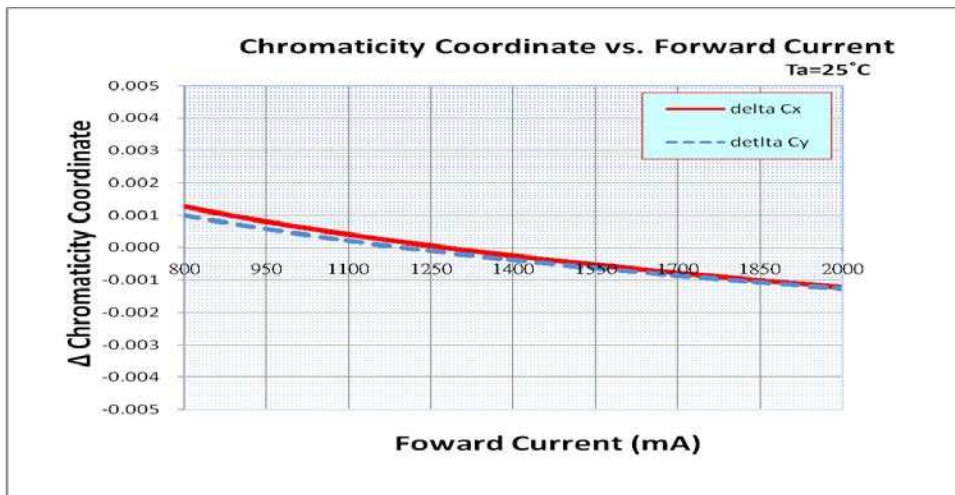
The CCT range shown in the following table is COM Product standard CCT ranks.

**Table 3**

Product No.	ANSI CCT (K)	CRI	Luminous flux(lm)		Test Current (mA)	Power (W) (Typ)	Efficacy (lm/W) (Typ at Tj 25°C)	Lumen depreciation
			Tj=25°C	Tj=85°C				
HT65C	5200K	>70	2063	1815	1000	18.10	114	12%
			2420	2130	1200	22.21	109	12%
			<b>2780</b>	<b>2446</b>	<b>1400</b>	<b>26.41</b>	<b>105</b>	<b>12%</b>
			3433	3021	1800	35.28	97	12%
HT65N	4000K	>75	1791	1594	1000	18.10	99	11%
			2086	1857	1200	22.21	94	11%
			<b>2376</b>	<b>2115</b>	<b>1400</b>	<b>26.4</b>	<b>90</b>	<b>11%</b>
			2857	2543	1800	35.28	81	11%
HT65W	2900K	>80	1647	1466	1000	18.10	91	11%
			1953	1738	1200	22.21	88	11%
			<b>2244</b>	<b>1997</b>	<b>1400</b>	<b>26.41</b>	<b>85</b>	<b>11%</b>
			2751	2448	1800	35.28	78	11%

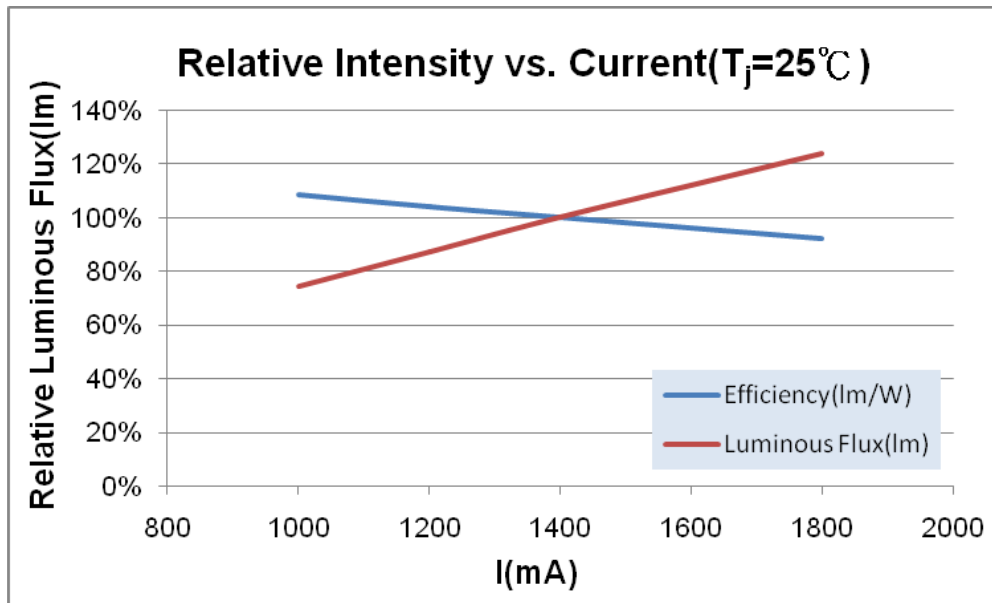
**Notes for Table 3:**

Luminous flux is measured with an accuracy of  $\pm 10\%$



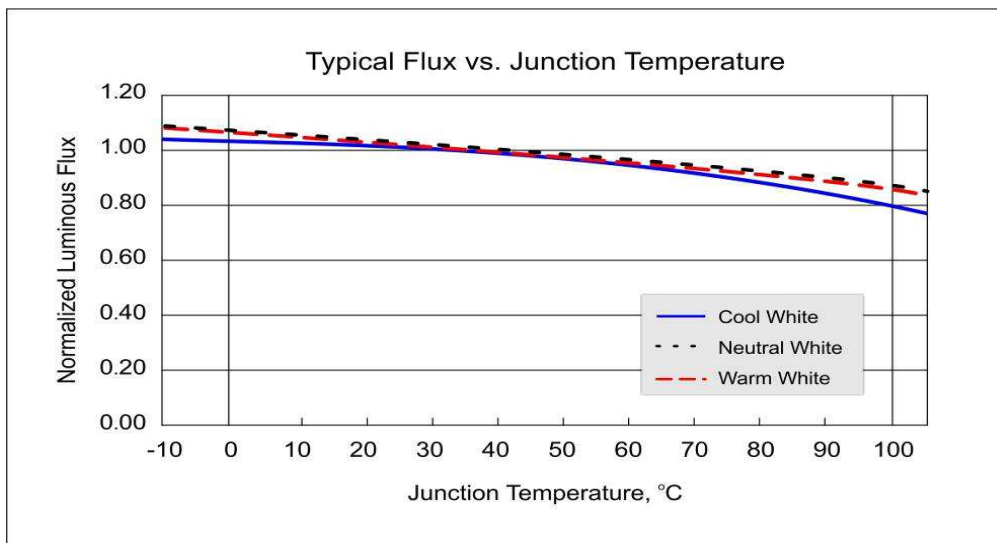
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## Current vs. Efficiency



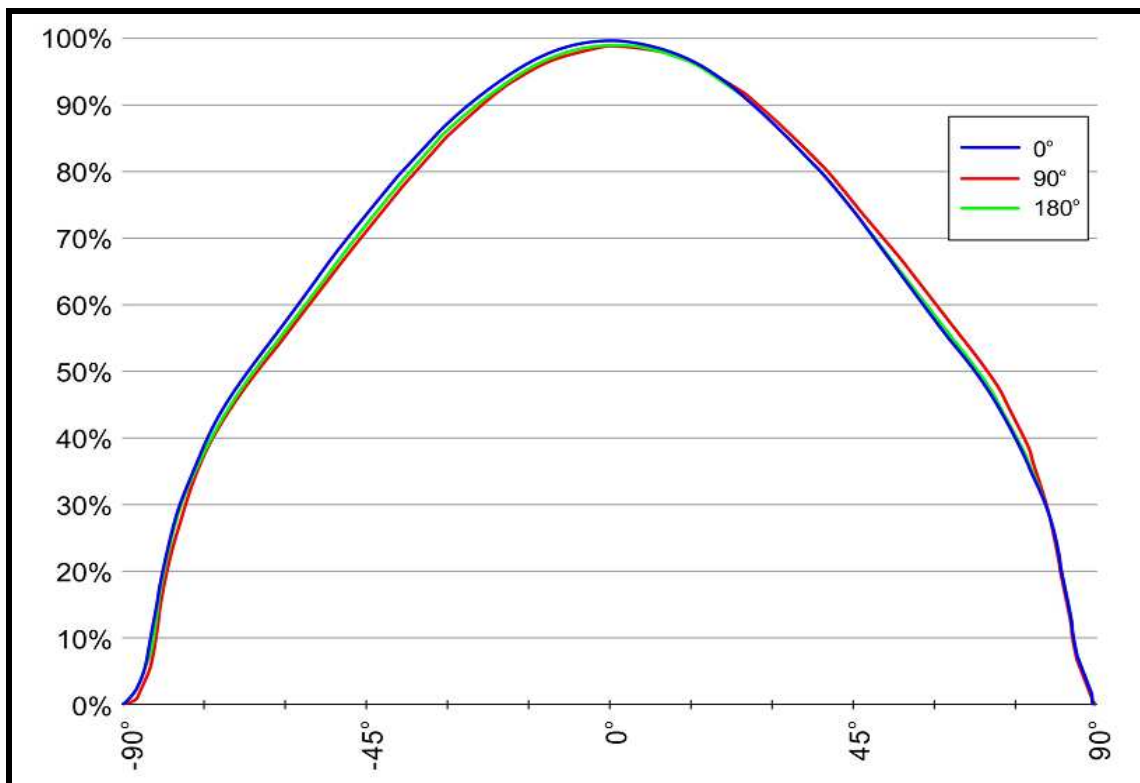
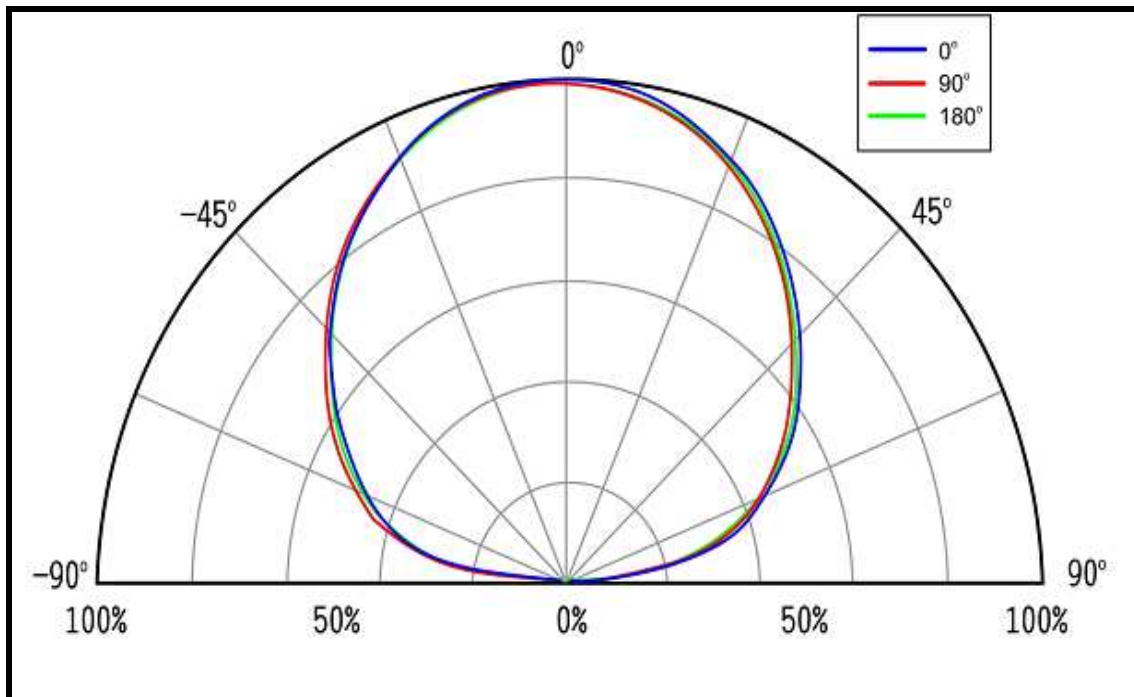
<Figure 2 The trend chart for relative intensity vs. current of HT65C, HT65W>

Input Current (mA)	1000	1200	1400	1800
<b>Actual Watt</b>	18.10	22.21	<b>26.41</b>	35.28
<b>Total Typical Im for CW</b>	2063	2420	<b>2780</b>	3433
<b>Total Typical Im for WW</b>	1647	1953	<b>2244</b>	2751
<b>Suggested Application</b>	Flood Light/ Down Light			



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## Photometric



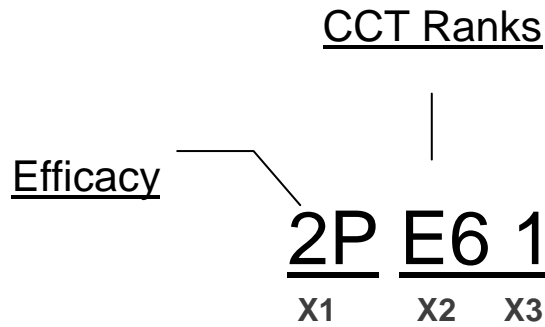
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## Appendix

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**BIN Code Definition**

The following tables describe luminous flux group and color group.



**Table 1-1.**

X1	X2	X3
<b>Light Efficacy</b>	<b>ANSI C78.377A CCT Quadrangles</b>	<b>Detailed CCT Ranks</b>
	E1 E10	0 No Detailed ranks
	E2 E20	1
	E3 E30	2
	E4 E40	3
	E5 E50	4
	E6 E60	
	E7 E70	
	E8 E80	

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**Table 1-2. Light efficacy**

Main BIN No.	lm/W		Secondary BIN No.	lm/W		Warm White (WW)			Neutral White (NW)		Cool White (CW)		
	min.	max.		min.	max.	E10	E20	E30	E40	E50	E60	E70	E80
						2700K	3000K	3500K	4000K	4500K	5000K	5700K	6500K
J	10	25	1J	10	17								
			2J	17	25								
K	25	40	1K	25	32								
			2K	32	40								
L	40	62	1L	40	51								
			2L	51	62								
M	62	70	1M	62	66								
			2M	66	70								
N	70	85	1N	70	77								
			2N	77	85		Main						
P	85	100	1P	85	92		Main		Main				
			2P	92	100		Main		Main				
Q	100	115	1Q	100	107						Main		
			2Q	107	115						Main		
R	115	130	1R	115	122								
			2R	122	130								
S	130	145	1S	130	137								
			2S	137	145								
T	145	160	1T	145	152								
			2T	152	160								
U	160	175	1U	160	167								
			2U	167	175								
V	175	190	1V	175	182								
			2V	182	190								
W	190	205	1W	190	197								
			2W	197	205								

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**Table 1-3. CCT ANSI C78.377A**

BIN Code		E10	E20	E30	E40	E50	E60	E70	E80
Nominal CCT(K)		2700	3000	3500	4000	4500	5000	5700	6500
CCT Range(K)		2580-2870	2870-3220	3220-3710	3710-4260	4260-4745	4745-5310	5310-6020	6020-7040
Center	x	0.4578	0.4338	0.4073	0.3818	0.3611	0.3447	0.3287	0.3123
	y	0.4101	0.4030	0.3917	0.3797	0.3658	0.3553	0.3417	0.3282
Tolerance Quadrant	x	0.4813	0.4562	0.4299	0.4006	0.3736	0.3551	0.3376	0.3205
	y	0.4319	0.4260	0.4165	0.4044	0.3874	0.3760	0.3616	0.3481
	x	0.4562	0.4299	0.3996	0.3736	0.3548	0.3376	0.3207	0.3028
	y	0.4260	0.4165	0.4015	0.3874	0.3736	0.3616	0.3462	0.3304
	x	0.4373	0.4147	0.3889	0.3670	0.3512	0.3366	0.3222	0.3068
	y	0.3893	0.3814	0.3690	0.3578	0.3465	0.3369	0.3234	0.3113
	x	0.4593	0.4373	0.4147	0.3898	0.3670	0.3515	0.3366	0.3221
	y	0.3944	0.3893	0.3814	0.3716	0.3578	0.3487	0.3369	0.3261

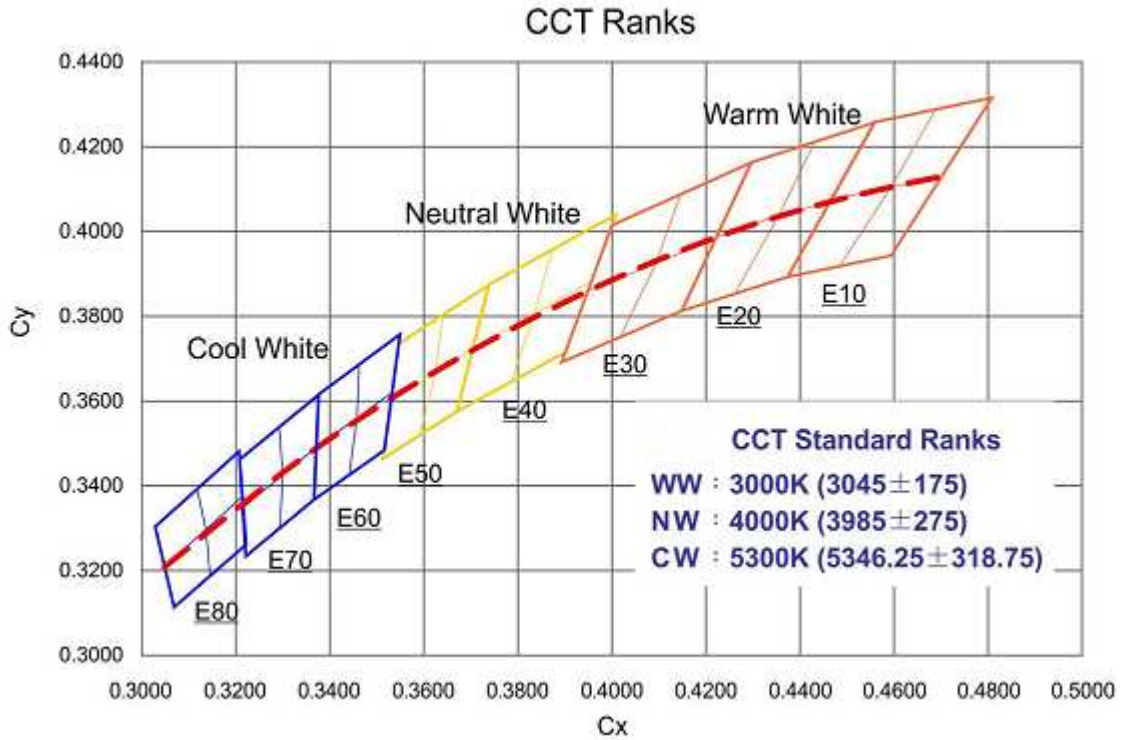
**Table 1-4. Secondary BIN No.**

BIN Code	Secondary BIN No.	Position	CCT(K)		Tolerance Quadrant							
			Left	Right	Right Up		Left Up		Left Down		Right Down	
			min.	max.	x	y	x	y	x	y	x	y
E10	E11	Down	2580	2725	0.4703	0.4132	0.4593	0.4106	0.4483	0.3919	0.4593	0.3944
	E12	Up			0.4813	0.4319	0.4688	0.4290	0.4593	0.4106	0.4703	0.4132
	E13	Down	2725	2870	0.4593	0.4106	0.4468	0.4077	0.4373	0.3893	0.4483	0.3919
	E14	Up			0.4688	0.4290	0.4562	0.4260	0.4468	0.4077	0.4593	0.4106
E20	E21	Down	2870	3045	0.4468	0.4077	0.4355	0.4037	0.4260	0.3854	0.4373	0.3893
	E22	Up			0.4562	0.4260	0.4431	0.4213	0.4355	0.4037	0.4468	0.4077
	E23	Down	3045	3220	0.4355	0.4037	0.4223	0.3990	0.4147	0.3814	0.4260	0.3854
	E24	Up			0.4431	0.4213	0.4299	0.4165	0.4223	0.3990	0.4355	0.4037
E30	E31	Down	3220	3465	0.4223	0.3990	0.4094	0.3928	0.4018	0.3752	0.4147	0.3814
	E32	Up			0.4299	0.4165	0.4148	0.4090	0.4094	0.3928	0.4223	0.3990
	E33	Down	3465	3710	0.4094	0.3928	0.3943	0.3853	0.3889	0.3690	0.4018	0.3752
	E34	Up			0.4148	0.4090	0.3996	0.4015	0.3943	0.3853	0.4094	0.3928

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<b>E40</b>	<b>E41</b>	Down	3710	3985	0.3952	0.3880	0.3838	0.3811	0.3784	0.3647	0.3898	0.3716
	<b>E42</b>	Up			0.4006	0.4044	0.3871	0.3959	0.3838	0.3811	0.3952	0.3880
	<b>E43</b>	Down	3985	4260	0.3838	0.3811	0.3703	0.3726	0.3670	0.3578	0.3784	0.3647
	<b>E44</b>	Up			0.3871	0.3959	0.3736	0.3874	0.3703	0.3726	0.3838	0.3811
<b>E50</b>	<b>E51</b>	Down	4260	4502.5	0.3703	0.3726	0.3624	0.3670	0.3591	0.3522	0.3670	0.3578
	<b>E52</b>	Up			0.3736	0.3874	0.3642	0.3805	0.3624	0.3670	0.3703	0.3726
	<b>E53</b>	Down	4502.5	4745	0.3624	0.3670	0.3530	0.3601	0.3512	0.3465	0.3591	0.3522
	<b>E54</b>	Up			0.3642	0.3805	0.3548	0.3736	0.3530	0.3601	0.3624	0.3670
<b>E60</b>	<b>E61</b>	Down	4745	5027.5	0.3533	0.3624	0.3459	0.3565	0.3441	0.3428	0.3515	0.3487
	<b>E62</b>	Up			0.3551	0.3760	0.3464	0.3688	0.3459	0.3565	0.3533	0.3624
	<b>E63</b>	Down	5027.5	5310	0.3459	0.3565	0.3371	0.3493	0.3366	0.3369	0.3441	0.3428
	<b>E64</b>	Up			0.3464	0.3688	0.3376	0.3616	0.3371	0.3493	0.3459	0.3565
<b>E70</b>	<b>E71</b>	Down	5310	5665	0.3371	0.3493	0.3299	0.3425	0.3294	0.3302	0.3366	0.3369
	<b>E72</b>	Up			0.3376	0.3616	0.3292	0.3539	0.3299	0.3425	0.3371	0.3493
	<b>E73</b>	Down	5665	6020	0.3299	0.3425	0.3215	0.3348	0.3222	0.3234	0.3294	0.3302
	<b>E74</b>	Up			0.3292	0.3539	0.3207	0.3462	0.3215	0.3348	0.3299	0.3425
<b>E80</b>	<b>E81</b>	Down	6020	6530	0.3213	0.3371	0.3137	0.3297	0.3145	0.3187	0.3221	0.3261
	<b>E82</b>	Up			0.3205	0.3481	0.3117	0.3393	0.3137	0.3297	0.3213	0.3371
	<b>E83</b>	Down	6530	7040	0.3137	0.3297	0.3048	0.3209	0.3068	0.3113	0.3145	0.3187
	<b>E84</b>	Up			0.3117	0.3393	0.3028	0.3304	0.3048	0.3209	0.3137	0.3297

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<Figure 1 CCT Ranks>

**Color Temperature Characteristics**

The following tables describe color temperature of HT65 series.

**Table 2.**

P/N	Color	$\lambda_d$ / CCT		Unit
		Min.	Max	
HT65C	Cool White	5000	10000	K
HT65N	Neutral White	3700	5000	K
HT65W	Warm White	2600	3700	K

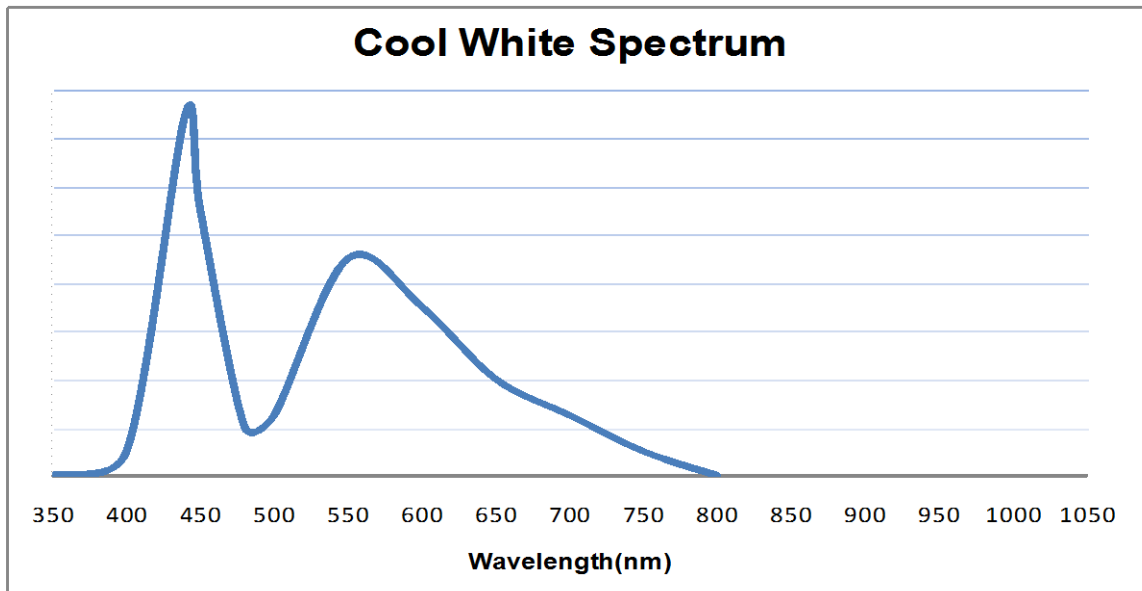
Notes for Table 4:

1. CCT is measured with an accuracy of  $\pm 200K$ .

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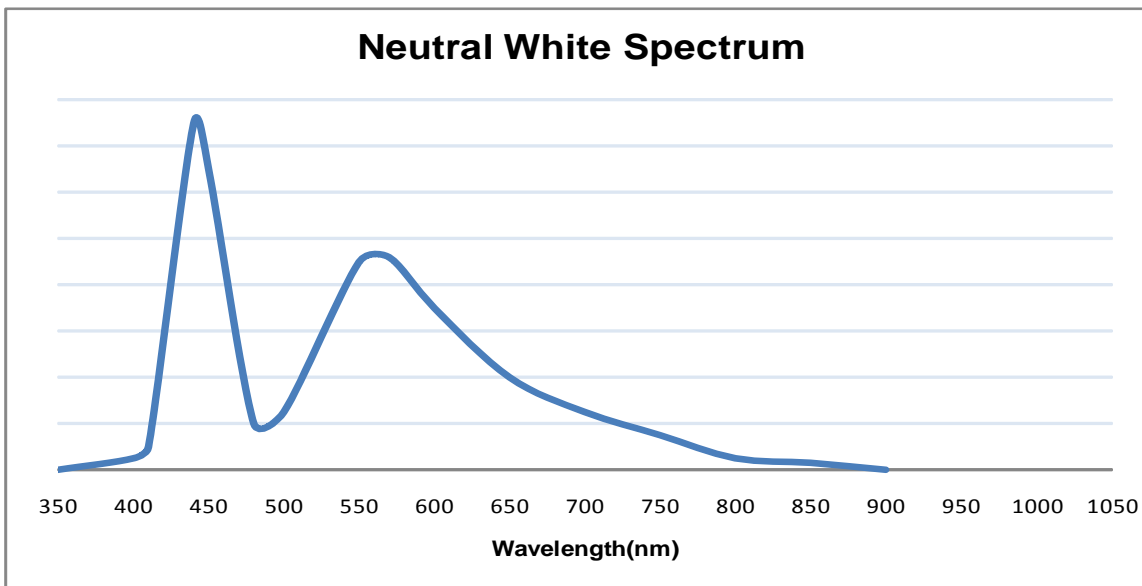
Color Spectrum

**Cool White Color Spectrum**



<Figure 2 cool white color spectrum of HT65 typical CCT part, integrated measurement>

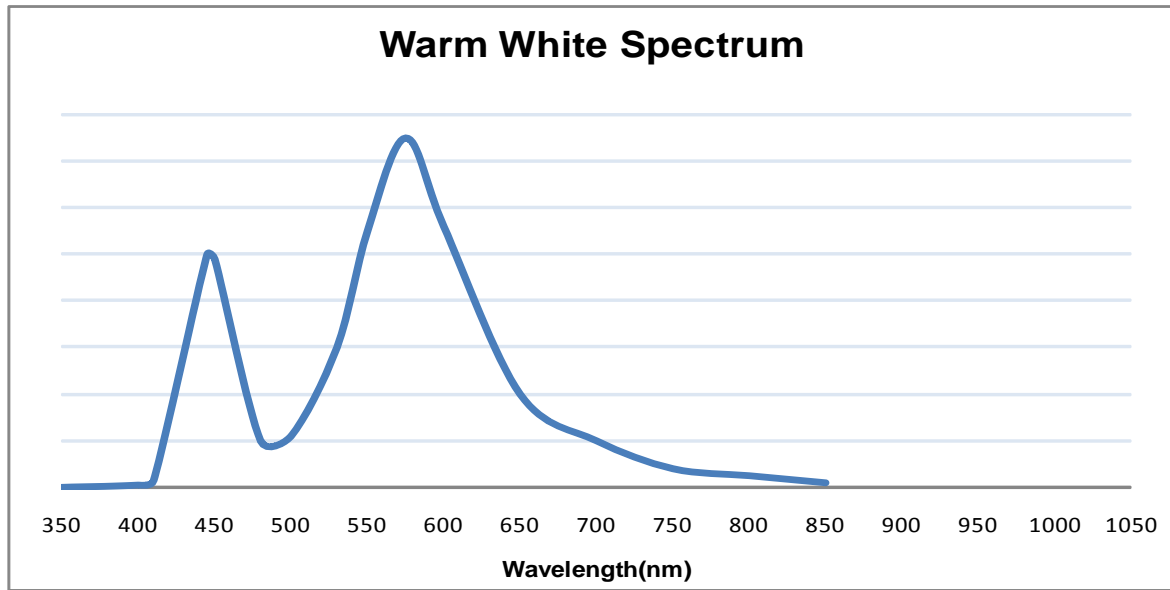
**Neutral White Color Spectrum**



<Figure 3 neutral white color spectrum of HT65 typical CCT part, integrated measurement>

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**Warm White Color Spectrum**

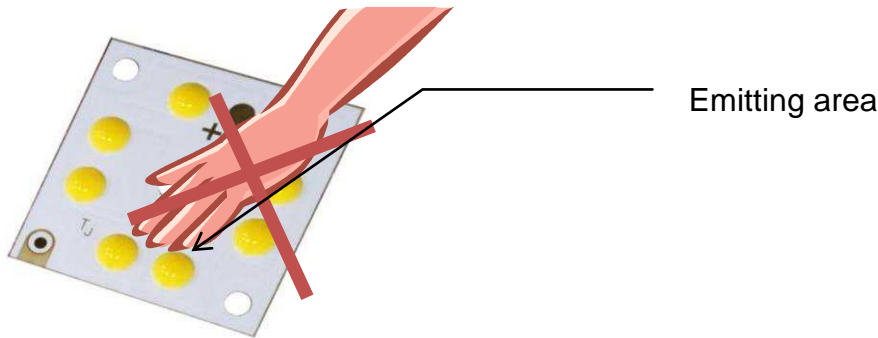


<Figure 4 warm white color spectrum of HT65 typical CCT part, integrated measurement>

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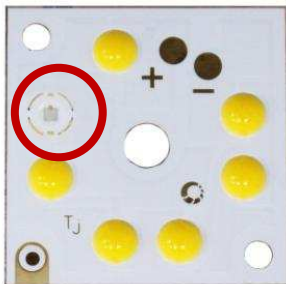
Precaution

- Don't touch, push or squish the light emitting area



Do not touch the LED Array or resin area during operation. Allow the LED Array to cool for a sufficient period of time before handling. The LED Array may reach elevated temperatures such that it can burn skin when touched.

- It may cause the situation as the following picture if the emitter crashes by accident.



- Recommended soldering method

1	Please set up the temperature of the temperature-controlled solder to 400 °C±10°C when soldering.
2	Please put the emitter on hot plate and set up the temperature of the hot plate to 100°C±10°C. Besides, please set up the temperature of the temperature-controlled solder to 300°C±10°C.

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