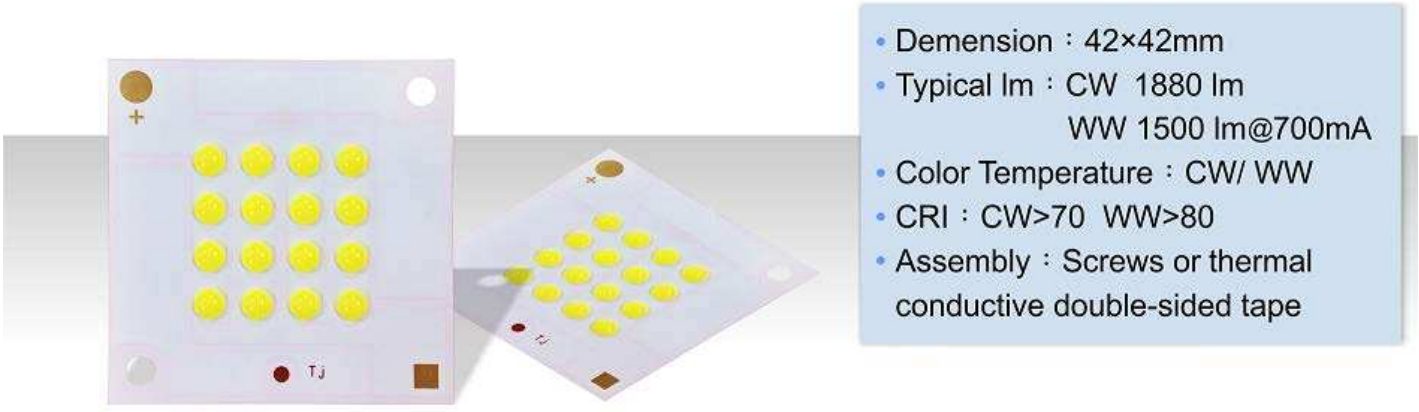
Harvatek COM LEDs Approval Sheet

Model No.: HT64 Series

HARVATEK® COM- HT64C[1] Series



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Note:

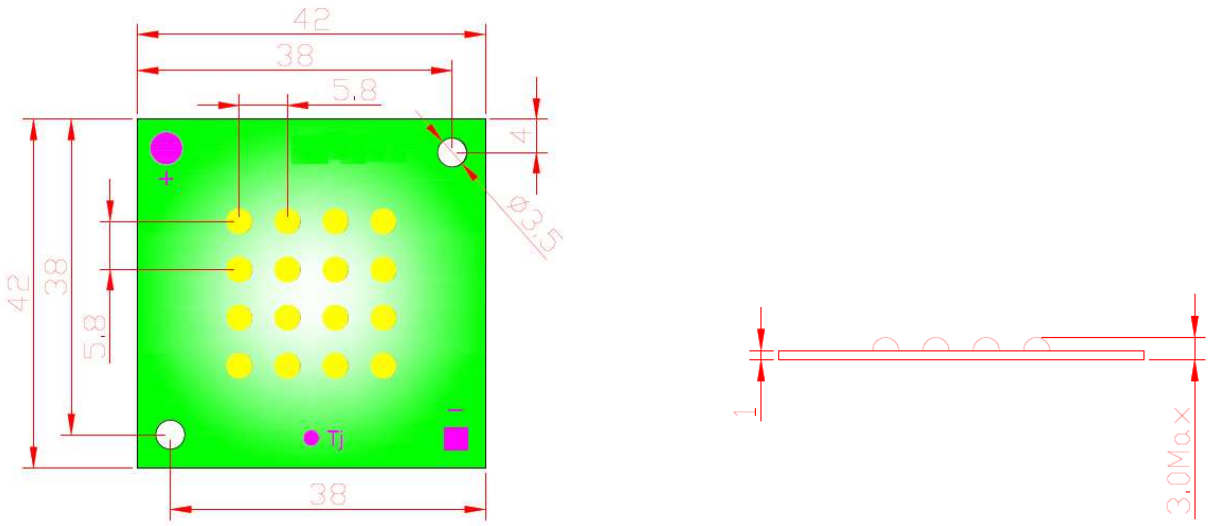
The fifth code represents color temperature

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

Same as below shown.

Dimensions

HT64



Top View Front View

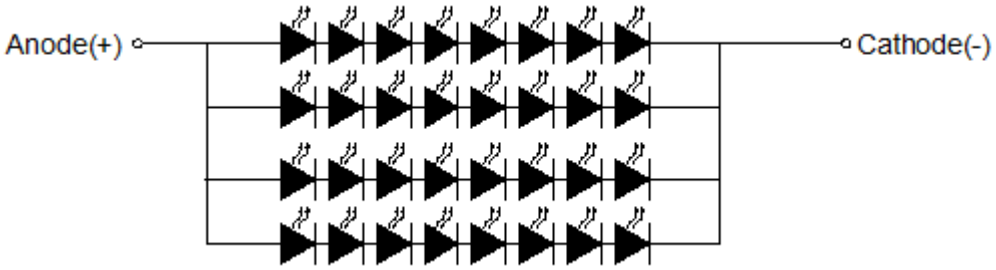
<Figure1 Drawing for part no. HT64C, HT64N, HT64W>.

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 ± 0.20mm.
5. The optical center of the LED Array is defined by the mechanical center of the array.

Circuit Layout

HT64



Absolute Maximum Ratings

The following tables describe absolute maximum ratings of HT64 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_j
Operating Temperature	(-40 to +100)	°C	
Storage Temperature	(-40 to +120)	°C	
LED Substrate Temperature(Heatsink)	<80	°C	T_s

Table 1-2

Table 1-2

	Product Code		
Parameter	HT64(8S4P)	**Unit**	**Symbol**
DC Forward Current(1)	700	mA	I_F
DC Forward Voltage	25	V	V_F
Reverse Voltage(2)	--	V	V_R

Notes for Table 1-2:

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

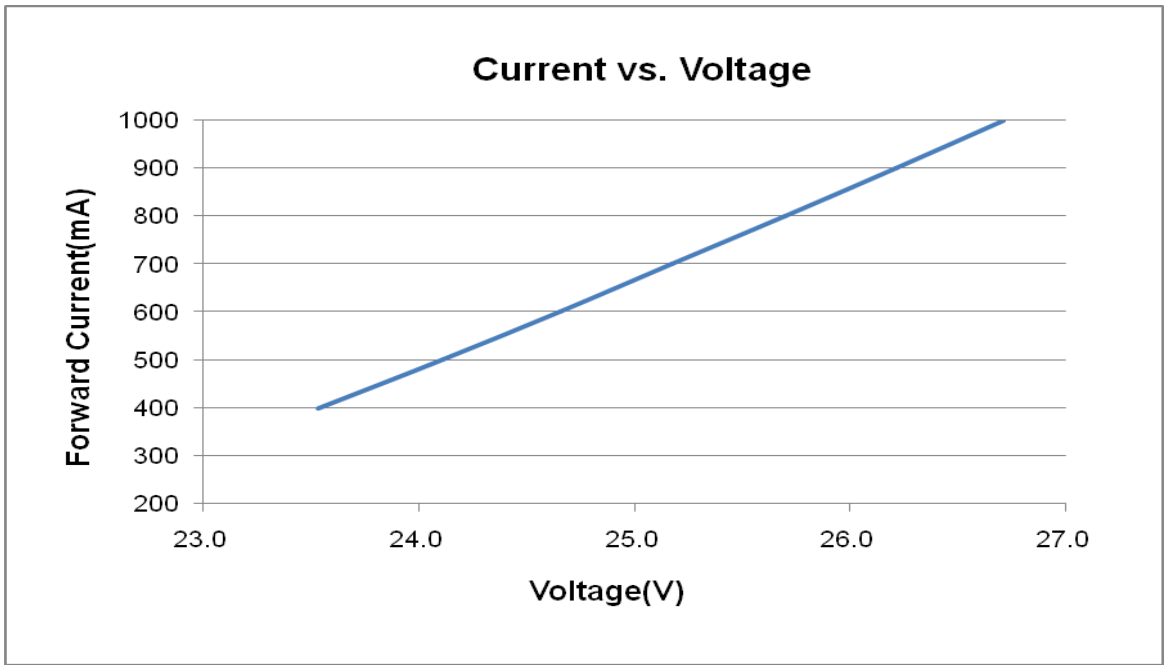
Forward Voltage Characteristics

The following table describes forward voltage of HT64 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_F)	Typ. Voltage (V_F)	Max. Voltage (V_F)	Unit
HT64	23.5	25	27.5	V

Notes for Table 2:



Forward voltage is measured with an accuracy of ±10%

Operating Current and Luminous Flux Characteristics

The following table describes typical luminous flux at T_j=25℃ and T_j=85℃ for HT64 at DC forward current 400mA , 600mA, 700mA and 1000 mA.

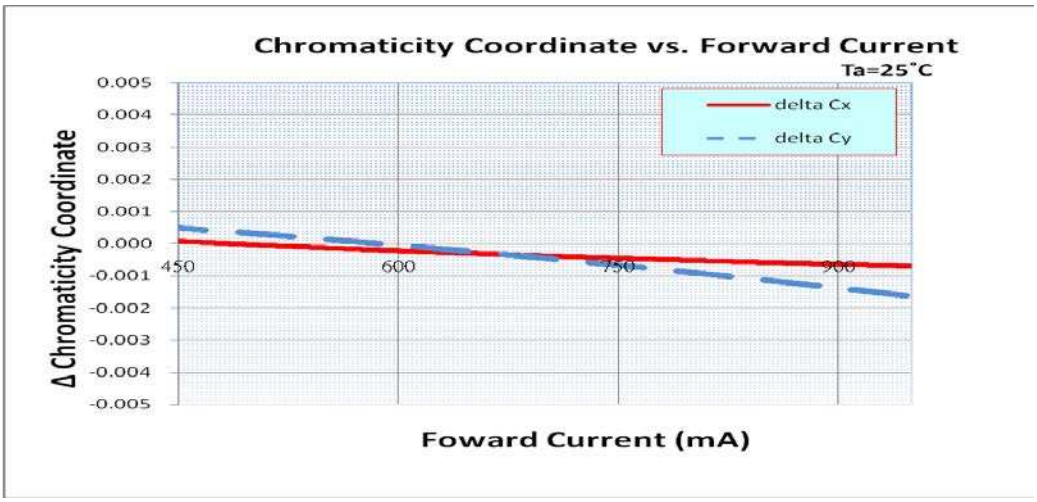
The CCT range shown in the following table is COM Product standard CCT ranks.

Table 3

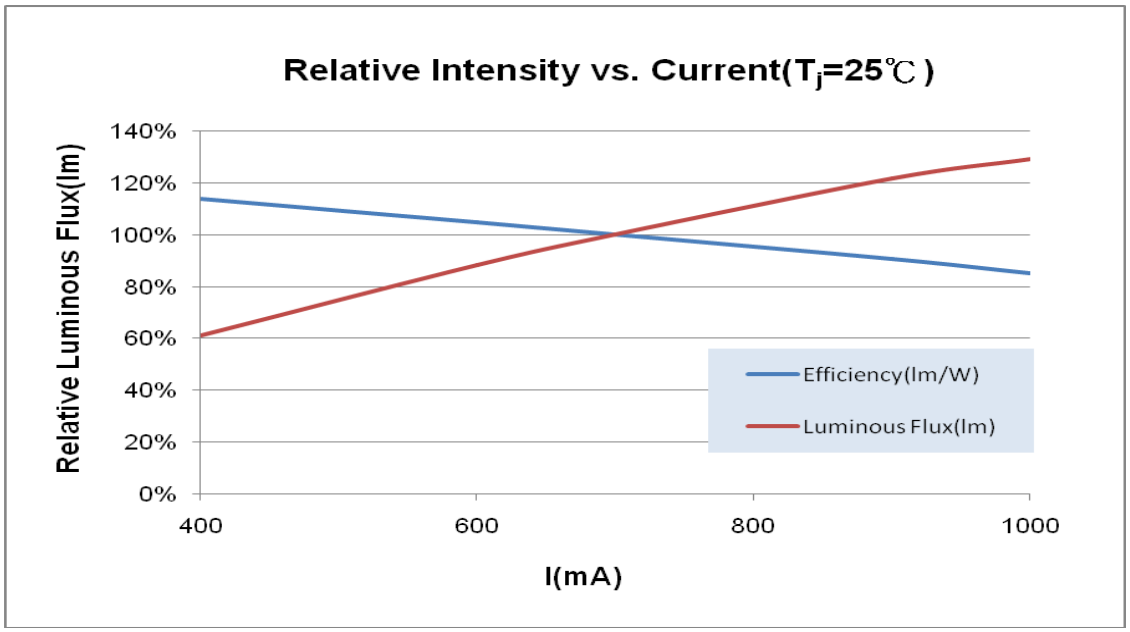
Product No.	ANSI CCT (K)	CRI	Luminous flux(lm)		Test Current (mA)	Power (W) (Typ)	Efficacy (lm/W) (Typ at Tj 25ºC)	Lumen depreciation
			Tj=25ºC	Tj=85ºC				
HT64C	5200K	>70	1150	1012	400	9.42	122	12%
			1658	1459	600	14.8	112	12%
			1880	**1654**	**700**	**17.6**	**107**	**12%**
			2433	2141	1000	26.7	91	12%
HT64N	4000K	>75	1036	922	400	9.42	110	11%
			1490	1326	600	14.8	101	11%
			1707	**1519**	**700**	**17.6**	**97**	**11%**
			2189	1948	1000	26.7	82	11%
HT64W	2900K	>80	923	821	400	9.42	98	11%
			1332	1185	600	14.8	90	11%
			1500	**1335**	**700**	**17.6**	**86**	**11%**
			1940	1727	1000	26.7	73	11%

Notes for Table 3:

Luminous flux is measured with an accuracy of ±10%

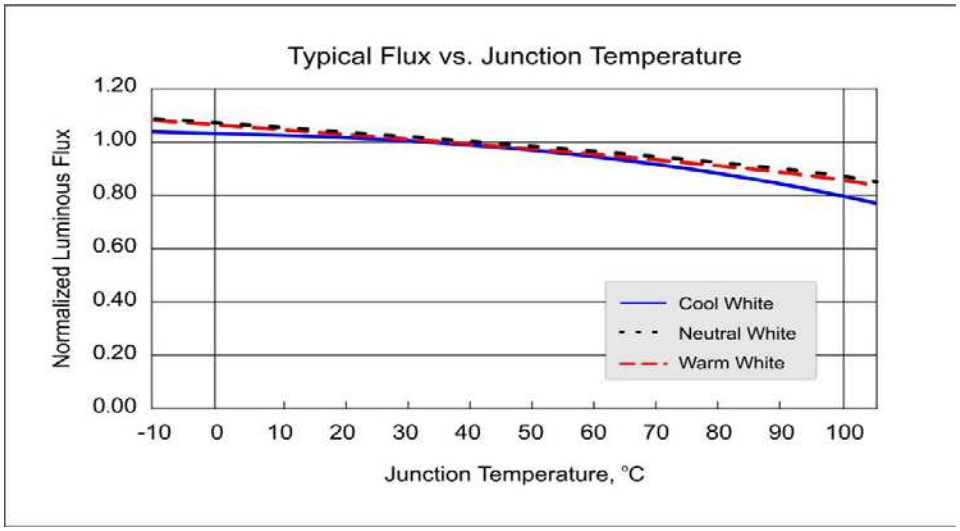


Current vs. Efficiency

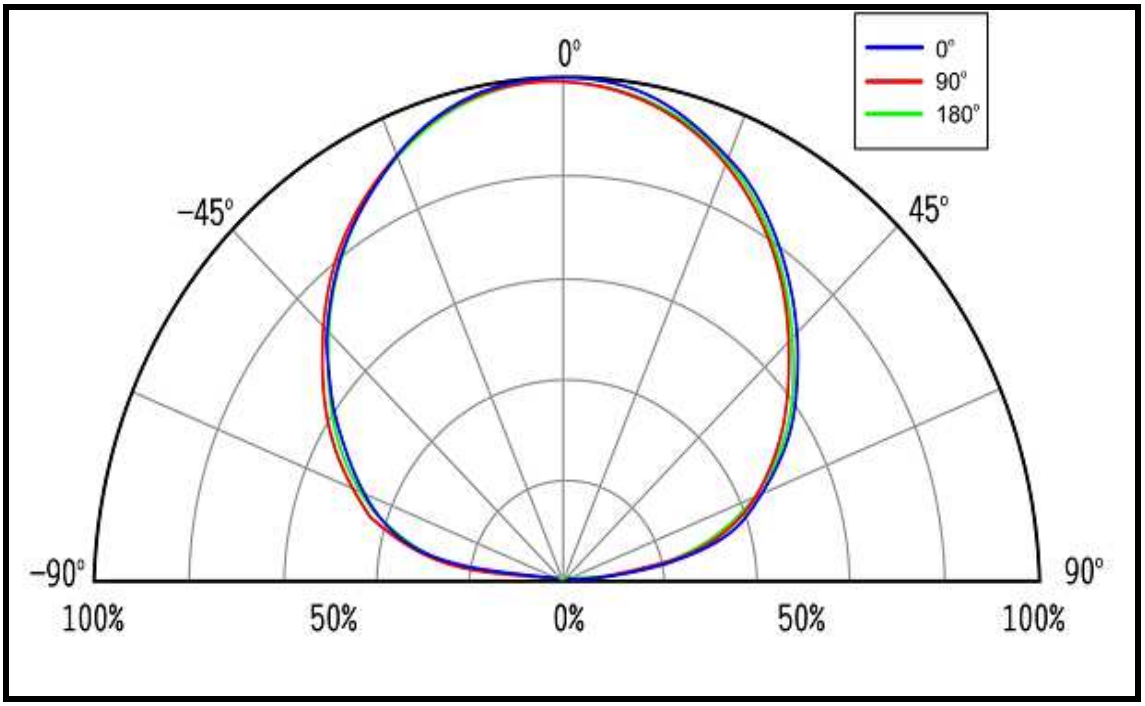


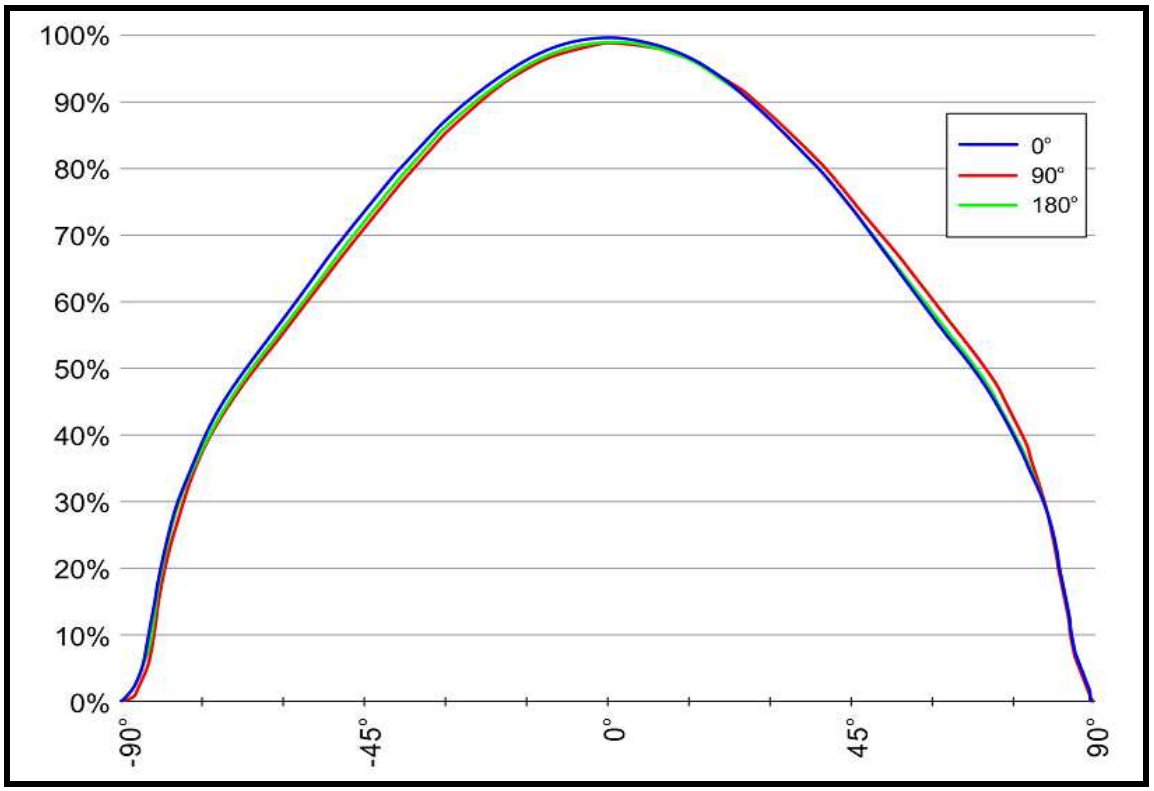
<Figure 2 The trend chart for relative intensity vs. current of HT64C, HT64W>

Input Current (mA)	400	600	700	1000
Actual Watt	9.42	14.8	**17.6**	26.7
Total Typical lm for CW	1150	1658	**1880**	2433
Total Typical lm for WW	923	1332	**1500**	1940
Suggested Application			**Flood light** **Downlight**	



Photometric





Appendix

BIN Code Definition

The following tables describe luminous flux group and color group.

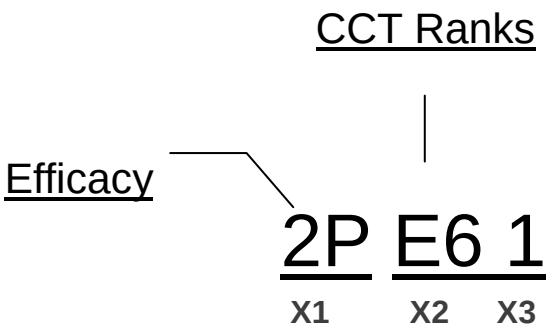


Table 1-1.

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

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 2700K	E20 3000K	E30 3500K	E40 4000K	E50 4500K	E60 5000K	E70 5700K	E80 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				
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								

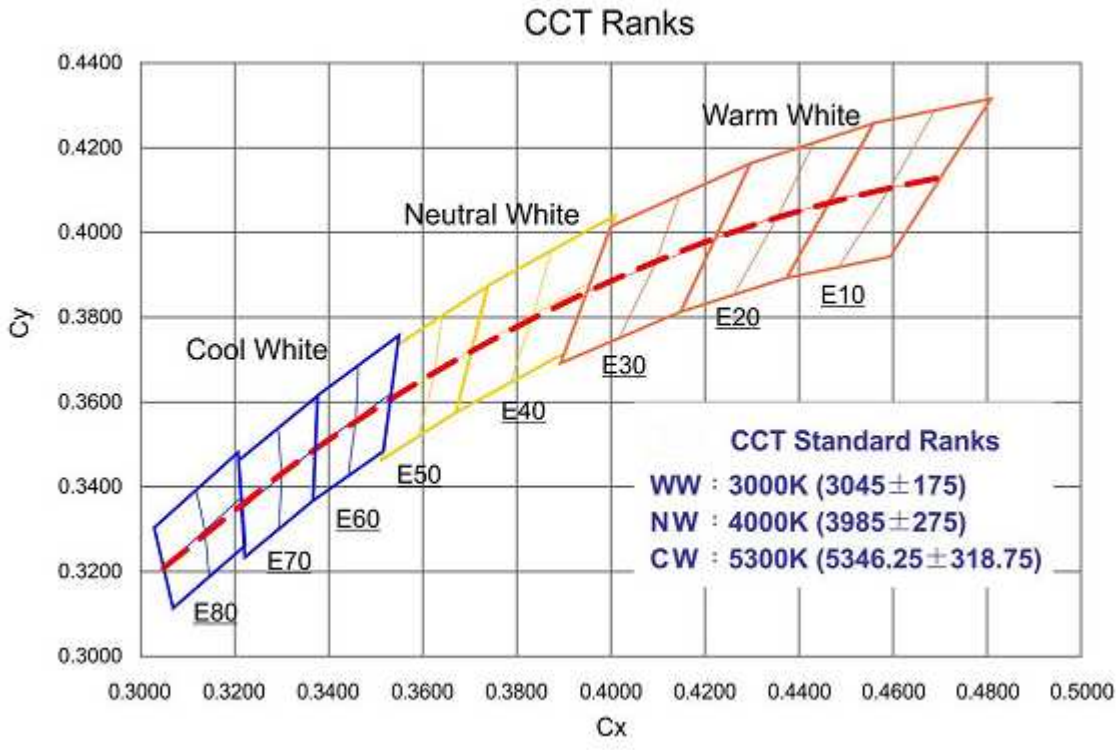
Table 1-3. CCT ANSI C78.377A

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

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



<Figure 1 CCT Ranks>

Color Temperature Characteristics

The following tables describe color temperature of HT64 series.

Table 2.

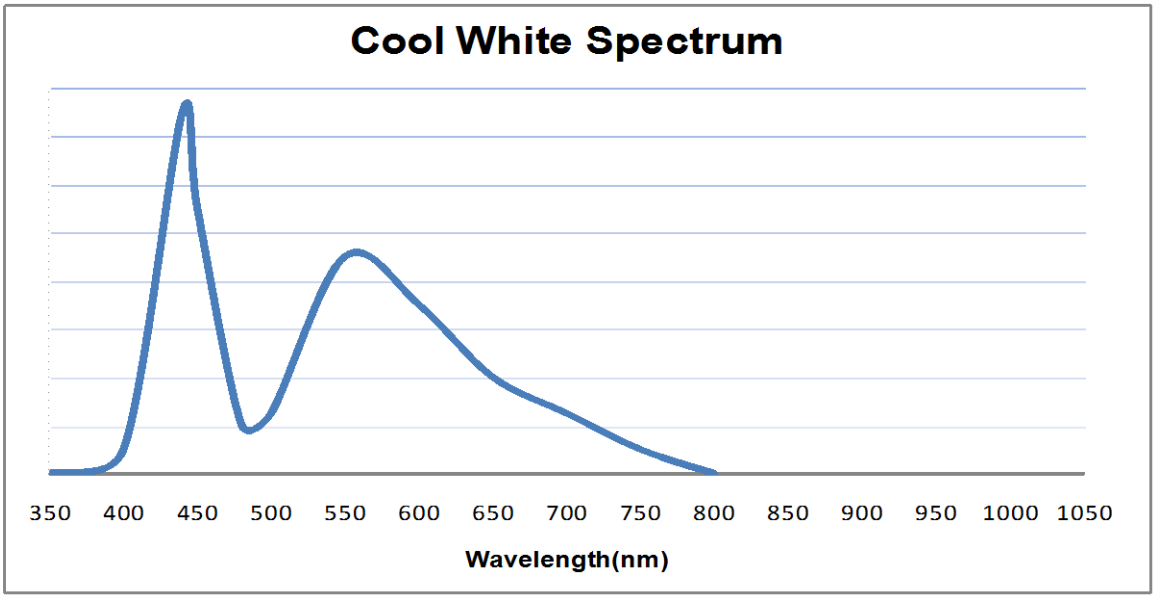
P/N	Color	λ d / CCT		Unit
		Min.	Max	
HT64C	**Cool White**	5000	10000	K
HT64N	**Neutral White**	3700	5000	K
HT64W	**Warm White**	2600	3700	K

Notes for Table 4:

1. CCT is measured with an accuracy of ± 200K.

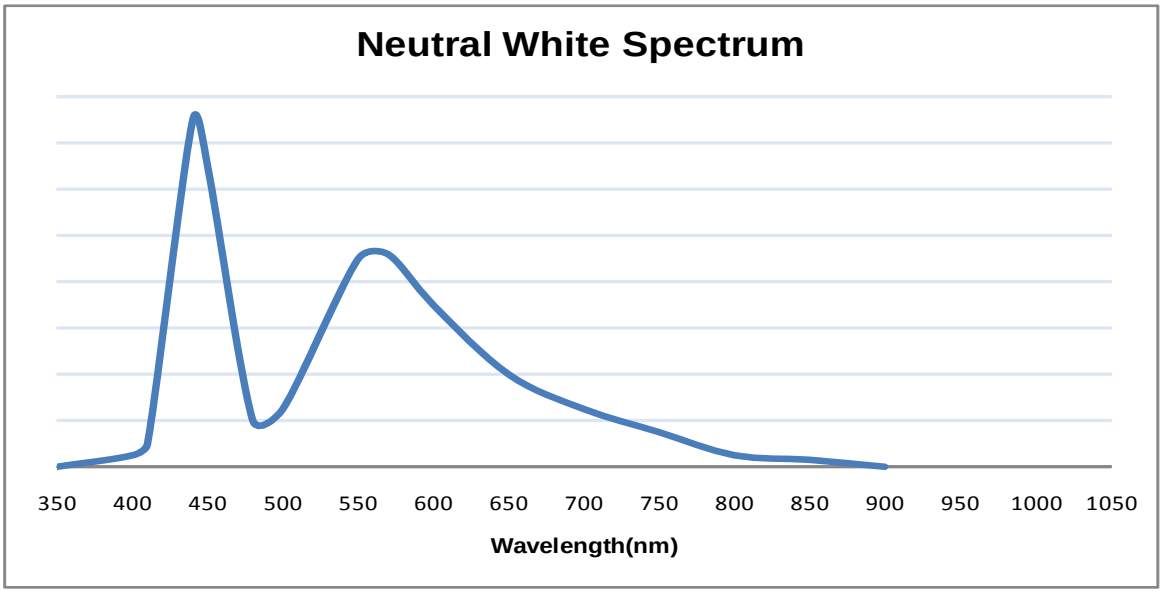
Color Spectrum

Cool White Color Spectrum



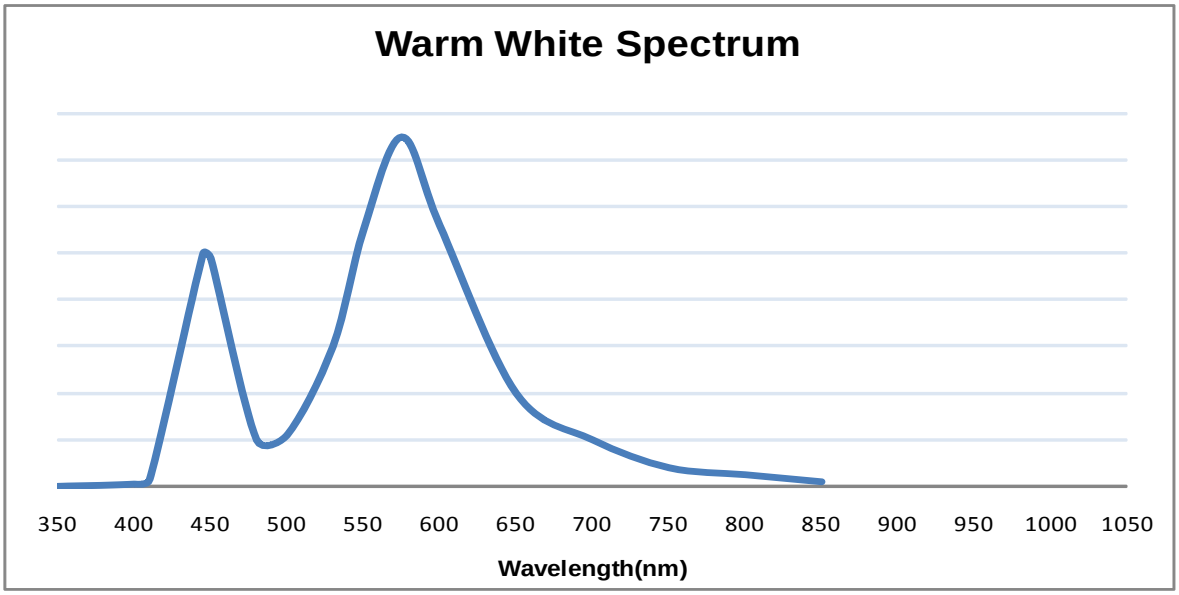
<Figure 2 cool white color spectrum of HT64 typical CCT part, integrated measurement>

Neutral White Color Spectrum



<Figure 3 neutral white color spectrum of HT64 typical CCT part, integrated measurement>

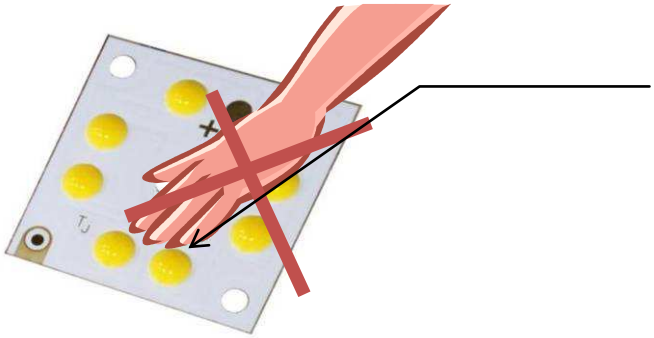
Warm White Color Spectrum



<Figure 4 warm white color spectrum of HT64 typical CCT part, integrated measurement>

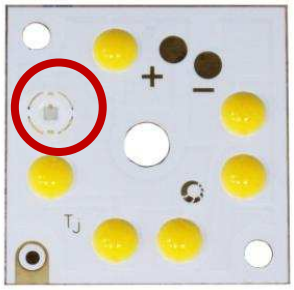
Precaution

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