LITEON®
OPTOELECTRONICS

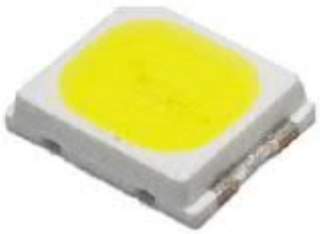
Specific Lighting

2835 Product Data Sheet

LTW-2835AQLXX Series

Create Date：

Revision:



LITE-ON Technology Corp. / Optoelectronics
No.90,Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.
Tel: 886-2-2222-6181 Fax: 886-2-2221-1948 / 886-2-2221-0660
http://www.liteon.com/opto

Specific Lighting
LTW-2835AQLXX Series

1. Description

The LiteON 2835 Product series is a wide beam angle standard-dimension package, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. It gives you total design freedom and unmatched brightness, creating a new opportunities for solid state lighting to displace conventional lighting technologies.

.

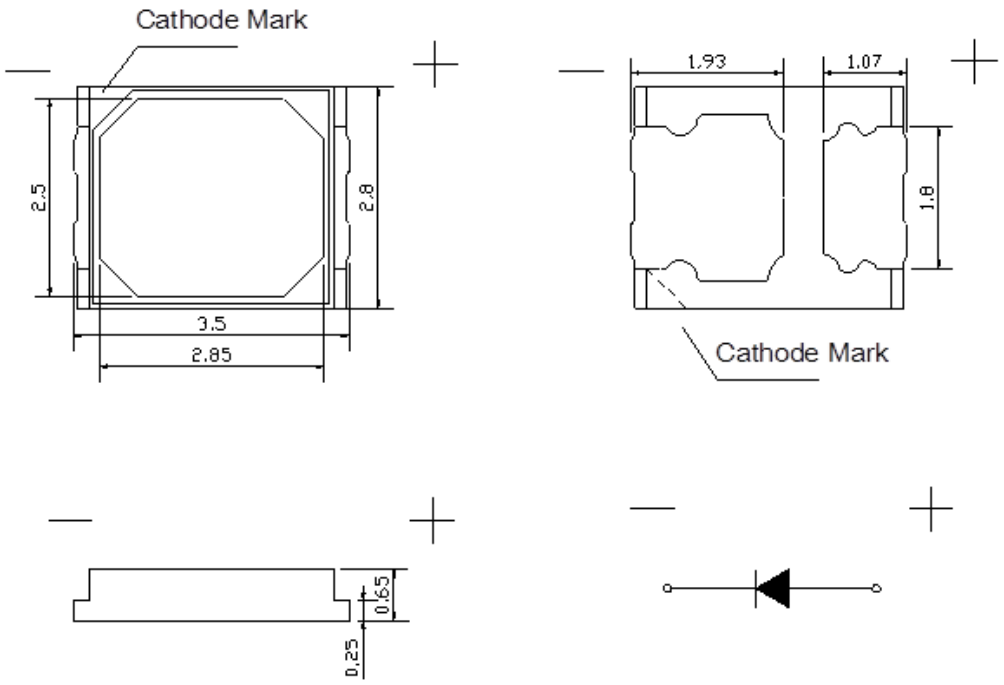
1.1Features

- Package in 8mm tape on 7" diameter reels.
- Compatible with automatic placement equipment.
- Compatible with infrared and vapor phase reflow solder process.
- EIA STD package.
- I.C. compatible.
- Meet green product and Pb-free(According to RoHS)

1.2 Available Part Numbers

CCT	Part No.
2700K	LTW-2835AQL27
3000K	LTW-2835AQL30
3500K	LTW-2835AQL35
4000K	LTW-2835AQL40
5000K	LTW-2835AQL50
5700K	LTW-2835AQL57
6500K	LTW-2835AQL65

2. Outline Dimensions



Part No.	Lens Color	Source Color
LTW-2835AQL27	Orange	InGaN Blue
LTW-2835AQL30		
LTW-2835AQL35		
LTW-2835AQL40		
LTW-2835AQL50		
LTW-2835AQL57		
LTW-2835AQL65		

Notes:

1. All dimensions are in millimeters.
2. Thickness tolerance of copper plate is ±0.02 mm.
3. Thickness tolerance of product is ±0.05 mm.
4. Tolerance is ±0.1 mm unless otherwise noted.

3. Absolute Maximum Ratings at Ta=25℃

Parameter	Symbol	Rating	Unit
Power Dissipation	P_o	594	mW
Continuous Forward Current	I_F	180	mA
Pulse Forward Current	I_{PF}	400	mA
Reverse Voltage	V_R	5	V
Operating Temperature Range	T_{opr}	-40 ~ +85	°C
Storage Temperature Range	T_{stg}	-40 ~ +100	°C
Junction Temperature	Tj	115	°C

Note:

1. Pulsed Duty ≤ 1/10, Pulse width ≤100us.
2. Forbid to operating at reverse voltage condition for long
3. It is recommended to follow de-rating curve to use maximum rating to ensure LED can operated normally.

4. Electro-Optical Characteristics at Ta=25°C

4.1 Typical Performance

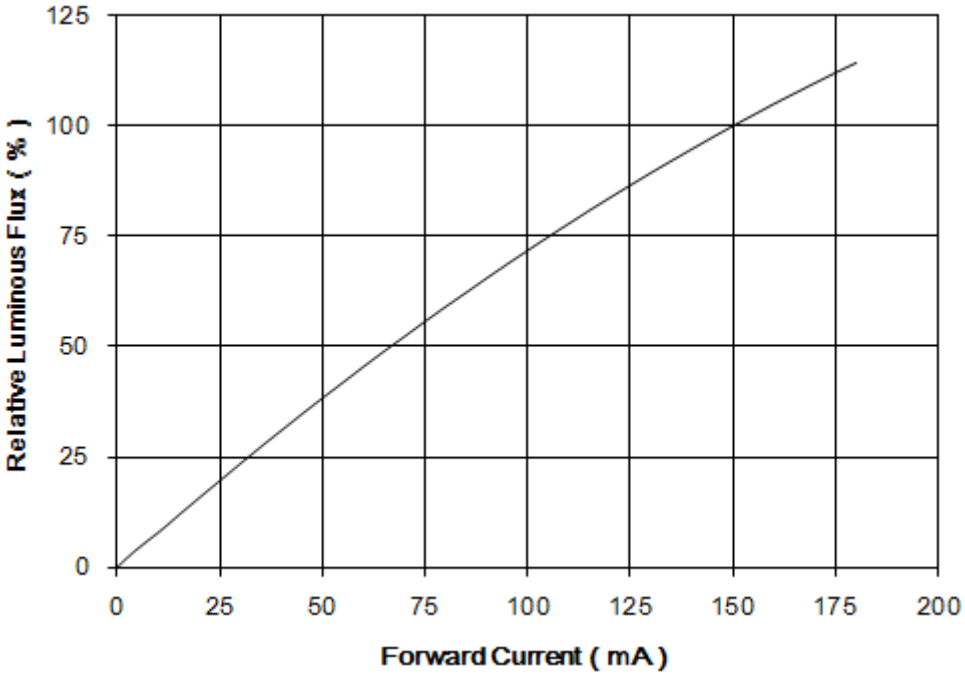
Parameter	Symbol	Values								Unit	Test Condition
Correlated Color Temp.	CCT	Typ.	2700	3000	3500	4000	5000	5700	6500	K	
Chromaticity Coordinates	x	Typ.	0.458	0.434	0.408	0.382	0.345	0.329	0.312	-	I_F = 150mA
	y	Typ.	0.41	0.403	0.392	0.38	0.355	0.342	0.328		
Luminous Flux [1]	Φ_V	Min	43.5	44.8	47.4	47.4	48.7	48.7	47.4	lm	
		Typ.	49.4	50.7	53.5	53.5	54.8	54.8	53.5		
		Max.	55.2	56.6	59.6	59.6	60.9	60.9	59.6		
Optical Efficacy	η_{opt}	Typ.	103.8	106.6	112.5	112.5	115.3	115.3	112.5	lm/W	
Color Rendering Index	CRI	Min.	90							-	
Viewing Angle	$2\theta_{1/2}$	Typ.	120							deg	
Forward Voltage	V_F	Min	3.00							V	
		Typ.	3.17								
		Max.	3.40								
Thermal Resistance (Junction to Solder Point)	R_{th-js}	Typ.	21							°C/W	
ESD-Withstand Voltage	ESD	Min	2K							HBM	V

Notes

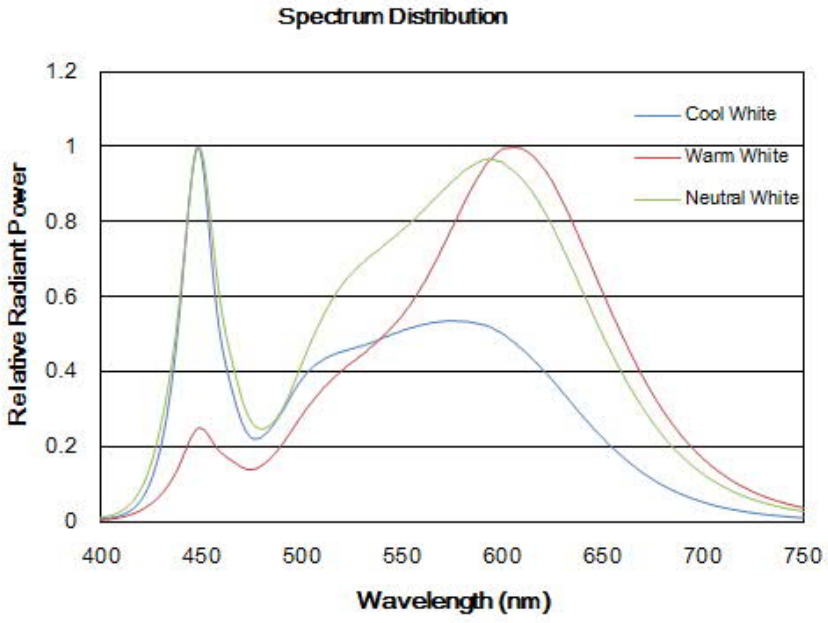
1. Luminous flux is the total luminous flux output as measured with an integrating sphere.
2. Iv classification code is marked on each packing bag.
3. The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.
4. Caution in ESD:

   Static Electricity and surge damages the LED. It is recommended using a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.
5. CAS140B is the test standard for the chromaticity coordinates (x, y) & Iv
6. The chromaticity coordinates (x, y) guarantee should be added ± 0.007 tolerance
7. Ra measurement allowance is ±3
8. Luminous flux measurement tolerance is ±10%
9. Forward Voltage measurement tolerance is ±0.1V

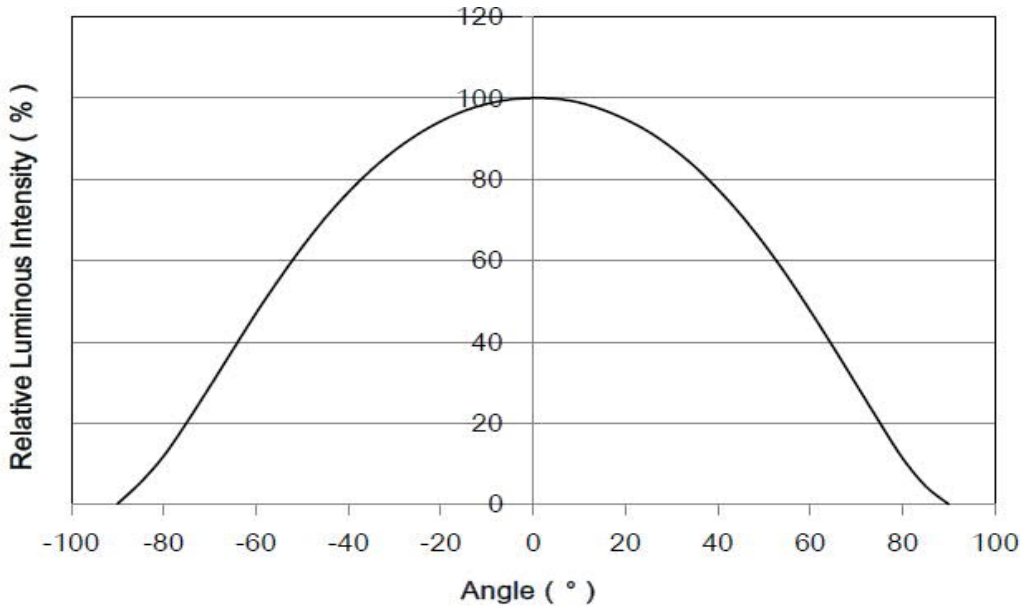
4.2 Forward Current vs. Lumen



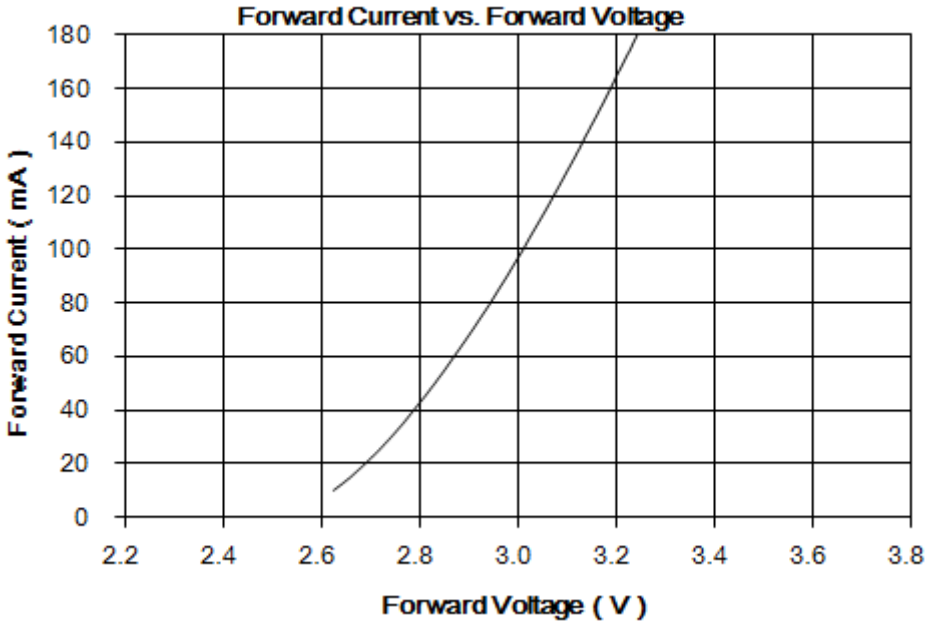
4.3 Relative Spectral Power Distribution at Typical Current



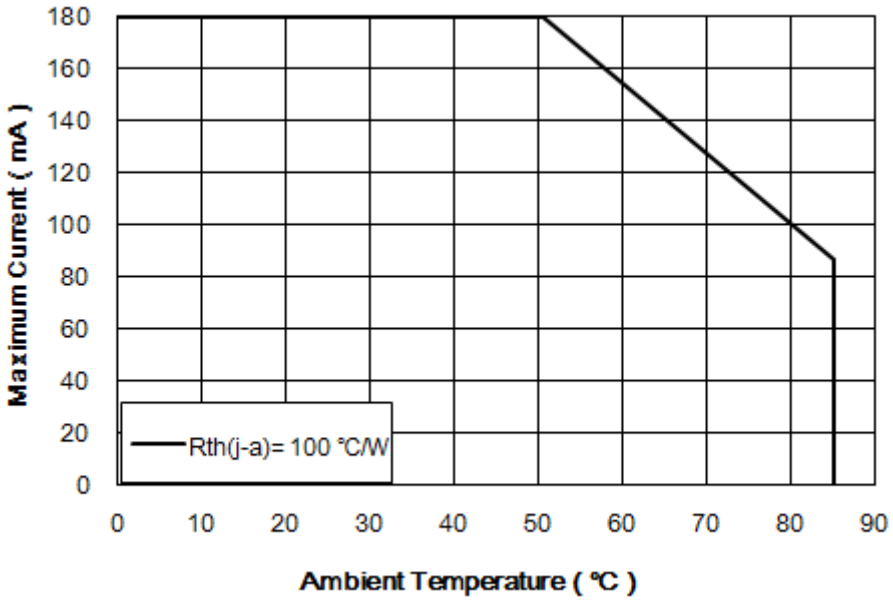
4.4 Radiation Characteristics



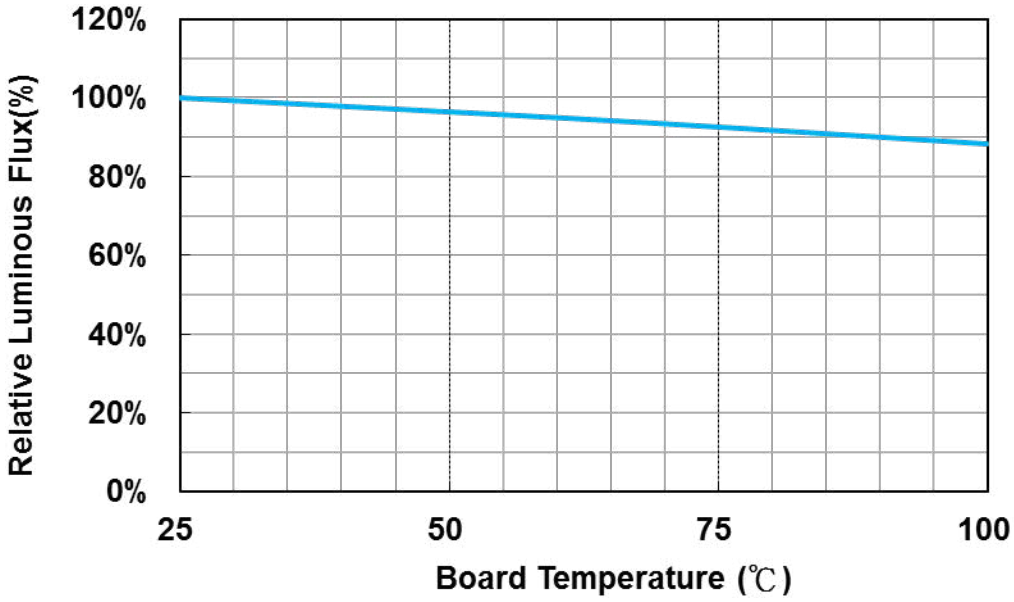
4.5 Forward Current vs. Forward Voltage



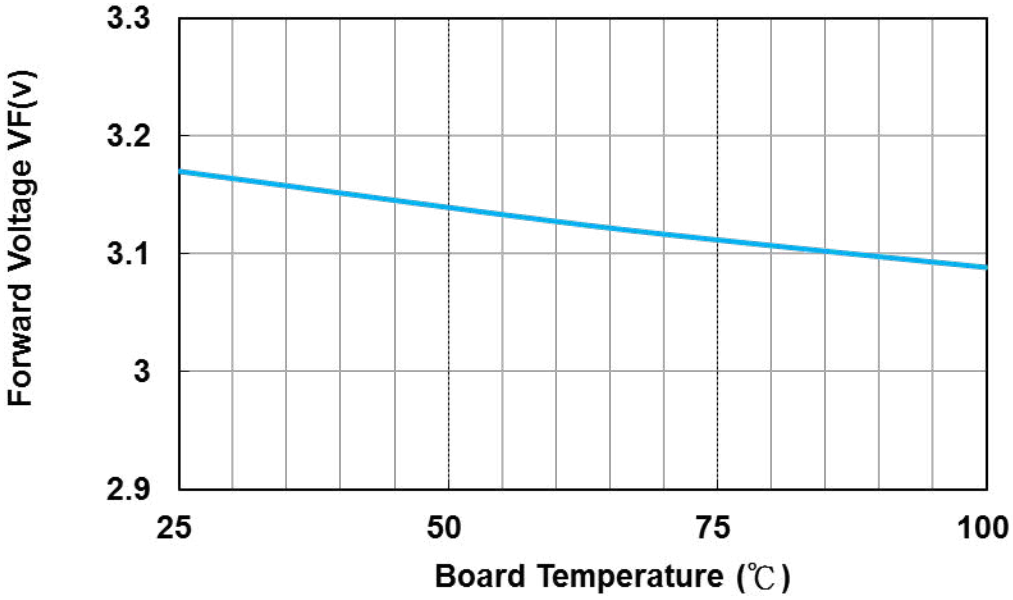
4.6 Forward Current Derating Curve



4.7 Relative Intensity vs. board Temperature



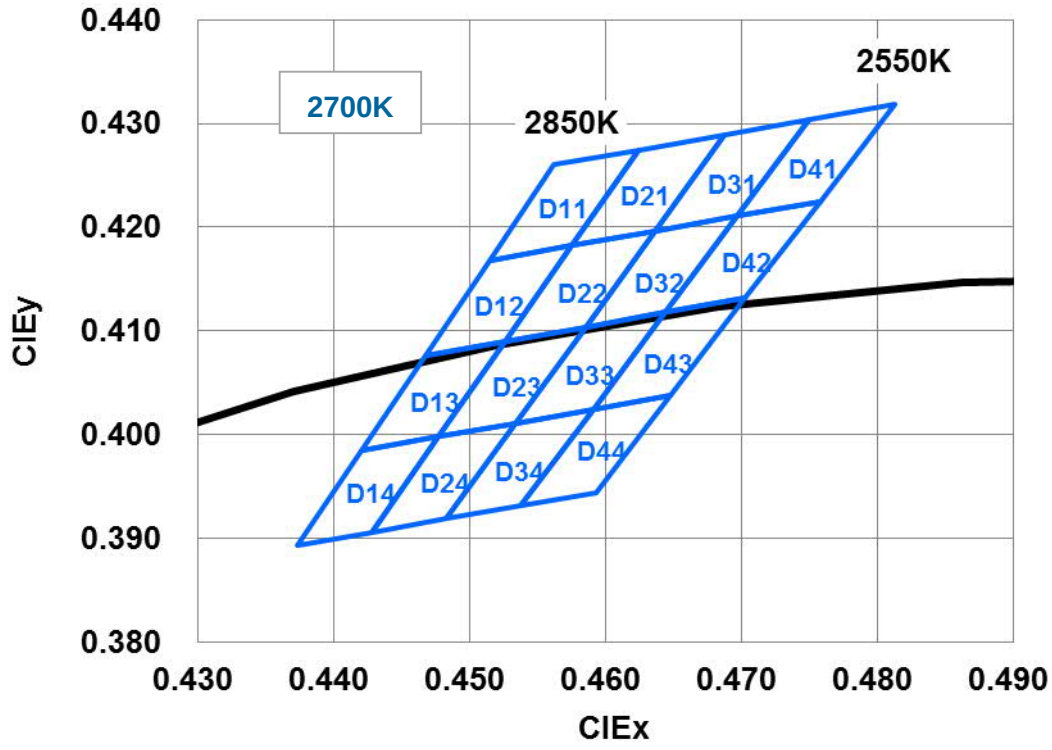
4.8 Forward Voltage vs. board Temperature



5. Binning Definition

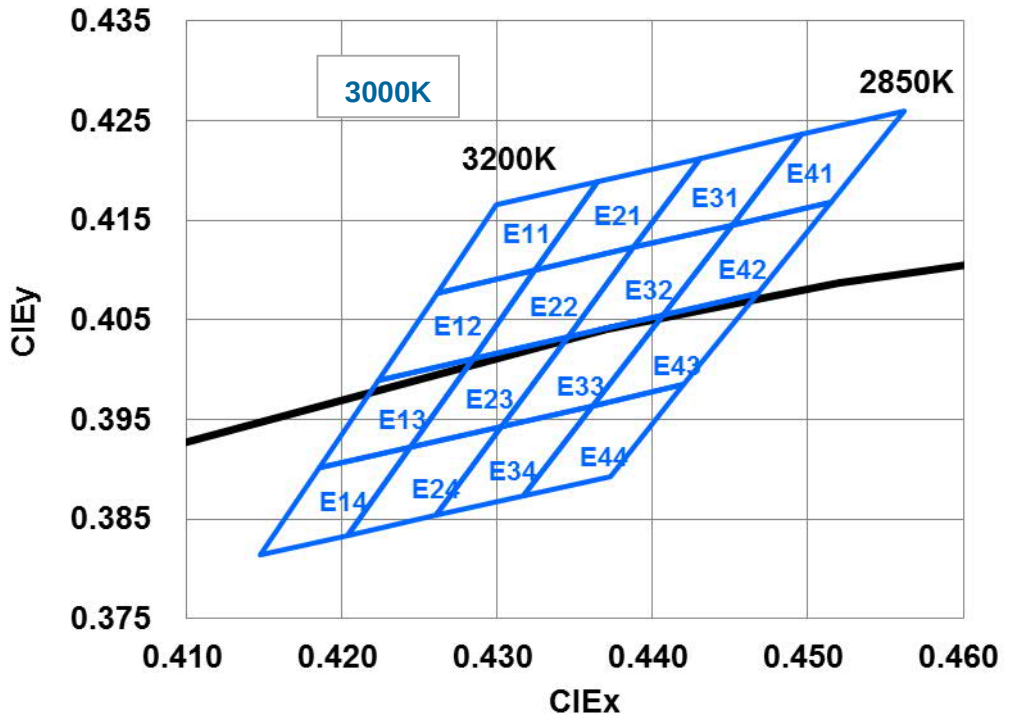
5.1 Color Bin

2700K (IF = 150 mA)															
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
D11	1	0.4562	0.4260	D21	1	0.4625	0.4275	D31	1	0.4688	0.4290	D41	1	0.4750	0.4304
	2	0.4515	0.4168		2	0.4576	0.4183		2	0.4636	0.4197		2	0.4697	0.4211
	3	0.4576	0.4183		3	0.4636	0.4197		3	0.4697	0.4211		3	0.4758	0.4225
	4	0.4625	0.4275		4	0.4688	0.4290		4	0.4750	0.4304		4	0.4813	0.4319
	1	0.4562	0.4260		1	0.4625	0.4275		1	0.4688	0.4290		1	0.4750	0.4304
D12	1	0.4515	0.4168	D22	1	0.4576	0.4183	D32	1	0.4636	0.4197	D42	1	0.4697	0.4211
	2	0.4468	0.4077		2	0.4526	0.4090		2	0.4585	0.4104		2	0.4644	0.4118
	3	0.4526	0.4090		3	0.4585	0.4104		3	0.4644	0.4118		3	0.4703	0.4132
	4	0.4576	0.4183		4	0.4636	0.4197		4	0.4697	0.4211		4	0.4758	0.4225
	1	0.4515	0.4168		1	0.4576	0.4183		1	0.4636	0.4197		1	0.4697	0.4211
D13	1	0.4468	0.4077	D23	1	0.4526	0.4090	D33	1	0.4585	0.4104	D43	1	0.4644	0.4118
	2	0.4420	0.3985		2	0.4477	0.3998		2	0.4534	0.4011		2	0.4591	0.4025
	3	0.4477	0.3998		3	0.4534	0.4011		3	0.4591	0.4025		3	0.4648	0.4038
	4	0.4526	0.4090		4	0.4585	0.4104		4	0.4644	0.4118		4	0.4703	0.4132
	1	0.4468	0.4077		1	0.4526	0.4090		1	0.4585	0.4104		1	0.4644	0.4118
D14	1	0.4420	0.3985	D24	1	0.4477	0.3998	D34	1	0.4534	0.4011	D44	1	0.4591	0.4025
	2	0.4373	0.3893		2	0.4428	0.3906		2	0.4483	0.3919		2	0.4538	0.3931
	3	0.4428	0.3906		3	0.4483	0.3919		3	0.4538	0.3931		3	0.4593	0.3944
	4	0.4477	0.3998		4	0.4534	0.4011		4	0.4591	0.4025		4	0.4648	0.4038
	1	0.4420	0.3985		1	0.4477	0.3998		1	0.4534	0.4011		1	0.4591	0.4025



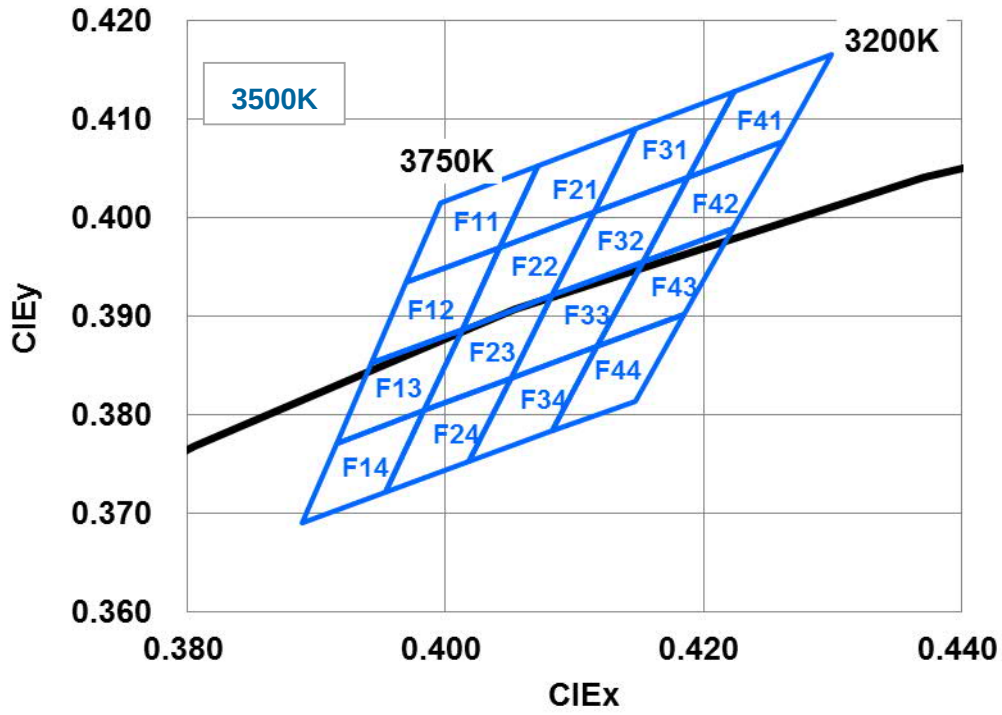
Specific Lighting
LTW-2835AQLXX Series

3000K (IF = 150 mA)															
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
E11	1	0.4299	0.4165	E21	1	0.4365	0.4189	E31	1	0.4431	0.4213	E41	1	0.4496	0.4236
	2	0.4261	0.4077		2	0.4324	0.4100		2	0.4388	0.4123		2	0.4451	0.4146
	3	0.4324	0.4100		3	0.4388	0.4123		3	0.4451	0.4146		3	0.4515	0.4168
	4	0.4365	0.4189		4	0.4431	0.4213		4	0.4496	0.4236		4	0.4562	0.4260
	1	0.4299	0.4165		1	0.4365	0.4189		1	0.4431	0.4213		1	0.4496	0.4236
E12	1	0.4261	0.4077	E22	1	0.4324	0.4100	E32	1	0.4388	0.4123	E42	1	0.4451	0.4146
	2	0.4223	0.3990		2	0.4284	0.4011		2	0.4345	0.4033		2	0.4406	0.4055
	3	0.4284	0.4011		3	0.4345	0.4033		3	0.4406	0.4055		3	0.4468	0.4077
	4	0.4324	0.4100		4	0.4388	0.4123		4	0.4451	0.4146		4	0.4515	0.4168
	1	0.4261	0.4077		1	0.4324	0.4100		1	0.4388	0.4123		1	0.4451	0.4146
E13	1	0.4223	0.3990	E23	1	0.4284	0.4011	E33	1	0.4345	0.4033	E43	1	0.4406	0.4055
	2	0.4185	0.3902		2	0.4244	0.3923		2	0.4303	0.3943		2	0.4361	0.3964
	3	0.4244	0.3923		3	0.4303	0.3943		3	0.4361	0.3964		3	0.4420	0.3985
	4	0.4284	0.4011		4	0.4345	0.4033		4	0.4406	0.4055		4	0.4468	0.4077
	1	0.4223	0.3990		1	0.4284	0.4011		1	0.4345	0.4033		1	0.4406	0.4055
E14	1	0.4185	0.3902	E24	1	0.4244	0.3923	E34	1	0.4303	0.3943	E44	1	0.4361	0.3964
	2	0.4147	0.3814		2	0.4204	0.3834		2	0.4260	0.3854		2	0.4317	0.3873
	3	0.4204	0.3834		3	0.4260	0.3854		3	0.4317	0.3873		3	0.4373	0.3893
	4	0.4244	0.3923		4	0.4303	0.3943		4	0.4361	0.3964		4	0.4420	0.3985
	1	0.4185	0.3902		1	0.4244	0.3923		1	0.4303	0.3943		1	0.4361	0.3964



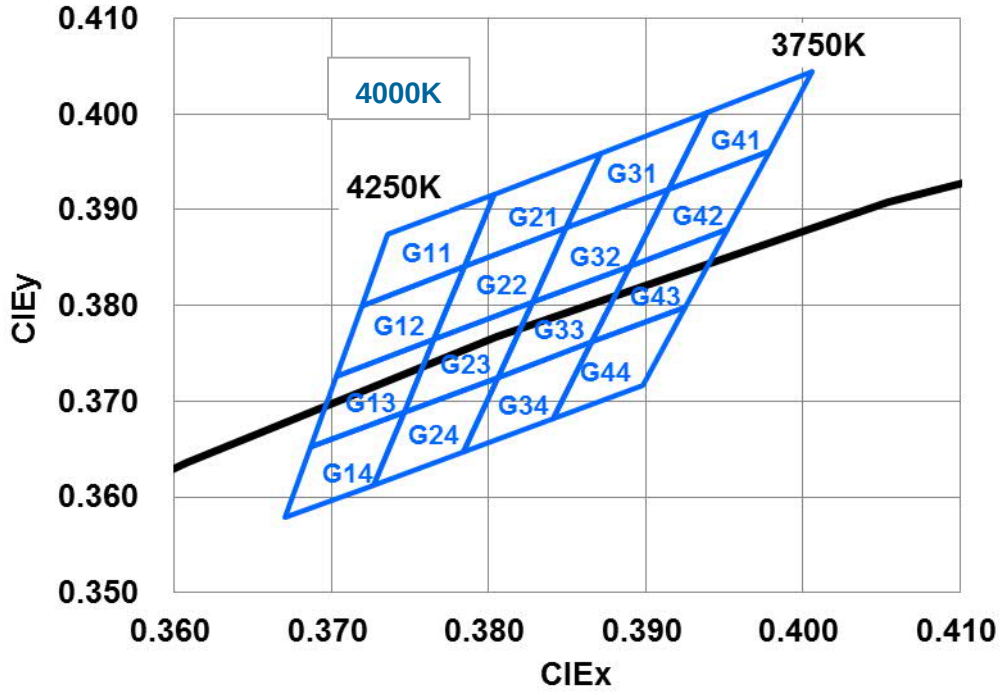
Specific Lighting
LTW-2835AQLXX Series

3500K (IF = 150 mA)															
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
F11	1	0.3996	0.4015	F21	1	0.4072	0.4053	F31	1	0.4148	0.4090	F41	1	0.4223	0.4128
	2	0.3969	0.3934		2	0.4042	0.3970		2	0.4115	0.4006		2	0.4188	0.4041
	3	0.4042	0.3970		3	0.4115	0.4006		3	0.4188	0.4041		3	0.4261	0.4077
	4	0.4072	0.4053		4	0.4148	0.4090		4	0.4223	0.4128		4	0.4299	0.4165
	1	0.3996	0.4015		1	0.4072	0.4053		1	0.4148	0.4090		1	0.4223	0.4128
F12	1	0.3969	0.3934	F22	1	0.4042	0.3970	F32	1	0.4115	0.4006	F42	1	0.4188	0.4041
	2	0.3943	0.3853		2	0.4013	0.3887		2	0.4083	0.3921		2	0.4153	0.3955
	3	0.4013	0.3887		3	0.4083	0.3921		3	0.4153	0.3955		3	0.4223	0.3990
	4	0.4042	0.3970		4	0.4115	0.4006		4	0.4188	0.4041		4	0.4261	0.4077
	1	0.3969	0.3934		1	0.4042	0.3970		1	0.4115	0.4006		1	0.4188	0.4041
F13	1	0.3943	0.3853	F23	1	0.4013	0.3887	F33	1	0.4083	0.3921	F43	1	0.4153	0.3955
	2	0.3916	0.3771		2	0.3983	0.3804		2	0.4050	0.3837		2	0.4118	0.3869
	3	0.3983	0.3804		3	0.4050	0.3837		3	0.4118	0.3869		3	0.4185	0.3902
	4	0.4013	0.3887		4	0.4083	0.3921		4	0.4153	0.3955		4	0.4223	0.3990
	1	0.3943	0.3853		1	0.4013	0.3887		1	0.4083	0.3921		1	0.4153	0.3955
F14	1	0.3916	0.3771	F24	1	0.3983	0.3804	F34	1	0.4050	0.3837	F44	1	0.4118	0.3869
	2	0.3889	0.3690		2	0.3954	0.3721		2	0.4018	0.3752		2	0.4083	0.3783
	3	0.3954	0.3721		3	0.4018	0.3752		3	0.4083	0.3783		3	0.4147	0.3814
	4	0.3983	0.3804		4	0.4050	0.3837		4	0.4118	0.3869		4	0.4185	0.3902
	1	0.3916	0.3771		1	0.3983	0.3804		1	0.4050	0.3837		1	0.4118	0.3869



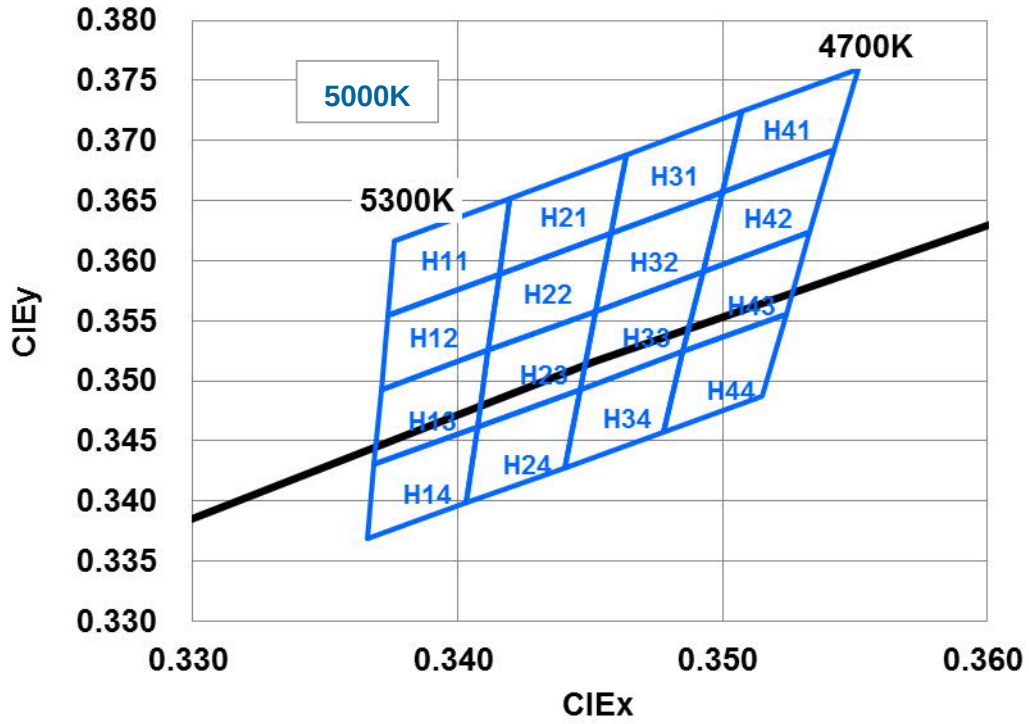
Specific Lighting
LTW-2835AQLXX Series

4000K (IF = 150 mA)															
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
G11	1	0.3736	0.3874	G21	1	0.3804	0.3917	G31	1	0.3871	0.3959	G41	1	0.3939	0.4002
	2	0.3720	0.3800		2	0.3784	0.3841		2	0.3849	0.3881		2	0.3914	0.3922
	3	0.3784	0.3841		3	0.3849	0.3881		3	0.3914	0.3922		3	0.3979	0.3962
	4	0.3804	0.3917		4	0.3871	0.3959		4	0.3939	0.4002		4	0.4006	0.4044
	1	0.3736	0.3874		1	0.3804	0.3917		1	0.3871	0.3959		1	0.3939	0.4002
G12	1	0.3720	0.3800	G22	1	0.3784	0.3841	G32	1	0.3849	0.3881	G42	1	0.3914	0.3922
	2	0.3703	0.3726		2	0.3765	0.3765		2	0.3828	0.3803		2	0.3890	0.3842
	3	0.3765	0.3765		3	0.3828	0.3803		3	0.3890	0.3842		3	0.3952	0.3880
	4	0.3784	0.3841		4	0.3849	0.3881		4	0.3914	0.3922		4	0.3979	0.3962
	1	0.3720	0.3800		1	0.3784	0.3841		1	0.3849	0.3881		1	0.3914	0.3922
G13	1	0.3703	0.3726	G23	1	0.3765	0.3765	G33	1	0.3828	0.3803	G43	1	0.3890	0.3842
	2	0.3687	0.3652		2	0.3746	0.3689		2	0.3806	0.3725		2	0.3865	0.3762
	3	0.3746	0.3689		3	0.3806	0.3725		3	0.3865	0.3762		3	0.3925	0.3798
	4	0.3765	0.3765		4	0.3828	0.3803		4	0.3890	0.3842		4	0.3952	0.3880
	1	0.3703	0.3726		1	0.3765	0.3765		1	0.3828	0.3803		1	0.3890	0.3842
G14	1	0.3687	0.3652	G24	1	0.3746	0.3689	G34	1	0.3806	0.3725	G44	1	0.3865	0.3762
	2	0.3670	0.3578		2	0.3727	0.3613		2	0.3784	0.3647		2	0.3841	0.3682
	3	0.3727	0.3613		3	0.3784	0.3647		3	0.3841	0.3682		3	0.3898	0.3716
	4	0.3746	0.3689		4	0.3806	0.3725		4	0.3865	0.3762		4	0.3925	0.3798
	1	0.3687	0.3652		1	0.3746	0.3689		1	0.3806	0.3725		1	0.3865	0.3762



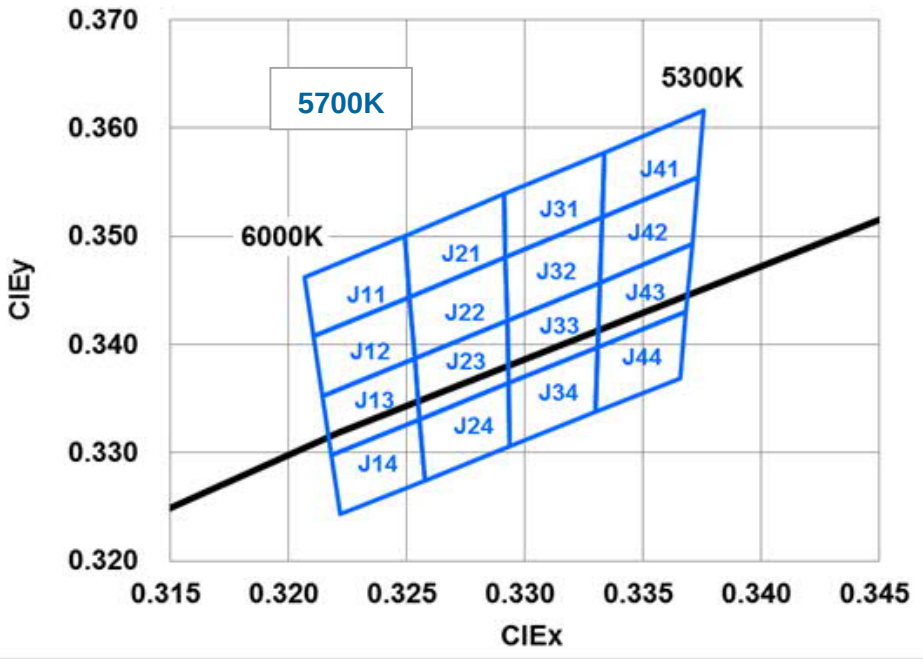
Specific Lighting
LTW-2835AQLXX Series

5000K (IF = 150 mA)															
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
H11	1	0.3376	0.3616	H21	1	0.3420	0.3652	H31	1	0.3464	0.3688	H41	1	0.3507	0.3724
	2	0.3374	0.3554		2	0.3416	0.3589		2	0.3458	0.3623		2	0.3500	0.3657
	3	0.3416	0.3589		3	0.3458	0.3623		3	0.3500	0.3657		3	0.3542	0.3692
	4	0.3420	0.3652		4	0.3464	0.3688		4	0.3507	0.3724		4	0.3551	0.3760
	1	0.3376	0.3616		1	0.3420	0.3652		1	0.3464	0.3688		1	0.3507	0.3724
H12	1	0.3374	0.3554	H22	1	0.3416	0.3589	H32	1	0.3458	0.3623	H42	1	0.3500	0.3657
	2	0.3371	0.3493		2	0.3412	0.3525		2	0.3452	0.3558		2	0.3493	0.3591
	3	0.3412	0.3525		3	0.3452	0.3558		3	0.3493	0.3591		3	0.3533	0.3624
	4	0.3416	0.3589		4	0.3458	0.3623		4	0.3500	0.3657		4	0.3542	0.3692
	1	0.3374	0.3554		1	0.3416	0.3589		1	0.3458	0.3623		1	0.3500	0.3657
H13	1	0.3371	0.3493	H23	1	0.3412	0.3525	H33	1	0.3452	0.3558	H43	1	0.3493	0.3591
	2	0.3369	0.3431		2	0.3407	0.3462		2	0.3446	0.3493		2	0.3485	0.3524
	3	0.3407	0.3462		3	0.3446	0.3493		3	0.3485	0.3524		3	0.3524	0.3555
	4	0.3412	0.3525		4	0.3452	0.3558		4	0.3493	0.3591		4	0.3533	0.3624
	1	0.3371	0.3493		1	0.3412	0.3525		1	0.3452	0.3558		1	0.3493	0.3591
H14	1	0.3369	0.3431	H24	1	0.3407	0.3462	H34	1	0.3446	0.3493	H44	1	0.3485	0.3524
	2	0.3366	0.3369		2	0.3403	0.3399		2	0.3441	0.3428		2	0.3478	0.3458
	3	0.3403	0.3399		3	0.3441	0.3428		3	0.3478	0.3458		3	0.3515	0.3487
	4	0.3407	0.3462		4	0.3446	0.3493		4	0.3485	0.3524		4	0.3524	0.3555
	1	0.3369	0.3431		1	0.3407	0.3462		1	0.3446	0.3493		1	0.3485	0.3524



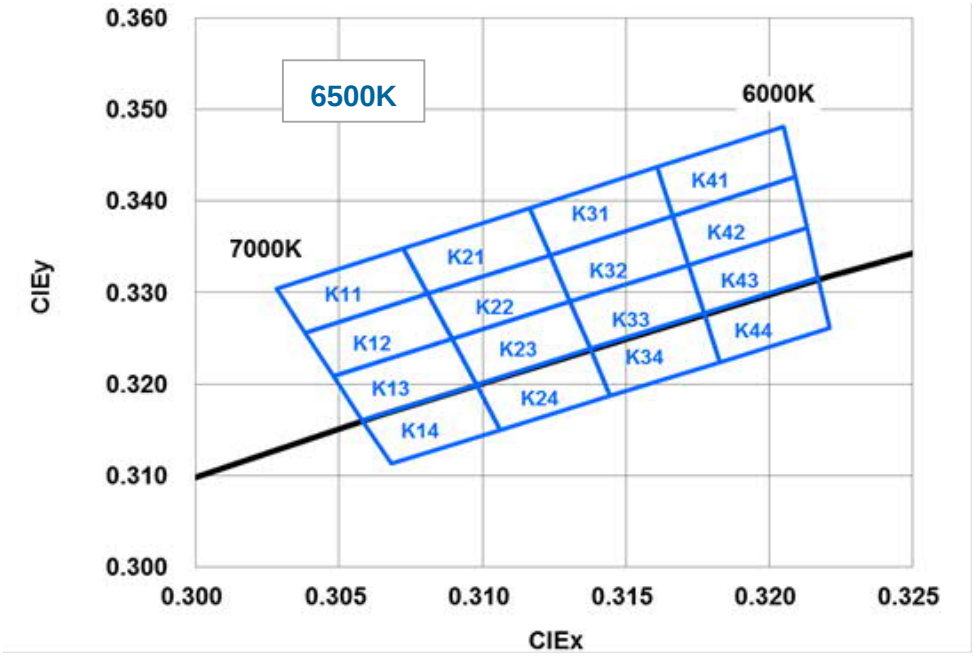
Specific Lighting
LTW-2835AQLXX Series

5700K (IF = 150 mA)															
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
J11	1	0.3207	0.3462	J21	1	0.3249	0.3501	J31	1	0.3292	0.3539	J41	1	0.3334	0.3578
	2	0.3211	0.3407		2	0.3251	0.3444		2	0.3292	0.3481		2	0.3333	0.3518
	3	0.3251	0.3444		3	0.3292	0.3481		3	0.3333	0.3518		3	0.3374	0.3554
	4	0.3249	0.3501		4	0.3292	0.3539		4	0.3334	0.3578		4	0.3376	0.3616
	1	0.3207	0.3462		1	0.3249	0.3501		1	0.3292	0.3539		1	0.3334	0.3578
J12	1	0.3211	0.3407	J22	1	0.3251	0.3444	J32	1	0.3292	0.3481	J42	1	0.3333	0.3518
	2	0.3215	0.3353		2	0.3254	0.3388		2	0.3293	0.3423		2	0.3332	0.3458
	3	0.3254	0.3388		3	0.3293	0.3423		3	0.3332	0.3458		3	0.3371	0.3493
	4	0.3251	0.3444		4	0.3292	0.3481		4	0.3333	0.3518		4	0.3374	0.3554
	1	0.3211	0.3407		1	0.3251	0.3444		1	0.3292	0.3481		1	0.3333	0.3518
J13	1	0.3215	0.3353	J23	1	0.3254	0.3388	J33	1	0.3293	0.3423	J43	1	0.3332	0.3458
	2	0.3218	0.3298		2	0.3256	0.3331		2	0.3293	0.3364		2	0.3331	0.3398
	3	0.3256	0.3331		3	0.3293	0.3364		3	0.3331	0.3398		3	0.3369	0.3431
	4	0.3254	0.3388		4	0.3293	0.3423		4	0.3332	0.3458		4	0.3371	0.3493
	1	0.3215	0.3353		1	0.3254	0.3388		1	0.3293	0.3423		1	0.3332	0.3458
J14	1	0.3218	0.3298	J24	1	0.3256	0.3331	J34	1	0.3293	0.3364	J44	1	0.3331	0.3398
	2	0.3222	0.3243		2	0.3258	0.3275		2	0.3294	0.3306		2	0.3330	0.3338
	3	0.3258	0.3275		3	0.3294	0.3306		3	0.3330	0.3338		3	0.3366	0.3369
	4	0.3256	0.3331		4	0.3293	0.3364		4	0.3331	0.3398		4	0.3369	0.3431
	1	0.3218	0.3298		1	0.3256	0.3331		1	0.3293	0.3364		1	0.3331	0.3398



Specific Lighting
LTW-2835AQLXX Series

6500K (IF = 150 mA)															
Rank	-	x	y	Rank	-	x	y	Rank	-	x	y	Rank	-	x	y
K11	1	0.3028	0.3304	K21	1	0.3072	0.3348	K31	1	0.3117	0.3393	K41	1	0.3161	0.3437
	2	0.3038	0.3256		2	0.3081	0.3299		2	0.3124	0.3341		2	0.3166	0.3384
	3	0.3081	0.3299		3	0.3124	0.3341		3	0.3166	0.3384		3	0.3209	0.3426
	4	0.3072	0.3348		4	0.3117	0.3393		4	0.3161	0.3437		4	0.3205	0.3481
	1	0.3028	0.3304		1	0.3072	0.3348		1	0.3117	0.3393		1	0.3161	0.3437
K12	1	0.3038	0.3256	K22	1	0.3081	0.3299	K32	1	0.3124	0.3341	K42	1	0.3166	0.3384
	2	0.3048	0.3209		2	0.3089	0.3249		2	0.3131	0.3290		2	0.3172	0.3330
	3	0.3089	0.3249		3	0.3131	0.3290		3	0.3172	0.3330		3	0.3213	0.3371
	4	0.3081	0.3299		4	0.3124	0.3341		4	0.3166	0.3384		4	0.3209	0.3426
	1	0.3038	0.3256		1	0.3081	0.3299		1	0.3124	0.3341		1	0.3166	0.3384
K13	1	0.3048	0.3209	K23	1	0.3089	0.3249	K33	1	0.3131	0.3290	K43	1	0.3172	0.3330
	2	0.3058	0.3161		2	0.3098	0.3200		2	0.3138	0.3238		2	0.3177	0.3277
	3	0.3098	0.3200		3	0.3138	0.3238		3	0.3177	0.3277		3	0.3217	0.3316
	4	0.3089	0.3249		4	0.3131	0.3290		4	0.3172	0.3330		4	0.3213	0.3371
	1	0.3048	0.3209		1	0.3089	0.3249		1	0.3131	0.3290		1	0.3172	0.3330
K14	1	0.3058	0.3161	K24	1	0.3098	0.3200	K34	1	0.3138	0.3238	K44	1	0.3177	0.3277
	2	0.3068	0.3113		2	0.3106	0.3150		2	0.3145	0.3187		2	0.3183	0.3224
	3	0.3106	0.3150		3	0.3145	0.3187		3	0.3183	0.3224		3	0.3221	0.3261
	4	0.3098	0.3200		4	0.3138	0.3238		4	0.3177	0.3277		4	0.3217	0.3316
	1	0.3058	0.3161		1	0.3098	0.3200		1	0.3138	0.3238		1	0.3177	0.3277



5.2 Flux Bin

2700K	Luminous Flux Spec. Table	
Φ_v Bin	Lumen (lm) at I_F = 150 **mA**	
	Min	Max
IL	43.5	47.4
LO	47.4	51.3
OR	51.3	55.2

4000K	Luminous Flux Spec. Table	
Φ_v Bin	Lumen (lm) at I_F = 150 **mA**	
	Min	Max
LO	47.4	51.3
OR	51.3	55.2
CK	55.2	59.6

3000K	Luminous Flux Spec. Table	
Φ_v Bin	Lumen (lm) at I_F = 150 **mA**	
	Min	Max
JM	44.8	48.7
MP	48.7	52.6
PS	52.6	56.6

5000K	Luminous Flux Spec. Table	
Φ_v Bin	Lumen (lm) at I_F = 150 **mA**	
	Min	Max
MP	48.7	52.6
PS	52.6	56.6
CF	56.6	60.9

3500K	Luminous Flux Spec. Table	
Φ_v Bin	Lumen (lm) at I_F =150 **mA**	
	Min	Max
LO	47.4	51.3
OR	51.3	55.2
CK	55.2	59.6

5700K	Luminous Flux Spec. Table	
Φ_v Bin	Lumen (lm) at I_F = 150 **mA**	
	Min	Max
MP	48.7	52.6
PS	52.6	56.6
CF	56.6	60.9

6500K	Luminous Flux Spec. Table	
Φ_v Bin	Lumen (lm) at I_F = 150 **mA**	
	Min	Max
LO	47.4	51.3
OR	51.3	55.2
CK	55.2	59.6

Tolerance on each Luminous Flux bin is +/- 10%.

5.3 Voltage Bin

V_F Spec. Table		
V_F Bin	Forward Voltage (volts) at I_F = 150 mA	
	Min	Max
V1	3.0	3.1
V2	3.1	3.2
V3	3.2	3.3
V4	3.3	3.4

Tolerance on each Forward Voltage bin is +/- 0.1V

6. Bin Code List

Example: V1 / LO / K11

Forward Voltage Rank	Luminous Flux Rank	Color Rank
V1	LO	K11

7. Reflow Soldering Characteristics

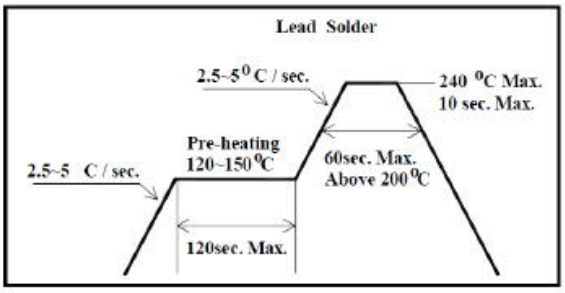
For Reflow Process:

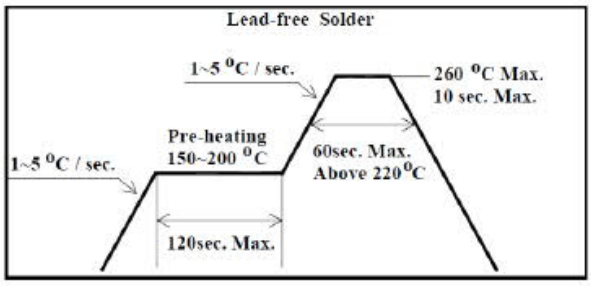
Preheating : 140℃~160℃±5℃,within 2 minutes.

Operation heating : 260℃(Max.) within 10 seconds.(Max)

Gradual Cooling (Avoid quenching).

Lead solder		Lead-free solder	
Pre-heat	120-150℃	Pre-heat	150-200℃
Pre-heat time	120 sec.Max.	Pre-heat time	120 sec.Max.
Peak Temperature	240℃ Max.	Peak Temperature	260℃ Max.
Soldering time condition	10 sec.Max.	Soldering time condition	10 sec.Max.





Notes:

The encapsulated material of the LEDs is silicone . Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when using the picking up nozzle, the pressure on the silicone resin should be proper.

This product is qualified as Moisture sensitive Level 3 per JEDEC J-STD-020 Precaution when handing this moisture sensitive product is important to ensure the reliability of the product

8. Reliability Test

No	Test item	Test Condition	Duration	Number of Damaged
1	Steady State Operating Life of High Temperature (HTOL)	Ts=85℃, I_F=180mA	1000 hrs	0/20
2	Steady State Operating Life of Low Temperature (LTOL)	Ta=-40℃, I_F=180mA	1000 hrs	0/20
3	Pulse Wet Operating Life of High Temperature (PWHTOL)	60℃/90%RH, I_F=180mA 30mins ON/30min OFF	500 hrs	0/20
4	High Temperature Storage (HTS)	100℃	1000 hrs	0/20
5	Low Temperature Storage (LTS)	-40℃	1000 hrs	0/20
6	Thermal Cycle (TC)	-40℃~100℃ 30min dwell 5min transfer	200 cycle	0/20
7	Thermal Shock (TS)	-40℃~100℃ 20min dwell 20sec transfer	200 cycle	0/20
8	Solder Resistance (SR)	265℃, 3X MSL	5sec	0/20
9	Solder Ability (SA)	245℃5sec, 95% coverage	5sec	0/11

Criteria for Judging the Damage

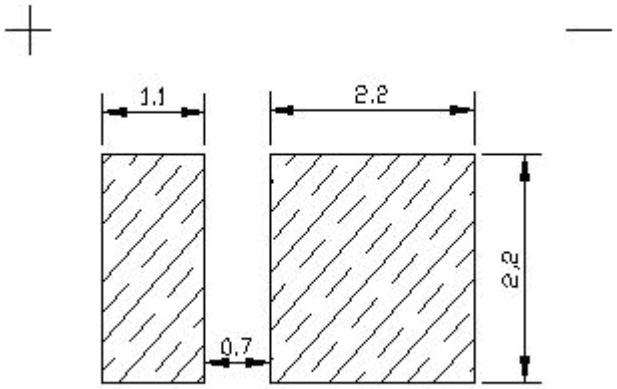
Item	Symbol	Test Condition	Criteria for Judgment	
			Min.	Max.
Forward Voltage	Vf	I_F=Typical Current		U.S.L. x 1.1
Luminous Flux	Lm	I_F=Typical Current	L.S.L. x 0.7	
CCX&CCY	x,y	I_F=Typical Current		Shift<0.02

9. User Guide

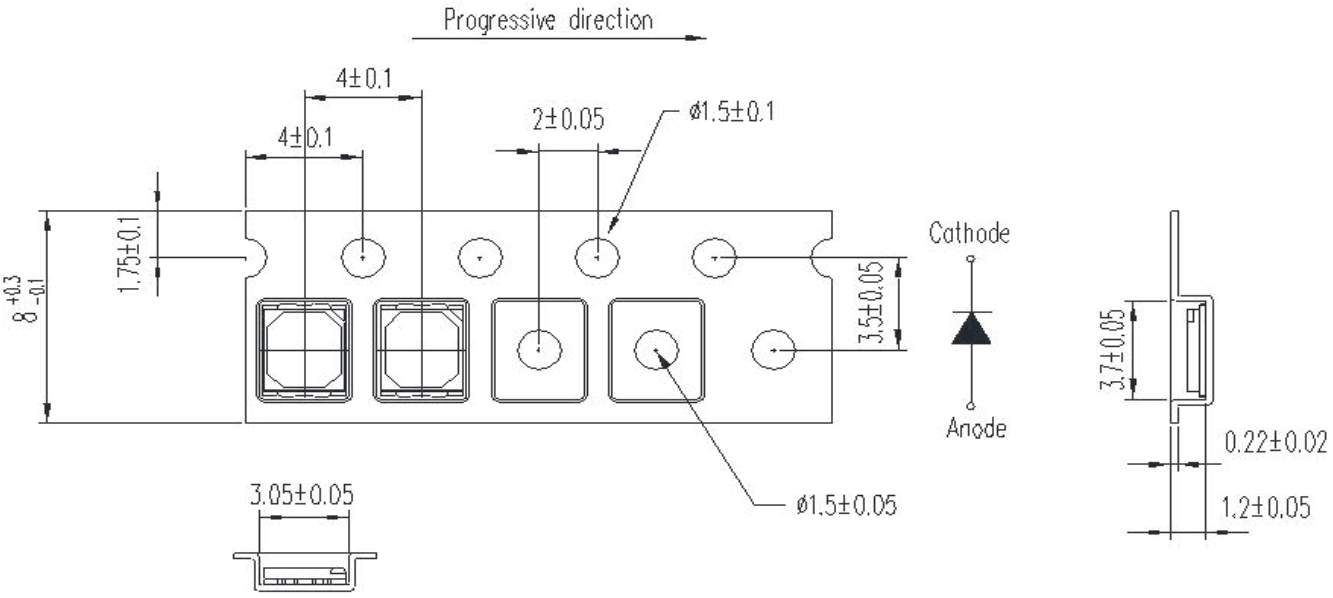
Cleaning

Do not use unspecified chemical liquid to clean LED they could harm the package. If cleaning is necessary, immerse the LED in ethyl alcohol or isopropyl alcohol at normal temperature for less than one minute.

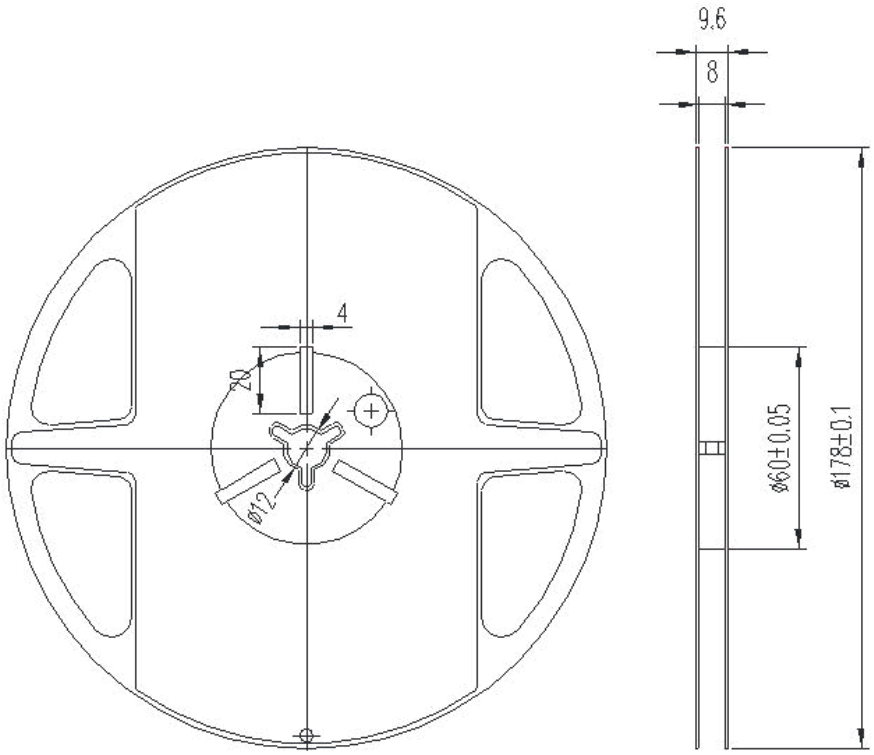
Recommend Printed Circuit Board Attachment Pad



Package Dimensions of Tape



Package Dimensions of Reel



Note: The tolerances unless mentioned is ±0.1mm, Unit=mm

Notes:

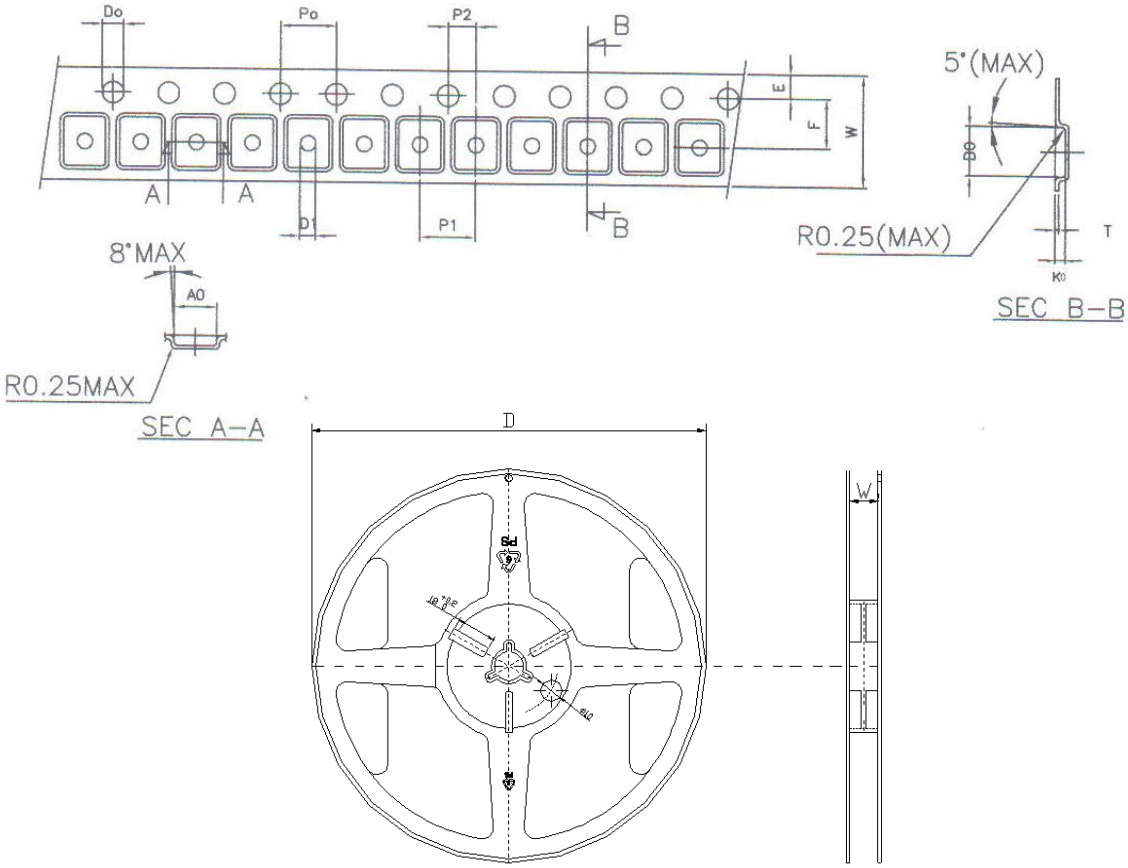
(1) Quantity : 3,000pcs/Reel

(2) Cumulative Tolerance : Cumulative Tolerance/10 pitches to be ±0.2mm

(3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10º to the carrier tape

(4) Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package.

Specific Lighting
LTW-2835AQLXX Series



ITEM	Symbol	Specifications（mm）
Tape width	W	8.0±0.2
Sprocket hole position	E	1.75±0.1
Punch hole position	F	3.50±0.1
Sprocket hole	D0	1.50+0.1/-0
Sprocket hole pitch	P0	4.00±0.1
Punch hole pitch	P1	4.00±0.1
Embossment center	P2	2.00±0.1
Carrier width	A0	3.05±0.1
Carrier length	B0	3.70±0.1
Carrier depth	K0	1.05±0.1
Reel outside diameter	D	178±1
Reel width	W	9±0.1

10. Cautions

10.1 Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications).Consult Liteon's Sales in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

10.2 Storage

This product is qualified as Moisture sensitive Level 3 per JEDEC J-STD-020 Precaution when handing this moisture sensitive product is important to ensure the reliability of the product.

The package is sealed:

The LEDs should be stored at 30°C or less and 90%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

The package is opened:

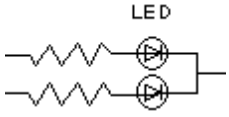
The LEDs should be stored at 30°C or less and 60%RH or less. Moreover, the LEDs are limited to solder process within 168hrs. If exceeding the storage limiting time since opened, that we recommended to bake LEDs at 60°C at least 24hrs. To seal the remainder LEDs return to package, it's recommended to be with workable desiccants in original package.

10.3 Cleaning

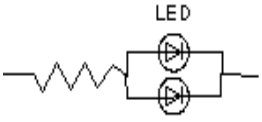
Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.

10.4 Drive Mode

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below



Circuit model A



Circuit model B

(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

10.5 ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents.To verify for ESD damage, check for "light up" and Vf of the suspect LEDs at low currents.The Vf of "good" LEDs should be >2.0V@0.1mA for InGaN product and >1.4V@0.1mA for AlInGaP product.

10.6 Suggested Checking List:

- Training and Certification
  1. Everyone working in a static-safe area is ESD-certified?
  2. Training records kept and re-certification dates monitored?

- Static-Safe Workstation & Work Areas
  1. Static-safe workstation or work-areas have ESD signs?
  2. All surfaces and objects at all static-safe workstation and within 1 ft measure less than 100V?
  3. All ionizer activated, positioned towards the units?
  4. Each work surface mats grounding is good?

- Personnel Grounding
  1. Every person (including visitors) handling ESD sensitive (ESDS) items wear wrist strap, heel strap or conductive shoes with conductive flooring?
  2. If conductive footwear used, conductive flooring also present where operator stand or walk?
  3. Garments, hairs or anything closer than 1 ft to ESD items measure less than 100V*?

4. Every wrist strap or heel strap/conductive shoes checked daily and result recorded for all DLs?
5. All wrist strap or heel strap checkers calibration up to date?

Note: *50V for Blue LED.

- Device Handling
  1. Every ESDS items identified by EIA-471 labels on item or packaging?
  2. All ESDS items completely inside properly closed static-shielding containers when not at static-safe workstation?
  3. No static charge generators (e.g. plastics) inside shielding containers with ESDS items?
  4. All flexible conductive and dissipative package materials inspected before reuse or recycle?

- Others
  1. Audit result reported to entity ESD control coordinator?
  2. Corrective action from previous audits completed?
  3. Are audit records complete and on file?

10.7 Others:

- Do not put any pressure on the light emitting surface either by finger or any hand tool and do not stack the products. Stress or pressure may cause damage to the wires of the LED array.
- This product is not designed for the use under any of the following conditions, please confirm the performance and reliability are well enough if you use it under any of the following conditions
- Do not use sulfur-containing materials in commercial products including the materials such as seals and adhesives that may contain sulfur.
- Do not put this product in a place with a lot of moisture (over 85% relative humidity), dew condensation, briny air, and corrosive gas (Cl, H_2S, NH_3, SO_2, NO_X, etc.), exposure to a corrosive environment may affect silver plating.
- The appearance and specifications of the product may be modified for improvement without prior notice.

Revision History:

Revision Date:

Last Version: (Ver -)

Version	Page	Content of Change	Date Record
1.0	-	New SPEC	03/29/2017