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Revision Date: April 28, 2017
Issue Date:February 24, 2017
Project No. G102901912
Quote No.:00747024

Contact: Stella Su
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Report No. 102901912CRT-001

Nanhua Electronics Co. Ltd.

Building 9, No 1755, Wenbei Rd,
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China

Standards

International Civil Aviation Organization (ICAO), Aerodromes, Annex 14, Volume 1, Seventh Edition, dated July 2016

Revision Note	AC only version of report, removed DC version testing.
Test Purpose	Photometry and Chromaticity High Intensity Type A & B Obstacle Light
Test Dates	February 10, 2017 - February 24, 2017

Ryan Fanelli
Engineer
Lighting

Christopher W Metcalf
Engineering Supervisor
Lighting

Test Plan and Datasheets			
Client	Nanhua Electronics Co. Ltd.	Engineer	Ryan Fanelli
Report #	102901912CRT-001Rev1	Reviewer	Christopher Metcalf
Product	High Intensity Type A, High Intensity Type B	System Series No.	LH88
Standard	ICAO Annex 14, dated July 2016		

Spec	Test name	Clause	Pass Fail NA
Annex 14	Photometry High Intensity Type A (White)	Table 6-3W	Pass
Annex 14	Photometry High Intensity Type B (White)	Table 6-3W	Pass
Annex 14	Chromaticity Type A&B	2.3.1	Pass

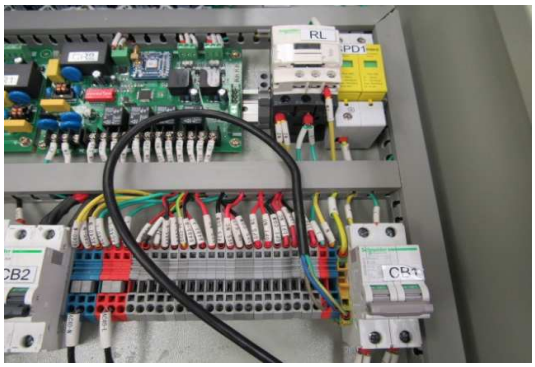
Sample Information				
Date Rec.	**Intertek ID**	**Description**	**Condition**	**System Series No.**
1/30/17	CRT1701271342-001	220AC Control Box	Production	LH88
2/2/17	CRT1701261324-001-001	Light Head	Production	LH88
2/2/17	CRT1701261324-001-002	Junction Box	Production	LH88

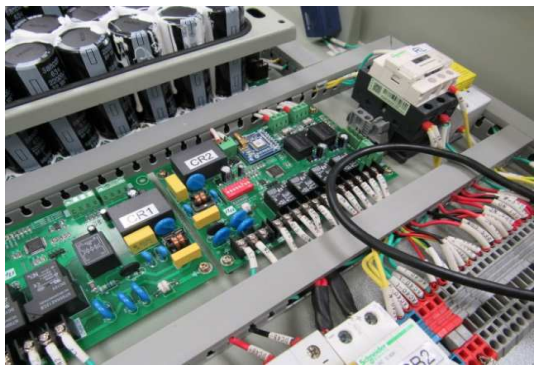
Further Sample Description	
Type:	ICAO High Intensity Type A, ICAO High Intensity Type B
Options:	NA
Type A Light Source:	144 CERR XHP35 White LED
Type B Light Source:	72 CERR XHP35 White LED
Filter:	Sabic LUX130T polycarbonate
Individual Beam Coverage:	beam spread -60 to +60 degrees
Power Supply Location:	Inside control box
Test Cable Length:	10 feet
Electrical Input:	220VAC
Casting Material:	Aluminum
Mounting:	4 bolt holes
Part Number:	Junction Box: 257-003, Light Head: 100257

*client indicated that there is no part number for contollers

Picture(s)

AC Control Box * incorrect label AC input, no separate part number

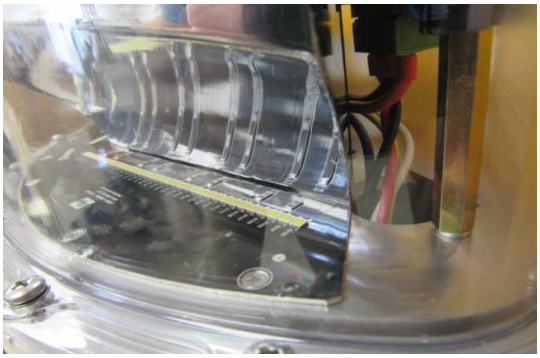

RL
CB2


CR2
CR1


CP1
CP2
CP3

Junction Box

Light Head



Photometry High Intensity Type A (White)

Energize the light by the system power supply and control unit and test for compliance with the photometric requirements in Table 6-3. Vary the input voltage to the light ± 10% from nominal voltage and measure the effective intensity at the input extremes. Make the effective intensity measurements using an integrating photometer whose calibration is traceable to an NIST steady state source. The test distance is 25 meters. The horizontal beam spread is 360 degrees.

Results

ICAO High Intensity, Type A (White Day)

Table 6-3 Minimum Requirements

Mode	Parameter	Requirement	Measured		Result
White Day	Flash Rate (FPM)	40-60 FPM	60.0	FPM	Pass
	Min. Avg. Intensity	200,000 cd at 0°	213129	cd	Pass
	Min. Peak Intensity	150,000 cd at 0°	208205	cd	Pass
	Min. Peak Intensity	75,000 cd at -1°	122564	cd	Pass
	Beam Spread	≥3° at each vertical slice (min 75,000cd)	3.5	degrees	Pass

Table 6-3 Recommendations

Mode	Parameter	Requirement	Measured		Result
White Day	Max. Intensity	250,000 cd at 0°	221083	cd	Pass
	Max. Intensity	112,500 cd at -1°	176011	cd	Fail
	Max. Intensity	7500 cd at -10°	534	cd	Pass

Minimum Cable Length

Voltage Variation	Voltage	Position	Measured	Factor	Min. Avg. Int. 200,000cd @ 0°			Min. Peak Int. 150,000cd @ 0°		
Input Voltage	220.4VAC	0, 0	388000	NA	213129	cd	Result	208205	cd	Result
Input Voltage +10%	242.1VAC	0, 0	388000	100%	213129	cd	Pass	208205	cd	Pass
Input Voltage -10%	198.3VAC	0, 0	383000	99%	210382	cd	Pass	205522	cd	Pass

Cable Length (ft):	10	Calibration Factor:	3.61 x 10^-12	Input:	220.4 Vac
Flash Duration (sec):	0.151	Neutral Density Filter:	None		
Flash Period (sec.):	1				

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 1 Lamp																
	Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U	221	806	1595	23248	47236	73618	67293	90598	82507	74872	60399	54245	40000	18405	1960	772	227
2U	188	781	16638	44957	70199	104501	101538	121368	127066	119088	96353	77835	62450	39886	11852	737	186
1.5U	173	985	24615	80798	89231	110598	136752	156695	160114	160114	129345	102450	79430	50370	20969	758	168
1U	161	1453	31909	69858	104046	127635	156695	186895	198860	185755	157265	128205	103704	67920	28946	1023	153
0	138	1185	31738	69573	104900	131624	170940	206838	221083	210826	177778	140741	113903	79088	37265	1875	1265
1D	141	581	11852	33732	104729	98632	105869	132194	143590	164672	117949	93162	71282	42963	16695	881	107
1.5D	109	452	4154	14644	32194	47123	56581	70769	83077	81709	71567	58462	41880	20912	6729	602	98
2D	103	395	1282	4946	12365	19487	23647	28148	33276	39259	37208	31966	19715	8359	2217	491	91
3D	91	319	409	853	1818	2798	3590	3823	4142	6462	5373	4764	27635	1151	449	372	81
10D	45	121	106	152	230	293	344	392	414	391	347	301	243	173	129	142	51

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 120 Degree 3 Lamp System																
	Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U					87236	92023	69254	91370	82507	75677	61994	77493	87236				
2U					132650	144387	113390	122104	127066	119870	112991	122792	132650				
1.5U					168661	160969	157721	157453	160114	161099	153960	183248	168661				
1U					207749	195556	185641	187917	198860	187208	189174	198063	207749				
0					218803	210712	208205	208712	221083	212011	209516	210313	218803				
1D					176011	141595	122564	133075	143590	165254	129801	126895	176011				
1.5D					74074	68034	63311	71371	83077	82162	75721	73105	74074				
2D					32080	27846	25863	28639	33276	39654	38490	36912	32080				
3D					29453	3949	4039	4195	4142	6781	5782	5617	29453				
10D					473	466	473	534	414	512	453	452	473				

Complies: ☑ YES ☐ NO

Tested By:	Matthew Benninger			Signature or initials:	mb	Comp. Date 2/10/12
Reviewed By:	cwm			Signature or initials:	cwm	
Test Equipment Used:	1,2,3,4,5			Sample:	CRT170121342-001	
Amb (ºC):	22	RH%	31%	Sample:	CRT1701261324-001-001,002	

Photometry High Intensity Type B (White)

Energize the light by the system power supply and control unit and test for compliance with the photometric requirements in Table 6-3. Vary the input voltage to the light ± 10% from nominal voltage and measure the effective intensity at the input extremes. Make the effective intensity measurements using an integrating photometer whose calibration is traceable to an NIST steady state source. The test distance is 25 meters. The horizontal beam spread is 360 degrees.

Results

ICAO High Intensity, Type B (White Day)

Table 6-3 Minimum Requirements

Mode	Parameter	Requirement	Measured		Result
Red Night	Flash Rate (FPM)	40-60 FPM	60.0	FPM	Pass
	Min. Avg. Intensity	100,000 cd at 0°	109331	cd	Pass
	Min. Peak Intensity	75,000 cd at 0°	104634	cd	Pass
	Min. Peak Intensity	37,500 cd at -1°	66057	cd	Pass
	Beam Spread	≥3° at each vertical slice (min 37500cd)	3.5	degrees	Pass

Table 6-3 Recommendations

Mode	Parameter	Requirement	Measured		Result
White Night	Max. Intensity	125,000 cd at 0°	117143	cd	Pass
	Max. Intensity	56,250 cd at -1°	74309	cd	Fail
	Max. Intensity	3750 cd at -10°	282	cd	Pass

Minimum Cable Length

Voltage Variation	Voltage	Position	Measured	Factor	Min. Avg. Int. 100,000cd @ 0°			Min. Peak Int. 75,000cd @ 0°		
Input Voltage	220.2VAC	0, 0	194100	NA	109331	cd	Result	104634	cd	Result
Input Voltage +10%	242.2VAC	0, 0	194000	100%	109275	cd	Pass	104580	cd	Pass
Input Voltage -10%	198.5VAC	0, 0	193800	100%	109162	cd	Pass	104473	cd	Pass

Cable Length (ft):	10	Calibration Factor:	3.61 x 10^-12	Input:	220.2 Vac
Flash Duration (sec):	0.15	Neutral Density Filter:	None		
Flash Period (sec.):	1				

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 1 Lamp Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U	122	395	1314	11114	27943	31600	35257	41371	44571	40914	32571	28914	21314	9697	948	466	237
2U	105	371	7051	26114	34743	44114	63600	62743	66343	62629	60743	40629	32171	20514	5709	458	190
1.5U	99	382	11257	28000	44514	64286	70400	80629	100000	78571	67657	53486	40914	25543	10183	489	175
1U	93	539	20629	34057	52171	65829	80514	95257	102171	95600	80686	65543	52857	34229	14057	520	166
0	81	775	16571	36571	54514	68000	87086	103943	110914	105600	89314	71143	58000	49143	19200	691	125
1D	71	315	7983	19943	33029	42514	64457	65771	70629	67429	58114	46629	36457	23543	9851	386	101
1.5D	65	230	3223	9554	22800	25314	29029	34914	40343	39714	34971	28971	21543	11771	4777	315	87
2D	61	198	983	3634	6994	13429	12743	14400	16000	15943	18000	15829	12343	4686	1417	248	77
3D	51	163	259	554	1166	1794	2143	2069	2057	2000	2611	2406	1434	817	2469	121	64
10D	26	69	57	84	135	171	201	223	223	203	171	144	115	103	71	59	48

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 120 Degree 3 Lamp System Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U					49257	41297	36205	41837	44571	41309	33886	40029	49257				
2U					66914	64629	69309	63201	66343	63000	67794	66743	66914				
1.5U					85429	89829	80583	81117	100000	78954	78914	81486	85429				
1U					105029	100057	94571	95777	102171	96139	101314	99600	105029				
0					112514	117143	106286	104634	110914	106375	105886	107714	112514				
1D					69486	66057	74309	66158	70629	67744	66097	66571	69486				
1.5D					44343	37086	33806	35230	40343	39944	38194	38526	44343				
2D					19337	18114	14160	14648	16000	16141	18983	19463	19337				
3D					2600	2611	4611	2190	2057	2163	2871	2959	2600				
10D					250	274	272	282	223	272	228	228	250				

ICAO High Intensity, Type B (White Night)

Table 6-3 Minimum Requirements

Mode	Parameter	Requirement	Measured		Result
Red Night	Flash Rate (FPM)	40-60 FPM	60.0	FPM	Pass
	Min. Avg. Intensity	2,000 cd at 0°	3110	cd	Pass
	Min. Peak Intensity	1,500 cd at 0°	2996	cd	Pass
	Min. Peak Intensity	750 cd at -1°	2097	cd	Pass
	Beam Spread	≥3° at each vertical slice (min 750cd)	3.5	degrees	Pass

Table 6-3 Recommendations

Mode	Parameter	Requirement	Measured		Result
White Night	Max. Intensity	2,500 cd at 0°	3193	cd	Fail
	Max. Intensity	1,125 cd at -1°	2496	cd	Fail
	Max. Intensity	75 cd at -10°	0	cd	Pass

Minimum Cable Length

Voltage Variation	Voltage	Position	Measured	Factor	Min. Avg. Int. 2,000cd @ 0°			Min. Peak Int. 1,500cd @ 0°		
Input Voltage	220.3VAC	0, 0	5560	NA	3110	cd	Result	2996	cd	Result
Input Voltage +10%	242.1VAC	0, 0	5600	101%	3132	cd	Pass	3018	cd	Pass
Input Voltage -10%	198.1VAC	0, 0	5510	99%	3082	cd	Pass	2969	cd	Pass

Cable Length (ft):	10	Calibration Factor:	3.61 x 10^-12	Input:	220.3 Vac
Flash Duration (sec):	0.151	Neutral Density Filter:	None		
Flash Period (sec.):	1				

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 1 Lamp																
	Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U	0	0	15	129	447	663	746	767	921	773	659	593	414	91	1	0	0
2U	0	0	97	458	776	1009	1191	1499	1578	1442	1118	936	736	432	49	0	0
1.5U	0	7	232	595	1114	1236	1601	1915	2353	1818	1778	1350	885	588	191	0	0
1U	0	10	353	816	1550	1647	2137	2581	2678	2450	2028	1590	1248	810	340	6	0
0	0	22	668	1103	1567	1949	2524	3037	3185	2974	2524	1943	1601	1145	560	15	0
1D	0	5	236	695	1225	1567	1823	2125	2211	2097	2222	1590	1271	729	274	3	0
1.5D	0	2	59	375	768	1080	1179	1311	1390	1305	1197	1075	805	425	100	1	0
2D	0	2	13	126	380	602	660	650	715	684	723	665	459	165	15	0	0
3D	0	1	1	9	47	79	95	92	88	91	125	90	53	3	0	0	0
10D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 120 Degree 3 Lamp System																
	Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U					862	754	747	767	921	773	675	723	862				
2U					1512	1441	1240	1499	1578	1442	1215	1394	1512				
1.5U					1999	1825	1793	1915	2353	1825	2010	1945	1999				
1U					2798	2457	2476	2587	2678	2460	2381	2406	2798				
0					3168	3094	3084	3052	3185	2996	3193	3046	3168				
1D					2496	2296	2097	2128	2211	2102	2459	2285	2496				
1.5D					1572	1505	1280	1312	1390	1307	1256	1450	1572				
2D					839	766	675	650	715	686	736	791	839				
3D					100	82	95	92	88	91	126	99	100				
10D					0	0	0	0	0	0	0	0	0				

Complies: ☑ YES ☐ NO

Tested By:	Matthew Benninger	Signature or initials:	mb	Comp. Date	2/12/17
Reviewed By:	cwm	Signature or initials:	cwm		
Test Equipment Used:	1,2,3,4,5	Sample:	CRT170121342-001		
Amb (ºC):	22 RH% 31%	Sample:	CRT1701261324-001-001,002		

ICAO High Intensity, Type B (Twighlight)

Table 6-3 Minimum Requirements

Mode	Parameter	Requirement	Measured		Result
Red Night	Flash Rate (FPM)	40-60 FPM	60.0	FPM	Pass
	Min. Avg. Intensity	20,000 cd at 0°	20911	cd	Pass
	Min. Peak Intensity	15,000 cd at 0°	19593	cd	Pass
	Min. Peak Intensity	7500 cd at -1°	13522	cd	Pass
	Beam Spread	≥3° at each vertical slice (min 750cd)	3.5	degrees	Pass

Table 6-3 Recommendations

Mode	Parameter	Requirement	Measured		Result
White Night	Max. Intensity	25,000 cd at 0°	23313	cd	Pass
	Max. Intensity	11,250 cd at -1°	17140	cd	Fail
	Max. Intensity	750 cd at -10°	95	cd	Pass

Minimum Cable Length

Voltage Variation	Voltage	Position	Measured	Factor	Min. Avg. Int. 20,000cd @ 0°			Min. Peak Int. 15,000cd @ 0°		
Input Voltage	220.4VAC	0, 0	36200	NA	20911	cd	Result	19593	cd	Result
Input Voltage +10%	242.3VAC	0, 0	36800	102%	21258	cd	Pass	19918	cd	Pass
Input Voltage -10%	198.0VAC	0, 0	36000	99%	20796	cd	Pass	19485	cd	Pass

Cable Length (ft):	10	Calibration Factor:	3.61 x 10^-12	Input:	220.4 Vac
Flash Duration (sec):	0.1489	Neutral Density Filter:	None		
Flash Period (sec.):	1				

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 1 Lamp																
	Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U	20	75	139	1017	3141	4523	5130	5331	7658	5400	4758	4219	2992	799	105	77	28
2U	17	72	919	3147	5325	6821	9619	9642	10605	9814	7848	6455	5085	3073	457	76	24
1.5U	16	71	1594	4964	6489	8323	10542	12210	13070	12382	10341	7853	6145	4070	1450	75	22
1U	15	88	2362	5583	8656	10828	13528	16968	17713	16509	13815	10840	8593	6627	2345	83	20
0	13	161	3657	7326	10473	12668	15764	19719	20751	19891	16910	13070	12840	7653	3829	178	18
1D	11	59	1605	4534	7956	9986	11637	13700	17140	13815	12210	10398	8220	4764	1886	94	16
1.5D	11	43	4322	2419	5062	6741	7504	8386	8971	8593	7830	6884	5171	2780	832	62	15
2D	10	38	1204	702	2419	3772	4208	4070	4437	4574	4689	4202	2929	1074	208	52	14
3D	9	32	42	100	3336	566	609	576	595	657	697	6346	416	111	45	42	13
10D	5	14	14	21	35	46	77	51	53	47	42	35	30	22	18	18	6

Vertical Position (deg.)	Calculated Effective Intensity Data (candela) - 120 Degree 3 Lamp System																
	Horizontal Position (deg.)																
	120L	105L	90L	75L	60L	45L	30L	15L	0	15R	30R	45R	60R	75R	90R	105R	120R
3U					6134	5321	5236	5408	7658	5474	4897	5236	6134				
2U					10410	9894	10076	9717	10605	9885	8766	9602	10410				
1.5U					12634	12393	11992	12284	13070	12452	11935	12817	12634				
1U					17248	17455	15873	17050	17713	16597	16177	16423	17248				
0					23313	20321	19593	19897	20751	20052	20567	20396	23313				
1D					16177	14749	13522	13794	17140	13874	13815	14933	16177				
1.5D					10232	9521	8336	8448	8971	8636	12152	9304	10232				
2D					5348	4846	4416	4122	4437	4613	5893	4903	5348				
3D					3752	678	653	617	595	688	739	6445	3752				
10D					65	68	95	69	53	61	57	56	65				

Complies: ☑ YES ☐ NO

Tested By:	Matthew Benninger			Signature or initials:	mb	Comp. Date 2/12/17
Reviewed By:	cwm			Signature or initials:	cwm	
Test Equipment Used:	1,2,3,4,5			Sample:	CRT170121342-001	
Amb (ºC):	22	RH%	31%	Sample:	CRT1701261324-001-001,002	

Chromaticity ICAO

Test the fixture with the lamp, filter and optical system for color of light emitted. Chromaticity Coordinates are to be calculated from a spectral distribution measured in 2nm increments for LEDs, and 5nm increments for incandescent. Measure the color after stabilization at rated input at the main beam center and beam extremes.

Measurements

Type: A	White Day, AC						
Sample	Color	Input	Location	x	y	z	Color Temp(K)
CRT-170271342001	White	220V	(0,0)	0.336	0.355	0.309	5367

Results

The aviation White must be per ICAO Annex 14, Volume 1, Appendix 1, Colors for Aeronautical Ground Lights, within the following chromaticity boundaries

White LED	White Day, AC		
Boundary	**Line Equation**	**Calc.**	**(P/F)**
Yellow Boundary	x < 0.440	0.336	Pass
Blue Boundary	x > 0.320	0.336	Pass
Green Boundary	y < 0.150 + 0.643x	0.366	Pass
Purple Boundary	y > 0.050 + 0.757x	0.304	Pass

Complies: ☑ YES ☐ NO

Tested By:	Kristie Ray			Signature or initials:	Kristie Ray	Comp. Date	2/23/17
Reviewed By:	cwm			Signature or initials:	cwm		
Test Equipment Used:	8, 9, 10, 11, 12, 13, 14			Sample:	CRT1701271342-001		
Amb (ºC):	27	RH%	17	Sample:	CRT1701261324-001-001, -002		

Chromaticity ICAO

Test the fixture with the lamp, filter and optical system for color of light emitted. Chromaticity Coordinates are to be calculated from a spectral distribution measured in 2nm increments for LEDs, and 5nm increments for incandescent. Measure the color after stabilization at rated input at the main beam center and beam extremes.

Measurements

Type: B	White Day, AC						
Sample	Color	Input	Location	x	y	z	Color Temp(K)
CRT-170271342001	White	220V	(0,0)	0.329	0.337	0.334	5642

Type: B	White Night, AC						
Sample	Color	Input	Location	x	y	z	Color Temp(K)
CRT-170271342001	White	220V	(0,0)	0.328	0.357	0.315	5702

Type: B	White Twilight, AC						
Sample	Color	Input	Location	x	y	z	Color Temp(K)
CRT-170271342001	White	220V	(0,0)	0.338	0.365	0.297	5307

Results

The aviation White must be per ICAO Annex 14, Volume 1, Appendix 1, Colors for Aeronautical Ground Lights, within the following chromaticity boundaries

White LED	White Day, AC		
Boundary	**Line Equation**	**Calc.**	**(P/F)**
Yellow Boundary	x < 0.440	0.329	Pass
Blue Boundary	x > 0.320	0.329	Pass
Green Boundary	y < 0.150 + 0.643x	0.362	Pass
Purple Boundary	y > 0.050 + 0.757x	0.299	Pass

White LED	White Night, AC		
Boundary	**Line Equation**	**Calc.**	**(P/F)**
Yellow Boundary	x < 0.440	0.328	Pass
Blue Boundary	x > 0.320	0.328	Pass
Green Boundary	y < 0.150 + 0.643x	0.361	Pass
Purple Boundary	y > 0.050 + 0.757x	0.298	Pass

White LED	White Twilight, AC		
Boundary	**Line Equation**	**Calc.**	**(P/F)**
Yellow Boundary	x < 0.440	0.338	Pass
Blue Boundary	x > 0.320	0.338	Pass
Green Boundary	y < 0.150 + 0.643x	0.367	Pass
Purple Boundary	y > 0.050 + 0.757x	0.306	Pass

Complies: ☑ YES ☐ NO

Tested By:	Kristie Ray		Signature or initials:	Kristie Ray	Comp. Date	2/22/17
Reviewed By:	cwm		Signature or initials:	cwm		
Test Equipment Used:	8, 9, 10, 11, 12		Sample:	CRT1701261324-001-001, -002, -003		
Amb (ºC):	26.9	RH%	20			

Equipment list				
#	Intertek ID No.	Description	Manufacturer	Calibration Due
1	O109	Goniometer	Optroniks	03-Oct-2017
2	T1555	Hygro-Thermometer	Extech	03-May-2017
3	M135	Multimeter	Fluke	04-Apr-2017
4	L061	IL1700	International Light	23-Oct-2017
5	E466	Oscilloscope	Tektroniks	17-Jul-2017
6	M236	Multimeter	Fluke	10-Mar-2017
7	T1364	Hygro-Thermometer	Extech	19-Jan-2018
8	N1404	Stopwatch	Fisher Scientific	29-Dec-2017
9	E288	OL-750 Spectroradiometer	Optronics Laboratories	09-Mar-2017
10	T1362	Hygro-Thermometer	Extech	28-Mar-2017
11	E536	Digital Power Meter	Yokogowa	06-Jan-2018
12	A116	Current Transformer	Pearson Electric	05-May-2017
13	M226	Multimeter	Fluke	29-Dec-2017
14	--	DC Power Supply 6268B	Hewlett Packard	VBU
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Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files				