

Appendix A for Emission and Immunity test results

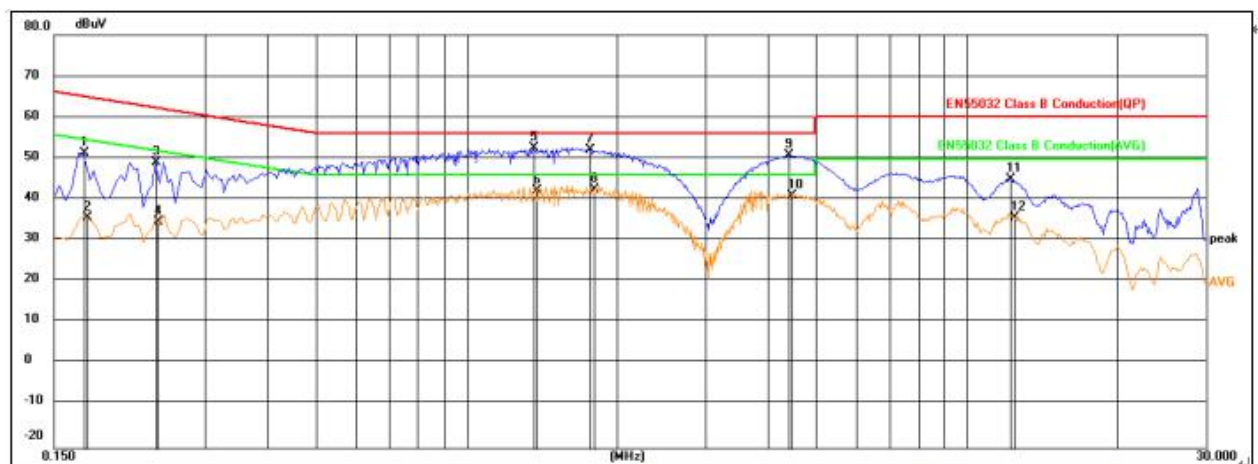
Product Name: Single channel dimming controller

Test Model: ERC1201

A.1 Line Conducted Emission

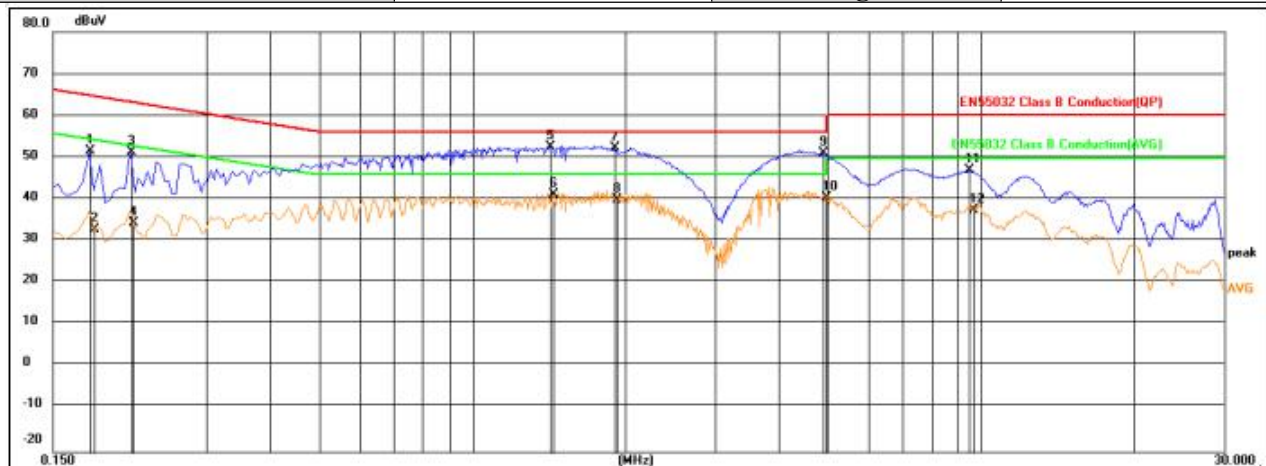
***Note: For pre-scan, the worst case is TM1, and the test data was shown as follow:

Test Model	ERC1201	Test Mode	TM1
Environmental Conditions	23.3°C, 53.7% RH	Test Engineer	Jay Li
Pol.	Line	Test Voltage	AC 230V/50Hz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1725	32.28	19.16	51.44	64.84	-13.40	QP
2	0.1749	16.62	19.16	35.78	54.72	-18.94	AVG
3	0.2400	30.03	19.22	49.25	62.10	-12.85	QP
4	0.2429	15.60	19.22	34.82	52.00	-17.18	AVG
5	1.3650	33.24	19.31	52.55	56.00	-3.45	QP
6	1.3829	22.98	19.31	42.29	46.00	-3.71	AVG
7	1.7655	32.80	19.37	52.17	56.00	-3.83	QP
8	1.7970	23.24	19.37	42.61	46.00	-3.39	AVG
9	4.3980	31.32	19.47	50.79	56.00	-5.21	QP
10	4.4655	21.49	19.47	40.96	46.00	-5.04	AVG
11	12.2100	25.20	19.88	45.08	60.00	-14.92	QP
12	12.4170	15.76	19.91	35.67	50.00	-14.33	AVG

Test Model	ERC1201	Test Mode	TM1
Environmental Conditions	23.3°C, 53.7% RH	Test Engineer	Jay Li
Pol.	Neutral	Test Voltage	AC 230V/50Hz

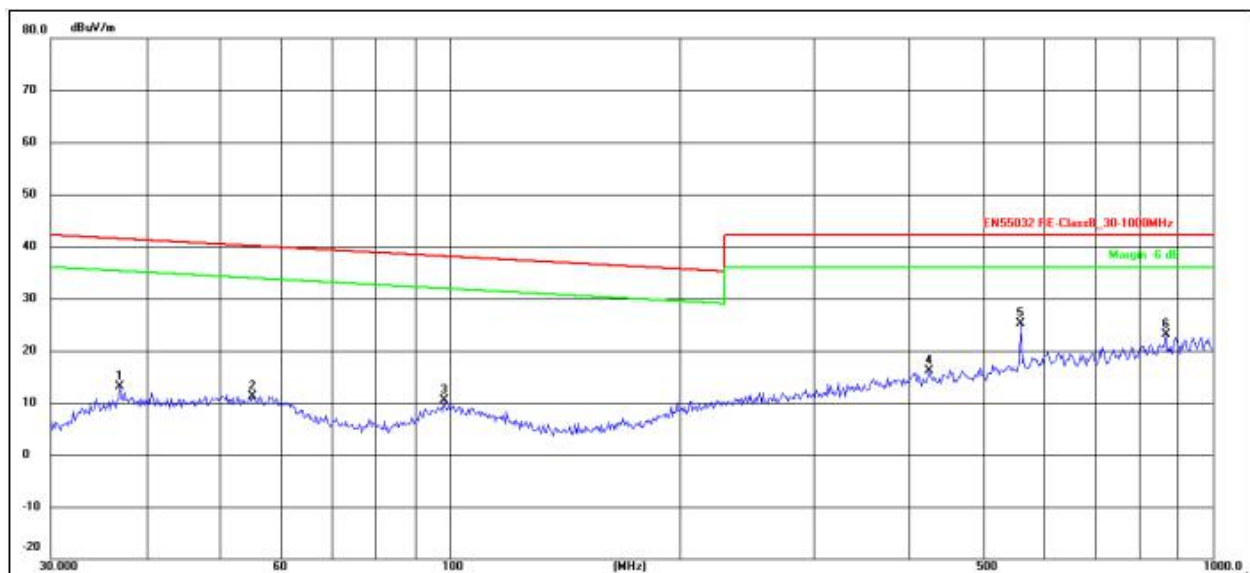


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1770	32.37	19.17	51.54	64.63	-13.09	QP
2	0.1815	13.93	19.17	33.10	54.42	-21.32	AVG
3	0.2130	32.14	19.19	51.33	63.09	-11.76	QP
4	0.2162	15.36	19.20	34.56	52.96	-18.40	AVG
5	1.4190	33.41	19.32	52.73	56.00	-3.27	QP
6	1.4415	22.11	19.32	41.43	46.00	-4.57	AVG
7	1.9005	32.94	19.39	52.33	56.00	-3.67	QP
8	1.9185	20.62	19.39	40.01	46.00	-5.99	AVG
9	4.8750	31.58	19.49	51.07	56.00	-4.93	QP
10	4.9605	21.09	19.49	40.58	46.00	-5.42	AVG
11	9.4515	27.38	19.67	47.05	60.00	-12.95	QP
12	9.6450	17.78	19.67	37.45	50.00	-12.55	AVG

Note: For conducted emission and radiated emission test, a power supply of 230VAC and 120VAC was used for testing respectively, and only recorded the worst case of 230VAC.

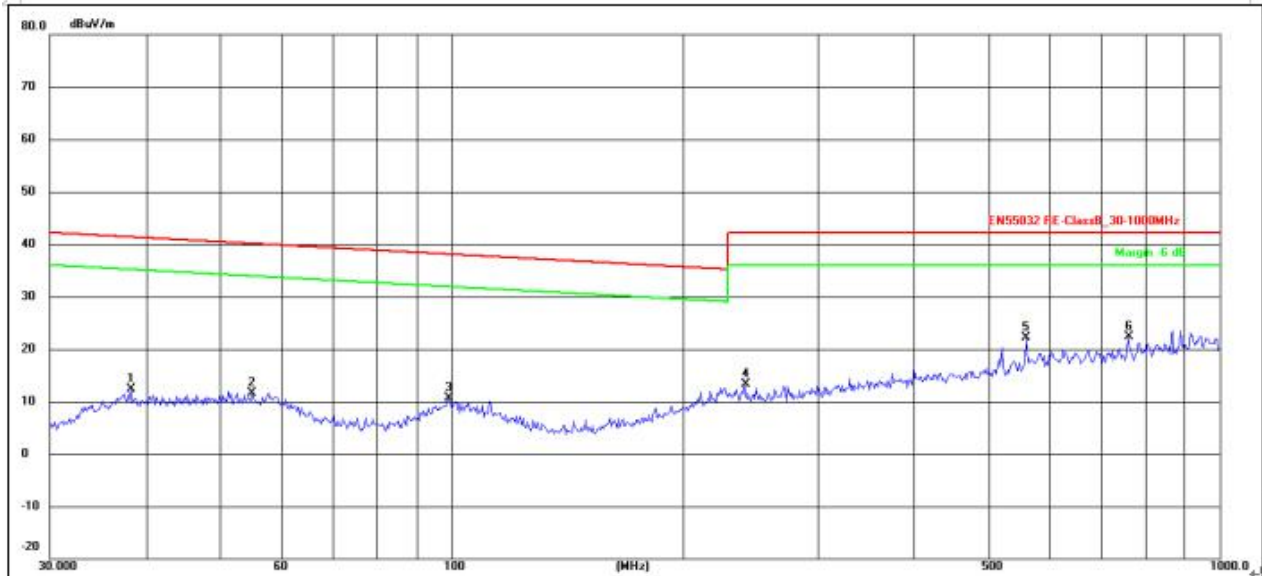
A.3 Radiated Disturbance

Test Model	ERC1201	Test Mode	TM1
Environmental Conditions	24.6°C, 54.1% RH	Test Engineer	Jay Li
Pol.	Vertical	Detector Function	Quasi-peak
Distance	3m	Test Voltage	AC 230V/50Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	37.0248	30.11	-17.07	13.04	41.28	-28.24	QP
2	55.2207	27.42	-16.25	11.17	39.90	-28.73	QP
3	98.4866	28.07	-17.69	10.38	37.91	-27.53	QP
4	425.0280	28.87	-12.78	16.09	42.00	-25.91	QP
5	560.6928	35.61	-10.46	25.15	42.00	-16.85	QP
6	869.1302	30.67	-7.58	23.09	42.00	-18.91	QP

Test Model	ERC1201	Test Mode	TM1
Environmental Conditions	24.6°C, 54.1% RH	Test Engineer	Jay Li
Pol.	Horizontal	Detector Function	Quasi-peak
Distance	3m	Test Voltage	AC 230V/50Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	38.3462	29.10	-16.76	12.34	41.16	-28.82	QP
2	55.0274	27.86	-16.22	11.64	39.92	-28.28	QP
3	99.1797	28.25	-17.55	10.70	37.89	-27.19	QP
4	240.8304	29.51	-16.28	13.23	42.00	-28.77	QP
5	560.6928	32.64	-10.46	22.18	42.00	-19.82	QP
6	760.7036	31.22	-8.90	22.32	42.00	-19.68	QP

Test Mode: TM1 (Above 1GHz)	Tested by: Jay Li
Test Voltage: AC 230V/50Hz	Test Distance: 3m
Detector Function: Peak + AV	Test Results: Passed

Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
1398.88	49.50	35.78	70.00	50.00	-20.50	Peak	Horizontal
1717.15	59.87	30.26	70.00	50.00	-10.13	Average	Horizontal
2534.99	57.39	38.55	70.00	50.00	-12.61	Peak	Horizontal
3844.38	50.73	38.45	74.00	54.00	-23.27	Average	Horizontal
4954.41	59.05	33.68	74.00	54.00	-14.95	Peak	Horizontal
5512.26	48.17	34.47	74.00	54.00	-25.83	Average	Horizontal
1229.96	52.56	35.00	70.00	50.00	-17.44	Peak	Horizontal
1608.94	55.02	39.91	70.00	50.00	-14.98	Average	Horizontal
2316.74	48.19	31.12	70.00	50.00	-21.81	Peak	Horizontal
3507.24	59.15	37.95	74.00	54.00	-14.85	Average	Horizontal
4826.64	55.52	36.55	74.00	54.00	-18.48	Peak	Horizontal
5318.31	55.34	34.68	74.00	54.00	-18.66	Average	Horizontal

Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
1371.62	52.71	32.65	70.00	50.00	-17.29	Peak	Vertical
1960.57	50.38	30.17	70.00	50.00	-19.62	Average	Vertical
2546.28	51.38	33.21	70.00	50.00	-18.62	Peak	Vertical
3119.40	53.53	40.05	74.00	54.00	-20.47	Average	Vertical
4856.65	56.77	34.60	74.00	54.00	-17.23	Peak	Vertical
5308.81	53.39	34.42	74.00	54.00	-20.61	Average	Vertical
1420.19	52.47	36.36	70.00	50.00	-17.53	Peak	Vertical
1654.97	49.65	37.47	70.00	50.00	-20.35	Average	Vertical
2039.33	46.60	31.32	70.00	50.00	-23.40	Peak	Vertical
3233.18	49.81	31.97	74.00	54.00	-24.19	Average	Vertical
4840.73	60.66	32.44	74.00	54.00	-13.34	Peak	Vertical
5892.23	56.11	32.63	74.00	54.00	-17.89	Average	Vertical

Note:

1. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
2. Measurements above show only up to 6 maximum emissions noted.
3. Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Factor = Antenna Factor + Cable Loss + Amplifier Factor
Emission Level = Reading level + Factor
Margin = Emission Level - Limit

A.4 Harmonic Current Emissions

Because power of EUT less than 75W, According standard EN 61000-3-2, Harmonic current unnecessary to test.

A.5 Voltage Fluctuation and Flicker

Test Model	ERC1201	Test Engineer	Jay Li
Environmental Conditions	22.2°C, 52.3% RH	Test Voltage	AC 230V/50Hz
Type of Test: Flickermeter Test - Table			
Power Analyzer: Voltech PM6000 SN: 200006700523 Firmware Version: v1.21.07RC2			
Channel(s):			
1. SN: 090015502053, 28 Adjusted Date: 22 JUN 2011. 2. SN:None Adjusted Date:None			
3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None			
5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None			
Shunt(s):			
1. SN: 091024301916, 4 Adjusted Date: 23 JUN 2011. 2. SN:None Adjusted Date:None			
3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None			
5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None			
AC Source: Mains / Manual Source			
Overall Result:	Notes:		
PASS	Measurement method - Voltage		

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.089	0.008	0.122	0

.6 RF Electromagnetic Field (80 MHz - 6000 MHz)

Test Model	ERC1201	Test Engineer	Jay Li
Environmental Conditions	24.1 °C, 54.9% RH	Test Voltage	AC 230V/50Hz

TM1 Test Result:

EUT Working Mode	Antenna Polarity	Frequency (MHz)	Fielded Strength (V/m)	Observation	Position	Conclusion
Operating Mode	Vertical	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
	Horizontal	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
Idle	Vertical	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
	Horizontal	80-6000	3	CT, CR	Front, Right, Left, Back	Pass

TM2-TM3 Test Result:

EUT Working Mode	Antenna Polarity	Frequency (MHz)	Fielded Strength (V/m)	Observation	Position	Conclusion
Operating Mode	Vertical	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
	Horizontal	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
Idle	Vertical	80-6000	3	CT, CR	Front, Right, Left, Back	Pass
	Horizontal	80-6000	3	CT, CR	Front, Right, Left, Back	Pass

A.7 Electrostatic Discharge

Electrostatic Discharge Test Results			
Standard	<input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2		
Applicant	Shenzhen EBELONG Technology Co., Ltd		
EUT	Single channel dimming controller	Temperature	23.6℃
M/N	ERC1201	Humidity	53.7%
Criterion	B	Pressure	1021mbar
Test Mode	TM1-TM3	Test Engineer	Jay Li
TEST RESULT OF TM1			
Test Voltage	Coupling	Observation	Result (Pass/Fail)
±2KV, ±4kV	Contact Discharge	TT, TR	Pass
±2KV, ±4kV, ±8kV	Air Discharge	TT, TR	Pass
±2KV, ±4kV	Indirect Discharge HCP	TT, TR	Pass
±2KV, ±4kV	Indirect Discharge VCP	TT, TR	Pass
TEST RESULT OF TM2-TM3			
Test Voltage	Coupling		Result (Pass/Fail)
±2KV, ±4kV	Contact Discharge		Pass
±2KV, ±4kV, ±8kV	Air Discharge		Pass
±2KV, ±4kV	Indirect Discharge HCP		Pass
±2KV, ±4kV	Indirect Discharge VCP		Pass
Note: The EUT performance complied with performance criteria for TT&TR Function and there is no any degradation of performance and function.			

A.8 Electrical Fast Transient Immunity

Electrical Fast Transient/Burst Test Results			
Standard	<input type="checkbox"/> IEC 61000-4-4 <input checked="" type="checkbox"/> EN 61000-4-4		
Applicant	Shenzhen EBELONG Technology Co., Ltd		
EUT	Single channel dimming controller	Temperature	22.4℃
M/N	ERC1201	Humidity	52.5%
Test Mode	TM1-TM3	Criterion	B
Test Engineer	Jay Li		

TEST RESULT OF TM1				
Line	Test Voltage	Polarity	Observation	Result (Pass/Fail)
L	1KV	+/-	TT, TR	Pass
N	1KV	+/-	TT, TR	Pass
L-N	1KV	+/-	TT, TR	Pass
TEST RESULT OF TM2-TM3				
Line	Test Voltage	Polarity	Result (Pass/Fail)	
L	1KV	+/-	Pass	
N	1KV	+/-	Pass	
L-N	1KV	+/-	Pass	

A.9 RF Common Mode

Injected Currents Susceptibility Test Results				
Standard	<input type="checkbox"/> IEC 61000-4-6 <input checked="" type="checkbox"/> EN 61000-4-6			
Applicant	Shenzhen EBELONG Technology Co., Ltd			
EUT	Single channel dimming controller	Temperature	23.5℃	
M/N	ERC1201	Humidity	52.4%	
Test Mode	TM1-TM3	Criterion	A	
Test Engineer	Jay Li			
TEST RESULT OF TM1				
Frequency Range (MHz)	Strength (Unmodulated)	Injected Position	Observation	Result (Pass/Fail)
0.15 ~ 10	3V	AC Mains	CT, CR	Pass
10 ~ 30	3V to 1V			
30 ~ 80	1V			
TEST RESULT OF TM2-TM3				
Frequency Range (MHz)	Strength (Unmodulated)	Injected Position	Result (Pass/Fail)	
0.15 ~ 10	3V	AC Mains	Pass	
10 ~ 30	3V to 1V			
30 ~ 80	1V			
Remark: 1. Modulation Signal: 1kHz 80% AM 2. Measurement Equipment : Simulator: CIT-10 (FRANKONIA) CDN : <input checked="" type="checkbox"/> CDN-M2 (FRANKONIA) <input type="checkbox"/> CDN-M3 (FRANKONIA)				

A.10 Surges, Line to Line and Line to Ground

Surge Immunity Test Result			
Standard	<input type="checkbox"/> IEC 61000-4-5 <input checked="" type="checkbox"/> EN 61000-4-5		
Applicant	Shenzhen EBELONG Technology Co., Ltd		
EUT	Single channel dimming controller	Temperature	22.8°C
M/N	ERC1201	Humidity	52.4%
Test Mode	TM1-TM3	Criterion	B
Test Engineer	Jay Li		

TEST RESULT OF TM1						
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Observation	Result (Pass/Fail)
L-N	+	0°, 90°, 180°, 270°	5	1.0	TT, TR	Pass
	-	0°, 90°, 180°, 270°	5	1.0	TT, TR	Pass
TEST RESULT OF TM2-TM3						
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)		Result (Pass/Fail)
L-N	+	0°, 90°, 180°, 270°	5	1.0		Pass
	-	0°, 90°, 180°, 270°	5	1.0		Pass

A.11 Voltage Dips/Interruptions Immunity Test

Voltage Dips And Interruptions Test Results			
Standard	<input type="checkbox"/> IEC 61000-4-11 <input checked="" type="checkbox"/> EN 61000-4-11		
Applicant	Shenzhen EBELONG Technology Co., Ltd		
EUT	Single channel dimming controller	Temperature	23.6℃
M/N	ERC1201	Humidity	52.2%
Test Mode	TM1-TM3	Criterion	B&C
Test Engineer	Jay Li		

TEST RESULT OF TM1				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Observation	Result (Pass/Fail)
0	100	0.5P	TT, TR	Pass
0	100	1P	TT, TR	Pass
70	30	25P	TT, TR	Pass
0	100	250P	TT, TR	Pass
TEST RESULT OF TM2-TM3				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Result (Pass/Fail)	
0	100	0.5P	Pass	
0	100	1P	Pass	
70	30	25P	Pass	
0	100	250P	Pass	