

FCC TEST REPORT

Reference No. : GPWL2003000544EG

Applicant : Pittasoft Co., Ltd.

Equipment Under Test (EUT) :

Product Name : Blackvue Connectivity Module

Model Name : CM100LTE

Alt.Model Name : CM100LTE1, CM100LTE2, CM100LTE3,
CM100LTE4, CM100LTE5, CM100LTE6,
CM100LTE7, CM100LTE8, CM100LTE9,
CM100LTE10

Applied Standards : FCC Part 15 Subpart B

ANSI C 63.4:2014

FCC ID : YCK-CM100LTE

Date of Receipt : March 12, 2020

Date of Test : March 26, 2020

Date of Issue : May 15, 2020

Test Results : Complied

Tested by :



Yongtae Yu

Reviewed by :



Paul Kang

Remarks :

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Revision History

Revision	Report Number	Description
0	F690501-RF-EMG000144	Initial
1	F690501-RF-EMG000144-1	Corrected System Configurations.
2	F690501-RF-EMG000144-2	Corrected System Configurations.

1. General Information

1.1 Client Information

Applicant : Pittasoft Co., Ltd.
- Address of Applicant : A 4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

Manufacturer : Pittasoft Co., Ltd.
- Address of Manufacturer : A 4th floor, ABN Tower, 331, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

Factory : SMT SCOUT Co., Ltd.
- Address of Factory : 38 Dangeong-ro, Gunpo-so, Gyeonggi-do, Republic of Korea, 15849

1.2 Test Laboratory

Name and Address : SGS Korea Co., Ltd.
- Giheung 1 Laboratory : 35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Giheung 2 Laboratory : 23, Giheungdanji-ro 24beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Gunpo Laboratory : 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807, Republic of Korea.

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e-mail : paul.kang@sgs.com

1.3 General Information of E.U.T.

Classification	Description
Product Name	Blackvue Connectivity Module
Model Name	CM100LTE
Alt.Model Name	CM100LTE1, CM100LTE2, CM100LTE3, CM100LTE4, CM100LTE5, CM100LTE6, CM100LTE7, CM100LTE8, CM100LTE9, CM100LTE10
Model Differences	Refer to Note1.
Serial No.	None
Highest Internal Frequency	1 850 MHz ~ 1 990 MHz
EMI Classification	Class B
Test Voltage	120 V~, 60 Hz(for Travel Adapter), 12 Vd.c.(for Battery)
Operating Voltage	5.0 Vd.c. 2.0 A (Minimum 2.7 Vd.c. ~ Maximum 5.5 Vd.c.)
Operating Temperature	(-)35 °C ~ (+)75 °C
S/W Version	LTEON_VER0.90
H/W Version	CM100LTE_PP_V02
Function	This device is an LTE connection used in Dash Cam.

Note1. Model Differences

Model name		Information
Basic Model	CM100LTE	- Basic model
Variant Models	CM100LTE1	- Variant models are all same as basic model except for supported country.
	CM100LTE2	
	CM100LTE3	
	CM100LTE4	
	CM100LTE5	
	CM100LTE6	
	CM100LTE7	
	CM100LTE8	
	CM100LTE9	
	CM100LTE10	

1.4 Operating Modes and Conditions

Operating Mode	Percussor
1) Standby(LTE 2)	Standby(LTE 2) Mode

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer
Travel Adapter	EP-TA200	R37MA8S2NF1SE3	SAMSUNG
Power Module	KM001	-	Chargerlab
Car Battery	-	-	-
Dash Cam	BLACKVUE Cloud	-	Pittasoft Co., Ltd.

1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length	Shield	
Radiated Emission(Below 1 GHz) Test						
Car Battery	AC OUT	Dash Cam	AC IN	4.2	Unshield	No
Dash Cam	DC OUT	EUT	DC IN	1.5	Unshield	No
Radiated Emission(Above 1 GHz) Test						
AC Source	AC OUT	Travel Adapter	AC IN	-	-	-
Travel Adapter	DC OUT	Power Module	DC IN	-	-	-
Power Module	USB	EUT	-	1.5	Unshield	No

1.7 System Configurations

Description	Model	Serial No.	Manufacturer
Main Board	CM100LTE_PP_V02	-	-
Antenna	-	-	-

Note. Antenna Requirement

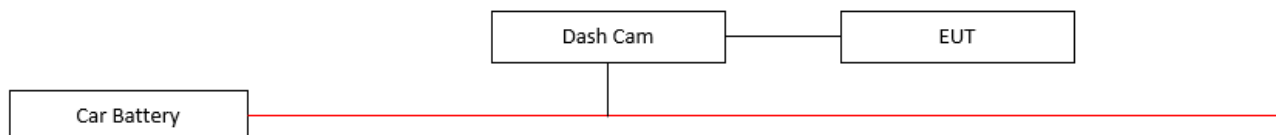
For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The antennas have unique connectors.

- Antenna gain

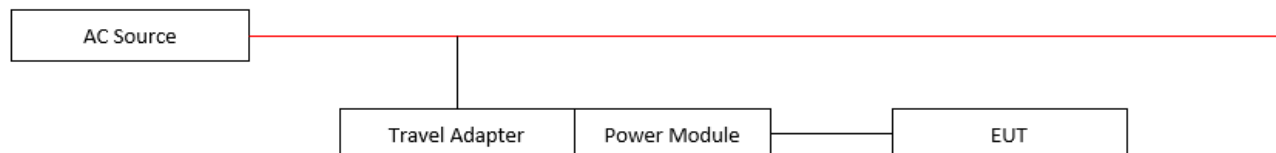
Category	Antenna Gain(dB i)
LTE FDD 2	1.05
LTE FDD 4	1.23
LTE FDD 12	1.54

1.8 Test System Layout

- Radiated Emission(Below 1 GHz) Test



- Radiated Emission(Above 1 GHz) Test



1.9 Modifications

- There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 Subpart B	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Basic Standards	Results
Radiated Emission	ANSI C 63.4:2014 FCC Part 15 Subpart B	Complied

Note: Test methods of all test items are performed according to the basic standards in this table.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Radiated Emission	ANSI C 63.4:2014, FCC Part 15 Subpart B	Complied

2.2 Test Method and Limits

2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Radiated Emission	30 MHz ~ 1 GHz	120 kHz	10 m&3 m
	Above 1 GHz	1 MHz	3 m

2.2.2 Test Limits

-Radiated Emission Limits below 1 GHz

Frequency Range	Limits(dB(μ V/m))	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.1	Class A
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40	Class B
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46	
960 MHz ~ 1 GHz	54	

-Radiated Emission Limits above 1 GHz (3m method)

Frequency Range	Limits(dB(μ V/m))		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	Class A
Above 1 GHz	54	74	Class B

2.3 Radiated Emission

The initial preliminary exploratory scans were performed at 3 m distance over the measuring frequency range(30 MHz to 18 GHz) using a max hold mode incorporating a Peak detector and using the software of EP5RE(Version Ver5.3.70 from TOYO). The final test data was measured using a Quasi-Peak detector below 1 GHz at 3 m distance and a Peak and Average detector above 1 GHz at 3 m distance. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

2.3.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Cal Due. Date
Horn Antenna	HF906	R & S	100326	2021.02.14
Signal Conditioning Unit	SCU 18	R & S	10117	2020.06.12
Test Receiver	ESU26	R & S	100109	2021.02.18
Bilog Antenna	VULB9163	SCHWARZBECK	396	2021.03.21
Amplifier	8447F	HP	2944A03909	2020.08.07
Wideband Radio Communication Tester	CMW500	R & S	144032	2020.05.14
3m SEMI-ANECHOIC CHAMBER	-	SY CORPORATION	-	-

Note : The Bilog Antenna calibration period is 2 years, but the other equipment calibration period are 1 year.

2.3.2 Test Site

3m SEMI-ANECHOIC CHAMBER Gunpo Laboratory (Below 1 GHz, Above 1 GHz)

2.3.3 Environment Conditions and data

- Below 1 GHz

Temperature (Minimum 20.1, Maximum 20.9) °C,
Humidity (Minimum 29.0, Maximum 34.0) % R.H.,
Atmospheric Pressure (Minimum 100.6, Maximum 100.7) kPa

Test Date : March 26, 2020

- Above 1 GHz

Temperature (Minimum 20.1, Maximum 20.9) °C,
Humidity (Minimum 29.0, Maximum 34.0) % R.H.,
Atmospheric Pressure (Minimum 100.6, Maximum 100.7) kPa

Test Date : March 26, 2020

- Below 1 GHz (3 m method)

Freq. (MHz)	Level (dB(μV))	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	Result (dB(μV/m))	Limit (dB(μV/m))	Margin (dB)
57.61	32.70	V	158	100	18.72	1.77	28.08	25.11	40.00	14.89
104.21	34.20	V	67	200	17.00	2.24	27.98	25.46	43.50	18.04
181.56	32.90	H	106	300	15.36	2.89	27.67	23.48	43.50	20.02
232.89	39.80	V	74	100	17.82	3.20	27.50	33.32	46.00	12.68
233.70	42.50	H	87	400	17.85	3.20	27.50	36.05	46.00	9.95
377.71	35.50	H	17	400	20.75	4.02	27.88	32.39	46.00	13.61
720.80	34.70	V	20	100	25.72	5.47	28.74	37.15	46.00	8.85

Measurement Uncertainty (Horizontal) : 5.01 dB (The confidential level is about 95%, $k=2$)

Measurement Uncertainty (Vertical) : 5.38 dB (The confidential level is about 95%, $k=2$)

Note 1: • AF = Antenna Factor • CL = Cable Loss • Amp = Amplifier Gain
• POL H = Horizontal • POL V = Vertical • A : Angle
• H : Height • Margin = Limit – Result • Result = Level + AF + CL – Amp

- Above 1 GHz (3 m method)

Freq. (MHz)	Level (dB μ V)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Peak	C-AV										
3057.71	45.60	-	H	79	100	30.30	9.90	45.44	0.00	40.36	74.00	33.64
3057.71	-	20.40	H	79	100	30.30	9.90	45.44	0.00	15.16	54.00	38.84
3319.08	44.90	-	V	51	100	30.60	10.33	45.24	0.00	40.59	74.00	33.41
3319.08	-	20.60	V	51	100	30.60	10.33	45.24	0.00	16.29	54.00	37.71
3417.54	47.00	-	H	27	200	31.01	10.46	45.18	0.00	43.29	74.00	30.71
3417.54	-	23.30	H	27	200	31.01	10.46	45.18	0.00	19.59	54.00	34.41
4685.46	42.10	-	V	35	100	32.24	12.26	45.74	0.00	40.86	74.00	33.14
4685.46	-	20.90	V	35	100	32.24	12.26	45.74	0.00	19.66	54.00	34.34
5075.75	42.10	-	V	281	200	33.30	12.77	45.52	0.00	42.65	74.00	31.35
5075.75	-	22.60	V	281	200	33.30	12.77	45.52	0.00	23.15	54.00	30.85
5119.67	41.80	-	H	225	100	33.44	12.84	45.52	0.00	42.56	74.00	31.44
5119.67	-	22.60	H	225	100	33.44	12.84	45.52	0.00	23.36	54.00	30.64
11707.17	39.90	-	V	320	200	38.79	19.74	45.09	0.00	53.34	74.00	20.66
11707.17	-	21.30	V	320	200	38.79	19.74	45.09	0.00	34.74	54.00	19.26
11979.17	40.30	-	H	52	100	38.56	20.31	45.01	0.00	54.16	74.00	19.84
11979.17	-	22.20	H	52	100	38.56	20.31	45.01	0.00	36.06	54.00	17.94
12671.21	40.90	-	H	301	100	38.74	20.79	44.66	0.00	55.77	74.00	18.23
12671.21	-	20.80	H	301	100	38.74	20.79	44.66	0.00	35.67	54.00	18.33
12931.17	39.30	-	V	320	100	39.20	21.30	44.53	0.00	55.27	74.00	18.73
12931.17	-	19.30	V	320	100	39.20	21.30	44.53	0.00	35.27	54.00	18.73
13192.54	40.10	-	V	357	200	39.37	21.49	44.56	0.00	56.40	74.00	17.60
13192.54	-	22.50	V	357	200	39.37	21.49	44.56	0.00	38.80	54.00	15.20
13451.08	40.10	-	H	45	100	40.00	21.19	44.64	0.00	56.65	74.00	17.35
13451.08	-	24.70	H	45	100	40.00	21.19	44.64	0.00	41.25	54.00	12.75
14396.71	40.20	-	V	259	100	41.21	21.91	44.64	0.00	58.68	74.00	15.32
14396.71	-	23.70	V	259	100	41.21	21.91	44.64	0.00	42.18	54.00	11.82
14583.71	39.90	-	H	64	100	41.13	22.49	44.57	0.00	58.95	74.00	15.05
14583.71	-	22.00	H	64	100	41.13	22.49	44.57	0.00	41.05	54.00	12.95
15309.75	41.50	-	H	79	200	39.98	22.69	44.74	0.00	59.43	74.00	14.57
15309.75	-	21.60	H	79	200	39.98	22.69	44.74	0.00	39.53	54.00	14.47

Measurement Uncertainty (Horizontal) : 5.33 dB (The confidential level is about 95%, $k=2$)

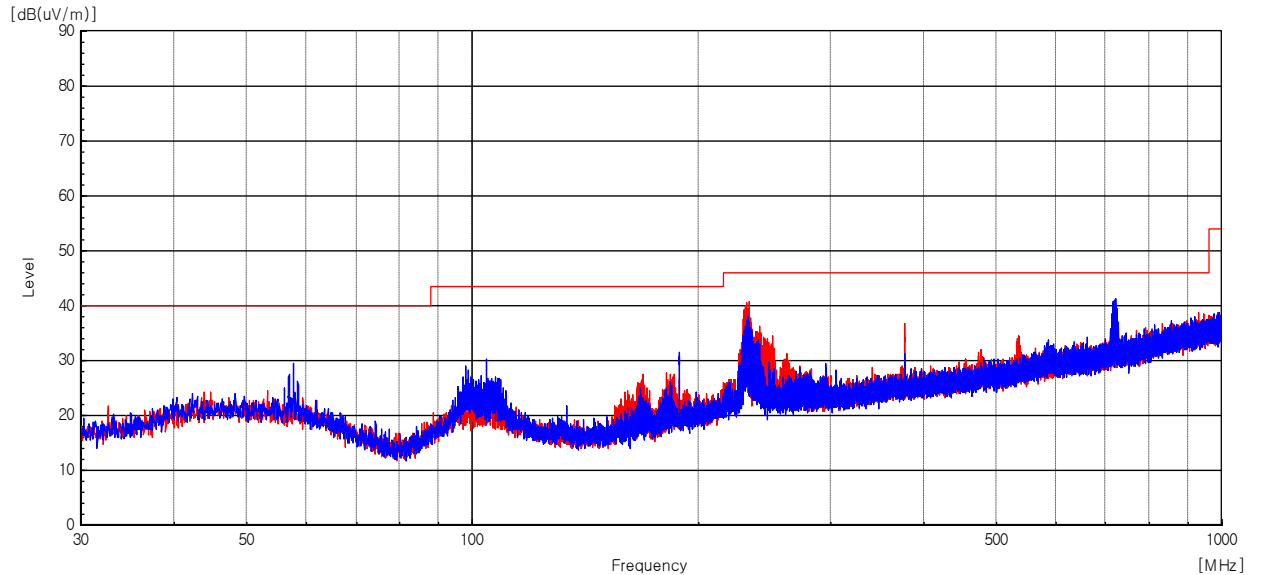
Measurement Uncertainty (Vertical) : 5.35 dB (The confidential level is about 95%, $k=2$)

Note 1: • AF = Antenna Factor • CL = Cable Loss • Amp = Amplifier Gain
• POL H = Horizontal • POL V = Vertical • A : Angle
• H : Height • Margin = Limit – Result • Result = Level + AF + CL – Amp

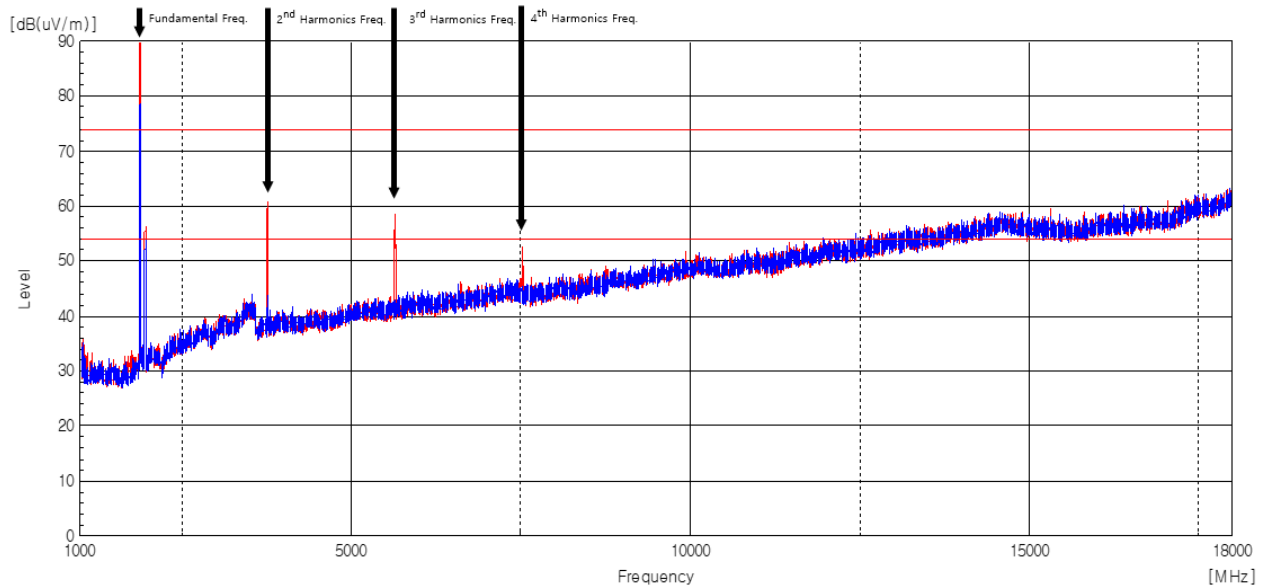
See Appendix A (Radiated Emission)

Appendix A : Radiated Emission

Below 1 GHz



Above 1 GHz



- End of the Report -