
TEST REPORT

Report No.: SRTC2019-9003(F)-0040
Product Name: Fi Smart Collar
Model Name: FC1
Applicant: Barking Labs Corp.
Manufacturer: Barking Labs Corp.
Specification: FCC Part15B (Certification)
(2019 edition)
ANSI C63.4-2014
FCC ID: 2ARXN-FC1

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District,

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1. General information

1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: 15th Building, No.30 Shixing Street, Shijingshan District
Testing location: No.80, Zhaojiachang, BeizangCun, Daxing District, Beijing, China.
City: Beijing
Country or Region: China
Contacted person: Liu Jia
Tel: +86 10 57996183
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1.3 Applicant's details

Company: Barking Labs Corp.
Address: 53 Bridge St., Suite 103USA
City: Brooklyn, NY
Country or Region: USA
Contacted person: Bob Blake
Tel: +1-914-249-9347
Email: bob@tryfi.com

1.4 Manufacturer's details

Company: Barking Labs Corp.
Address: 53 Bridge St., Suite 103USA
City: Brooklyn, NY
Country or Region: USA
Contacted person: Bob Blake
Tel: +1-914-249-9347
Email: bob@tryfi.com

1.5 Application details

Date of reception of test sample: 12thAug. 2019

Date of test: 12thAug. 2019 to 15thAug. 2019

1.6 Reference specification

FCC Part 15B, 2019 (Certification)

1.7 Information of EUT

1.7.1 General information

Name of EUT	Fi Smart Collar
FCC ID	2ARXN-FC1
Power Supply	Battery or Charger
Rated Power Supply Voltage	3.7V
Extreme Temperature	Lowest: -20°C Highest: +60°C
Extreme Voltage	Minimum: 3.0V Maximum: 4.35V
HW Version	Rev.B
SW Version	v1.0

1.7.2EUT details

Product Name	Model Name	IMEI
Fi Smart Collar	FC1	/

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: USB Cable

Manufacturer	SuZhou KELI TECHNOLOGY DEVELOPMENT CO., LTD.
Model Number	KLC-3103

AE (Auxiliary Equipment) 2#: Battery

Type	Li-Lon
Manufacturer	Jiade Energy Technology(Zhuhai)Co.,Ltd.
Model Number	JKIT
Capacity	520mAh
Nominal Voltage	3.85

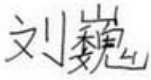

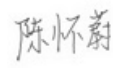
AE (Auxiliary Equipment) 3#: Charger

Manufacturer	DEE VAN ENTERPRISE CO., LTD.
Model Number	DSA-5PF03-05 FUS 050100
Input Voltage	100V-240V AC
Frequency	50/60Hz

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Conducted emissions	15.107	Pass
2	Radiated emissions	15.109	Pass

Approved By: LiuWei Director of the test department 	Checked By: GuoYu Vice director of the test department 
Tested By: Mr Chen Huaiwei 	Issued date: 2019.08.19

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.5°C	40.5%	100.5kPa

Test Setup with charger:

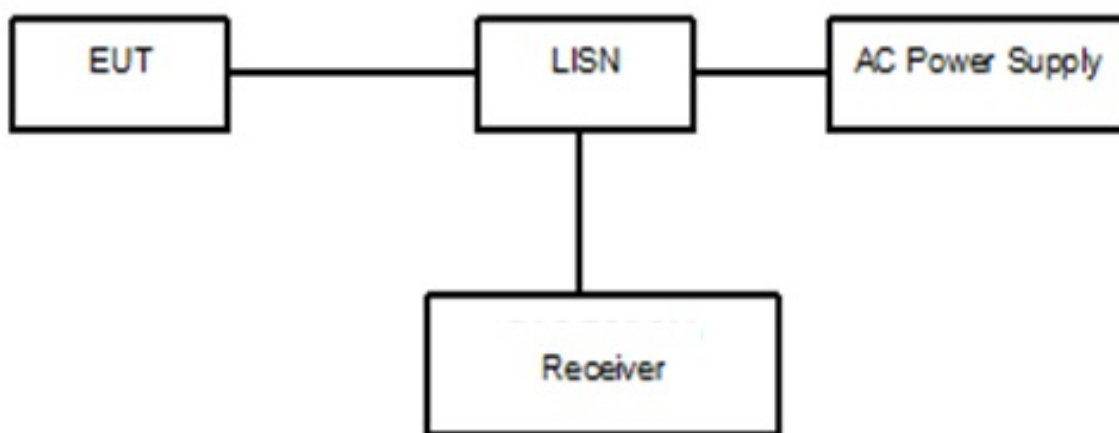


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The EUT is connected with LISN via the charger. The LISN is connected to the reference ground. When performing the test, open the GNSS function of EUT.

The test set-up and the test methods are performed according to ANSI C63.4:2014. Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz. The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.

The data of cable loss has been calibrated in full testing frequency range before the testing.

A "reference path loss" Corr.(dB) is established and the $L_{\text{cable}} + \text{ATT} + \text{VDF}$ is the attenuation of "reference path loss", and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{\text{result}} = P_{\text{mea}} + \text{Corr. (dB)}$$

Sample calculation: $(35.28 \text{ dB}\mu\text{V}) = (5.58 \text{ dB}\mu\text{V}) + (29.7 \text{ dB})$, the corresponding frequency is 0.326386MHz.

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Cor. (dB)	Pmea MaxPeak (dBμV)	Pmea Average (dBμV)
0.326386	---	35.28	49.54	14.26	L1	29.7	---	5.58

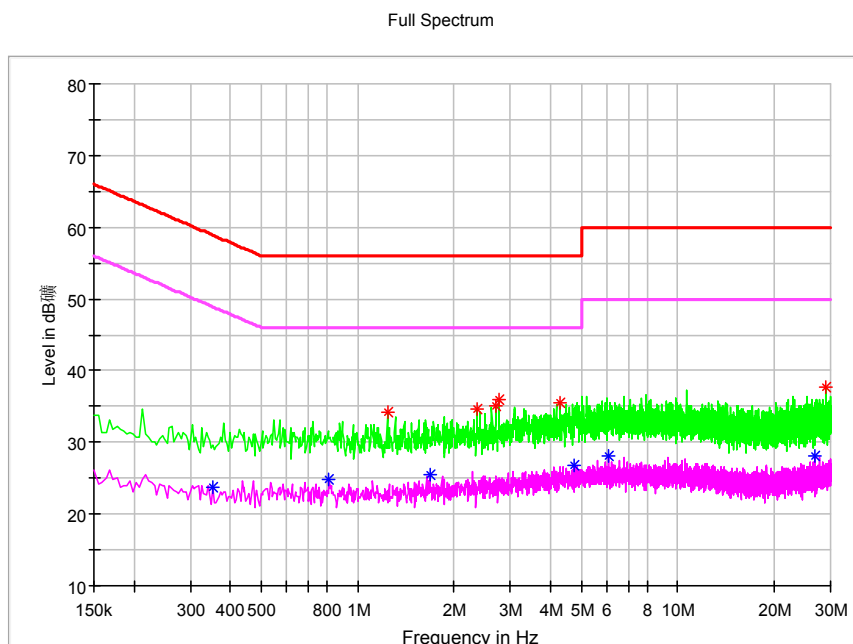
Limit:

Frequency of Emission(MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15~0.5	66 to 56*	56 to 46*
0.5~5	56	46
5~30	60	50

Note: * Decreases with the logarithm of the frequency

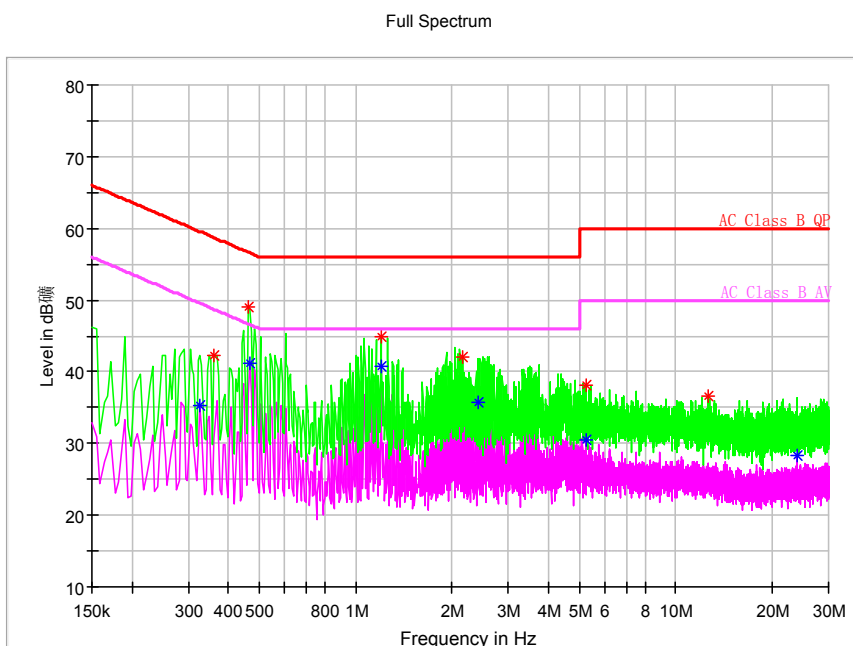
Test result:

Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line

EUT + Charger:



Pic2. Conducted emission L&N Line

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Pmea MaxPeak (dBµV)	Pmea Average (dBµV)
0.326386	---	35.28	49.54	14.26	L1	29.7	---	5.58
0.362568	42.25	---	58.67	16.42	L1	29.7	12.55	---
0.462068	48.95	---	56.66	7.70	L1	29.7	19.25	---
0.466591	---	41.28	46.57	5.29	L1	29.7	---	11.58
1.203795	44.93	---	56.00	11.07	L1	29.7	15.23	---
1.203795	---	40.75	46.00	5.25	L1	29.7	---	11.05
2.153568	42.09	---	56.00	13.91	N	29.8	12.29	---
2.415886	---	35.72	46.00	10.28	L1	29.8	---	5.92
5.219977	---	30.59	50.00	19.41	L1	29.8	---	0.79
5.219977	38.20	---	60.00	21.80	L1	29.8	8.4	---
12.582977	36.64	---	60.00	23.36	L1	29.9	6.74	---
23.989295	---	28.22	50.00	21.78	N	29.9	---	-1.68

2.2.2 Radiated Emissions-FCC Part 15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.4°C	41.2%	101.2kPa

Test Setup:

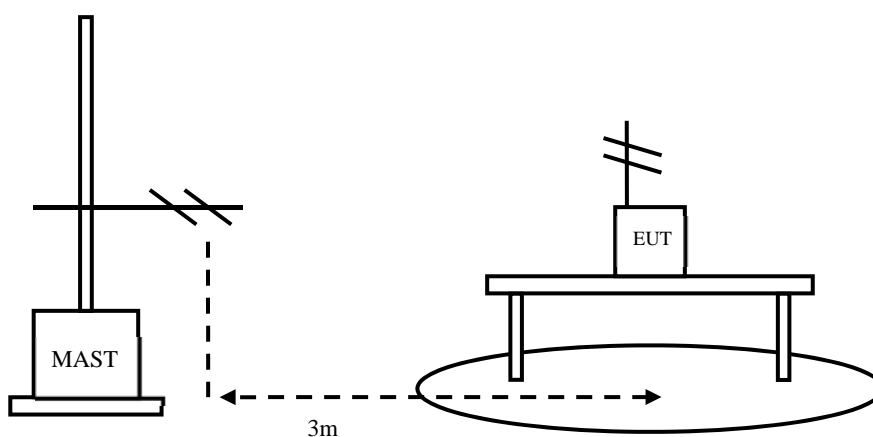


Figure 2

Test Procedure:

EUT+Charger:

- The EUT should be placed on a non-metallic table 80cm above the ground plane. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters. When performing the test, open the GNSS function of EUT, and receivers that operate within the frequency range of 30-960 MHz, the mobile base station starts to work, EUT is in the receiving state.

The EUT should work in idle mode. The test set-up and the test methods are performed according to ANSI C63.4:2014.

Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna VULB9163.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow:
1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing frequency range before the testing. All test results are performed with max hold at the horizontal and vertical polarity.

RBW=120kHz, VBW=300kHz, when the test frequency: 30MHz<f<1GHz

RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

A “reference path loss” is established and the AR_{pl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + AR_{\text{pl}}$$

Sample calculation: (22.06 dB μ V/m) = (42.56dBuV/m) + (-20.5dB), the corresponding frequency is 32.425000MHz.

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
32.425000	22.06	-20.5	42.56	V

Limit:

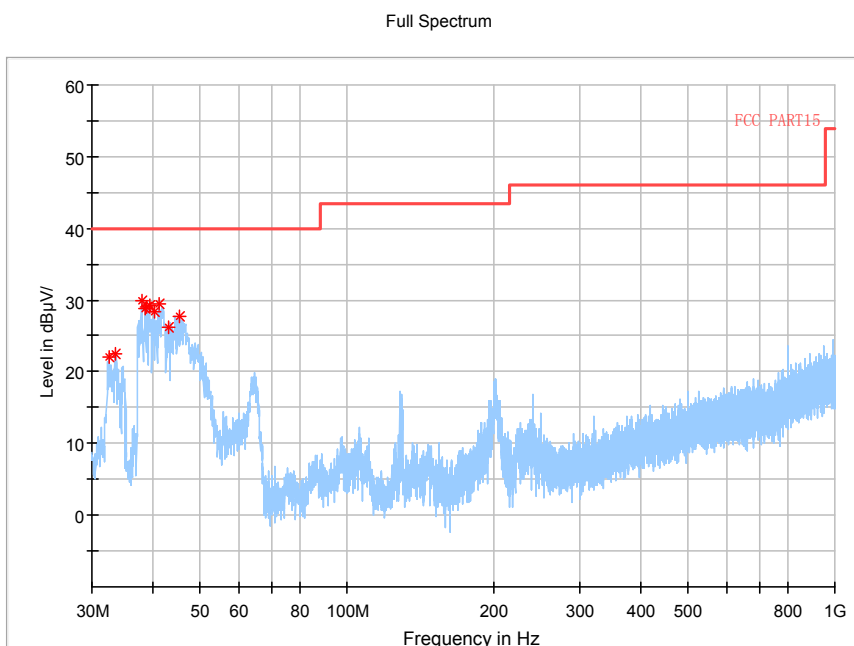
Frequency of Emission(MHz)	Limits	
	Detector	Unit (dB μ V/m)
30~88	Quasi-peak	40
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46
960~1000	Quasi-peak	54
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54
	Peak	74

Test result:

EUT + Charger

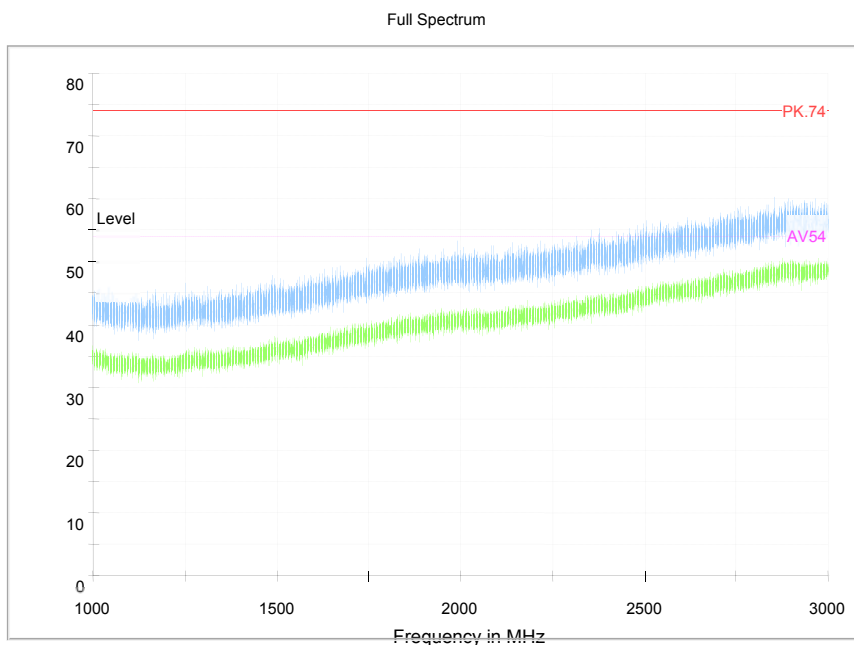
Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
32.425000	22.06	-20.5	42.56	V
33.589000	22.55	-20.1	42.65	V
37.857000	29.91	-18.8	48.71	V
38.633000	28.75	-18.6	47.35	V
38.924000	28.95	-18.5	47.45	V
39.312000	29.15	-18.4	47.55	V
40.185000	28.42	-18.1	46.52	V
41.058000	29.49	-18.0	47.49	V
43.192000	26.12	-17.8	43.92	V
45.229000	27.81	-17.5	45.31	V

EUT + Charger+ : refer to Pic3,Pic4 ,Pic5 and Pic6



Pic3. Radiated emission(30MHz – 1GHz)

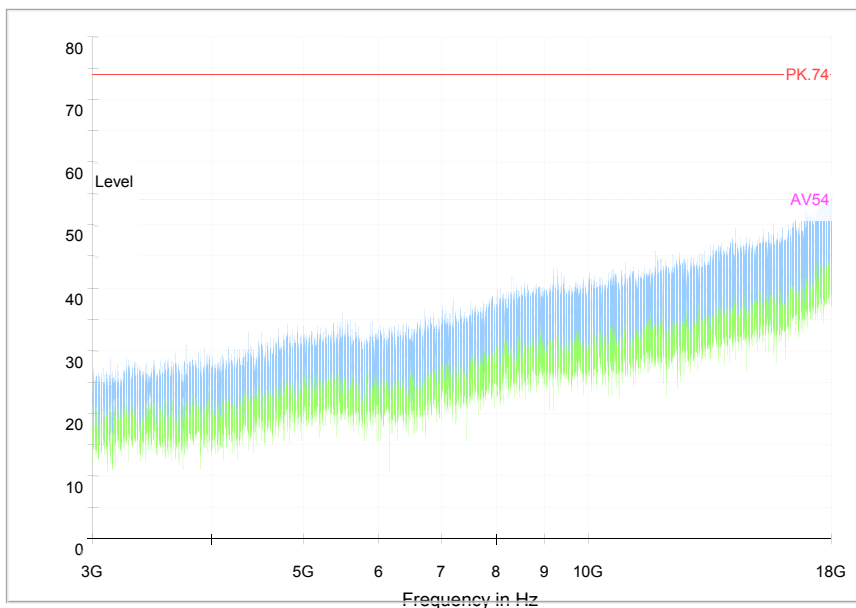
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic4. Radiated emission (1GHz –3GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical

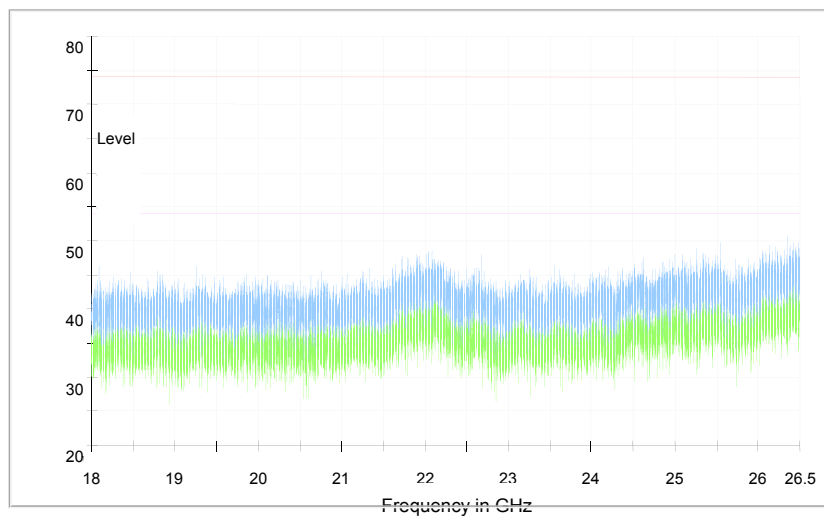
Full Spectrum



Pic5. Radiated emission (3GHz –18GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical

Full Spectrum



Preview Result 2-AVG Preview Result 1-PK+ PK70-74 AV50-54

Comment

Pic6. Radiated emission (18GHz –26.5GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical.

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60mS emi-AnechoicChamber	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2019	20th Aug. 2018
3	CMW500 Mobile Station Tester	R&S	160132	20th Aug. 2019	20th Aug. 2018
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
5	ESIB7 EMI test receiver	R&S	100280	20th Aug. 2019	20th Aug. 2018
6	VULB9163 Receive antenna	R&S	886	20th Aug. 2019	20th Aug. 2018
7	ENV216 AMN	R&S	3560.6550. 12	20th Aug. 2019	20th Aug. 2018
8	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	20th Aug. 2019	20th Aug. 2018
9	PS2000 Turn Table	FRANKONIA	-----	-----	-----
10	MA260 Antenna Master	FRANKONIA	-----	-----	-----
11	EMC32EMI test software	R&S	-----	-----	-----