



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:

2840ERM.004

Test report

**FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition)
&
ICES-003 ISSUE 6 – Update April (2017)**

Identification of item tested	Dual band WiFi and BLE 5 radio module
Trademark	Telit
Model and /or type reference	WE866C6-P
Other identification of the product	FCC ID: RI7WE866C6
Features	BT BR/EDR/LE 5.0 + Wifi a/b/g/n/ac (wave 1=> Max BW= 80 MHz)
Manufacturer	TELIT COMMUNICATIONS S.P.A. Viale Stazione di Prosecco 5/B, 34010 Sgonico, Trieste (Italy)
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) ICES-003 ISSUE 6 – Update April (2017)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	06-19-2020
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Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Certification Inc. has a calibration and maintenance program for its measurement equipment.

DEKRA Certification Inc. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Certification at the time of performance of the test.

DEKRA Certification Inc. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Certification internal document PODT000.

	Frequency (MHz)	U(k=2)	Units
Conducted emission	0,009 - 30	2.69	dB
Radiated emission	30-180	3.82	dB
	180-1000	2.61	dB
	1000-18000	2.92	dB
	18000-40000	2.15	dB

Data provided by the client

Companion module, supporting Wi-Fi 802.11 a/b/g/n/ac (wave 1) and BT (BR/EDR/LE(5.0)). Single RF antenna port for both technologies Wifi and BT. SDIO and HCI I/F, respectively for Wi-Fi and BT control. Module is controlled via a host Telit module, LE920A4 or LE910C1.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
2840/01	Telit module WE866C6-P in Cradle	LE910C4-AP	IMEI:357575100004589	4/27/2020
2840/06	WLAN Antenna	ATEL- ANTENNAS T- AT9552	-	4/27/2020
2840/09		-	-	4/27/2020
	Power cable			

Sample S/01 was used in following testing: All the testing in Appendix B

Test sample description

Ports..... :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded		
	WIFI/BT RF port		0.1	☒	☐		
Supplementary information to the ports..... :	No user accessible ports.						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC:					
☒	DC:3.8V (internal DCDC converter supplying the WE866C3-P module with regulated voltage = 3.3V)						
Rated Power	18 dBm max						
Clock frequencies	48MHz						
Other parameters..... :	Not provided						
Software version	25.20.308						
Hardware version..... :	1.0 / CS2049b-a						
Dimensions in cm (L x W x D)	15x13mm						
Mounting position..... :	☐	Table top equipment					
	☒	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Other:					
Modules/parts	Module/parts of test item		Type		Manufacturer		
Accessories (not part of the test item)	Description		Type		Manufacturer		
Documents as provided by the applicant..... :	Description		File name		Issue date		

Copy of marking plate:



Identification of the client

TELIT COMMUNICATIONS S.P.A
Viale Stazione di Prosecco 5/b, Trieste, Italy, 34010

Testing period and place

Test Location	DEKRA Certification, Inc
Date (start)	05-15-2020
Date (finish)	05-21-2020

Document history

Report number	Date	Description
2840ERM.004	06-19-2020	First release

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semi anechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: Koji Nishimoto & Lourdes María Valverde Malagón

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

Emission Test			
Report Section	Requirement – Test case	Verdict	Remark
A.1.	Radiated emission electromagnetic field test (30 MHz – 1000 MHz)	P	N/A
A.1.	Radiated emission electromagnetic field test (1 GHz – 18 GHz)	P	Refer 1
A.1.	Radiated emission electromagnetic field test (18 GHz – 40 GHz)	P	Refer 1
A.2.	Conducted emission test (150 kHz to 30 MHz)	N/A	Refer 2
Supplementary information and remarks: - As per standard 47 CFR §15.33 due to the highest frequency generated or used in the device is above 1000MHz the upper frequency of measurement range is up to 5th harmonic of the highest frequency or 40GHz, whichever is lower. - DUT is DC powered			

List of equipment used during the test

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
0980	Preamplifier	BONN ELEKTRONIK	BLNA0360-01N	2019/08	2021/08
0981	Preamplifier	BONN ELEKTRONIK	BLMA 0118-2A	2018/10	2020/10
0982	Preamplifier	BONN ELEKTRONIK	BLMA1840-1M	2018/10	2020/10
1012	EMI Test Receiver	Rohde & Schwarz	ESR26	2018/09	2020/09
1017	EMC measurement software	ROHDE & SCHWARZ	EMC32 V9.01	---	---
1039	Signal Analyser	ROHDE & SCHWARZ	FSV40	2018/10	2020/10
1056	HORN ANTENNA	ETS LINDGREN	3116C	2020/01	2023/01
1057	Horn Antenna	ETS LINDGREN	3115	2020/05	2023/05
1064	Biconilog Antenna	ETS LINDGREN	3142E	2018/01	2021/01
1108	Ethernet SNMP Thermometer- CR room	HW GROUP	HWg-STE Plain	N/A	N/A
1111	Ethernet SNMP Thermometer- SAC	HW GROUP	HWg-STE Plain	N/A	N/A

Appendix A: Test results

Appendix A Content

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DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

The operation modes used by the samples to which the present report refers, are shown in the following table:

OPERATION MODE	DESCRIPTION
OM#01*	DUT on 3.8Vdc, • WLAN 5GHz Idle mode

*Worst configurations detected

A.1.RADIATED EMISSION. ELECTROMAGNETIC FIELD TEST

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 6 – Update April (2017)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 6 – Update April (2017); ANSI C63.4 (2014)

Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-01-19 Edition), Secs. 15.109 & ICES-003 Issue 6 – Update April (2017) in the frequency range 30 MHz to 40 GHz for class B equipment.

Frequency range (MHz)	QP Limit for 3 m	
	(μ V/m)	(dB μ V/m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46
Above 960	500	54

Frequency range (MHz)	AVG Limit for 3 m		PK Limit for 3 m (1)
	(μ V/m)	(dB μ V/m)	(dB μ V/m)
Above 1000	500	54	74

Frequencies above 1 GHz, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test, as per §15.35(b)

TEST SETUP

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30-1000 MHz (Bilog antenna) and 1-18GHz (Double ridge horn antennas). A distance of 1m is used for the frequency range 18-40 GHz (Double ridge horn antennas).

For radiated emissions in the range 18-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (Cont.)

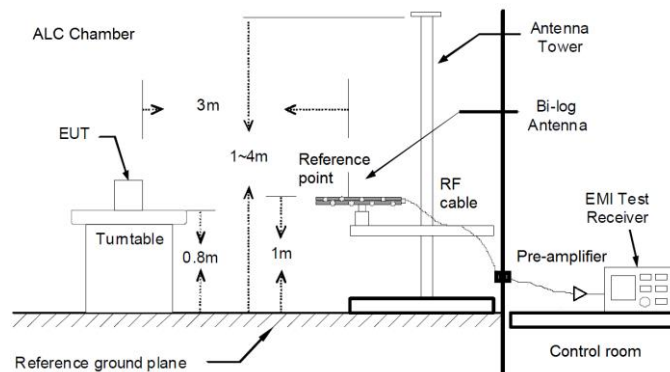


Fig A1: Generic setup for measurements from 30 to 1000MHz

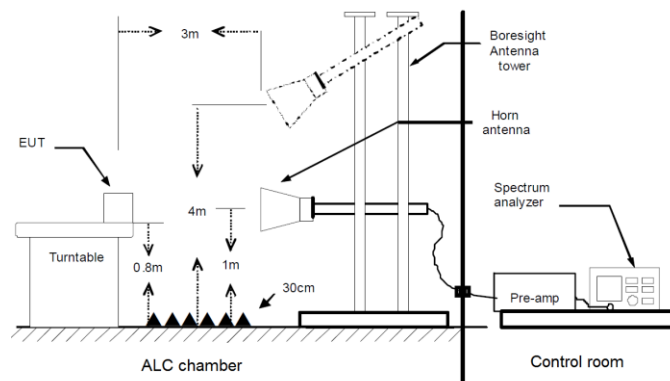
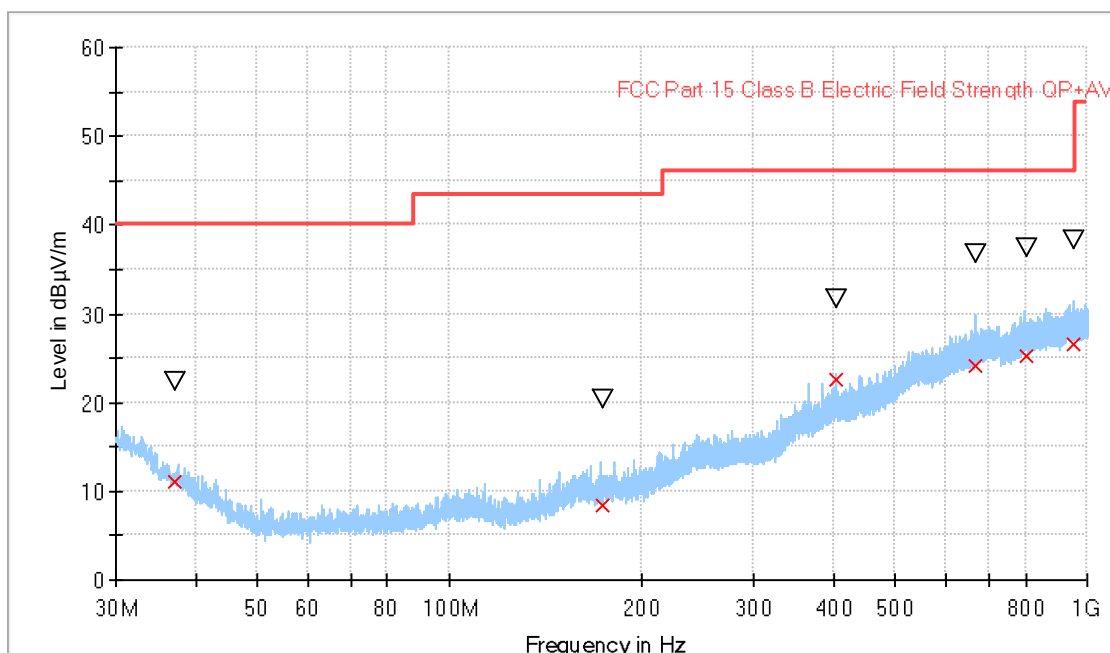


Fig A2: Generic setup for measurements from 1 to 18GHz (Analyzer outside the chamber)

TESTED SAMPLES:	S/01		
TESTED OPERATION MODES:	OM#01		
TEST RESULTS:	CRmmnnxx: CR, Radiation Condition; mm: Sample number; nn: Operation mode.,xx:Range,		
CRmmnnxx	Description	Result	
CR0101LR	Range: 30 MHz - 1000 MHz Horizontal Polarization	P	
CR0101LR	Range: 30 MHz - 1000 MHz Vertical Polarization	P	
CR0101HR1	Range: 1-18 GHz Horizontal Polarization	P	
CR0101HR1	Range: 1-18 GHz Vertical Polarization	P	
CR0101HR2	Range: 18-40 GHz Horizontal Polarization	P	
CR0101HR2	Range: 18-40 GHz Vertical Polarization	P	

Radiated Emission. CR0101LR

Project: 02840ERM004
Company: TELIT
Sample: S/01
Operation mode: OM#01
Description: EUT ON. Wi-Fi 2.4/5 GHz and BTEDR + LE in IDLE mode. Power supply 3.8 VDC.



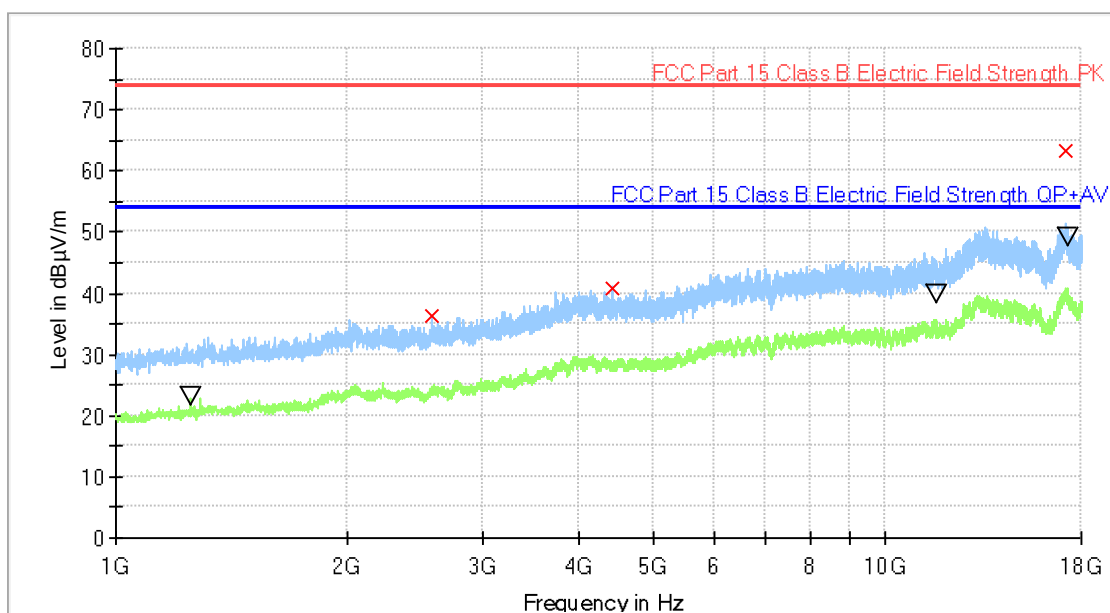
— Preview Result 1-PK+
— FCC Part 15 Class B Electric Field Strength QP+AV
x Final Result QPK
v Final Result PK+

Final_Result

Frequency	QuasiPeak	MaxPeak	Limit	Margin	Height	Pol	Azimuth
37.030000	11.17	22.31	40.00	28.83	199.0	V	-131.0
173.210000	8.45	20.42	43.50	35.05	272.0	H	82.0
403.190000	22.63	31.64	46.00	23.37	118.0	V	-105.0
669.090000	24.23	36.76	46.00	21.77	175.0	H	-27.0
800.180000	25.15	37.38	46.00	20.85	291.0	V	76.0
950.760000	26.58	38.39	46.00	19.42	200.0	V	-42.0

Radiated Emission. CR0101HR1

Project: 02840ERM004
Company: TELIT
Sample: S/01
Operation mode: OM#01
Description: EUT ON. Wi-Fi 2.4/5 GHz and BTEDR + LE in IDLE mode. Power supply 3.8 VDC.



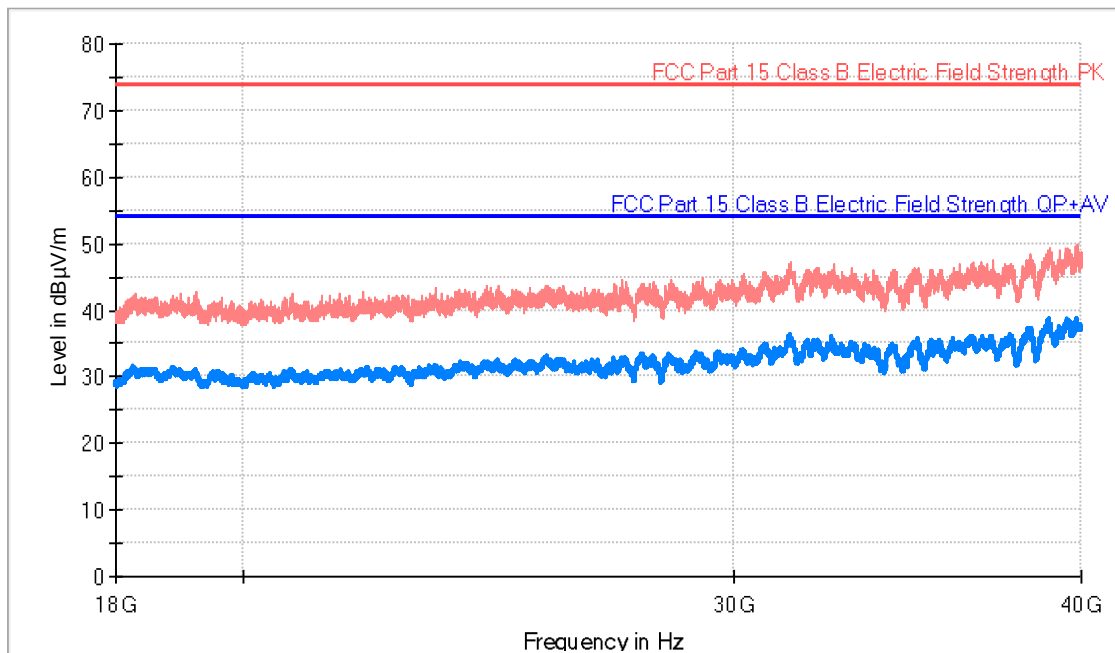
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV
X Final_Result PK+
▽ Final_Result AVG

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
1248.050000	---	23.19	53.90	30.71	121.0	V	115.0
2573.100000	36.30	---	73.90	37.60	197.0	V	-50.0
4414.500000	40.95	---	73.90	32.95	196.0	V	-55.0
11621.700000	---	40.00	53.90	13.90	129.0	V	143.0
17202.000000	63.42	---	73.90	10.48	250.0	V	-160.0
17224.900000	---	49.15	53.90	4.75	100.0	V	161.0

Radiated Emission. CR0101HR2

Project: 02840ERM004
Company: TELIT
Sample: S/01
Operation mode: OM#01
Description: EUT ON. Wi-Fi 2.4/5 GHz and BTEDR + LE in IDLE mode. Power supply 3.8 VDC.



— AVG_MAXH
 — PK+_MAXH
 — FCC Part 15 Class B Electric Field Strength PK
 — FCC Part 15 Class B Electric Field Strength QP+AV

No spurious emission observed in 18-40GHz