

TEST REPORT

of

FCC Part 2 Subpart J, Part 22 Subpart C/H and Part 27 Subpart C
IC RSS-132 Issue 3, RSS-139 Issue 3,
RSS-199 Issue 3 and RSS-Gen Issue 5

FCC ID: BEJTFGMEIBBCD1
IC Certification: 2703H-TFGMEIBBCD1

Equipment Under Test : Telematics
Model Name : TFGMEIBBCD1
Variant Model Name(s) : Refer to the page 3
Applicant : FCC: LG Electronics USA
IC: LG ELECTRONICS INC.
Manufacturer : LG Electronics Inc.
Date of Receipt : 2022.07.22
Date of Test(s) : 2022.07.25 ~ 2023.03.09
Date of Issue : 2023.03.13

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
- 3) This test report cannot be reproduced, except in full, without prior written permission of the Company.
- 4) The data marked * in this report was provided by the customer and may affect the validity of the test results.

We are responsible for all the information of this test report except for the data(*) provided by the customer.

Tested by:



Teo Kim

Technical
Manager:



Jinhyoung Cho

SGS Korea Co., Ltd. Gunpo Laboratory



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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
 - 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
 - 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
 - Designation number: KR0150

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1.2. Details of Applicant

FCC Applicant : LG Electronics USA
 FCC Address : 111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632
 IC Applicant : LG ELECTRONICS INC.
 IC Address : 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea (Republic of), 451-713
 Contact Person : Cho, Hee-jae
 Phone No. : +1 201 470 2696

1.3. Details of Manufacturer

Company : LG Electronics Inc.
 Address : 10, Magokjungang 10-ro, Gangseo-gu, Seoul, Korea, 07796

1.4. Description of EUT

Kind of Product	Telematics
Model Name	TFGMEIBBCD1
Variant Model Names	TFGMEIBBCD2, TFGMEIBBCD3
Serial Number	Conducted: 351015130056680 Radiated: 351015130065751
Power Supply	DC 13.5 V
Rated Power	LTE Band 2, 7, 13, 14: 24 dB m LTE Band 4, 66: 23.5 dB m LTE Band 5, 12: 24.2 dB m
Frequency Range	LTE Band 2: 1 850 MHz ~ 1 910 MHz LTE Band 4: 1 710 MHz ~ 1 755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2 500 MHz ~ 2 570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 66: 1 710 MHz ~ 1 780 MHz
Uplink CA Bands	5B, 7C, 66B, 66C
Modulation Technique	QPSK, 16QAM, 64QAM
Antenna Type	Internal: Planar Inverted F Antenna External: Metal Antenna
Antenna Gain*	Refer to the clause 1.18
H/W Version	REV.D
S/W Version	SW168
FVIN	N/A

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	R&S	SMA100B	106887	Oct. 13, 2022	Annual	Oct. 13, 2023
Signal Generator	R&S	SMBV100A	255834	May 25, 2022	Annual	May 25, 2023
Spectrum Analyzer	R&S	FSV30	103210	Dec. 07, 2022	Annual	Dec. 07, 2023
Spectrum Analyzer	Agilent	N9020A	MY53421758	Aug. 26, 2022	Annual	Aug. 26, 2023
Mobile Test Unit	R&S	CMW 500	144034	Feb. 17, 2023	Annual	Feb. 17, 2024
Communication Analyzer	Anritsu	MT8821C	6262192291	Oct. 11, 2022	Annual	Oct. 11, 2023
Power Meter	Anritsu	ML2495A	1223004	Nov. 29, 2022	Annual	Nov. 29, 2023
Power Sensor	Anritsu	MA2411B	1207272	May 27, 2022	Annual	May 27, 2023
Temperature Chamber	ESPEC CORP.	SH-662	93000533	Jun. 02, 2022	Annual	Jun. 02, 2023
Low Pass Filter	Mini-Circuits	NLP-1200+	V 8979400903-1	May 13, 2022	Annual	May 13, 2023
High Pass Filter	Wainwright Instrument GmbH	WHKX10-900-1000-18000-40SS	7	Mar. 02, 2023	Annual	Mar. 02, 2024
High Pass Filter	Wainwright Instrument GmbH	WHKX2.2/12.75G-10SS	8	Mar. 02, 2023	Annual	Mar. 02, 2024
High Pass Filter	Wainwright Instrument GmbH	WHKX3.0/18G-6SS	21	Jun. 09, 2022	Annual	Jun. 09, 2023
High Pass Filter	Wainwright Instrument GmbH	WHNX7.5/26.5G-6SS	11	Oct. 24, 2022	Annual	Oct. 24, 2023
BRIDGE COUPLER	MARKI MICROWAVE INC	CBR16-0012	1542	May 06, 2022	Annual	May 06, 2023
Directional Coupler	KRYTAR	152613	122660	Jul. 06, 2022	Annual	Jul. 06, 2023
DC Power Supply	Agilent	U8002A	MY49030063	Jan. 20, 2023	Annual	Jan. 20, 2024
Preamplifier	H.P.	8447F	2944A03909	Aug. 04, 2022	Annual	Aug. 04, 2023
Preamplifier	R&S	SCU 18	10117	Jun. 13, 2022	Annual	Jun. 13, 2023
Preamplifier	TESTEK	TK-PA1840H	130016	Jan. 11, 2023	Annual	Jan. 11, 2024
Test Receiver	R&S	ESCI 7	100911	Feb. 24, 2023	Annual	Feb. 24, 2024
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 23, 2021	Biennial	Aug. 23, 2023
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	01126	Feb. 09, 2023	Annual	Feb. 09, 2024
Horn Antenna	R&S	HF906	100326	Feb. 28, 2023	Annual	Feb. 28, 2024
Horn Antenna	R&S	HF907	102270	Mar. 09, 2023	Annual	Mar. 09, 2024
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA 9170	9170-540	Nov. 30, 2022	Annual	Nov. 30, 2023
Antenna Master	Innco systems GmbH	MA4640-XP-ET	MA4640/536/383 30516/L	N.C.R.	N/A	N.C.R.
Turn Table	Innco systems GmbH	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/383 30516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.6 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	RFONE	MWX221-NMSNMS (4 m)	J1023142	Oct. 04, 2022	Semi-Annual	Apr. 04, 2023
Coaxial Cable	Qualwave Inc.	QA500-18-NN-10 (10 m)	22200114	Oct. 04, 2022	Semi-Annual	Apr. 04, 2023
Coaxial Cable	RADIALL	TESTPRO 3	182287	Feb. 18, 2023	Semi-Annual	Aug. 18, 2023
Coaxial Cable	RADIALL	TESTPRO 3	182288	Feb. 18, 2023	Semi-Annual	Aug. 18, 2023
Coaxial Cable	RADIALL	TESTPRO 3	182291	Feb. 18, 2023	Semi-Annual	Aug. 18, 2023

Note;

- For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 2, 22 and 27 / IC RSS-Gen Issue 5, RSS-132 Issue 3, RSS-139 Issue 3 and RSS-199 Issue 3			
Section in FCC	Section in IC	Test Item(s)	Result
§2.1046 §22.913(a)(5) §27.50(d)(4) §27.50(h)(2)	RSS-132 Issue 3 5.4 RSS-139 Issue 3 6.5 RSS-199 Issue 3 4.4	E.R.P. / E.I.R.P.	Complied ¹⁾
§22.917(a) §27.53(h)(1) §27.53(m)(4)	RSS-132 Issue 3 5.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Radiated Spurious Emissions	Complied ¹⁾
§2.1046	RSS-Gen Issue 5 6.12	Conducted Output Power	Complied ²⁾
§2.1049	RSS-Gen Issue 5 6.7	Occupied Bandwidth	Complied ²⁾
§22.913(d) §27.50(d)(5)	RSS-132 Issue 3 5.4 RSS-139 Issue 3 6.5 RSS-199 Issue 3 4.4	Peak-Average Ratio	Complied ²⁾
§22.917(a) §27.53(h)(1) §27.53(m)(4)	RSS-132 Issue 3 5.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Spurious Emission at Antenna Terminal	Complied ²⁾
§22.917(a) §27.53(h)(1) §27.53(m)(4)	RSS-132 Issue 3 5.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Band Edge and Emission Mask	Complied ²⁾
§2.1055 §22.355 §27.54	RSS-Gen Issue 5 6.11 RSS-132 Issue 3 5.3 RSS-139 Issue 3 6.4 RSS-199 Issue 3 4.3	Frequency Stability	Complied ²⁾

Note;

- 1) The EUT has two antennas (external, internal) and each antenna operated by one module.
- 2) The EUT uses same module with TM05FNNAGM0, so only spot check was performed for radiated spurious emissions and the rule was satisfied.

1.7. Sample Calculation for Offset

Where relevant, the following sample calculation is provided:

1.7.1. Conducted Test

Offset value (dB) = Directional Coupler (dB) + Cable loss (dB)

1.7.2. Radiation Test

- E.I.R.P. (dB m) = Measured level (dB μ V) + Antenna factor (dB/m) + Cable loss (dB) + 20 Log D - 104.8;
 where D is the measurement distance in meters.
- E.R.P. (dB m) = E.I.R.P. (dB m) - 2.15 (dB)

1.8. Introduction of Test Data Reuse

This report referenced from the FCC ID: BEJTM05FNNAGM0 and IC Certification: 2703H-TM05FNNAGM0. The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID and IC Certification.

1.9. Difference

Model name	Description
TM05FNNAGM0	- Reference model - Single modular
TFGMEIBBCD1	- Host equipment - Same to reference model except below - With external case - Internal antenna

1.10. Spot Check Data

After confirming through preliminary radiated emissions in the each below 1 GHz and above 1 GHz worst band that the performance of the FCC ID: BEJTM05FNNAGM0 and IC Certification: 2703H-TM05FNNAGM0 remains representative of FCC ID: BEJTFGMEIBBCD1 and IC Certification: 2703H-TFGMEIBBCD1. The test data of FCC ID: BEJTM05FNNAGM0 and IC Certification: 2703H-TM05FNNAGM0 being submitted for this application to cover LTE ULCA features.

Band	Test item	Frequency (MHz)	Limit	Original model	Spot check model	Deviation (dB)	Remark
				TM05FNNAGM0	TFGMEIBBCD1		
				FCC ID: BEJTM05FNNAGM0 IC Certification: 2703H-TM05FNNAGM0	FCC ID: BEJTFGMEIBBCD1 IC Certification: 2703H-TM05FNNAGM0		
5B	Radiated Spurious Emissions	829 + 836.2	-13 dB m	-48.48 dB m	-51.32 dB m	-2.84	-
66B	Radiated Spurious Emissions	1 717.5 + 1 726.8	-13 dB m	-17.31 dB m	-17.63 dB m	-0.32	-

Note;

Comparison of two models, upper deviation is within 3 dB range and all test results are under FCC/IC technical limits.

1.11. Reference Detail

Reference applicant that contains the reused reference data in the individual test reports:

Equipment class	Reference FCC ID and IC Certification	Application type	Reference test report number	Exhibit type	Variant test report number	Data reuse
PCB	FCC ID: BEJTM05FNNAGM0 IC Certification: 2703H-TM05FNNAGM0	Original grant	F690501-RF-RTL003820-1 (LTE)	Test report	F690501-RF-RTL003895 (LTE)	All
			F690501-RF-RTL003821-1 (NR)		F690501-RF-RTL003896 (NR)	
			F690501-RF-RTL003822-1 (Inter CA)		F690501-RF-RTL003897 (Inter CA)	
			F690501-RF-RTL003823-1 (WCDMA)		F690501-RF-RTL003898 (WCDMA)	
			F690501-RF-RTL003824-1 (intra CA)		F690501-RF-RTL003899 (intra CA)	
			F690501-RF-RTL003825-1 (NR n41)		F690501-RF-RTL003900 (NR n41)	
			F690501-RF-RTL003827-1 (FCC_NR n77/78)		F690501-RF-RTL003902 (FCC_NR n77/78)	
			F690501-RF-RTL003828-1 (IC_NR n77/78)		F690501-RF-RTL003903 (IC_NR n77/78)	

1.12. Manufacturer Declaration

The EUT supports two ports and LTE, WCDMA and 5G NR FDD bands support only port 1.
 The 5G NR TDD (n41, n77, n78) band supports both port 1 and port 2.
 The EUT has two antennas (external, internal) and each antenna operated by one module.
 The EUT's internal and external antennas do not transmit simultaneously.

1.13. The Test Channel Details

The EUT supports with carrier aggregation uplink. Intra-Band contiguous specification as below

E-UTRA Intra-Band CA configuration / Bandwidth combination set			
E-UTRA CA Configuration	Channel bandwidth for carrier (MHz)	Channel bandwidth for carrier (MHz)	Maximum aggregated bandwidth (MHz)
CA_5B	3	5	8
	5	3	
	5	10	15
	10	5	
	10	10	
CA_7C	10	20	30
	20	10	
	15	15	
	15	10	25
	15	20	
	20	15	
CA_66B	20	20	40
	5	5	
	5	10	
	10	5	
	5	15	
	15	5	
10	10		
CA_66C	10	15	25
	15	10	
	10	20	30
	20	10	
	15	15	
	15	20	35
	20	15	
	20	5	25
	5	20	
20	20		

1.14. Worst Case Configuration and Mode

The worst-case is based on the conducted output power measurement investigation results. All testing was performed using QPSK and 16QAM modulations. However, the spurious radiated emission and spurious at antenna terminal were only performed on bandwidth and RB offset (with RB size 1) with the highest conducted power in QPSK.

The peak to average ratio were tested only 64QAM modulation as worst case.

The radiation test of the EUT was investigated in three orthogonal orientations X, Y, and Z, and the worst case data is reported.

1.15. Measurement Configuration

Test Items	Band	Test Channel			Bandwidth (MHz)								Modulation			RB #		
		Low	Mid	High	8	10	15	20	25	30	35	40	QPSK	16QAM	64QAM	1	Half	Full
Conducted Output Power	5B	V	V	V	V		V	V					V	V	-	V	-	V
	7C	V	V	V					V	V	V	V	V	V	-	V	-	V
	66B	V	V	V		V	V	V					V	V	-	V	-	V
	66C	V	V	V					V	V	V	V	V	V	-	V	-	V
Frequency Stability	5B	-	V	-	V		V	V					V	-	-	-	-	V
	7C	-	V	-					V	V	V	V	V	-	-	-	-	V
	66B	-	V	-		V	V	V					V	-	-	-	-	V
	66C	-	V	-					V	V	V	V	V	-	-	-	-	V
Occupied Bandwidth	5B	-	V	-	V		V	V					V	V	-	-	-	V
	7C	-	V	-					V	V	V	V	V	V	-	-	-	V
	66B	-	V	-		V	V	V					V	V	-	-	-	V
	66C	-	V	-					V	V	V	V	V	V	-	-	-	V
Peak-to-Average Ratio	5B	-	V	-	V		V	V					-	-	V	-	-	V
	7C	-	V	-					V	V	V	V	-	-	V	-	-	V
	66B	-	V	-		V	V	V					-	-	V	-	-	V
	66C	-	V	-					V	V	V	V	-	-	V	-	-	V
Band edge	5B	V	-	V	V		V	V					V	V	-	-	-	V
	7C	V	-	V					V	V	V	V	V	V	-	-	-	V
	66B	V	-	V		V	V	V					V	V	-	-	-	V
	66C	V	-	V					V	V	V	V	V	V	-	-	-	V
Spurious at antenna terminal & Radiated Spurious Emissions	5B	V	V	V	Worst Case													
	7C	V	V	V	Worst Case													
	66B	V	V	V	Worst Case													
	66C	V	V	V	Worst Case													

1.16. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty	
RF Output Power	0.32 dB	
Occupied Bandwidth	3.90 kHz	
Conducted Spurious Emissions	0.61 dB	
Peak to Average Ratio	0.60 dB	
Frequency Stability	5.97 kHz	
Radiated Emission, 9 kHz to 30 MHz	H	3.40 dB
	V	3.40 dB
Radiated Emission, below 1 GHz	H	4.50 dB
	V	5.10 dB
Radiated Emission, above 1 GHz	H	3.70 dB
	V	3.90 dB

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95 % level of confidence.

1.17. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL003899	2023.03.13	Initial

1.18. Antenna Information

Band	Operating Frequency (MHz)	Antenna Peak Gain (dB i)	
		External	Internal
LTE 2	1 850 ~ 1 910	5.12	2.23
LTE 5	824 ~ 849	0.37	0.75
LTE 7	2 500 ~ 2 570	5.99	2.50
LTE 12	699 ~ 716	-1.05	0.58
LTE 13	777 ~ 787	-0.53	0.44
LTE 14	788 ~ 798	-0.53	0.44
LTE 66/4	1 710 ~ 1 780	5.54	3.15

1.19. Emission Designator and Max Power

- Internal Antenna

Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator		
CA_5B	3+5	QPSK	825.6	846.5	24.48	0.75	23.08	0.203	7M41G7D		
		16QAM			23.59		22.19	0.166	7M39D7D		
	5+3	QPSK	825.6	847.4	24.22		22.82	0.191	7M45G7D		
		16QAM			23.35		21.95	0.157	7M45D7D		
	5+10	QPSK	826.8	844.0	24.51		23.11	0.205	13M8G7D		
		16QAM			23.98		22.58	0.181	13M8D7D		
	10+5	QPSK	829.0	846.2	24.75		23.35	0.216	14M0G7D		
		16QAM			24.27		22.87	0.194	13M9D7D		
	10+10	QPSK	829.0	844.0	24.55		23.15	0.207	18M7G7D		
		16QAM			24.06		22.66	0.185	18M7D7D		
	CA_7C	10+20	QPSK	2 505.5	2 560.0		23.27	2.50	25.77	0.378	28M1G7D
			16QAM				22.39		24.89	0.308	28M1D7D
20+10		QPSK	2 510.0	2 564.5	23.00	25.50	0.355		28M2G7D		
		16QAM			21.53	24.03	0.253		28M1D7D		
15+15		QPSK	2 507.5	2 562.5	23.15	25.65	0.367		28M2G7D		
		16QAM			22.11	24.61	0.289		28M2D7D		
15+10		QPSK	2 507.5	2 564.7	23.14	25.64	0.366		23M1G7D		
		16QAM			22.30	24.80	0.302		23M1D7D		
15+20		QPSK	2 507.8	2 560.0	23.13	25.63	0.366		32M9G7D		
		16QAM			22.18	24.68	0.294		32M9D7D		
20+15		QPSK	2 510.0	2 562.2	22.79	25.29	0.338		32M9G7D		
		16QAM			21.49	23.99	0.251		32M8D7D		
20+20		QPSK	2 510	2 560	22.87	25.37	0.344		37M7G7D		
		16QAM			21.53	24.03	0.253		37M6D7D		
CA_66B	5+5	QPSK	1 712.5	1 777.5	22.63	3.15	25.78	0.378	9M17G7D		
		16QAM			21.34		24.49	0.281	9M25D7D		
	5+10	QPSK	1 712.8	1 775.0	22.71		25.86	0.385	13M9G7D		
		16QAM			21.32		24.47	0.280	13M9D7D		
	10+5	QPSK	1 715.0	1 777.2	22.58		25.73	0.374	13M9G7D		
		16QAM			21.35		24.50	0.282	13M9D7D		
	5+15	QPSK	1 713.0	1 772.5	22.68		25.83	0.383	18M2G7D		
		16QAM			21.34		24.49	0.281	18M2D7D		
	15+5	QPSK	1 717.5	1 777.0	22.75		25.90	0.389	18M2G7D		
		16QAM			21.48		24.63	0.290	18M2D7D		
	10+10	QPSK	1 715.0	1 775.0	22.66		25.81	0.381	18M8G7D		
		16QAM			21.25		24.40	0.275	18M7D7D		

Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
CA_66C	10+15	QPSK	1 715.3	1 772.5	22.72	3.15	25.87	0.386	23M0G7D
		16QAM			21.63		24.78	0.301	23M0D7D
	15+10	QPSK	1 717.5	1 774.7	22.71		25.86	0.385	23M0G7D
		16QAM			21.32		24.47	0.280	23M0D7D
	10+20	QPSK	1 715.5	1 770.0	22.77		25.92	0.391	28M1G7D
		16QAM			21.64		24.79	0.301	27M9D7D
	20+10	QPSK	1 720.0	1 774.5	22.73		25.88	0.387	28M1G7D
		16QAM			21.18		24.33	0.271	27M9D7D
	15+15	QPSK	1 717.5	1 772.5	22.74		25.89	0.388	28M2G7D
		16QAM			21.36		24.51	0.282	28M2D7D
	15+20	QPSK	1 717.8	1 770.0	22.71		25.86	0.385	32M7G7D
		16QAM			21.43		24.58	0.287	32M7D7D
	20+15	QPSK	1 720.0	1 772.2	22.71		25.86	0.385	32M9G7D
		16QAM			21.32		24.47	0.280	32M7D7D
	20+5	QPSK	1 720.0	1 776.7	22.74		25.89	0.388	22M8G7D
		16QAM			21.12		24.27	0.267	22M8D7D
	5+20	QPSK	1 713.3	1 770.0	22.72		25.87	0.386	22M7G7D
		16QAM			21.51		24.66	0.292	22M7D7D
	20+20	QPSK	1 720.0	1 770.0	22.62		25.77	0.378	37M6G7D
		16QAM			21.56		24.71	0.296	37M6D7D

- External Antenna

Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator		
CA_5B	3+5	QPSK	825.6	846.5	24.48	0.37	22.70	0.186	7M41G7D		
		16QAM			23.59		21.81	0.152	7M39D7D		
	5+3	QPSK	825.6	847.4	24.22		22.44	0.175	7M45G7D		
		16QAM			23.35		21.57	0.144	7M45D7D		
	5+10	QPSK	826.8	844.0	24.51		22.73	0.187	13M8G7D		
		16QAM			23.98		22.20	0.166	13M8D7D		
	10+5	QPSK	829.0	846.2	24.75		22.97	0.198	14M0G7D		
		16QAM			24.27		22.49	0.177	13M9D7D		
	10+10	QPSK	829.0	844.0	24.55		22.77	0.189	18M7G7D		
		16QAM			24.06		22.28	0.169	18M7D7D		
	CA_7C	10+20	QPSK	2 505.5	2 560.0		23.27	5.99	29.26	0.843	28M1G7D
			16QAM				22.39		28.38	0.689	28M1D7D
20+10		QPSK	2 510.0	2 564.5	23.00	28.99	0.793		28M2G7D		
		16QAM			21.53	27.52	0.565		28M1D7D		
15+15		QPSK	2 507.5	2 562.5	23.15	29.14	0.820		28M2G7D		
		16QAM			22.11	28.10	0.646		28M2D7D		
15+10		QPSK	2 507.5	2 564.7	23.14	29.13	0.818		23M1G7D		
		16QAM			22.30	28.29	0.675		23M1D7D		
15+20		QPSK	2 507.8	2 560.0	23.13	29.12	0.817		32M9G7D		
		16QAM			22.18	28.17	0.656		32M9D7D		
20+15		QPSK	2 510.0	2 562.2	22.79	28.78	0.755		32M9G7D		
		16QAM			21.49	27.48	0.560		32M8D7D		
20+20		QPSK	2 510	2 560	22.87	28.86	0.769		37M7G7D		
		16QAM			21.53	27.52	0.565		37M6D7D		
CA_66B		5+5	QPSK	1 712.5	1 777.5	22.63	5.54		28.17	0.656	9M17G7D
			16QAM			21.34			26.88	0.488	9M25D7D
	5+10	QPSK	1 712.8	1 775.0	22.71	28.25		0.668	13M9G7D		
		16QAM			21.32	26.86		0.485	13M9D7D		
	10+5	QPSK	1 715.0	1 777.2	22.58	28.12		0.649	13M9G7D		
		16QAM			21.35	26.89		0.489	13M9D7D		
	5+15	QPSK	1 713.0	1 772.5	22.68	28.22		0.664	18M2G7D		
		16QAM			21.34	26.88		0.488	18M2D7D		
	15+5	QPSK	1 717.5	1 777.0	22.75	28.29		0.675	18M2G7D		
		16QAM			21.48	27.02		0.504	18M2D7D		
	10+10	QPSK	1 715.0	1 775.0	22.66	28.20		0.661	18M8G7D		
		16QAM			21.25	26.79		0.478	18M7D7D		

Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
CA_66C	10+15	QPSK	1 715.3	1 772.5	22.72	5.54	28.26	0.670	23M0G7D
		16QAM			21.63		27.17	0.521	23M0D7D
	15+10	QPSK	1 717.5	1 774.7	22.71		28.25	0.668	23M0G7D
		16QAM			21.32		26.86	0.485	23M0D7D
	10+20	QPSK	1 715.5	1 770.0	22.77		28.31	0.678	28M1G7D
		16QAM			21.64		27.18	0.522	27M9D7D
	20+10	QPSK	1 720.0	1 774.5	22.73		28.27	0.671	28M1G7D
		16QAM			21.18		26.72	0.470	27M9D7D
	15+15	QPSK	1 717.5	1 772.5	22.74		28.28	0.673	28M2G7D
		16QAM			21.36		26.90	0.490	28M2D7D
	15+20	QPSK	1 717.8	1 770.0	22.71		28.25	0.668	32M7G7D
		16QAM			21.43		26.97	0.498	32M7D7D
	20+15	QPSK	1 720.0	1 772.2	22.71		28.25	0.668	32M9G7D
		16QAM			21.32		26.86	0.485	32M7D7D
	20+5	QPSK	1 720.0	1 776.7	22.74		28.28	0.673	22M8G7D
		16QAM			21.12		26.66	0.463	22M8D7D
	5+20	QPSK	1 713.3	1 770.0	22.72		28.26	0.670	22M7G7D
		16QAM			21.51		27.05	0.507	22M7D7D
	20+20	QPSK	1 720.0	1 770.0	22.62		28.16	0.655	37M6G7D
		16QAM			21.56		27.10	0.513	37M6D7D

1.20. Information of Variant Model

Model Name		Description
Basic Model	TFGMEIBBCD1	- Dual GNSS
Variant Models	TFGMEIBBCD2	- Same to RF module with basic model except following function - Single GNSS and Ultra-super cruise service doesn't supported
	TFGMEIBBCD3	- Same to RF module with basic model except following function - Single GNSS and Ultra-super cruise service doesn't supported - eUICC part is different with TFGMEIBBCD2

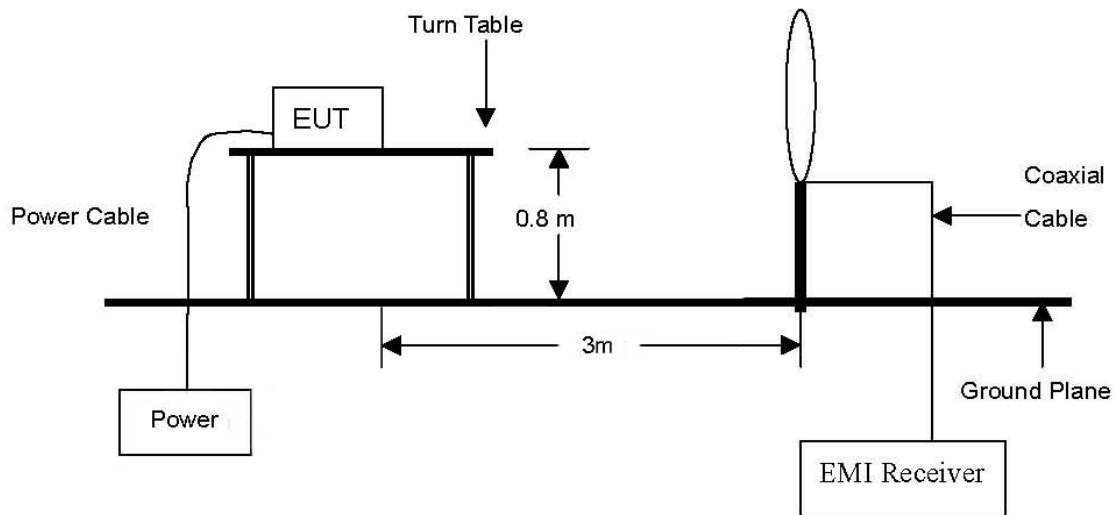
Note;

The all test items performed with basic model.

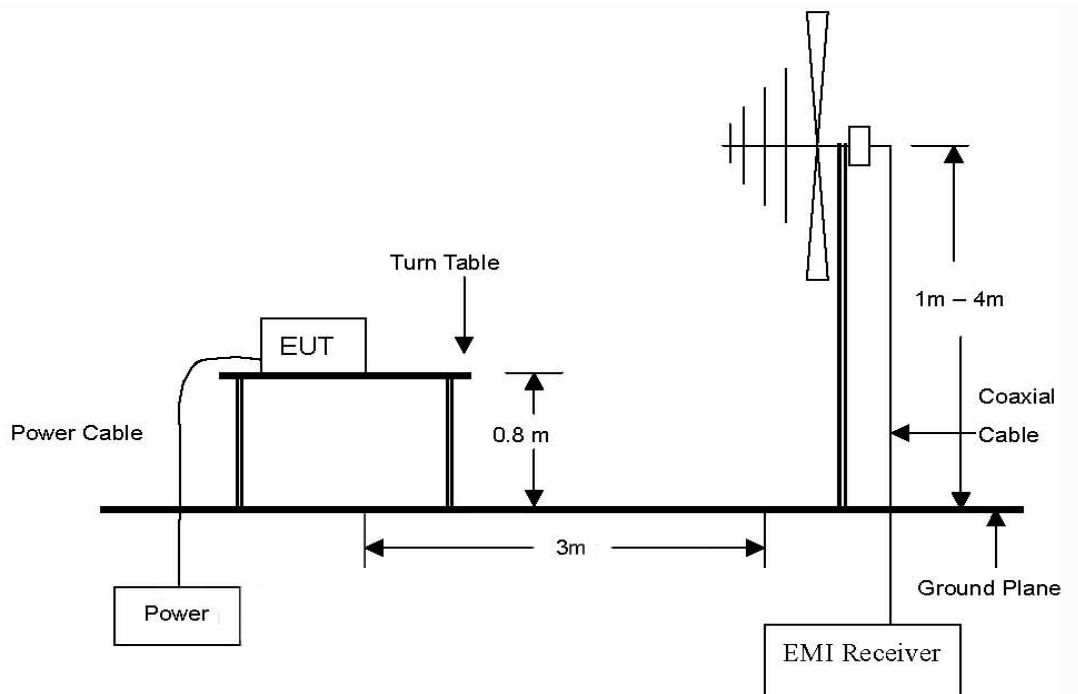
2. E.R.P. / E.I.R.P. & Radiated Spurious Emissions

2.1. Test setup

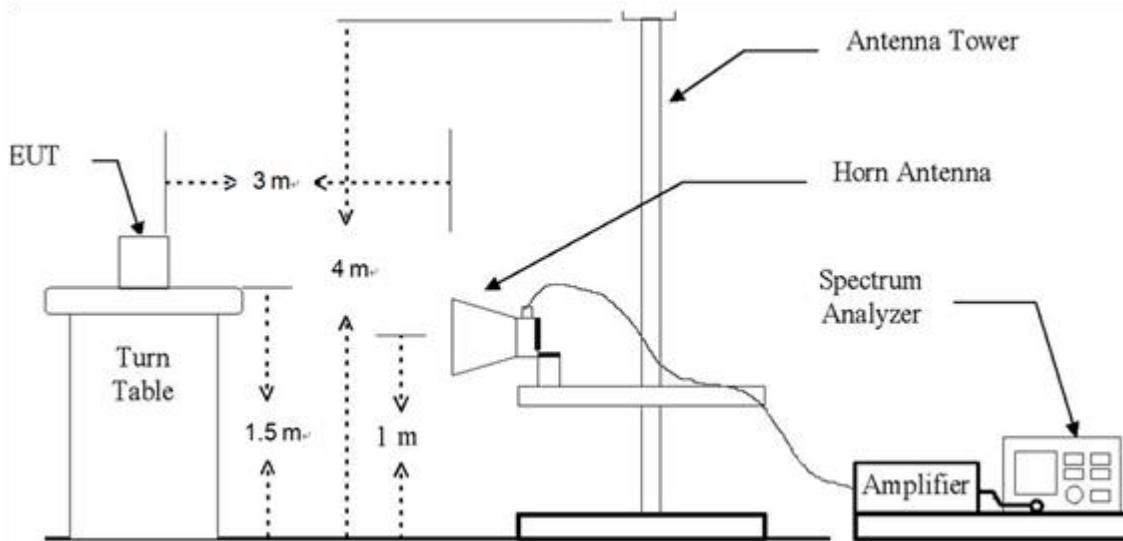
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 26 GHz Emissions.



2.2. Limit

2.2.1. Limit of E.R.P. / E.I.R.P.

FCC

- §22.913(a)(5), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

- §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1 710-1 755 MHz band and mobile and portable stations operating in the 1 695-1 710 MHz and 1 755-1 780 MHz bands are limited to 1 watt EIRP.

- §27.50(h)(2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

IC

- RSS-132 Issue 3

5.4, the transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts. Refer to SRSP-503 for base station e.i.r.p. limits.

- RSS-139 Issue 3

6.5, the equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1 710-1 780 MHz shall not exceed one watt.

- RSS-199 Issue 3

4.4, the transmitter output power shall be measured in terms of average value.

For base station equipment, refer to SRSP-517 for the maximum permissible e.i.r.p.

For mobile subscriber equipment, the e.i.r.p. shall not exceed 2 W. For fixed subscriber equipment, the transmitter output power shall not exceed 2 W and the e.i.r.p. shall be limited to 40 W.

2.2.2. Limit of Radiated Spurious Emissions

FCC

- §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

- §27.53(h)(1), for operations in the 1 695-1 710 MHz, 1 710-1 755 MHz, 1 755-1 780 MHz, 1 915-1 920 MHz, 1 995-2 000 MHz, 2 000-2 020 MHz, 2 110-2 155 MHz, 2 155-2 180 MHz, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

- §27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log_{10} (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log_{10} (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log_{10} (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that $43 + 10 \log_{10} (P)$ dB on all frequencies between 2 490.5 MHz and 2 496 MHz and $55 + 10 \log_{10} (P)$ dB at or below 2 490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2 495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

IC

- RSS-132 Issue 3

5.5, Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

- RSS-139 Issue 3

6.6, (i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1 % of the emission bandwidth shall be attenuated below the transmitter output power P (in dB W) by at least $43 + 10 \log_{10} p$ (watts) dB.

(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dB W) by at least $43 + 10 \log_{10} p$ (watts) dB.

- RSS-199 Issue 3

4.5, In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dB W), by at least $43 + 10 \log_{10} p$ for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dB W), by at least:

- i. $40 + 10 \log_{10} p$ from the channel edges to 5 MHz away
- ii. $43 + 10 \log_{10} p$ between 5 MHz and X MHz from the channel edges, and
- iii. $55 + 10 \log_{10} p$ at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than $43 + 10 \log_{10} p$ on all frequencies between 2 490.5 MHz and 2 496 MHz, and $55 + 10 \log_{10} p$ at or below 2 490.5 MHz.

In (a) and (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

2.3. Test Procedure: Based on ANSI/TIA 603E: 2016 and ANSI C63.26-2015 and KDB 971168 D01 Power Meas License Digital Systems v03r01.

1. On a test site, the EUT shall be placed at 0.8 m or 1.5 m height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. Radiated spurious emissions measurement method was set as follows:
RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz, VBW \geq 3 x RBW,
Detector = RMS, trace mode = max hold, per the guidelines of KDB 971168 D01 Power Meas License Digital Systems v03r01.
5. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
11. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
12. The measurement shall be repeated with the test antenna orientated for horizontal polarization.

2.4. Test results

Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

2.4.1. E.R.P. / E.I.R.P.

- Internal Antenna

Band	Frequency (MHz)	Maximum Conducted Power (dB m)	Maximum Conducted Power (W)	Antenna Gain (dB i)	Maximum E.I.R.P. (dB m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (dB m)	Maximum E.R.P. (W)	Limit
5B	824 ~ 849	24.75	0.299	0.75	25.50	0.355	23.35	0.216	7 W E.I.R.P.
7C	2 500 ~ 2 570	23.27	0.212	2.50	25.77	0.378			2 W E.I.R.P.
66B	1 710 ~ 1 780	22.75	0.188	3.15	25.90	0.389			1 W E.I.R.P.
66C	1 710 ~ 1 780	22.77	0.189	3.15	25.92	0.391			1 W E.I.R.P.

- External Antenna

Band	Frequency (MHz)	Maximum Conducted Power (dB m)	Maximum Conducted Power (W)	Antenna Gain (dB i)	Maximum E.I.R.P. (dB m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (dB m)	Maximum E.R.P. (W)	Limit
5B	824 ~ 849	24.75	0.299	0.37	25.12	0.325	22.97	0.198	7 W E.I.R.P.
7C	2 500 ~ 2 570	23.27	0.212	5.99	29.26	0.843			2 W E.I.R.P.
66B	1 710 ~ 1 780	22.75	0.188	5.54	28.29	0.675			1 W E.I.R.P.
66C	1 710 ~ 1 780	22.77	0.189	5.54	28.31	0.678			1 W E.I.R.P.

Remark;

1. E.I.R.P. (dB m) = Maximum Conducted Power (dB m) + Antenna Gain (dB i)
2. E.R.P. (dB m) = E.I.R.P. (dB m) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.

2.4.2. Radiated spurious emissions

- Internal Antenna

ULCA_5B

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 5 MHz_Low Channel (829 MHz + 836.2 MHz)									
1 667.12	57.10	H	25.81	-38.67	44.24	-97.41	-53.17	-13	40.17
1 666.95	61.70	V	25.80	-38.67	48.83	-97.41	-48.58	-13	35.58
1 797.75	46.02	H	27.28	-38.71	34.59	-97.41	-62.82	-13	49.82
2 500.78	47.30	V	28.10	-37.20	38.20	-97.41	-59.21	-13	46.21
6 384.28	52.35	H	34.60	-33.51	53.44	-97.41	-43.97	-13	30.97
6 384.26	52.64	V	34.60	-33.51	53.73	-97.41	-43.68	-13	30.68
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 5 MHz_Middle Channel (834 MHz + 841.2 MHz)									
1 676.81	56.52	H	25.92	-38.67	43.77	-97.41	-53.64	-13	40.64
1 677.39	59.26	V	25.93	-38.68	46.51	-97.41	-50.90	-13	37.90
1 815.70	46.86	H	27.36	-38.55	35.67	-97.41	-61.74	-13	48.74
2 515.44	48.84	V	28.19	-36.99	40.04	-97.41	-57.37	-13	44.37
6 384.32	52.33	V	34.60	-33.51	53.42	-97.41	-43.99	-13	30.99
6 383.88	51.99	H	34.60	-33.51	53.08	-97.41	-44.33	-13	31.33
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 5 MHz_High Channel (839 MHz + 846.2 MHz)									
1 687.00	52.56	H	26.04	-38.73	39.87	-97.41	-57.54	-13	44.54
1 687.11	61.80	V	26.05	-38.73	49.12	-97.41	-48.29	-13	35.29
1 812.05	50.34	H	27.35	-38.59	39.10	-97.41	-58.31	-13	45.31
2 530.85	47.98	V	28.29	-36.77	39.50	-97.41	-57.91	-13	44.91
6 384.22	49.36	H	34.60	-33.51	50.45	-97.41	-46.96	-13	33.96
6 384.14	55.66	V	34.60	-33.51	56.75	-97.41	-40.66	-13	27.66
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-

ULCA_7C

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 20 MHz_Low Channel (2 505.5 MHz + 2 519.9 MHz)									
7 544.13	43.69	H	35.90	-32.76	46.83	-95.26	-48.43	-25	23.43
7 543.88	42.19	V	35.90	-32.76	45.33	-95.26	-49.93	-25	24.93
Above 7 600.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 20 MHz_Middle Channel (2 525.6 MHz + 2 540.0 MHz)									
7 603.52	44.49	H	35.90	-32.62	47.77	-95.26	-47.49	-25	22.49
7 603.98	44.33	V	35.90	-32.62	47.61	-95.26	-47.65	-25	22.65
Above 7 700.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 20 MHz_High Channel (2 545.6 MHz + 2 560.0 MHz)									
7 662.87	44.55	H	35.93	-32.36	48.12	-95.26	<u>-47.14</u>	-25	22.14
7 663.16	41.13	V	35.93	-32.36	44.70	-95.26	-50.56	-25	25.56
Above 7 700.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66B

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 15 MHz + SCC 5 MHz_ Low Channel (1 717.5 MHz + 1 726.8 MHz)									
3 994.95	48.97	V	32.01	-36.42	44.56	-95.26	-50.70	-13	37.70
5 146.00	43.92	H	33.29	-35.48	41.73	-95.26	-53.53	-13	40.53
5 146.23	44.26	V	33.29	-35.48	42.07	-95.26	-53.19	-13	40.19
5 987.50	47.69	V	34.58	-33.14	49.13	-95.26	-46.13	-13	33.13
6 384.02	48.86	V	34.60	-33.51	49.95	-95.26	-45.31	-13	32.31
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 15 MHz + SCC 5 MHz_ Middle Channel (1 752.6 MHz + 1 761.9 MHz)									
3 982.80	49.53	V	32.03	-36.39	45.17	-95.26	-50.09	-13	37.09
5 251.05	44.99	H	33.60	-35.09	43.50	-95.26	-51.76	-13	38.76
5 251.08	45.51	V	33.60	-35.09	44.02	-95.26	-51.24	-13	38.24
5 984.58	47.90	V	34.57	-33.17	49.30	-95.26	-45.96	-13	32.96
6 383.39	48.46	V	34.60	-33.50	49.56	-95.26	-45.70	-13	32.70
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 15 MHz + SCC 5 MHz_ High Channel (1 767.7 MHz + 1 777.0 MHz)									
3 998.85	49.42	V	32.00	-36.43	44.99	-95.26	-50.27	-13	37.27
5 296.62	45.96	H	33.79	-34.81	44.94	-95.26	-50.32	-13	37.32
5 296.78	46.85	V	33.79	-34.81	45.83	-95.26	-49.43	-13	36.43
5 985.36	48.30	V	34.57	-33.16	49.71	-95.26	-45.55	-13	32.55
6 383.95	50.82	V	34.60	-33.51	51.91	-95.26	-43.35	-13	30.35
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66C

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 20 MHz_Low Channel (1 715.5 MHz + 1 729.9 MHz)									
3 982.65	49.48	V	32.03	-36.39	45.12	-95.26	-50.14	-13	37.14
5 160.91	43.10	H	33.34	-35.41	41.03	-95.26	-54.23	-13	41.23
5 159.70	43.96	V	33.34	-35.42	41.88	-95.26	-53.38	-13	40.38
5 984.35	47.10	V	34.57	-33.17	48.50	-95.26	-46.76	-13	33.76
6 384.09	47.79	V	34.60	-33.51	48.88	-95.26	-46.38	-13	33.38
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 20 MHz_Middle Channel (1 745.6 MHz + 1 760.0 MHz)									
3 982.05	49.39	V	32.04	-36.39	45.04	-95.26	-50.22	-13	37.22
5 249.91	44.62	H	33.60	-35.10	43.12	-95.26	-52.14	-13	39.14
5 249.97	45.85	V	33.60	-35.10	44.35	-95.26	-50.91	-13	37.91
5 984.30	48.40	V	34.57	-33.17	49.80	-95.26	-45.46	-13	32.46
6 384.00	48.42	V	34.60	-33.51	49.51	-95.26	-45.75	-13	32.75
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 20 MHz_High Channel (1 755.6 MHz + 1 770.0 MHz)									
3 996.15	49.55	V	32.01	-36.42	45.14	-95.26	-50.12	-13	37.12
5 280.29	45.45	H	33.72	-34.89	44.28	-95.26	-50.98	-13	37.98
5 280.86	45.82	V	33.72	-34.89	44.65	-95.26	-50.61	-13	37.61
5 984.05	48.37	V	34.57	-33.17	49.77	-95.26	-45.49	-13	32.49
6 384.15	49.62	V	34.60	-33.51	50.71	-95.26	<u>-44.55</u>	-13	31.55
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-

- External Antenna

ULCA_5B

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 5 MHz_Low Channel (829 MHz + 836.2 MHz)									
1 667.75	60.79	H	25.81	-38.67	47.93	-97.41	-49.48	-13	36.48
1 667.25	61.79	V	25.81	-38.67	48.93	-97.41	-48.48	-13	35.48
2 501.00	53.94	H	28.11	-37.20	44.85	-97.41	-52.56	-13	39.56
2 501.00	52.56	V	28.11	-37.20	43.47	-97.41	-53.94	-13	40.94
6 384.50	43.24	V	34.60	-33.51	44.33	-97.41	-53.08	-13	40.08
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 5 MHz_Middle Channel (834 MHz + 841.2 MHz)									
1 677.00	55.16	H	25.92	-38.67	42.41	-97.41	-55.00	-13	42.00
1 677.00	60.42	V	25.92	-38.67	47.67	-97.41	-49.74	-13	36.74
2 516.00	47.89	V	28.20	-36.98	39.11	-97.41	-58.30	-13	45.30
6 378.50	44.85	V	34.60	-33.47	45.98	-97.41	-51.43	-13	38.43
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 5 MHz_High Channel (839 MHz + 846.2 MHz)									
1 687.25	59.21	V	26.05	-38.73	46.53	-97.41	-50.88	-13	37.88
2 530.75	51.91	H	28.28	-36.77	43.42	-97.41	-53.99	-13	40.99
2 531.00	49.41	V	28.29	-36.77	40.93	-97.41	-56.48	-13	43.48
6 379.25	43.74	V	34.60	-33.48	44.86	-97.41	-52.55	-13	39.55
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-

ULCA_7C

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 20 MHz_Low Channel (2 505.5 MHz + 2 519.9 MHz)									
5 028.30	48.71	V	33.00	-35.27	46.44	-95.26	-48.82	-25	23.82
7 544.10	49.14	H	35.90	-32.76	52.28	-95.26	-42.98	-25	17.98
7 542.20	56.76	V	35.90	-32.76	59.90	-95.26	-35.36	-25	10.36
Above 7 600.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 20 MHz_ Middle Channel (2 525.6 MHz + 2 540.0 MHz)									
5 067.70	47.16	V	33.07	-35.28	44.95	-95.26	-50.31	-25	25.31
7 602.20	48.12	H	35.90	-32.62	51.40	-95.26	-43.86	-25	18.86
7 604.10	58.36	V	35.90	-32.62	61.64	-95.26	<u>-33.62</u>	-25	8.62
Above 7 700.00	Not detected	-	-	-	-	-	-	-	-
PCC 10 MHz + SCC 20 MHz_ High Channel (2 545.6 MHz + 2 560.0 MHz)									
5 108.00	46.30	V	33.22	-35.42	44.10	-95.26	-51.16	-25	26.16
6 383.40	42.91	V	34.60	-33.50	44.01	-95.26	-51.25	-25	26.25
7 662.20	47.45	H	35.92	-32.36	51.01	-95.26	-44.25	-25	19.25
7 663.60	56.51	V	35.93	-32.36	60.08	-95.26	-35.18	-25	10.18
Above 7 700.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66B

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 15 MHz + SCC 5 MHz_Low Channel (1 717.5 MHz + 1 726.8 MHz)									
3 430.80	64.75	H	30.95	-36.88	58.82	-95.26	-36.44	-13	23.44
3 430.30	79.58	V	30.94	-36.88	73.64	-95.26	-21.62	-13	8.62
5 145.90	60.61	H	33.29	-35.48	58.42	-95.26	-36.84	-13	23.84
5 145.50	67.43	V	33.29	-35.48	65.24	-95.26	-30.02	-13	17.02
6 860.60	67.01	H	35.30	-33.82	68.49	-95.26	-26.77	-13	13.77
6 860.20	76.47	V	35.30	-33.82	77.95	-95.26	-17.31	-13	4.31
8 575.80	65.60	H	36.55	-33.47	68.68	-95.26	-26.58	-13	13.58
8 575.80	71.01	V	36.55	-33.47	74.09	-95.26	-21.17	-13	8.17
10 291.90	58.47	H	37.80	-31.28	64.99	-95.26	-30.27	-13	17.27
10 292.30	63.88	V	37.80	-31.28	70.40	-95.26	-24.86	-13	11.86
12 006.60	62.98	H	38.50	-31.35	70.13	-95.26	-25.13	-13	12.13
12 006.10	64.00	V	38.50	-31.37	71.13	-95.26	-24.13	-13	11.13
13 723.60	53.84	H	40.45	-28.26	66.03	-95.26	-29.23	-13	16.23
13 723.10	56.96	V	40.45	-28.25	69.16	-95.26	-26.10	-13	13.10
15 437.80	50.70	H	40.00	-25.84	64.86	-95.26	-30.40	-13	17.40
15 436.40	50.12	V	40.00	-25.87	64.25	-95.26	-31.01	-13	18.01
17 152.50	42.90	H	42.31	-23.06	62.15	-95.26	-33.11	-13	20.11
17 152.00	44.32	V	42.30	-23.06	63.56	-95.26	-31.70	-13	18.70
Above 17 200.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66B

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 15 MHz + SCC 5 MHz_ Middle Channel (1 752.6 MHz + 1 761.9 MHz)									
3 500.60	61.39	H	31.10	-36.66	55.83	-95.26	-39.43	-13	26.43
3 500.60	74.73	V	31.10	-36.66	69.17	-95.26	-26.09	-13	13.09
5 250.50	46.89	H	33.60	-35.10	45.39	-95.26	-49.87	-13	36.87
5 250.50	57.13	V	33.60	-35.10	55.63	-95.26	-39.63	-13	26.63
7 001.30	56.00	H	35.50	-33.06	58.44	-95.26	-36.82	-13	23.82
7 000.80	71.41	V	35.50	-33.05	73.86	-95.26	-21.40	-13	8.40
8 751.60	60.30	H	37.00	-33.72	63.58	-95.26	-31.68	-13	18.68
8 752.00	67.48	V	37.00	-33.71	70.77	-95.26	-24.49	-13	11.49
10 501.90	45.75	H	37.70	-31.09	52.36	-95.26	-42.90	-13	29.90
10 501.90	54.79	V	37.70	-31.09	61.40	-95.26	-33.86	-13	20.86
12 252.20	53.06	H	38.40	-30.06	61.40	-95.26	-33.86	-13	20.86
12 252.20	54.82	V	38.40	-30.06	63.16	-95.26	-32.10	-13	19.10
14 003.00	41.28	H	40.81	-28.00	54.09	-95.26	-41.17	-13	28.17
14 002.50	42.98	V	40.81	-27.99	55.80	-95.26	-39.46	-13	26.46
15 753.30	42.58	H	40.20	-23.43	59.35	-95.26	-35.91	-13	22.91
15 753.30	40.50	V	40.20	-23.43	57.27	-95.26	-37.99	-13	24.99
Above 15 800.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66B

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 15 MHz + SCC 5 MHz_ High Channel (1 767.7 MHz + 1 777.0 MHz)									
3 530.60	56.94	H	31.04	-36.87	51.11	-95.26	-44.15	-13	31.15
3 530.60	66.83	V	31.04	-36.87	61.00	-95.26	-34.26	-13	21.26
5 296.40	47.63	H	33.79	-34.81	46.61	-95.26	-48.65	-13	35.65
5 296.90	57.16	V	33.79	-34.81	56.14	-95.26	-39.12	-13	26.12
7 061.70	44.78	H	35.52	-33.09	47.21	-95.26	-48.05	-13	35.05
7 061.70	54.67	V	35.52	-33.09	57.10	-95.26	-38.16	-13	25.16
8 827.50	42.47	H	37.16	-32.94	46.69	-95.26	-48.57	-13	35.57
8 827.00	49.08	V	37.15	-32.94	53.29	-95.26	-41.97	-13	28.97
10 593.30	41.42	H	37.79	-30.78	48.43	-95.26	-46.83	-13	33.83
10 592.80	47.07	V	37.79	-30.78	54.08	-95.26	-41.18	-13	28.18
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66C

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 20 MHz_Low Channel (1 715.5 MHz + 1 729.9 MHz)									
3 440.60	64.96	H	31.02	-36.81	59.17	-95.26	-36.09	-13	23.09
3 439.20	77.58	V	31.01	-36.82	71.77	-95.26	-23.49	-13	10.49
5 161.40	55.89	H	33.35	-35.41	53.83	-95.26	-41.43	-13	28.43
5 159.50	64.32	V	33.34	-35.42	62.24	-95.26	-33.02	-13	20.02
6 879.40	62.05	H	35.30	-33.68	63.67	-95.26	-31.59	-13	18.59
6 880.30	73.82	V	35.30	-33.67	75.45	-95.26	-19.81	-13	6.81
8 599.20	62.53	H	36.60	-33.73	65.40	-95.26	-29.86	-13	16.86
8 600.20	67.31	V	36.60	-33.74	70.17	-95.26	-25.09	-13	12.09
10 320.90	56.87	H	37.80	-30.95	63.72	-95.26	-31.54	-13	18.54
10 320.00	64.49	V	37.80	-30.97	71.32	-95.26	-23.94	-13	10.94
12 039.80	59.55	H	38.50	-30.90	67.15	-95.26	-28.11	-13	15.11
12 041.30	61.49	V	38.50	-30.87	69.12	-95.26	-26.14	-13	13.14
13 761.60	49.02	H	40.50	-28.19	61.33	-95.26	-33.93	-13	20.93
13 759.70	52.39	V	40.50	-28.19	64.70	-95.26	-30.56	-13	17.56
15 481.90	48.86	H	40.00	-25.50	63.36	-95.26	-31.90	-13	18.90
15 480.90	45.72	V	40.00	-25.51	60.21	-95.26	-35.05	-13	22.05
17 201.70	37.13	H	42.40	-23.62	55.91	-95.26	-39.35	-13	26.35
17 202.20	38.93	V	42.40	-23.63	57.70	-95.26	-37.56	-13	24.56
Above 17 300.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66C

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 20 MHz_ Middle Channel (1 745.6 MHz + 1 760.0 MHz)									
3 499.70	58.65	H	31.10	-36.66	53.09	-95.26	-42.17	-13	29.17
3 499.70	73.65	V	31.10	-36.66	68.09	-95.26	-27.17	-13	14.17
5 250.00	42.47	H	33.60	-35.10	40.97	-95.26	-54.29	-13	41.29
5 249.50	53.50	V	33.60	-35.10	52.00	-95.26	-43.26	-13	30.26
7 000.80	56.85	H	35.50	-33.05	59.30	-95.26	-35.96	-13	22.96
7 000.80	67.39	V	35.50	-33.05	69.84	-95.26	-25.42	-13	12.42
8 749.70	58.29	H	37.00	-33.74	61.55	-95.26	-33.71	-13	20.71
8 750.60	63.45	V	37.00	-33.73	66.72	-95.26	-28.54	-13	15.54
10 500.90	42.61	H	37.70	-31.10	49.21	-95.26	-46.05	-13	33.05
10 503.30	48.54	V	37.70	-31.09	55.15	-95.26	-40.11	-13	27.11
12 252.20	47.03	H	38.40	-30.06	55.37	-95.26	-39.89	-13	26.89
12 250.80	47.41	V	38.40	-30.02	55.79	-95.26	-39.47	-13	26.47
14 002.00	37.60	H	40.80	-27.99	50.41	-95.26	-44.85	-13	31.85
14 001.10	41.14	V	40.80	-27.98	53.96	-95.26	-41.30	-13	28.30
15 755.20	36.78	H	40.20	-23.44	53.54	-95.26	-41.72	-13	28.72
15 751.40	36.33	V	40.20	-23.41	53.12	-95.26	-42.14	-13	29.14
Above 15 800.00	Not detected	-	-	-	-	-	-	-	-

ULCA_66C

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
PCC 10 MHz + SCC 20 MHz_ High Channel (1 755.6 MHz + 1 770.0 MHz)									
3 519.80	54.36	H	31.06	-36.80	48.62	-95.26	-46.64	-13	33.64
3 519.80	67.85	V	31.06	-36.80	62.11	-95.26	-33.15	-13	20.15
5 280.00	44.68	H	33.72	-34.90	43.50	-95.26	-51.76	-13	38.76
5 280.90	51.57	V	33.72	-34.89	50.40	-95.26	-44.86	-13	31.86
7 039.20	44.42	H	35.50	-33.12	46.80	-95.26	-48.46	-13	35.46
7 040.60	53.47	V	35.50	-33.11	55.86	-95.26	-39.40	-13	26.40
8 801.30	42.12	H	37.10	-33.10	46.12	-95.26	-49.14	-13	36.14
8 800.80	48.03	V	37.10	-33.10	52.03	-95.26	-43.23	-13	30.23
10 562.30	40.74	H	37.72	-30.91	47.55	-95.26	-47.71	-13	34.71
10 560.00	48.54	V	37.72	-30.93	55.33	-95.26	-39.93	-13	26.93
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

Remark;

1. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.
2. E (dB μ V/m) = Measured Level (dB μ V) + Antenna Factor (dB/m) + AMP (dB) + Cable Loss (dB).
3. E.I.R.P. (dB m) = E (dB μ V/m) + CF (dB).
4. E.R.P. (dB m) = E (dB μ V/m) + CF (dB) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.
5. CF (dB) = 20 log D - 104.8; where D is the measurement distance in meters, According to KDB 971168 D01 v03r01 5.8.4.
6. The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

3. Conducted Output Power

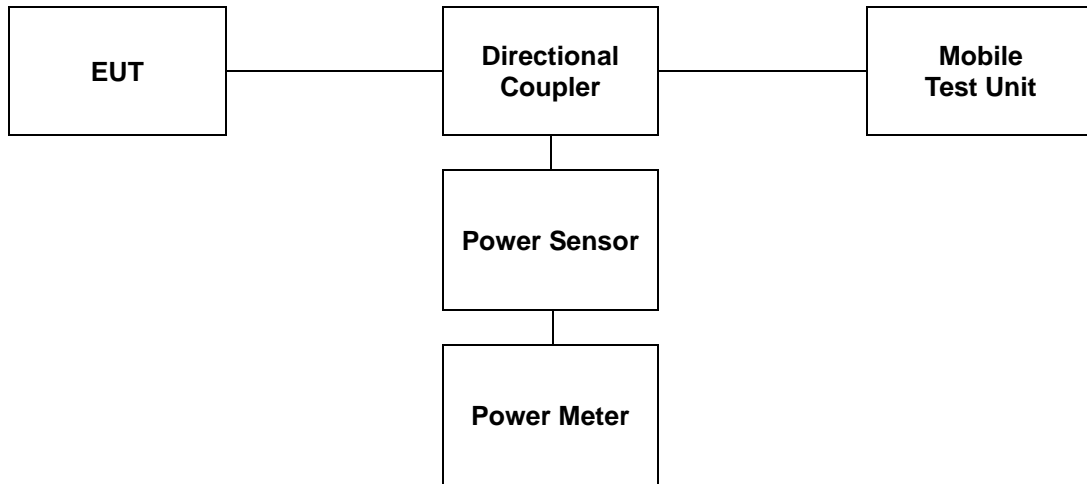
3.1. Limit

CFR 47, Section FCC §2.1046 and IC RSS-Gen Issue 5 6.12.

3.2. Test Procedure

Output power shall be measured at the RF output terminals for all configurations.

1. The RF output of the transmitter was connected to the input of the mobile test unit in order to establish communication with the EUT.
2. The EUT was set up for the max. output power with pseudo random data modulation by using mobile test unit parameters.
3. The measurement performed using a wideband RF power meter.
4. This EUT was tested under all configurations and the highest power was investigated and reported.



3.3. Test Result

Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

ULCA 5B												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
	Low	3	825.6	20416	1	14	5	825.6	20455	1	0	24.48
5		826.5	20425	1	24	3	830.4	20464	1	0	24.22	0.264
5		826.8	20428	1	24	10	834.0	20500	1	0	24.28	0.268
10		829.0	20450	1	49	5	836.2	20522	1	0	24.51	0.282
10		829.0	20450	1	49	10	838.9	20549	1	0	24.48	0.281
Middle	3	834.1	20501	1	14	5	838.0	20540	1	0	22.81	0.191
	5	835.0	20510	1	24	3	838.9	20549	1	0	23.50	0.224
	5	831.8	20478	1	24	10	839.0	20550	1	0	24.51	0.282
	10	834.0	20500	1	49	5	841.2	20572	1	0	24.75	0.299
	10	831.6	20476	1	49	10	841.5	20575	1	0	24.55	0.285
High	3	842.6	20586	1	14	5	846.5	20625	1	0	22.72	0.187
	5	843.5	20595	1	24	3	847.4	20634	1	0	21.81	0.152
	5	836.8	20528	1	24	10	844.0	20600	1	0	24.13	0.259
	10	839.0	20550	1	49	5	846.2	20622	1	0	24.46	0.279
	10	834.1	20501	1	49	10	844.0	20600	1	0	24.44	0.278

Note;

QPSK Modulation with 1 RB

ULCA 5B												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
Low	3	825.6	20416	1	14	5	825.6	20455	1	0	23.59	0.229
	5	826.5	20425	1	24	3	830.4	20464	1	0	23.35	0.216
	5	826.8	20428	1	24	10	834.0	20500	1	0	23.94	0.248
	10	829.0	20450	1	49	5	836.2	20522	1	0	23.97	0.249
	10	829.0	20450	1	49	10	838.9	20549	1	0	23.95	0.248
Middle	3	834.1	20501	1	14	5	838.0	20540	1	0	22.43	0.175
	5	835.0	20510	1	24	3	838.9	20549	1	0	23.00	0.199
	5	831.8	20478	1	24	10	839.0	20550	1	0	23.98	0.250
	10	834.0	20500	1	49	5	841.2	20572	1	0	24.27	0.267
	10	831.6	20476	1	49	10	841.5	20575	1	0	24.06	0.255
High	3	842.6	20586	1	14	5	846.5	20625	1	0	21.75	0.150
	5	843.5	20595	1	24	3	847.4	20634	1	0	21.59	0.144
	5	836.8	20528	1	24	10	844.0	20600	1	0	23.83	0.241
	10	839.0	20550	1	49	5	846.2	20622	1	0	23.89	0.245
	10	834.1	20501	1	49	10	844.0	20600	1	0	23.86	0.243

Note;

16QAM Modulation with 1 RB

ULCA 5B												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
Low	3	825.6	20416	15	0	5	825.6	20455	25	0	<u>23.78</u>	<u>0.239</u>
	5	826.5	20425	25	0	3	830.4	20464	15	0	23.45	0.221
	5	826.8	20428	25	0	10	834.0	20500	50	0	23.17	0.208
	10	829.0	20450	50	0	5	836.2	20522	25	0	22.73	0.188
	10	829.0	20450	50	0	10	838.9	20549	50	0	22.74	0.188
Middle	3	834.1	20501	15	0	5	838.0	20540	25	0	<u>23.33</u>	<u>0.215</u>
	5	835.0	20510	25	0	3	838.9	20549	15	0	23.26	0.212
	5	831.8	20478	25	0	10	839.0	20550	50	0	22.74	0.188
	10	834.0	20500	50	0	5	841.2	20572	25	0	22.95	0.197
	10	831.6	20476	50	0	10	841.5	20575	50	0	22.72	0.187
High	3	842.6	20586	15	0	5	846.5	20625	25	0	<u>22.98</u>	<u>0.199</u>
	5	843.5	20595	25	0	3	847.4	20634	15	0	22.67	0.185
	5	836.8	20528	25	0	10	844.0	20600	50	0	22.74	0.188
	10	839.0	20550	50	0	5	846.2	20622	25	0	22.52	0.179
	10	834.1	20501	50	0	10	844.0	20600	50	0	22.65	0.184

Note;

QPSK Modulation with Full RB

ULCA 5B												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
Low	3	825.6	20416	15	0	5	825.6	20455	25	0	<u>23.25</u>	<u>0.211</u>
	5	826.5	20425	25	0	3	830.4	20464	15	0	22.89	0.195
	5	826.8	20428	25	0	10	834.0	20500	50	0	21.95	0.157
	10	829.0	20450	50	0	5	836.2	20522	25	0	21.87	0.154
	10	829.0	20450	50	0	10	838.9	20549	50	0	21.85	0.153
Middle	3	834.1	20501	15	0	5	838.0	20540	25	0	<u>22.59</u>	<u>0.182</u>
	5	835.0	20510	25	0	3	838.9	20549	15	0	22.52	0.178
	5	831.8	20478	25	0	10	839.0	20550	50	0	21.94	0.156
	10	834.0	20500	50	0	5	841.2	20572	25	0	21.92	0.156
	10	831.6	20476	50	0	10	841.5	20575	50	0	21.83	0.152
High	3	842.6	20586	15	0	5	846.5	20625	25	0	<u>21.91</u>	<u>0.155</u>
	5	843.5	20595	25	0	3	847.4	20634	15	0	21.85	0.153
	5	836.8	20528	25	0	10	844.0	20600	50	0	21.90	0.155
	10	839.0	20550	50	0	5	846.2	20622	25	0	21.91	0.155
	10	834.1	20501	50	0	10	844.0	20600	50	0	21.88	0.154

Note;

16QAM Modulation with Full RB

ULCA 7C												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
Low	10	2 505.5	20805	1	49	20	2 519.9	20949	1	0	<u>23.27</u>	<u>0.212</u>
	20	2 510.0	20850	1	99	10	2 524.4	20994	1	0	23.00	0.199
	15	2 507.5	20825	1	74	10	2 519.5	20945	1	0	23.14	0.206
	15	2 507.5	20825	1	74	15	2 522.5	20975	1	0	23.15	0.206
	15	2 507.8	20828	1	74	20	2 524.9	20999	1	0	23.13	0.206
	20	2 510.0	20850	1	99	15	2 527.1	21021	1	0	22.79	0.190
	20	2 510.0	20850	1	99	20	2 529.8	21048	1	0	22.87	0.193
Middle	10	2 525.6	21006	1	49	20	2 540.0	21150	1	0	<u>22.88</u>	<u>0.194</u>
	20	2 530.1	21051	1	99	10	2 544.5	21195	1	0	22.78	0.190
	15	2 530.1	21051	1	74	10	2 542.1	21171	1	0	22.40	0.174
	15	2 527.5	21025	1	74	15	2 542.5	21175	1	0	22.55	0.180
	15	2 525.3	21003	1	74	20	2 542.4	21174	1	0	22.66	0.184
	20	2 527.6	21026	1	99	15	2 544.7	21197	1	0	22.50	0.178
	20	2 525.1	21001	1	99	20	2 544.9	21199	1	0	22.63	0.183
High	10	2 545.6	21206	1	49	20	2 560.0	21350	1	0	<u>22.99</u>	<u>0.199</u>
	20	2 550.1	21251	1	99	10	2 564.5	21395	1	0	22.40	0.174
	15	2 552.7	21277	1	74	10	2 564.7	21397	1	0	22.57	0.181
	15	2 547.5	21225	1	74	15	2 562.5	21375	1	0	22.20	0.166
	15	2 542.9	21179	1	74	20	2 560.0	21350	1	0	22.95	0.197
	20	2 545.1	21201	1	99	15	2 562.2	21372	1	0	22.79	0.190
	20	2 540.2	21152	1	99	20	2 560.0	21350	1	0	22.75	0.188

Note;

QPSK Modulation with 1 RB

ULCA 7C												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
Low	10	2 505.5	20805	1	49	20	2 519.9	20949	1	0	22.39	0.173
	20	2 510.0	20850	1	99	10	2 524.4	20994	1	0	21.17	0.131
	15	2 507.5	20825	1	74	10	2 519.5	20945	1	0	22.30	0.170
	15	2 507.5	20825	1	74	15	2 522.5	20975	1	0	22.11	0.163
	15	2 507.8	20828	1	74	20	2 524.9	20999	1	0	22.00	0.158
	20	2 510.0	20850	1	99	15	2 527.1	21021	1	0	21.49	0.141
	20	2 510.0	20850	1	99	20	2 529.8	21048	1	0	20.97	0.125
Middle	10	2 525.6	21006	1	49	20	2 540.0	21150	1	0	21.49	0.141
	20	2 530.1	21051	1	99	10	2 544.5	21195	1	0	21.48	0.141
	15	2 530.1	21051	1	74	10	2 542.1	21171	1	0	21.39	0.138
	15	2 527.5	21025	1	74	15	2 542.5	21175	1	0	21.31	0.135
	15	2 525.3	21003	1	74	20	2 542.4	21174	1	0	21.36	0.137
	20	2 527.6	21026	1	99	15	2 544.7	21197	1	0	21.40	0.138
	20	2 525.1	21001	1	99	20	2 544.9	21199	1	0	21.40	0.138
High	10	2 545.6	21206	1	49	20	2 560.0	21350	1	0	22.24	0.168
	20	2 550.1	21251	1	99	10	2 564.5	21395	1	0	21.53	0.142
	15	2 552.7	21277	1	74	10	2 564.7	21397	1	0	21.58	0.144
	15	2 547.5	21225	1	74	15	2 562.5	21375	1	0	21.83	0.152
	15	2 542.9	21179	1	74	20	2 560.0	21350	1	0	22.18	0.165
	20	2 545.1	21201	1	99	15	2 562.2	21372	1	0	21.49	0.141
	20	2 540.2	21152	1	99	20	2 560.0	21350	1	0	21.53	0.142

Note;

16QAM Modulation with 1 RB

ULCA 7C												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
	Low	10	2 505.5	20805	50	0	20	2 519.9	20949	100	0	21.53
20		2 510.0	20850	100	0	10	2 524.4	20994	50	0	21.44	0.139
15		2 507.5	20825	75	0	10	2 519.5	20945	50	0	21.37	0.137
15		2 507.5	20825	75	0	15	2 522.5	20975	75	0	21.50	0.141
15		2 507.8	20828	75	0	20	2 524.9	20999	100	0	21.36	0.137
20		2 510.0	20850	100	0	15	2 527.1	21021	75	0	21.25	0.133
20		2 510.0	20850	100	0	20	2 529.8	21048	100	0	21.03	0.127
Middle	10	2 525.6	21006	50	0	20	2 540.0	21150	100	0	21.30	0.135
	20	2 530.1	21051	100	0	10	2 544.5	21195	50	0	21.15	0.130
	15	2 530.1	21051	75	0	10	2 542.1	21171	50	0	21.19	0.132
	15	2 527.5	21025	75	0	15	2 542.5	21175	75	0	21.06	0.128
	15	2 525.3	21003	75	0	20	2 542.4	21174	100	0	20.88	0.123
	20	2 527.6	21026	100	0	15	2 544.7	21197	75	0	21.03	0.127
	20	2 525.1	21001	100	0	20	2 544.9	21199	100	0	20.88	0.123
High	10	2 545.6	21206	50	0	20	2 560.0	21350	100	0	21.51	0.142
	20	2 550.1	21251	100	0	10	2 564.5	21395	50	0	21.43	0.139
	15	2 552.7	21277	75	0	10	2 564.7	21397	50	0	21.19	0.131
	15	2 547.5	21225	75	0	15	2 562.5	21375	75	0	21.31	0.135
	15	2 542.9	21179	75	0	20	2 560.0	21350	100	0	21.47	0.140
	20	2 545.1	21201	100	0	15	2 562.2	21372	75	0	21.37	0.137
	20	2 540.2	21152	100	0	20	2 560.0	21350	100	0	21.37	0.137

Note;

QPSK Modulation with Full RB

ULCA 7C												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
Low	10	2 505.5	20805	50	0	20	2 519.9	20949	100	0	20.22	0.105
	20	2 510.0	20850	100	0	10	2 524.4	20994	50	0	20.06	0.101
	15	2 507.5	20825	75	0	10	2 519.5	20945	50	0	19.81	0.096
	15	2 507.5	20825	75	0	15	2 522.5	20975	75	0	20.02	0.101
	15	2 507.8	20828	75	0	20	2 524.9	20999	100	0	19.96	0.099
	20	2 510.0	20850	100	0	15	2 527.1	21021	75	0	19.59	0.091
	20	2 510.0	20850	100	0	20	2 529.8	21048	100	0	20.16	0.104
Middle	10	2 525.6	21006	50	0	20	2 540.0	21150	100	0	19.95	0.099
	20	2 530.1	21051	100	0	10	2 544.5	21195	50	0	19.86	0.097
	15	2 530.1	21051	75	0	10	2 542.1	21171	50	0	19.75	0.094
	15	2 527.5	21025	75	0	15	2 542.5	21175	75	0	19.73	0.094
	15	2 525.3	21003	75	0	20	2 542.4	21174	100	0	19.71	0.094
	20	2 527.6	21026	100	0	15	2 544.7	21197	75	0	19.76	0.095
	20	2 525.1	21001	100	0	20	2 544.9	21199	100	0	19.47	0.089
High	10	2 545.6	21206	50	0	20	2 560.0	21350	100	0	20.01	0.100
	20	2 550.1	21251	100	0	10	2 564.5	21395	50	0	19.51	0.089
	15	2 552.7	21277	75	0	10	2 564.7	21397	50	0	19.53	0.090
	15	2 547.5	21225	75	0	15	2 562.5	21375	75	0	19.73	0.094
	15	2 542.9	21179	75	0	20	2 560.0	21350	100	0	19.81	0.096
	20	2 545.1	21201	100	0	15	2 562.2	21372	75	0	19.39	0.087
	20	2 540.2	21152	100	0	20	2 560.0	21350	100	0	19.41	0.087

Note;

16QAM Modulation with Full RB

ULCA 66B												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
Low	5	1 712.5	131997	1	24	5	1 717.3	132045	1	0	22.63	0.183
	5	1 712.8	132000	1	24	10	1 720.0	132072	1	0	22.59	0.182
	10	1 715.0	132022	1	49	5	1 722.2	132094	1	0	22.49	0.177
	5	1 713.0	132002	1	24	15	1 722.3	132095	1	0	22.62	0.183
	15	1 717.5	132047	1	74	5	1 726.8	132140	1	0	22.72	0.187
	10	1 715.0	132022	1	49	10	1 724.9	132121	1	0	22.54	0.180
Middle	5	1 752.6	132398	1	24	5	1 757.4	132446	1	0	22.55	0.180
	5	1 750.3	132375	1	24	10	1 757.5	132447	1	0	22.51	0.178
	10	1 752.5	132397	1	49	5	1 759.7	132469	1	0	22.53	0.179
	5	1 748.1	132353	1	24	15	1 757.4	132446	1	0	22.57	0.181
	15	1 752.6	132398	1	74	5	1 761.9	132491	1	0	22.65	0.184
	10	1 750.1	132373	1	49	10	1 760.0	132472	1	0	22.65	0.184
High	5	1 772.7	132599	1	24	5	1 777.5	132647	1	0	22.60	0.182
	5	1 767.8	132550	1	24	10	1 775.0	132622	1	0	22.71	0.186
	10	1 770.0	132572	1	49	5	1 777.2	132644	1	0	22.58	0.181
	5	1 763.2	132504	1	24	15	1 772.5	132597	1	0	22.68	0.185
	15	1 767.7	132549	1	74	5	1 777.0	132642	1	0	22.75	0.189
	10	1 765.1	132523	1	49	10	1 775.0	132622	1	0	22.66	0.185

Note;

QPSK Modulation with 1 RB

ULCA 66B												
Ch.	PCC					SCC					Power	
	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	BW [MHz]	Freq. [MHz]	Ch.	RB	RB Offset	(dB m)	(W)
	Low	5	1 712.5	131997	1	24	5	1 717.3	132045	1	0	21.08
5		1 712.8	132000	1	24	10	1 720.0	132072	1	0	21.20	0.132
10		1 715.0	132022	1	49	5	1 722.2	132094	1	0	21.16	0.130
5		1 713.0	132002	1	24	15	1 722.3	132095	1	0	21.28	0.134
15		1 717.5	132047	1	74	5	1 726.8	132140	1	0	21.30	0.135
10		1 715.0	132022	1	49	10	1 724.9	132121	1	0	21.22	0.132
Middle	5	1 752.6	132398	1	24	5	1 757.4	132446	1	0	21.27	0.134
	5	1 750.3	132375	1	24	10	1 757.5	132447	1	0	21.19	0.131
	10	1 752.5	132397	1	49	5	1 759.7	132469	1	0	21.23	0.133
	5	1 748.1	132353	1	24	15	1 757.4	132446	1	0	20.98	0.125
	15	1 752.6	132398	1	74	5	1 761.9	132491	1	0	21.44	0.139
	10	1 750.1	132373	1	49	10	1 760.0	132472	1	0	21.22	0.132
High	5	1 772.7	132599	1	24	5	1 777.5	132647	1	0	21.34	0.136
	5	1 767.8	132550	1	24	10	1 775.0	132622	1	0	21.32	0.136
	10	1 770.0	132572	1	49	5	1 777.2	132644	1	0	21.35	0.137
	5	1 763.2	132504	1	24	15	1 772.5	132597	1	0	21.34	0.136
	15	1 767.7	132549	1	74	5	1 777.0	132642	1	0	21.48	0.141
	10	1 765.1	132523	1	49	10	1 775.0	132622	1	0	21.25	0.133

Note;

16QAM Modulation with 1 RB