

Test Report

FCC ID :2AMKU-DK66

Date of issue: Jun. 16, 2017

Report Number:	MTi170621E136
Sample Description:	Rugged Smartphone
Model(s):	DK66
Applicant:	Shenzhen Gomtel Science & Technology Co., Ltd.
Address:	5th Floor, Sector B, Fuhua Technology Building No.9116 Beihuan Road, Nanshan, Shenzhen, China
Date of Test:	May. 26, 2017 to Jun. 16, 2017

Shenzhen Microtest Co., Ltd.
<http://www.mtitest.com>

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Tel: (86-755) 88850135

Fax: (86-755) 88850136

Web: <http://www.mtitest.com>

E-mail: mti@51mti.com

Address: No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China

TEST RESULT CERTIFICATION	
Applicant's name	Shenzhen Gomtel Science & Technology Co., Ltd.
Address	5th Floor, Sector B, Fuhua Technology Building No.9116 Beihuan Road, Nanshan, Shenzhen, China
Manufacture's Name	Shenzhen Gomtel Science & Technology Co., Ltd.
Address	5th Floor, Sector B, Fuhua Technology Building No.9116 Beihuan Road, Nanshan, Shenzhen, China
Product description	
Product name	Rugged Smartphone
Model and/or type reference :	DK66
Serial Model	DK66plus, DK6x series (X is arabic number), WF68
Standards	FCC Part15.407
Test procedure	ANSI C63.10-2013

Tested by:



Ace Chai

Jun. 15, 2017

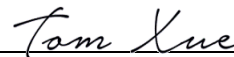
Reviewed by:



Smith Chen

Jun. 16, 2017

Approved by:



Tom Xue

Jun. 16, 2017

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.407(a)	Conducted Peak Output Power	PASS	
15.407(a)	Emission Bandwidth	PASS	
15.407(a)	Power Spectral Density	PASS	
15.407(b)&15.209	Spurious Emission	PASS	
15.407(b)	Undesirable emission	PASS	
15.407	Frequency stability	PASS	
15.203/15.407	Antenna Requirement	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen Toby Technology Co., Ltd.

Add.: 10/F, A Block, Jiada R&D Bldg., No.5 Songpingshan, Road, Science&Technology Park,
Shenzhen, 518057

FCC Registration No.:811562

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Rugged Smartphone	
Trade Name	DuraMobi	
Model Name	DK66	
Serial Model	DK66plus, DK6x series (X is arabic number), WF68	
Model Difference	N/A	
Product Description	The EUT is a Rugged Smartphone	
	Operation Frequency:	802.11a:5180MHz~5240MHz 802.11n(H20):5180MHz~5240MHz
	Modulation Type:	11n: BPSK, QPSK, 16QAM, 64QAM with OFDM 11a: BPSK, QPSK, 16QAM, 64QAM, OFDM
	Bit Rate of Transmitter	802.11a: 6Mbps 802.11n(20): 6.5Mbps
	Number Of Channel	4 for 802.11a/802.11n(H20)
	Antenna Designation:	Please see Note 3.
	Output Power(Conducted):	802.11a: 19.31 dBm (Max.)
	Antenna Gain (dBi)	-0.76dbi
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Adapter	Model: UT-133E- 5200ZY AC Power Input: 100-240V~50/60Hz 0.3A MAX Output :5V DC, 2000mA	
Battery	Model:EU955164PV 3.8V 4600mAh	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

For IEEE 802.11 a with 5.2G			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH36	5180	CH44	5220
CH40	5200	CH48	5240

For IEEE 802.11 n/HT20 with 5.2G			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH36	5180	CH44	5220
CH40	5200	CH48	5240

3.

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	Integrated antenna	-	-0.76dBi	Wifi Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11a CH36/ CH40/ CH48
Mode 2	802.11n CH36/ CH40/ CH48
Mode 3	Link Mode

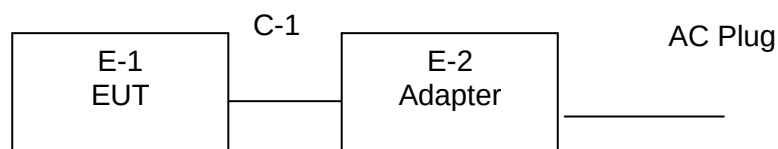
For Conducted Emission	
Final Test Mode	Description
Mode 3	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a CH36/ CH40/ CH48
Mode 2	802.11n CH36/ CH40/ CH48
Mode 3	Link Mode

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.2.1 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.3 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Rugged Smartphone	DragonKing	DK66	N/A	EUT
E-2	Adapter	N/A	PGAK0500100U1EU	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.0m	
C-2	NO	NO	0.8m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.4 EQUIPMENTS LIST FOR ALL TEST ITEMS

For RF conducted test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Signal Analyzer	Agilent	N9010A	MY48030494	2017/11/4
4 Ch. Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	TW54063513	2017/11/4
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54080019	2017/11/4
vector Signal Generator	Agilent	E4438C	US44271917	2017/11/4
vector Signal Generator	Agilent	E4438C	MY49070163	2017/11/4
Dc Power Supply	GW	GPR-6030D	/	2017/11/4
Temperature & Humidity Chamber	GIANT FORCE	GTH-056P	GF-94454-1	2017/11/4
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	120909	2017/11/4

For Radiated test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Broadband TRILOG Antenna	Schwarabeck	VULB9163	9163-872	2017/11/14
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1145	2017/11/14
Amplifier	HP	8447D	3113A06150	2017/11/4
Amplifier	Agilent	8449B	3008A02400	2017/7/4
Test Receiver	Schwarabeck	ESPI7	100314	2017/11/4
Spectrum analyzer	Agilent	E4407B	MY41441082	2017/11/4
Signal Generator	R&S	SMT 06	832080/007	2017/11/4

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

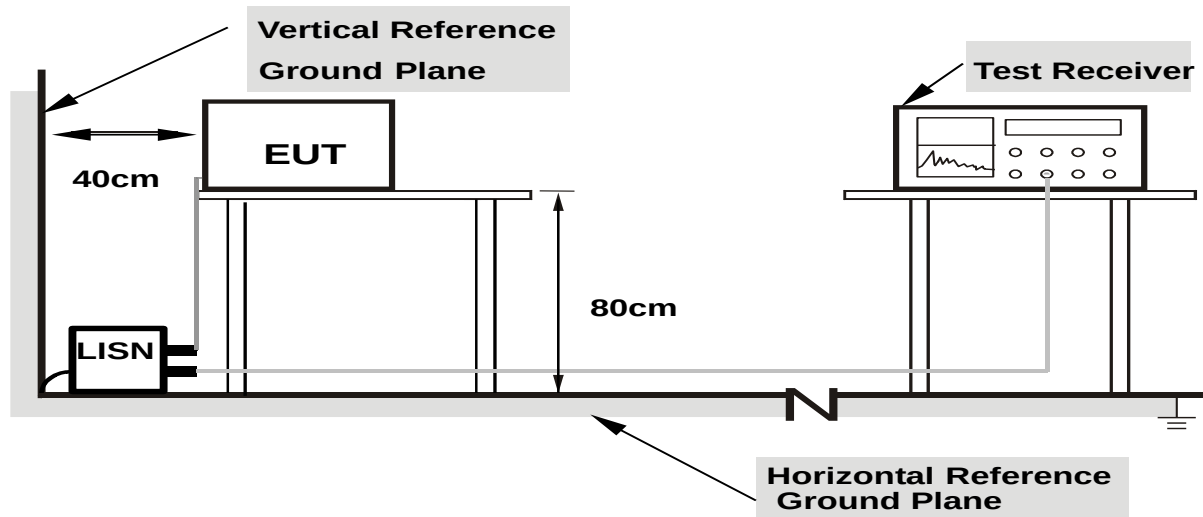
3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

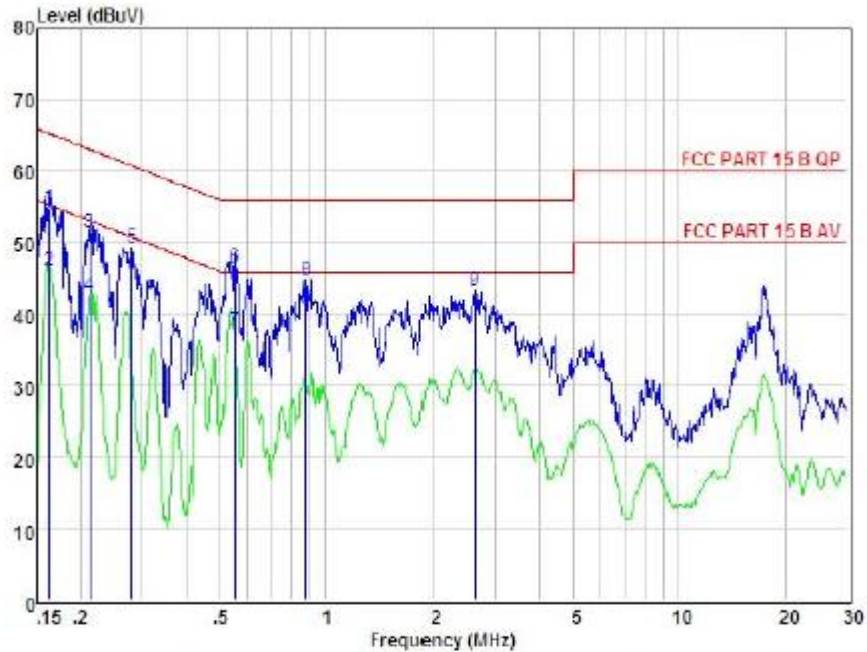
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

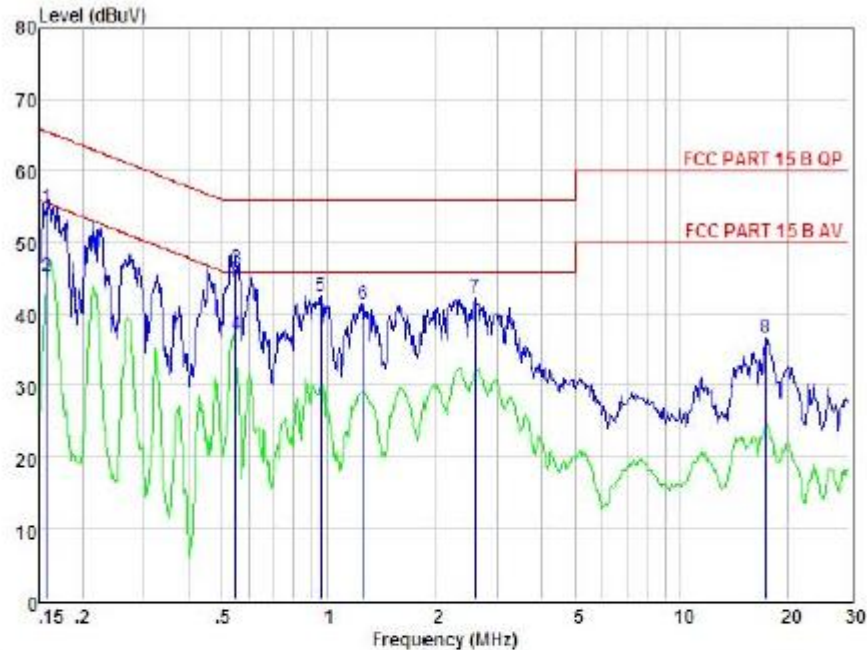
EUT :	Rugged Smartphone	Model Name. :	DK66
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz	Test Mode :	Mode 5



Item	Freq MHz	Read Level dBuV	LISN Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	0.163	45.31	0.03	-9.52	0.10	54.96	55.30	-10.34	QP
2	0.163	36.50	0.03	-9.52	0.10	46.15	55.30	-9.15	Average
3	0.213	41.80	0.03	-9.52	0.10	51.45	63.10	-11.65	QP
4	0.213	33.11	0.03	-9.52	0.10	42.76	53.10	-10.34	Average
5	0.280	39.56	0.03	-9.56	0.10	49.25	60.81	-11.56	Peak
6	0.349	36.93	0.03	-9.58	0.10	46.64	56.00	-9.36	QP
7	0.349	28.10	0.03	-9.58	0.10	37.81	46.00	-8.19	Average
8	0.576	35.08	0.04	-9.62	0.10	44.84	56.00	-11.16	Peak
9	2.622	33.33	0.06	-9.76	0.11	43.26	56.00	-12.74	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

EUT :	Rugged Smartphone	Model Name. :	DK66
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz	Test Mode :	Mode 5



Item	Freq MHz	Read Level dBuV	LISN Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	0.158	45.32	0.03	-9.52	0.10	54.97	65.56	-10.59	QP
2	0.158	35.50	0.03	-9.52	0.10	45.15	55.56	-10.41	Average
3	0.546	36.58	0.03	-9.58	0.10	46.29	56.00	-9.71	QP
4	0.546	27.40	0.03	-9.58	0.10	37.11	46.00	-8.89	Average
5	0.953	32.79	0.04	-9.63	0.10	42.56	56.00	-13.44	Peak
6	1.262	31.61	0.05	-9.65	0.10	41.41	56.00	-14.59	Peak
7	2.594	32.23	0.06	-9.76	0.11	42.16	56.00	-13.84	Peak
8	17.383	26.18	0.28	-9.82	0.30	36.58	60.00	-23.42	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

3.2 RADIATED EMISSION MEASUREMENT(UNDESIRABLE EMISSION)

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

微测检测

- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

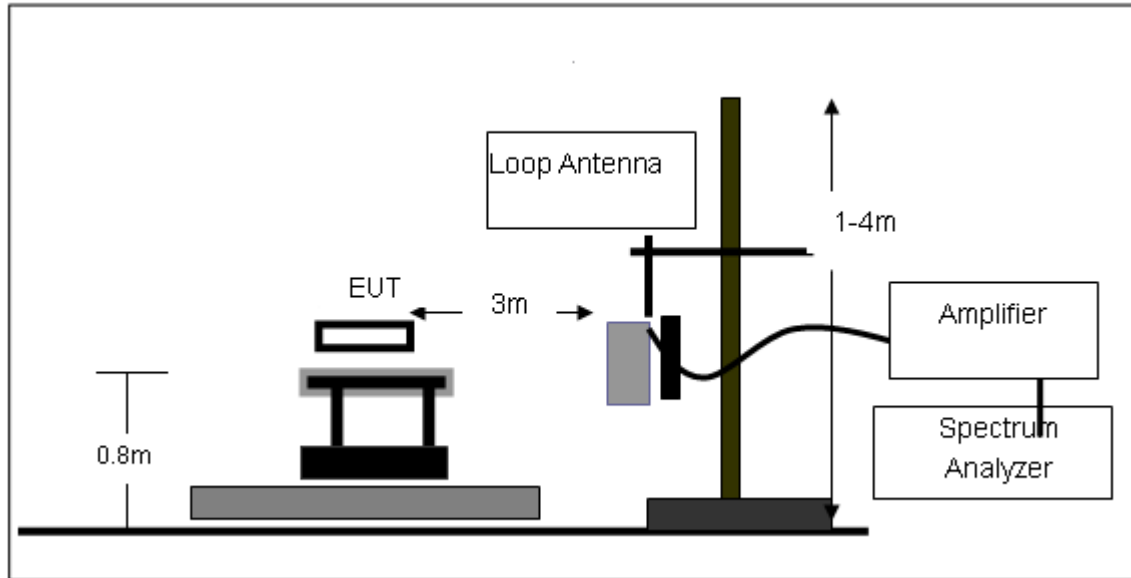
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

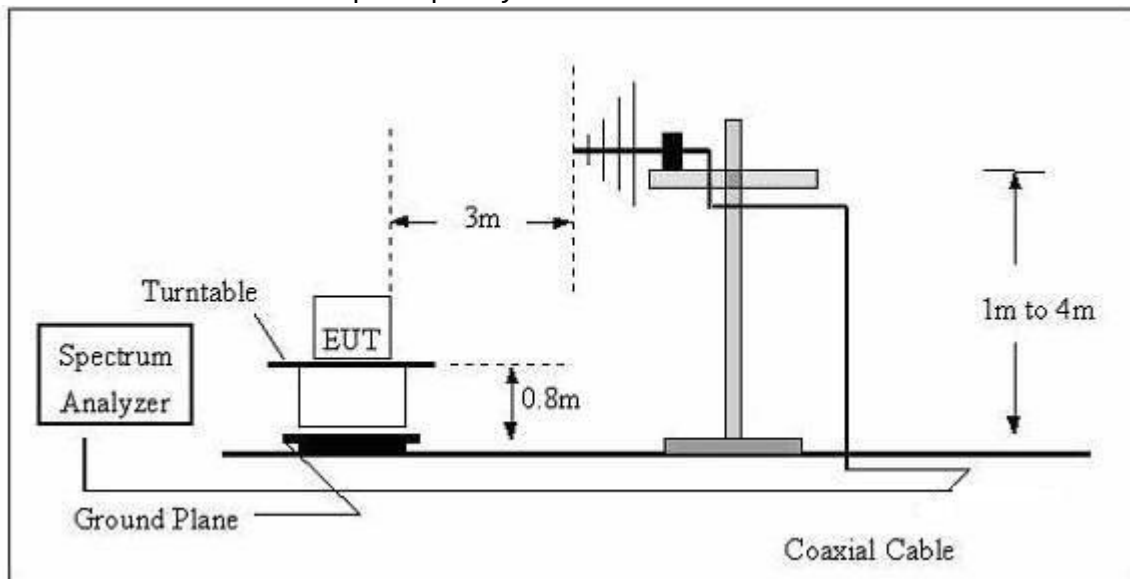
No deviation

3.2.4 TEST SETUP

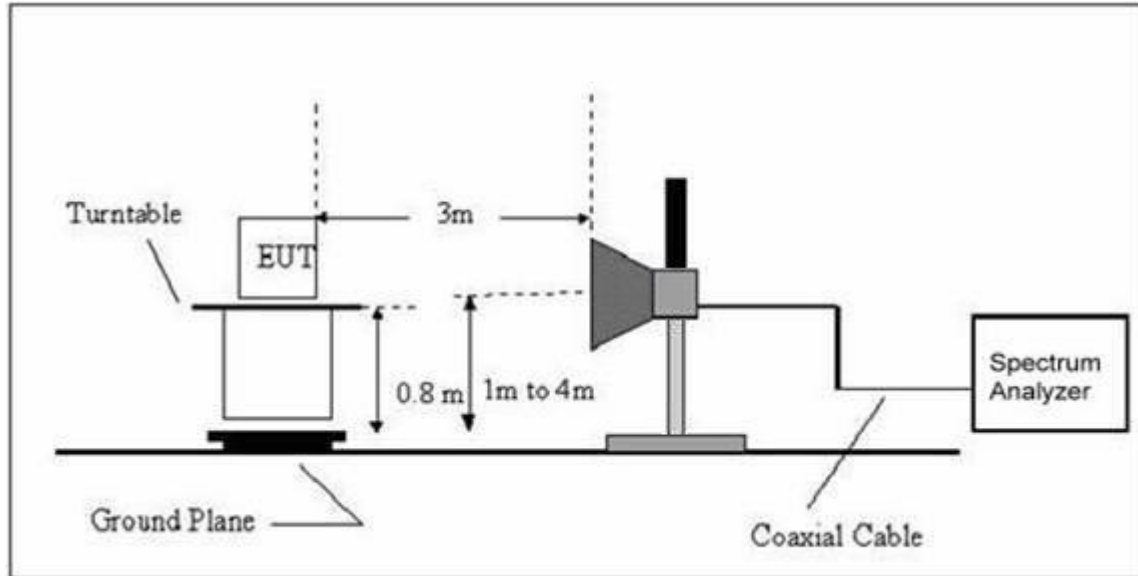
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz

**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	Rugged Smartphone	Model Name. :	DK66
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

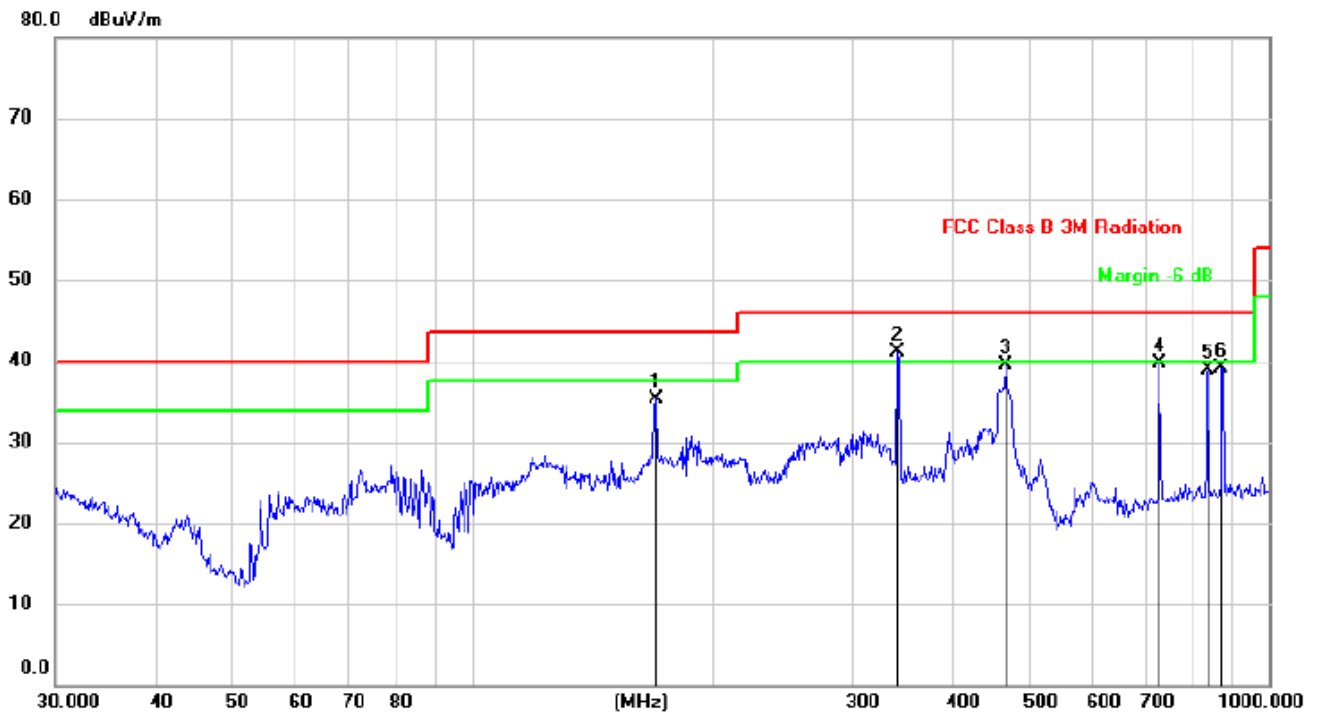
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})(\text{dB})$;

Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX	Polarization:	Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		170.1947	51.64	-16.41	35.23	43.50	-8.27	QP		
2	*	341.9786	50.77	-9.75	41.02	46.00	-4.98	QP		
3		467.2348	47.08	-7.55	39.53	46.00	-6.47	QP		
4		729.3582	43.44	-3.81	39.63	46.00	-6.37	QP		
5		839.1816	41.03	-2.20	38.83	46.00	-7.17	QP		
6		872.1832	40.77	-1.70	39.07	46.00	-6.93	QP		

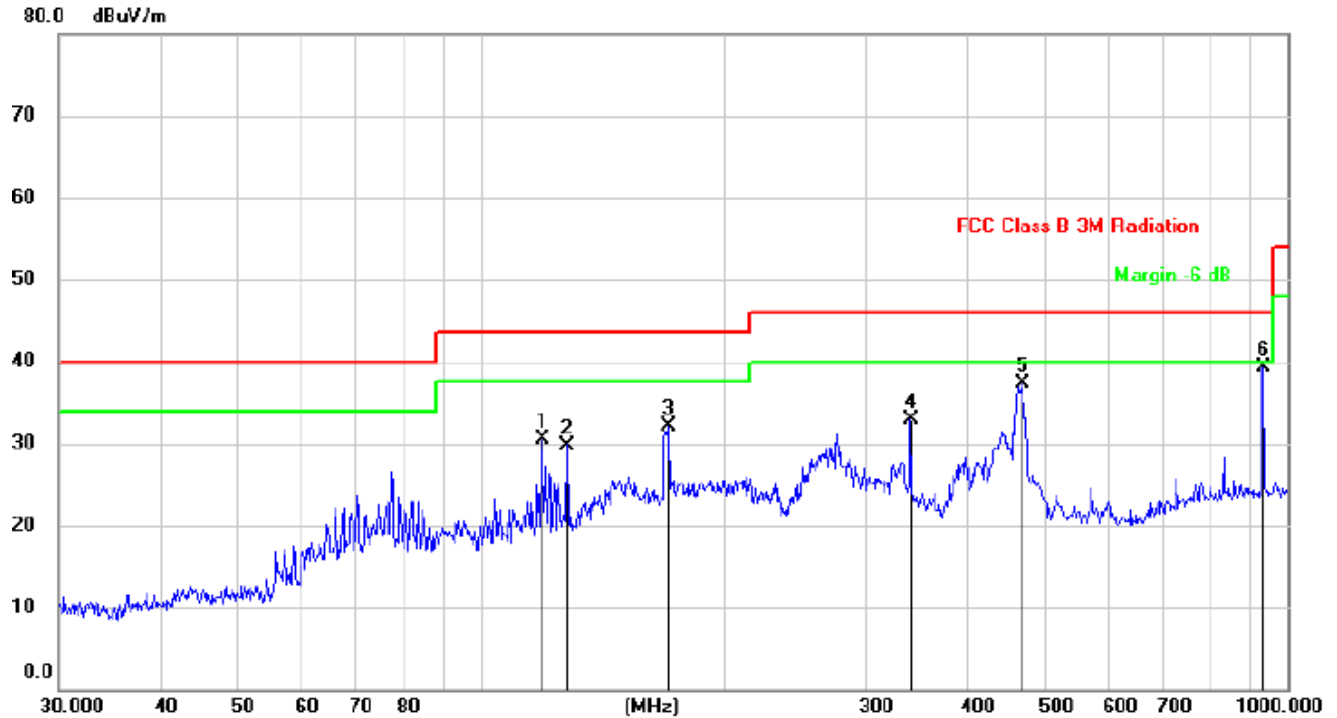
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX	Polarization:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		119.0180	46.39	-15.90	30.49	43.50	-13.01	QP		
2		128.1127	47.03	-17.23	29.80	43.50	-13.70	QP		
3		170.7923	48.55	-16.37	32.18	43.50	-11.32	QP		
4		340.7817	42.73	-9.77	32.96	46.00	-13.04	QP		
5		468.8761	44.90	-7.54	37.36	46.00	-8.64	QP		
6	*	932.2712	40.28	-0.98	39.30	46.00	-6.70	QP		

Remark:

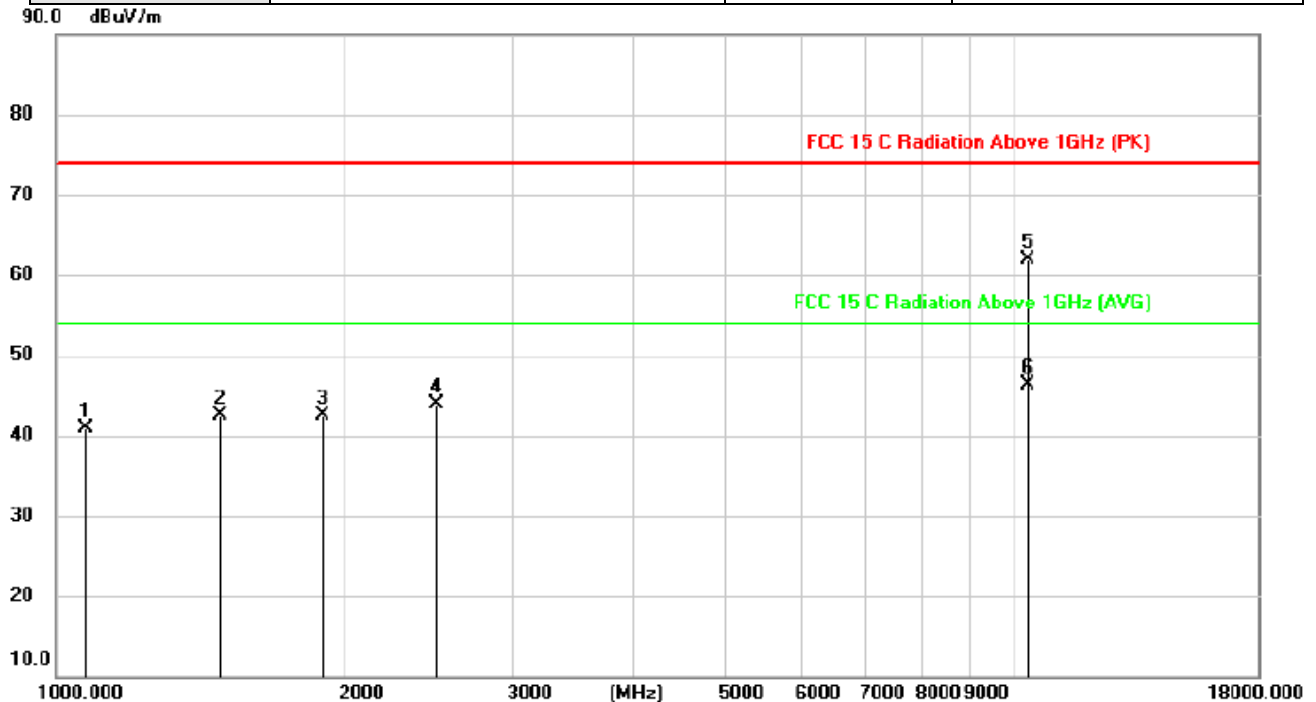
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

3.2.8 TEST RESULTS (1G-25GHZ)

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11a: 5180MHz	Polarization:	Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		1074.301	59.00	-18.03	40.97	74.00	-33.03	peak		
2		1483.178	58.44	-15.88	42.56	74.00	-31.44	peak		
3		1895.832	56.38	-13.96	42.42	74.00	-31.58	peak		
4		2498.247	53.53	-9.63	43.90	74.00	-30.10	peak		
5		10360.112	51.88	10.08	61.96	74.00	-12.04	peak		
6	*	10360.112	36.28	10.08	46.36	54.00	-7.64	AVG		

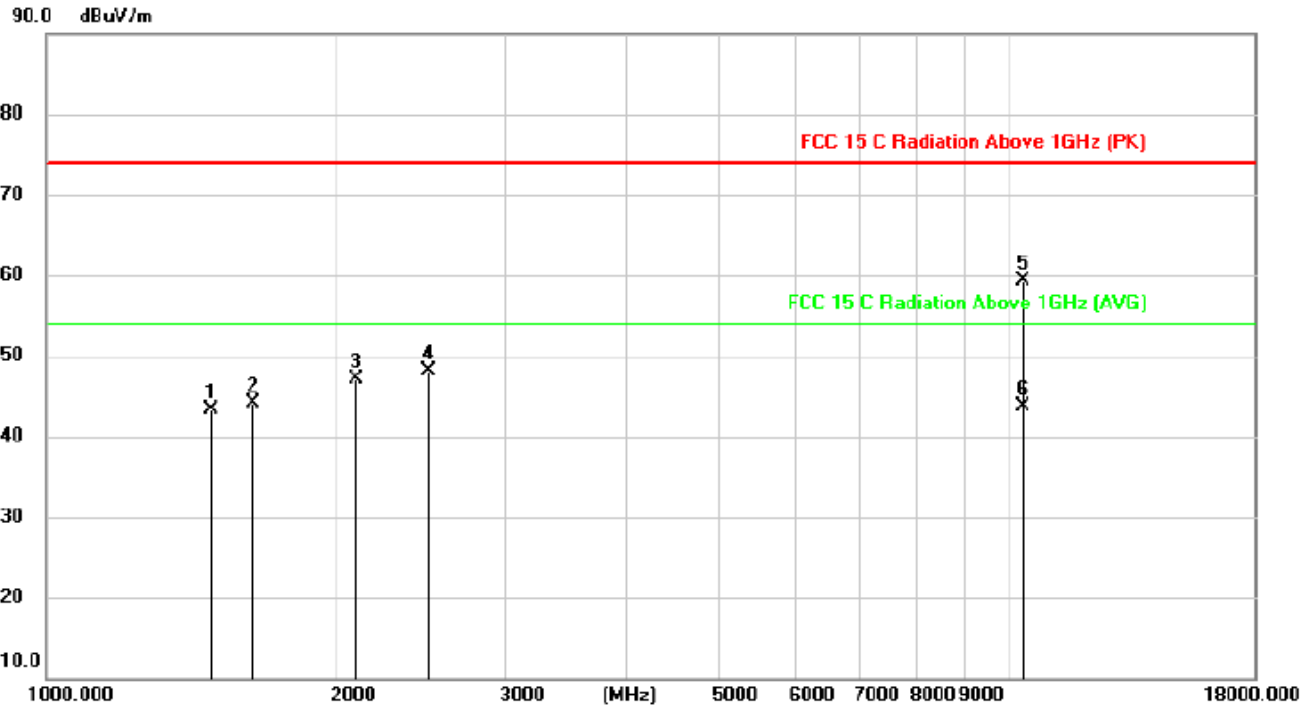
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11a:5180MHz	Polarization:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		1485.838	59.20	-15.87	43.33	74.00	-30.67	peak		
2		1636.784	59.48	-15.42	44.06	74.00	-29.94	peak		
3		2095.928	59.49	-12.44	47.05	74.00	-26.95	peak		
4		2491.777	57.75	-9.67	48.08	74.00	-25.92	peak		
5		10360.112	49.25	10.08	59.33	74.00	-14.67	peak		
6	*	10360.112	33.55	10.08	43.63	54.00	-10.37	AVG		

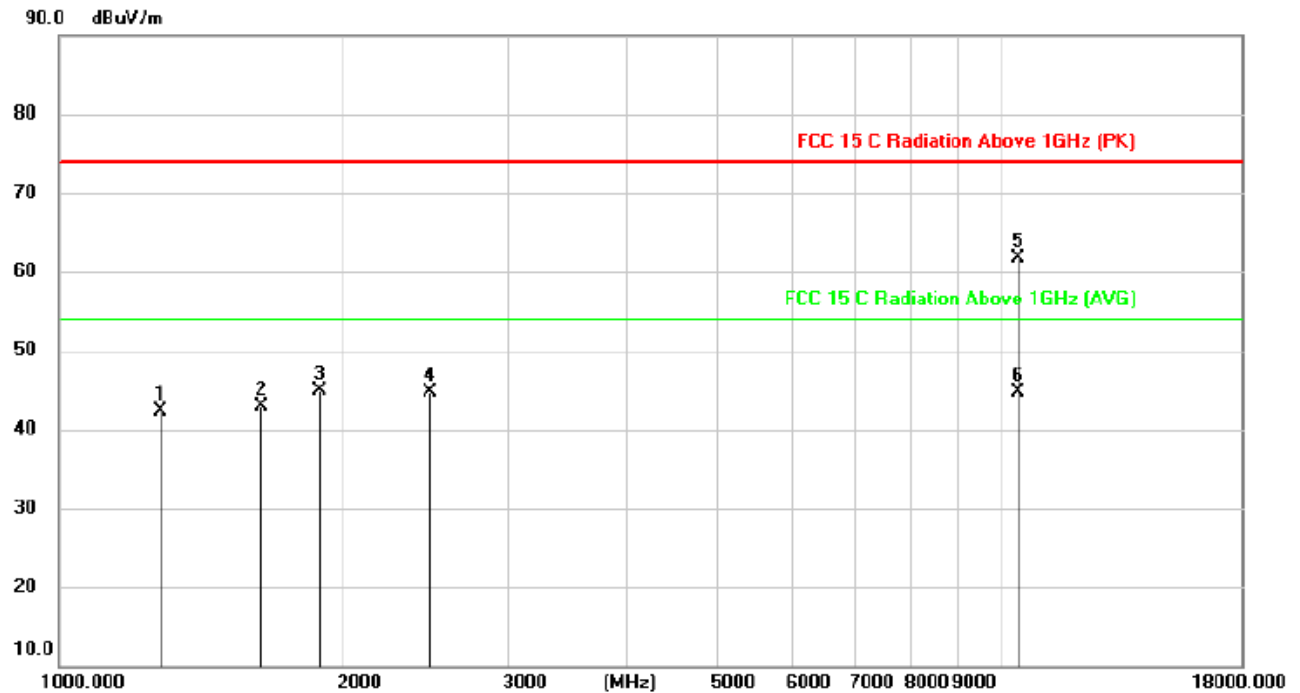
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11a : 5200MHz	Polarization:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1280.515	59.26	-16.94	42.32	74.00	-31.68	peak		
2		1636.784	58.33	-15.42	42.91	74.00	-31.09	peak		
3		1892.438	58.79	-13.98	44.81	74.00	-29.19	peak		
4		2474.144	54.49	-9.79	44.70	74.00	-29.30	peak		
5		10400.425	51.62	10.13	61.75	74.00	-12.25	peak		
6	*	10400.425	34.53	10.13	44.66	54.00	-9.34	AVG		

Remark:

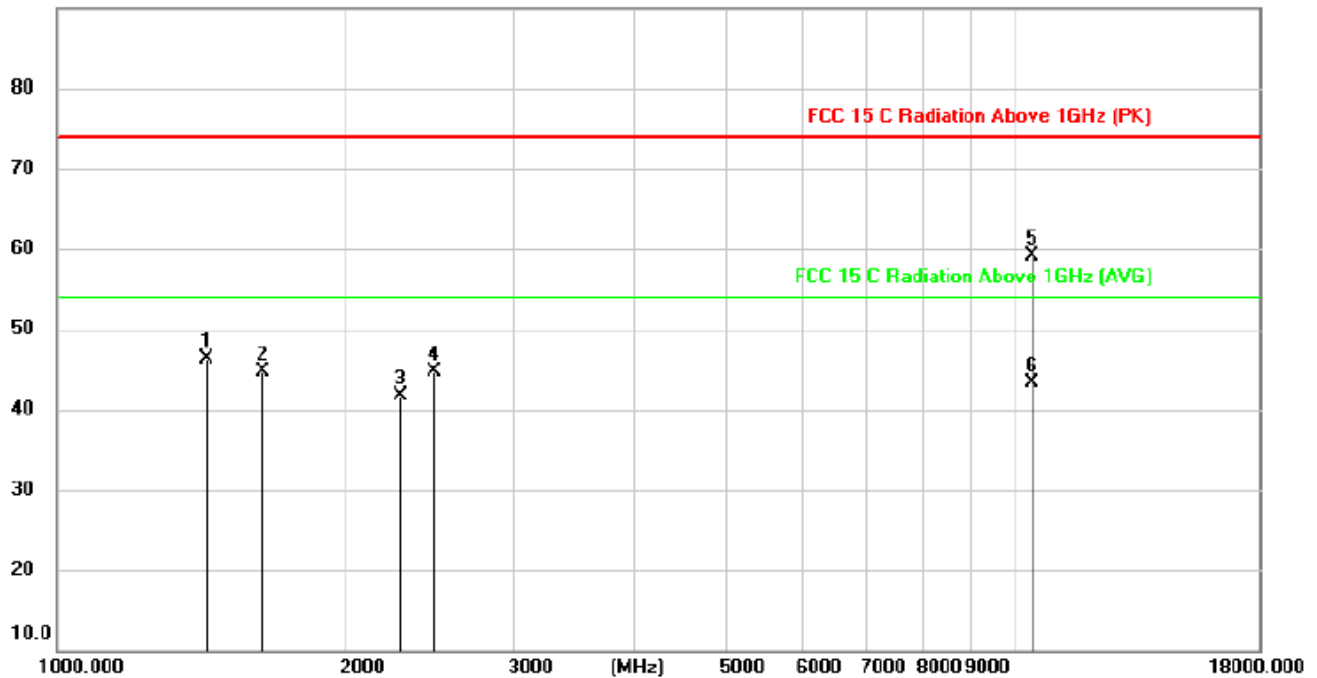
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11a: 5200MHz	Polarization:	Vertical

90.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1433.535	62.29	-16.00	46.29	74.00	-27.71	peak		
2		1636.784	60.10	-15.42	44.68	74.00	-29.32	peak		
3		2284.166	52.77	-11.12	41.65	74.00	-32.35	peak		
4		2474.777	54.49	-9.79	44.70	74.00	-29.30	peak		
5		10400.425	48.94	10.13	59.07	74.00	-14.93	peak		
6	*	10400.425	33.13	10.13	43.26	54.00	-10.74	AVG		

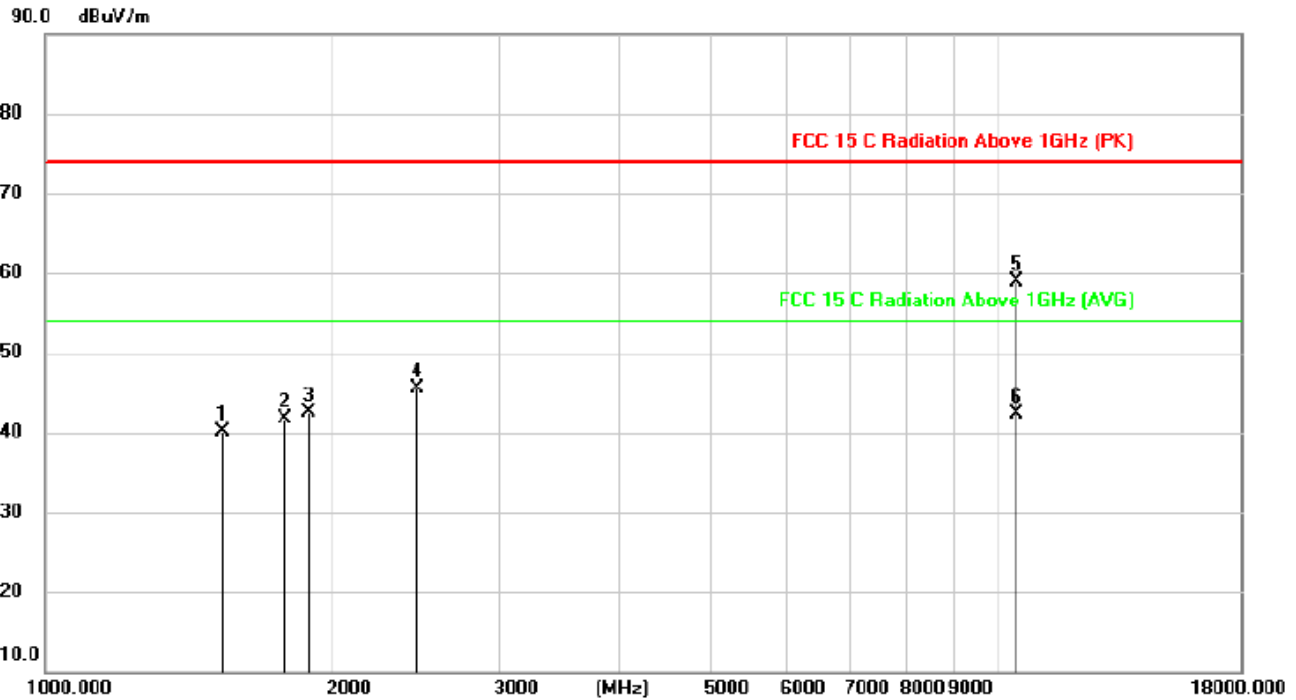
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11a : 5240MHz	Polarization:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1534.540	55.90	-15.74	40.16	74.00	-33.84	peak		
2		1786.985	56.57	-14.80	41.77	74.00	-32.23	peak		
3		1892.438	56.39	-13.98	42.41	74.00	-31.59	peak		
4		2453.839	55.36	-9.94	45.42	74.00	-28.58	peak		
5		10480.325	48.77	10.19	58.96	74.00	-15.04	peak		
6	*	10480.325	32.09	10.19	42.28	54.00	-11.72	AVG		

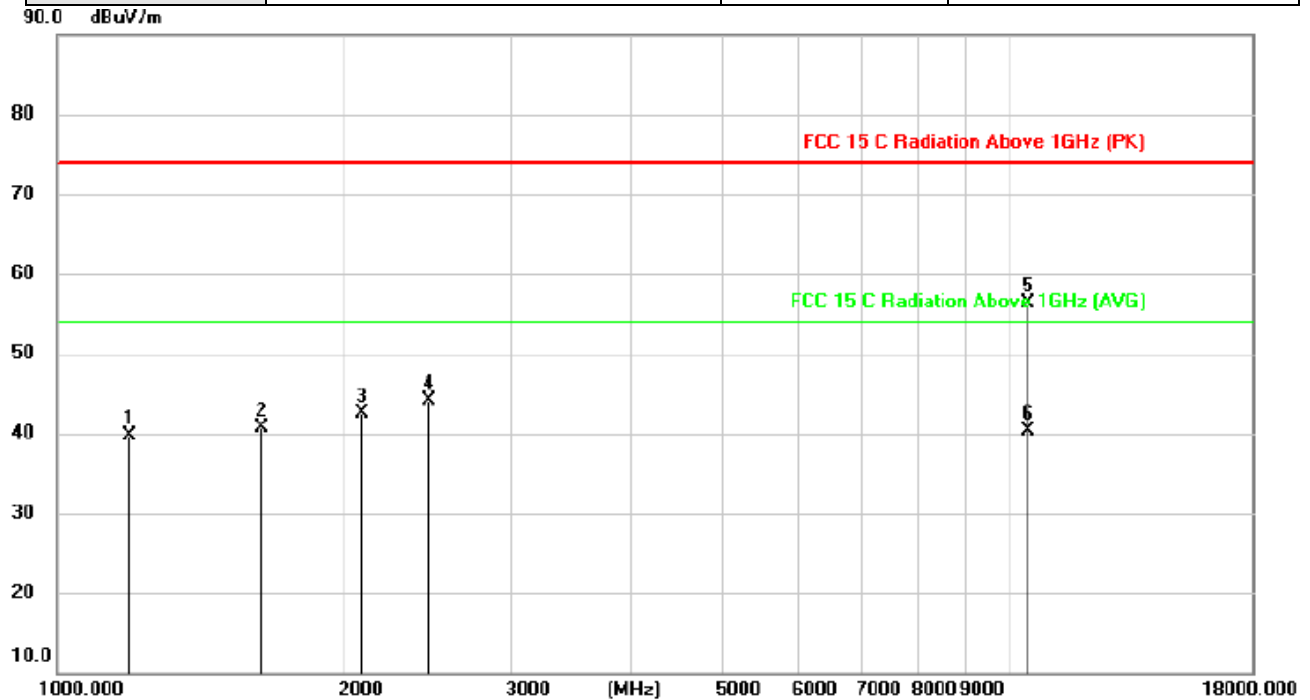
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11a: 5240MHz	Polarization:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1187.688	57.35	-17.58	39.77	74.00	-34.23	peak		
2		1636.784	56.21	-15.42	40.79	74.00	-33.21	peak		
3		2084.693	54.97	-12.52	42.45	74.00	-31.55	peak		
4		2453.883	54.04	-9.94	44.10	74.00	-29.90	peak		
5		10480.325	46.02	10.19	56.21	74.00	-17.79	peak		
6	*	10480.325	30.14	10.19	40.33	54.00	-13.67	AVG		

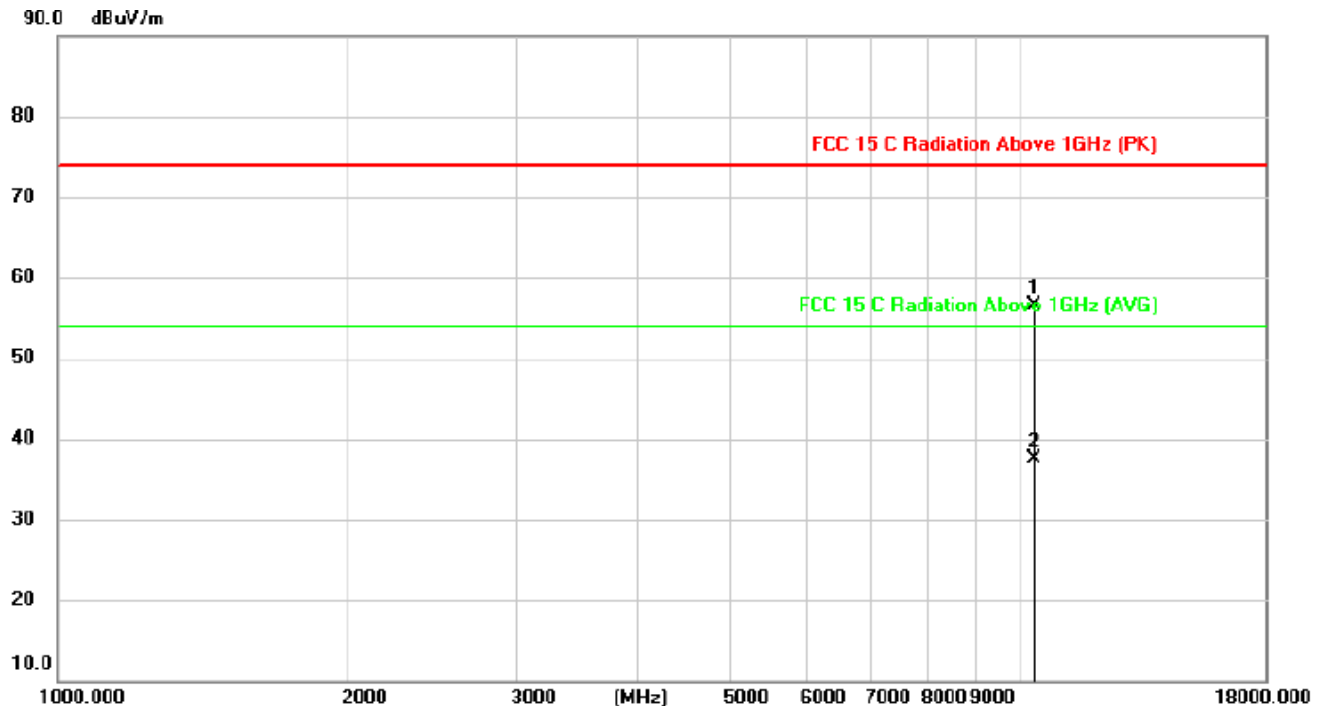
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11n: 5180MHz	Polarization:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		10360.529	46.51	10.08	56.59	74.00	-17.41	peak		
2	*	10360.529	27.41	10.08	37.49	54.00	-16.51	AVG		

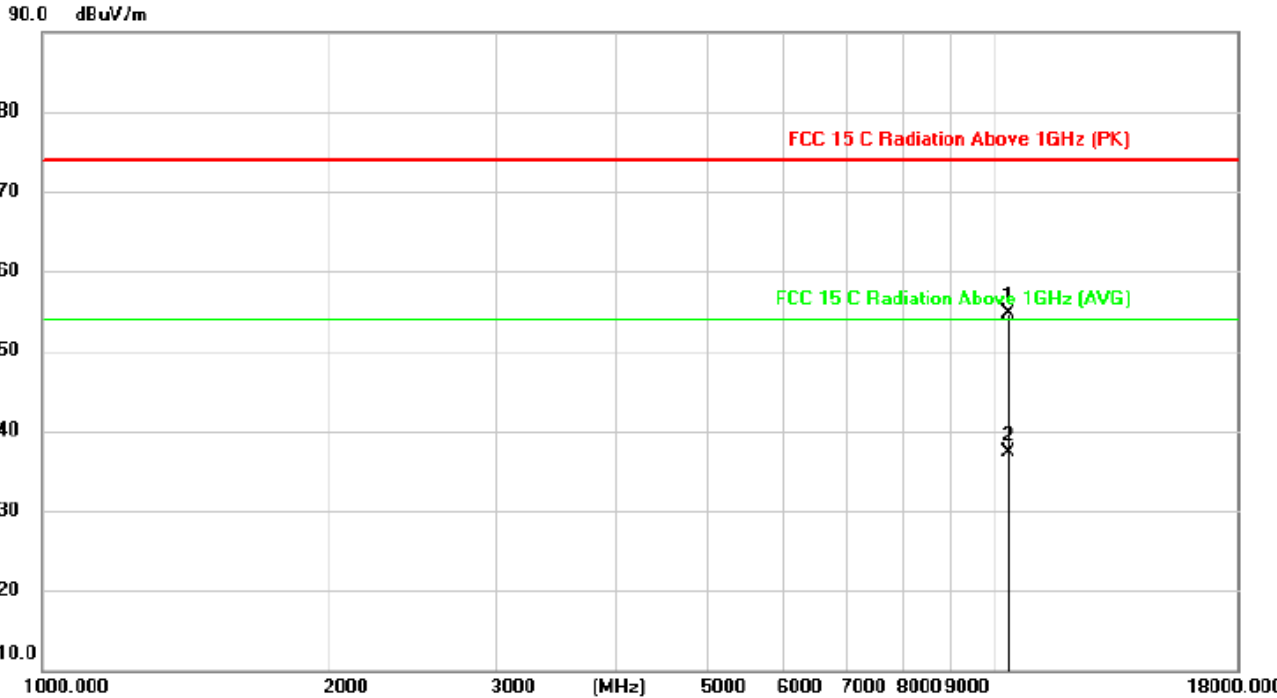
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11n: 5180MHz	Polarization:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		10360.428	44.60	10.08	54.68	74.00	-19.32	peak		
2	*	10360.428	27.32	10.08	37.40	54.00	-16.60	AVG		

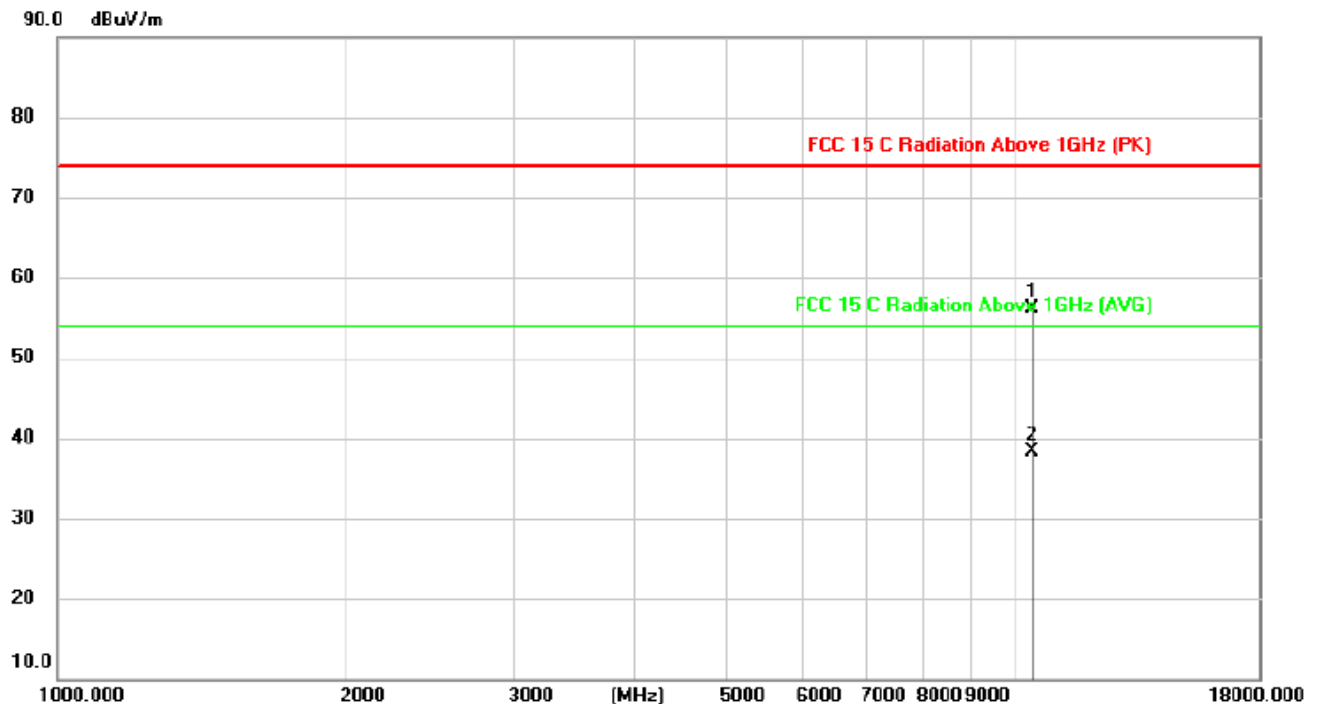
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11n: 5200MHz	Polarization:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		10400.279	45.99	10.13	56.12	74.00	-17.88	peak		
2	*	10400.279	28.22	10.13	38.35	54.00	-15.65	AVG		

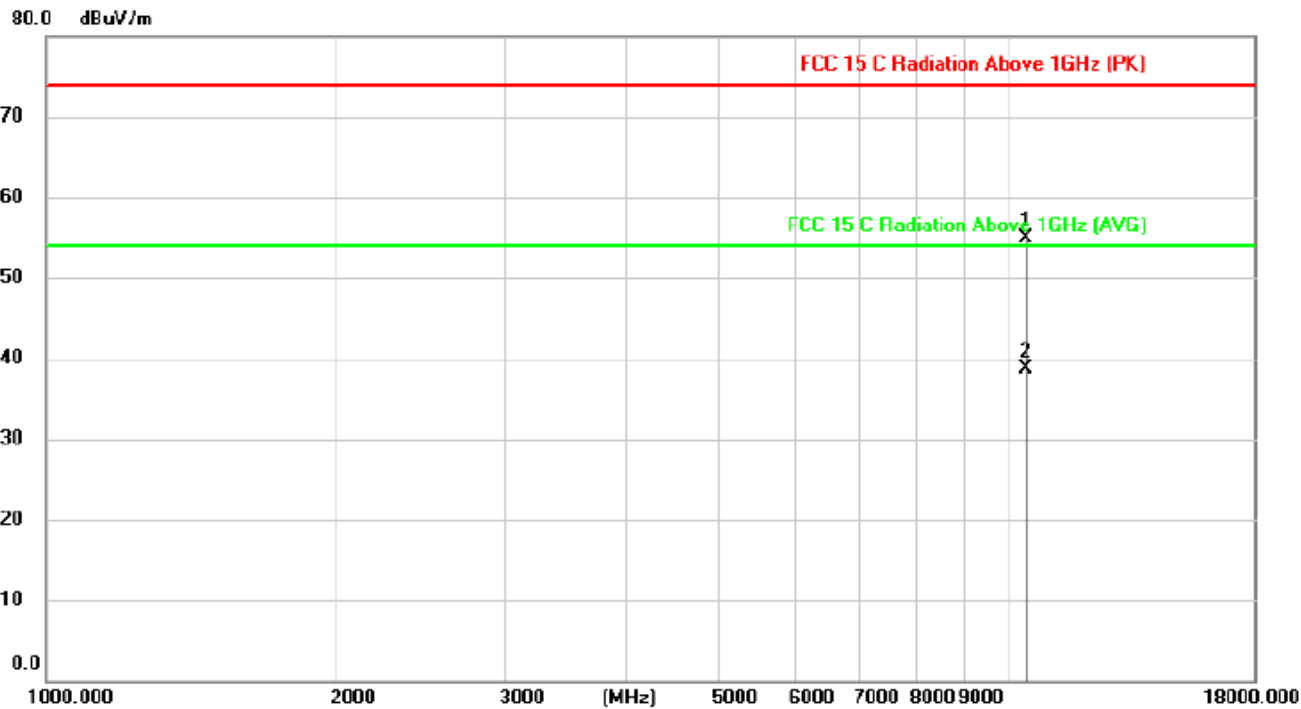
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11n: 5200MHz	Polarization:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		10400.548	44.79	10.13	54.92	74.00	-19.08	peak		
2	*	10400.548	28.67	10.13	38.80	54.00	-15.20	AVG		

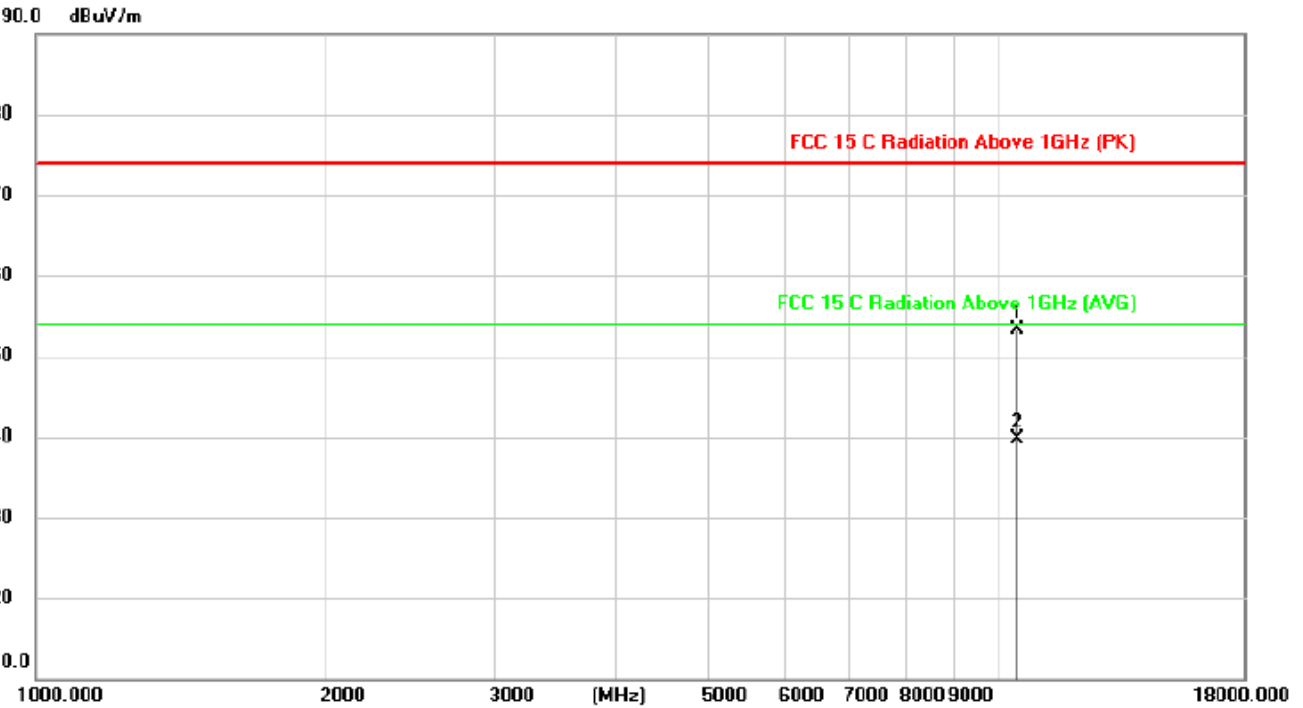
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11n: 5240MHz	Polarization:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	cm	degree
1		10480.591	43.17	10.19	53.36	74.00	-20.64	peak	
2	*	10480.591	29.56	10.19	39.75	54.00	-14.25	AVG	

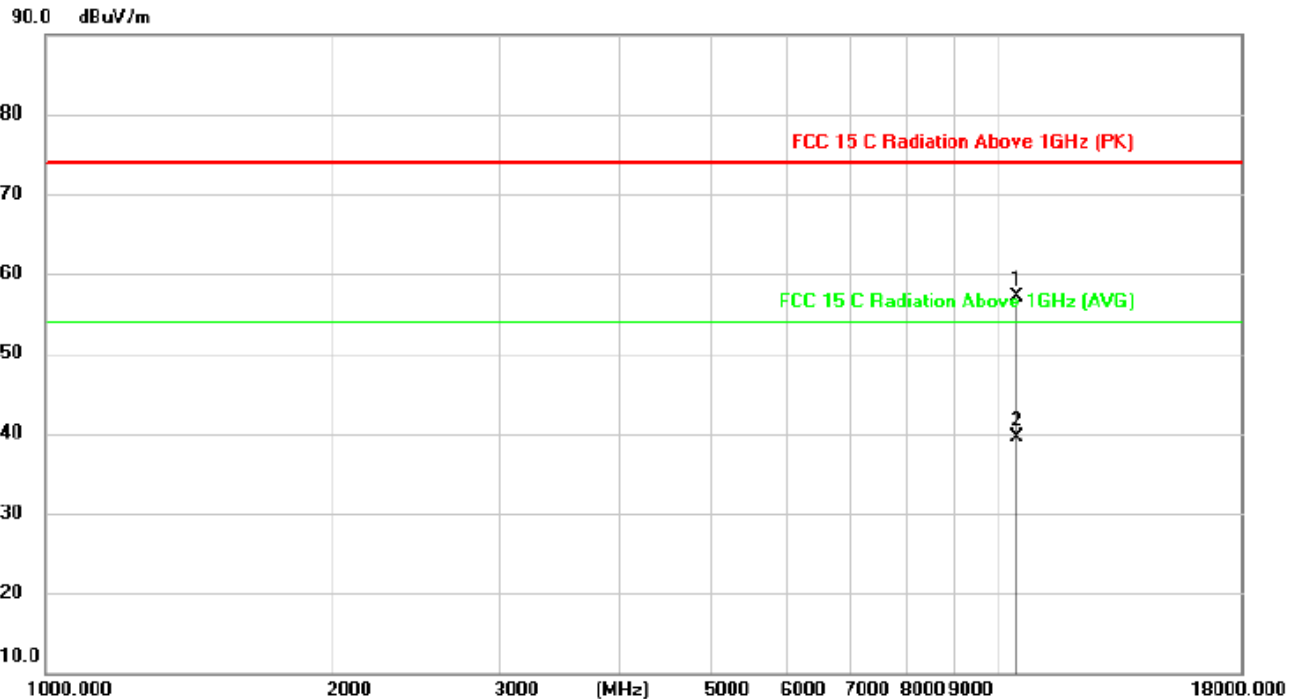
Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	Normal Voltage
Test Mode :	TX 802.11n: 5240MHz	Polarization:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		10480.591	46.99	10.19	57.18	74.00	-16.82	peak		
2	*	10480.591	29.41	10.19	39.60	54.00	-14.40	AVG		

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

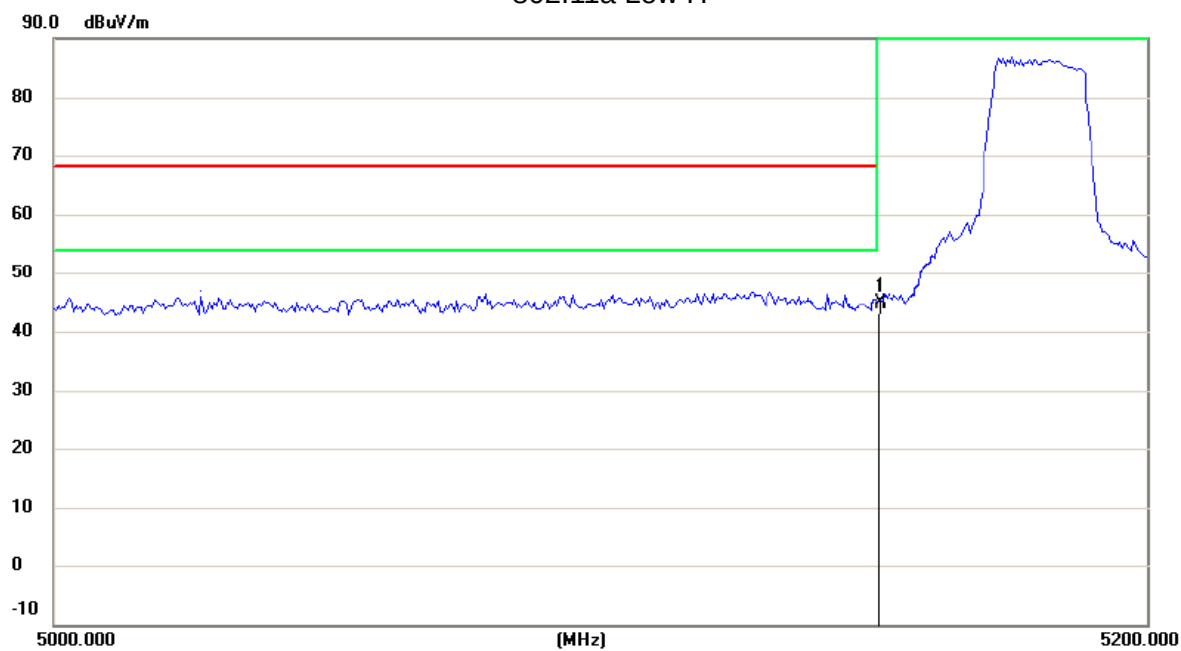
Factor added by measurement software automatically

BAND EDGE(Radiated)

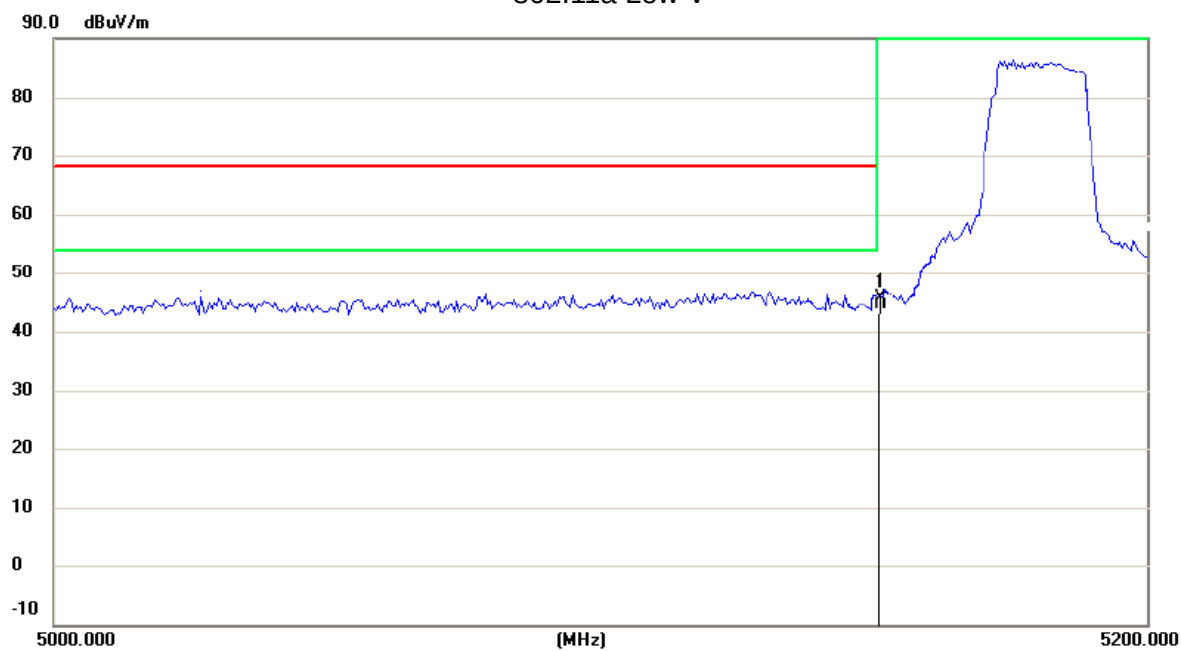
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11a							
5150	55.65	-9.06	46.59	68.2	21.61	peak	Vertical
5150	56.75	-9.06	47.69	68.2	20.51	peak	Horizontal
--	--	--	--	--	--	peak	Vertical
--	--	--	--	--	--	peak	Horizontal
802.11n							
5350	55.82	-8.96	46.86	68.2	21.34	peak	Vertical
5350	56.27	-8.96	47.31	68.2	20.89	peak	Horizontal
--	--	--	--	--	--	peak	Vertical
--	--	--	--	--	--	peak	Horizontal

NOTE: The PK value is less than the AV value, AV value is not required.

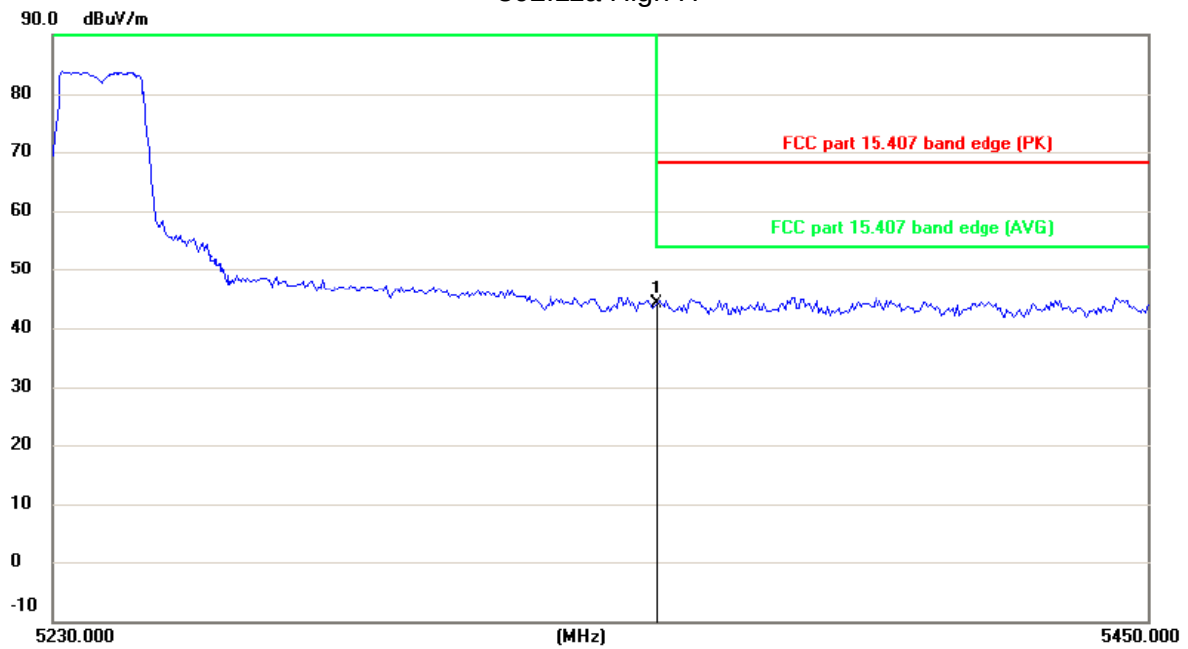
802.11a Low H



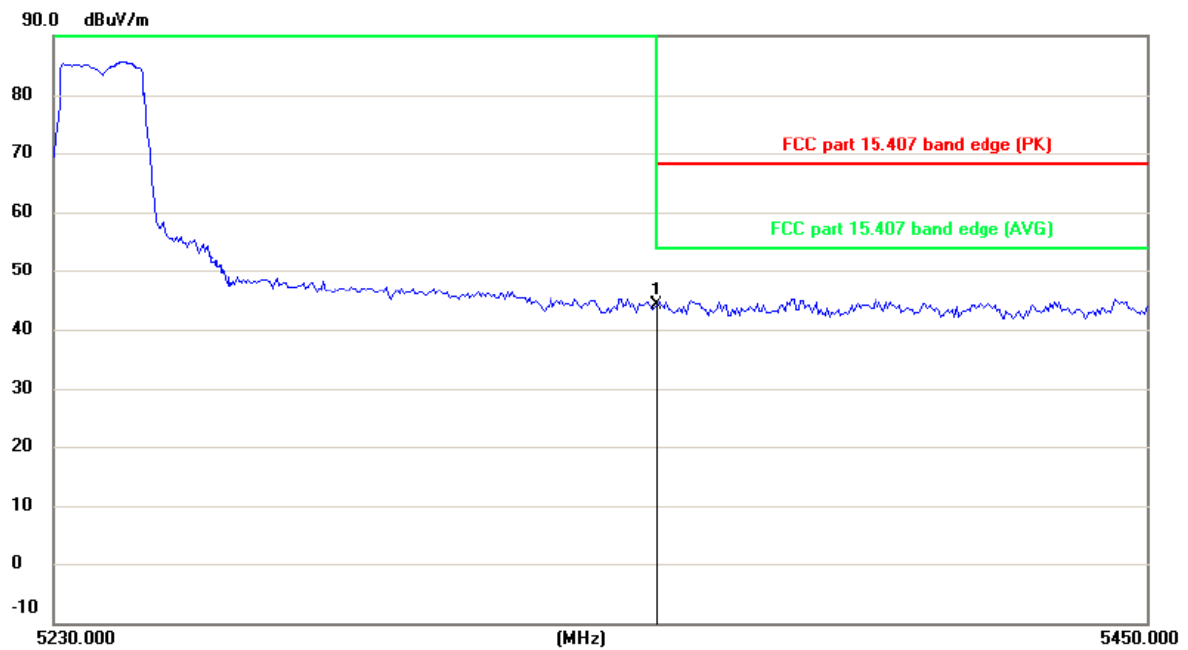
802.11a Low V



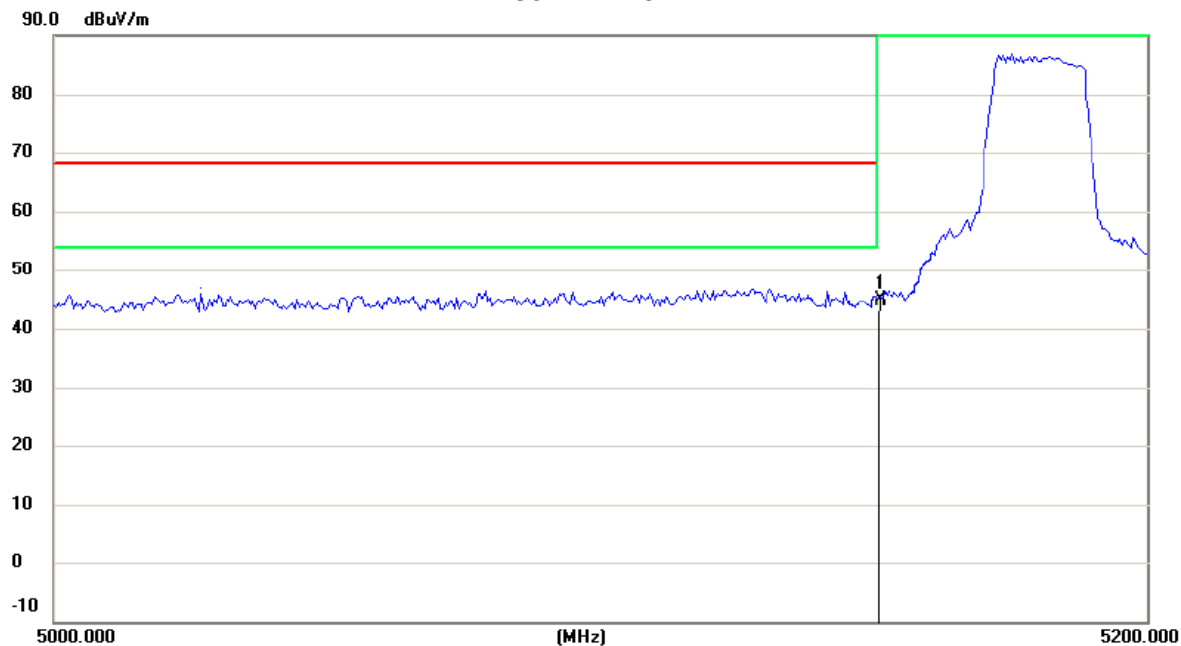
802.11a High H



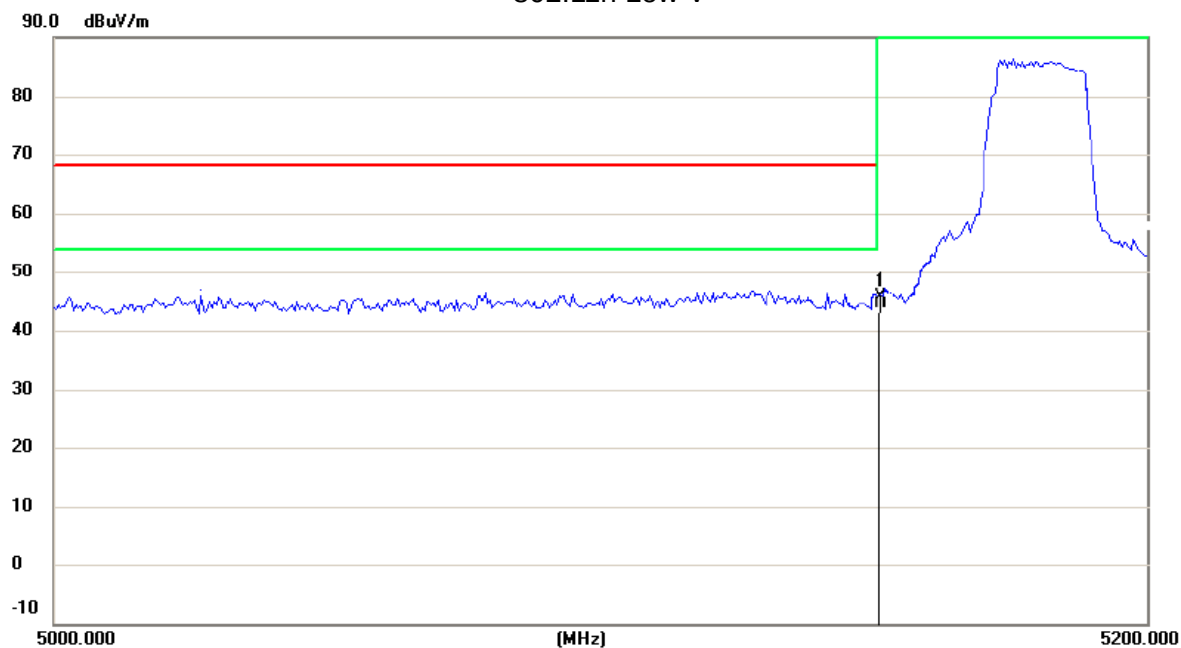
802.11a High V



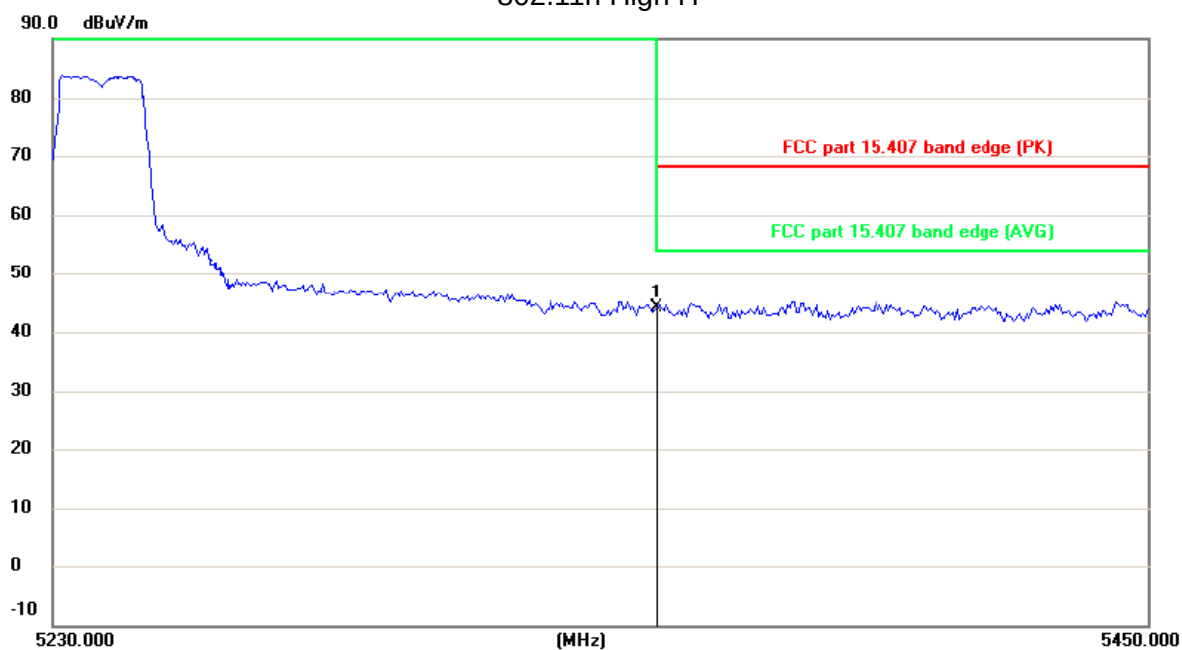
802.11n Low H



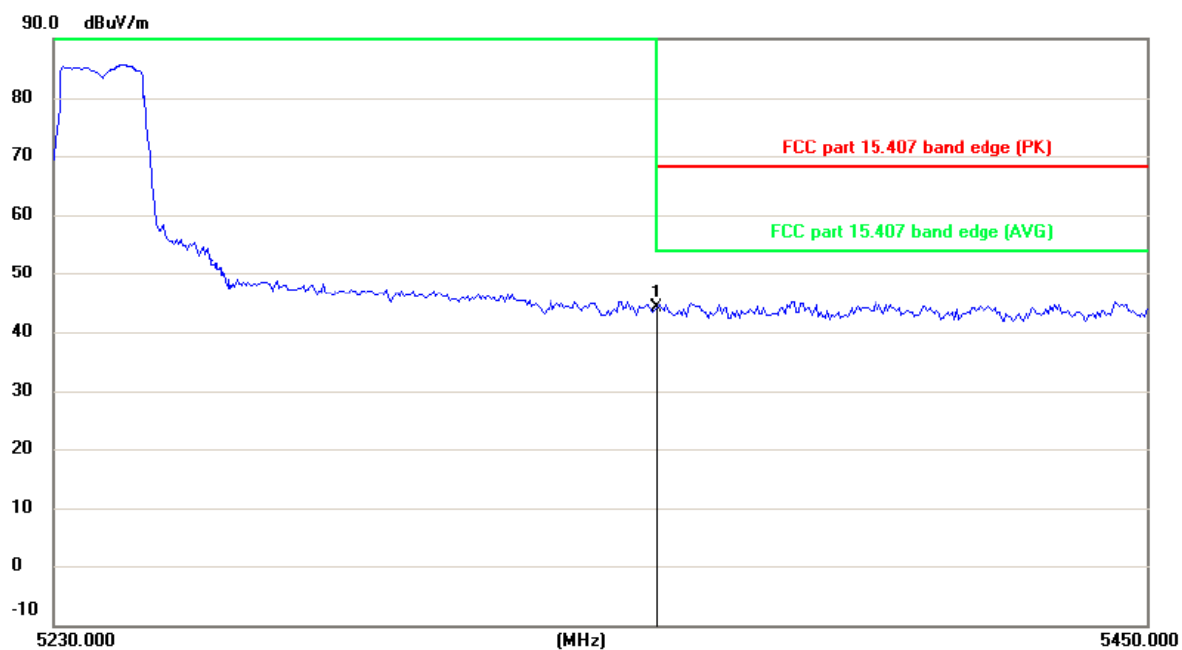
802.11n Low V



802.11n High H



802.11n High V



4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part 15 Subpart C(15.407)		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	17dBm(in any 1 megahertz)	5150-5250
Power Spectral Density	30dBm(in any 500KHz)	5725-5850

4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW $\geq 3 \times$ RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



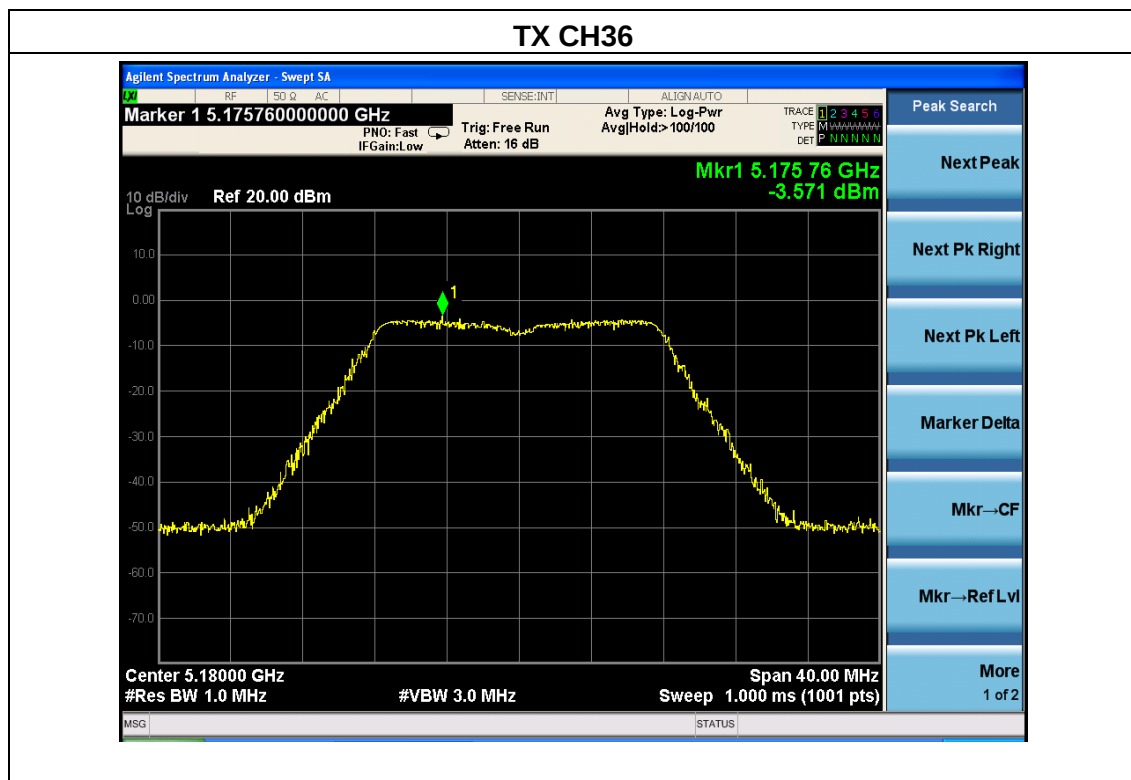
4.1.4 EUT OPERATION CONDITIONS

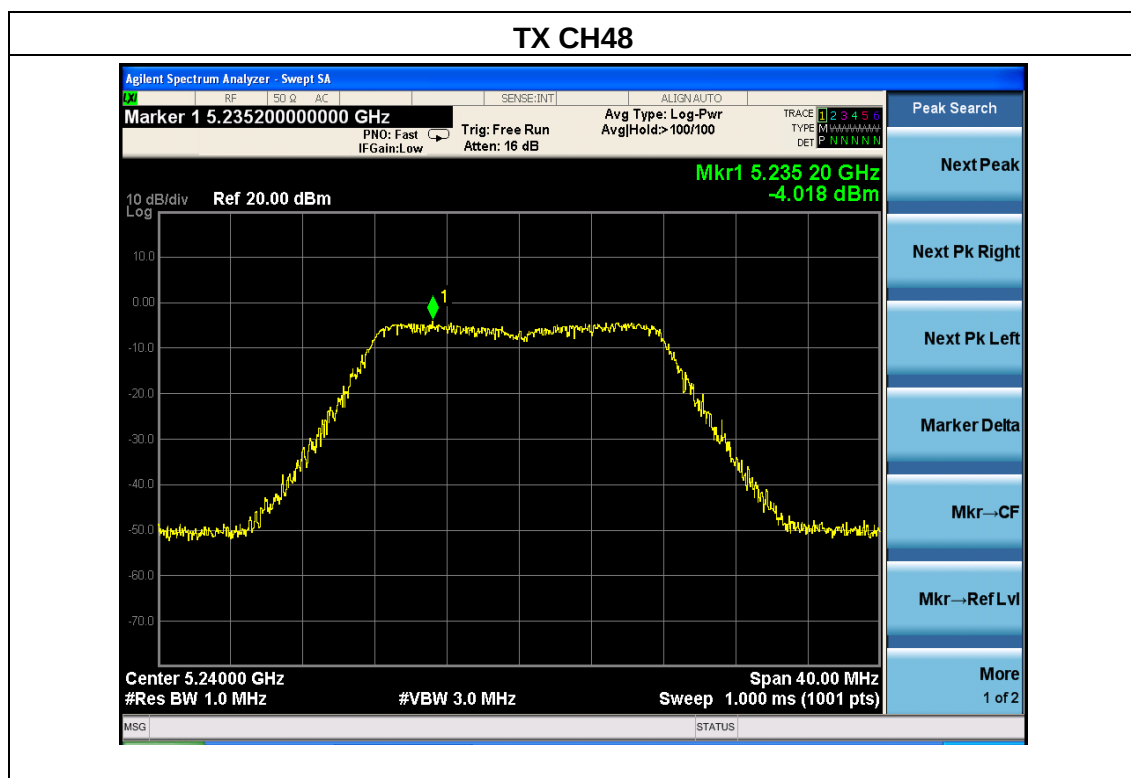
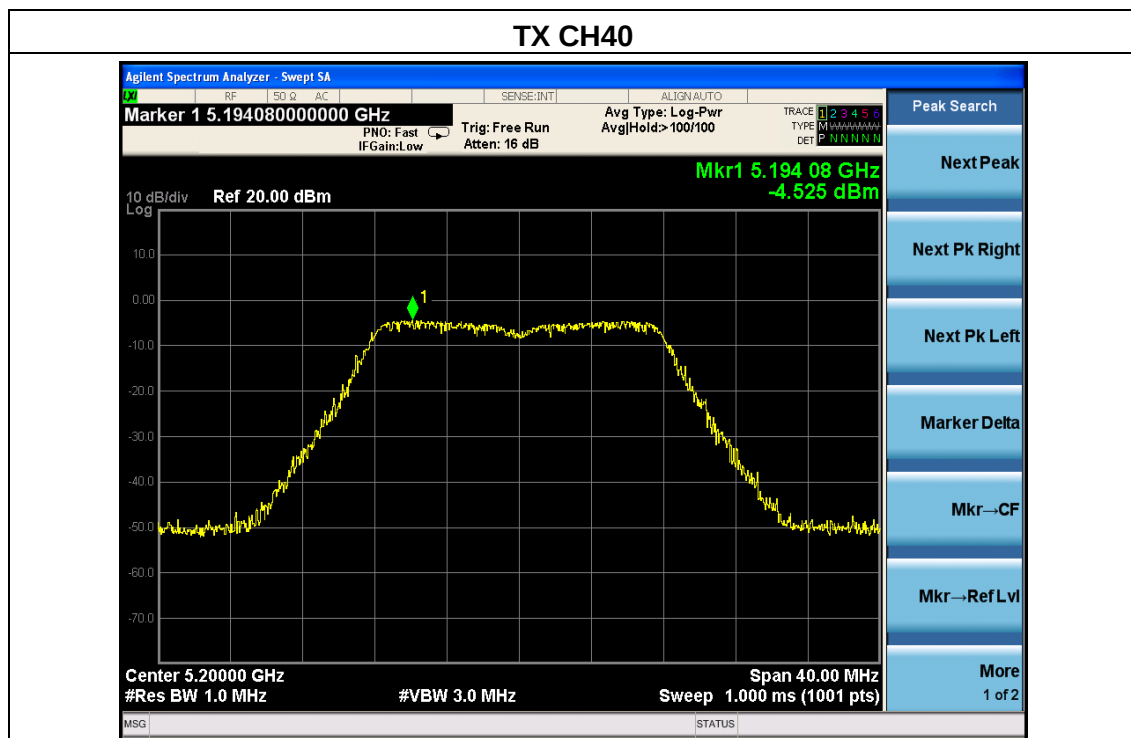
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX a Mode /CH36, CH40, CH48		

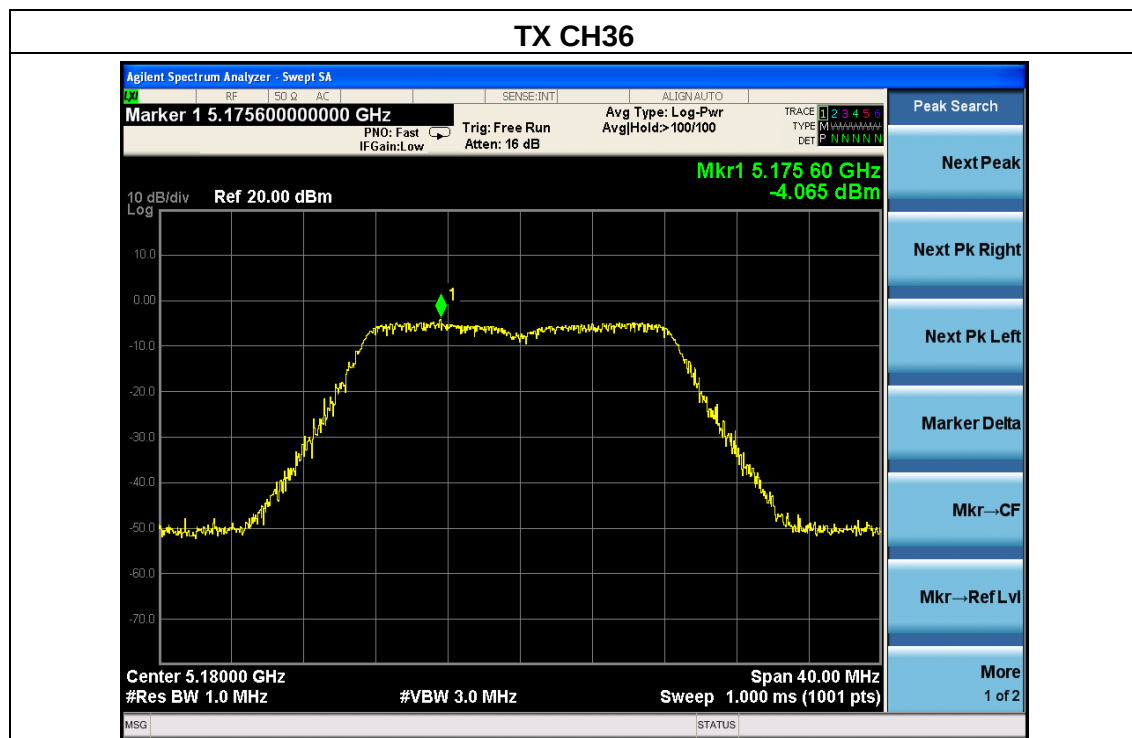
Frequency	Power Density (dBm)	Limit (dBm)	Result
5180 MHz	-3.571	17	PASS
5200 MHz	-4.525	17	PASS
5240 MHz	-4.018	17	PASS



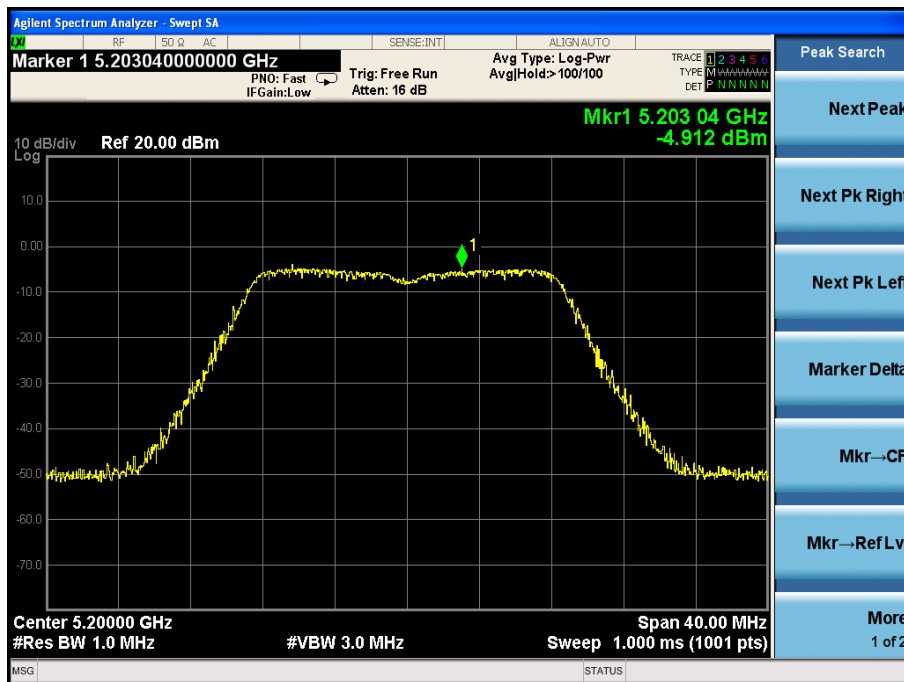


EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX n Mode /CH36, CH40, CH48		

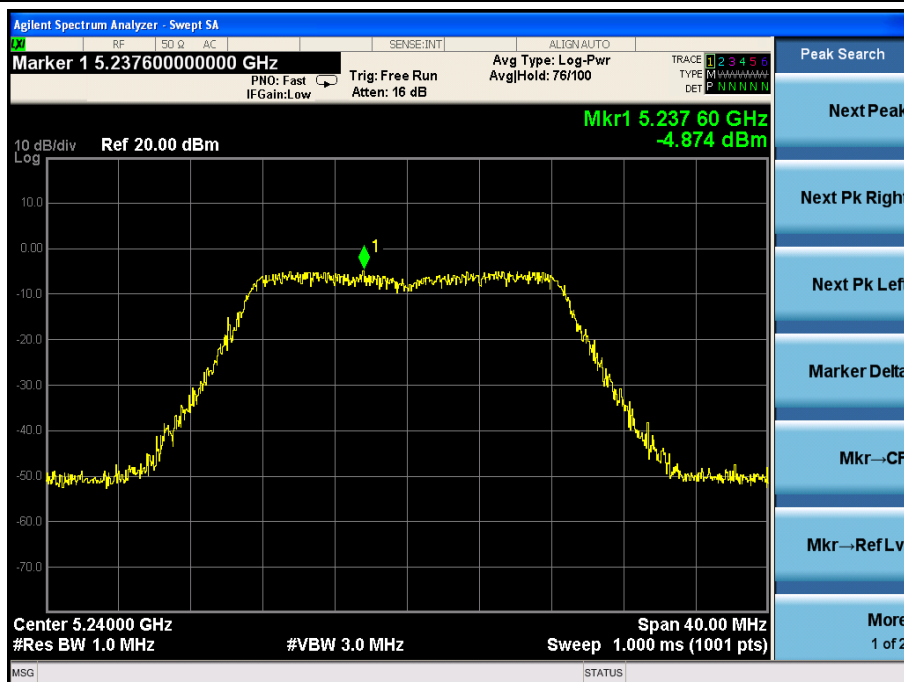
Frequency	Power Density (dBm)	Limit (dBm)	Result
5180 MHz	-4.065	17	PASS
5200 MHz	-4.912	17	PASS
5240 MHz	-4.874	17	PASS



TX CH40



TX CH48



5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier

5.1.1 TEST PROCEDURE

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



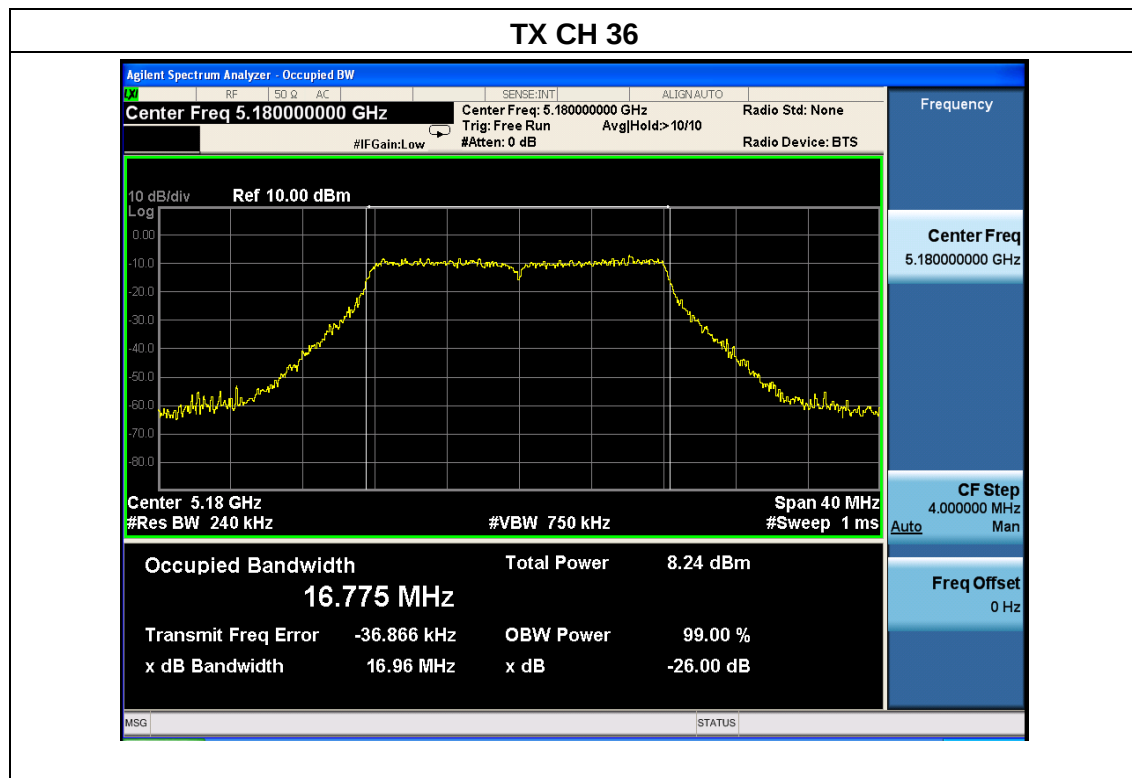
5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

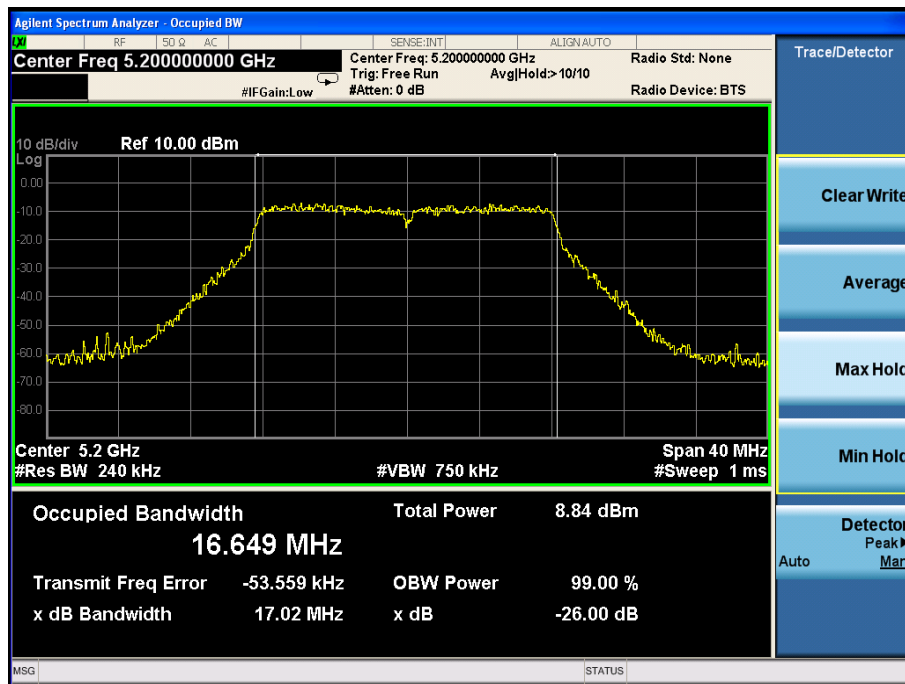
5.1.5 TEST RESULTS

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX a Mode /CH36, CH40, CH48		

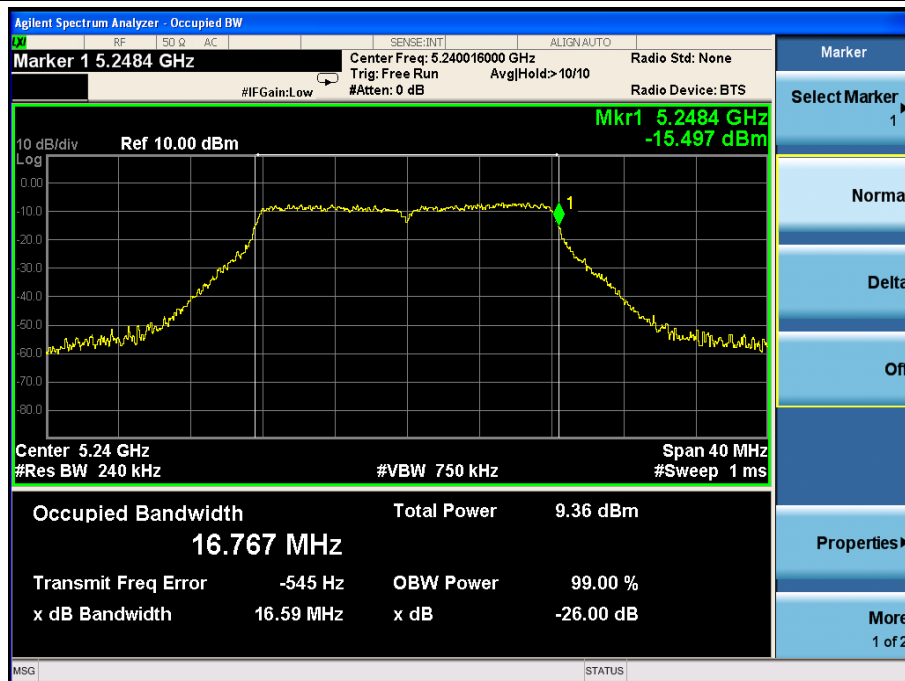
Channel	Frequency (MHz)	26dB bandwidth (MHz)	Limit (kHz)	Result
Low	5180	16.96	/	Pass
Middle	5200	17.02	/	Pass
High	5240	16.59	/	Pass



TX CH 40

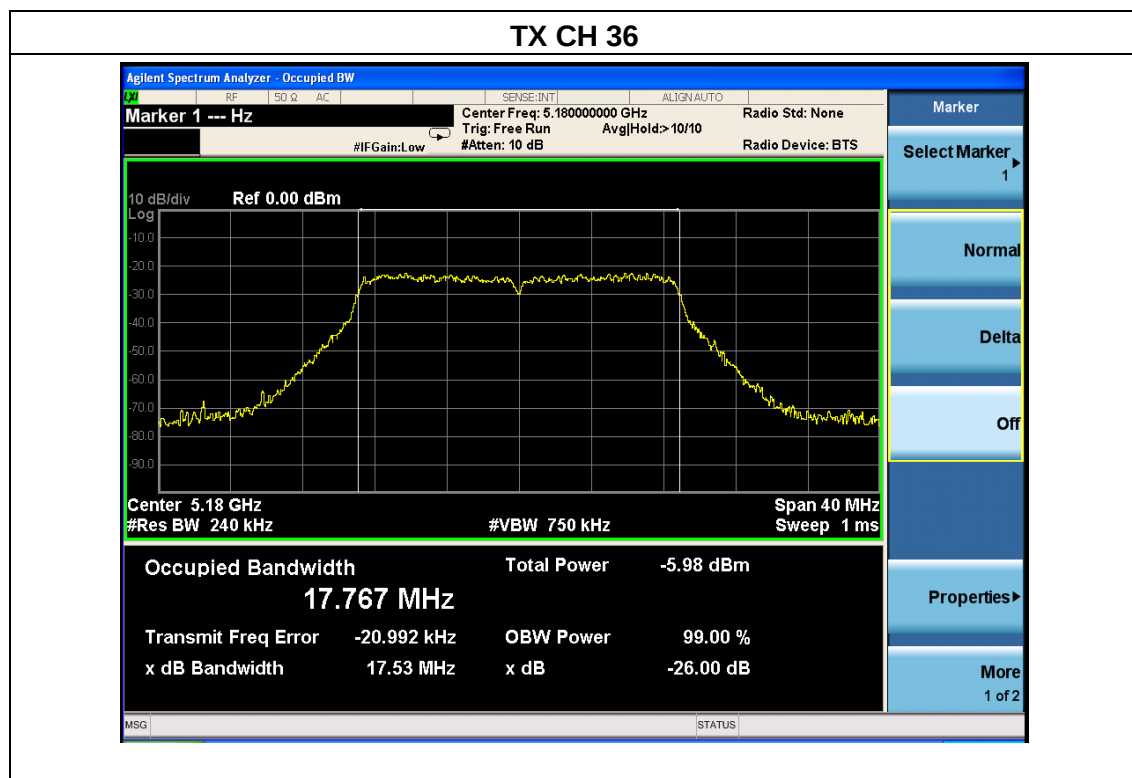


TX CH48

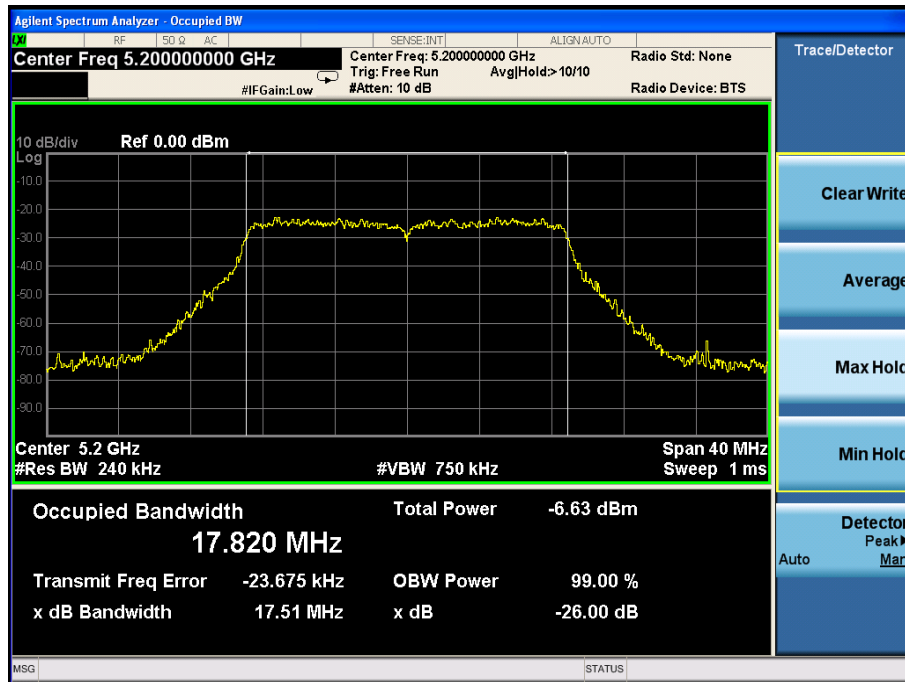


EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX n Mode /CH36, CH40, CH48		

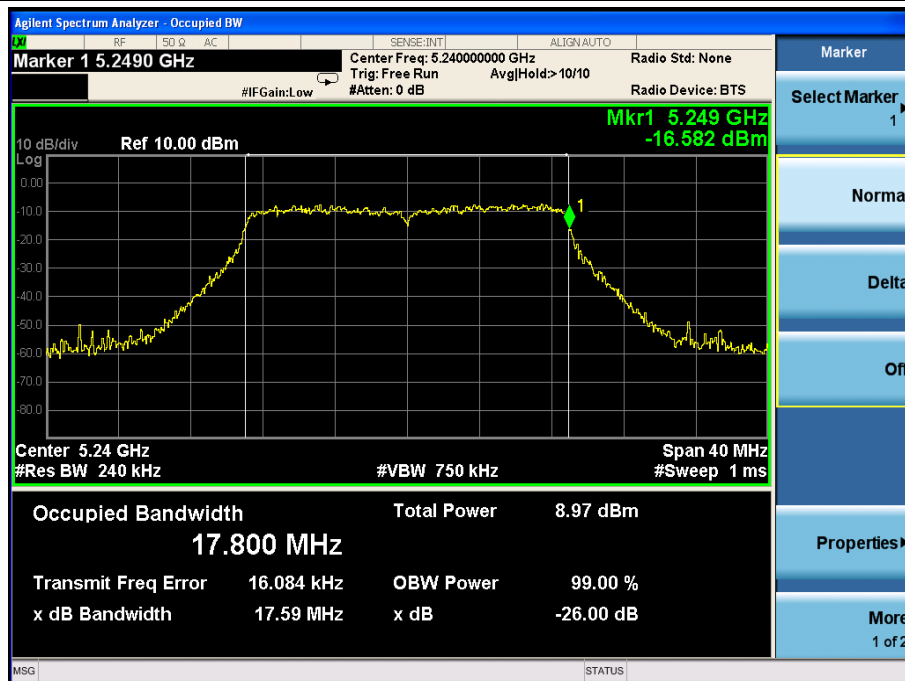
Channel	Frequency (MHz)	26dB bandwidth (MHz)	Limit (kHz)	Result
Low	5180	17.53	/	Pass
Middle	5200	17.51	/	Pass
High	5240	17.59	/	Pass



TX CH 40



TX CH48



6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX a Mode /CH36, CH40, CH48		

TX 802.11a Mode			
Test Channe	Frequency	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	dBm
CH36	5180	19.26	24
CH40	5200	19.18	24
CH48	5240	19.31	24
TX 802.11n Mode			
CH36	5180	18.76	24
CH40	5200	18.69	24
CH48	5240	18.68	24

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7. FREQUENCY STABILITY

7.1 APPLIED PROCEDURES / LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

7.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Spectrum Analyzer

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 TEST RESULTS

EUT :	Rugged Smartphone	Model Name :	DK66
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter

Mode	Voltage (V)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	4.2V	5179.974	26	5239.973	27
	3.8V	5179.974	26	5239.973	27
	3.2V	5179.974	26	5239.973	27

Mode	Temperature (°C)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	-30	5179.931	69	5239.944	56
	-20	5179.954	46	5239.955	45
	-10	5179.966	34	5239.956	44
	0	5179.957	43	5239.961	39
	10	5179.975	25	5239.967	33
	20	5179.975	25	5239.958	42
	30	5179.965	35	5239.977	23
	40	5179.973	27	5239.971	29
	50	5179.987	13	5239.977	23

8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

8.2 EUT ANTENNA

The EUT antenna is Integrated antenna,-0.76dbi). It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

END OF REPORT