

# FCC RADIO TEST REPORT FCC ID:2AFEV-SP5026I

**Product**: Smartphone

**Trade Name: WOO** 

Model Name: SP5026i

Serial Model: N/A

Report No.: NTEK-2015NT06152058F4

# **Prepared for**

WOO Global Markets, S.L.

Calle Amado Nervo 3, 28007 Madrid - Spain

# Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

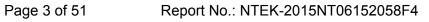
1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street
Bao'an District, Shenzhen P.R. China

Tel.: +86-0755-61156588 Fax.: +86-0755-61156599 Website:www.ntek.org.cn



# **TEST RESULT CERTIFICATION**

Applicant's name	WOO Global M	lark	ets, S.L.			
Address	Calle Amado N	erv	o 3, 28007 Madrid - Spain			
Manufacture's Na	ame Bluebank Com	mui	nication Technology Co.Ltd.			
Address	ddress No. 13-2, Jiang Ying Road, Nan An District, Chongqing, P.R. China					
Product descript	ion					
Product name	Smartphone	Smartphone				
Model and/or type reference	SP5026i					
Serial Model	N/A					
Standards	FCC Part15.24	7 0	1 Oct. 2014			
Test procedure	ANSI C63.10-2	013	3 and KDB 558074: June 5, 2014			
equipment under t		anc	ed by NTEK, and the test results show that the ce with the FCC requirements. And it is applicable only to			
document may be the document.	altered or revised by	-	in full, without the written approval of NTEK, this EK, personnel only, and shall be noted in the revision of			
Date of Test		l	2045 02 Ivl 2045			
	nance of tests 15					
			2015			
lest Result	Pas	SS				
	Testing Engineer	:	Denny Grany Denny Huang			
	Technical Manager	:	(Brown Lu)			
	Authorized Signatory	:	(Bill Yao)			





# **Table of Contents**

	Page
1 . SUMMARY OF TEST RESULTS	5
1.1 TEST FACILITY	6
1.2 MEASUREMENT UNCERTAINTY	6
2 . GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	9
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTER	D 10
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	11
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
3 . EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
3.1.2 TEST PROCEDURE 3.1.3 DEVIATION FROM TEST STANDARD	14 14
3.1.4 TEST SETUP	14
3.1.5 EUT OPERATING CONDITIONS	14
3.1.6 TEST RESULTS	15
3.2 RADIATED EMISSION MEASUREMENT	19
3.2.1 RADIATED EMISSION LIMITS	19
3.2.2 TEST PROCEDURE 3.2.3 DEVIATION FROM TEST STANDARD	20 20
3.2.4 TEST SETUP	20 21
3.2.5 EUT OPERATING CONDITIONS	22
3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)	23
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)	24
3.2.8 TEST RESULTS (ABOVE 1000 MHZ)	26
4 . POWER SPECTRAL DENSITY TEST	27
4.1 APPLIED PROCEDURES / LIMIT	27
4.1.1 TEST PROCEDURE 4.1.2 DEVIATION FROM STANDARD	27 27
4.1.3 TEST SETUP	27
4.1.4 EUT OPERATION CONDITIONS	27
4.1.5 TEST RESULTS	28
5 . BANDWIDTH TEST	34
5.1 APPLIED PROCEDURES / LIMIT	34
5.1.1 TEST PROCEDURE	34



# **Table of Contents**

	Page
TEST SETUP	34
5.1.2 EUT OPERATION CONDITIONS 5.1.3 TEST RESULTS	34 35
6 . PEAK OUTPUT POWER TEST	41
6.1 APPLIED PROCEDURES / LIMIT	41
6.1.1 TEST PROCEDURE	41
6.1.2 DEVIATION FROM STANDARD	41
6.1.3 TEST SETUP	41
6.1.4 EUT OPERATION CONDITIONS	41
6.1.5 TEST RESULTS	42
7 . 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE	43
7.1 DEVIATION FROM STANDARD	43
7.2 TEST SETUP	43
7.3 EUT OPERATION CONDITIONS	43
7.4 TEST RESULTS	44
8 . ANTENNA REQUIREMENT	49
8.1 STANDARD REQUIREMENT	49
8.2 EUT ANTENNA	49
9 . EUT TEST PHOTO APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	50



# 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		
15.247 (a)(2)	6dB Bandwidth	PASS		
15.247 (b)	Peak Output Power	PASS		
15.247 (c)	Radiated Spurious Emission	PASS		
15.247 (d)	Power Spectral Density	PASS		
15.205	Band Edge Emission	PASS		
15.203	Antenna Requirement	PASS		

Page 5 of 51

## NOTE:

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



## 1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

#### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $\mathbf{y} \pm \mathbf{U}$ , where expended uncertainty  $\mathbf{U}$  is based on a standard uncertainty multiplied by a coverage factor of  $\mathbf{k=2}$ , providing a level of confidence of approximately 95 %  $^{\circ}$ 

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%



# 2. GENERAL INFORMATION

# 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smartphone			
Trade Name	WOO			
Model Name	SP5026i			
Serial Model	N/A			
Model Difference	N/A			
Product Description	Operation Frequency: Modulation Type:  Bit Rate of Transmitter  Number Of Channel Antenna Designation: Antenna Gain (dBi)	802.11b/g/n(20MHz): 2412~2462MHz  IEEE 802.11b : DSSS (CCK, QPSK, DBPSK) IEEE 802.11g/n (HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20MHz):150/144.44/130/117/ 115.56/104/86.67/78/52/6.5Mbps 802.11b/g/n20MHz:11CH Please see Note 3.		
Channel List	Please refer to the No	ote 2.		
Ratings	DC 3.7V			
Adapter		le: WTA0501000USA1 ut: 100-240V~, 50/60Hz, 0.3A out: 5.0V, 1000mA		
Battery	DC 3.7V,2000mAh			
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.

Page 8 of 51

2.

	Channel List for 802.11b/g/n(20 MHz)						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	80	2447	11	2462
03	2422	06	2437	09	2452		

3.

## Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
Α	N/A	N/A	FPCB Antenna	N/A	1.0	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	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	Link Mode

Page 9 of 51

	For Conducted Emission
Final Test Mode	Description
Mode 4	Link Mode

For Radiated Emission			
Final Test Mode	Description		
Mode 1	802.11b CH1/ CH6/ CH11		
Mode 2	802.11g CH1/ CH6/ CH11		
Mode 3	802.11n20 CH1/ CH6/ CH11		
Mode 4	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
- (3) EUT configured to transmit continuously:

Operated Mode for Worst Duty Cycle			
Test Signal Duty Cycle (x)	Average correction factor (dB)		
100% - IEEE 802.11b	0		
100% - IEEE 802.11g	0		
100% - IEEE 802.11n (HT20)	0		



# 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test

E-1 EUT



# 2.4 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	Smartphone	WOO	SP5026i	N/A	EUT
E-2	Adapter	N/A	WTA0501000USA1	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2m	

#### 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 <code>"Length\_"</code> column.



# 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Spectrum Analyzer	Agilent	E4407B	MY4510804 0	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2015.06.07	2016.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 6	2015.06.07	2016.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2015.06.07	2016.06.06	1 year
6	Horn Antenna	EM	EM-AH-101 80	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2015.06.08	2016.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619. 05	2014.07.06	2015.07.05	1 year
12	Test Cable	N/A	R-01	N/A	2014.07.06	2015.07.05	1 year
13	Test Cable	N/A	R-02	N/A	2014.07.06	2015.07.05	1 year

Conduction Test equipment

Item	Kind of	Manufactu	Type No.	Serial No.	Last	Calibrated	Calibratio
	Equipment	rer			calibration	until	n period
1	Test Receiver	R&S	ESCI	101160	2015.06.06	2016.06.05	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 7	2015.06.07	2016.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2015.06.07	2016.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2015.06.08	2016.06.07	1 year
7	Test Cable	N/A	C01	N/A	2015.06.08	2016.06.07	1 year
8	Test Cable	N/A	C02	N/A	2015.06.08	2016.06.07	1 year
9	Test Cable	N/A	C03	N/A	2015.06.08	2016.06.07	1 year

1	Attenuation	MCE	24-10-34	BN9258	2015.06.08	2016.06.07	1 year
---	-------------	-----	----------	--------	------------	------------	--------



# 3. EMC EMISSION TEST

## 3.1 CONDUCTED EMISSION MEASUREMENT

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

	Class A (dBuV)		Class B	Standard	
FREQUENCY (MHz)	Quasi-peak	Average	Quasi-peak	Average	Stariuaru
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

- a. 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.
- b. 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.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. 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

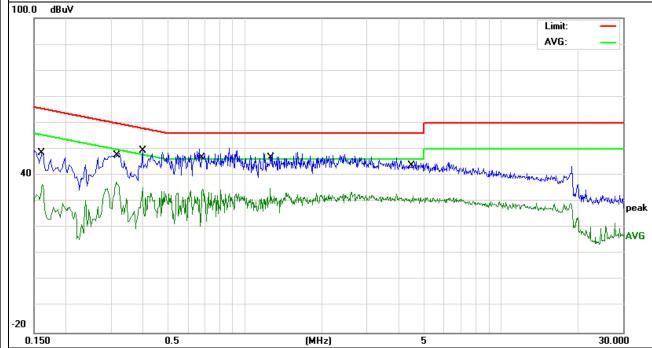
EUT:	Smartphone	Model Name. :	SP5026i
Temperature :	<b>26</b> ℃	Relative Humidity:	56%
Pressure:	1010hPa	Phase :	L
TASI VOIIANA .	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 4

Page 15 of 51

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remark
0.1620	39.08	9.62	48.70	65.36	-16.66	QP
0.1620	26.79	9.62	36.41	55.36	-18.95	AVG
0.3140	37.62	9.69	47.31	59.86	-12.55	QP
0.3140	27.81	9.69	37.50	49.86	-12.36	AVG
0.3980	40.18	9.37	49.55	57.89	-8.34	QP
0.3980	26.01	9.37	35.38	47.89	-12.51	AVG
0.6860	39.27	9.78	49.05	56.00	-6.95	QP
0.6860	25.08	9.78	34.86	46.00	-11.14	AVG
1.2579	38.74	9.71	48.45	56.00	-7.55	QP
1.2579	25.23	9.71	34.94	46.00	-11.06	AVG
4.5458	34.45	9.70	44.15	56.00	-11.85	QP
4.5458	22.36	9.70	32.06	46.00	-13.94	AVG

# Remark:

- All readings are Quasi-Peak and Average values.
   Factor = Insertion Loss + Cable Loss.



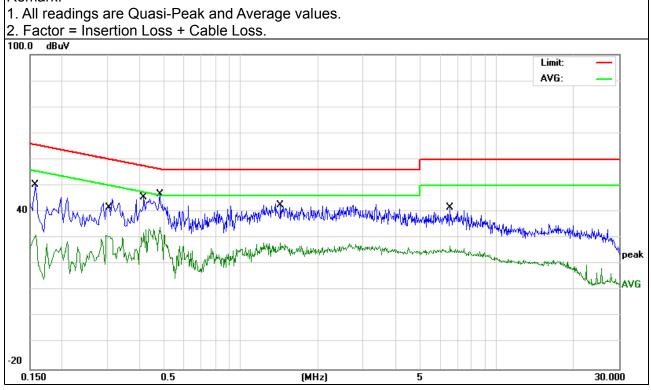


EUT:	Smartphone	Model Name. :	SP5026i
Temperature :	26 ℃	Relative Humidity:	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter	Test Mode:	Mode 4

Page 16 of 51

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remark
0.1580	40.69	9.62	50.31	65.56	-15.25	QP
0.1580	21.50	9.62	31.12	55.56	-24.44	AVG
0.3002	31.81	9.75	41.56	60.23	-18.67	QP
0.3002	21.30	9.75	31.05	50.23	-19.18	AVG
0.4179	35.97	9.43	45.40	57.49	-12.09	QP
0.4179	22.59	9.43	32.02	47.49	-15.47	AVG
0.4819	34.70	9.70	44.40	56.31	-11.91	QP
0.4819	24.39	9.70	34.09	46.31	-12.22	AVG
1.4259	32.73	9.70	42.43	56.00	-13.57	QP
1.4259	18.46	9.70	28.16	46.00	-17.84	AVG
6.5858	31.87	9.70	41.57	60.00	-18.43	QP
6.5858	17.29	9.70	26.99	50.00	-23.01	AVG

# Remark:





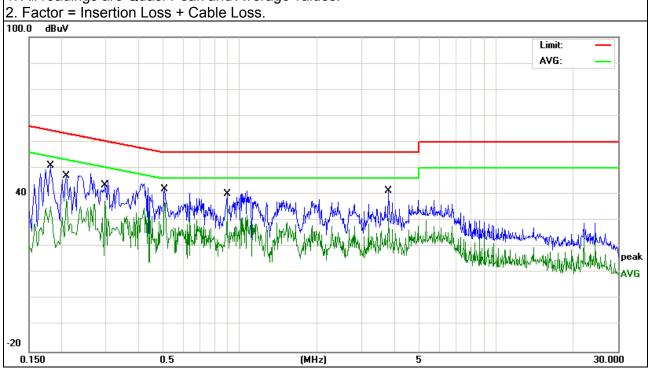
=K	Page 17 of 51

EUT:	Smartphone	Model Name. :	SP5026i
Temperature :	<b>26</b> ℃	Relative Humidity:	56%
Pressure:	1010hPa	Phase :	L
riesi vollane .	DC 5V form Adapter AC 240V/60Hz	Test Mode:	Mode 4

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	
0.1819	41.29	9.61	50.90	64.39	-13.49	QP
0.1819	25.80	9.61	35.41	54.39	-18.98	AVG
0.2099	37.59	9.61	47.20	63.21	-16.01	QP
0.2099	28.34	9.61	37.95	53.21	-15.26	AVG
0.2977	33.69	9.74	43.43	60.30	-16.87	QP
0.2977	27.69	9.74	37.43	50.30	-12.87	AVG
0.5100	30.47	9.77	40.24	56.00	-15.76	QP
0.5100	27.09	9.77	36.86	46.00	-9.14	AVG
0.8940	30.50	9.75	40.25	56.00	-15.75	QP
0.8940	25.42	9.75	35.17	46.00	-10.83	AVG
3.8180	31.68	9.70	41.38	56.00	-14.62	QP
3.8180	21.22	9.70	30.92	46.00	-15.08	AVG

## Remark:

- 1. All readings are Quasi-Peak and Average values.



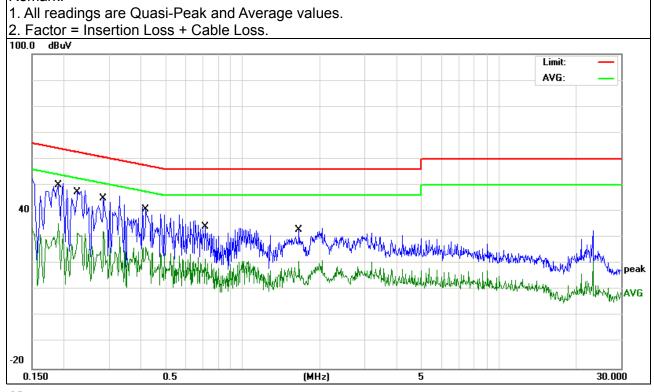


EUT:	Smartphone	Model Name. :	SP5026i
Temperature :	<b>26</b> ℃	Relative Humidity:	56%
Pressure :	1010hPa	Phase :	N
Test vollage .	DC 5V form Adapter AC 240V/60Hz	Test Mode:	Mode 4

Page 18 of 51

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	
0.1901	39.93	9.61	49.54	64.03	-14.49	QP
0.1901	25.61	9.61	35.22	54.03	-18.81	AVG
0.2260	37.62	9.64	47.26	62.59	-15.33	QP
0.2260	22.03	9.64	31.67	52.59	-20.92	AVG
0.2857	35.32	9.72	45.04	60.65	-15.61	QP
0.2857	22.77	9.72	32.49	50.65	-18.16	AVG
0.4178	32.07	9.43	41.50	57.49	-15.99	QP
0.4178	17.01	9.43	26.44	47.49	-21.05	AVG
0.7137	24.46	9.78	34.24	56.00	-21.76	QP
0.7137	11.96	9.78	21.74	46.00	-24.26	AVG
1.6537	23.26	9.67	32.93	56.00	-23.07	QP
1.6537	11.34	9.67	21.01	46.00	-24.99	AVG

#### Remark:



 $Note: {\it pre-test all of charging mode, this mode is worst case, only provide the worst case } \ \ {\it in report.}$ 



#### 3.2 RADIATED EMISSION MEASUREMENT

## 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	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	dBuV/m@at 3M	
FREQUENCT (WITZ)	PEAK	AVERAGE
Above 1000	74	54

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

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

- a. 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.
- b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; 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.
- d. 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.
- 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 EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report(Z orientation).

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
	Peak	1 MHz	1 MHz
Above 1000	Average	1 MHz	10 Hz

#### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation



# 3.2.4 TEST SETUP

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

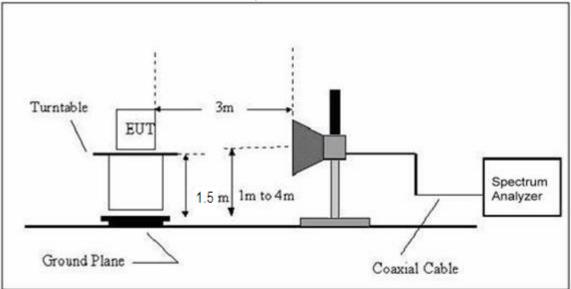


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz









## 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:	Smartphone	Model Name. :	SP5026i
Temperature:	20 ℃	Relative Humidtity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V
Test Mode:	TX	Polarization :	

Report No.: NTEK-2015NT06152058F4

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
				N/A
		1		N/A

## 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 (specific distance/test distance)(dB);

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



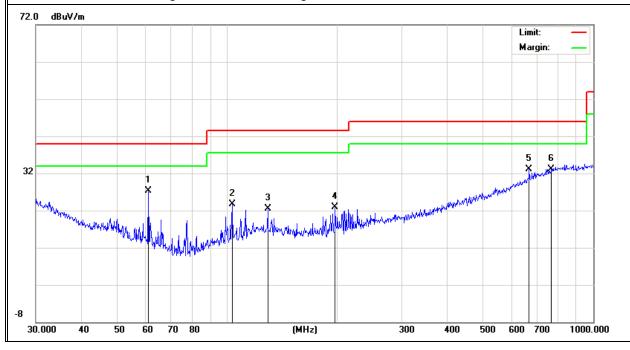
# 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT:	Smartphone	Model Name :	SP5026i
Temperature :	<b>20</b> ℃	Relative Humidity:	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX		

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	remark
V	60.9176	19.66	7.63	27.29	40.00	-12.71	QP
V	103.0798	14.34	9.28	23.62	43.50	-19.88	QP
V	129.0146	10.55	11.91	22.46	43.50	-21.04	QP
V	197.1999	12.21	10.75	22.96	43.50	-20.54	QP
V	668.1422	9.17	23.91	33.08	46.00	-12.92	QP
V	768.7481	6.54	26.59	33.13	46.00	-12.87	QP

# Remark:

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

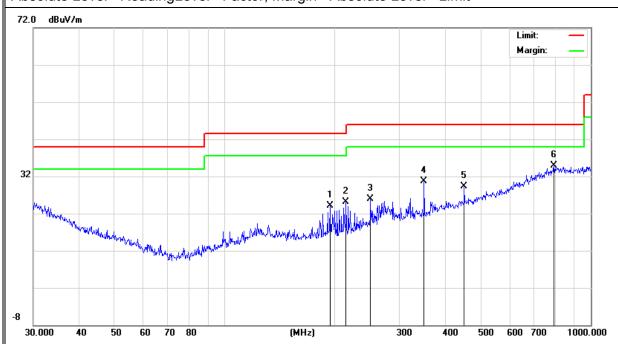




Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	rterriarit
Н	193.7726	13.43	10.74	24.17	43.50	-19.33	QP
Н	214.5141	13.25	11.76	25.01	43.50	-18.49	QP
Н	250.3009	12.35	13.59	25.94	46.00	-20.06	QP
Н	350.4768	14.44	16.26	30.70	46.00	-15.30	QP
Н	451.1349	9.91	19.33	29.24	46.00	-16.76	QP
Н	793.3958	7.76	27.24	35.00	46.00	-11.00	QP

## Remark:

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





# 3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT:	Smartphone	Model Name :	SP5026i
Temperature :	<b>20</b> ℃	Relative Humidity:	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX		

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре
		Low Cha	nnel (241	2 MHz)-Abov	e 1G		
Vertical	4824.133	52.02	10.44	62.46	74.00	-11.54	Pk
Vertical	4824.133	33.58	10.44	44.02	54.00	-9.98	Av
Vertical	7236.206	45.23	12.39	57.62	74.00	-16.38	Pk
Vertical	7236.206	29.51	12.39	41.90	54.00	-12.10	Av
Horizontal	4824.148	53.77	10.44	64.21	74.00	-9.79	Pk
Horizontal	4824.148	32.49	10.44	42.93	54.00	-11.07	Av
Horizontal	7236.311	45.93	12.39	58.32	74.00	-15.68	Pk
Horizontal	7236.311	31.07	12.39	43.46	54.00	-10.54	Av
		Mid Char	nnel (2437	7 MHz)-Above	e 1G		
Vertical	4874.326	51.43	10.40	61.83	74.00	-12.17	Pk
Vertical	4874.326	32.35	10.40	42.75	54.00	-11.25	Av
Vertical	7311.142	45.09	12.75	57.84	74.00	-16.16	Pk
Vertical	7311.142	28.08	12.75	40.83	54.00	-13.17	Av
Horizontal	4874.096	52.2	10.40	62.60	74.00	-11.40	Pk
Horizontal	4874.096	33.43	10.40	43.83	54.00	-10.17	Av
Horizontal	7311.263	48.31	12.75	61.06	74.00	-12.94	Pk
Horizontal	7311.263	29	12.75	41.75	54.00	-12.25	Av
		High Cha	nnel (246	2 MHz)- Abov	e 1G		
Vertical	4924.326	51.37	10.39	61.76	74.00	-12.24	Pk
Vertical	4924.326	33	10.39	43.39	54.00	-10.61	Av
Vertical	7386.247	44.77	12.68	57.45	74.00	-16.55	Pk
Vertical	7386.247	28.41	12.68	41.09	54.00	-12.91	Av
Horizontal	4924.089	51.4	10.39	61.79	74.00	-12.21	Pk
Horizontal	4924.089	33.5	10.39	43.89	54.00	-10.11	Av
Horizontal	7386.147	47.79	12.68	60.47	74.00	-13.53	Pk
Horizontal	7386.147	29.09	12.68	41.77	54.00	-12.23	Av

Note:"802.11b" mode is the worst mode.



#### 4. POWER SPECTRAL DENSITY TEST

#### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS		

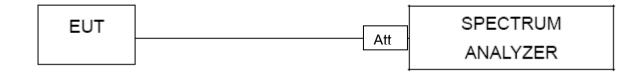
#### 4.1.1 TEST PROCEDURE

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS channel bandwidth.
- 3. 3 kHz ≤Set the RBW≤100 kHz.
- 4. Set the VBW  $\geq$  3 x 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 within the RBW.
- 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.

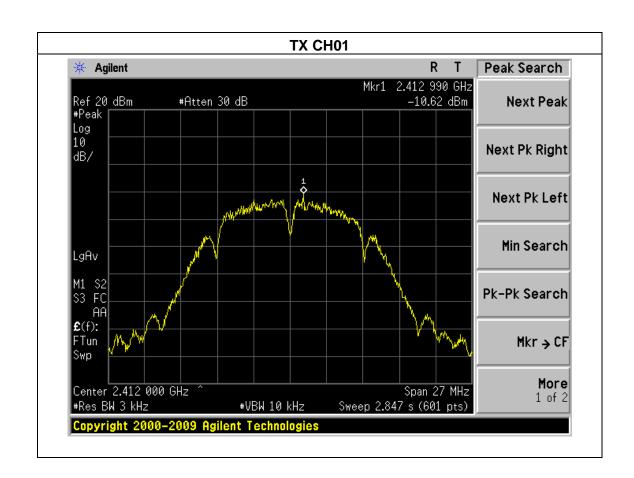


## 4.1.5 TEST RESULTS

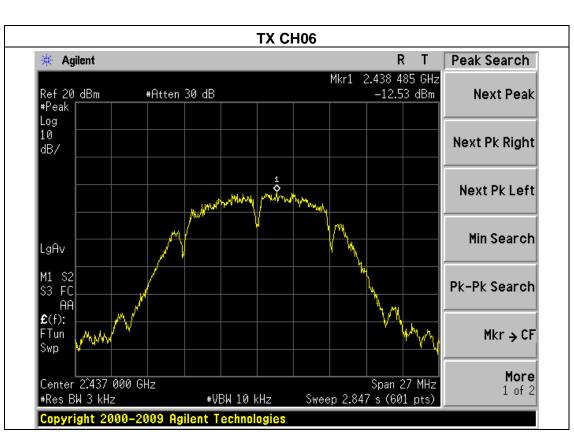
EUT:	Smartphone	Model Name :	SP5026i	
Temperature :	<b>25</b> ℃	Relative Humidity:	56%	
Pressure:	1015 hPa	Test Voltage :	DC 3.7V	
Test Mode :	TX b Mode /CH01, CH06, CH11			

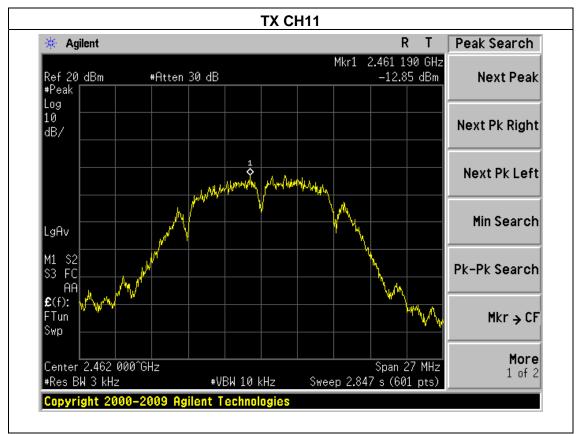
Page 28 of 51

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-10.62	8	PASS
2437 MHz	-12.53	8	PASS
2462 MHz	-12.85	8	PASS







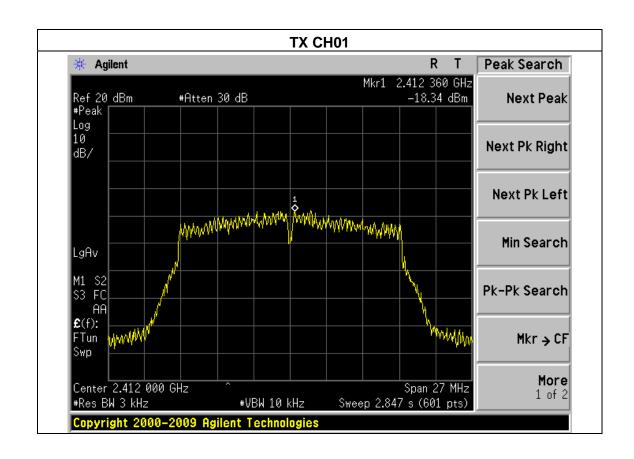




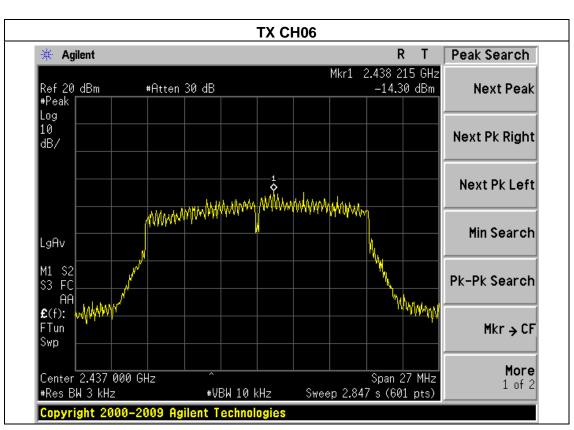
		_	_
EUT:	Smartphone	Model Name :	SP5026i
Temperature :	25 ℃	Relative Humidity:	56%
Pressure:	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX g Mode /CH01, CH06, CH11		

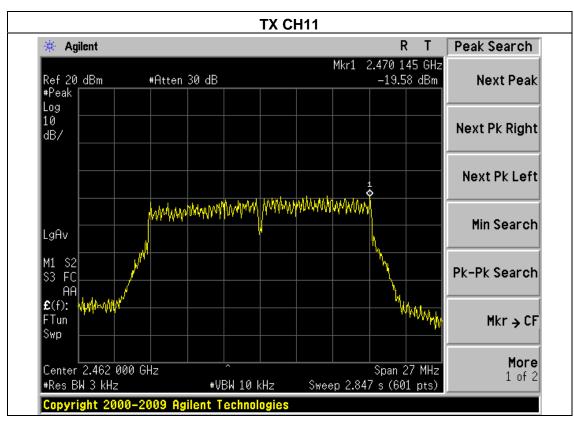
Page 30 of 51

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-18.34	8	PASS
2437 MHz	-14.30	8	PASS
2462 MHz	-19.58	8	PASS







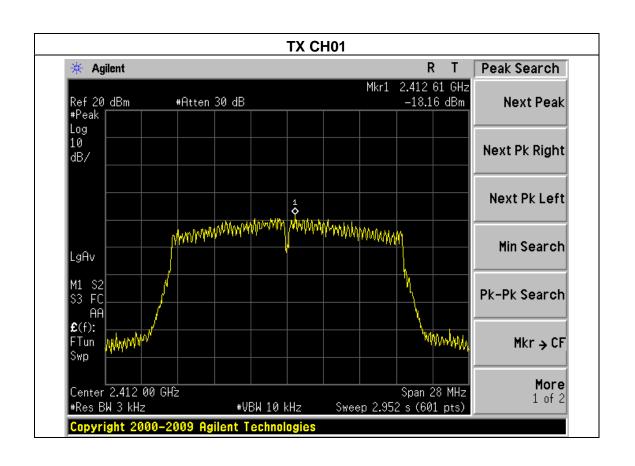




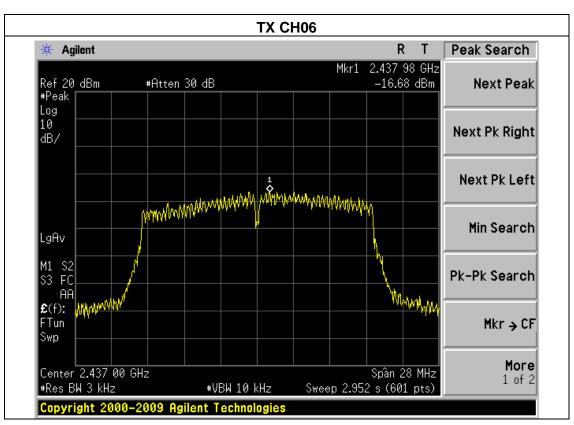
-			
EUT:	Smartphone	Model Name :	SP5026i
Temperature :	<b>25</b> ℃	Relative Humidity:	56%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX n Mode (20MHz)/CH01, CH06, CH11		

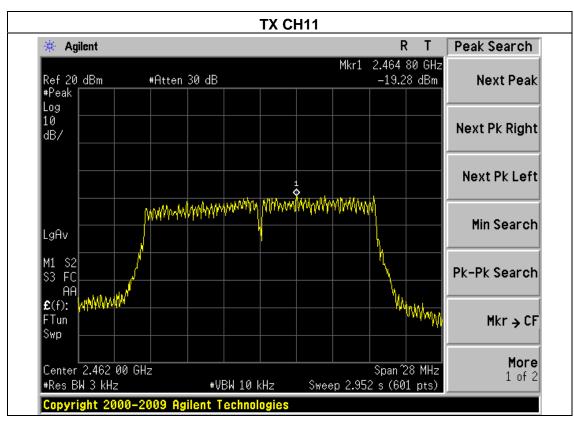
Page 32 of 51

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-18.16	8	PASS
2437 MHz	-16.68	8	PASS
2462 MHz	-19.28	8	PASS











#### **5. BANDWIDTH TEST**

#### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS		

#### **5.1.1 TEST PROCEDURE**

- 1. Set RBW = 100 kHz.
- 2. Set the video bandwidth (VBW)  $\geq$  3 x 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.

#### **TEST SETUP**



### **5.1.2 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.

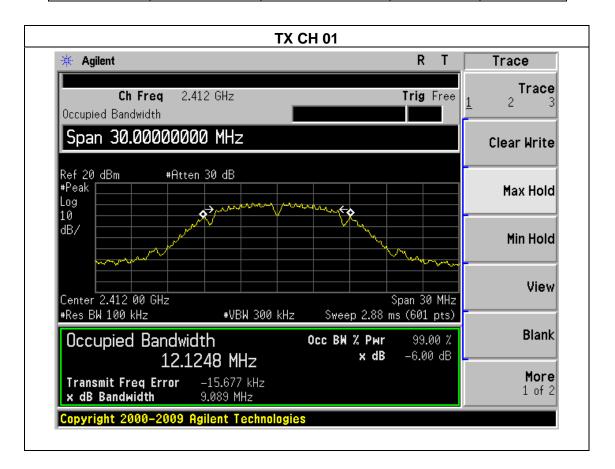


#### **5.1.3 TEST RESULTS**

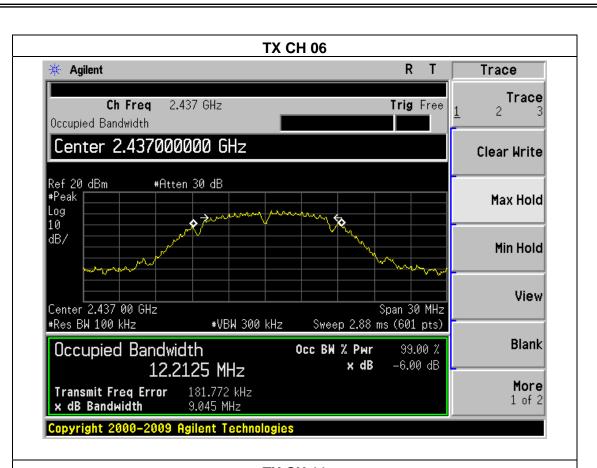
EUT:	Smartphone	Model Name :	SP5026i	
Temperature :	25 ℃	Relative Humidity:	56%	
Pressure:	1012 hPa	Test Voltage :	DC 3.7V	
Test Mode :	TX b Mode /CH01, CH06, CH11			

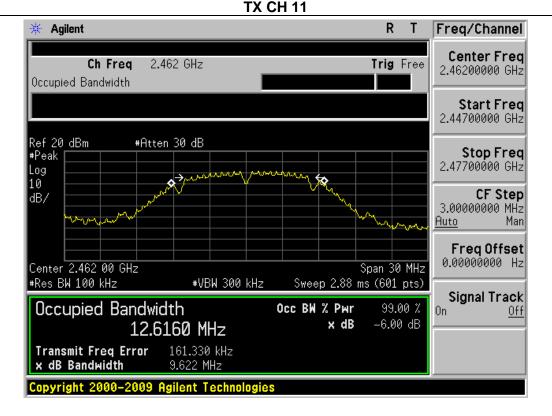
Page 35 of 51

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	9.089	500	Pass
Middle	2437	9.045	500	Pass
High	2462	9.622	500	Pass







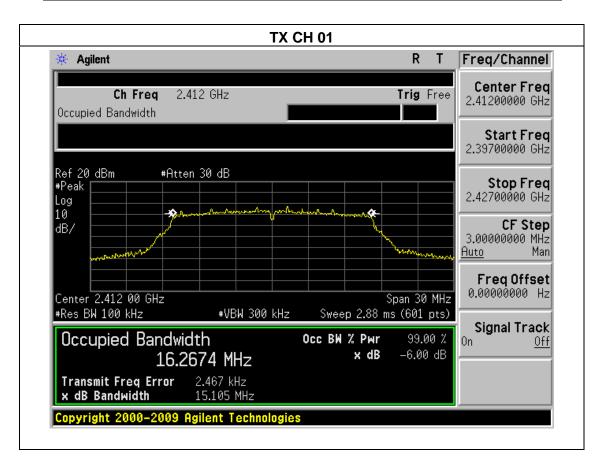




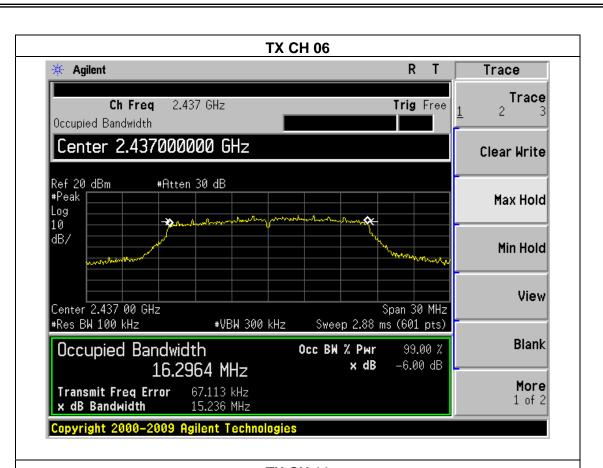
EUT:	Smartphone	Model Name :	SP5026i
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX g Mode /CH01, CH06, CH1	1	

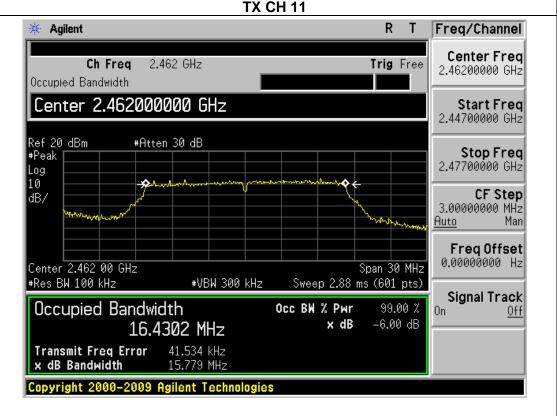
Page 37 of 51

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.105	500	Pass
Middle	2437	15.236	500	Pass
High	2462	15.779	500	Pass







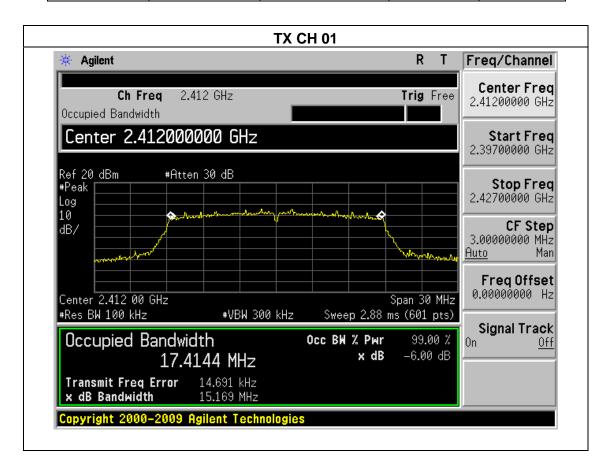


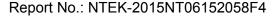


		_	
EUT:	Smartphone	Model Name :	SP5026i
Temperature :	<b>25</b> ℃	Relative Humidity:	56%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX n Mode(20M) /CH01, CH06	6, CH11	

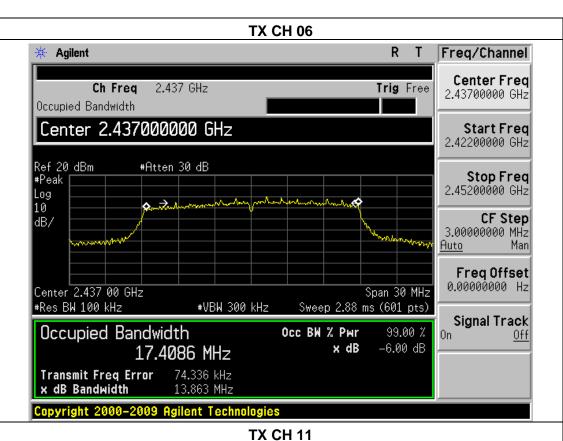
Page 39 of 51

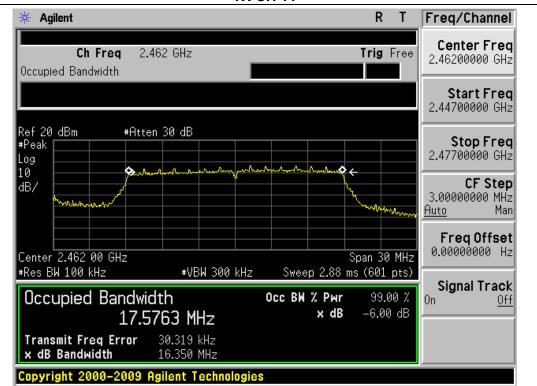
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.169	500	Pass
Middle	2437	13.863	500	Pass
High	2462	16.350	500	Pass













# **6. PEAK OUTPUT POWER TEST**

# **6.1 APPLIED PROCEDURES / LIMIT**

FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS	

#### **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:	Smartphone	Model Name :	SP5026i
Temperature :	<b>25</b> ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX b/g/n(20M) Mode		

	TX 802.11b Mode						
Test Channe	Frequency	Maximum Peak Conducted Output Power (PK)	Maximum Peak Conducted Output Power (AV)	LIMIT			
	(MHz)	(dBm)	(dBm)	dBm			
CH01	2412	14.27	8.92	30			
CH06	2437	14.29	9.12	30			
CH11	2462	14.37	9.01	30			
		TX 802.11	g Mode				
CH01	2412	12.99	8.51	30			
CH06	2437	12.08	8.67	30			
CH11	2462	12.05	8.34	30			
	TX 802.11n(20) Mode						
CH01	2412	12.29	8.63	30			
CH06	2437	12.28	8.36	30			
CH11	2462	12.34	8.27	30			



# 7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

#### **TEST PROCEDURE**

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

#### 7.1 DEVIATION FROM STANDARD

No deviation.

#### 7.2 TEST SETUP



#### 7.3 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.



# 7.4 TEST RESULTS

EUT:	Smartphone	Model Name :	SP5026i
Temperature :	<b>25</b> ℃	Relative Humidity:	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V

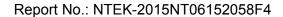
Frequency Band MHz	Delta Peak to band emission (dBc)	>Limit (dBc)	Result				
	802.11b mode						
2400	2400 63.00		Pass				
2483.5	60.89	20	Pass				
	802.11g mod	е					
2400	42.21	20	Pass				
2483.5	2483.5 53.68		Pass				
	802.11n-HT20 mode						
2400	2400 42.22		Pass				
2483.5	51.65		Pass				



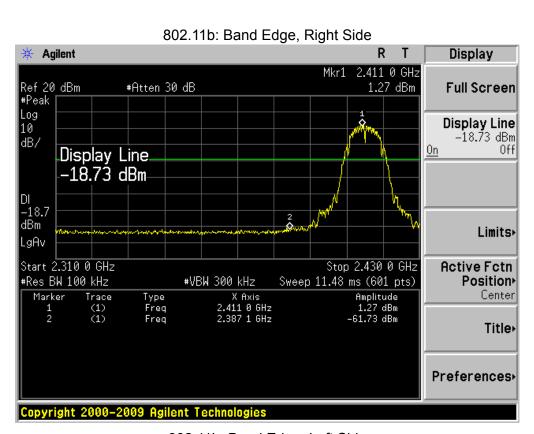
# Radiated band edge:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Commont	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment	
	802.11b							
2390	59.32	-13.06	46.26	74	-27.74	peak	Vertical	
2390	58.73	-13.06	45.67	74	-28.33	peak	Horizontal	
2483.5	59.92	-12.78	47.14	74	-26.86	peak	Vertical	
2483.5	59.94	-12.78	47.16	74	-26.84	peak	Horizontal	
	802.11g							
2390	58.58	-13.06	45.52	74	-28.48	peak	Vertical	
2390	57.81	-13.06	44.75	74	-29.25	peak	Horizontal	
2483.5	59.32	-12.78	46.54	74	-27.46	peak	Vertical	
2483.5	59.69	-12.78	46.91	74	-27.09	peak	Horizontal	
			802.11n (20)					
2390	61.51	-13.06	48.45	74	-25.55	peak	Vertical	
2390	61.29	-13.06	48.23	74	-25.77	peak	Horizontal	
2483.5	61.43	-12.78	48.65	74	-25.35	peak	Vertical	
2483.5	61.57	-12.78	48.79	74	-25.21	peak	Horizontal	

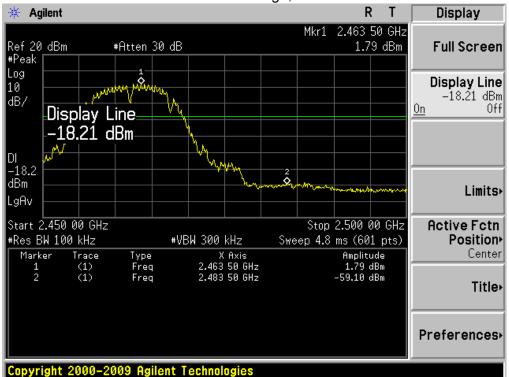
Note: Test method to see chapter 3.2 . When PK value is lower than the Average value limit, average not record.



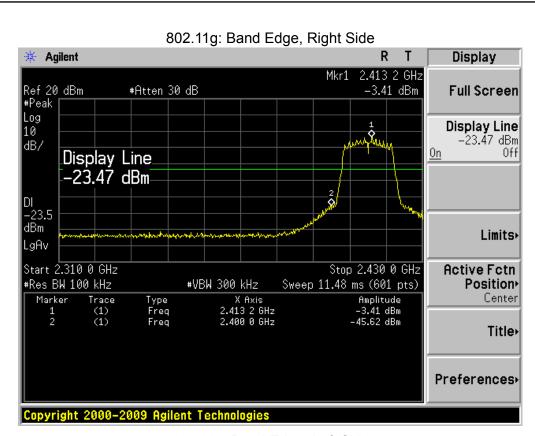








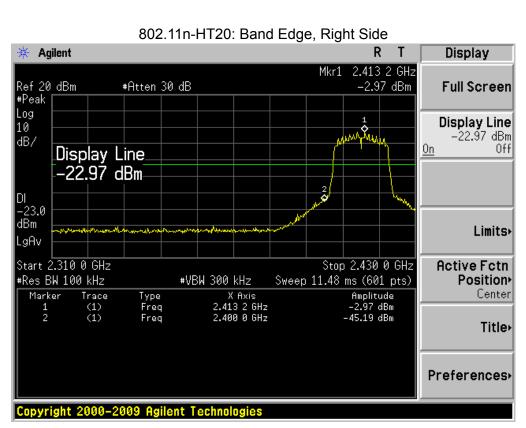












802.11n-HT20: Band Edge, Left Side





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.

Report No.: NTEK-2015NT06152058F4

# **8.2 EUT ANTENNA**

The EUT antenna is	permanent atta	ched antenna.	It comply wi	ith the standa	ard requirement
--------------------	----------------	---------------	--------------	----------------	-----------------



# 9. EUT TEST PHOTO



