

SIMULTANEOUSLY TRANSMISSION AND CO-LOCATION TEST REPORT

For

Smart POS

FCC MODEL NUMBER: D60

FCC ID: 2AGQ6-D60

REPORT NUMBER: 4790950508-1-RF-10

ISSUE DATE: November 27, 2023

Prepared for

**Dspread Technology(Beijing) Inc
Rm.407, B12C, #10(Universal Business Park), Jiuxianqiao Road, Chaoyang
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Prepared by

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V0	November 27, 2023	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Dspread Technology(Beijing) Inc
Address: Rm.407, B12C, #10(Universal Business Park), Jiuxianqiao Road,
Chaoyang District, Beijing, 100015, China

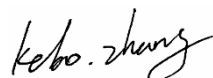
Manufacturer Information

Company Name: Dspread Technology(Beijing) Inc
Address: Rm.407, B12C, #10(Universal Business Park), Jiuxianqiao Road,
Chaoyang District, Beijing, 100015, China

EUT Information

EUT Name: Smart POS
Model: D60
Sample Received Date: August 2, 2023
Sample Status: Normal
Sample ID: 6327587
Date of Tested: November 27, 2023

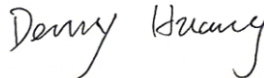
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, CFR 47 FCC Part 2, Part 22 H, Part 24 E, Part 27, Part 90S.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p>ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046.</p> <p>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B, the VCCI registration No. is C-20012 and T-20011</p>
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OFS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

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

Test Item	Uncertainty
Radiated Emission (Included Fundamental Emission) (1 GHz to 40 GHz)	5.78 dB (1 GHz-18 GHz)
	5.23dB (18 GHz-26 GHz)
	5.64 dB (26 GHz-40 GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Smart POS
FCC&ISED Model	D60

5.2. THE TEST CASE CONFIGURATIONS

Simultaneously Transmission Conditions:

Co-Location Conditions:

Condition	Technology			Support (YES/NO)
1	GSM	BT/BLE	NFC	YES
2	GSM	WLAN (2.4G)	NFC	YES
3	GSM	WLAN (5G)	NFC	YES
4	WCDMA	BT/BLE	NFC	YES
5	WCDMA	WLAN (2.4G)	NFC	YES
6	WCDMA	WLAN (5G)	NFC	YES
7	LTE	BT/BLE	NFC	YES
8	LTE	WLAN (2.4G)	NFC	YES
9	LTE	WLAN (5G)	NFC	YES
10	BT/BLE	WLAN (2.4G)	/	NO
11	BT/BLE	WLAN (5G)	/	NO
12	WLAN (2.4G)	WLAN (5G)	/	NO
13	GSM	WCDMA	/	NO
14	LTE	WCDMA	/	NO
15	GSM	LTE	/	NO

Note: All the Conditions have been tested, only the worst data for Condition 8 was recorded in the report.

For the detailed test description, please refer to the below report number:

Technology	Report Number
BLE	4790950508-1-RF-1
BT	4790950508-1-RF-2
WLAN (2.4G)	4790950508-1-RF-3
WLAN (5G)	4790950508-1-RF-4
NFC	4790950508-1-RF-5
GSM	4790950508-1-RF-6
WCDMA	4790950508-1-RF-7
LTE	4790950508-1-RF-8

6. MEASURING INSTRUMENT AND SOFTWARE USED

Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Oct.12, 2023	Oct.11, 2024
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Aug.02, 2021	Aug.01, 2024
Preamplifier	HP	8447D	2944A09099	Oct.12, 2023	Oct.11, 2024
EMI Measurement Receiver	R&S	ESR26	101377	Oct.12, 2023	Oct.11, 2024
Horn Antenna	TDK	HRN-0118	130940	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Oct.12, 2023	Oct.11, 2024
Horn Antenna	Schwarzbeck	BBHA9170	697	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-2	TRS-307-00003	Oct.12, 2023	Oct.11, 2024
Preamplifier	TDK	PA-02-3	TRS-308-00002	Oct.12, 2023	Oct.11, 2024
Loop antenna	Schwarzbeck	1519B	00008	Dec.14, 2021	Dec.13, 2024
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Oct.12, 2023	Oct.11, 2024
High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Oct.12, 2023	Oct.11, 2024
Highpass Filter	Wainwright	WHKX10-5850-6500-1800-40SS	4	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	4	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV20-5120-5150-5350-5380-60SS	2	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV20-5440-5470-5725-5755-60SS	1	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCD5-1879-1879.85-	1	Oct.12, 2023	Oct.11, 2024

		1880.15-1881-40SS			
Notch Filter	Wainwright	WHJ10-882-980-7000-40SS	1	Oct.12, 2023	Oct.11, 2024
Highpass Filter	Xingbo	XBLBQ-GTA68	211115-2-1	Oct.12, 2023	Oct.11, 2024
Notch Filter (5905-6445 MHz)	Xingbo	XBLBQ-DZA175	210922-2-1	Oct.12, 2023	Oct.11, 2024
Notch Filter (6425-6525 MHz)	Xingbo	XBLBQ-DZA176	210922-2-2	Oct.12, 2023	Oct.11, 2024
Notch Filter (6825-7125 MHz)	Xingbo	XBLBQ-DZA177	210922-2-3	Oct.12, 2023	Oct.11, 2024
Notch Filter (6525-6875 MHz)	Xingbo	XBLBQ-DZA178	210922-2-4	Oct.12, 2023	Oct.11, 2024
Software					
Description			Manufacturer	Name	Version
Test Software for Radiated Emissions			Farad	EZ-EMC	Ver. UL-3A1

7. RADIATED TEST RESULTS

LIMITS

Refer to CFR 47 FCC §15.205, §15.209 and §15.407 (b).

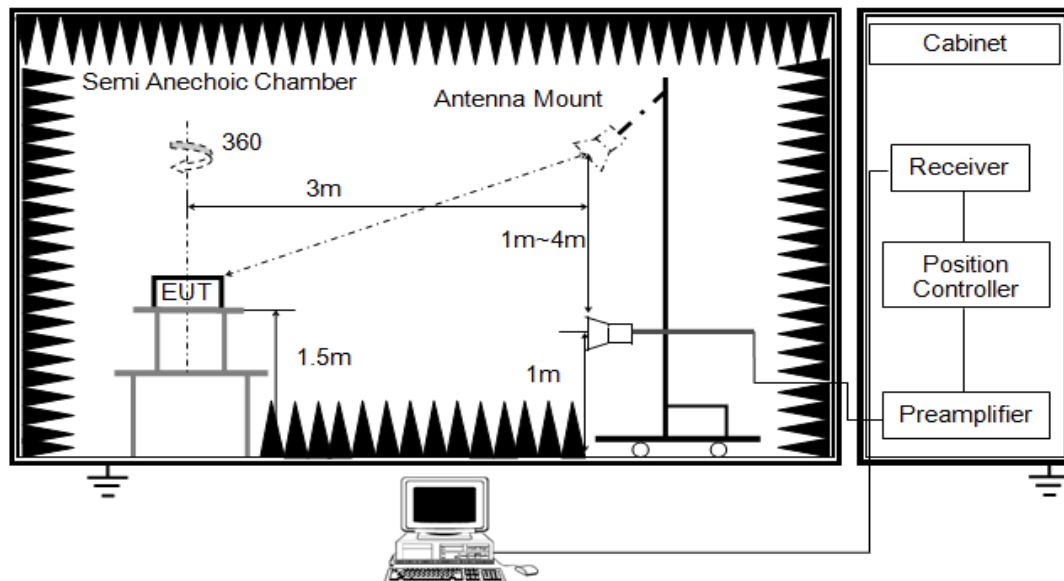
Refer to ISSED RSS-GEN Clause 8.9, Clause 8.10 and ISSED RSS-247 6.2.

Emissions radiated outside of the specified frequency bands above 30MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

Limits of unwanted/undesirable emission out of the restricted bands refer to CFR 47 FCC §15.407 (b) and ISSED RSS-247 6.2.

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1GHz)		
Frequency Range (MHz)	EIRP Limit	Field Strength Limit (dBuV/m) at 3 m
5150~5250 MHz	PK: -27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz		
5470~5725 MHz		
5725~5850 MHz	PK: -27 (dBm/MHz) *1 PK: 10 (dBm/MHz) *2 PK: 15.6 (dBm/MHz) *3 PK: 27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK: 105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK: 122.2 (dBμV/m) *4
Note: *1 beyond 75 MHz or more above of the band edge. *2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. *3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. *4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.		

Above 1GHz

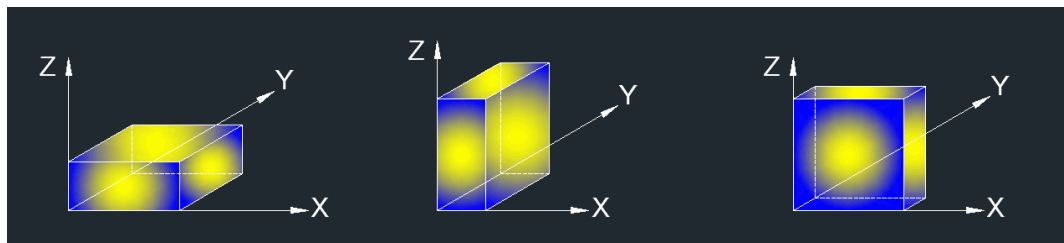


The setting of the spectrum analyser

RBW	1MHz
VBW	PEAK: 3MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 11.11 and 11.12.
2. The testing follows the guidelines in KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.G.3 ~ II.G.6.
2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements.

X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

TEST ENVIRONMENT

Temperature	25.4°C	Relative Humidity	55%
Atmosphere Pressure	101kPa	Test Voltage	DC 7.2 V

RESULTS

Note: For spurious emissions below 1 GHz and above 18 GHz, pre-scan had done for all conditions, the test results are almost the same as other no-co-location modes and no worse emission was found during tested, so do not show in this report except for condition 8.

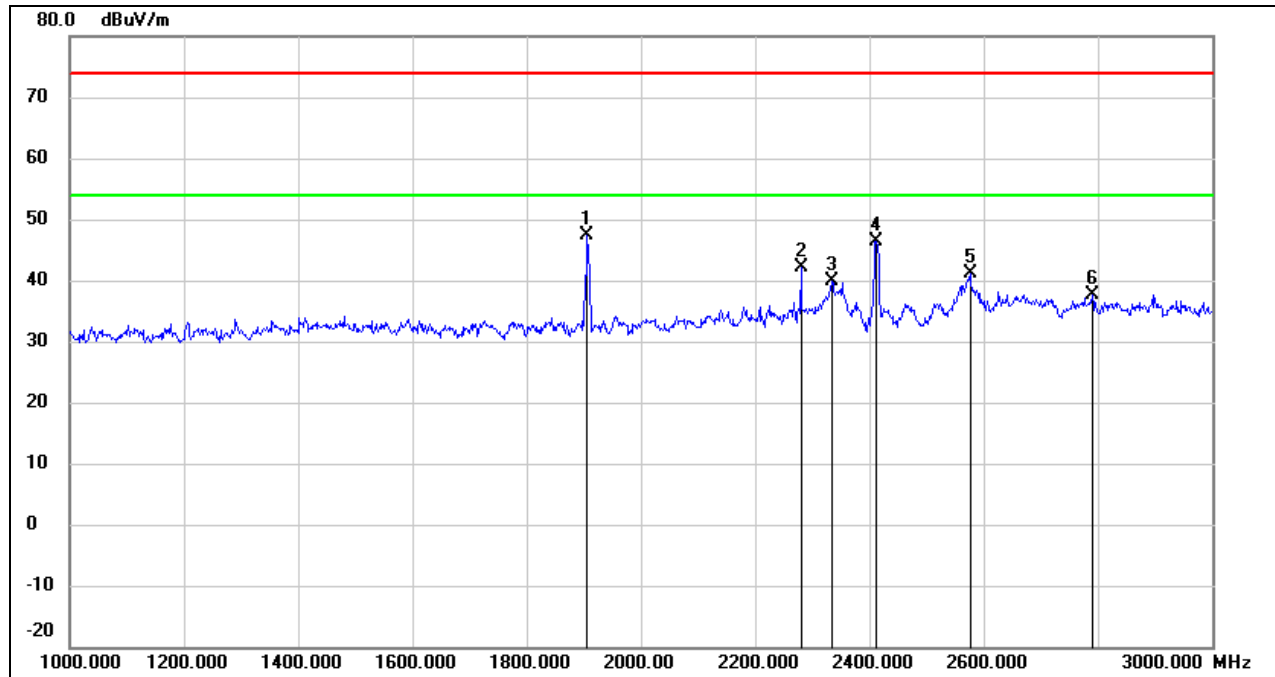
7.1. WORST-CASE TEST RESULTS

7.1.1. CONDITION 8

802.11b MODE LOW CHANNEL & LTE MODE QPSK-20 MHz HIGH CHANNEL & NFC

SPURIOUS EMISSIONS (WORST-CASE CONFIGURATION, HORIZONTAL)

1-3 GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1904.000	58.76	-11.38	47.38	/	/	fundamental
2	2280.000	51.71	-9.61	42.10	74.00	-31.90	peak
3	2334.000	49.34	-9.35	39.99	74.00	-34.01	peak
4	2412.000	55.33	-8.94	46.39	/	/	fundamental
5	2576.000	49.33	-8.26	41.07	74.00	-32.93	peak
6	2790.000	45.28	-7.62	37.66	74.00	-36.34	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

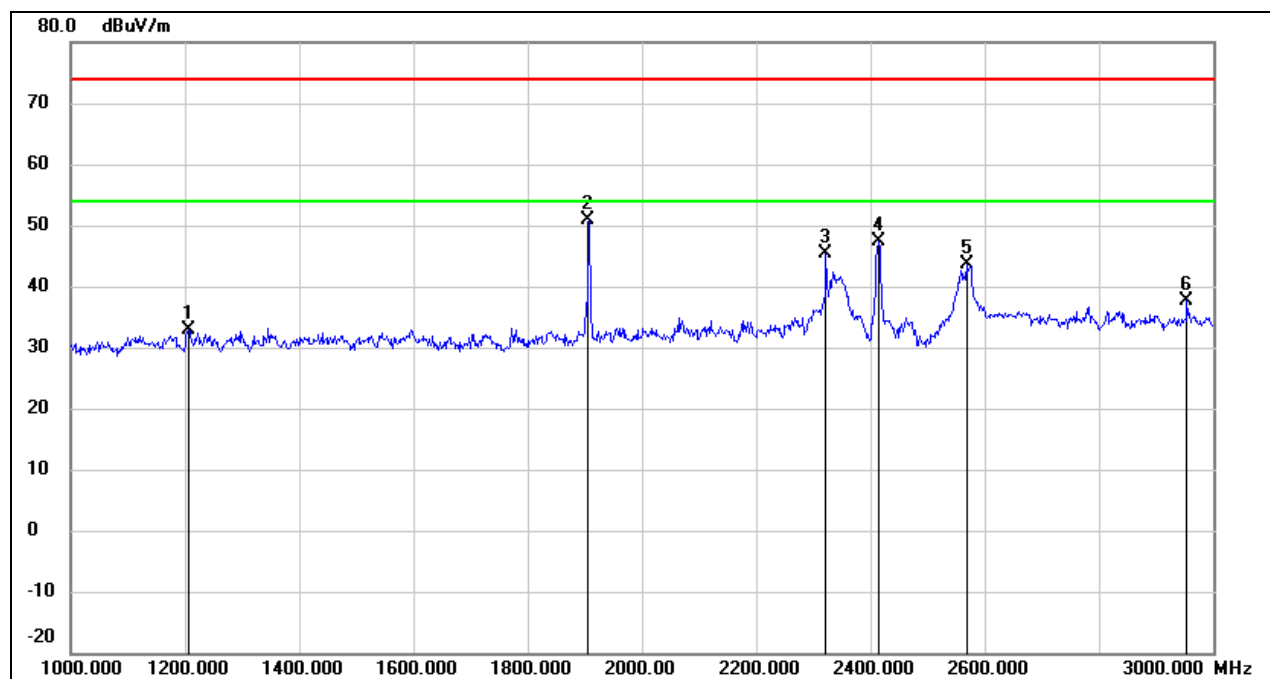
3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

SPURIOUS EMISSIONS (WORST-CASE CONFIGURATION, VERTICAL)

1-3 GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1206.000	46.86	-14.07	32.79	74.00	-41.21	peak
2	1904.000	62.15	-11.38	50.77	/	/	fundamental
3	2322.000	54.76	-9.40	45.36	74.00	-28.64	peak
4	2412.000	56.37	-8.93	47.44	/	/	fundamental
5	2568.000	51.93	-8.28	43.65	74.00	-30.35	peak
6	2954.000	44.65	-7.11	37.54	74.00	-36.46	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

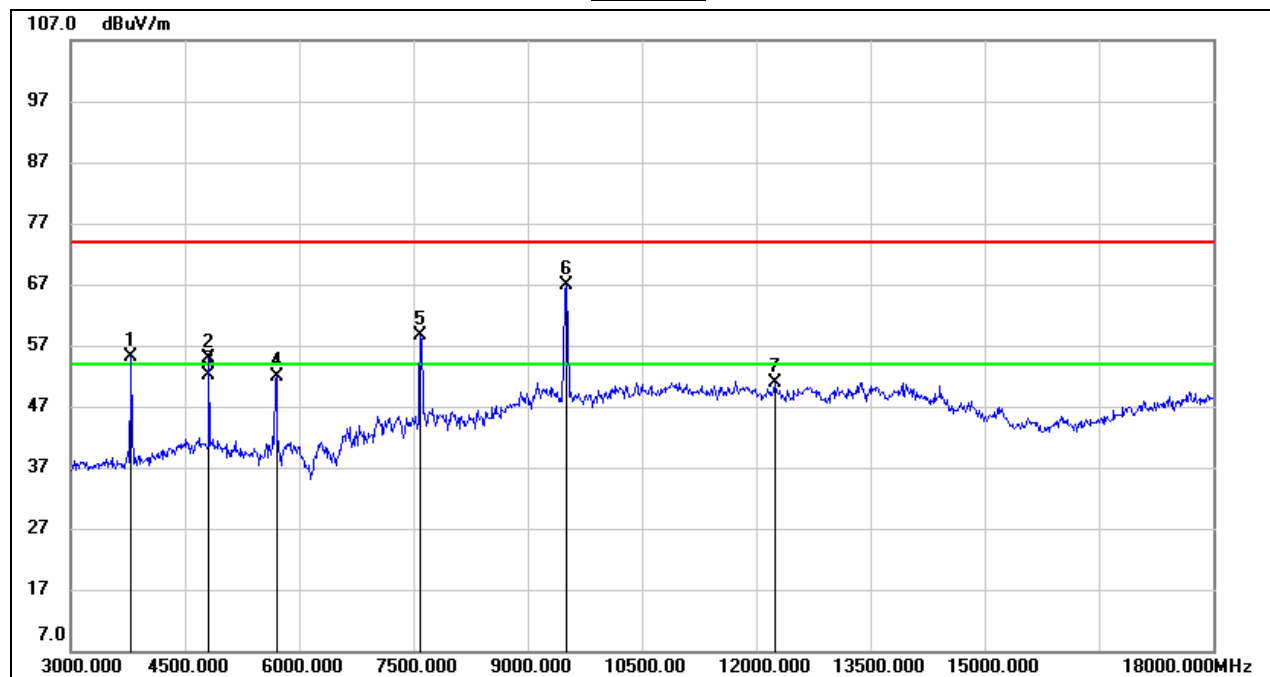
3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

SPURIOUS EMISSIONS (WORST-CASE CONFIGURATION, HORIZONTAL)

3-18 GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3795.000	59.50	-4.28	55.22	88.25	-33.03	peak
2	4815.000	55.02	-0.26	54.76	74	-19.24	peak
3	4815.000	52.36	-0.26	52.10	54	-1.9	AVG
4	5700.000	50.56	1.41	51.97	88.25	-36.28	peak
5	7590.000	52.23	6.32	58.55	88.25	-29.7	peak
6	9510.000	56.06	10.72	66.78	88.25	-21.47	peak
7	12240.000	33.02	17.79	50.81	74.00	-23.19	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.

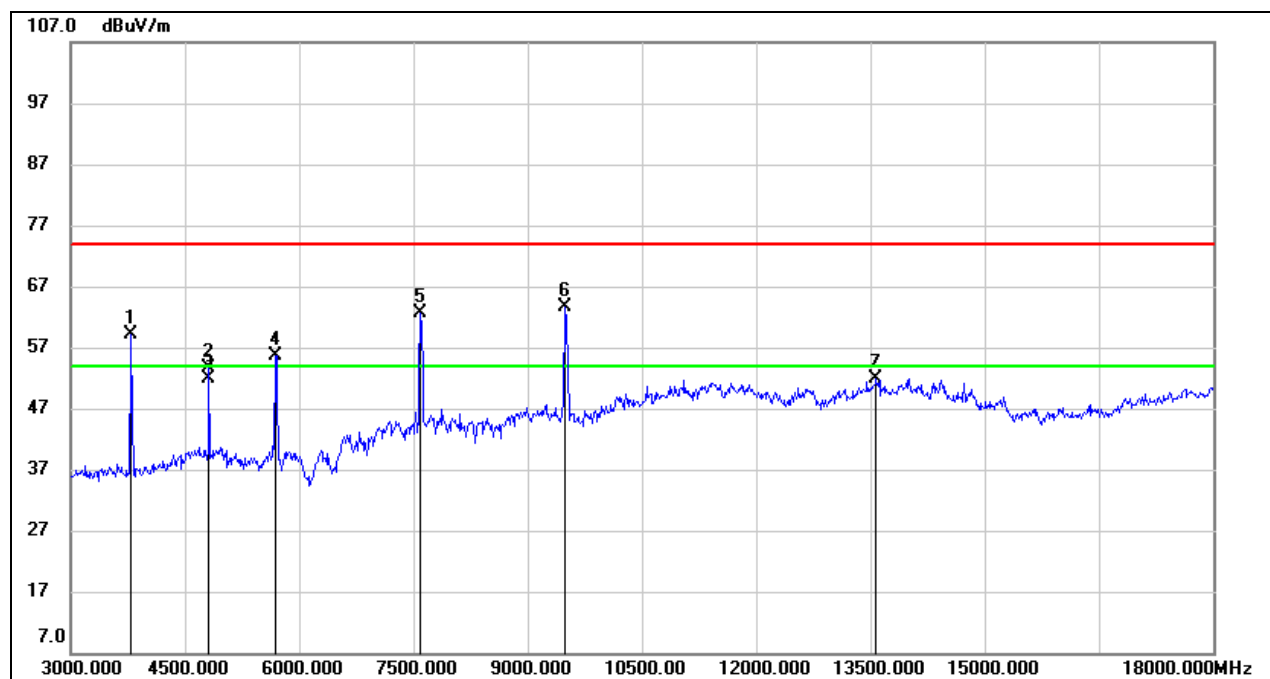
5. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

6. Proper operation of the transmitter prior to adding the filter to the measurement chain.

7. Mark 1,4,5,6 are the harmonics of LTE.

SPURIOUS EMISSIONS (WORST-CASE CONFIGURATION, VERTICAL)

7-18 GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3795.000	63.46	-4.28	59.18	88.25	-29.07	peak
2	4815.000	53.84	-0.26	53.58	74.00	-19.24	peak
3	4815.000	52.02	-0.26	51.76	54.00	-1.90	AVG
4	5685.000	54.28	1.37	55.65	88.25	-32.6	peak
5	7590.000	56.33	6.32	62.65	88.25	-25.6	peak
6	9480.000	53.03	10.68	63.71	88.25	-24.54	peak
7	13575.000	30.89	21.06	51.95	74.00	-23.19	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Mark 1,4,5,6 are the harmonics of LTE.

END OF REPORT