TEST REPORT

KCTL KCTL Inc.
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Suwon-si, Gyeonggi-do, 16677, Korea
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1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2020-08-31

2. Use of Report : Certification

3. Name of Product / Model : Tablet PC / SM-T577U/DS

4. Manufacturer / Country of Origin : Samsung Electronics Co., Ltd. / Vietnam

5. FCC ID : A3LSMT577U

6. IC Certificate No. : 649E-SMT577U

7. Date of Test : 2020-07-14 to 2020-09-28

8. Location of Test : ■ Permanent Testing Lab □ On Site Testing (Address: Address of testing location)

9. Test method used : FCC Part 15 Subpart C, 15.247
RSS-247 Issue 2 February 2017
RSS-Gen Issue 5 March 2019

10. Test Results : Refer to the test result in the test report

	Tested by	Technical Manager
Affirmation	Name : Taeyoung Kim (Signature)	Name : Seungyong Kim (Signature)

2020-10-06

KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2020-10-06	Originally issued	-

General remarks for test reports

Nothing significant to report.

CONTENTS

1. General information

Client	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Manufacturer	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Factory	:	Samsung Electronics Vietnam Thai Nguyen Co., Ltd (SEVT)
Address	:	Yen binh Industrial Park, Dong Tien Ward, Pho Yen Town Thai Nguyen Province, Vietnam
Laboratory	:	KCTL Inc.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132 VCCI Registration No. : R-20080, G-20078, C-20059, T-20056 Industry Canada Registration No. : 8035A KOLAS No.: KT231

2. Device information

Equipment under test	:	Tablet PC
Model	:	SM-T577U/DS
Modulation technique	:	Bluetooth(BDR/EDR)_ GFSK, π/4DQPSK, 8DPSK Bluetooth(BLE)_GFSK WIFI(802.11a/b/g/n/ac/ax)_DSSS, OFDM, OFDMA NFC_ASK LTE_QPSK, 16QAM, 64QAM WCDMA_QPSK GSM_GMSK, 8-PSK
Number of channels	:	Bluetooth(BDR/EDR)_79 ch / Bluetooth(BLE)_40 ch 802.11b/g/n/ac/ax_HT20/VHT20/HE20 : 11 ch UNII-1: 4 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒) UNII-2A: 4 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒) UNII-2C: 12 ch (20 ㎒), 6 ch (40 ㎒), 3 ch (80 ㎒) UNII-3: 5 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒) NFC: 1 ch
Power source	:	DC 3.85 Ⅴ
Antenna specification	:	LTE/WCDMA_LDS carrier Antenna WIFI/Bluetooth(BDR/EDR/BLE)_LDS carrier Antenna NFC_FPCB Antenna

Antenna gain	:	WIFI/Bluetooth(BDR/EDR/BLE): ANT 1: -2.50 dBi, ANT 2: -2.50 dBi UNII-1 ANT 1: -3.20 dBi, ANT 2: -3.70 dBi UNII-2A ANT 1: -3.20 dBi, ANT 2: -3.80 dBi UNII-2C ANT 1: -6.20 dBi, ANT 2: -6.70 dBi UNII-3 ANT 1: -6.50 dBi, ANT 2: -6.40 dBi
Frequency range	:	Bluetooth(BDR/EDR/BLE)_2 402 ㎒ ~ 2 480 ㎒ 2 412 ㎒ ~ 2 462 ㎒ (802.11b/g/n/ac/ax_HT20/VHT20/HE20) UNII-1: 5 180 ㎒ ~ 5 240 ㎒ (802.11a/n/ac/ax_HT20/VHT20/HE20) UNII-1: 5 190 ㎒ ~ 5 230 ㎒ (802.11n/ac/ax_HT40/VHT40/HE40) UNII-1: 5 210 ㎒ (802.11ac/ax_VHT80/HE80) UNII-2A: 5 260 ㎒ ~ 5 320 ㎒ (802.11a/n/ac/ax_HT20/VHT20/HE20) UNII-2A: 5 270 ㎒ ~ 5 310 ㎒ (802.11n/ac/ax_HT40/VHT40/HE40) UNII-2A: 5 290 ㎒ (802.11ac/ax_VHT80/HE80) UNII-2C: 5 500 ㎒ ~ 5 720 ㎒ (802.11a/n/ac/ax_HT20/VHT20/HE20) UNII-2C: 5 510 ㎒ ~ 5 710 ㎒ (802.11n/ac/ax_HT40/VHT40/HE40) UNII-2C: 5 530 ㎒ ~ 5 690 ㎒ (802.11ac/ax_VHT80/HE80) UNII-3: 5 745 ㎒ ~ 5 825 ㎒ (802.11a/n/ac/ax_HT20/VHT20/HE20) UNII-3: 5 755 ㎒ ~ 5 795 ㎒ (802.11n/ac/ax_HT40/VHT40/HE40) UNII-3: 5 775 ㎒ (802.11ac/ax_VHT80/HE80) LTE Band 2_1 850.7 ㎒ ~ 1 909.3 ㎒ LTE Band 4_1 710.7 ㎒ ~ 1 754.3 ㎒ LTE Band 5_824.7 ㎒ ~ 848.3 ㎒ LTE Band 7_2 502.5 ㎒ ~ 2 567.5 ㎒ LTE Band 12_699.7 ㎒ ~ 715.3 ㎒ LTE Band 13_779.5 ㎒ ~ 784.5 ㎒ LTE Band 14_790.5 ㎒ ~ 795.5 ㎒ LTE Band 17_706.5 ㎒ ~ 713.5 ㎒ LTE Band 25_1 850.7 ㎒ ~ 1 914.3 ㎒ LTE Band 26_814.7 ㎒ ~ 848.3 ㎒, 814.7 ㎒ ~ 823.3 ㎒ LTE Band 41_2 498.5 ㎒ ~ 2 687.5 ㎒ (FCC) LTE Band 41_2 502.5 ㎒ ~ 2 687.5 ㎒ (IC) LTE Band 66_1 710.7 ㎒ ~ 1 779.3 ㎒ LTE Band 71_665.5 ㎒ ~ 695.5 ㎒ WCDMA 850_826.4 ㎒ ~ 846.6 ㎒ WCDMA 1700_1 712.4 ㎒ ~ 1 752.6 ㎒ WCDMA 1900_1 852.4 ㎒ ~ 1 907.6 ㎒ NFC_13.56 ㎒
Software version	:	T577U.001
Hardware version	:	REV1.0
Test device serial No.	:	Conducted(R32N601ACHA,R32N601A7VE) Radiated(R32N601A80M, R32N601AW9N)
Operation temperature	:	-30 ℃ ~ 50 ℃

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source	FCC ID & IC
Travel Adapter	SOLU-M	EP-TA200	R37M12L1A C1HM3	Input : 100-240V, 50-60Hz (0.5A) Output : 9.0V, 1.67A or 5.0V, 2.0A	-
Data Cable	RFTECH	EP-DT725BBE	-	-	-
External Earphone	ALMUS	EHS64AVFBE	-	-	-
Protective Cover	WILLTECH VINA	GH98-45810A	-	-	-
S-Pen	WACOM	CP-913W-00B	-	-	-

2.2. Frequency/channel operations

This device contains the following capabilities:
WiFi (802.11a/b/g/n/ac/ax), Bluetooth (BDR/EDR/BLE), NFC,
LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 7, LTE Band 12, LTE Band 13, LTE Band 14, LTE Band 17, LTE Band 25, LTE Band 26, LTE Band 29 (Downlink only), LTE Band 41 (PC2, PC3), LTE Band 66, LTE Band 71, WCDMA 850, WCDMA 1700, WCDMA 1900

Ch.	Frequency (㎒)
01	2 412
..	..
06	2 437
..	..
11	2 462

Table 2.2.1. 802.11ax HE 20 mode

2.3. RU allocations

Mode	Tones number in RU	RU offset
HE20	26T	0
		4
		8
	52T	37
		38
		40
	106T	53
		54
	242T	61
	SU	-

Table 2.3.1. Test RU offset for tones

2.4. Simultaneous Tx Condition

For Simultaneous mode (Bluetooth, WLAN), please refer to
Test report #KR20-SRF0258_04639_Samsung Electronics_SM-T577UDS_WiFi(P15.407)_ax.

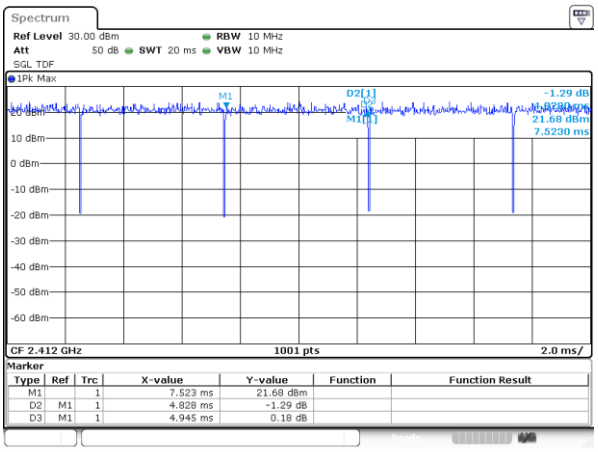
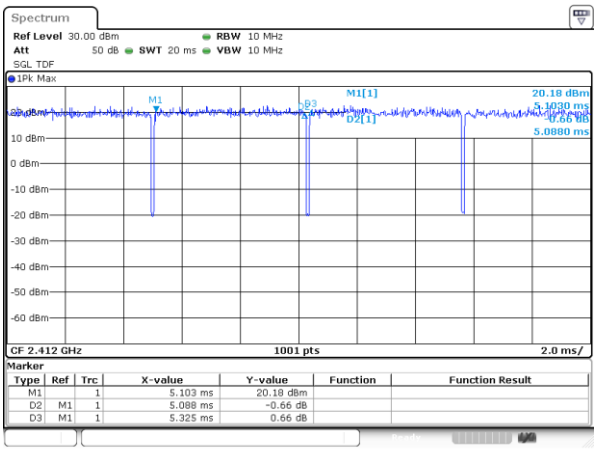
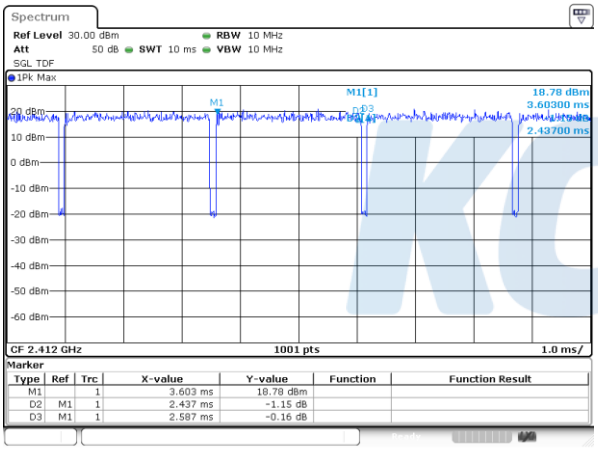
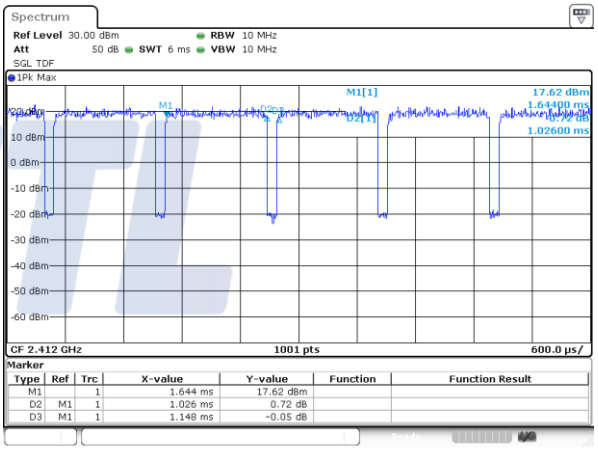
2.5. Duty Cycle Factor

Test mode	Tone	Period (ms)	On time (ms)	Duty cycle		Duty Cycle Factor (dB)
				(Linear)	(%)	
802.11ax HE 20 SISO	26T	4.945	4.828	0.976 3	97.63	0.10
	52T	5.325	5.088	0.955 5	95.55	0.20
	106T	2.587	2.437	0.942 0	94.20	0.26
	SU / 242T	1.148	1.026	0.893 7	89.37	0.49
802.11ax HE 20 MIMO	26T	5.350	5.218	0.975 3	97.53	0.11
	52T	2.750	2.618	0.952 0	95.20	0.21
	106T	1.385	1.268	0.915 5	91.55	0.38
	SU / 242T	0.660	0.538	0.815 2	81.52	0.89

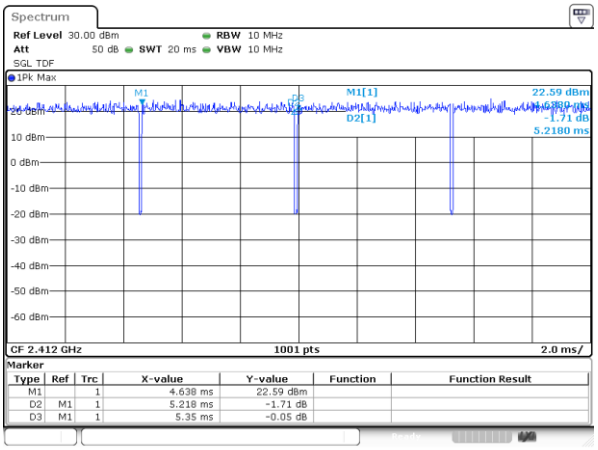
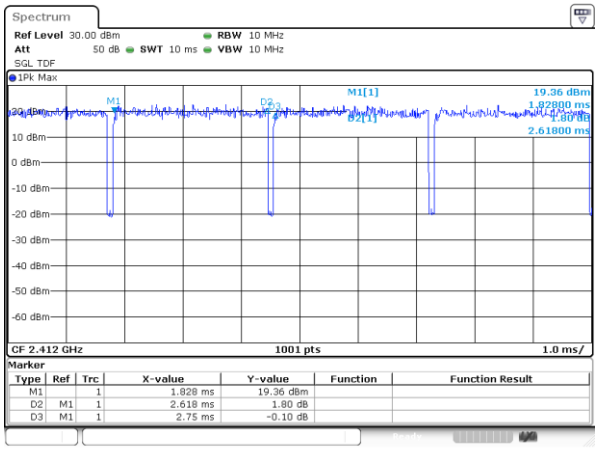
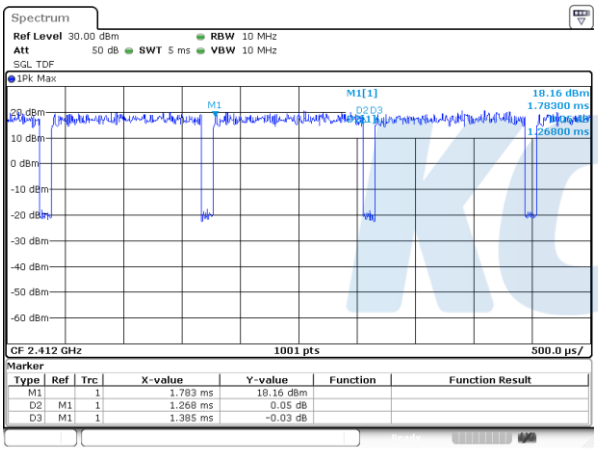
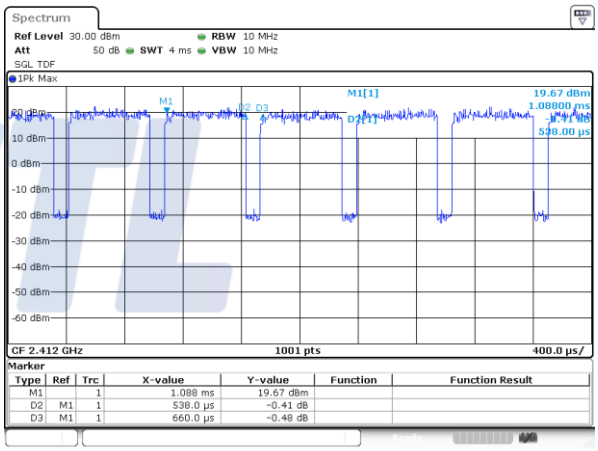
Notes.

1. Duty cycle (Linear) = Ton time / Period
2. DCF(Duty cycle factor) = 10log(1/duty cycle)
3. DCF is not compensated to Average result if duty cycle is more than 98%

SISO

26T	52T
	
106T	**SU / 242T**
	

MIMO

26T	52T
	
106T	**SU / 242T**
	

3. Antenna requirement

Requirement of FCC part section 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Requirement of RSS-Gen Section 6.8:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

- The transmitter has permanently attached LDS carrier Antenna (Internal antenna) on board.
- The E.U.T Complies with the requirement of §15.203, §15.247.

3.1 Antenna information

Mode	SISO		CDD	MIMO
	ANT 1	ANT 2	ANT 1 + 2	ANT 1 + 2
802.11ax HE20	√	√	√	√

√ = Support, X= Not support

3.2 Directional Gain Calculations

According to clause F), 2), d), (i) of KDB 662911 D01 Multiple Transmitter Output, Directional gain may be calculated by using the formulas as below.

3.2.1. Directional Antenna Gain

ANT 1 Gain (dBi)	ANT 2 Gain (dBi)	Combined Gain (dBi)
-2.50	-2.50	0.51

Note.

Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]$ dBi

4. Introduction

This report referenced from the FCC ID : A3LSMT575
Based on their similarity, the FCC Part 15C (equipment class: DTS) reuses the original model's result and do spot-check, following the FCC KDB 484596 D01 v01.
And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

4.1 Difference

The FCC ID: A3LSMT577U shares the same enclosure and circuit board as FCC ID: A3LSMT575. The WIFI/BT/BLE/NFC/WCDMA/LTE antenna and surrounding circuitry and layout are identical between these two units.
As for all bands, they have been verified and the parent model test results under FCC ID : A3LSMT575 shall remain representative of FCC ID : A3LSMT577U.

Note. The Product equality letter includes detailed information about the differences between FCC ID: A3LSMT575 and FCC ID: A3LSMT577U.

4.2 Spot check verification data (Band-edge & Spurious emission)

Test band	Test item	Test mode	Channel	Measured frequency (㎒)	SM-T575 (dB㎶)		SM-T577U/DS (dB㎶)		Deviation (dB)	
					Avg.	Peak	Avg.	Peak	Avg.	Peak
2.4G WIFI	Band edge	802.11ax HE20_RU 52T offset 40 MIMO	11	2 483.5 ~ 2 500	51.97	70.31	52.89	70.05	-0.92	0.26
	RSE	802.11ax HE20_RU 26T offset 0 MIMO	1	7 236	-	48.37	-	50.17	-	-1.80

Notes:
1. For FCC ID: A3LSMT577U has been verified the performance as for WIFI identical with the FCC ID: A3LSMT575.
2. Comparison of two models, upper deviation is within 3 dB range and all test results are under FCC technical limits.
3. The test procedure(s) in this report were performed in accordance as following.
   - KDB 484596 D01 v01

4.3 Reference Detail

Reference application that contains the reused reference data in the individual test reports.

Equipment Class	Reference FCC ID	Application Type	Reference Test report Number	Exhibit Type	Variant Test Report Number	Data Re-used
DTS	A3LSMT575	Original	KP20-SRF0209 (802.11b/g/n/ac)	Test report	KR20-SRF0255	All
			KP20-SRF0214 (802.11ax)	Test report	KR20-SRF0256	All
			KP20-SRF0208 (Bluetooth LE)	Test report	KR20-SRF0253	All
DSS	A3LSMT575	Original	KP20-SRF0207 (Bluetooth)	Test report	KR20-SRF0252	All
NII	A3LSMT575	Original	KP20-SRF0210 (802.11a/n/ac)	Test report	KR20-SRF0257	All
			KP20-SRF0215 (802.11ax)	Test report	KR20-SRF0258	All
			KR20-SRF0216 (DFS)	Test report	KR20-SRF0259	All
DXX	A3LSMT575	Original	KP20-SRF0211 (NFC)	Test report	KR20-SRF0254	All
PCB	A3LSMT575	Original	KP20-SRF0212 (2G, 3G)	Test report	KR20-SRF0260	Partial
			KP20-SRF0213 (LTE)	Test report	KR20-SRF0261	Partial

For this application the data reuse is summarized below for each equipment class

Equipment Class	Reference FCC ID	Application Type	Test Item	Data Re-used
DTS	A3LSMT575	Original	WLAN (802.11b/g/n/ac)	All
			WLAN (802.11ax)	All
			Bluetooth LE	All
DSS	A3LSMT575	Original	Bluetooth	All
NII	A3LSMT575	Original	WLAN (802.11a/n/ac)	All
			WLAN (802.11ax)	All
			WLAN (DFS)	All
DXX	A3LSMT575	Original	NFC	All
PCB	A3LSMT575	Original	2G, 3G	All except for 2G
			LTE	Band 66, Band 12, Band 5, Band 13 LTE 41 (PC 3)

5. Summary of tests

FCC Part section(s)	IC Rule Referene	Parameter	Test Condition	Test results
15.247(b)(3)	RSS-247 (5.4)(d)	Maximum peak output power	Conducted	Pass
15.247(e)	RSS-247 (5.2)(b)	Peak power spectral density		Pass
15.247(a)(2)	RSS-247 (5.2)(a)	6 dB channel bandwidth		Pass
-	RSS-Gen (6.7)	Occupied Bandwidth		Pass
15.207(a)	RSS-Gen (8.8)	AC Conducted Emissions		Pass
15.247(d)	RSS-247 (5.5)	Conducted Spurious Emissions		Pass
15.205(a), 15.209(a)	RSS-Gen (8.9), (8.10)	Spurious emission	Radiated	Pass
		Band-edge, restricted band		Pass

Notes:

1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2. For AC Conducted emission, please refer to test report #KR20-SRF0255_04639_Samsung Electronics_SM-T577UDS_WiFi(P15.247).
3. According to exploratory test no any obvious emission were detected from 9 ㎑ to 30 ㎒. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
4. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that **X** orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in **X** orientation.
5. All the radiated tests have been performed several case.
   (Stand-alone, with accessories (earphone, cover, TA etc.))
   Worst case: stand alone
6. The test procedure(s) in this report were performed in accordance as following.
   - ANSI C63.10-2013
   - KDB 558074 D01 V05r02
7. The worst-case data rate were : MCS0

6. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k=2 to indicated a 95 % level of confidence. The measurement data shown herein meets of exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (±)	
Conducted RF power	1.3 dB	
Conducted spurious emissions	1.3 dB	
Radiated spurious emissions	9 kHz ~ 30 MHz:	2.3 dB
	30 MHz ~ 300 MHz	5.4 dB
	300 MHz ~ 1 000 MHz	5.5 dB
	Above 1 GHz	6.7 dB
Conducted emissions	9 kHz ~ 150 kHz	3.7 dB
	150 kHz ~ 30 MHz	3.3 dB

7. Measurement results explanation example

The offset level is set in the spectrum analyzer to compensate the RF cable loss factor between EUT conducted output port and spectrum analyzer.
With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

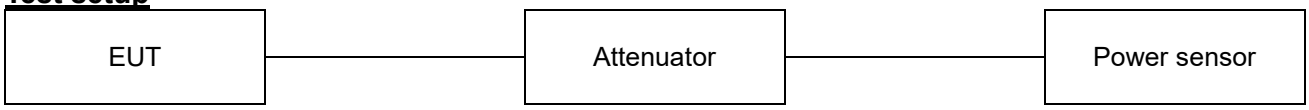
Frequency (㎒)	Factor(㏈)	Frequency (㎒)	Factor(㏈)
30	9.29	9 000	12.34
50	9.36	10 000	12.61
100	9.43	11 000	12.79
200	9.55	12 000	12.81
300	9.64	13 000	12.85
400	9.73	14 000	12.99
500	9.80	15 000	13.10
600	9.85	16 000	13.52
700	9.89	17 000	13.55
800	9.94	18 000	13.74
900	10.03	19 000	13.77
1 000	10.09	20 000	13.82
2 000	10.85	21 000	14.14
3 000	11.51	22 000	14.44
4 000	11.54	23 000	14.64
5 000	12.03	24 000	14.71
6 000	12.31	25 000	15.01
7 000	12.05	26 000	15.06
8 000	12.26	26 500	15.10

Note : Offset(㏈) = RF cable loss(㏈) + Attenuator(㏈)

8. Test results

8.1. Maximum peak output power

Test setup



Limit

FCC

According to §15.247(b)(3), For systems using digital modulation in the 902-928 ㎒, 2 400-2 483.5 ㎒, and 5 725-5 850 ㎒ bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to §15.247(b)(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 ㏈i. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 ㏈i are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

IC

According to RSS-247 5.4(d), For DTSs employing digital modulation techniques operating in the bands 902-928 ㎒ and 2400-2483.5 ㎒, the maximum peak conducted output power shall not exceed 1 ㏗. The e.i.r.p. shall not exceed 4 ㏗, except as provided in section 5.4(e).

Test procedure

ANSI C63.10 - Section 11.9
Used test method is section 11.9.1.3 and 11.9.2.3.1

Test settings

General

Section 15.247 permits the maximum conducted (average) output power to be measured as an alternative to the maximum peak conducted output power for demonstrating compliance to the limit. When this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth (see ANSI C63.10 for measurement guidance).

When using a spectrum analyzer or EMI receiver to perform these measurements, it shall be capable of utilizing a number of measurement points in each sweep that is greater than or equal to twice the span/RBW to set a bin-to-bin spacing of ≤ RBW/2 so that narrowband signals are not lost between frequency bins.

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level. The intent is to test at 100 % duty cycle; however a small reduction in duty cycle (to no lower than 98 %) is permitted, if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

If continuous transmission (or at least 98 % duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level, with the transmit duration as long as possible, and the duty cycle as high as possible during which sweep triggering/signal gating techniques may be used to perform the measurement over the transmission duration.

11.9.1. Maximum peak conducted output power

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

11.9.1.1. RBW ≥ DTS bandwidth

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ [3 × RBW].
c) Set span ≥ [3 × RBW].
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

11.9.1.3. PKPM1 Peak power meter method

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

11.9.2.3.1. Measurement using a power meter (PM)

Method AVGPM is a measurement using an RF average power meter, as follows:

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied:
   1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
   2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
   3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter output signal as described in 11.6.

c) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.

d) Adjust the measurement in dBm by adding [10 log(1/D)], where D is the duty cycle

Notes:

A peak responding power sensor is used, where the power sensor system video bandwidth is greater than the occupied bandwidth of the EUT.

Test results

SISO
Conducted Output Power

Frequency (㎒)	Tone	RU offset	Measured output power							Limit (dBm)
			Reading (dBm)				DCF (dB)	Result (dBm)		
			Peak		Average			Average		
			ANT 1	ANT 2	ANT 1	ANT 2		ANT 1	ANT 2	
2 412	26T	0	24.93	24.49	15.43	15.61	0.10	15.53	15.71	30.00
		4	24.71	24.64	15.81	15.61	0.10	15.91	15.71	
		8	24.65	24.61	15.26	15.77	0.10	15.36	15.87	
	52T	37	24.93	24.57	15.64	15.60	0.20	15.84	15.80	
		38	24.67	24.62	15.50	15.26	0.20	15.70	15.46	
		40	24.87	24.67	15.26	15.72	0.20	15.46	15.92	
	106T	53	24.66	24.43	15.02	14.87	0.26	15.28	15.13	
		54	24.83	24.79	15.35	15.10	0.26	15.61	15.36	
	242T	61	24.04	23.82	12.62	12.78	0.49	13.11	13.27	
	SU	-	24.63	24.12	12.64	13.04	0.49	13.13	13.53	
2 437	26T	0	24.86	24.85	14.99	15.00	0.10	15.09	15.10	
		4	24.81	24.59	15.10	15.36	0.10	15.20	15.46	
		8	24.98	24.52	15.58	15.69	0.10	15.68	15.79	
	52T	37	24.92	24.54	15.16	14.99	0.20	15.36	15.19	
		38	24.82	24.41	14.75	14.93	0.20	14.95	15.13	
		40	25.05	24.52	15.55	15.55	0.20	15.75	15.75	
	106T	53	24.97	24.89	15.30	15.51	0.26	15.56	15.77	
		54	25.01	24.57	15.61	14.90	0.26	15.87	15.16	
	242T	61	24.35	22.84	13.06	12.33	0.49	13.55	12.82	
	SU	-	24.83	23.19	13.46	12.54	0.49	13.95	13.03	
2 462	26T	0	25.03	24.59	15.12	15.19	0.10	15.22	15.29	
		4	25.03	24.70	15.88	15.34	0.10	15.98	15.44	
		8	24.53	24.98	14.94	14.97	0.10	15.04	15.07	
	52T	37	25.13	24.67	15.25	15.06	0.20	15.45	15.26	
		38	25.03	24.78	15.71	15.21	0.20	15.91	15.41	
		40	24.61	24.79	15.08	15.00	0.20	15.28	15.20	
	106T	53	25.01	24.87	15.42	15.34	0.26	15.68	15.60	
		54	24.59	24.64	15.24	15.70	0.26	15.50	15.96	
	242T	61	24.24	23.57	12.95	12.54	0.49	13.44	13.03	
	SU	-	24.43	23.87	13.00	12.76	0.49	13.49	13.25	

Notes:

1. Average result(dB m) = Average Reading (dB m) + DCF(dB)

e.i.r.p.

Frequency (㎒)	Tone	RU offset	Measured output power				ANT Gain (dBi)	Max.e.i.r.p (dBm)		Max e.i.r.p Limit (dBm)
			Conducted Output Power (dBm)							
			Peak		Average			Average		
			ANT 1	ANT 2	ANT 1	ANT 2		ANT 1	ANT 2	
2 412	26T	0	25.03	24.59	15.53	15.71	-2.50	13.03	13.21	36.02
		4	24.81	24.74	15.91	15.71		13.41	13.21	
		8	24.75	24.71	15.36	15.87		12.86	13.37	
	52T	37	25.13	24.77	15.84	15.80		13.34	13.30	
		38	24.87	24.82	15.70	15.46		13.20	12.96	
		40	25.07	24.87	15.46	15.92		12.96	13.42	
	106T	53	24.92	24.69	15.28	15.13		12.78	12.63	
		54	25.09	25.05	15.61	15.36		13.11	12.86	
	242T	61	24.53	24.31	13.11	13.27		10.61	10.77	
	SU	-	25.12	24.61	13.13	13.53		10.63	11.03	
2 437	26T	0	24.96	24.95	15.09	15.10		12.59	12.60	
		4	24.91	24.69	15.20	15.46		12.70	12.96	
		8	25.08	24.62	15.68	15.79		13.18	13.29	
	52T	37	25.12	24.74	15.36	15.19		12.86	12.69	
		38	25.02	24.61	14.95	15.13		12.45	12.63	
		40	25.25	24.72	15.75	15.75		13.25	13.25	
	106T	53	25.23	25.15	15.56	15.77		13.06	13.27	
		54	25.27	24.83	15.87	15.16		13.37	12.66	
	242T	61	24.84	23.33	13.55	12.82		11.05	10.32	
	SU	-	25.32	23.68	13.95	13.03		11.45	10.53	
2 462	26T	0	25.13	24.69	15.22	15.29		12.72	12.79	
		4	25.13	24.80	15.98	15.44		13.48	12.94	
		8	24.63	25.08	15.04	15.07		12.54	12.57	
	52T	37	25.33	24.87	15.45	15.26		12.95	12.76	
		38	25.23	24.98	15.91	15.41		13.41	12.91	
		40	24.81	24.99	15.28	15.20		12.78	12.70	
	106T	53	25.27	25.13	15.68	15.60		13.18	13.10	
		54	24.85	24.90	15.50	15.96		13.00	13.46	
	242T	61	24.73	24.06	13.44	13.03		10.94	10.53	
	SU	-	24.92	24.36	13.49	13.25		10.99	10.75	

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dB m) = Conducted output power (dB m) + Antenna gain (dB i)

MIMO
Conducted Output Power

Frequency (㎒)	Tone	RU offset	Measured output power							Limit (dBm)
			Reading (dBm)				DCF (dB)	Result (dBm)		
			Peak		Average			Peak	Average	
			ANT 1	ANT 2	ANT 1	ANT 2				
2 412	26T	0	24.50	24.14	15.79	15.78	0.11	27.33	18.91	30.00
		4	24.59	24.46	15.82	15.71	0.11	27.54	18.89	
		8	24.60	24.49	15.43	15.18	0.11	27.56	18.43	
	52T	37	24.49	24.26	14.97	15.09	0.21	27.39	18.25	
		38	24.41	24.45	15.62	15.52	0.21	27.44	18.79	
		40	24.83	25.03	15.28	16.02	0.21	27.94	18.89	
	106T	53	24.37	24.36	15.15	15.04	0.38	27.38	18.49	
		54	24.69	24.52	15.35	15.30	0.38	27.62	18.72	
	242T	61	23.97	23.80	12.57	12.65	0.89	26.90	16.51	
	SU	-	24.40	24.22	12.91	12.83	0.89	27.32	16.77	
2 437	26T	0	24.71	23.96	16.08	15.08	0.11	27.36	18.73	
		4	24.82	24.60	16.08	15.44	0.11	27.72	18.89	
		8	24.77	24.51	15.50	14.76	0.11	27.65	18.27	
	52T	37	24.67	24.52	15.05	14.43	0.21	27.61	17.97	
		38	24.81	24.53	15.80	15.04	0.21	27.68	18.66	
		40	25.03	25.03	15.58	15.79	0.21	28.04	18.91	
	106T	53	25.13	25.23	15.49	15.56	0.38	28.19	18.92	
		54	24.86	24.36	15.58	14.80	0.38	27.63	18.60	
	242T	61	24.00	23.40	12.74	12.00	0.89	26.72	16.29	
	SU	-	24.52	23.93	13.01	12.40	0.89	27.25	16.62	
2 462	26T	0	24.68	24.48	15.54	15.26	0.11	27.59	18.52	
		4	24.63	24.56	15.86	15.50	0.11	27.61	18.80	
		8	24.39	24.30	15.00	14.73	0.11	27.36	17.99	
	52T	37	24.87	24.44	15.30	15.09	0.21	27.67	18.42	
		38	24.72	24.50	15.77	15.33	0.21	27.62	18.78	
		40	24.42	24.19	15.05	14.79	0.21	27.32	18.14	
	106T	53	24.66	24.53	15.35	15.02	0.38	27.61	18.58	
		54	24.36	24.21	15.20	14.82	0.38	27.30	18.40	
	242T	61	24.17	23.60	12.73	12.57	0.89	26.90	16.55	
	SU	-	24.28	23.66	12.81	12.66	0.89	26.99	16.64	

Notes:
1. Peak result(dB m) = 10log($10^{(ANT1/10)}$+$10^{(ANT2/10)}$) (dB m)
2. Average result(dB m) = 10log($10^{(ANT1/10)}$+$10^{(ANT2/10)}$) (dB m) + DCF(dB)

e.i.r.p.

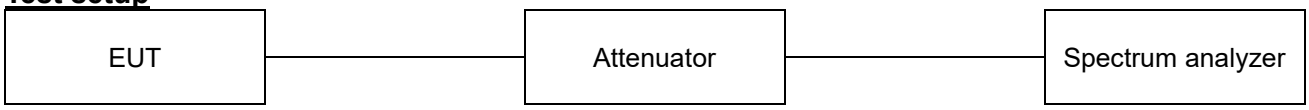
Frequency (㎒)	Tone	RU offset	Measured output power		ANT Gain (dBi)			Limit (dBm)
			Conducted output Power (dBm)			Max.e.i.r.p (dBm)		
			Peak	Average		Peak	Average	
2 412	26T	0	27.33	18.91	0.51	27.84	19.42	36.02
		4	27.54	18.89		28.05	19.40	
		8	27.56	18.43		28.07	18.94	
	52T	37	27.39	18.25		27.90	18.76	
		38	27.44	18.79		27.95	19.30	
		40	27.94	18.89		28.45	19.40	
	106T	53	27.38	18.49		27.89	19.00	
		54	27.62	18.72		28.13	19.23	
	242T	61	26.90	16.51		27.41	17.02	
	SU	-	27.32	16.77		27.83	17.28	
2 437	26T	0	27.36	18.73		27.87	19.24	
		4	27.72	18.89		28.23	19.40	
		8	27.65	18.27		28.16	18.78	
	52T	37	27.61	17.97		28.12	18.48	
		38	27.68	18.66		28.19	19.17	
		40	28.04	18.91		28.55	19.42	
	106T	53	28.19	18.92		28.70	19.43	
		54	27.63	18.60		28.14	19.11	
	242T	61	26.72	16.29		27.23	16.80	
	SU	-	27.25	16.62		27.76	17.13	
2 462	26T	0	27.59	18.52		28.10	19.03	
		4	27.61	18.80		28.12	19.31	
		8	27.36	17.99		27.87	18.50	
	52T	37	27.67	18.42		28.18	18.93	
		38	27.62	18.78		28.13	19.29	
		40	27.32	18.14		27.83	18.65	
	106T	53	27.61	18.58		28.12	19.09	
		54	27.30	18.40		27.81	18.91	
	242T	61	26.90	16.55		27.41	17.06	
	SU	-	26.99	16.64		27.50	17.15	

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dB m) = Conducted output power (dB m) + Antenna gain (dB i)

8.2. Peak Power Spectral Density

Test setup



Limit

According to §15.247(e) and RSS-247(5.2), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 ㏈m in any 3 ㎑ band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test procedure

ANSI C63.10 - Section 11.10.2

Test settings

Method PKPSD (peak PSD)

The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

1) Set analyzer center frequency to DTS channel center frequency.
2) Set the span to 1.5 times the DTS bandwidth.
3) Set the RBW to: 3 ㎑ ≤ RBW ≤ 100 ㎑.
4) Set the VBW ≥ 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 ㎑) and repeat.

Test results

SISO

Frequency (㎒)	Tone	RU offset	Reading(dB m/ 3 ㎑)		DCF (dB)	Result(dBm/ 3㎑)		Limit (dBm/ 3㎑)
			ANT 1	ANT 2		ANT 1	ANT 2	
2 412	26T	0	0.25	-0.31	0.10	0.35	-0.21	8.00
		4	-0.96	-0.39	0.10	-0.86	-0.29	
		8	-0.05	-0.13	0.10	0.05	-0.03	
	52T	37	-3.09	-2.71	0.20	-2.89	-2.51	
		38	-3.60	-3.30	0.20	-3.40	-3.10	
		40	-3.69	-0.73	0.20	-3.49	-0.53	
	106T	53	-5.57	-6.26	0.26	-5.31	-6.00	
		54	-6.11	-6.33	0.26	-5.85	-6.07	
	SU	-	-11.64	-11.24	0.49	-11.15	-10.75	
2 437	26T	0	-1.68	-0.43	0.10	-1.58	-0.33	
		4	-1.70	-1.56	0.10	-1.60	-1.46	
		8	-0.30	-0.53	0.10	-0.20	-0.43	
	52T	37	-3.24	-2.21	0.20	-3.04	-2.01	
		38	-4.87	-3.81	0.20	-4.67	-3.61	
		40	-3.41	-2.94	0.20	-3.21	-2.74	
	106T	53	-5.14	-5.14	0.26	-4.88	-4.88	
		54	-6.22	-6.07	0.26	-5.96	-5.81	
	SU	-	-12.25	-11.77	0.49	-11.76	-11.28	
2 462	26T	0	0.26	-0.71	0.10	0.36	-0.61	
		4	-0.33	-1.25	0.10	-0.23	-1.15	
		8	-1.75	-1.50	0.10	-1.65	-1.40	
	52T	37	-1.22	-3.22	0.20	-1.02	-3.02	
		38	-3.05	-3.55	0.20	-2.85	-3.35	
		40	-2.83	-4.00	0.20	-2.63	-3.80	
	106T	53	-5.57	-4.41	0.26	-5.31	-4.15	
		54	-5.40	-5.41	0.26	-5.14	-5.15	
	SU	-	-12.04	-11.04	0.49	-11.55	-10.55	

Notes:

1. Result(dB m) = Reading (dB m) + DCF(dB)

MIMO

Frequency (㎒)	Tone	RU offset	Reading(dB m/ 3 ㎑)		DCF (dB)	Result(dBm/ 3㎑)	Limit (dBm/ 3㎑)
			ANT 1	ANT 2			
2 412	26T	0	-1.20	-0.20	0.11	2.45	8.00
		4	-1.76	-0.64	0.11	1.96	
		8	-2.39	0.35	0.11	2.31	
	52T	37	-4.11	-4.00	0.21	-0.83	
		38	-2.45	-3.76	0.21	0.16	
		40	-4.06	-3.58	0.21	-0.59	
	106T	53	-7.30	-6.87	0.38	-3.69	
		54	-6.44	-6.59	0.38	-3.12	
	SU	-	-11.45	-10.63	0.89	-7.12	
2 437	26T	0	-2.55	-1.32	0.11	1.23	
		4	-1.45	-1.24	0.11	1.78	
		8	-2.79	-2.92	0.11	0.27	
	52T	37	-5.15	-4.89	0.21	-1.80	
		38	-3.56	-3.83	0.21	-0.47	
		40	-4.27	-4.62	0.21	-1.22	
	106T	53	-8.45	-7.16	0.38	-4.37	
		54	-7.18	-7.52	0.38	-3.96	
	SU	-	-11.37	-10.97	0.89	-7.27	
2 462	26T	0	-1.20	-1.47	0.11	1.79	
		4	-0.24	-0.36	0.11	2.82	
		8	-1.62	-1.53	0.11	1.55	
	52T	37	-4.17	-3.06	0.21	-0.36	
		38	-4.19	-3.25	0.21	-0.47	
		40	-4.50	-4.19	0.21	-1.12	
	106T	53	-7.05	-5.76	0.38	-2.97	
		54	-6.85	-6.69	0.38	-3.38	
	SU	-	-11.55	-11.30	0.89	-7.52	

Notes:

1. Result(dB ㎷) = 10log($10^{(Ant1/10)}$+$10^{(ant2/10)}$) (dB ㎷) + DCF(dB)

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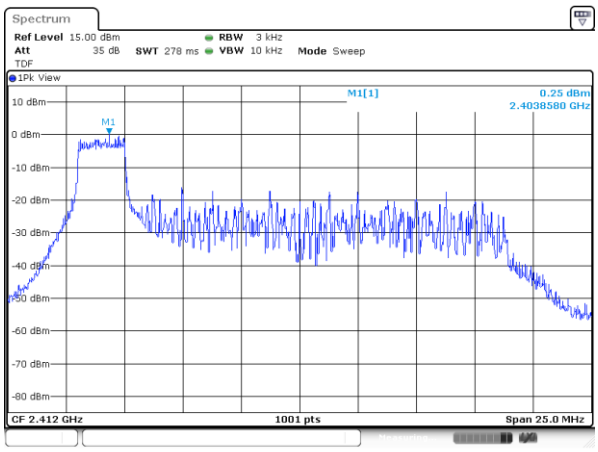
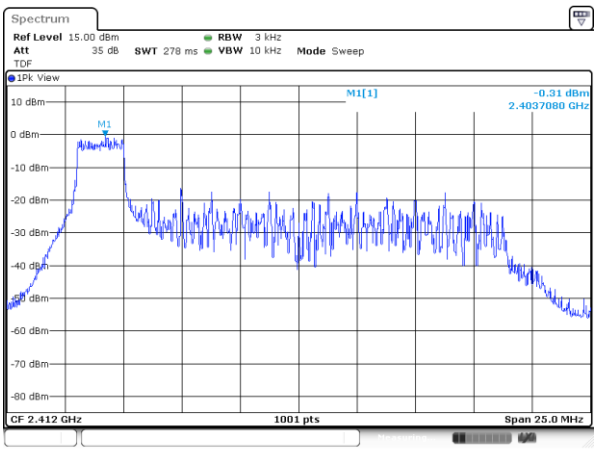
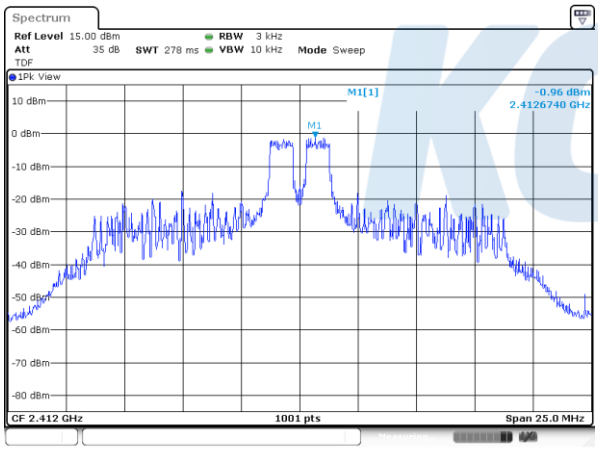
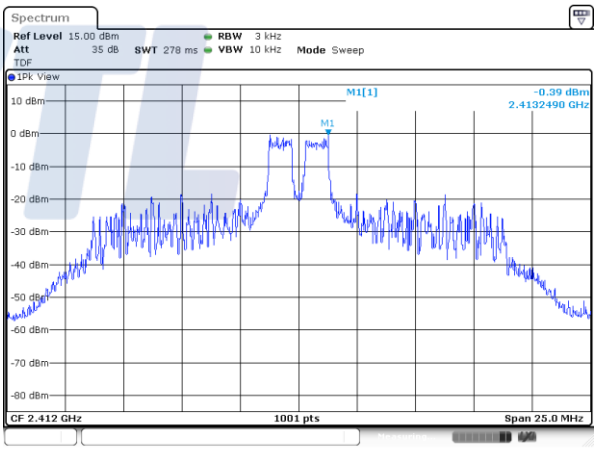
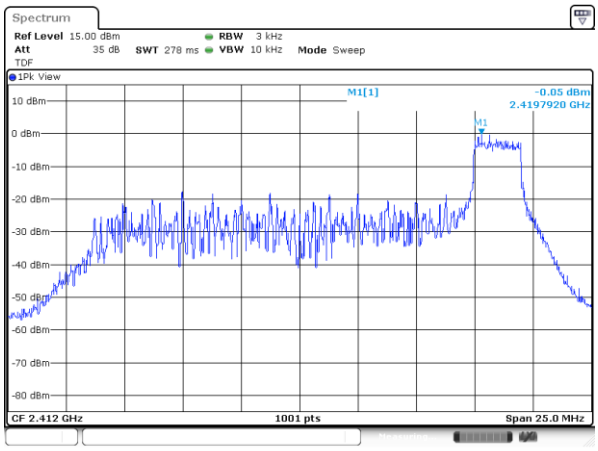
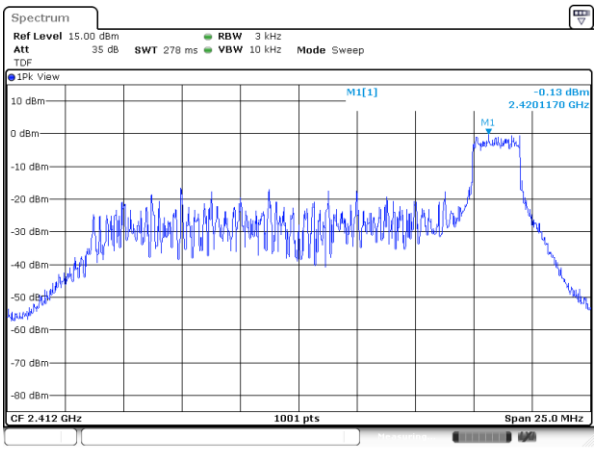
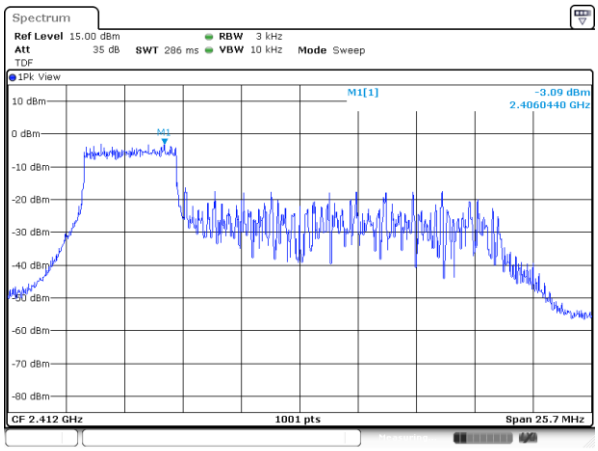
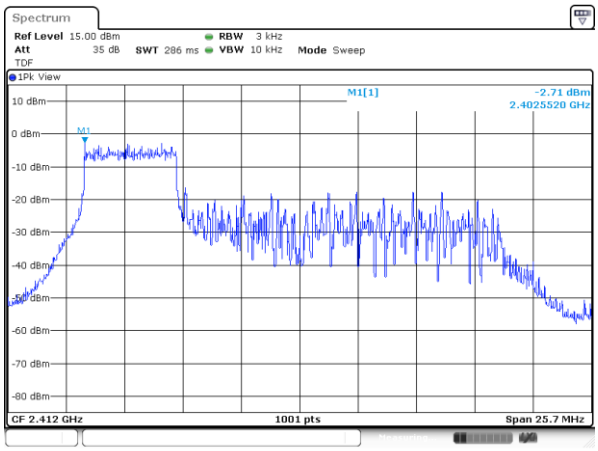
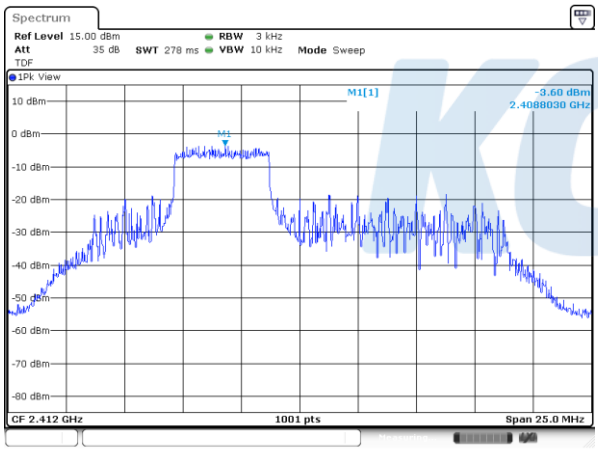
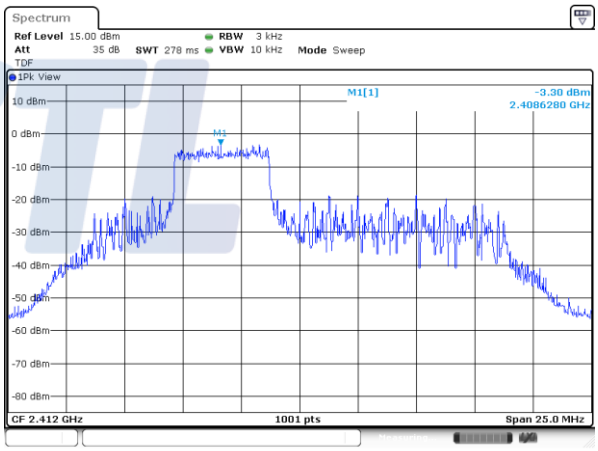
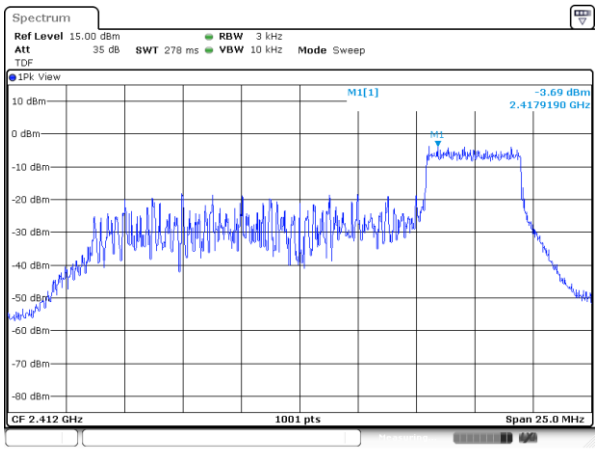
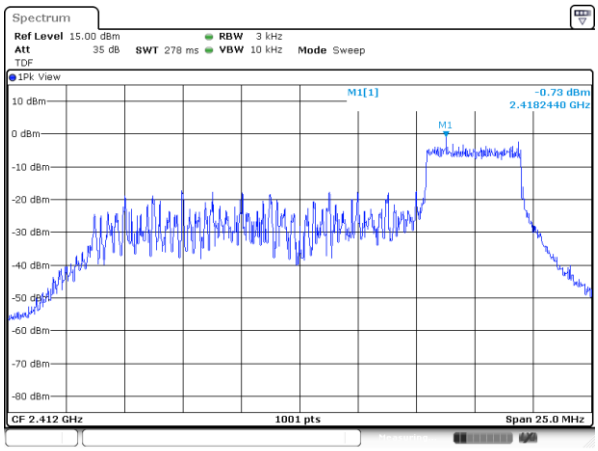
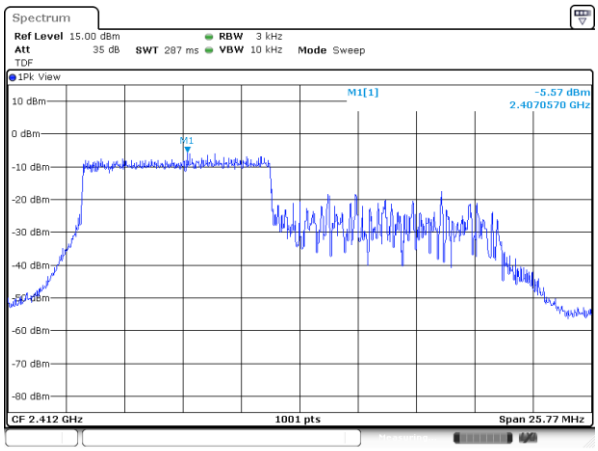
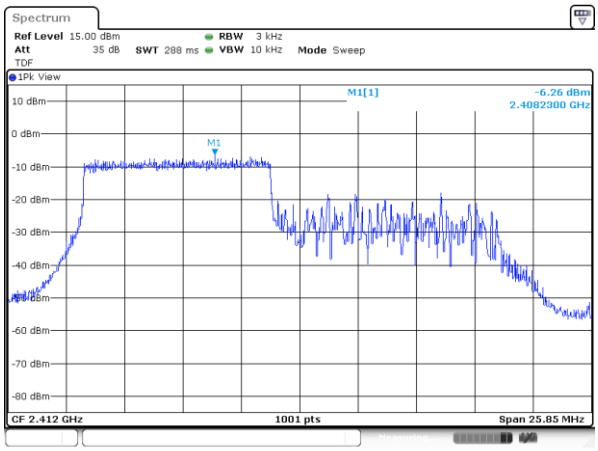
26T / 2 412 ㎒	
ANT 1	**ANT 2**
RU offset 0	**RU offset 0**
	
RU offset 4	**RU offset 4**
	
RU offset 8	**RU offset 8**
	

52T / 2 412 ㎒	
ANT 1	**ANT 2**
RU offset 37	**RU offset 37**
	
RU offset 38	**RU offset 38**
	
RU offset 40	**RU offset 40**
	

106T / 2 412 ㎒	
ANT 1	**ANT 2**
RU offset 53	**RU offset 53**
	
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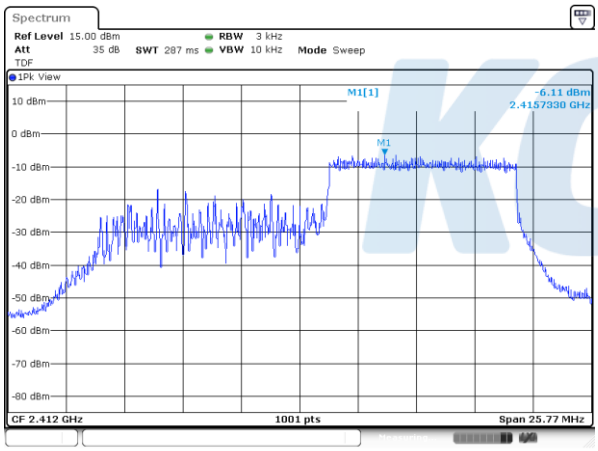
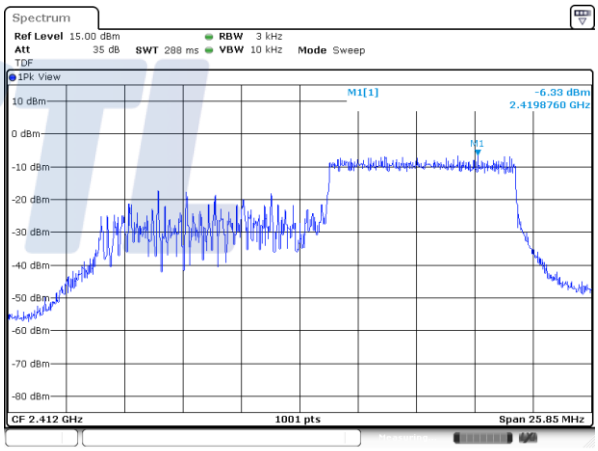
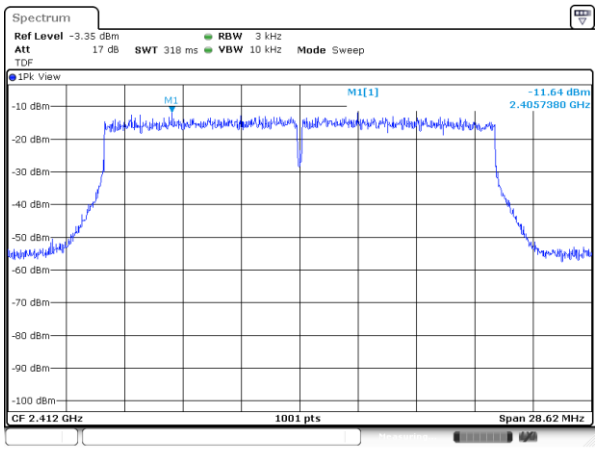
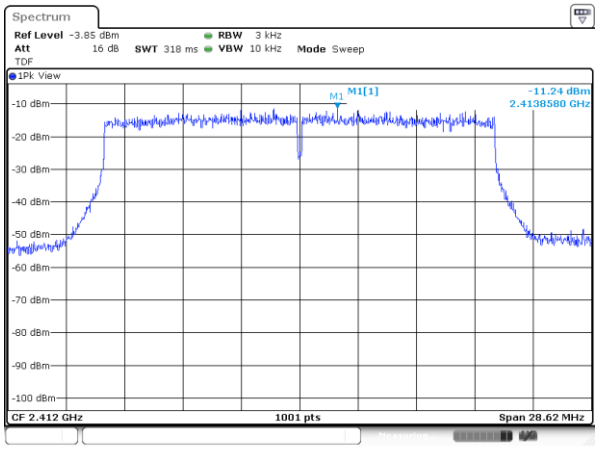
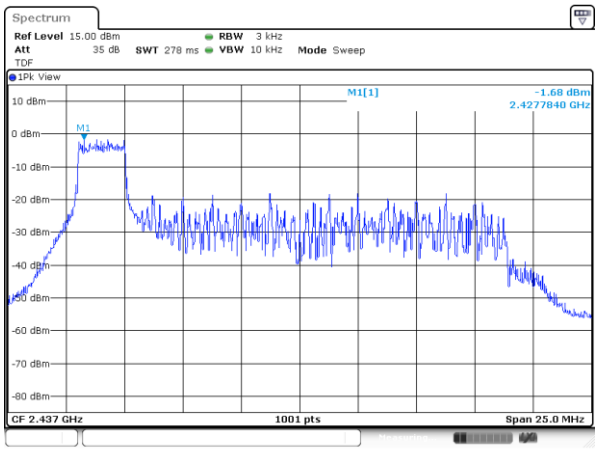
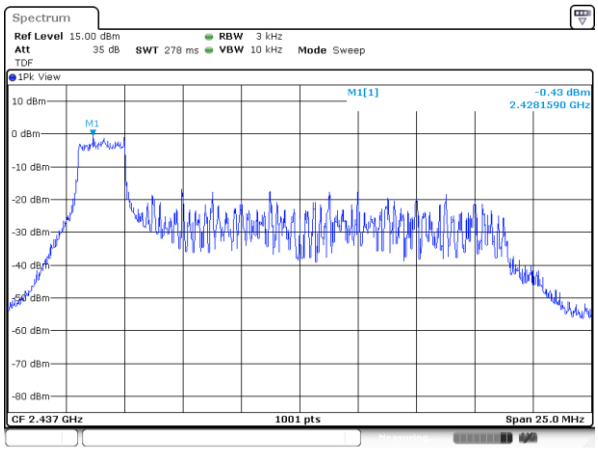
	
SU / 2 412 ㎒	
ANT 1	**ANT 2**
	

26T / 2 437 ㎒	
ANT 1	**ANT 2**
RU offset 0	**RU offset 0**
	
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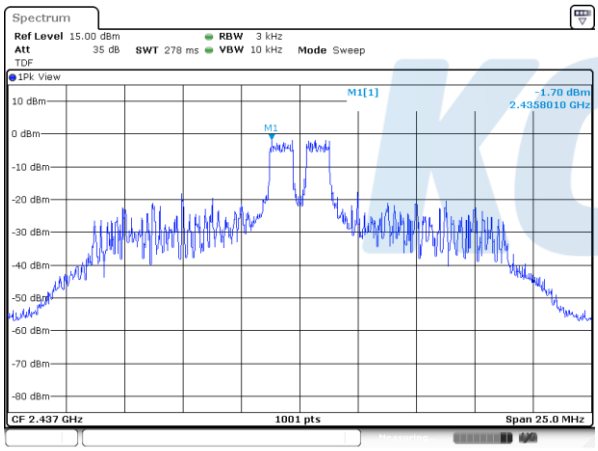
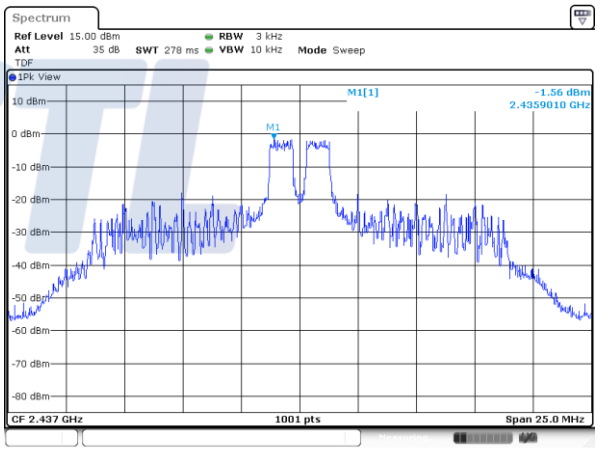
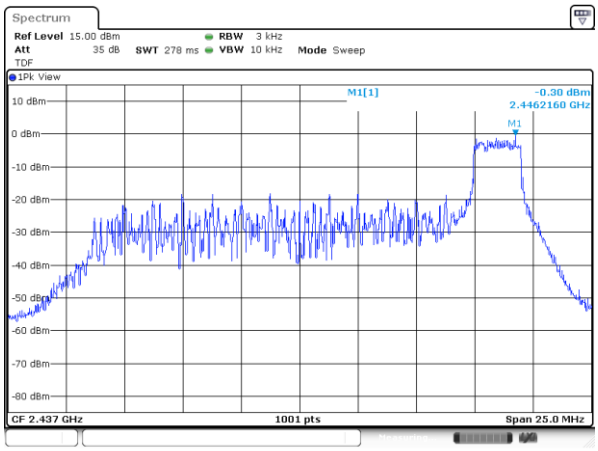
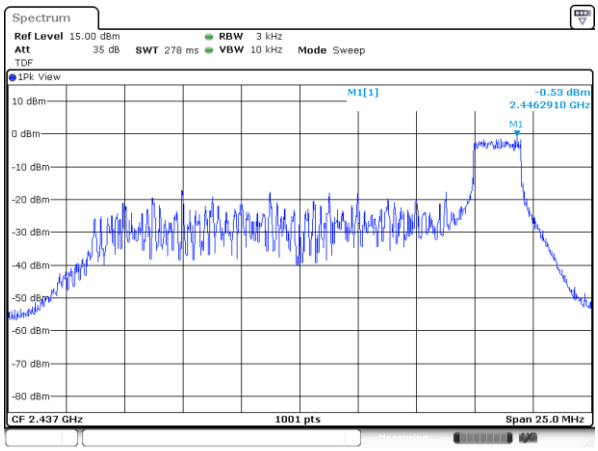
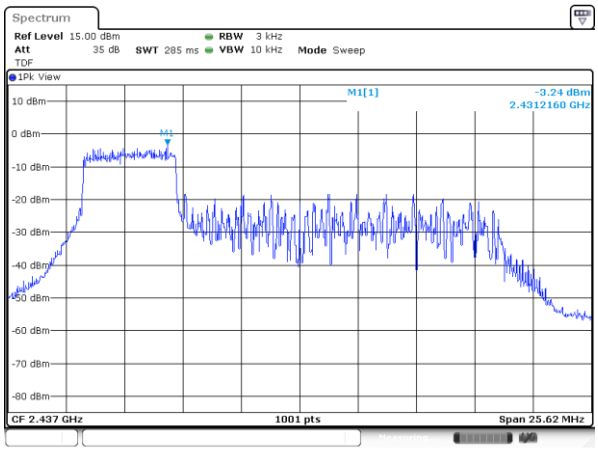
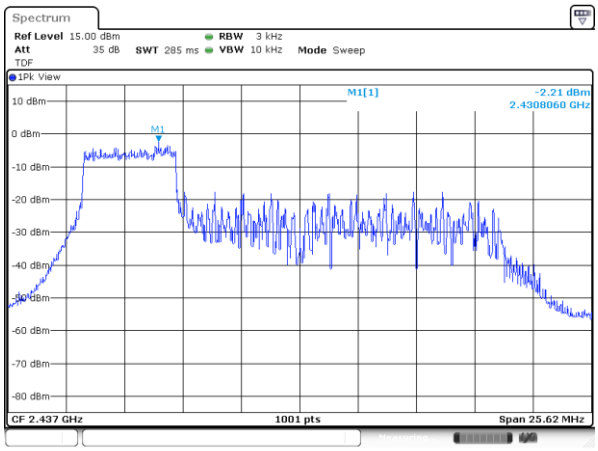
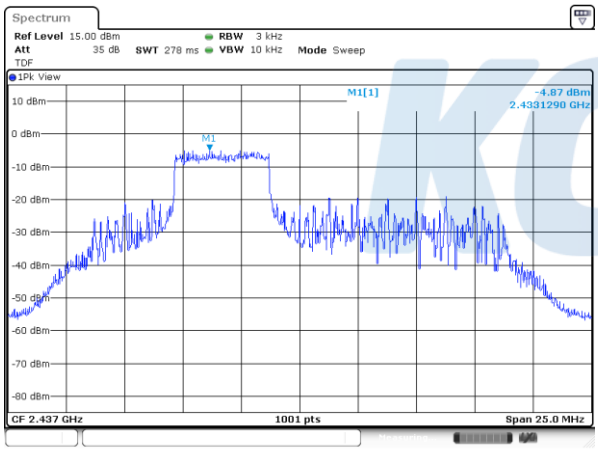
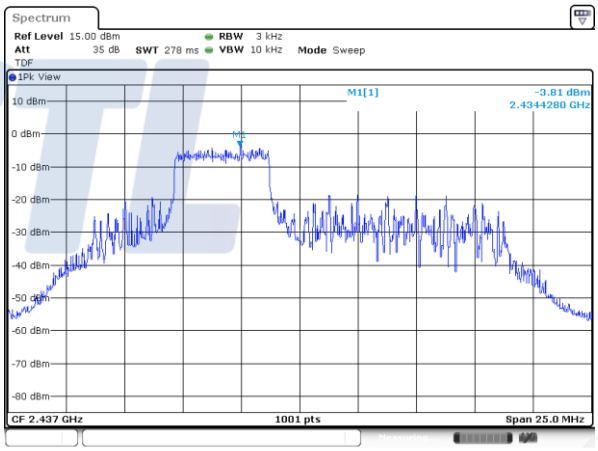
	
RU offset 8	**RU offset 8**
	

52T / 2 437 ㎒	
ANT 1	**ANT 2**
RU offset 37	**RU offset 37**
	
RU offset 38	**RU offset 38**
	
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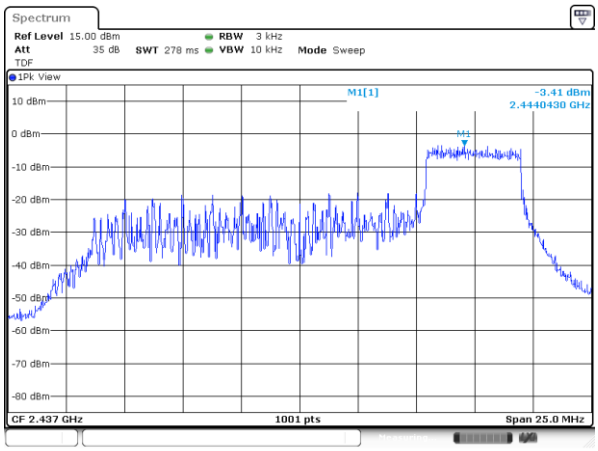
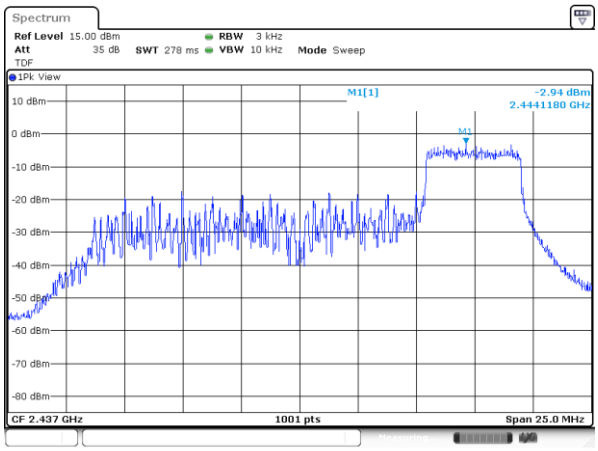
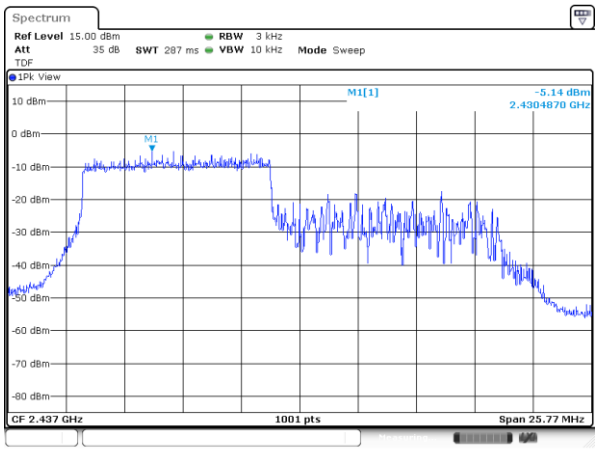
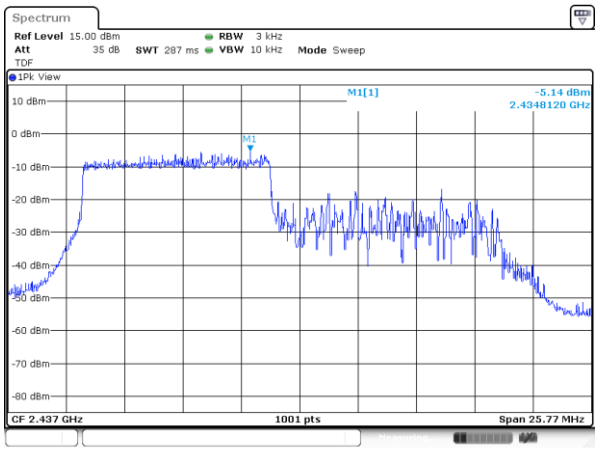
	

106T / 2 437 ㎒	
ANT 1	**ANT 2**
RU offset 53	**RU offset 53**
	
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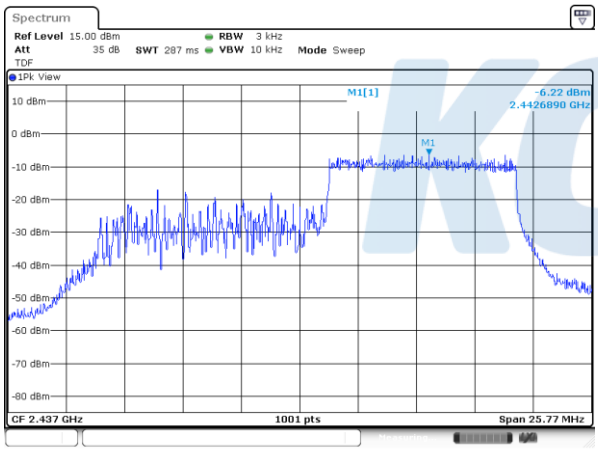
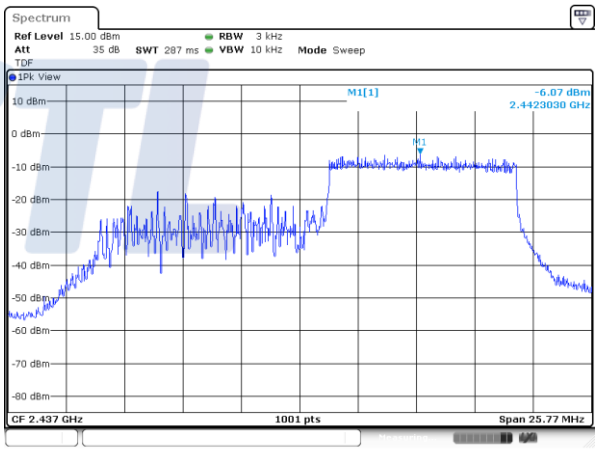
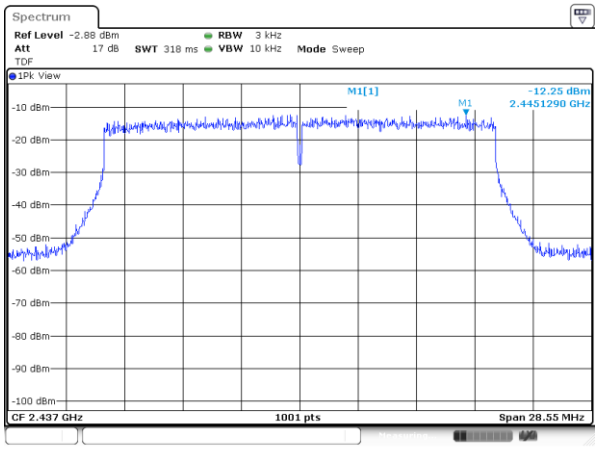
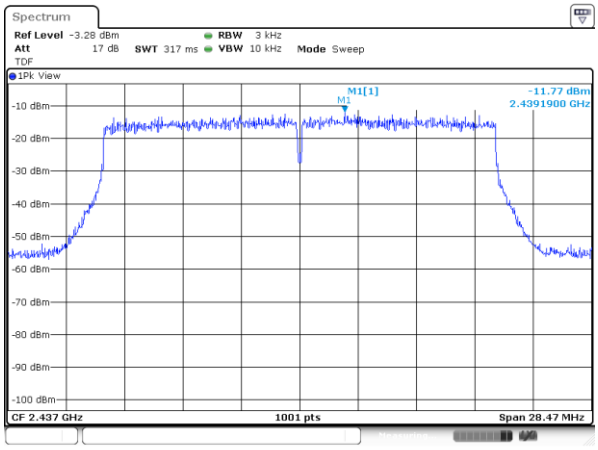
	
SU / 2 437 ㎒	
ANT 1	**ANT 2**
	

26T / 2 462 ㎒	
ANT 1	**ANT 2**
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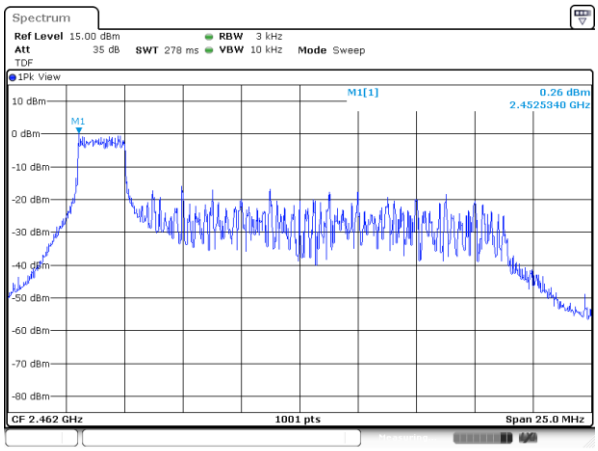	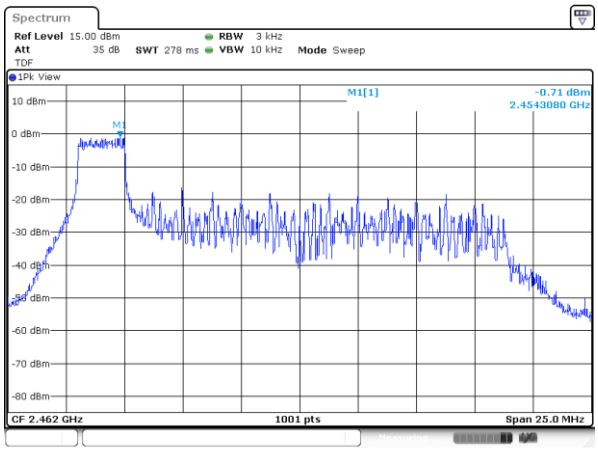
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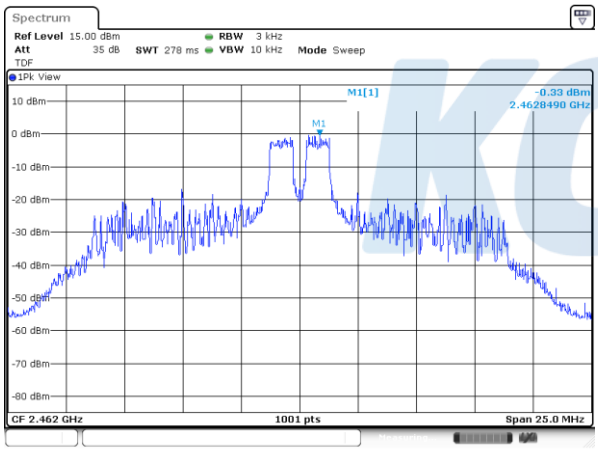	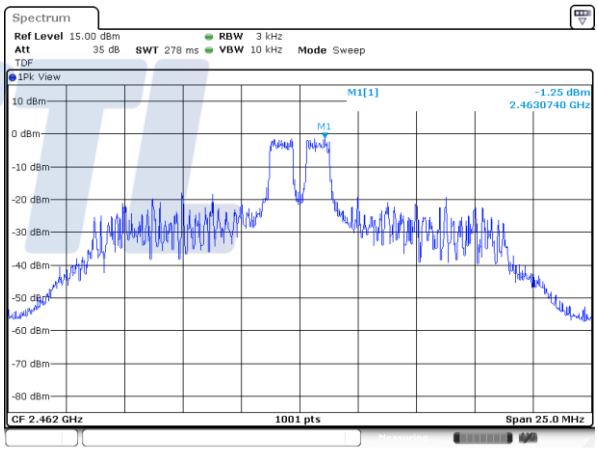
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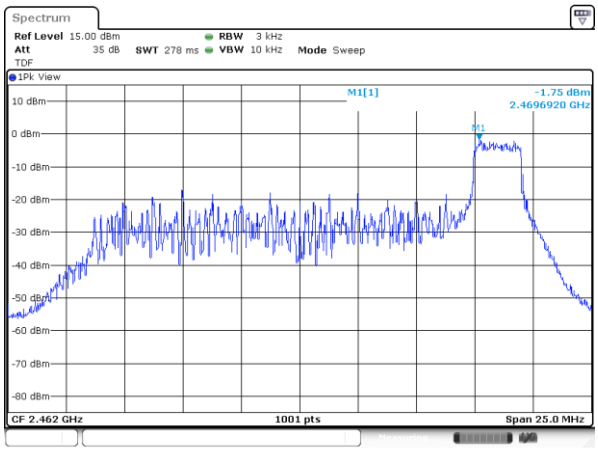
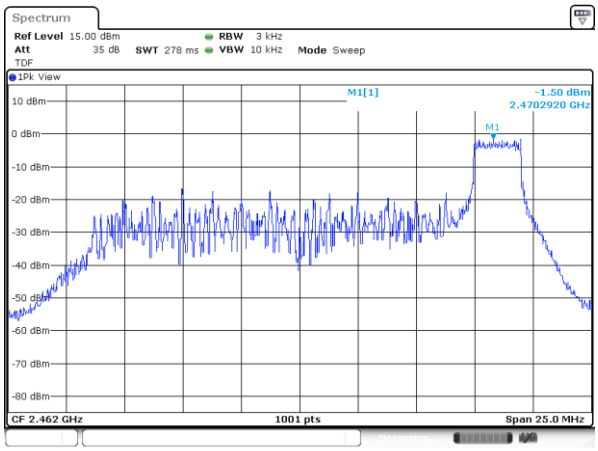
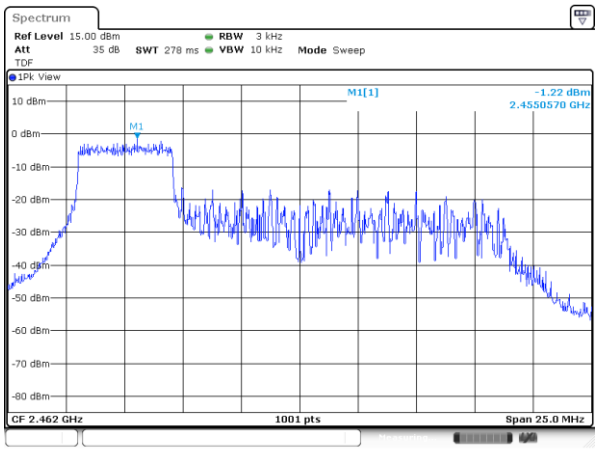
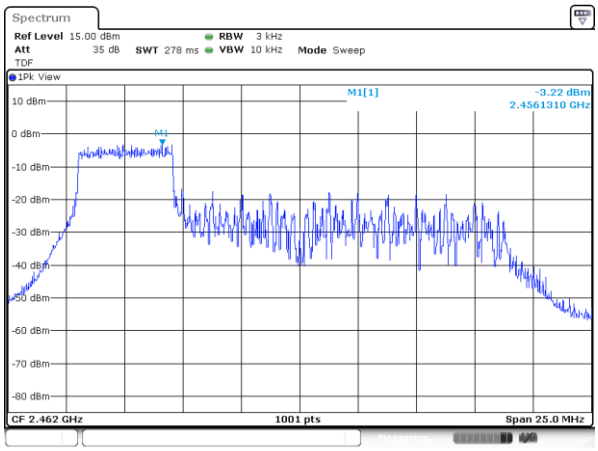
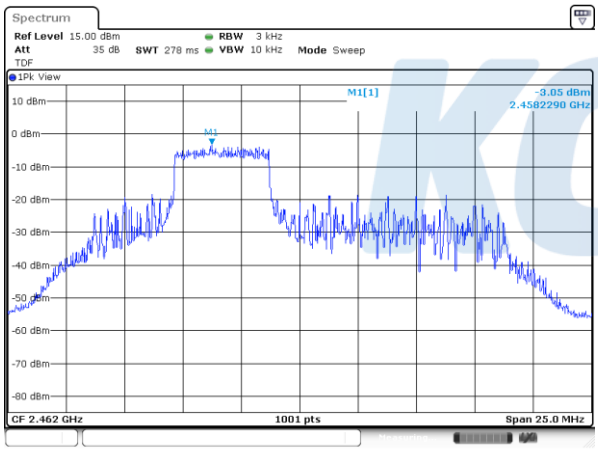
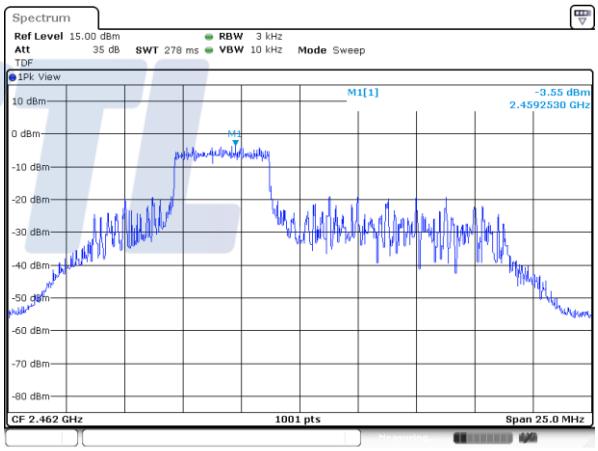
	

52T / 2 462 ㎒	
ANT 1	**ANT 2**
RU offset 37	**RU offset 37**
	
RU offset 38	**RU offset 38**
	
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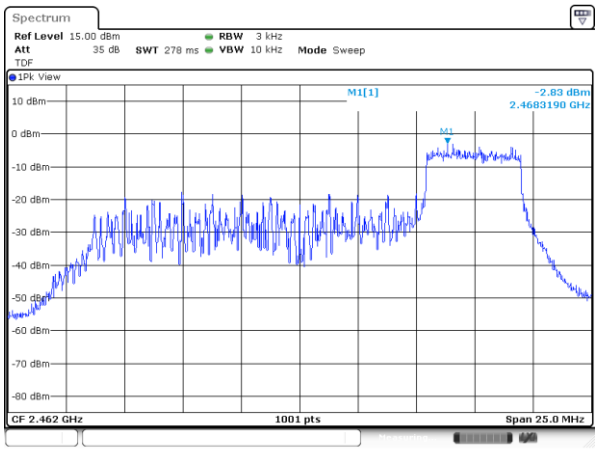
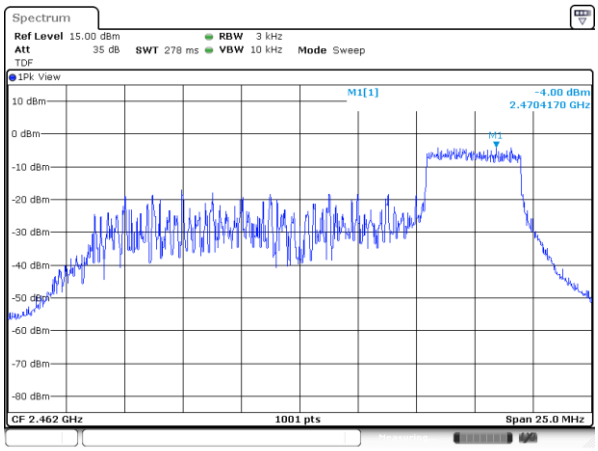
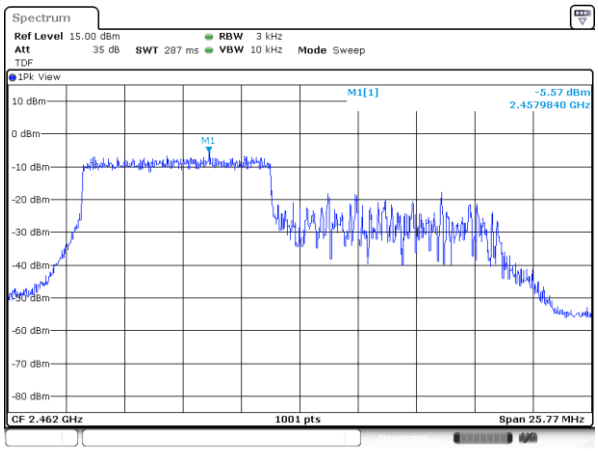
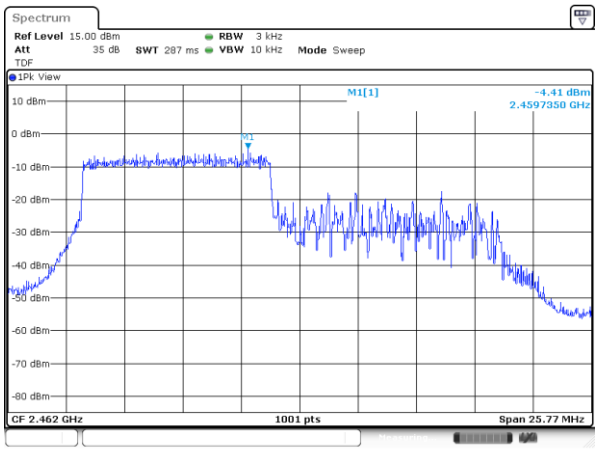
	

106T / 2 462 ㎒	
ANT 1	**ANT 2**
RU offset 53	**RU offset 53**
	
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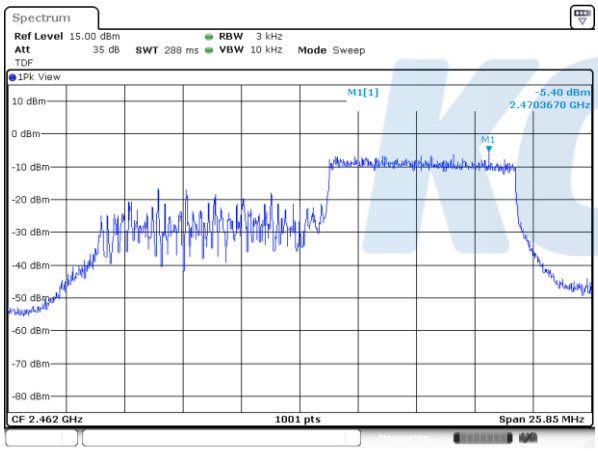
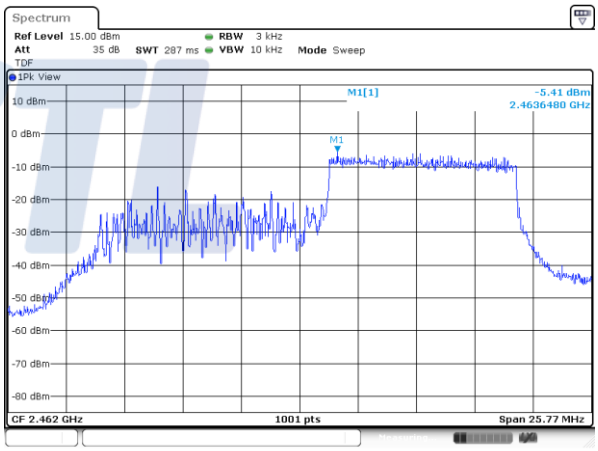
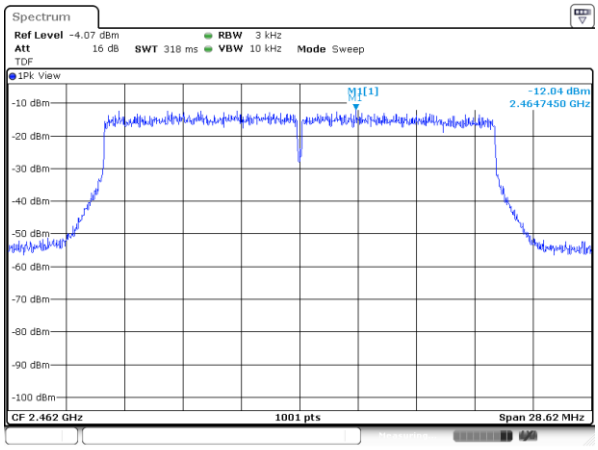
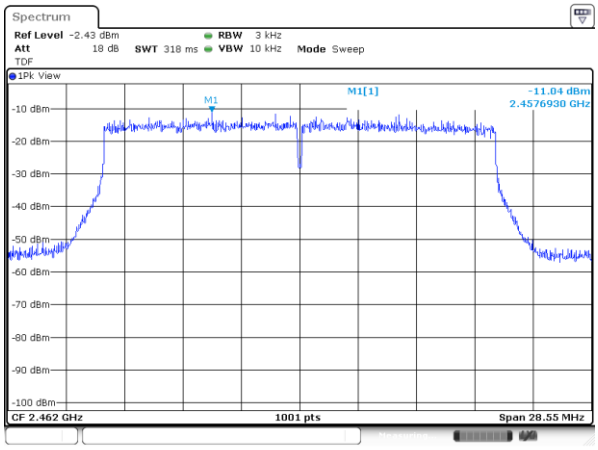
	
SU / 2 462 ㎒	
ANT 1	**ANT 2**
	

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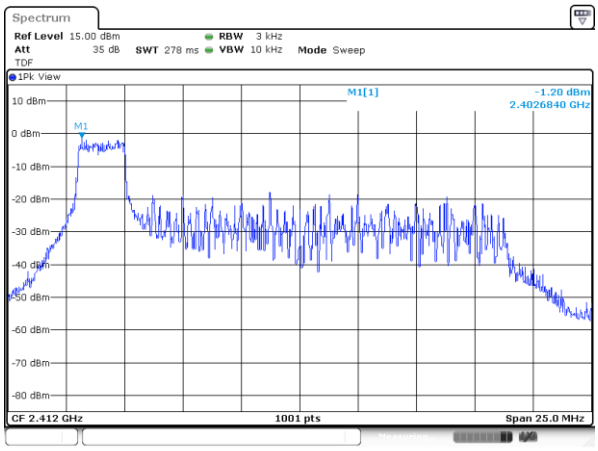
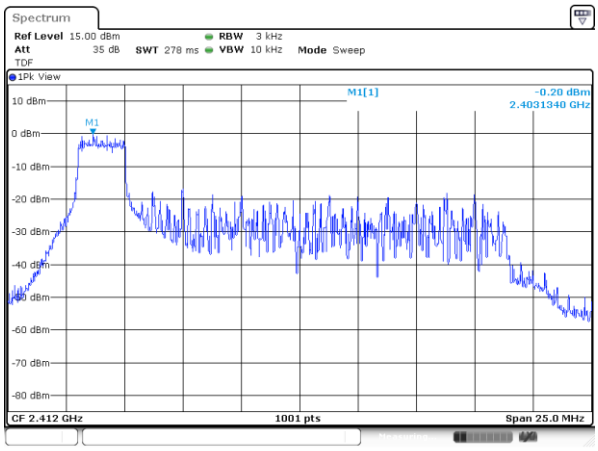
26T / 2 412 ㎒	
ANT 1	**ANT 2**
RU offset 0	**RU offset 0**
	
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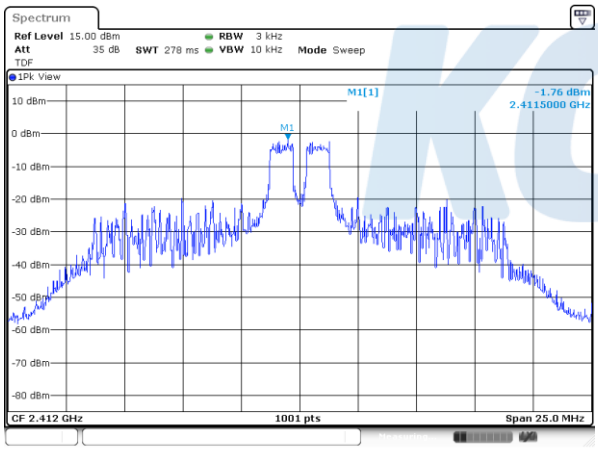	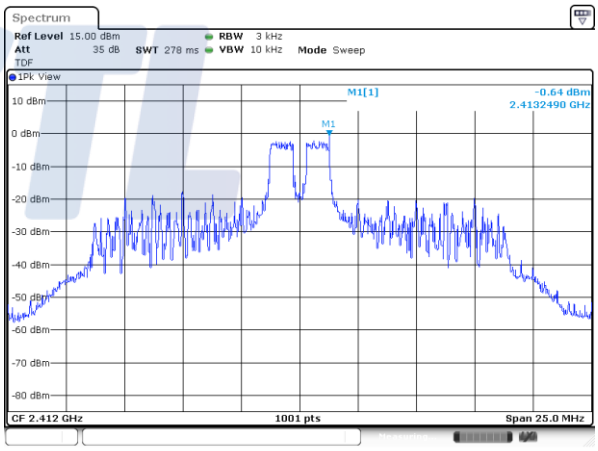
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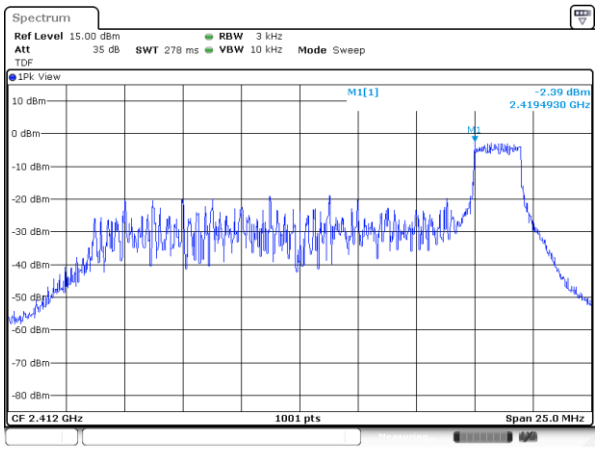
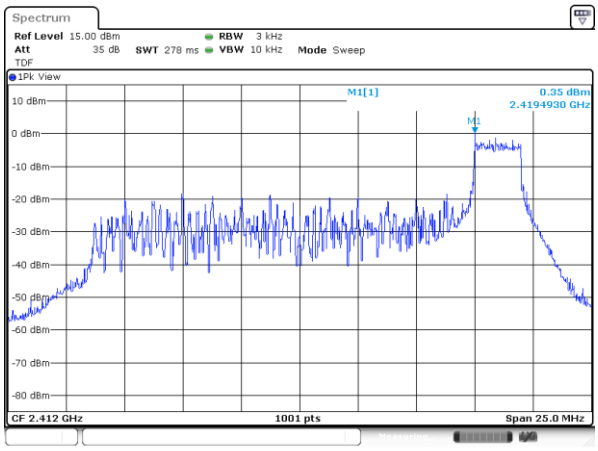
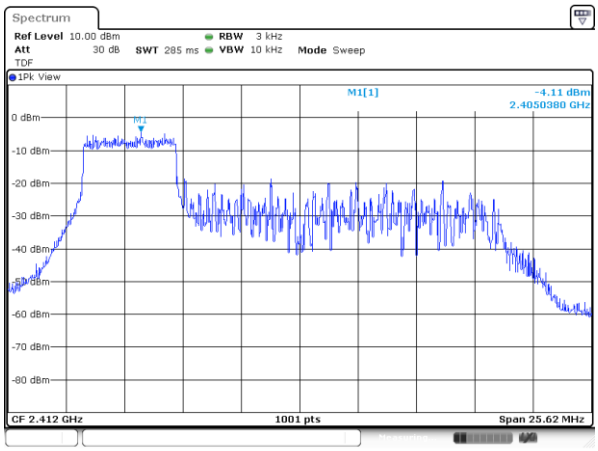
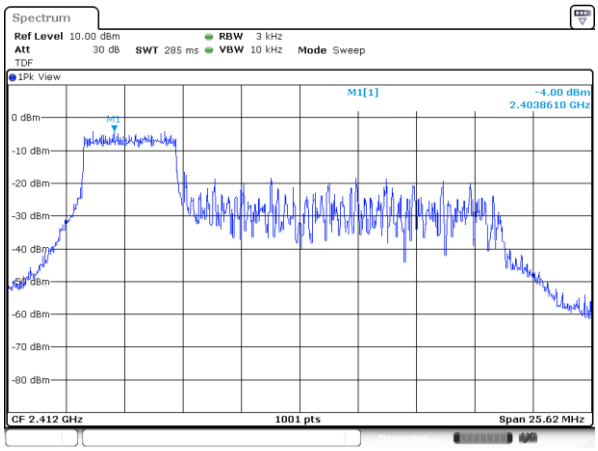
	

52T / 2 412 ㎒	
ANT 1	**ANT 2**
RU offset 37	**RU offset 37**
	
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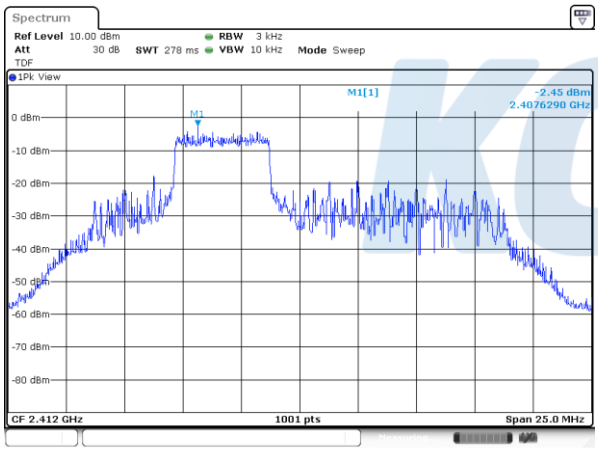
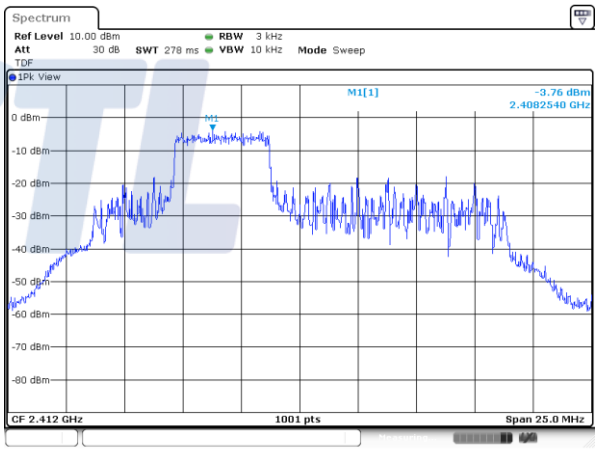
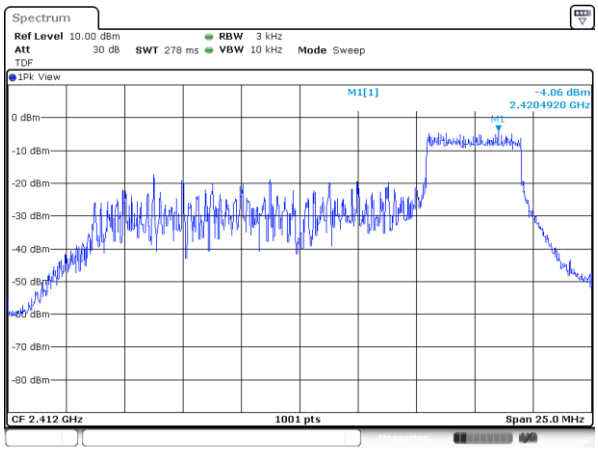
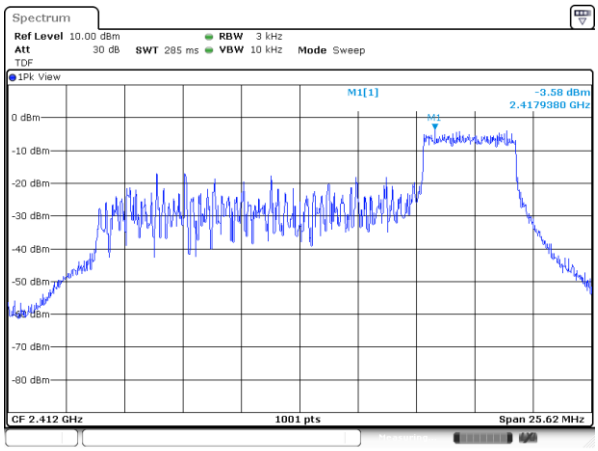
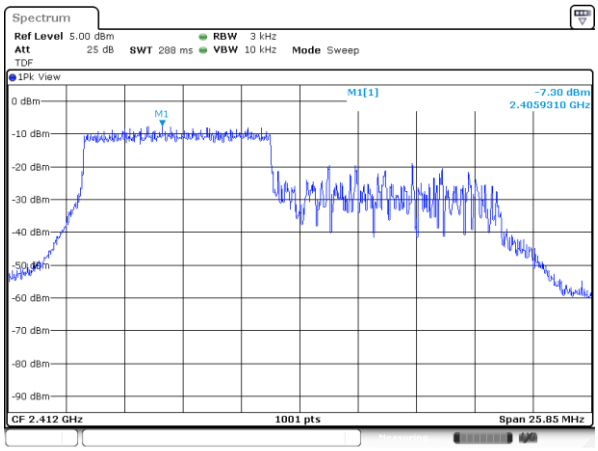
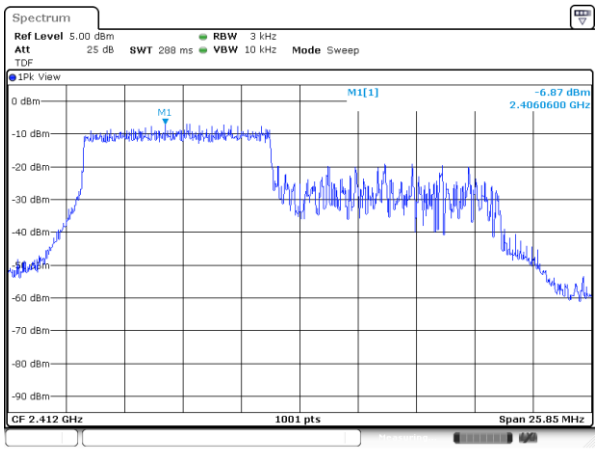
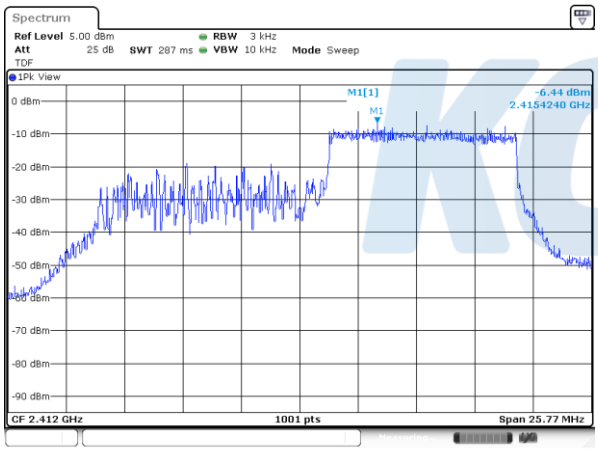
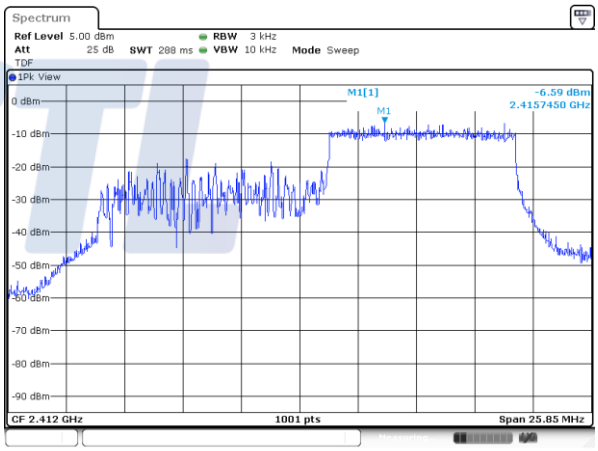
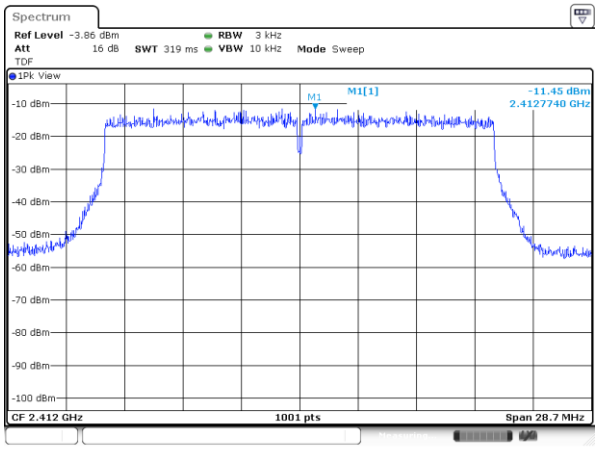
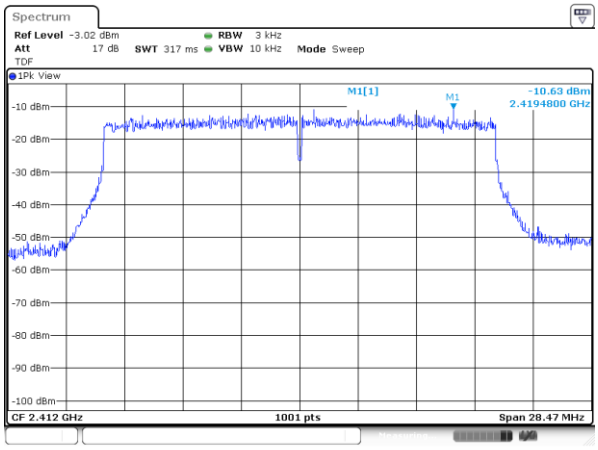
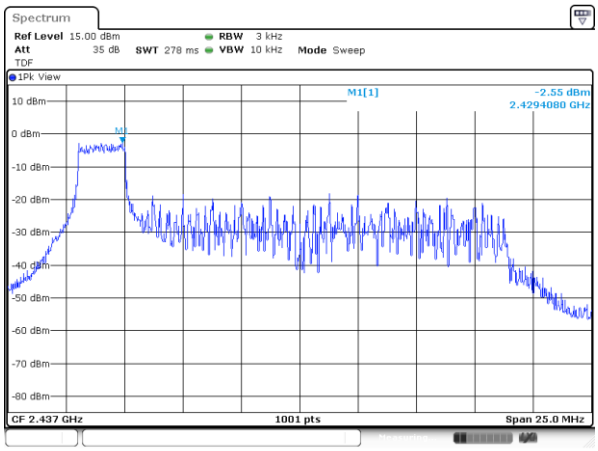
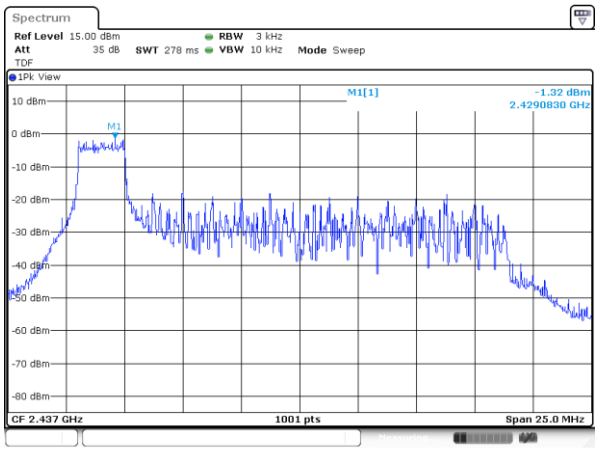
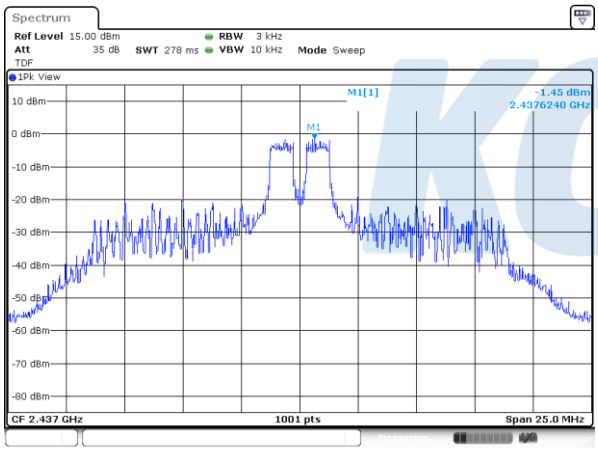
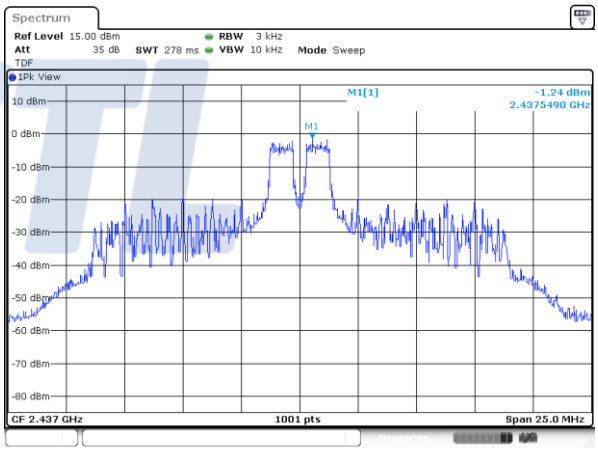
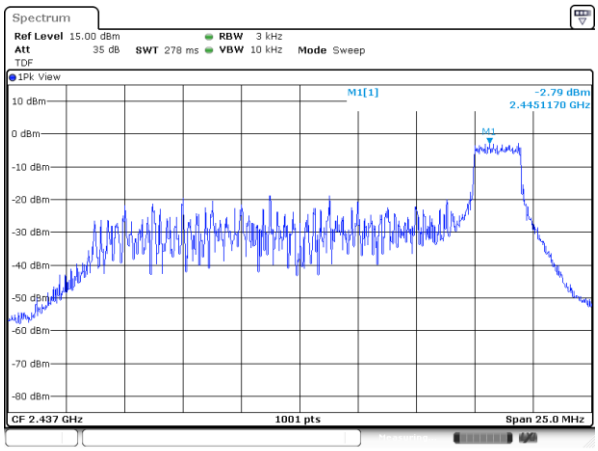
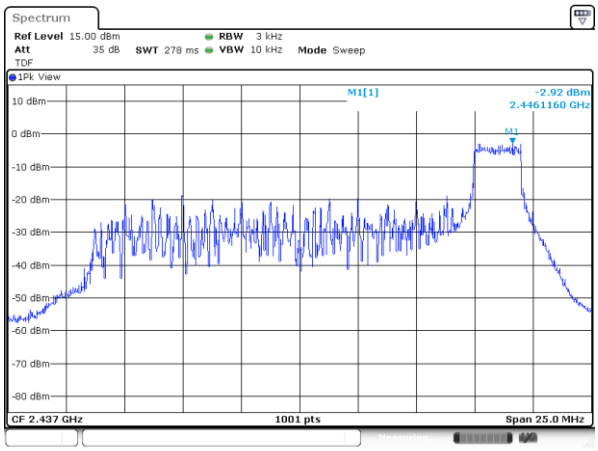
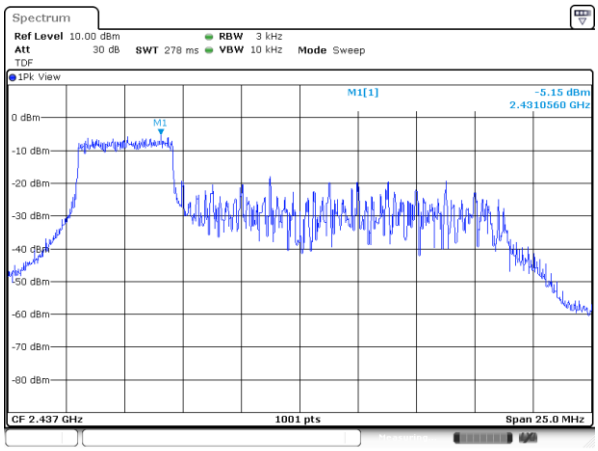
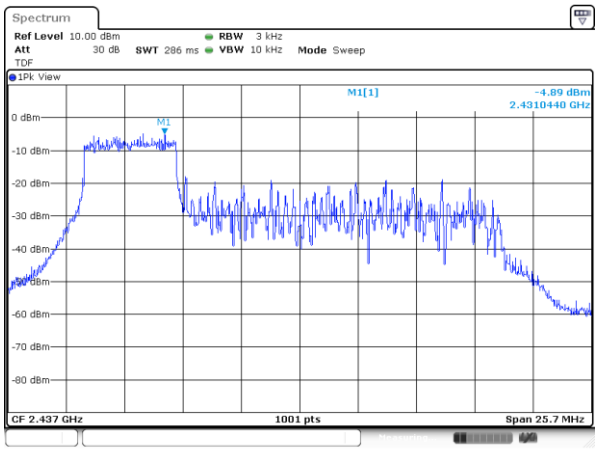
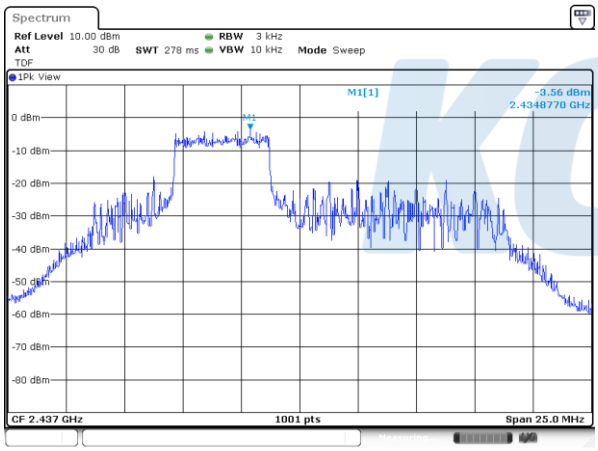
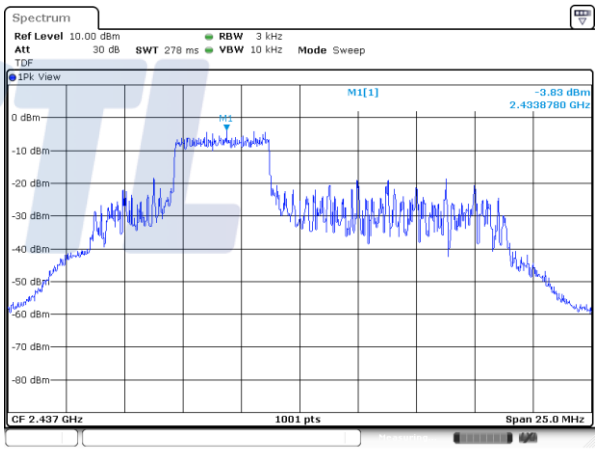
	
RU offset 40	**RU offset 40**
	

106T / 2 412 ㎒	
ANT 1	**ANT 2**
RU offset 53	**RU offset 53**
	
RU offset 54	**RU offset 54**
	
SU / 2 412 ㎒	
ANT 1	**ANT 2**
	

26T / 2 437 ㎒	
ANT 1	**ANT 2**
RU offset 0	**RU offset 0**
	
RU offset 4	**RU offset 4**
	
RU offset 8	**RU offset 8**
	

52T / 2 437 ㎒	
ANT 1	**ANT 2**
RU offset 37	**RU offset 37**
	
RU offset 38	**RU offset 38**
	
RU offset 40	**RU offset 40**