

FCC AND IC CERTIFICATION TEST REPORT

FOR

Applicant	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	SOUNDBAR
Model No.	:	BAR 9.1 CNTR
Trade Mark	:	JBL
FCC ID	:	APIBAR91CNTR
IC	:	6132A-BAR91CNTR
Manufacturer	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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REPORT

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TEST REPORT DECLARE

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Trade Mark	:	JBL
Manufacturer	:	Harman International Industries, Inc.
Address	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 2 February 2017.

Test procedure used: ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New Rules v02r01, RSS-Gen Issue 5, Apr. 2018, 662911 D01 Multiple Transmitter Output v02r01

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&IC standards.

Report No:	DDT-R19080513-1E7		
Date of Receipt:	Sep. 04, 2019	Date of Test:	Sep. 04, 2019 ~ Nov. 25, 2019

Prepared By:

Sam Li

Sam Li/Engineer

Approved By:



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision history

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Nov. 25, 2019	

1. Summary of test results

The EUT have been tested according to the applicable standards as referenced below.

Description of Test Item	Standard	Results
6/26db Bandwidth and 99% Bandwidth	FCC 15.407 (e) RSS-247 Clause 6.2	PASS
Maximum Conducted Output Power	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
Power Spectral Density	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
Frequency Stability Measurement	FCC 15.407 (g)	PASS
Emissions in restricted frequency bands	FCC 15.407 (a) FCC 15.209 FCC 15.205 RSS-247 Clause 6.2 RSS-GEN Clause 8.9	PASS
Band Edge Compliance	FCC 15.407 (a) FCC 15.209 FCC 15.205 RSS-247 Clause 6.2 RSS-GEN Clause 8.9	PASS
Power Line Conducted Emission	FCC 15.207 RSS-GEN Clause 8.8	PASS
Antenna requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS
Dynamic Frequency Selection	FCC 15.407 (h) RSS-247 Clause 6.3	PASS

2. General test information

2.1. Description of EUT

EUT* Name	: SOUNDBAR
Model Number	: BAR 9.1 CNTR
EUT function description	: Please reference user manual of this device
Power supply	: 100-240V~, 50/60Hz, 175W
Radio Technology	: IEEE 802.11a/n/ac
FCC Operation frequency	: IEEE 802.11a: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz IEEE 802.11n HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz IEEE 802.11n HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5670MHz, 5755MHz-5755MHz IEEE 802.11ac HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz IEEE 802.11ac HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5670MHz, 5755MHz-5755MHz IEEE 802.11ac HT80: 5210MHz, 5290MHz, 5530MHz, 5775MHz
Modulation	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Transmitter rate	: IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130.0, 144.4 Mbps IEEE 802.11n HT40: 30, 60, 90, 120, 180, 240, 270, 300 Mbps IEEE 802.11ac HT20: 14.4, 28.8, 43.4, 57.8, 86.6, 115.6, 130, 144.4, 173.4 Mbps IEEE 802.11ac HT40: 30, 60, 90, 120, 180, 240, 270, 300, 360, 400 Mbps IEEE 802.11ac HT80: 65, 130, 195, 260, 390, 520, 585, 650, 780, 866.6 Mbps
Antenna Type	: Antenna 1: External FPC antenna, maximum PK gain: 3.67 dBi Antenna 2: External FPC antenna, maximum PK gain: 3.69 dBi
Sample Type	: Series production

Note: EUT is the ab. of equipment under test.

Antenna information			
	Ant1 gain	Ant2 gain	MIMO
IEEE 802.11a	3.67	3.69	/
IEEE 802.11n HT20	3.67	3.69	6.69
IEEE 802.11n HT40	3.67	3.69	6.69
IEEE 802.11ac VHT20	3.67	3.69	6.69
IEEE 802.11ac VHT40	3.67	3.69	6.69
IEEE 802.11ac VHT80	3.67	3.69	6.69

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
AC Cable	Harman	N/A	1.5 m long, unshielded, non-magnetic ring	2 pcs
HDMI Cable	Harman	N/A	1.2 m long, unshielded, With two magnetic rings	N/A
Remote control	Harman	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
Notebook	Lenovo Beijing Co. Ltd.	ThinkPad	FCC/CE	TP00015A
Wireless LAN Access Point	HUAWEI	AP6050	21500829352SC5000371	FCC ID: QISAP6050DN6150DN

2.4. Block diagram of EUT configuration for test



Run a special test software “MtkTool.exe” provided by manufacturer to control EUT work in Continuous Tx mode, and select test channel, wireless mode and data rate.

Tested mode, channel, and data rate information				
Mode	Setting Tx Power	data rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11a	14	6	Low: CH36	5180
	14	6	Middle: CH40	5200
	14	6	High: CH48	5240
	14	6	Low: CH52	5260
	14	6	Middle: CH56	5280
	14	6	High: CH64	5320
	14	6	Low: CH100	5500
	14	6	Middle: CH116	5580
	14	6	High: CH140	5700
	14	6	Low: CH149	5745
	14	6	Middle: CH157	5785
	14	6	High: CH165	5825
IEEE 802.11n HT20	13	MCS 8	Low: CH36	5180
	13	MCS 8	Middle: CH40	5200
	13	MCS 8	High: CH48	5240
	13	MCS 8	Low: CH52	5260
	13	MCS 8	Middle: CH56	5280
	13	MCS 8	High: CH64	5320
	13	MCS 8	Low: CH100	5500
	13	MCS 8	Middle: CH116	5580
	13	MCS 8	High: CH140	5700
	13	MCS 8	Low: CH149	5745
	13	MCS 8	Middle: CH157	5785
	13	MCS 8	High: CH165	5825
IEEE 802.11n HT40	14	MCS 8	Low: CH38	5190
	14	MCS 8	Middle: CH46	5230
	14	MCS 8	High: CH54	5270
	14	MCS 8	Low: CH62	5310
	14	MCS 8	Middle: CH102	5510
	14	MCS 8	High: CH110	5550
	14	MCS 8	Low: CH134	5670
	14	MCS 8	Middle: CH151	5755
	14	MCS 8	High: CH159	5795
IEEE 802.11ac HT20	12	MCS 8	Low: CH36	5180
	12	MCS 8	Middle: CH40	5200
	12	MCS 8	High: CH48	5240
	12	MCS 8	Low: CH52	5260
	12	MCS 8	Middle: CH56	5280
	12	MCS 8	High: CH64	5320
	12	MCS 8	Low: CH100	5500
	12	MCS 8	Middle: CH116	5580
	12	MCS 8	High: CH140	5700
	12	MCS 8	Low: CH149	5745
	12	MCS 8	Middle: CH157	5785
	12	MCS 8	High: CH165	5825

IEEE 802.11ac HT40	14	MCS 8	Low: CH38	5190
	14	MCS 8	Middle: CH46	5230
	14	MCS 8	High: CH54	5270
	14	MCS 8	Low: CH62	5310
	14	MCS 8	Middle: CH102	5510
	14	MCS 8	High: CH110	5550
	14	MCS 8	Low: CH134	5670
	14	MCS 8	Middle: CH151	5755
	14	MCS 8	High: CH159	5795
IEEE 802.11ac HT80	15	MCS 8	CH42	5210
	15	MCS 8	CH58	5290
	15	MCS 8	CH106	5530
	15	MCS 8	CH155	5775

Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

2.5. Deviations of test standard

No Deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25°C
Humidity range:	40-75%
Pressure range:	86-106 kPa

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

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CNAS Accreditation No. L6451; A2LA Accreditation No. 3870.01

Designation Number: CN1182; Test Firm Registration Number: 540522

Industry Canada site registration number: 10288A-1

2.8. Measurement uncertainty

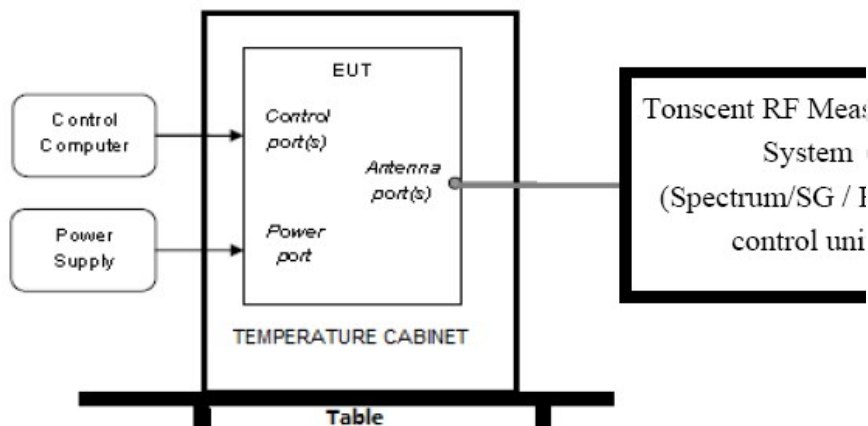
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method) 5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.40 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$) 1.66 dB ($8 \text{ GHz} \leq f < 22 \text{ GHz}$)
Uncertainty for radio frequency (RBW<20kHz)	3×10^{-8}
Temperature	0.4 °C
Humidity	2%
Uncertainty for Radiation Emission test (30MHz-1GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz-40GHz)	4.10 dB (1-6 GHz) 4.40 dB (6 GHz-18 GHz) 3.54 dB (18 GHz-26 GHz) 4.30 dB (26 GHz-40 GHz)
Uncertainty for Power line conduction emission test	3.32 dB (150 kHz-30 MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment used during test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test (Tonscend RF Measurement System)					
Spectrum analyzer	R&S	FSU26	200071	Sep. 29, 2019	1 Year
Wideband Radio Communication tester	R&S	CMW500	117491	Jun. 25, 2019	1 Year
Vector Signal Generator	Agilent	E8267D	US49060192	Sep. 29, 2019	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180737	Jun. 25, 2019	1 Year
Power Sensor	Agilent	U2021XA	MY55150010	Jun. 28, 2019	1 Year
Power Sensor	Agilent	U2021XA	MY55150011	Jun. 28, 2019	1 Year
DC Power Source	MATRIS	MPS-3005L-3	D813058W	Jun. 25, 2019	1 Year
RF Cable	Micable	C10-01-01-1	100309	Sep. 29, 2019	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	Oct. 21, 2019	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.2.7	N/A	N/A
Radiation 1#chamber					
EMI Test Receiver	R&S	ESU8	100316	Sep. 29, 2019	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	Jun. 25, 2019	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	Nov. 15, 2019	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2019	1 Year
Double Ridged Horn Antenna	R&S	HF907	100276	Nov. 15, 2019	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	Sep. 29, 2019	1 Year
Pre-amplifier	A.H.	PAM-0118	360	Sep. 29, 2019	1 Year
Pre-amplifier	TERA-MW	TRLA-0040 G35	101303	Sep. 29, 2019	1 Year
RF Cable	HUBSER	CP-X2+ CP-X1	W11.03+ W12.02	Sep. 29, 2019	1 Year
RF Cable	N/A	5m+6m+1m	06270619	Sep. 29, 2019	1 Year
MI Cable	HUBSER	C10-01-01-1 M	1091629	Sep. 29, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Power Line Conducted Emissions Test					
EMI Test Receiver	R&S	ESU8	100316	Sep. 29, 2019	1 Year
LISN 1	R&S	ENV216	101109	Sep. 29, 2019	1 Year
LISN 2	R&S	ESH2-Z5	100309	Sep. 29, 2019	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Sep. 29, 2019	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Sep. 29, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A

4. 26dB Bandwidth, 6dB Bandwidth and 99% Bandwidth

4.1. Block diagram of test setup



4.2. Limits

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
Bandwidth	26 dB Bandwidth	5150-5250
	26 dB Bandwidth	5250-5350
	26 dB Bandwidth	For FCC:5470-5725 For IC:5470-5600 5650-5725
	Minimum 500kHz 6dB Bandwidth	5725-5850

4.3. Test Procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth: RBW=100 kHz For 26 dB Bandwidth: approximately 1% of the emission bandwidth.
VBW	For 6 dB Bandwidth: VBW=300 kHz For 26 dB Bandwidth: >3 RBW
Trace	Max hold
Sweep	Auto couple

(2) Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB and 6 dB relative to the maximum level measured in the fundamental emission.

4.4. Test Result

99% Bandwidth

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.36	5171.280	5188.640	---	PASS
	Ant2	5180	17.4	5171.240	5188.640	---	PASS
	Ant1	5200	17.32	5191.320	5208.640	---	PASS
	Ant2	5200	17.44	5191.240	5208.680	---	PASS
	Ant1	5240	17.32	5231.320	5248.640	---	PASS
	Ant2	5240	17.44	5231.200	5248.640	---	PASS
	Ant1	5260	17.36	5251.280	5268.640	---	PASS
	Ant2	5260	17.4	5251.240	5268.640	---	PASS
	Ant1	5280	17.52	5271.240	5288.760	---	PASS
	Ant2	5280	17.36	5271.280	5288.640	---	PASS
	Ant1	5320	17.44	5311.200	5328.640	---	PASS
	Ant2	5320	17.36	5311.280	5328.640	---	PASS
	Ant1	5500	17.4	5491.280	5508.680	---	PASS
	Ant2	5500	17.44	5491.280	5508.720	---	PASS
	Ant1	5580	17.44	5571.200	5588.640	---	PASS
	Ant2	5580	17.44	5571.200	5588.640	---	PASS
	Ant1	5700	17.4	5691.160	5708.560	---	PASS
	Ant2	5700	17.52	5691.200	5708.720	---	PASS
	Ant1	5745	17.4	5736.320	5753.720	---	PASS
	Ant2	5745	17.44	5736.200	5753.640	---	PASS
	Ant1	5785	17.56	5776.160	5793.720	---	PASS
	Ant2	5785	17.4	5776.280	5793.680	---	PASS
	Ant1	5825	17.44	5816.160	5833.600	---	PASS
	Ant2	5825	17.52	5816.200	5833.720	---	PASS
11N20MIMO	Ant1	5180	17.96	5171.000	5188.960	---	PASS
	Ant2	5180	18.16	5170.960	5189.120	---	PASS
	Ant1	5200	17.88	5191.080	5208.960	---	PASS
	Ant2	5200	18.08	5191.000	5209.080	---	PASS
	Ant1	5240	18	5231.000	5249.000	---	PASS
	Ant2	5240	18.12	5231.040	5249.160	---	PASS
	Ant1	5260	17.92	5251.080	5269.000	---	PASS
	Ant2	5260	18.16	5250.960	5269.120	---	PASS
	Ant1	5280	17.84	5271.080	5288.920	---	PASS
	Ant2	5280	18.16	5270.960	5289.120	---	PASS
	Ant1	5320	17.84	5311.120	5328.960	---	PASS
	Ant2	5320	18.08	5311.000	5329.080	---	PASS
	Ant1	5500	17.84	5491.120	5508.960	---	PASS
	Ant2	5500	18.04	5491.040	5509.080	---	PASS
	Ant1	5580	17.92	5571.040	5588.960	---	PASS
	Ant2	5580	18.12	5570.960	5589.080	---	PASS
	Ant1	5700	18	5691.000	5709.000	---	PASS
	Ant2	5700	18.08	5690.920	5709.000	---	PASS
	Ant1	5745	17.92	5736.040	5753.960	---	PASS
	Ant2	5745	18.12	5736.040	5754.160	---	PASS
	Ant1	5785	17.84	5776.120	5793.960	---	PASS
	Ant2	5785	18.24	5775.880	5794.120	---	PASS
	Ant1	5825	17.92	5816.040	5833.960	---	PASS

	Ant2	5825	18.24	5815.840	5834.080	---	PASS
11N40MIMO	Ant1	5190	36.72	5171.600	5208.320	---	PASS
	Ant2	5190	36.8	5171.600	5208.400	---	PASS
	Ant1	5230	36.64	5211.600	5248.240	---	PASS
	Ant2	5230	36.88	5211.680	5248.560	---	PASS
	Ant1	5270	36.56	5251.680	5288.240	---	PASS
	Ant2	5270	36.72	5251.600	5288.320	---	PASS
	Ant1	5310	36.64	5291.680	5328.320	---	PASS
	Ant2	5310	36.72	5291.680	5328.400	---	PASS
	Ant1	5510	36.72	5491.680	5528.400	---	PASS
	Ant2	5510	36.72	5491.760	5528.480	---	PASS
	Ant1	5550	36.8	5531.600	5568.400	---	PASS
	Ant2	5550	36.8	5531.600	5568.400	---	PASS
	Ant1	5670	36.48	5651.760	5688.240	---	PASS
	Ant2	5670	37.04	5651.520	5688.560	---	PASS
	Ant1	5755	36.72	5736.600	5773.320	---	PASS
	Ant2	5755	36.64	5736.760	5773.400	---	PASS
	Ant1	5795	36.64	5776.680	5813.320	---	PASS
	Ant2	5795	37.12	5776.280	5813.400	---	PASS
11AC20MIMO	Ant1	5180	18	5171.040	5189.040	---	PASS
	Ant2	5180	18.08	5171.040	5189.120	---	PASS
	Ant1	5200	18	5191.000	5209.000	---	PASS
	Ant2	5200	18.08	5191.000	5209.080	---	PASS
	Ant1	5240	18.04	5230.960	5249.000	---	PASS
	Ant2	5240	18.04	5231.080	5249.120	---	PASS
	Ant1	5260	18	5251.000	5269.000	---	PASS
	Ant2	5260	18.08	5251.000	5269.080	---	PASS
	Ant1	5280	17.96	5271.000	5288.960	---	PASS
	Ant2	5280	18.12	5271.000	5289.120	---	PASS
	Ant1	5320	18	5311.040	5329.040	---	PASS
	Ant2	5320	18.12	5311.000	5329.120	---	PASS
	Ant1	5500	18	5491.040	5509.040	---	PASS
	Ant2	5500	18.12	5491.000	5509.120	---	PASS
	Ant1	5580	18.04	5570.960	5589.000	---	PASS
	Ant2	5580	18.12	5570.960	5589.080	---	PASS
	Ant1	5700	18.08	5690.960	5709.040	---	PASS
	Ant2	5700	18.04	5690.960	5709.000	---	PASS
	Ant1	5745	18	5736.000	5754.000	---	PASS
	Ant2	5745	18.04	5736.080	5754.120	---	PASS
	Ant1	5785	18	5776.040	5794.040	---	PASS
	Ant2	5785	18.08	5776.000	5794.080	---	PASS
	Ant1	5825	18.04	5815.960	5834.000	---	PASS
	Ant2	5825	18.08	5815.960	5834.040	---	PASS
11AC40MIMO	Ant1	5190	36.64	5171.600	5208.240	---	PASS
	Ant2	5190	36.64	5171.680	5208.320	---	PASS
	Ant1	5230	36.64	5211.600	5248.240	---	PASS
	Ant2	5230	36.8	5211.680	5248.480	---	PASS
	Ant1	5270	36.56	5251.760	5288.320	---	PASS
	Ant2	5270	36.64	5251.600	5288.240	---	PASS
	Ant1	5310	36.64	5291.760	5328.400	---	PASS
	Ant2	5310	36.8	5291.600	5328.400	---	PASS

	Ant1	5510	36.72	5491.680	5528.400	---	PASS
	Ant2	5510	36.72	5491.680	5528.400	---	PASS
	Ant1	5550	36.96	5531.600	5568.560	---	PASS
	Ant2	5550	36.64	5531.680	5568.320	---	PASS
	Ant1	5670	36.88	5651.600	5688.480	---	PASS
	Ant2	5670	36.64	5651.760	5688.400	---	PASS
	Ant1	5755	36.8	5736.440	5773.240	---	PASS
	Ant2	5755	36.56	5736.680	5773.240	---	PASS
	Ant1	5795	36.8	5776.600	5813.400	---	PASS
	Ant2	5795	36.48	5776.680	5813.160	---	PASS
11AC80MIMO	Ant1	5210	76.8	5171.920	5248.720	---	PASS
	Ant2	5210	76.64	5171.440	5248.080	---	PASS
	Ant1	5290	76.96	5251.760	5328.720	---	PASS
	Ant2	5290	76.48	5251.600	5328.080	---	PASS
	Ant1	5530	76.96	5491.760	5568.720	---	PASS
	Ant2	5530	76.64	5491.600	5568.240	---	PASS
	Ant1	5610	76.48	5571.600	5648.080	---	PASS
	Ant2	5610	76.16	5571.760	5647.920	---	PASS
	Ant1	5775	77.12	5736.440	5813.560	---	PASS
	Ant2	5775	76.48	5736.600	5813.080	---	PASS

26db EBW

TestMode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.800	5170.080	5189.880	---	PASS
	Ant2	5180	20.080	5169.840	5189.920	---	PASS
	Ant1	5200	19.920	5190.040	5209.960	---	PASS
	Ant2	5200	19.920	5190.080	5210.000	---	PASS
	Ant1	5240	19.920	5230.120	5250.040	---	PASS
	Ant2	5240	20.000	5230.040	5250.040	---	PASS
	Ant1	5260	19.960	5250.080	5270.040	---	PASS
	Ant2	5260	20.040	5250.000	5270.040	---	PASS
	Ant1	5280	20.200	5269.960	5290.160	---	PASS
	Ant2	5280	19.880	5270.080	5289.960	---	PASS
	Ant1	5320	21.320	5308.880	5330.200	---	PASS
	Ant2	5320	20.040	5310.000	5330.040	---	PASS
	Ant1	5500	20.200	5489.960	5510.160	---	PASS
	Ant2	5500	20.080	5490.120	5510.200	---	PASS
	Ant1	5580	20.320	5569.840	5590.160	---	PASS
	Ant2	5580	20.320	5569.880	5590.200	---	PASS
	Ant1	5700	20.480	5689.760	5710.240	---	PASS
	Ant2	5700	20.280	5689.880	5710.160	---	PASS
	Ant1	5745	20.200	5735.040	5755.240	---	PASS
	Ant2	5745	20.280	5734.880	5755.160	---	PASS
	Ant1	5785	22.440	5772.840	5795.280	---	PASS
	Ant2	5785	20.400	5774.840	5795.240	---	PASS
	Ant1	5825	20.600	5814.640	5835.240	---	PASS
	Ant2	5825	20.520	5814.720	5835.240	---	PASS
11N20MIMO	Ant1	5180	20.240	5169.920	5190.160	---	PASS
	Ant2	5180	20.240	5169.960	5190.200	---	PASS
	Ant1	5200	20.440	5189.760	5210.200	---	PASS

	Ant2	5200	20.440	5189.840	5210.280	---	PASS
	Ant1	5240	20.280	5229.880	5250.160	---	PASS
	Ant2	5240	20.160	5230.040	5250.200	---	PASS
	Ant1	5260	20.200	5249.960	5270.160	---	PASS
	Ant2	5260	20.200	5249.960	5270.160	---	PASS
	Ant1	5280	20.200	5269.880	5290.080	---	PASS
	Ant2	5280	20.320	5269.880	5290.200	---	PASS
	Ant1	5320	20.160	5310.040	5330.200	---	PASS
	Ant2	5320	20.200	5309.960	5330.160	---	PASS
	Ant1	5500	20.040	5490.040	5510.080	---	PASS
	Ant2	5500	20.200	5489.960	5510.160	---	PASS
	Ant1	5580	20.200	5569.920	5590.120	---	PASS
	Ant2	5580	20.280	5569.880	5590.160	---	PASS
	Ant1	5700	20.280	5689.840	5710.120	---	PASS
	Ant2	5700	20.200	5689.880	5710.080	---	PASS
	Ant1	5745	20.160	5734.920	5755.080	---	PASS
	Ant2	5745	20.760	5735.080	5755.840	---	PASS
	Ant1	5785	20.200	5774.920	5795.120	---	PASS
	Ant2	5785	22.440	5773.320	5795.760	---	PASS
	Ant1	5825	20.240	5814.840	5835.080	---	PASS
	Ant2	5825	22.960	5813.280	5836.240	---	PASS
11N40MIMO	Ant1	5190	40.560	5169.680	5210.240	---	PASS
	Ant2	5190	41.280	5169.360	5210.640	---	PASS
	Ant1	5230	40.640	5209.680	5250.320	---	PASS
	Ant2	5230	41.440	5209.360	5250.800	---	PASS
	Ant1	5270	40.480	5249.760	5290.240	---	PASS
	Ant2	5270	41.440	5249.360	5290.800	---	PASS
	Ant1	5310	40.720	5289.600	5330.320	---	PASS
	Ant2	5310	41.280	5289.440	5330.720	---	PASS
	Ant1	5510	40.560	5489.760	5530.320	---	PASS
	Ant2	5510	41.280	5489.440	5530.720	---	PASS
	Ant1	5550	40.720	5529.680	5570.400	---	PASS
	Ant2	5550	41.360	5529.440	5570.800	---	PASS
	Ant1	5670	40.480	5649.840	5690.320	---	PASS
	Ant2	5670	46.080	5649.200	5695.280	---	PASS
	Ant1	5755	40.560	5734.680	5775.240	---	PASS
	Ant2	5755	42.080	5734.360	5776.440	---	PASS
	Ant1	5795	40.400	5774.840	5815.240	---	PASS
	Ant2	5795	47.280	5768.280	5815.560	---	PASS
11AC20MIMO	Ant1	5180	20.240	5169.880	5190.120	---	PASS
	Ant2	5180	20.280	5169.880	5190.160	---	PASS
	Ant1	5200	20.280	5189.880	5210.160	---	PASS
	Ant2	5200	20.280	5189.840	5210.120	---	PASS
	Ant1	5240	20.320	5229.840	5250.160	---	PASS
	Ant2	5240	20.320	5229.880	5250.200	---	PASS
	Ant1	5260	20.160	5249.960	5270.120	---	PASS
	Ant2	5260	20.360	5249.840	5270.200	---	PASS
	Ant1	5280	20.240	5269.880	5290.120	---	PASS
	Ant2	5280	20.280	5269.840	5290.120	---	PASS
	Ant1	5320	20.160	5310.000	5330.160	---	PASS
	Ant2	5320	20.360	5309.840	5330.200	---	PASS

	Ant1	5500	20.200	5489.960	5510.160	---	PASS
	Ant2	5500	20.280	5489.880	5510.160	---	PASS
	Ant1	5580	20.360	5569.800	5590.160	---	PASS
	Ant2	5580	20.360	5569.840	5590.200	---	PASS
	Ant1	5700	20.240	5689.920	5710.160	---	PASS
	Ant2	5700	20.280	5689.840	5710.120	---	PASS
	Ant1	5745	20.280	5734.880	5755.160	---	PASS
	Ant2	5745	20.280	5734.920	5755.200	---	PASS
	Ant1	5785	20.120	5774.920	5795.040	---	PASS
	Ant2	5785	20.400	5774.800	5795.200	---	PASS
	Ant1	5825	20.360	5814.840	5835.200	---	PASS
	Ant2	5825	20.240	5814.840	5835.080	---	PASS
11AC40MIMO	Ant1	5190	40.960	5169.520	5210.480	---	PASS
	Ant2	5190	40.960	5169.600	5210.560	---	PASS
	Ant1	5230	40.880	5209.520	5250.400	---	PASS
	Ant2	5230	40.800	5209.600	5250.400	---	PASS
	Ant1	5270	40.720	5249.760	5290.480	---	PASS
	Ant2	5270	40.960	5249.520	5290.480	---	PASS
	Ant1	5310	40.720	5289.680	5330.400	---	PASS
	Ant2	5310	40.720	5289.680	5330.400	---	PASS
	Ant1	5510	41.040	5489.520	5530.560	---	PASS
	Ant2	5510	40.720	5489.760	5530.480	---	PASS
	Ant1	5550	40.880	5529.600	5570.480	---	PASS
	Ant2	5550	40.880	5529.600	5570.480	---	PASS
	Ant1	5670	41.040	5649.440	5690.480	---	PASS
	Ant2	5670	40.880	5649.600	5690.480	---	PASS
	Ant1	5755	40.640	5734.600	5775.240	---	PASS
	Ant2	5755	40.800	5734.600	5775.400	---	PASS
	Ant1	5795	40.960	5774.520	5815.480	---	PASS
	Ant2	5795	40.720	5774.680	5815.400	---	PASS
11AC80MIMO	Ant1	5210	82.240	5169.040	5251.280	---	PASS
	Ant2	5210	81.440	5169.200	5250.640	---	PASS
	Ant1	5290	82.400	5249.040	5331.440	---	PASS
	Ant2	5290	81.600	5249.200	5330.800	---	PASS
	Ant1	5530	82.400	5488.880	5571.280	---	PASS
	Ant2	5530	81.600	5489.360	5570.960	---	PASS
	Ant1	5610	82.560	5568.720	5651.280	---	PASS
	Ant2	5610	81.440	5569.200	5650.640	---	PASS
	Ant1	5775	82.240	5733.720	5815.960	---	PASS
	Ant2	5775	81.440	5734.200	5815.640	---	PASS

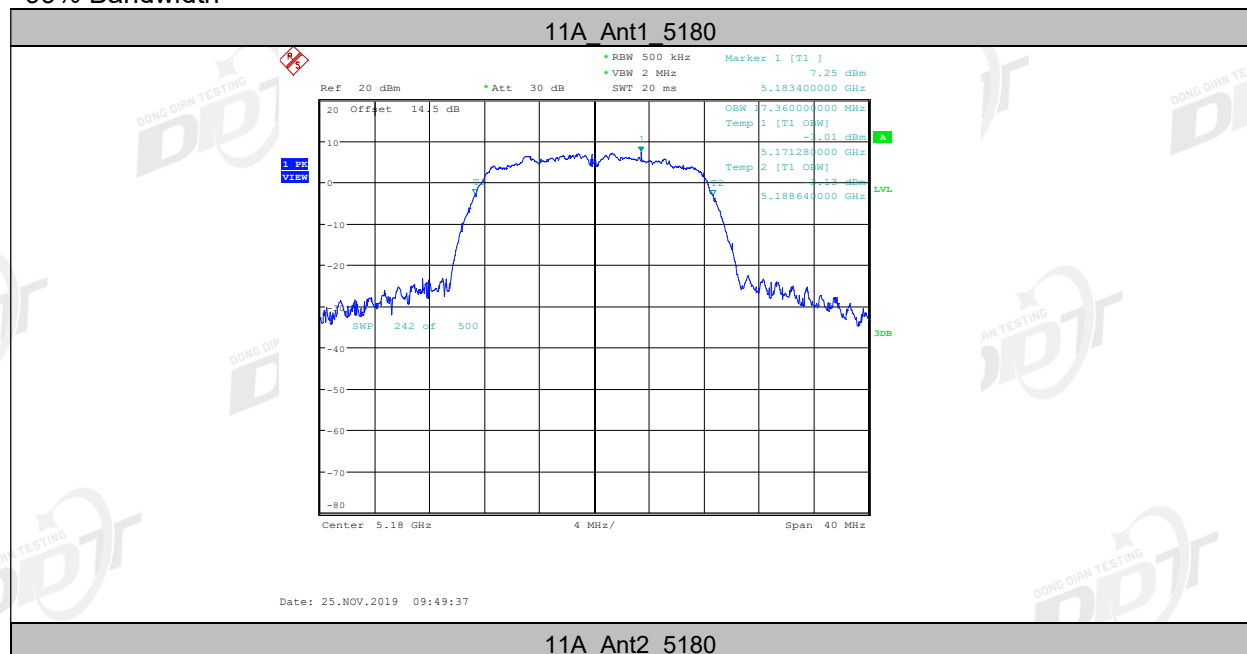
6db EBW

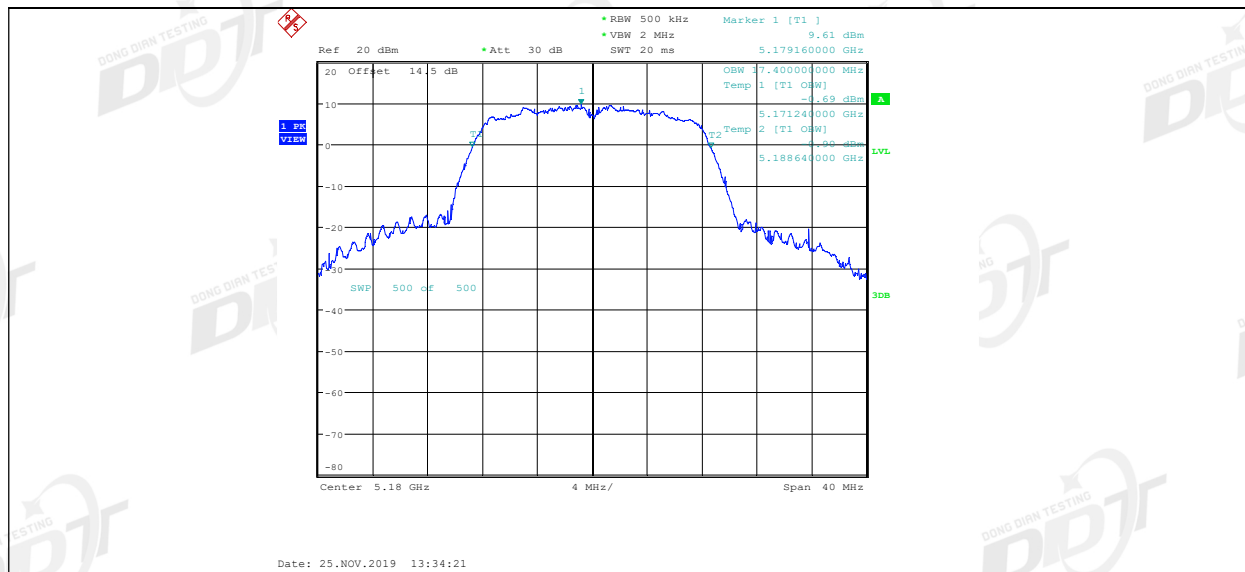
TestMode	Antenna	Channel	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	15.240	5737.400	5752.640	0.5	PASS
	Ant2	5745	15.240	5737.400	5752.640	0.5	PASS
	Ant1	5785	15.200	5777.440	5792.640	0.5	PASS
	Ant2	5785	15.200	5777.400	5792.600	0.5	PASS
	Ant1	5825	15.200	5817.440	5832.640	0.5	PASS
	Ant2	5825	15.240	5817.400	5832.640	0.5	PASS
11N20MIMO	Ant1	5745	15.760	5736.880	5752.640	0.5	PASS

	Ant2	5745	15.160	5737.480	5752.640	0.5	PASS
	Ant1	5785	15.200	5777.440	5792.640	0.5	PASS
	Ant2	5785	15.240	5777.440	5792.680	0.5	PASS
	Ant1	5825	15.760	5816.880	5832.640	0.5	PASS
	Ant2	5825	15.200	5817.440	5832.640	0.5	PASS
11N40MIMO	Ant1	5755	35.280	5737.400	5772.680	0.5	PASS
	Ant2	5755	35.280	5737.400	5772.680	0.5	PASS
	Ant1	5795	35.280	5777.400	5812.680	0.5	PASS
	Ant2	5795	35.280	5777.400	5812.680	0.5	PASS
11AC20MIMO	Ant1	5745	17.760	5736.120	5753.880	0.5	PASS
	Ant2	5745	17.680	5736.200	5753.880	0.5	PASS
	Ant1	5785	17.720	5776.160	5793.880	0.5	PASS
	Ant2	5785	17.720	5776.160	5793.880	0.5	PASS
	Ant1	5825	17.760	5816.120	5833.880	0.5	PASS
	Ant2	5825	17.680	5816.120	5833.800	0.5	PASS
11AC40MIMO	Ant1	5755	35.920	5736.760	5772.680	0.5	PASS
	Ant2	5755	36.480	5736.760	5773.240	0.5	PASS
	Ant1	5795	36.160	5776.760	5812.920	0.5	PASS
	Ant2	5795	35.360	5777.320	5812.680	0.5	PASS
11AC80MIMO	Ant1	5775	76.800	5736.600	5813.400	0.5	PASS
	Ant2	5775	76.640	5736.760	5813.400	0.5	PASS

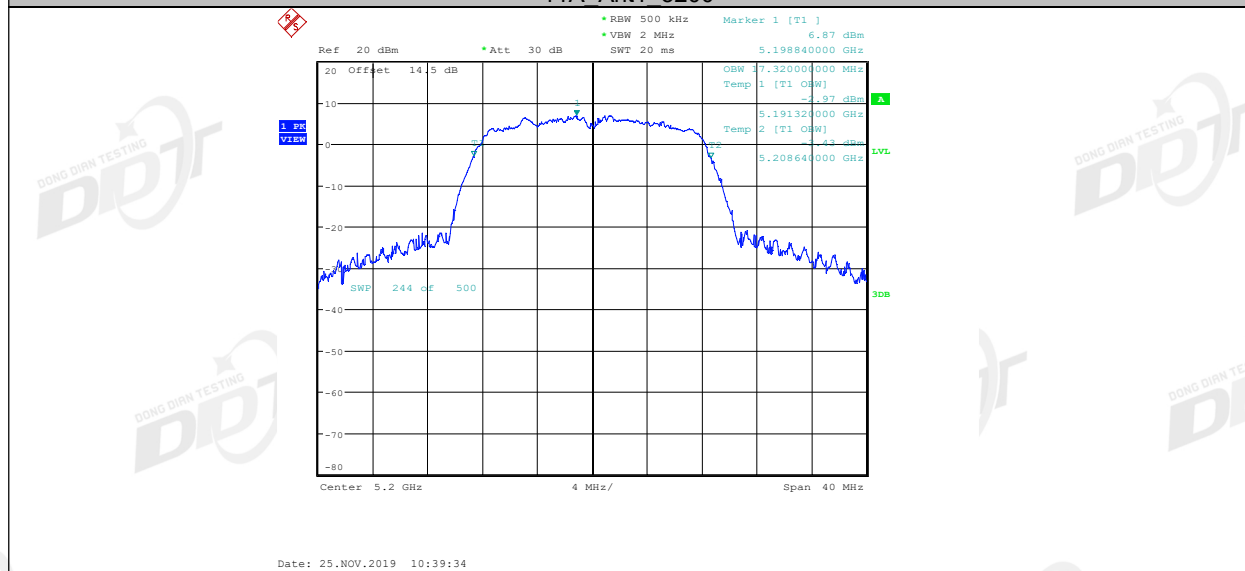
4.5. Original test data

99% Bandwidth

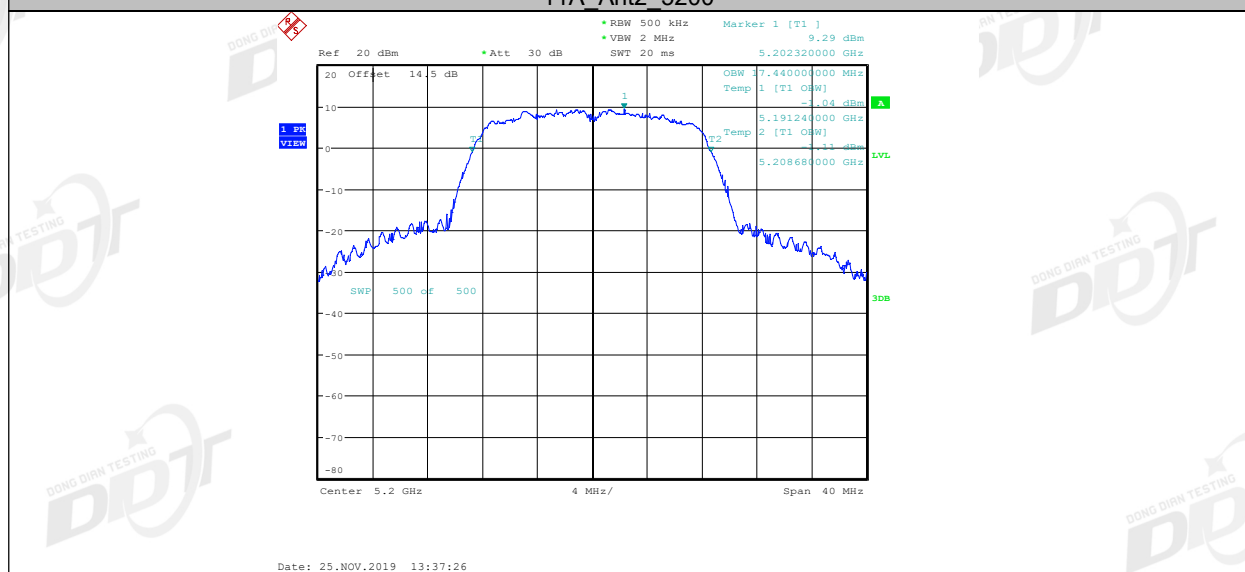




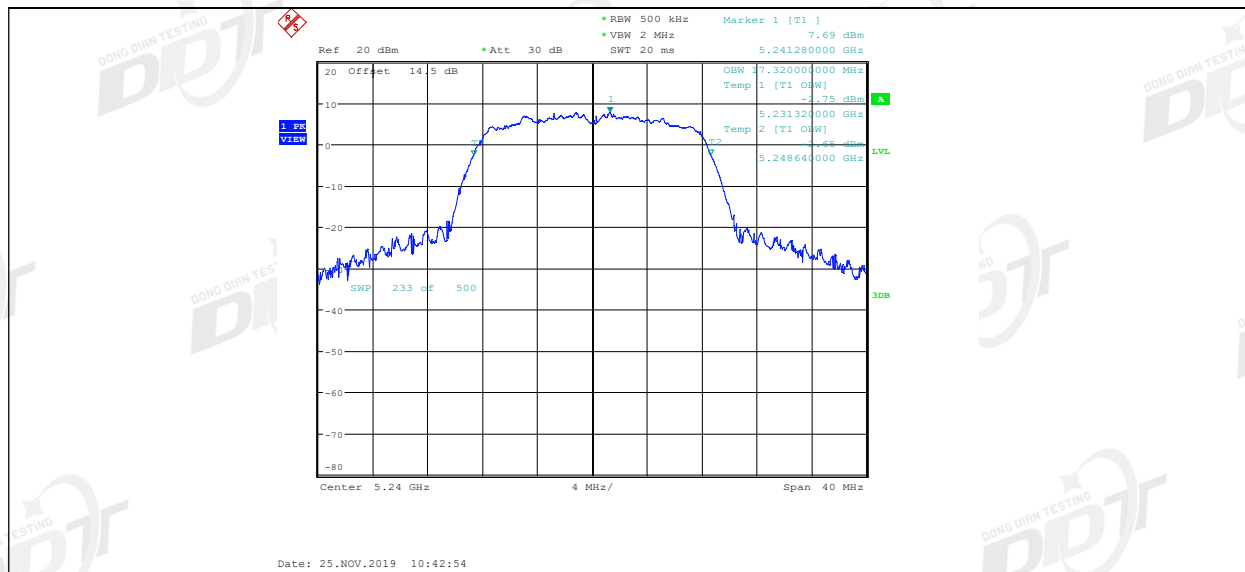
11A Ant1 5200



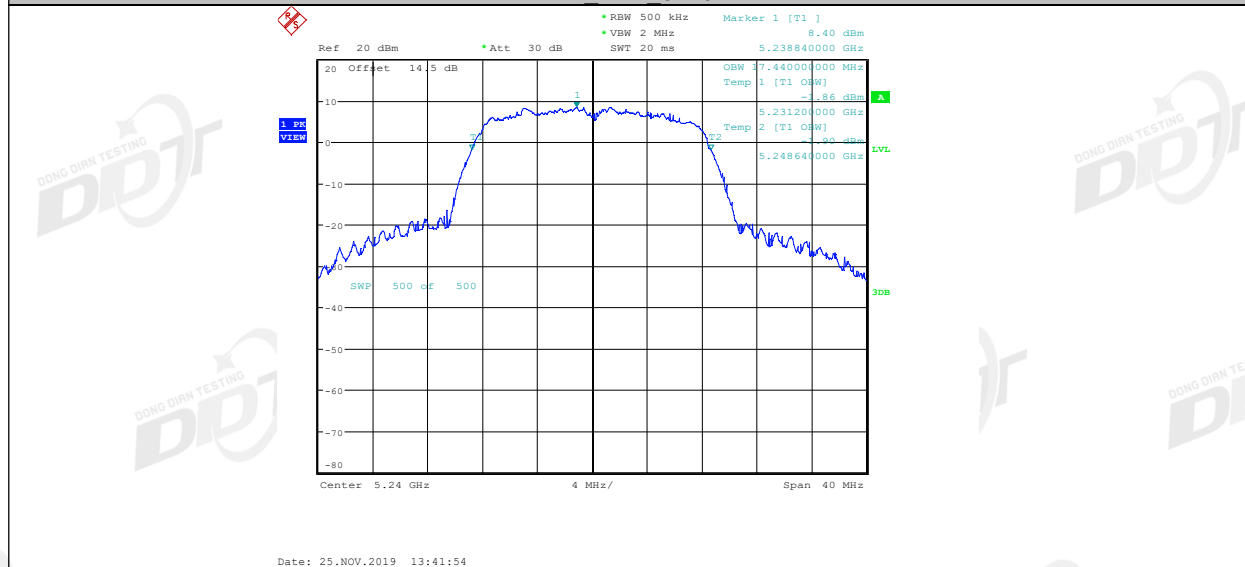
11A Ant2 5200



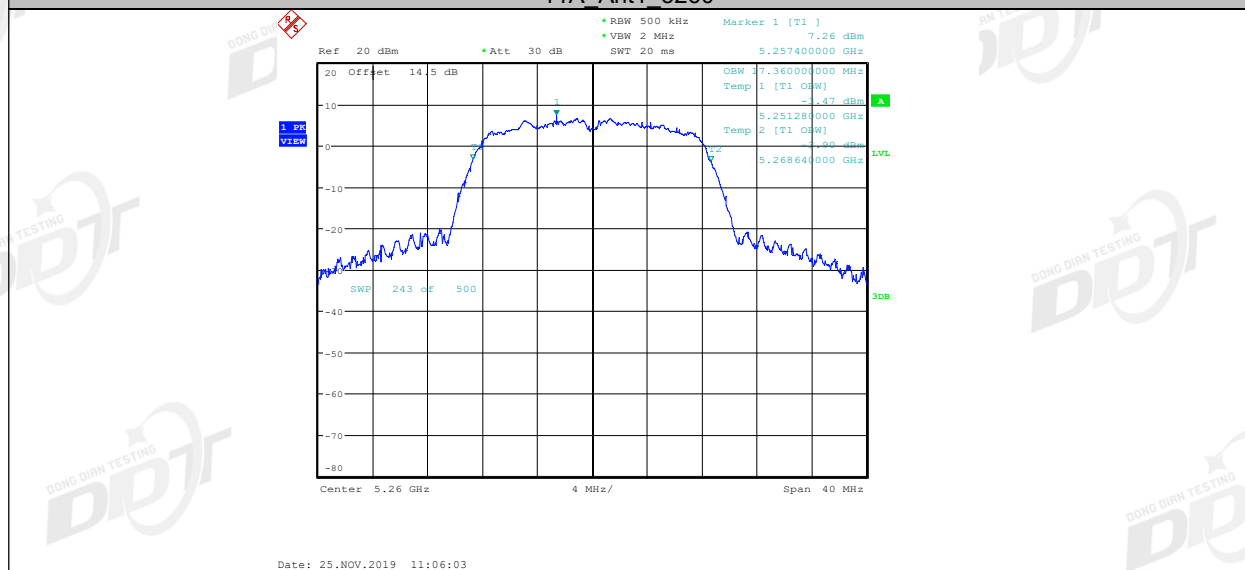
11A Ant1 5240



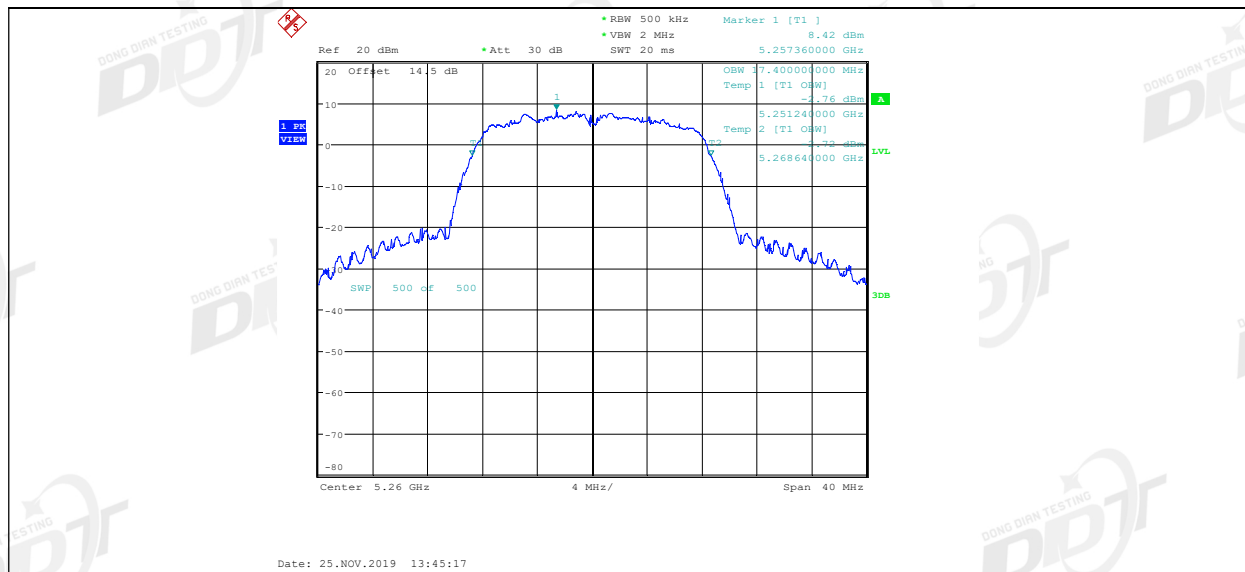
11A Ant2 5240



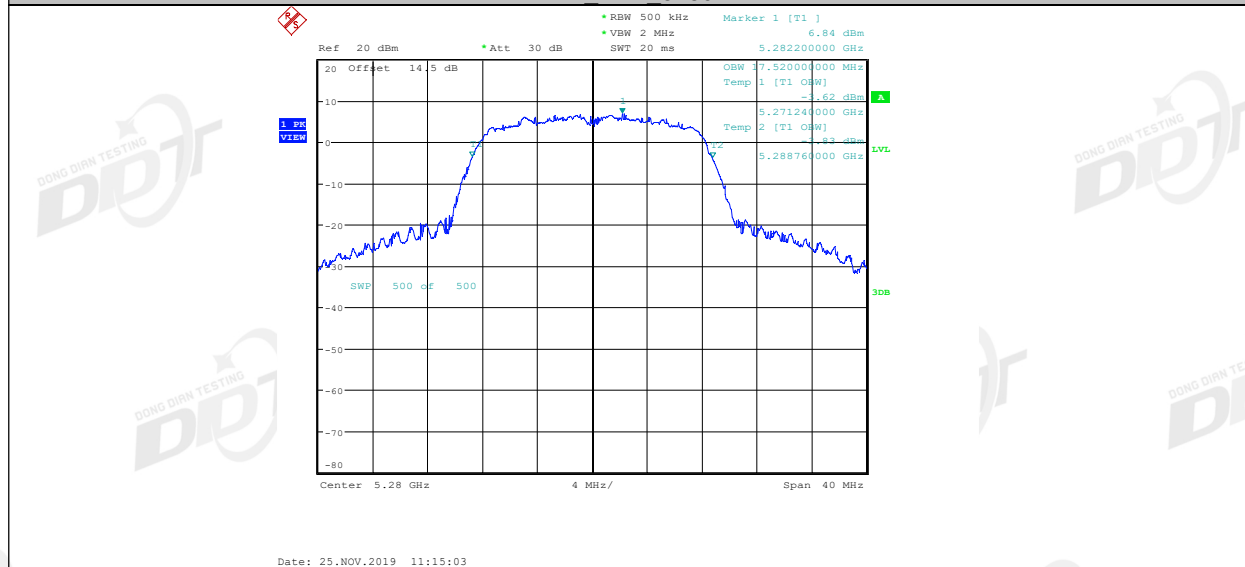
11A Ant1 5260



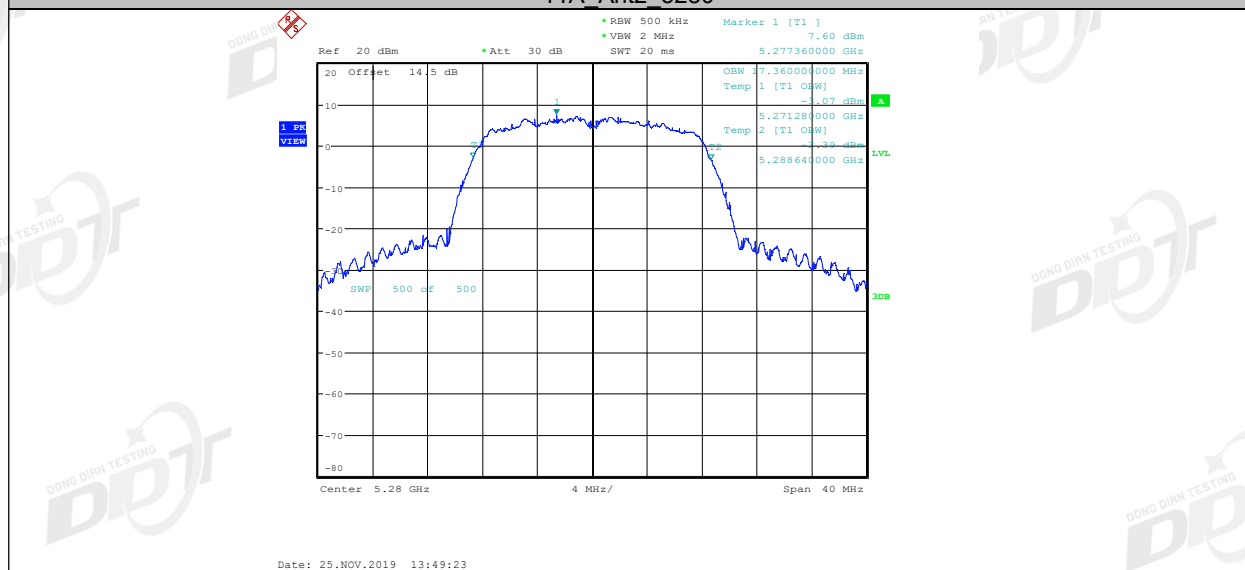
11A Ant2 5260



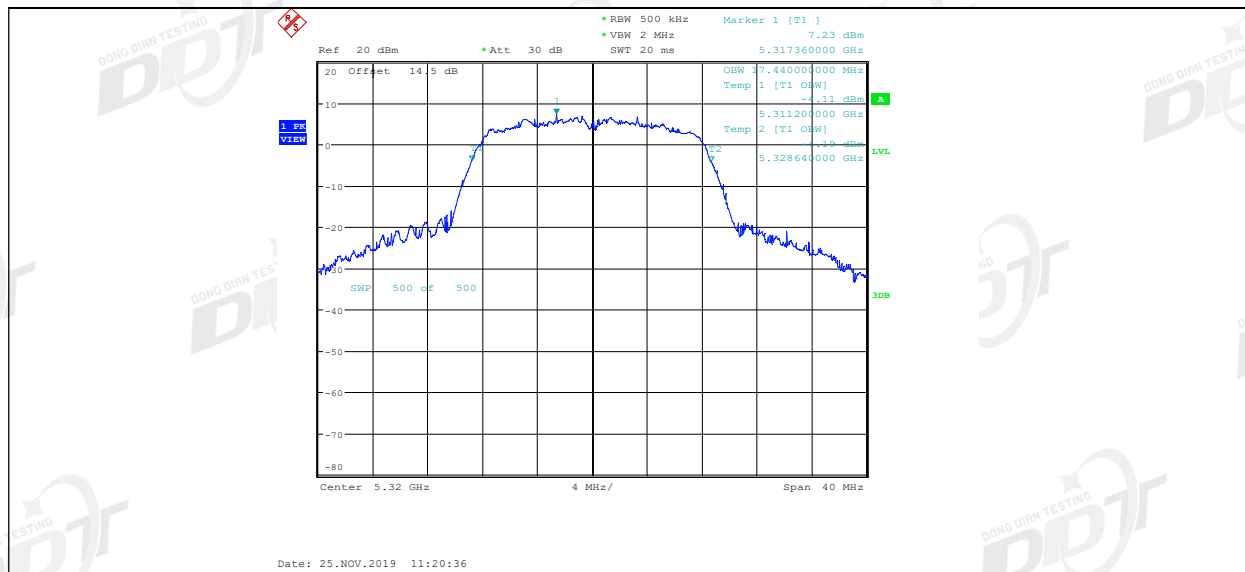
11A Ant1 5280



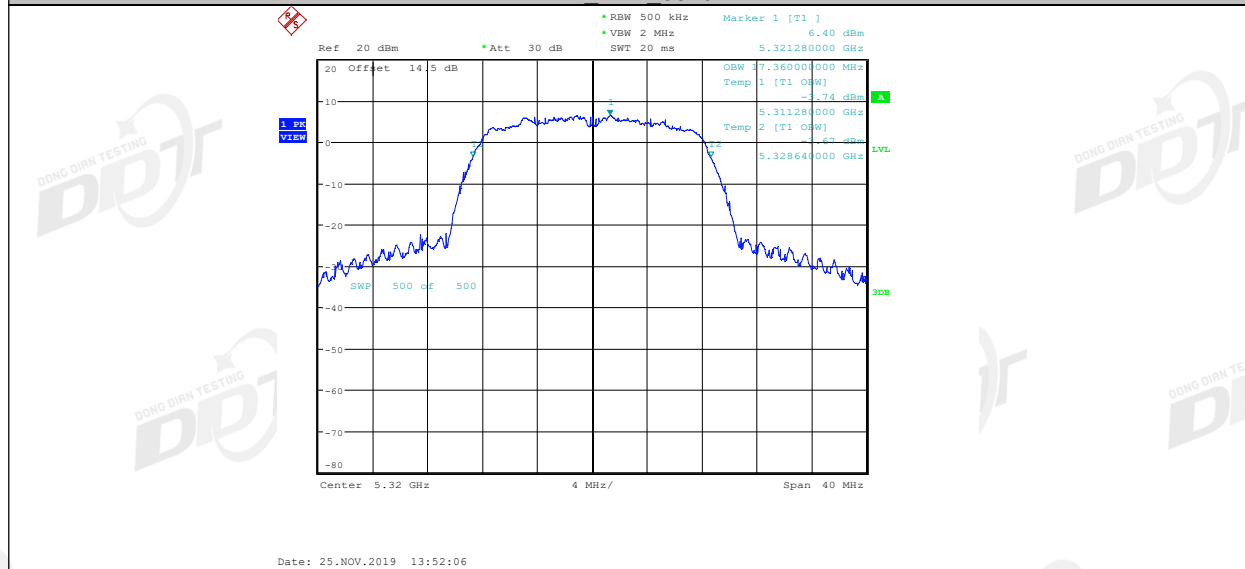
11A Ant2 5280



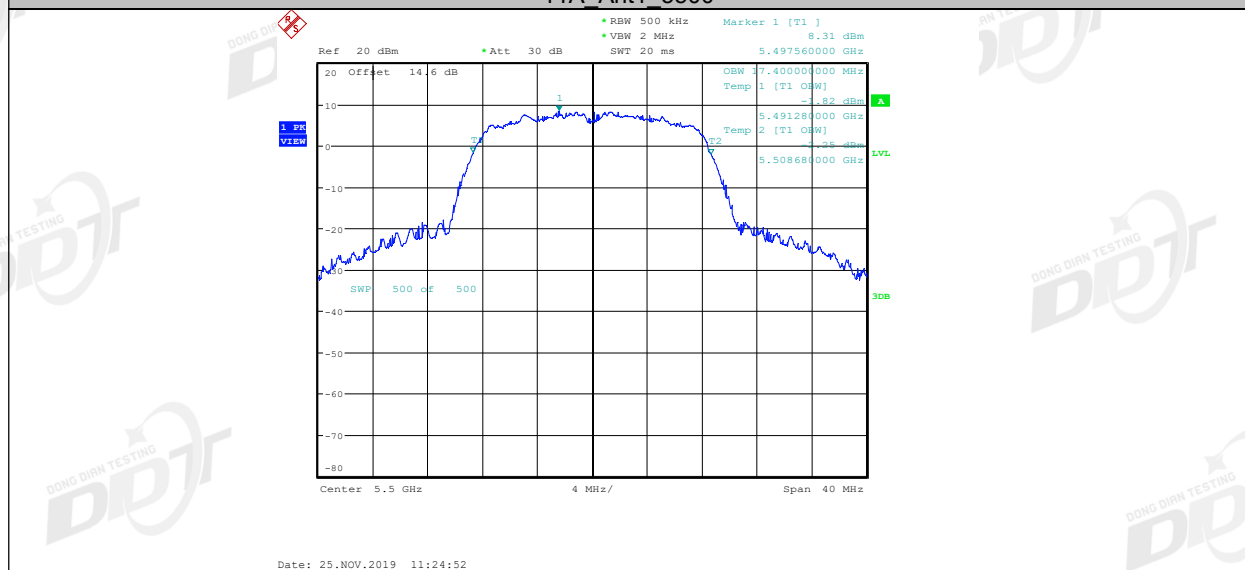
11A Ant1 5320



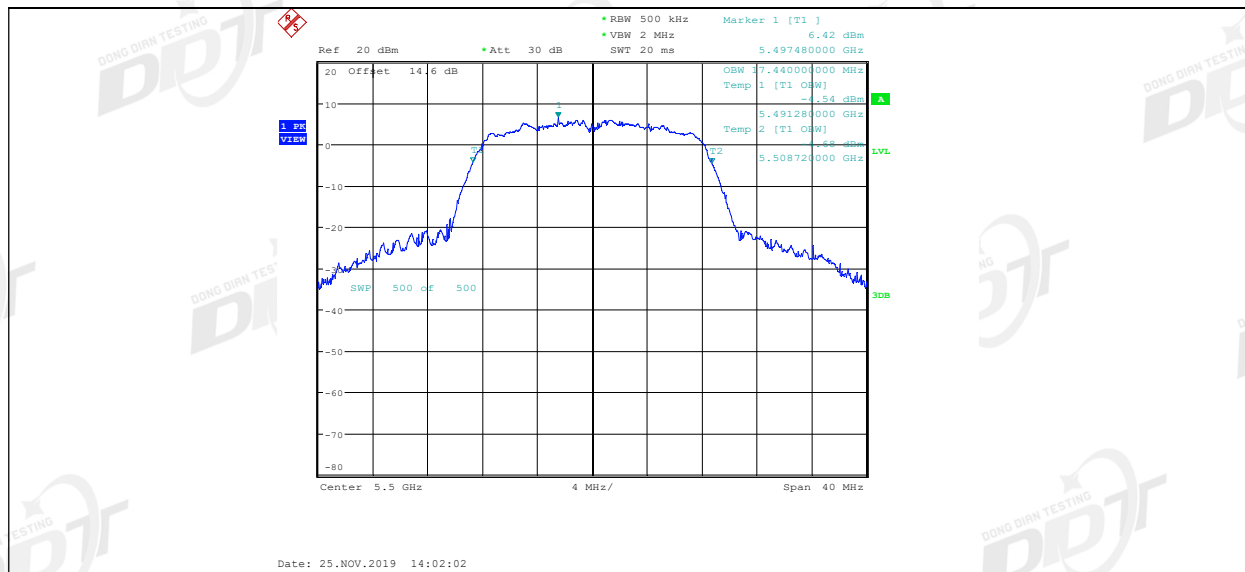
11A Ant2 5320



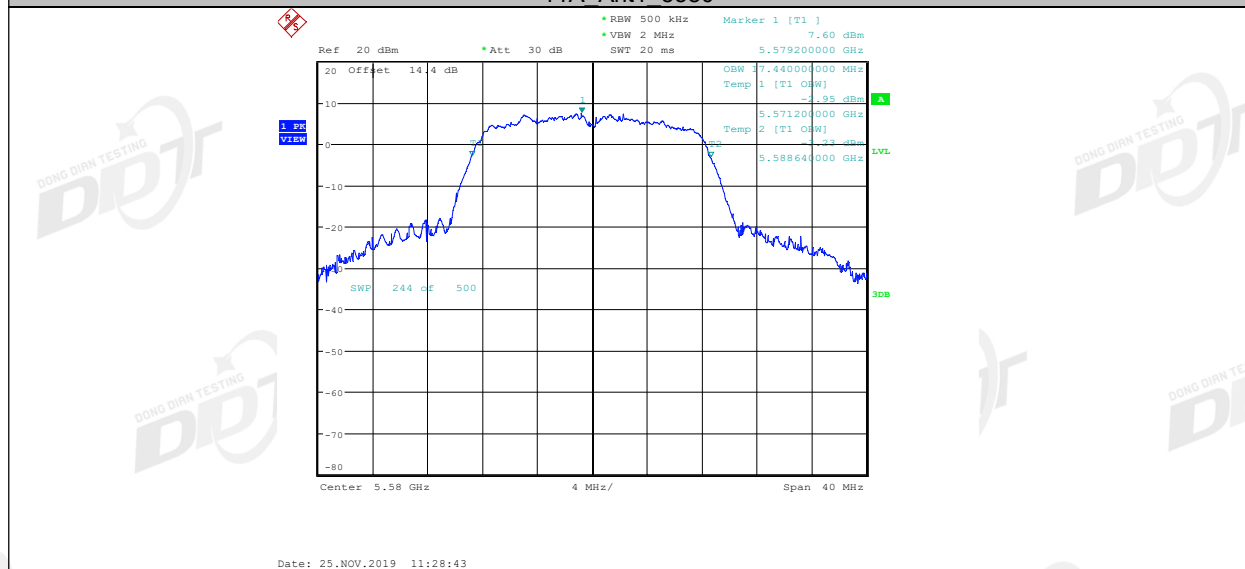
11A Ant1 5500



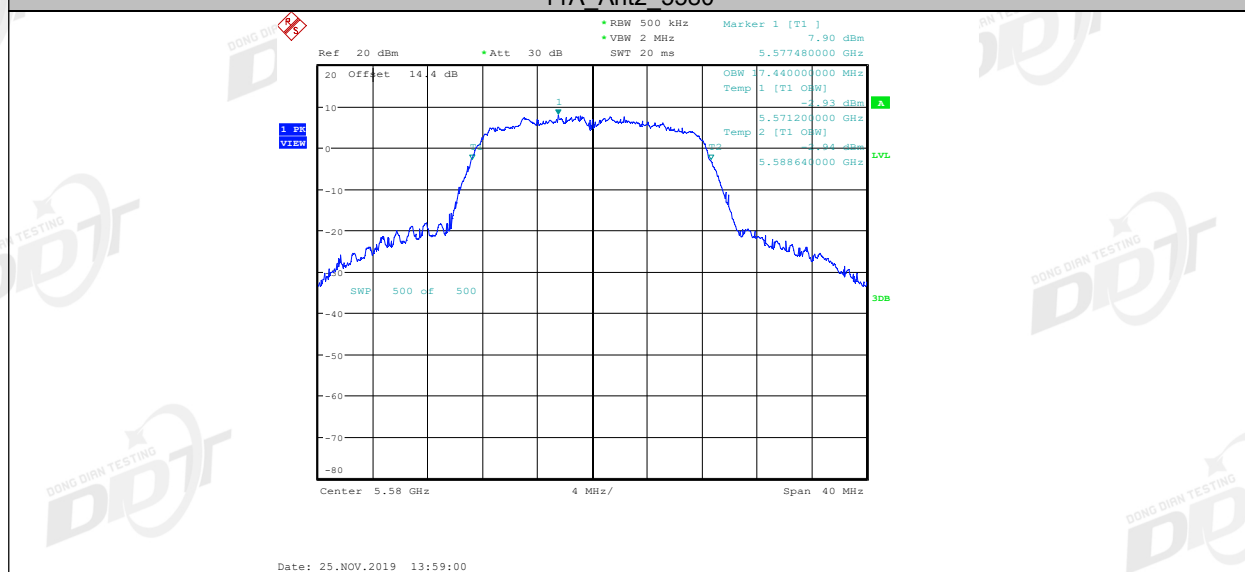
11A Ant2 5500



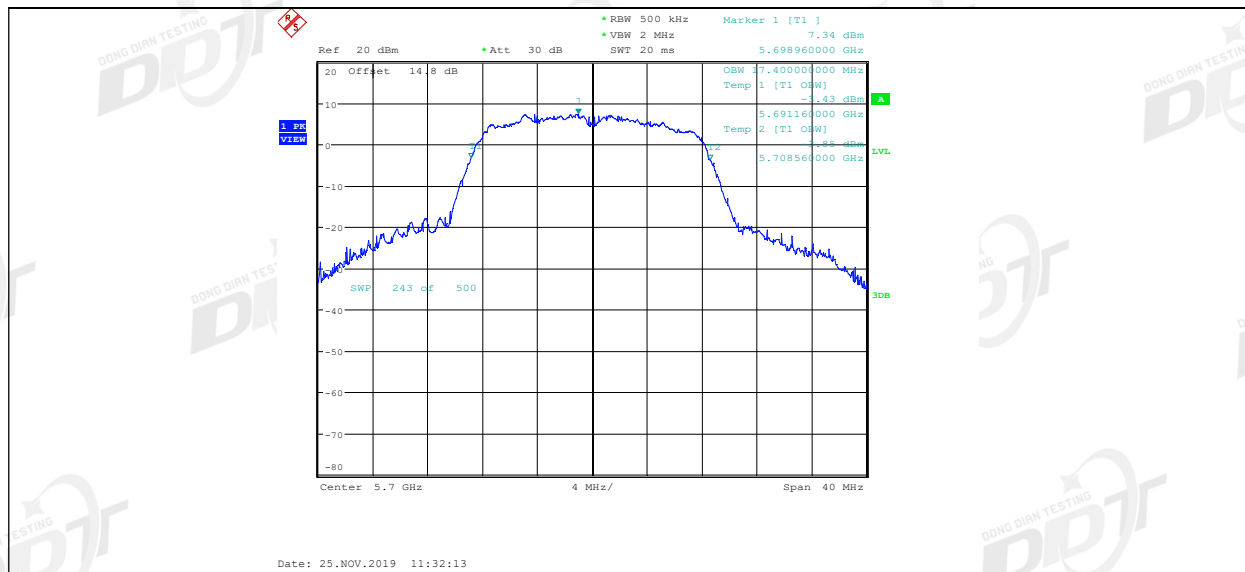
11A Ant1 5580



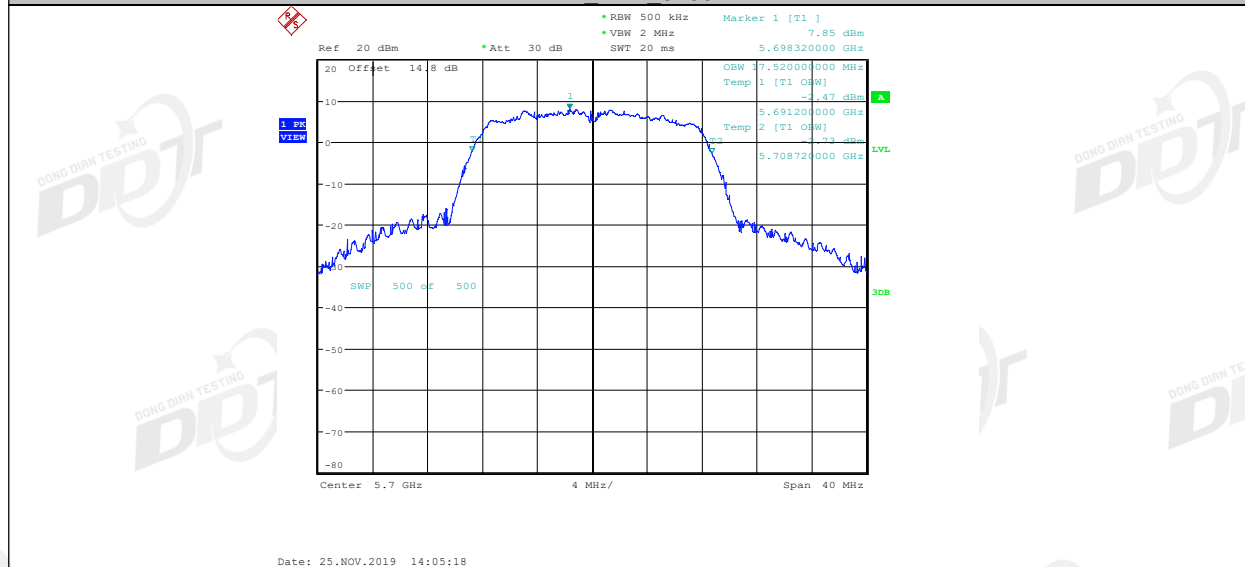
11A Ant2 5580



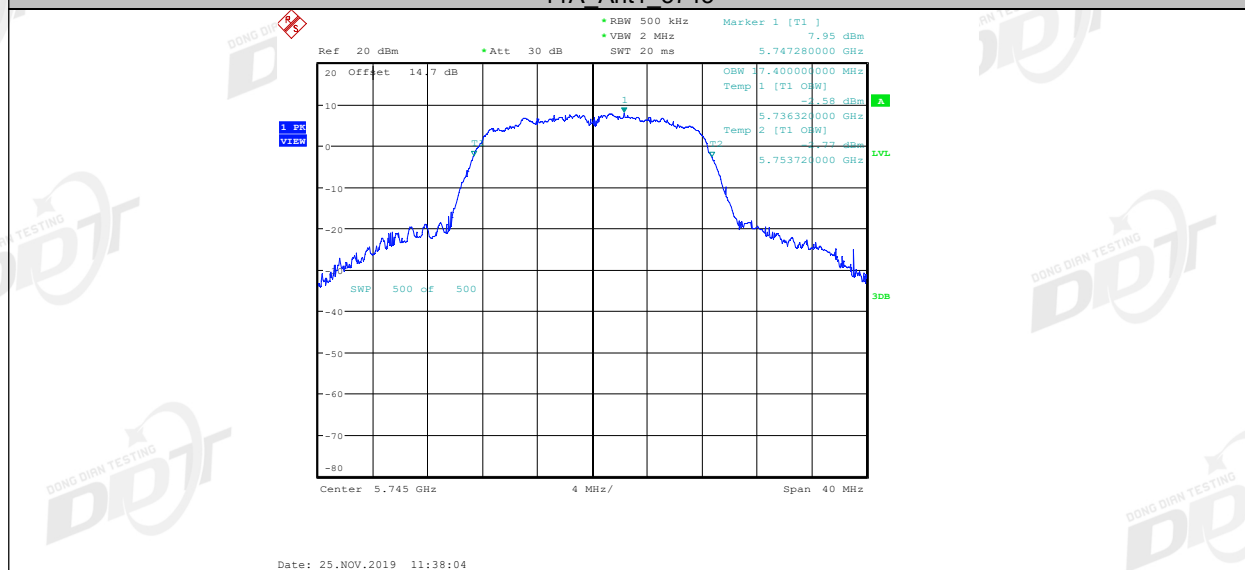
11A Ant1 5700



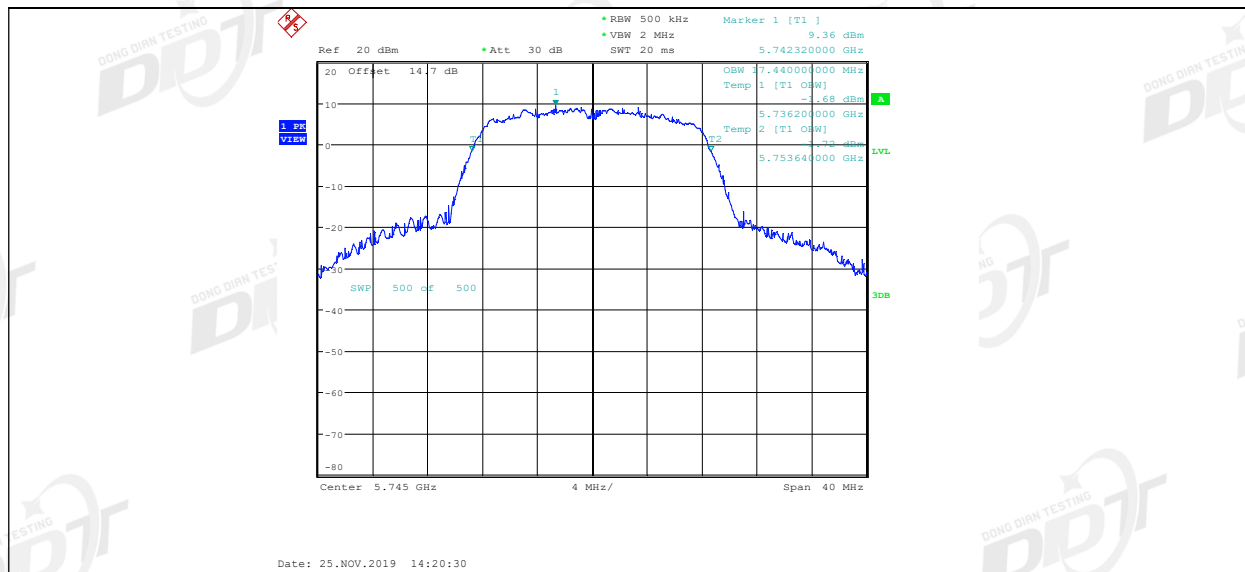
11A_Ant2_5700



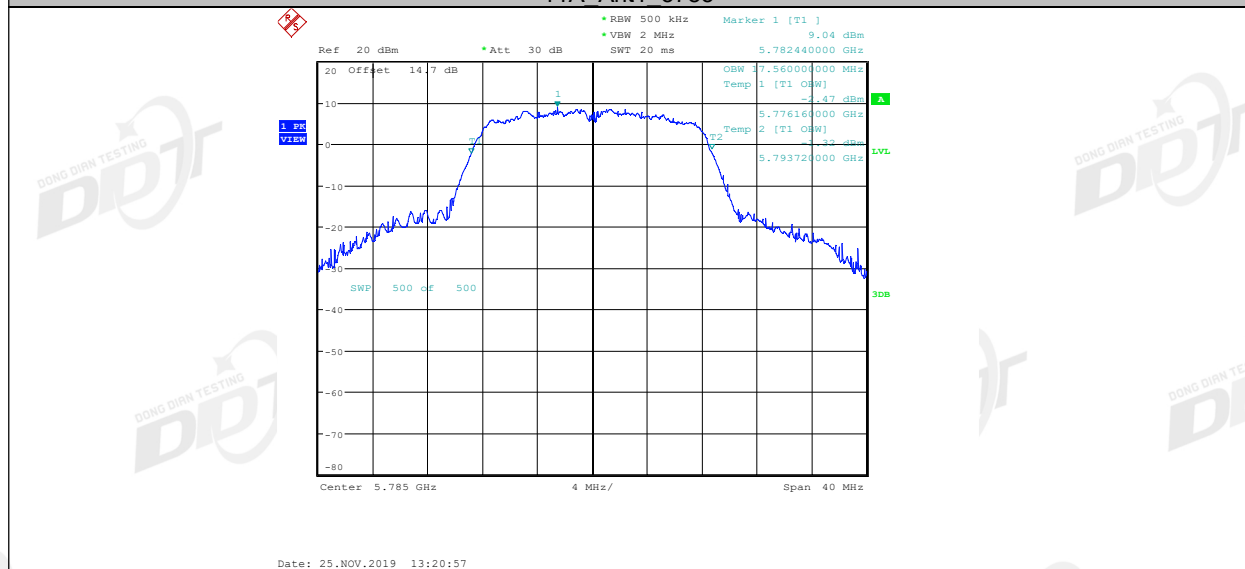
11A_Ant1_5745



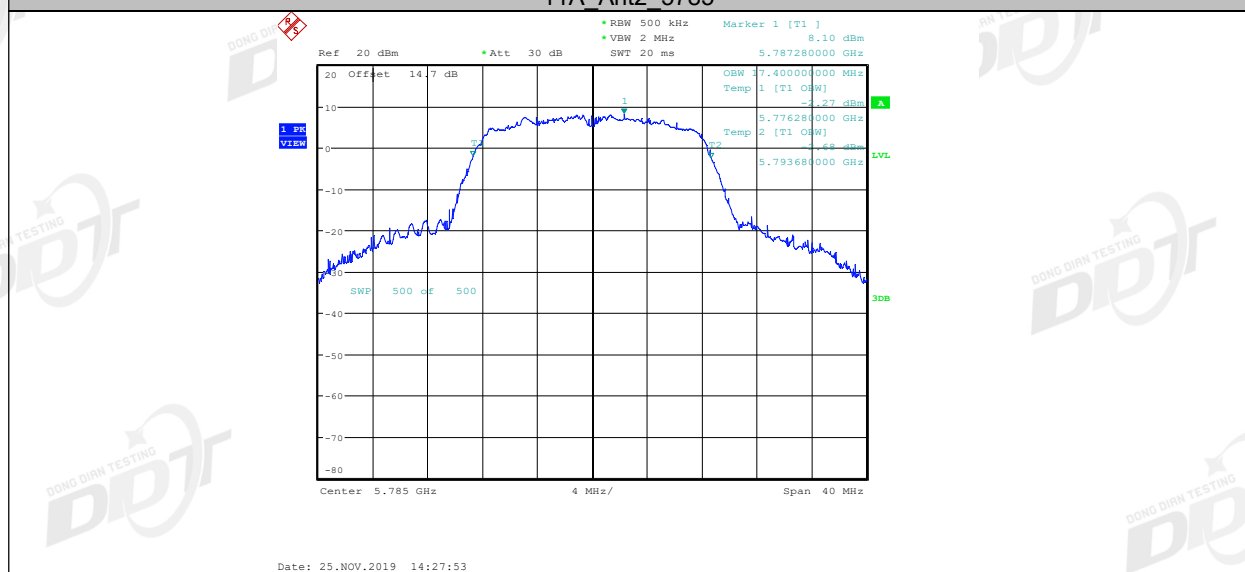
11A_Ant2_5745



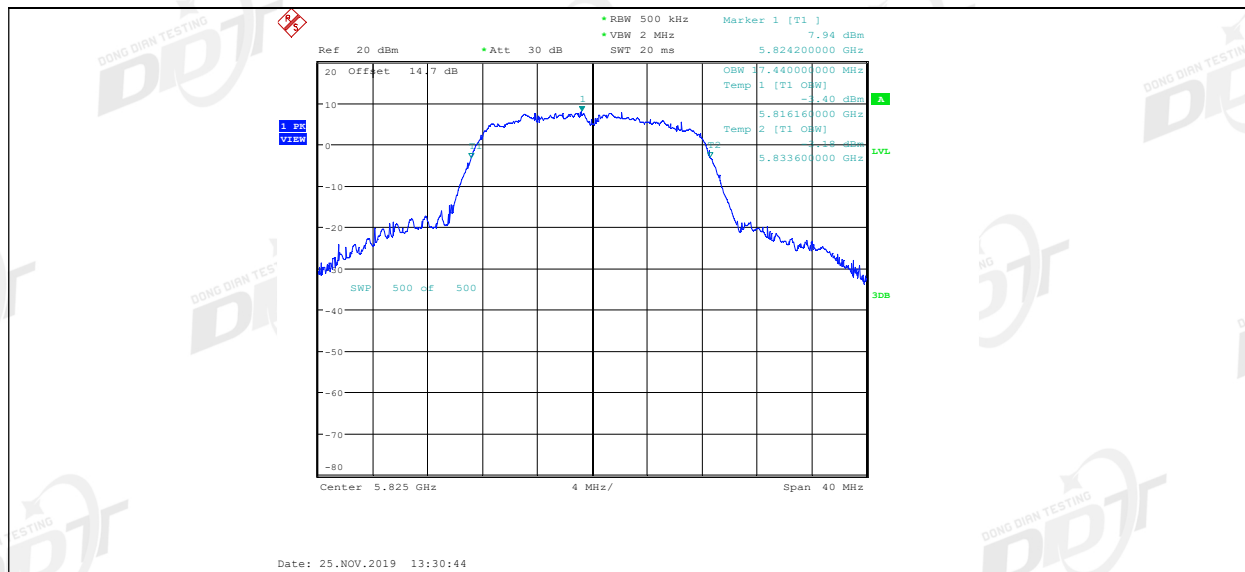
11A Ant1 5785



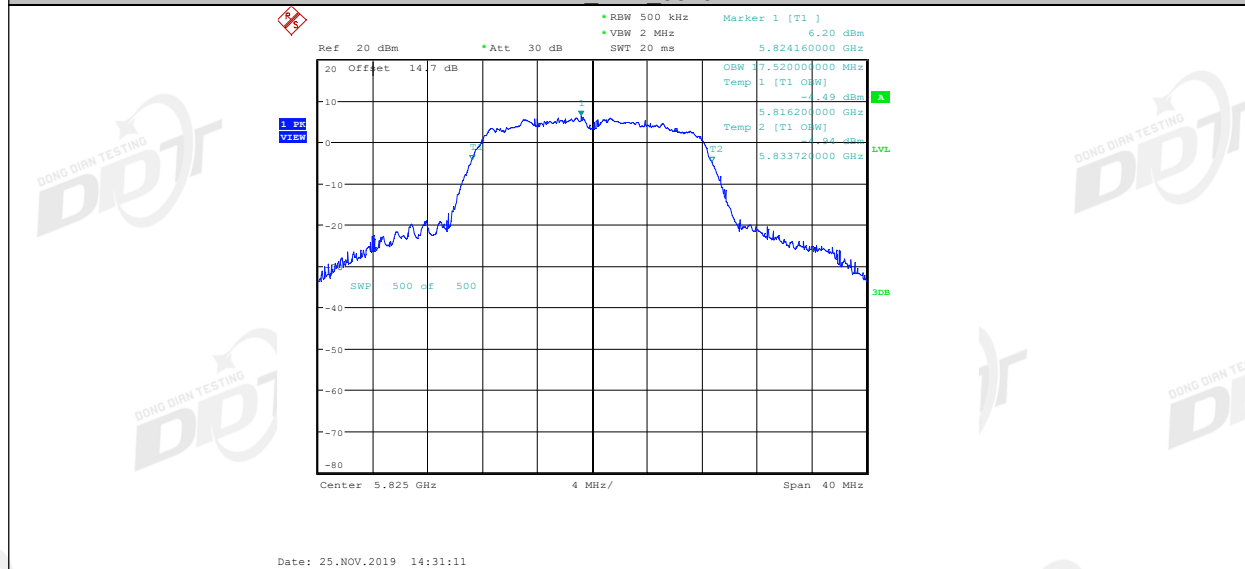
11A Ant2 5785



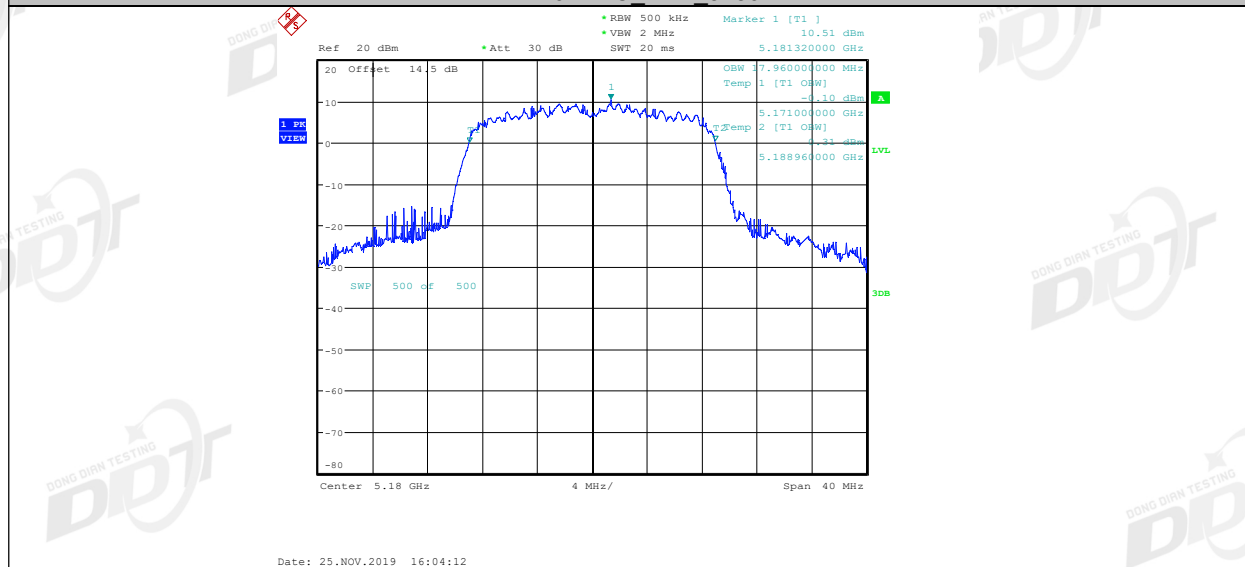
11A Ant1 5825



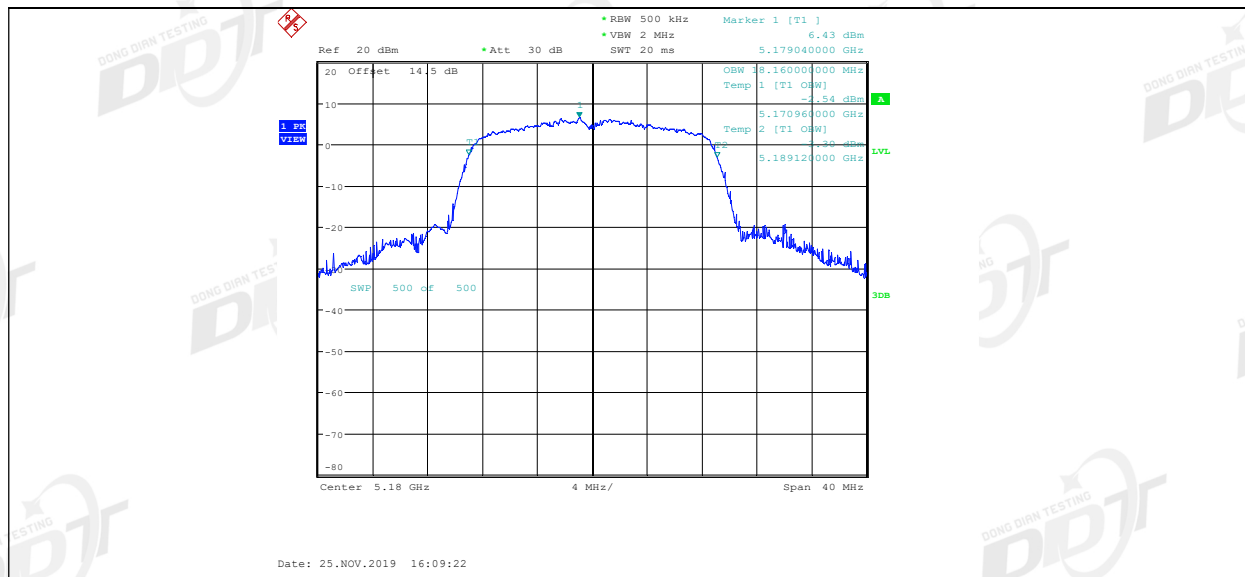
11A Ant2 5825



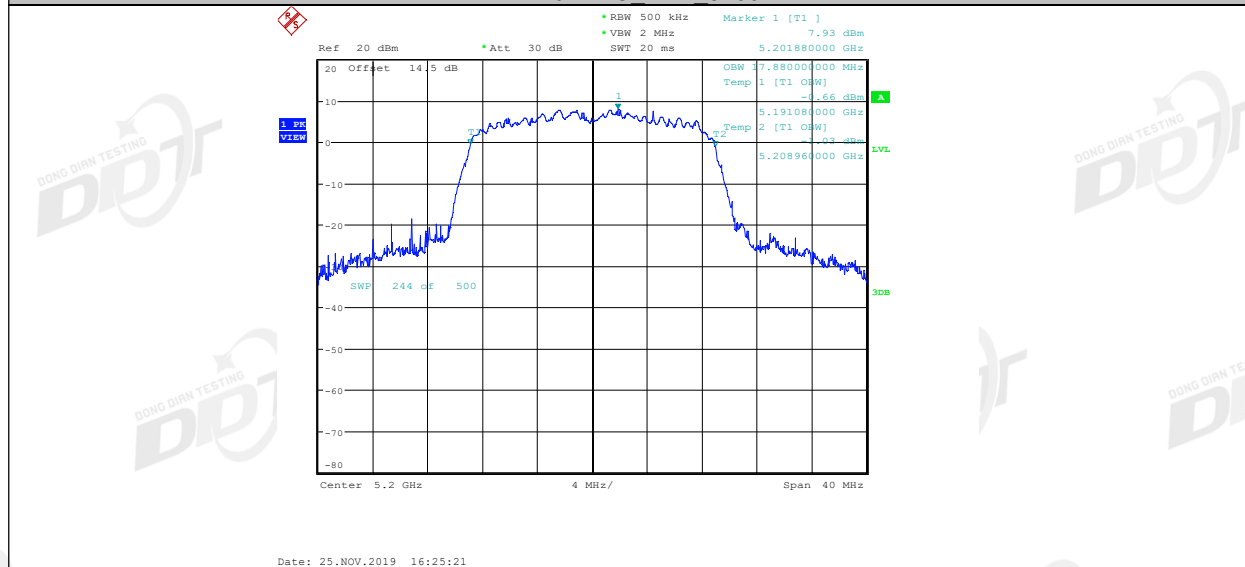
11N20MIMO Ant1 5180



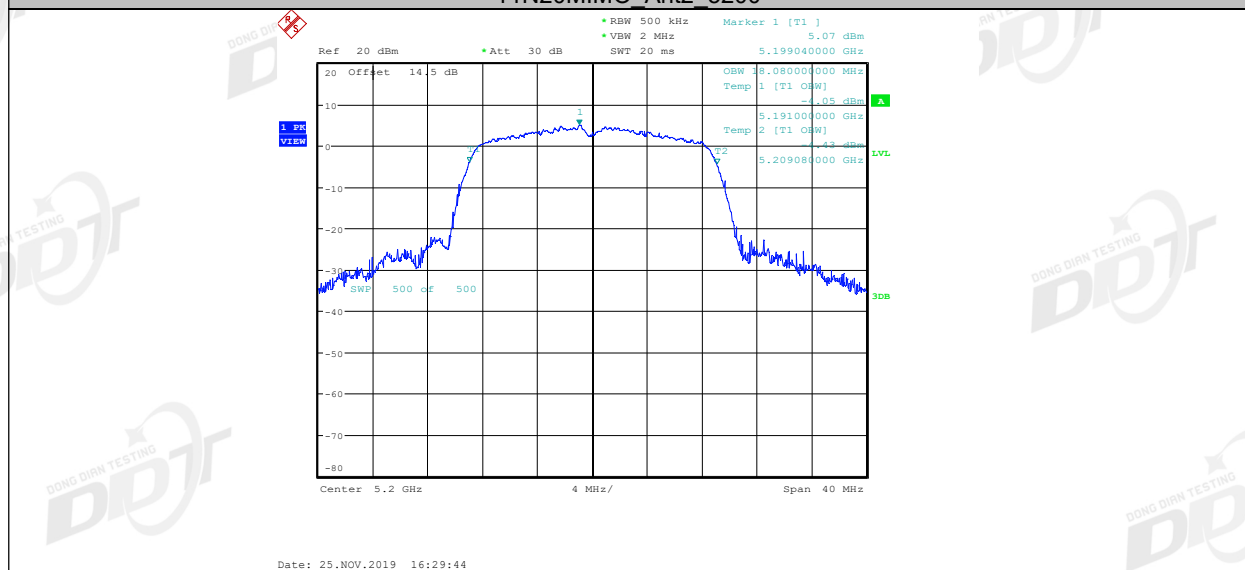
11N20MIMO Ant2 5180



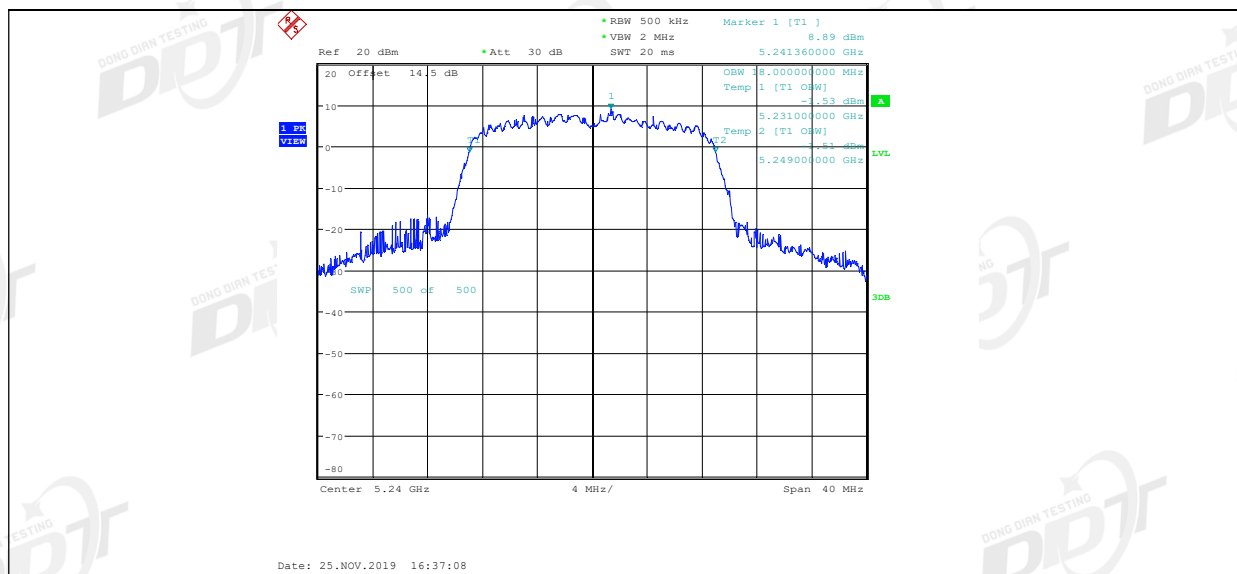
11N20MIMO Ant1 5200



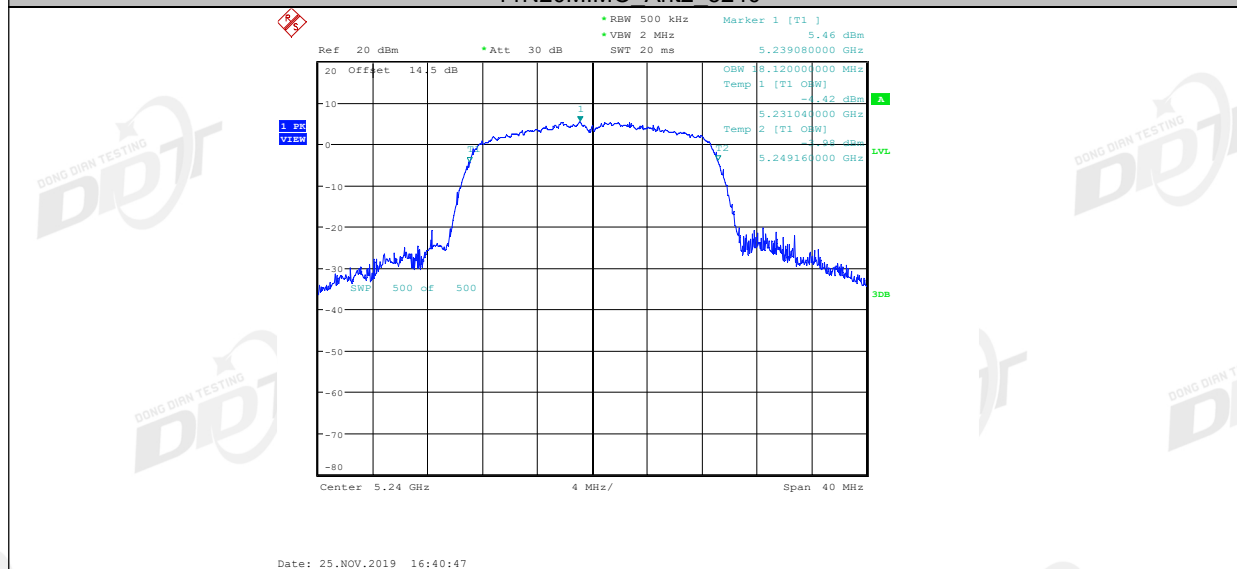
11N20MIMO Ant2 5200



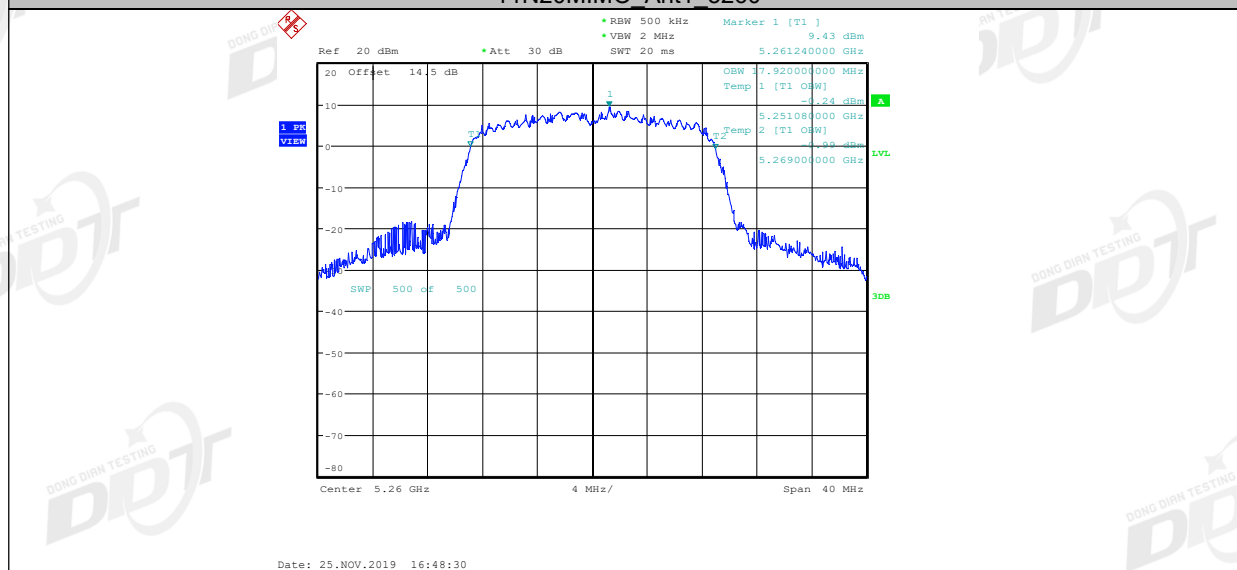
11N20MIMO Ant1 5240



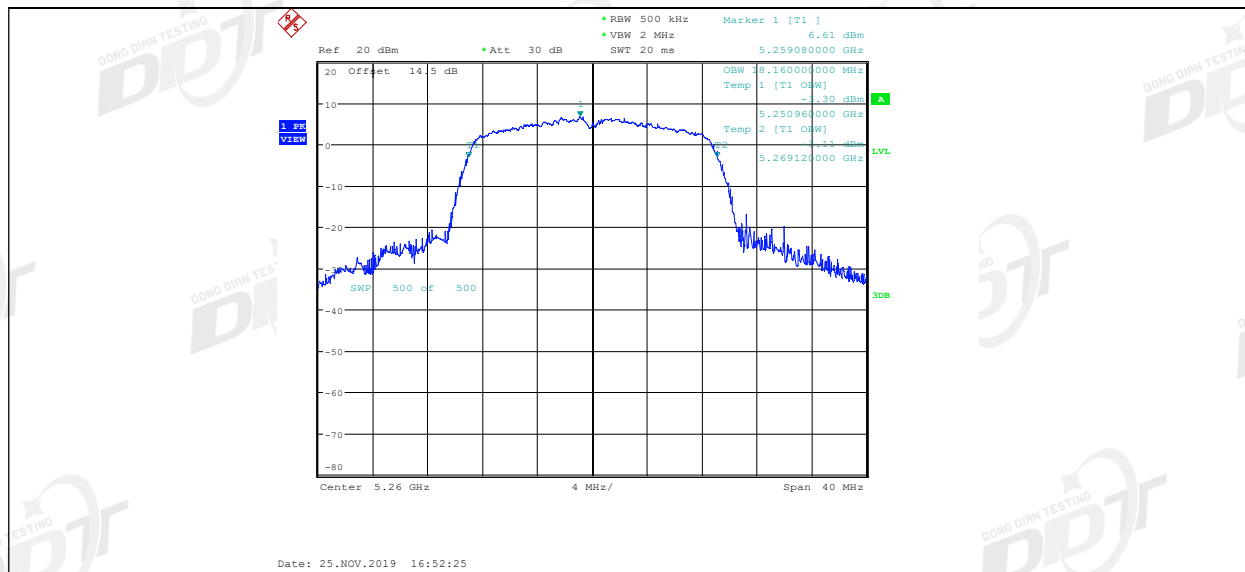
11N20MIMO Ant2 5240



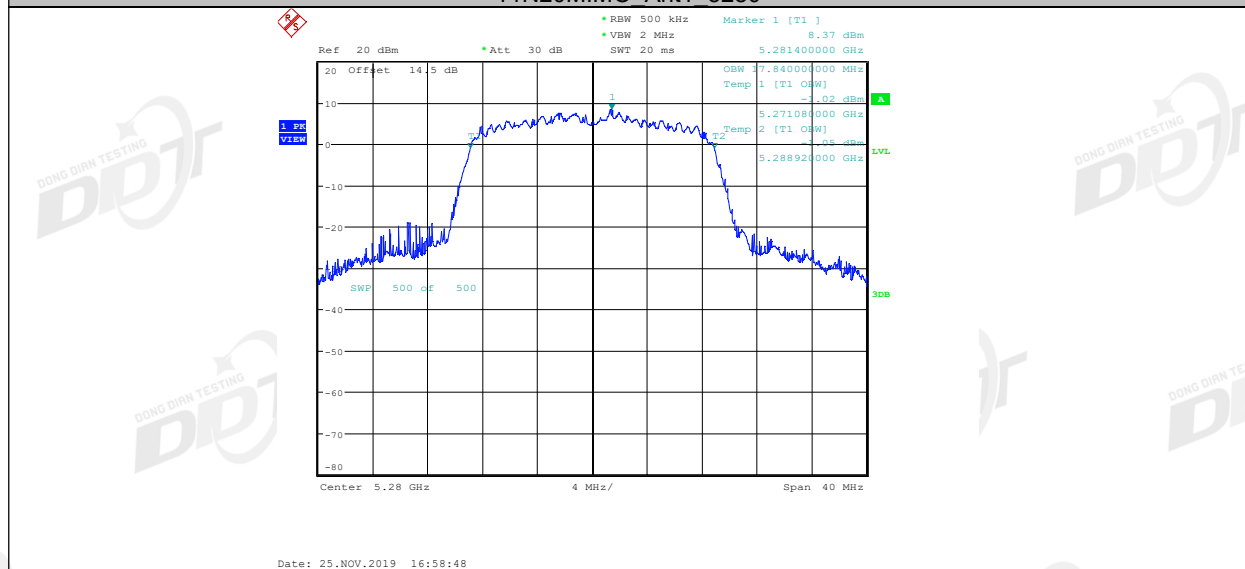
11N20MIMO Ant1 5260



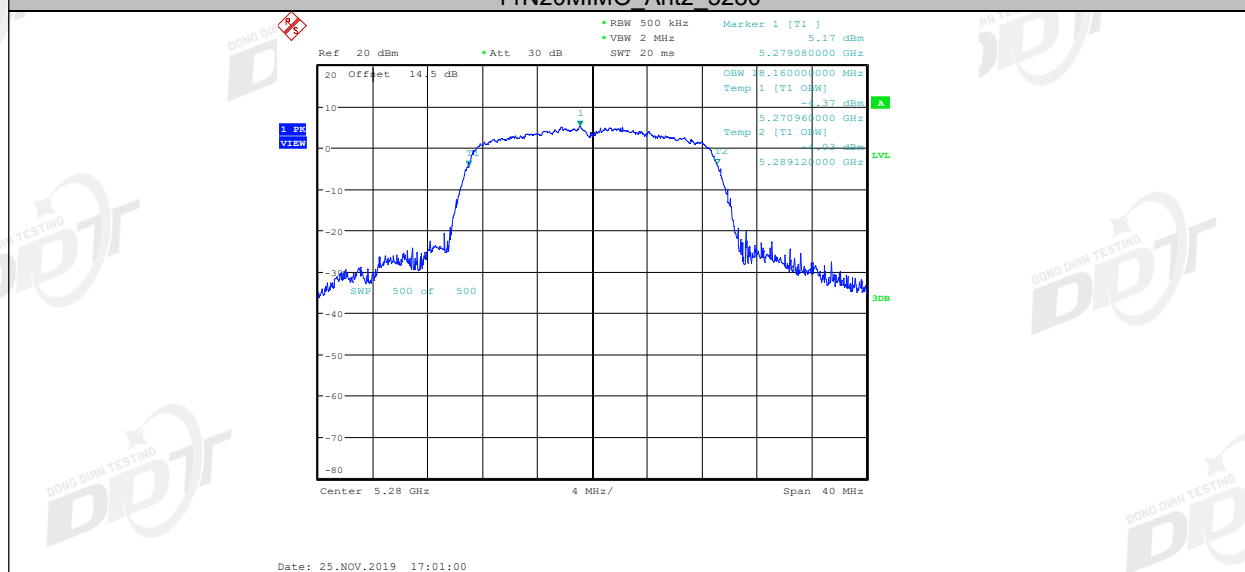
11N20MIMO Ant2 5260



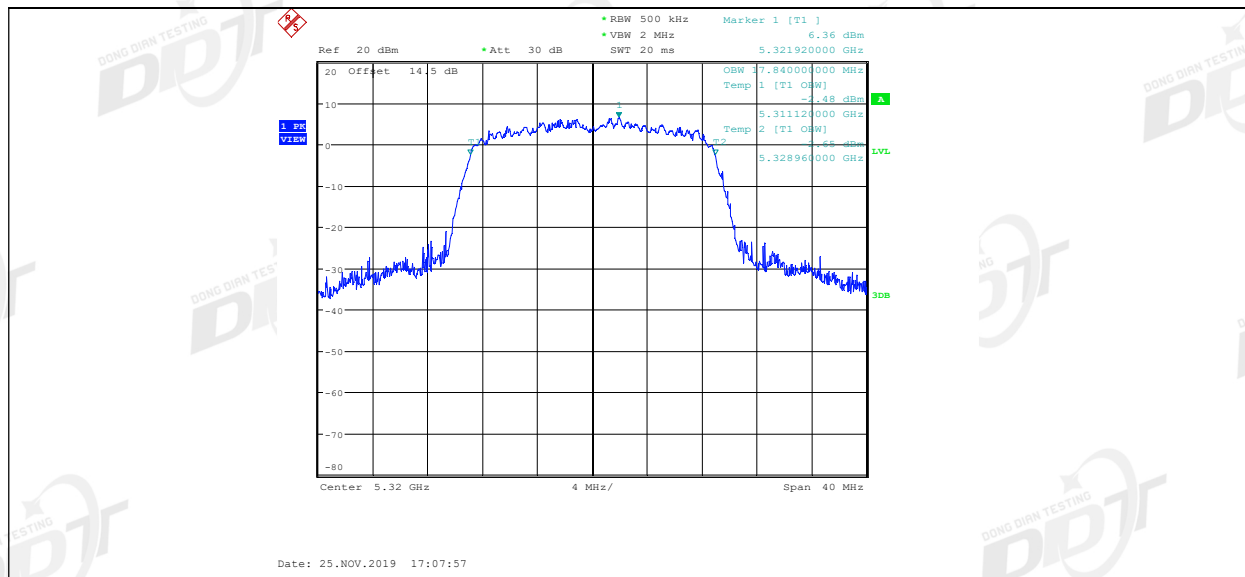
11N20MIMO Ant1 5280



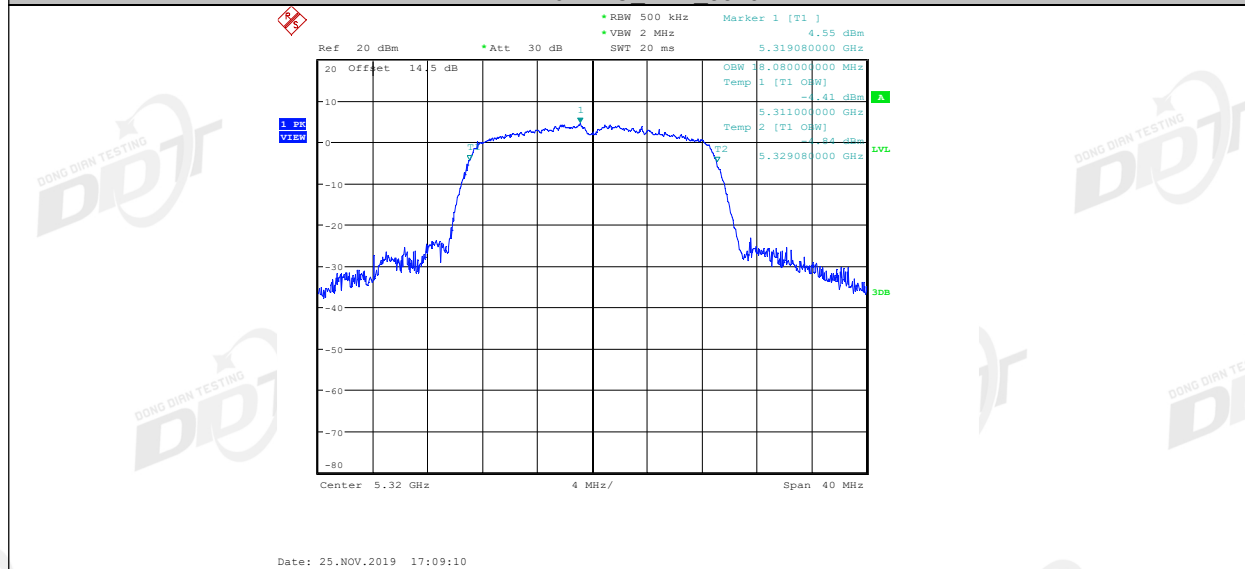
11N20MIMO Ant2 5280



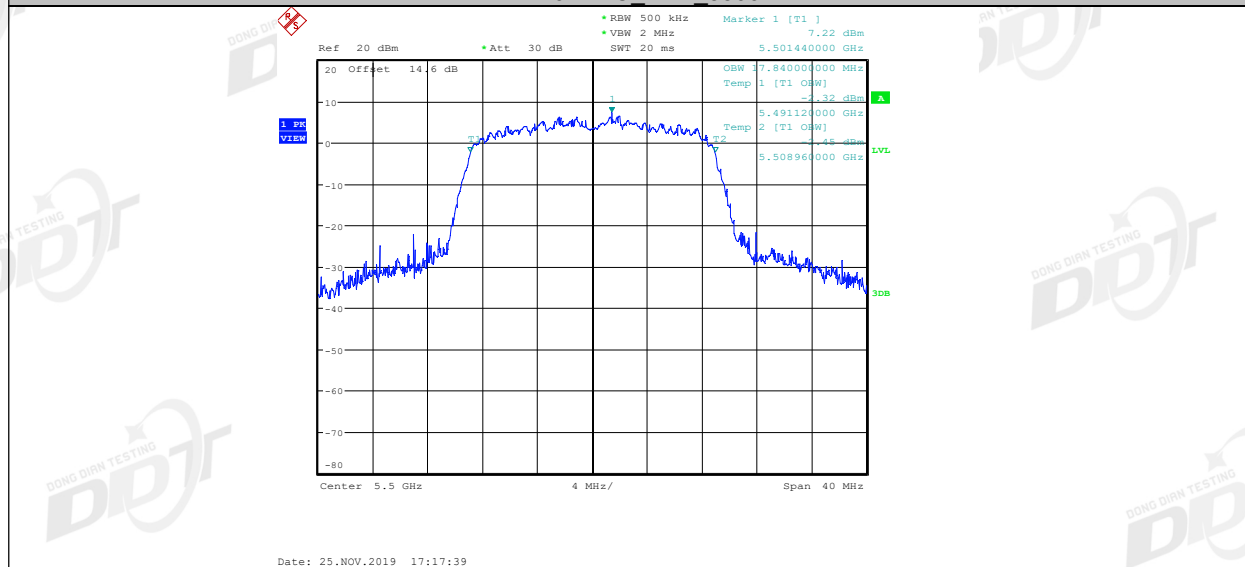
11N20MIMO Ant1 5320



11N20MIMO Ant2 5320



11N20MIMO Ant1 5500



11N20MIMO Ant2 5500



1.99
VIEW

Ref 20 dBm *Att 30 dB SWT 20 ms 5.581880000 GHz

20 Offset 14 dB

10

0

-10

-20

-40

-50

-60

-70

-80

Center 5.58 GHz 4 MHz/ Span 40 MHz

OBW 17.920000000 MHz
Temp 1 [T1 CW] -41.41 dBm
2 [T1 CW] -41.63 dBm
5.581880000 GHz
5.588960000 GHz

Date: 25.NOV.2019 17:49:29

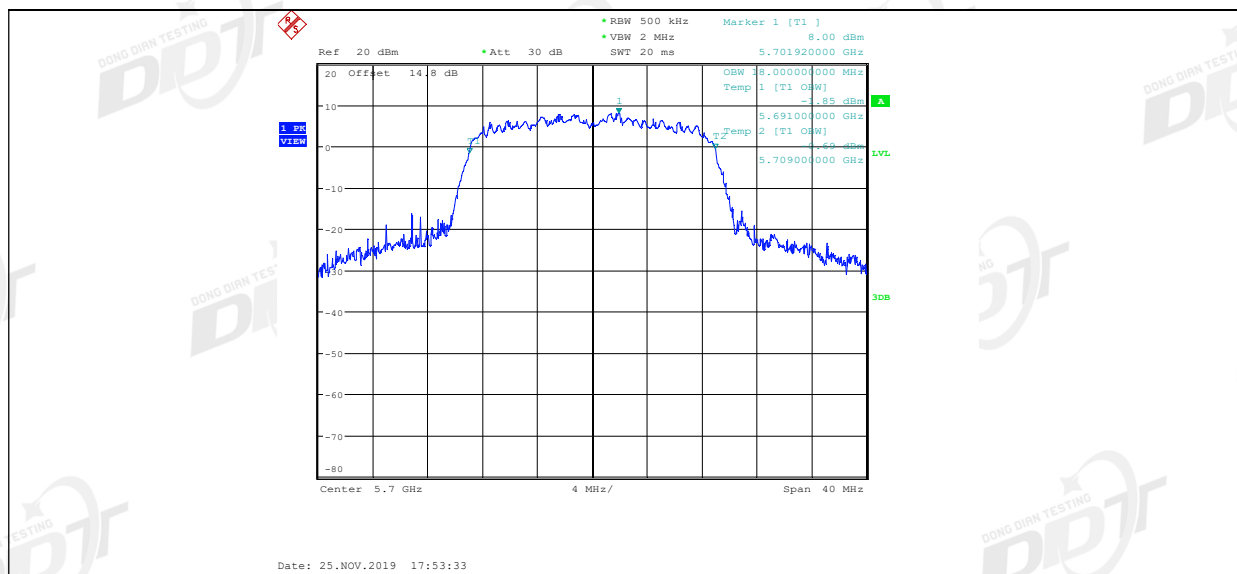
RBW 500 kHz
 VBW 2 MHz
 Ref 20 dBm
 Att 30 dB
 SWT 20 ms
 Marker 1 [T1]
 5.15 dBm
 5.579120000 GHz
 5.120000000 MHz
 1 [T1 CW]
 Temp 1
 5.570960000 GHz
 2 [T1 CW]
 Temp 2
 5.589080000 GHz

1 PR
 VIEW

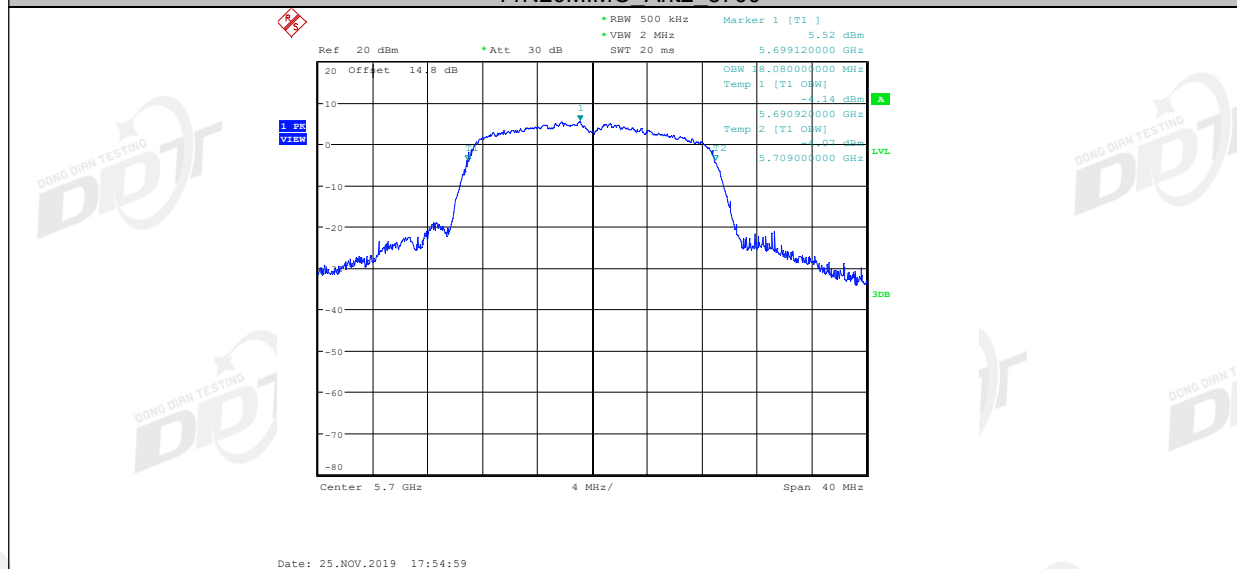
Center 5.58 GHz
 4 MHz/
 Span 40 MHz

Date: 25.NOV.2019 17:50:54

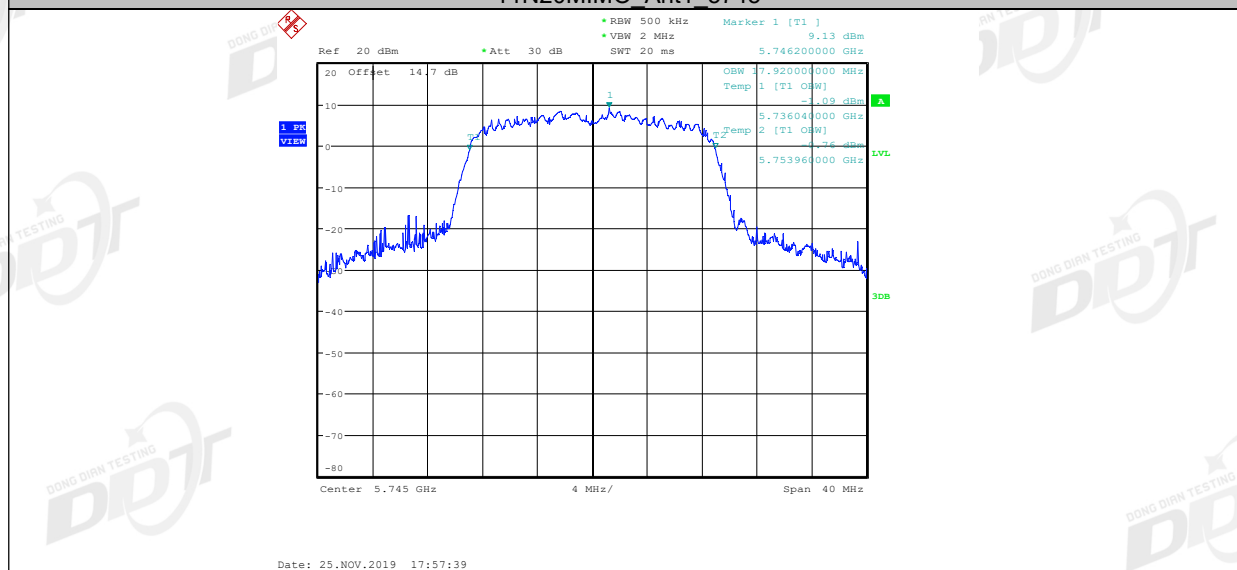
11N20MIMO Ant1 5700



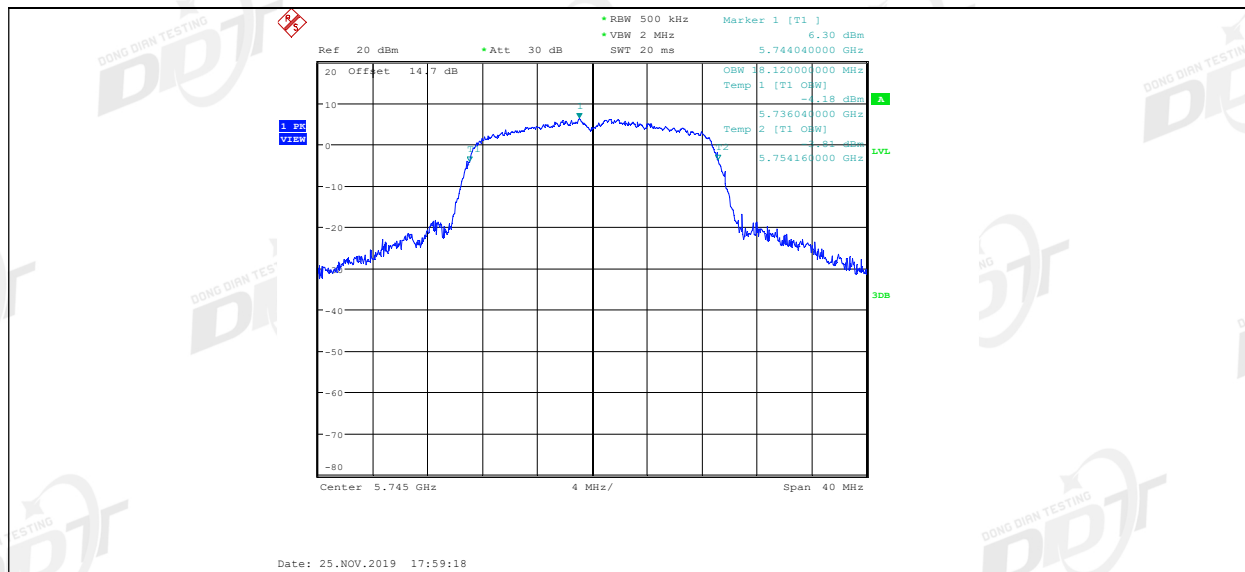
11N20MIMO Ant2 5700



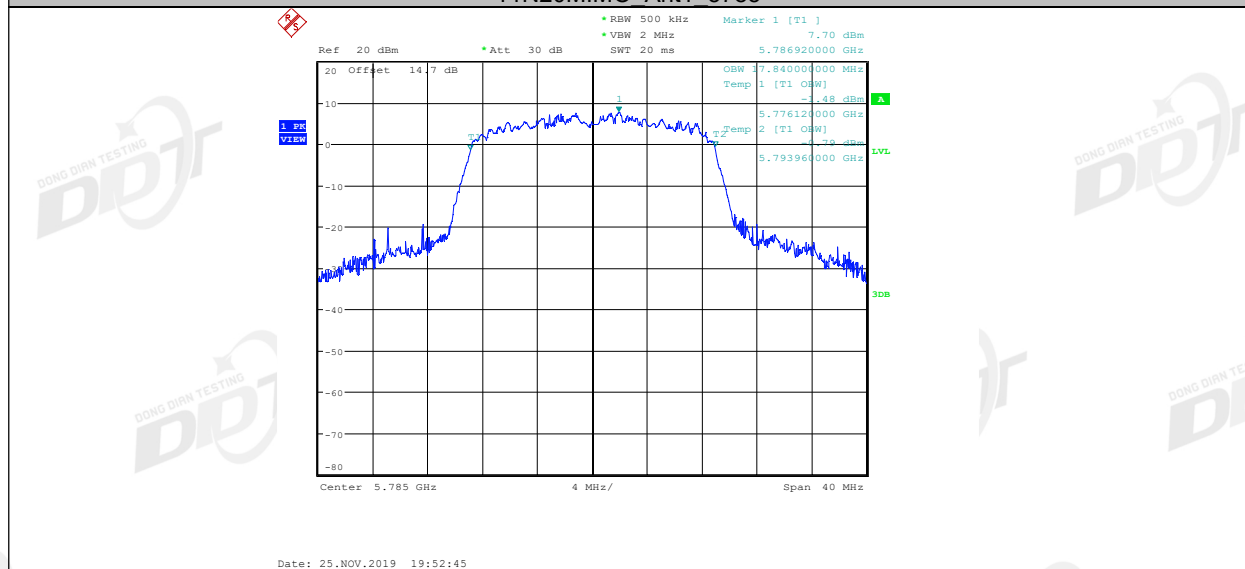
11N20MIMO Ant1 5745



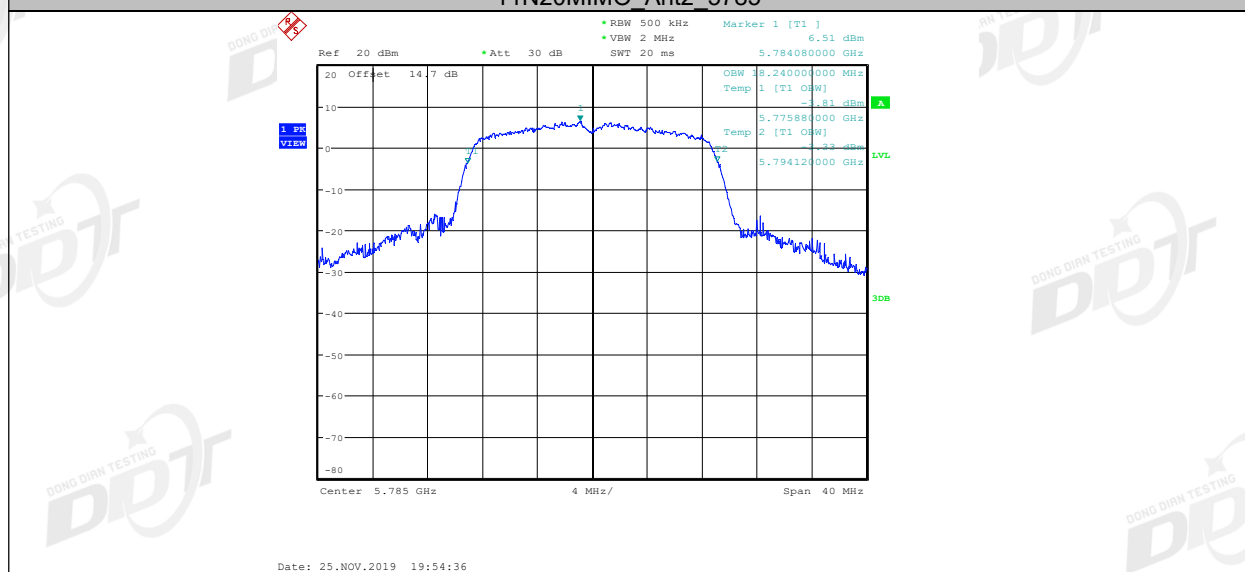
11N20MIMO Ant2 5745



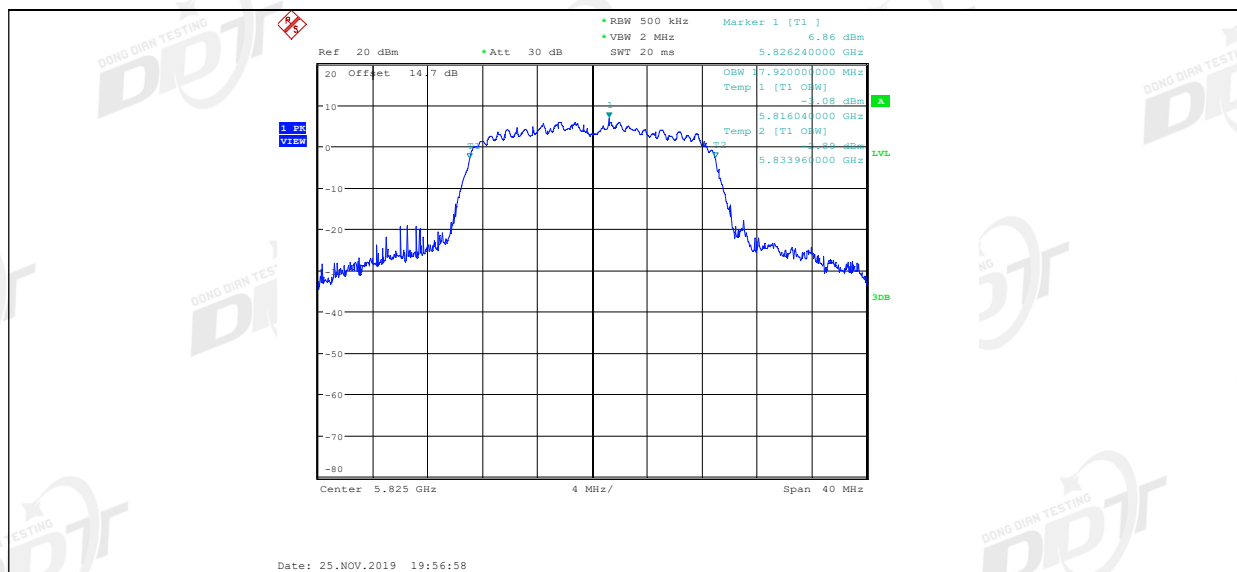
11N20MIMO Ant1 5785



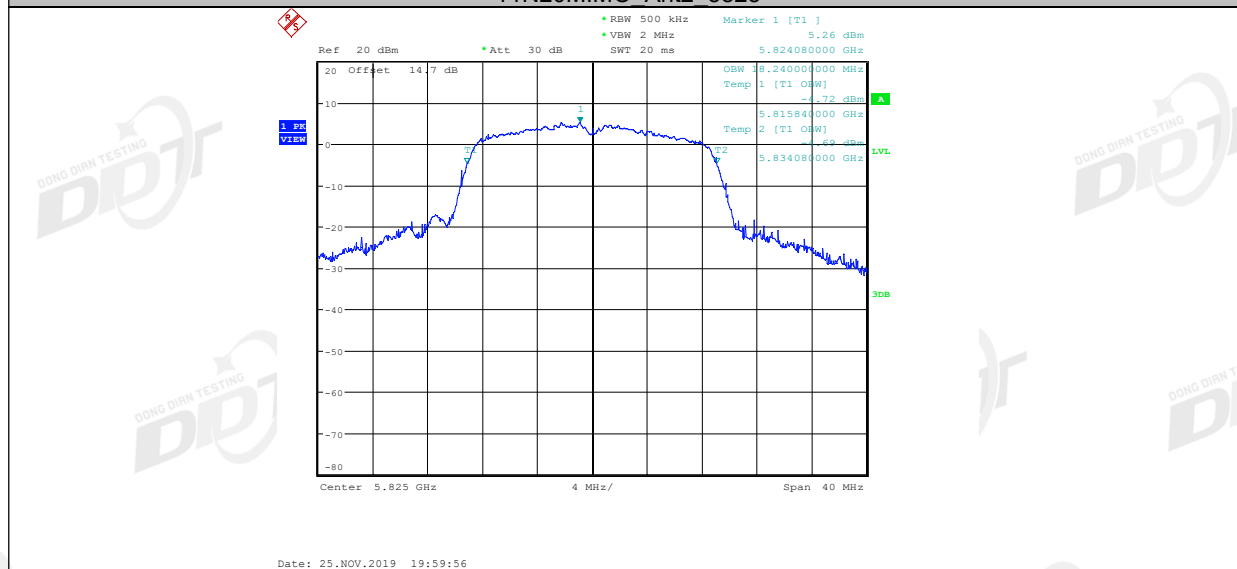
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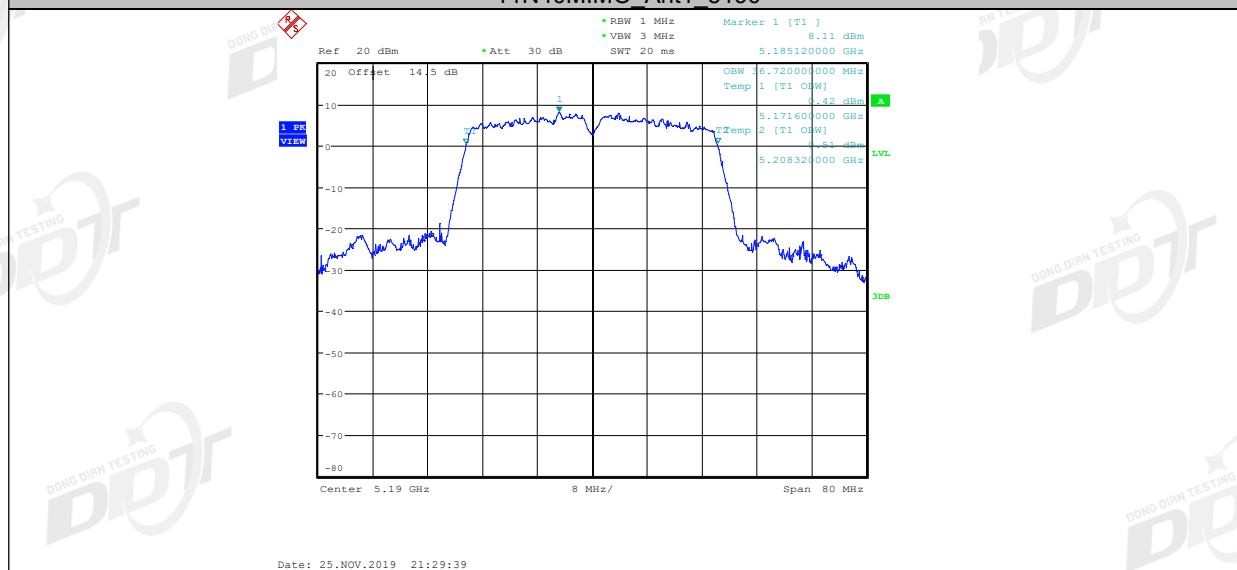
11N20MIMO Ant1 5825



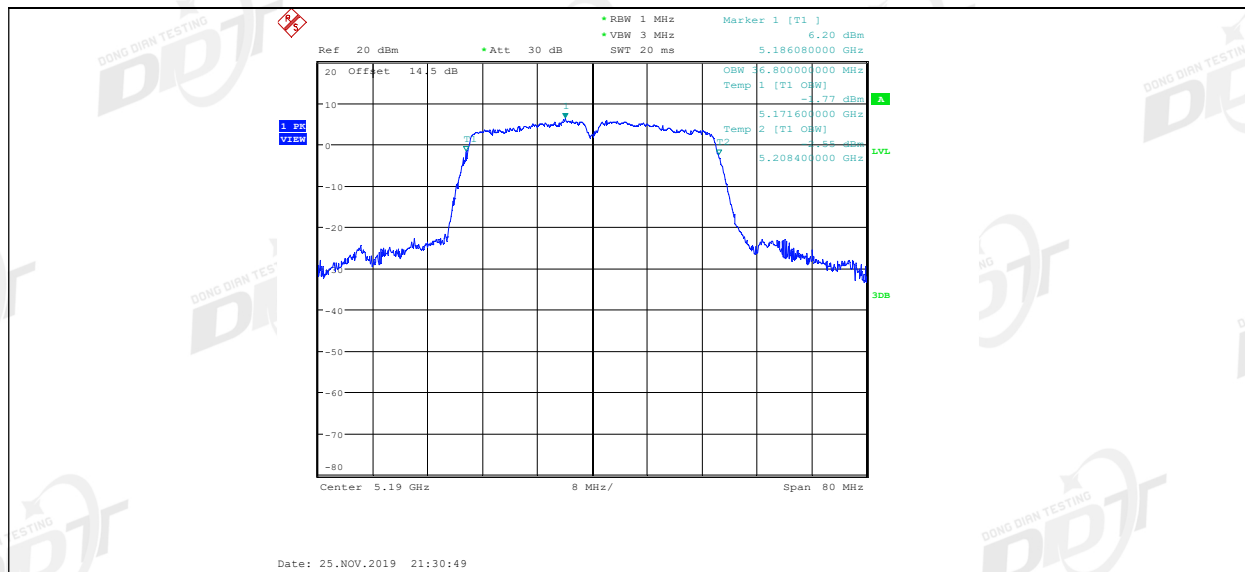
11N20MIMO Ant2 5825



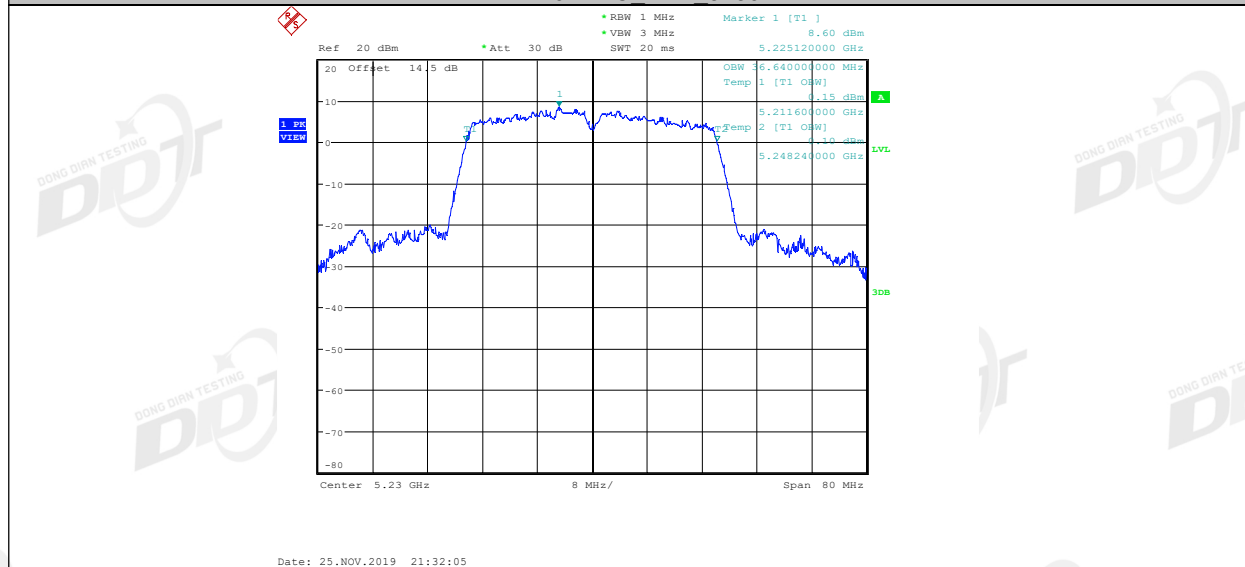
11N40MIMO Ant1 5190



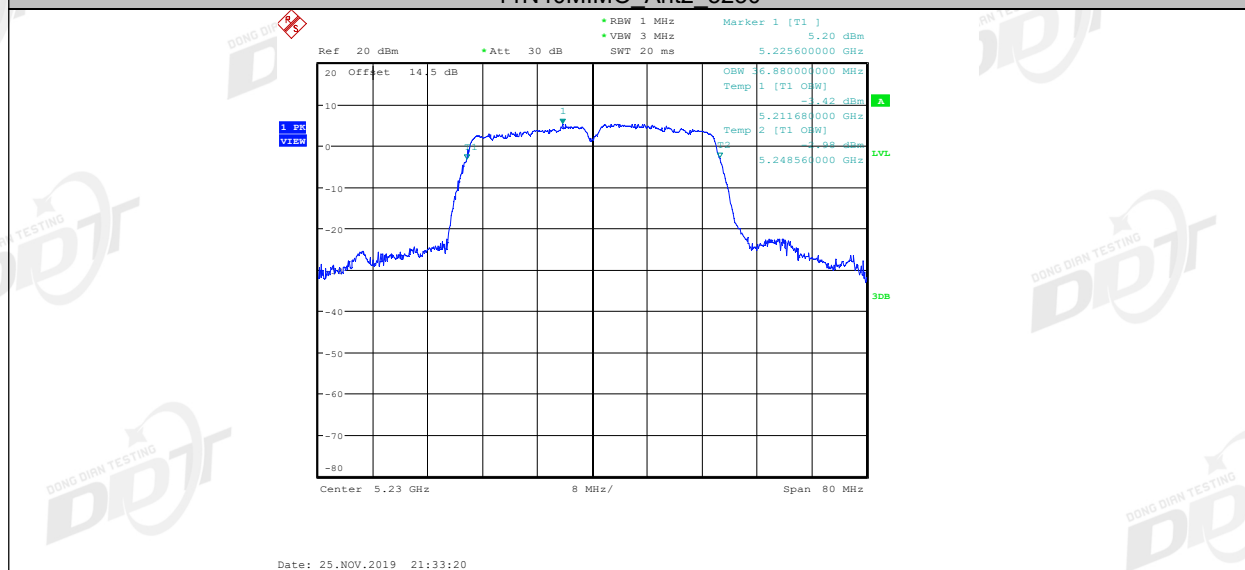
11N40MIMO Ant2 5190



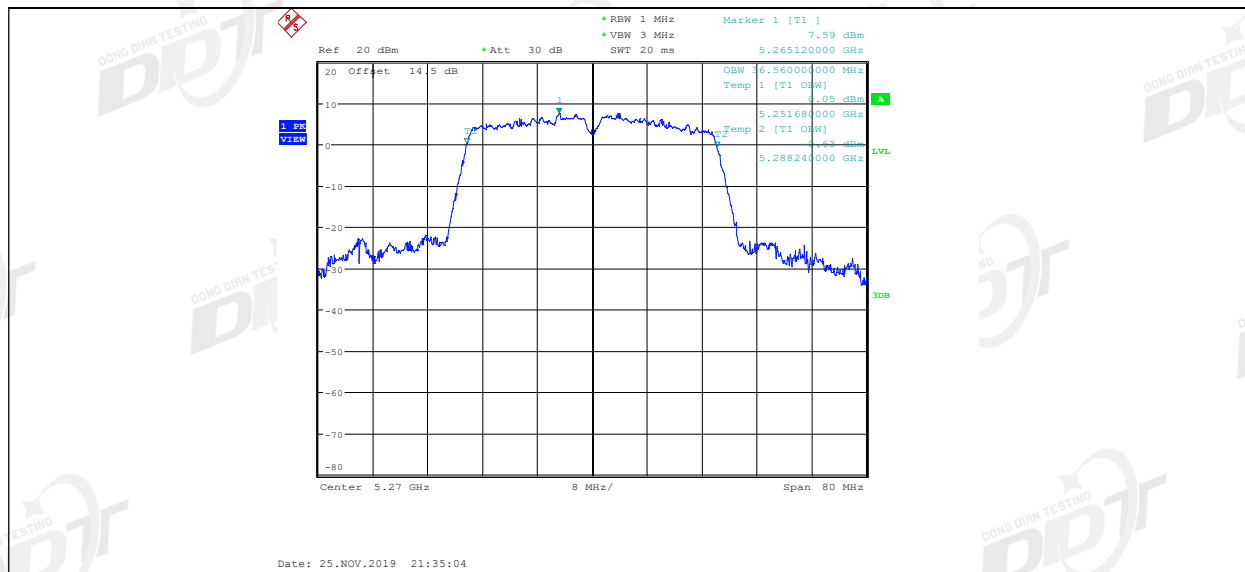
11N40MIMO Ant1 5230



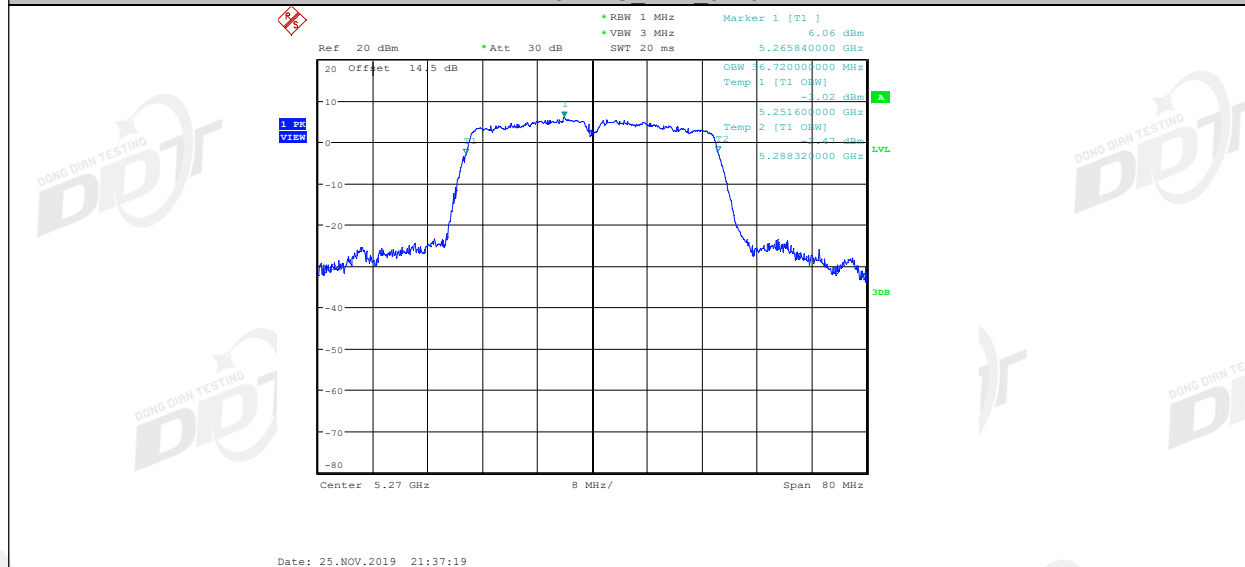
11N40MIMO Ant2 5230



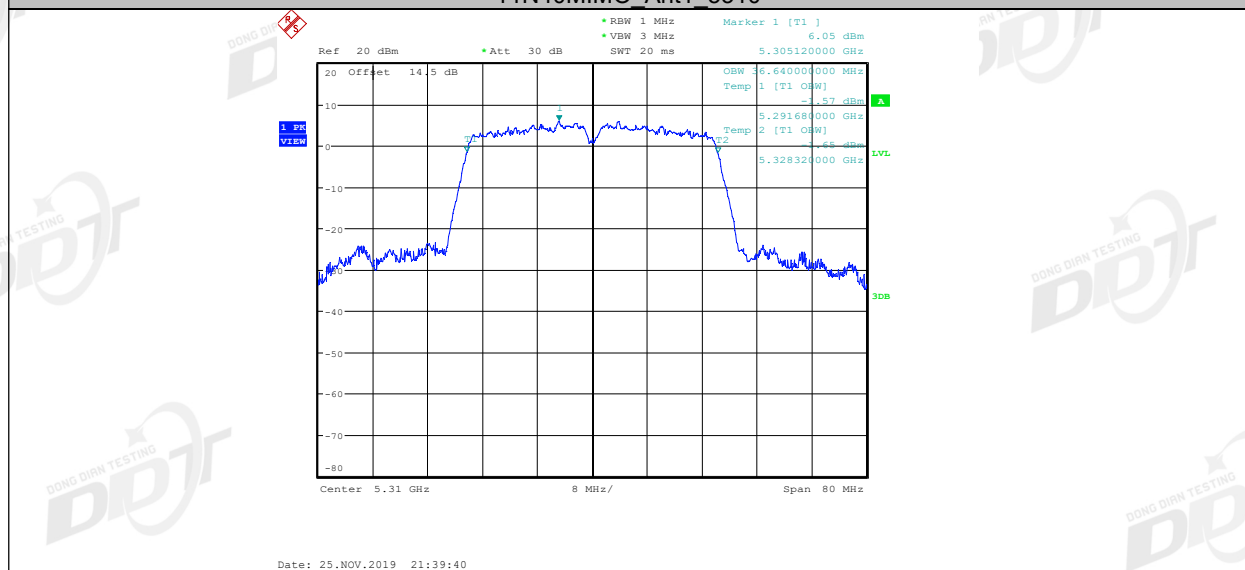
11N40MIMO Ant1 5270



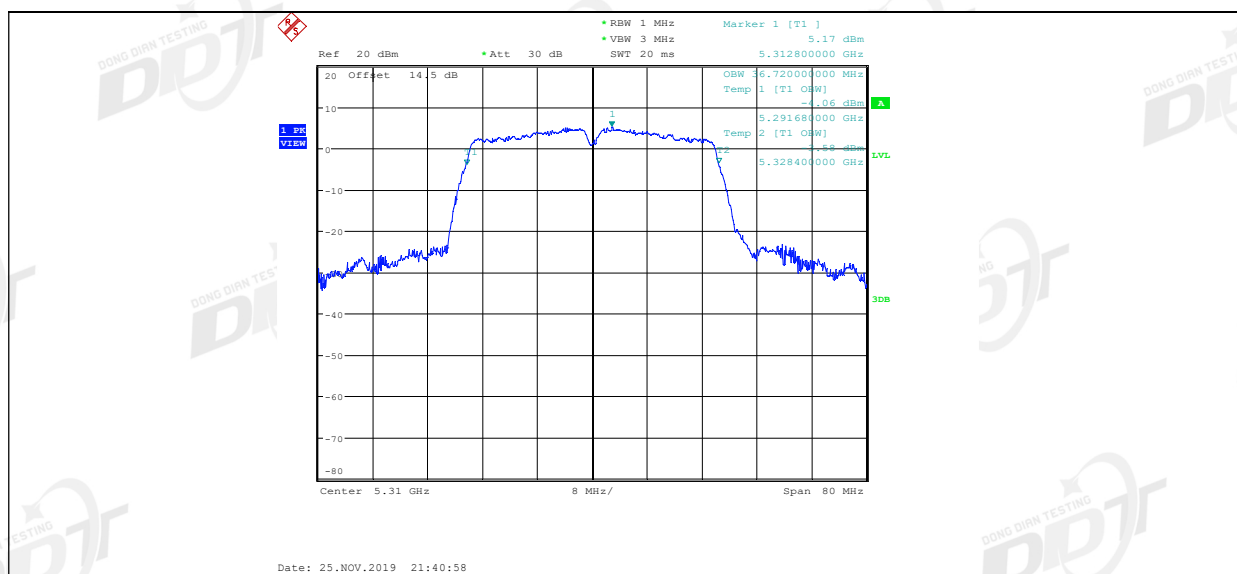
11N40MIMO Ant2 5270



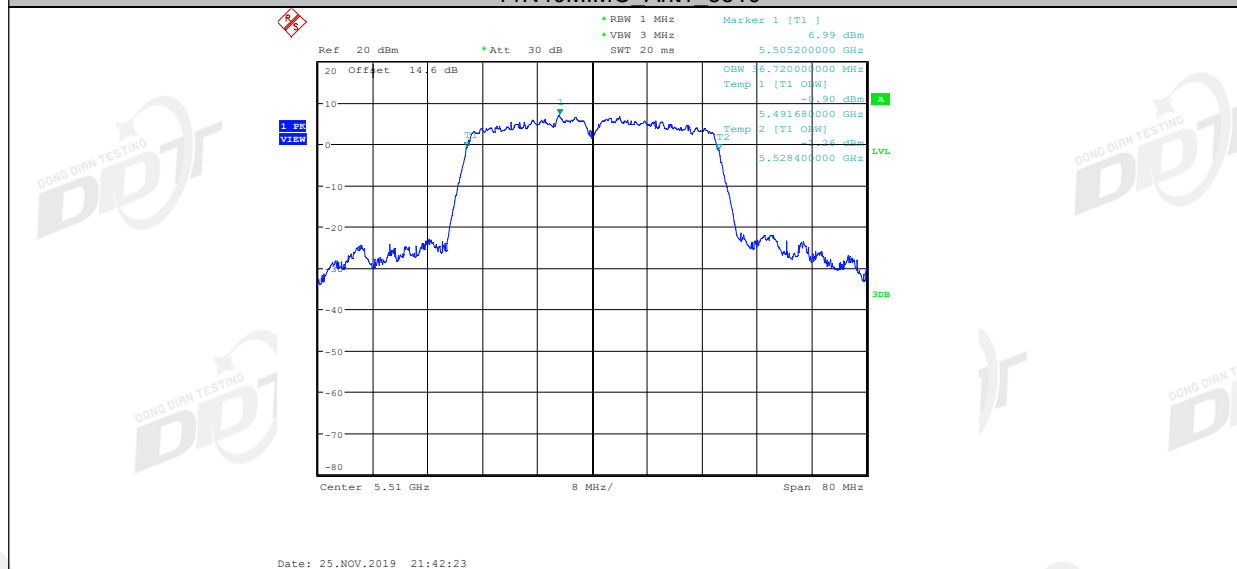
11N40MIMO Ant1 5310



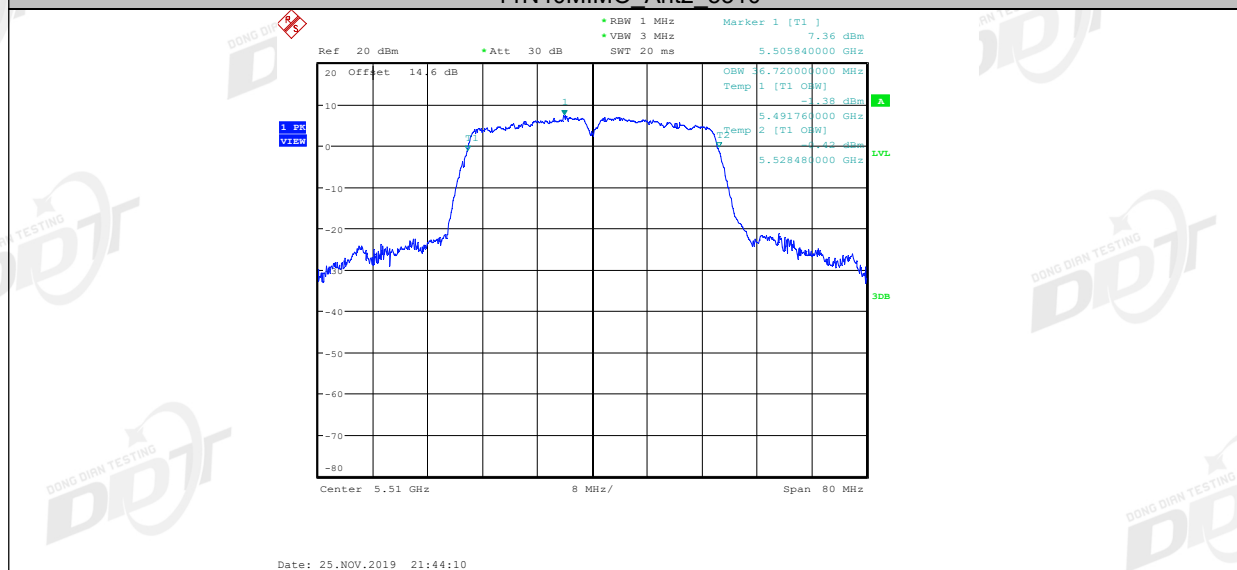
11N40MIMO Ant2 5310



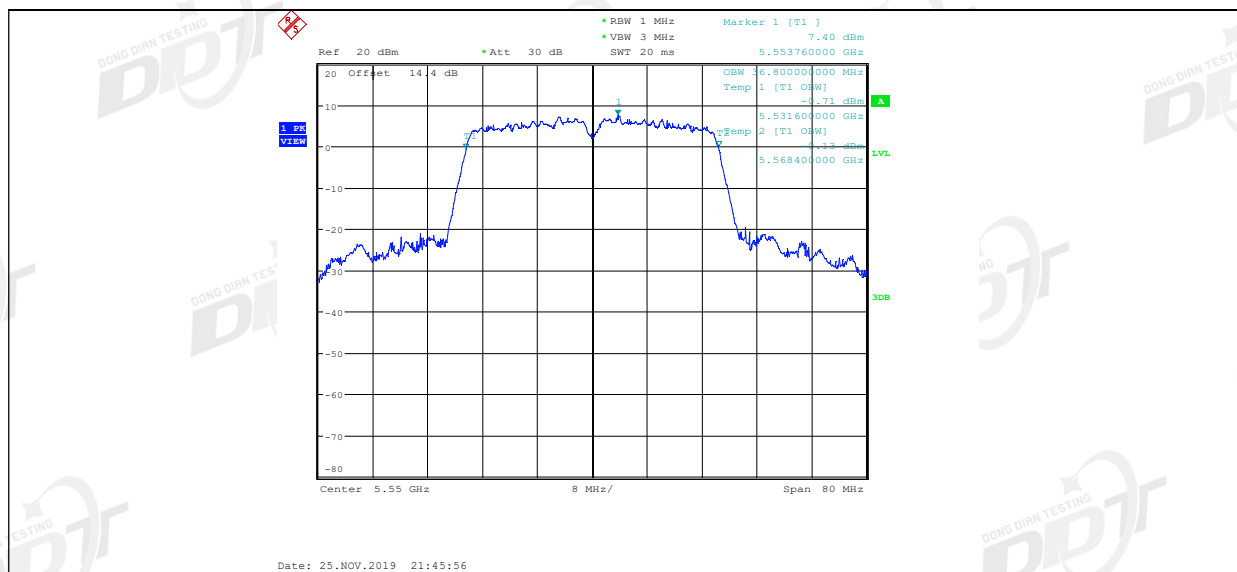
11N40MIMO Ant1 5510



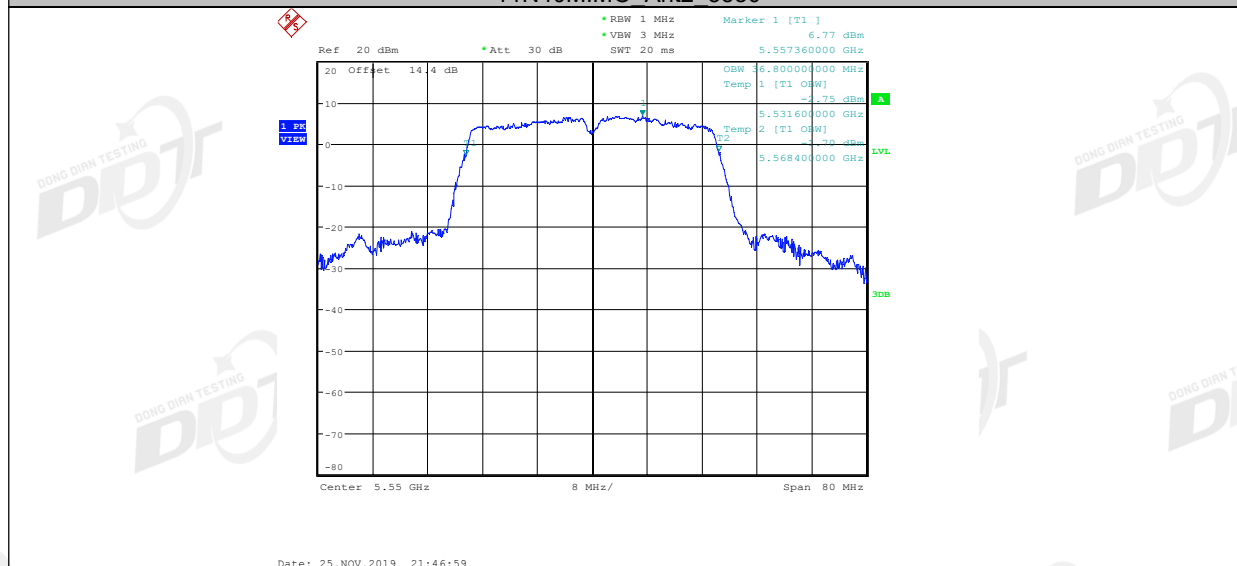
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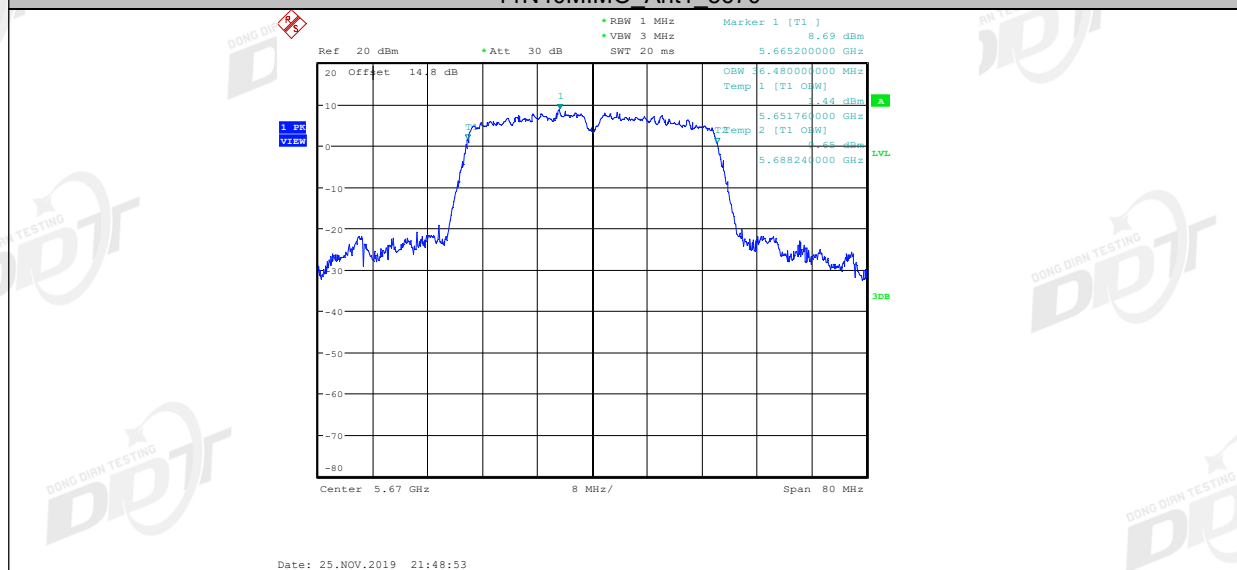
11N40MIMO Ant1 5550



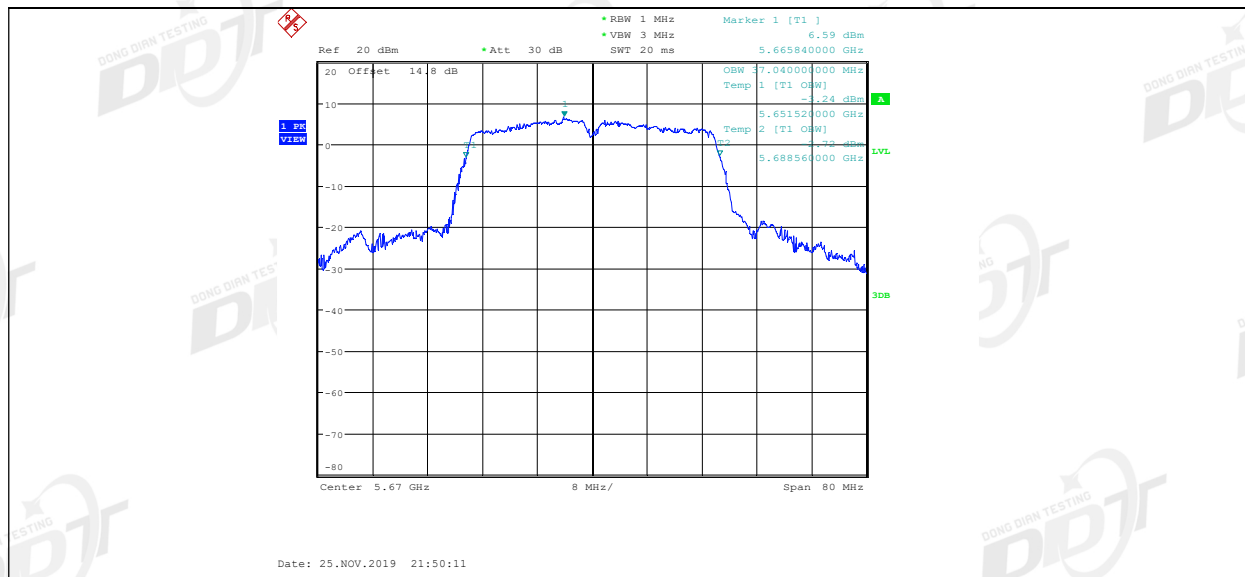
11N40MIMO Ant2 5550



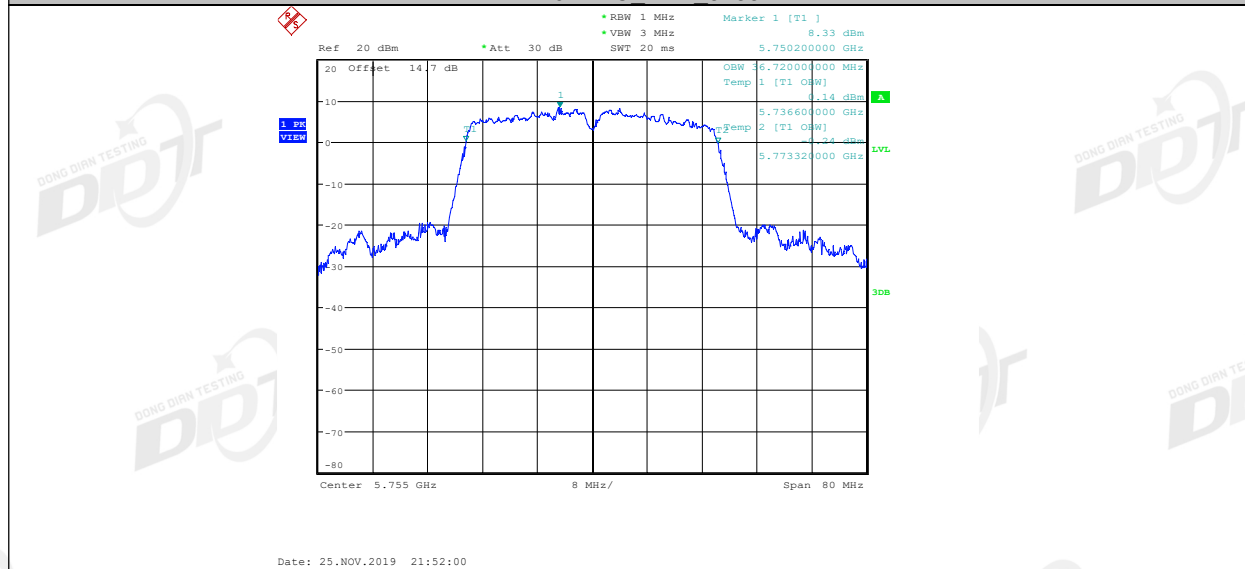
11N40MIMO Ant1 5670



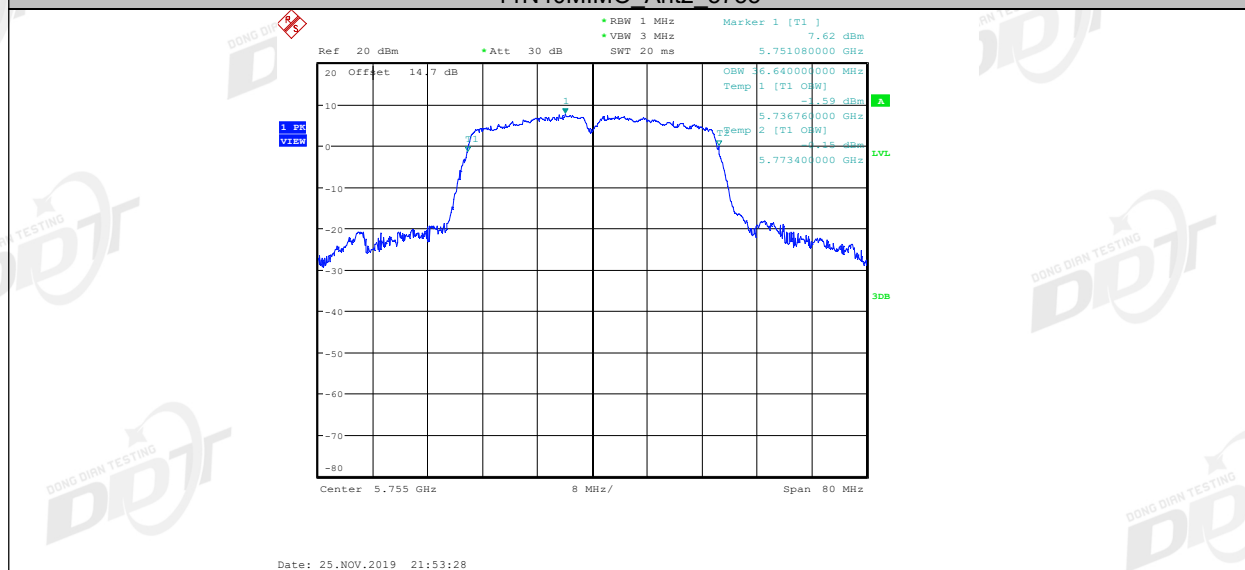
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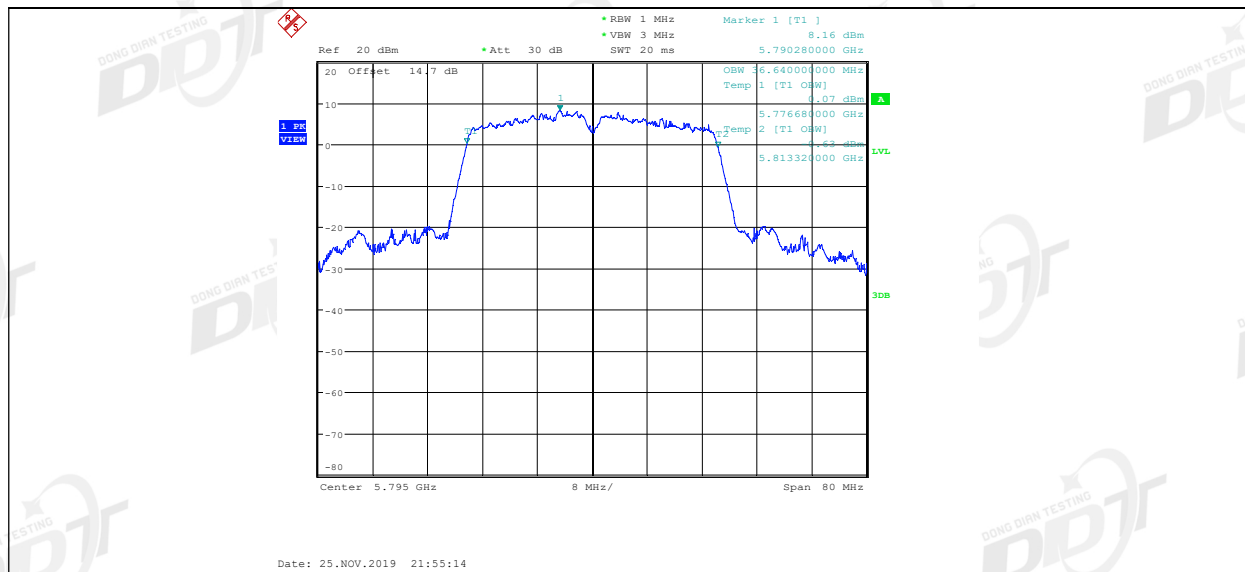
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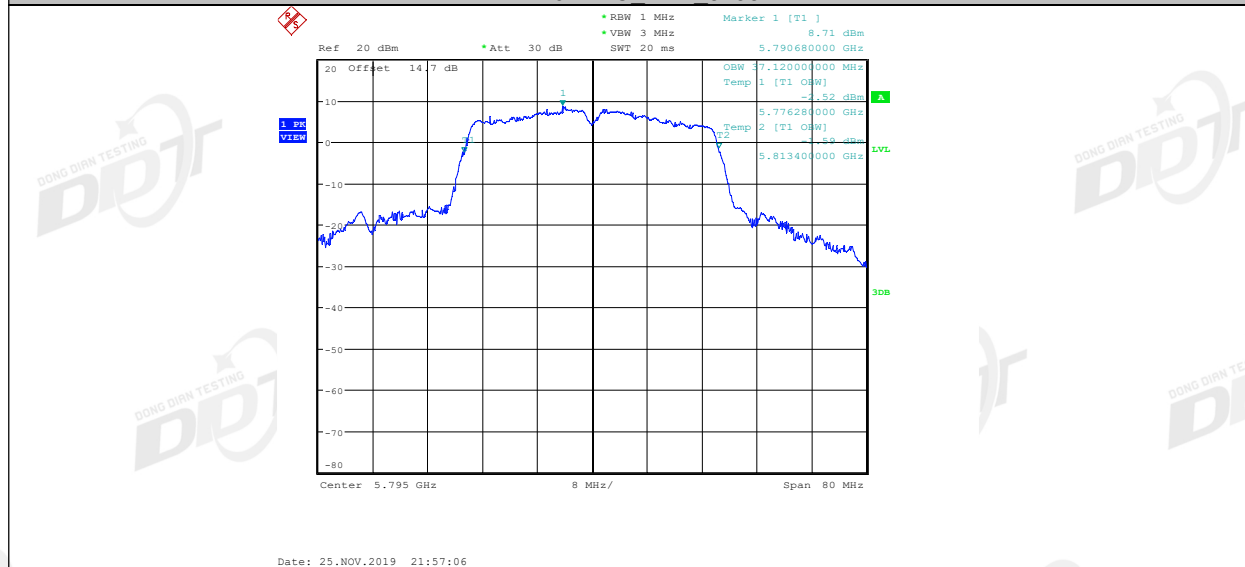
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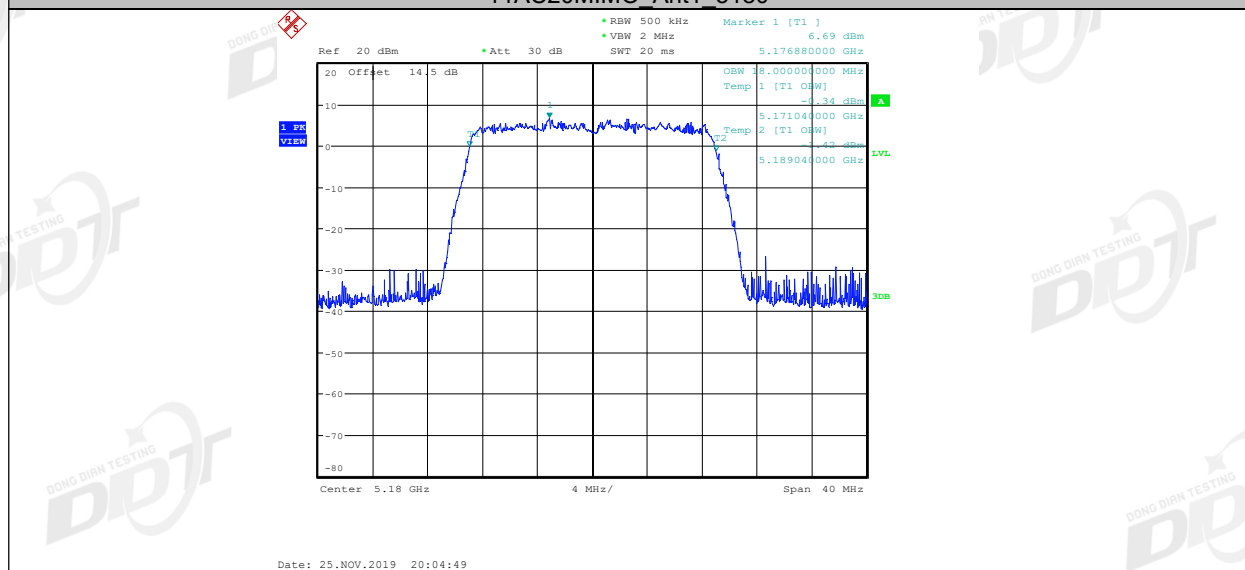
11N40MIMO Ant1 5795



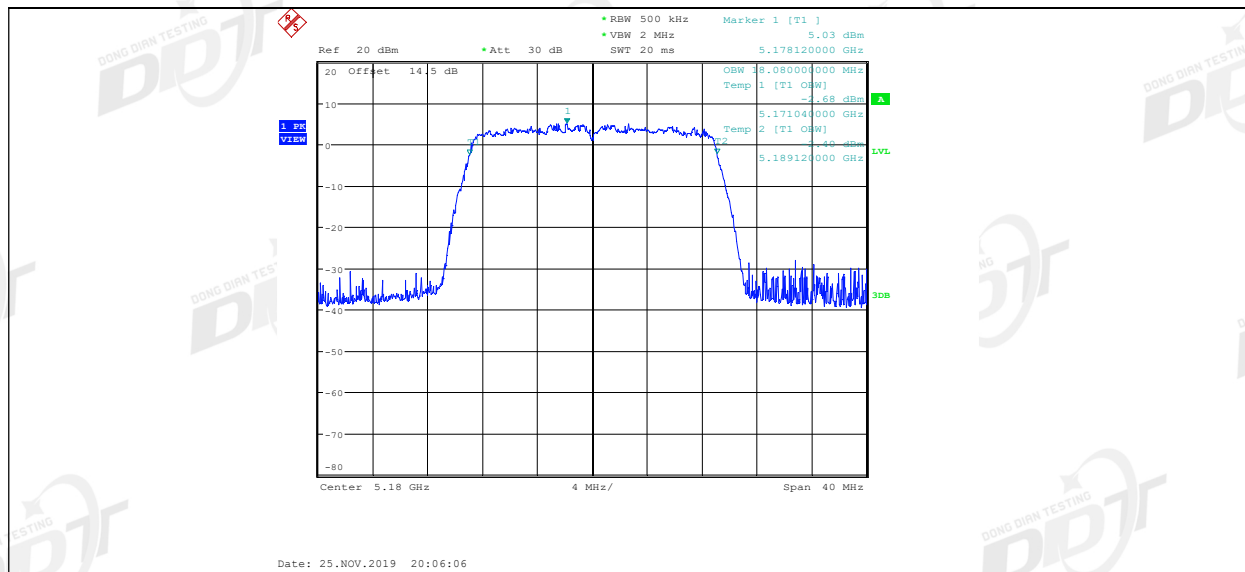
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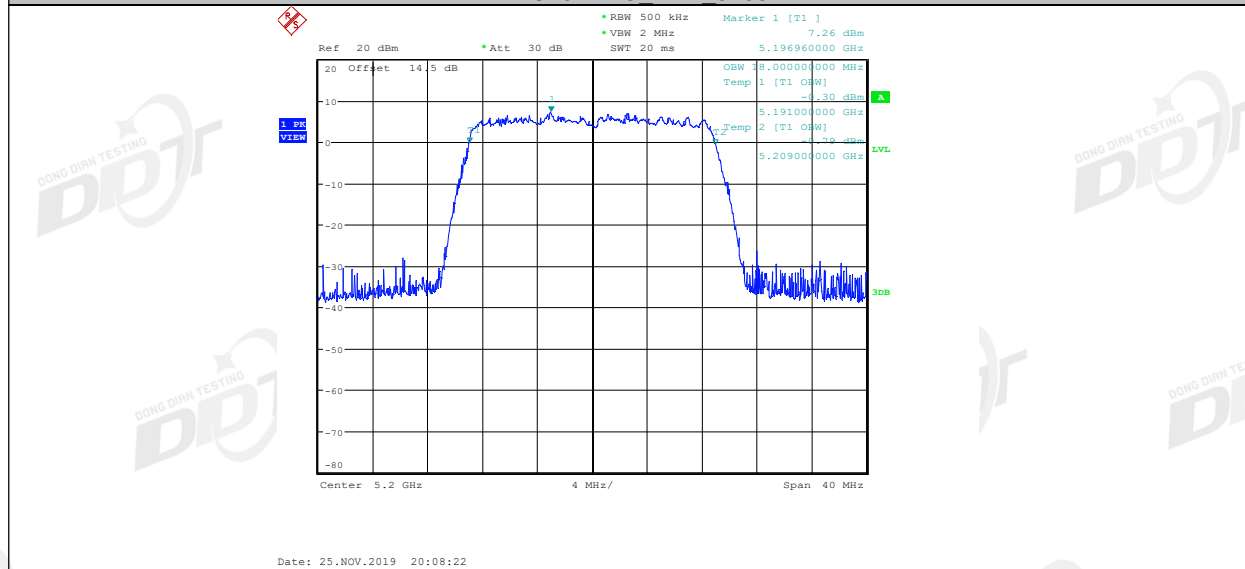
11AC20MIMO Ant1 5180



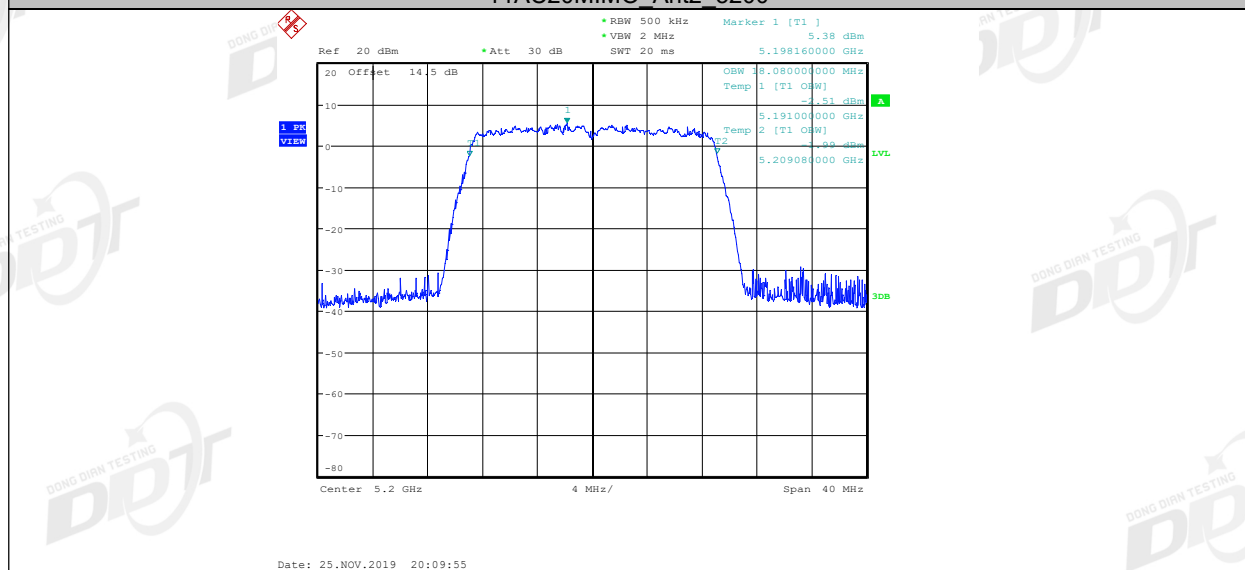
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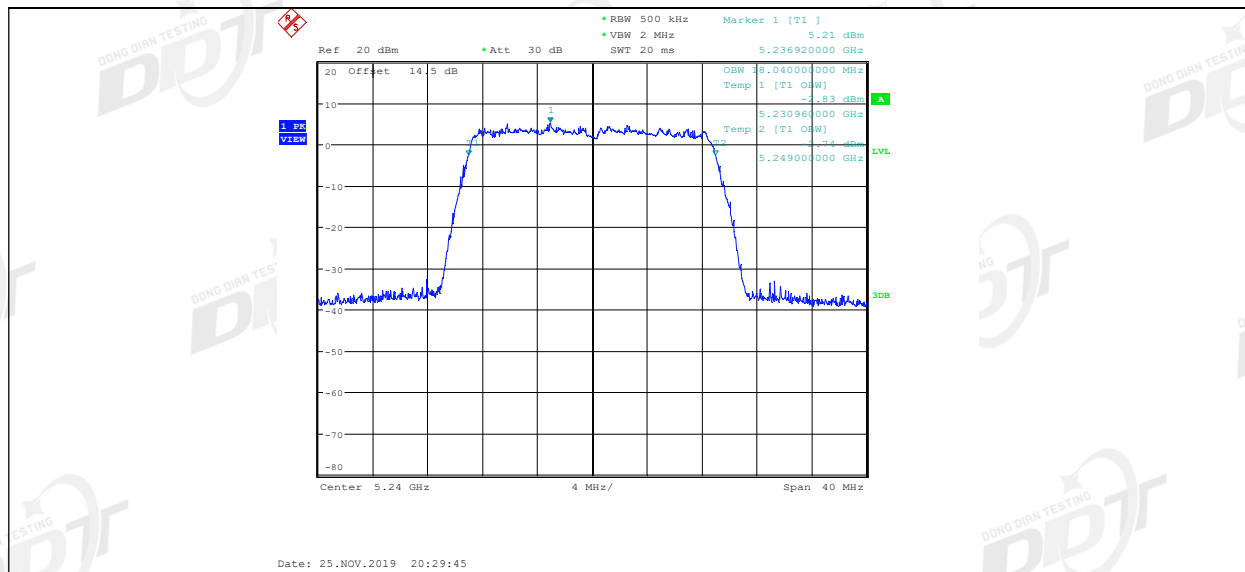
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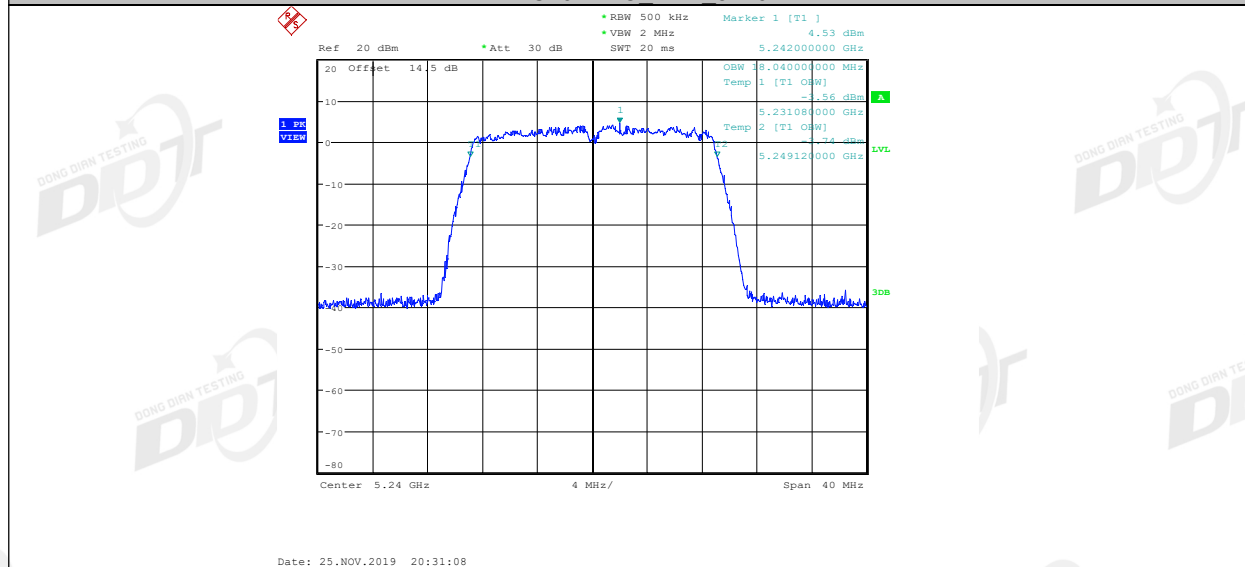
11AC20MIMO_Ant2_5200



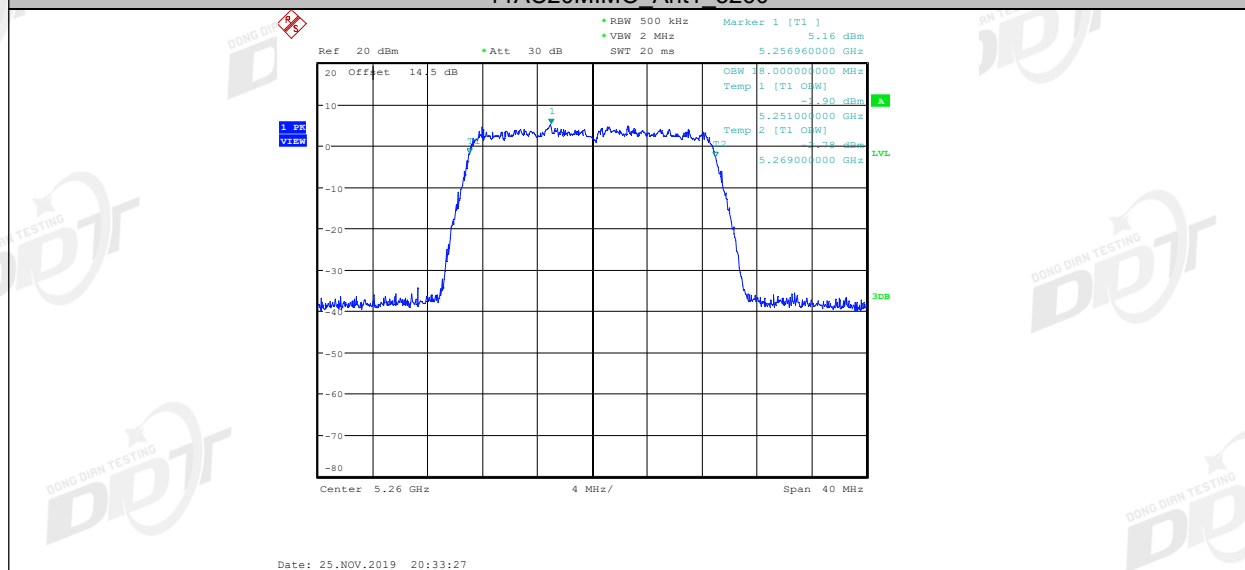
11AC20MIMO_Ant1_5240



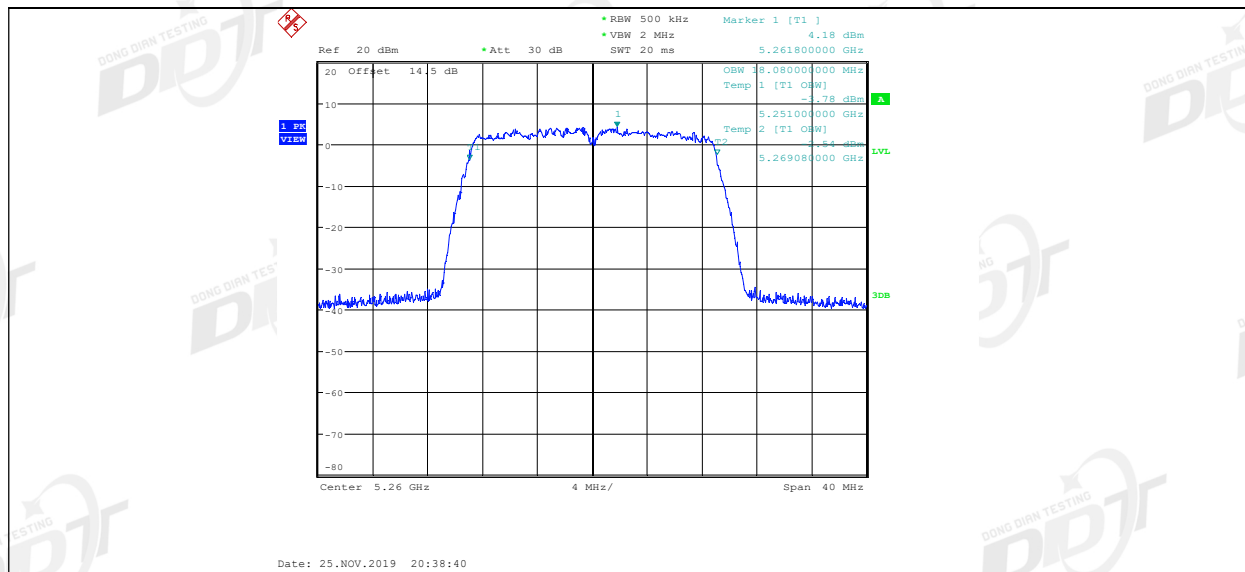
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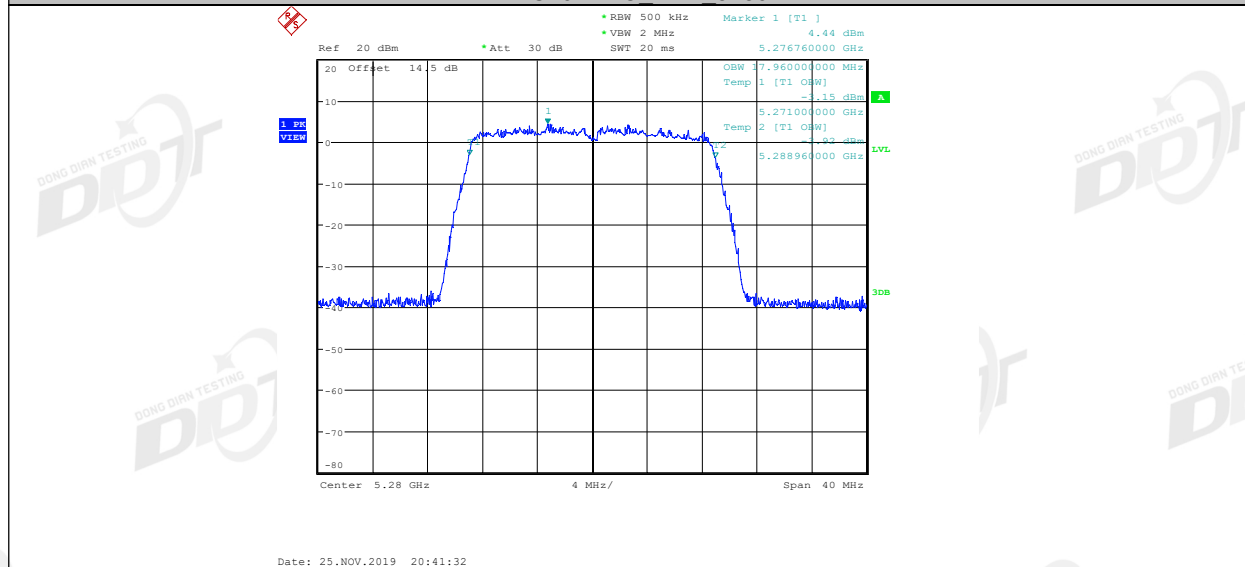
11AC20MIMO Ant1 5260



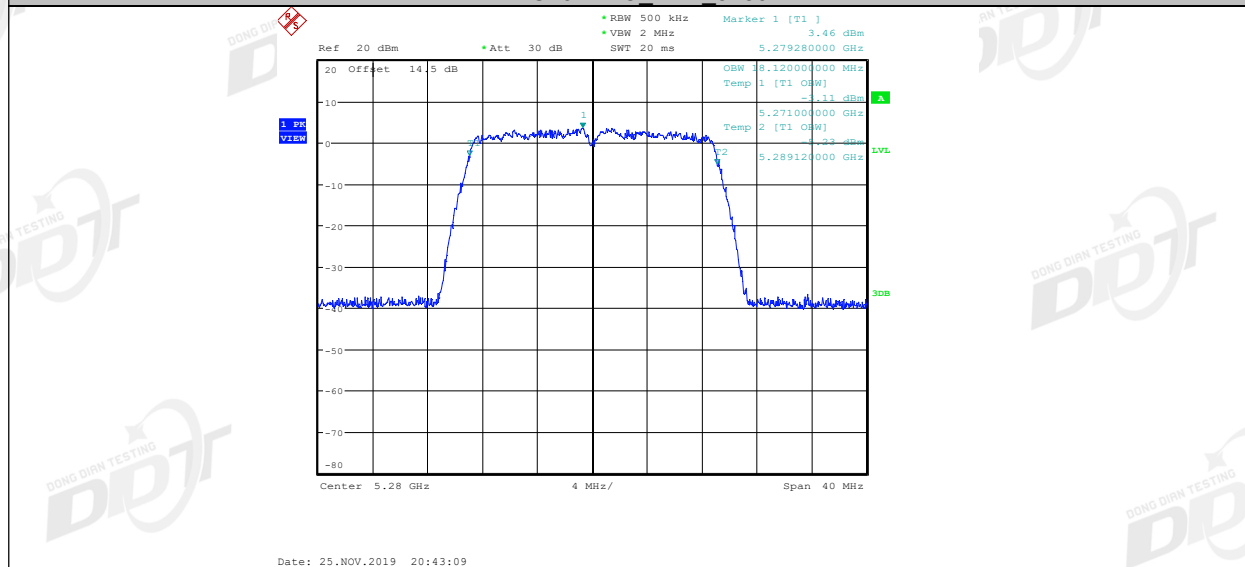
11AC20MIMO Ant2 5260



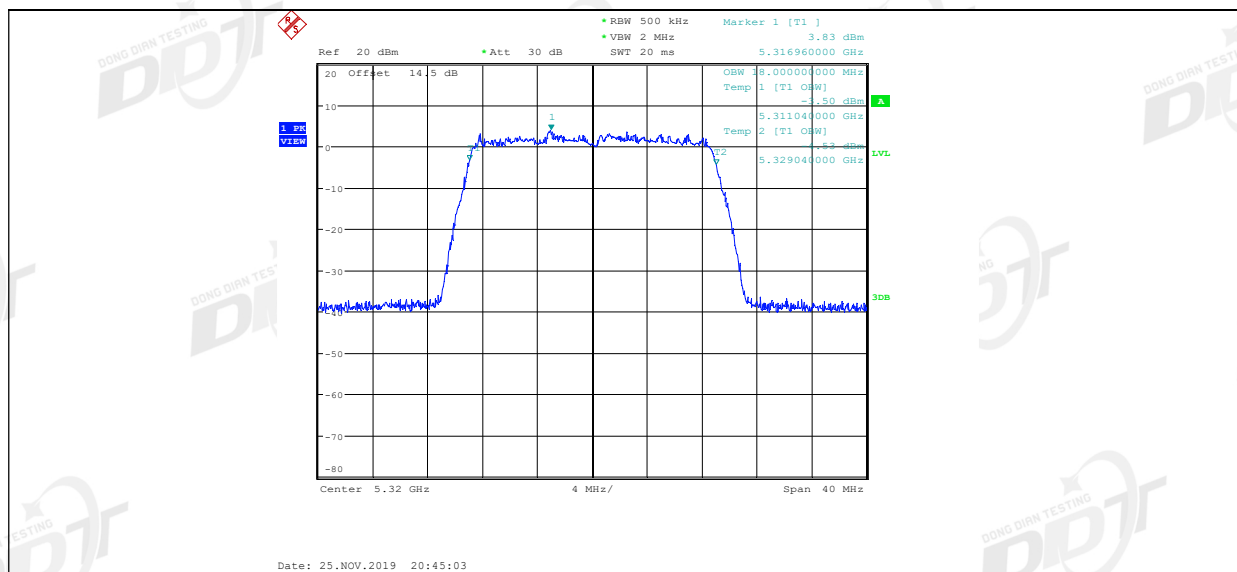
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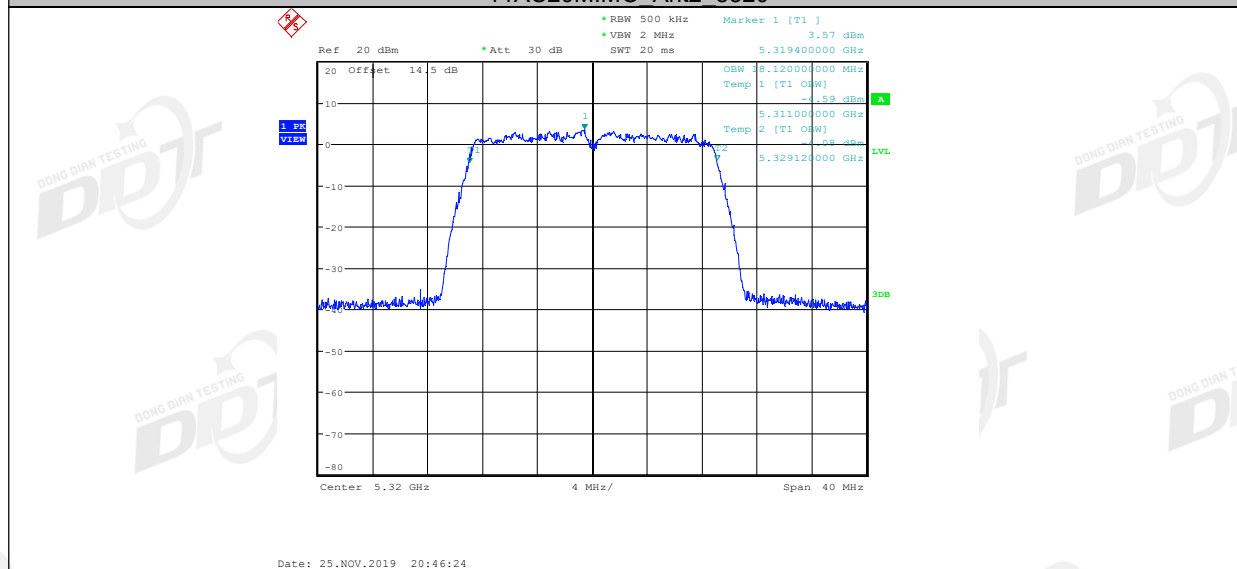
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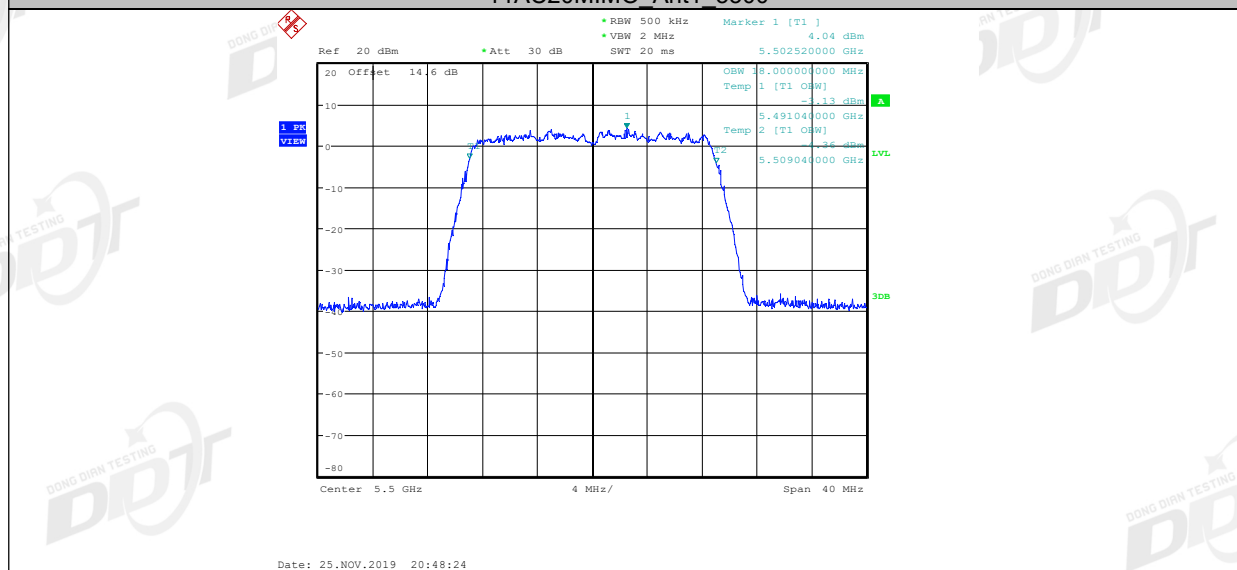
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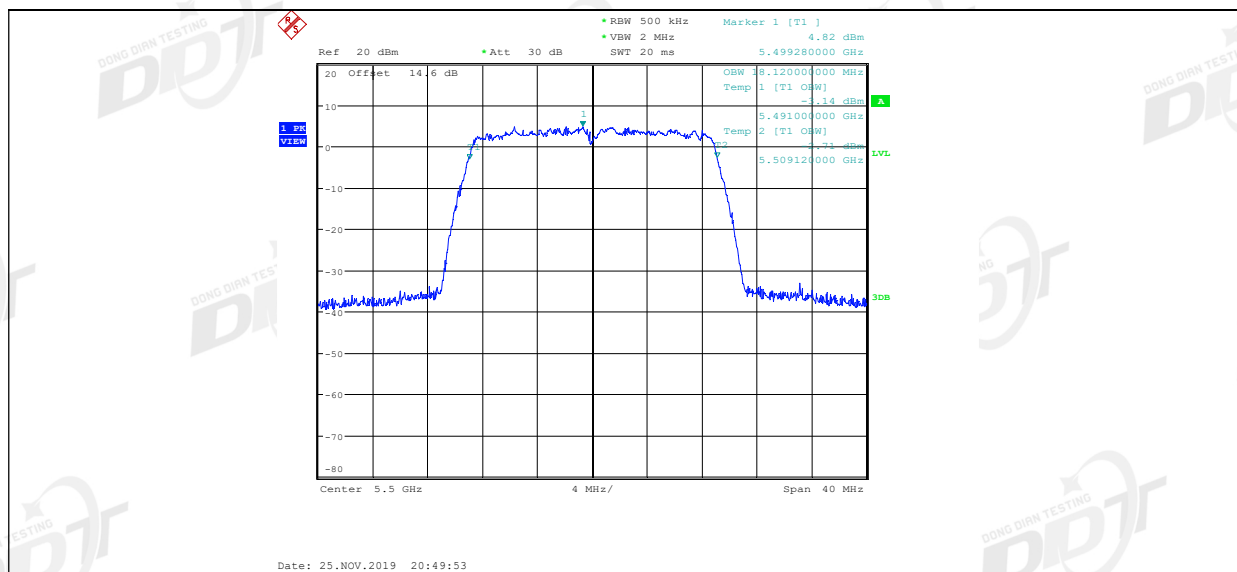
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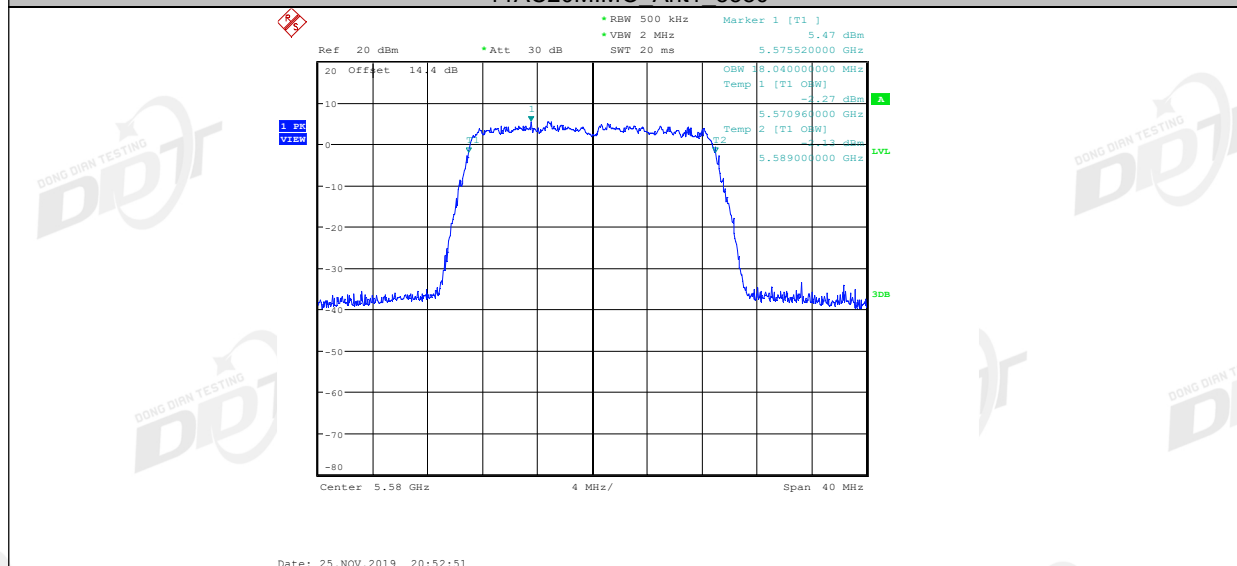
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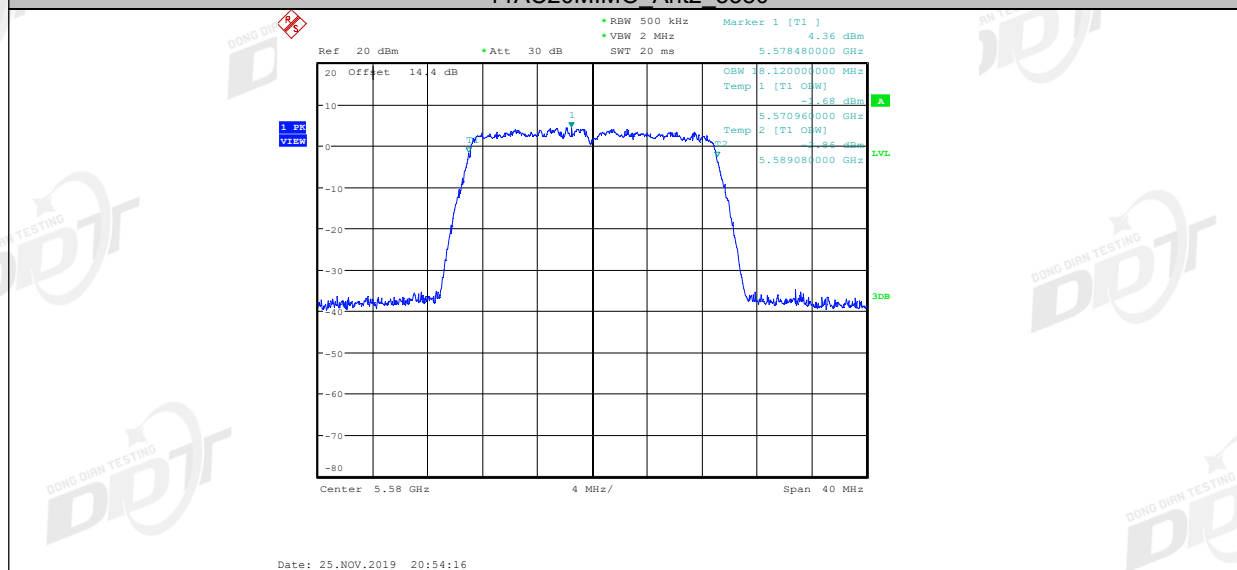
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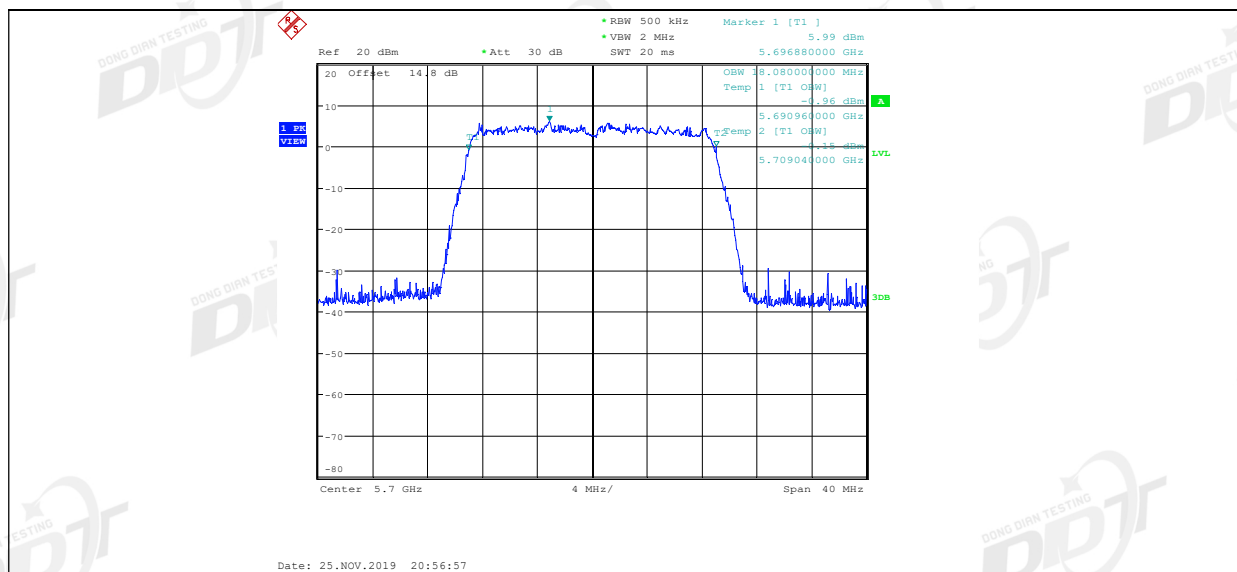
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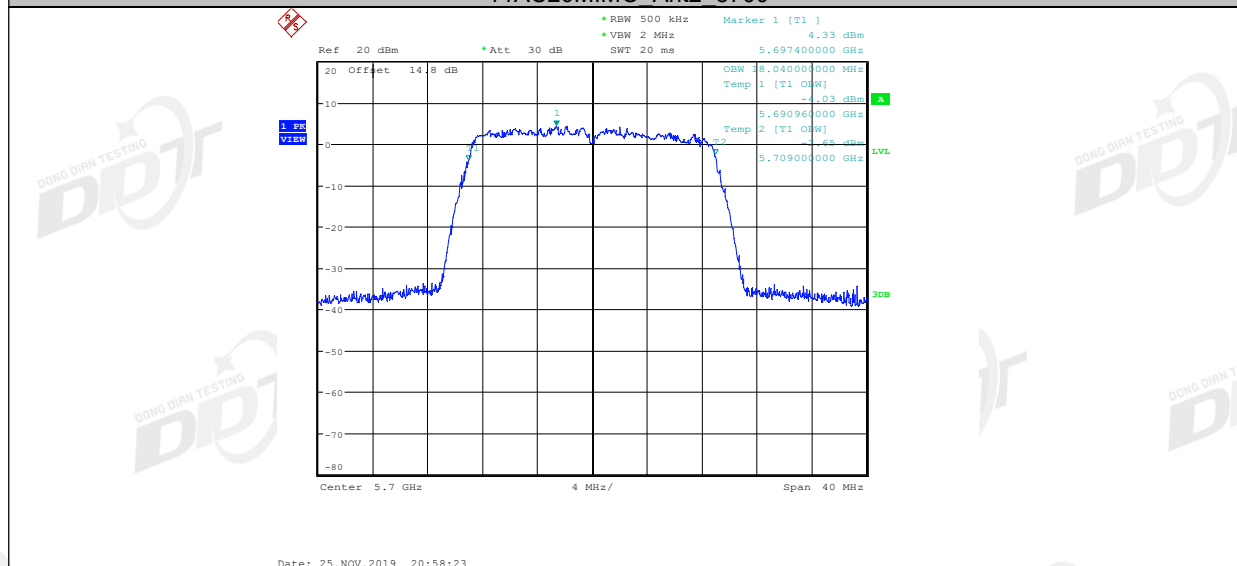
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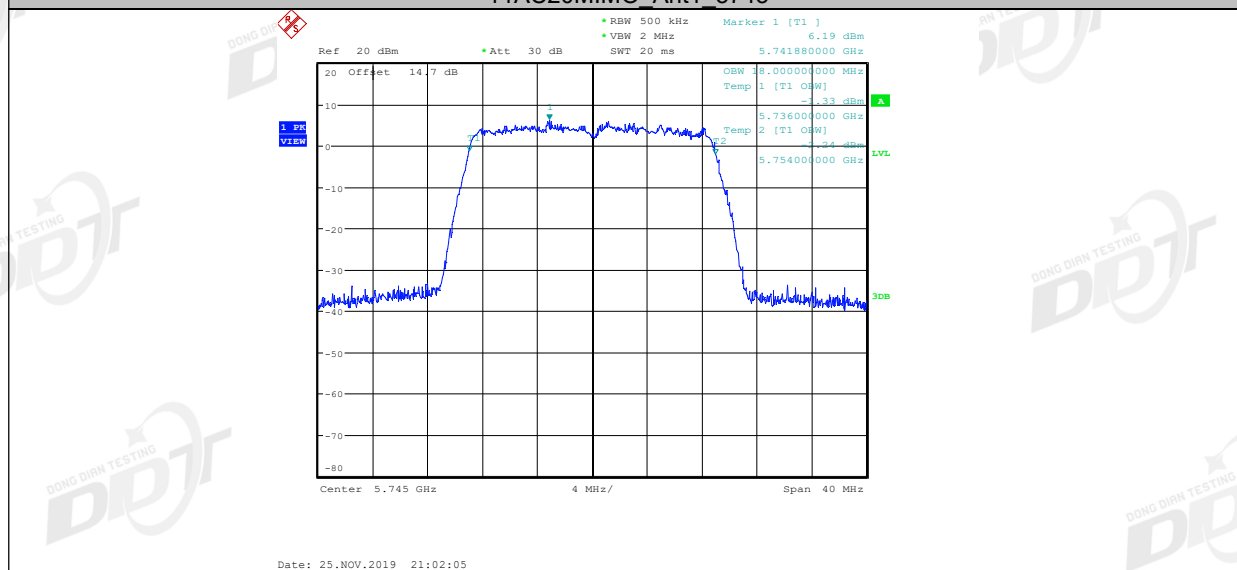
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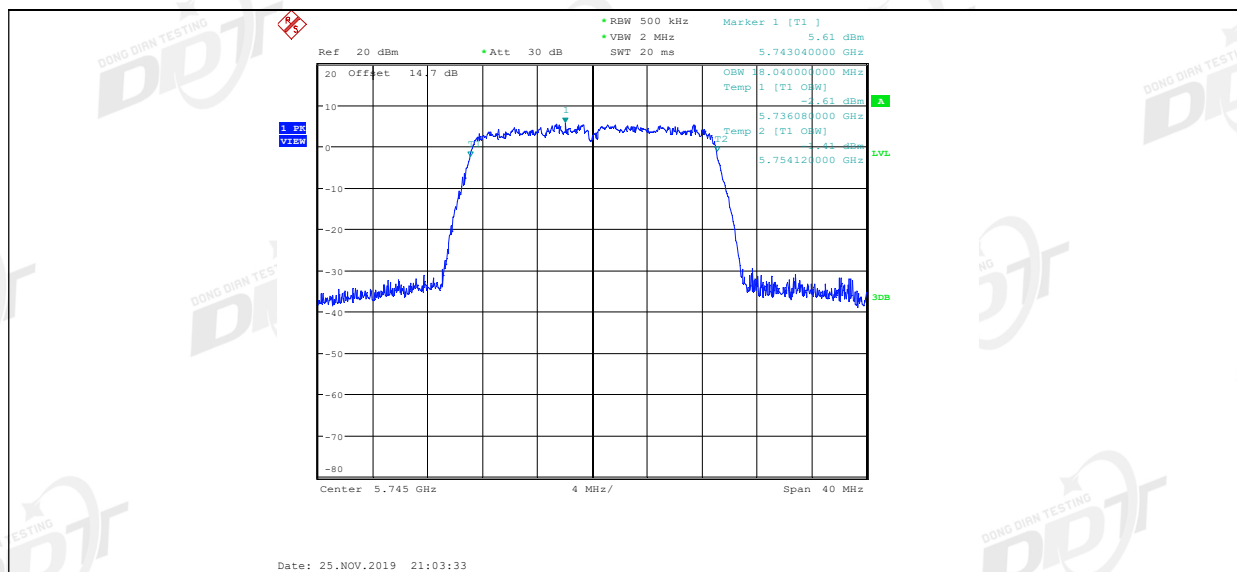
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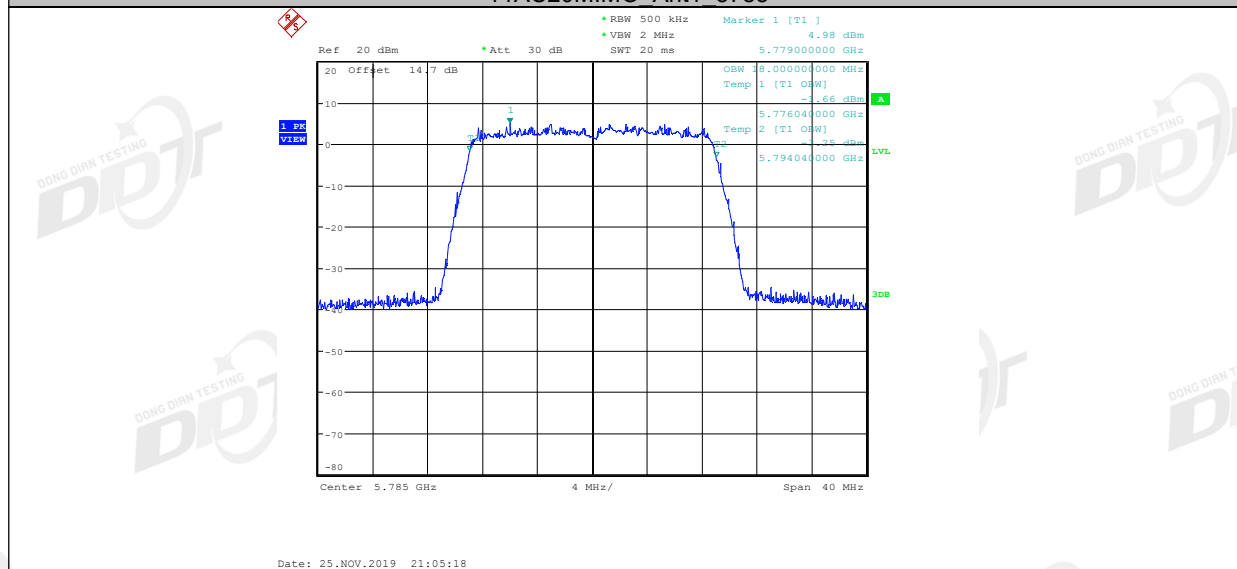
11AC20MIMO Ant1 5745



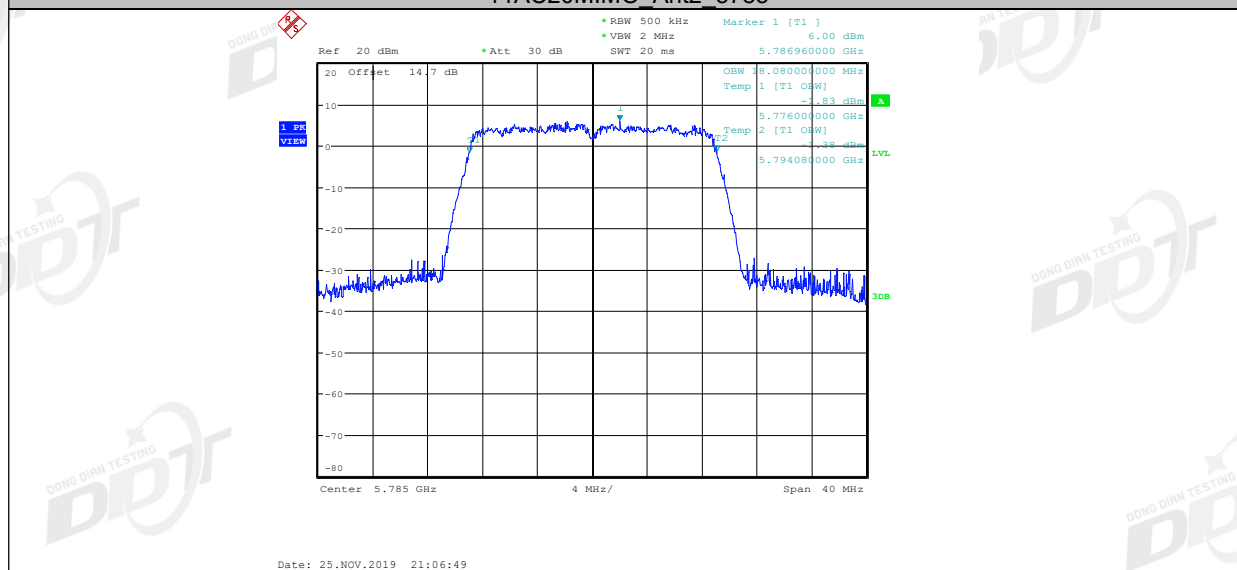
11AC20MIMO Ant2 5745



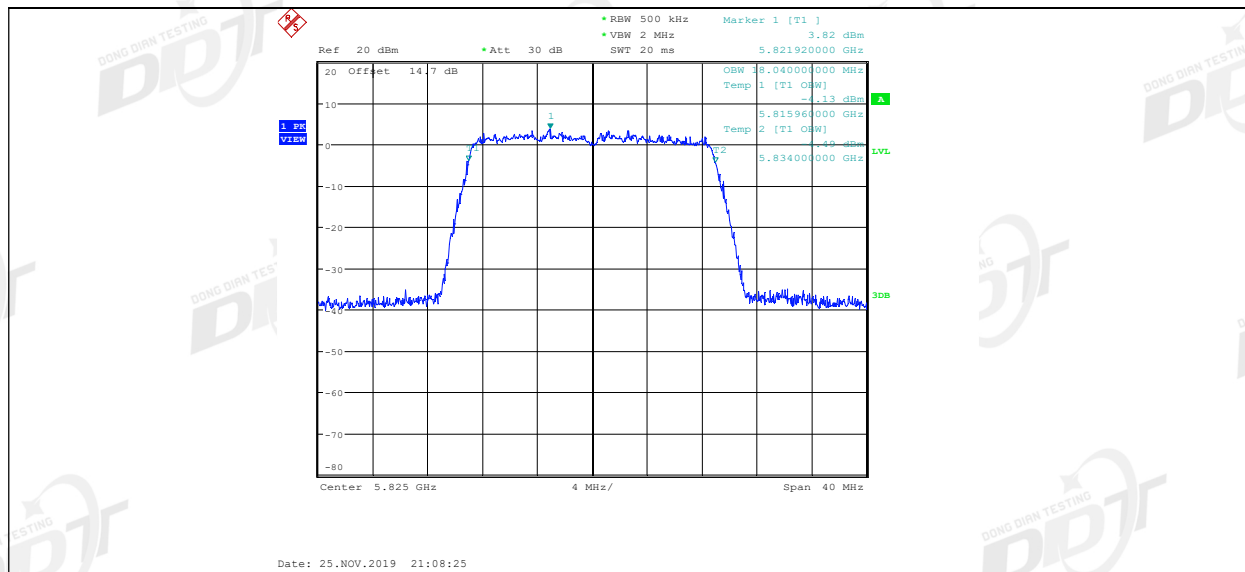
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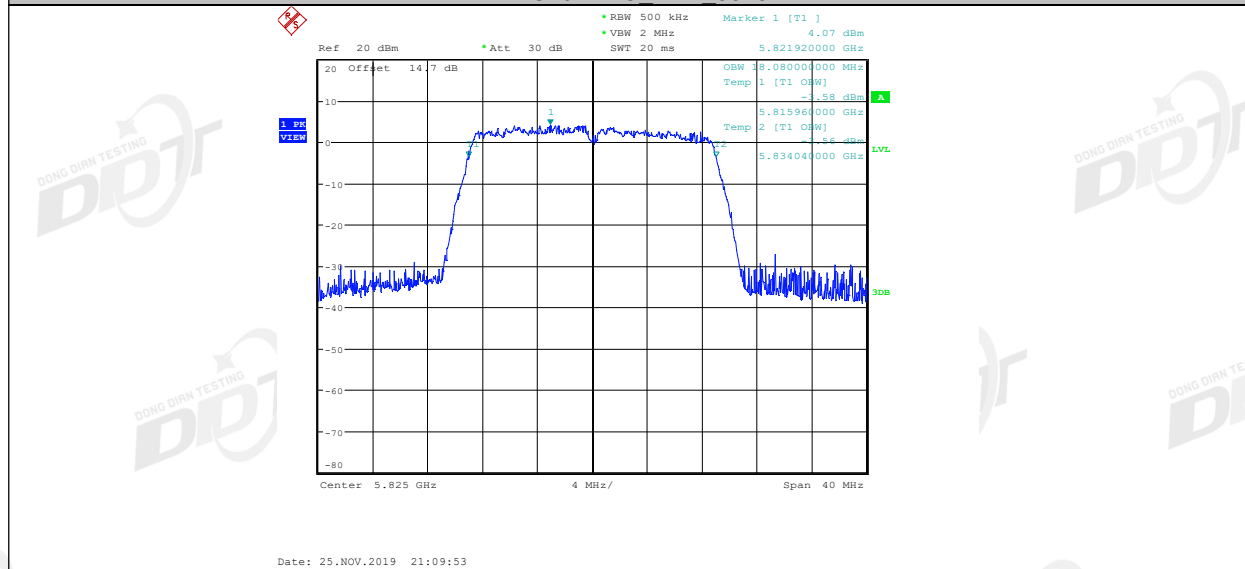
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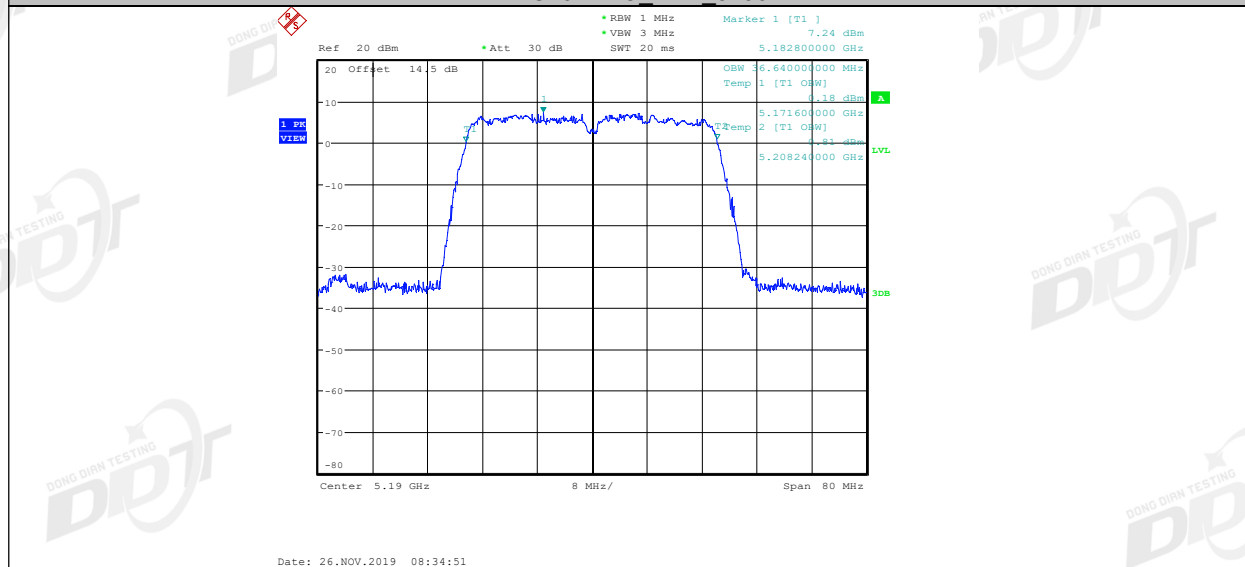
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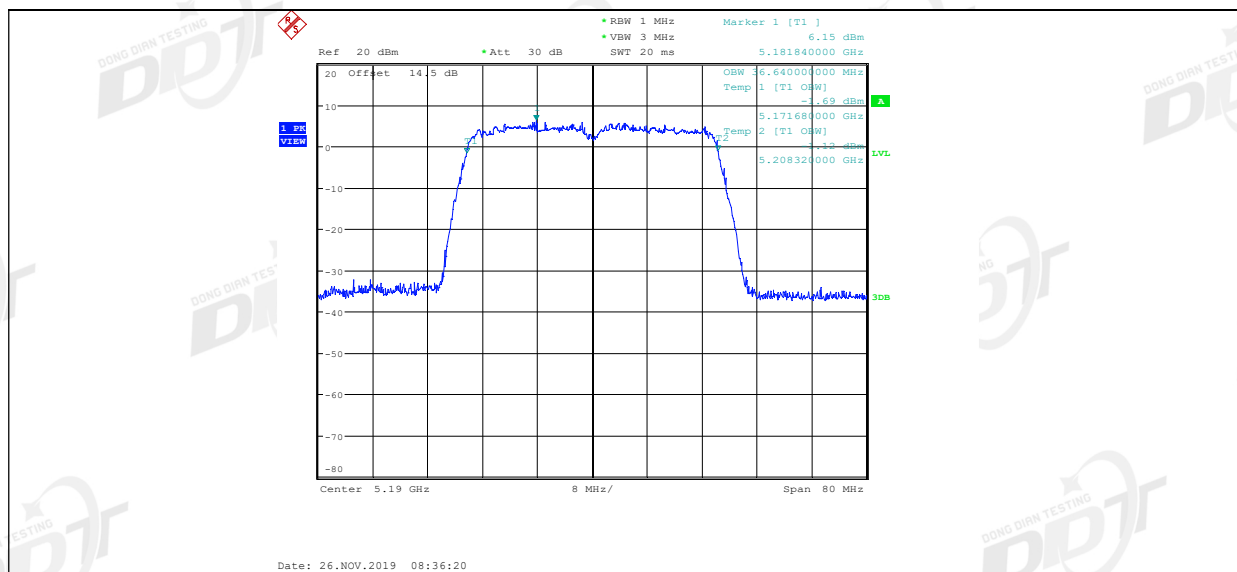
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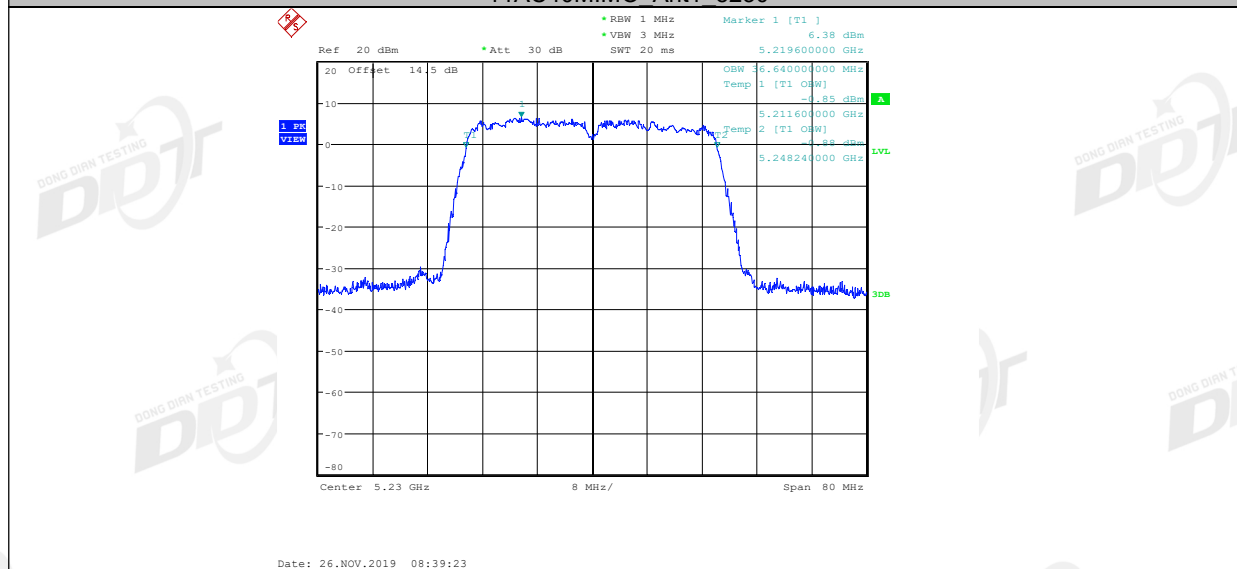
11AC40MIMO Ant1 5190



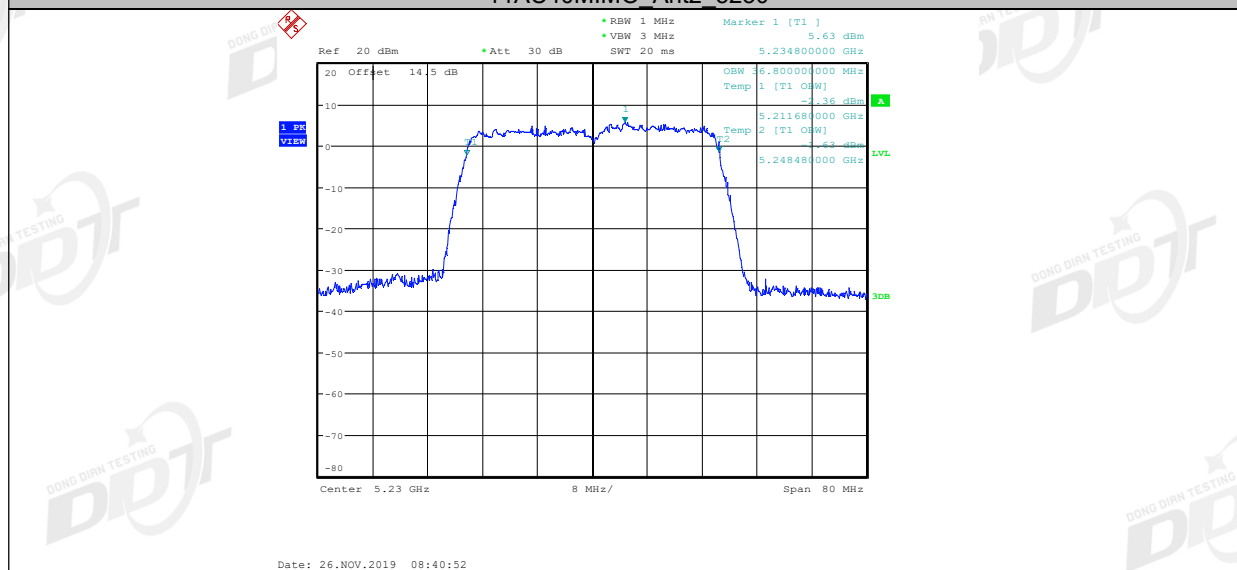
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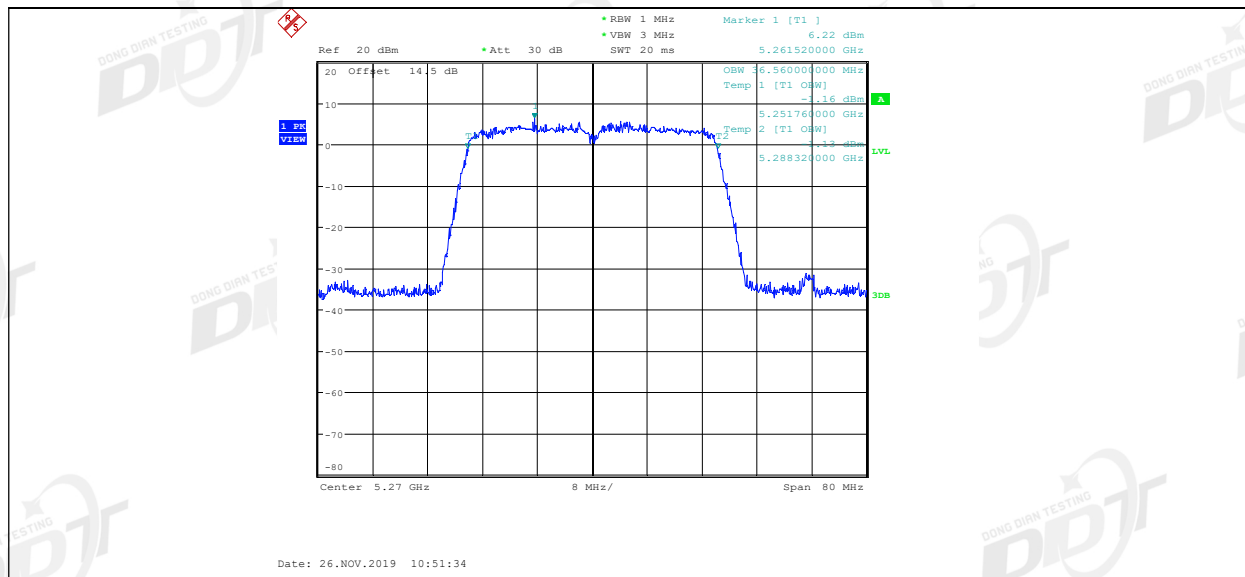
11AC40MIMO Ant1 5230



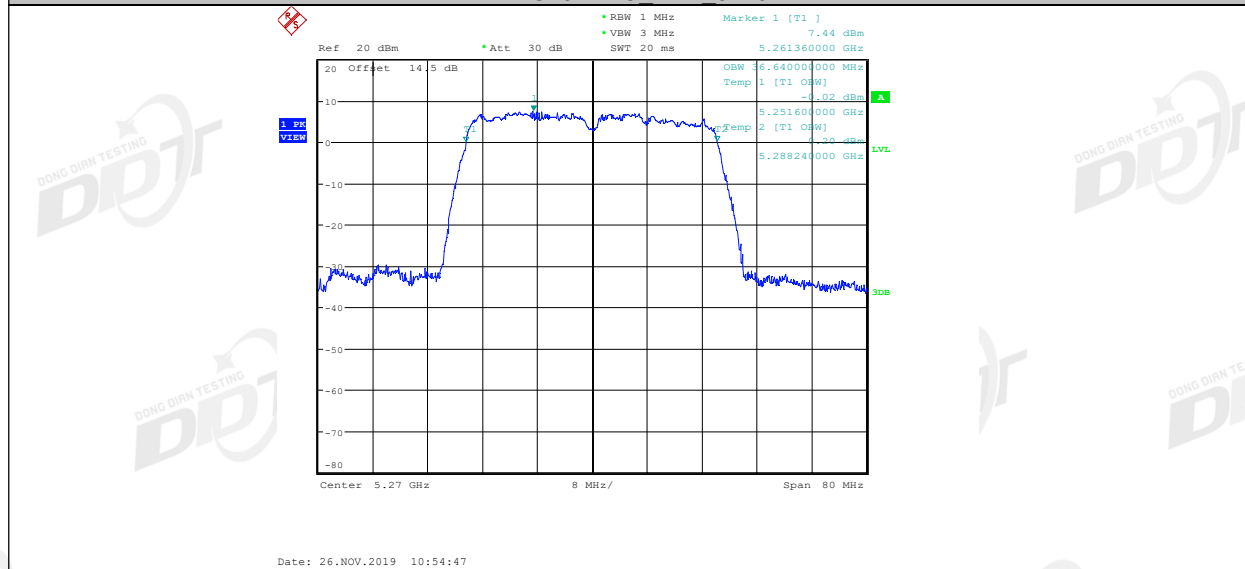
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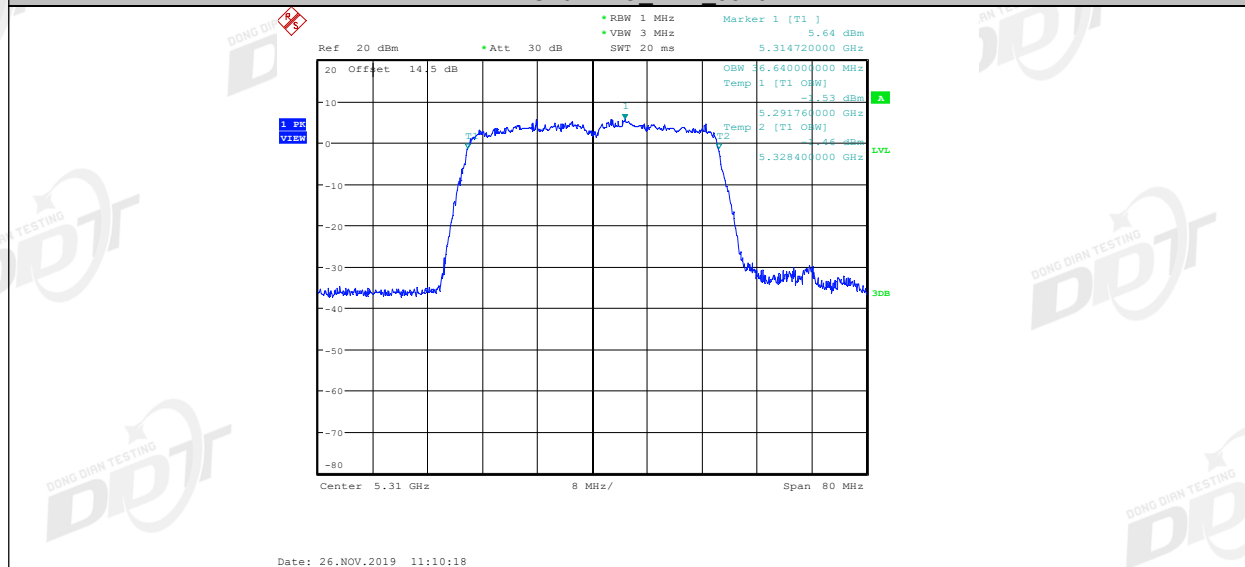
11AC40MIMO Ant1 5270



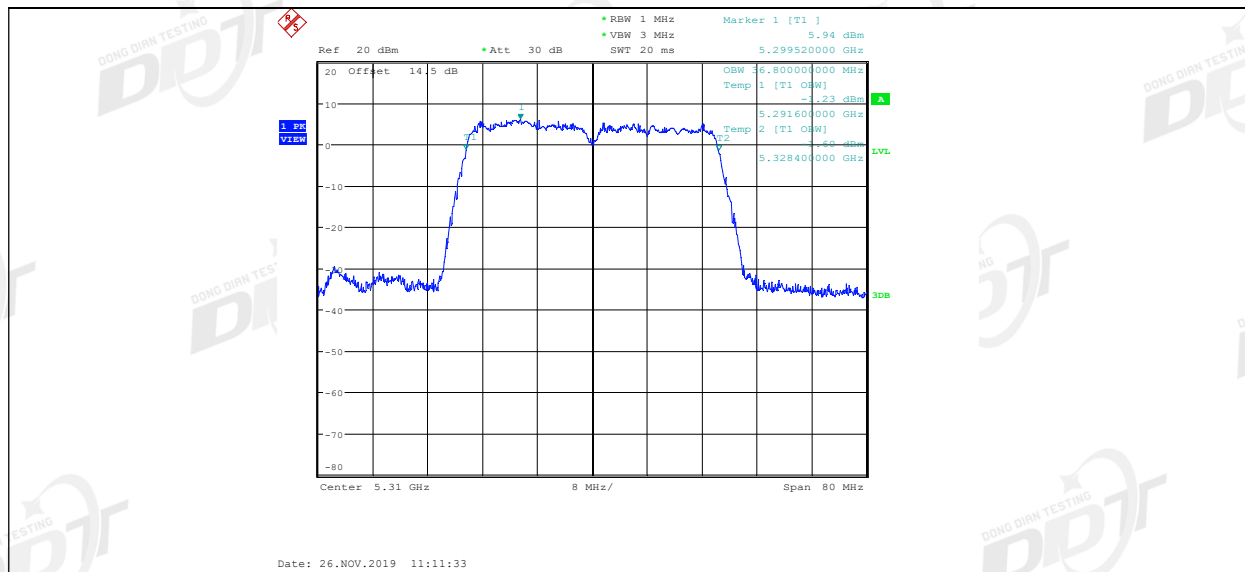
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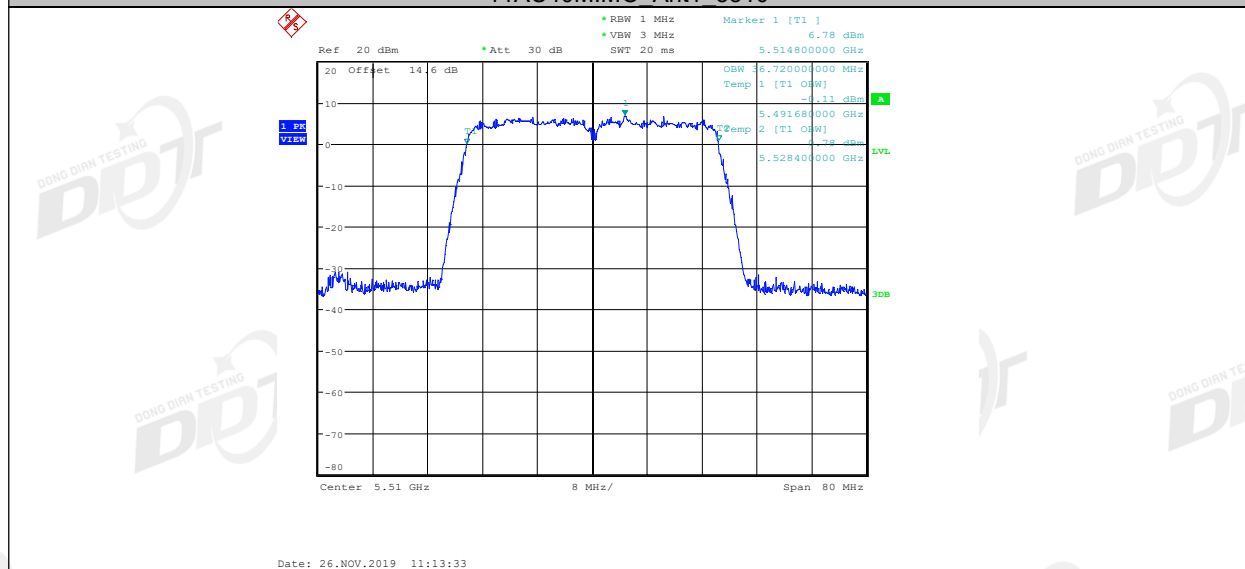
11AC40MIMO Ant1 5310



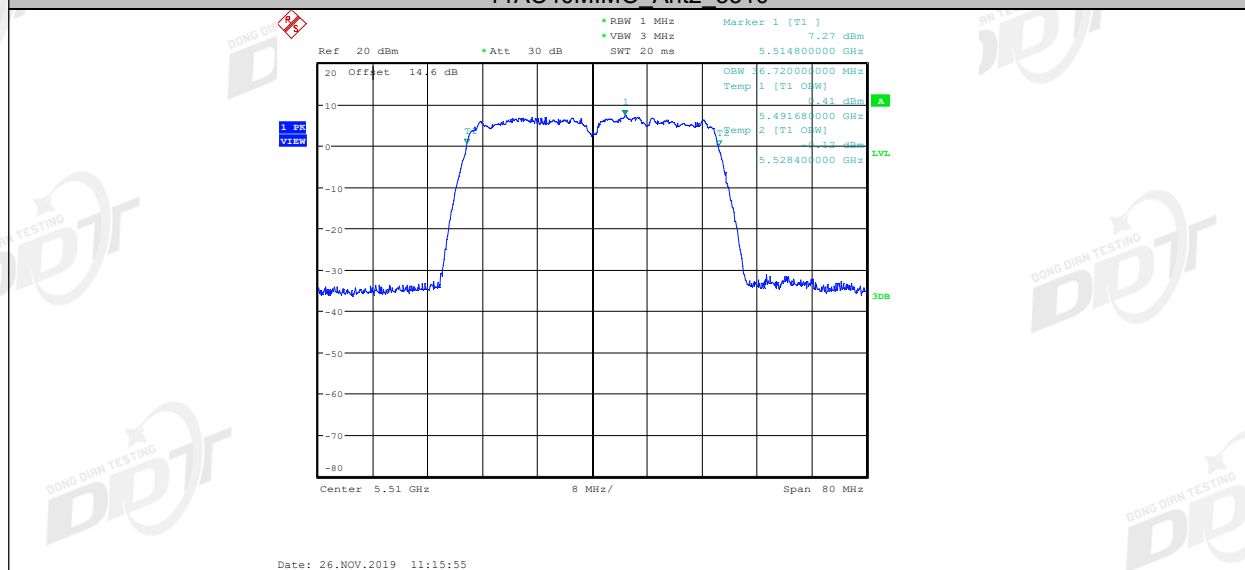
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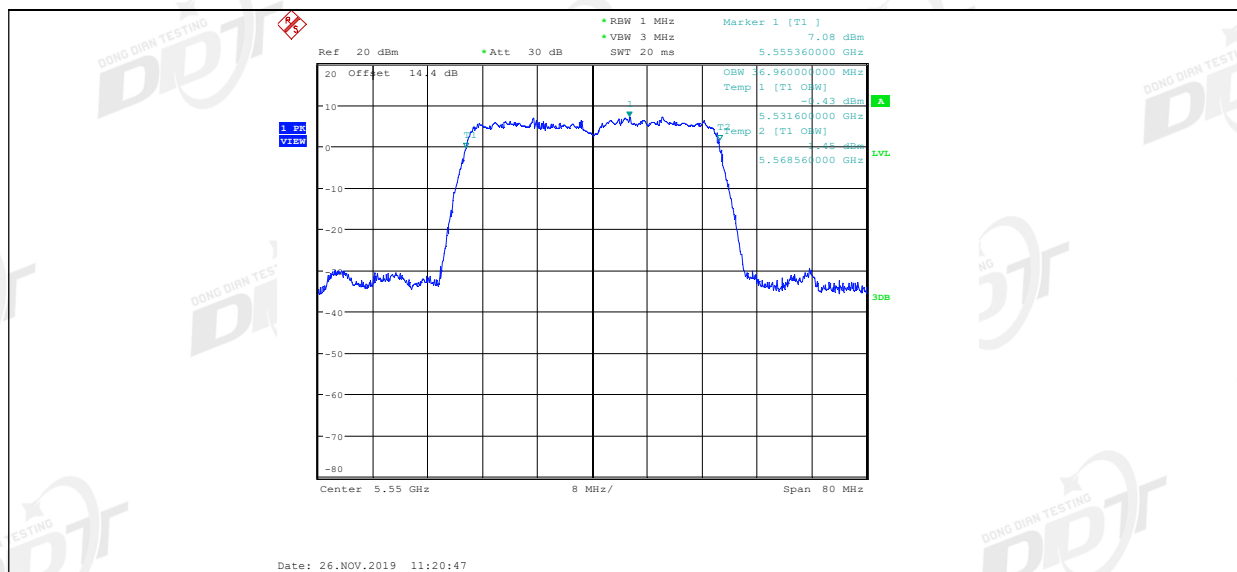
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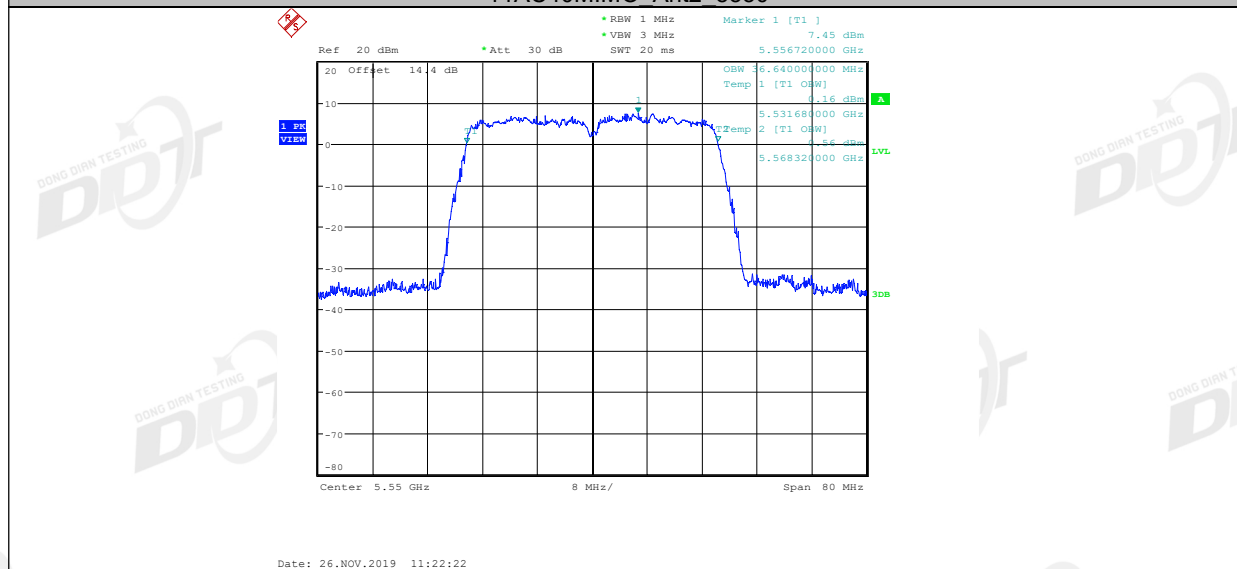
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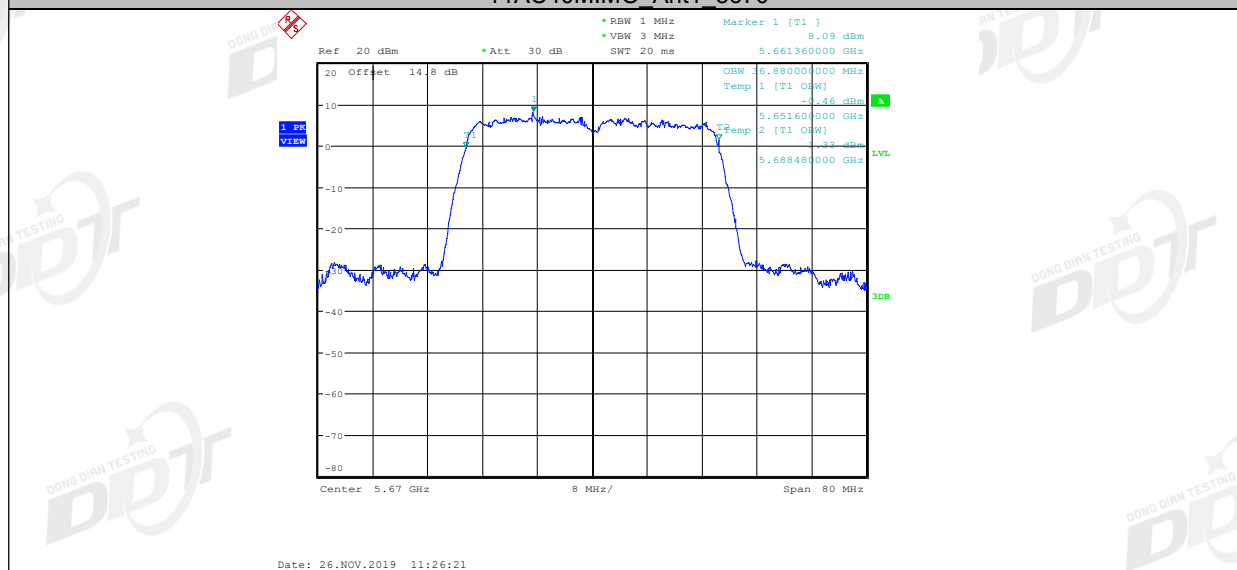
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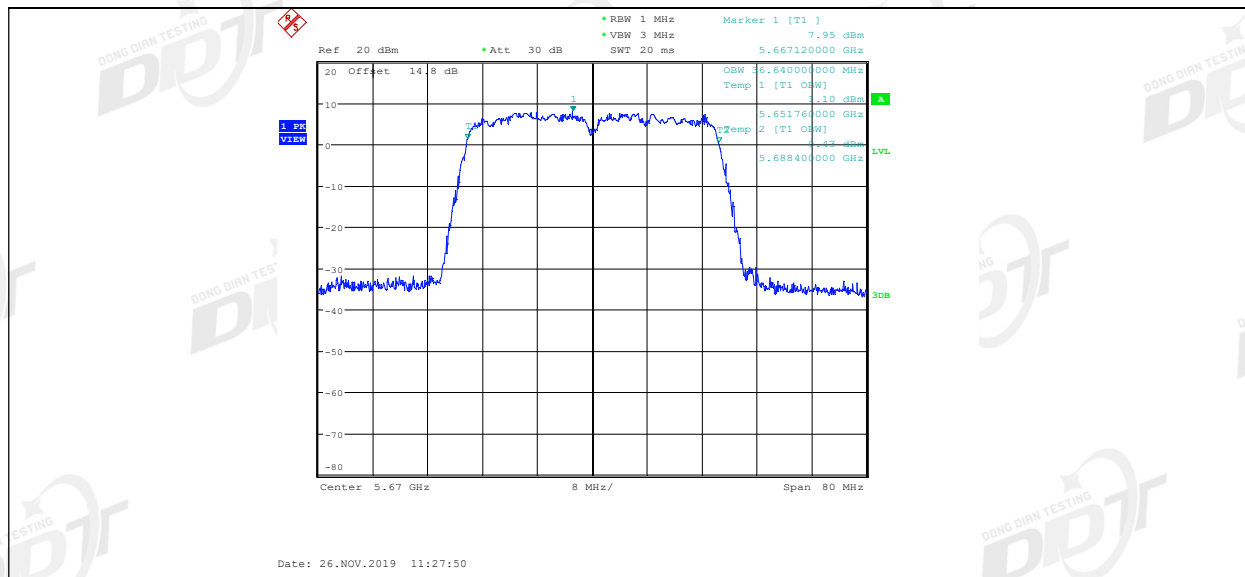
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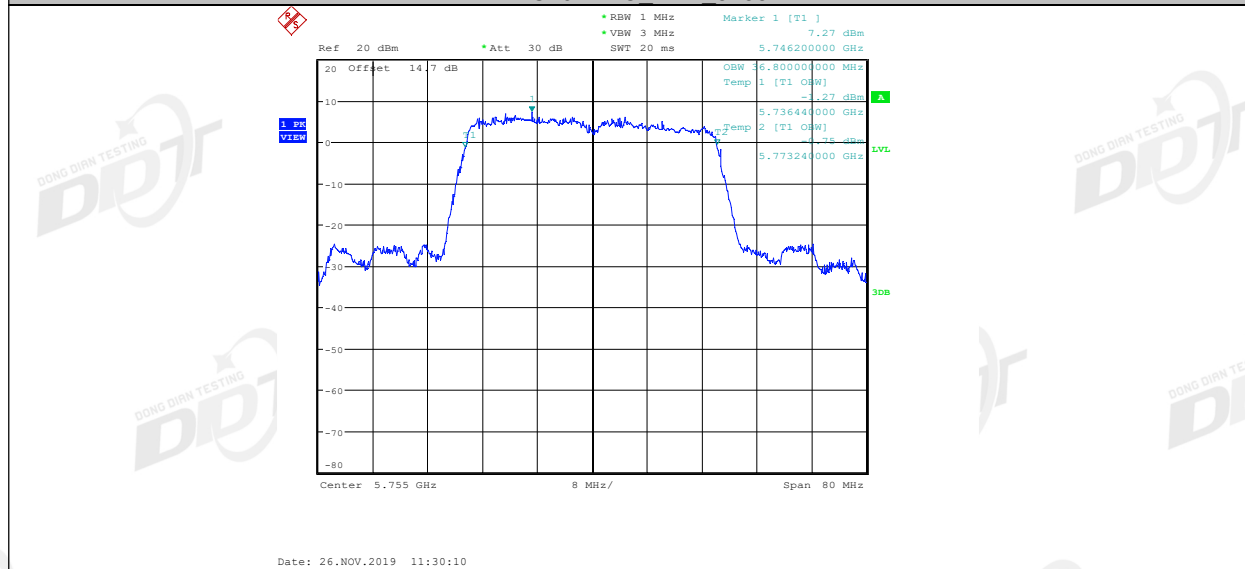
11AC40MIMO Ant1 5670



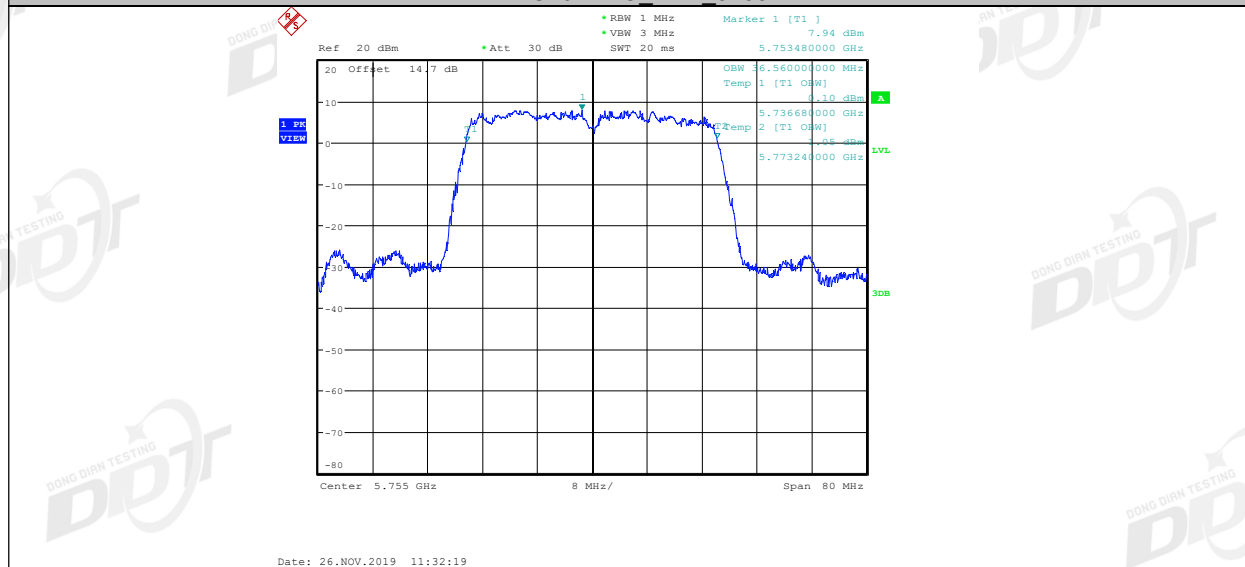
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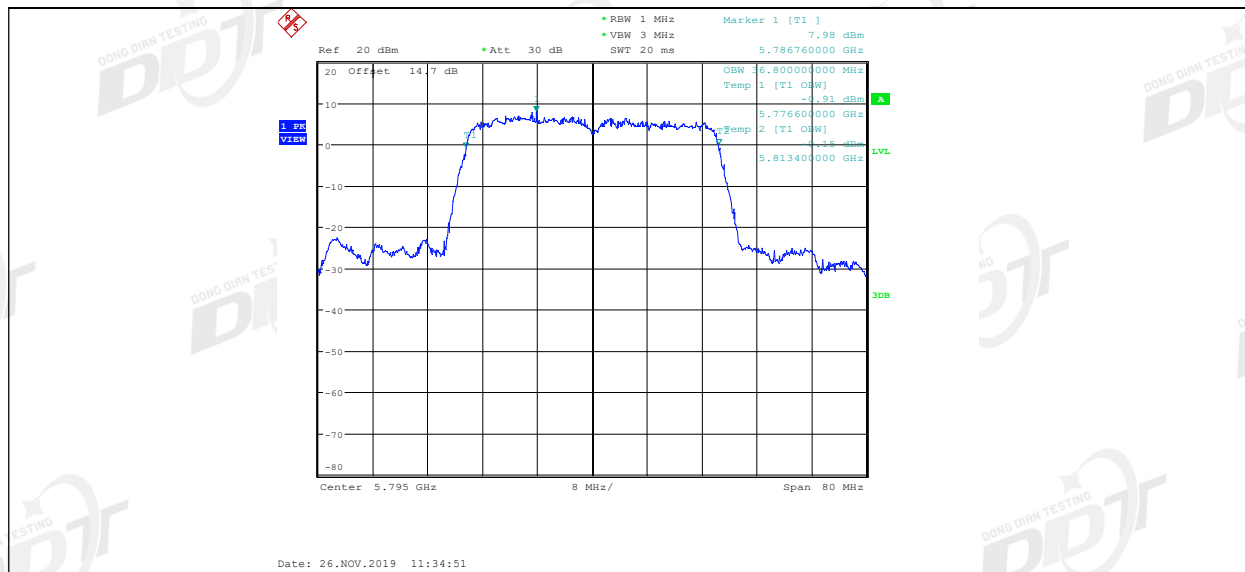
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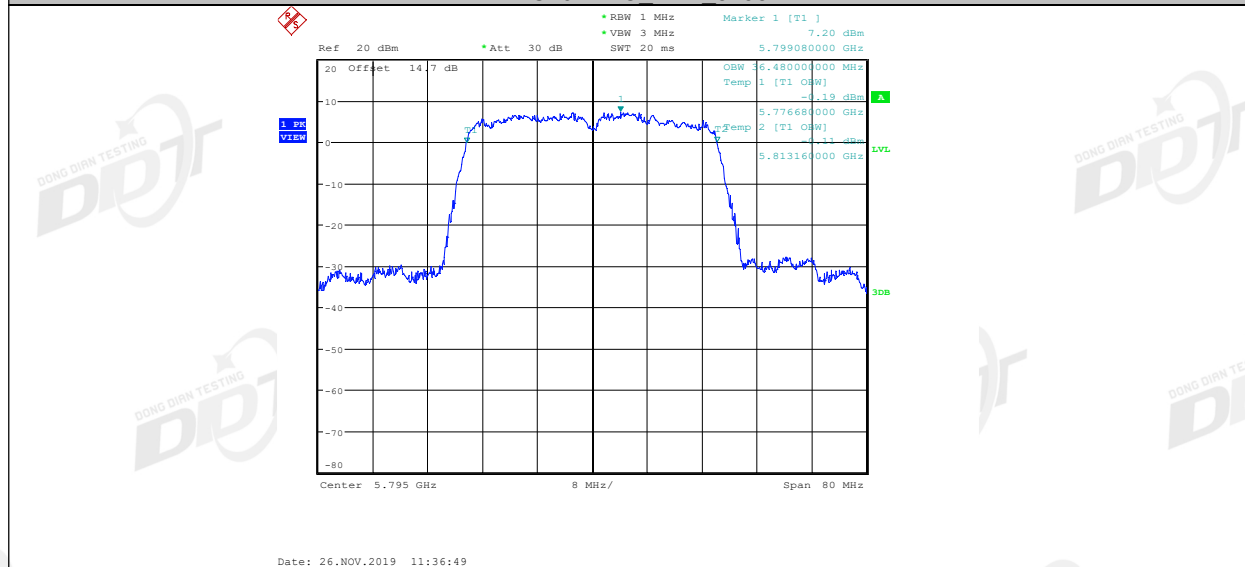
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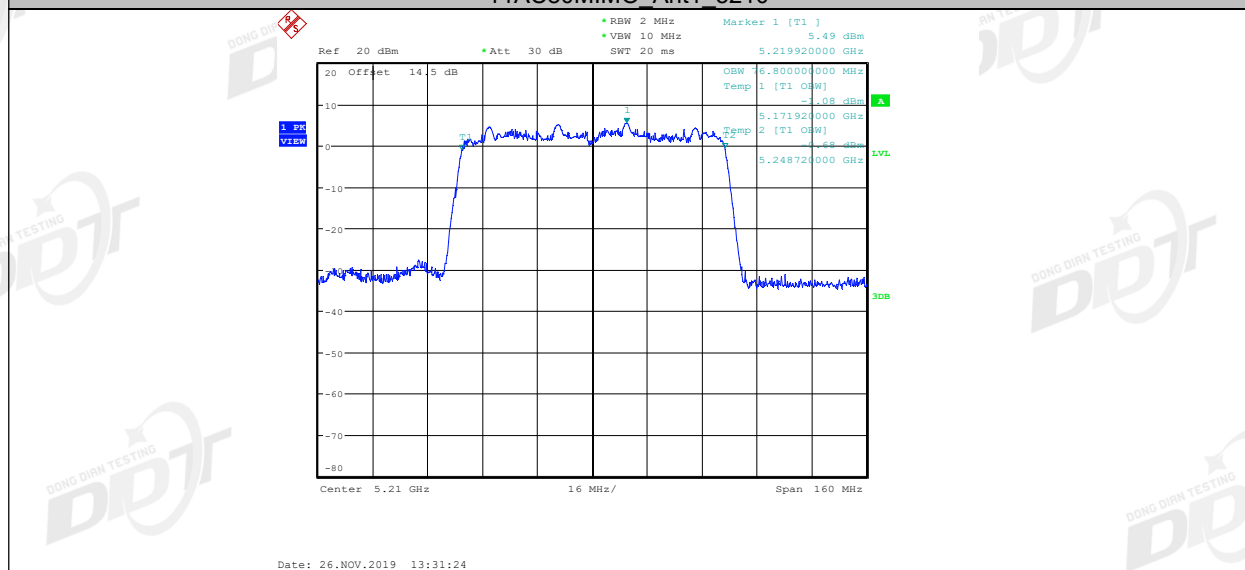
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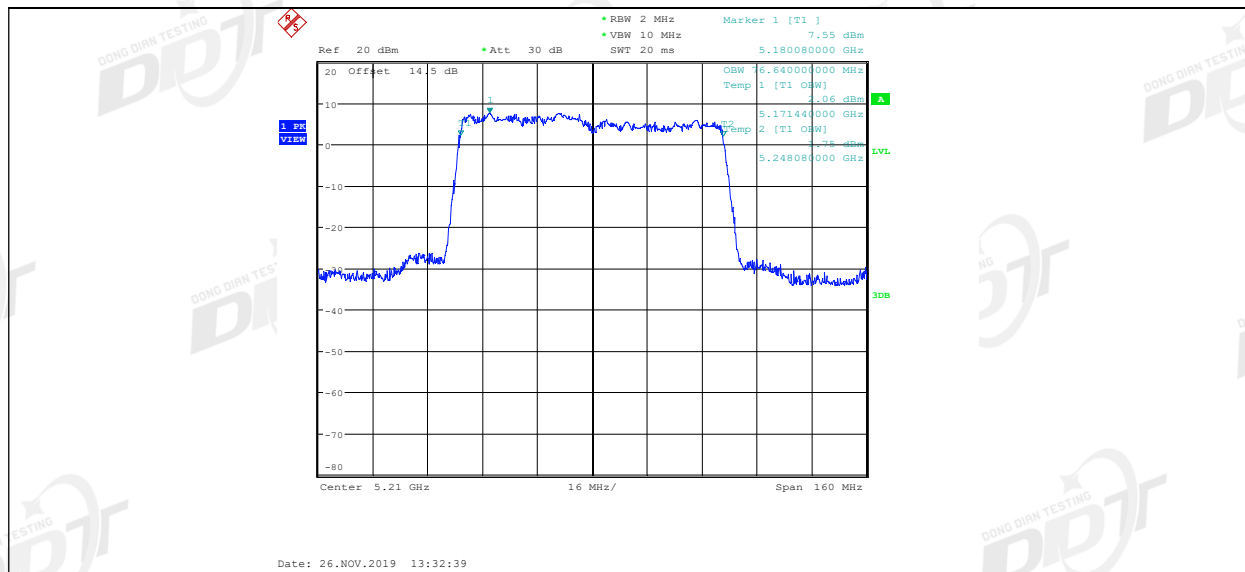
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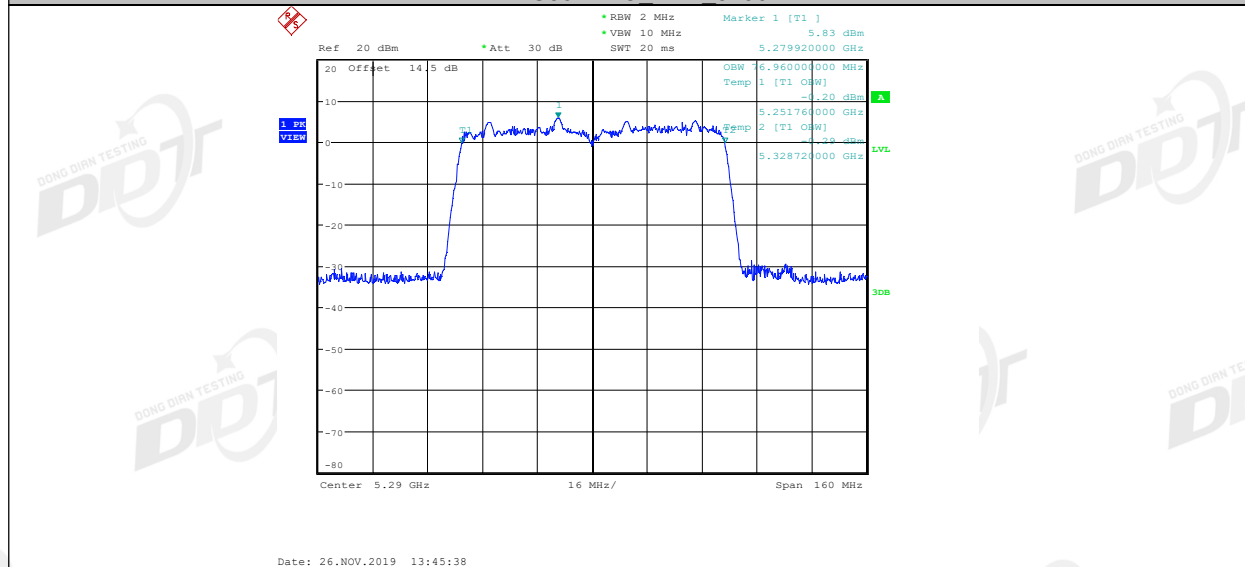
11AC80MIMO Ant1 5210



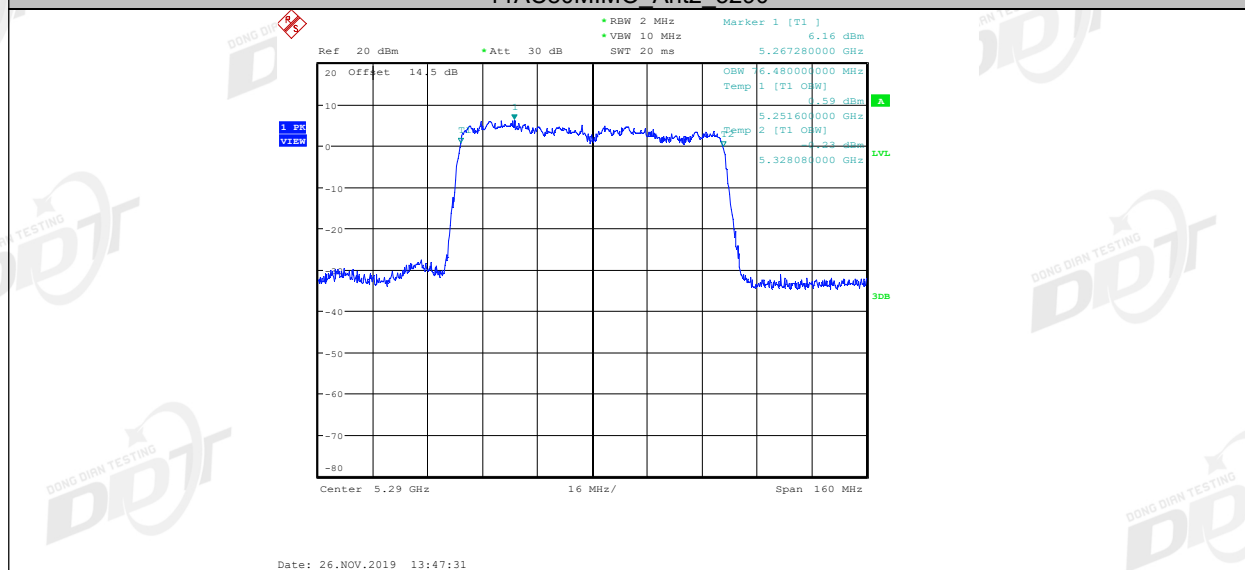
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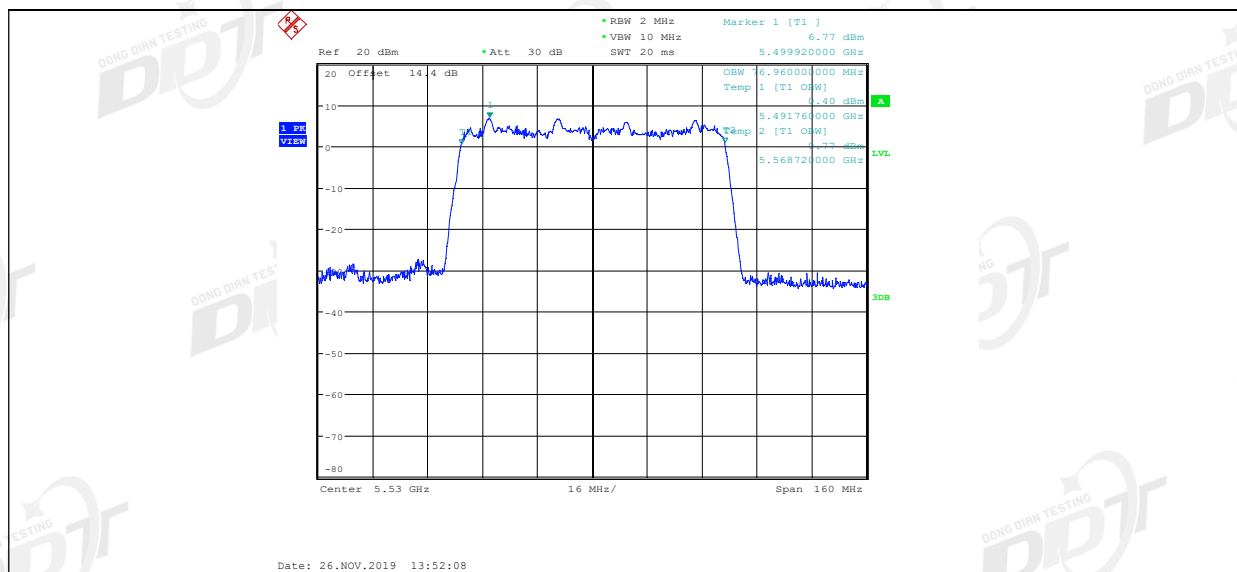
11AC80MIMO Ant1 5290



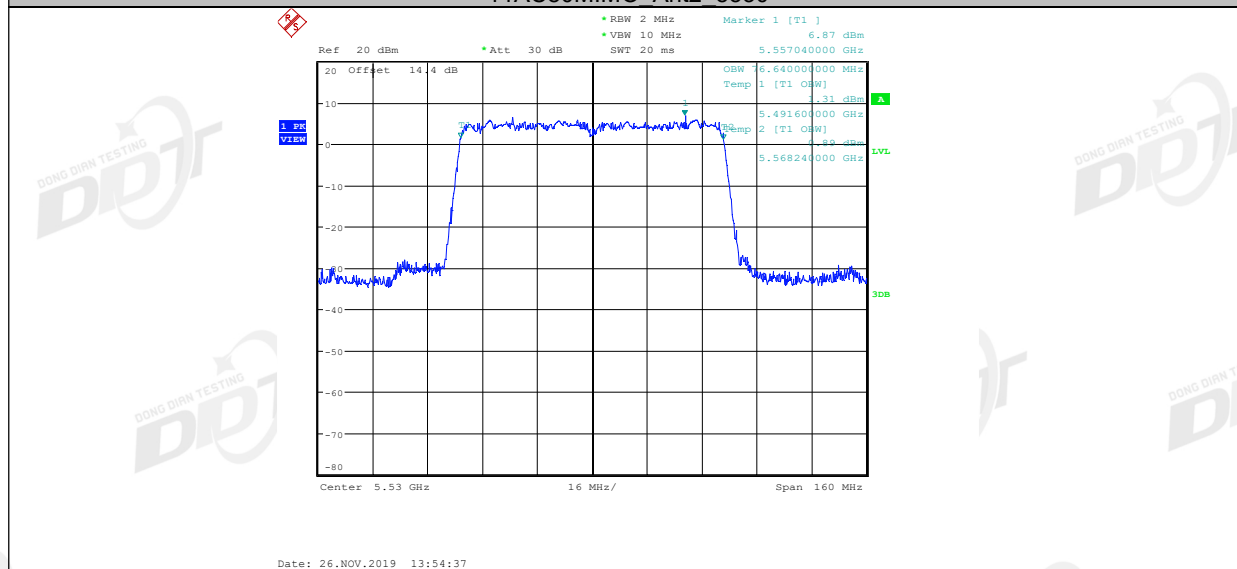
11AC80MIMO Ant2 5290



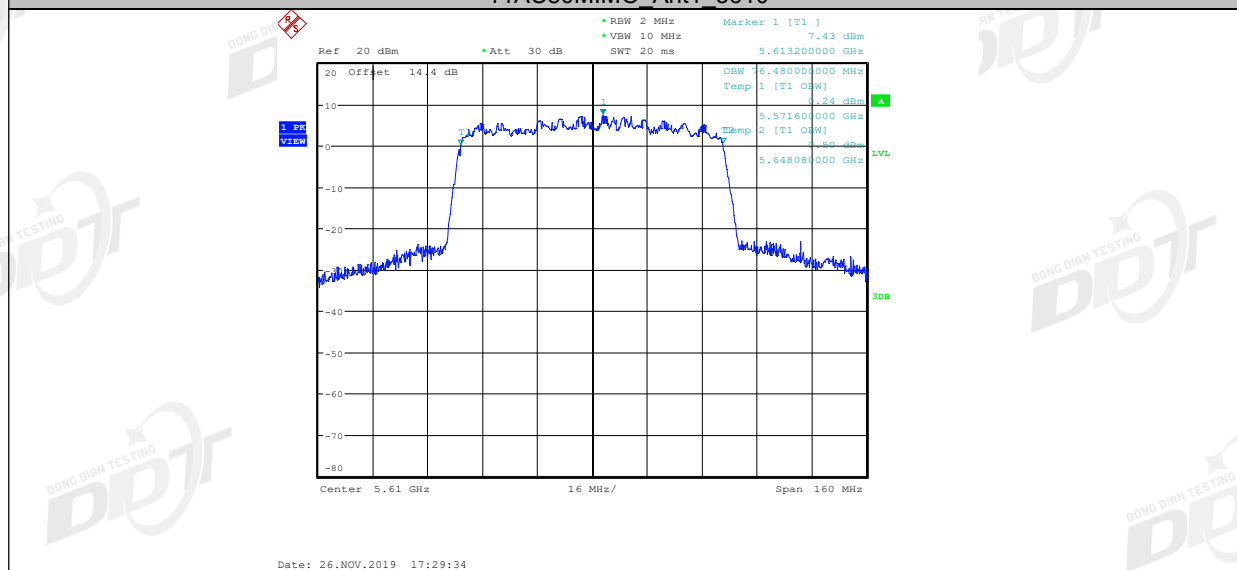
11AC80MIMO Ant1 5530



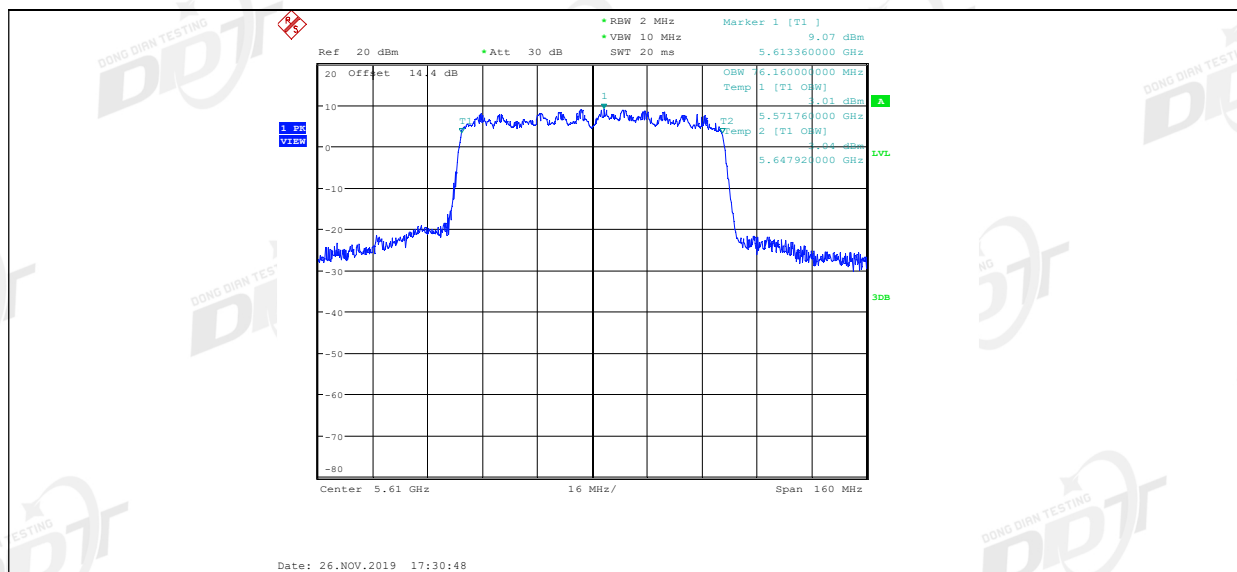
11AC80MIMO Ant2 5530



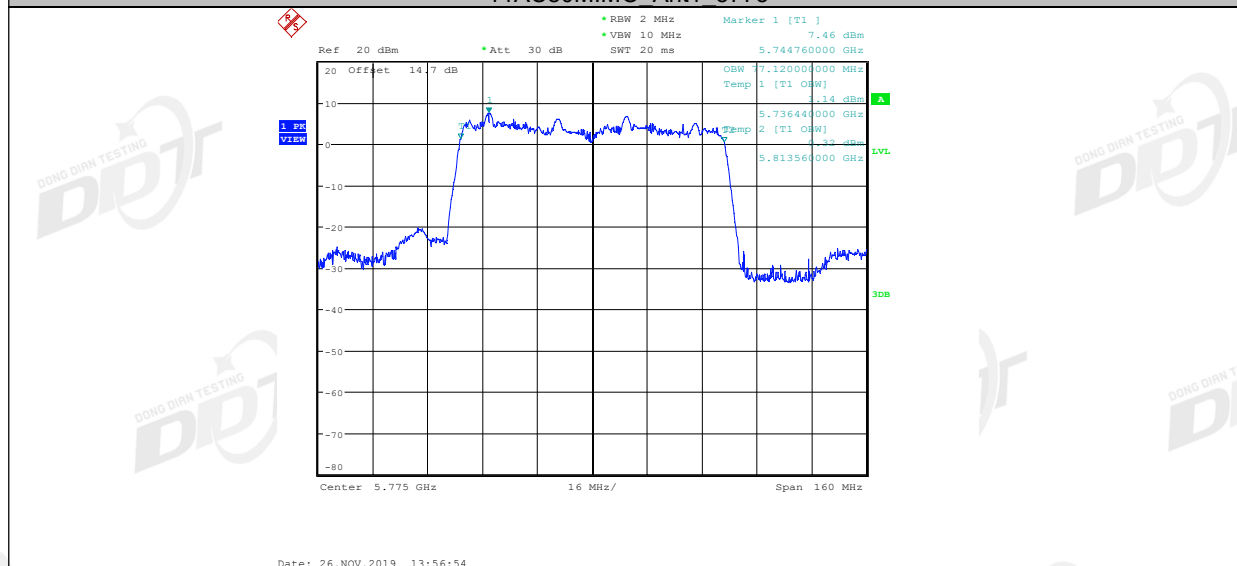
11AC80MIMO Ant1 5610



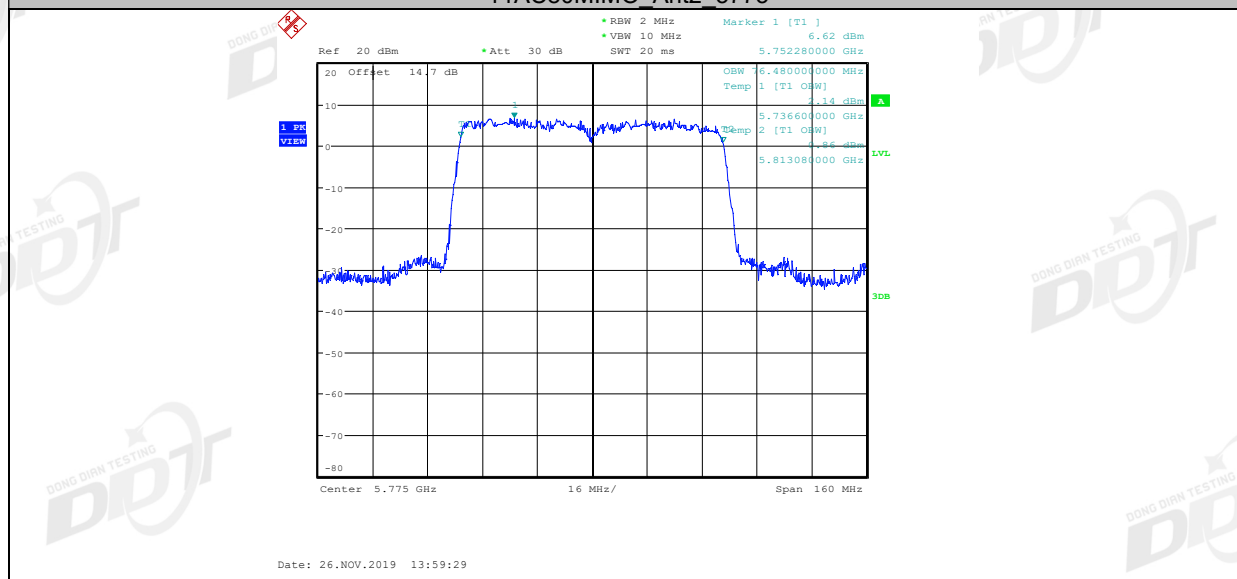
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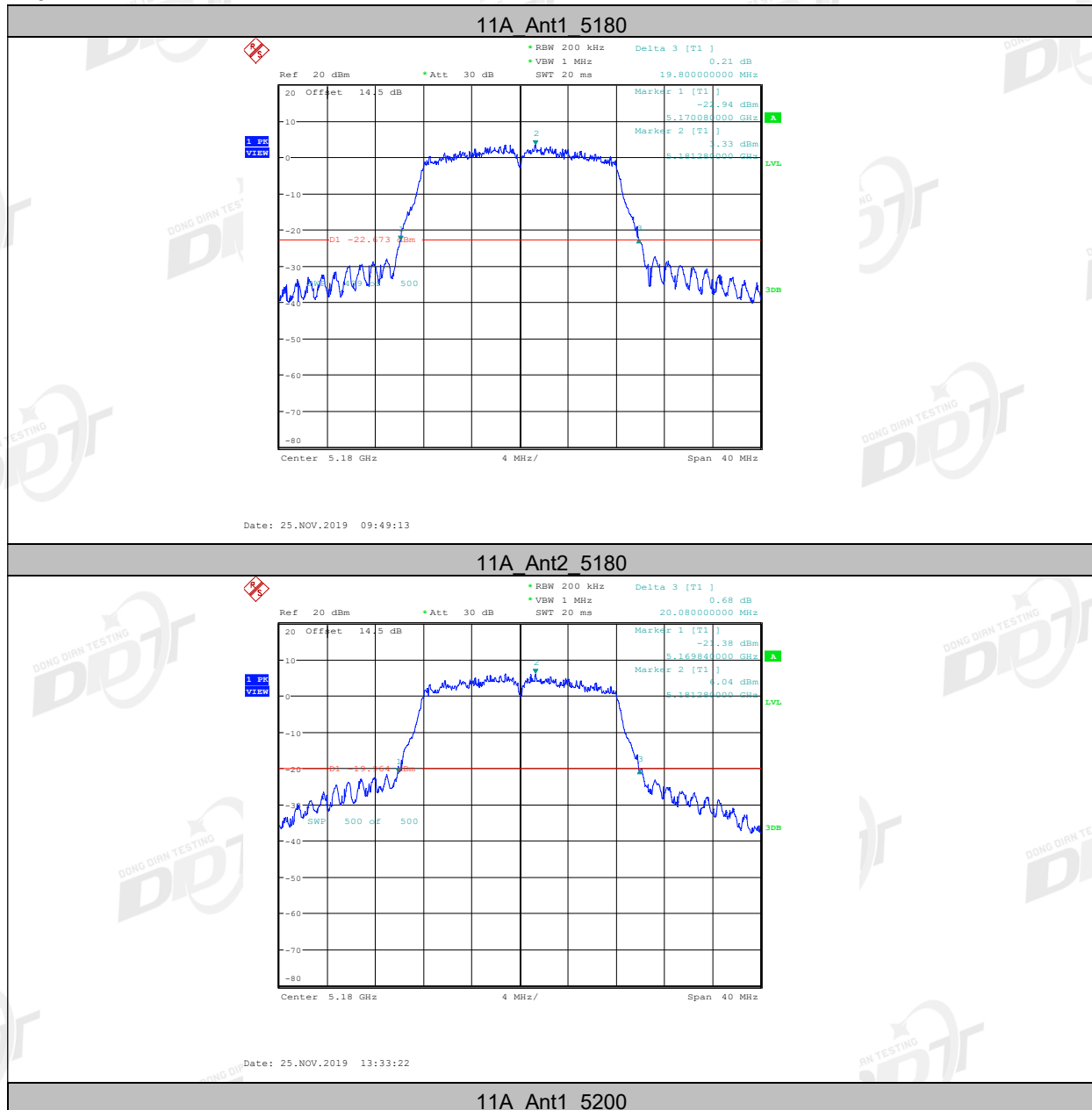
11AC80MIMO Ant1 5775

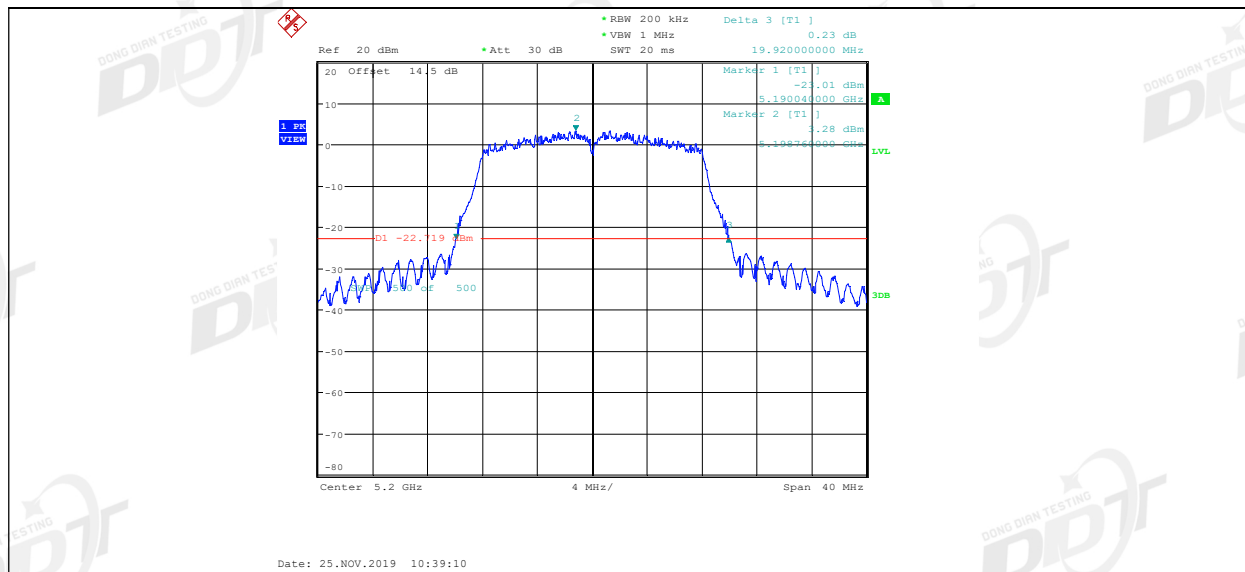


11AC80MIMO Ant2 5775

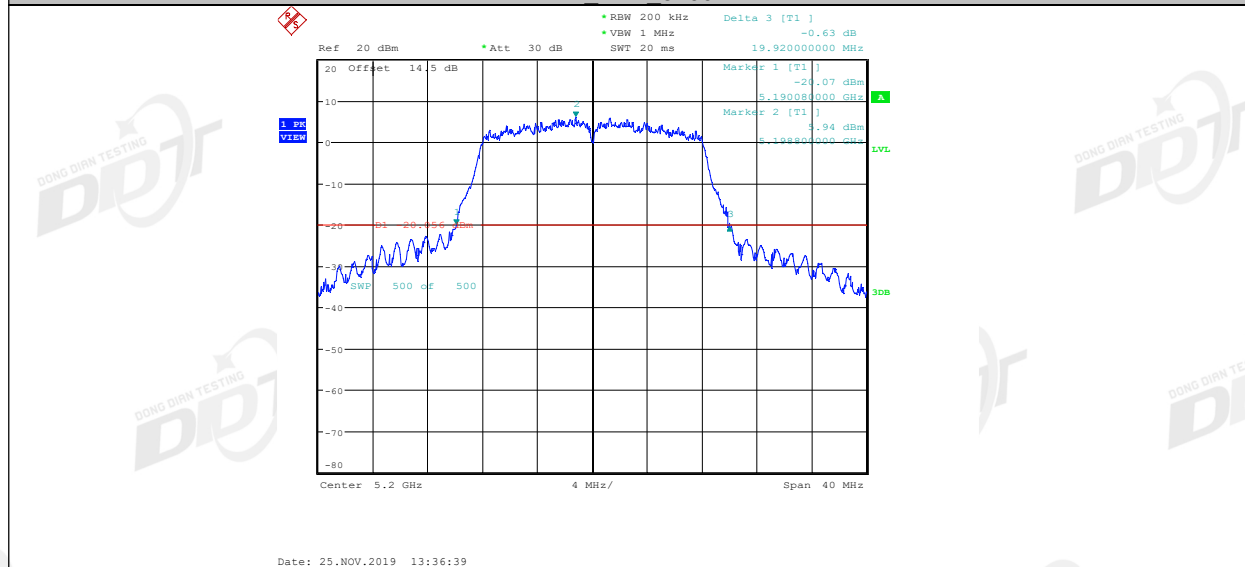


26db EBW

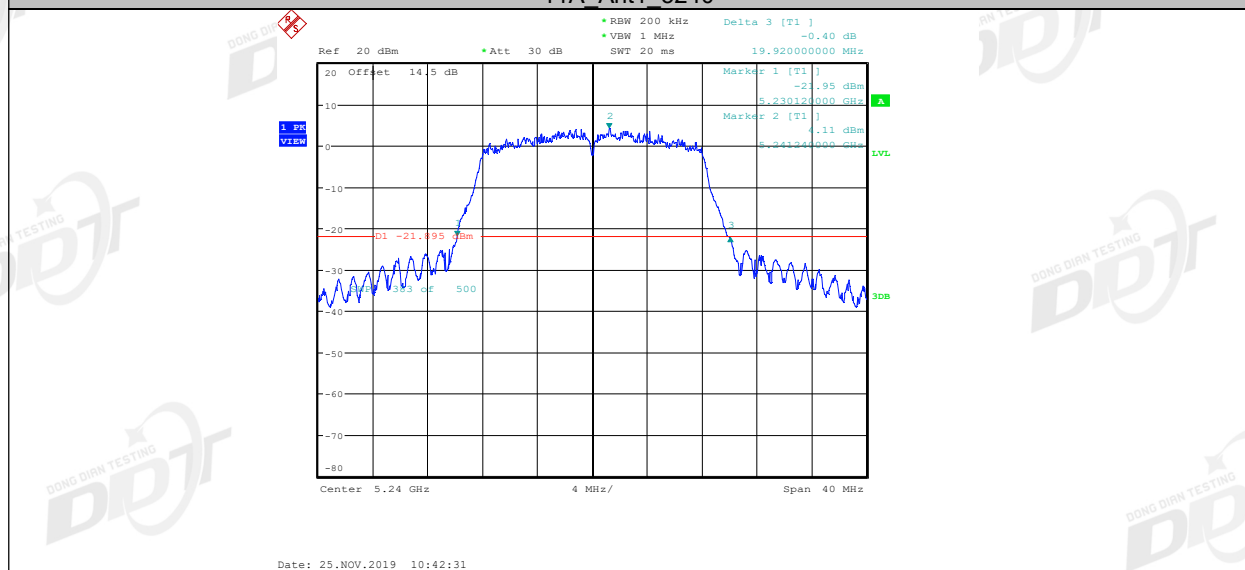




11A_Ant2_5200



11A_Ant1_5240



11A_Ant2_5240