

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

OF

Applicant: FUJITSU CONNECTED TECHNOLOGIES Ltd.
Chuorinkan 7-10-1 Yamato, Kanagawa 242-0007, Japan

Product Name: Smart Phone

Brand Name: FUJITSU

Model No.: F-42A

Model Difference: N/A

Report Number: ER/2020/40010

FCC ID 2AQYEFMP178

FCC Rule Part: 2 , 22H & 24E & 27 C

Issue Date: May 8th, 2020

Date of Test: Mar. 31st, 2020 ~ May 4th, 2020

Date of EUT Received: Mar. 31st, 2020

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Approved By:

CHUN-CHIEH, CHEN
Chun Chieh Chen / Supervisor



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Revision History

Report Number	Revision	Description	Issue Date	Remark
ER/2020/40010	Rev.00	Original.	May 8th, 2020	Revised By: Yuri Tsai

Note:

1. Disclaimer

Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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1 GENERAL PRODUCT INFORMATION

1.1 Product Description

General:

Product Name:	Smart Phone	
Brand Name:	FUJITSU	
Model No.:	F-42A	
Model Difference:	N/A	
Hardware Version:	V1.2.0	
Software Version:	V00R016Ve	
Power Supply:	3.8Vdc from Rechargeable Li-ion Battery	
	Battery:	Model No.:CA54310-0075 Supplier: FUJITSU CONNECTED TECHNOLOGIES LIMITED
IMEI:	355345110005329	

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1.2 Operation Frequency Range

Operating Frequency (MHz)			
GSM/GPRS/EDGE 850	824.2	-	848.8
GSM/GPRS/EDGE 1900	1850.2	-	1909.8
WCDMA / HSPA+ Band V	826.4	-	846.6

LTE Band	BW (MHz)	Operation Frequency (MHz)		
5	1.4	824.7	-	848.3
	3	825.5	-	847.5
	5	826.5	-	846.5
	10	829.0	-	844.0
12	1.4	699.7	-	715.3
	3	700.5	-	714.5
	5	701.5	-	713.5
	10	704.0	-	711.0
17	5	706.5	-	713.5
	10	709.0	-	711.0

1.3 Antenna Designation

Vendor	Type	Antenna Part No.	Modulation	Frequency (MHz)	Peak Antenna Gain (dBi)
N/A	λ/4 Monopole Antenna	N/A	GSM / GPRS850	842.2 ~ 848.8	-3.2
			GSM / GPRS1900	1850.2 ~ 1909.8	-1.2
			WCDMA Band V	826.4 ~ 846.6	-2.9
			LTE Band 5	824 ~ 849	-2.9
			LTE Band 12	699 ~ 716	-10.3
			LTE Band 17	704 ~ 716	-10.3

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1.4 Type of Emission & Max ERP/EIRP Power Measurement Result:

	ERP / EIRP (dBm)	W	99%	Type of Emission	
GPRS 850	29.31	ERP	0.853	0.2467	246KGXW
GPRS 1900	28.36	EIRP	0.685	0.2485	248KGXW
	ERP / EIRP (dBm)	W	99%	Type of Emission	
WCDMA Band V	20.70	ERP	0.117	4.1217	4M12F9W
HSDPA Band V	19.72	ERP	0.094	4.1146	4M11F9W
HSUPA Band V	19.82	ERP	0.096	4.1129	4M11F9W

LTE Band	BW	Modulation	ERP / EIRP (dBm)	(W)	Type of Emission	
5	1.4	QPSK	18.14	ERP	0.065	1M10G7D
		16QAM	17.19	ERP	0.052	1M10D7W
5	3	QPSK	18.01	ERP	0.063	2M70G7D
		16QAM	16.94	ERP	0.049	2M70D7W
5	5	QPSK	17.94	ERP	0.062	4M50G7D
		16QAM	17.04	ERP	0.051	4M50D7W
5	10	QPSK	17.95	ERP	0.062	8M99G7D
		16QAM	17.09	ERP	0.051	8M96D7W
LTE Band	BW	Modulation	ERP / EIRP (dBm)	(W)	Type of Emission	
12	1.4	QPSK	10.96	ERP	0.012	1M11G7D
		16QAM	10.06	ERP	0.010	1M11D7W
12	3	QPSK	10.80	ERP	0.012	2M70G7D
		16QAM	10.02	ERP	0.010	2M70D7W
12	5	QPSK	10.66	ERP	0.012	4M50G7D
		16QAM	9.88	ERP	0.010	4M50D7W
12	10	QPSK	10.93	ERP	0.012	9M01G7D
		16QAM	9.94	ERP	0.010	8M96D7W

LTE Band	BW	Modulation	ERP / EIRP (dBm)	(W)	Type of Emission	
17	5	QPSK	10.40	ERP	0.011	4M50G7D
		16QAM	9.50	ERP	0.009	4M50D7W
17	10	QPSK	10.77	ERP	0.012	8M96G7D
		16QAM	9.81	ERP	0.010	8M93D7W

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1.5 Test Methodology of Applied Standards

FCC 47 CFR Part 2, 22H, 24E, 27C

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03r01

KDB941225 D01 SAR test for 3G devices v03r01 (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

KDB412172 D01 Determining ERP and EIRP v01r01

TS 151 010-1 is used to set, and measure the output power.

1.6 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory (TAF code 0513)

No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

FCC Designation number: TW0001

1.7 Special Accessories

No special accessories were used during testing.

1.8 Equipment Modifications

There was no modifications incorporated into the EUT.

1.9 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port

The EUT is placed on a table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

The EUT is placed on a turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

2.4 Measurement Results Explanation Example

For all conducted test items:

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

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation in physical test.

	RF cable loss (dB)	Attenuation factor(dB)	offset(dB)
Low Band (Below 1GHz)	3.9	10	13.9
High Band (Above 1 GHz)	3.9	10	13.9

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2.5 Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.8	184
GSM 1900		237
WCDMA V		233
LTE Band 5		211
LTE Band 12		255
LTE Band 17		211

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2.6 Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)

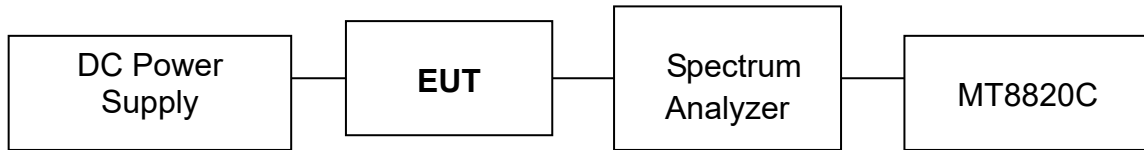


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)

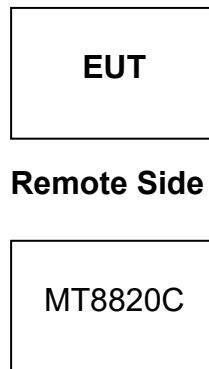


Table 2-1 Equipment Used in

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Radio Communication Analyer	Anritsu	MT8820C	6200995019	shielded	Un-shielded
2	Radio Communication Analyer	Anritsu	MT8815B	6200711454	shielded	Un-shielded
3	DC Power Supply	Agilent	E3640A	MY40000811	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§22.913(a)(5) §24.232(c) §27.50(c)(10)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occupied Bandwidth	Compliant
§2.1051 §22.917(a)(b) §24.238(a) §27.53(g)	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask re- quirements	Compliant
§2.1053 §2.1057(a)(1) §22.917(a) §24.238(a) §27.53(g)	Field Strength of Spurious Radiation	Compliant
§24.232(d) §27.50(B)	Peak to Average Ratio	Compliant
§2.1055(1) §22.355 §24.235 §27.54	Frequency Stability	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X(E1)Y(E2)Z(H) axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

BAND	H PLAN
GSM/GPRS 850	V
GSM/GPRS 1900	V
WCDMA/HSPA Band V	V
LTE Band 5	V
LTE Band 12	V
LTE Band 17	V

4.2 Measurement Configuration

Test Items	GSM Bands	Test Channel		
		L	M	H
ERP	850	v	v	v
EIRP	1900	v	v	v
FREQUENCY STABILITY	850	-	v	-
	1900	-	v	-
OCCUPIED BANDWIDTH	850	v	v	v
	1900	v	v	v
PEAK TO AVERAGE RATIO	850	v	v	v
	1900	v	v	v
BAND EDGE	850	v	-	v
	1900	v	-	v
CONDCUETED EMISSION	850	v	v	v
	1900	v	v	v
RADIATED EMISSION	850	v	v	v
	1900	v	v	v

Test Items	WCDMA / HSPA Bands	Test Channel		
		L	M	H
ERP	Band V	v	v	v
FREQUENCY STABILITY	Band V	-	v	-
OCCUPIED BANDWIDTH	Band V	v	v	v
PEAK TO AVERAGE RATIO	Band V	v	v	v
BAND EDGE	Band V	v	-	v
CONDCUETED EMISSION	Band V	v	v	v
RADIATED EMISSION	Band V	v	v	v

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Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation		RB #		
		L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full
Max. Output Power	5	v	v	v	v	v	v	v	-	-	v	v	v	v	v
	12	v	v	v	v	v	v	v	-	-	v	v	v	v	v
	17	v	v	v	-	-	v	v	-	-	v	v	v	v	v
Frequency Stability	5	-	v	-			v		-	-	v	-	-	-	v
	12	-	v	-			v		-	-	v	-	-	-	v
	17	-	v	-	-	-	v		-	-	v	-	-	-	v
Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation		RB #		
		L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full
26dB and 99% Bandwidth	5	v	v	v	v	v	v	v	-	-	v	v	-	-	v
	12	v	v	v	v	v	v	v	-	-	v	v	-	-	v
	17	v	v	v	-	-	v	v	-	-	v	v	-	-	v
Peak-to-Average Ratio	5	v	v	v	v	v	v	v	-	-		v	-	-	v
	12	v	v	v	v	v	v	v	-	-		v	-	-	v
	17	v	v	v	-	-	v	v	-	-		v	-	-	v
Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation		RB #		
		L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full
Band Edge	5	v	-	v	v	v	v	v	-	-	v	-	v	v	v
	12	v	-	v	v	v	v	v	-	-	v	-	v	v	v
	17	v	-	v	-	-	v	v	-	-	v	-	v	v	v
Conducted Emission	5	v	v	v	v	v	v	v	-	-	v	-	v	-	-
	12	v	v	v	v	v	v	v	-	-	v	-	v	-	-
	17	v	v	v	-	-	v	v	-	-	v	-	v	-	-
Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation		RB #		
		L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full
Radiated Emission	5	v	v	v			v		-	-	v		v		
	12	v	v	v			v		-	-	v		v		
	17	v	v	v	-	-	v		-	-	v		v		

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1.10 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 4.74dB Horizontal Polarization = +/- 4.62dB
99% Occupied Bandwidth	+/- 5.19 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.70 dB
Peak to Average Ratio	+/- 0.70 dB
Frequency Stability vs. Temperature	+/- 5.19 Hz
Frequency Stability vs. Voltage	+/- 5.19 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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6 MAXMUM OUTPUT POWER

6.1 Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

6.1.1 ERP/EIRP LIMIT

According to FCC §2.1046

FCC 22.913(a)

(5) mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

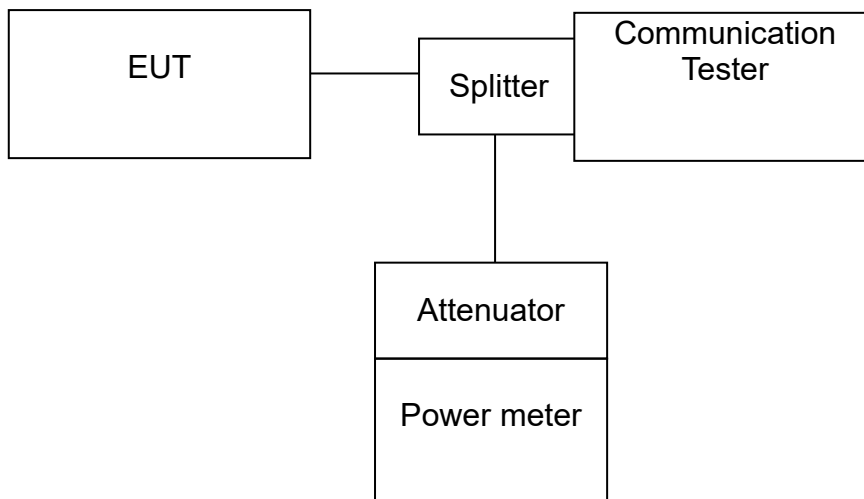
FCC 24.232(c)

(b) Mobile and portable stations are limited to 2W EIRP.

FCC 27.50(c)

(10) Portable stations (hand-held devices) are limited to 3 watts ERP.

6.2 Test Set-up



Note: Measurement setup for testing on Antenna connector

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6.3 Output Power Measurement Applicable Guidance

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCD-MA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results.

All LTE bands conducted average power is obtained from the simulator telecommunication test set.

6.4 Determining ERP and/or EIRP from conducted RF output power measurements

According to KDB 412172 D01 Power Approach,

$$EIRP = P_T + G_T - L_C,$$

$$ERP = EIRP - 2.15,$$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power (expressed in the same units as P_T , typically dBW, dBm, or power spectral density (PSD)², relative to either a dipole antenna (ERP) or an isotropic antenna (EIRP);

P_T = transmitter output power, expressed in dBW, dBm, or PSD;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

6.5 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communication Analyser	Anritsu	MT8820C	6200995019	Apr. 1st, 2020	Mar. 31st, 2021
Radio Communication Analyser	Anritsu	MT8815B	6200711454	Apr. 1st, 2020	Mar. 31st, 2021

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6.6 GSM Measurement Results

GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
GSM 850	824.2	128	32.51	-3.20	27.16	29.31	38.50	-9.19
	836.6	190	32.45	-3.20	27.10	29.25	38.50	-9.25
	848.8	251	32.17	-3.20	26.82	28.97	38.50	-9.53
GPRS 850	824.2	128	32.51	-3.20	27.16	29.31	38.50	-9.19
	836.6	190	32.45	-3.20	27.10	29.25	38.50	-9.25
	848.8	251	32.17	-3.20	26.82	28.97	38.50	-9.53

GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
GSM 1900	1850.2	512	29.46	-1.20	26.11	28.26	33.00	-4.74
	1880.0	661	29.56	-1.20	26.21	28.36	33.00	-4.64
	1909.8	810	29.23	-1.20	25.88	28.03	33.00	-4.97
GPRS 1900	1850.2	512	29.46	-1.20	26.11	28.26	33.00	-4.74
	1880.0	661	29.56	-1.20	26.21	28.36	33.00	-4.64
	1909.8	810	29.23	-1.20	25.88	28.03	33.00	-4.97

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EUT Mode	Frequency (MHz)	CH	Average Burst Power (1DN 1UP) Class 8 (dBm)	Average Burst Power (1DN 2UP) Class 10 (dBm)	Average Burst Power (1DN 3UP) Class 12 (dBm)	Average Burst Power (1DN 4UP) Class 12 (dBm)
GPRS 850	824.2	128	32.51	30.87	29.13	27.83
	836.6	190	32.45	30.89	29.21	27.89
	848.8	251	32.17	30.86	29.28	28.07

EUT Mode	Frequency (MHz)	CH	Average Burst Power (1DN 1UP) Class 8 (dBm)	Average Burst Power (1DN 2UP) Class 10 (dBm)	Average Burst Power (1DN 3UP) Class 12 (dBm)	Average Burst Power (1DN 4UP) Class 12 (dBm)
GPRS 1900	1850.2	512	29.46	27.03	25.26	23.88
	1880.0	661	29.56	27.08	25.28	23.99
	1909.8	810	29.23	27.07	25.20	23.97

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6.7 WCDMA & HSPA Measurement Results:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

WCDMA/HSUPA/HSDPA Band V Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	826.4	4132	23.60	-2.90	18.55	20.70	38.50	-17.80
	836.6	4183	23.50	-2.90	18.45	20.60	38.50	-17.90
	846.6	4233	23.56	-2.90	18.51	20.66	38.50	-17.84
HSDPA	826.4	4132	22.46	-2.90	17.41	19.56	38.50	-18.94
	836.6	4183	22.50	-2.90	17.45	19.60	38.50	-18.90
	846.6	4233	22.62	-2.90	17.57	19.72	38.50	-18.78
HSUPA	826.4	4132	22.53	-2.90	17.48	19.63	38.50	-18.87
	836.6	4183	22.56	-2.90	17.51	19.66	38.50	-18.84
	846.6	4233	22.72	-2.90	17.67	19.82	38.50	-18.68

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6.7.1 HSPA (HSDPA & HSUPA) Release 6:

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1. RMC 12.2kps is used for this testing.

6.7.2 HSDPA SUB-TEST Setting

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

Mode	Sub test	Avg. Power (dBm) Channel		
		4132.00	4183.00	4233.00
HSDPA V	1	22.46	22.50	22.62
	2	22.07	21.99	22.15
	3	21.99	22.00	22.17
	4	21.97	21.99	22.17

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6.7.3 HSPA SUB-TEST Setting

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (Code s)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA MPRs are implemented as per following sub-tests.

Mode	Sub test	Avg. Power (dBm)		
		Channel		
		4132.00	4183.00	4233.00
HSUPA V	1	22.53	22.56	22.72
	2	20.43	20.45	20.69
	3	21.45	21.46	21.62
	4	20.54	20.56	20.69
	5	22.53	22.52	22.68

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Minimum Communications Power Measurement

PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.33	28.16	26.02	23.88	21.89	19.94	17.79	15.68	13.74

PCL	9	10	11	12	13	14	15
Output power (dBm)	11.66	10.21	8.07	6.16	4.1	2.13	0.63

Note: The EUT output power was controlled by simulator. Set Communication Tester [MT8820C](#) PCL as above, and get the mobile phone output power reading.

6.7.4 WCDMA/HSDPA/HSUPA band V

The EUT output power was controlled by simulator and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm then record the read. The min. power was measures by a function key “minimum power” then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

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6.8 LTE Measurement Results:

Antenna gain (dBi) -2.9

LTE Band 5_Uplink frequency band : 824 to 849 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	20407	824.7	QPSK	1	0	23.08	18.03	20.18	38.45	-18.27
				1	5	23.19	18.14	20.29	38.45	-18.16
				3	2	22.63	17.58	19.73	38.45	-18.72
				6	0	22.09	17.04	19.19	38.45	-19.26
	20525	836.5	QPSK	1	0	23.19	18.14	20.29	38.45	-18.16
				1	5	23.07	18.02	20.17	38.45	-18.28
				3	2	22.77	17.72	19.87	38.45	-18.58
				6	0	22.20	17.15	19.30	38.45	-19.15
	20643	848.3	QPSK	1	0	23.04	17.99	20.14	38.45	-18.31
				1	5	23.11	18.06	20.21	38.45	-18.24
				3	2	22.70	17.65	19.80	38.45	-18.65
				6	0	22.09	17.04	19.19	38.45	-19.26
	20407	824.7	16QAM	1	0	21.86	16.81	18.96	38.45	-19.49
				1	5	21.76	16.71	18.86	38.45	-19.59
				3	2	21.69	16.64	18.79	38.45	-19.66
				6	0	20.93	15.88	18.03	38.45	-20.42
	20525	836.5	16QAM	1	0	22.24	17.19	19.34	38.45	-19.11
				1	5	21.54	16.49	18.64	38.45	-19.81
				3	2	21.64	16.59	18.74	38.45	-19.71
				6	0	21.10	16.05	18.20	38.45	-20.25
	20643	848.3	16QAM	1	0	21.62	16.57	18.72	38.45	-19.73
				1	5	21.92	16.87	19.02	38.45	-19.43
				3	2	21.77	16.72	18.87	38.45	-19.58
				6	0	20.93	15.88	18.03	38.45	-20.42

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Antenna gain (dBi) -2.9

LTE Band 5_Uplink frequency band : 824 to 849 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	20415	825.5	QPSK	1	0	23.06	18.01	20.16	38.45	-18.29
				1	14	22.98	17.93	20.08	38.45	-18.37
				8	4	22.14	17.09	19.24	38.45	-19.21
				15	0	22.14	17.09	19.24	38.45	-19.21
	20525	836.5	QPSK	1	0	22.98	17.93	20.08	38.45	-18.37
				1	14	23.04	17.99	20.14	38.45	-18.31
				8	4	22.21	17.16	19.31	38.45	-19.14
				15	0	22.15	17.10	19.25	38.45	-19.2
	20635	847.5	QPSK	1	0	22.90	17.85	20.00	38.45	-18.45
				1	14	22.79	17.74	19.89	38.45	-18.56
				8	4	22.18	17.13	19.28	38.45	-19.17
				15	0	22.15	17.10	19.25	38.45	-19.2
	20415	825.5	16QAM	1	0	21.68	16.63	18.78	38.45	-19.67
				1	14	21.62	16.57	18.72	38.45	-19.73
				8	4	21.04	15.99	18.14	38.45	-20.31
				15	0	20.73	15.68	17.83	38.45	-20.62
	20525	836.5	16QAM	1	0	21.72	16.67	18.82	38.45	-19.63
				1	14	21.68	16.63	18.78	38.45	-19.67
				8	4	21.15	16.10	18.25	38.45	-20.2
				15	0	20.94	15.89	18.04	38.45	-20.41
20635	847.5	16QAM	1	0	21.90	16.85	19.00	38.45	-19.45	
			1	14	21.99	16.94	19.09	38.45	-19.36	
			8	4	21.33	16.28	18.43	38.45	-20.02	
			15	0	21.17	16.12	18.27	38.45	-20.18	

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Antenna gain (dBi) -2.9

LTE Band 5_Uplink frequency band : 824 to 849 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	20425	826.5	QPSK	1	0	22.62	17.57	19.72	38.45	-18.73
				1	24	22.66	17.61	19.76	38.45	-18.69
				12	6	22.21	17.16	19.31	38.45	-19.14
				25	0	22.13	17.08	19.23	38.45	-19.22
	20525	836.5	QPSK	1	0	22.79	17.74	19.89	38.45	-18.56
				1	24	22.99	17.94	20.09	38.45	-18.36
				12	6	22.19	17.14	19.29	38.45	-19.16
				25	0	22.16	17.11	19.26	38.45	-19.19
	20625	846.5	QPSK	1	0	22.75	17.70	19.85	38.45	-18.6
				1	24	22.87	17.82	19.97	38.45	-18.48
				12	6	22.14	17.09	19.24	38.45	-19.21
				25	0	22.05	17.00	19.15	38.45	-19.3
	20425	826.5	16QAM	1	0	21.60	16.55	18.70	38.45	-19.75
				1	24	21.76	16.71	18.86	38.45	-19.59
				12	6	21.12	16.07	18.22	38.45	-20.23
				25	0	21.29	16.24	18.39	38.45	-20.06
	20525	836.5	16QAM	1	0	21.50	16.45	18.60	38.45	-19.85
				1	24	22.09	17.04	19.19	38.45	-19.26
				12	6	21.00	15.95	18.10	38.45	-20.35
				25	0	21.09	16.04	18.19	38.45	-20.26
	20625	846.5	16QAM	1	0	22.02	16.97	19.12	38.45	-19.33
				1	24	21.67	16.62	18.77	38.45	-19.68
				12	6	21.07	16.02	18.17	38.45	-20.28
				25	0	21.08	16.03	18.18	38.45	-20.27

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Antenna gain (dBi) -2.9

LTE Band 5_Uplink frequency band : 824 to 849 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20450	829	QPSK	1	0	22.88	17.83	19.98	38.45	-18.47
				1	49	22.90	17.85	20.00	38.45	-18.45
				25	12	22.10	17.05	19.20	38.45	-19.25
				50	0	22.11	17.06	19.21	38.45	-19.24
	20525	836.5	QPSK	1	0	22.87	17.82	19.97	38.45	-18.48
				1	49	22.86	17.81	19.96	38.45	-18.49
				25	12	22.17	17.12	19.27	38.45	-19.18
				50	0	22.12	17.07	19.22	38.45	-19.23
	20600	844	QPSK	1	0	22.97	17.92	20.07	38.45	-18.38
				1	49	23.00	17.95	20.10	38.45	-18.35
				25	12	22.24	17.19	19.34	38.45	-19.11
				50	0	22.17	17.12	19.27	38.45	-19.18
	20450	829	16QAM	1	0	22.14	17.09	19.24	38.45	-19.21
				1	49	21.90	16.85	19.00	38.45	-19.45
				25	12	21.30	16.25	18.40	38.45	-20.05
				50	0	21.09	16.04	18.19	38.45	-20.26
	20525	836.5	16QAM	1	0	22.12	17.07	19.22	38.45	-19.23
				1	49	21.85	16.80	18.95	38.45	-19.5
				25	12	21.23	16.18	18.33	38.45	-20.12
				50	0	20.98	15.93	18.08	38.45	-20.37
	20600	844	16QAM	1	0	21.90	16.85	19.00	38.45	-19.45
				1	49	21.62	16.57	18.72	38.45	-19.73
				25	12	21.46	16.41	18.56	38.45	-19.89
				50	0	21.09	16.04	18.19	38.45	-20.26

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Antenna gain (dBi) -10.3

LTE Band 12_Uplink frequency band : 699 to 716 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	23017	699.7	QPSK	1	0	23.41	10.96	13.11	34.77	-21.66
				1	5	23.41	10.96	13.11	34.77	-21.66
				3	2	22.80	10.35	12.50	34.77	-22.27
				6	0	22.37	9.92	12.07	34.77	-22.7
	23095	707.5	QPSK	1	0	23.33	10.88	13.03	34.77	-21.74
				1	5	23.36	10.91	13.06	34.77	-21.71
				3	2	23.00	10.55	12.70	34.77	-22.07
				6	0	22.37	9.92	12.07	34.77	-22.7
	23173	715.5	QPSK	1	0	23.27	10.82	12.97	34.77	-21.8
				1	5	23.35	10.90	13.05	34.77	-21.72
				3	2	22.71	10.26	12.41	34.77	-22.36
				6	0	22.31	9.86	12.01	34.77	-22.76
	23017	699.7	16QAM	1	0	22.51	10.06	12.21	34.77	-22.56
				1	5	22.17	9.72	11.87	34.77	-22.9
				3	2	21.94	9.49	11.64	34.77	-23.13
				6	0	21.27	8.82	10.97	34.77	-23.8
	23095	707.5	16QAM	1	0	22.06	9.61	11.76	34.77	-23.01
				1	5	21.85	9.40	11.55	34.77	-23.22
				3	2	21.93	9.48	11.63	34.77	-23.14
				6	0	21.19	8.74	10.89	34.77	-23.88
	23173	715.5	16QAM	1	0	22.40	9.95	12.10	34.77	-22.67
				1	5	22.10	9.65	11.80	34.77	-22.97
				3	2	21.99	9.54	11.69	34.77	-23.08
				6	0	21.26	8.81	10.96	34.77	-23.81

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Antenna gain (dBi) -10.3

LTE Band 12_Uplink frequency band : 699 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	23025	700.5	QPSK	1	0	23.11	10.66	12.81	34.77	-21.96
				1	14	23.13	10.68	12.83	34.77	-21.94
				8	4	22.42	9.97	12.12	34.77	-22.65
				15	0	22.40	9.95	12.10	34.77	-22.67
	23095	707.5	QPSK	1	0	23.10	10.65	12.80	34.77	-21.97
				1	14	23.25	10.80	12.95	34.77	-21.82
				8	4	22.42	9.97	12.12	34.77	-22.65
				15	0	22.37	9.92	12.07	34.77	-22.7
	23165	714.5	QPSK	1	0	23.03	10.58	12.73	34.77	-22.04
				1	14	23.16	10.71	12.86	34.77	-21.91
				8	4	22.41	9.96	12.11	34.77	-22.66
				15	0	22.29	9.84	11.99	34.77	-22.78
	23025	700.5	16QAM	1	0	22.45	10.00	12.15	34.77	-22.62
				1	14	22.11	9.66	11.81	34.77	-22.96
				8	4	21.51	9.06	11.21	34.77	-23.56
				15	0	21.33	8.88	11.03	34.77	-23.74
	23095	707.5	16QAM	1	0	22.47	10.02	12.17	34.77	-22.6
				1	14	21.95	9.50	11.65	34.77	-23.12
				8	4	21.47	9.02	11.17	34.77	-23.6
				15	0	21.39	8.94	11.09	34.77	-23.68
	23165	714.5	16QAM	1	0	22.14	9.69	11.84	34.77	-22.93
				1	14	22.45	10.00	12.15	34.77	-22.62
				8	4	21.37	8.92	11.07	34.77	-23.7
				15	0	21.30	8.85	11.00	34.77	-23.77

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Antenna gain (dBi) -10.3

LTE Band 12_Uplink frequency band : 699 to 716 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23035	701.5	QPSK	1	0	22.95	10.50	12.65	34.77	-22.12
				1	24	22.99	10.54	12.69	34.77	-22.08
				12	6	22.39	9.94	12.09	34.77	-22.68
				25	0	22.22	9.77	11.92	34.77	-22.85
	23095	707.5	QPSK	1	0	22.83	10.38	12.53	34.77	-22.24
				1	24	23.11	10.66	12.81	34.77	-21.96
				12	6	22.42	9.97	12.12	34.77	-22.65
				25	0	22.34	9.89	12.04	34.77	-22.73
	23155	713.5	QPSK	1	0	22.77	10.32	12.47	34.77	-22.3
				1	24	22.83	10.38	12.53	34.77	-22.24
				12	6	22.33	9.88	12.03	34.77	-22.74
				25	0	22.24	9.79	11.94	34.77	-22.83
	23035	701.5	16QAM	1	0	21.80	9.35	11.50	34.77	-23.27
				1	24	22.33	9.88	12.03	34.77	-22.74
				12	6	21.42	8.97	11.12	34.77	-23.65
				25	0	21.27	8.82	10.97	34.77	-23.8
	23095	707.5	16QAM	1	0	21.88	9.43	11.58	34.77	-23.19
				1	24	21.87	9.42	11.57	34.77	-23.2
				12	6	21.54	9.09	11.24	34.77	-23.53
				25	0	21.30	8.85	11.00	34.77	-23.77
	23155	713.5	16QAM	1	0	21.88	9.43	11.58	34.77	-23.19
				1	24	22.28	9.83	11.98	34.77	-22.79
				12	6	21.33	8.88	11.03	34.77	-23.74
				25	0	21.34	8.89	11.04	34.77	-23.73

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Antenna gain (dBi) -10.3

LTE Band 12_Uplink frequency band : 699 to 716 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23060	704	QPSK	1	0	22.87	10.42	12.57	34.77	-22.2
				1	49	23.38	10.93	13.08	34.77	-21.69
				25	12	22.34	9.89	12.04	34.77	-22.73
				50	0	22.35	9.90	12.05	34.77	-22.72
	23095	707.5	QPSK	1	0	22.80	10.35	12.50	34.77	-22.27
				1	49	23.28	10.83	12.98	34.77	-21.79
				25	12	22.41	9.96	12.11	34.77	-22.66
				50	0	22.43	9.98	12.13	34.77	-22.64
	23130	711	QPSK	1	0	23.12	10.67	12.82	34.77	-21.95
				1	49	22.94	10.49	12.64	34.77	-22.13
				25	12	22.40	9.95	12.10	34.77	-22.67
				50	0	22.23	9.78	11.93	34.77	-22.84
	23060	704	16QAM	1	0	21.70	9.25	11.40	34.77	-23.37
				1	49	22.39	9.94	12.09	34.77	-22.68
				25	12	21.17	8.72	10.87	34.77	-23.9
				50	0	21.38	8.93	11.08	34.77	-23.69
	23095	707.5	16QAM	1	0	21.83	9.38	11.53	34.77	-23.24
				1	49	22.38	9.93	12.08	34.77	-22.69
				25	12	21.42	8.97	11.12	34.77	-23.65
				50	0	21.43	8.98	11.13	34.77	-23.64
23130	711	16QAM	1	0	22.01	9.56	11.71	34.77	-23.06	
			1	49	21.73	9.28	11.43	34.77	-23.34	
			25	12	21.52	9.07	11.22	34.77	-23.55	
			50	0	21.28	8.83	10.98	34.77	-23.79	

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Antenna gain (dBi) -10.3

LTE Band 17_Uplink frequency band : 704 to 716 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23755	706.5	QPSK	1	0	22.72	10.27	12.42	34.77	-22.35
				1	24	22.70	10.25	12.40	34.77	-22.37
				12	6	22.29	9.84	11.99	34.77	-22.78
				25	0	22.27	9.82	11.97	34.77	-22.8
	23790	710	QPSK	1	0	22.75	10.30	12.45	34.77	-22.32
				1	24	22.85	10.40	12.55	34.77	-22.22
				12	6	22.05	9.60	11.75	34.77	-23.02
				25	0	22.15	9.70	11.85	34.77	-22.92
	23825	713.5	QPSK	1	0	22.68	10.23	12.38	34.77	-22.39
				1	24	22.83	10.38	12.53	34.77	-22.24
				12	6	22.14	9.69	11.84	34.77	-22.93
				25	0	22.07	9.62	11.77	34.77	-23
	23755	706.5	16QAM	1	0	21.87	9.42	11.57	34.77	-23.2
				1	24	21.67	9.22	11.37	34.77	-23.4
				12	6	21.10	8.65	10.80	34.77	-23.97
				25	0	21.23	8.78	10.93	34.77	-23.84
	23790	710	16QAM	1	0	21.95	9.50	11.65	34.77	-23.12
				1	24	21.89	9.44	11.59	34.77	-23.18
				12	6	21.04	8.59	10.74	34.77	-24.03
				25	0	21.29	8.84	10.99	34.77	-23.78
23825	713.5	16QAM	1	0	21.66	9.21	11.36	34.77	-23.41	
			1	24	21.71	9.26	11.41	34.77	-23.36	
			12	6	21.03	8.58	10.73	34.77	-24.04	
			25	0	21.37	8.92	11.07	34.77	-23.7	

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Antenna gain (dBi) -10.3

LTE Band 17_Uplink frequency band : 704 to 716 MHz

BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23780	709	QPSK	1	0	22.92	10.47	12.62	34.77	-22.15
				1	49	22.91	10.46	12.61	34.77	-22.16
				25	12	22.15	9.70	11.85	34.77	-22.92
				50	0	22.34	9.89	12.04	34.77	-22.73
	23790	710	QPSK	1	0	22.75	10.30	12.45	34.77	-22.32
				1	49	22.81	10.36	12.51	34.77	-22.26
				25	12	22.20	9.75	11.90	34.77	-22.87
				50	0	22.19	9.74	11.89	34.77	-22.88
	23800	711	QPSK	1	0	22.71	10.26	12.41	34.77	-22.36
				1	49	23.22	10.77	12.92	34.77	-21.85
				25	12	22.27	9.82	11.97	34.77	-22.8
				50	0	22.17	9.72	11.87	34.77	-22.9
	23780	709	16QAM	1	0	21.82	9.37	11.52	34.77	-23.25
				1	49	22.26	9.81	11.96	34.77	-22.81
				25	12	21.19	8.74	10.89	34.77	-23.88
				50	0	21.34	8.89	11.04	34.77	-23.73
	23790	710	16QAM	1	0	21.76	9.31	11.46	34.77	-23.31
				1	49	21.71	9.26	11.41	34.77	-23.36
				25	12	21.32	8.87	11.02	34.77	-23.75
				50	0	21.35	8.90	11.05	34.77	-23.72
23800	711	16QAM	1	0	22.16	9.71	11.86	34.77	-22.91	
			1	49	22.13	9.68	11.83	34.77	-22.94	
			25	12	21.25	8.80	10.95	34.77	-23.82	
			50	0	21.17	8.72	10.87	34.77	-23.9	

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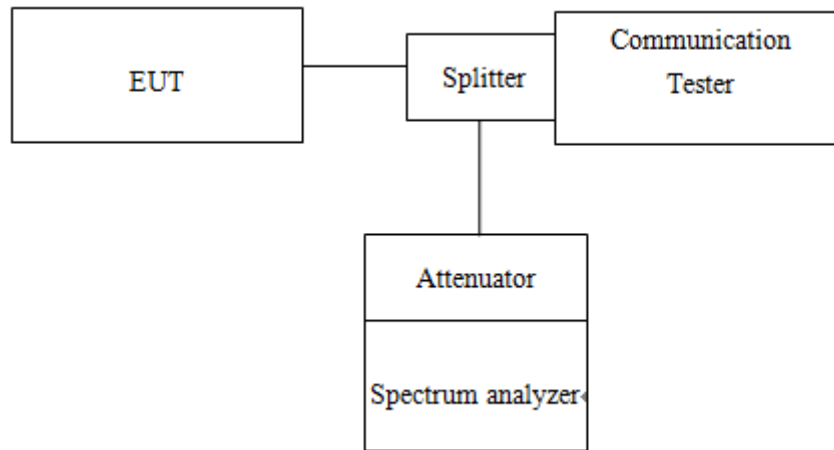
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7 OCCUPIED BANDWIDTH MEASUREMENT

7.1 Standard Applicable

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

7.2 Test Set-up



7.3 Measurement Procedure

99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

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7.4 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54200716	Apr. 1st, 2020	Mar. 31st, 2021
Radio Communication Analyer	Anritsu	MT8820C	6200995019	Apr. 1st, 2020	Mar. 31st, 2021
DC Power Supply	Agilent	E3640A	MY40000811	Dec. 23th, 2019	Dec. 22nd, 2020
Radio Communication Analyer	Anritsu	MT8815B	6200711454	Apr. 1st, 2020	Mar. 31st, 2021
Attenuator	Mini-Circuit	BW-S10W2+	2	Jan. 2nd, 2020	Jan. 1st, 2021
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	Jan. 2nd, 2020	Jan. 1st, 2021
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	Jan. 2nd, 2020	Jan. 1st, 2021

7.5 Measurement Result

Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		GSM 850	GPRS 850	GPRS 850	GPRS 850
824.2	128	0.24593	0.24112	0.315	0.314
836.6	190	0.24378	0.24672	0.315	0.319
848.8	251	0.24426	0.24270	0.319	0.314
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		GSM 1900	GPRS 1900	GSM 1900	GPRS 1900
1850.2	512	0.24333	0.24386	0.316	0.318
1880.0	661	0.24853	0.24450	0.321	0.314
1909.8	810	0.24329	0.24611	0.320	0.316

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		WCDMA V	HSDPA V	HSUPA V	WCDMA V	HSDPA V	HSUPA V
826.40	4132	4.10360	4.09760	4.10870	4.684	4.666	4.656
836.60	4183	4.12170	4.11410	4.11290	4.699	4.684	4.672
846.60	4233	4.11880	4.11460	4.10530	4.681	4.675	4.656

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LTE BAND 5 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
824.7	20407	1.0976	1.1007	1.290	1.299
836.5	20525	1.0970	1.1012	1.281	1.292
848.3	20643	1.0976	1.1004	1.285	1.304

LTE BAND 5 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
825.5	20415	2.6957	2.7001	2.993	3.001
836.5	20525	2.6991	2.7027	2.989	2.992
847.5	20635	2.6994	2.7031	2.982	2.993

LTE BAND 5 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
826.5	20425	4.4818	4.4938	4.985	5.015
836.5	20525	4.4984	4.5042	5.026	5.044
846.5	20625	4.4980	4.4988	5.026	5.017

LTE BAND 5 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
829.0	20450	8.9807	8.9380	9.827	9.859
836.5	20525	8.9930	8.9559	9.922	9.789
844.0	20600	8.9632	8.9237	9.861	9.829

LTE BAND 12 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
699.7	23017	1.1108	1.1114	1.280	1.267
707.5	23095	1.0969	1.0946	1.264	1.262
715.3	23173	1.0979	1.1017	1.291	1.298

LTE BAND 12 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
700.5	23025	2.6649	2.6987	2.880	2.996
707.5	23095	2.6674	2.7004	2.899	2.997
714.5	23165	2.7035	2.7014	2.997	2.994

LTE BAND 12 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
701.5	23035	4.4968	4.4929	4.998	4.972
707.5	23095	4.4873	4.4954	4.869	5.019
713.5	23155	4.5025	4.5013	5.003	5.007

LTE BAND 12 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
704.0	23060	9.0000	8.9626	9.919	9.853
707.5	23095	9.0084	8.9510	9.874	9.769
711.0	23130	8.9778	8.8929	9.829	9.548

LTE BAND 17 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
706.5	23755	4.4973	4.4781	5.017	4.820
710.0	23790	4.4713	4.4749	4.786	4.859
713.5	23825	4.4985	4.5011	5.061	5.014

LTE BAND 17 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
709.0	23780	8.9467	8.9305	9.387	9.786
710.0	23790	8.9282	8.8995	9.546	10.515
711.0	23800	8.9600	8.8948	9.636	9.403

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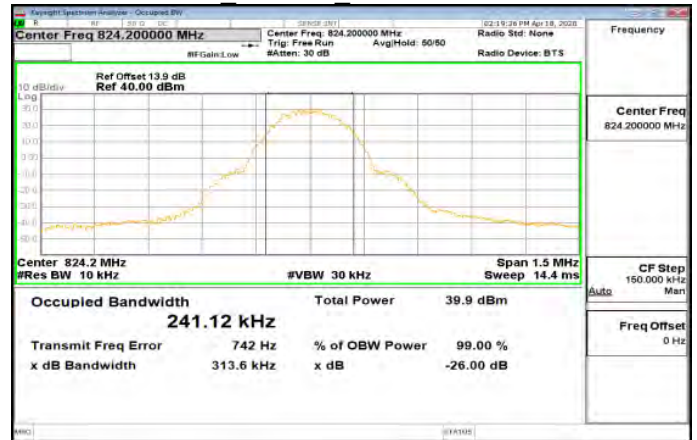
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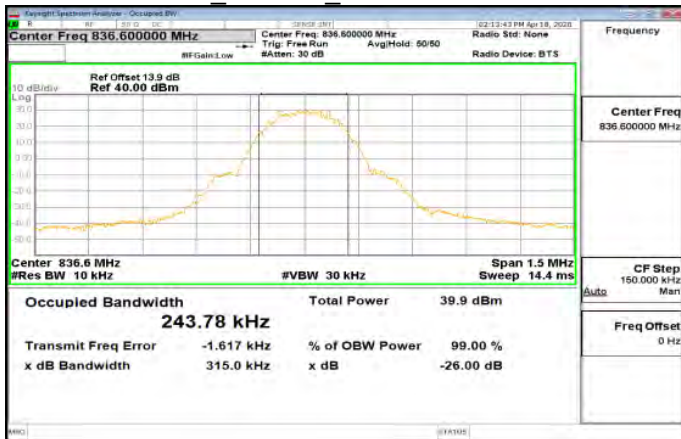
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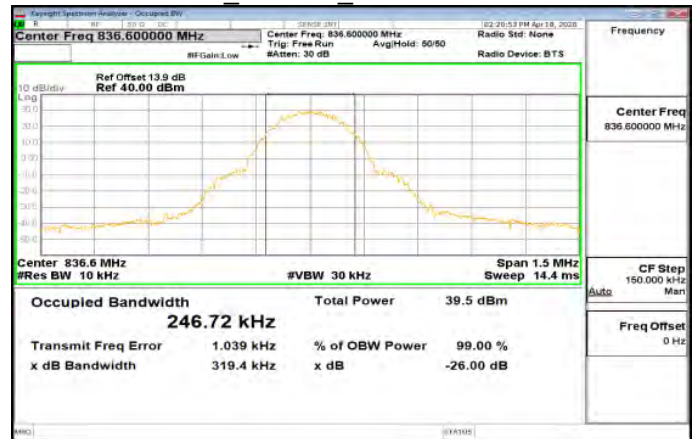
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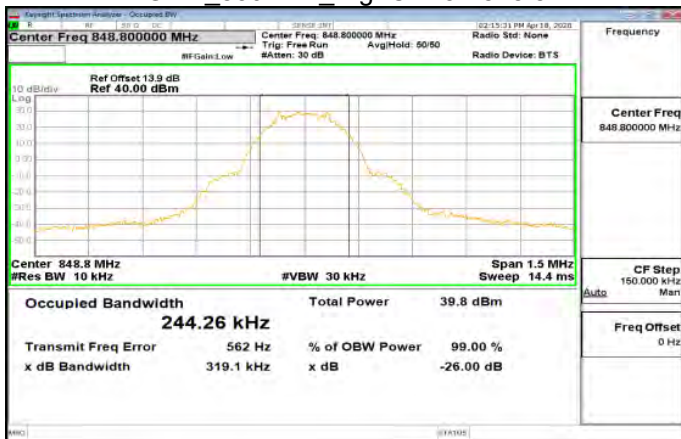
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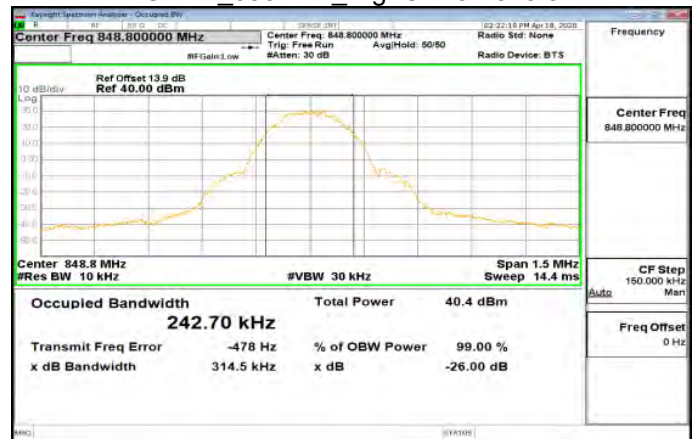
GPRS 850MHz MidCH190-836.6



GSM 850MHz HighCH251-848.8



GPRS 850MHz HighCH251-848.8



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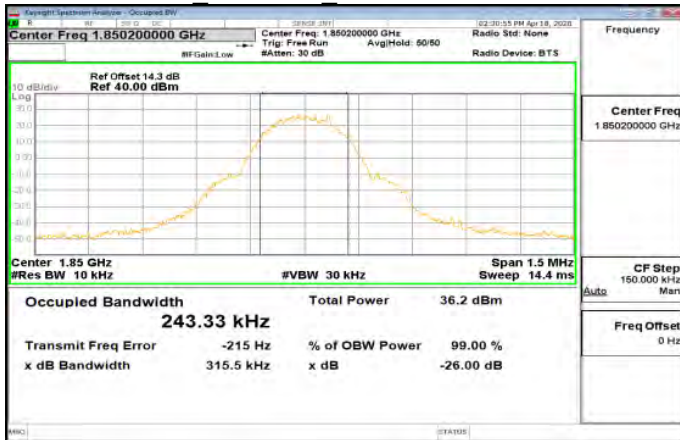
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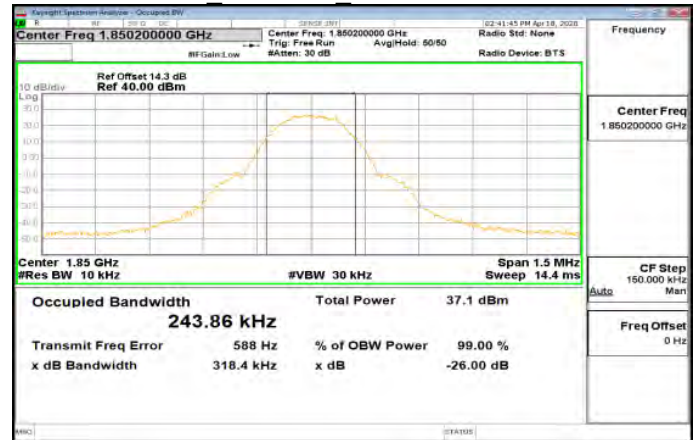
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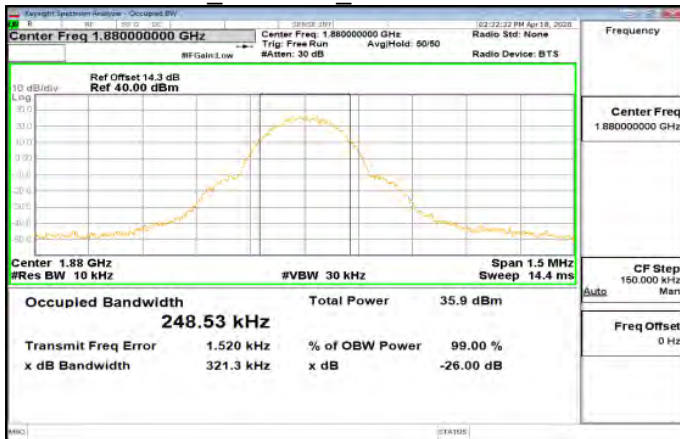
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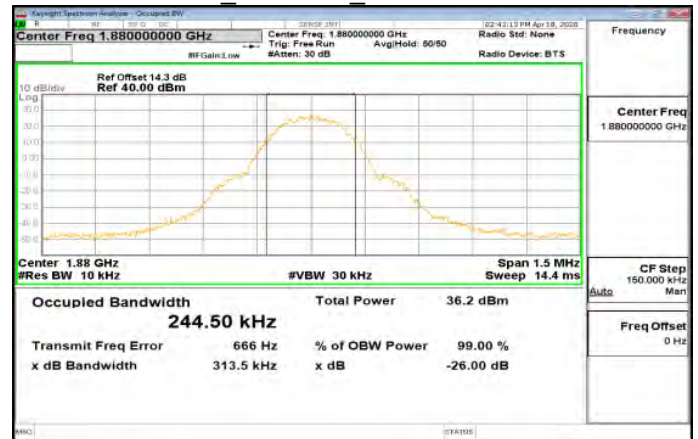
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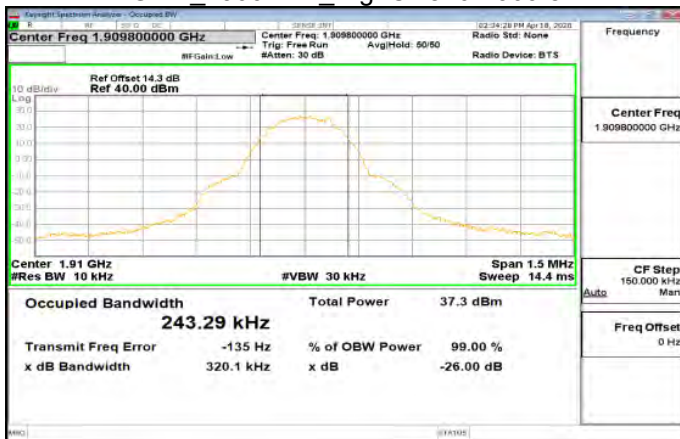
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GPRS 1900MHz MidCH661-1880



GSM 1900MHz HighCH810-1909.8



GPRS 1900MHz HighCH810-1909.8



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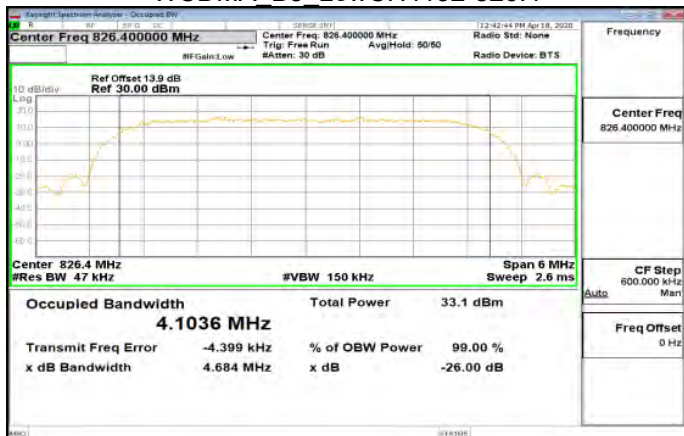
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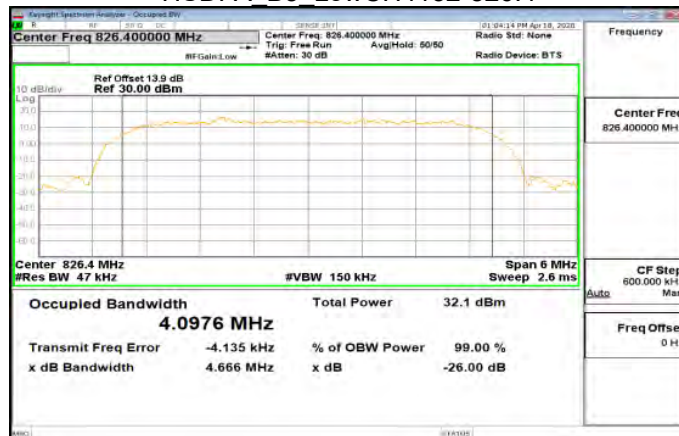
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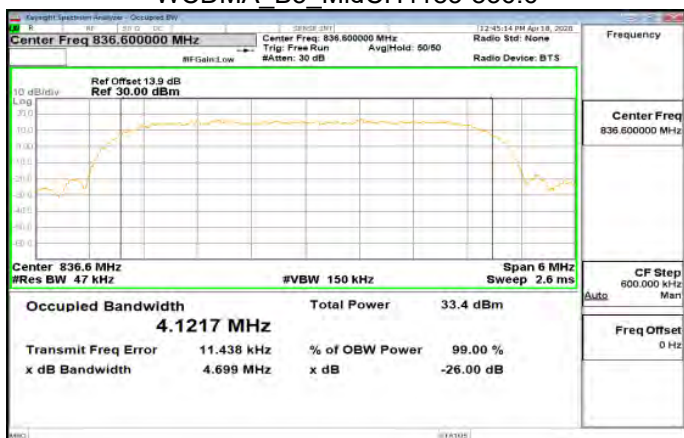
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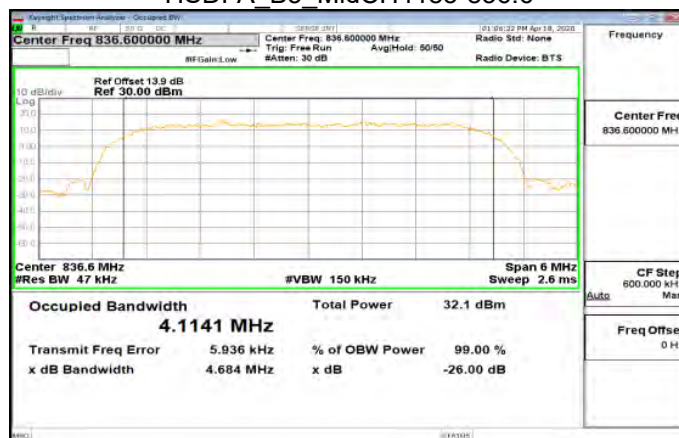
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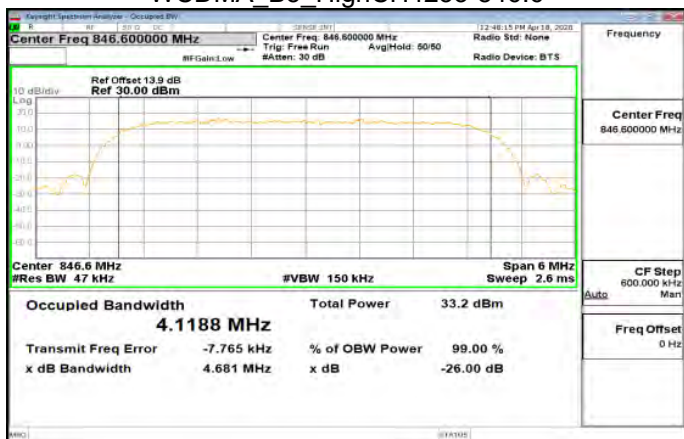
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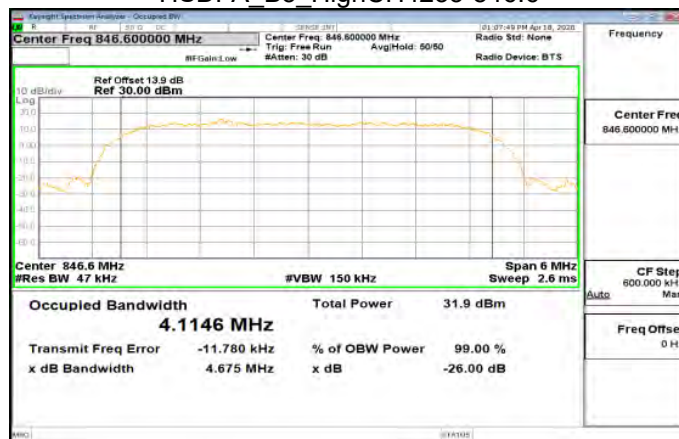
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HSDPA B5 HighCH4233-846.6



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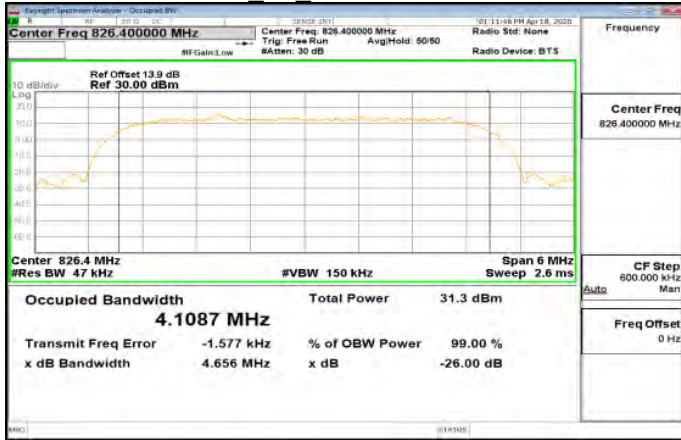
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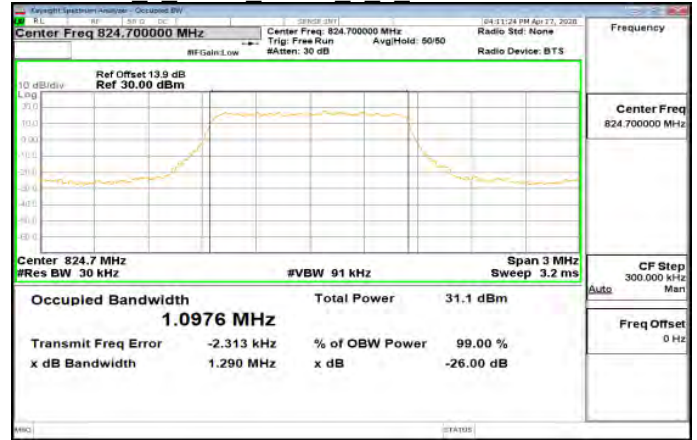
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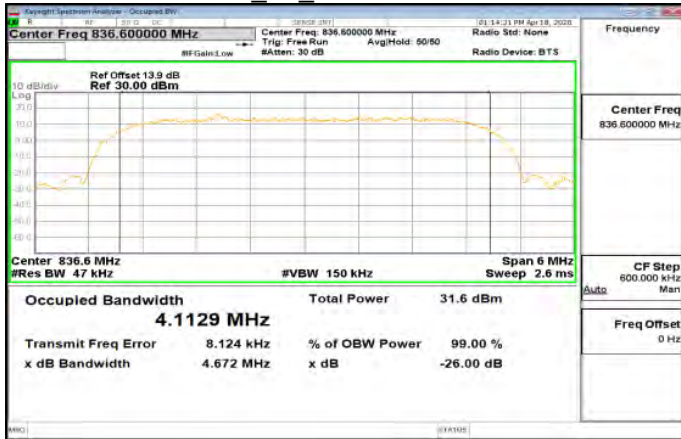
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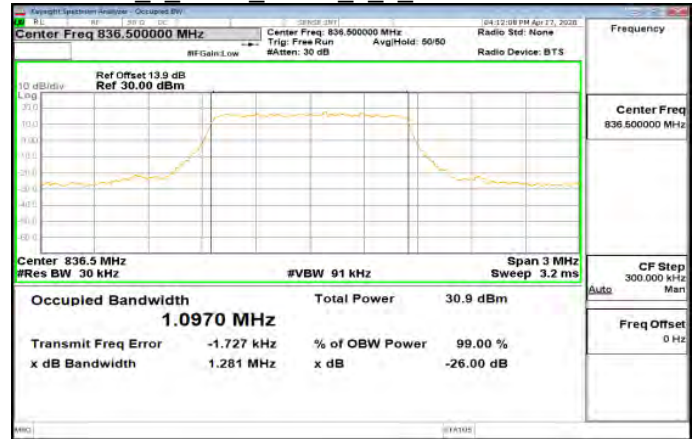
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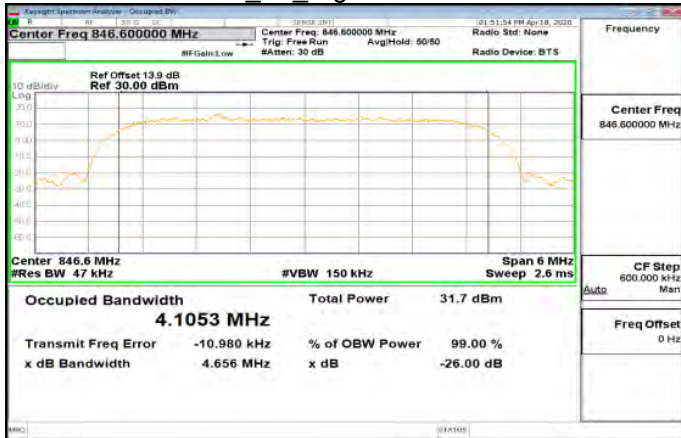
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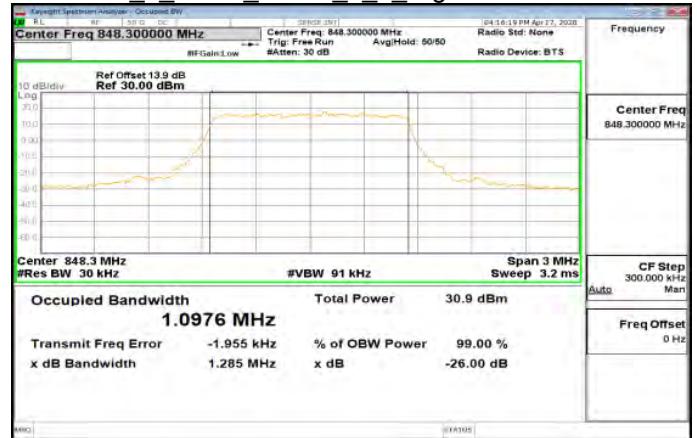
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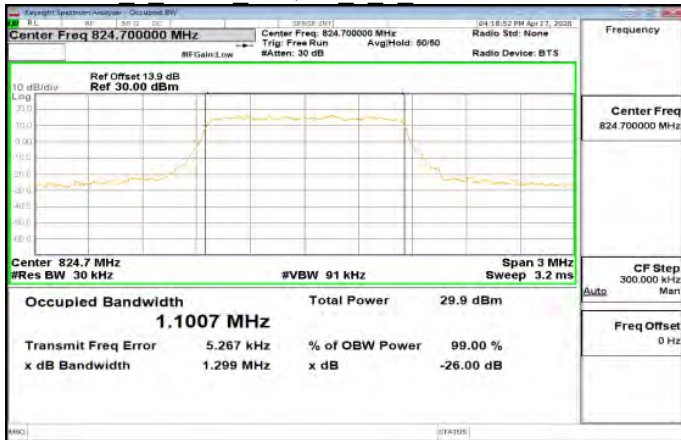
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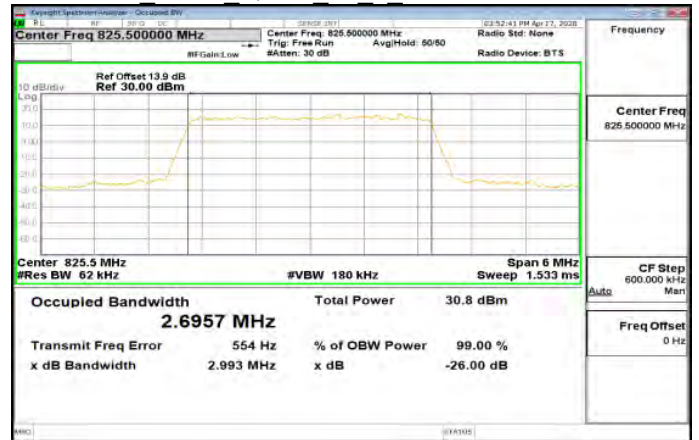
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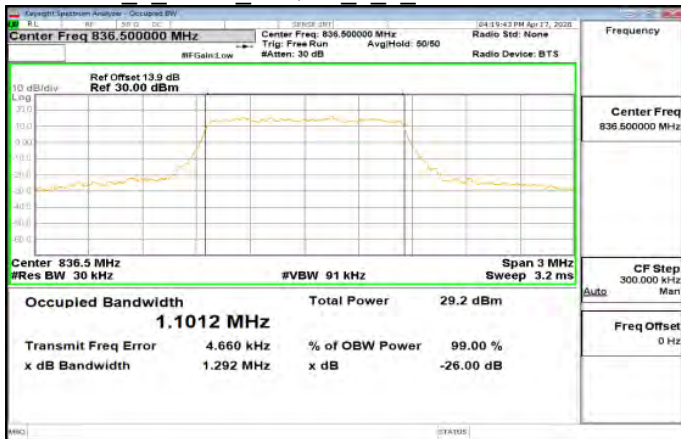
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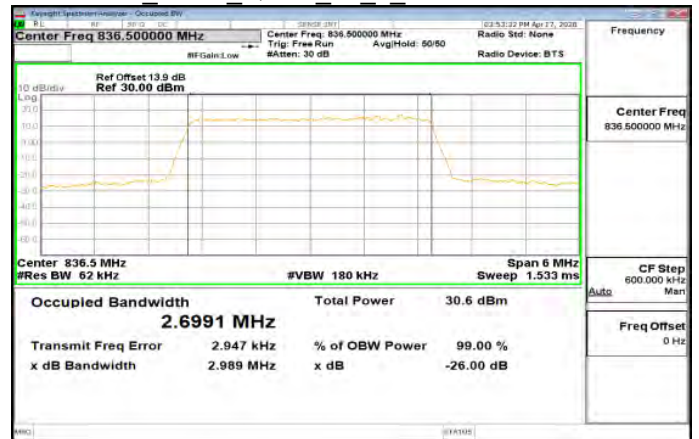
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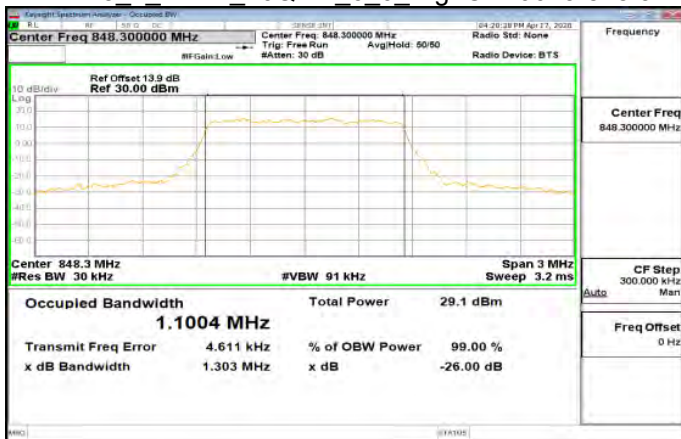
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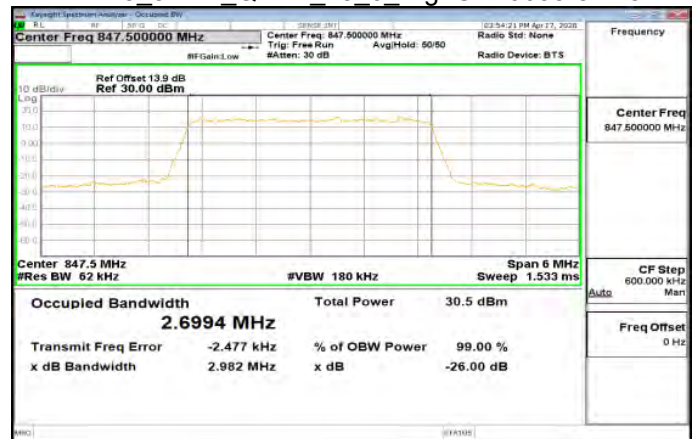
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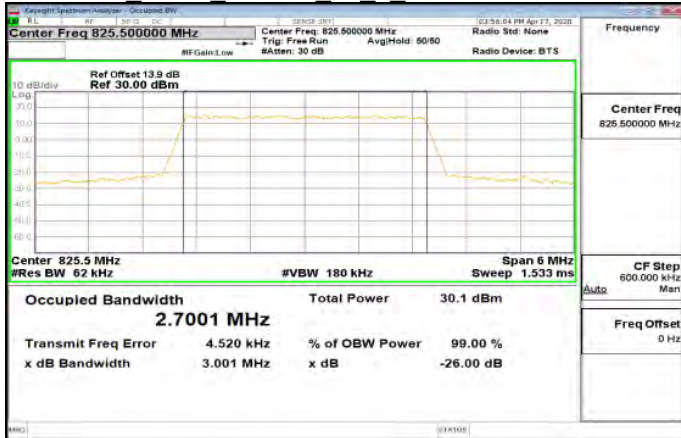


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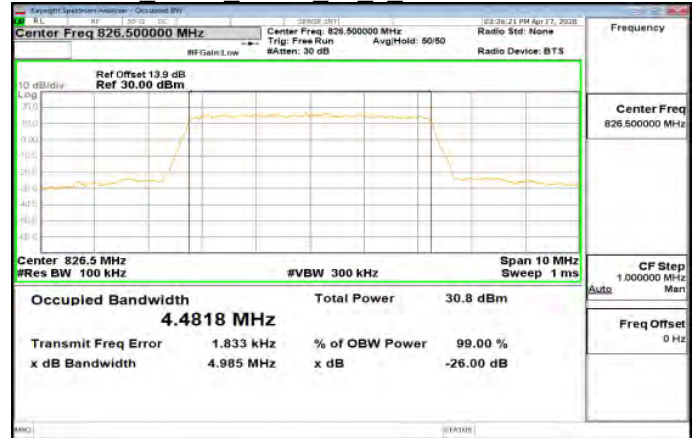
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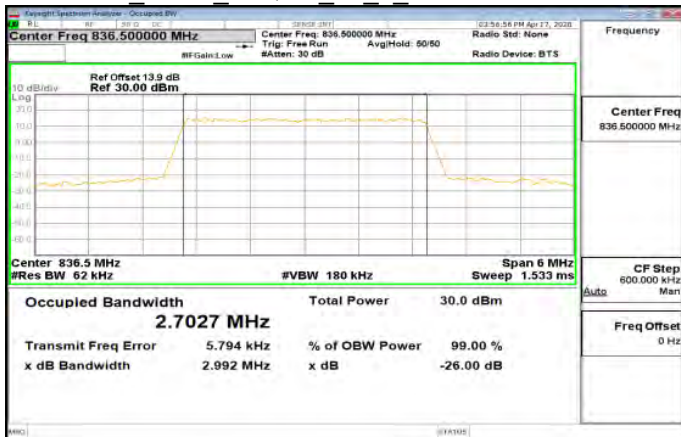
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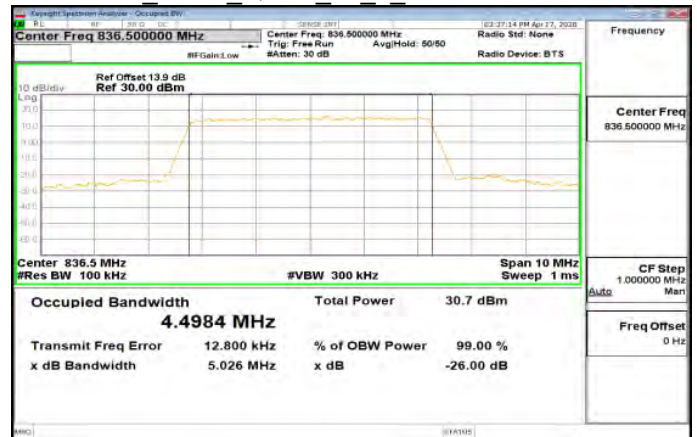
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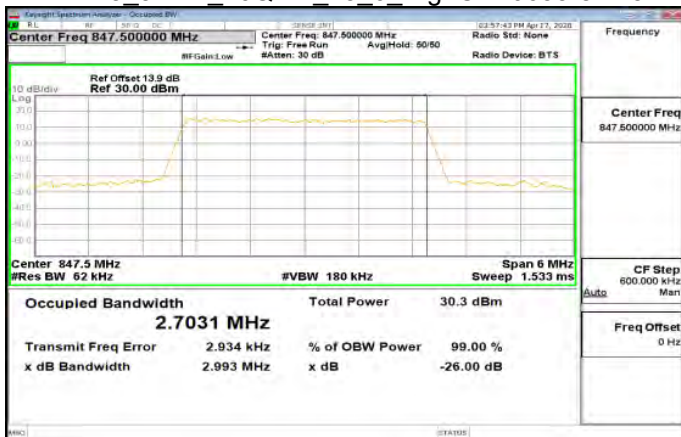
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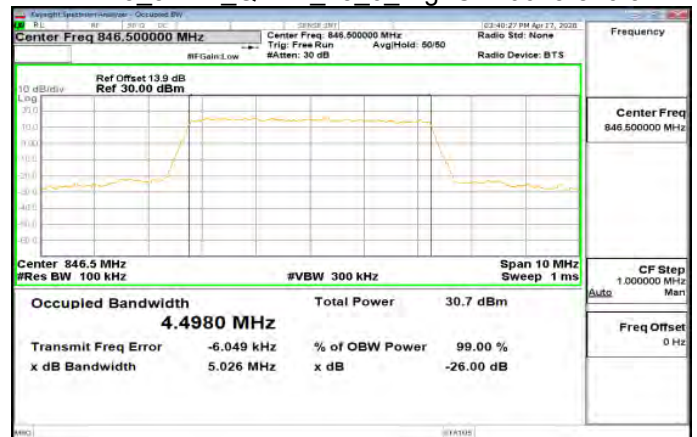
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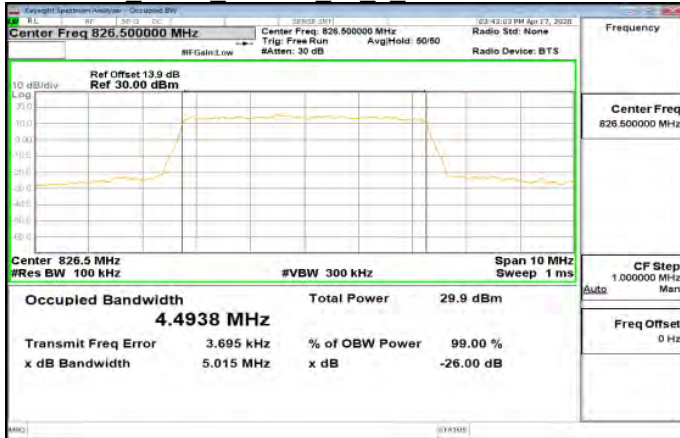
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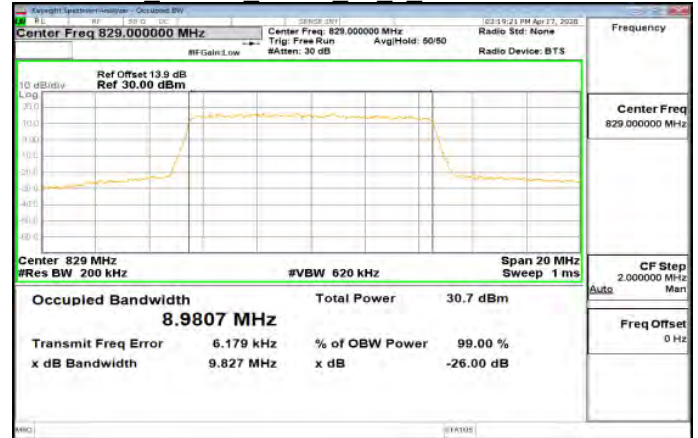
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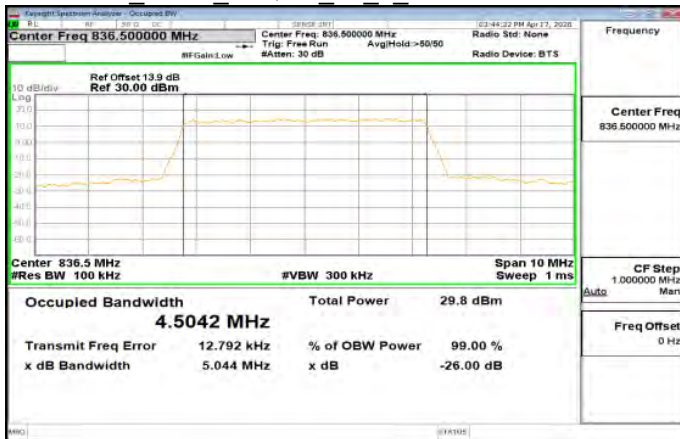
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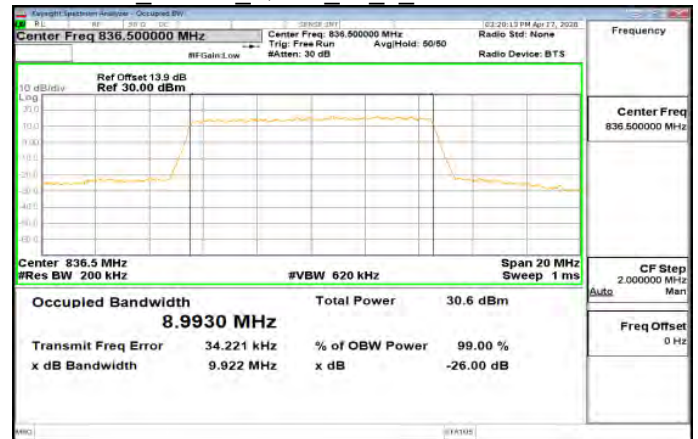
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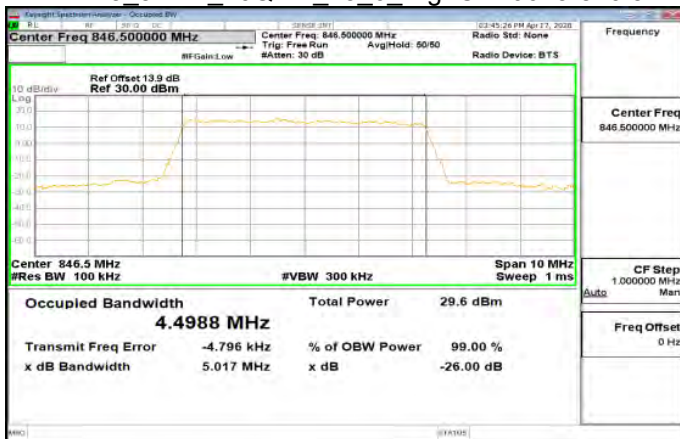
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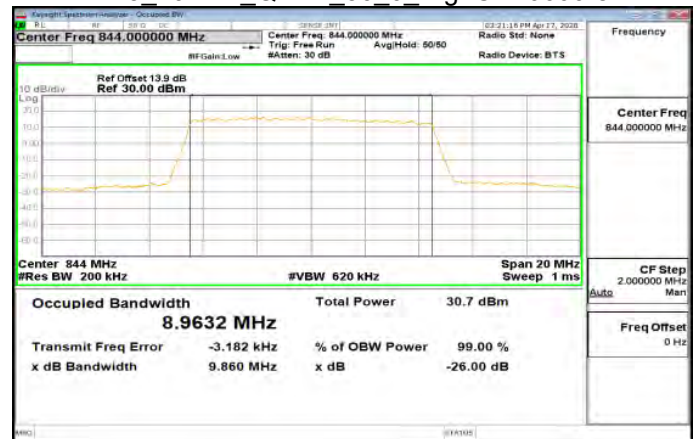
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Band5 5MHz 16QAM 25 0 HighCH20625-846.5



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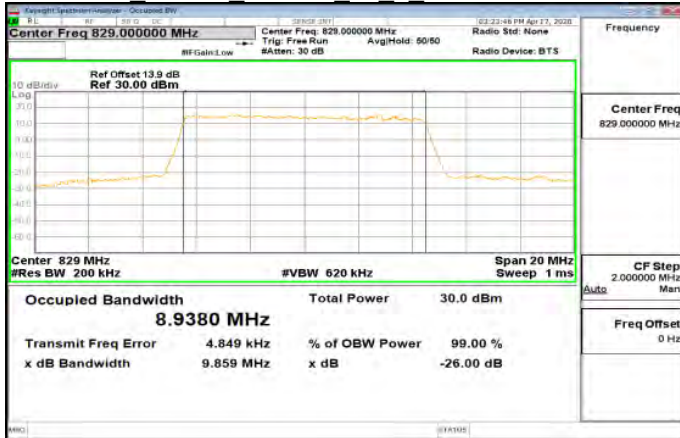
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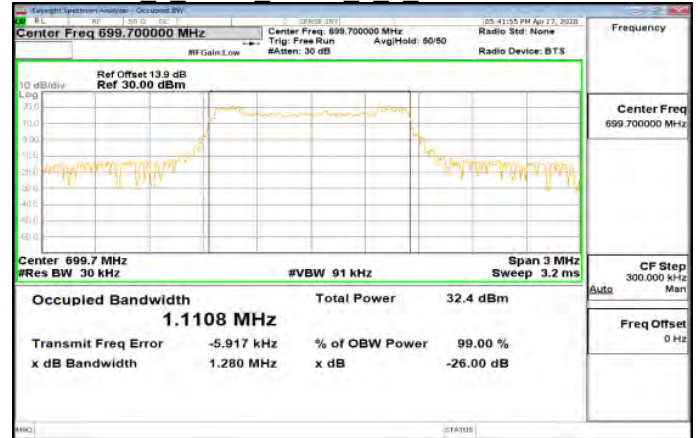
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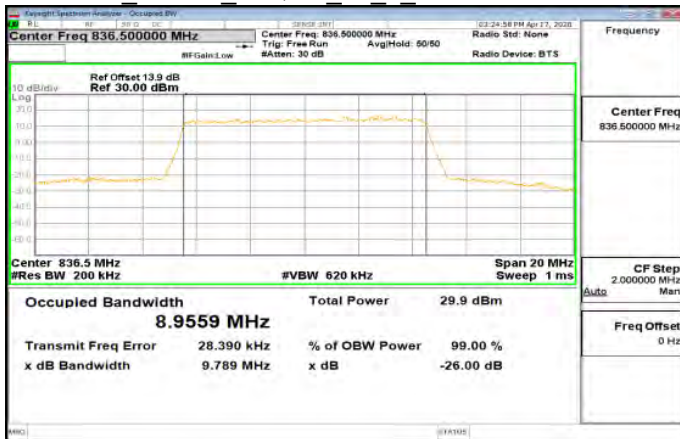
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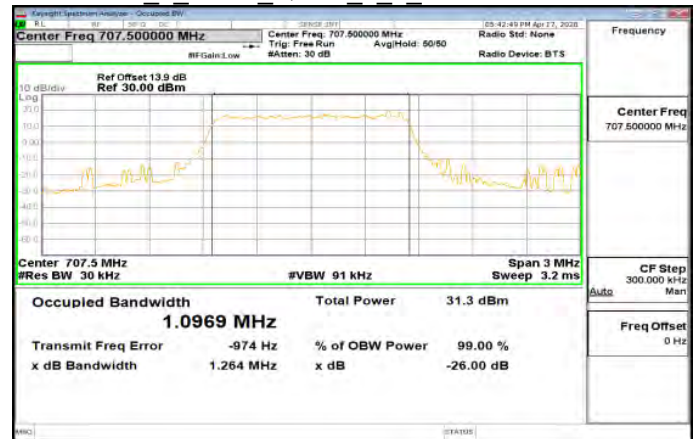
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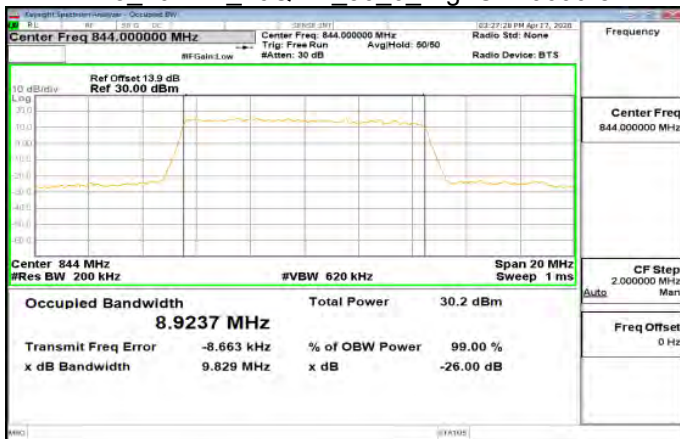
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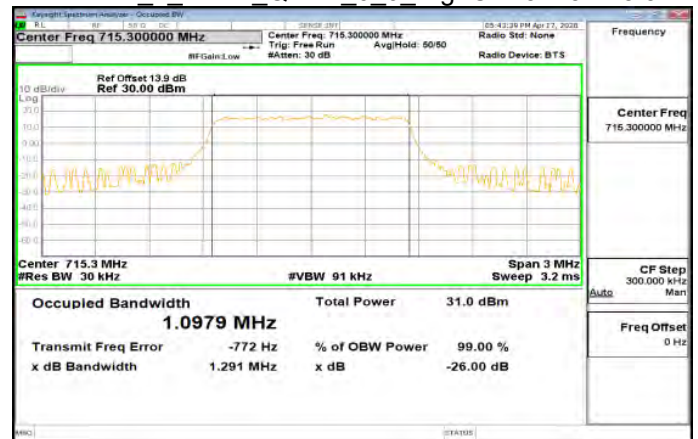
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Band5 10MHz 16QAM 50 0 HighCH20600-844



Band12 1 4MHz QPSK 6 0 HighCH23173-715.3



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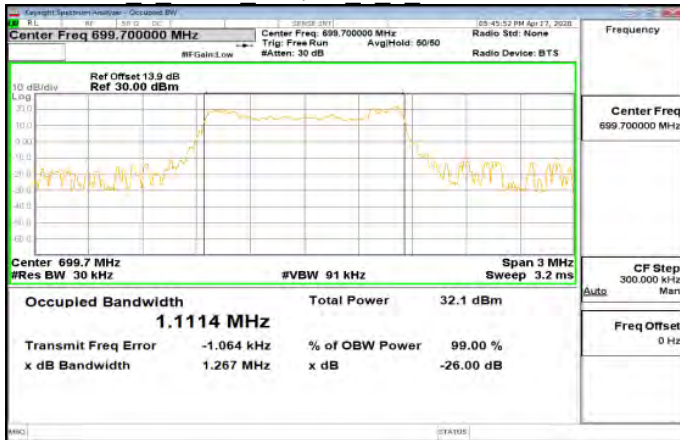
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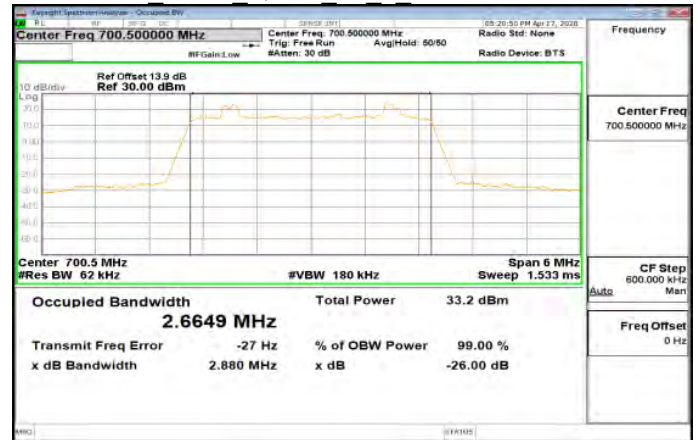
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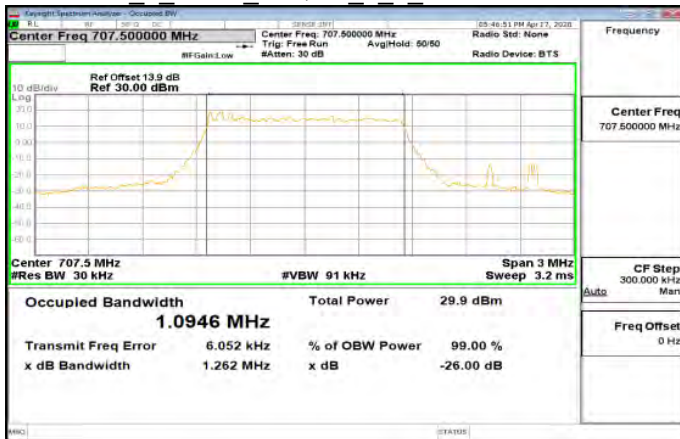
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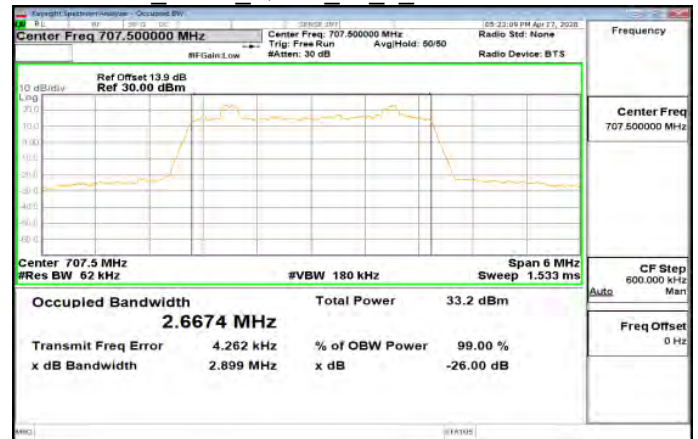
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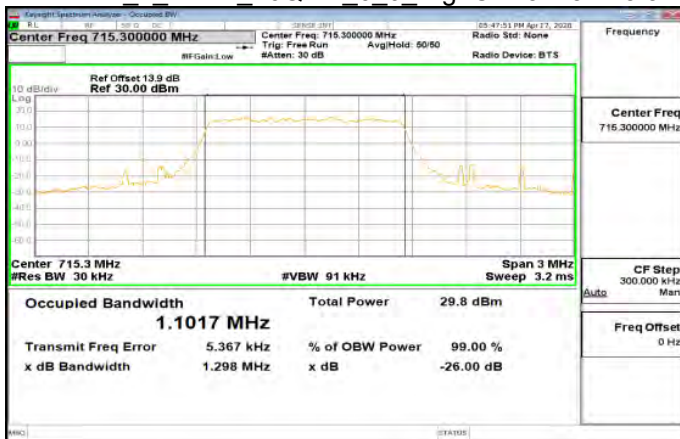
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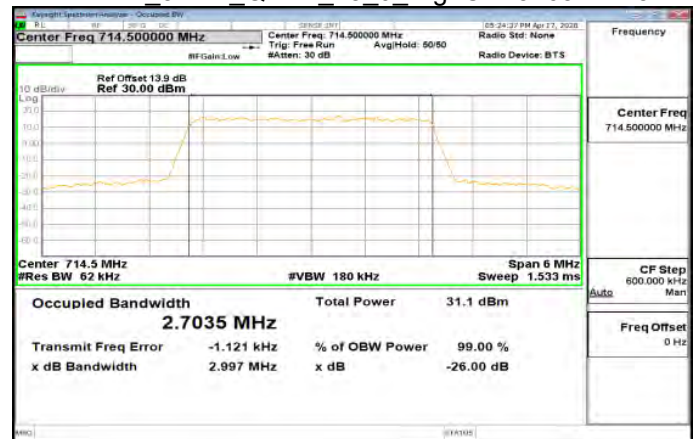
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Band12 1 4MHz 16QAM 6 0 HighCH23173-715.3



Band12 3MHz QPSK 15 0 HighCH23165-714.5



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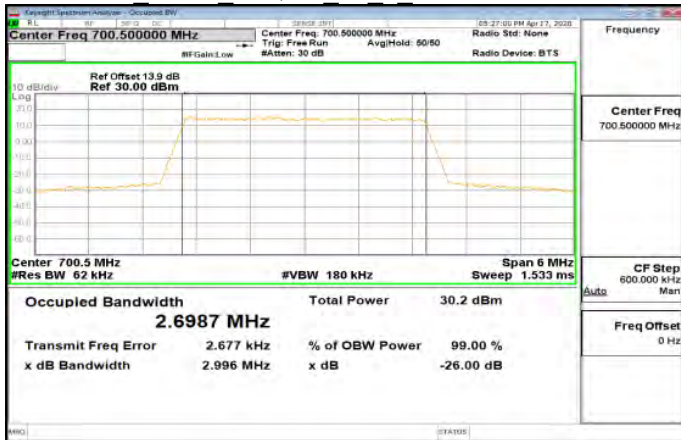
t (886-2) 2299-3279

f (886-2) 2298-0488

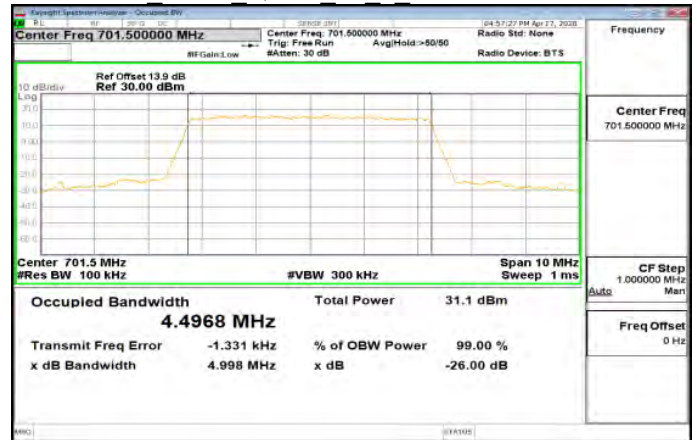
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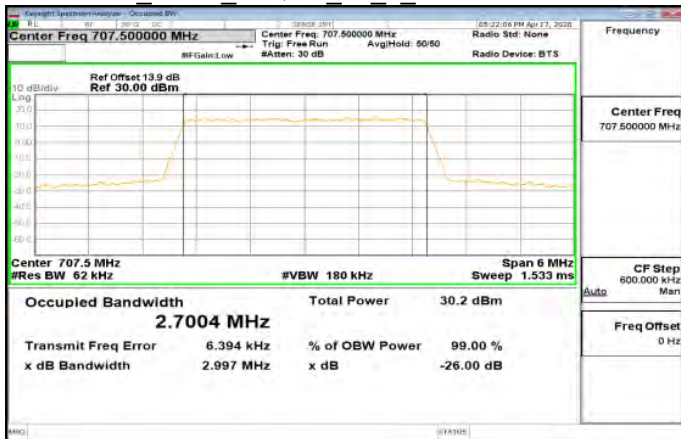
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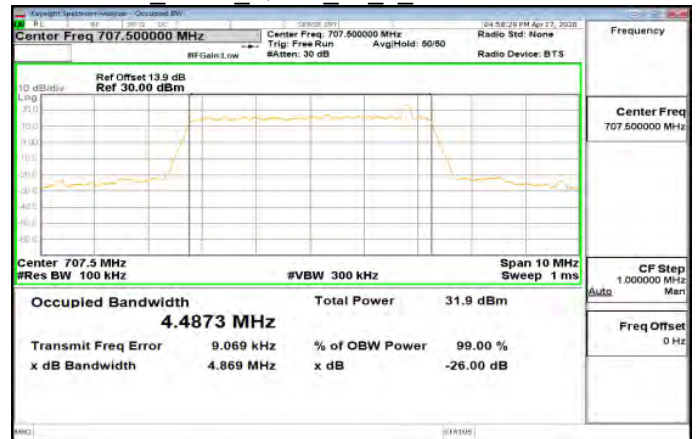
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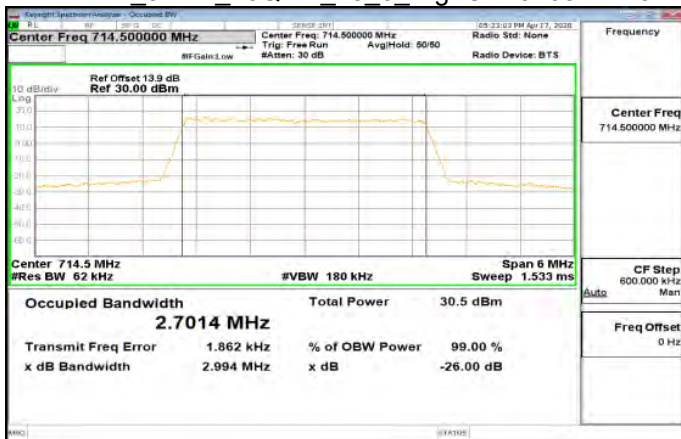
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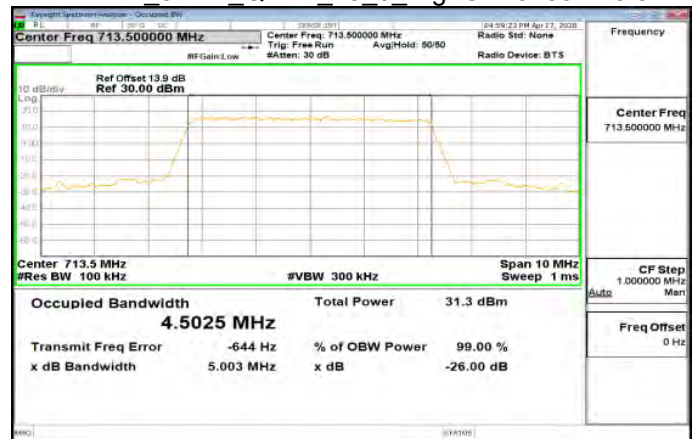
Band12 5MHz QPSK 25 0 MidCH23095-707.5



Band12 3MHz 16QAM 15 0 HighCH23165-714.5



Band12 5MHz QPSK 25 0 HighCH23155-713.5



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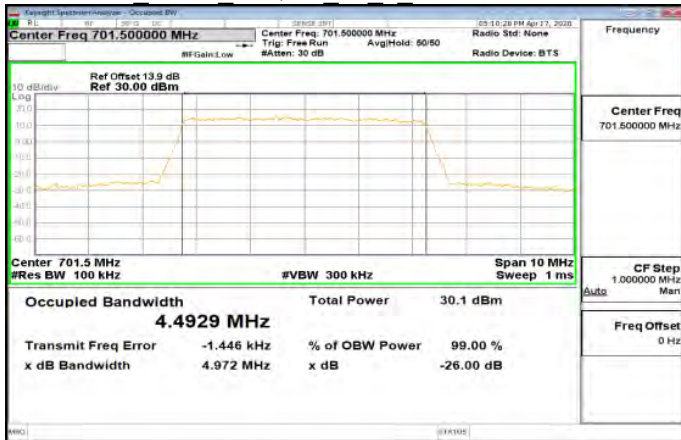
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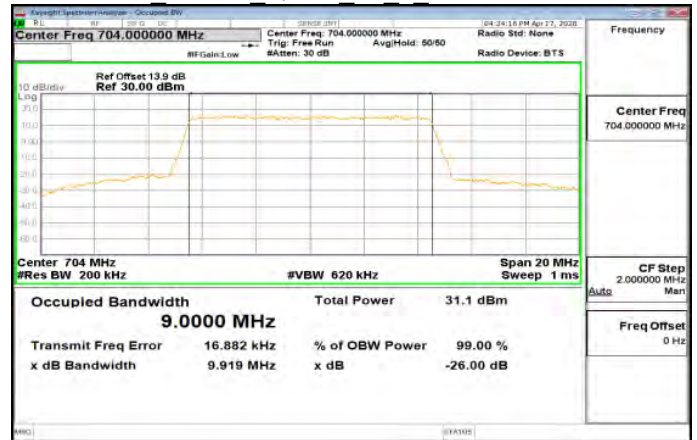
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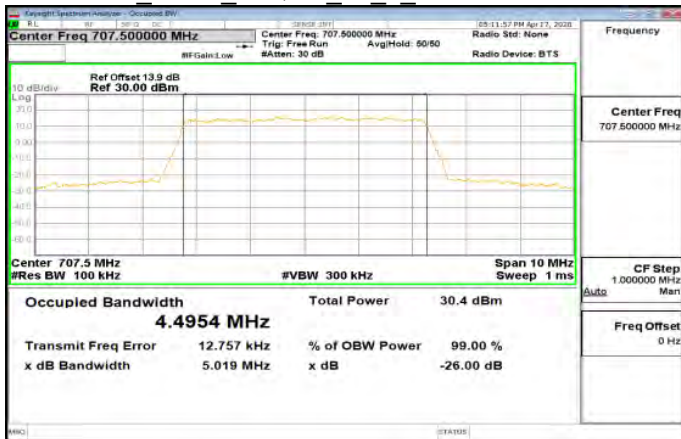
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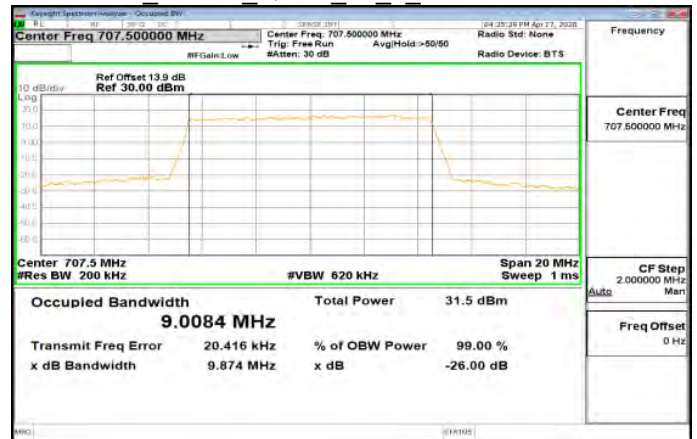
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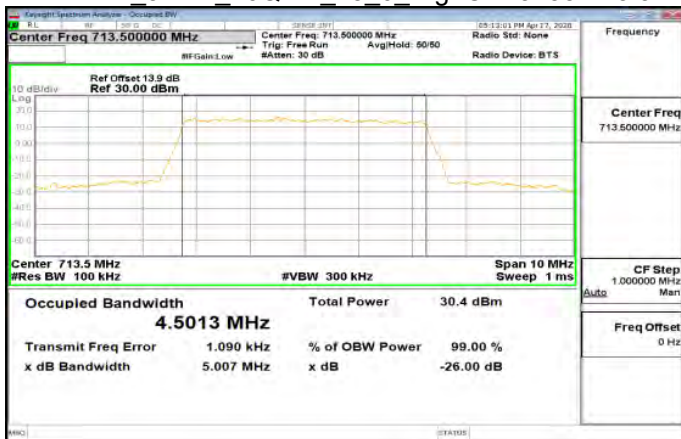
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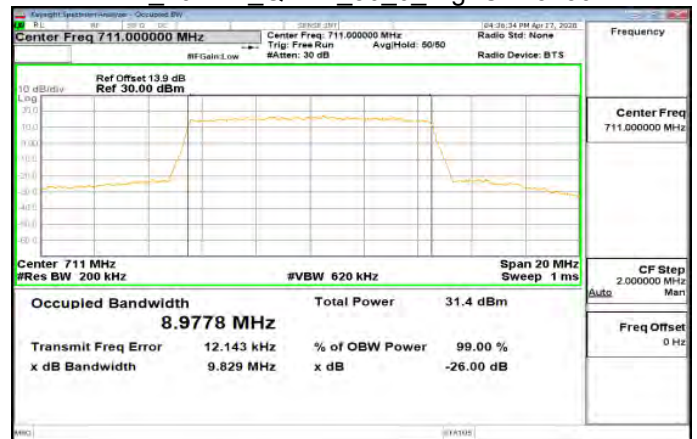
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Band12 5MHz 16QAM 25 0 HighCH23155-713.5



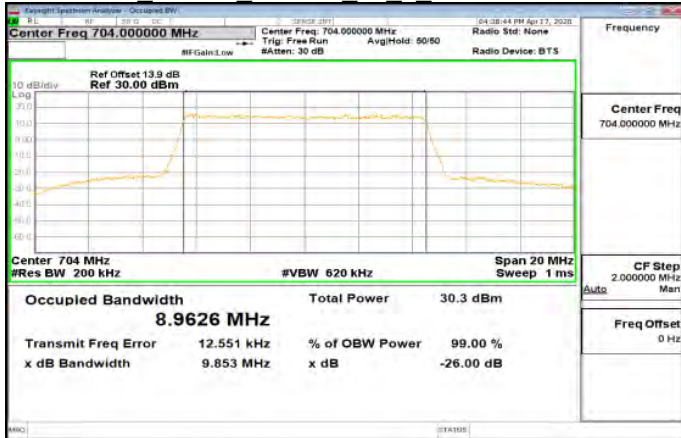
Band12 10MHz QPSK 50 0 HighCH23130-711



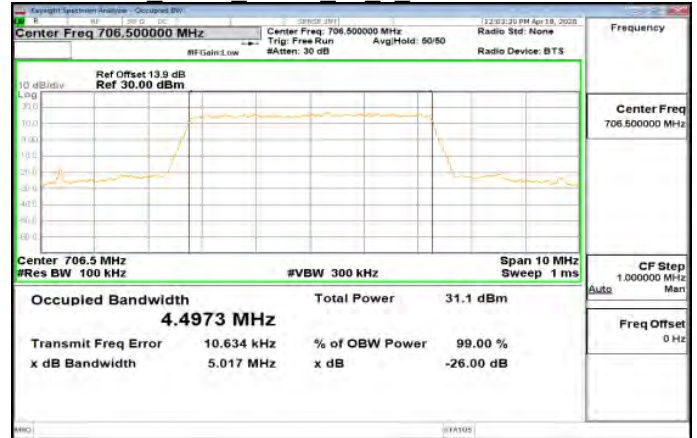
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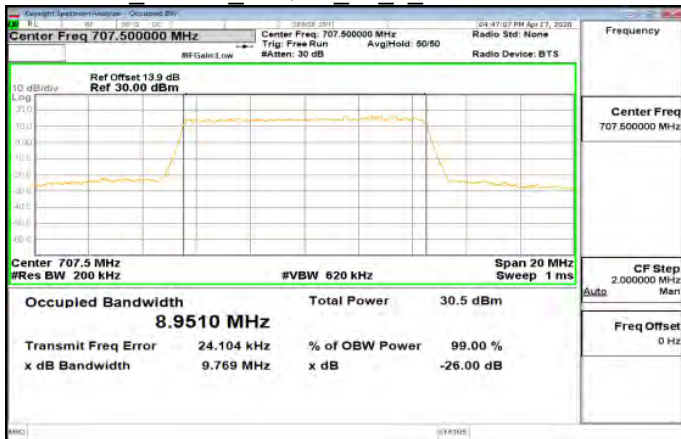
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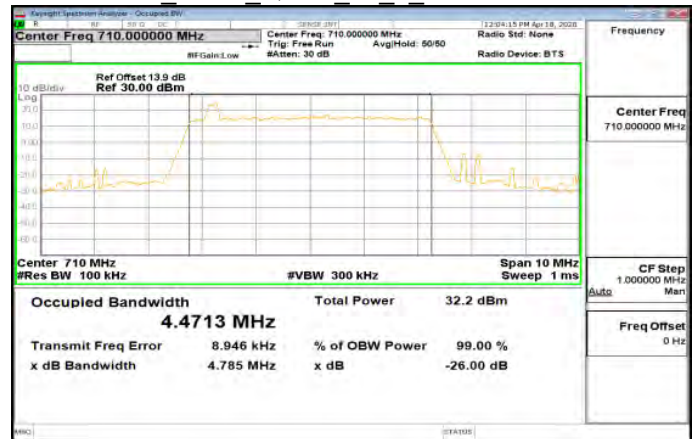
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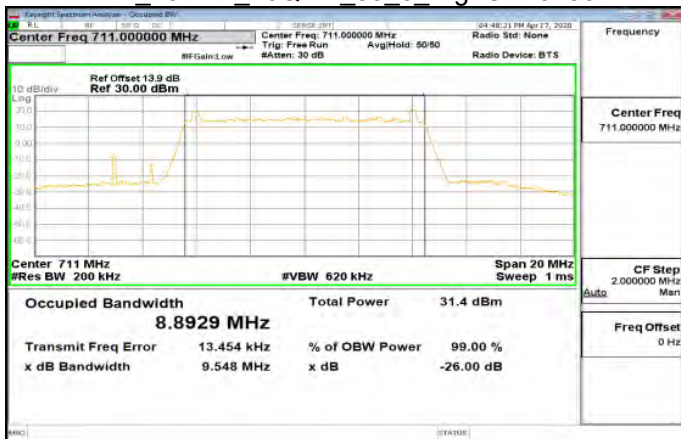
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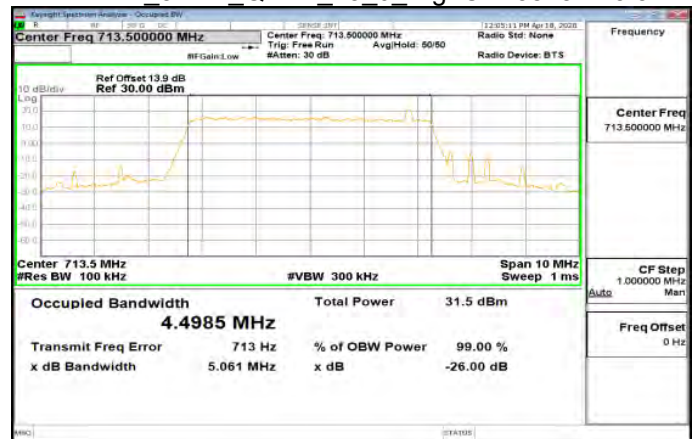
Band17 5MHz QPSK 25 0 MidCH23790-710



Band12 10MHz 16QAM 50 0 HighCH23130-711



Band17 5MHz QPSK 25 0 HighCH23825-713.5



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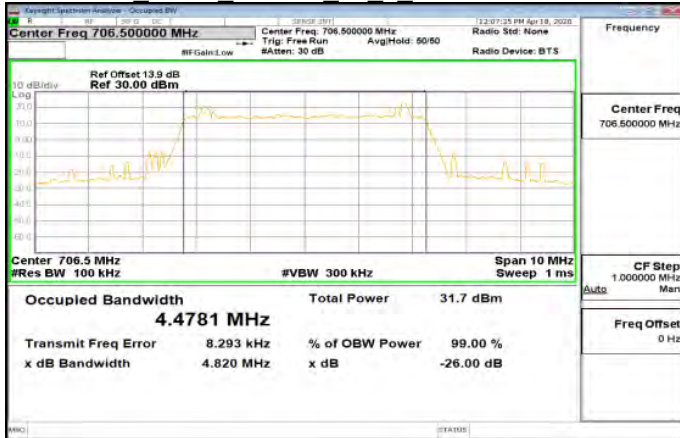
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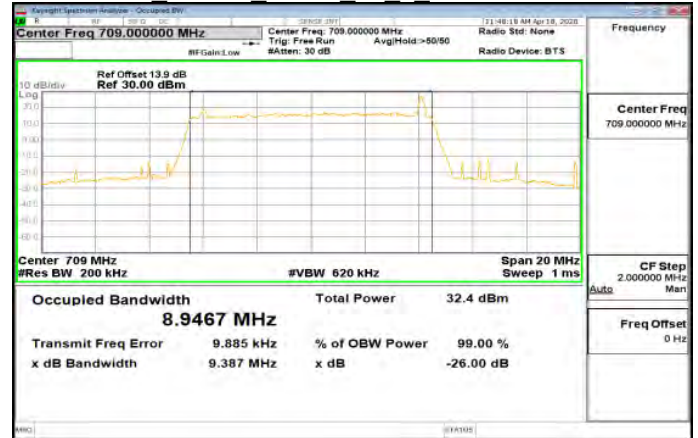
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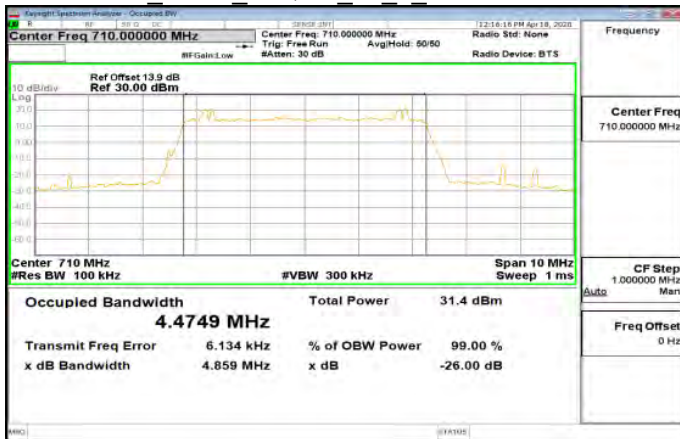
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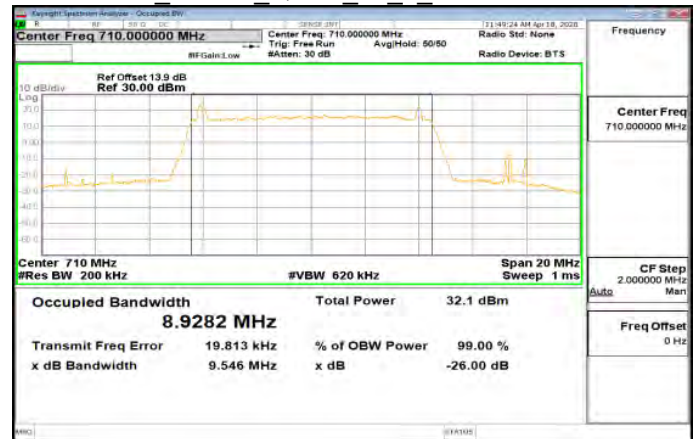
Band17 10MHz QPSK 50 0 LowCH23780-709



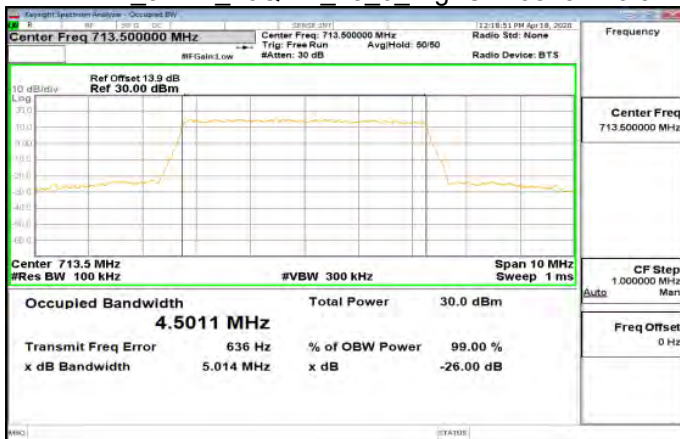
Band17 5MHz 16QAM 25 0 MidCH23790-710



Band17 10MHz QPSK 50 0 MidCH23790-710



Band17 5MHz 16QAM 25 0 HighCH23825-713.5



Band17 10MHz QPSK 50 0 HighCH23800-711



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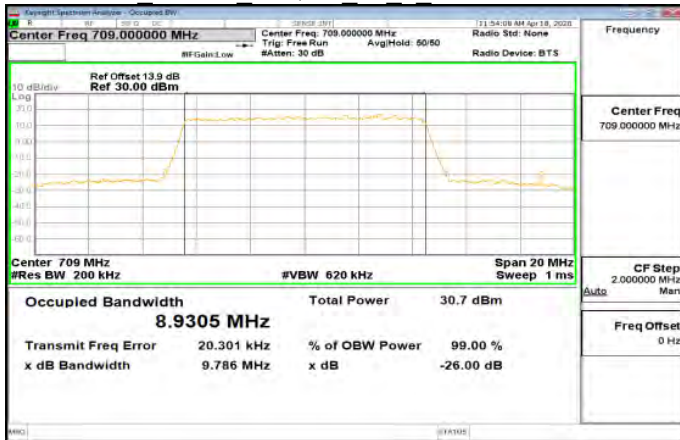
t (886-2) 2299-3279

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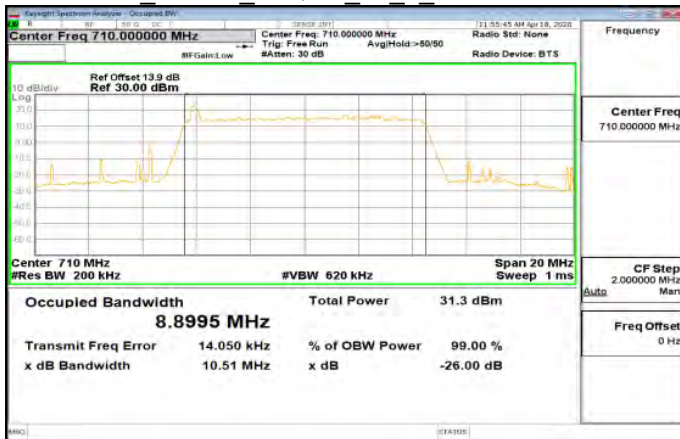
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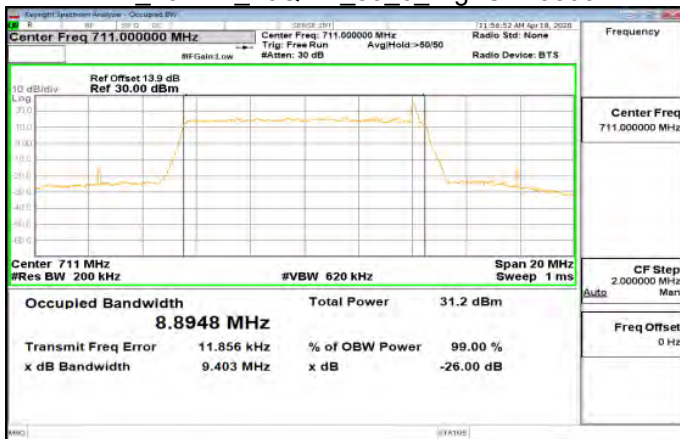
Band17 10MHz 16QAM 50 0 LowCH23780-709



Band17 10MHz 16QAM 50 0 MidCH23790-710



Band17 10MHz 16QAM 50 0 HighCH23800-711



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8 OUT OF BAND EMISSION AT ANTENNA TERMINALS

8.1 Standard Applicable

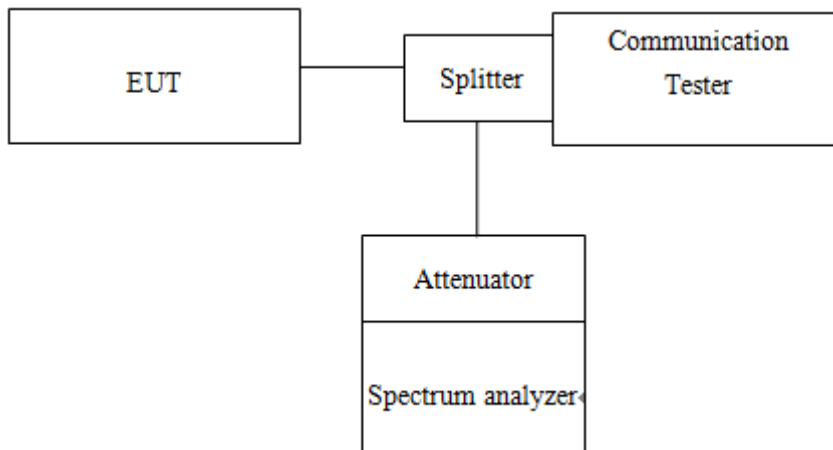
FCC §22.917(a), §24.238(a)

Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

FCC §27.53(g)

Compliance for operations in the 600 MHz, 698-746 MHz, 746-758 MHz and the 776-788 MHz band with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

8.2 Test SET-UP



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8.3 Measurement Procedure

8.3.1 Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

8.3.2 Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW \geq 1% EBW.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

8.4 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54200716	Apr. 1st, 2020	Mar. 31st, 2021
Radio Communication Analyser	Anritsu	MT8820C	6200995019	Apr. 1st, 2020	Mar. 31st, 2021
DC Power Supply	Agilent	E3640A	MY40000811	Dec. 23th, 2019	Dec. 22nd, 2020
Radio Communication Analyser	Anritsu	MT8815B	6200711454	Apr. 1st, 2020	Mar. 31st, 2021
Attenuator	Mini-Circuit	BW-S10W2 +	2	Jan. 2nd, 2020	Jan. 1st, 2021
Splitter	RF-LAMBAD	RFLT2W1G 18G	11-JSPF412-018	Jan. 2nd, 2020	Jan. 1st, 2021
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	Jan. 2nd, 2020	Jan. 1st, 2021

8.5 Measurement Result:

Refer to next pages.

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GSM 850MHz LowCH128-824.2



GPRS 850MHz HighCH251-848.8



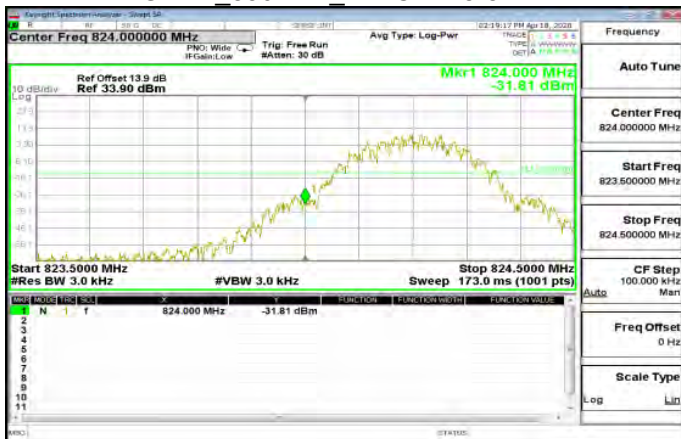
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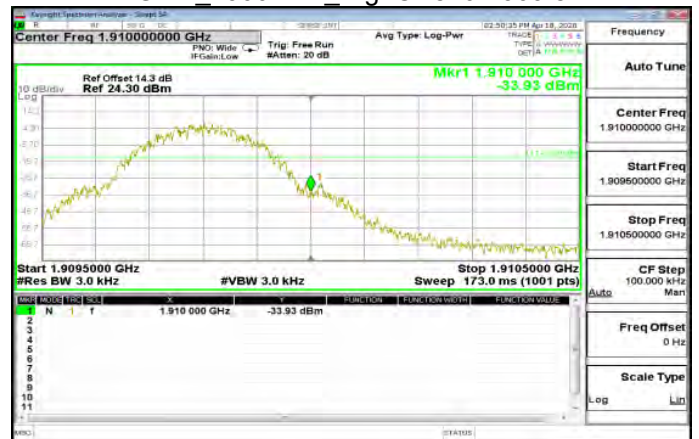
GSM 1900MHz LowCH512-1850.2



GPRS 850MHz LowCH128-824.2



GSM 1900MHz HighCH810-1909.8



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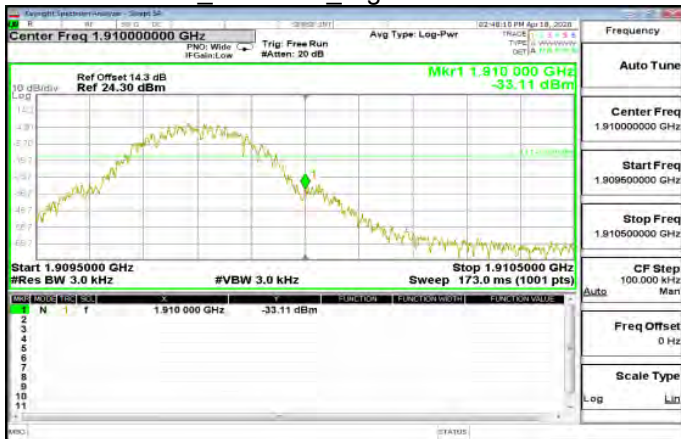
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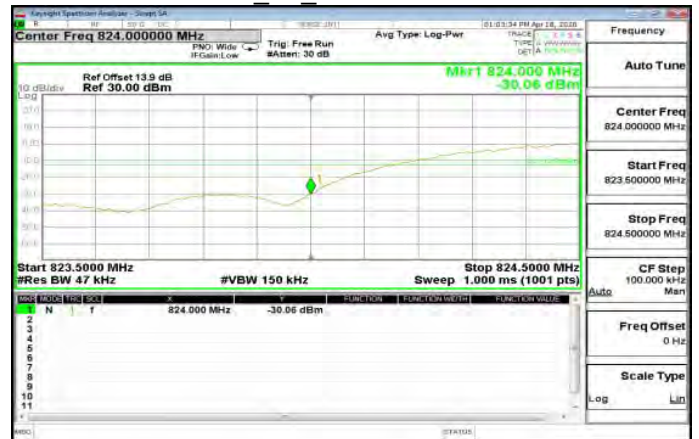
WCDMA B5 HighCH4233-846.6



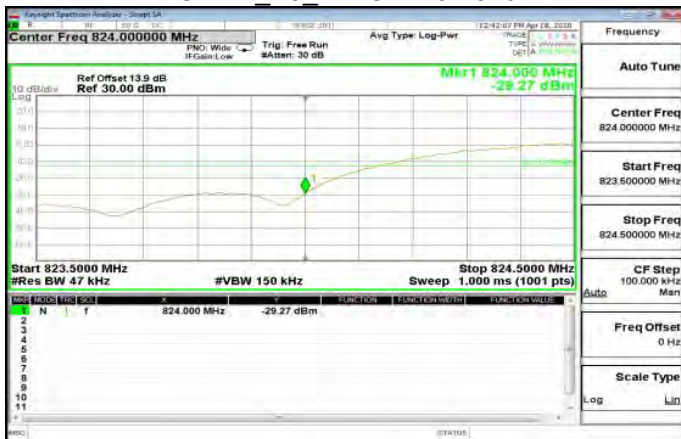
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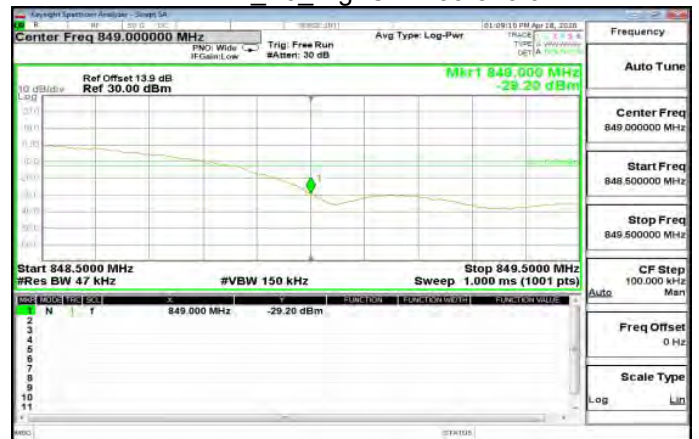
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WCDMA B5 LowCH4132-826.4



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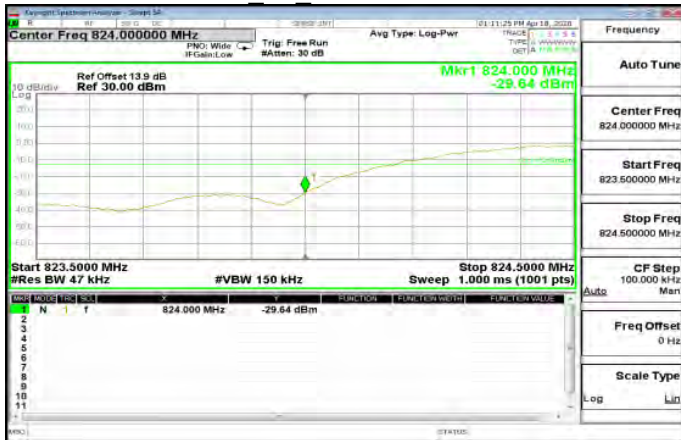


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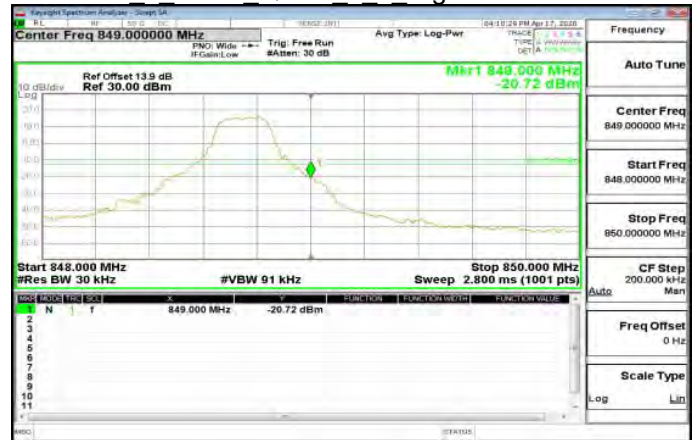
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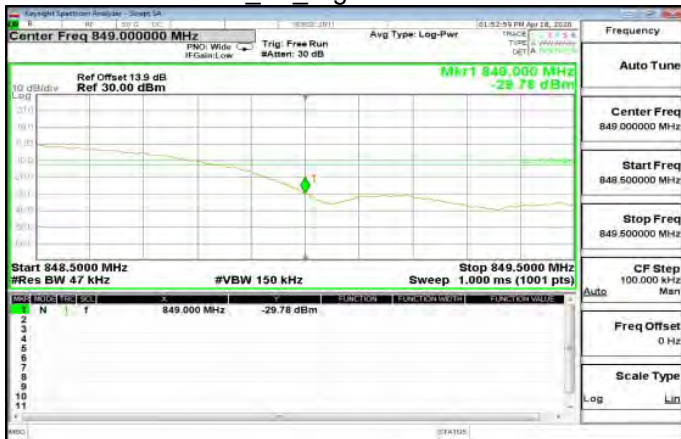
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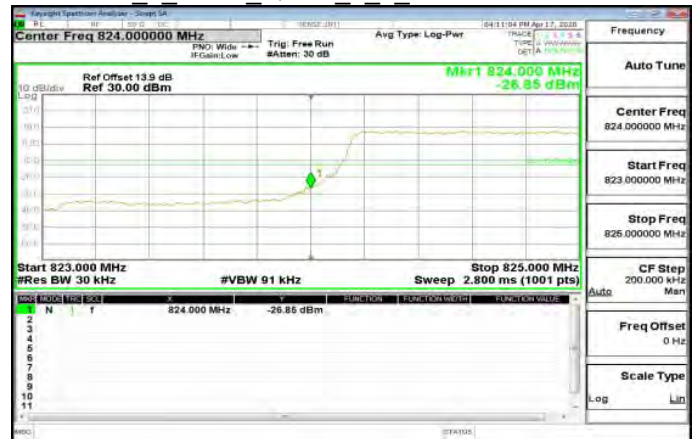
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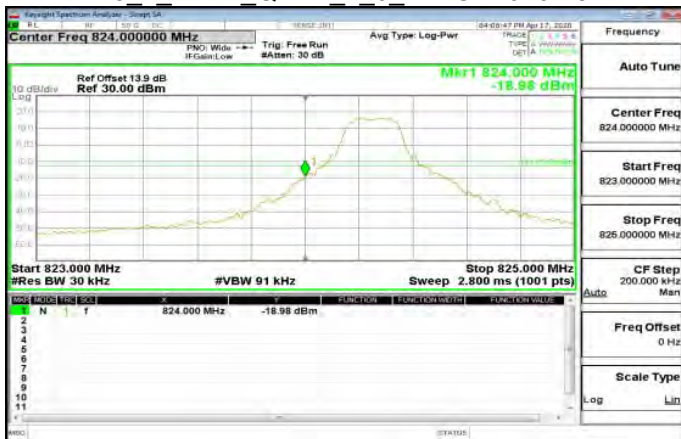
HSUPA B5 HighCH4233-846.6



Band5 1 4MHz QPSK 6 0 LowCH20407-824.7



Band5 1 4MHz QPSK 1 0 LowCH20407-824.7



Band5 1 4MHz QPSK 6 0 HighCH20643-848.3



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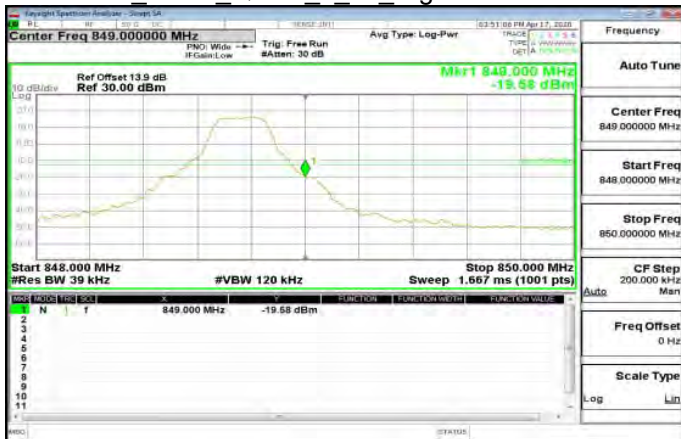
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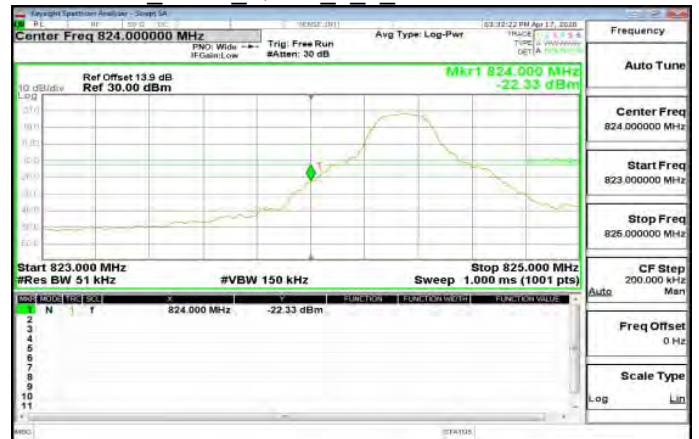
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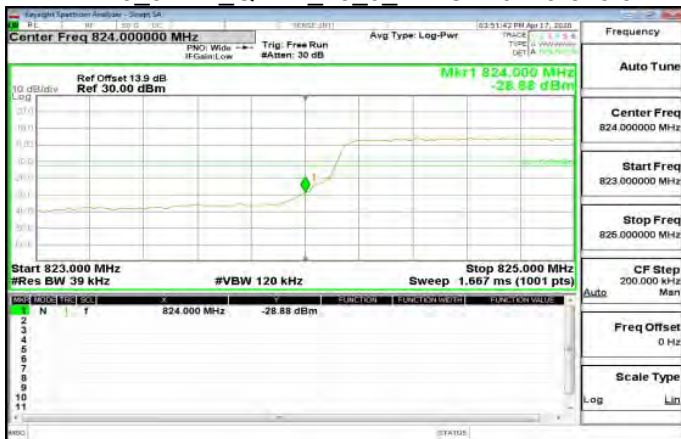
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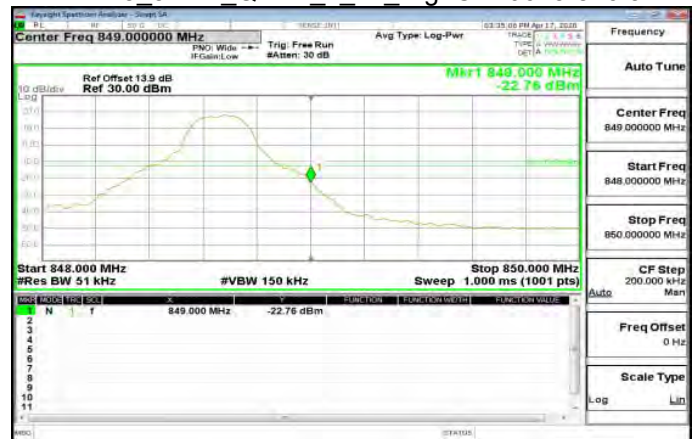
Band5 5MHz QPSK 1 0 LowCH20425-826.5



Band5 3MHz QPSK 15 0 LowCH20415-825.5



Band5 5MHz QPSK 1 24 HighCH20625-846.5

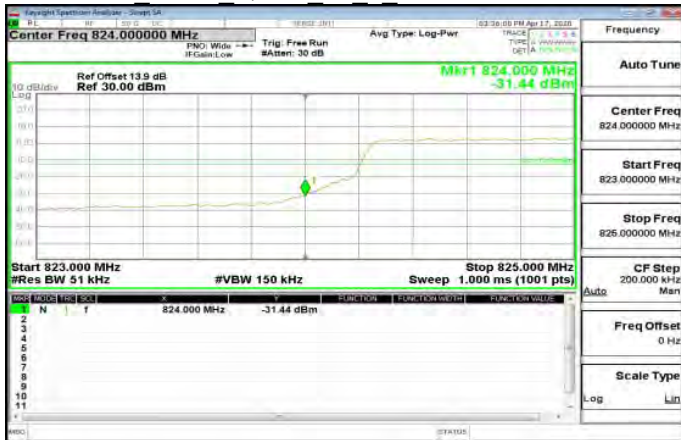


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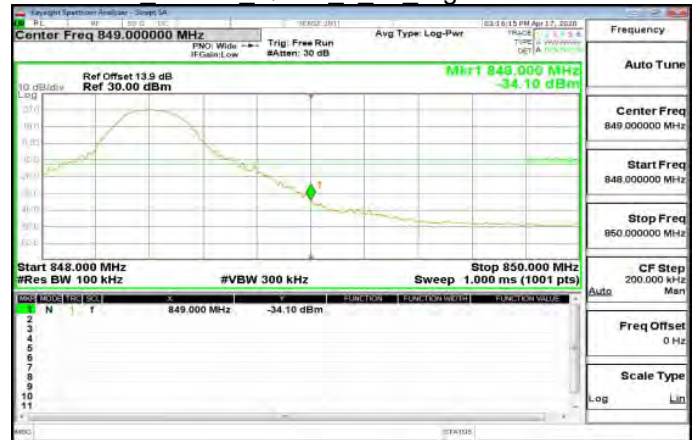
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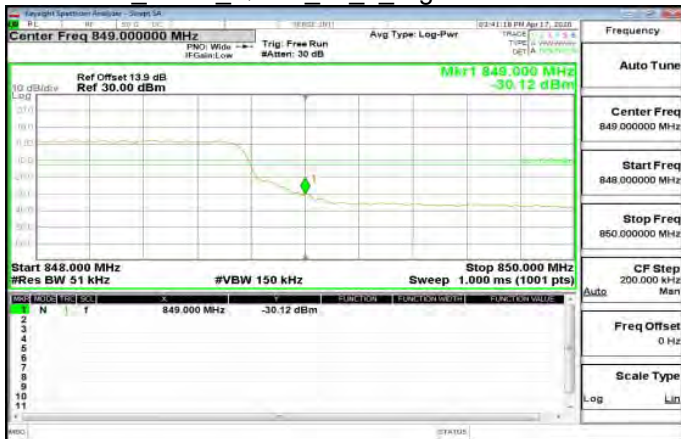
Band5 5MHz QPSK 25 0 LowCH20425-826.5



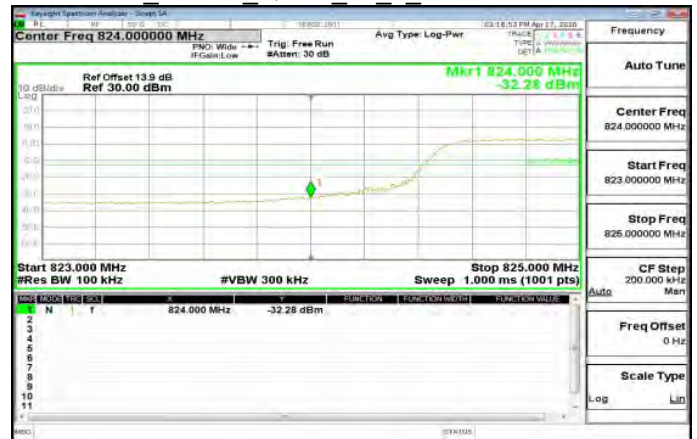
Band5 10MHz QPSK 1 49 HighCH20600-844



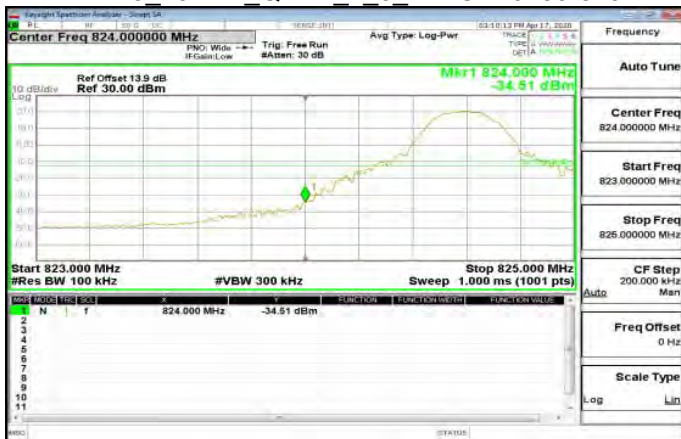
Band5 5MHz QPSK 25 0 HighCH20625-846.5



Band5 10MHz QPSK 50 0 LowCH20450-829



Band5 10MHz QPSK 1 0 LowCH20450-829



Band5 10MHz QPSK 50 0 HighCH20600-844



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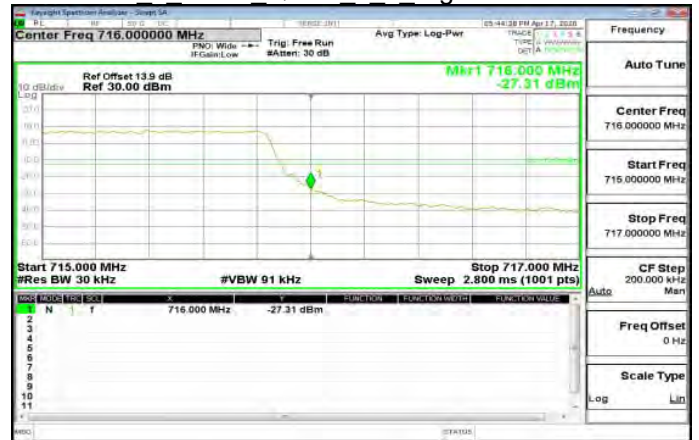
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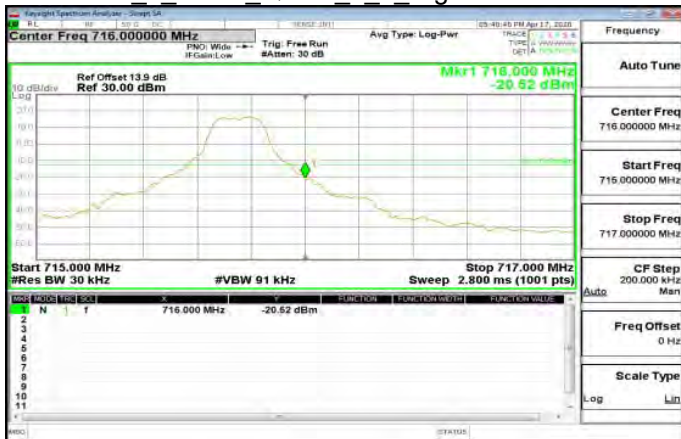
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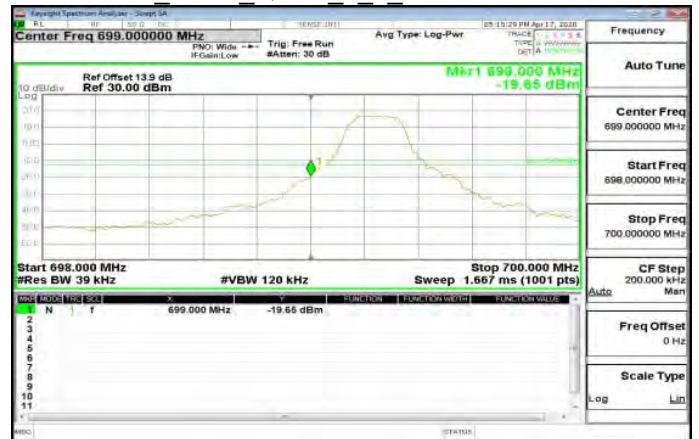
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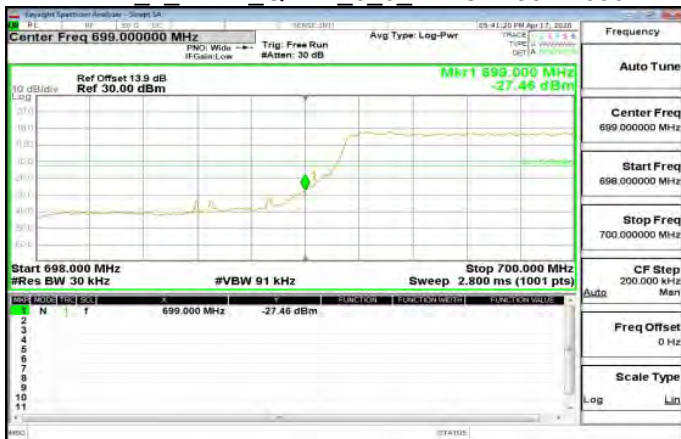
Band12 1 4MHz QPSK 1 5 HighCH23173-715.3



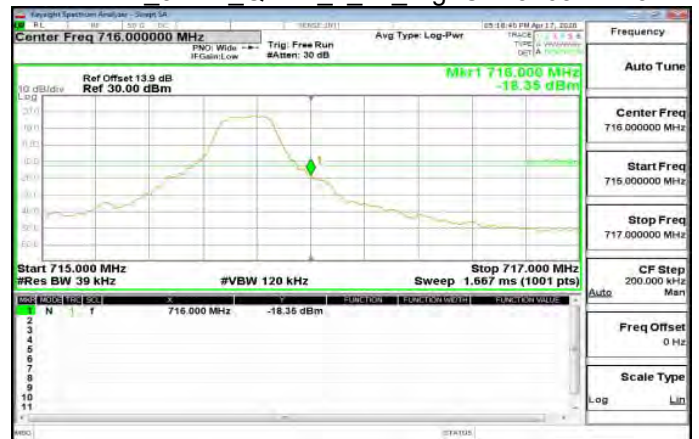
Band12 3MHz QPSK 1 0 LowCH23025-700.5



Band12 1 4MHz QPSK 6 0 LowCH23017-699.7



Band12 3MHz QPSK 1 14 HighCH23165-714.5



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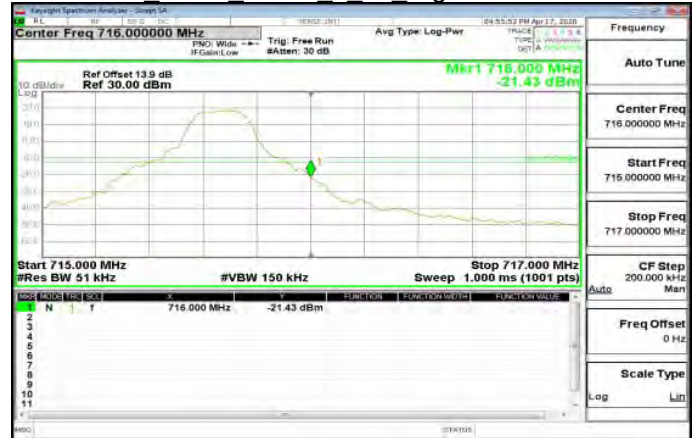
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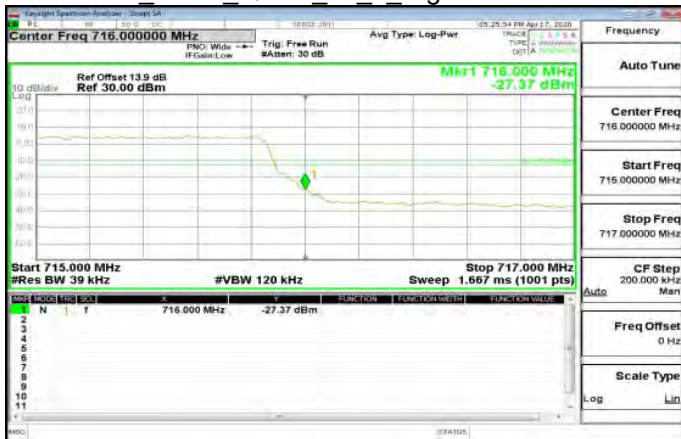
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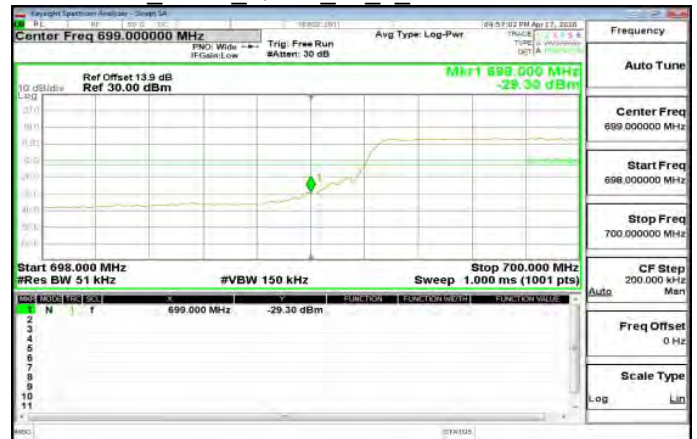
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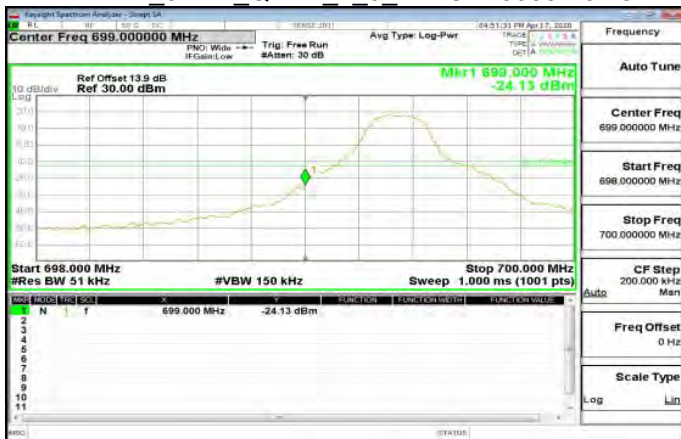
Band12 3MHz QPSK 15 0 HighCH23165-714.5



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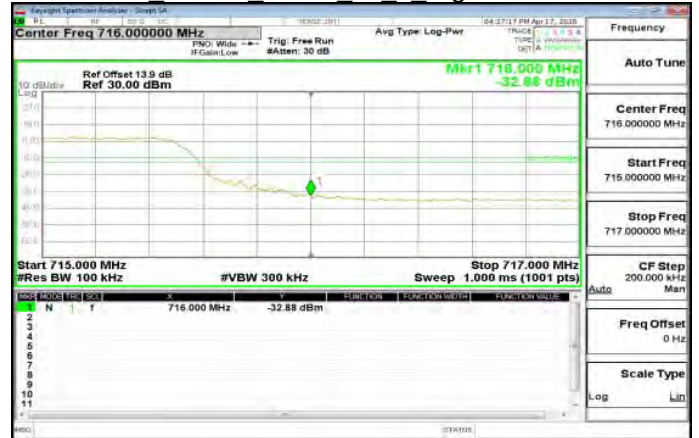
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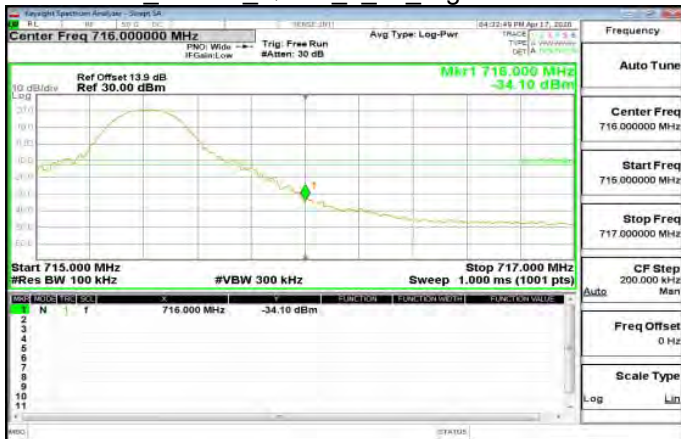
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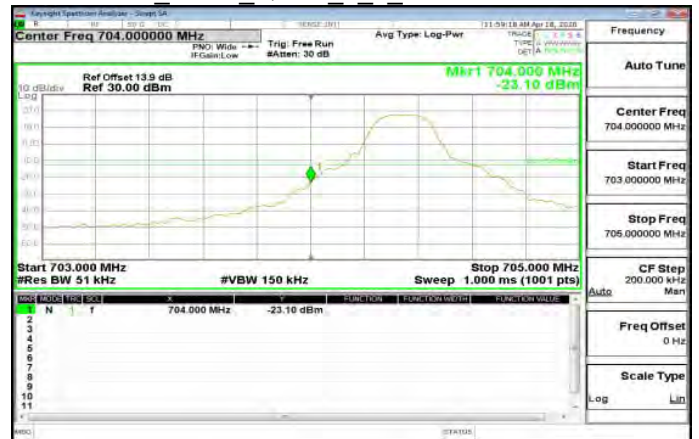
Band12 10MHz QPSK 50 0 HighCH23130-711



Band12 10MHz QPSK 1 49 HighCH23130-711



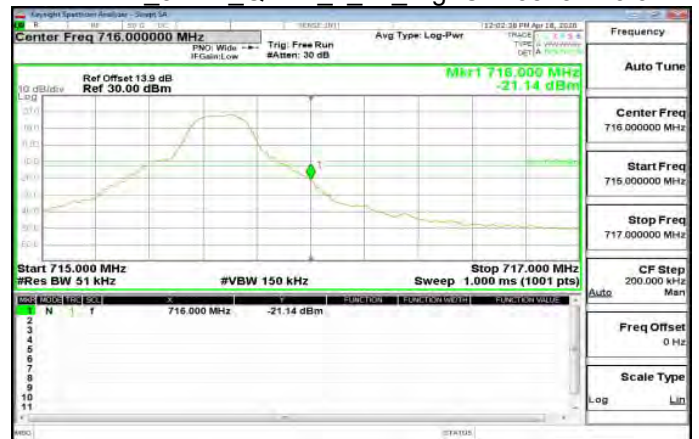
Band17 5MHz QPSK 1 0 LowCH23755-706.5



Band12 10MHz QPSK 50 0 LowCH23060-704



Band17 5MHz QPSK 1 24 HighCH23825-713.5



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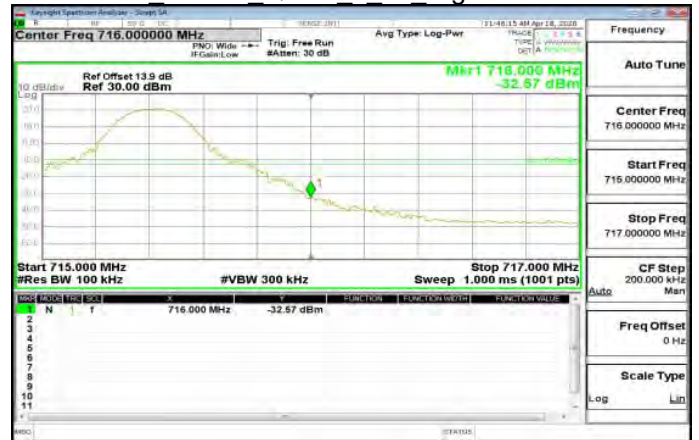
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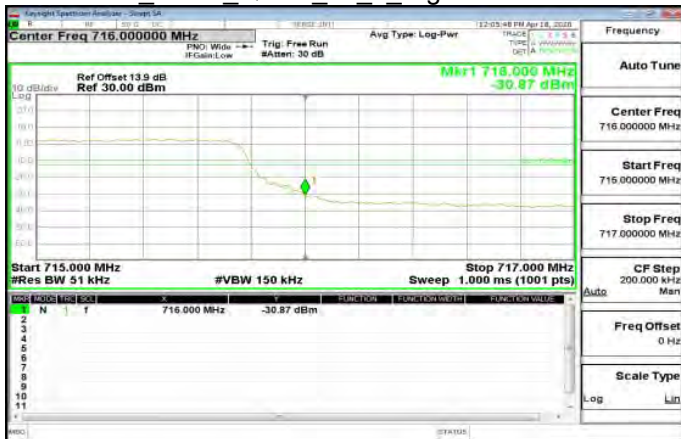
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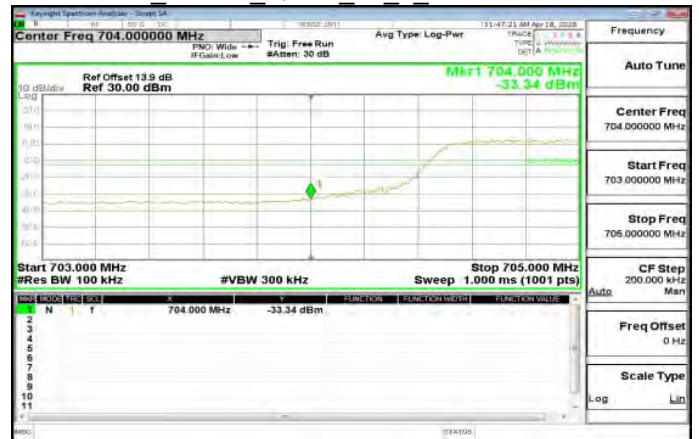
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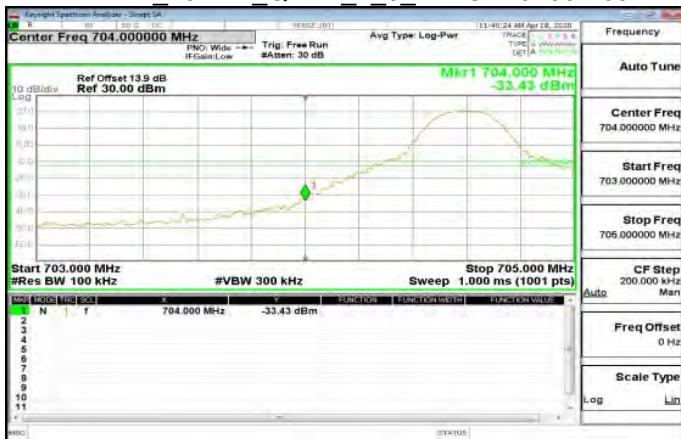
Band17 5MHz QPSK 25 0 HighCH23825-713.5



Band17 10MHz QPSK 50 0 LowCH23780-709



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Band17 10MHz QPSK 50 0 HighCH23800-711



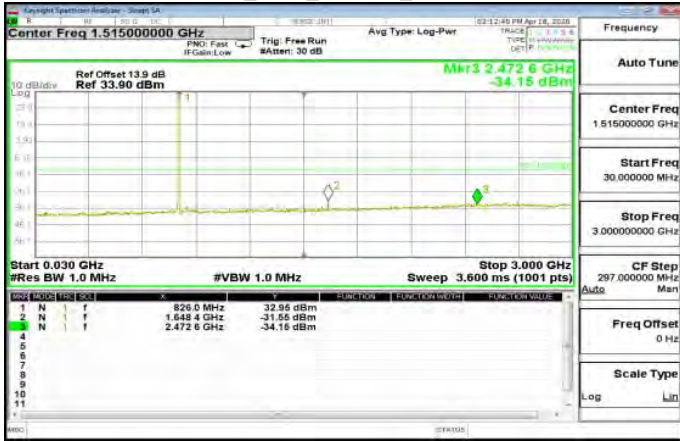
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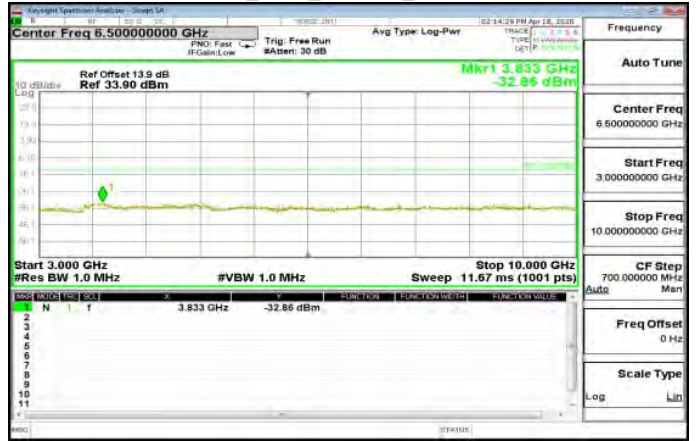
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Out of Band Emission

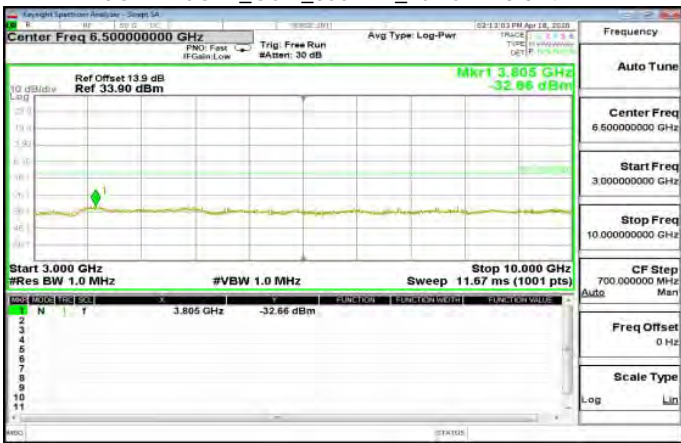
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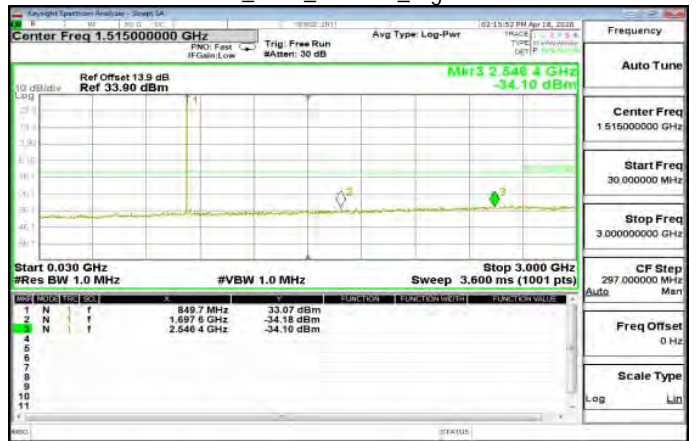
3GHz~10GHz_GSM_850MHz_MidCH190-836.6



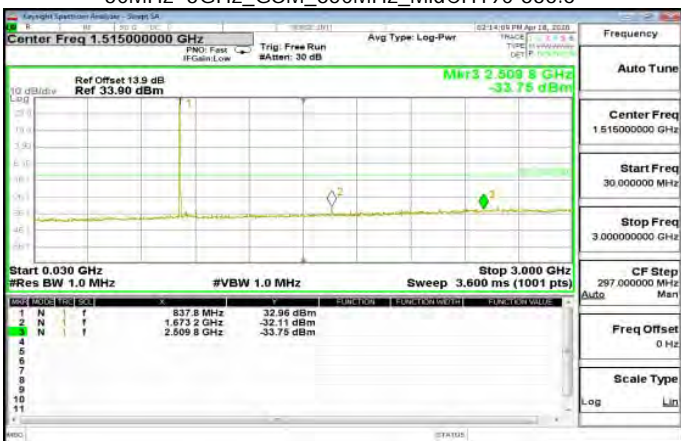
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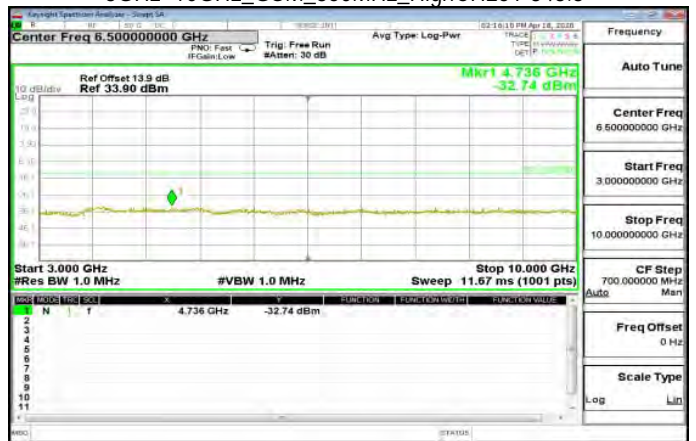
30MHz~3GHz_GSM_850MHz_HighCH251-848.8



30MHz~3GHz_GSM_850MHz_MidCH190-836.6



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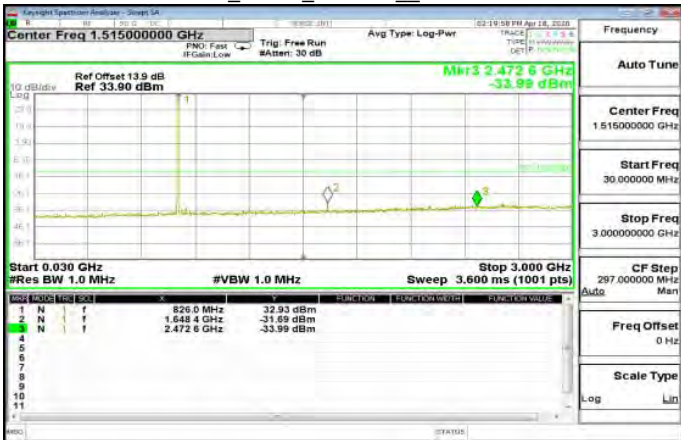


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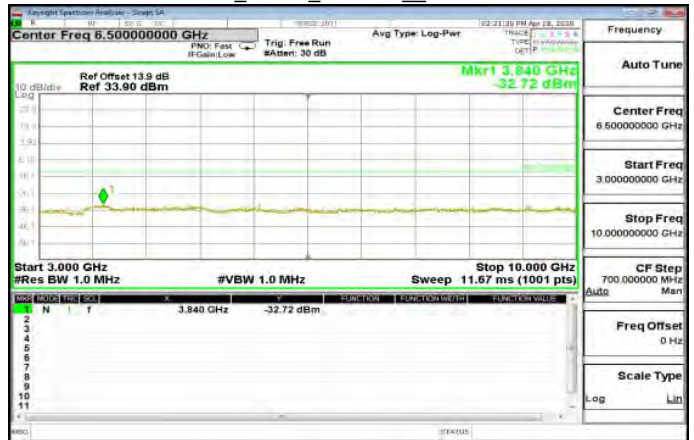
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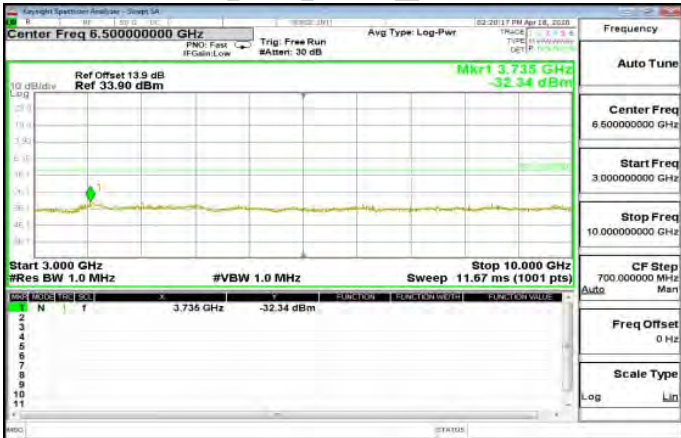
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3GHz-10GHz_GPRS_850MHz_MidCH190-836.6



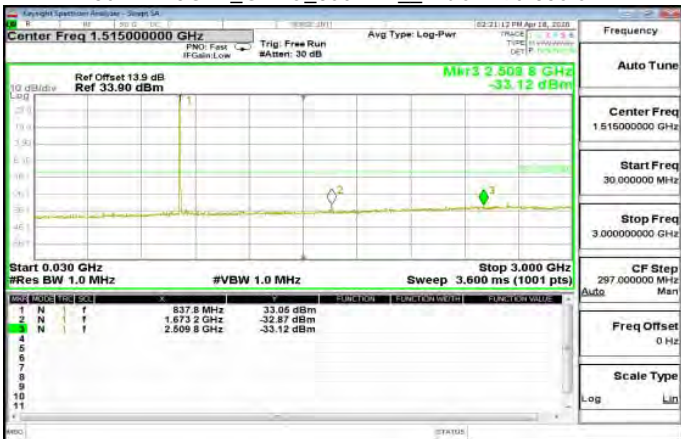
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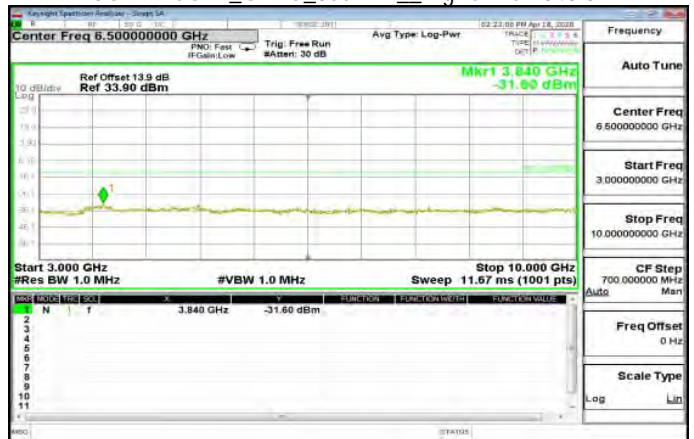
30MHz-3GHz_GPRS_850MHz_HighCH251-848.8



30MHz-3GHz_GPRS_850MHz_MidCH190-836.6



3GHz-10GHz_GPRS_850MHz_HighCH251-848.8



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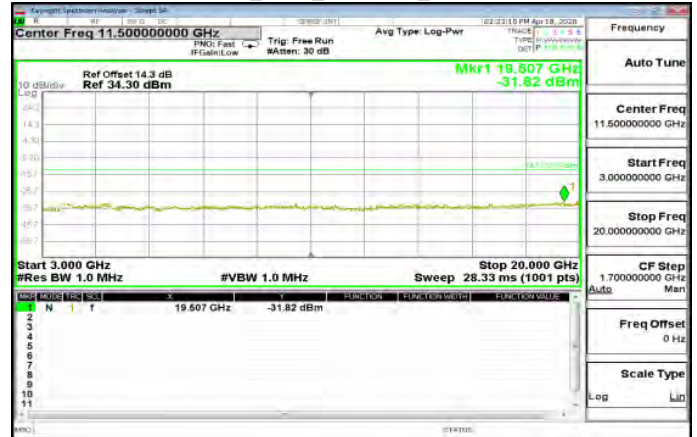
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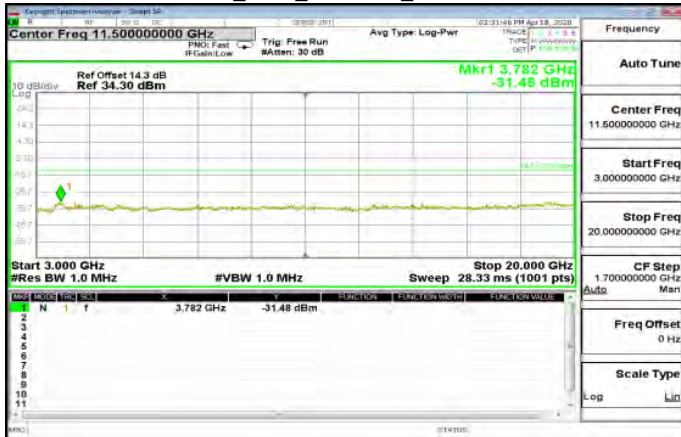
30MHz~3GHz_GSM_1900MHz_LowCH512-1850.2



3GHz~10GHz_GSM_1900MHz_MidCH661-1880



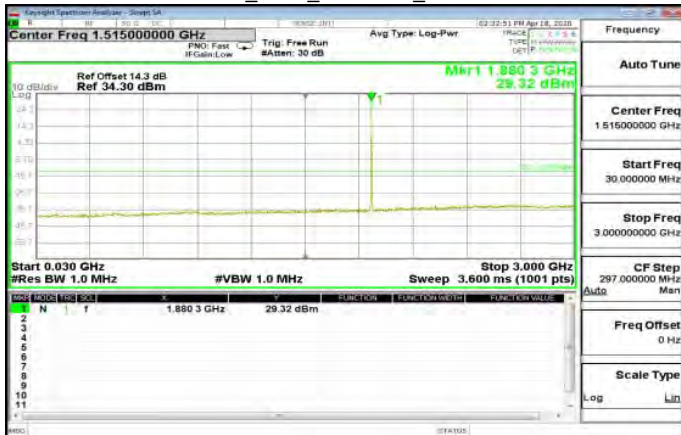
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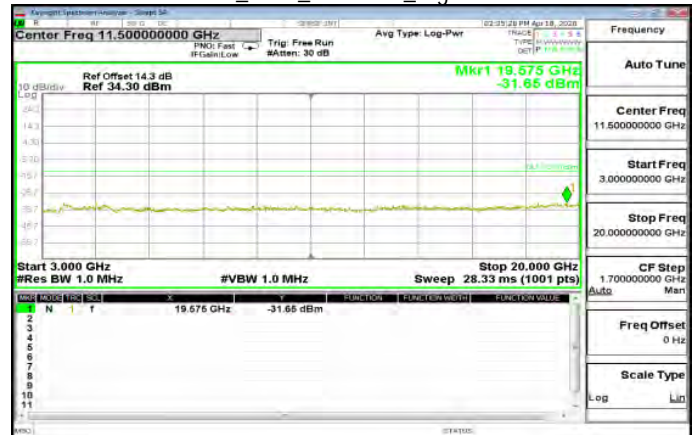
30MHz~3GHz_GSM_1900MHz_HighCH810-1909.8



30MHz~3GHz_GSM_1900MHz_MidCH661-1880



3GHz~10GHz_GSM_1900MHz_HighCH810-1909.8



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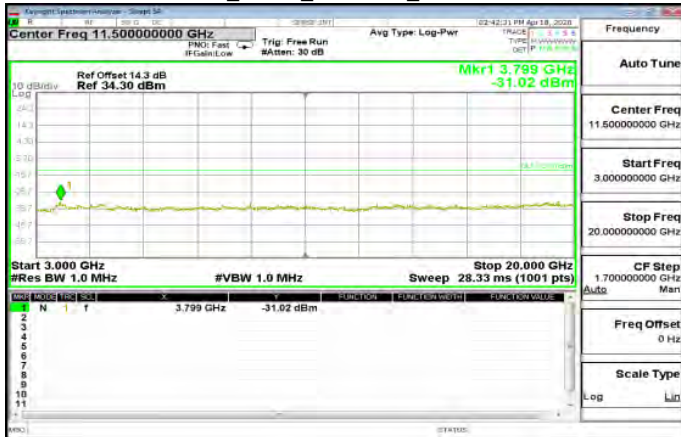
30MHz~3GHz_GPRS_1900MHz_LowCH512-1850.2



3GHz~10GHz_GPRS_1900MHz_MidCH661-1880



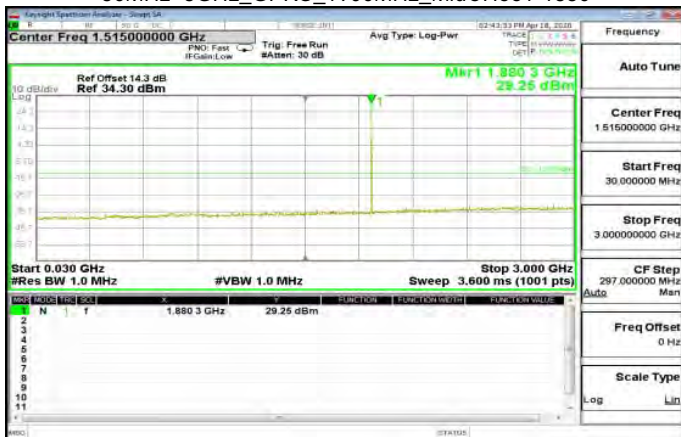
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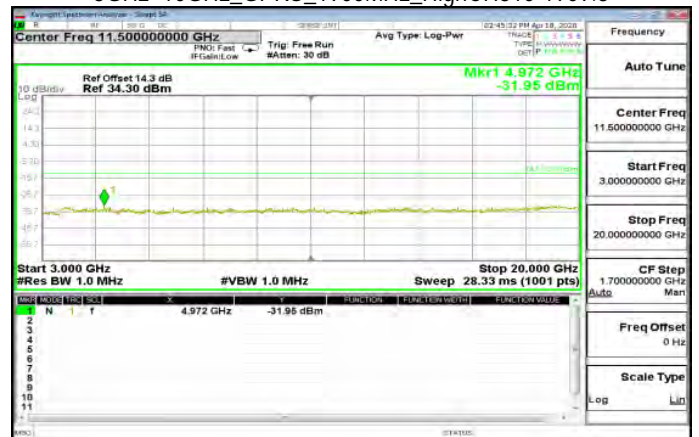
30MHz~3GHz_GPRS_1900MHz_HighCH810-1909.8



30MHz~3GHz_GPRS_1900MHz_MidCH661-1880



3GHz~10GHz_GPRS_1900MHz_HighCH810-1909.8

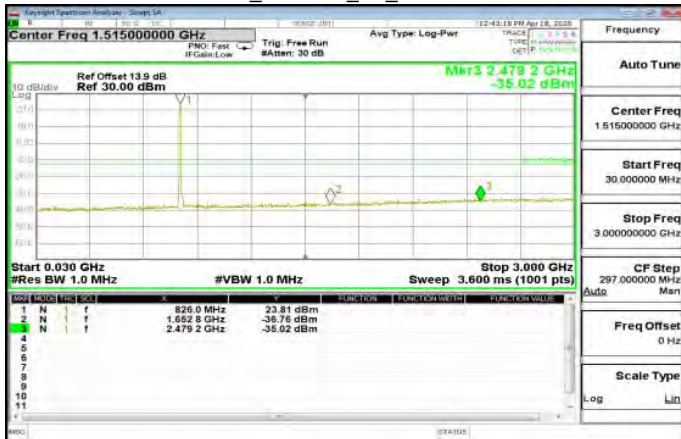


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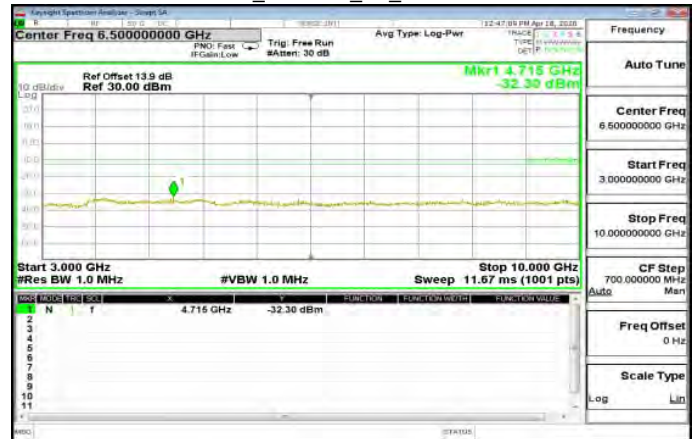
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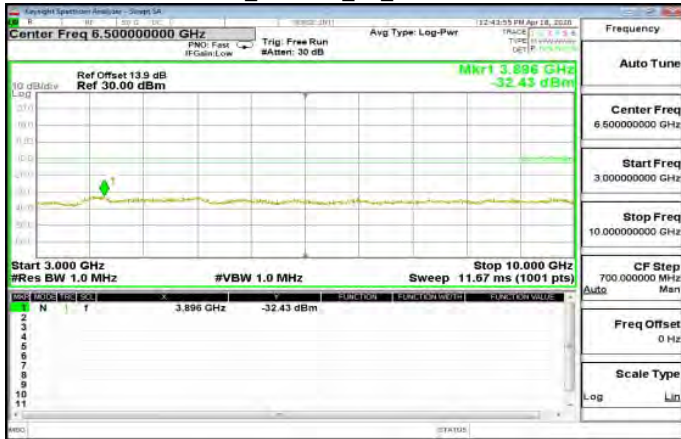
30MHz~3GHz_WCDMA_B5_LowCH4132-826.4



3GHz~10GHz_WCDMA_B5_MidCH4183-836.6



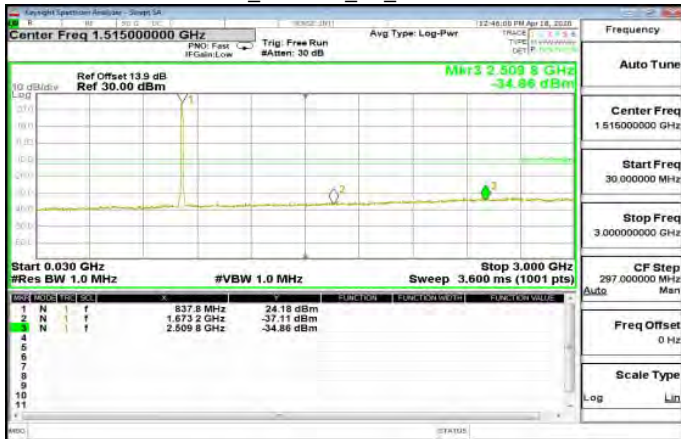
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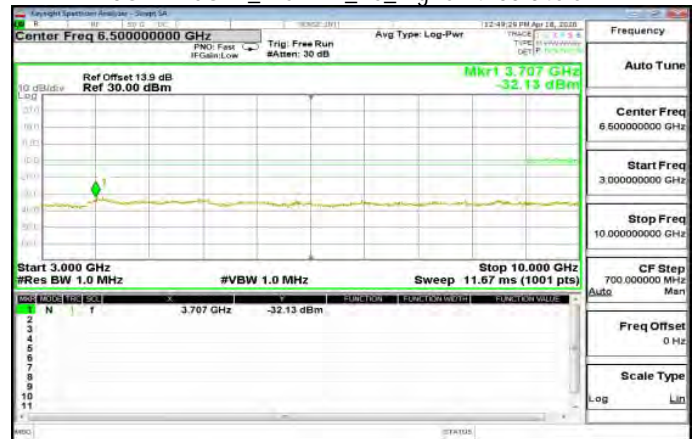
30MHz~3GHz_WCDMA_B5_HighCH4233-846.6



30MHz~3GHz_WCDMA_B5_MidCH4183-836.6



3GHz~10GHz_WCDMA_B5_HighCH4233-846.6

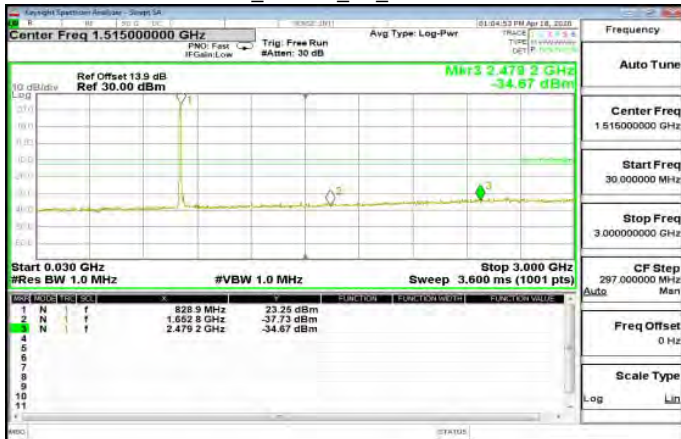


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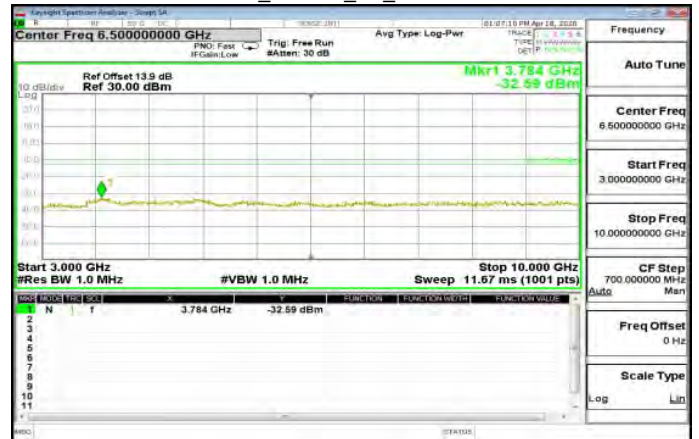
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30MHz~3GHz_HSDPA_B5_LowCH4132-826.4



3GHz~10GHz_HSDPA_B5_MidCH4183-836.6



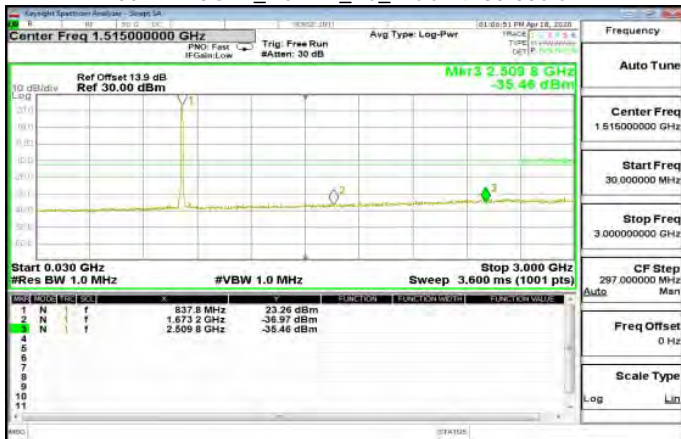
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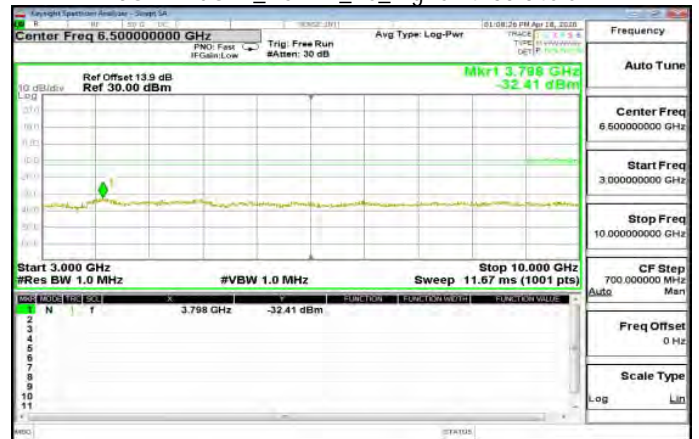
30MHz~3GHz_HSDPA_B5_HighCH4233-846.6



30MHz~3GHz_HSDPA_B5_MidCH4183-836.6



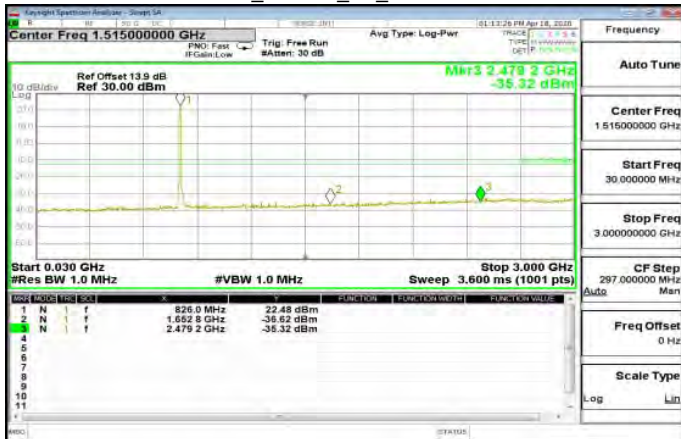
3GHz~10GHz_HSDPA_B5_HighCH4233-846.6



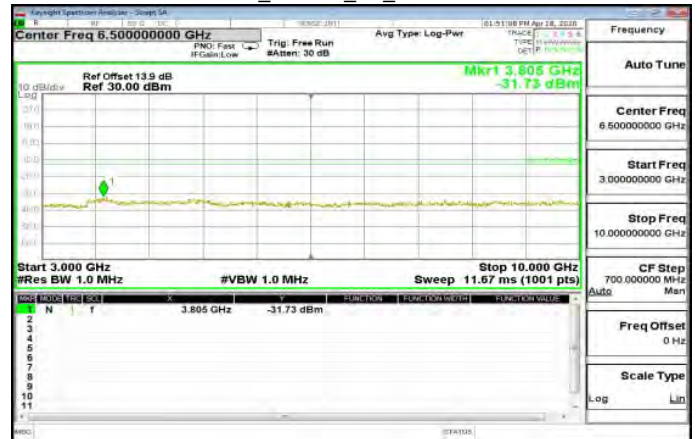
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30MHz~3GHz_HSUPA_B5_LowCH4132-826.4



3GHz~10GHz_HSUPA_B5_MidCH4183-836.6



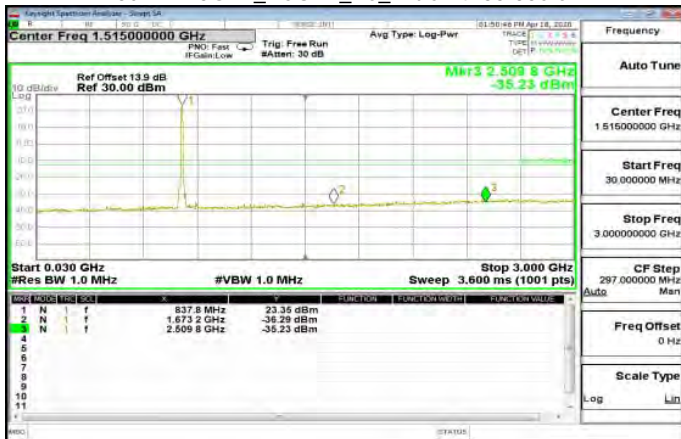
3GHz~10GHz_HSUPA_B5_LowCH4132-826.4



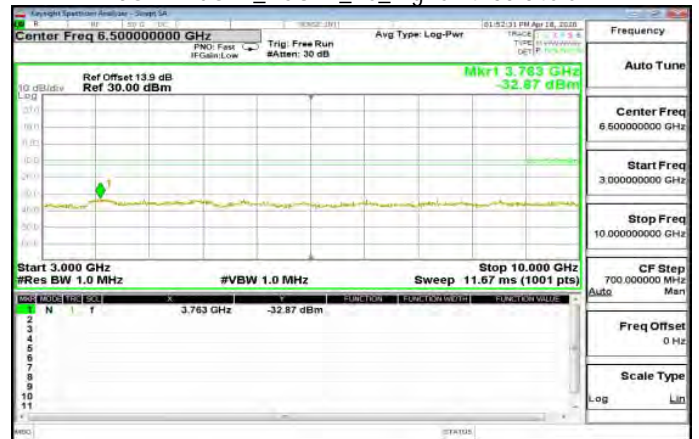
30MHz~3GHz_HSUPA_B5_HighCH4233-846.6



30MHz~3GHz_HSUPA_B5_MidCH4183-836.6



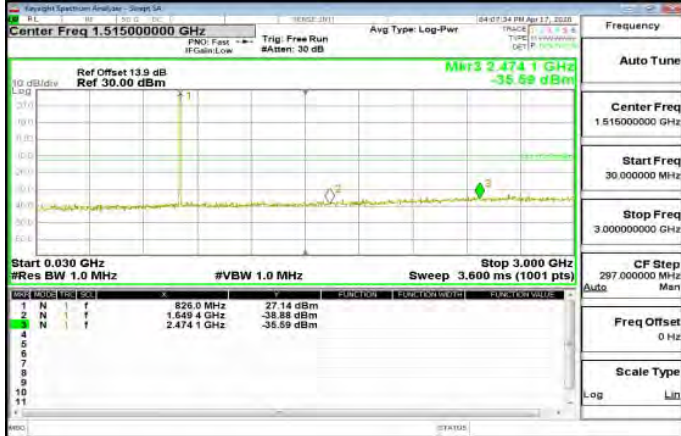
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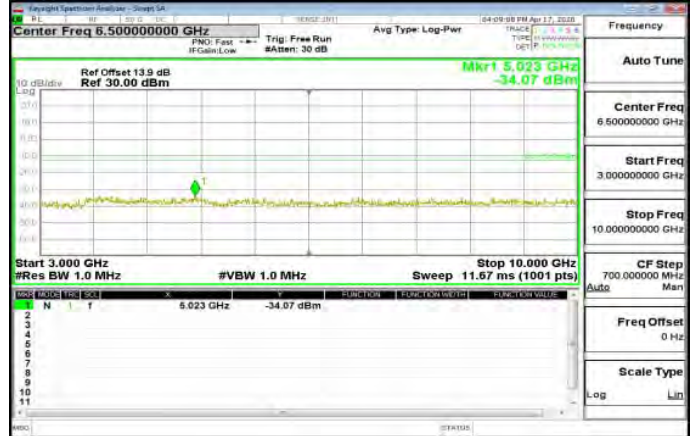
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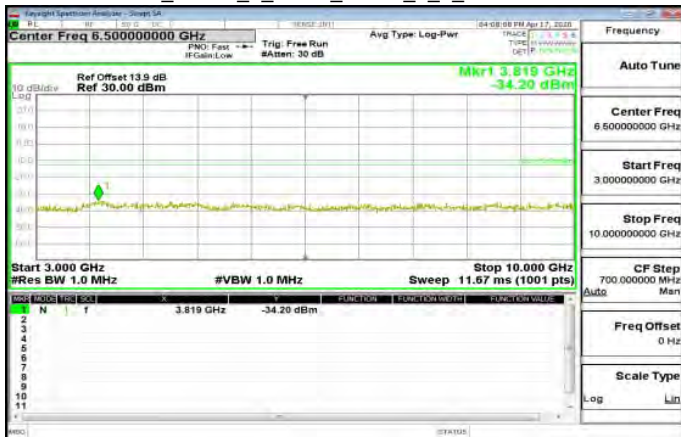
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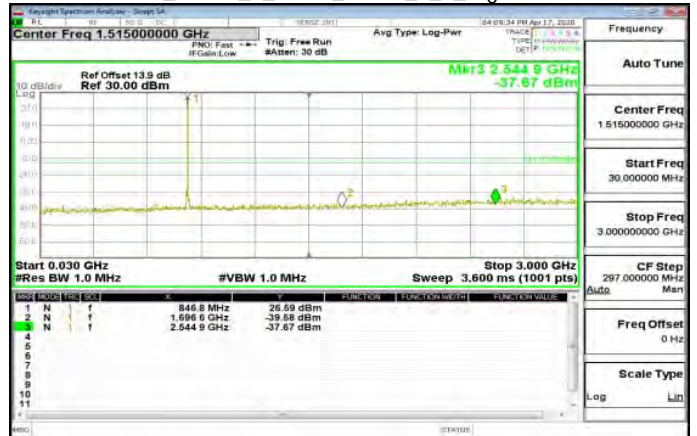
3GHz-10GHz_Band5_1_4MHz_QPSK_1_0_MidCH20525-836.5



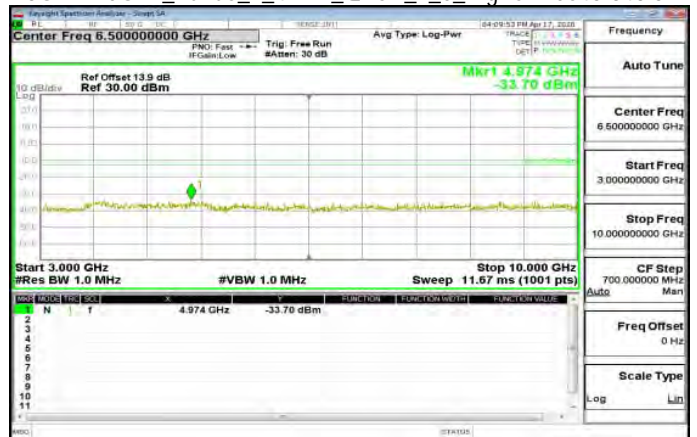
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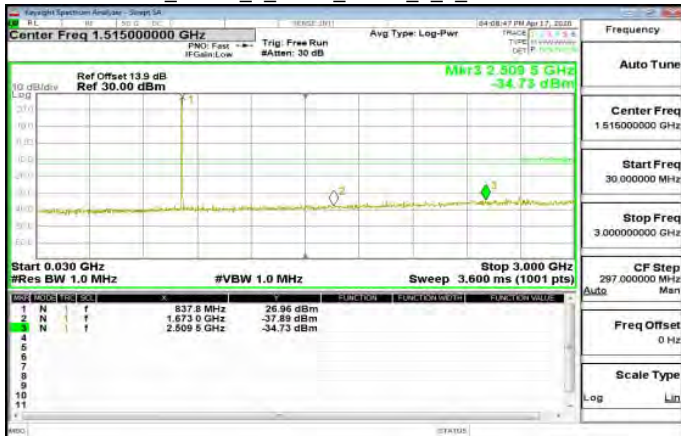
30MHz-3GHz_Band5_1_4MHz_QPSK_1_0_HighCH20643-848.3



3GHz-10GHz_Band5_1_4MHz_QPSK_1_0_HighCH20643-848.3



30MHz-3GHz_Band5_1_4MHz_QPSK_1_0_MidCH20525-836.5



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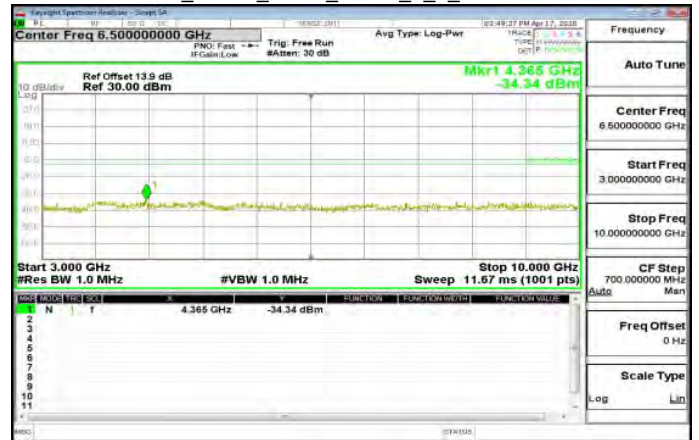
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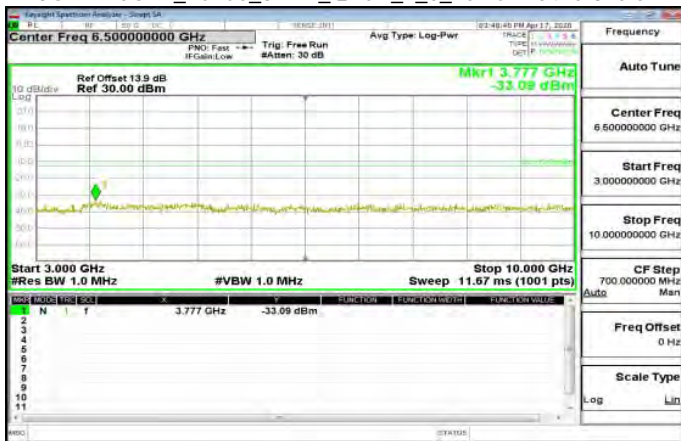
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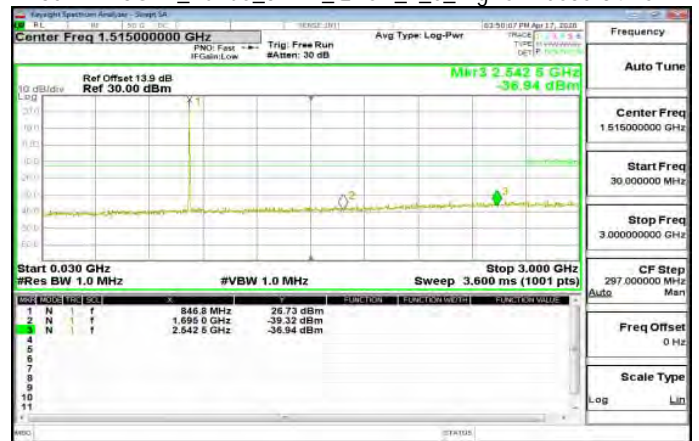
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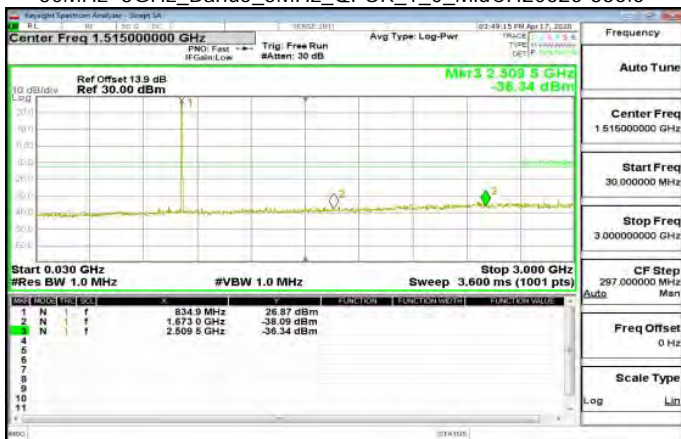
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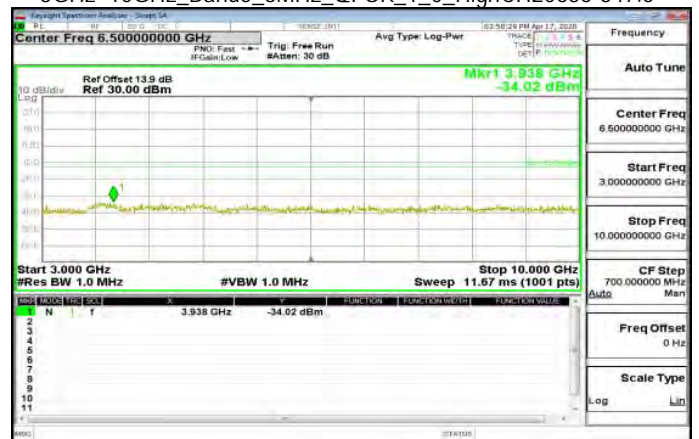
30MHz~3GHz_Band5_3MHz_QPSK_1_0_HighCH20635-847.5



30MHz~3GHz_Band5_3MHz_QPSK_1_0_MidCH20525-836.5



3GHz~10GHz_Band5_3MHz_QPSK_1_0_HighCH20635-847.5

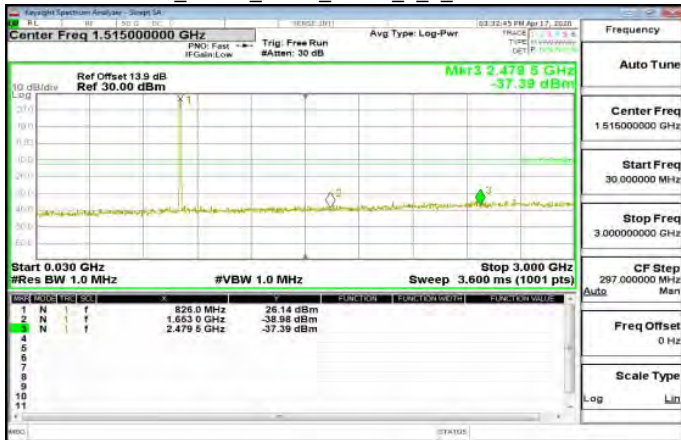


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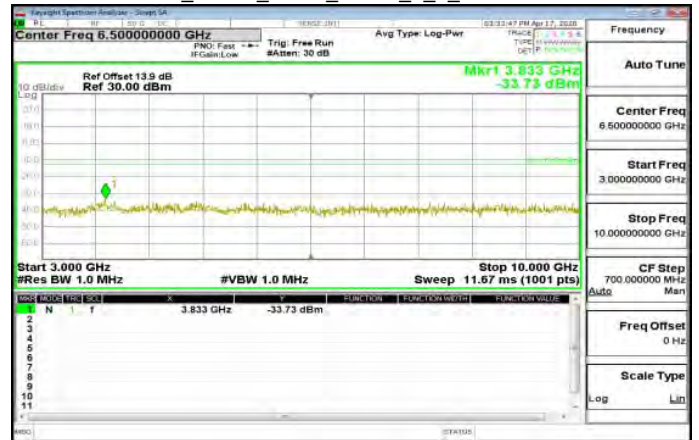
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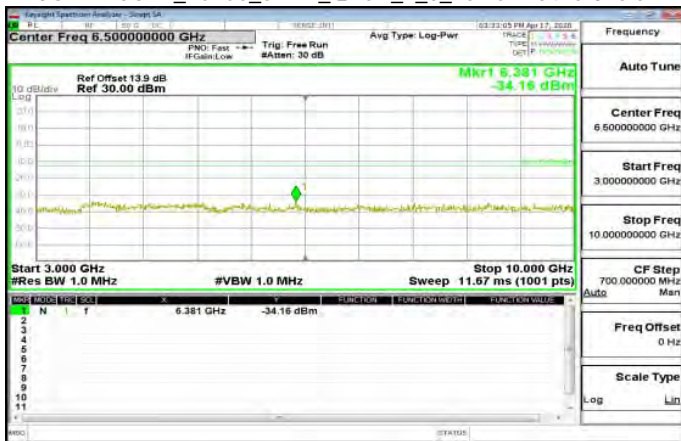
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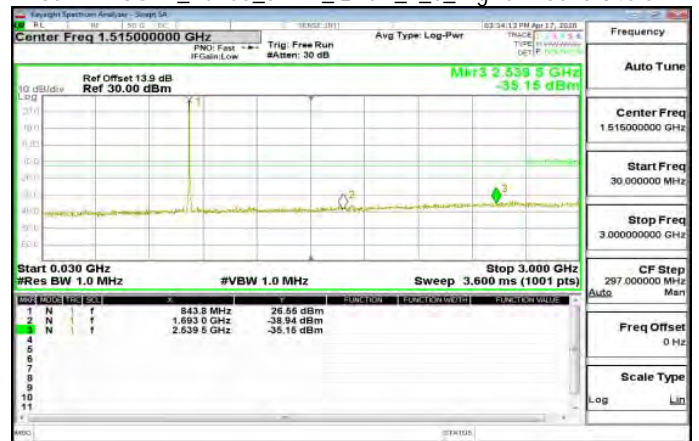
3GHz~10GHz_Band5_5MHz_QPSK_1_0_MidCH20525-836.5



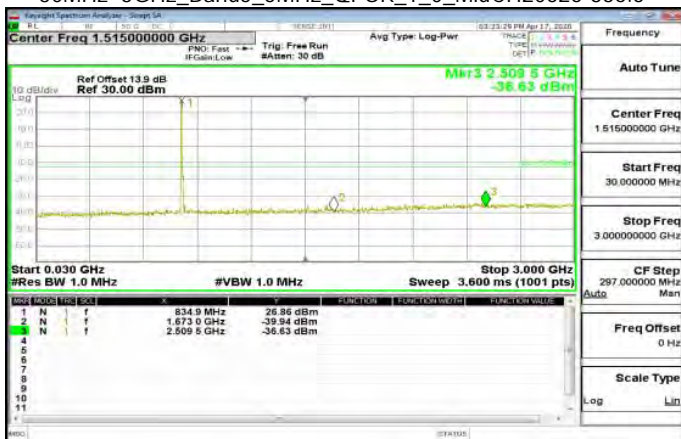
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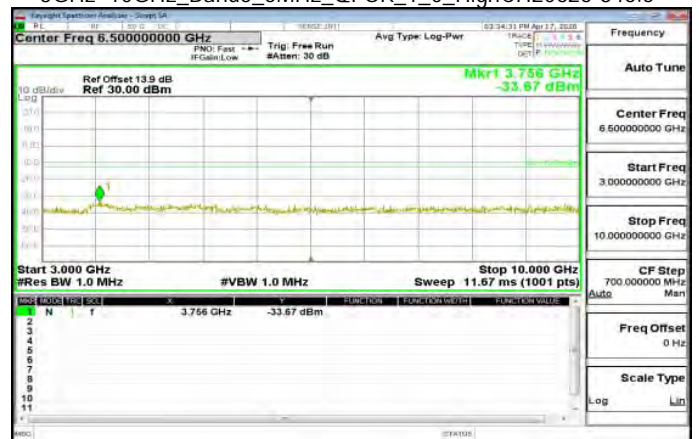
30MHz~3GHz_Band5_5MHz_QPSK_1_0_HighCH20625-846.5



30MHz~3GHz_Band5_5MHz_QPSK_1_0_MidCH20525-836.5



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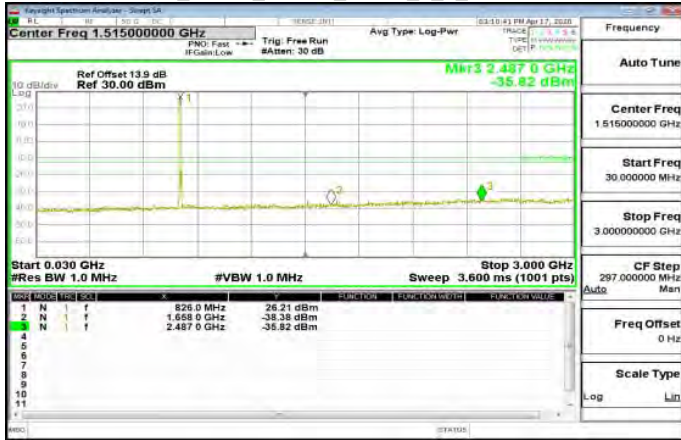


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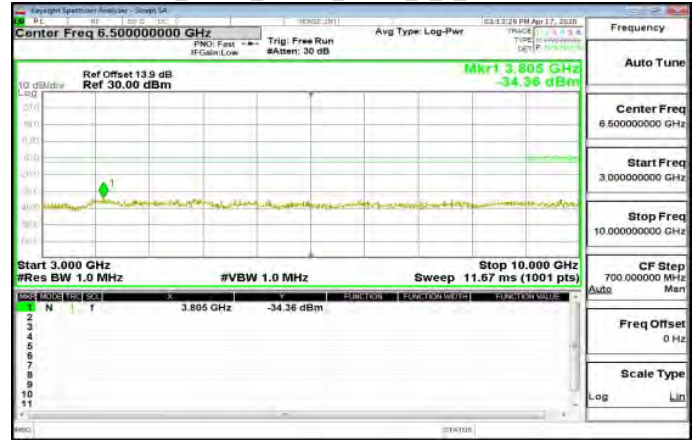
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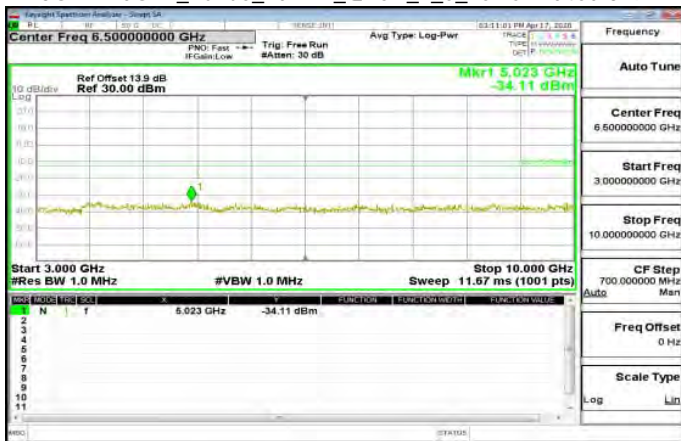
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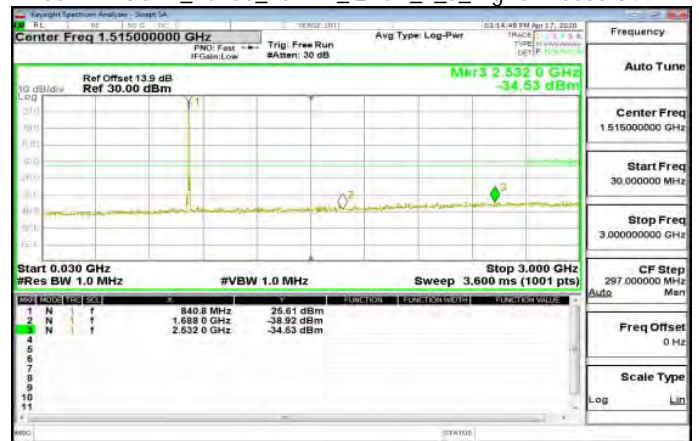
3GHz~10GHz_Band5_10MHz_QPSK_1_0_MidCH20525-836.5



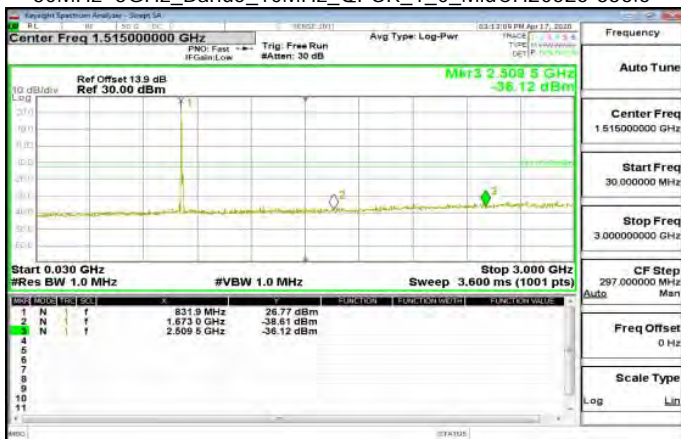
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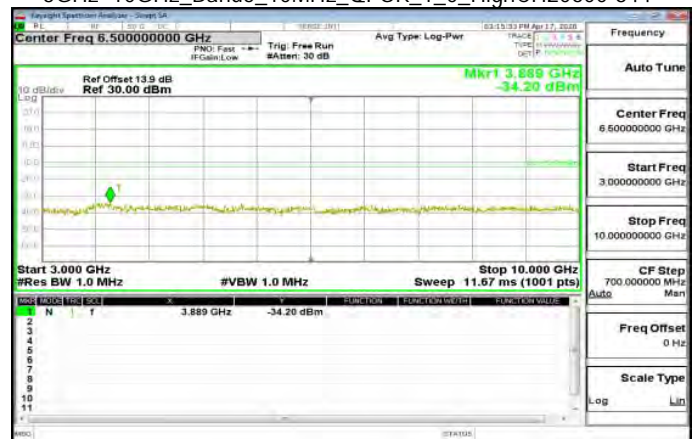
30MHz~3GHz_Band5_10MHz_QPSK_1_0_HighCH20600-844



30MHz~3GHz_Band5_10MHz_QPSK_1_0_MidCH20525-836.5



3GHz~10GHz_Band5_10MHz_QPSK_1_0_HighCH20600-844



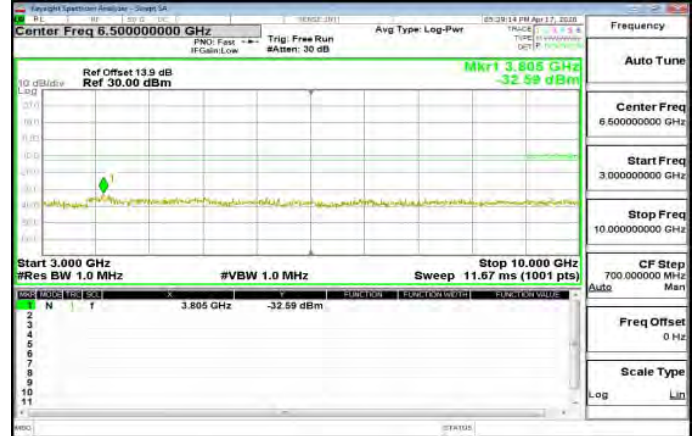
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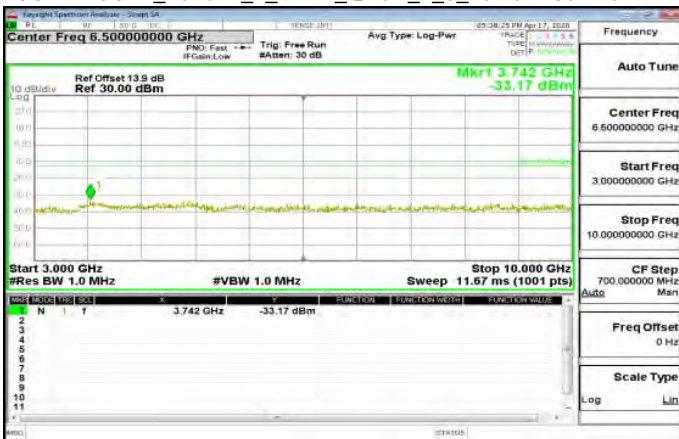
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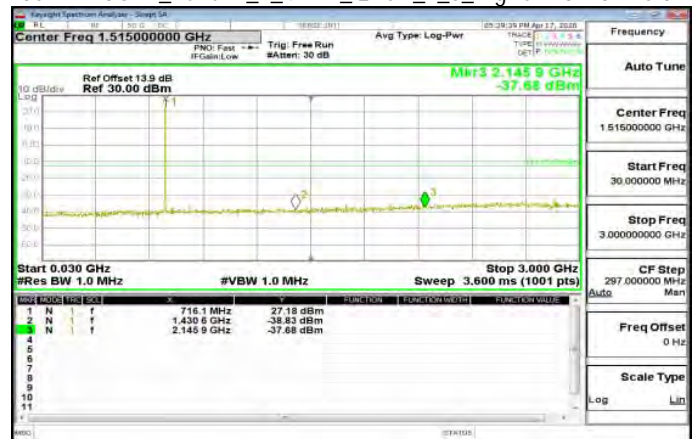
3GHz-10GHz_Band12_1_4MHz_QPSK_1_0_MidCH23095-707.5



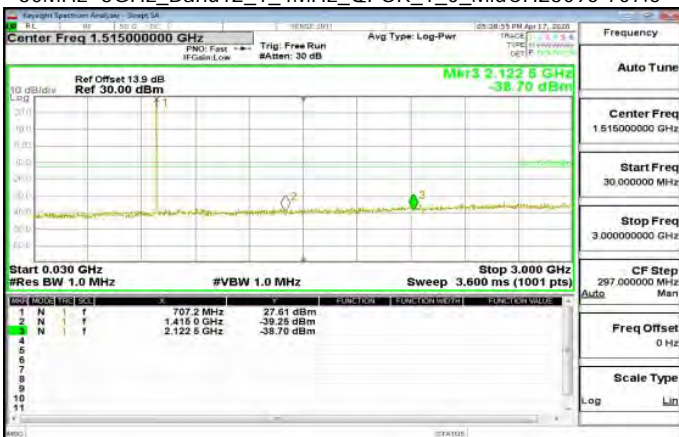
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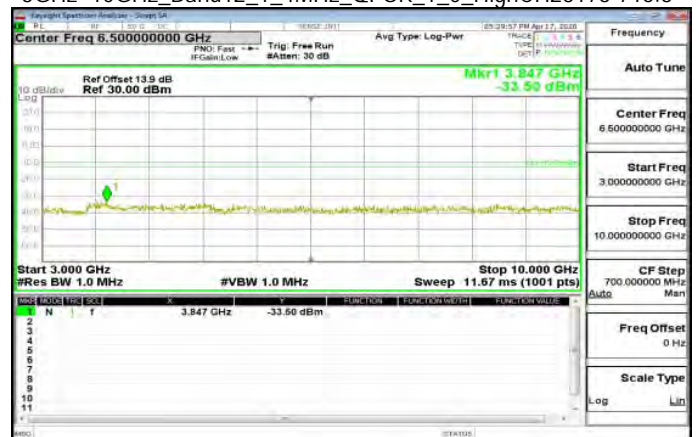
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30MHz-3GHz_Band12_1_4MHz_QPSK_1_0_MidCH23095-707.5



3GHz-10GHz_Band12_1_4MHz_QPSK_1_0_HighCH23173-715.3

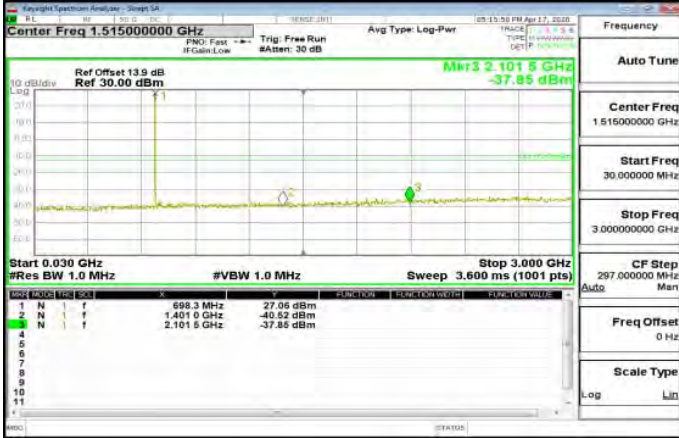


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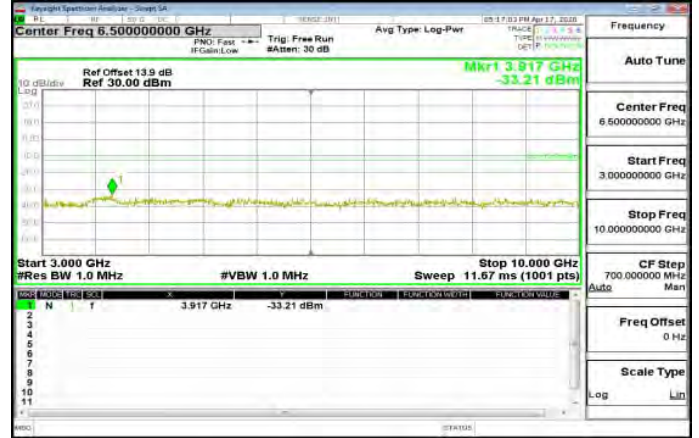
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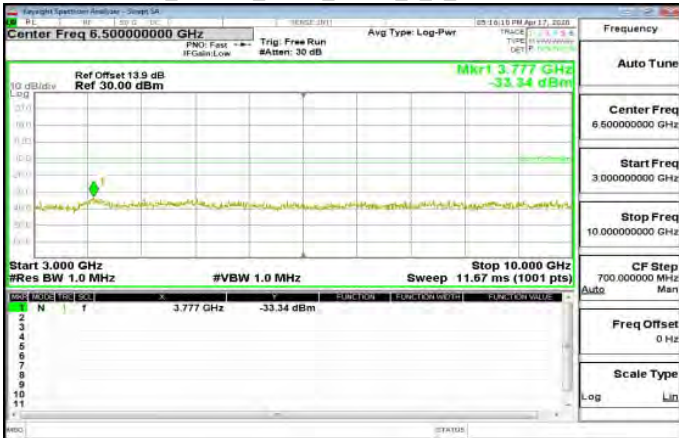
30MHz~3GHz_Band12_3MHz_QPSK_1_0_LowCH23025-700.5



3GHz~10GHz_Band12_3MHz_QPSK_1_0_MidCH23095-707.5



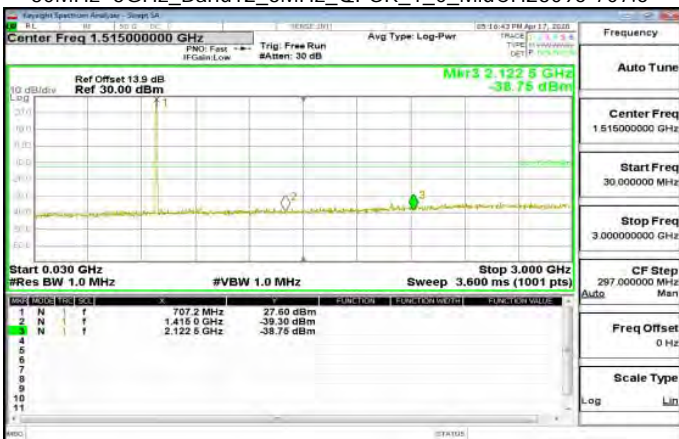
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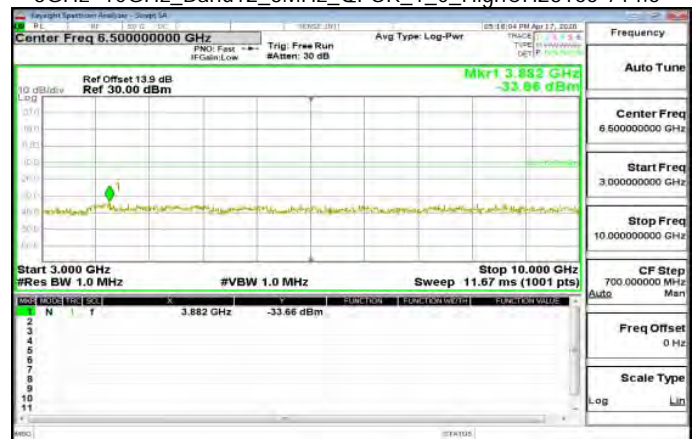
30MHz~3GHz_Band12_3MHz_QPSK_1_0_HighCH23165-714.5



30MHz~3GHz_Band12_3MHz_QPSK_1_0_MidCH23095-707.5



3GHz~10GHz_Band12_3MHz_QPSK_1_0_HighCH23165-714.5

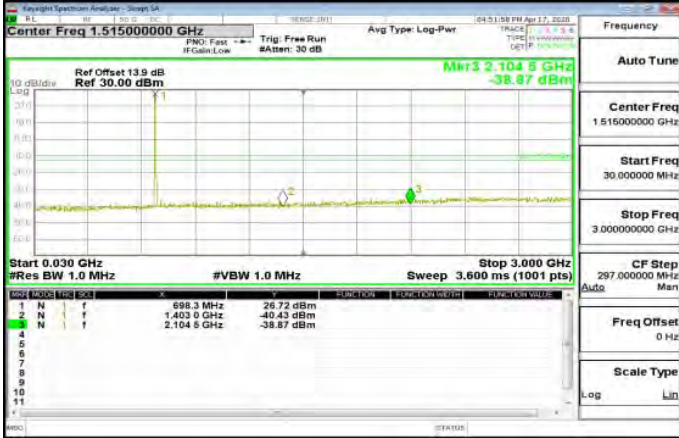


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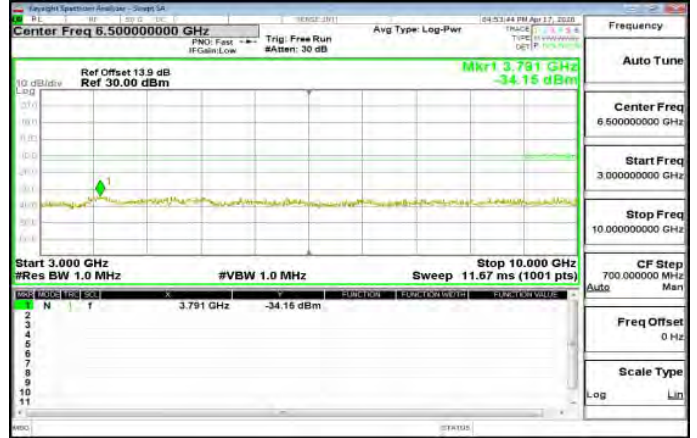
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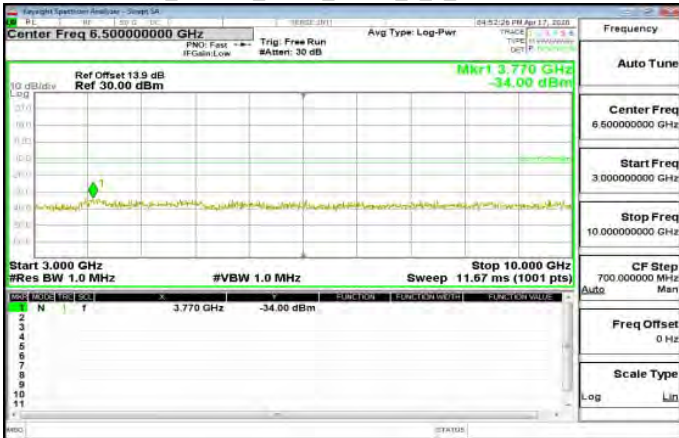
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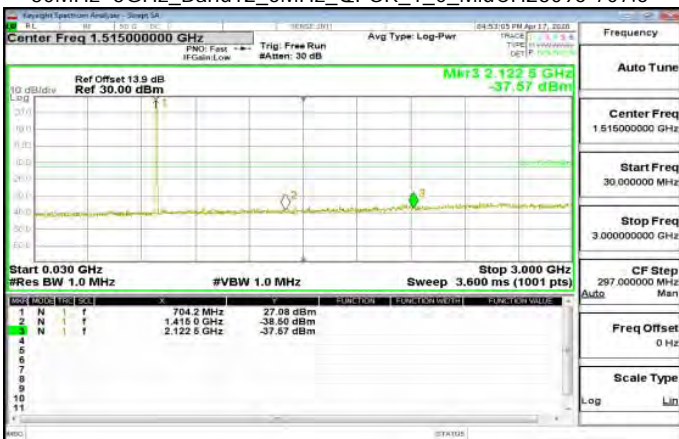
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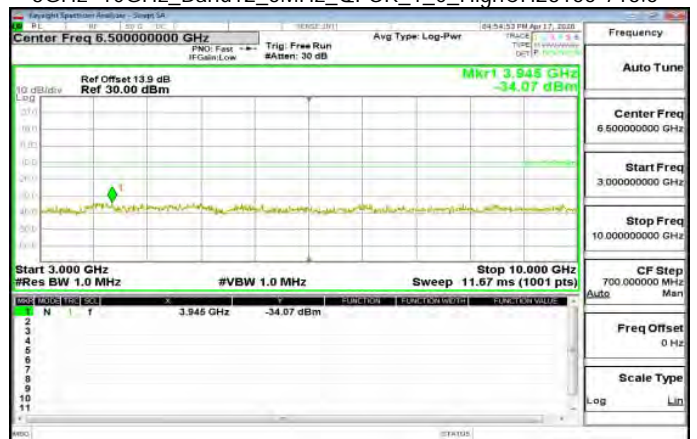
30MHz~3GHz_Band12_5MHz_QPSK_1_0_HighCH23155-713.5



30MHz~3GHz_Band12_5MHz_QPSK_1_0_MidCH23095-707.5



3GHz~10GHz_Band12_5MHz_QPSK_1_0_HighCH23155-713.5

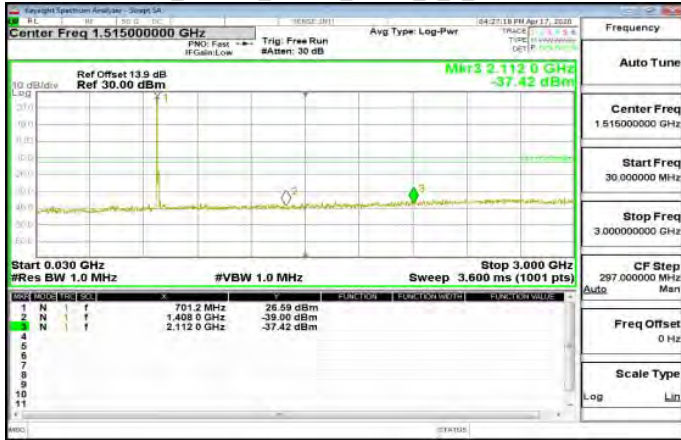


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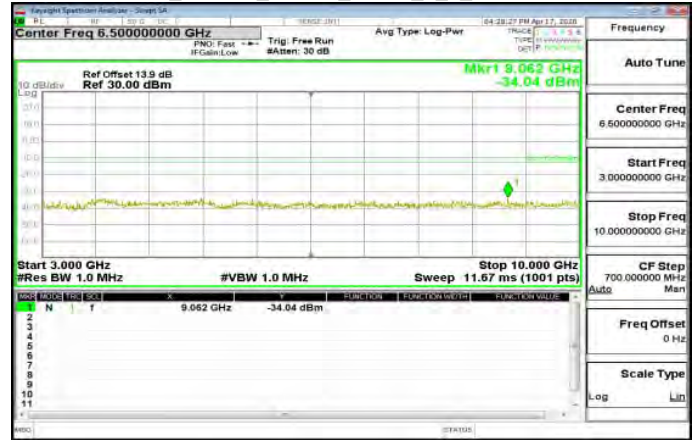
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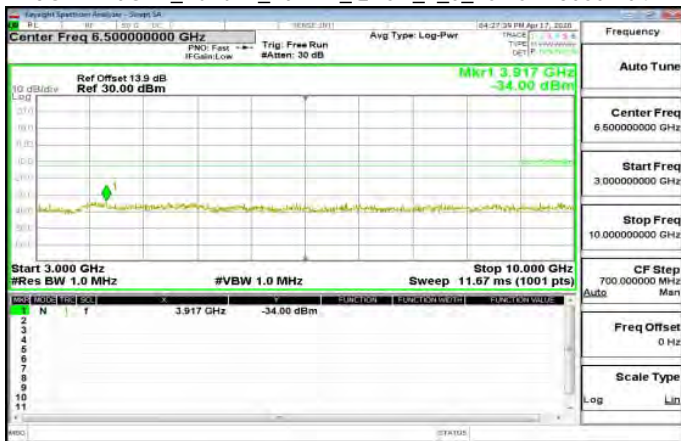
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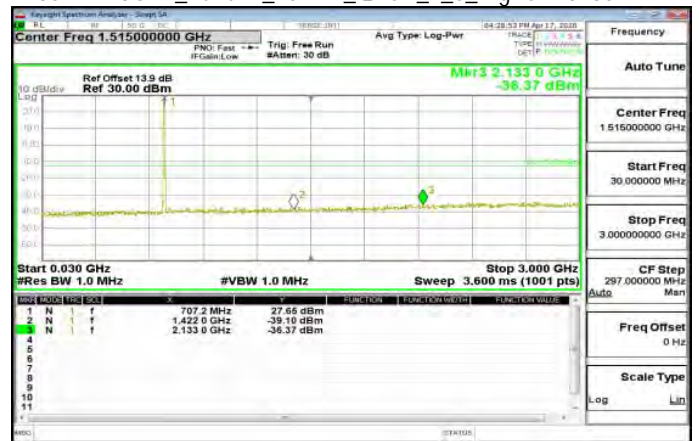
3GHz~10GHz_Band12_10MHz_QPSK_1_0_MidCH23095-707.5



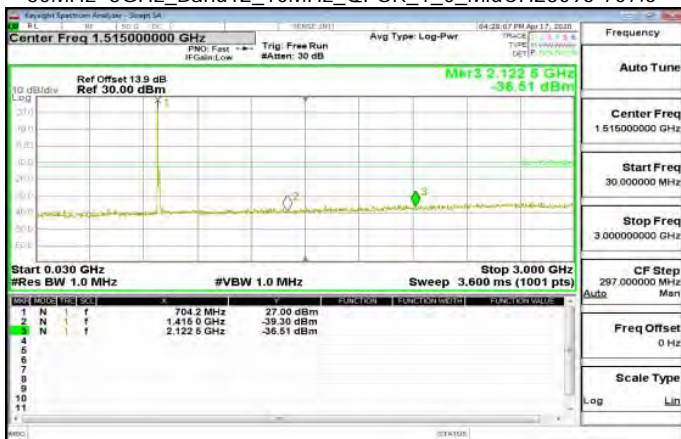
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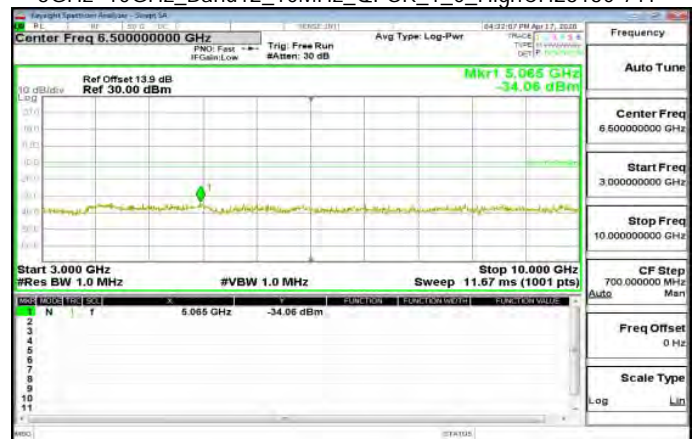
30MHz~3GHz_Band12_10MHz_QPSK_1_0_HighCH23130-711



30MHz~3GHz_Band12_10MHz_QPSK_1_0_MidCH23095-707.5



3GHz~10GHz_Band12_10MHz_QPSK_1_0_HighCH23130-711



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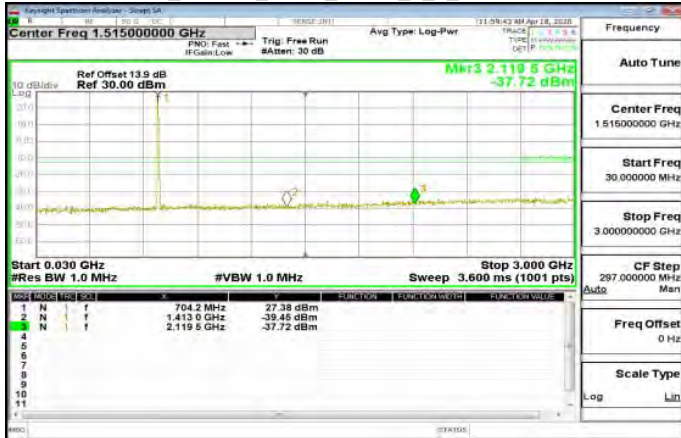
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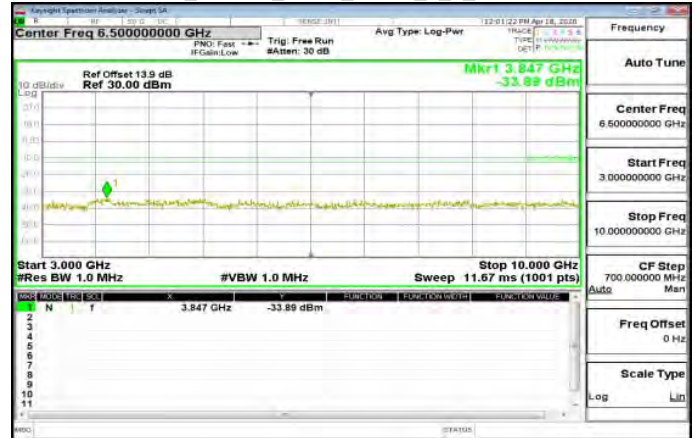
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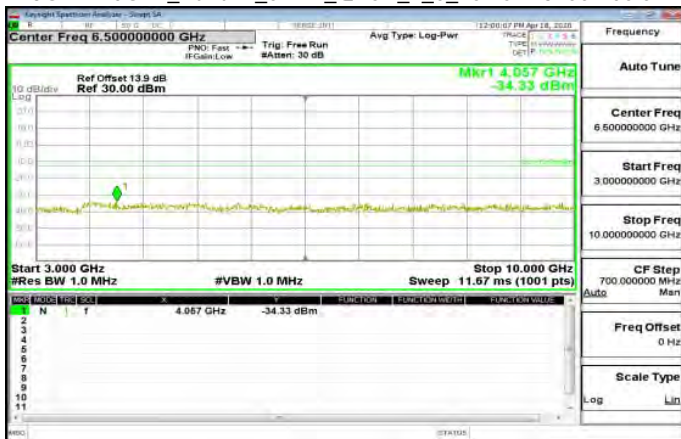
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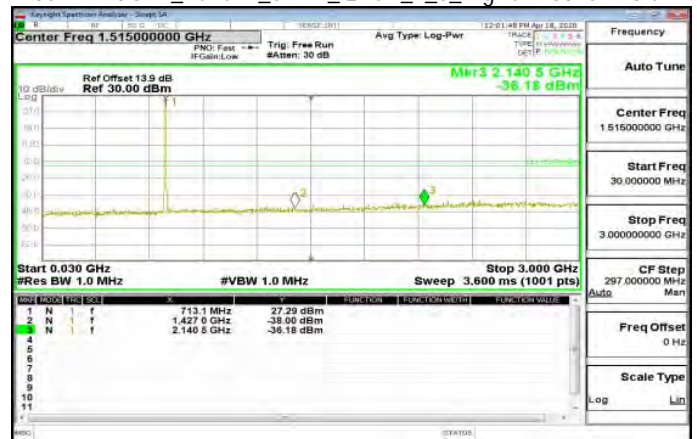
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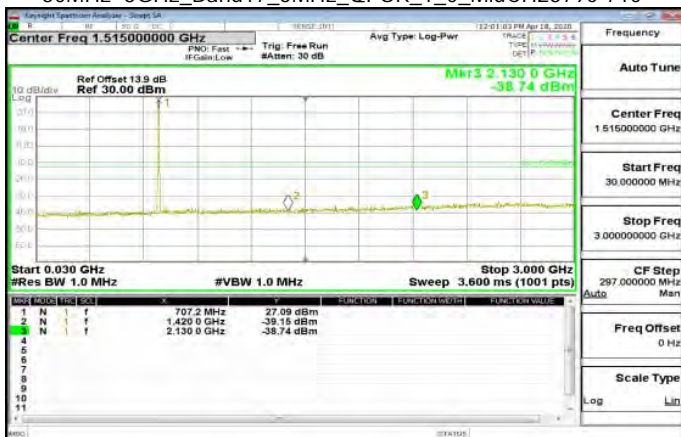
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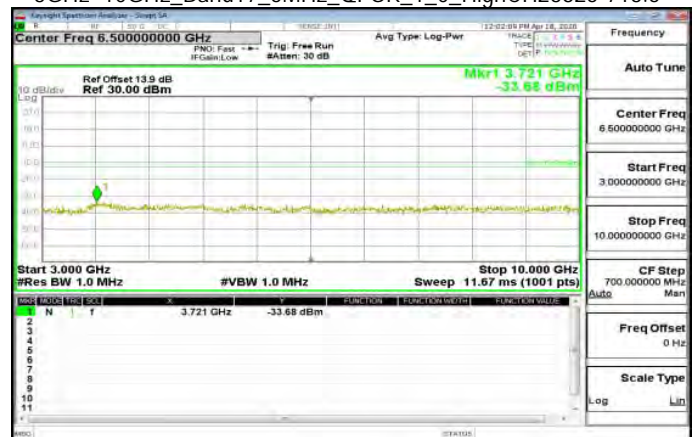
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3GHz~10GHz_Band17_5MHz_QPSK_1_0_HighCH23825-713.5



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