



Report No.: SZEM190101023908

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TEST REPORT

Application No.: SZEM1901010239CR
Applicant: Hytera Communications Corporation Limited
Address of Applicant: Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China
Manufacturer: Hytera Communications Corporation Limited
Address of Manufacturer: Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, People's Republic of China
Equipment Under Test (EUT):
EUT Name: Multi-mode Advanced Radio
Model No.: PTC680 FxB1
Trade mark: Hytera
FCC ID: YAMPTC680FXB1
Standard(s): 47 CFR Part 90
Date of Receipt: 2019-01-09
Date of Test: 2019-01-10 to 2019-02-18
Date of Issue: 2019-03-06

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-03-06		Original

Authorized for issue by:				
				
		Edison Li /Project Engineer		
				
		Eric Fu /Reviewer		



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR FCC Part90	N/A	47 CFR Part 90.205(g,h)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
RF Power Output	47 CFR FCC Part90	ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D; TIA-102 CCAA-D; ANSI C63.26-2015	47 CFR FCC Part 2.1046, Part90.205	Pass
Adjacent Channel Power	47 CFR FCC Part90		47 CFR FCC Part 90.210, Part90.221	Pass
Frequency Stability	47 CFR FCC Part90		47 CFR FCC Part 2.1055, Part90.213	Pass
Audio Frequency Response	47 CFR FCC Part90		47 CFR FCC Part2.1047, Part90.212	N/A
Modulation Limiting	47 CFR FCC Part90		47 CFR FCC Part2.1047, Part90.207,	N/A
Occupied Bandwidth	47 CFR FCC Part90		47 CFR FCC Part 2.1049, Part90.209, Part90.210, Part90.691	Pass
Transient Frequency Behaviour	47 CFR FCC Part90		47 CFR FCC Part90.214	N/A
Conducted Spurious Emission	47 CFR FCC Part90		47 CFR FCC Part 2.1051, Part90.210	Pass
Radiated Spurious Emission	47 CFR FCC Part90		47 CFR FCC Part 2.1051, Part90.210	Pass

N/A: Not Applicable. The test item is not required for TETRA.



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4 General Information

4.1 Details of E.U.T.

Power supply:	Switching Power Supply Model: S024AZM1200200 Input: AC 100-240V, 50/60Hz, 600mA Output: DC 12V, 2000mA DC 7.7V, 2400mAh rechargeable battery which charged by Cradle charger
Test voltage:	DC 7.7V
Cable:	DC cable: 148cm unshielded
Frequency Range:	TX: 350MHz-475MHz RX: 350MHz-475MHz
Number of Channels:	The equipment is able to operate on any designated channel within the specified frequency range.
Channel Spacing:	25KHz
Modulation Type:	$\pi/4$ -DQPSK
Antenna Type:	External
Antenna Gain:	0dBi

4.2 Description of Support Units

The EUT has been tested independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25×10^{-8}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Temperature test	1 °C
10	Humidity test	3%
11	Supply voltages	1.5%

4.4 Test Location

All tests were performed at:

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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

RF Conducted Test					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2018-09-27	2019-09-26
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2018-07-12	2019-07-11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018-09-27	2019-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018-09-25	2019-09-24
Attenuator	Shanghai huaxiang	WDT500- 40dB-8G	16051603	N/A	N/A
SPLITTER	Mini-Circuits	ZFSC-3-+	BUU47601527	N/A	N/A
Audio Analyzer	Rohde & Schwarz	UPL	SEM008-01	2018-09-27	2019-09-26

Radiated Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2018-07-12	2019-07-11
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-12	2018-04-13	2019-04-12
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2018-09-25	2019-09-24
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-11-12	2019-11-11
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2018-04-02	2019-04-01
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2018-04-02	2019-04-01
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2018-09-25	2019-09-24
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21



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Substitution Antenna	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Signal Generator	R&S	SMA100A	102174	2018-07-12	2019-07-11

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2018-09-25	2019-09-24
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2018-04-02	2019-04-01
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2018-07-12	2019-07-11
Substitution Antenna	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Signal Generator	R&S	SMA100A	102174	2018-07-12	2019-07-11

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2017-09-29	2018-09-28
Humidity/Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-17



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part90.205

6.1.2 Conclusion

90.205 Requirement:

(g) 421-430MHz. Limitations on power and antenna heights are specified in §90.279.

(h) 450-470MHz. (1) The maximum allowable station effective radiated power (ERP) is dependent upon the station's antenna HAAT and required service area and will be authorized in accordance with table 2. Applicants requesting an ERP in excess of that listed in table 2 must submit an engineering analysis based upon generally accepted engineering practices and standards that includes coverage contours to demonstrate that the requested station parameters will not produce coverage in excess of that which the applicant requires.

(2) Applications for stations where special circumstances exist that make it necessary to deviate from the ERP and antenna heights in Table 2 will be submitted to the frequency coordinator accompanied by a technical analysis, based upon generally accepted engineering practices and standards, that demonstrates that the requested station parameters will not produce a signal strength in excess of 39 dBu at any point along the edge of the requested service area. The coordinator may then recommend any ERP appropriate to meet this condition.

(3) An applicant for a station with a service area radius greater than 32 km (20 mi) must justify the requested service area radius, which may be authorized only in accordance with table 2, note 4. For base stations with service areas greater than 80 km, all operations 80 km or less from the base station will be on a primary basis and all operations outside of 80 km from the base station will be on a secondary basis and will be entitled to no protection from primary operations.

EUT Antenna:

Antenna location: Refer to Appendix(External photos)



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7 Radio Spectrum Matter Test Results

7.1 RF Power Output

Test Requirement: 47 CFR FCC Part2.1046 & FCC Part90.205;

Test Method: ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D;
TIA-102 CCAA-D; ANSI C63.26-2015

Limit:

For FCC Part 90.205:

(g) 421-430 MHz. Limitations on power and antenna heights are specified in §90.279.

(h) 450-470 MHz. (1) The maximum allowable station effective radiated power (ERP) is dependent upon the station's antenna HAAT and required service area and will be authorized in accordance with table 2. Applicants requesting an ERP in excess of that listed in table 2 must submit an engineering analysis based upon generally accepted engineering practices and standards that includes coverage contours to demonstrate that the requested station parameters will not produce coverage in excess of that which the applicant requires.

(2) Applications for stations where special circumstances exist that make it necessary to deviate from the ERP and antenna heights in Table 2 will be submitted to the frequency coordinator accompanied by a technical analysis, based upon generally accepted engineering practices and standards, that demonstrates that the requested station parameters will not produce a signal strength in excess of 39 dBu at any point along the edge of the requested service area. The coordinator may then recommend any ERP appropriate to meet this condition.

(3) An applicant for a station with a service area radius greater than 32 km (20 mi) must justify the requested service area radius, which may be authorized only in accordance with table 2, note 4. For base stations with service areas greater than 80 km, all operations 80 km or less from the base station will be on a primary basis and all operations outside of 80 km from the base station will be on a secondary basis and will be entitled to no protection from primary operations.

	Service area radius (km)									
	3	8	13	16	24	32	40	48 ⁴	64 ⁴	80 ⁴
Maximum ERP (w) ¹	1	28	178	² 500	² 500	² 500	500	² 500	² 500	² 500
Up to reference HAAT (m) ³	15	15	15	15	33	65	110	160	380	670

¹Maximum ERP indicated provides for a 39 dBu signal strength at the edge of the service area per FCC Report R-6602, Fig. 29 (See §73.699, Fig. 10 b).

²Maximum ERP of 500 watts allowed. Signal strength at the service area contour may be less than 39 dBu.

³When the actual antenna HAAT is greater than the reference HAAT, the allowable ERP will be reduced in accordance with the following equation: $ERP_{allow} = ERP_{max} \times (HAAT_{ref} / HAAT_{actual})^2$.

⁴Applications for this service area radius may be granted upon specific request with justification and must include a technical demonstration that the signal strength at the edge of the service area does not exceed 39 dBu.

(i) 470-512 MHz. Power and height limitations are specified in §§90.307 and 90.309.



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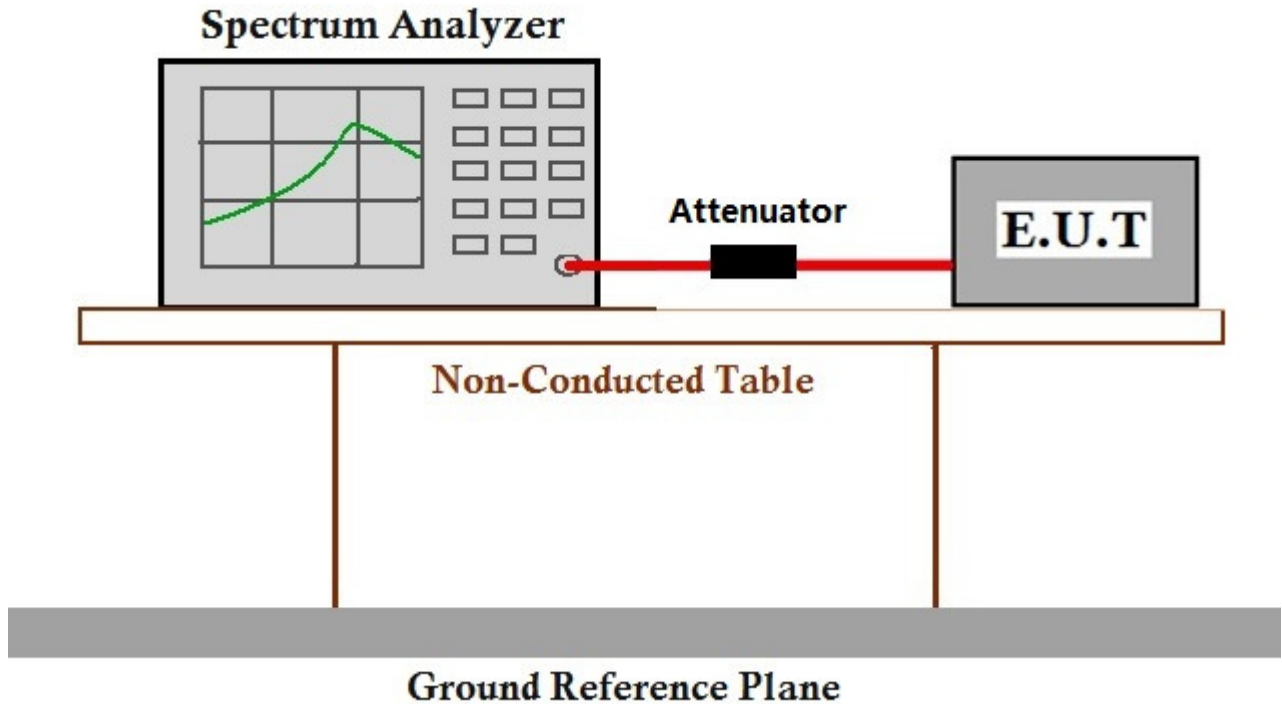
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix FCC data.

7.2 Adjacent Channel Power

Test Requirement: 47 CFR FCC Part90.210, Part90.221;

Test Method: ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D;
TIA-102 CCAA-D; ANSI C63.26-2015

Limit:

For FCC Part 90.221:

(a) For the frequency bands indicated below, operations using equipment designed to operate with a 25kHz channel bandwidth may be authorized up to a 22kHz bandwidth if the equipment meets the adjacent channel power (ACP) limits below. The table specifies a value for the ACP as a function of the displacement from the channel center frequency and a measurement bandwidth of 18 kHz.

(b)(1) Maximum adjacent power levels for frequencies in the 450-470 MHz band:

Frequency offset	Maximum ACP (dBc) for devices 1 watt and less	Maximum ACP (dBc) for devices above 1 watt
25 kHz	-55 dBc	-60 dBc
50 kHz	-70 dBc	-70 dBc
75 kHz	-70 dBc	-70 dBc

(2) In any case, no requirement in excess of -36 dBm shall apply.

(c)(1) Maximum adjacent power levels for frequencies in the 809-824/854-869 MHz band:

Frequency offset	Maximum ACP (dBc) for devices 15 watt and less	Maximum ACP (dBc) for devices 15 watt and above
25 kHz	-55 dBc	-55 dBc
50 kHz	-65 dBc	-65 dBc
75 kHz	-65 dBc	-70 dBc

(2) In any case, no requirement in excess of -36 dBm shall apply.

(d) On any frequency removed from the assigned frequency by more than 75 kHz, the attenuation of any emission must be at least $43 + 10 \log (P_{\text{watts}})$ dB.

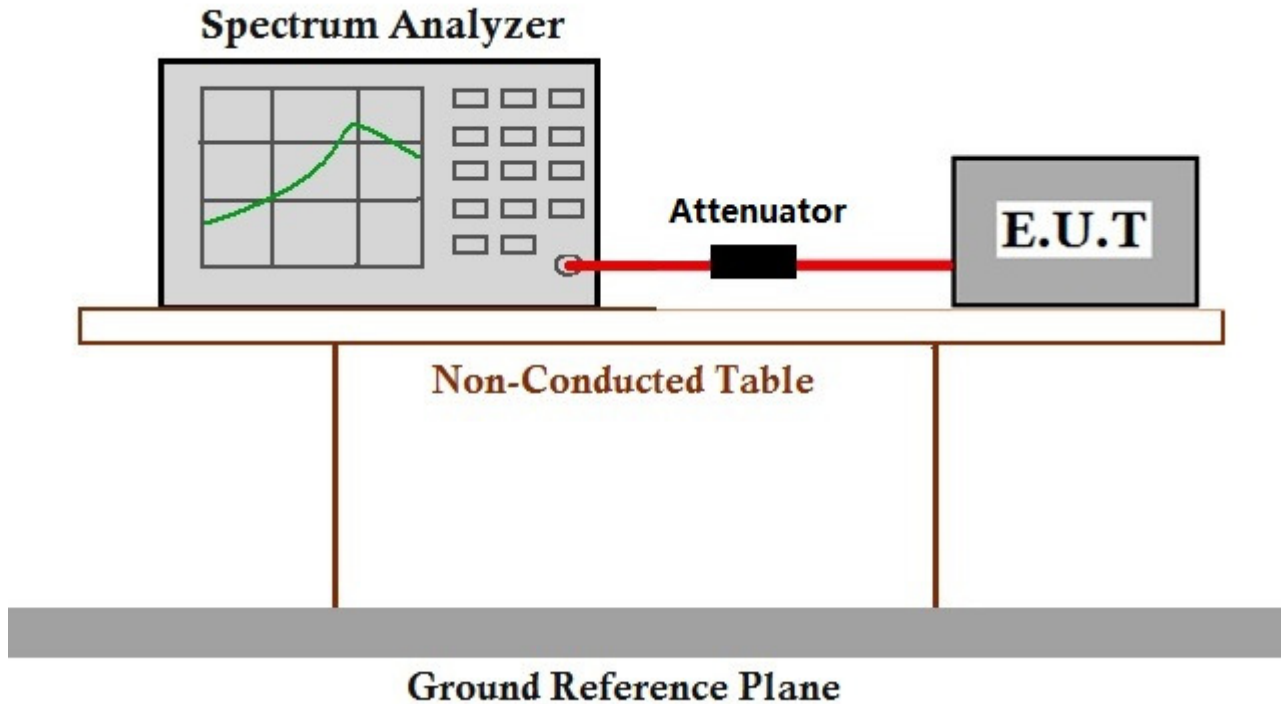
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix FCC data.



7.3 Frequency Stability

Test Requirement: 47 CFR FCC Part2.1055 & FCC Part90.213;
Test Method: ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D; TIA-102 CCAA-D; ANSI C63.26-2015
Limit:

For FCC Part 90.213:

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
Below 25	^{1 2 3} 100	100	200
25-50	20	20	50
72-76	5		50
150-174	^{5 11} 5	⁶ 5	^{4 6} 50
216-220	1.0		1.0
220-222 ¹²	0.1	1.5	1.5
421-512	^{7 11 14} 2.5	⁸ 5	⁸ 5
806-809	¹⁴ 1.0	1.5	1.5
809-824	¹⁴ 1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5
896-901	¹⁴ 0.1	1.5	1.5
902-928	2.5	2.5	2.5
902-928 ¹³	2.5	2.5	2.5
929-930	1.5		
935-940	0.1	1.5	1.5
1427-1435	⁹ 300	300	300
Above 2450 ¹⁰			



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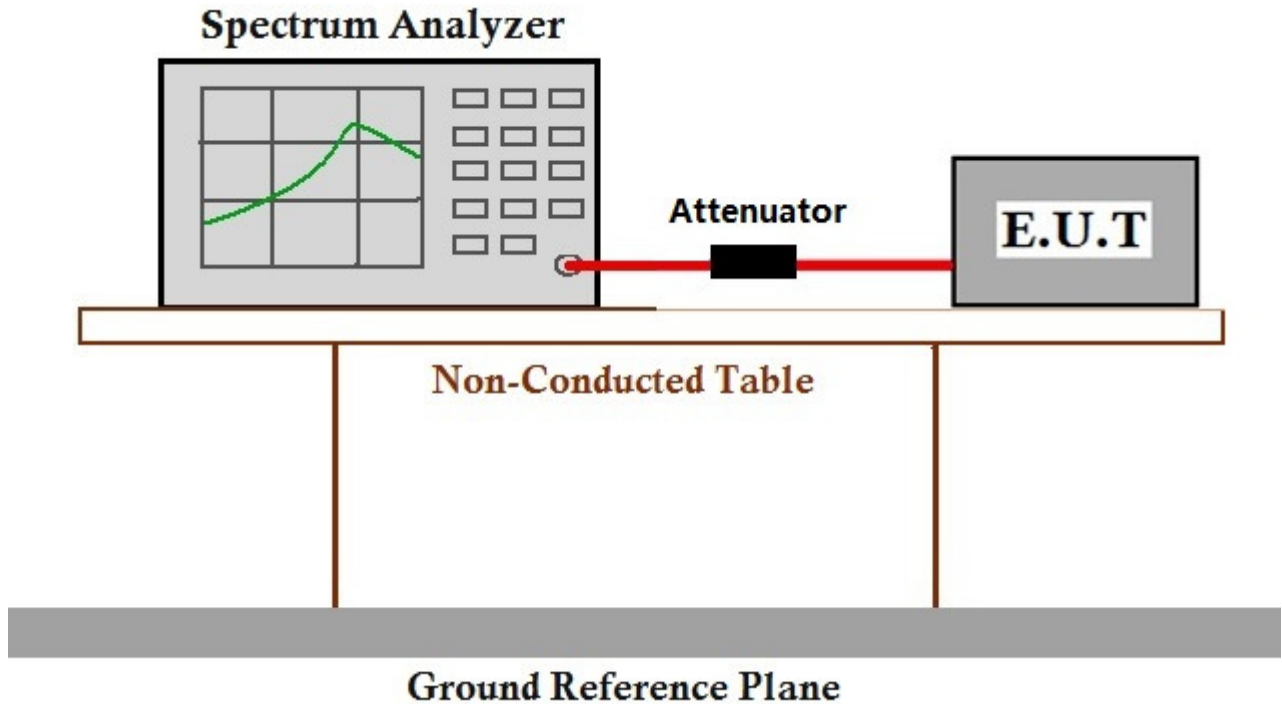
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix FCC data.

7.4 Modulation characteristics

Test Requirement 47 CFR FCC Part2.1047 & FCC Part90.212;
 Test Method: ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D; TIA-102 CCAA-D; ANSI C63.26-2015
 Limit:

For FCC Part 90.212:

- (a) Analog scrambling techniques may be employed at any station authorized the use of A3E, F3E, or G3E emission, subject to the provision of paragraph (d) of this section.
- (b) The use of digital scrambling techniques or digital voice modulation requires the specific authorization of F1E or G1E emission, and these emissions will only be authorized subject to the provisions of paragraph (d) of this section.
- (c) The transmission of any non-voice information or data under the authorization of F1E or G1E emission is prohibited. However, stations authorized the use of F1E or G1E emission may also be authorized F1D, F2D, G1D or G2D emission for non-voice communication purposes, pursuant to §90.207(l).
- (d) Station identification shall be transmitted in the unscrambled analog mode (clear voice) or Morse code in accordance with the provisions of §90.425. All digital encoding and digital modulation shall be disabled during station identification.



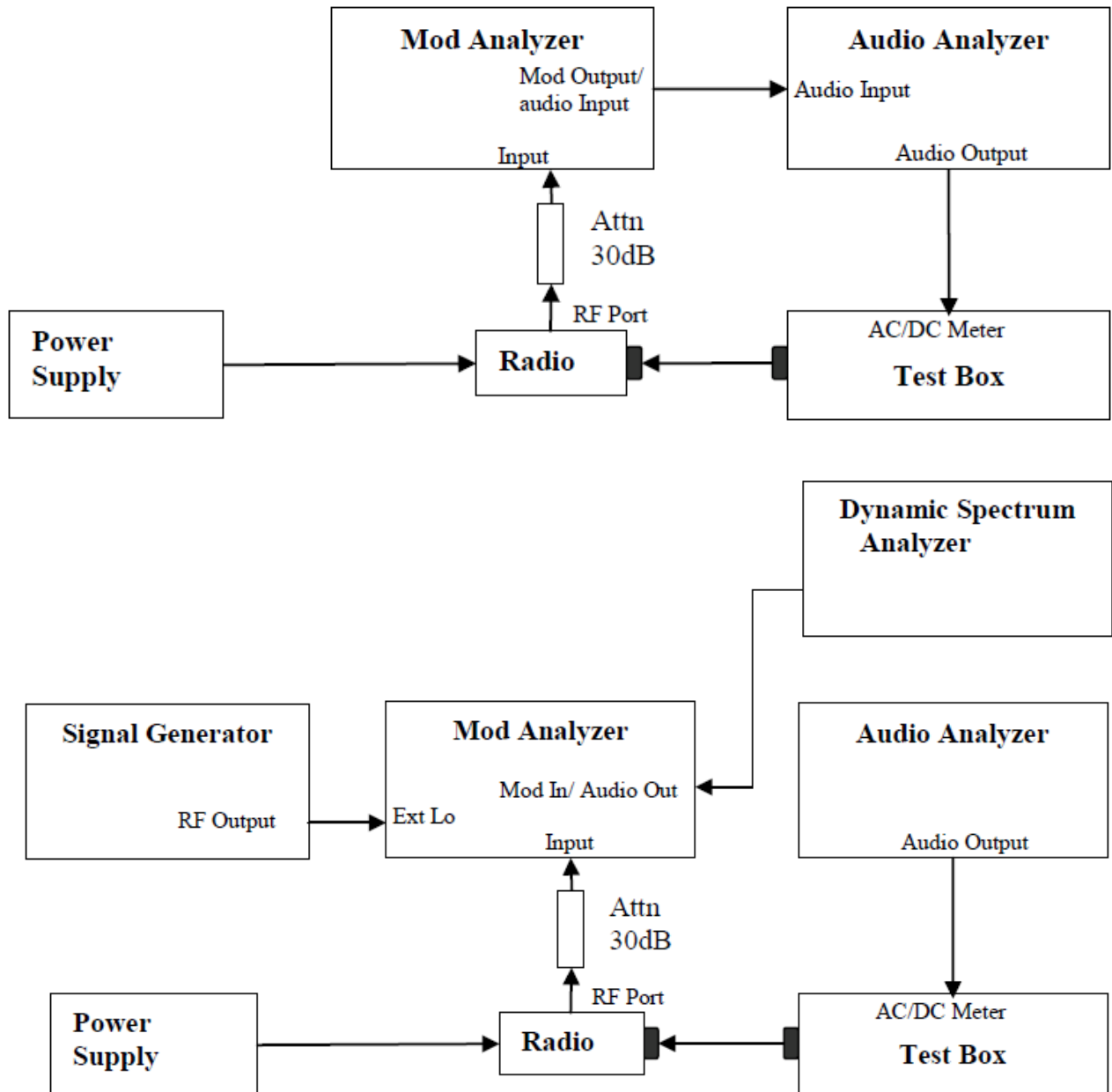
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

Not Applicable. This test item is not required for TETRA.

7.5 Occupied Bandwidth

Test Requirement 47 CFR FCC Part2.1049 & FCC Part90.209, Part90.210, Part90.691;
 Test Method: ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D; TIA-102 CCAA-D; ANSI C63.26-2015
 Limit:

For FCC Part 90.209:

(a) Each authorization issued to a station licensed under this part will show an emission designator representing the class of emission authorized. The designator will be prefixed by a specified necessary bandwidth. This number does not necessarily indicate the bandwidth occupied by the emission at any instant. In those cases where §2.202 of this chapter does not provide a formula for the computation of necessary bandwidth, the occupied bandwidth, as defined in part 2 of this chapter, may be used in lieu of the necessary bandwidth.

(b) The maximum authorized single channel bandwidth of emission corresponding to the type of emission specified in §90.207 is as follows:

(1) For A1A or A1B emissions, the maximum authorized bandwidth is 0.25 kHz. The maximum authorized bandwidth for type A3E emission is 8 kHz.

(2) For operations below 25 MHz utilizing J3E emission, the bandwidth occupied by the emission shall not exceed 3000 Hz. The assigned frequency will be specified in the authorization. The authorized carrier frequency will be 1400 Hz lower in frequency than the assigned frequency. Only upper sideband emission may be used. In the case of regularly available double sideband radiotelephone channels, an assigned frequency for J3E emissions is available either 1600 Hz below or 1400 Hz above the double sideband radiotelephone assigned frequency.

(3) For all other types of emissions, the maximum authorized bandwidth shall not be more than that normally authorized for voice operations.

(4) Where a frequency is assigned exclusively to a single licensee, more than a single emission may be used within the authorized bandwidth. In such cases, the frequency stability requirements of §90.213 must be met for each emission.



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(5) Unless specified elsewhere, channel spacings and bandwidths that will be authorized in the following frequency bands are given in the following table.

band (MHz)	Channel spacing (kHz)	Authorized bandwidth (kHz)
Below 25 ²		
25-50	20	20
72-76	20	20
150-174	17.5	¹ 320/11.25/6
216-220 ⁵	6.25	20/11.25/6
220-222	5	4
406-512 ²	¹ 6.25	¹³⁶ 20/11.25/6
806-809/851-854	12.5	20
809-824/854-869	25	⁶ 20
896-901/935-940	12.5	13.6
902-928 ⁴		
929-930	25	20
1427-1432 ⁵	12.5	12.5
³ 2450-2483.5 ²		
Above 2500 ²		

¹For stations authorized on or after August 18, 1995.

²Bandwidths for radiolocation stations in the 420-450 MHz band and for stations operating in bands subject to this footnote will be reviewed and authorized on a case-by-case basis.

³Operations using equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth. Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized a 11.25 kHz bandwidth. Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth. All stations must operate on channels with a bandwidth of 12.5 kHz or less beginning January 1, 2013, unless the operations meet the efficiency standard of §90.203(j)(3).

⁴The maximum authorized bandwidth shall be 12 MHz for non-multilateration LMS operations in the band 909.75-921.75 MHz and 2 MHz in the band 902.00-904.00 MHz. The maximum authorized bandwidth for multilateration LMS operations shall be 5.75 MHz in the 904.00-909.75 MHz band; 2 MHz in the 919.75-921.75 MHz band; 5.75 MHz in the 921.75-927.25 MHz band and its associated 927.25-927.50 MHz narrowband forward link; and 8.00 MHz if the 919.75-921.75 MHz and 921.75-927.25 MHz bands and their associated 927.25-927.50 MHz and 927.50-927.75 MHz narrowband forward links are aggregated.

⁵See §90.259.

⁶Operations using equipment designed to operate with a 25 kHz channel bandwidth may be authorized up to a 22 kHz bandwidth if the equipment meets the Adjacent Channel Power limits of §90.221.

(6)(i) Beginning January 1, 2011, no new applications for the 150-174 MHz and/or 421-512 MHz bands will be acceptable for filing if the applicant utilizes channels with an authorized bandwidth exceeding 11.25 kHz, unless specified elsewhere or the operations meet the efficiency standards of §90.203(j)(3).



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(ii) Beginning January 1, 2011, no modification applications for stations in the 150-174 MHz and/or 421-512 MHz bands that increase the station's authorized interference contour, will be acceptable for filing if the applicant utilizes channels with an authorized bandwidth exceeding 11.25 kHz, unless specified elsewhere or the operations meet the efficiency standards of §90.203(j)(3). See §90.187(b)(2)(iii) and (iv) for interference contour designations and calculations. Applications submitted pursuant to this paragraph must comply with frequency coordination requirements of §90.175.

(7) Economic Area (EA)-based licensees in frequencies 817-824/862-869 MHz (813.5-824/858.5-869 MHz in the counties listed in §90.614(c)) may exceed the standard channel spacing and authorized bandwidth listed in paragraph (b)(5) of this section in any National Public Safety Planning Advisory Committee Region when all 800 MHz public safety licensees in the Region have completed band reconfiguration consistent with this part. In any National Public Safety Planning Advisory Committee Region where the 800 MHz band reconfiguration is incomplete, EA-based licensees in frequencies 817-821/862-866 MHz (813.5-821/858.5-866 MHz in the counties listed in §90.614(c)) may exceed the standard channel spacing and authorized bandwidth listed in paragraph (b)(5) of this section. Upon all 800 MHz public safety licensees in a National Public Safety Planning Advisory Committee Region completing band reconfiguration, EA-based 800 MHz SMR licensees in the 821-824/866-869 MHz band may exceed the channel spacing and authorized bandwidth in paragraph (b)(5) of this section. Licensees authorized to exceed the standard channel spacing and authorized bandwidth under this paragraph must provide at least 30 days written notice prior to initiating such service in the bands listed herein to every 800 MHz public safety licensee with a base station in an affected National Public Safety Planning Advisory Committee Region, and every 800 MHz public safety licensee with a base station within 113 kilometers (70 miles) of an affected National Public Safety Planning Advisory Committee Region. Such notice shall include the estimated date upon which the EA-based 800 MHz SMR licensee intends to begin operations that exceed the channel spacing and authorized bandwidth in paragraph (b)(5) of this section.

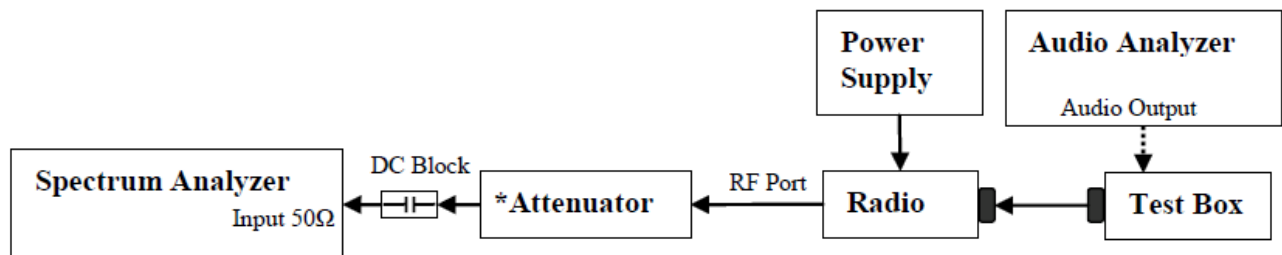
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix FCC data.

Note: The device meets the Adjacent Channel Power limits of 47 CFR FCC Part 90.221, so emission mask is not tested.

7.6 Transient Frequency Behaviour

Test Requirement 47 CFR FCC Part 90.214

Test Method: ANSI/TIA-603-E:2016; ANSI C63.4:2014; TIA-102 CCAA-A; TIA-102 CCAB-D; TIA-102 CCAA-D; ANSI C63.26-2015

Limit:

Time intervals ^{1 2}	Maximum frequency difference ³	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t ₁ ⁴	±25.0 kHz	5.0 ms	10.0 ms
t ₂	±12.5 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t ₁ ⁴	±12.5 kHz	5.0 ms	10.0 ms
t ₂	±6.25 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t ₁ ⁴	±6.25 kHz	5.0 ms	10.0 ms
t ₂	±3.125 kHz	20.0 ms	25.0 ms
t ₃ ⁴	±6.25 kHz	5.0 ms	10.0 ms

¹on is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t₁ is the time period immediately following t_{on}.

t₂ is the time period immediately following t₁.

t₃ is the time period from the instant when the transmitter is turned off until t_{off}.

t_{off} is the instant when the 1 kHz test signal starts to rise.

² During the time from the end of t₂ to the beginning of t₃, the frequency difference must not exceed the limits specified in §90.213.

³ Difference between the actual transmitter frequency and the assigned transmitter frequency.

⁴ If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

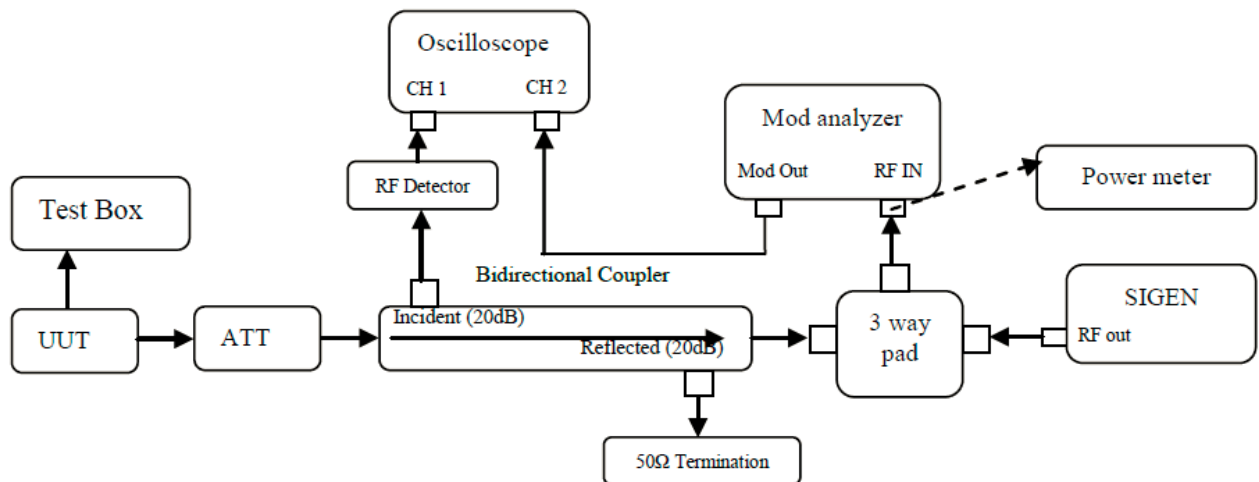
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.6.2 Test Setup Diagram



7.6.3 Measurement Procedure and Data

Not Applicable. This test item is not required for TETRA.

7.7 Conducted Spurious Emissions

Test Requirement: 47 CFR FCC Part2.1051 & FCC Part90.210;

Test Method: ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D; TIA-102 CCAA-D; ANSI C63.26-2015

Limit:

For FCC Part 90.210:

Frequency band (MHz)	Mask for equipment with audio low pass filter	Mask for equipment without audio low pass filter
Below 25 ¹	A or B	A or C
25-50	B	C
72-76	B	C
150-174 ²	B, D, or E	C, D or E
150 paging only	B	C
220-222	F	F
421-512 ^{2 5}	B, D, or E	C, D, or E
450 paging only	B	G
806-809/851-854 ⁶	B	H
809-824/854-869 ^{3 5}	B	G
896-901/935-940	I	J
902-928	K	K
929-930	B	G
4940-4990 MHz	L or M	L or M
5850-5925 ⁴		
All other bands	B	C

(b) Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

(c) Emission Mask C. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz, but not more than 10 kHz: At least 83 log (fd/5) dB;



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(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least $29 \log(f_d/11)$ dB or 50 dB, whichever is the lesser attenuation;

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log(P)$ dB.

(4) In the 1427-1432 MHz band, licensees are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed the following levels in the 1400-1427 MHz band:

(i) For stations of point-to-point systems in the fixed service: -45 dBW/27 MHz.

(ii) For stations in the mobile service: -60 dBW/27 MHz.

(d) Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88 \text{ kHz})$ dB.

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log(P)$ dB or 70 dB, whichever is the lesser attenuation.

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

(e) Emission Mask E—6.25 kHz or less channel bandwidth equipment. For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0 : Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least $30 + 16.67(f_d - 3 \text{ kHz})$ or $55 + 10 \log(P)$ or 65 dB, whichever is the lesser attenuation.

(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least $55 + 10 \log(P)$ or 65 dB, whichever is the lesser attenuation.

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.



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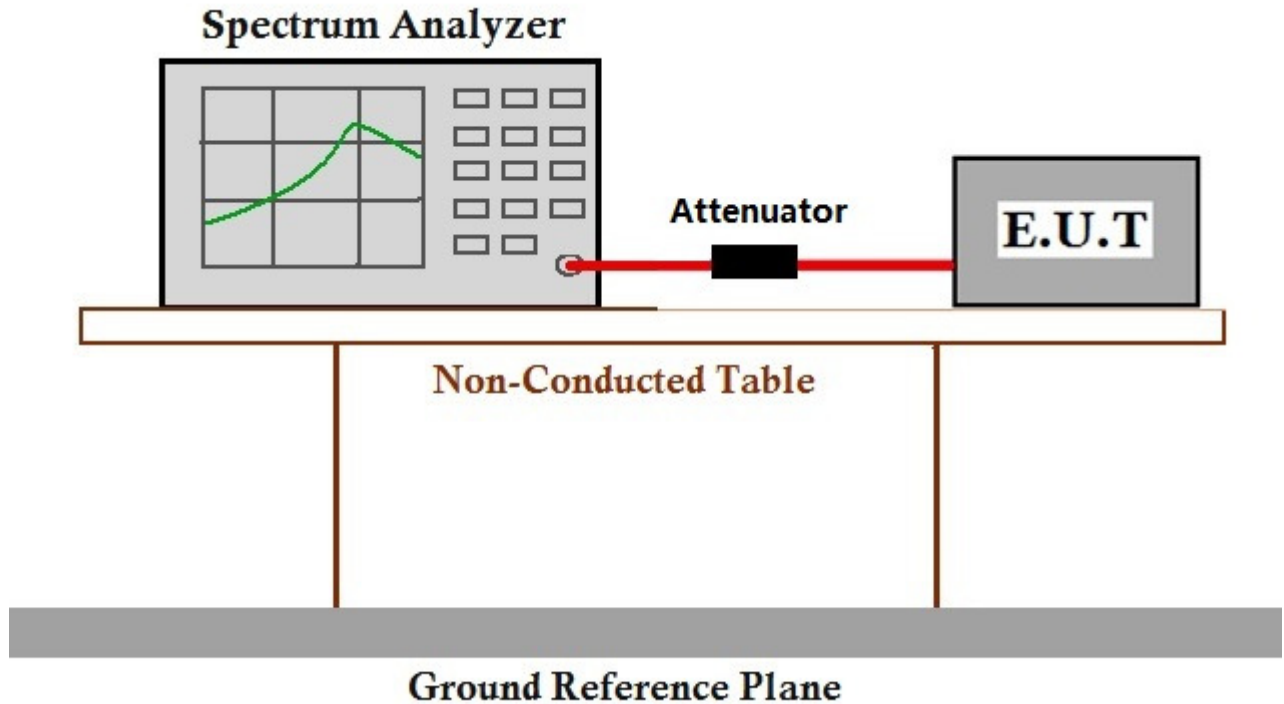
7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.7.2 Test Setup Diagram



7.7.3 Measurement Procedure and Data

The detailed test data see: Appendix FCC data.

7.8 Radiated Spurious Emissions

Test Requirement: 47 CFR FCC Part2.1051 & FCC Part90.210;

Test Method: ANSI/TIA-603-E:2016; ANSI C63.4.2014; TIA-102 CCAA-A; TIA-102 CCAB-D; TIA-102 CCAA-D; ANSI C63.26-2015

Measurement Distance: 3m

Limit:

For FCC Part 90.210:

Frequency band (MHz)	Mask for equipment with audio low pass filter	Mask for equipment without audio low pass filter
Below 25 ¹	A or B	A or C
25-50	B	C
72-76	B	C
150-174 ²	B, D, or E	C, D or E
150 paging only	B	C
220-222	F	F
421-512 ^{2 5}	B, D, or E	C, D, or E
450 paging only	B	G
806-809/851-854 ⁶	B	H
809-824/854-869 ^{3 5}	B	G
896-901/935-940	I	J
902-928	K	K
929-930	B	G
4940-4990 MHz	L or M	L or M
5850-5925 ⁴		
All other bands	B	C

(b) Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

(c) Emission Mask C. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz, but not more than 10 kHz: At least 83 log (fd/5) dB;



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(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least $29 \log(f_d/11)$ dB or 50 dB, whichever is the lesser attenuation;

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log(P)$ dB.

(4) In the 1427-1432 MHz band, licensees are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed the following levels in the 1400-1427 MHz band:

(i) For stations of point-to-point systems in the fixed service: -45 dBW/27 MHz.

(ii) For stations in the mobile service: -60 dBW/27 MHz.

(d) Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88 \text{ kHz})$ dB.

(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log(P)$ dB or 70 dB, whichever is the lesser attenuation.

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.

(e) Emission Mask E—6.25 kHz or less channel bandwidth equipment. For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0 : Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least $30 + 16.67(f_d - 3 \text{ kHz})$ or $55 + 10 \log(P)$ or 65 dB, whichever is the lesser attenuation.

(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least $55 + 10 \log(P)$ or 65 dB, whichever is the lesser attenuation.

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior Commission approval is obtained.



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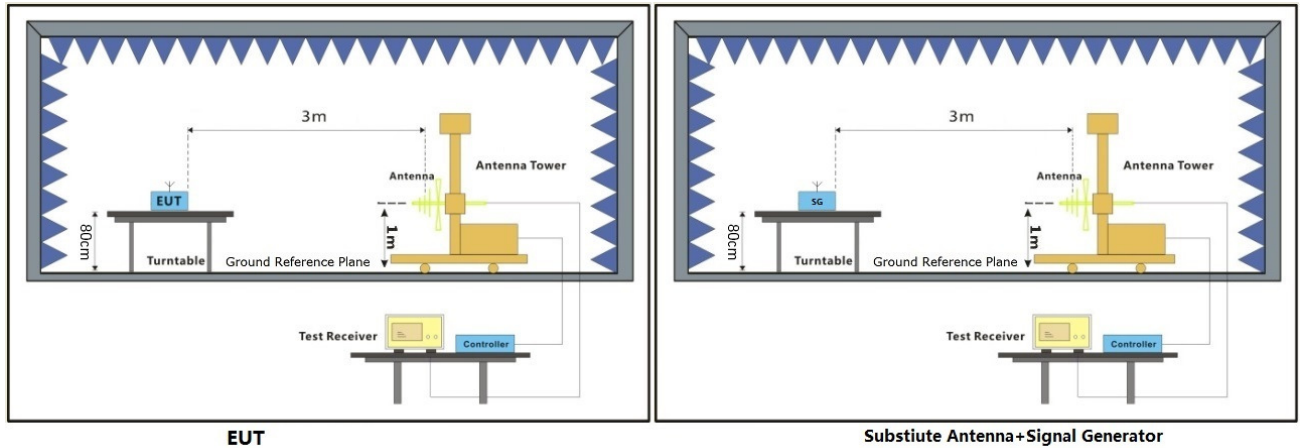
7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 22.7 °C Humidity: 68.1 % RH Atmospheric Pressure: 1030 mbar

Test mode: n: Tx mode, Keep the EUT in transmitting mode.

7.8.2 Test Setup Diagram



7.8.3 Measurement Procedure and Data

Test Procedure:

- (1) On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- (2) The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- (3) The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- (4) The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- (5) The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- (6) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- (7) The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- (8) The maximum signal level detected by the measuring receiver shall be noted.
- (9) The measurement shall be repeated with the test antenna set to horizontal polarization.
- (10) Replace the antenna with a proper Antenna (substitution antenna).
- (11) The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- (12) The substitution antenna shall be connected to a calibrated signal generator.
- (13) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- (14) The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- (15) The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- (16) The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- (17) The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

The detailed test data see: Appendix FCC data.



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8 EUT Constructional Details

8.1 Test Setup Photo

Please refer to setup photos.

8.2 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.



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9 Appendix FCC data

1.RF Output Power

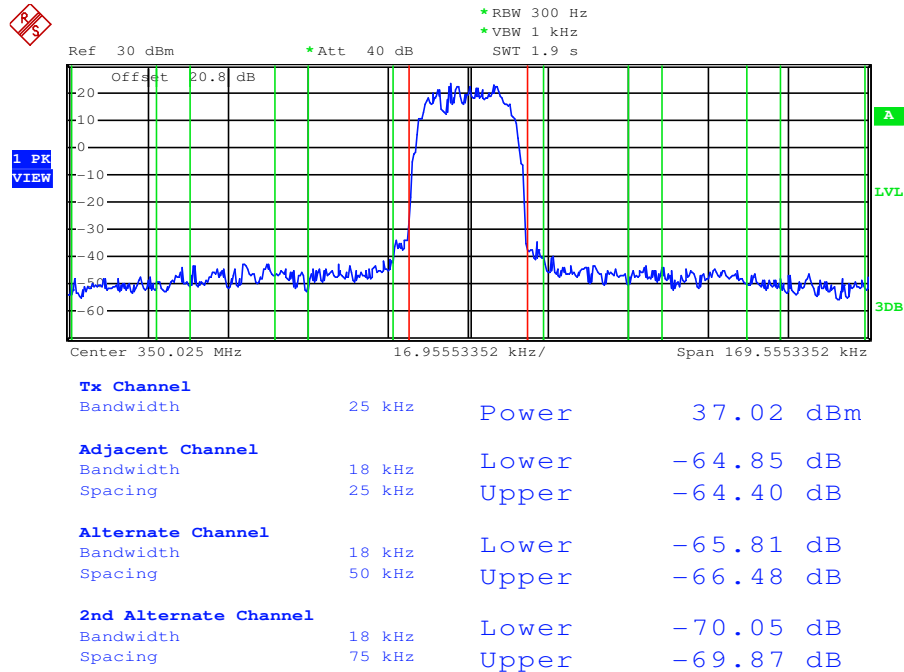
Modulation Type	Channel Separation	Frequency (MHz)	Power Level	RF Output Power(dBm)	RF Output Power(W)	Remark
$\pi/4$ -DQPSK	25KHz	350.025	Max	32.79	1.90	/
		405.975	Max	32.64	1.84	/
		450.025	Max	32.75	1.88	/
		459.975	Max	32.78	1.90	/
		469.975	Max	32.55	1.80	/

Note: The max rated power is 1.8W(32.55dBm).

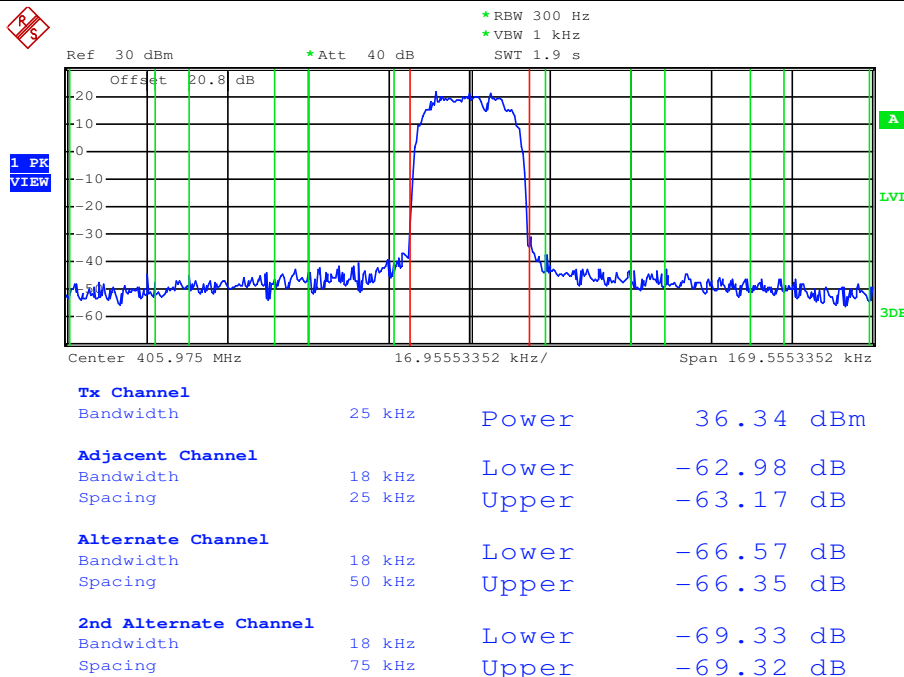
The limit is dependent upon the station's antenna HAAT and required service area.

2. Adjacent Channel Power

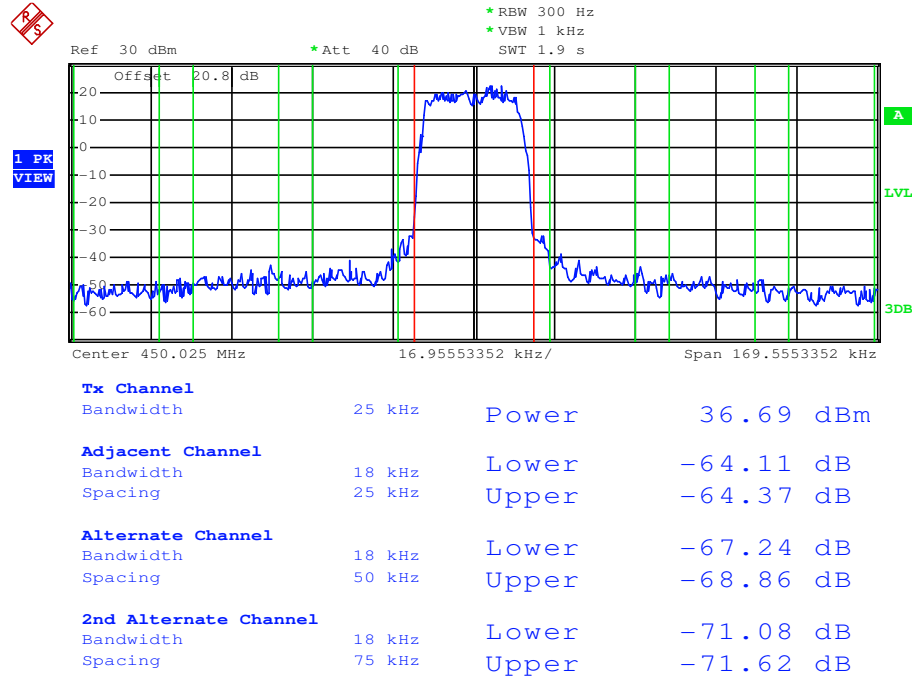
25KHz, $\Pi/4$ -DQPSK modulation, Assigned Frequency: 350.025MHz



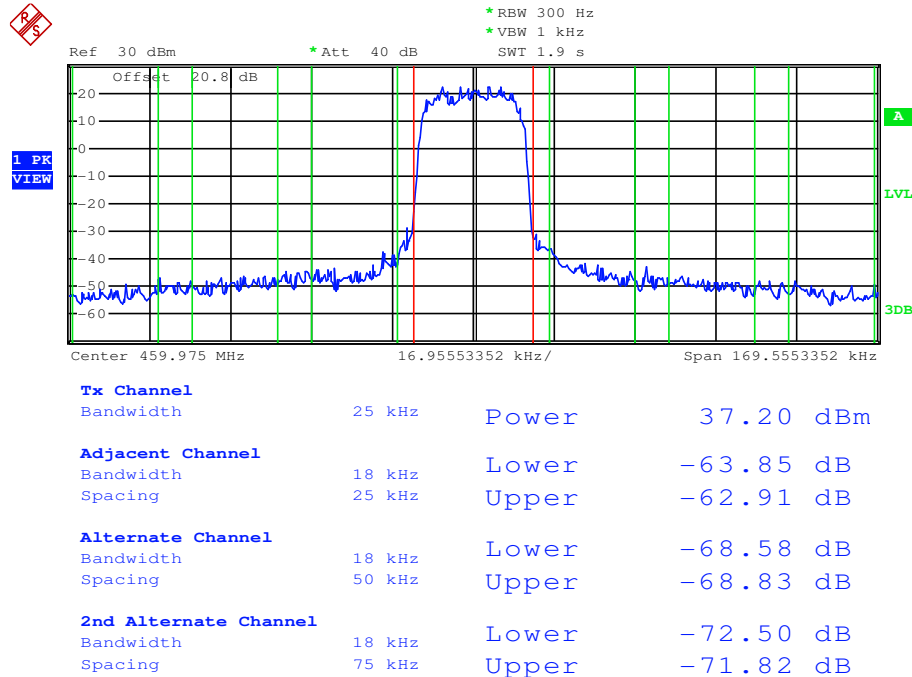
25KHz, $\Pi/4$ -DQPSK modulation, Assigned Frequency: 405.975MHz



25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 450.025MHz

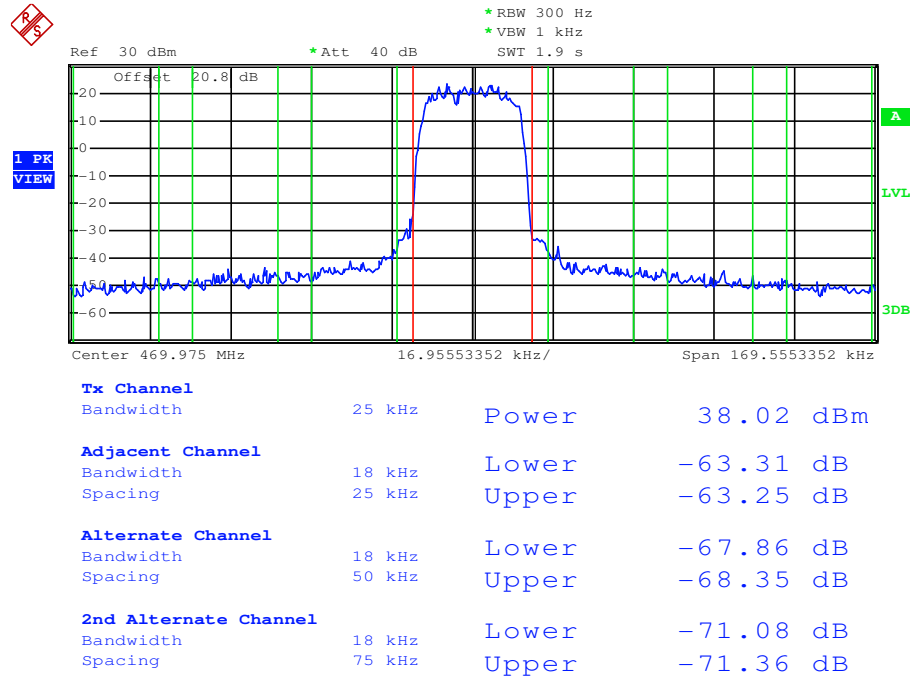


25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 459.975MHz





25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 469.975MHz



3. Frequency Stability

25KHz, $\Pi/4$ -DQPSK modulation, Assigned Frequency: 350.025MHz					
Voltage(V)	Temperature (°C)	Measured Frequency(MHz)	Frequency Deviation(ppm)	FCC Limit (ppm)	Result
7.7	-30	350.025030	0.0857	±5	Pass
	-20	350.025025	0.0714		
	-10	350.025020	0.0571		
	0	350.025010	0.0286		
	10	350.025008	0.0229		
	20	350.025006	0.0171		
	30	350.025006	0.0171		
	40	350.025013	0.0371		
	50	350.025013	0.0371		
6.54	25	350.025005	0.0143	±5	Pass
8.85	25	350.025005	0.0143		

25KHz, $\Pi/4$ -DQPSK modulation Assigned Frequency: 469.975MHz					
Voltage(V)	Temperature (°C)	Measured Frequency(MHz)	Frequency Deviation(ppm)	FCC Limit (ppm)	Result
7.7	-30	469.975030	0.0638	±5	Pass
	-20	469.975025	0.0532		
	-10	469.975020	0.0426		
	0	469.975010	0.0213		
	10	469.975008	0.0170		
	20	469.975006	0.0128		
	30	469.975006	0.0128		
	40	469.975013	0.0277		
	50	469.975013	0.0277		
6.54	25	469.975005	0.0106	±5	Pass
8.85	25	469.975005	0.0106		



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3. Occupied Bandwidth

Modulation Type	Channel Separation	Frequency (MHz)	Power Level	99% Occupied Bandwidth(kHz)	26dB Emissions Bandwidth(kHz)	Limit(KHz)
Π/4-DQPSK	25KHz	350.025	Max	20.48	23.13	20
		405.975	Max	20.32	23.21	
		450.025	Max	20.24	23.21	
		459.975	Max	20.24	23.29	
		469.975	Max	20.40	23.05	



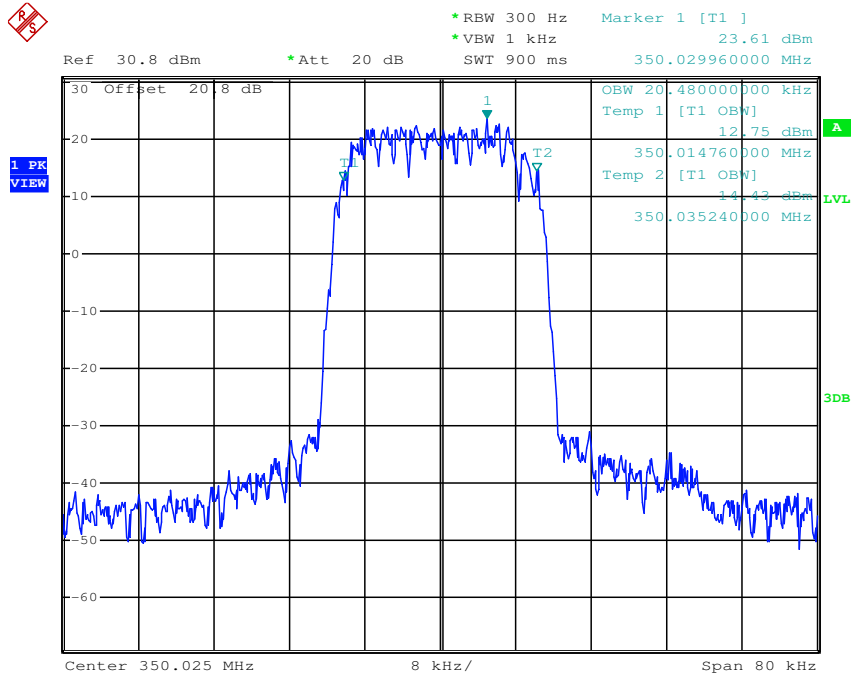
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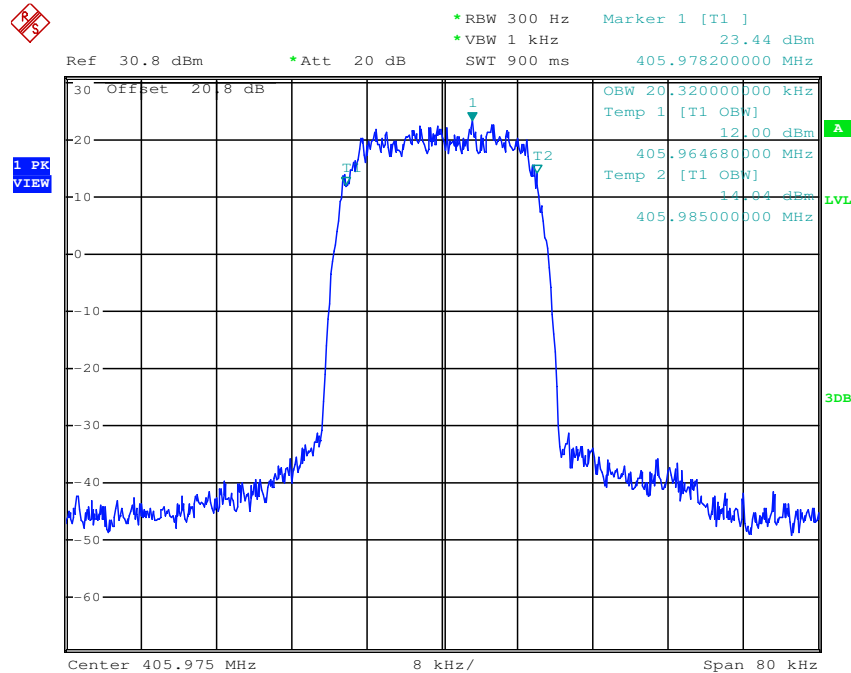
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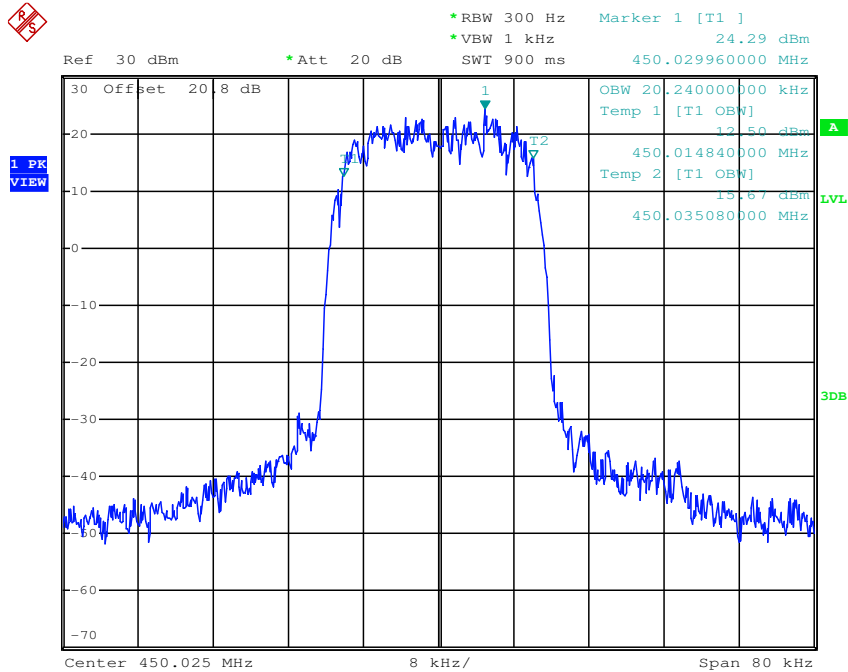
25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 350.025MHz, OCB



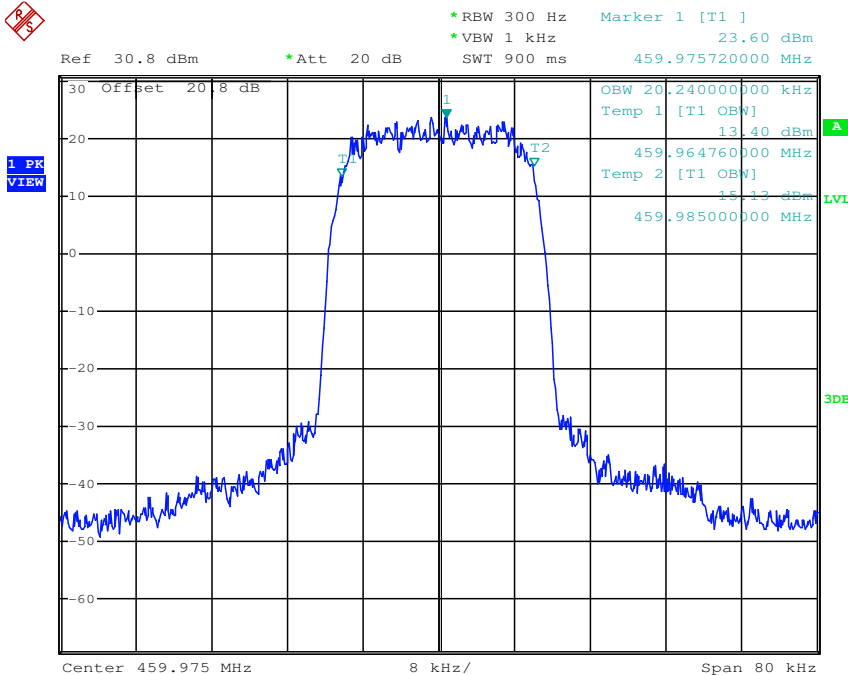
25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 405.975MHz, OCB

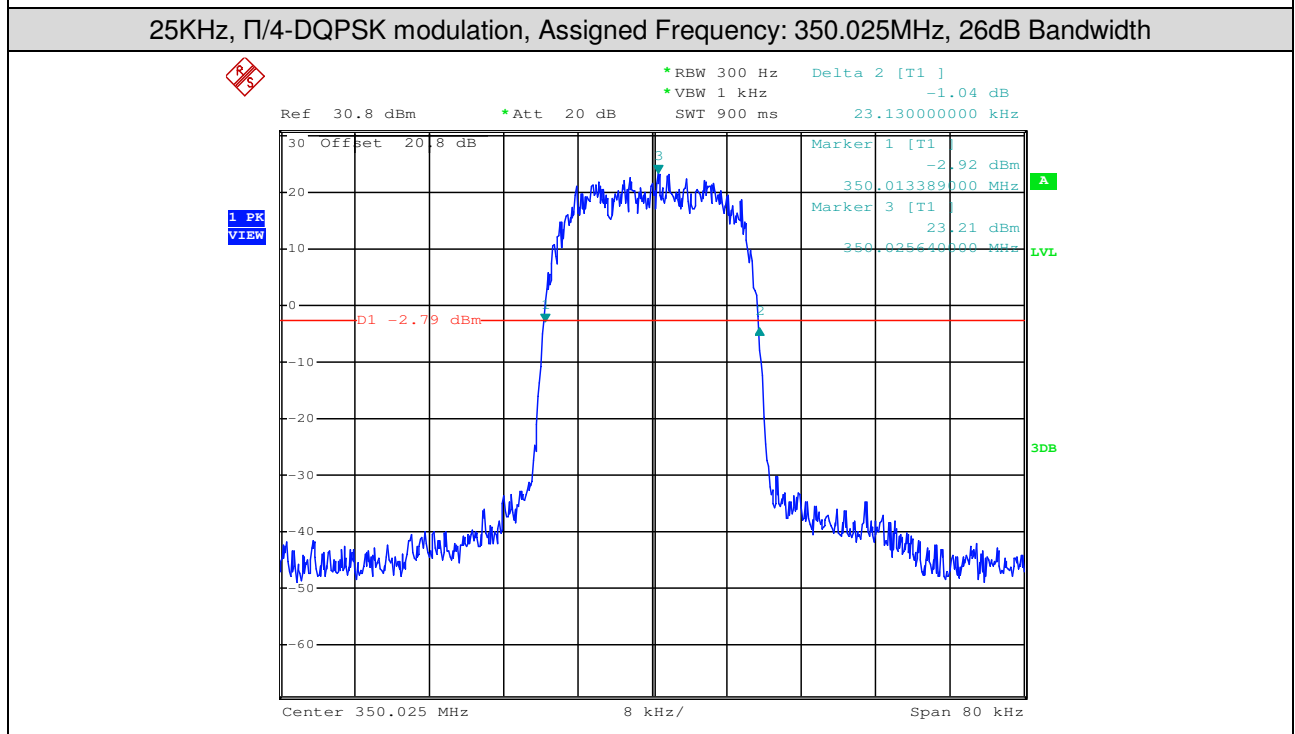
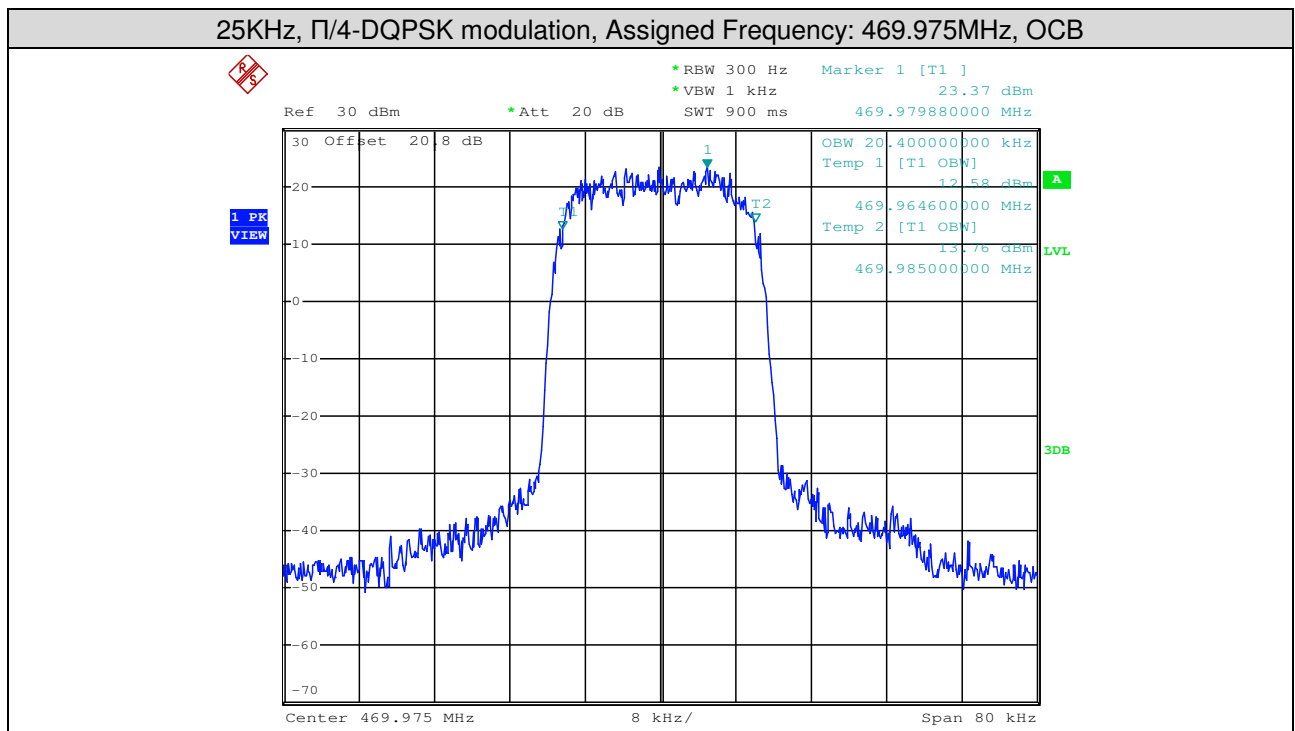


25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 450.025MHz, OCB



25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 459.975MHz, OCB



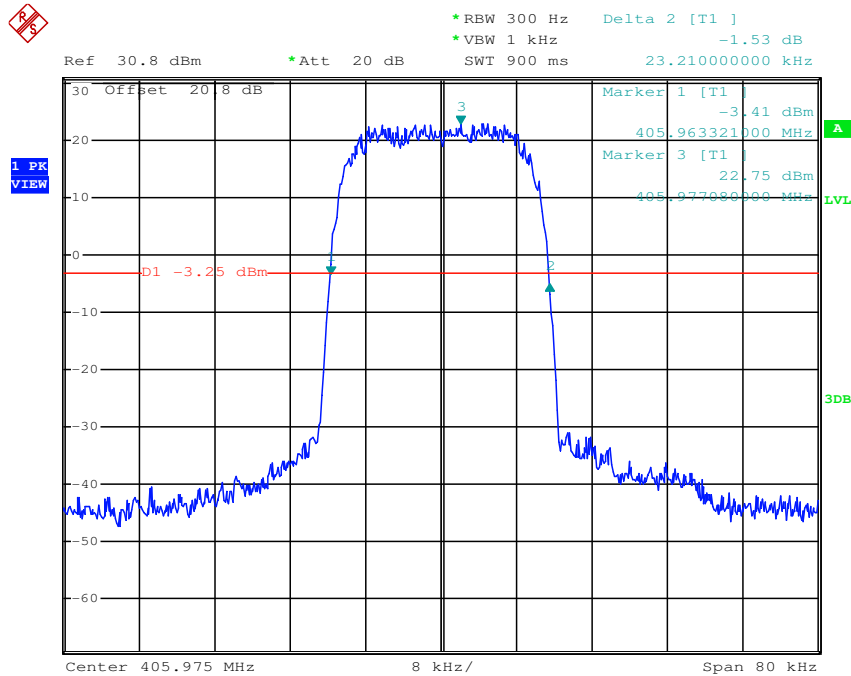


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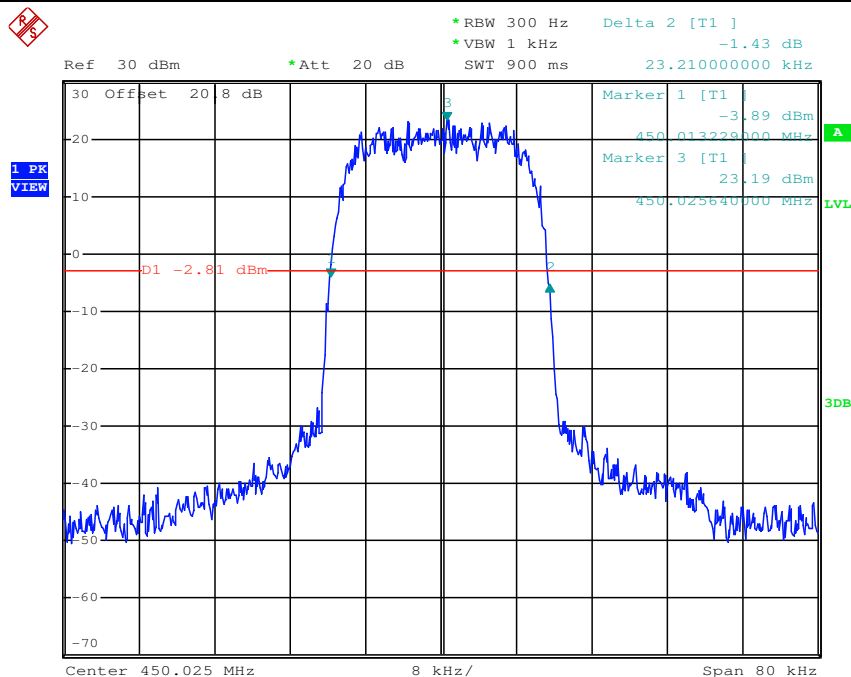
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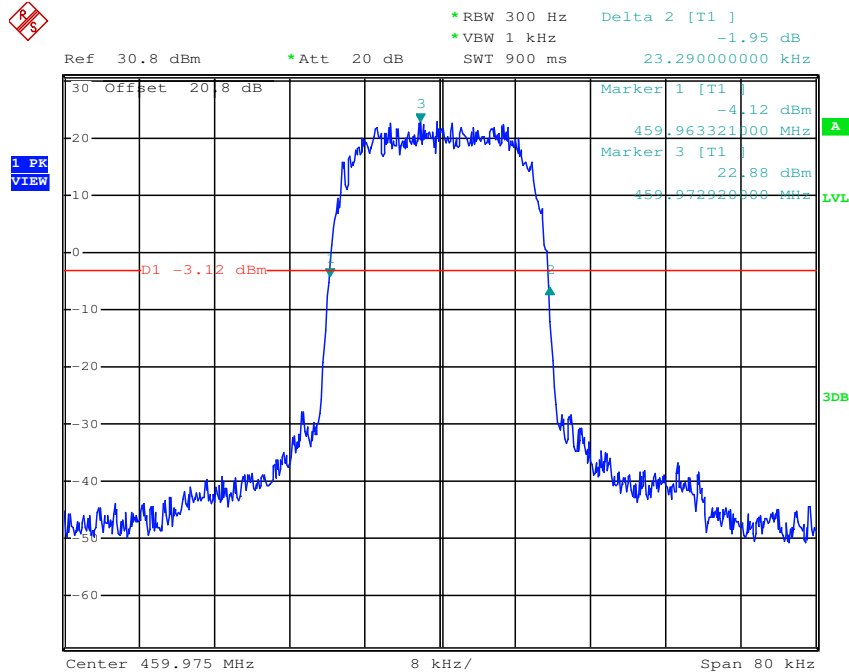
25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 405.975MHz, 26dB Bandwidth



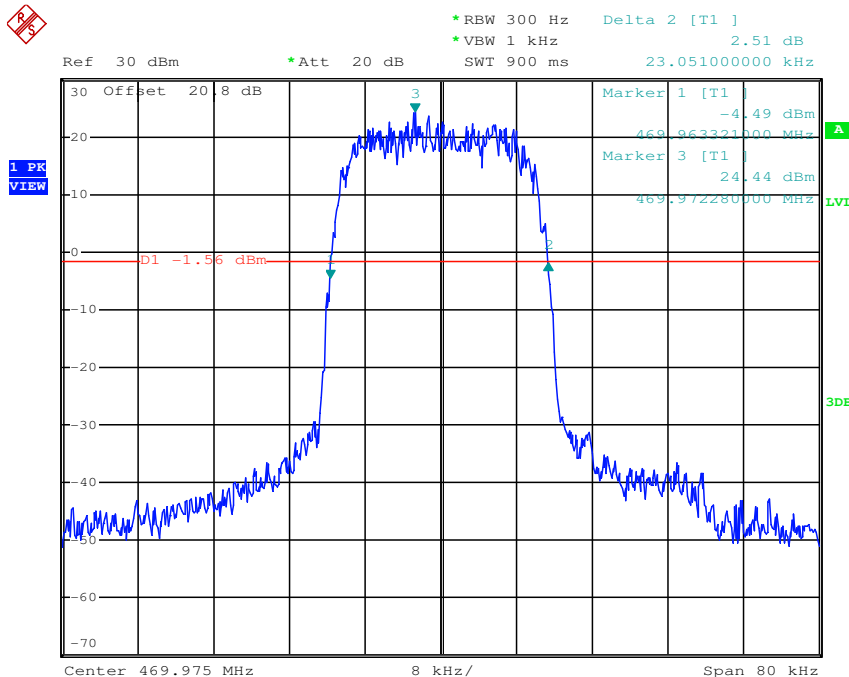
25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 450.025MHz, 26dB Bandwidth



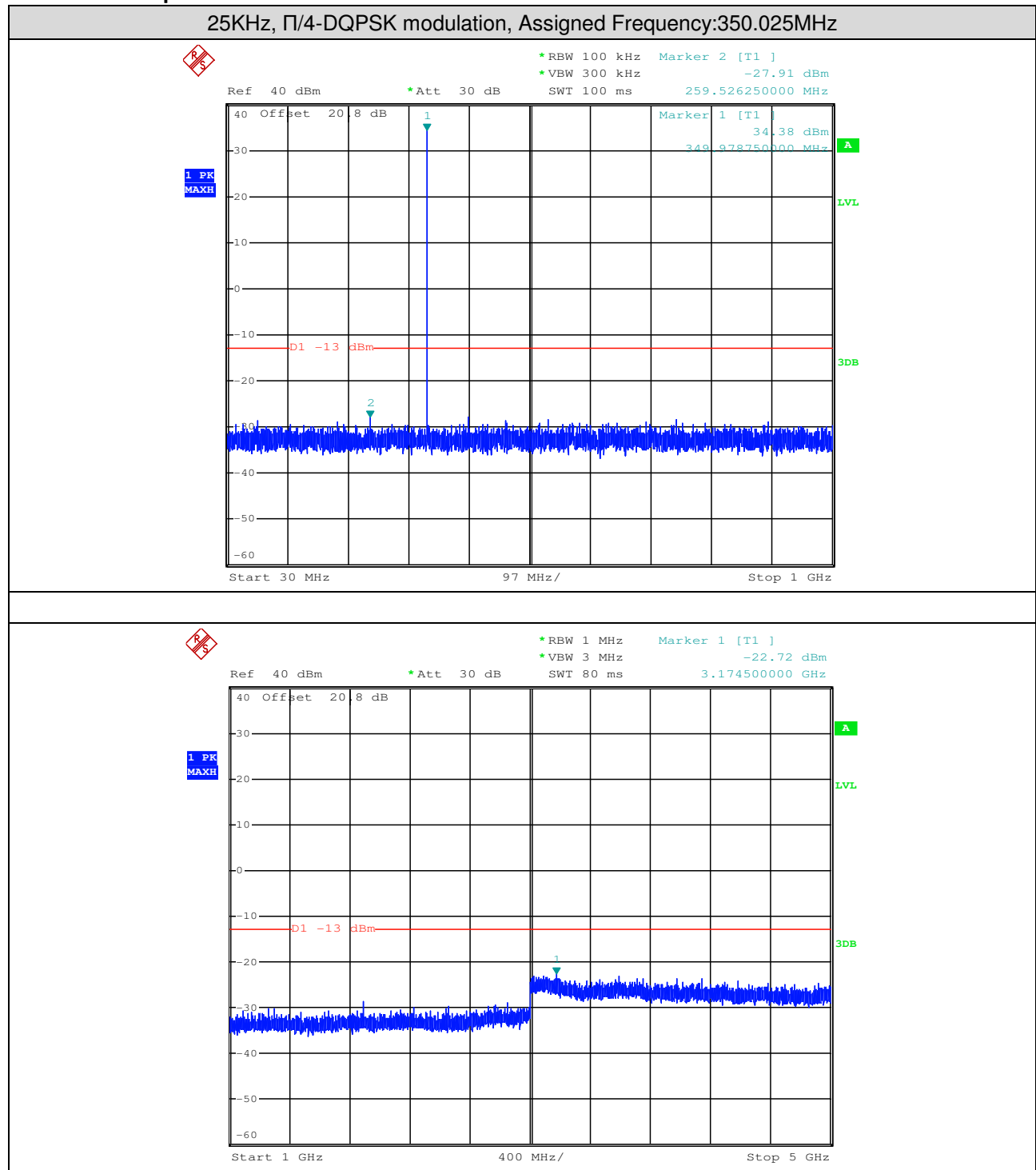
25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 459.975MHz, 26dB Bandwidth



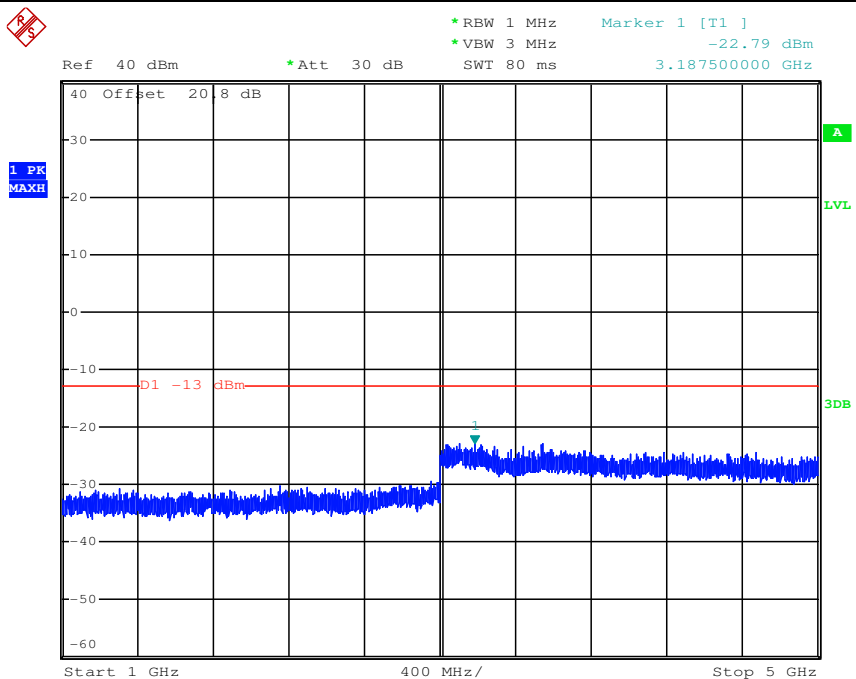
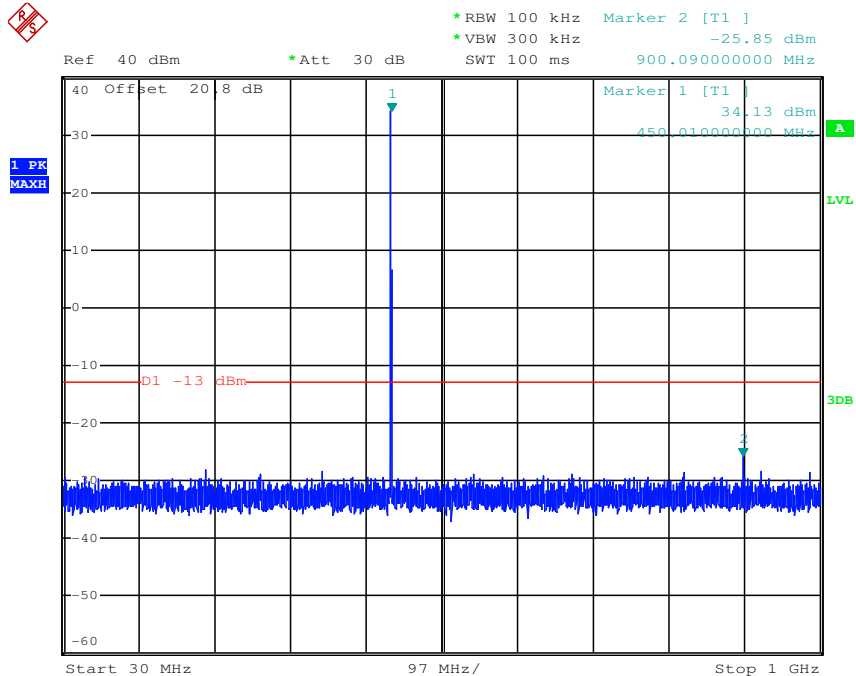
25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 469.975MHz, 26dB Bandwidth



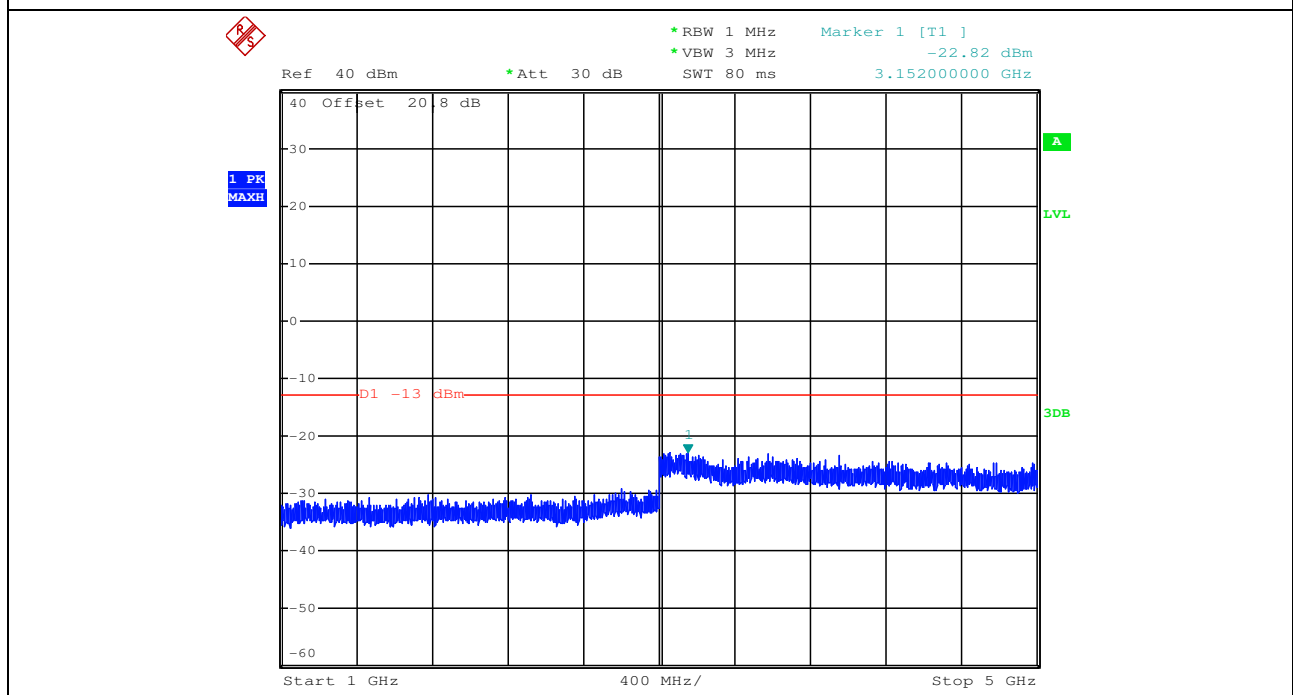
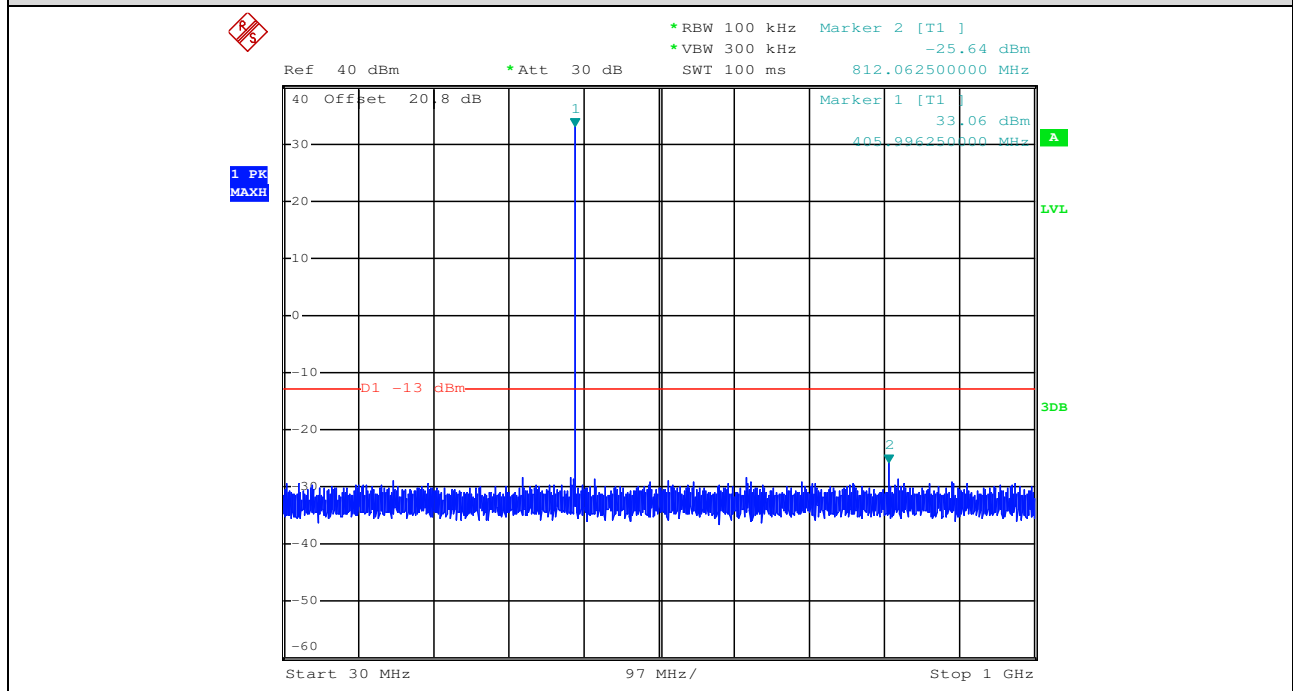
4. Conducted Spurious Emission



25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 405.975MHz

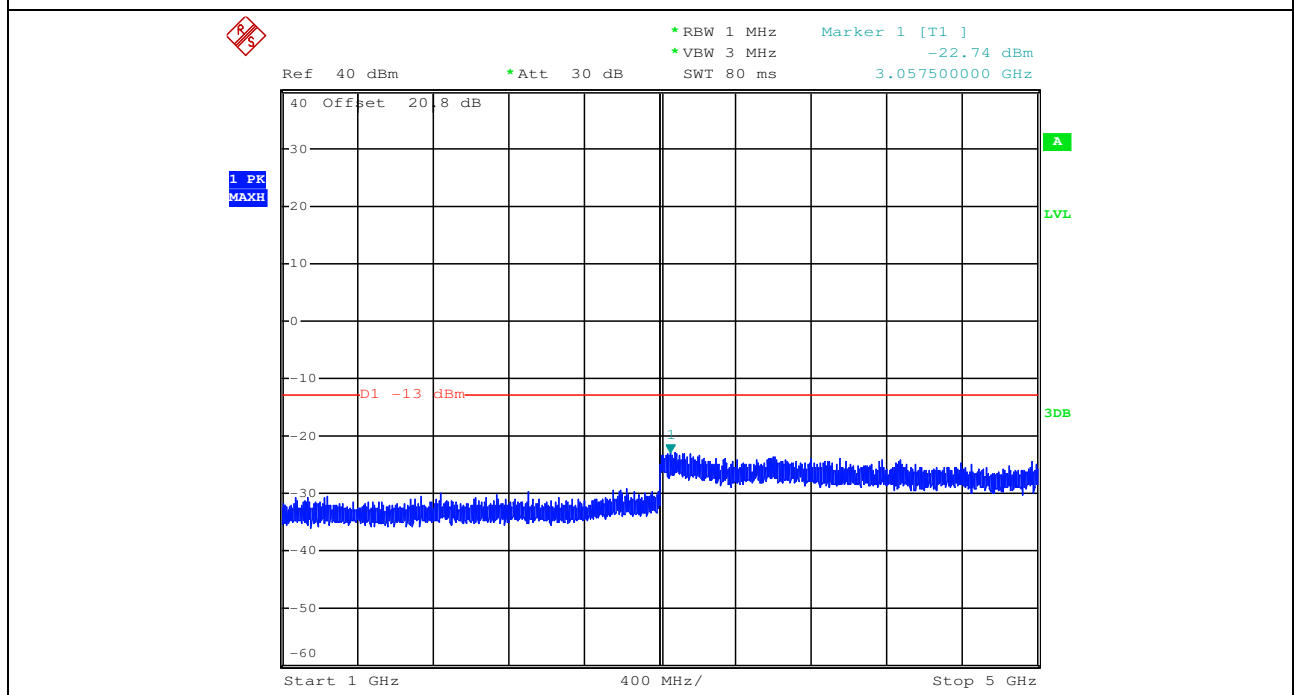
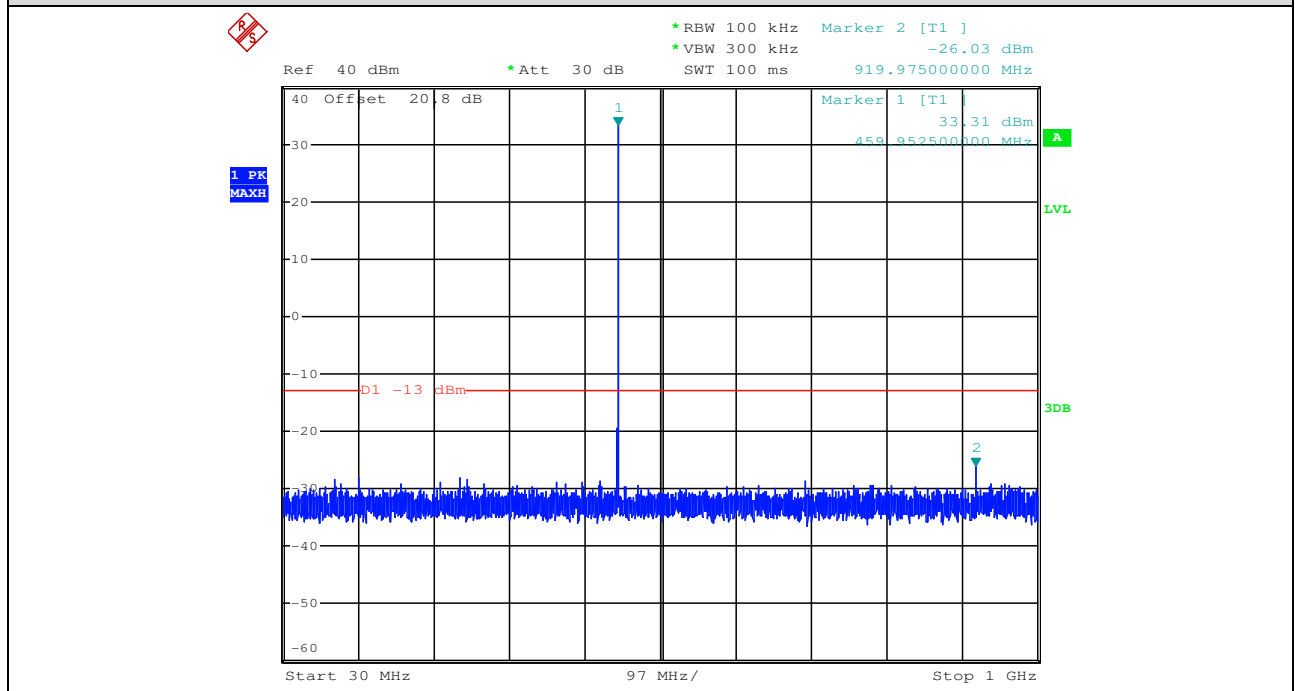


25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency:450.025MHz





25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 459.975MHz



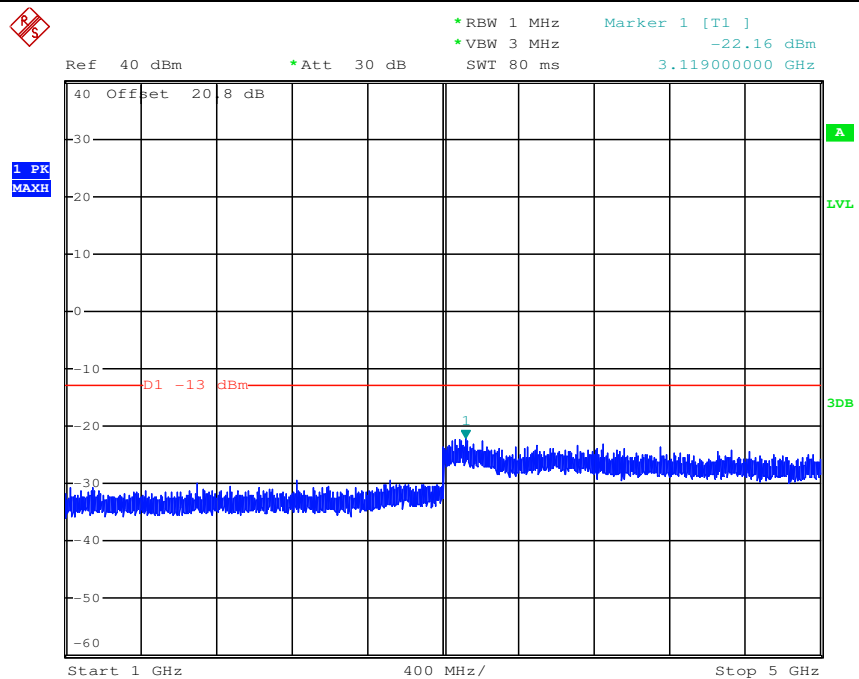
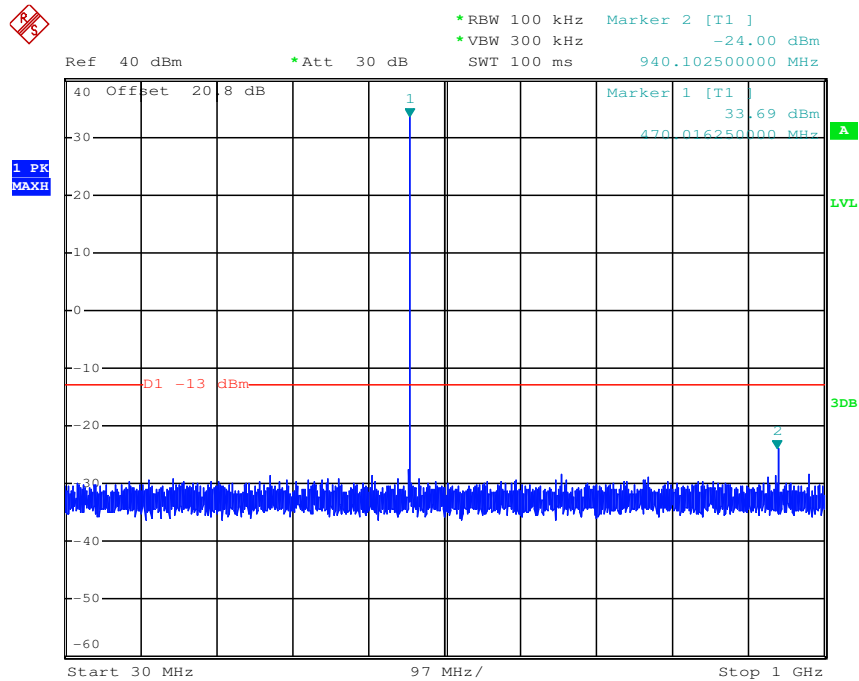
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25KHz, $\pi/4$ -DQPSK modulation, Assigned Frequency: 469.975MHz



5. Radiated Spurious Emission

25KHz, $\Pi/4$ -DQPSK modulation, Assigned Frequency: 350.025MHz								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
1050.075	-59.83	0.43	1.9	-60.51	-13	-47.51	Horizontal	Pass
1400.100	-55.63	0.43	1.9	-56.31	-13	-43.31	Horizontal	Pass
1750.125	-60.86	0.52	6	-57.53	-13	-44.53	Horizontal	Pass
1050.075	-59.43	0.43	1.9	-60.11	-13	-47.11	Vertical	Pass
1400.100	-55.01	0.43	1.9	-55.69	-13	-42.69	Vertical	Pass
1750.125	-59.47	0.52	6	-56.14	-13	-43.14	Vertical	Pass

25KHz, $\Pi/4$ -DQPSK modulation, Assigned Frequency: 450.025MHz								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
1050.075	-54.64	0.43	1.9	-55.32	-13	-42.32	Horizontal	Pass
1400.100	-55.87	0.43	1.9	-56.55	-13	-43.55	Horizontal	Pass
1750.125	-55.53	0.52	6	-52.2	-13	-39.20	Horizontal	Pass
1350.075	-54.87	0.43	1.9	-55.55	-13	-42.55	Vertical	Pass
1800.100	-59.38	0.52	6	-56.05	-13	-43.05	Vertical	Pass
2250.125	-58.57	0.53	5.8	-55.45	-13	-42.45	Vertical	Pass

25KHz, $\Pi/4$ -DQPSK modulation, Assigned Frequency: 469.975MHz								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Polarization (H/V)	Result
1409.925	-54.81	0.43	1.9	-55.49	-13	-42.49	Horizontal	Pass
1879.900	-58.92	0.52	6	-55.59	-13	-42.59	Horizontal	Pass
2349.875	-57.97	0.53	5.8	-54.85	-13	-41.85	Horizontal	Pass
1409.925	-56.6	0.43	1.9	-57.28	-13	-44.28	Vertical	Pass
1879.900	-60.08	0.52	6	-56.75	-13	-43.75	Vertical	Pass
2349.875	-59.31	0.53	5.8	-56.19	-13	-43.19	Vertical	Pass

- End of the Report -



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