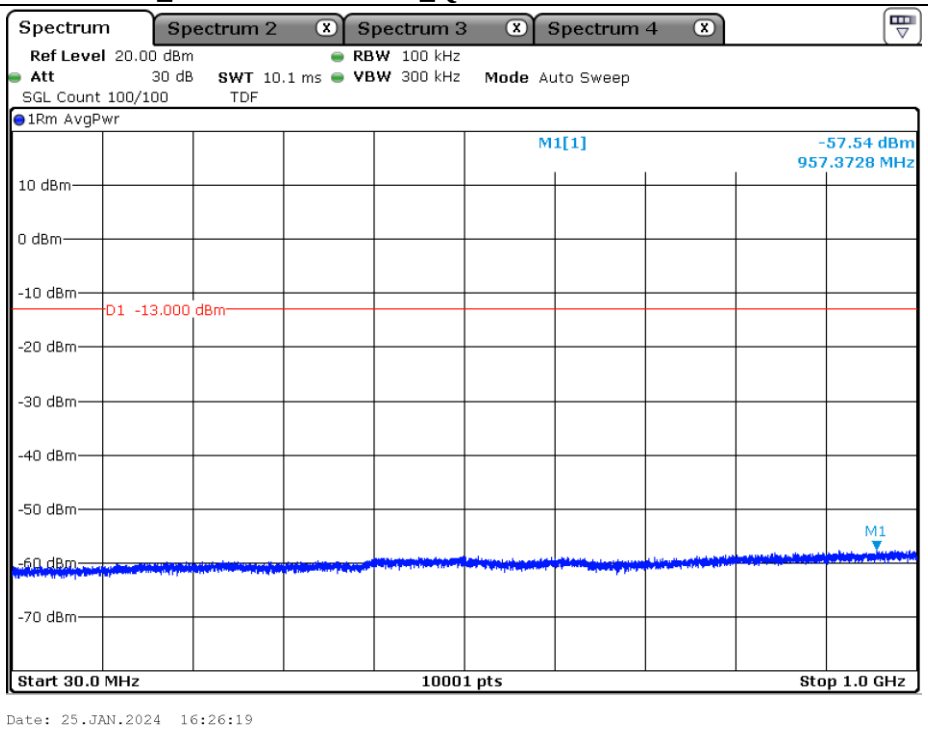
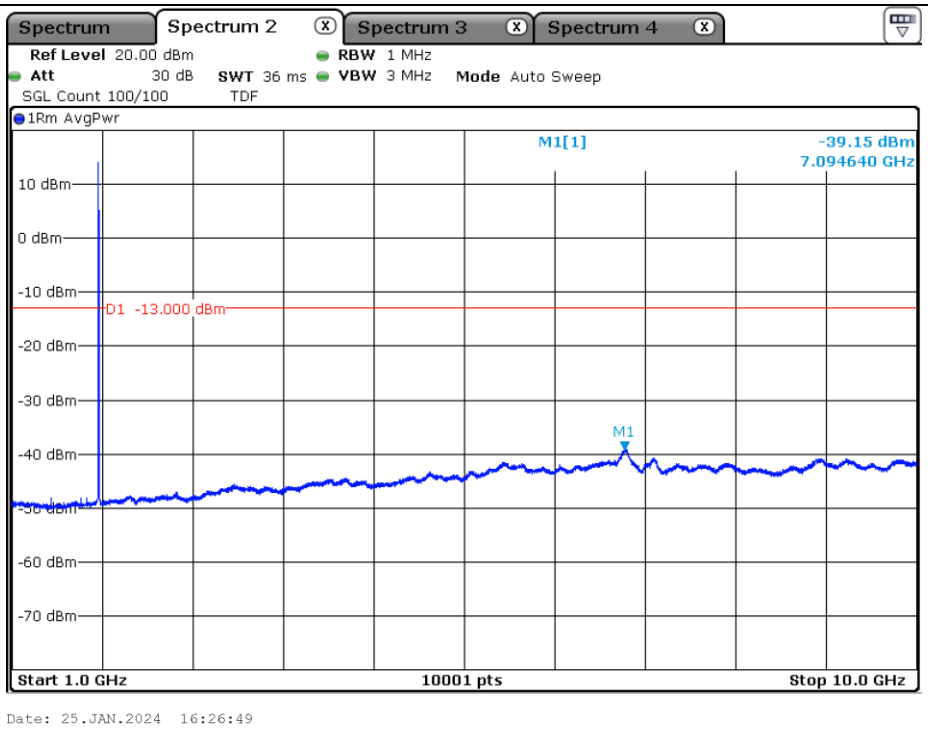
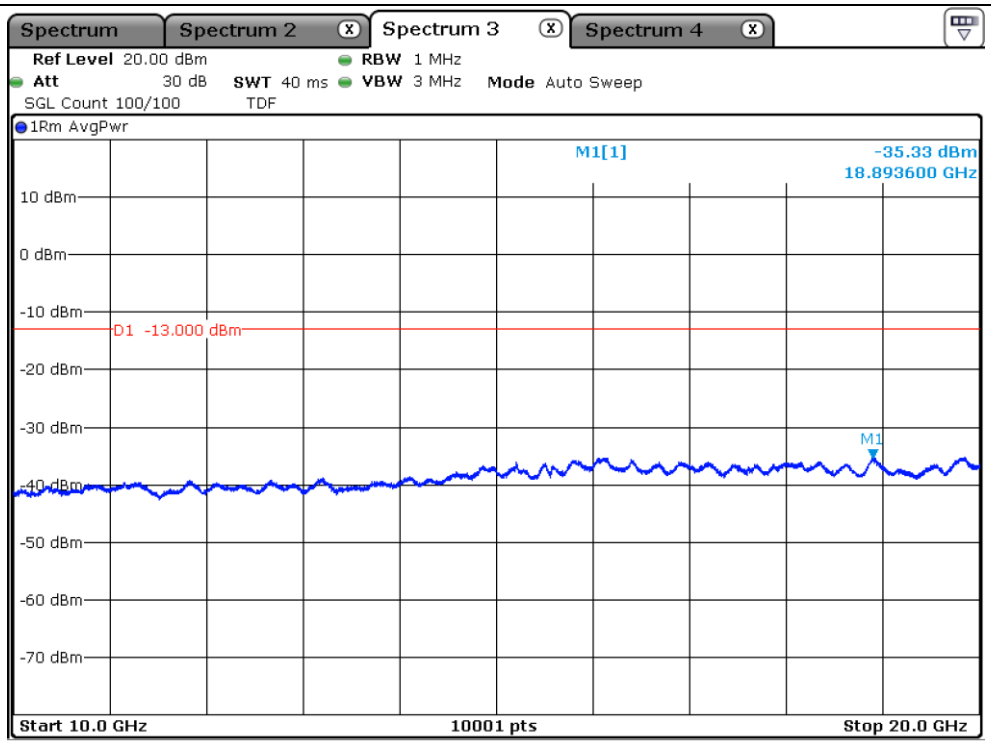
13.5.11 Test data for Band 2_Bandwidth 20 MHz_QPSK



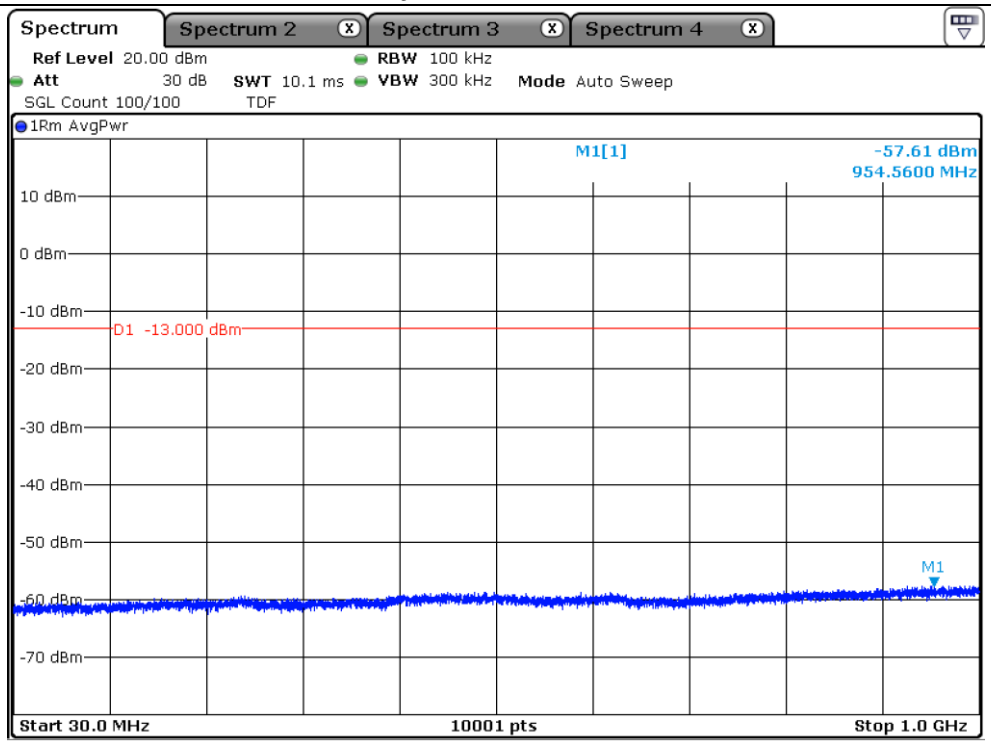
QPSK Low Channel



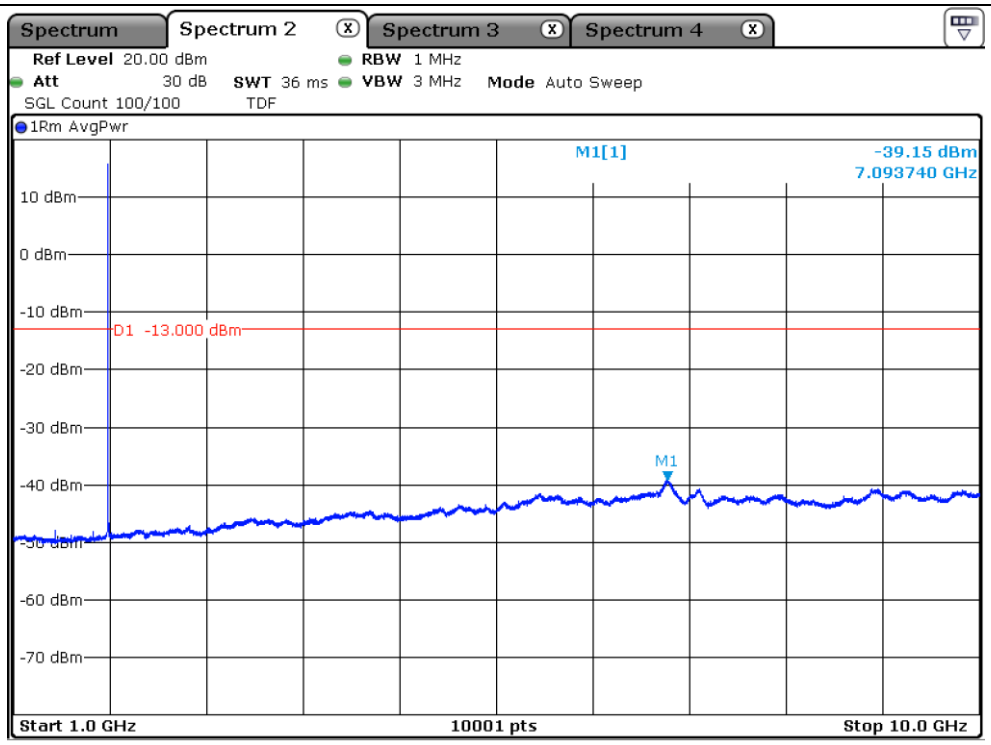
QPSK Low Channel



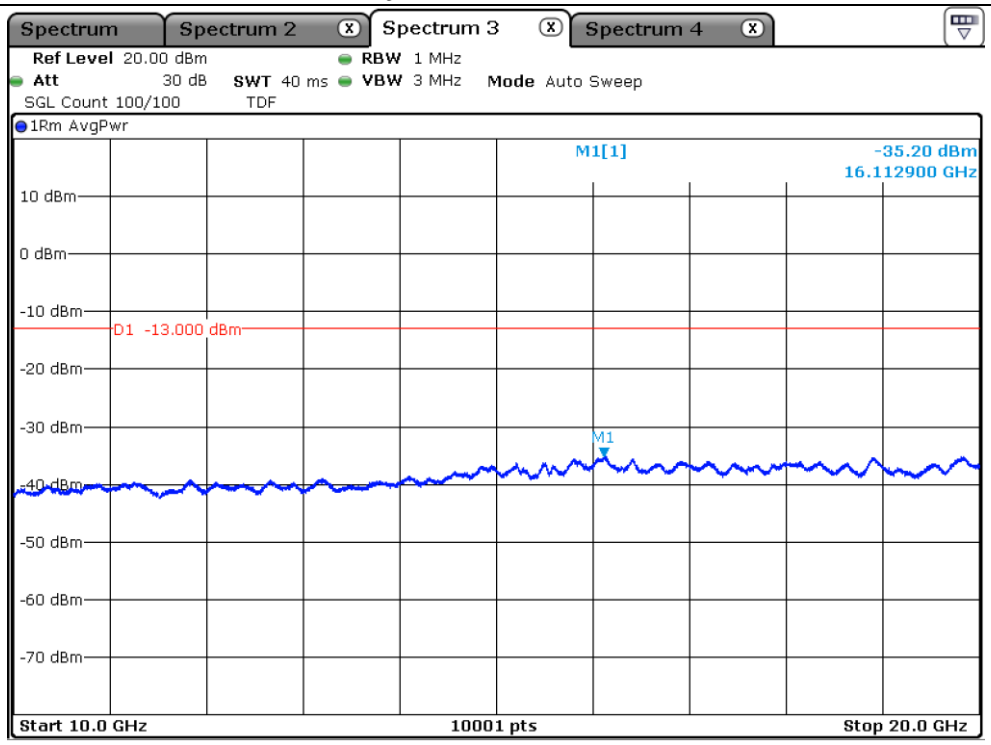
QPSK Low Channel



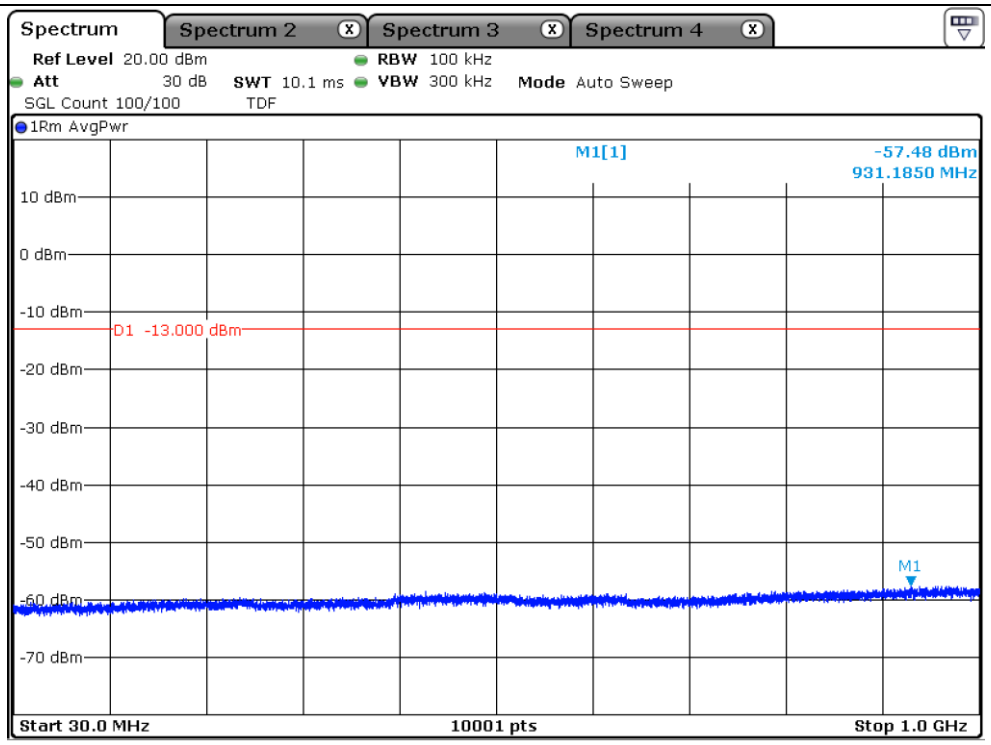
QPSK Middle Channel



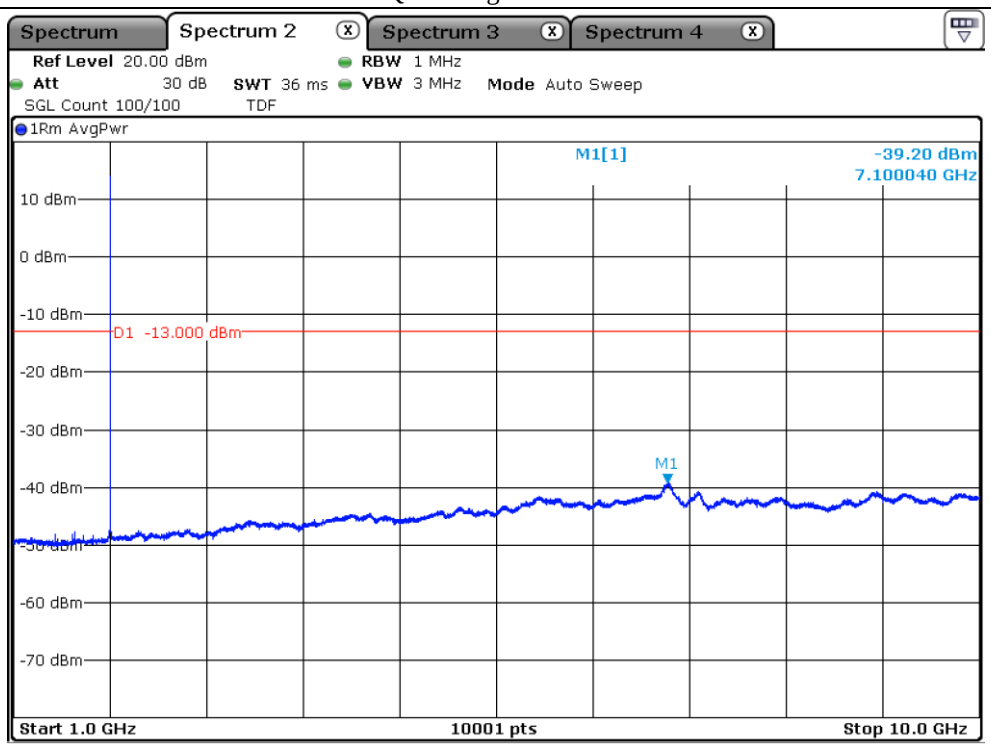
QPSK Middle Channel



QPSK Middle Channel

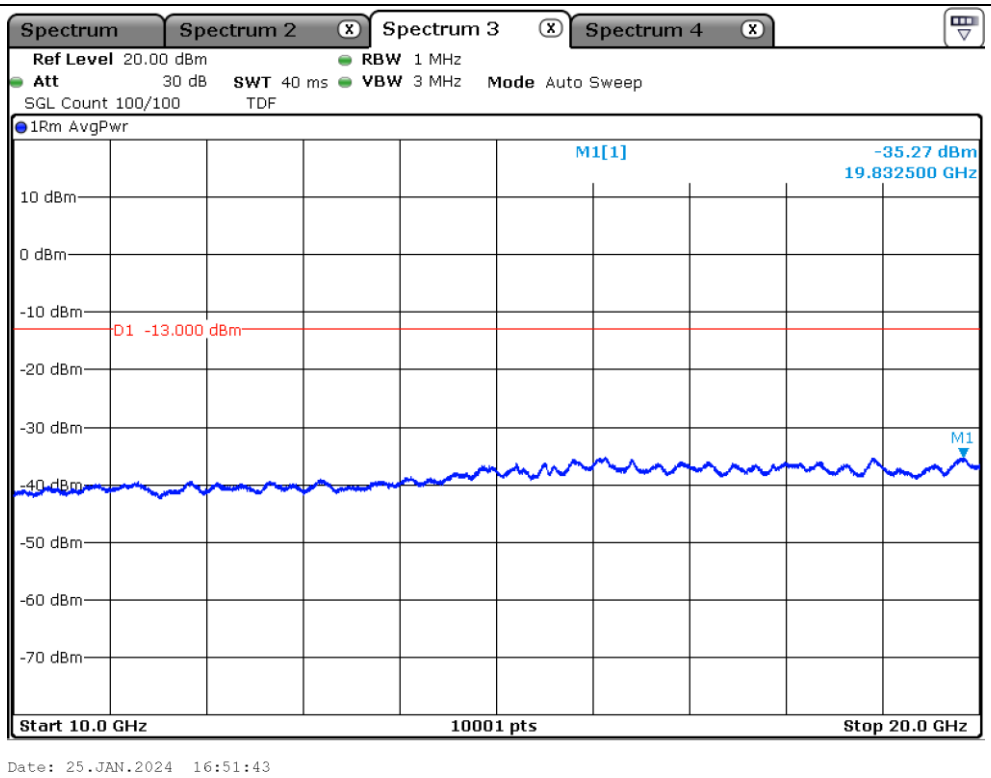


QPSK High Channel



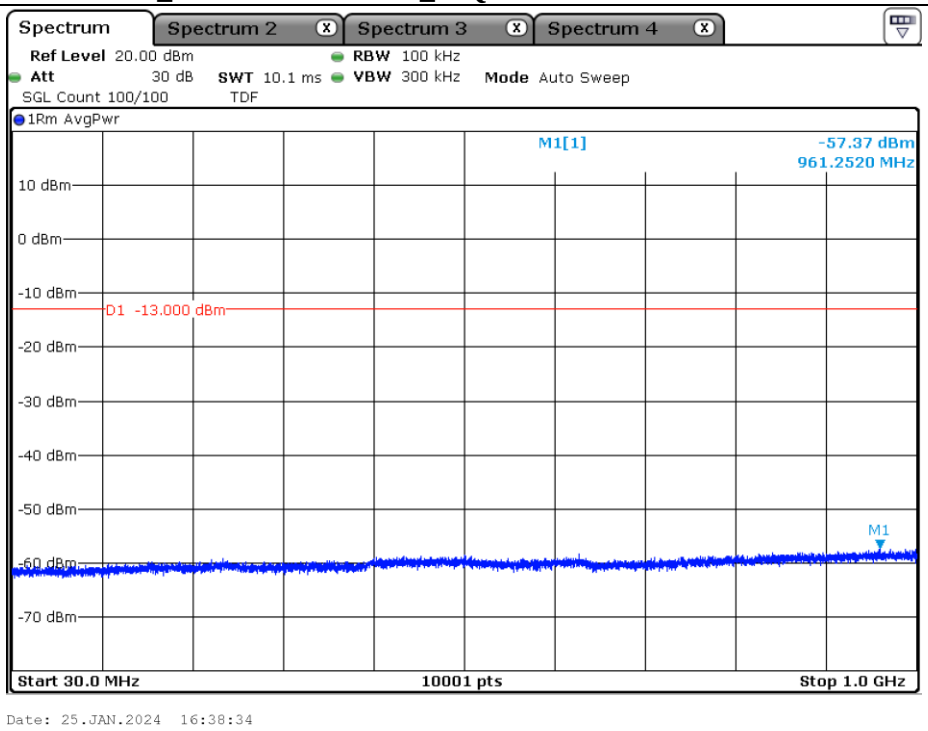
QPSK High Channel

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

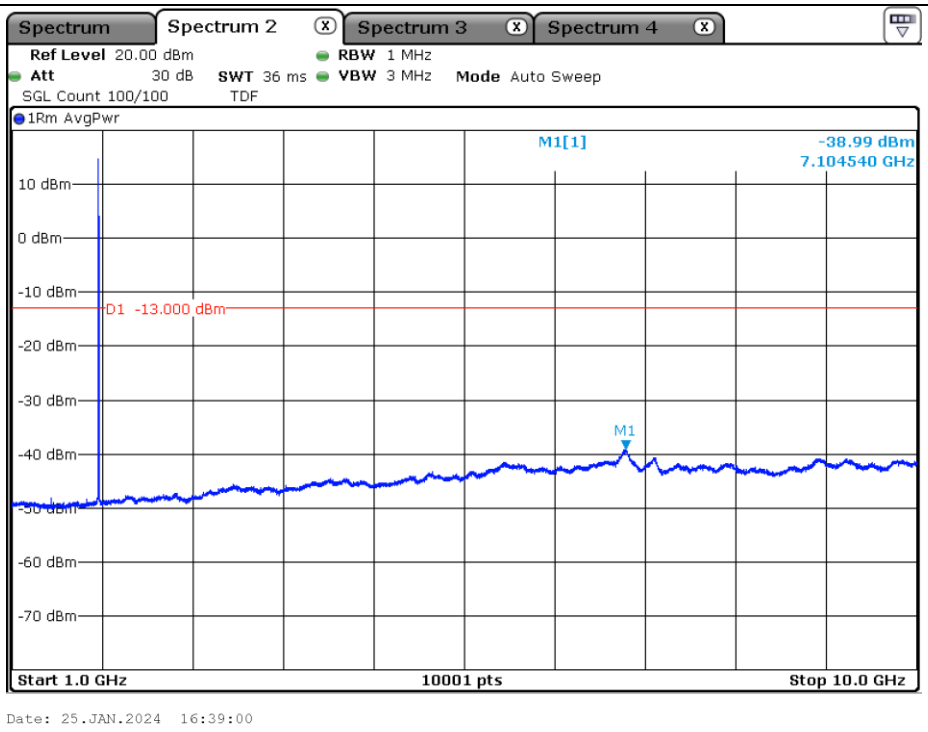


QPSK High Channel

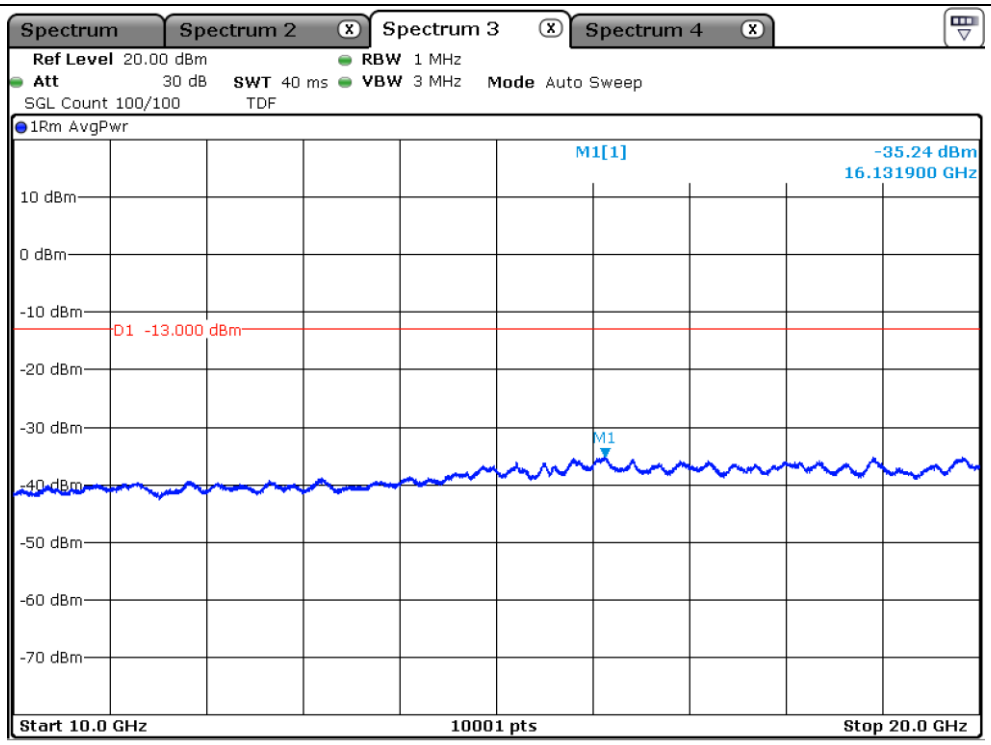
13.5.12 Test data for Band 2_Bandwidth 20 MHz_16QAM



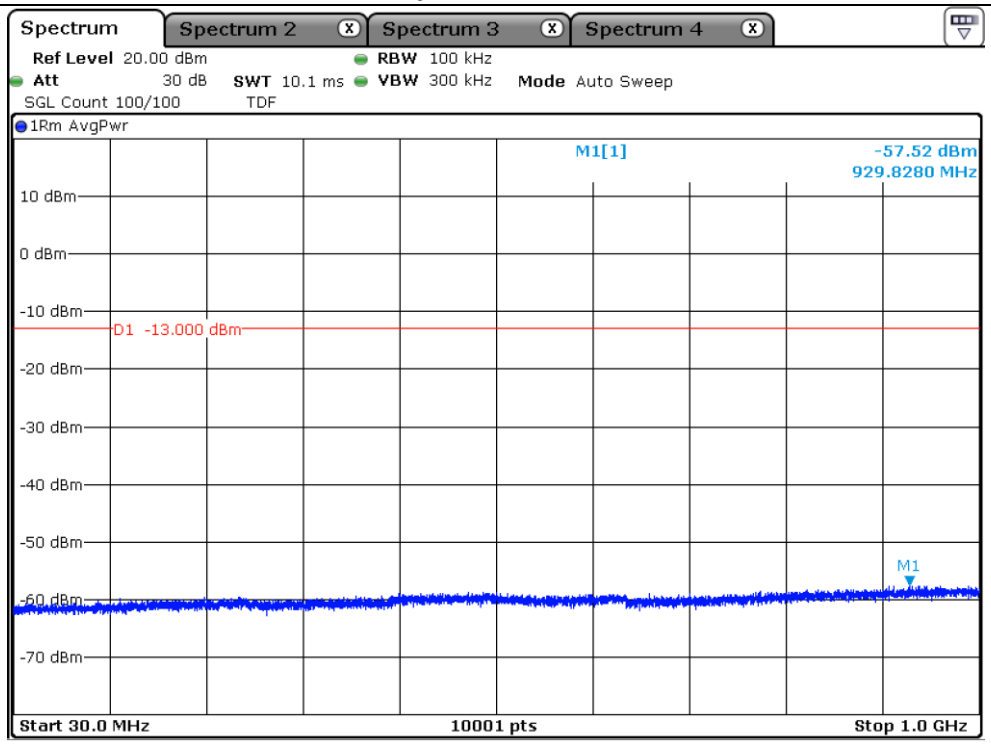
16QAM Low Channel



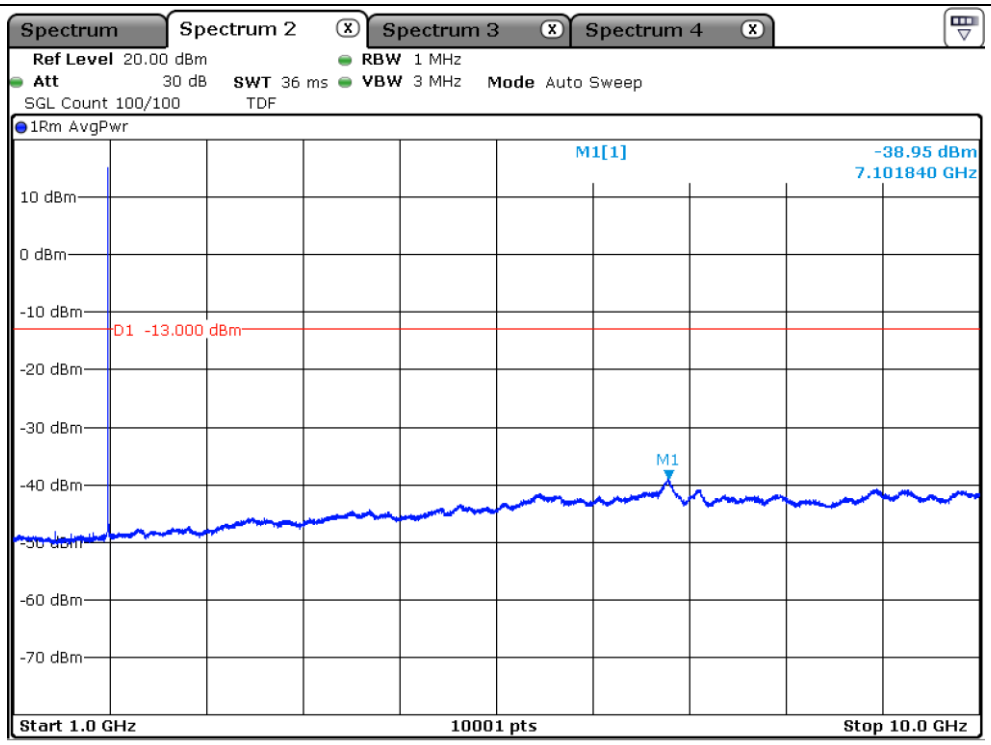
16QAM Low Channel



16QAM Low Channel

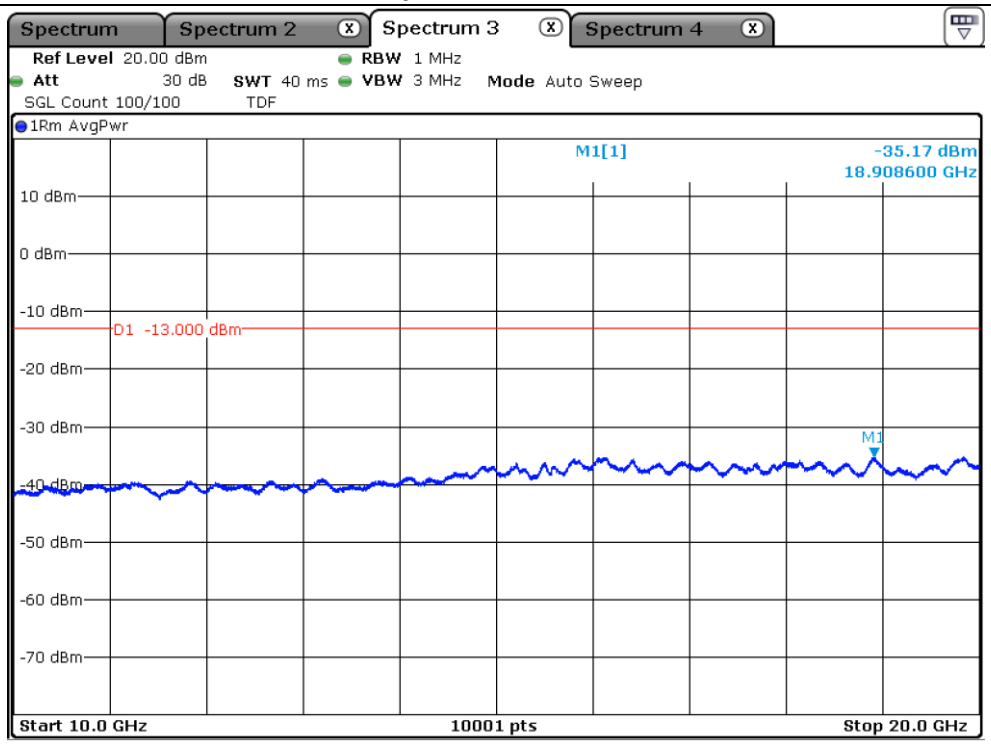


16QAM Middle Channel



Date: 25.JAN.2024 16:42:43

16QAM Middle Channel



Date: 25.JAN.2024 16:43:05

16QAM Middle Channel

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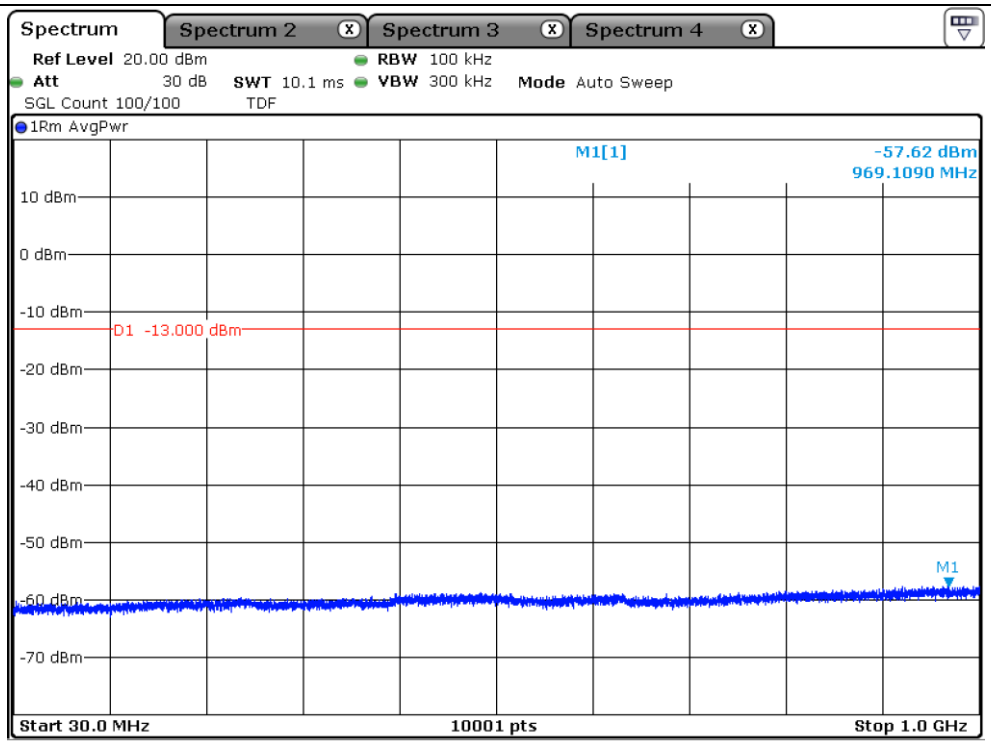
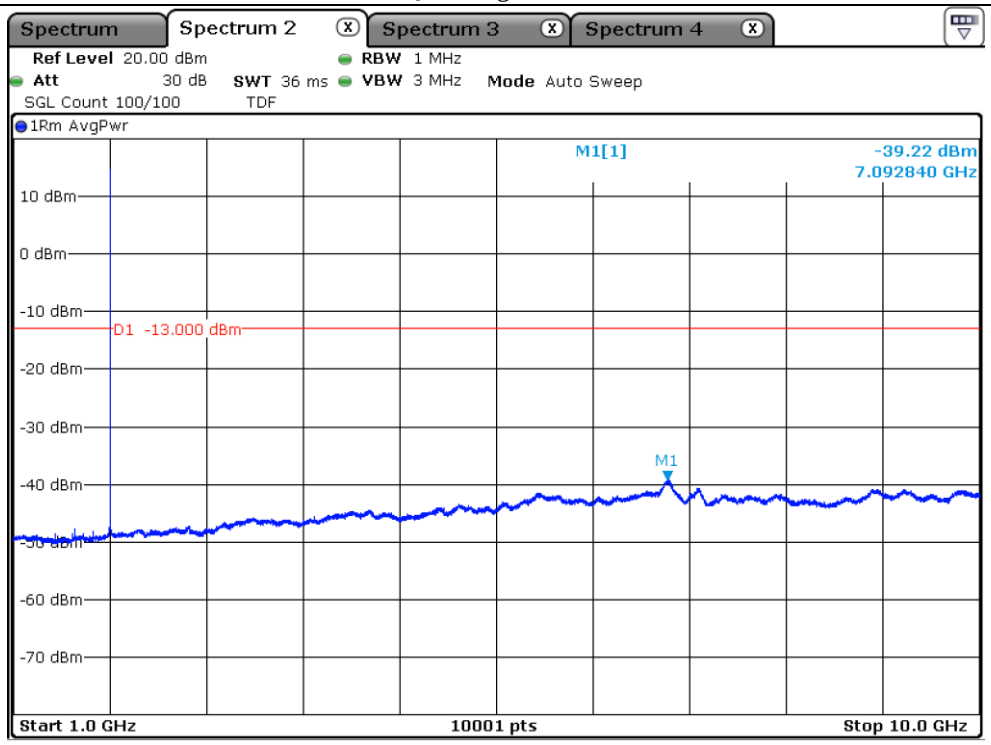
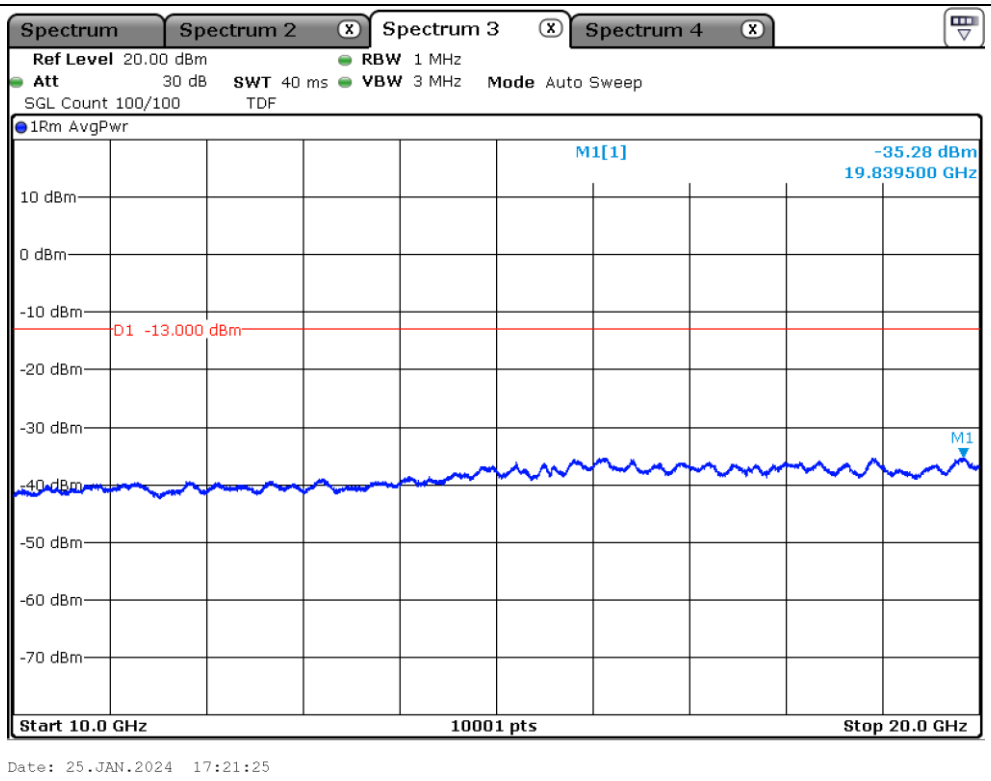


16QAM High Channel



16QAM High Channel



16QAM High Channel

14. FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

14.1 Operating environment

Temperature	:	22 °C
Relative humidity	:	45 % R.H.

14.2 Test set-up

1. Frequency Stability (Voltage Variation)

+20 °C temperature and ±15% supply voltage variations. If a product is specified to operate over a range of input voltage then the −15% variation is applied to the lowermost voltage and the +15% is applied to the uppermost voltage.

(1) Vary primary supply voltage from ±15% of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

2. Frequency Stability (Temperature Variation)

Turn EUT off and set chamber temperature to -30 °C and then allow sufficient time (approximately 20 to 30 minutes after chamber reach the assigned temperature) for EUT to stabilize. Turn ON EUT and measure the EUT operating frequency and then turn off the EUT after the measurement. The temperature in the chamber was raised 10 °C step from -30 °C to +50 °C. Repeat above method for frequency measurements every 10 °C step and then record all measured frequencies on each temperature step.

14.3 Test Date

January 15, 2024 ~ February 08, 2024

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14.4 Test data for Voltage(V)

Power (VDC)	LTE Band 2			
	Channel Bandwidth : 1.4 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 850.700 000		1 909.300 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.80	1 850.699 990	-0.01	1 909.299 990	-0.01
3.23	1 850.699 989	-0.01	1 909.299 989	-0.01
4.37	1 850.699 988	-0.01	1 909.299 986	-0.01

Power (VDC)	LTE Band 2			
	Channel Bandwidth : 3 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 851.500 000		1 908.500 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.80	1 851.500 005	0.00	1 908.499 996	0.00
3.23	1 851.500 007	0.00	1 908.499 993	0.00
4.37	1 851.500 009	0.00	1 908.499 995	0.00

Power (VDC)	LTE Band 2			
	Channel Bandwidth : 5 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 852.500 000		1 907.500 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.80	1 852.499 985	-0.01	1 907.499 988	-0.01
3.23	1 852.499 978	-0.01	1 907.499 986	-0.01
4.37	1 852.499 981	-0.01	1 907.499 988	-0.01

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Power (VDC)	LTE Band 2			
	Channel Bandwidth : 10 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 855.000 000		1 905.000 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.80	1 854.999 981	-0.01	1 904.999 982	-0.01
3.23	1 854.999 985	-0.01	1 904.999 983	-0.01
4.37	1 854.999 982	-0.01	1 904.999 986	-0.01

Power (VDC)	LTE Band 2			
	Channel Bandwidth : 15 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 857.500 000		1 902.500 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.80	1 857.499 988	-0.01	1 902.499 988	-0.01
3.23	1 857.499 985	-0.01	1 902.499 982	-0.01
4.37	1 857.499 983	-0.01	1 902.499 985	-0.01

Power (VDC)	LTE Band 2			
	Channel Bandwidth : 20 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 860.000 000		1 900.000 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.80	1 859.999 986	-0.01	1 899.999 988	-0.01
3.23	1 859.999 982	-0.01	1 899.999 983	-0.01
4.37	1 859.999 978	-0.01	1 899.999 984	-0.01

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14.5 Test data for Temperature(℃)

Temperature (℃)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 850.700 000		1 909.300 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1 850.699 988	-0.01	1 909.300 009	0.00
-20	1 850.700 008	0.00	1 909.300 008	0.00
-10	1 850.700 010	0.01	1 909.300 009	0.00
0	1 850.700 013	0.01	1 909.300 011	0.01
10	1 850.700 006	0.00	1 909.300 004	0.00
20	1 850.699 990	-0.01	1 909.299 990	-0.01
30	1 850.699 986	-0.01	1 909.299 989	-0.01
40	1 850.699 991	0.00	1 909.299 991	0.00
50	1 850.699 994	0.00	1 909.299 989	-0.01

Temperature (℃)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 851.500 000		1 908.500 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1 851.500 016	0.01	1 908.500 008	0.00
-20	1 851.500 015	0.01	1 908.500 004	0.00
-10	1 851.500 013	0.01	1 908.500 002	0.00
0	1 851.500 011	0.01	1 908.500 009	0.00
10	1 851.500 007	0.00	1 908.500 003	0.00
20	1 851.500 005	0.00	1 908.499 996	0.00
30	1 851.499 995	0.00	1 908.499 989	-0.01
40	1 851.499 994	0.00	1 908.499 988	-0.01
50	1 851.499 993	0.00	1 908.499 986	-0.01

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Temperature (°C)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 852.500 000		1 907.500 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1 852.499 981	-0.01	1 907.500 007	0.00
-20	1 852.500 012	0.01	1 907.500 006	0.00
-10	1 852.500 007	0.00	1 907.500 003	0.00
0	1 852.499 998	0.00	1 907.499 998	0.00
10	1 852.499 991	0.00	1 907.499 991	0.00
20	1 852.499 985	-0.01	1 907.499 988	-0.01
30	1 852.499 989	-0.01	1 907.499 990	-0.01
40	1 852.499 985	-0.01	1 907.499 985	-0.01
50	1 852.499 980	-0.01	1 907.499 981	-0.01

Temperature (°C)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 855.000 000		1 905.000 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1 855.000 009	0.00	1 905.000 011	0.01
-20	1 854.999 999	0.00	1 905.000 002	0.00
-10	1 855.000 006	0.00	1 905.000 007	0.00
0	1 855.000 018	0.01	1 905.000 011	0.01
10	1 855.000 006	0.00	1 905.000 007	0.00
20	1 854.999 981	-0.01	1 904.999 982	-0.01
30	1 854.999 987	-0.01	1 904.999 987	-0.01
40	1 854.999 985	-0.01	1 904.999 985	-0.01
50	1 854.999 982	-0.01	1 904.999 987	-0.01

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Temperature (°C)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 857.500 000		1 902.500 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1 857.499 985	-0.01	1 902.499 983	-0.01
-20	1 857.500 007	0.00	1 902.500 008	0.00
-10	1 857.500 008	0.00	1 902.500 007	0.00
0	1 857.500 006	0.00	1 902.500 007	0.00
10	1 857.500 001	0.00	1 902.499 997	0.00
20	1 857.499 988	-0.01	1 902.499 988	-0.01
30	1 857.499 989	-0.01	1 902.499 991	0.00
40	1 857.500 002	0.00	1 902.499 990	-0.01
50	1 857.500 011	0.01	1 902.499 988	-0.01

Temperature (°C)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel (MHz)		High Channel (MHz)	
	1 860.000 000		1 900.000 000	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1 859.999 990	-0.01	1 899.999 988	-0.01
-20	1 859.999 993	0.00	1 899.999 998	0.00
-10	1 860.000 002	0.00	1 900.000 002	0.00
0	1 860.000 008	0.00	1 900.000 007	0.00
10	1 859.999 995	0.00	1 899.999 997	0.00
20	1 859.999 986	-0.01	1 899.999 988	-0.01
30	1 859.999 988	-0.01	1 899.999 993	0.00
40	1 859.999 990	-0.01	1 899.999 991	0.00
50	1 859.999 991	0.00	1 899.999 989	-0.01

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15. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSVA40	Rohde & Schwarz	Signal Analyzer	101593	Jan. 15, 2024 (1Y)
152610	KRYTAR	Directional Coupler	214012	Jan. 17, 2024 (1Y)
MT8821C	ANRITSU	Radio Communication Analyzer	6261849029	Jul. 14, 2023 (1Y)
E3632A	Agilent	DC Power Supply	MY50370016	Jan. 15, 2024 (1Y)
PSL-2KP	ESPEC	Environmental Test Chamber	14009407	Jan. 15, 2024 (1Y)
ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 06, 2023 (1Y)
ELNA03	EXYNOD	RF Pre Amplifier	26594	Jan. 16, 2024 (1Y)
ELNA18	EXYNOD	RF Pre Amplifier	27594	Jan. 16, 2024 (1Y)
ELNA40	EXYNOD	RF Pre Amplifier	25339-27648	Jan. 23, 2024 (1Y)
FMZB1513	Schwarzbeck	Loop Antenna	50841	Mar. 24, 2022 (2Y)
VULB9163	Schwarzbeck	TRILOG Broadband Antenna	777	Jan. 26, 2024 (2Y)
HLP-2008	TDK RF Solutions	Hybrid Antenna	131316	Mar. 07, 2022 (2Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1349	Jul. 04, 2023 (1Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jun. 22, 2023 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 04, 2024 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 23, 2024 (1Y)
HPF 1.1 GHz	Rohde & Schwarz	High Pass Filter	N/A	Jan. 15, 2024 (1Y)
HPF 3GHz	Rohde & Schwarz	High Pass Filter	N/A	Jan. 15, 2024 (1Y)
MA-4640-XPET	Innco Systems GmbH	Antenna Master	MA4640/652	N/A
DT2000-2t	Innco Systems GmbH	Turn Table	N/A	N/A

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