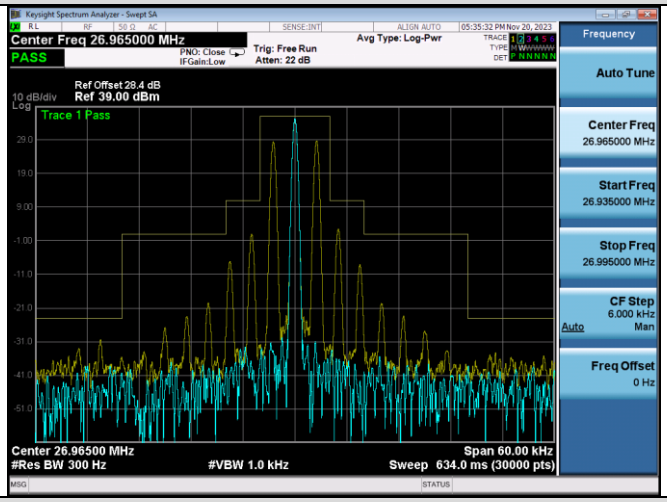
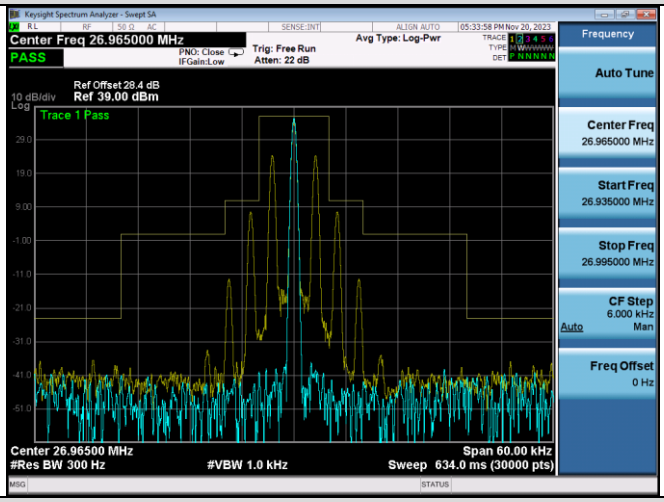
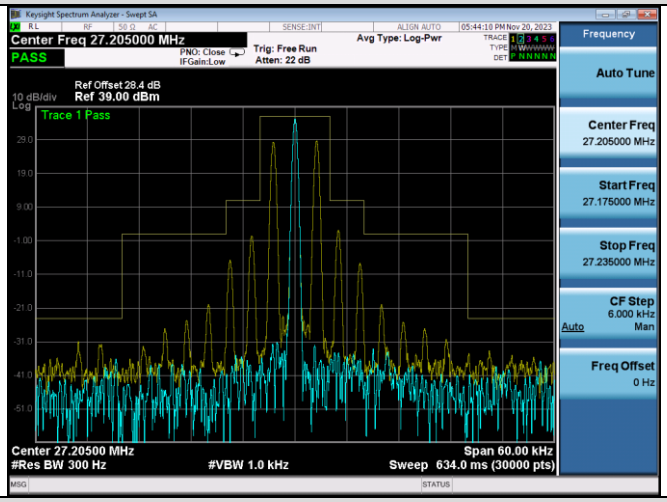
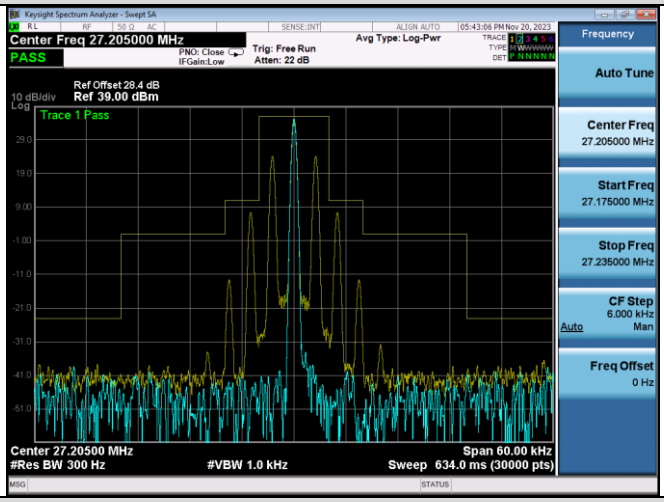
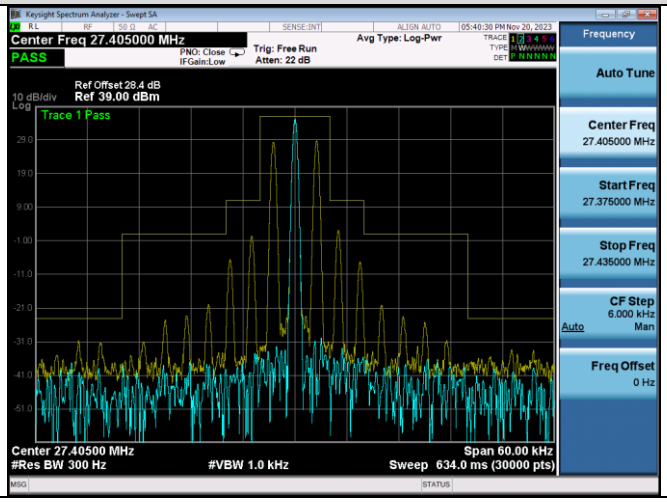
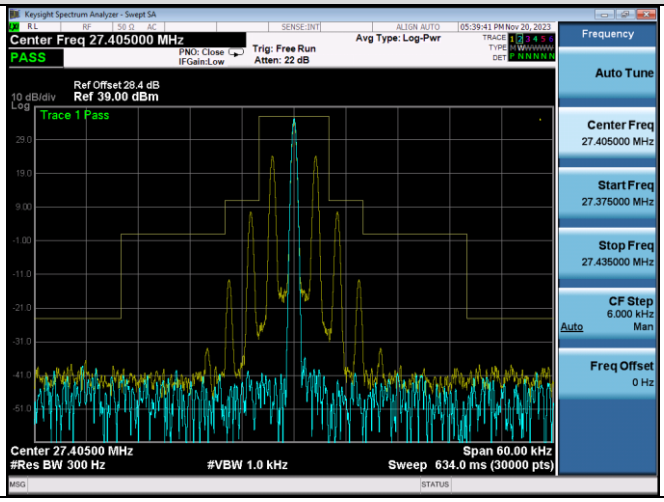
Test plot as follows: DC 24V

Emission Mask- AM Modulation @ 26.965MHz	Emission Mask- FM Modulation @ 26.965MHz
	
Emission Mask- AM Modulation @ 27.205MHz	**Emission Mask- FM Modulation @ 27.205MHz**
	
Emission Mask- AM Modulation @ 27.405MHz	**Emission Mask- FM Modulation @ 27.405MHz**
	

9. Spurious Emission on Antenna Port

9.1 Provisions Applicable

Please refer to FCC 47 CFR 2.1051, 2.1057 & 95.979 for specification details.
Emissions shall be attenuated below the mean output power of the transmitter as follows:

FCC Rules	Attenuation Limit (dBc)
§ 95.979	At least 53 + 10 log (P) dB
§ 95.979	60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency.

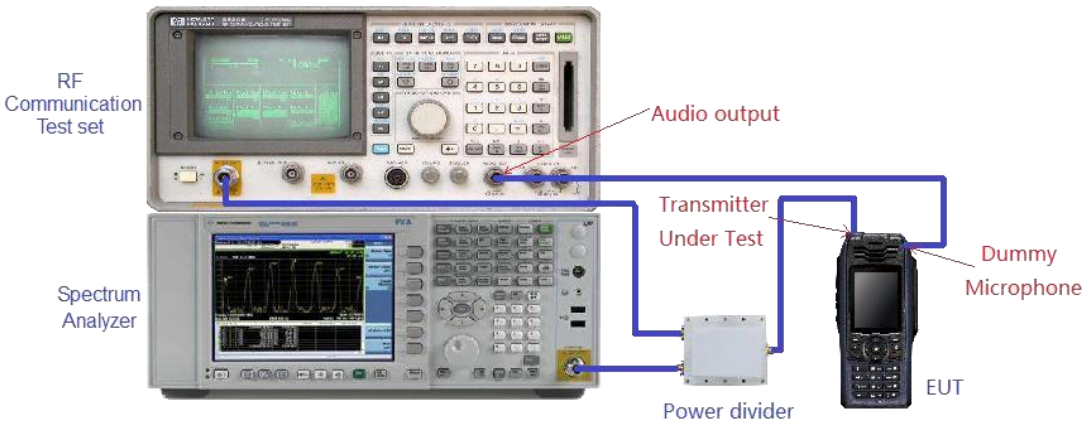
53 + 10 log (Pwatts)
Calculation: Limit (dBm) =EL-53-10log10 (TP)
Notes: EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is P(dBm).
Limit (dBm) = P(dBm)-53-10 log (Pwatts) = -23 dBm

Note:
UNWANTED Emission LIMIT =P(dBm)-53-10 log (Pwatts) = -23 dBm
HARMONIC Emission LIMIT = MEASURED POWER (dBm) -60

9.2 Measurement Method

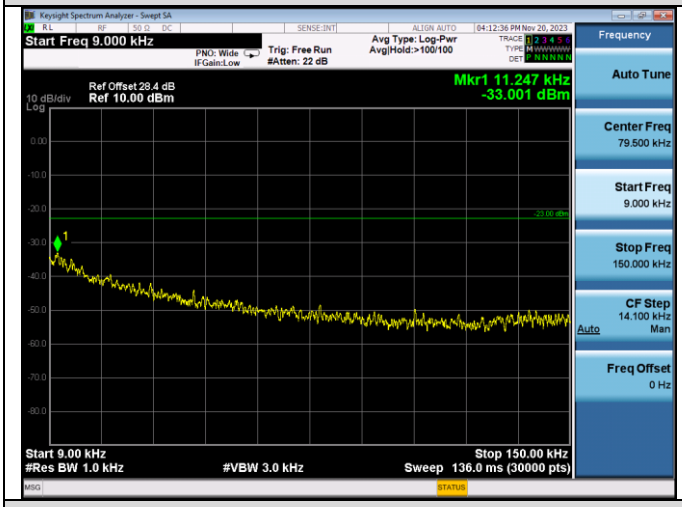
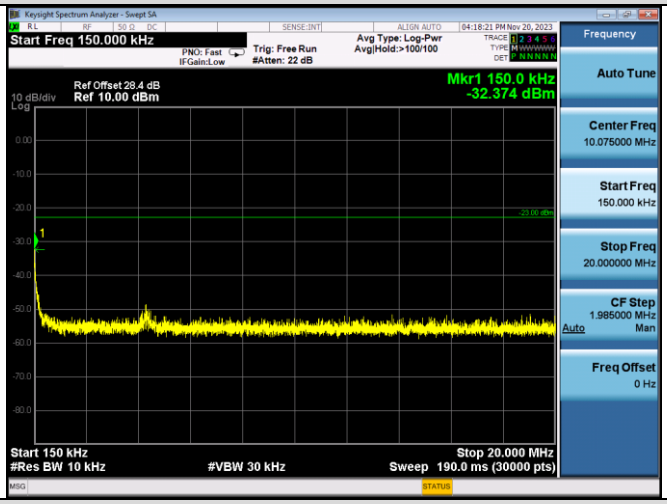
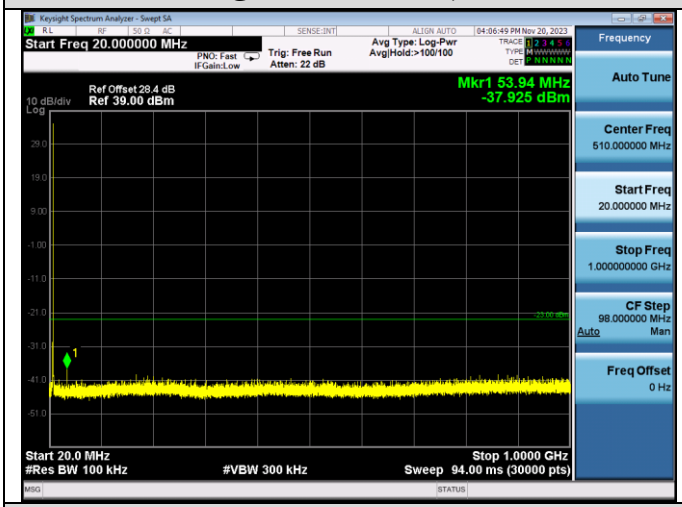
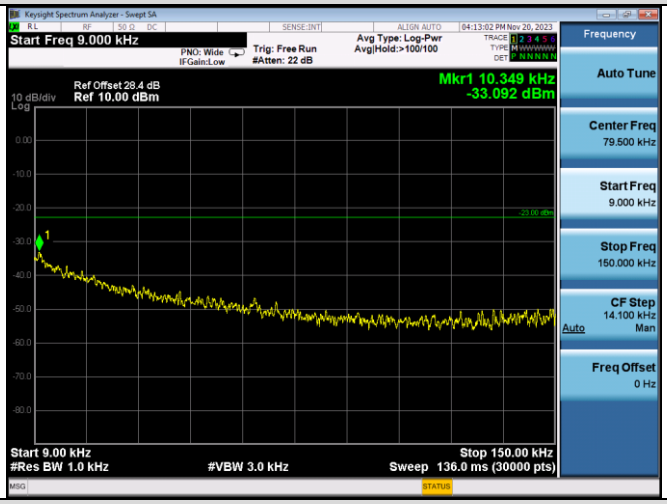
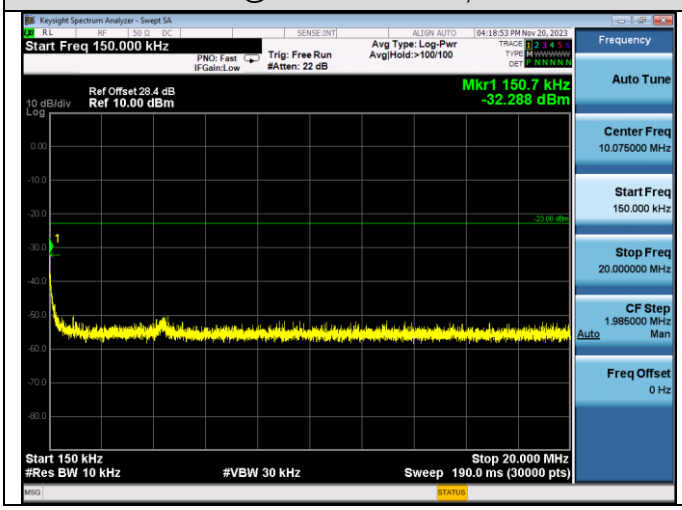
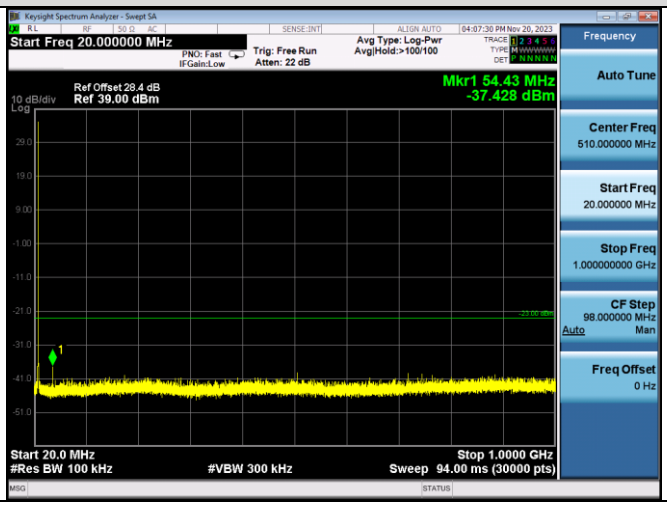
1. The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set to 100 kHz. Sufficient scans were taken to
3. show any out of band emission up to 10th . Harmonic for the lower and the highest frequency range.
4. Set RBW 1 kHz, VBW 3 kHz in the frequency band 9KHz to 150KHz;
   Set RBW 10 kHz, VBW 30 kHz in the frequency band 150KHz to 20MHz;
   Set RBW 100 kHz, VBW 300 kHz in the frequency band 20MHz to 1GHz;
   While set RBW=1MHz.VBW=3MHz from the 1GHz to 10th Harmonic.
5. The audio input was set the unmodulated carrier, the resulting picture is print out for each channel separation.

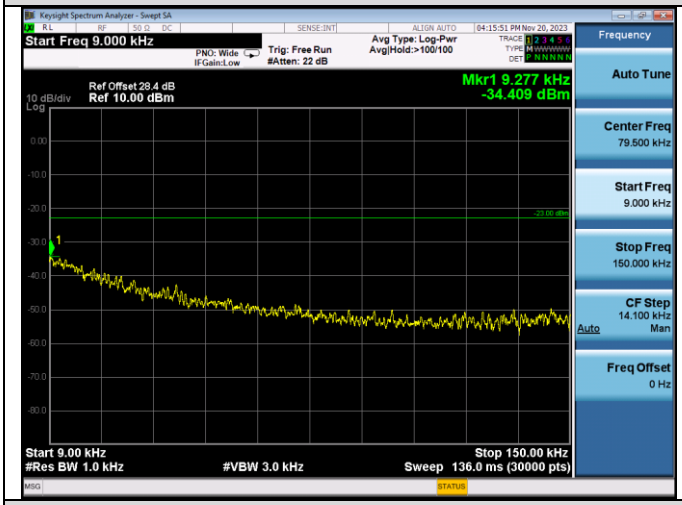
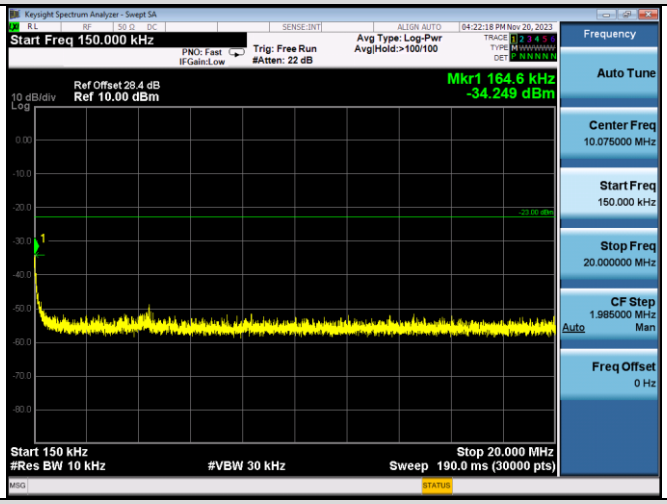
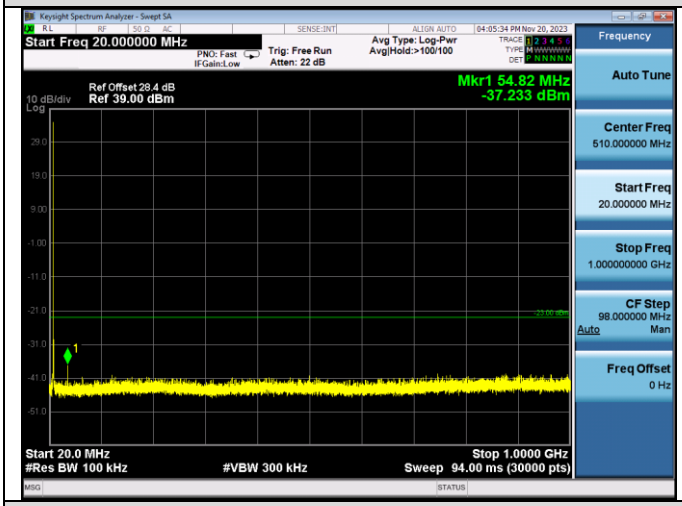
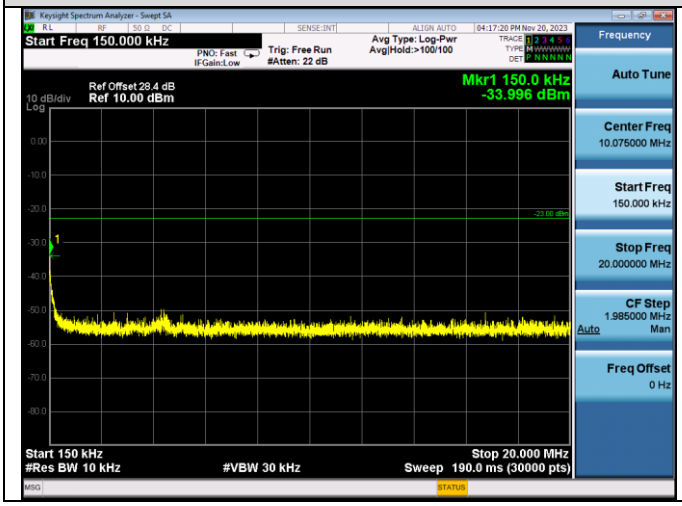
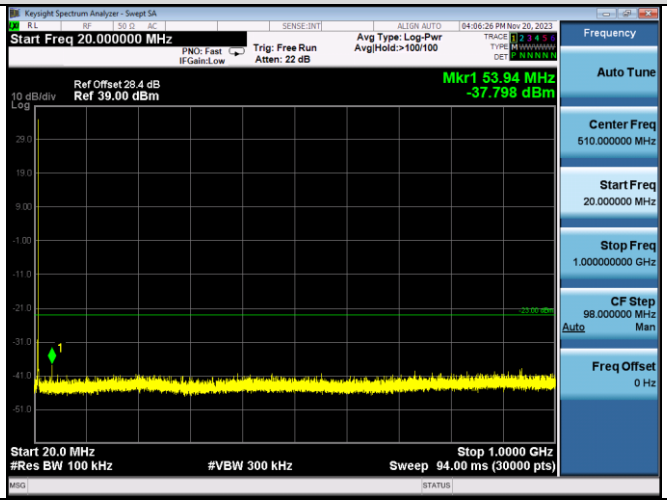
9.3 Measurement Setup



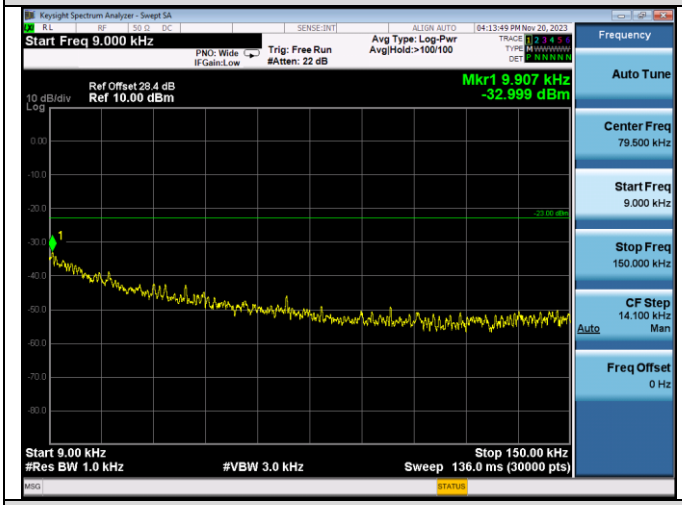
9.4 Measurement Results

Test plot as follows（UNWANTED Emission- DC 12V）

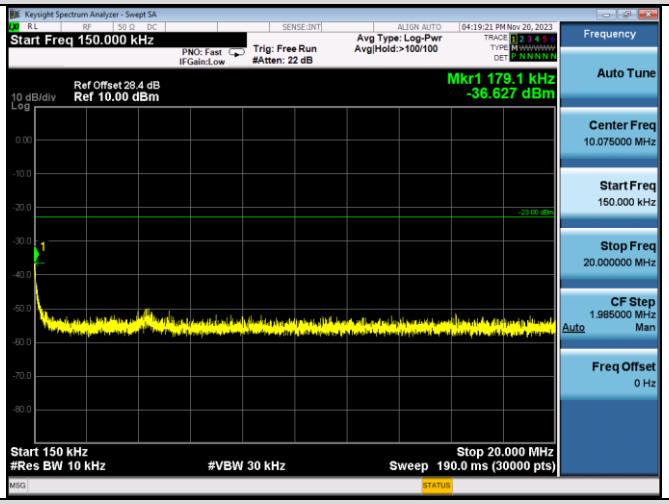
9KHz-150KHz@26.965MHz-AM, 10th Harmonic	150KHz-20MHz@26.965MHz-AM ,10th Harmonic
	
20MHz-1GHz@26.965MHz-AM,10th Harmonic	9KHz-150KHz@27.205MHz-AM, 10th Harmonic
	
150KHz-20MHz@27.205MHz-AM,10th Harmonic	20MHz-1GHz@27.205MHz-AM,10th Harmonic
	

9KHz-150KHz@27.405MHz-AM, 10th Harmonic	150KHz-20MHz@27.405MHz-AM ,10th Harmonic
	
20MHz-1GHz@27.405MHz-AM,10th Harmonic	9KHz-150KHz@26.965MHz-FM, 10th Harmonic
	
150KHz-20MHz@26.965MHz-FM ,10th Harmonic	20MHz-1GHz@26.965MHz-FM,10th Harmonic
	

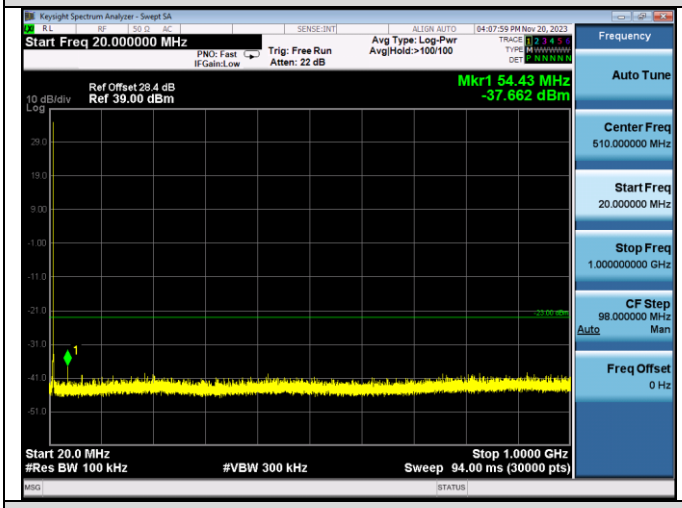
9KHz-150KHz@27.205MHz-FM, 10th Harmonic



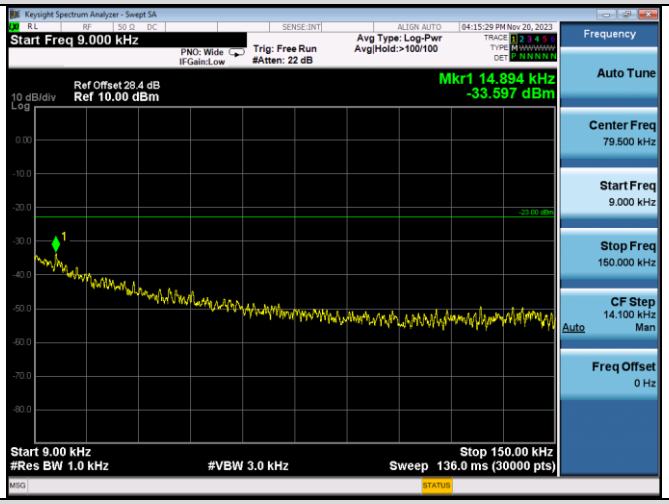
150KHz-20MHz@27.205MHz-FM,10th Harmonic



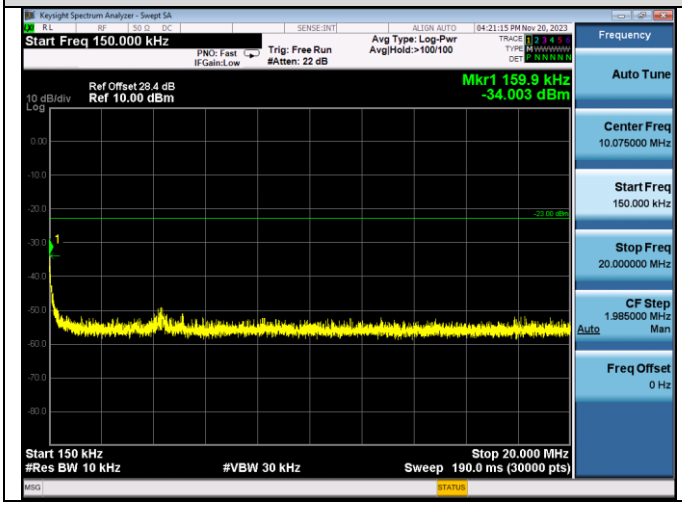
20MHz-1GHz@27.205MHz-FM,10th Harmonic



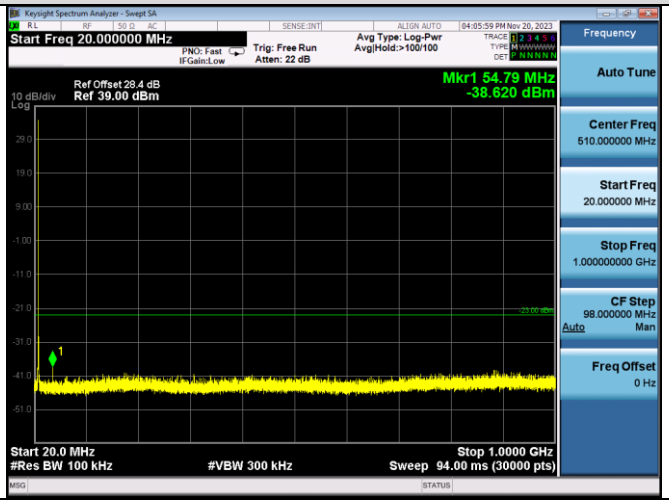
9KHz-150KHz@27.405MHz-FM, 10th Harmonic



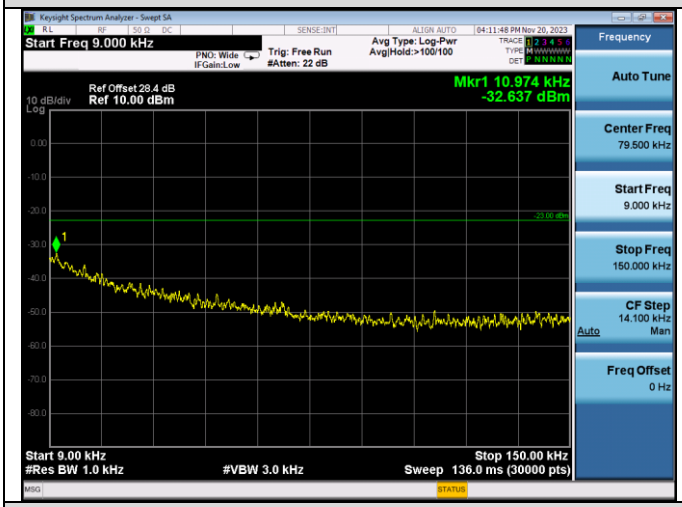
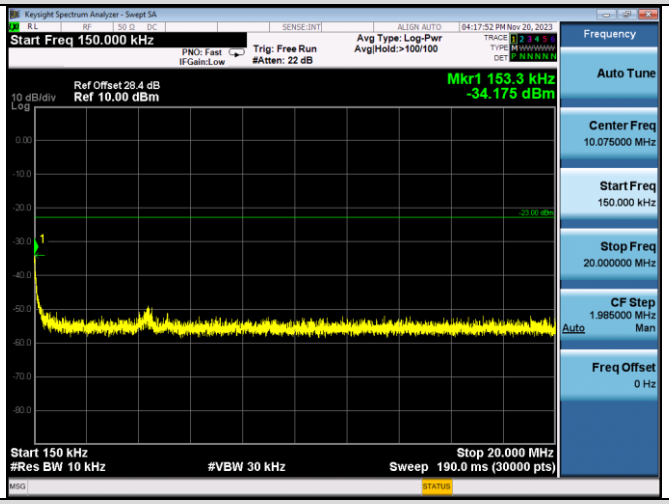
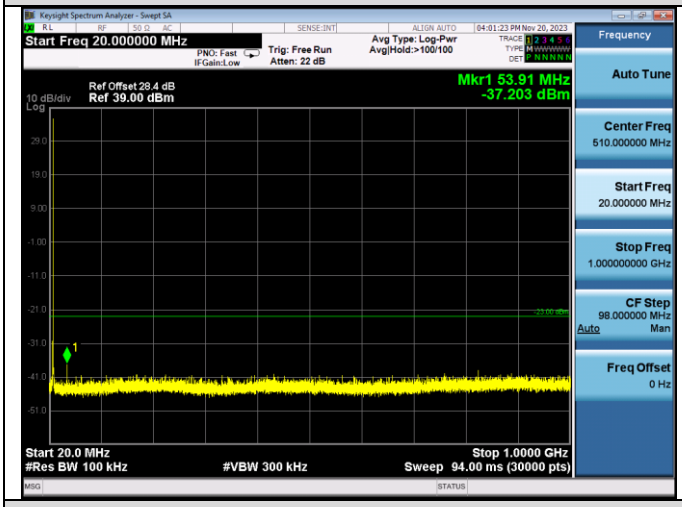
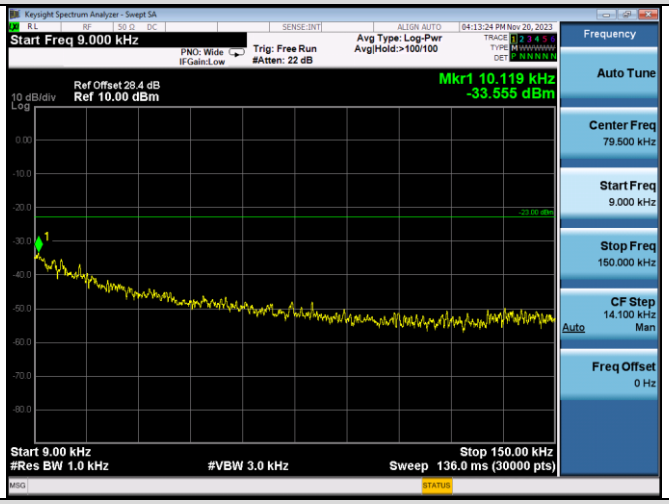
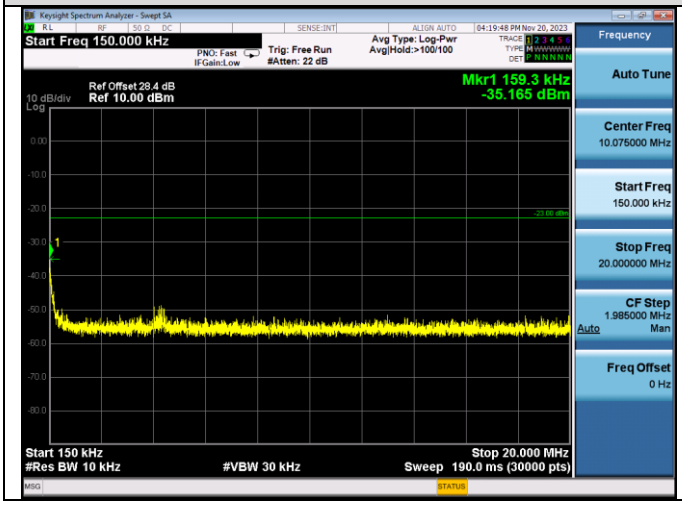
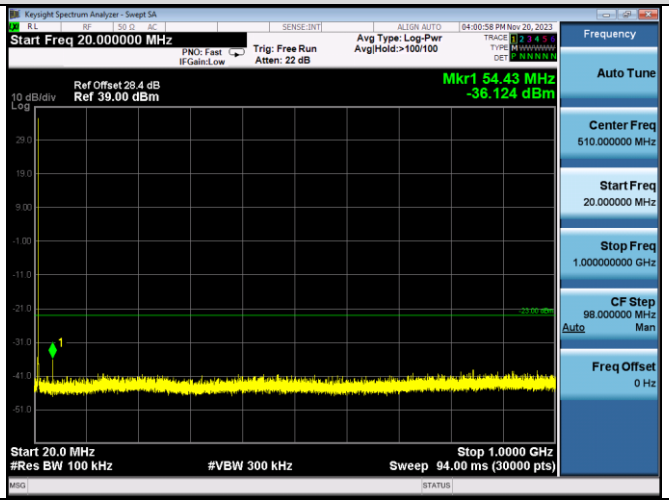
150KHz-20MHz@27.405MHz-FM ,10th Harmonic



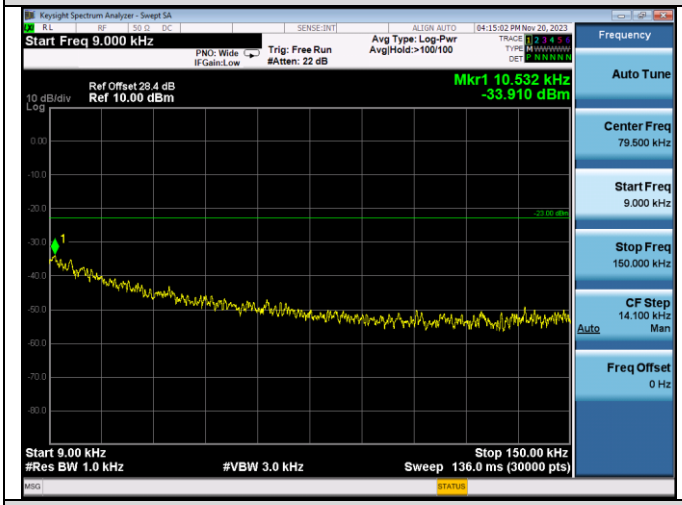
20MHz-1GHz@27.405MHz-FM,10th Harmonic



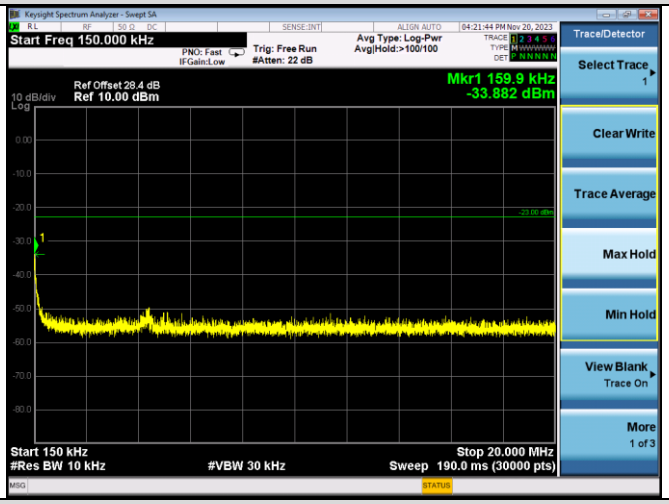
Test plot as follows（UNWANTED Emission- DC 24V）

9KHz-150KHz@26.965MHz-AM, 10th Harmonic	150KHz-20MHz@26.965MHz-AM ,10th Harmonic
	
20MHz-1GHz@26.965MHz-AM,10th Harmonic	9KHz-150KHz@27.205MHz-AM, 10th Harmonic
	
150KHz-20MHz@27.205MHz-AM,10th Harmonic	20MHz-1GHz@27.205MHz-AM,10th Harmonic
	

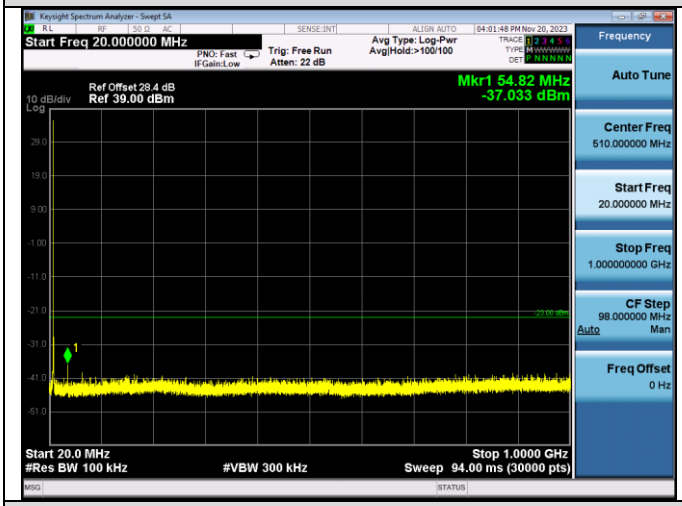
9KHz-150KHz@27.405MHz-AM, 10th Harmonic



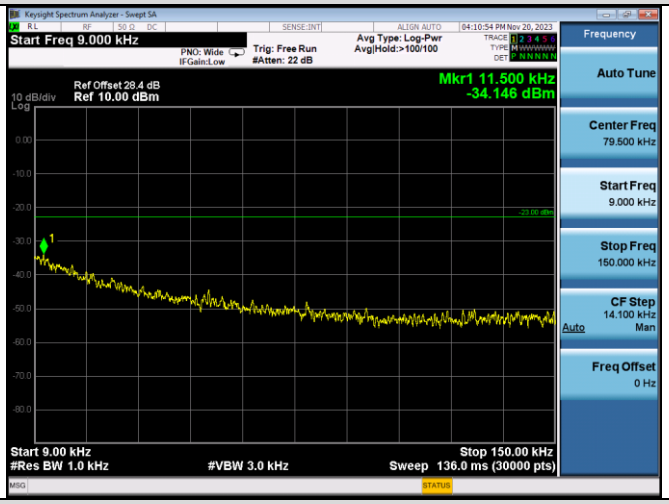
150KHz-20MHz@27.405MHz-AM ,10th Harmonic



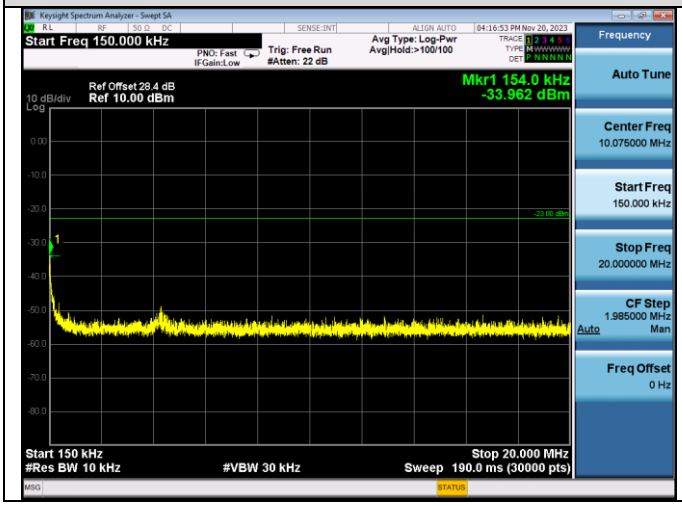
20MHz-1GHz@27.405MHz-AM,10th Harmonic



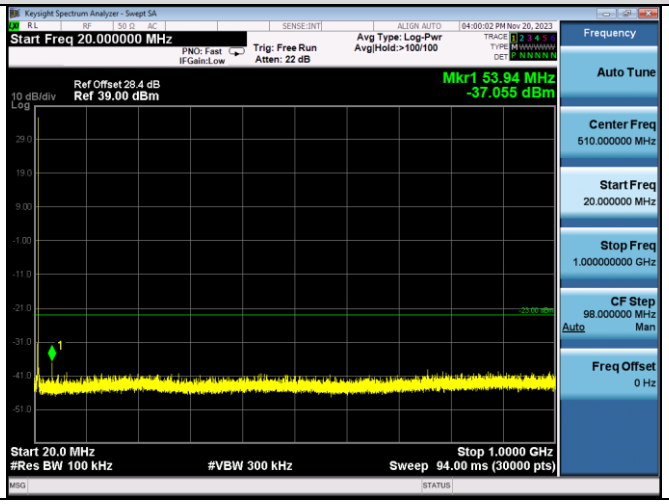
9KHz-150KHz@26.965MHz-FM, 10th Harmonic

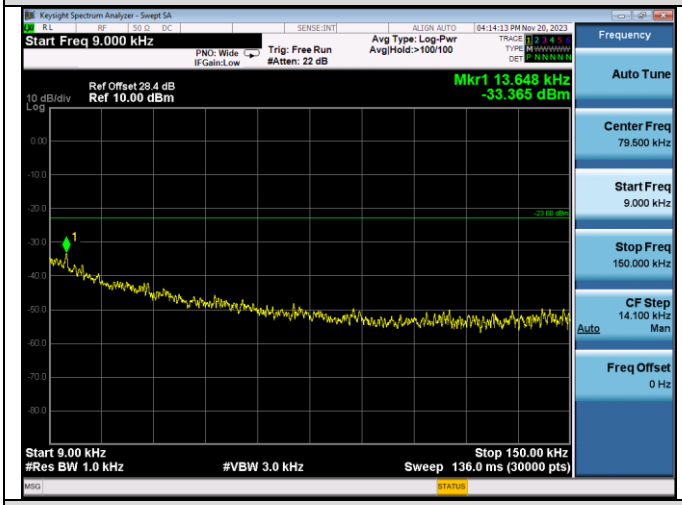
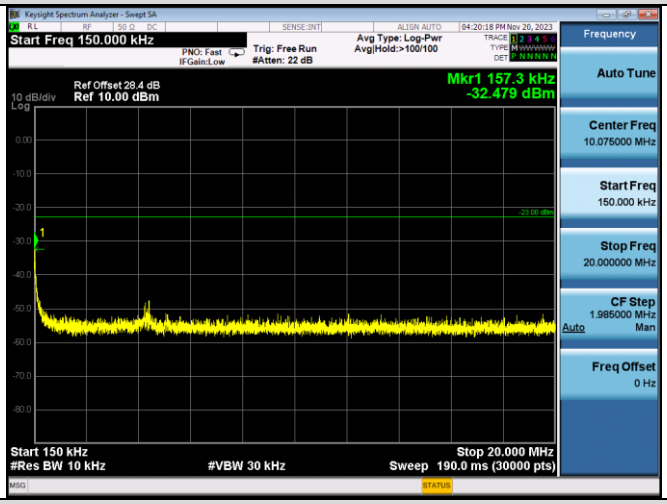
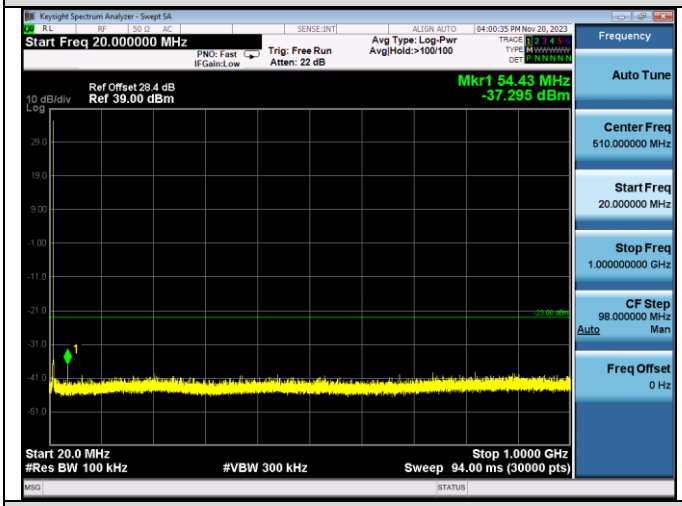
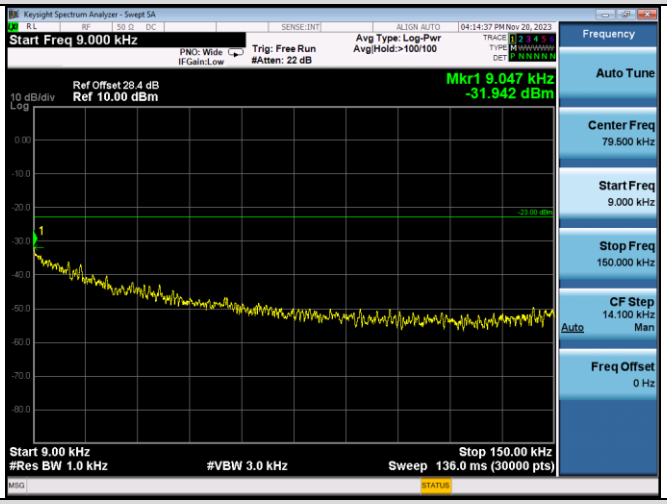
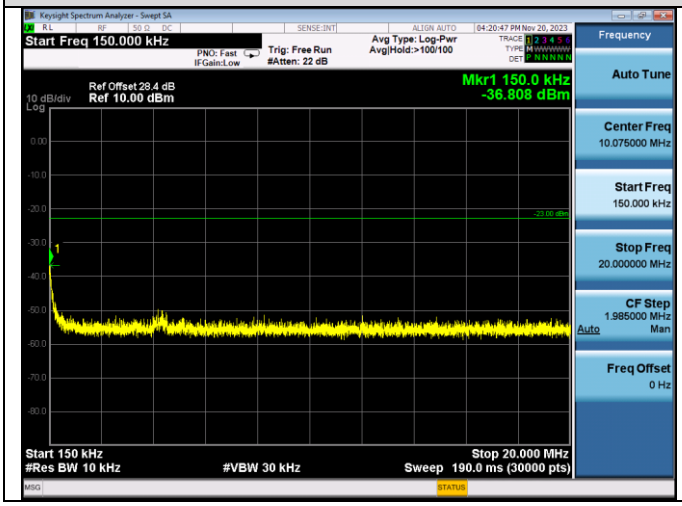
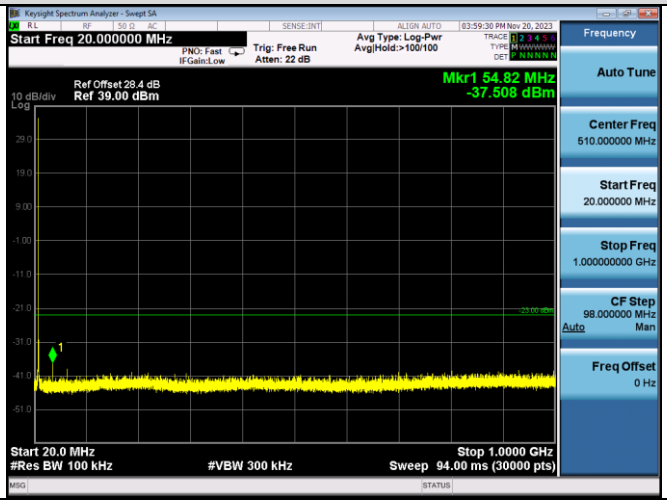


150KHz-20MHz@26.965MHz-FM ,10th Harmonic



20MHz-1GHz@26.965MHz-FM,10th Harmonic



9KHz-150KHz@27.205MHz-FM, 10th Harmonic	150KHz-20MHz@27.205MHz-FM,10th Harmonic
	
20MHz-1GHz@27.205MHz-FM,10th Harmonic	9KHz-150KHz@27.405MHz-FM, 10th Harmonic
	
150KHz-20MHz@27.405MHz-FM ,10th Harmonic	20MHz-1GHz@27.405MHz-FM,10th Harmonic
	

Test results as follows（HARMONIC Emission- DC 12V）

Test Mode	Freq. [MHz]	Reading [dBm]	Limit [dBm]	Margin [dB]
TX-CH1-AM	53.94	-37.925	-25.10	12.825
TX-CH20-AM	54.43	-37.428	-25.12	12.308
TX-CH40-AM	54.82	-37.233	-25.10	12.133
TX-CH1-FM	53.94	-37.798	-25.29	12.508
TX-CH20-FM	54.43	-37.662	-25.35	12.312
TX-CH40-FM	54.79	-38.620	-25.38	13.240

Test results as follows（HARMONIC Emission- DC 24V）

Test Mode	Freq. [MHz]	Reading [dBm]	Limit [dBm]	Margin [dB]
TX-CH1-AM	53.91	-37.203	-24.55	12.653
TX-CH20-AM	54.43	-36.124	-24.62	11.504
TX-CH40-AM	54.82	-37.033	-24.67	12.363
TX-CH1-FM	53.94	-37.055	-24.74	12.315
TX-CH20-FM	54.82	-37.295	-24.85	12.445
TX-CH40-FM	890.8	-35.508	-24.88	10.628

10. Maximumn Transmitter Power

10.1 Provisions Applicable

FCC Part 95.967, FCC Part2.1046(a)

Each CBRS transmitter type must be designed such that the transmitter power can not exceed the following limits:

(a) When transmitting amplitude modulated (AM) voice signals or frequency modulated (FM) voice signals, the mean carrier power must not exceed 4 Watts

(b) When transmitting single sideband (SSB) voice signals, the peak envelope power must not exceed 12 Watts.

10.2 Measurement Method

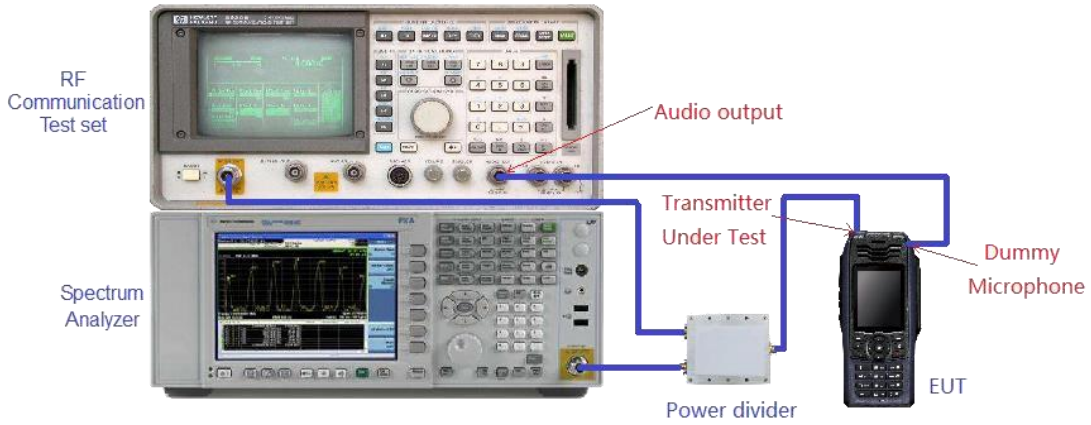
Conducted RF Output Power:

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the Automatic 6dB Cursor Bandwidth measurement. The output power of the DUT was set to the manufacturer's highest output power setting at the Low, Mid and High frequency channels as permitted by the device. The DUT was set to transmit at its maximum Duty Cycle.
3. Spectrum set as follow:

   Centre frequency = fundamental frequency, Span=150kHz , RBW=30kHz, VBW=30kHz ;

   Sweep = auto, Detector function = peak, Trace = max hold

10.3 Measurement Setup

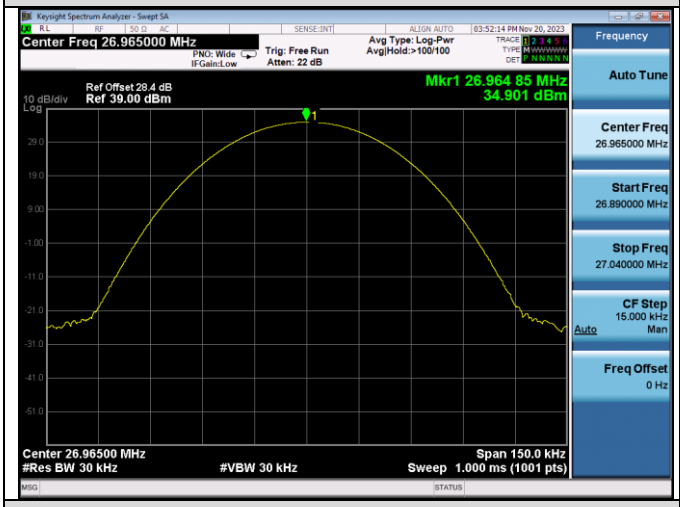
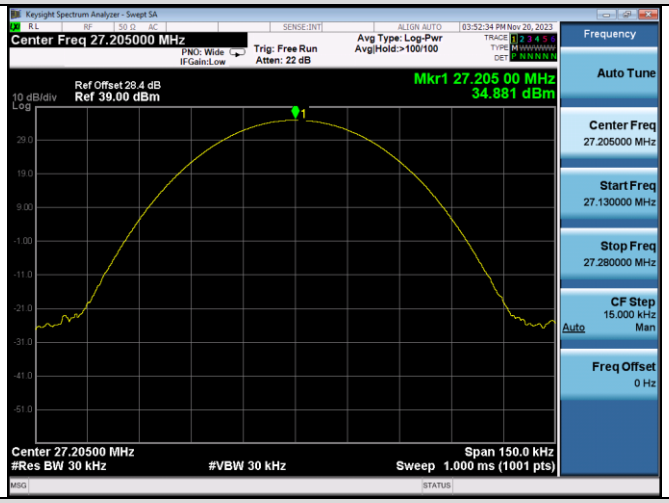
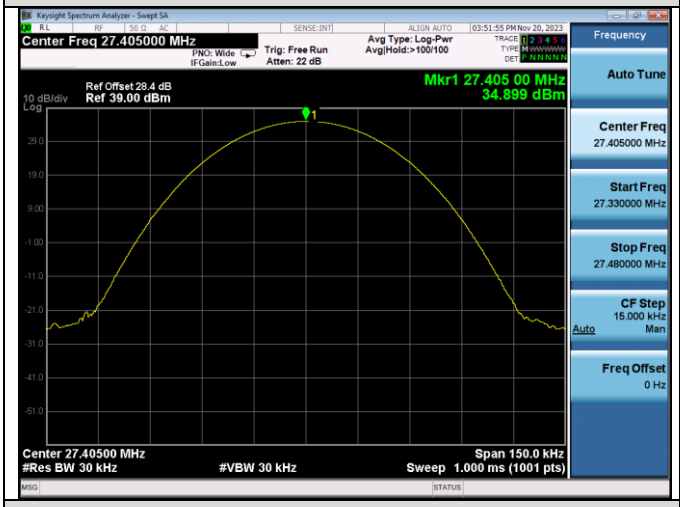
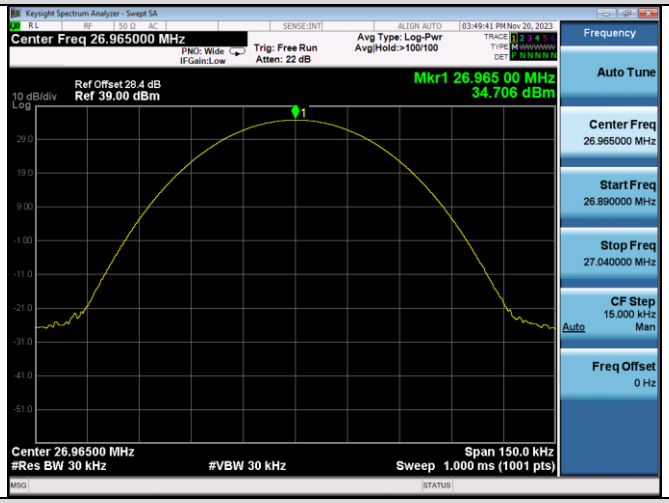
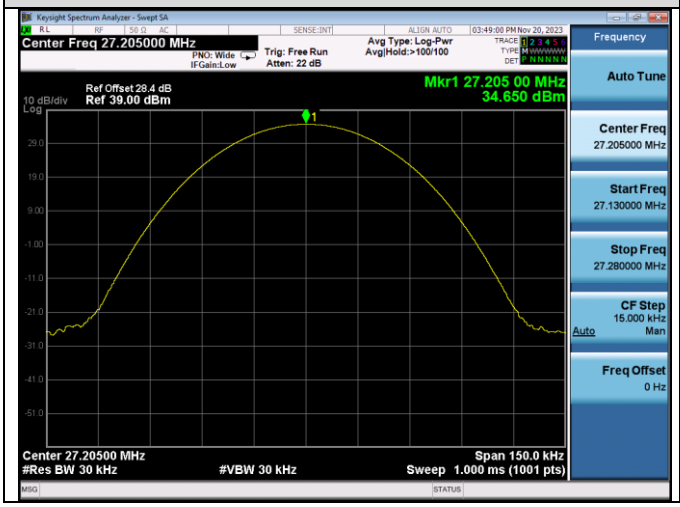
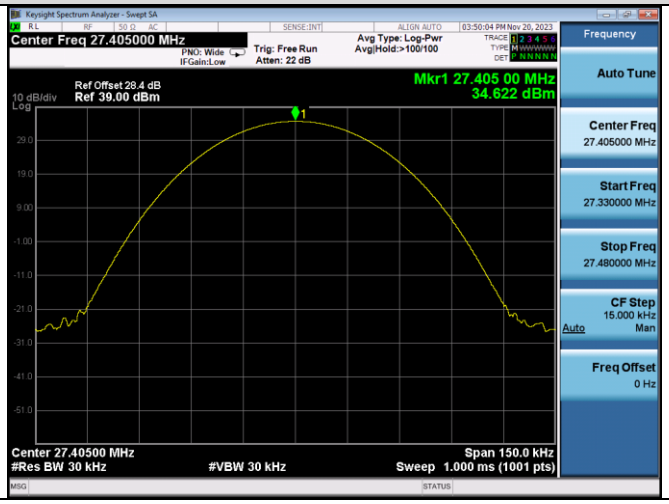


10.4 Measurement Results

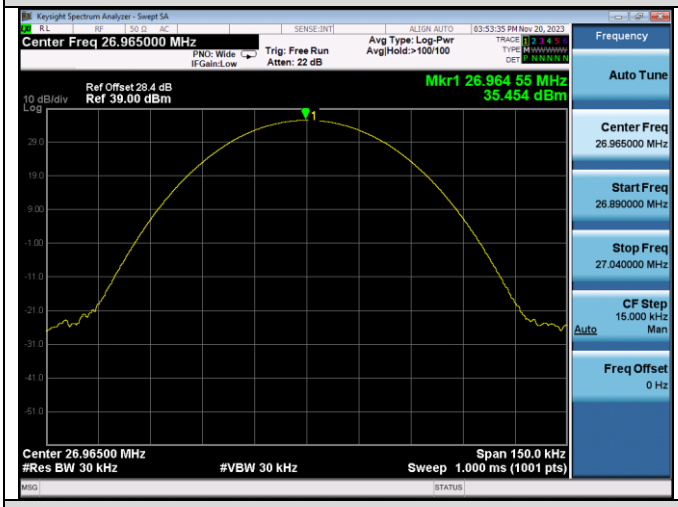
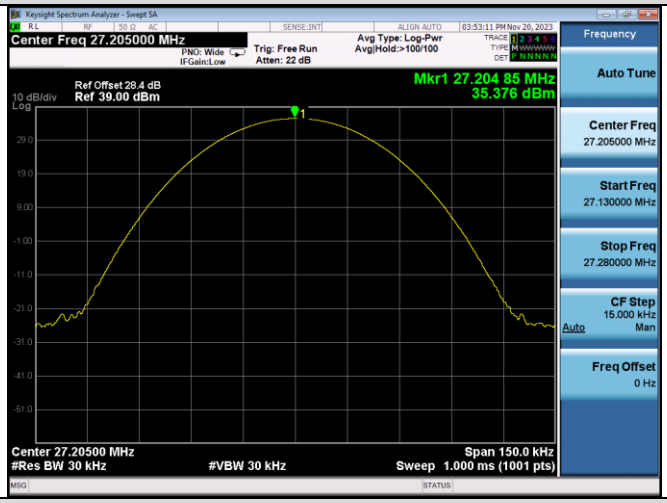
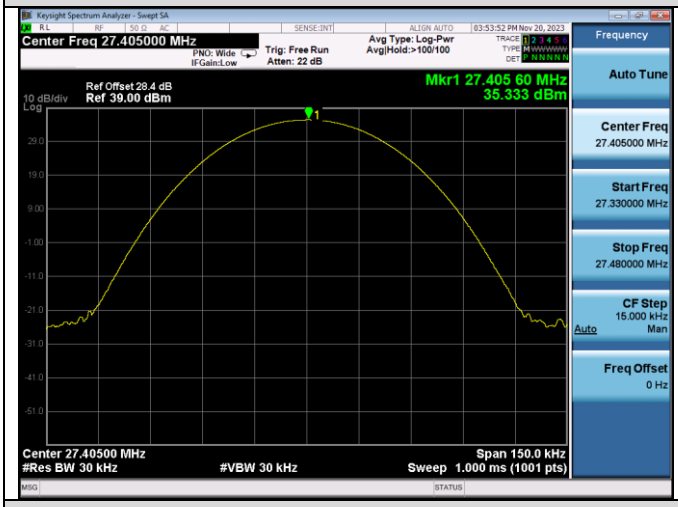
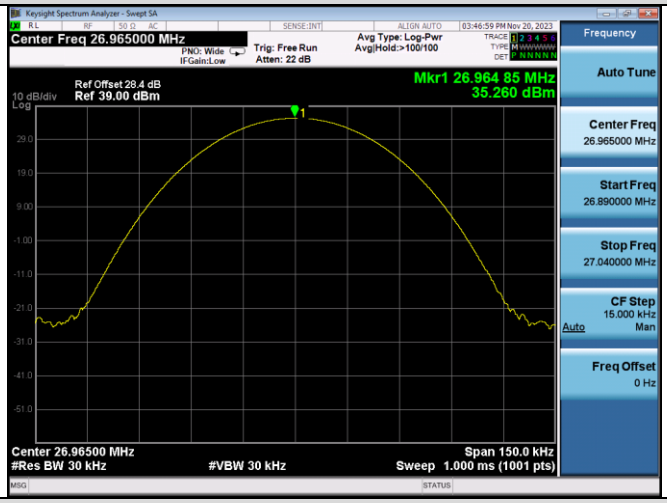
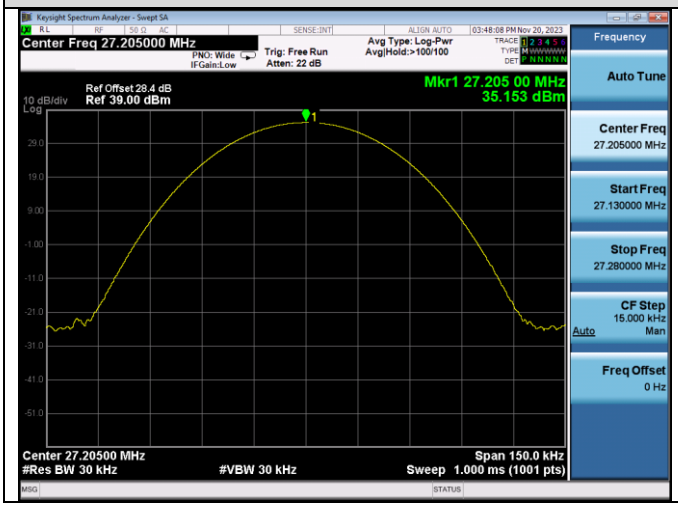
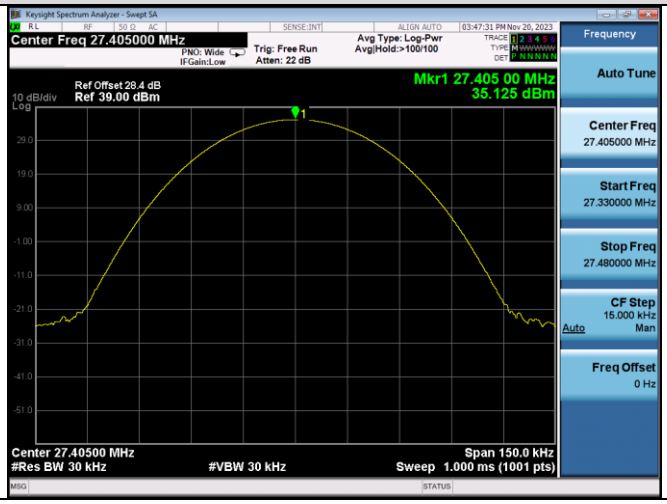
Conducted Power Measurement Results-DC 12V			
Mode	Channel Separation	Test Channel	Measurement Result (dBm)
CBRS TX-AM	10 kHz	26.965 MHz	**34.901**
		27.205 MHz	34.881
		27.405 MHz	34.899
CBRS TX-FM	10 kHz	26.965 MHz	**34.706**
		27.205 MHz	34.650
		27.405 MHz	34.622

Conducted Power Measurement Results-DC 24V			
Mode	Channel Separation	Test Channel	Measurement Result (dBm)
CBRS TX-AM	10 kHz	26.965 MHz	**35.454**
		27.205 MHz	35.376
		27.405 MHz	35.333
CBRS TX-FM	10 kHz	26.965 MHz	**35.260**
		27.205 MHz	35.153
		27.405 MHz	35.125

Test plot as follows: DC 12V

10kHz, AM Modulation:26.965MHz	10kHz, AM Modulation:27.205MHz
	
10kHz, AM Modulation:27.405MHz	**10kHz, FM Modulation:26.965MHz**
	
10kHz, FM Modulation:27.205MHz	**10kHz, FM Modulation:27.405MHz**
	

Test plot as follows: DC 24V

10kHz, AM Modulation:26.965MHz	10kHz, AM Modulation:27.205MHz
	
10kHz, AM Modulation:27.405MHz	**10kHz, FM Modulation:26.965MHz**
	
10kHz, FM Modulation:27.205MHz	**10kHz, FM Modulation:27.405MHz**
	

11.Modulation Characteristics

11.1 Provisions Applicable

FCC Part 95.975, FCC Part 2.1047(b)
Each CBRS transmitter type must be designed such that the modulation characteristics are in compliance with the rules in this section.

a) When emission type A3E is transmitted with voice modulation, the modulation percentage must be at least 85%, but not more than 100%.
b) When emission type A3E is transmitted by a CBRS transmitter having a transmitter output power of more than 2.5 W, the transmitter must contain a circuit that automatically prevents the modulation percentage from exceeding 100%.
c) When emission type F3E is transmitted the peak frequency deviation shall not exceed ±2 kHz.

11.2 Measurement Method_(AM)

(A) Audio frequency response

Connect the equipment as illustrated.
Adjust to deliver 50% modulation at the audio frequency that produces the maximum modulation level
Record the modulation input level (mV) and use this level as 0dB for plotting modulation limiting.
Vary the modulating frequency from 100Hz to 10000Hz and record the input levels necessary to maintain a constant 50% modulation.
Graph the audio level in dB relative to the 0dB reference level as a function of the modulating frequency. Record audio frequency where it is impossible to perform the measurement.

(B) Modulation limiting

Connect the equipment as illustrated.
Adjust to deliver 50% modulation at the audio frequency that produces the maximum modulation level
Record the modulation input level (mV) and use this level as 0dB for plotting modulation limiting.
Increment the audio signal level to 40dB above the reference level. Record the modulation level (%).
Repeat the measurements using a 400Hz and a 2500Hz sinusoidal audio signal, record the modulation level (%), perform for both positive and negative modulation.

11.3 Measurement Method_(FM)

(C) Modulation limiting

(1). Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1kHz using this level as a reference (0dB) and vary the input level from –20 to +20dB. Record the frequency deviation obtained as a function of the input level.

(2). Repeat step 1 with input frequency changing to 300, 1000, 1500 and 3000Hz in sequence.

(D) Audio frequency response

(1). Configure the EUT as shown in figure 1.

(2). Adjust the audio input for 20% of rated system deviation at 1 kHz using this level as a reference (0 dB).

(3). Vary the Audio frequency from 100 Hz to 10 kHz and record the frequency deviation.

(4). Audio Frequency Response = 20log10 (Deviation of test frequency/Deviation of 1 kHz reference).