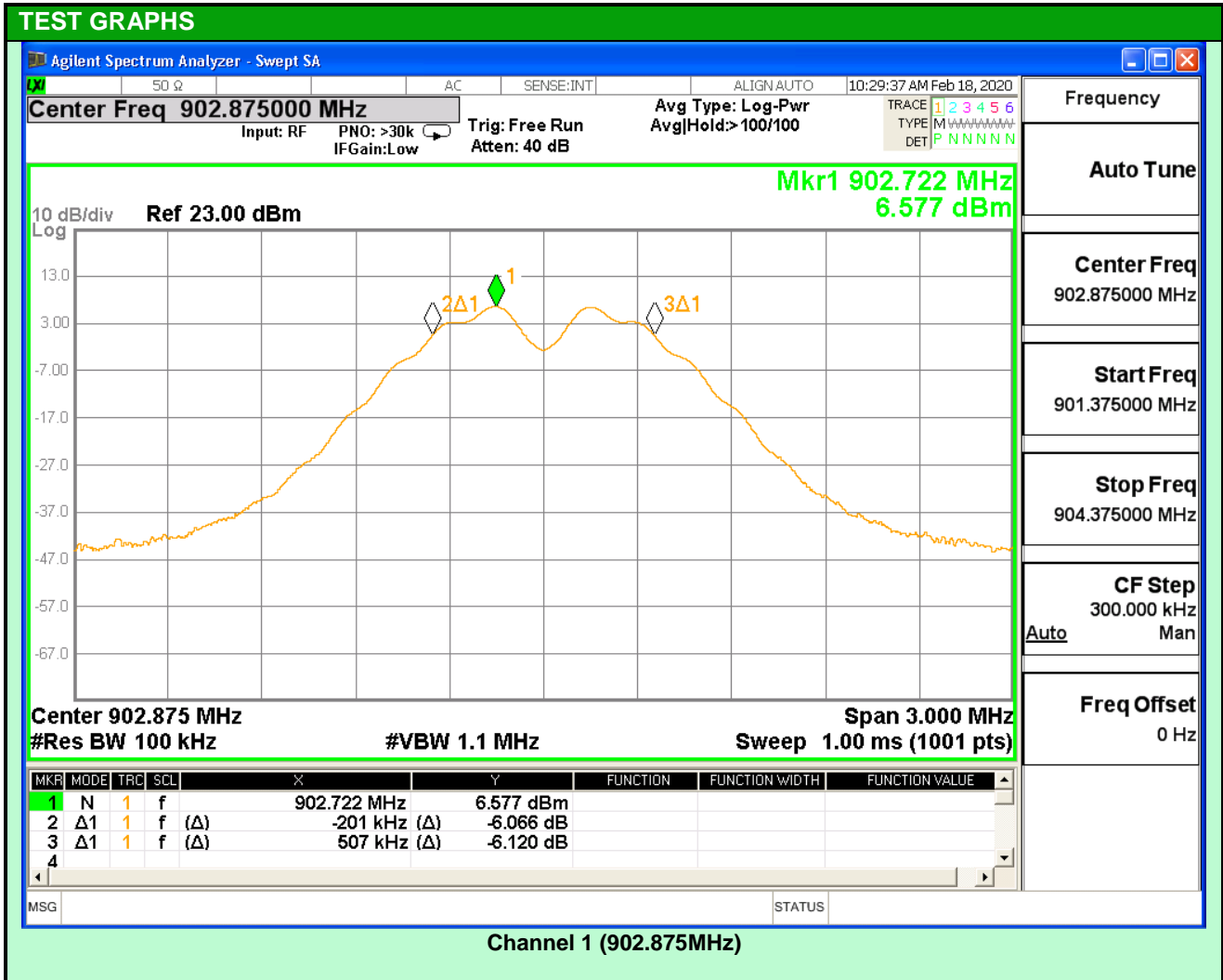


3 DTS CHANNELS

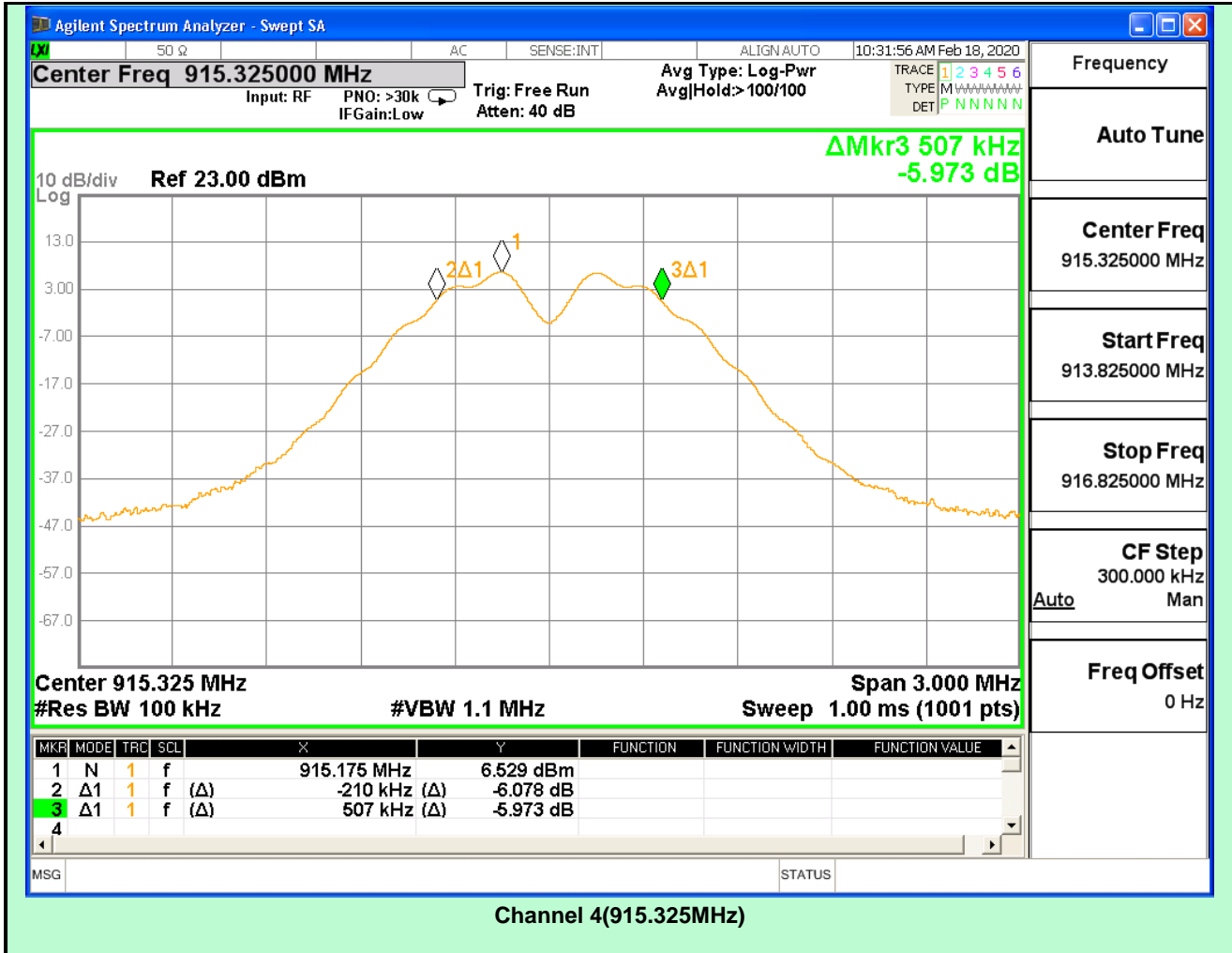
3.1 6dB BANDWIDTH

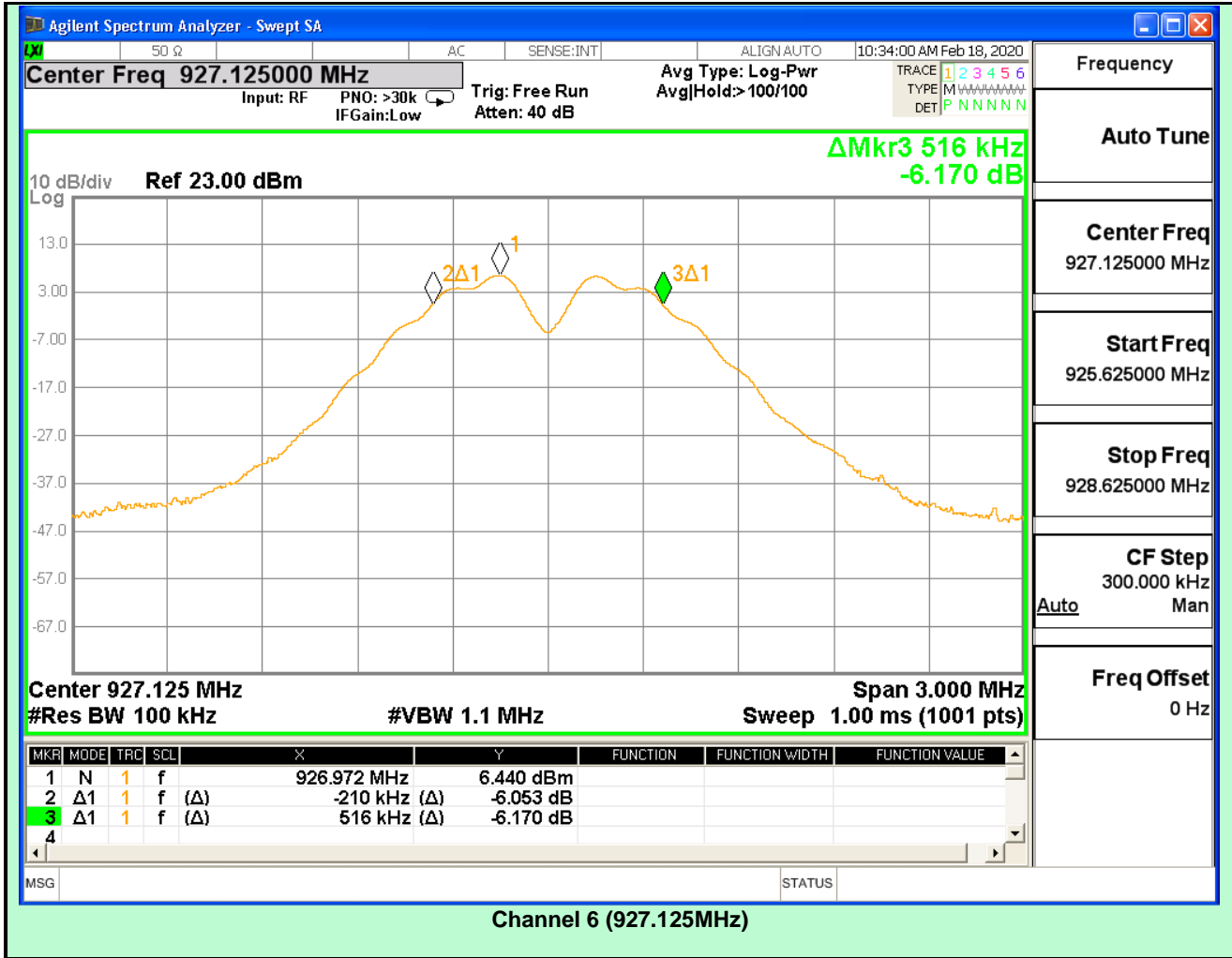
EUT Nomenclature	Wireless Monitor Module	Test Request No.	EMC0418-1
Model No.	FW-MM	Serial No.	127
Test Start Date	14 - Dec - 2019	Temperature (°C)	24.6°C
Test End Date	26 - Feb - 2020	Humidity RH (%)	53.9%RH
Tested By	Vinay Gujjar	Pressure (mbar)	NR
Input Voltage / Freq.	3.3Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	KDB 558074		
Comment	NA		
TEST DETAILS			
Method	Radiated <input type="checkbox"/>	Conducted <input checked="" type="checkbox"/>	
TEST PARAMETERS			
Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT					
Y/N	Equipment	Make	Model	Sl. No.	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	27-Feb-2021
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA



Frequency
Auto Tune
Center Freq 902.875000 MHz
Start Freq 901.375000 MHz
Stop Freq 904.375000 MHz
CF Step 300.000 kHz Auto Man
Freq Offset 0 Hz





TEST RESULT				
Channel #	Frequency MHz	Measured Bandwidth KHz	Limit KHz	Result
1	902.875	708	>500	PASS
4	915.325	717	>500	PASS
6	927.125	726	>500	PASS

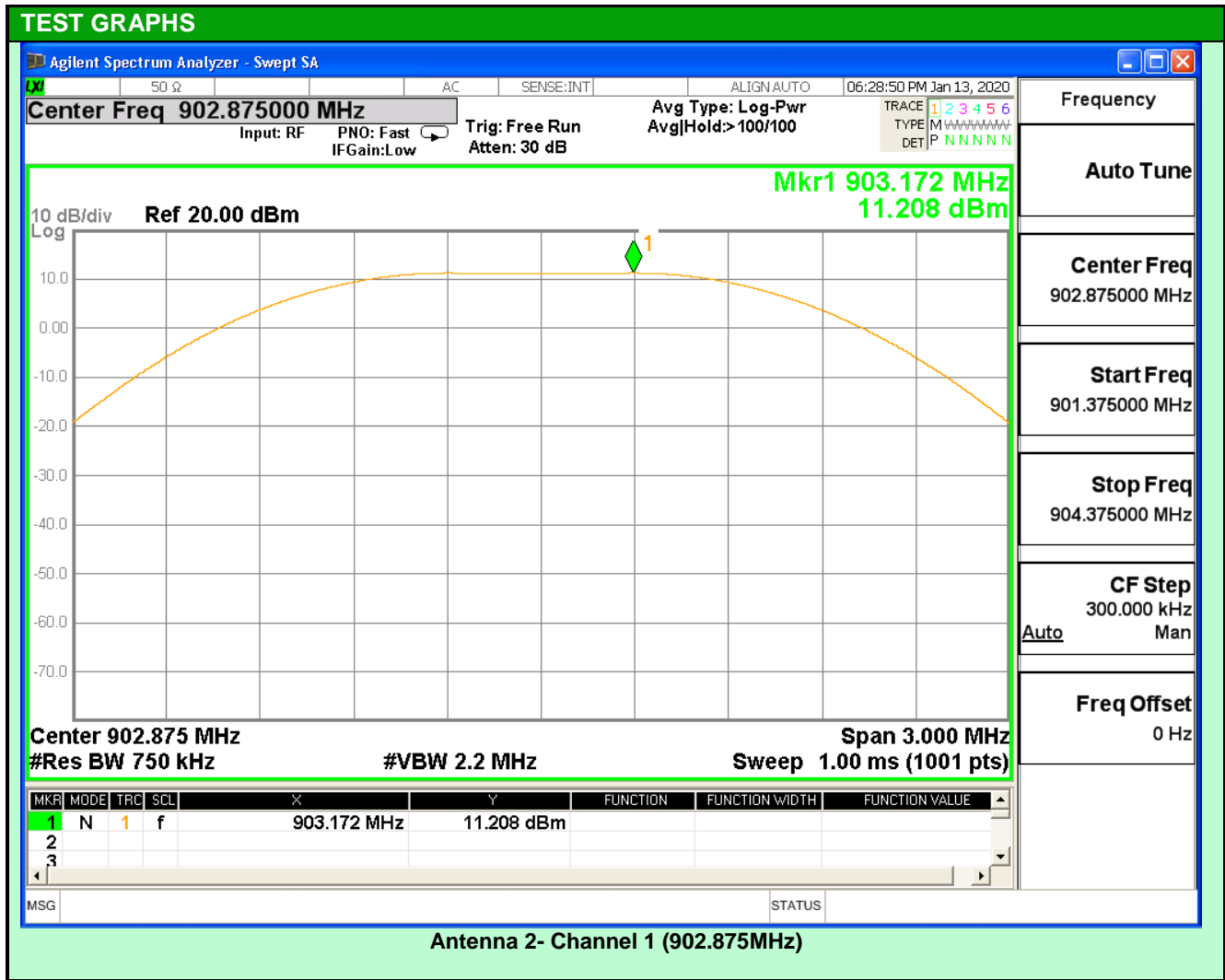
TEST SETUP PHOTOGRAPH

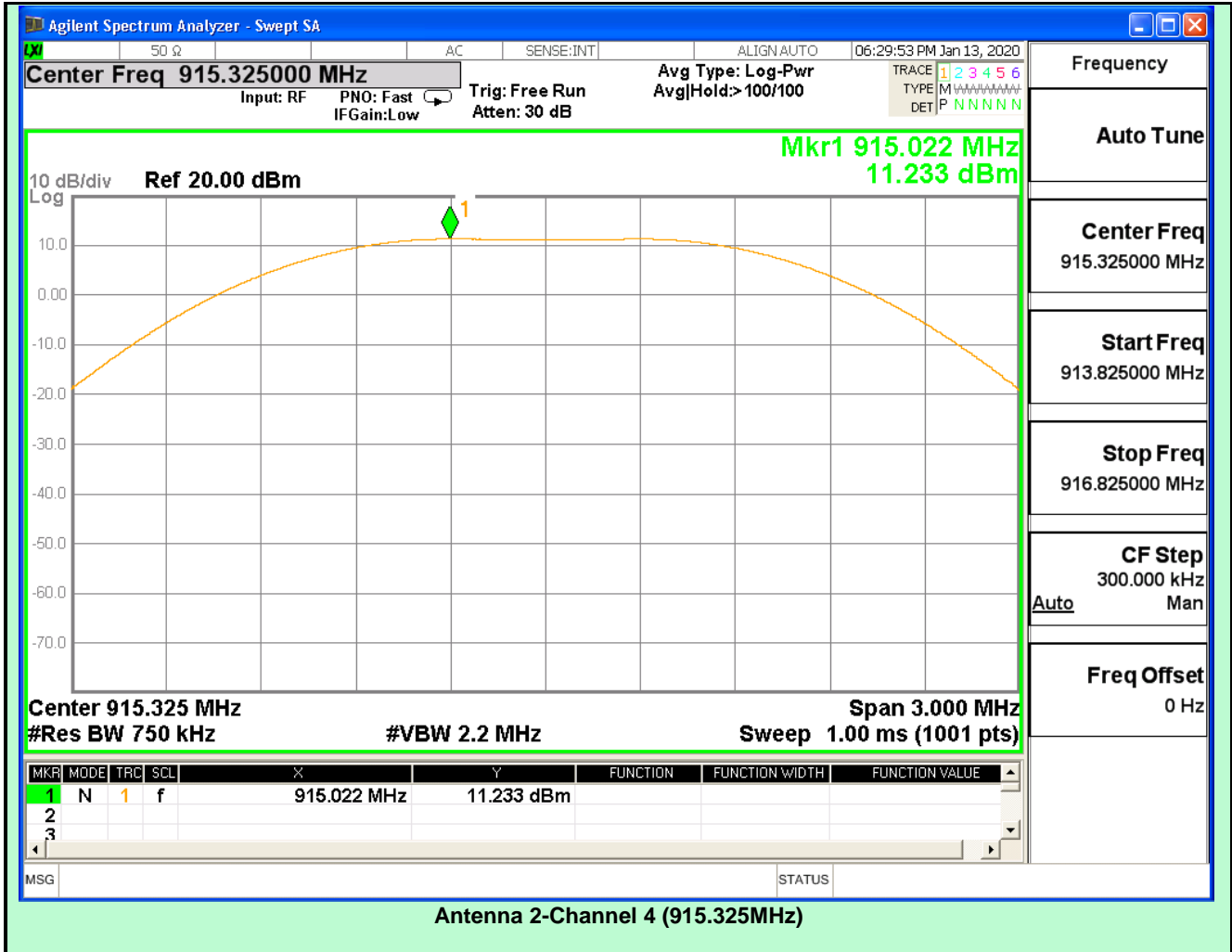
Refer Annexure -1

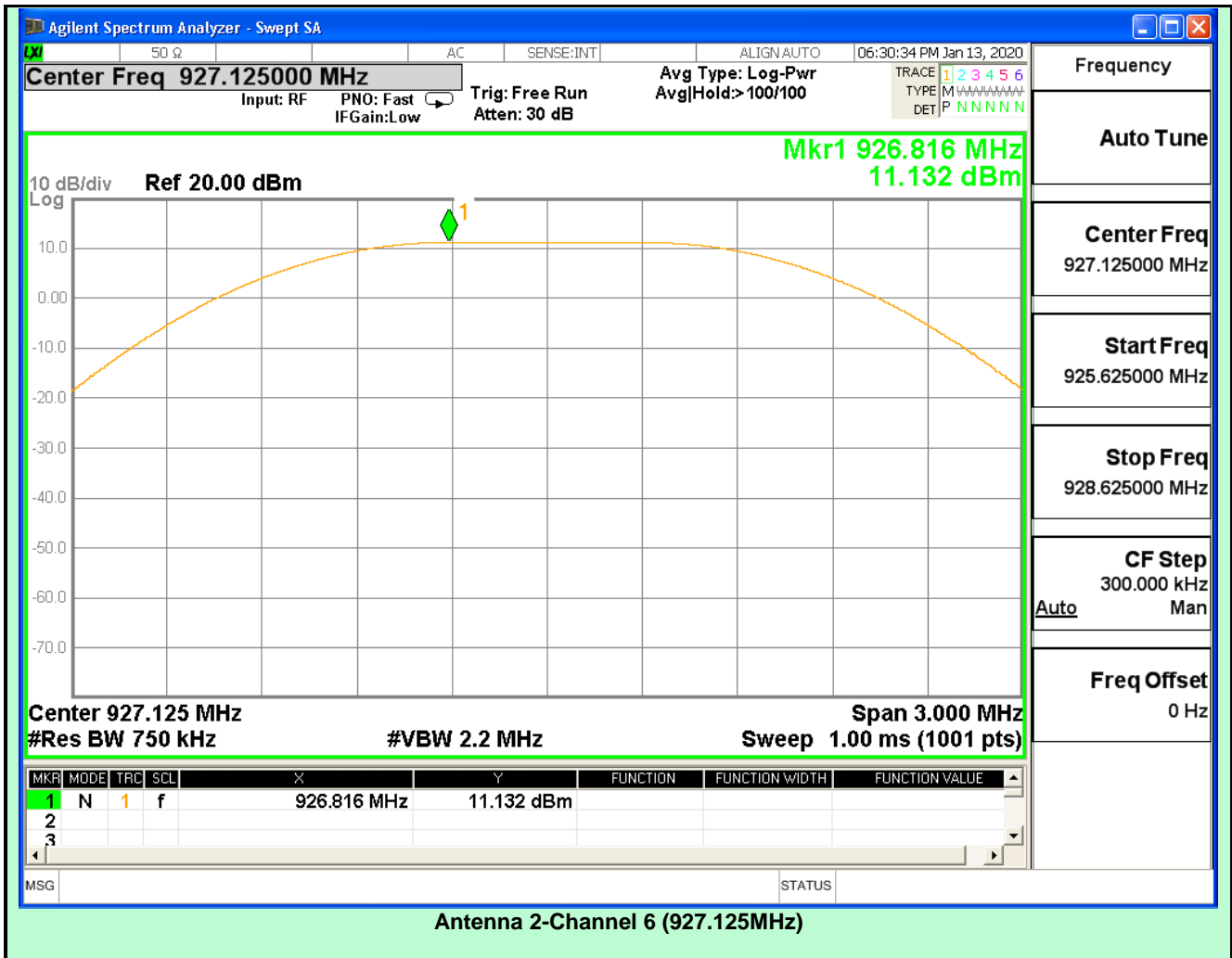
Conducted RF Test setup

3.2 PEAK OUTPUT POWER LEVEL			
EUT Nomenclature	Wireless Monitor Module	Test Request No.	EMC0418-1
Model No.	FW-MM	Serial No.	127
Test Start Date	16 - Dec- 2019	Temperature (°C)	23.6°C
Test End Date	26 - Feb - 2020	Humidity RH (%)	51.9%RH
Tested By	Vinay Gujjar	Pressure (mbar)	NR
Input Voltage / Freq.	3.3Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	KDB 558074		
Comment	NA		
TEST DETAILS			
Method	Radiated <input type="checkbox"/>		Conducted <input checked="" type="checkbox"/>
TEST PARAMETERS			
Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT					
Y/N	Equipment	Make	Model	Sl. No.	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	27-Feb-2021
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA







TEST RESULT						
Channel #	Frequency MHz	Measured Power Level dBm	Cable Loss dB	Transmitter Power Level dBm	Limit dBm	Result
Antenna 2						
1	902.875	11.2	0.6	11.8	≤30	PASS
4	915.325	11.23	0.6	11.83	≤30	PASS
6	927.125	11.13	0.6	11.73	≤30	PASS

Note: Transmitter Output Power = Measured Level (dBm) + Cable Loss (dB)

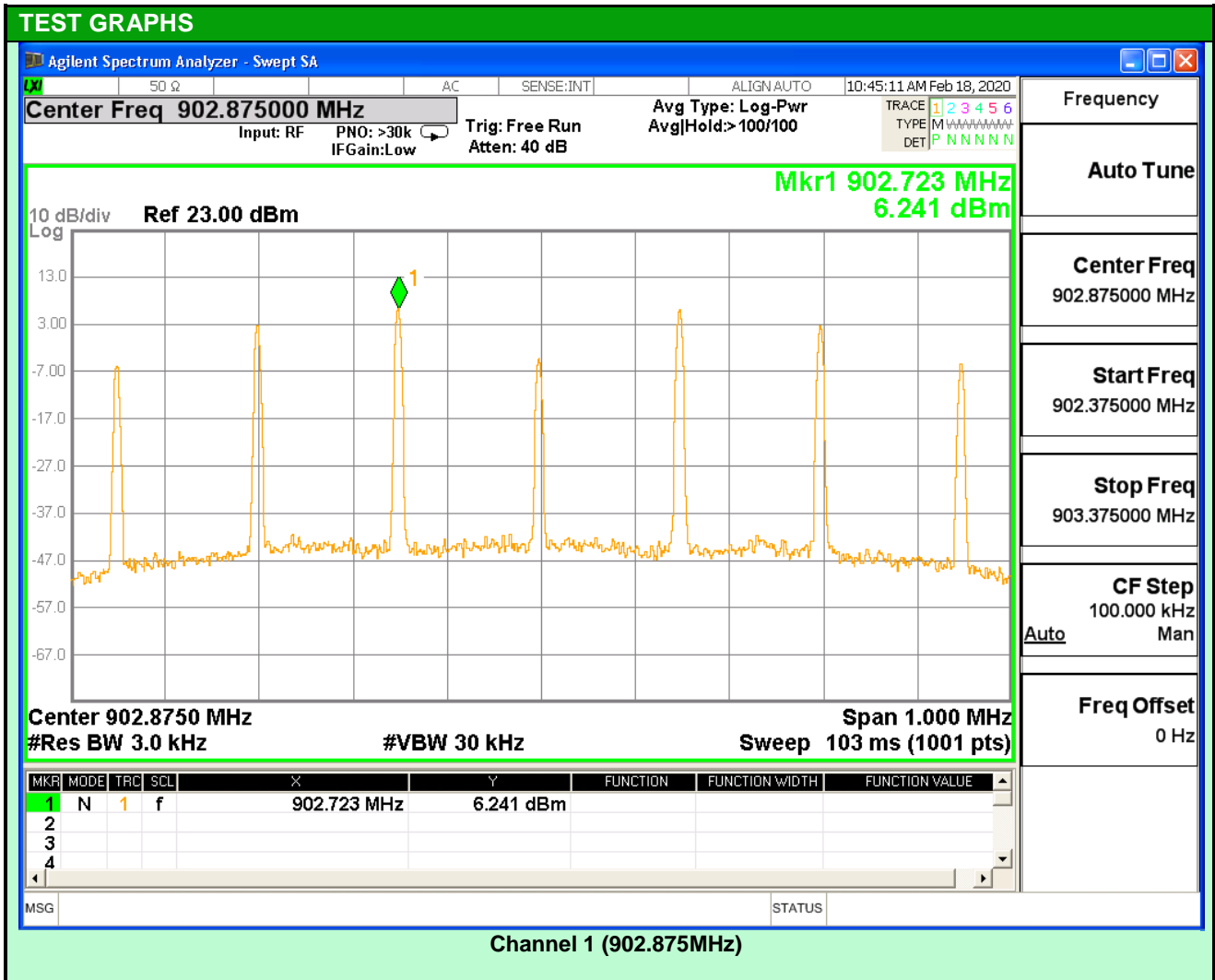
TEST SETUP PHOTOGRAPH

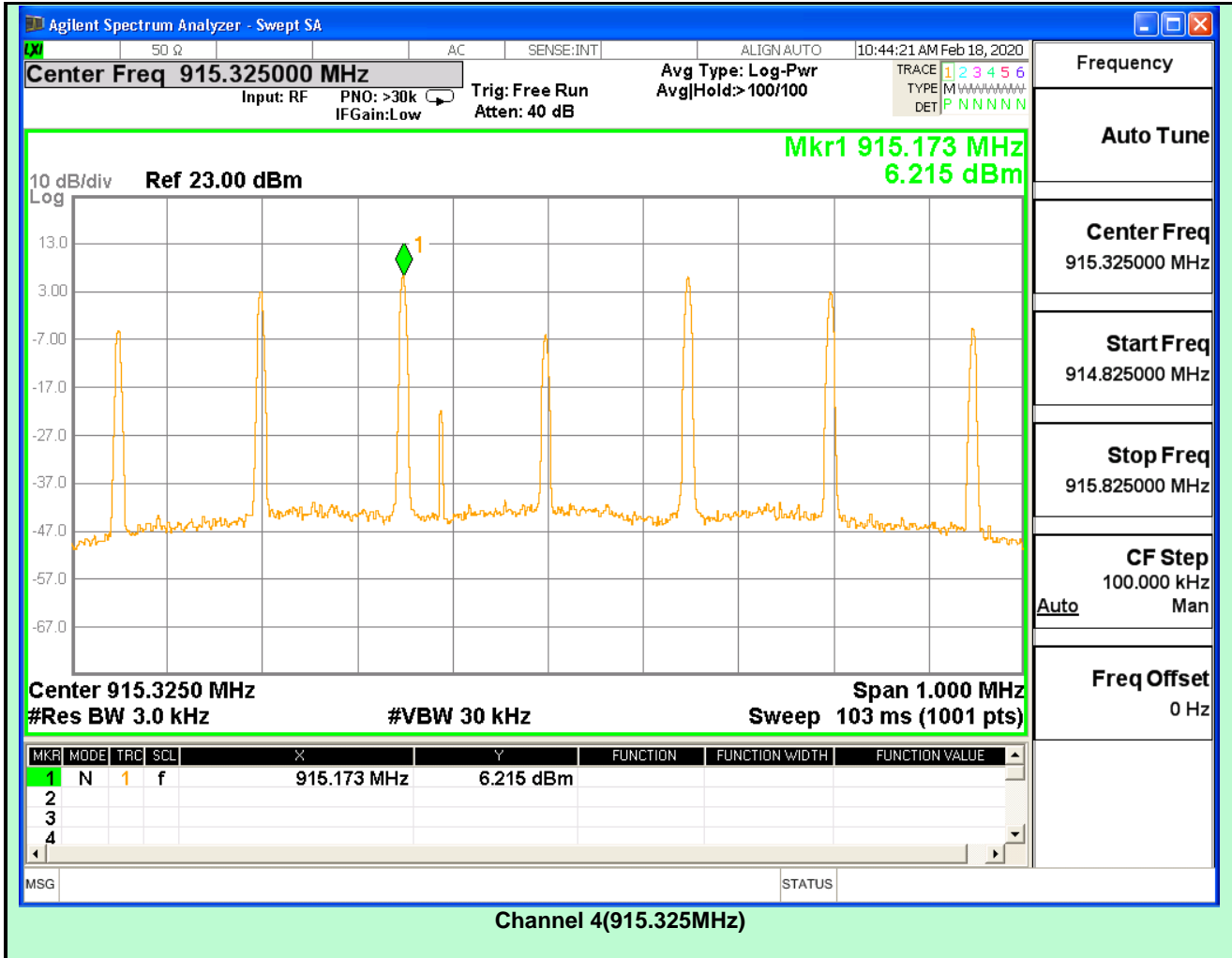
Refer Annexure -1

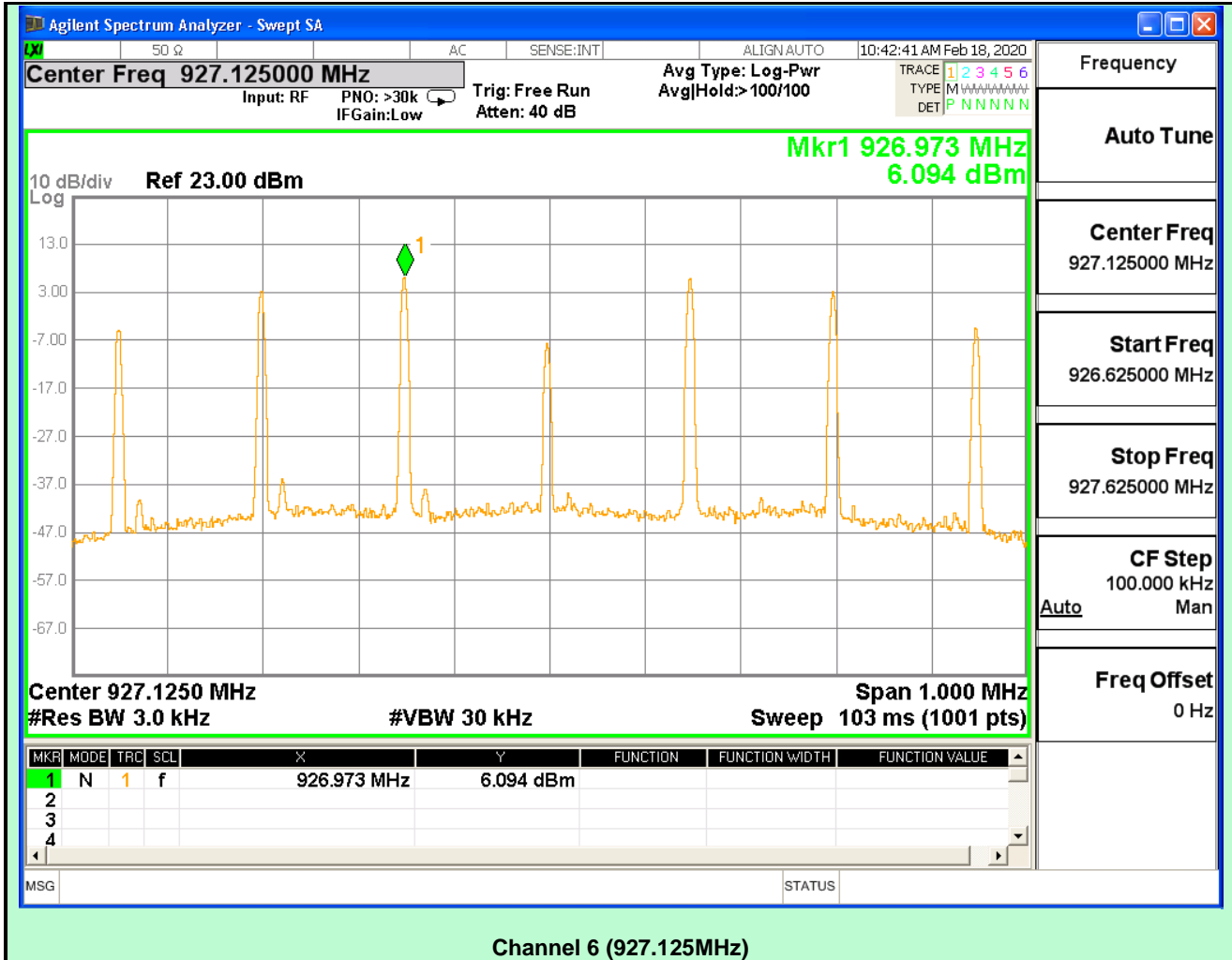
Conducted RF Test setup

3.3 MAXIMUM POWER SPECTRAL DENSITY			
EUT Nomenclature	Wireless Monitor Module	Test Request No.	EMC0418-1
Model No.	FW-MM	Serial No.	127
Test Start Date	14 - Dec - 2019	Temperature (°C)	23.6°C
Test End Date	26 - Feb - 2020	Humidity RH (%)	51.9%RH
Tested By	Vinay Gujjar	Pressure (mbar)	NR
Input Voltage / Freq.	3.3Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	KDB 558074		
Comment	NA		
TEST DETAILS			
Method	Radiated <input type="checkbox"/>		Conducted <input checked="" type="checkbox"/>
TEST PARAMETERS			
Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT					
Y/N	Equipment	Make	Model	SI. No.	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	27-Feb-2021
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA







TEST RESULT				
Channel #	Frequency MHz	Measured Level dBm/3KHz	Limit dBm/3KHz	Result
1	902.875	6.241	<8	PASS
4	915.325	6.215	<8	PASS
6	927.125	6.094	<8	PASS

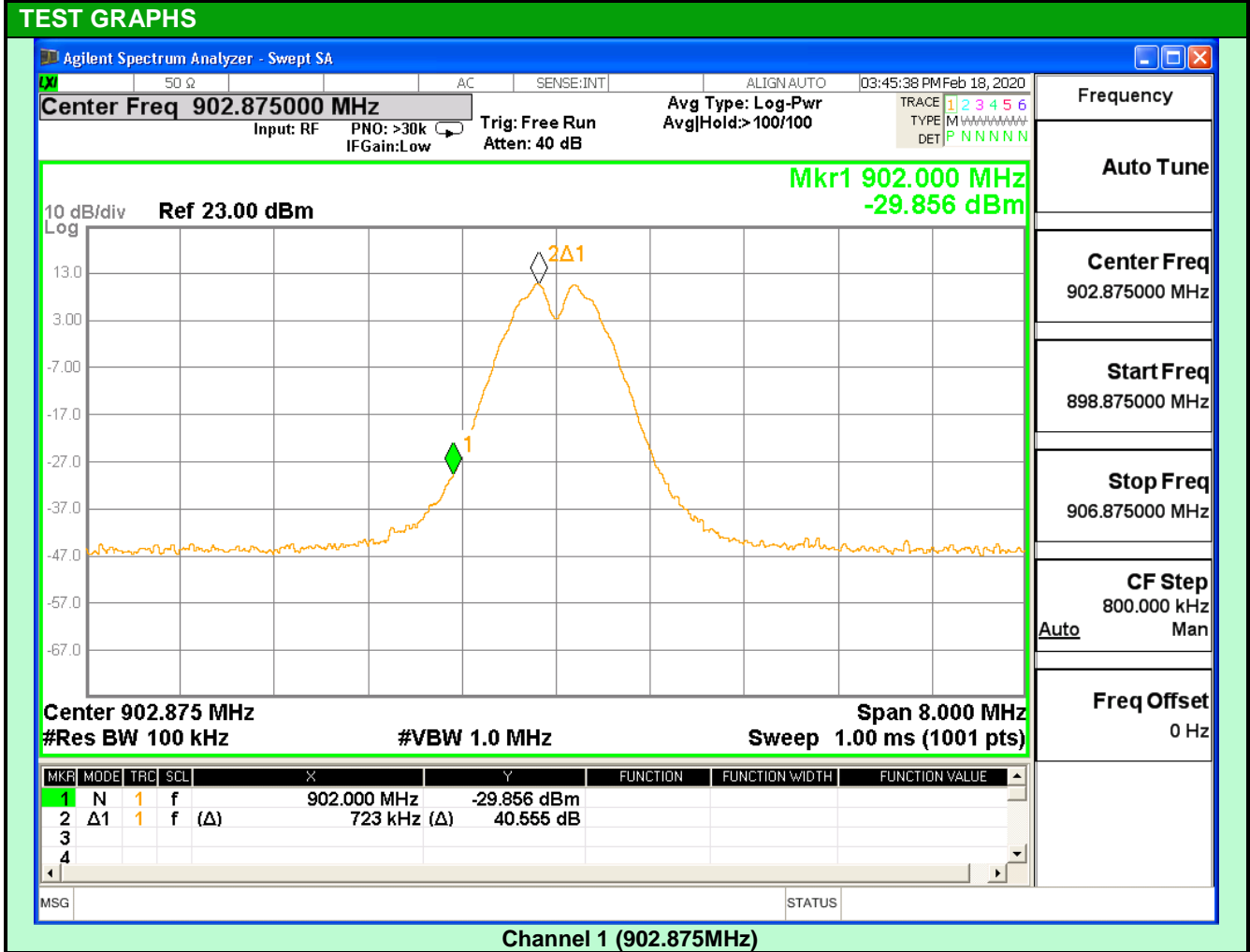
TEST SETUP PHOTOGRAPH

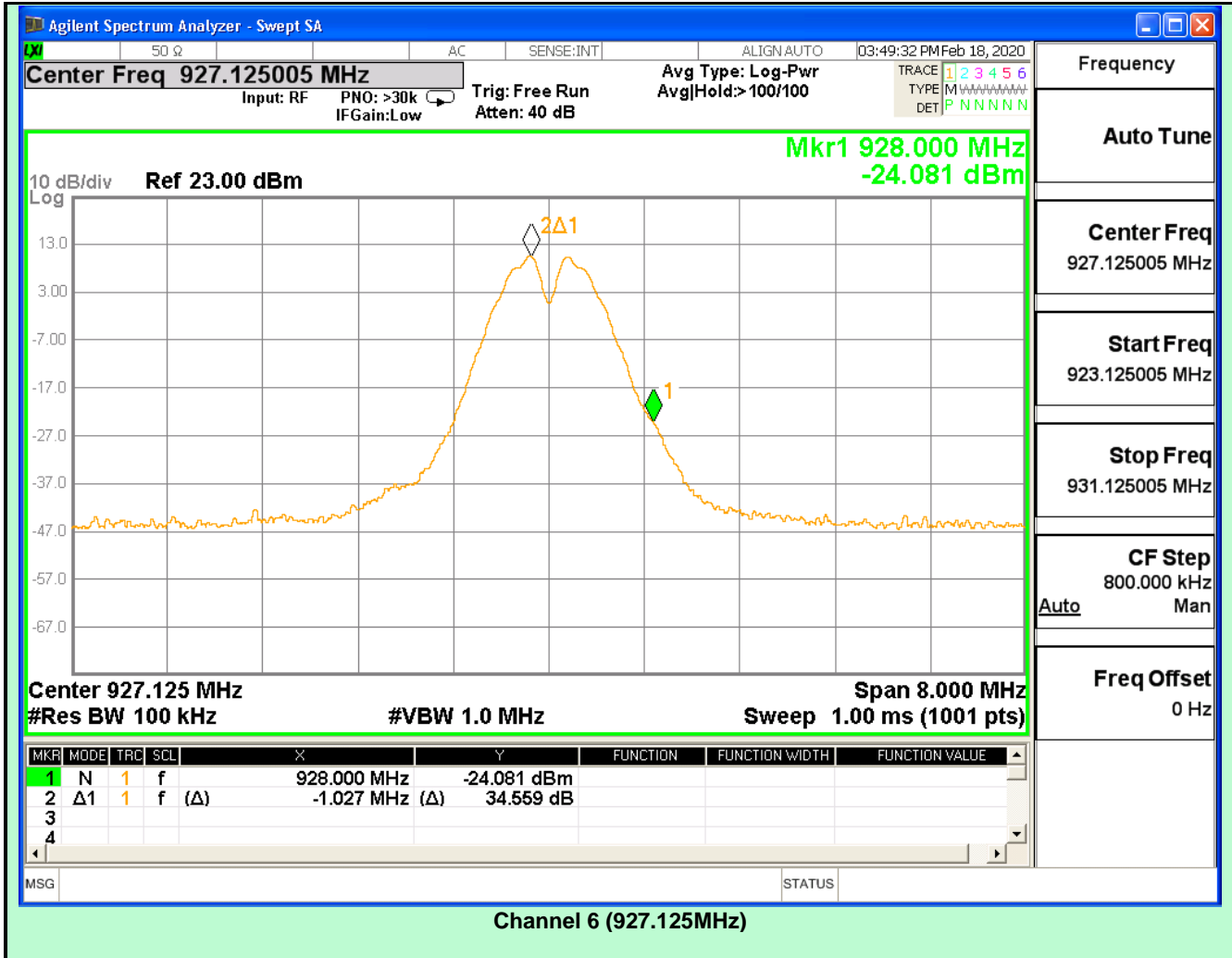
Refer Annexure -1

Conducted RF Test setup

3.4 BAND EDGE COMPLIANCE			
EUT Nomenclature	Wireless Monitor Module	Test Request No.	EMC0418-1
Model No.	FW-MM	Serial No.	127
Test Start Date	14 - Dec - 2019	Temperature (°C)	24.5°C
Test End Date	26 -Feb - 2020	Humidity RH (%)	51.5%RH
Tested By	Vinay Gujjar	Pressure (mbar)	NR
Input Voltage / Freq.	3.3Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std.	NA		
Applicable standard	FCC Part 15.247:2010		
Test Method	KDB 558074		
Comment	NA		
TEST DETAILS			
Method	Radiated <input type="checkbox"/>	Conducted <input checked="" type="checkbox"/>	
TEST PARAMETERS			
Antenna Height	NA	Turntable Rotation	NA
Equipment Class	NA	Measurement Distance	NA

TEST EQUIPMENT					
Y/N	Equipment	Make	Model	SI. No.	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	27-Feb-2021
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA





TEST RESULT				
Channel #	Frequency MHz	Measured Level dBm/3KHz	Limit dBm/3KHz	Result
1	902.875	40.555	>20	PASS
6	927.125	34.559	>20	PASS

TEST SETUP PHOTOGRAPH

Refer Annexure -1

Conducted RF Test setup

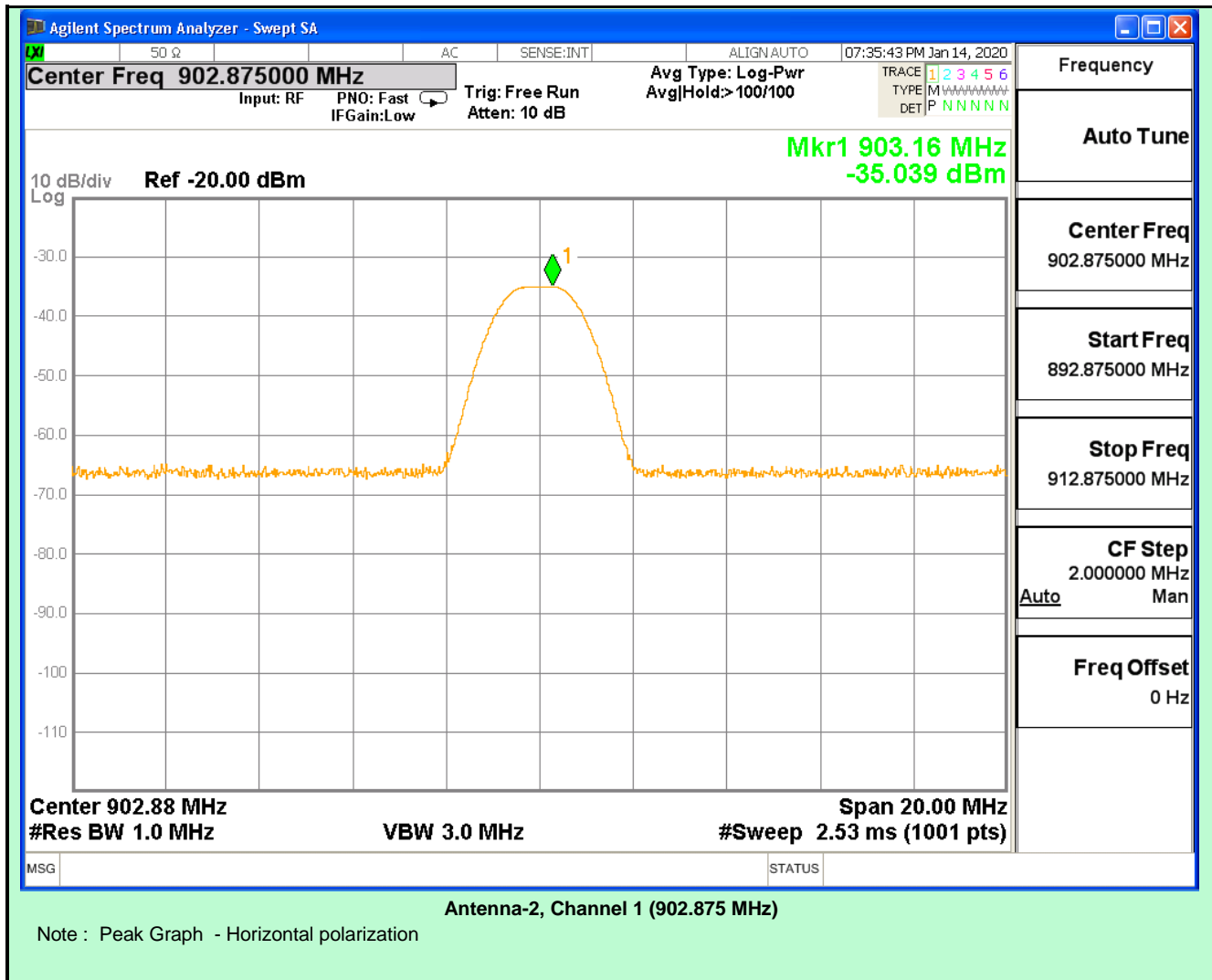
3.5 EFFECTIVE ISOTROPIC RADIATED POWER

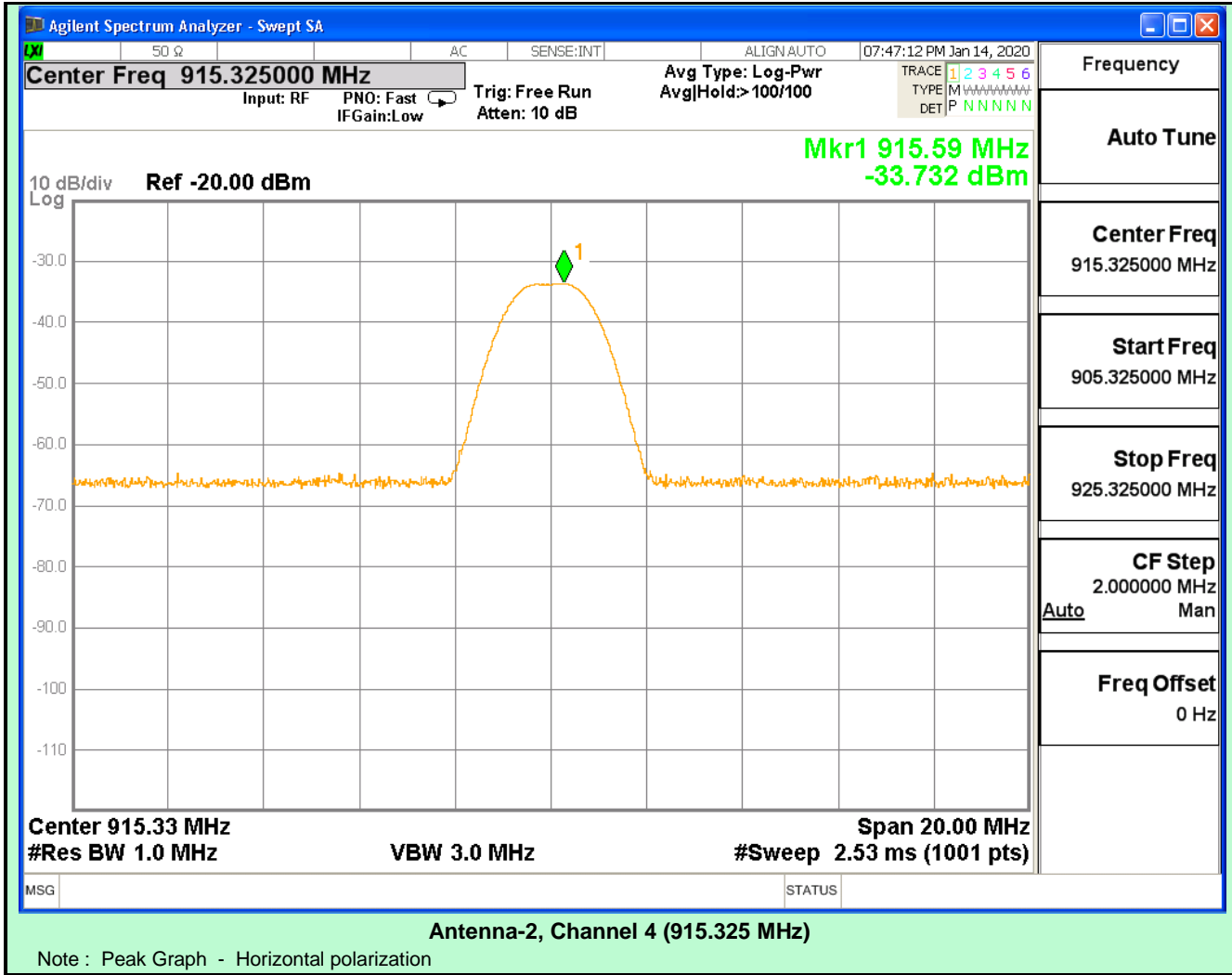
EUT Nomenclature	Wireless Monitor Module	Test Report No.	EMC0418-1
Model No.	FW-MM	Serial No.	127
Test Start Date	14-Dec-2019	Temperature (°C)	22.3±2
Test End Date	26-Feb-2020	Humidity RH (%)	54±2
Tested By	Vinay Gujjar	Pressure (mbar)	
Input Voltage / Freq	3.3Vdc		
Operating Mode	Refer Page 5 Operating Modes Table		
Test configuration	Refer Page 5 Test Configuration Table		
Deviation from Std	NA		
Comment	Nil		
TEST FREQUENCY RANGE			
Start Frequency	902MHz	Stop Frequency	928MHz
MAXIMUM OPERATING FREQUENCY			
902MHz to 928MHz			
TEST PARAMETERS			
Antenna Height	1m to 4m	Turntable Rotation	0° to 360°
Applicable standard	FCC Part 15.247: 2010 and 15.209: 2010	Test Method	KDB 412172
Equipment Class	NA	Measurement Distance	3m

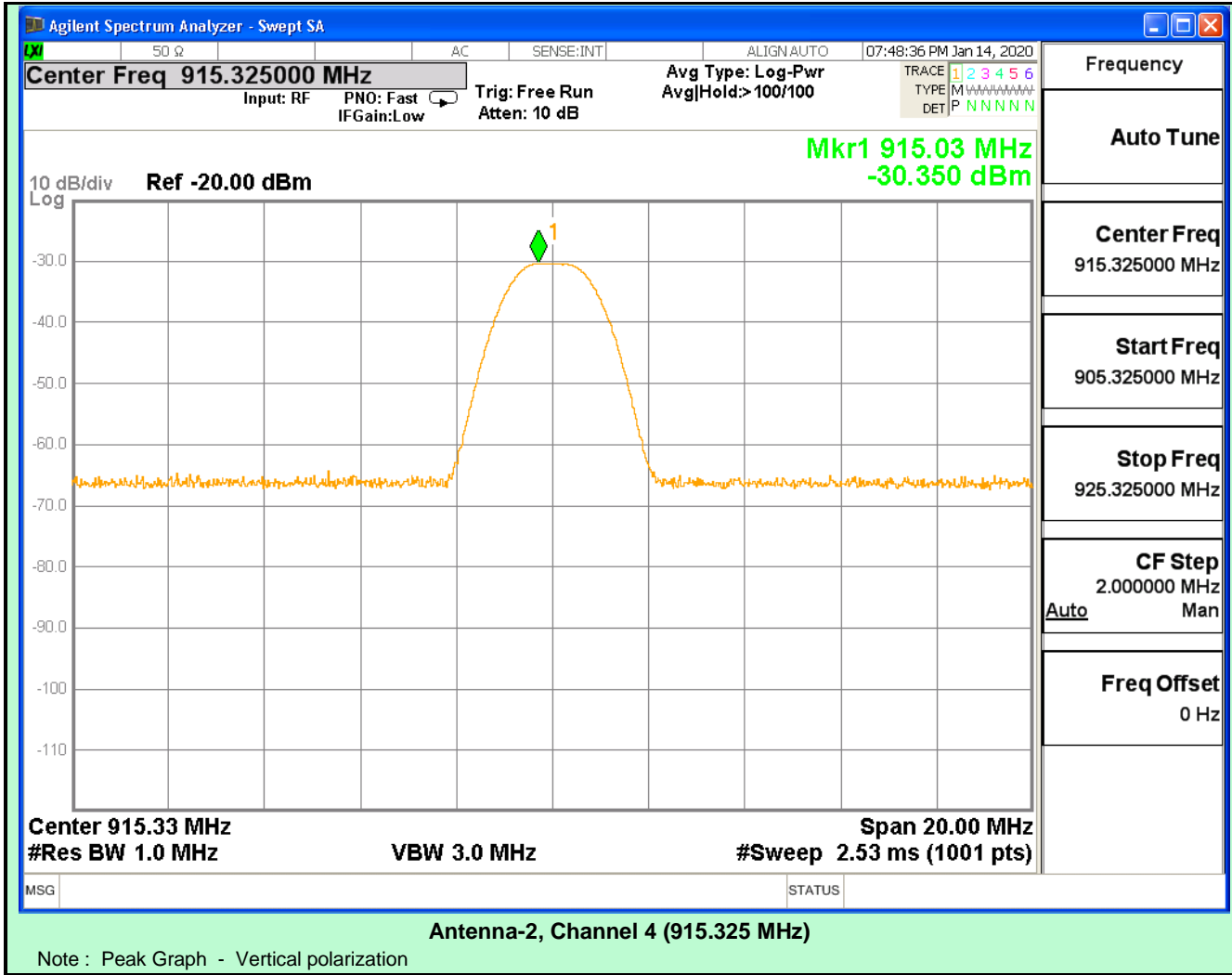
TEST EQUIPMENT

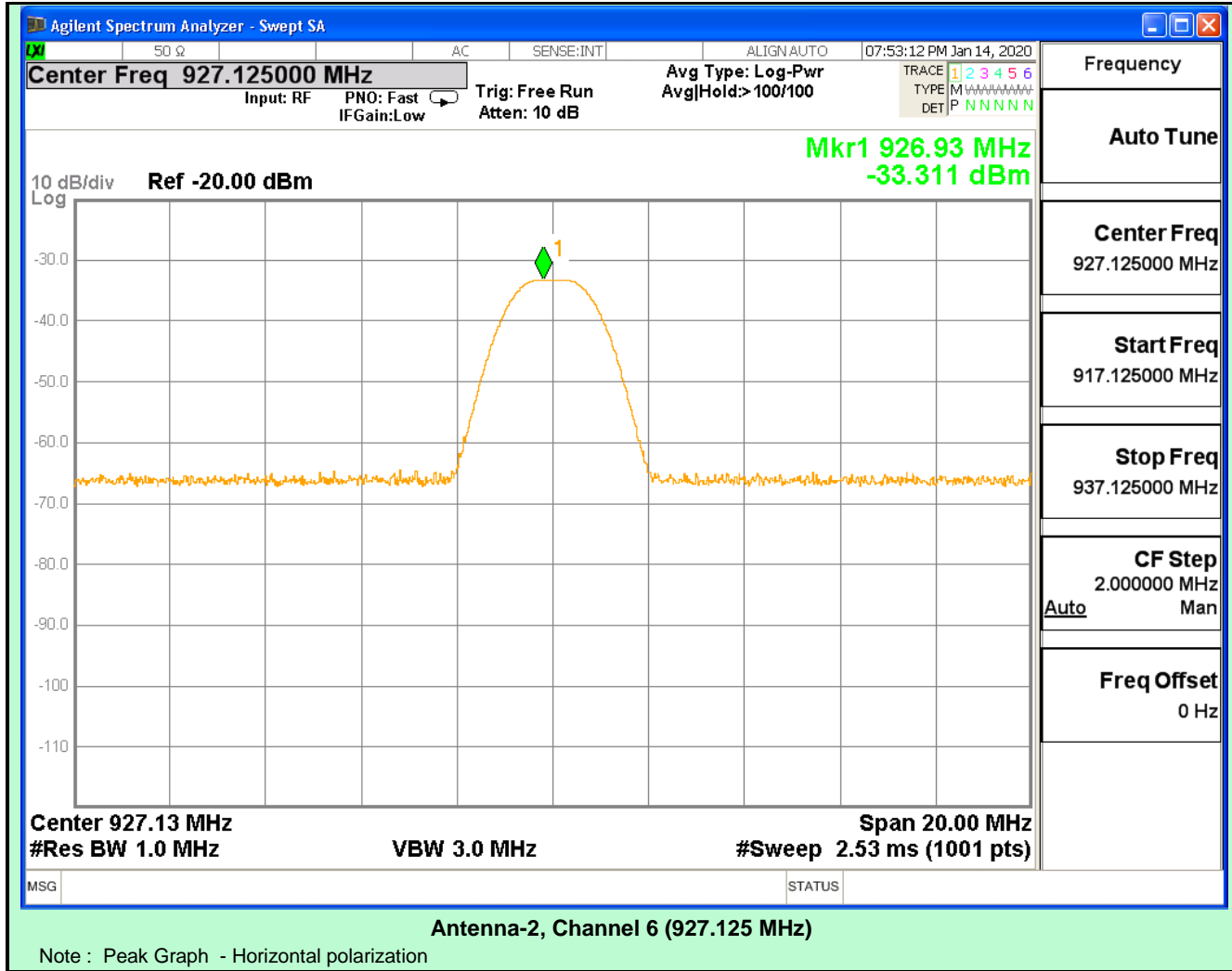
Y/N	Equipment	Make	Model	Sl. No.	Cal Due Date
Y	EMI Test Receiver	R&S	ESU26	100525	7-Aug-20
Y	3m Semi Anechoic Chamber	ETS Lindgren	DKE 6X7 DBL.DR	1625	30-Jul-22
Y	Bilog Antenna	ETS Lindgren	HLP3003C	130525	5-Nov-21
Y	RF cable (9KHz to 18GHz)	Huber + Schuner	Sucoflex100	515518/126E	04-Oct-21

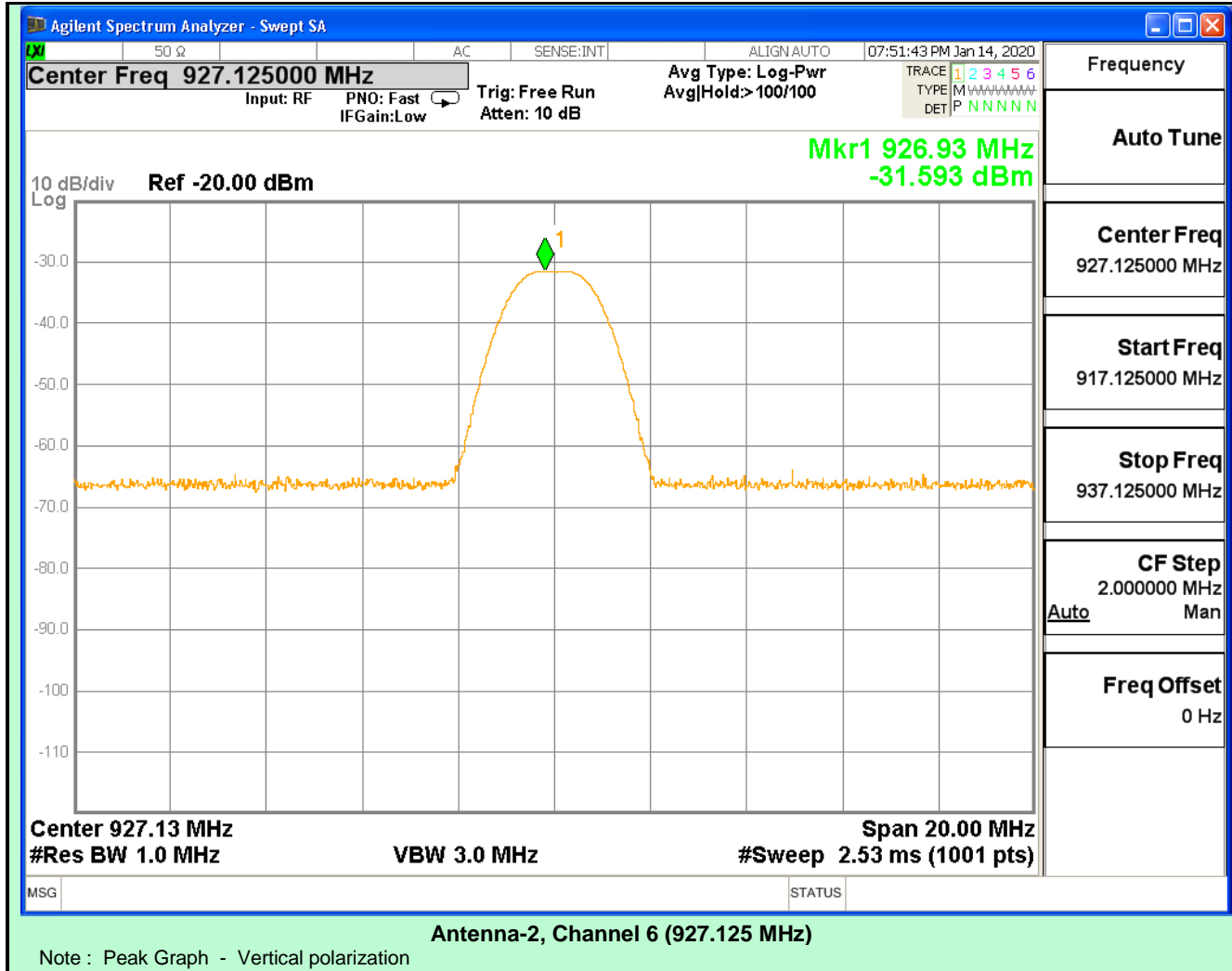
Note: Switch ON /OFF the Internal Preamplifier based on carrier level and or noise floor without overloading the receiver









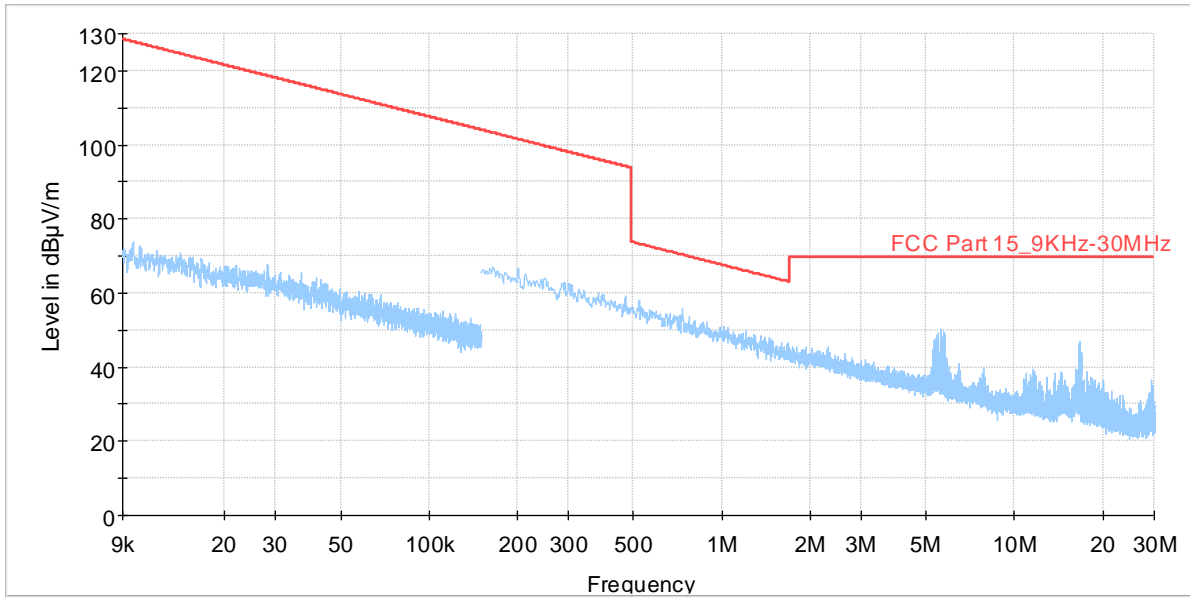


TEST RESULT – EIRP										
Channel	Channel Freq	Rx Antenna Height	Rx Ant Pol	Measured Level	Cable Loss	External Att	Path loss @ 3m	Rx Antenna Gain	Calculated Rx Power	Calculated EIRP
#	MHz	cm	H/V	dBm	dB	dB	dB	dBi	dBm	dBm
Antenna – 2 (DTS Mode)										
CH-1	902.875	100	H	-35.03	2.91	6	41.21	6.3	-32.42	8.79
CH-1	902.875	120	V	-28.47	2.91	6	41.21	6.3	-25.86	15.35
CH-4	915.325	100	H	-33.73	2.91	6	41.21	6.3	-31.12	10.09
CH-4	915.325	160	V	-30.35	2.91	6	41.21	6.3	-27.74	13.47
CH-6	927.125	255	H	-33.31	2.91	6	41.21	6.3	-30.7	10.51
CH-6	927.125	165	V	-31.59	2.91	6	41.21	6.3	-28.98	12.23
<p>Note : Effective Isotropic Radiated Power (dBm)= Pr(dBm) +Lp(dB)</p> <p>Pr = Pmeas(dBm)-Gr(dBi)+Lc(dB)+Latt(dB)</p> <p>Lp =20Log F+20LogD-27.5</p> <p>Where:</p> <p>Pr =Calculated Received Power Level(dBm)</p> <p>Lp= Free Space Path Loss(dB)</p> <p>Pmeas= Measured Power Level(dBm)</p> <p>Gr = Receiver Antenna Gain(dBi)</p> <p>Lc = Cable Loss (dB)</p> <p>Latt= External Attenuator(dB)</p> <p>F = Frequency (MHz)</p> <p>D= Distance (m)</p>										

3.6 SPURIOUS RADIATED EMISSIONS

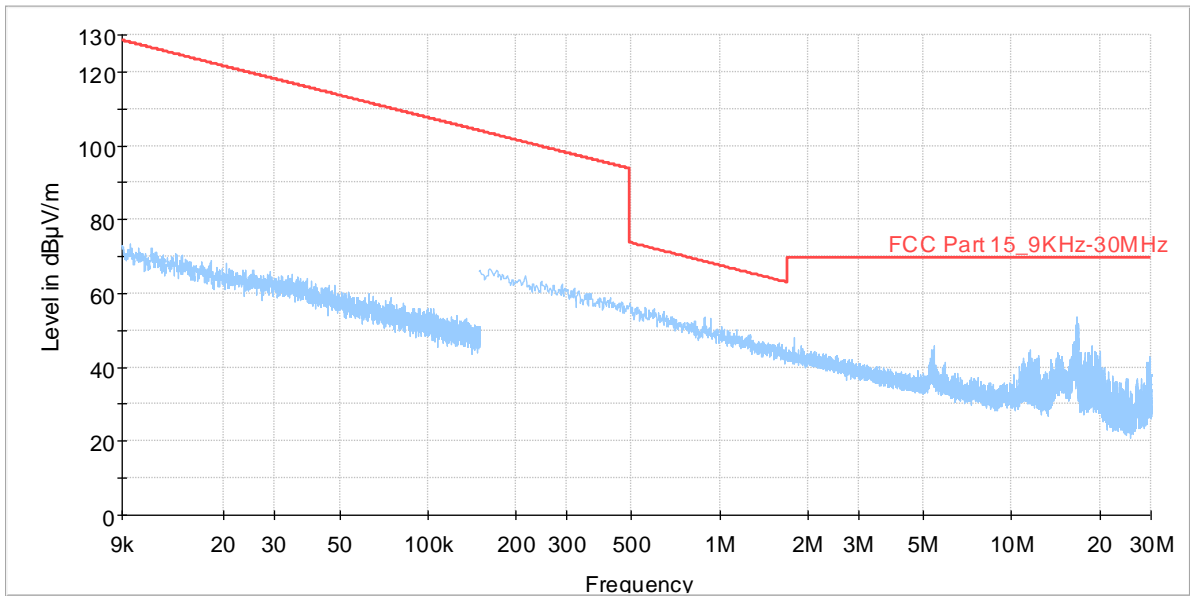
EUT Nomenclature	Wireless Monitor Module	Test Report No.	EMC0418-1
Model No.	FW-MM	Serial No.	127
Test Start Date	14 - Dec-2019	Temperature (°C)	23±2
Test End Date	26 -Feb -2020	Humidity RH (%)	56 ± 2
Tested By	Vinay Gujjar	Pressure (mbar)	
Input Voltage / Freq	3.3Vdc		
Operating Mode	Refer Page 5 Operating Modes Table		
Test configuration	Refer Page 5 Test Configuration Table		
Deviation from Std	NA		
Comment	Nil		
TEST FREQUENCY RANGE			
Start Frequency	9KHz	Stop Frequency	10GHz
MAXIMUM OPERATING FREQUENCY			
902MHz to 928MHz			
TEST PARAMETERS			
Antenna Height	1m to 4m	Turntable Rotation	0° to 360°
Applicable standard	FCC Part 15.247: 2010 and 15.209: 2010	Test Method	KDB 558074 ANSI C63.10 - 2013
Equipment Class	NA	Measurement Distance	3m

TEST EQUIPMENT					
Y/N	Equipment	Make	Model	Sl. No.	Cal Due Date
Y	EMI Test Receiver	R&S	ESU26	100229	7-Aug-20
Y	3m Semi Anechoic Chamber	ETS Lindgren	DKE 6X7 DBL.DR	1625	30-Jul-22
Y	Double Ridge Guide Horn Antenna	ETS Lindgren	3117	64055	1-Nov-21
Y	Bilog Antenna	ETS Lindgren	HLP3003C	130525	5-Nov-21
Y	Loop Antenna	ETS Lindgren	6507	103694	15-Nov-21
Y	RF cable (9KHz to 18GHz)	Huber + Schuner	Sucoflex100	515518/126E	04-Oct-21
Y	Signal Conditioning unit	R&S	SCU-18	10178	5-Jun-20
Y	High Pass Filter	Wainwright	WHKX1.5/15G-12ST	1	24-Feb-21
Y	EMC32 Software	R&S	8.30.0	820-OT101248	NA
Note: Switch ON /OFF the Internal Preampifier based on carrier level and or noise floor without overloading the receiver					



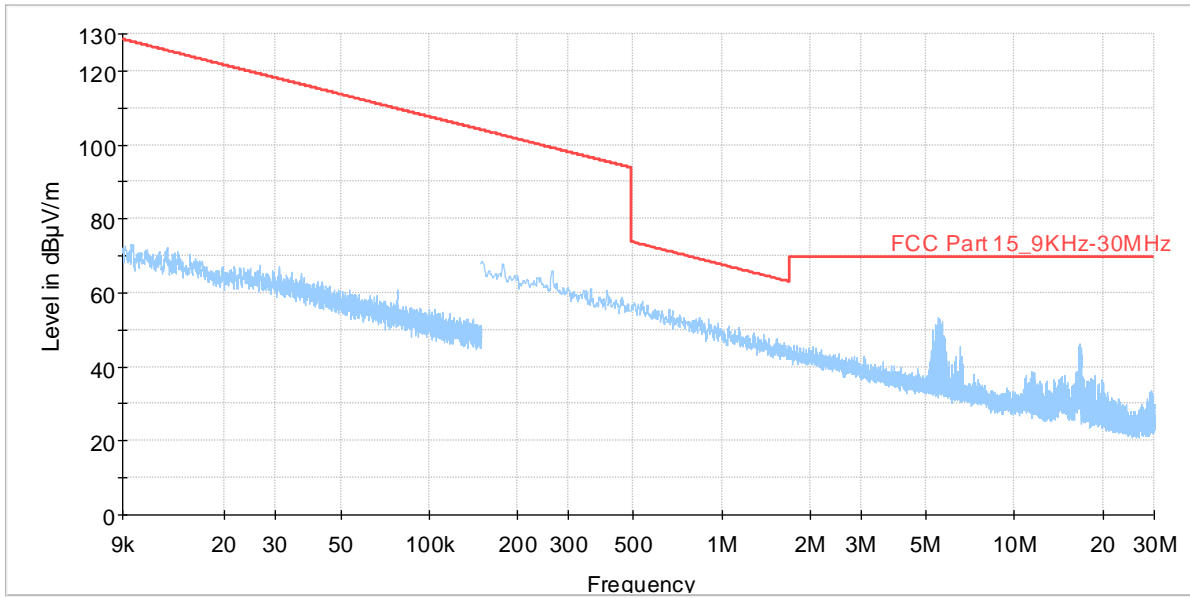
Antenna-2, Channel 1 (902.875 MHz)

Note : Peak Graph - Parallel



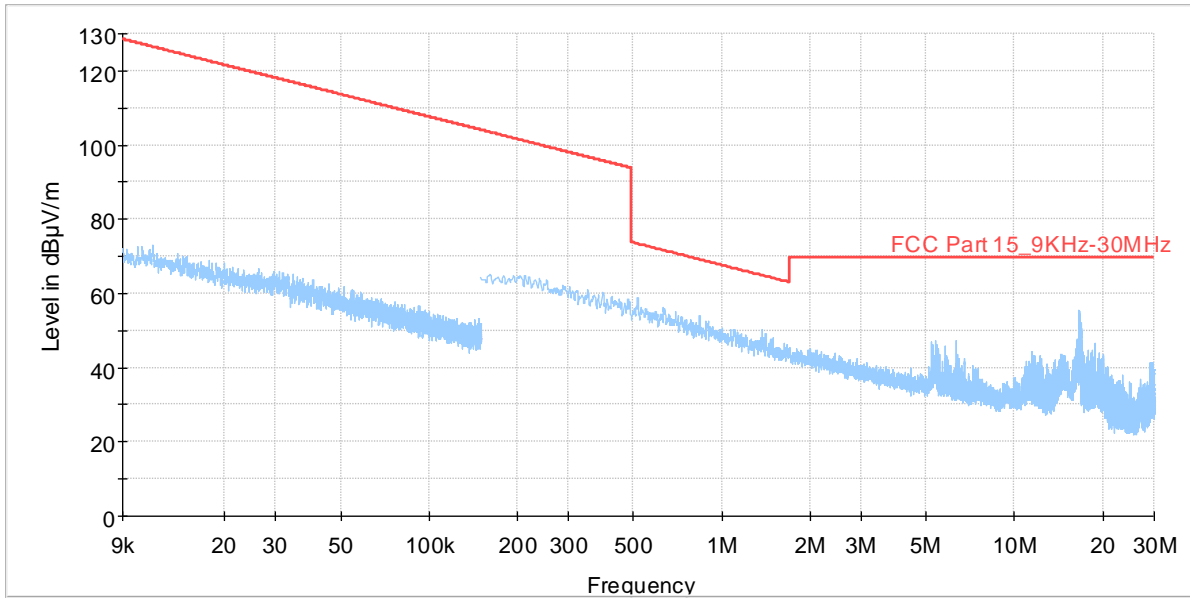
Antenna-2, Channel 1 (902.875 MHz)

Note : Peak Graph - Perpendicular



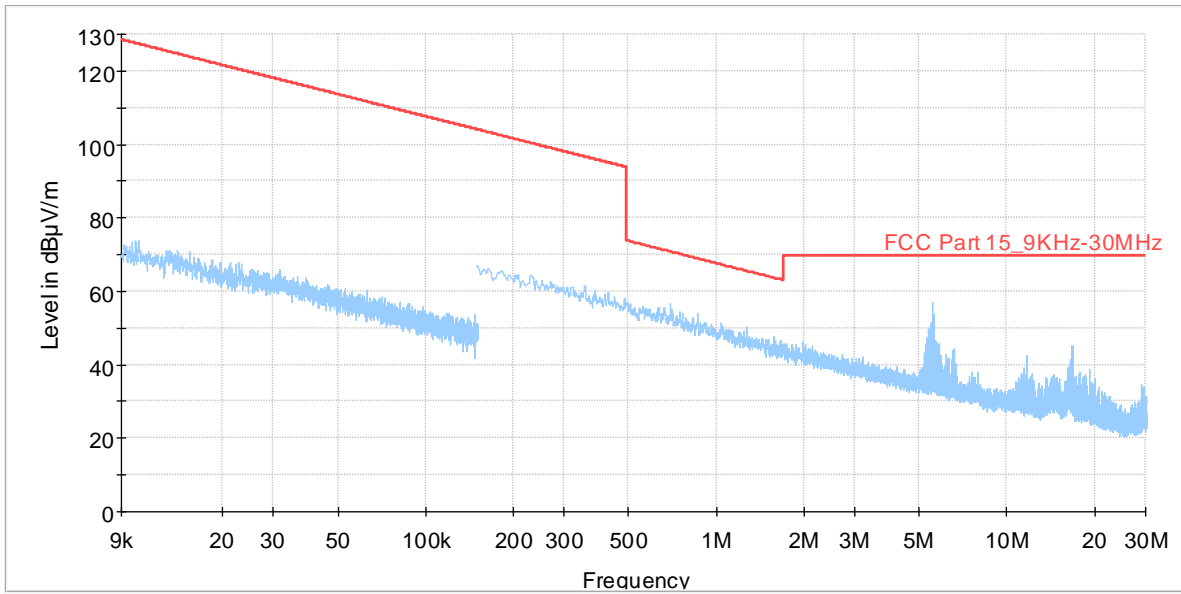
Antenna-2, Channel 4 (915.325 MHz)

Note : Peak Graph - Parallel



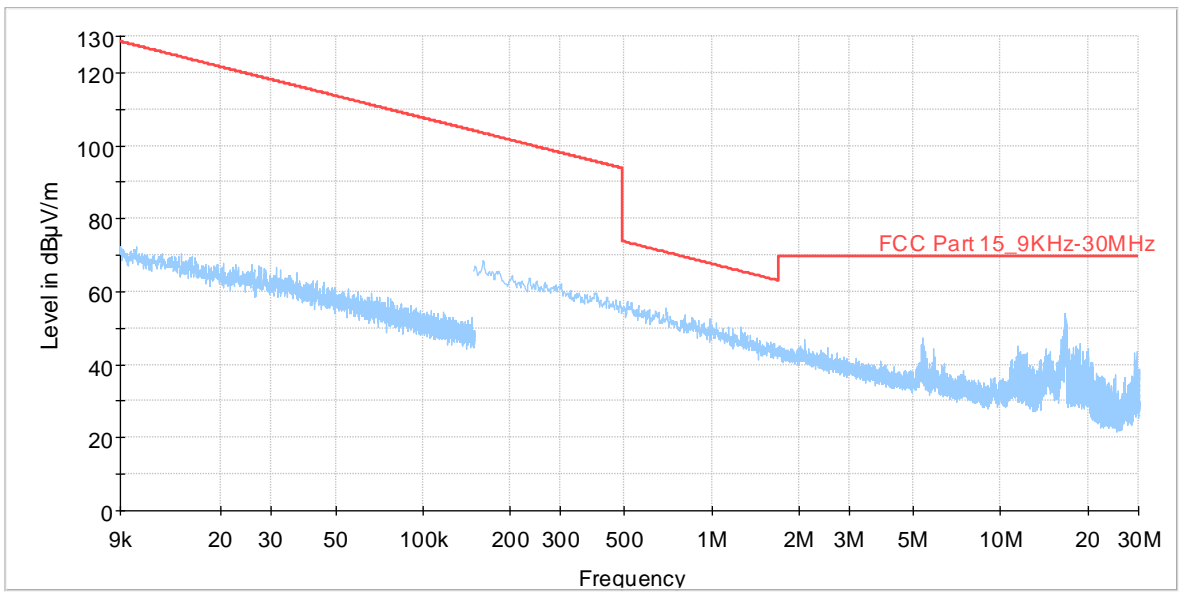
Antenna-2, Channel 4 (915.325 MHz)

Note : Peak Graph - Perpendicular



Antenna-2, Channel 6 (927.125MHz)

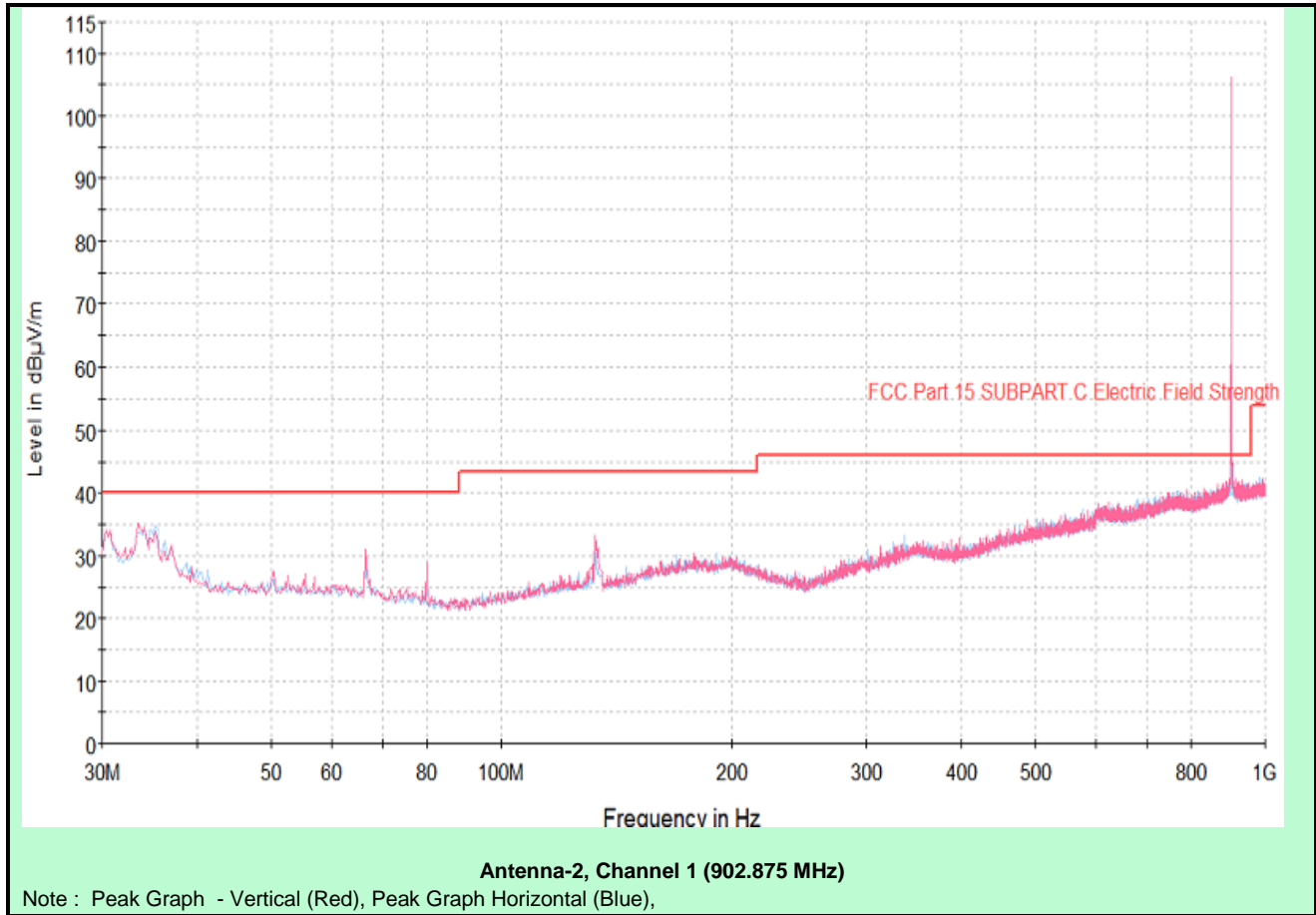
Note : Peak Graph - Parallel

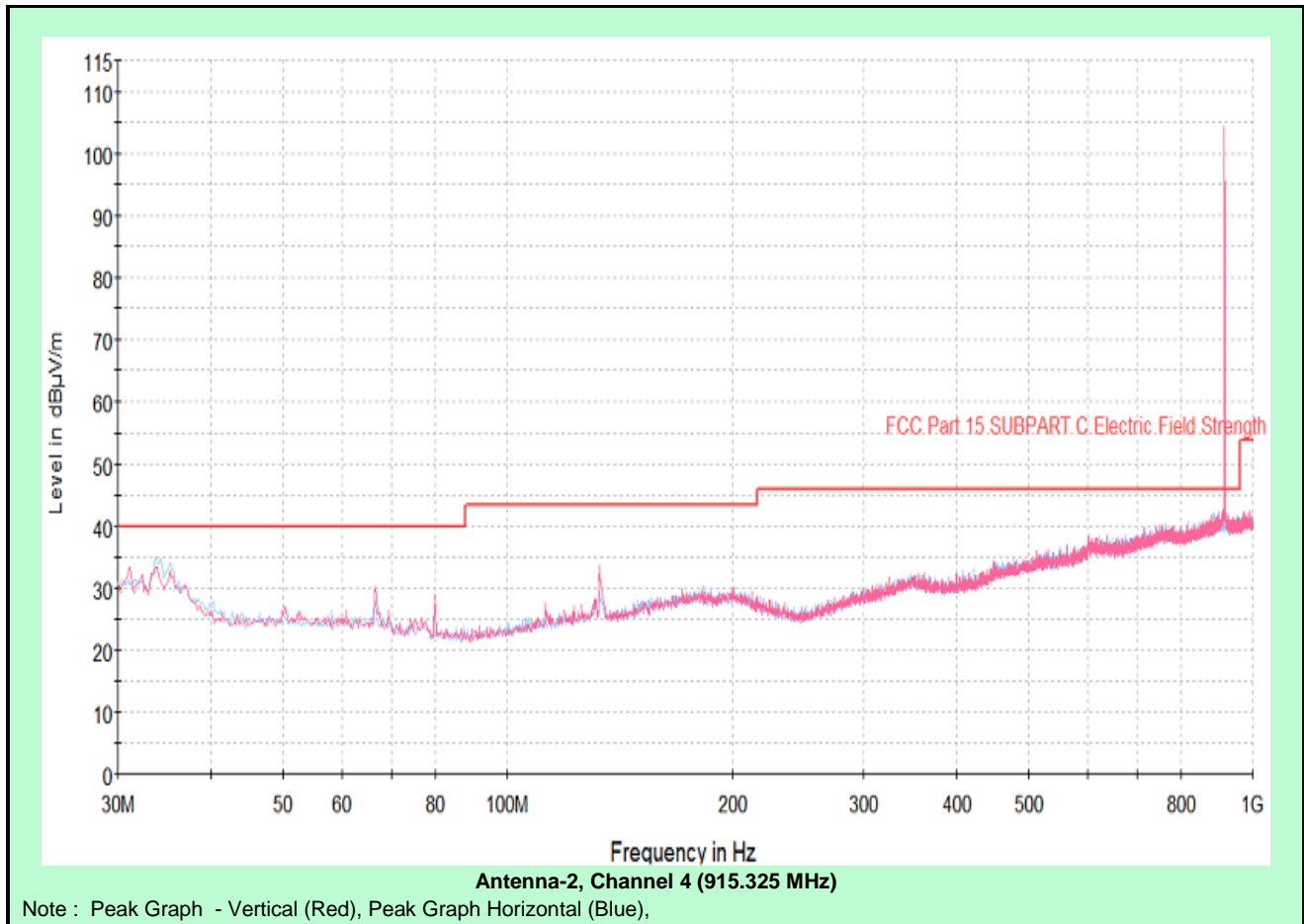


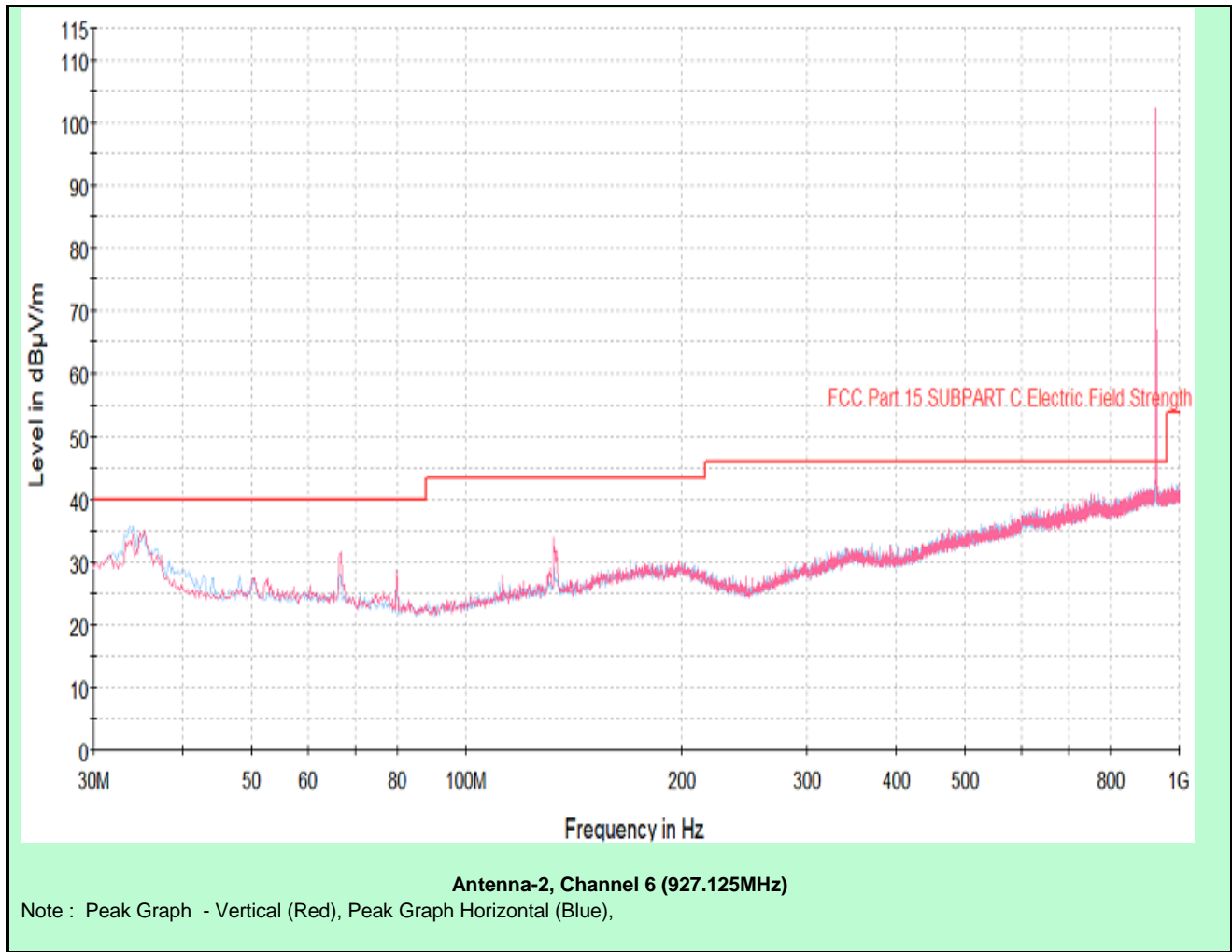
Antenna-2, Channel 6 (927.125MHz)

Note : Peak Graph - Perpendicular

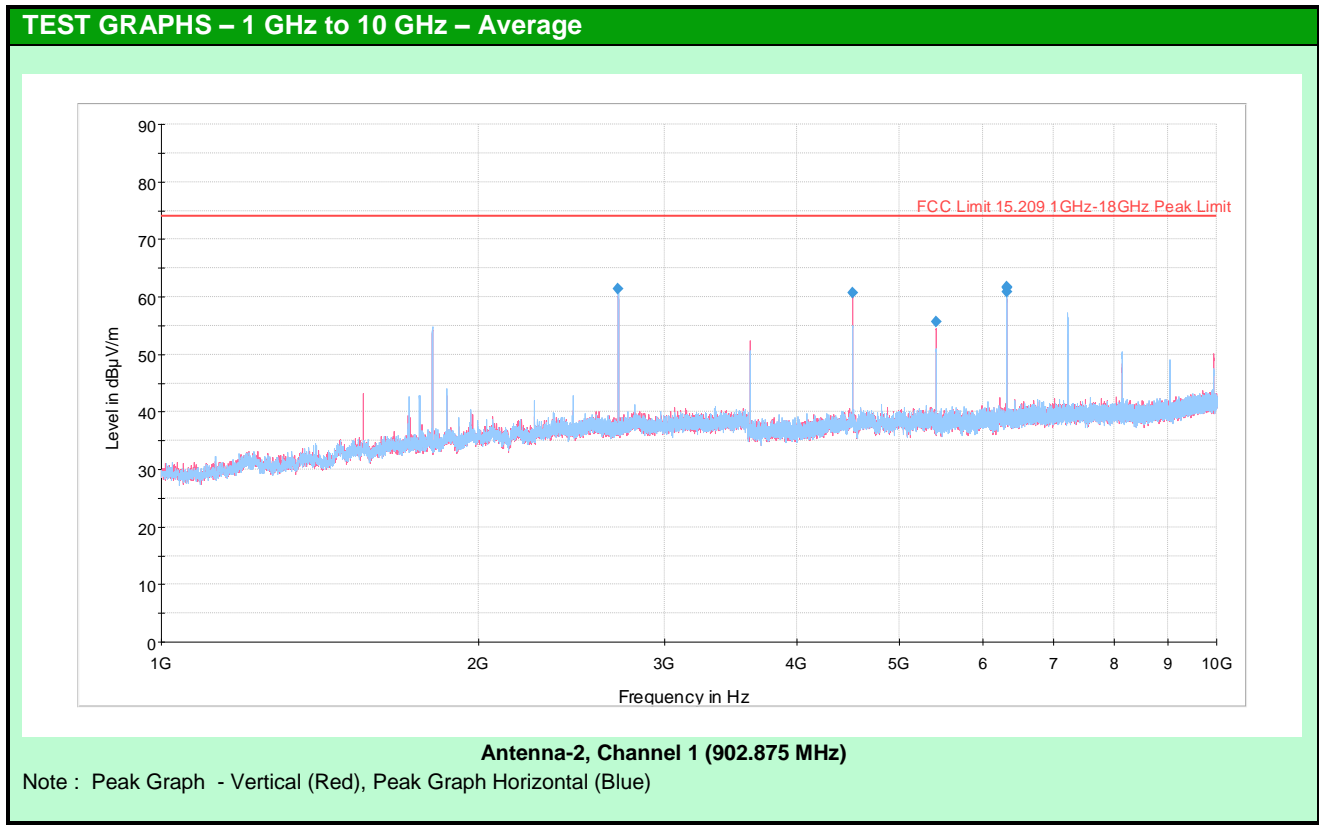
TEST RESULT – 9 KHz to 30 MHz									
Channel	Channel Frequency	Measured Spurious	Quasi Peak	Height	Ant Pol	Azimuth	Margin	Limit @ 3m Distance	Results
#	MHz	MHz	dBµV/m	cm	Parallel / Perpendicular	deg	dB	dBµV/m	
No emissions detected. Emissions shown in the plot are related to the chamber ambient									
Note : Measured Field Strength (dBuV/m) = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)									

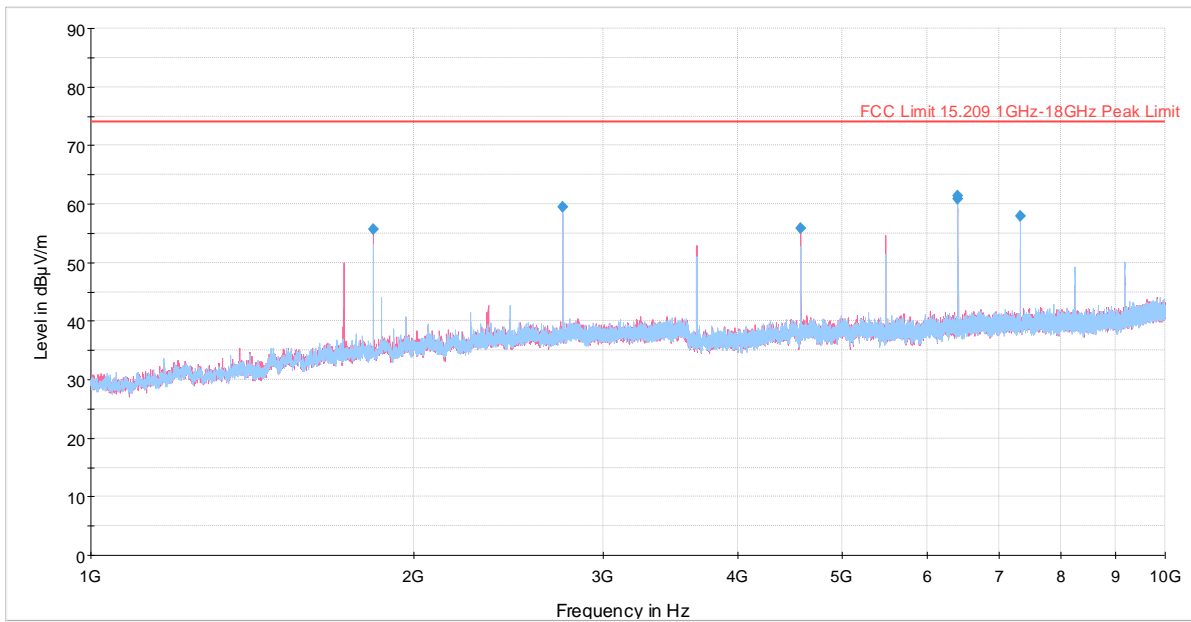






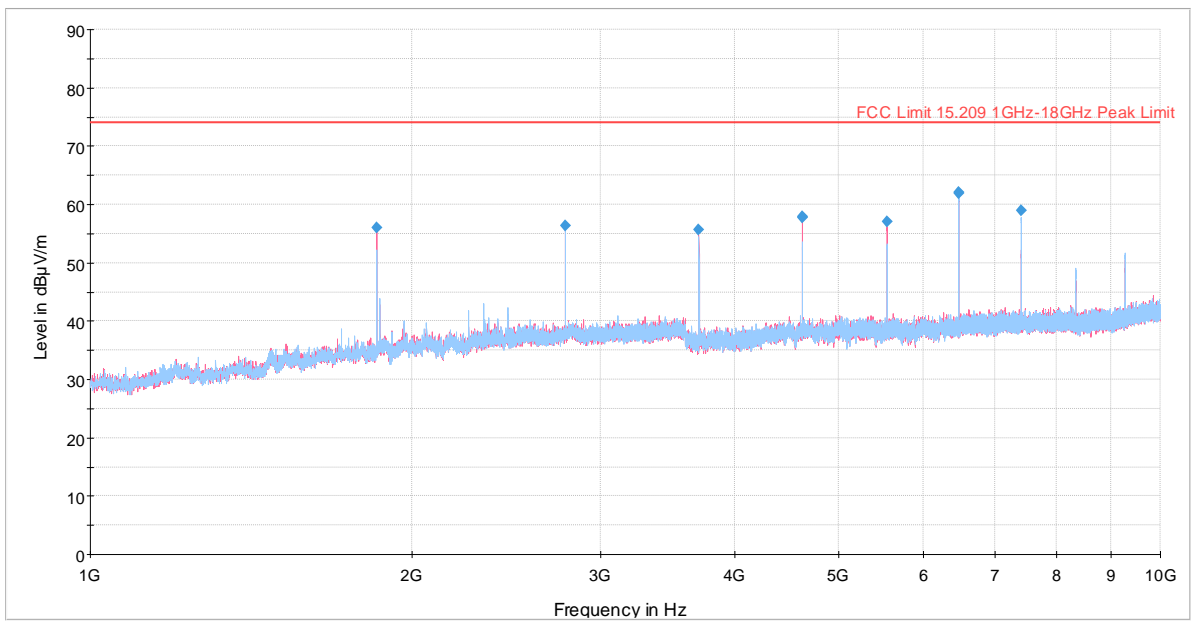
TEST RESULT – 30 MHz to 1 GHz								
Channel	Measured Spurious	Quasi Peak	Height	Ant Pol	Azimuth	Margin	Limit @ 3m Distance	Results
#	MHz	dBµV/m	Cm	H / V	deg	dB	dBµV/m	
Antenna – 2								
CH-1	678.34	32.24	300	H	27	13.76	46	Pass
CH-1	679.90	32.31	100	H	118	13.69	46	Pass
CH-1	692.31	32.55	200	H	57	13.45	46	Pass
CH-1	831.22	34.3	400	V	69	11.7	46	Pass
CH-1	847.12	34.5	400	H	274	11.5	46	Pass
CH-1	848.48	34.51	400	H	3	11.49	46	Pass
CH-1	902.74	103.01	200	V	211	-	-	Intended Frequency
CH-4	636.25	31.94	400	V	31	14.06	46	Pass
CH-4	674.27	32.18	100	H	120	13.82	46	Pass
CH-4	696.00	32.66	200	H	20	13.34	46	Pass
CH-4	819.58	33.95	300	H	0	12.05	46	Pass
CH-4	831.99	34.37	300	V	252	11.63	46	Pass
CH-4	847.51	34.43	400	H	164	11.57	46	Pass
CH-4	915.22	101.46	100	V	321	-	-	Intended Frequency
CH-6	687.07	32.44	200	H	335	13.56	46	Pass
CH-6	692.70	32.63	100	V	92	13.37	46	Pass
CH-6	696.58	32.71	200	V	140	13.29	46	Pass
CH-6	752.06	34.03	100	V	0	11.97	46	Pass
CH-6	768.36	34.08	400	H	249	11.92	46	Pass
CH-6	849.65	34.54	400	H	5	11.46	46	Pass
CH-6	926.99	100.77	100	V	138	-	-	Intended Frequency
NOTE: Measured Field Strength –dBuV/m (9 KHz to 1 GHz) = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)								





Antenna-2, Channel 4 (915.325 MHz)

Note : Peak Graph - Vertical (Red), Peak Graph Horizontal (Blue)



Antenna-2, Channel 6 (927.125MHz)

Note : Peak Graph - Vertical (Red), Peak Graph Horizontal (Blue)

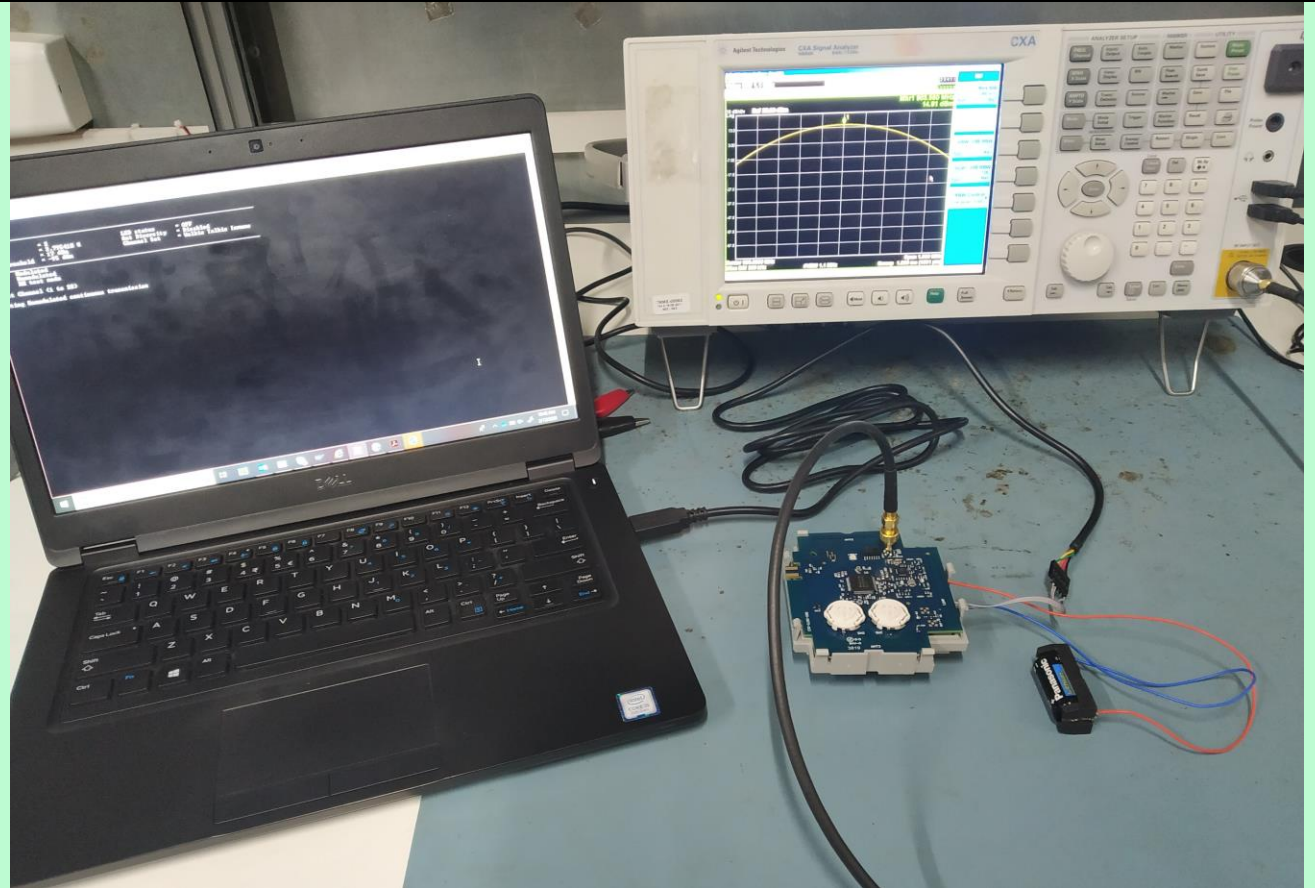
TEST RESULT – 1 GHz to 10 GHz						RESTRICTED BAND – PEAK		
Channel	Frequency	Measured Field Strength	Height	Ant Pol	Azimuth	Margin	Limit	Result
#	(MHz)	(dBµV/m)	(cm)	H / V	(deg)	(dB)	(dBµV/m)	
Antenna – 2								
CH-1	2707.75	60.18	100	H	338	13.82	74	PASS
CH-1	2709.35	58.96	300	V	0	15.04	74	PASS
CH-1	4512.89	57.81	300	V	352	16.19	74	PASS
CH-1	4515.78	56.61	300	V	7	17.39	74	PASS
CH-4	2744.71	56.99	200	H	349	17.01	74	PASS
CH-4	4578.14	55.96	200	V	345	18.04	74	PASS
CH-6	2782.00	57.21	300	H	327	16.79	74	PASS
CH-6	4636.96	56.07	300	V	354	17.93	74	PASS
Note : Measured Field Strength (dBuV/m) = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)								

TEST RESULT – 1 GHz to 10 GHz						RESTRICTED BAND – AVERAGE		
Channel	Frequency	Measured Average	Height	Ant Pol	Azimuth	Margin	Limit	Result
#	(MHz)	(dBµV/m)	(cm)	H / V	(deg)	(dB)	(dBµV/m)	
Antenna – 2								
CH-1	2707.75	51.69	100	H	338	2.31	54	PASS
CH-1	2709.04	52.59	100	H	338	1.41	54	PASS
CH-1	4513.21	47.59	300	V	0	6.41	54	PASS
CH-1	4514.50	45.29	200	V	0	8.71	54	PASS
CH-1	4515.46	47.51	300	V	346	6.49	54	PASS
CH-4	1721.61	23.2	200	V	52	30.8	54	PASS
CH-4	2745.04	50.47	200	H	339	3.53	54	PASS
CH-4	2746.64	51.59	200	H	344	2.41	54	PASS
CH-4	4575.25	45.83	200	V	339	8.17	54	PASS
CH-4	4576.86	44.01	200	V	345	9.99	54	PASS
CH-4	4577.82	45.96	200	V	345	8.04	54	PASS
CH-6	2331.04	25.17	100	V	0	28.83	54	PASS
CH-6	2780.71	49.84	300	H	327	4.16	54	PASS
CH-6	3707.39	40.15	300	V	21	13.85	54	PASS
CH-6	4636.96	46.17	300	V	354	7.83	54	PASS
Note : Measured Field Strength (dBuV/m) = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)								

TEST RESULT – 1 GHz to 10 GHz							NON- RESTRICTED BAND - PEAK		
Channel	Measured Fundamental	Spurious Emission	Measured Harmonic	Height	Ant Pol	Azimuth	Limit	Margin	Results
							[Fundamental – 20 dB]		
#	dBµV/m	MHz	dBµV/m	cm	H / V	deg	dBµV/m	dB	
Antenna – 2									
CH-1	103.01	6318.0357	55	400	H	267	83.01	28.01	PASS
CH-4	101.46	1829.9286	54.02	100	V	8	81.46	27.44	PASS
CH-4	101.46	6404.8214	54.35	400	H	291	81.46	27.11	PASS
CH-6	100.77	6491.9286	55.45	400	V	0	80.77	25.32	PASS
<u>Note:</u>									
Measured Harmonic Field Strength (dBµV/m) = Receiver Readings (dBµV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre- amplifier Gain (dB)									

Annexure – 1

CONDUCTED RF TEST SETUP



Conducted RF test setup

RADIATED EMISSION SETUP



Radiated Emission Setup – 9 KHz to 30 MHz [Parallel]





Radiated Emission Setup -30 MHz to 1 GHz [Horizontal polarization Polarization]



Radiated Emission Setup -30 MHz to 1 GHz [Vertical Polarization]

