

	    CERTIFICATE 2518.08 MS ISO/IEC 17025 TESTING SAMM NO. 0825																												
MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas Penang, MALAYSIA	FCC / ISED TEST REPORT Report Revision : Rev.C																												
<table><tr><td>Date/s Tested</td><td>: 04-MAY-2020 - 27-MAY-2020</td></tr><tr><td>Manufacturer/Location</td><td>: MOTOROLA SOLUTIONS INC.(ELGIN)</td></tr><tr><td>Manufacturer Address</td><td>: 2540 GALVIN DR ELGIN, IL 60124</td></tr><tr><td>Requestor</td><td>: TEH TIAN HONG</td></tr><tr><td>Product Type</td><td>: Base Station</td></tr><tr><td>Model Number</td><td>: T7039A (T7039-UHFR2C)</td></tr><tr><td>Frequency Band</td><td>: 435-524 MHZ</td></tr><tr><td>Firmware Version</td><td>: R35.00.09</td></tr><tr><td>Max RF Output Power</td><td>: 110 Watts</td></tr><tr><td>Applicant Name</td><td>: Motorola Solutions Inc</td></tr><tr><td>Applicant Address</td><td>: 1303 E Algonquin Road, Room 1043, Schaumburg, IL, 60196</td></tr><tr><td>ISED Registrations</td><td>: MY0001</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr></table>  The equipment was tested accordance to the requirement listed below: <table><tr><td>(LMR) FCC 47 CFR Part 15B RSS Gen</td><td>PASS</td></tr></table>		Date/s Tested	: 04-MAY-2020 - 27-MAY-2020	Manufacturer/Location	: MOTOROLA SOLUTIONS INC.(ELGIN)	Manufacturer Address	: 2540 GALVIN DR ELGIN, IL 60124	Requestor	: TEH TIAN HONG	Product Type	: Base Station	Model Number	: T7039A (T7039-UHFR2C)	Frequency Band	: 435-524 MHZ	Firmware Version	: R35.00.09	Max RF Output Power	: 110 Watts	Applicant Name	: Motorola Solutions Inc	Applicant Address	: 1303 E Algonquin Road, Room 1043, Schaumburg, IL, 60196	ISED Registrations	: MY0001	FCC Registrations	: 461337	(LMR) FCC 47 CFR Part 15B RSS Gen	PASS
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Prepared By:  Aaron Goh Tong Wen Test Personal	Approve Signatory: Vincent Foong Chuen Kit Deputy Technical Manager																												

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Revision History	Description	Date	Originator
Rev. A	Initial Report	27-MAY-2020	Aaron Goh
Rev. B	Typo in FCC ID rectified	28-June-2020	Vincent Foong
Rev. C	Updated applicant address	20-July-2020	Vincent Foong

1.0. General Information

EUT Description:

Technologies	LMR
Modulation Type	Analog,FSK

The EUT was tested with following device/accessory:

Item	Brand	Model or P/N
LINECORD PLUG & RECP 3.7 MTRS	MOTOROLA	3082933N20

General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, the EUT is to comply with the requirements of the following standards:

ANSI C63.26.2015

ANSI C63.4.2014

2.0. Summary of Test Results

FCC General Rules Part (47CFR)	IC General Rules Part	Test Item	Result
15.109, 15.111	RSS-Gen	Conducted Spurious Output Power	Pass
15.109, 15.111	RSS-Gen	Radiated Spurious Output Power	Pass
15.107	RSS-Gen 7.2	AC Power Conducted Spurious Emissions	Pass

NA → Not Applicable

3.0. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±dB)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.43
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	4.25
	200MHz ~ 1000MHz	4.25
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	4.94
	18GHz ~ 25GHz	4.94
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82

4.0. Equipment List

CONDUCTED SPUR EMISSION ATE # 1 (SW version: Conducted Spur ATE rev 1.23.02)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
SWITCH CONTROL UNIT	3488A	2719A32735	CNR	CNR
SPECTRUM ANALYZER	E4445A	MY46181732	12-Mar-19	12-Mar-21
POWER SUPPLY	6032A	2723A02219	2-Jul-19	2-Jul-20
HIGH PASS FILTER SWITCH BOX	-	CS001	4-Jul-19	4-Jul-20
N to N RF Cable # 1	SF126/11N/11N	NA	NA	NA
N to N RF Cable # 2	SF126/11N/11N	NA	NA	NA
BNC to BNC RF Cable # 1	RG 58	NA	NA	NA
Aeroflex Attenuator 30dB	49-30-43-LIM	NA	NA	NA
Aeroflex Attenuator 10dB	33-10-34-LIM	NA	NA	NA

Radiated Emission Station

EMC Chamber 1

DESCRIPTION	MODEL	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
DRG HORN FREQ.	SAS-571	720	21-Mar-19	21-Mar-21
DRG HORN FREQ.	SAS-571	1143	14-Feb-19	14-Feb-21
POWER SUPPLY (0-60V / 0-50A, 1000W)	6032A	MY41001736	25-May-19	25-May-20
SIGNAL GENERATOR	SMB 100A	181117	8-Nov-18	8-Nov-21
EMI TEST RECEIVER	ESW44	101750	24-Jul-19	24-Jul-20
EMI TEST RECEIVER	ESIB26	100017	19-Jul-19	19-Jul-20
5m Semi-anechoic Chamber	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
BILOG ANTENNA	CBL6112D	30991	5-Aug-19	5-Aug-20
BILOG ANTENNA	CBL6112B	2950	8-Jul-19	8-Jul-21
DATA LOGGER	DSB	16372019	31-Oct-19	31-Oct-20
SYSTEM CONTROLLER	SC104V	050806-1	No Cal. Req'd	No Cal. Req'd
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	No Cal. Req'd	No Cal. Req'd
ANTENNA POSITIONING TOWER	TLT2	NA	No Cal. Req'd	No Cal. Req'd
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	23-Jun-19	23-Jun-20
18 - 40GHz PREAMPLIFIER	Miteq Hi Gain Sucoflex	001	No Cal. Req'd	No Cal. Req'd
PREAMPLIFIER	PAM-0118	269	24-May-19	24-May-22

LOOP ANTENNA	6502	00208416	5-Sep-19	5-Sep-20
Test Software	EMC_FCC_IC_Bluetooth_RE_Test			
Version	EMC_FCC_RE_v1.6.1			

AC Power Line Conducted Spurious Emission

DESCRIPTION	MODEL	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
TEMPERATURE & HUMIDITY LOGGER	TM320	12249289	15-May-19	15-Aug-20
V-NETWORK 2-LINE	ENV216V	101039	20-Jul-19	20-Jul-20
EMI TEST RECEIVER	ESIB26	827769/009	25-Jul-19	25-Jul-20
PROGRAMMABLE AC SOURCE	61604	ABR000000926	1-Jul-19	1-Jul-20
Test Software	EMC32			
Version	Ver. 10.50.40			

5.0. Test Condition

5.1 Receiver Test Conditions

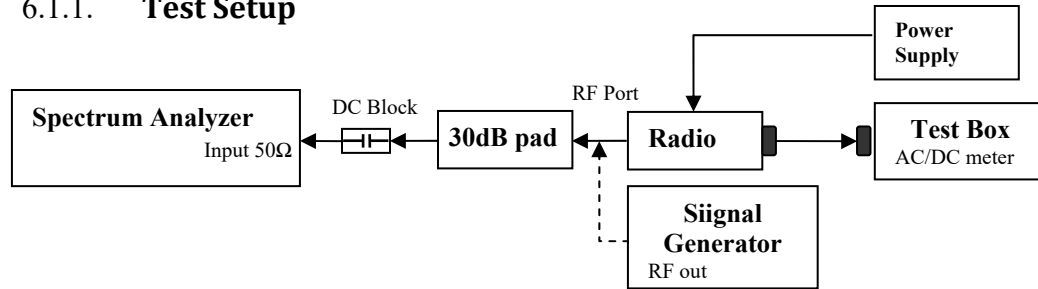
Test Item, (Channel Spacing)	Temperature (°C)	Voltage Supply (V)	Power (W)	Modulation	Test Frequency (MHz)
Conducted Spurious Output Power (12.5kHz / 25kHz)	25°C	Nominal	Max	Analog	435.0125, 450.0125, 469.9375, 511.9375 523.9875
Radiated Spurious Output Power (12.5kHz / 25kHz)	25°C	Nominal	Max	Analog	435.0125, 450.0125, 469.9375, 511.9375 523.9875
AC Power Line Conducted Spurious Emissions (12.5kHz / 25kHz)	22.4°C	240	Max	FSK	469.9375

NA → Not Applicable

6.0. Receiver Test Parameters

6.1. Conducted Spurious Output Power

6.1.1. Test Setup

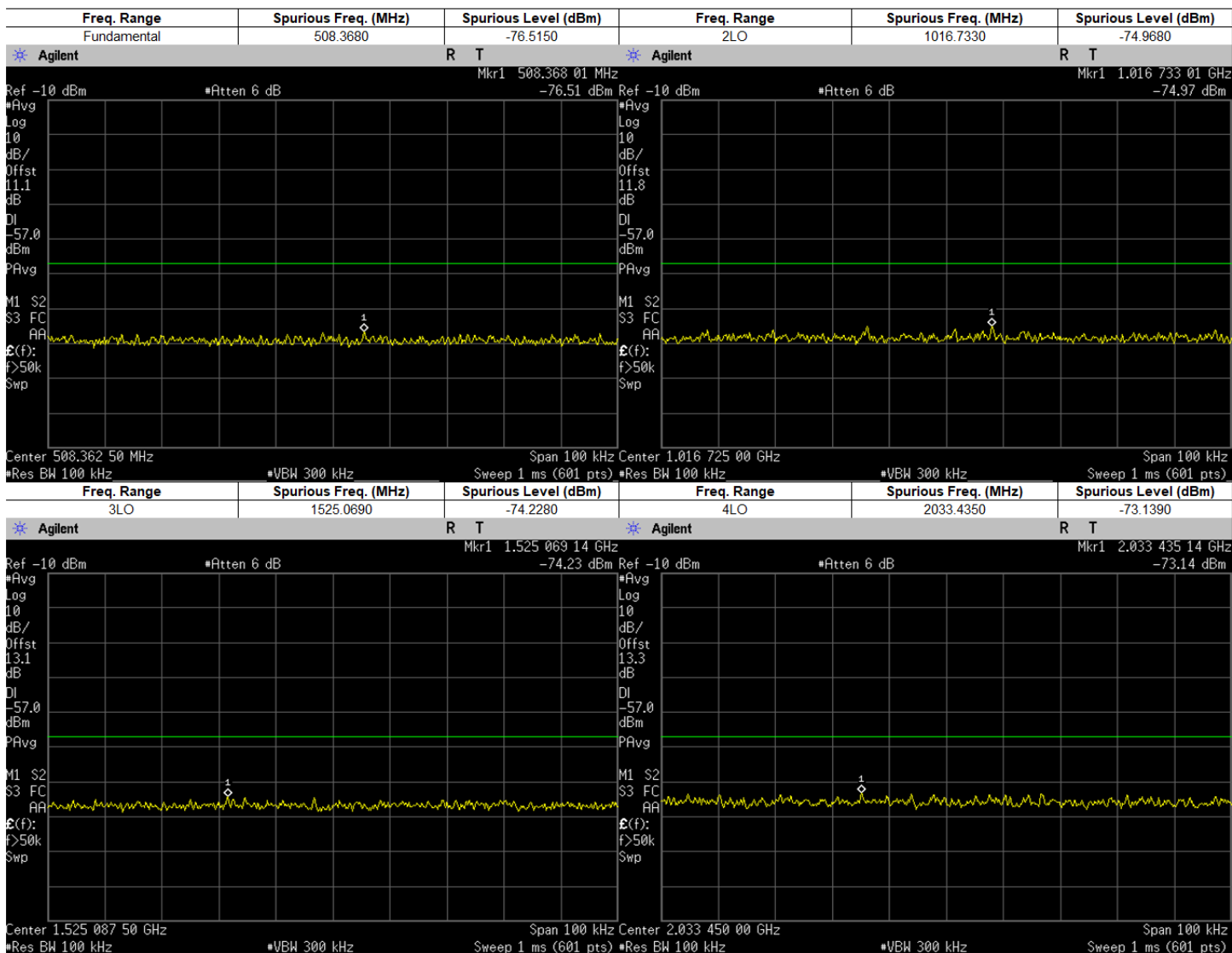


- 1) Identify the radio is high side ($LO = F_c + IF$) or low side injection ($LO = F_c - IF$).
- 2) To get the reference point, set sigen to 1st LO frequency with amplitude level 0dBm.
- 3) Set the LO frequency into PSA. Adjust the PSA RBW = 100 kHz and record the Reference level offset.
- 4) Replace the Sigen with the UUT.
- 5) At PSA, set the frequency step size to LO frequency to test from 2LO to 10LO.
- 6) Record or screen captures the data in dBm value.

6.1.2. Test Result

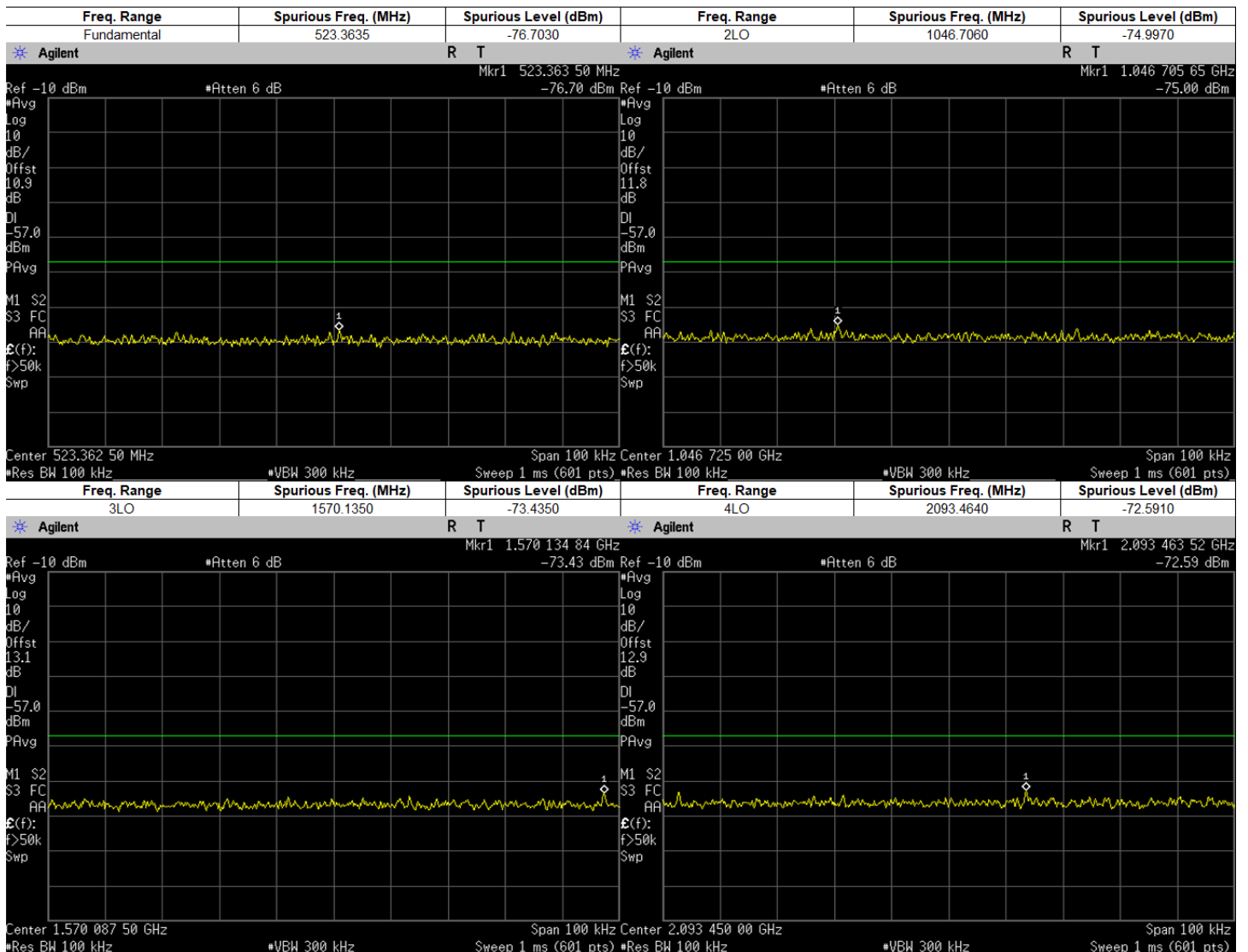
Channel Frequency : 435.0125

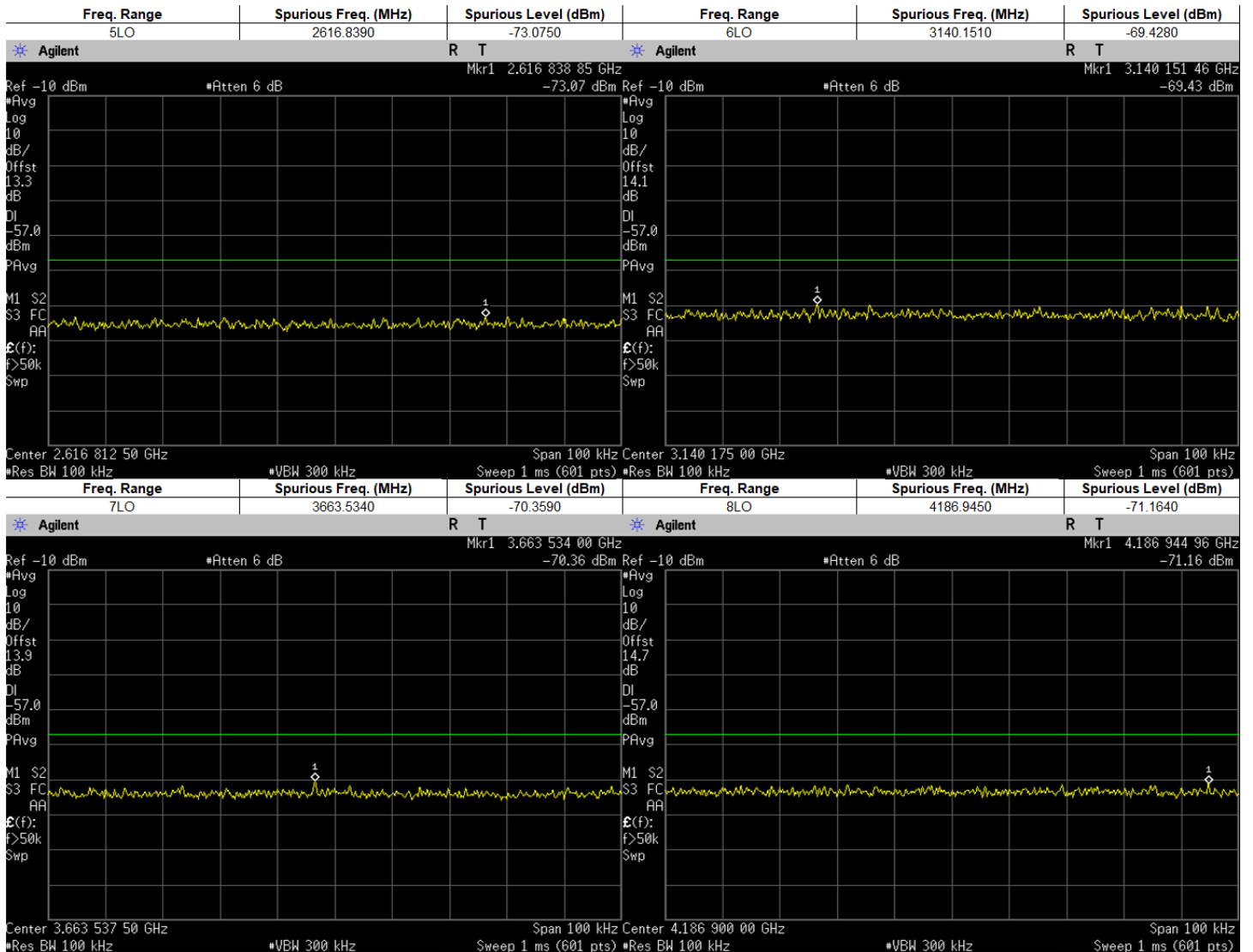
Channel Spacing : 12.5k

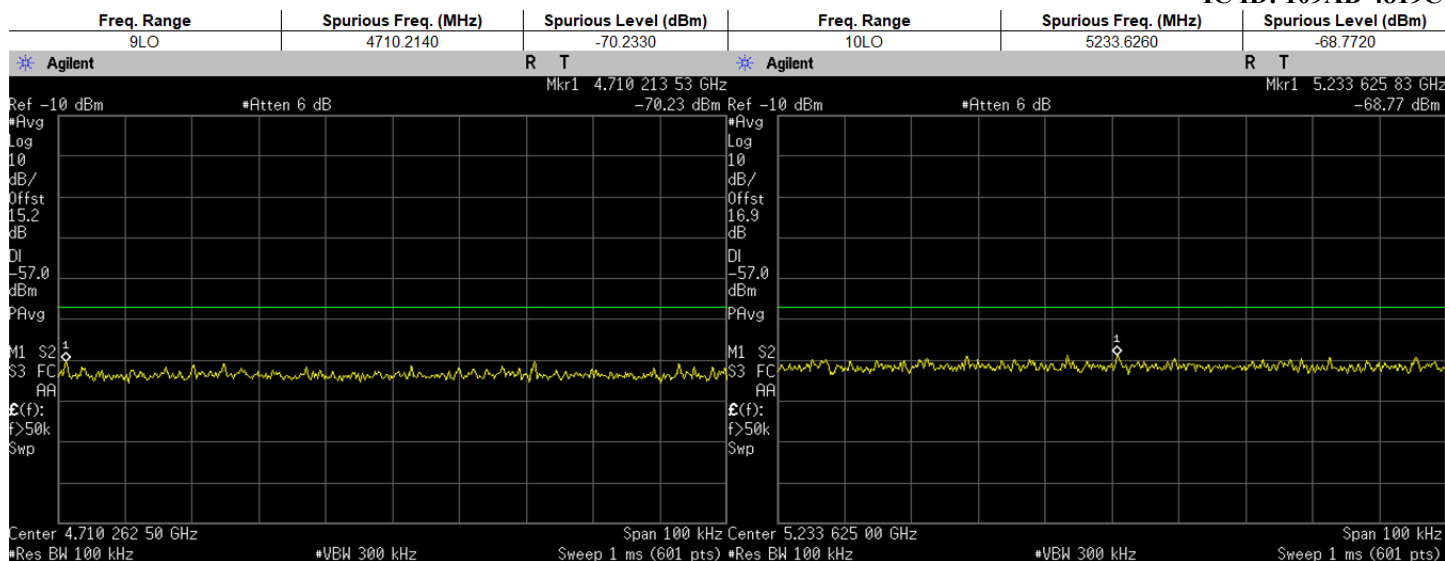




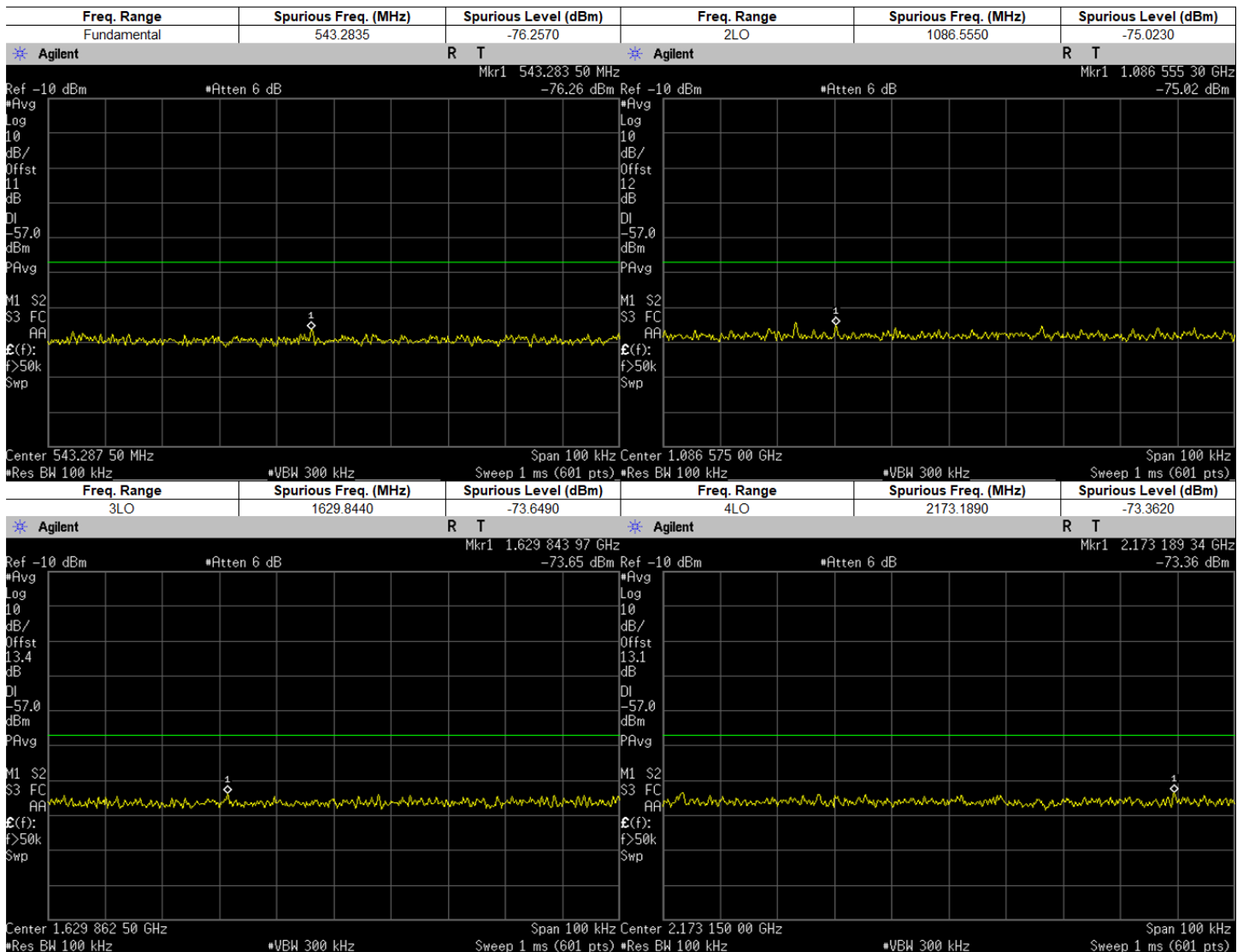
Channel Frequency : 450.0125 Channel Spacing : 12.5k

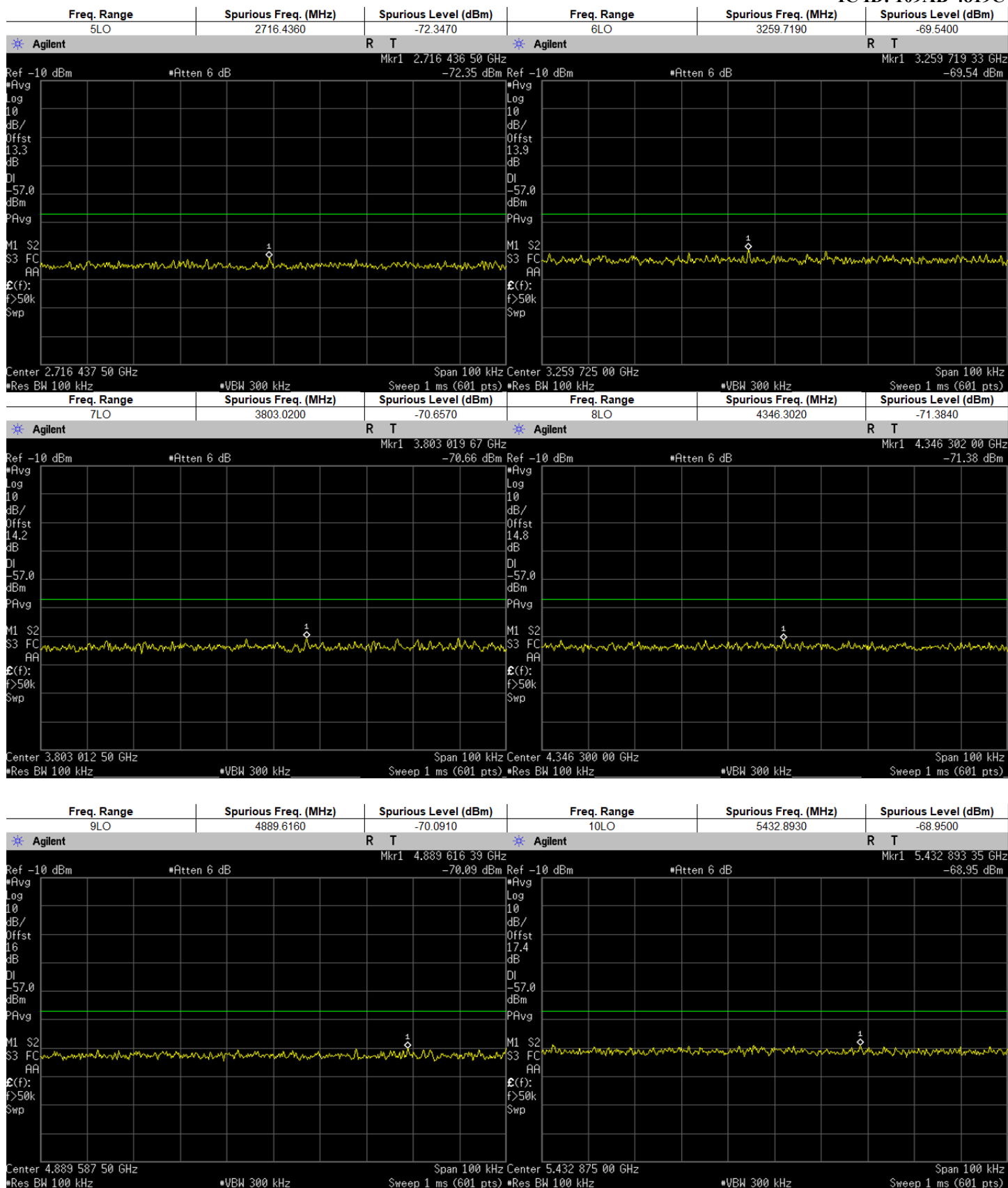




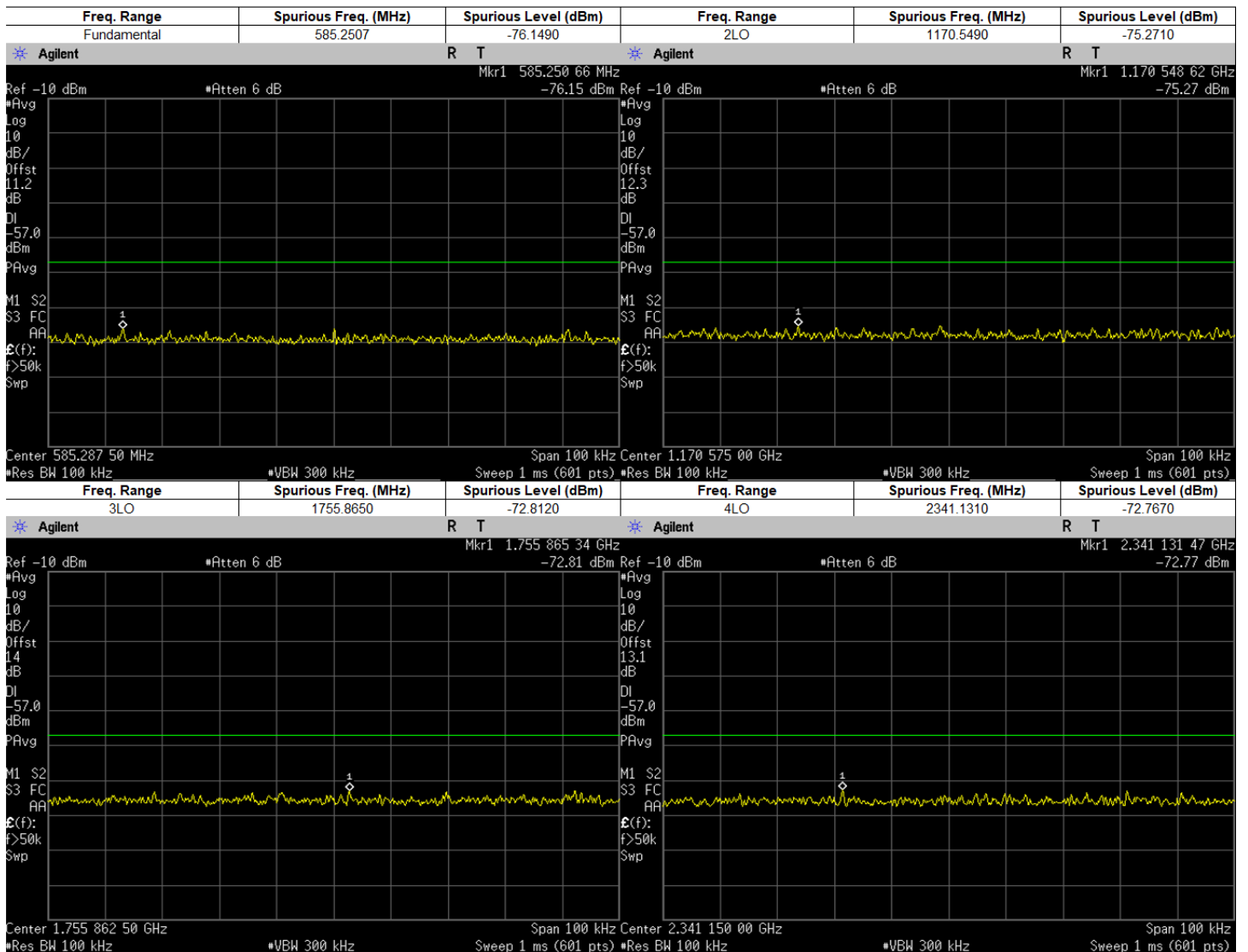


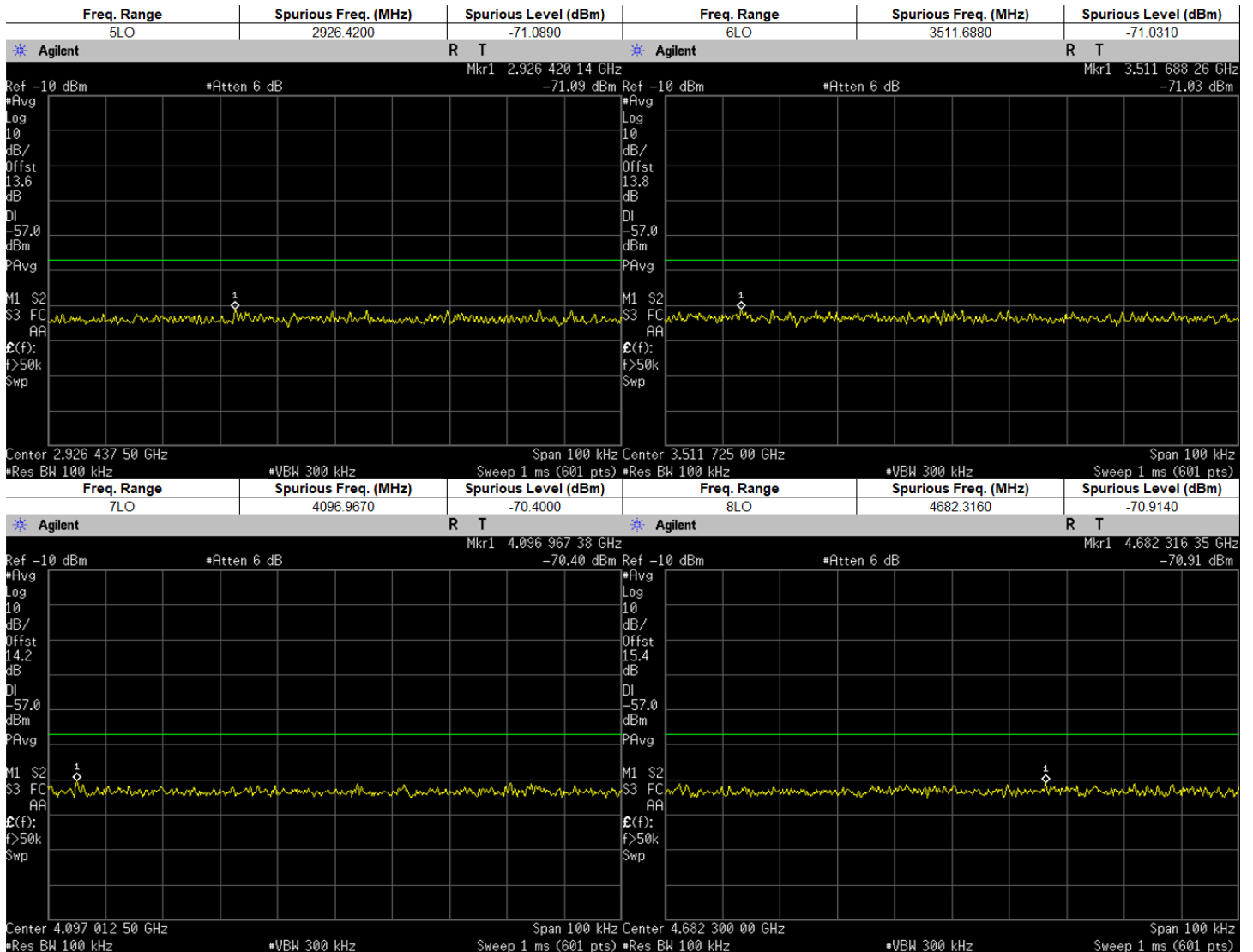
Channel Frequency : 469.9375 Channel Spacing : 25k

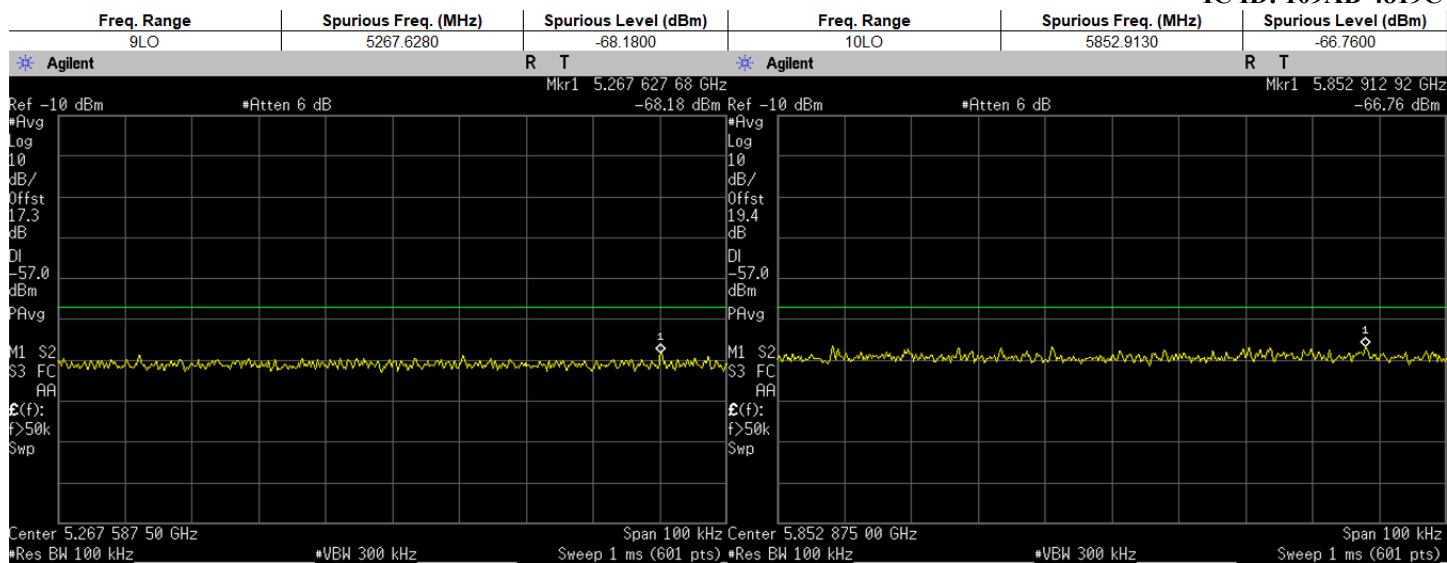




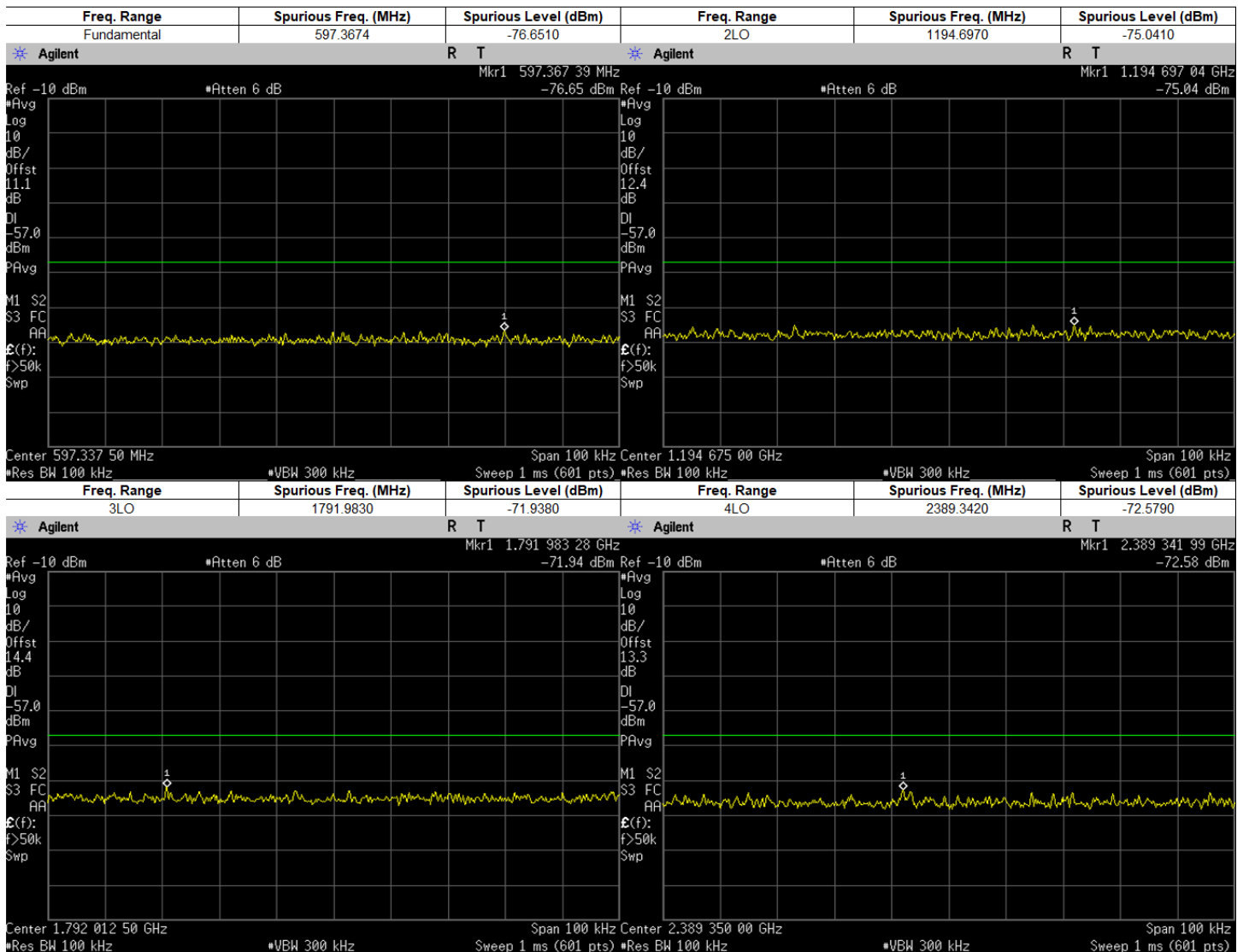
Channel Frequency : 511.9375 Channel Spacing : 12.5k

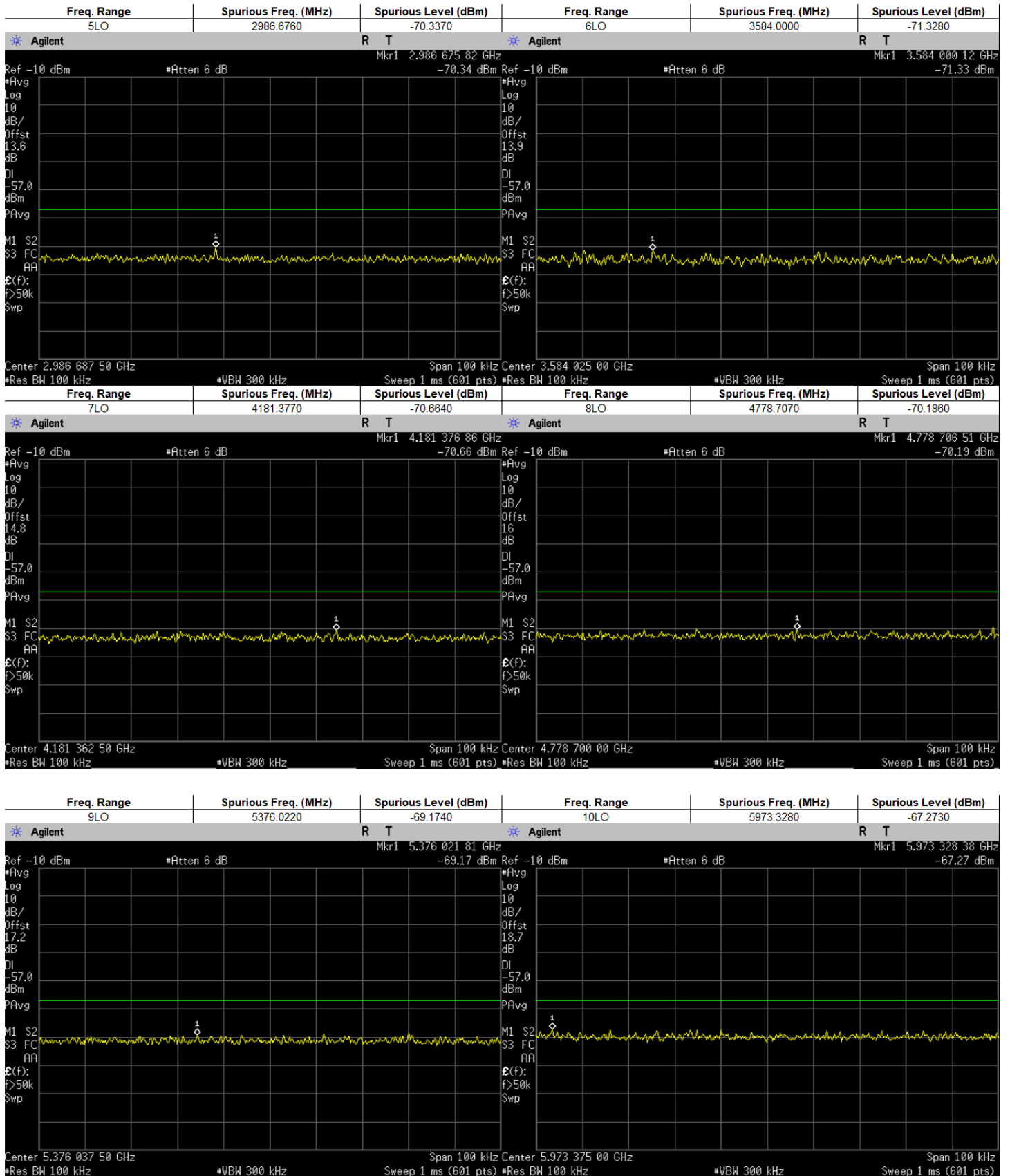






Channel Frequency : 523.9875 Channel Spacing : 25k



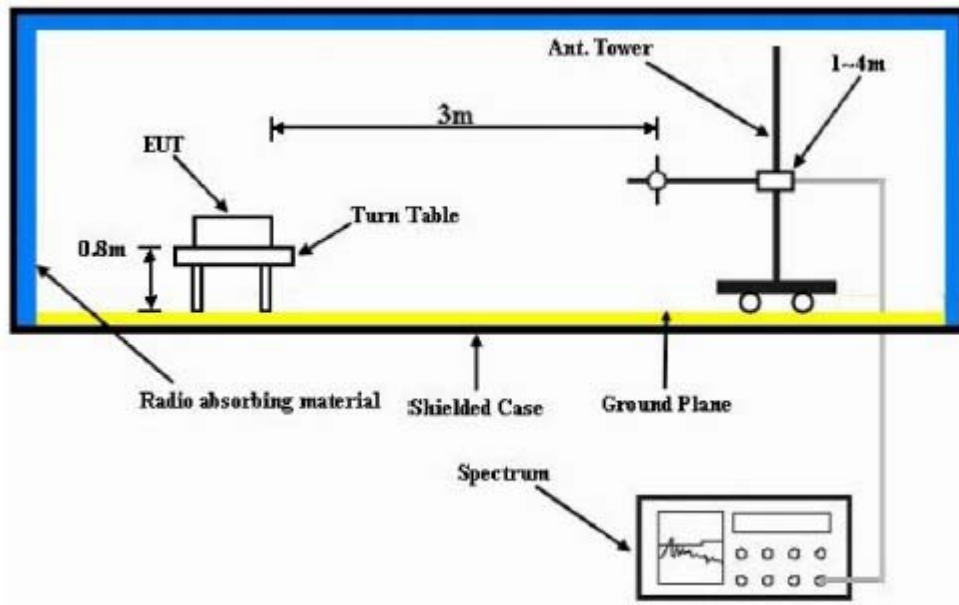


6.1.3. **Test Limit**

No spurious output appearing at the antenna terminals shall exceed -57dBm across 50Ω.

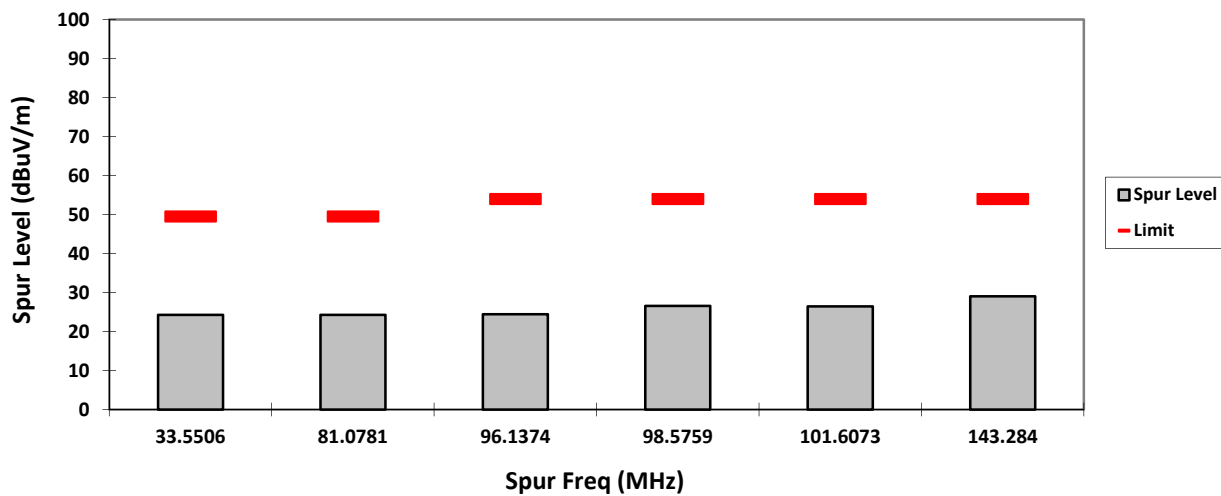
6.2. Radiated Spurious Output Power

6.2.1. Test Setup

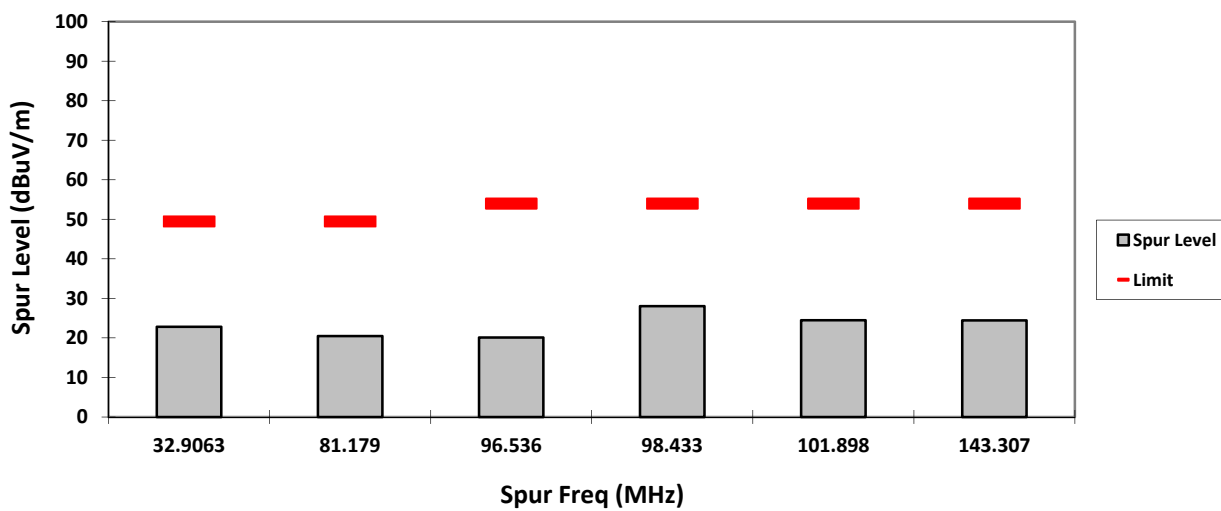


- 1) The spectrum setting for scanning Radiated Emission below 1 GHz is RBW = 100 kHz, VBW = 300 kHz and above 1 GHz is RBW = 1MHz, VBW = 3MHz. Detector mode is positive peak.
- 2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- 3) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain.
- 4) Final Radiated Spurious Emission = “Read Value” + Measured substitution value.

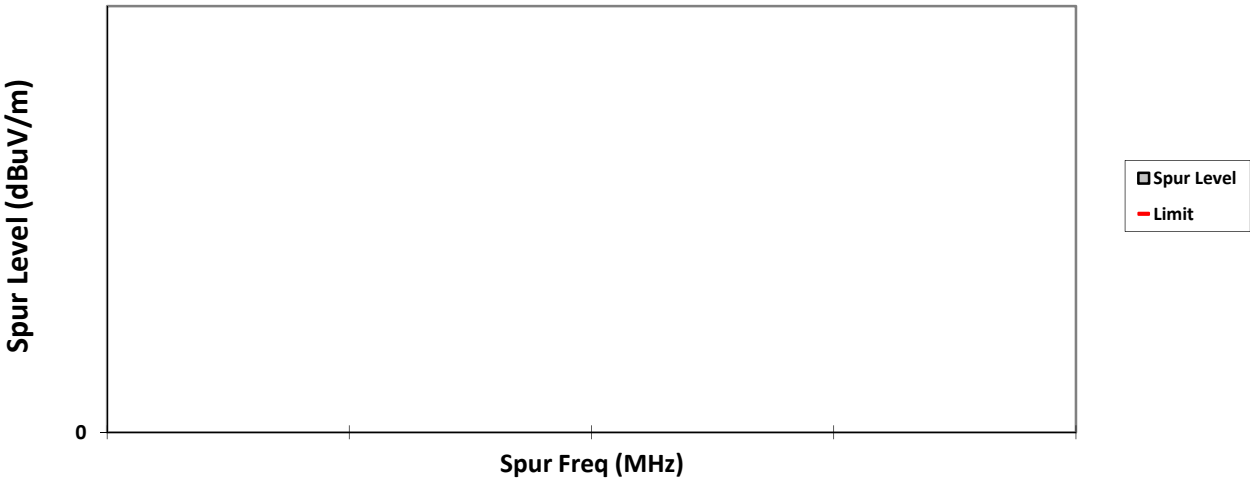
VERTICAL, QPK



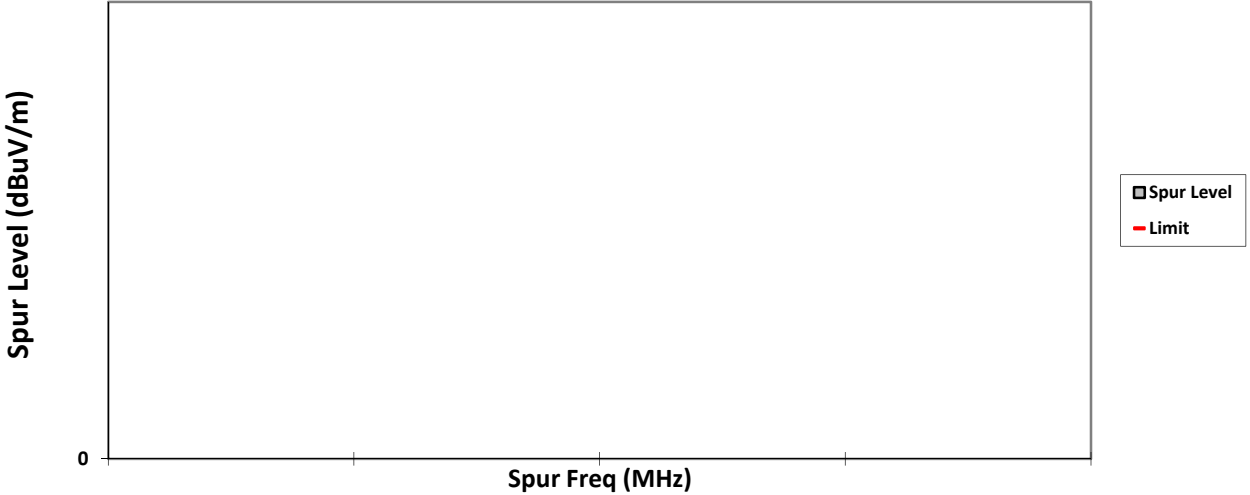
HORIZONTAL, QPK



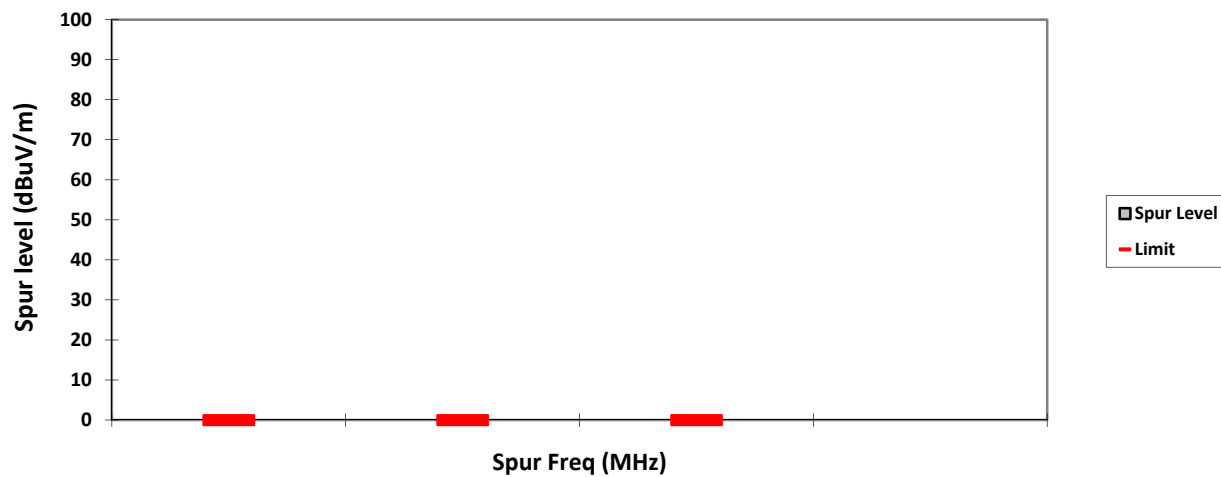
VERTICAL, PK



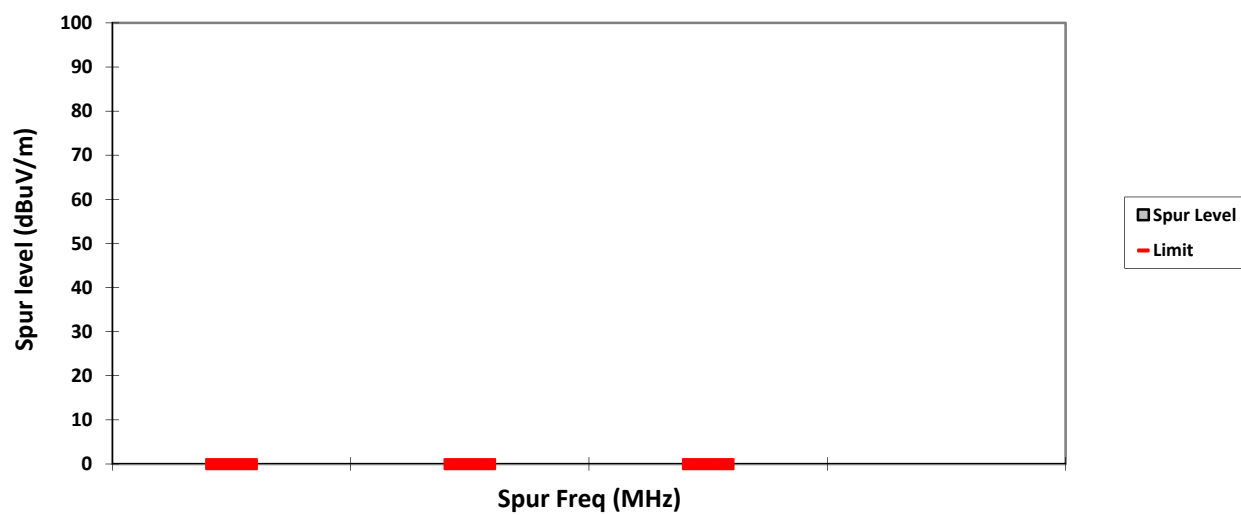
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

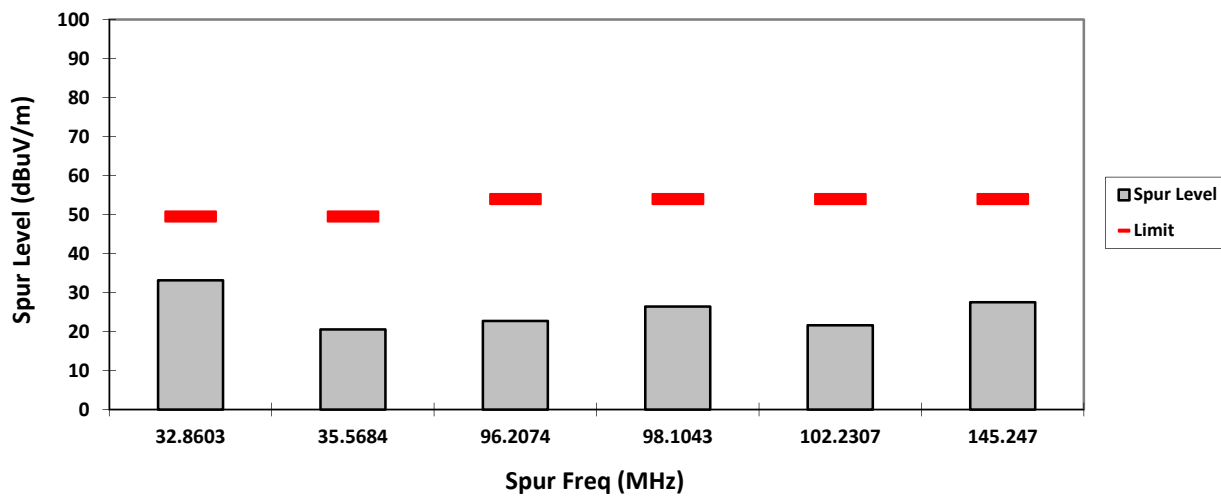


Radiated Emission (120V) tabular data

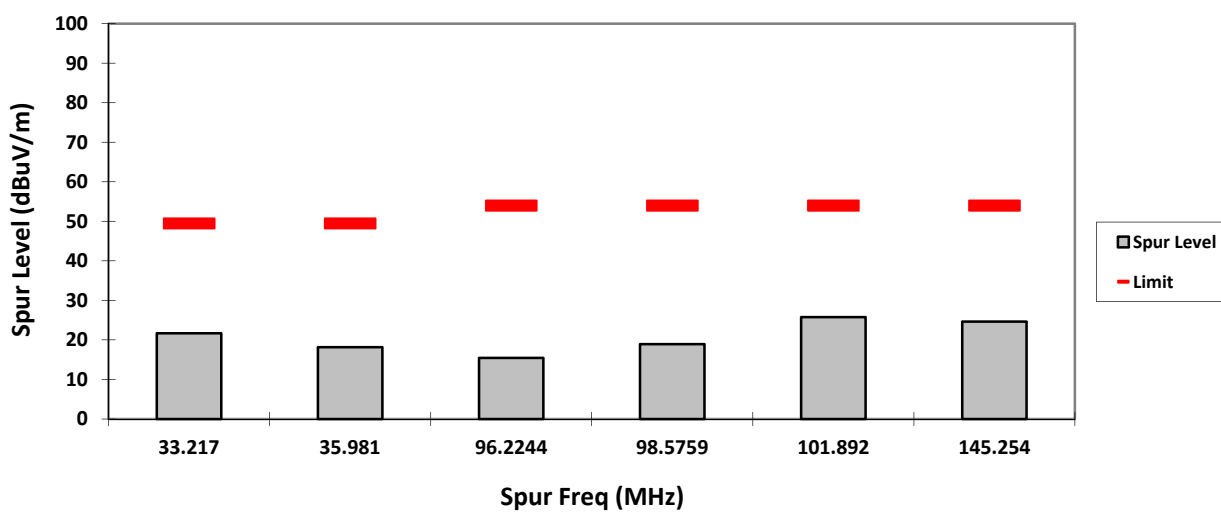
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

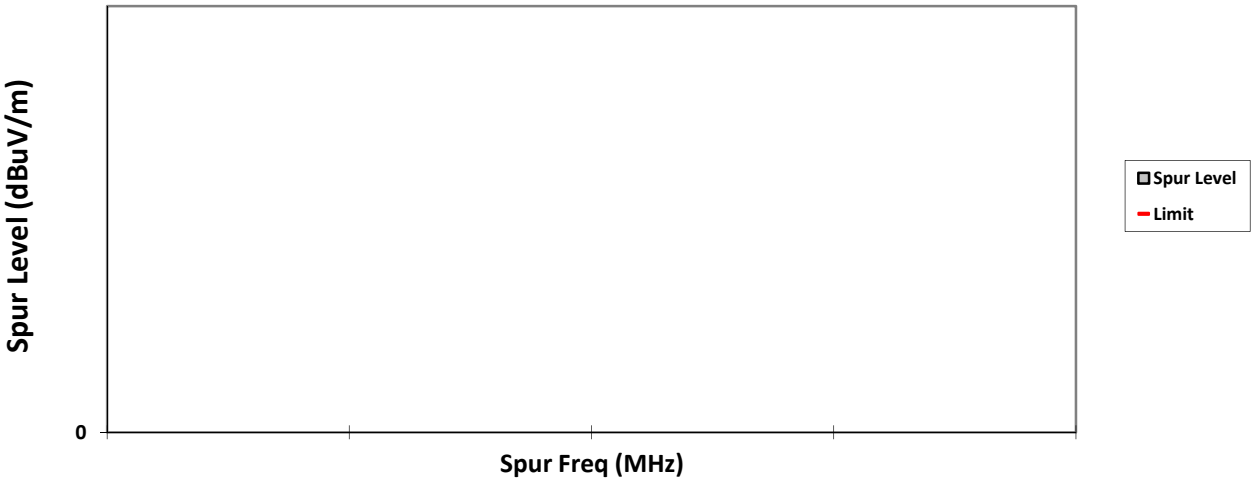
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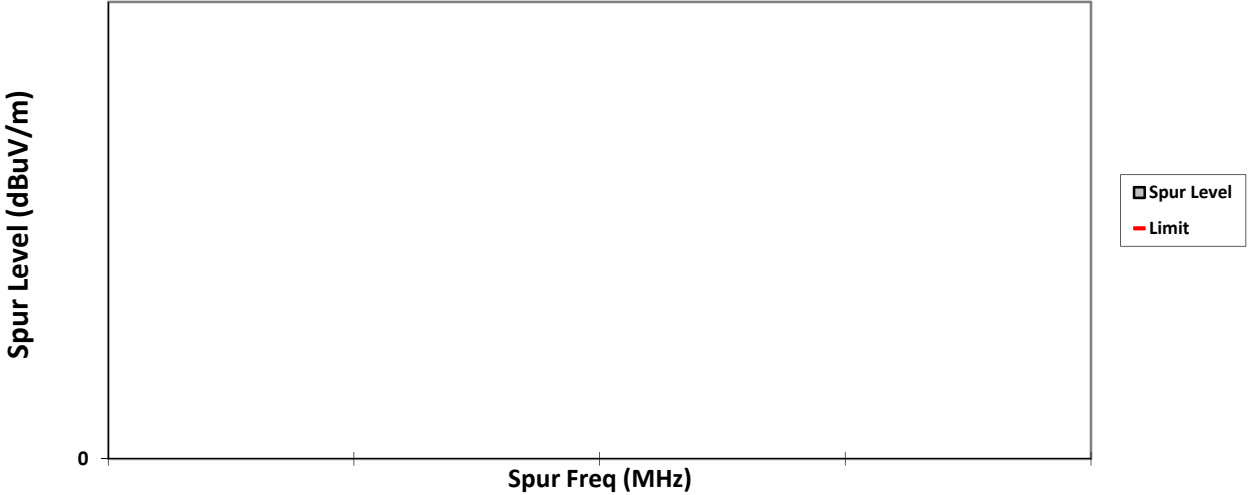
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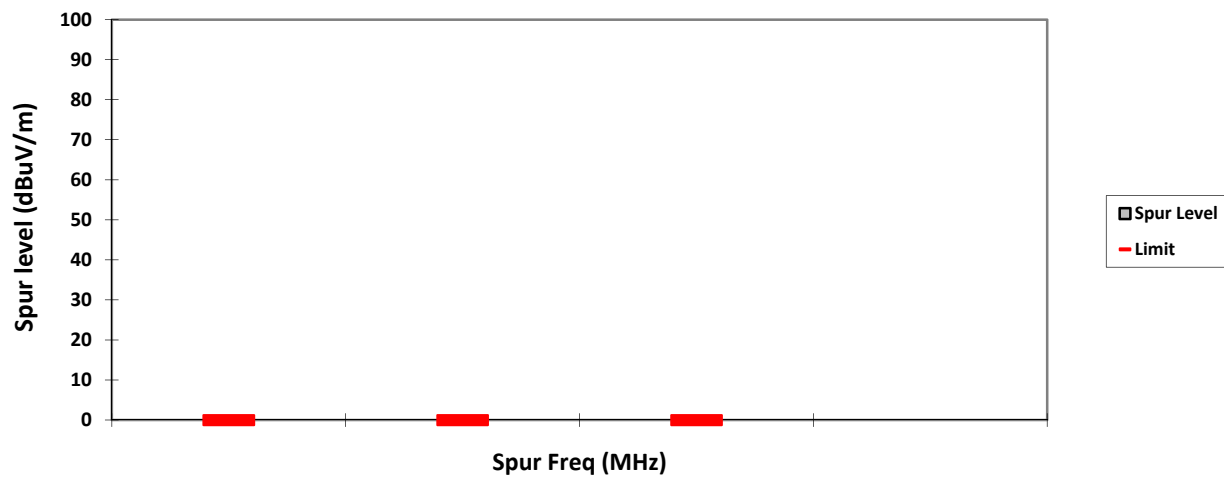
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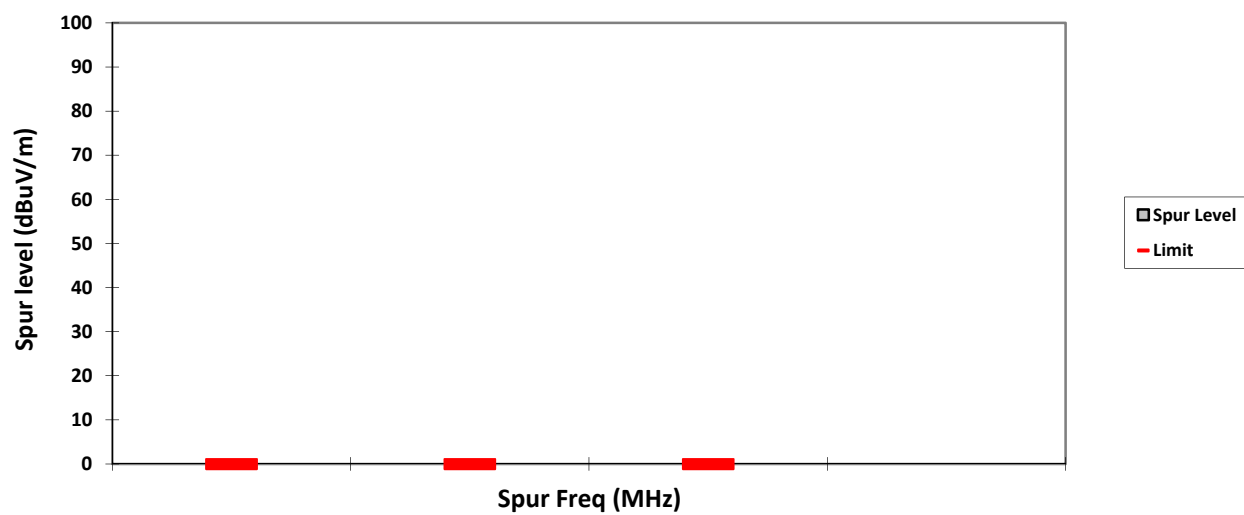
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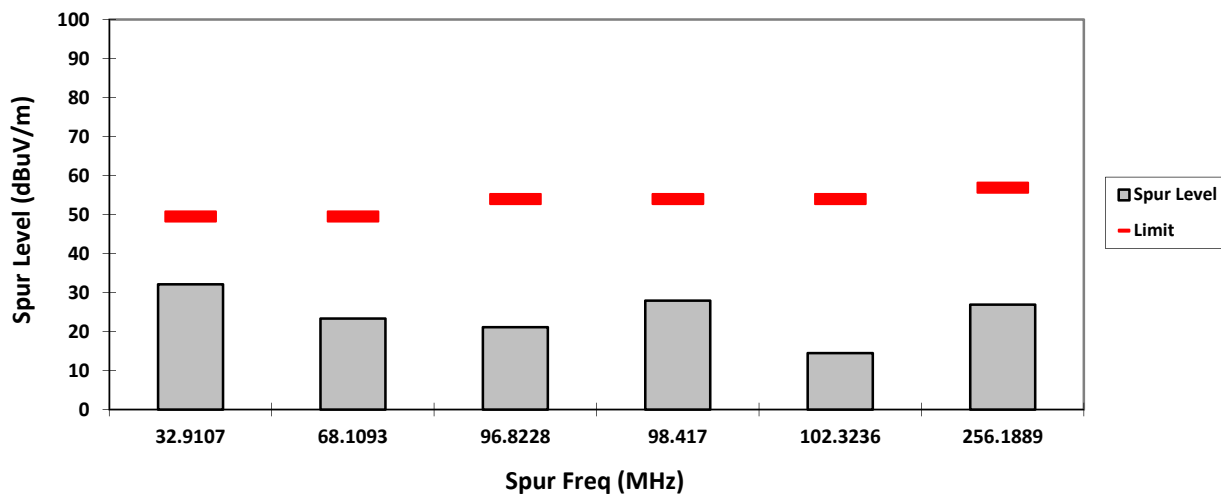
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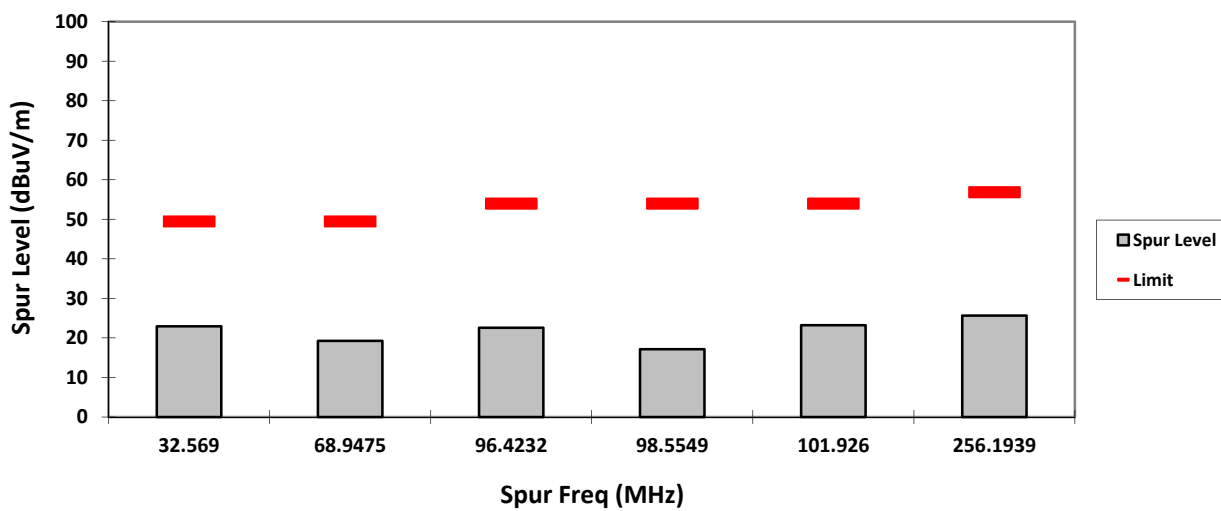
HORIZONTAL, AV



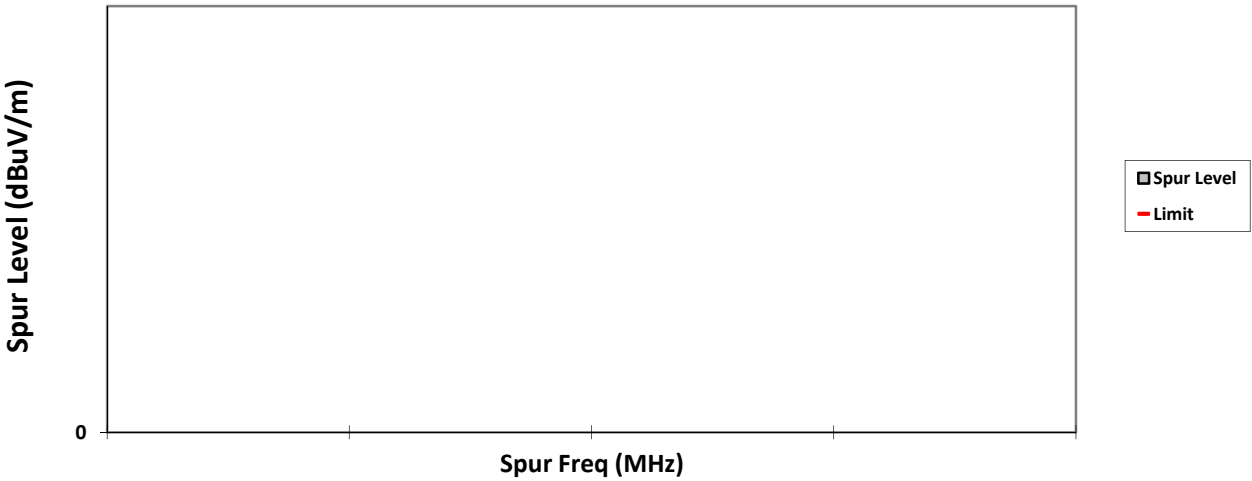
VERTICAL, QPK



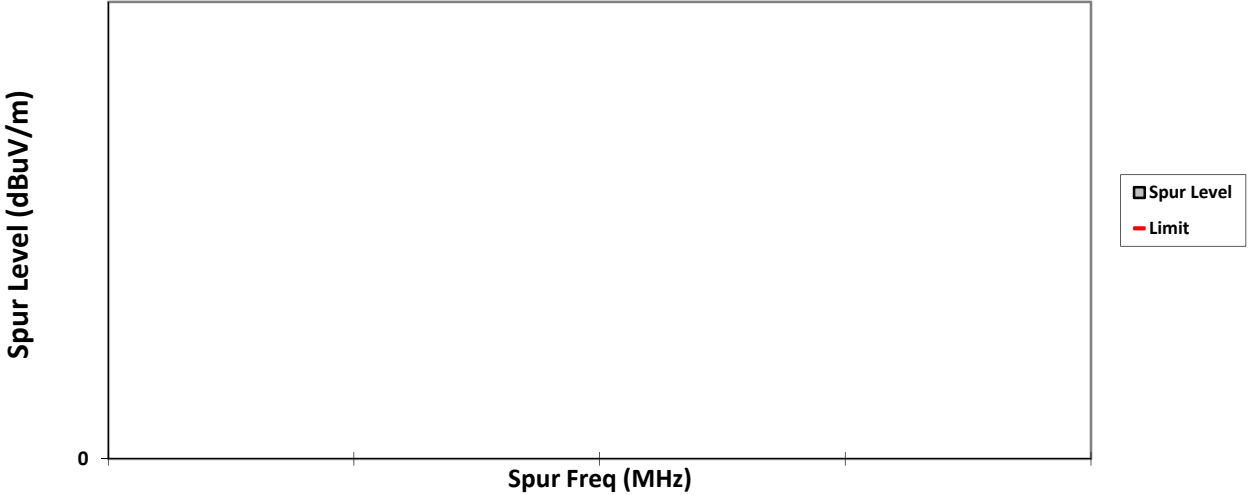
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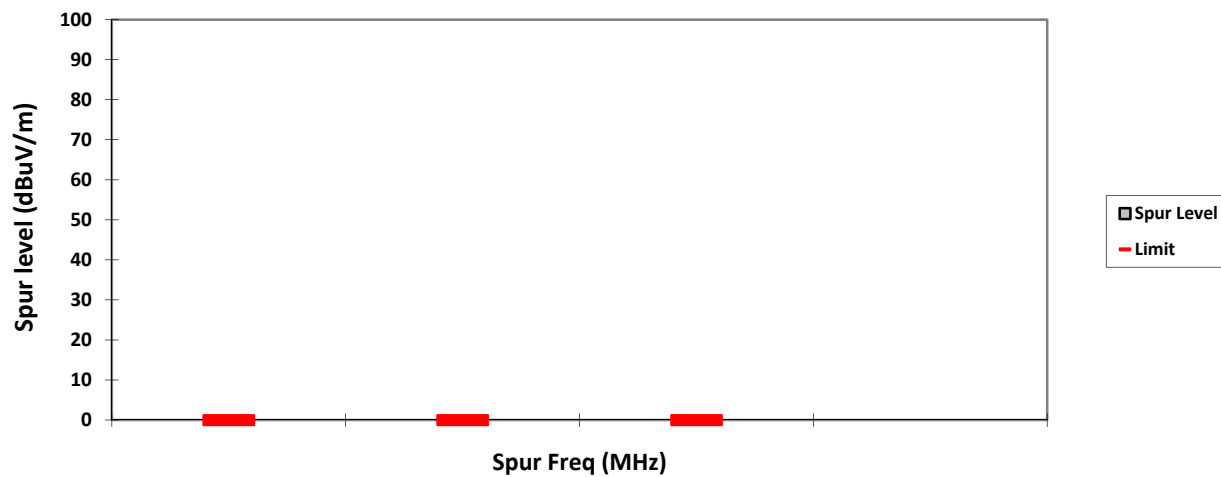
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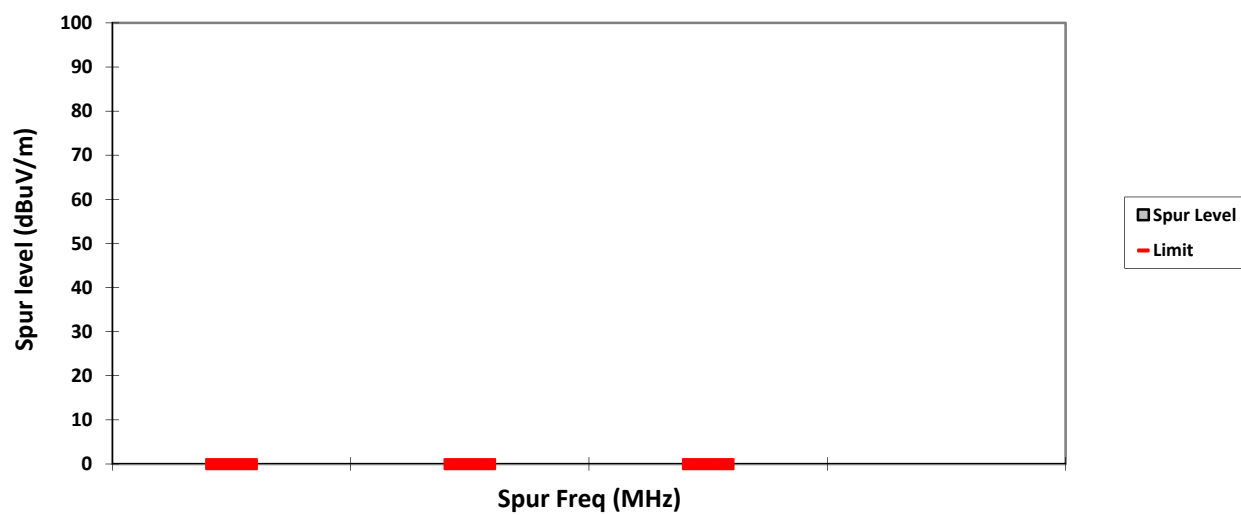
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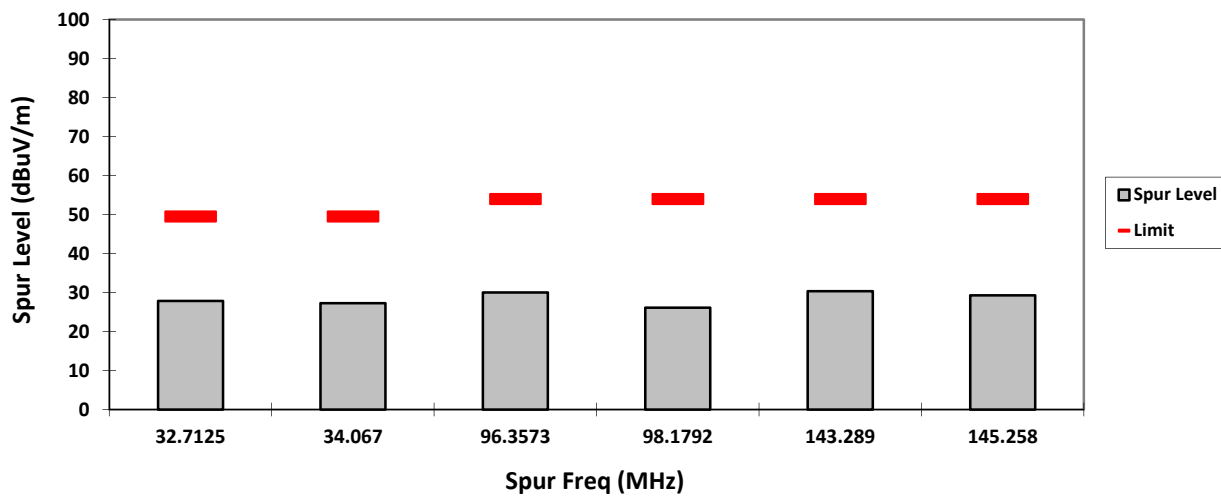
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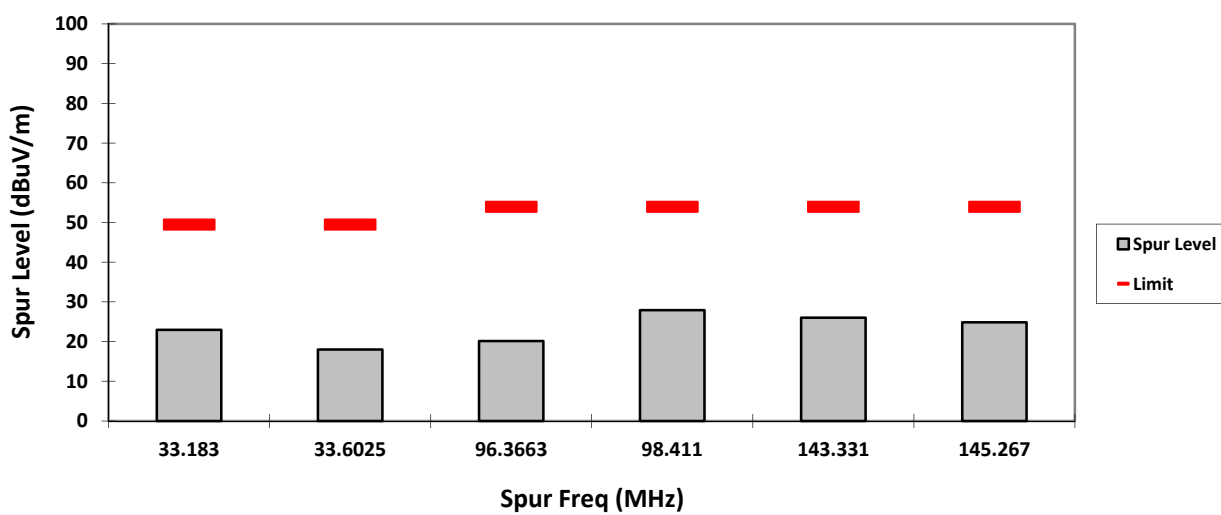
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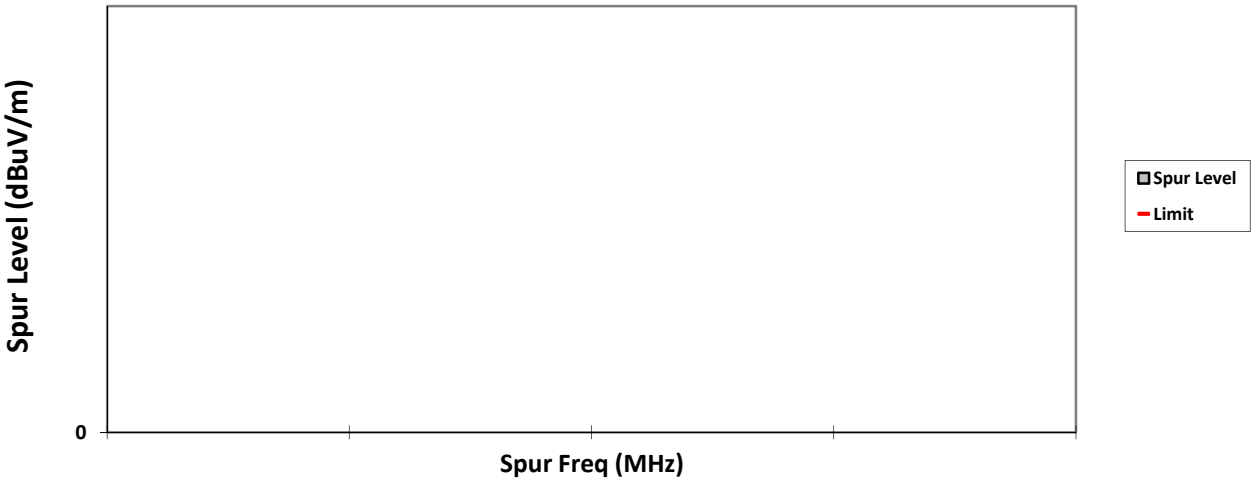
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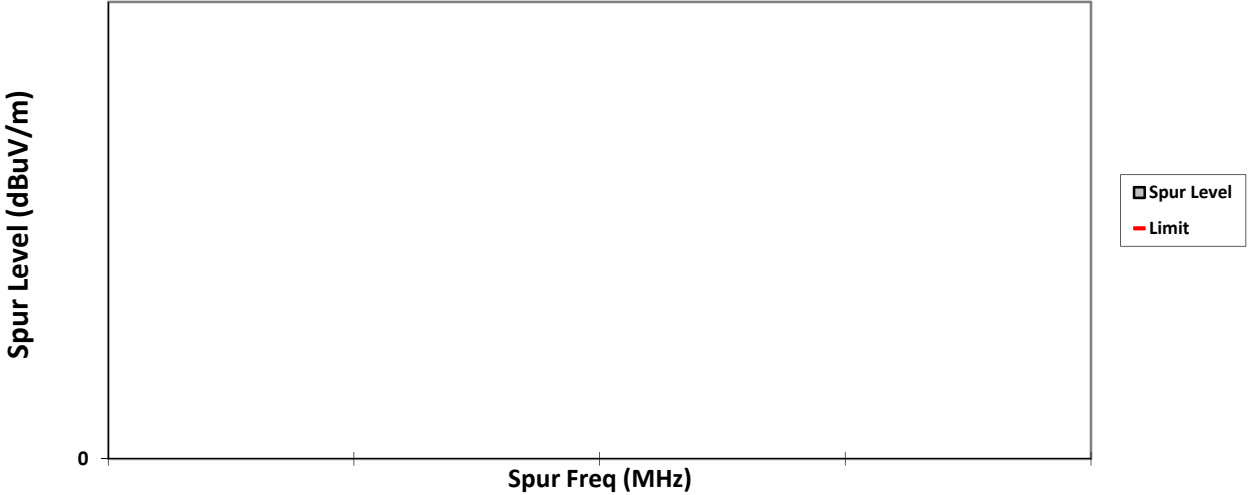
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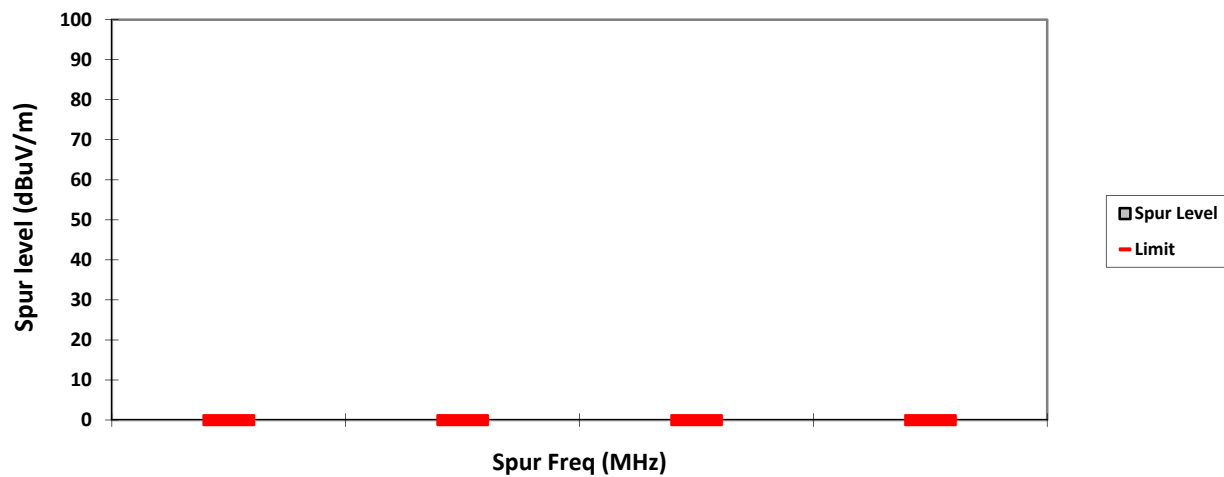
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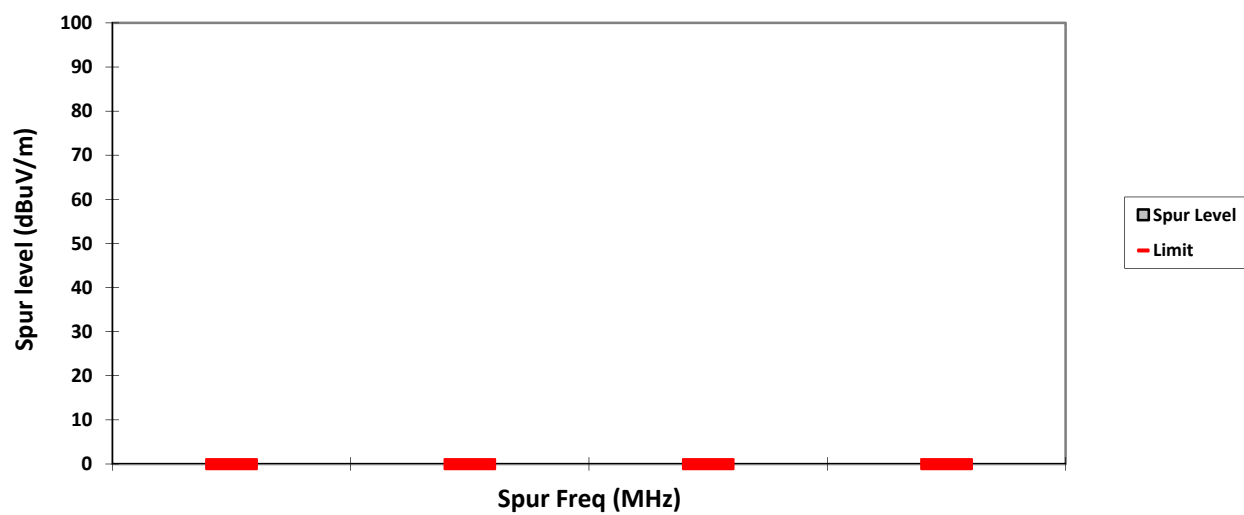
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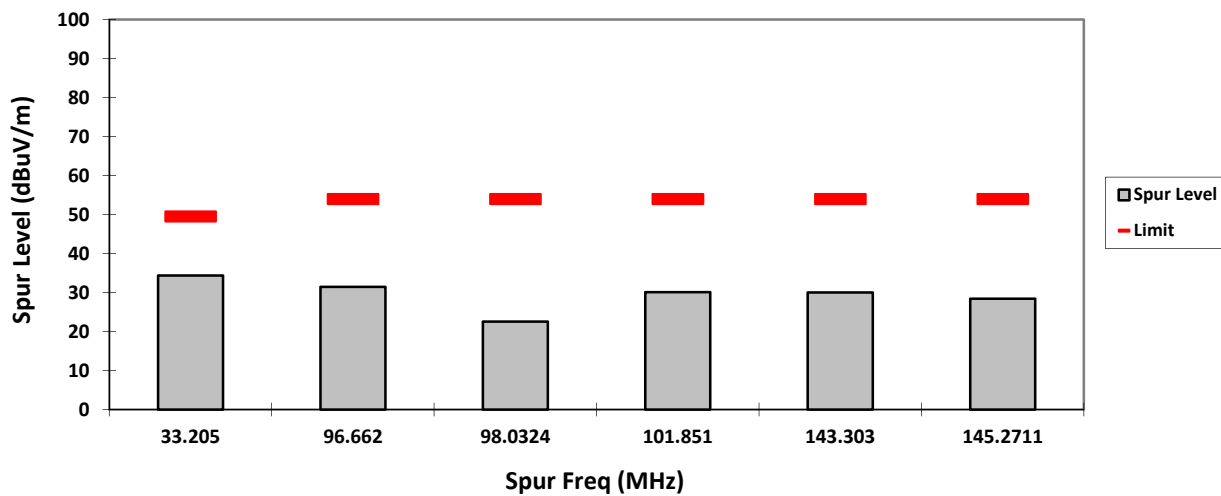
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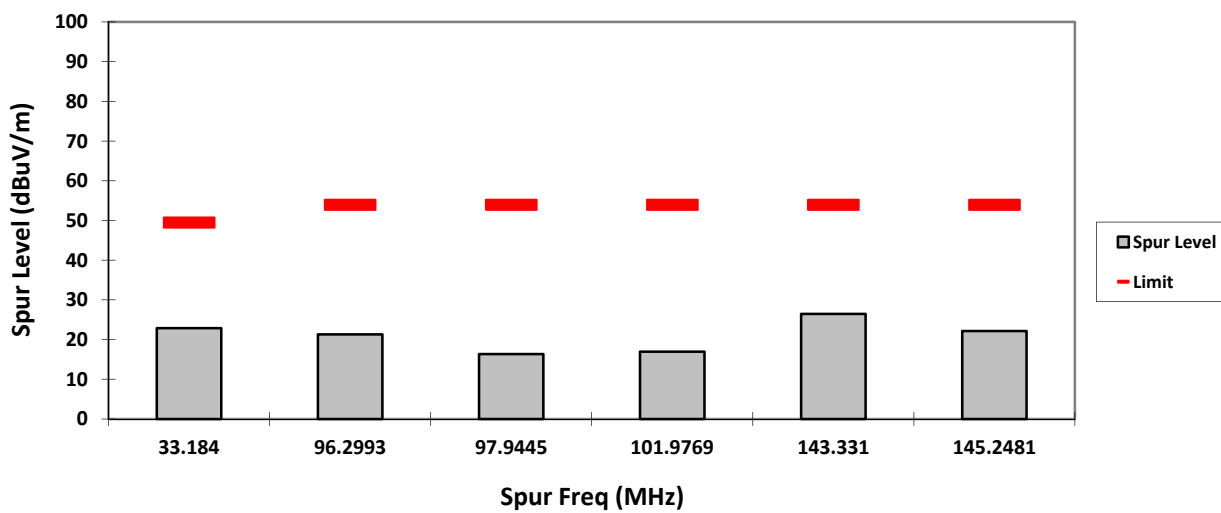
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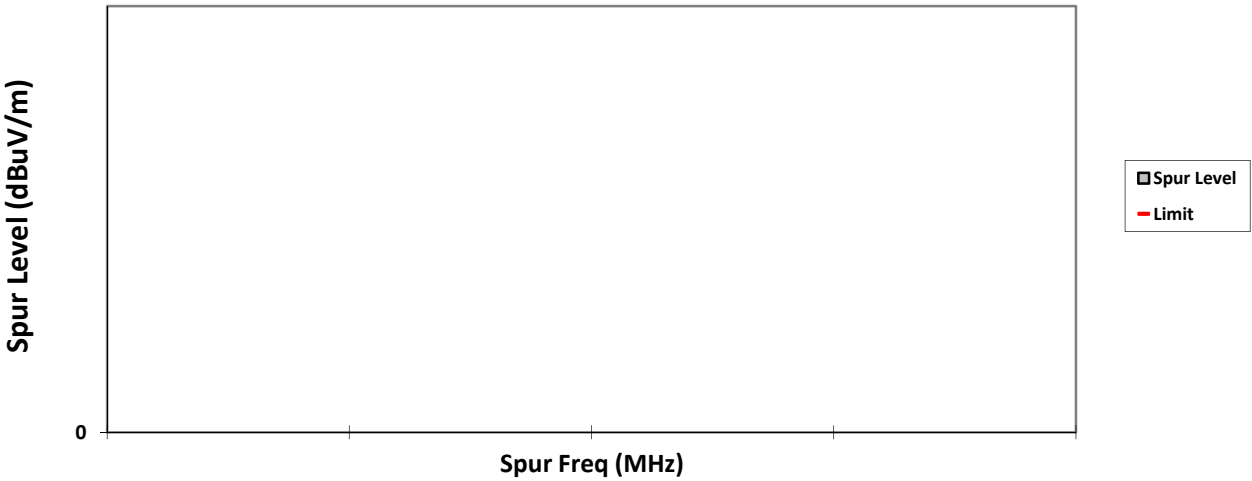
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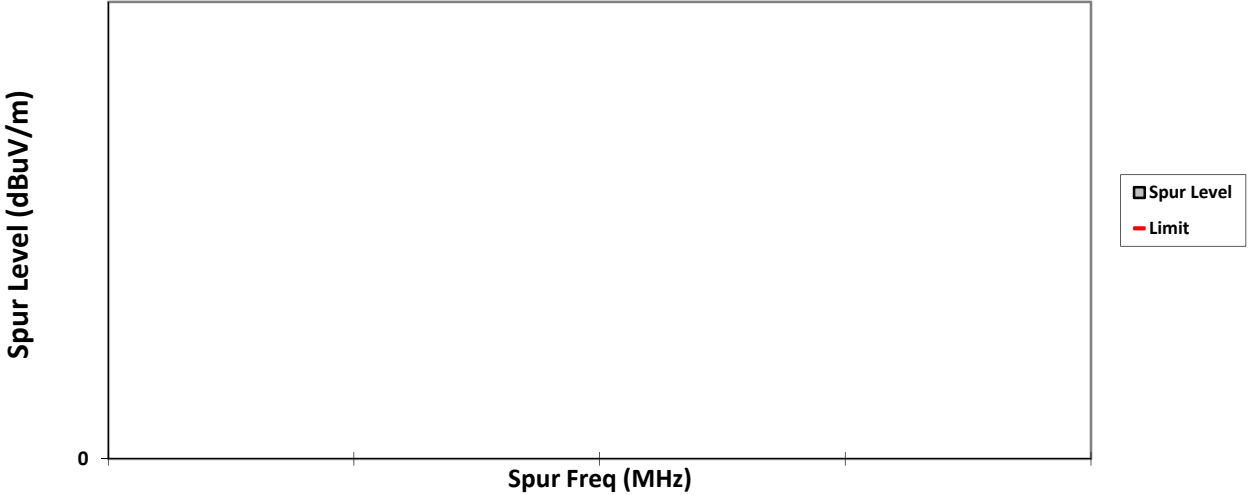
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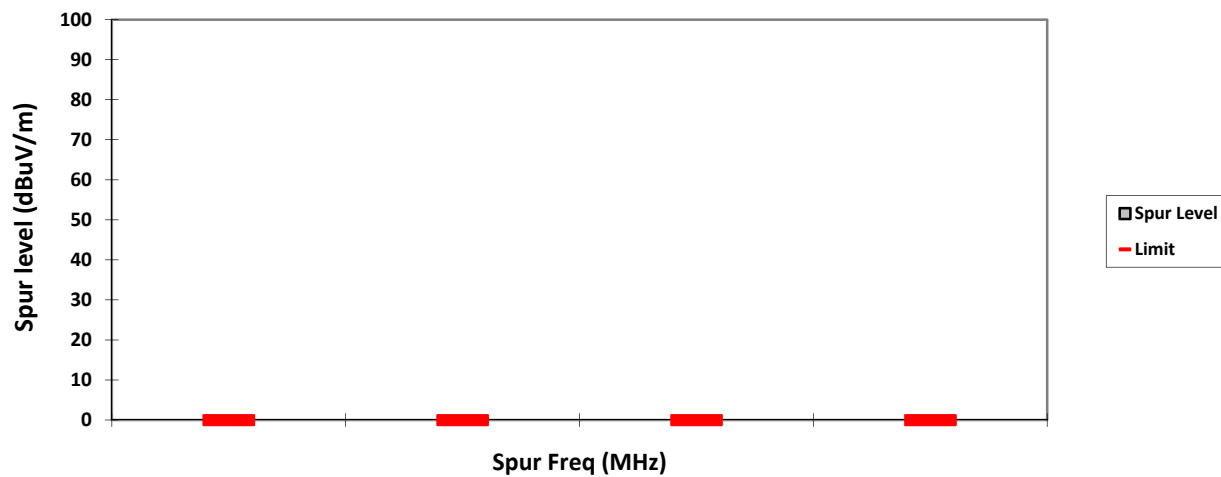
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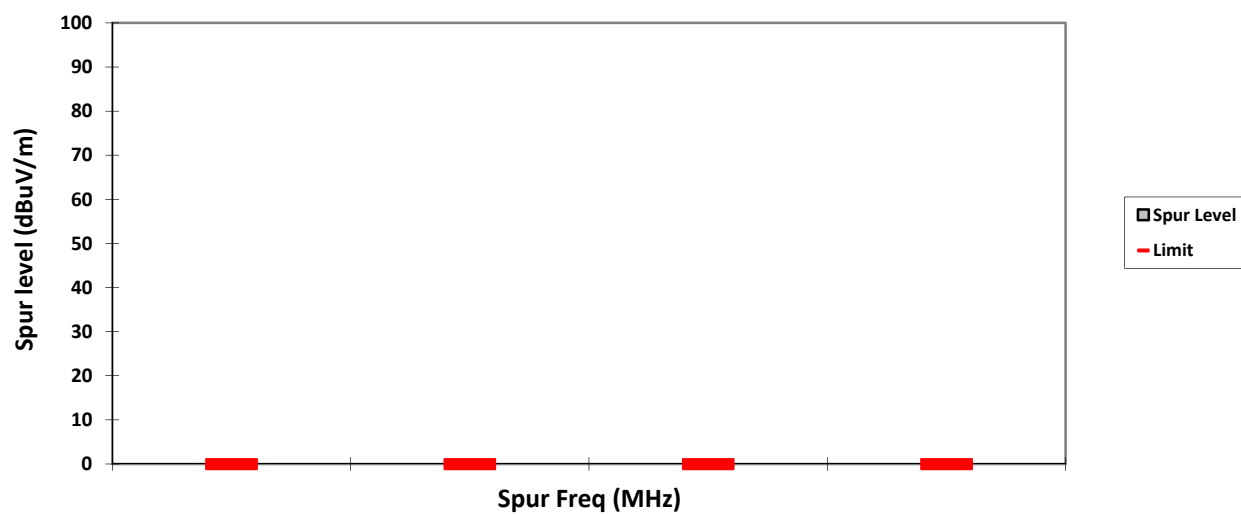
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



6.2.3. Test Limit

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

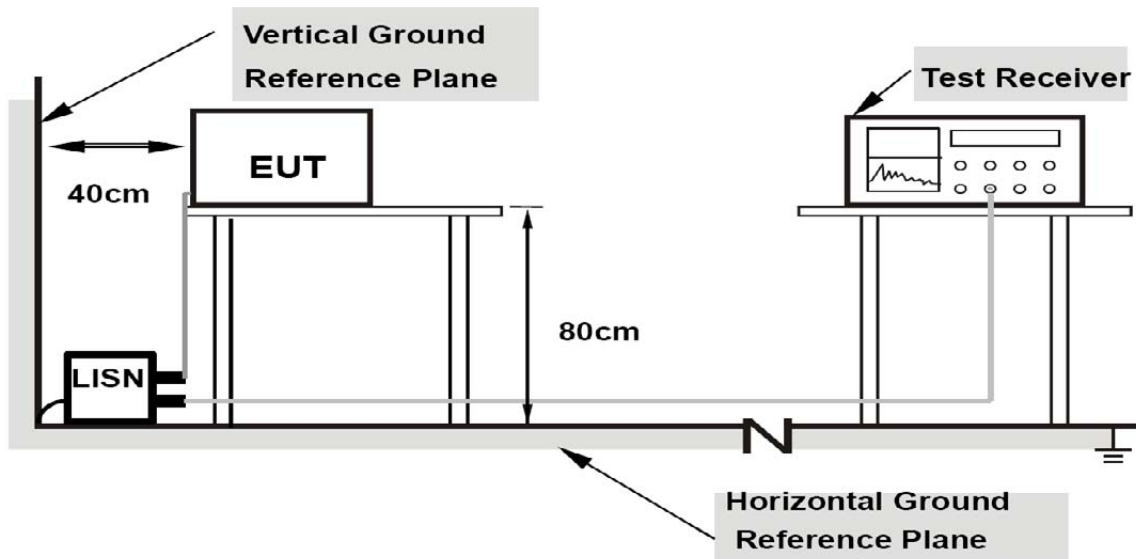
Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

(b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following:

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	90
88-216	150
216-960	210
Above 960	300

6.3. AC Power Line Conducted Spur Emissions

6.3.1. Test Setup



- 1) Tests were conducted for both Receive and Transmit Mode of the EUT.
- 2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 4) The frequency range from 150 kHz to 30MHz was measured.

6.3.2. Test Results

Report ID.:	: 19588-EMC-00019
Ambient Temperature:	: 22.4 °C
Humidity:	: 60.5%
Tester:	: Helmy, Azil & Faris
Date of test:	: 20 May 2020

EMI Auto Test Template: AC Voltage with 2-Line-LISN

Hardware Setup: Voltage with 2-Line-LISN
 Measurement Type: 2 Line LISN
 Frequency Range: 150 kHz - 30 MHz
 Graphics Level Range: 0 dBµV - 80 dBµV

Preview Measurements:
 Scan Test Template: Voltage with 2-Line-LISN pre

Data Reduction:
 Limit Line #1: FCC Part 15 Class A Voltage on Mains QP
 Limit Line #2: FCC Part 15 Class A Voltage on Mains AV
 Peak Search: 6 dB , Maximum Results: 20
 Subrange Maxima: 10 Subranges , Maxima per Subrange: 1
 Acceptance Offset: -20 dB
 Maximum Number of Results: 20

Maximization Measurements:
 Template for Single Meas.: Voltage with 2-Line-LISN max

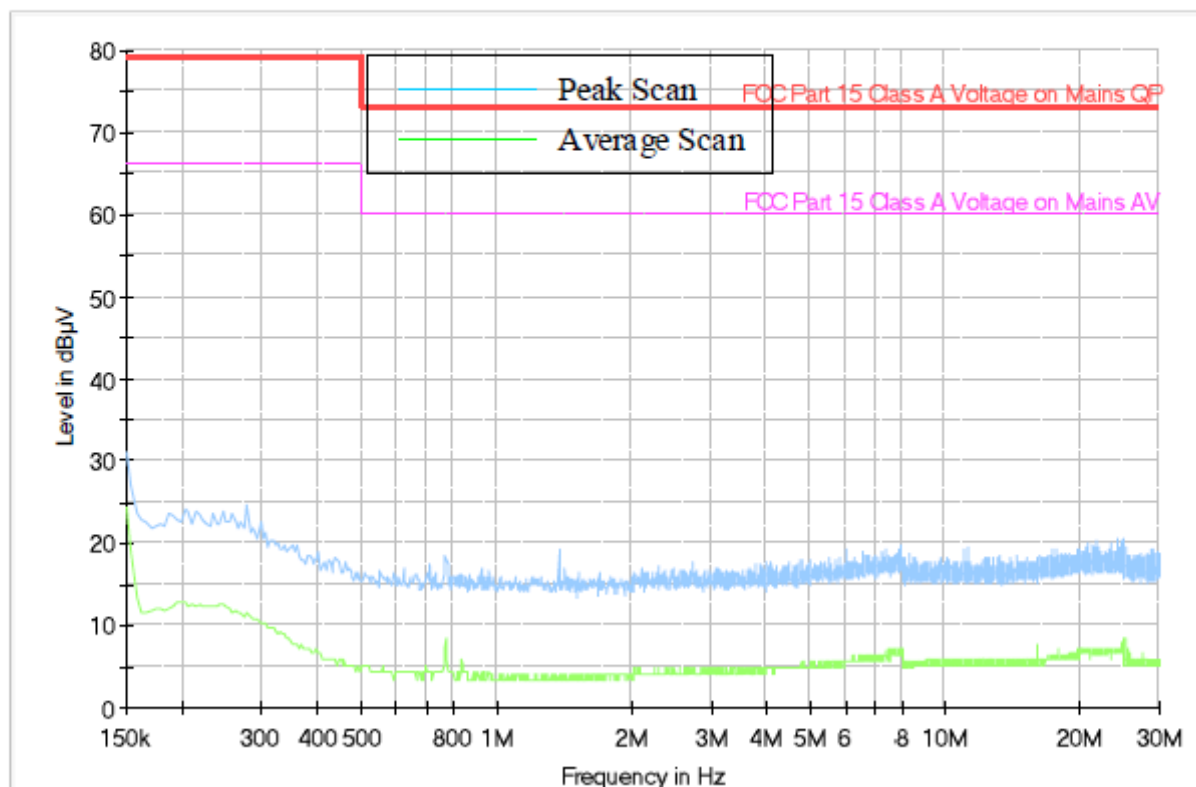
Final Measurements:
 Template for Single Meas.: Voltage with 2-Line-LISN fin

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamplifier
150 kHz - 30 MHz	4.5 kHz	QPK; CAV	9 kHz	1 s	0 dB
Receiver:	[ESIB 26]				

Test Data

1) Ambient Noise

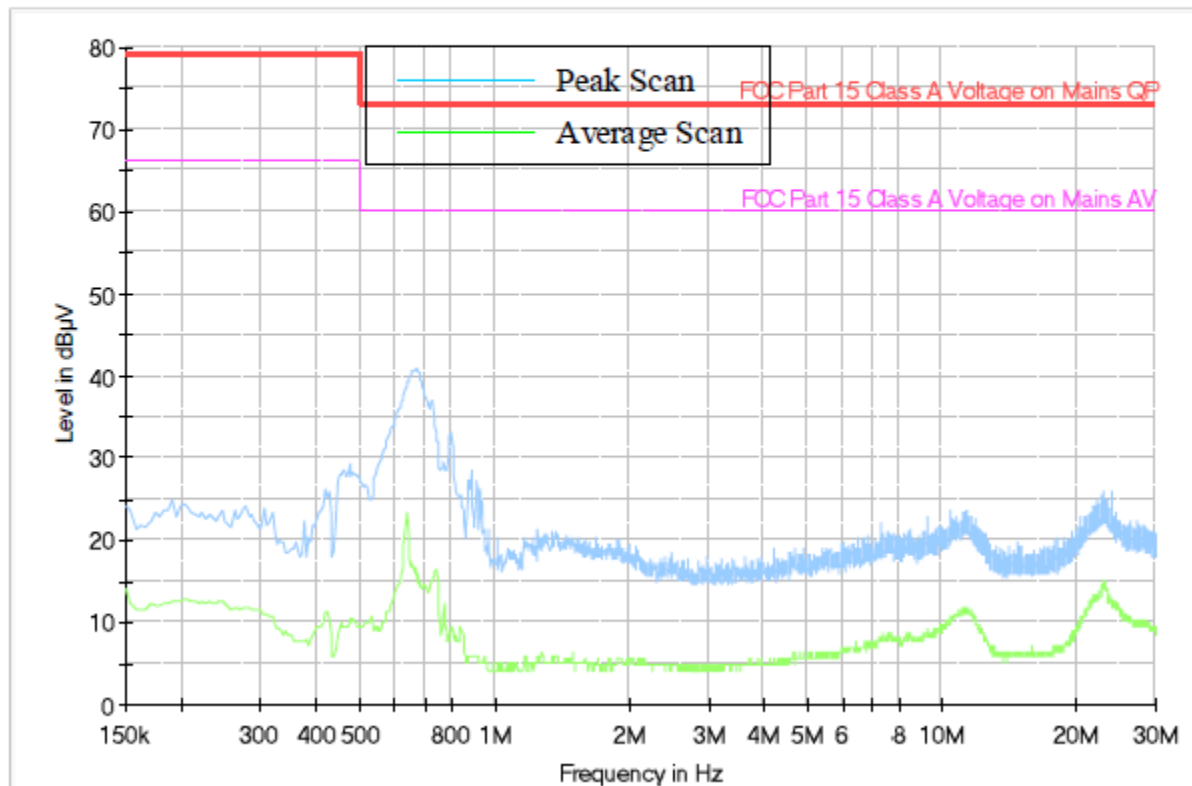
Full Spectrum



240V/50Hz

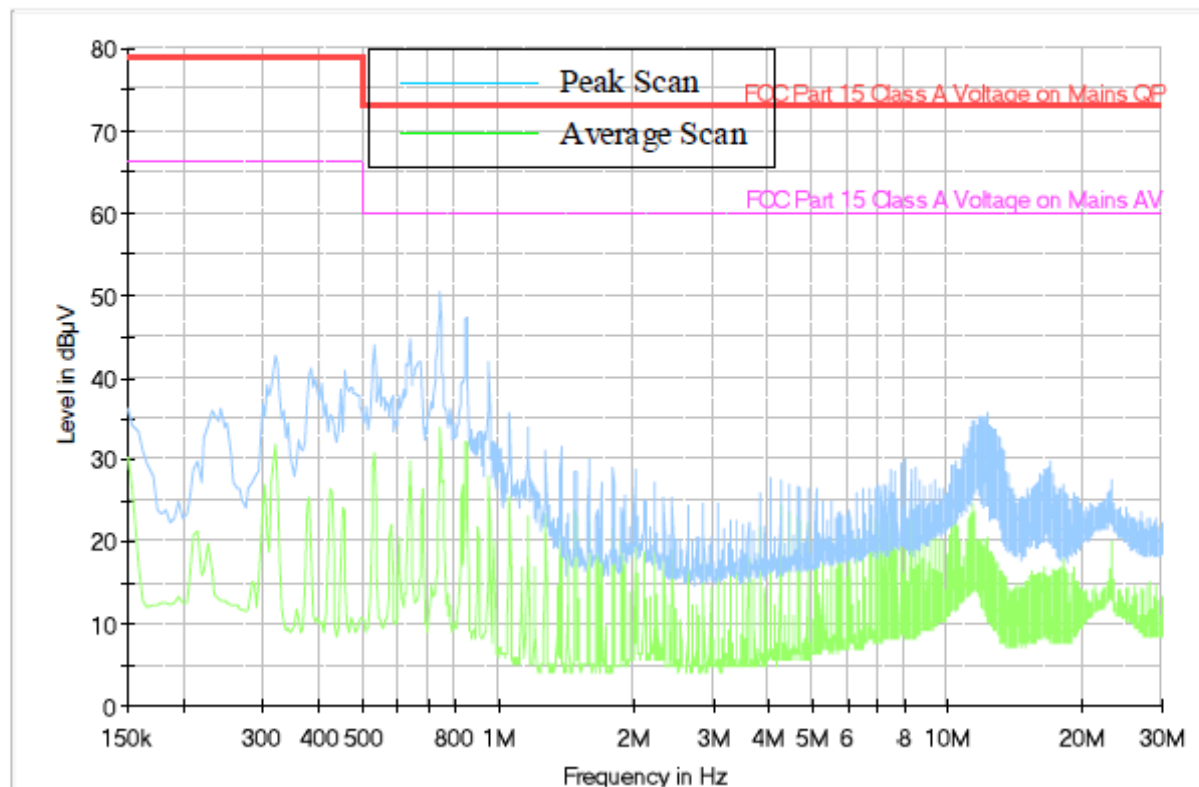
1) Radio Off

Full Spectrum



2) Radio Standby in FSK (3600 trunking, 12.5kHz channel spacing) Mode

Full Spectrum



6.3.3. Test Limits

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

**Limits for conducted disturbance at the mains ports
of class A ITE**

Frequency range MHz	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

**Limits for conducted disturbance at the mains ports
of class B ITE**

Frequency range MHz	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50
NOTE 1 The lower limit shall apply at the transition frequencies.		
NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

~ End of Test Report ~