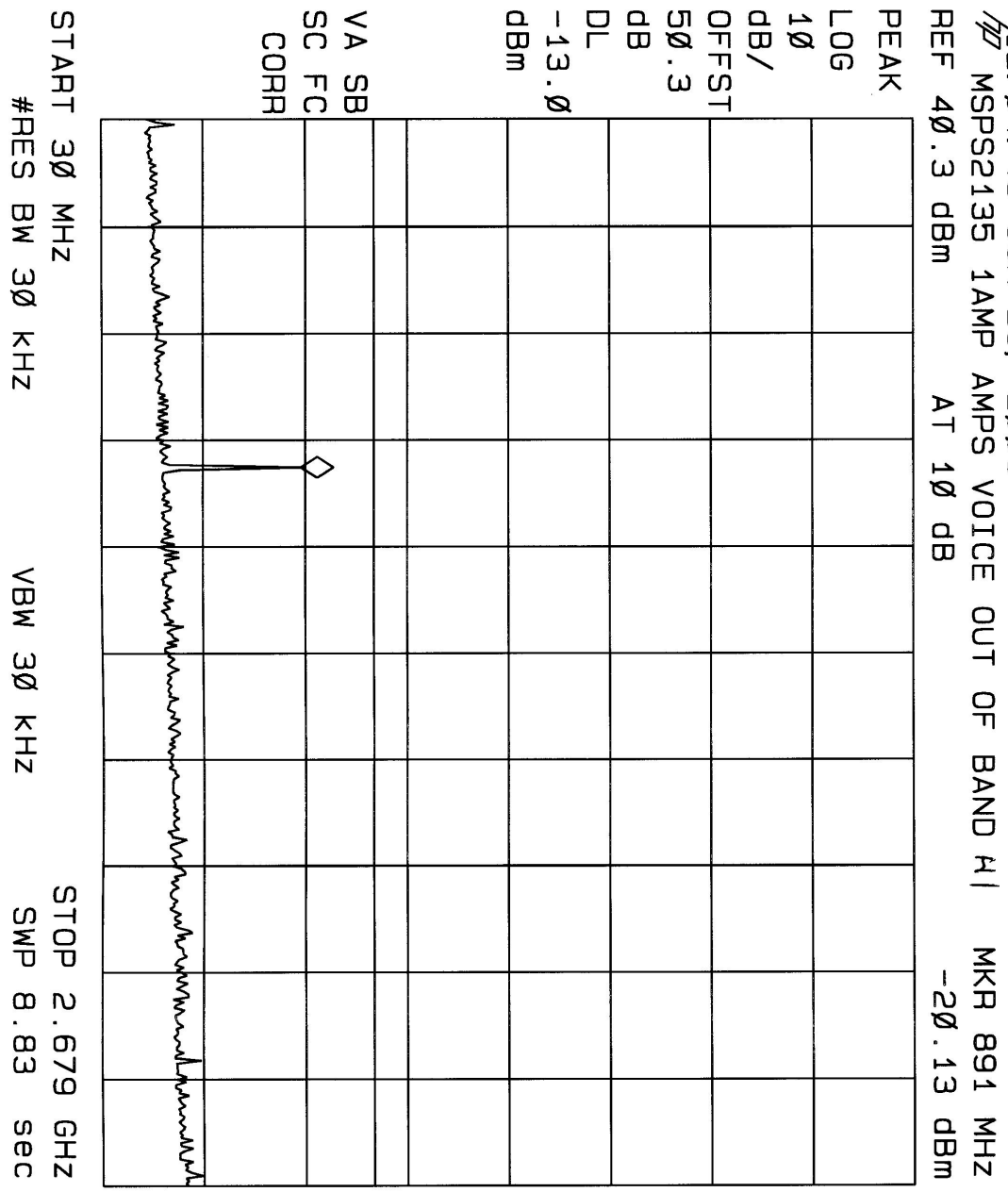

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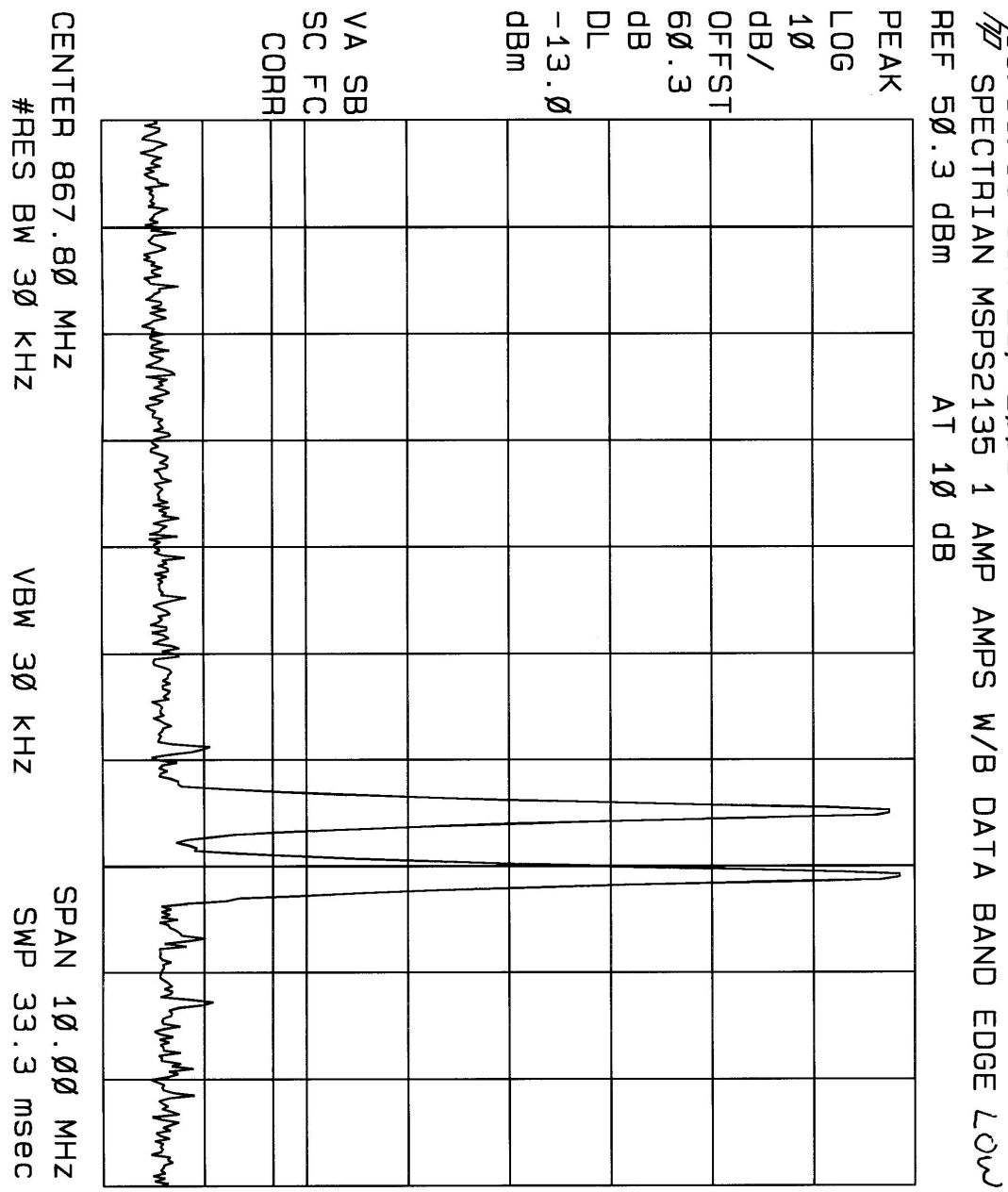

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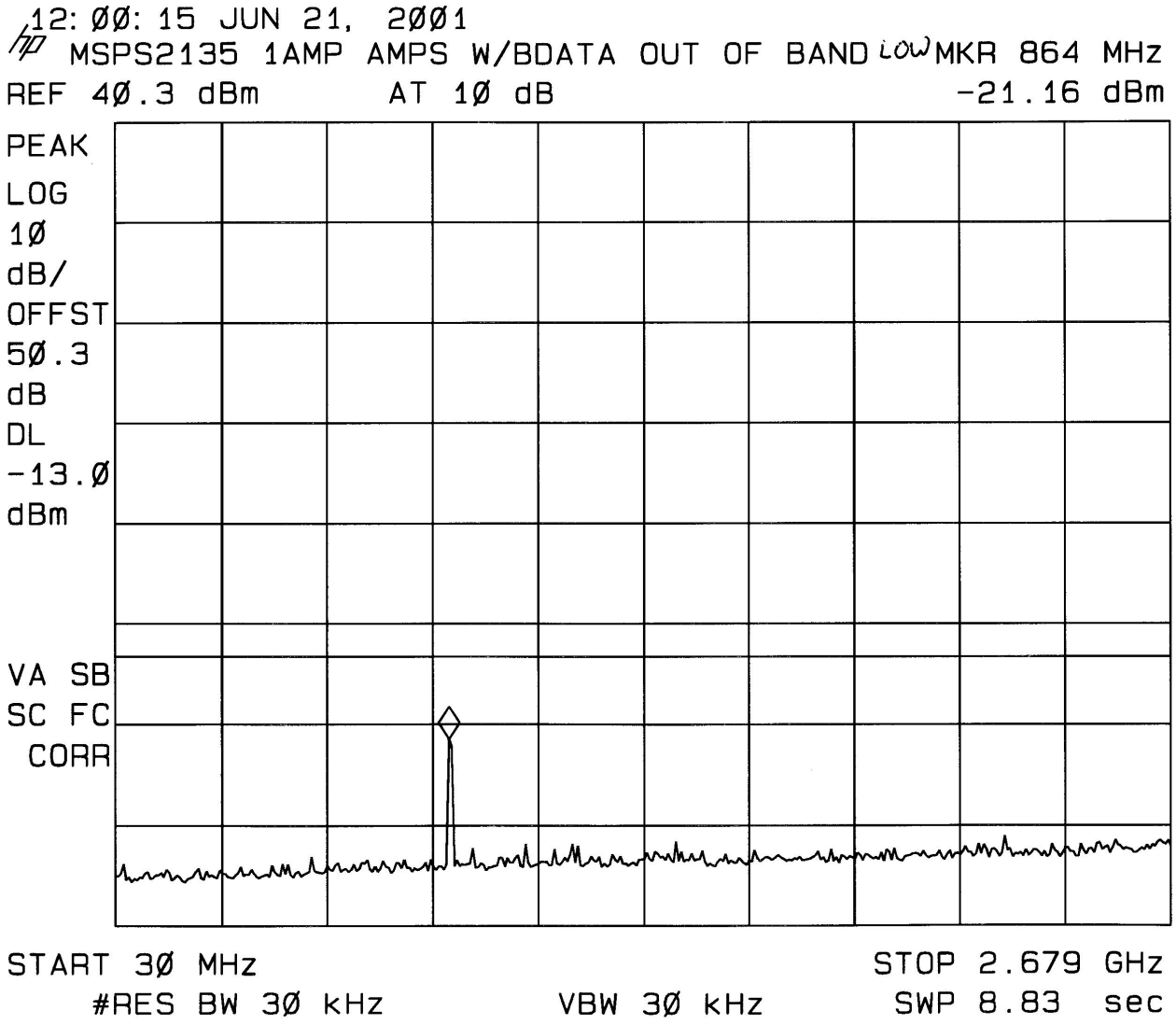

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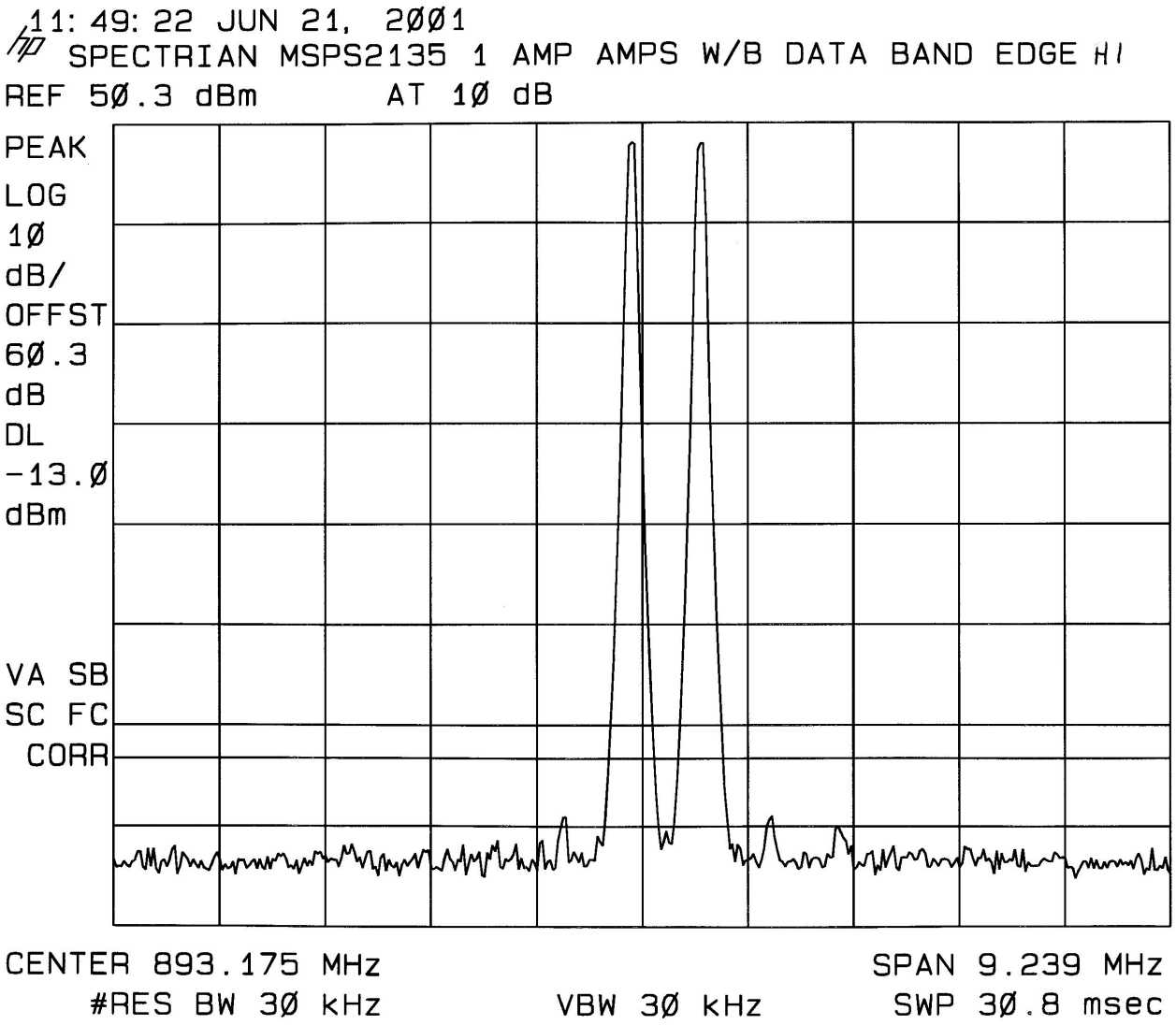

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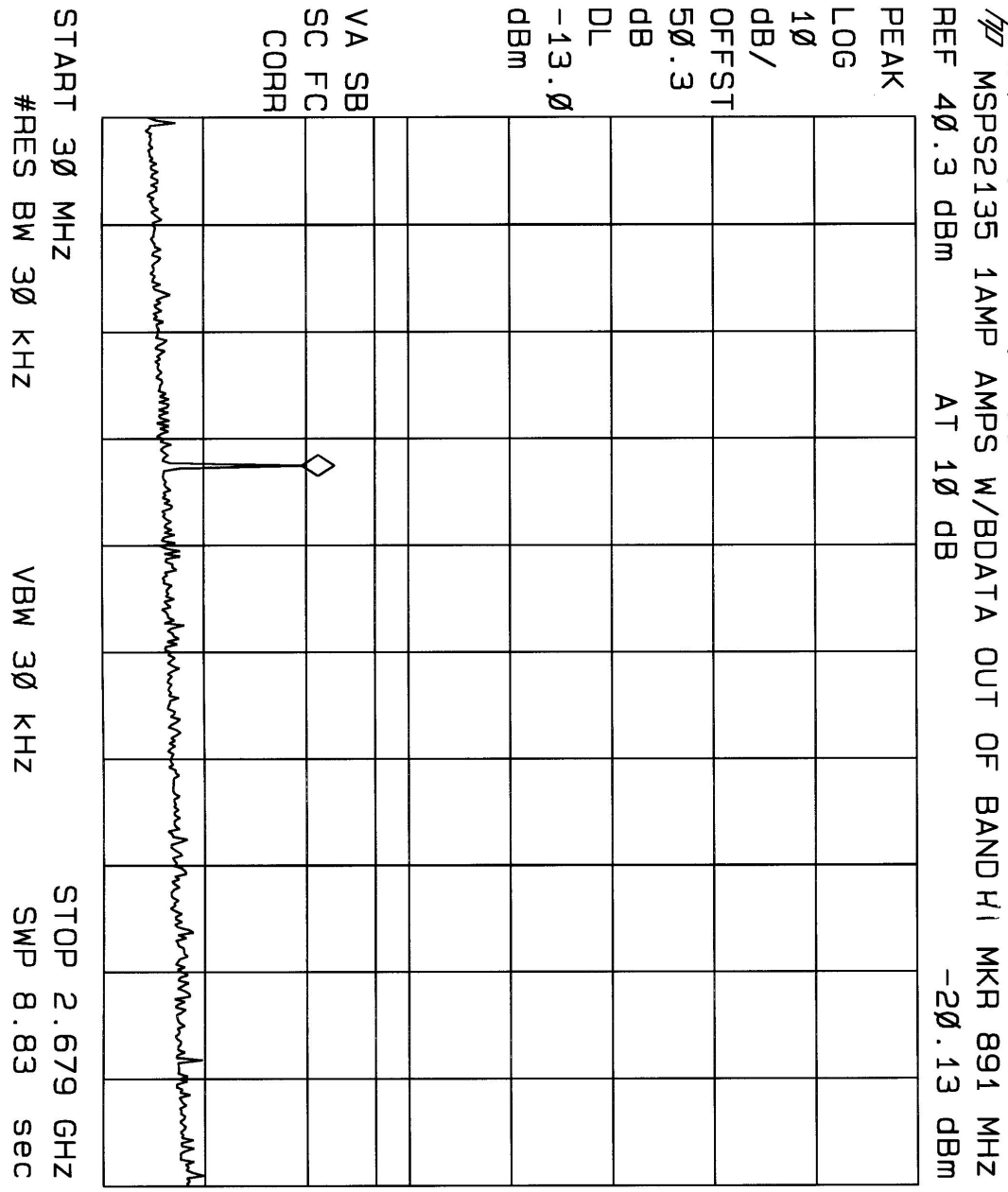

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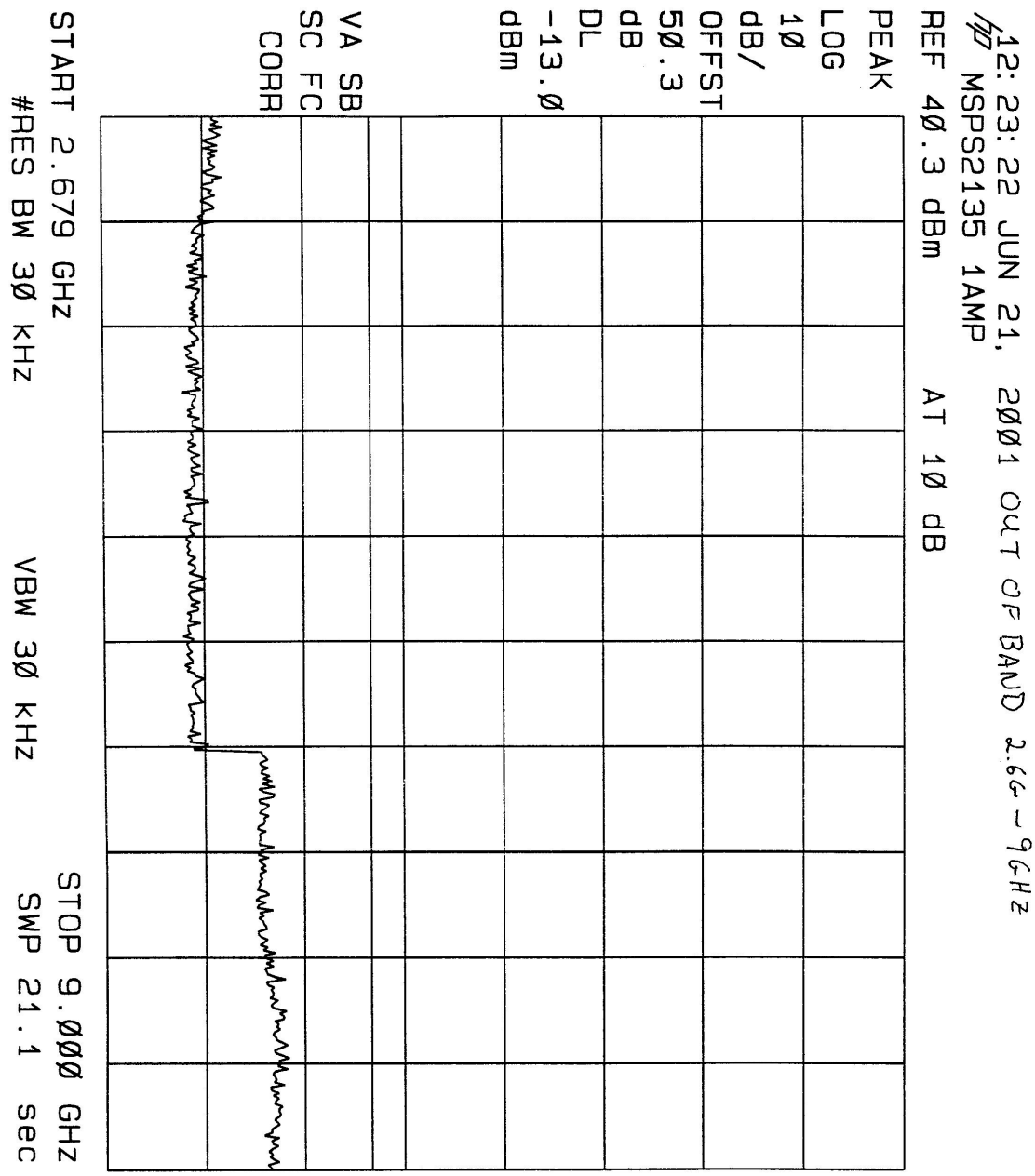

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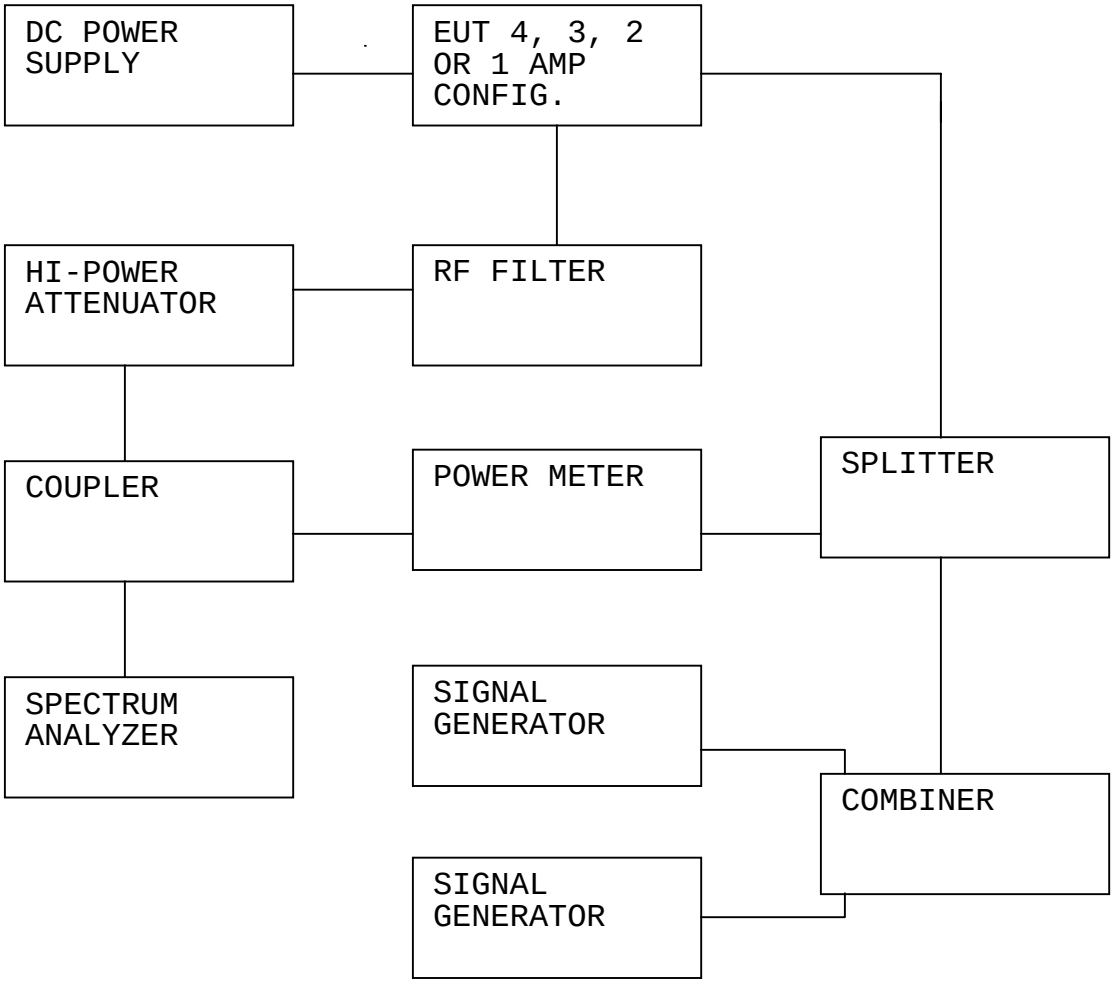
SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

TEST SETUP:



The EUT was configured as shown above with 4, 3 and 2 amplifiers in the 4 brick shelf, and 1 amplifier in the single brick shelf. The EUT was operated to give its maximum output power. Two unmodulated tones of equal amplitude were input to the EUT to achieve a composite output power equal to the maximum rated output power for each configuration. The two tones were at 881.5MHz and 882.5MHz.

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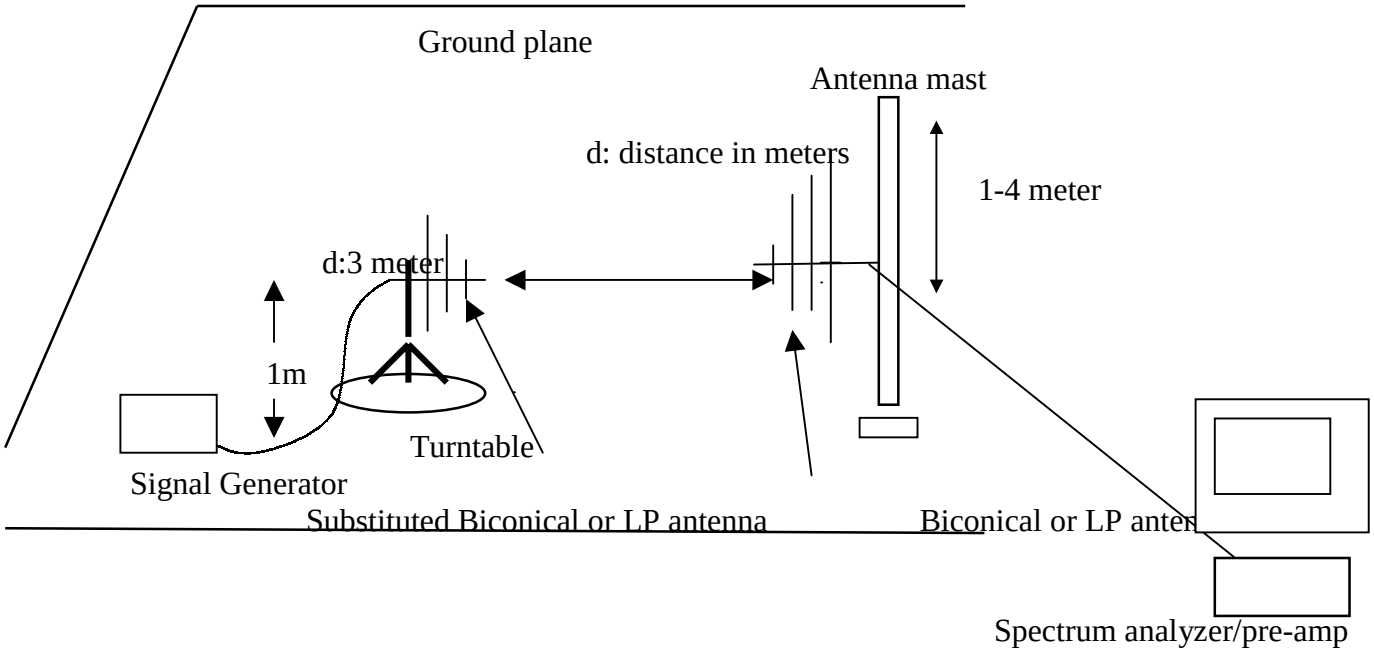
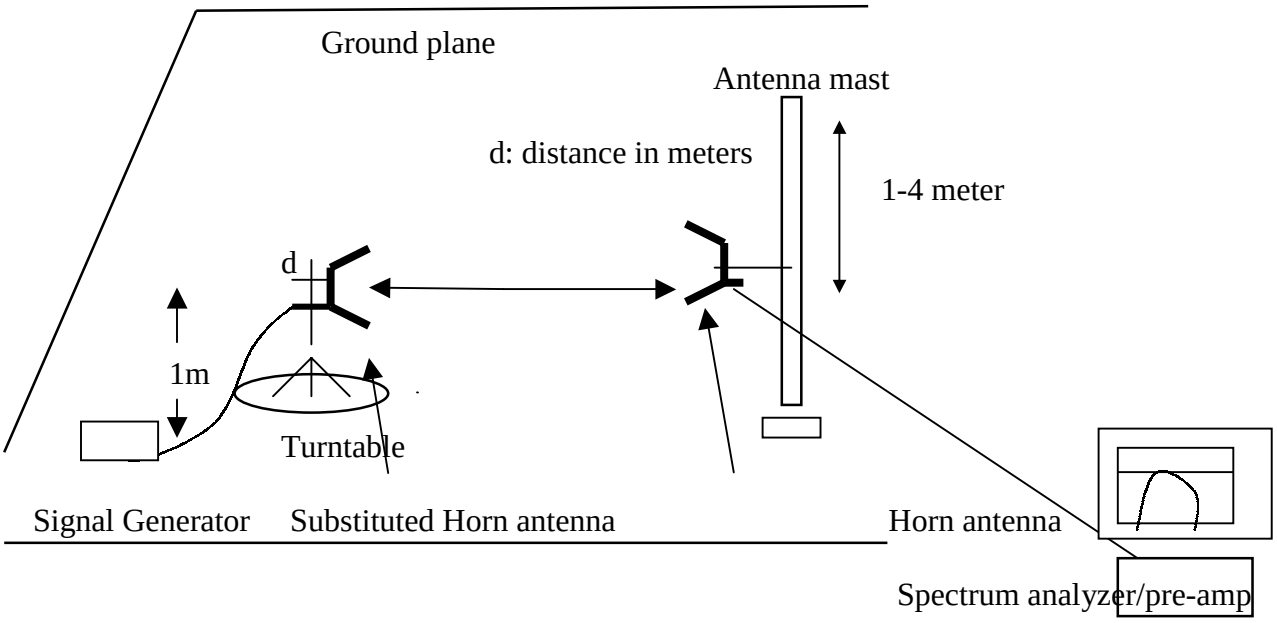
SUBSTITUTION METHOD: (Radiated Emissions)

Test Set-up:
Radiated BELOW 1GHz



Radiated ABOVE 1 GHz



The actual signal generated by the measured equipment may be determined by means of a substitution measurement in which a known signal source replaces the device to be measured.

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The substitution antenna will replace the Eut antenna in the same position and in vertical polarization. The frequency of the signal generator shall be set to the frequencies that were measured on the Eut. The test antenna shall be raised and lowered, if necessary, to ensure that the maximum signal is still being received. The signal generator, output level, shall be adjusted until an equal or a known related level to what was measured from the Eut is obtained in the spectrum analyzer.

The radiated power is equal to the power supplied by the signal generator
The formula, to calculated the true reading, is: True reading = dBm +GdBd - CL

dBm = signal generator output level
GdBd = the gain in dBd of the substitution antenna
CL = the cable loss

The calculated True reading is then compared to the limit and should not exceed the limit. This method must be performed for every emission measured from the Eut. This shall also be repeated for horizontal polarization.

Minimum Requirement:
Section 22.917(e):
The mean power of any spurious and harmonic emissions radiated from base stations transmitters must be attenuated below the mean power of the unmodulated carrier by at least 43 + 10 log (P). This calculates to an absolute limit of –13dBm.

Test Result:
Please refer to attached spreadsheets.

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Compliance Certification Services

Radiated Emissions 7/11/01
22.917(e) A-Site (1 meter)
Hue Vang

SPECTRIAN
1 AMPLIFIERS in ONE RACK (M/N: MSPS2135)

fo = 881.5 MHz (Configurations #1: 1 Amplifiers in a 1 unit rack)

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
1763V	54	-26.5	0.4	8.8	6.65	-20.25	-13	-7.25
1763H	54.4	-27	0.4	8.8	6.65	-20.75	-13	-7.75
2644.5V	30	-50	0.7	9	6.85	-43.85	-13	-30.85
2644.5H	30.2	-50.5	0.7	9	6.85	-44.35	-13	-31.35
3526V	30.8	-47	0.7	8.1	5.95	-41.75	-13	-28.75
3526H	34.7	-42	0.7	8.1	5.95	-36.75	-13	-23.75
4407.5V	29.8	-48	1	10.6	8.45	-40.55	-13	-27.55
4407.5H	29	-49	1	10.6	8.45	-41.55	-13	-28.55
5289V	24.5	-53	1	10.1	7.95	-46.05	-13	-33.05
5289H	26	-48	1	10.1	7.95	-41.05	-13	-28.05
6107.5V	36	-61	1.2	9.9	7.75	-54.45	-13	-41.45
6107.5H	37.1	-59	1.2	9.9	7.75	-52.45	-13	-39.45
7052V	38.9	-65.5	1.4	10	7.85	-59.05	-13	-46.05
7052H	32	-72.5	1.4	10	7.85	-66.05	-13	-53.05
7933.5V	34	-72.5	2.1	10.3	8.15	-66.45	-13	-53.45
7933.5H	29	-79.5	2.1	10.3	8.15	-73.45	-13	-60.45
8815V	36	-67	3.1	10.6	8.45	-61.65	-13	-48.65
8815H	30.9	-74.5	3.1	10.6	8.45	-69.15	-13	-56.15

NOTE: ***Used HPF from the frequencies of 3526 MHz to 8815 MHz***
Used Pre-Amp from the frequencies of 6107.5 MHz to 8815 MHz
*** Measured noise floor (worse case vertical); H=horizontal and V=vertical**
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft), PASTERNECK
TX Antenna: EMCO 3115, S/N: 2238 (dBi)
RX Antenna: EMCO 3115, S/N: 9001-3245
Pre-Amp: MITEQ, S/N: 646456
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Radiated Emissions 7/17/01
22.917(e) A-Site (1 meter)
Hue Vang

SPECTRIAN
2 AMPLIFIERS in a 4 AMPLIFIERS RACK (M/N: MSPS2135)

fo = 881.5 MHz

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
1763V	43.9	-38.5	0.4	8.8	6.65	-32.25	-13	-19.25
1763H	46.1	-35	0.4	8.8	6.65	-28.75	-13	-15.75
2644.5V	25.9	-58	0.7	9	6.85	-51.85	-13	-38.85
2644.5H	31	-49	0.7	9	6.85	-42.85	-13	-29.85
3526V	49	-59.5	0.7	8.1	5.95	-54.25	-13	-41.25
3526H	44.3	-65.5	0.7	8.1	5.95	-60.25	-13	-47.25
4407.5V	39.2	-70	1	10.6	8.45	-62.55	-13	-49.55
4407.5H	43	-61	1	10.6	8.45	-53.55	-13	-40.55
5289V	33	-73	1	10.1	7.95	-66.05	-13	-53.05
5289H	37.2	-72	1	10.1	7.95	-65.05	-13	-52.05
6107.5V	29	-72	1.2	9.9	7.75	-65.45	-13	-52.45
6107.5H	29.8	-73	1.2	9.9	7.75	-66.45	-13	-53.45
7052V	29.5	-73	1.4	10	7.85	-66.55	-13	-53.55
7052H	31	-73	1.4	10	7.85	-66.55	-13	-53.55
7933.5V	28	-73	2.1	10.3	8.15	-66.95	-13	-53.95
7933.5H	27.9	-73	2.1	10.3	8.15	-66.95	-13	-53.95
8815V	29.7	-73	3.1	10.6	8.45	-67.65	-13	-54.65
8815H	30.1	-73	3.1	10.6	8.45	-67.65	-13	-54.65

NOTE: ***Used HPF from the frequencies of 3526 MHz to 8815 MHz***
Used Pre-Amp from the frequencies of 3526 MHz to 8815 MHz
*** Measured noise floor (worse case vertical); H=horizontal and V=vertical**
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft), PASTERNECK
TX Antenna: EMCO 3115, S/N: 2238 (dBi)
RX Antenna: EMCO 3115, S/N: 9001-3245
Pre-Amp: MITEQ, S/N: 646456
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Radiated Emissions 7/17/01

22.917(e) A-Site (1 meter)

Hue Vang

SPECTRIAN

3 AMPLIFIERS in a 4 AMPLIFIERS RACK (M/N: MSPS2135)

fo = 881.5 MHz

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
1763V	47	-35	0.4	8.8	6.65	-28.75	-13	-15.75
1763H	53	-28	0.4	8.8	6.65	-21.75	-13	-8.75
2644.5V	28	-51	0.7	9	6.85	-44.85	-13	-31.85
2644.5H	31	-49	0.7	9	6.85	-42.85	-13	-29.85
3526V	46	-62	0.7	8.1	5.95	-56.75	-13	-43.75
3526H	44	-65.2	0.7	8.1	5.95	-59.95	-13	-46.95
4407.5V	39	-65.5	1	10.6	8.45	-58.05	-13	-45.05
4407.5H	42	-70	1	10.6	8.45	-62.55	-13	-49.55
5289V	32	-61.5	1	10.1	7.95	-54.55	-13	-41.55
5289H	38.5	-73	1	10.1	7.95	-66.05	-13	-53.05
6107.5V	29	-72	1.2	9.9	7.75	-65.45	-13	-52.45
6107.5H	29.8	-73	1.2	9.9	7.75	-66.45	-13	-53.45
7052V	29.8	-73	1.4	10	7.85	-66.55	-13	-53.55
7052H	31	-73	1.4	10	7.85	-66.55	-13	-53.55
7933.5V	29.5	-73	2.1	10.3	8.15	-66.95	-13	-53.95
7933.5H	29.9	-73	2.1	10.3	8.15	-66.95	-13	-53.95
8815V	29.6	-73	3.1	10.6	8.45	-67.65	-13	-54.65
8815H	30	-73	3.1	10.6	8.45	-67.65	-13	-54.65

NOTE: ***Used HPF from the frequencies of 3526 MHz to 8815 MHz***
Used Pre-Amp from the frequencies of 3526 MHz to 8815 MHz
*** Measured noise floor (worse case vertical); H=horizontal and V=vertical**
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft), PASTERNECK
TX Antenna: EMCO 3115, S/N: 2238 (dBi)
RX Antenna: EMCO 3115, S/N: 9001-3245
Pre-Amp: MITEQ, S/N: 646456
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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22.917(e) A-Site (1 meter)
Hue Vang

SPECTRIAN
4 AMPLIFIERS in a 4 AMPLIFIERS RACK (M/N: MSPS2135)

fo = 881.5 MHz

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
1763V	44	-38	0.4	8.8	6.65	-31.75	-13	-18.75
1763H	53.5	-27	0.4	8.8	6.65	-20.75	-13	-7.75
2644.5V	31	-48	0.7	9	6.85	-41.85	-13	-28.85
2644.5H	34.5	-45.5	0.7	9	6.85	-39.35	-13	-26.35
3526V	41.9	-65	0.7	8.1	5.95	-59.75	-13	-46.75
3526H	41	-70	0.7	8.1	5.95	-64.75	-13	-51.75
4407.5V	42.2	-66.5	1	10.6	8.45	-59.05	-13	-46.05
4407.5H	46	-58.5	1	10.6	8.45	-51.05	-13	-38.05
5289V	32.9	-73	1	10.1	7.95	-66.05	-13	-53.05
5289H	39	-72	1	10.1	7.95	-65.05	-13	-52.05
6107.5V	28.4	-73	1.2	9.9	7.75	-66.45	-13	-53.45
6107.5H	29.5	-73	1.2	9.9	7.75	-66.45	-13	-53.45
7052V	27.4	-73	1.4	10	7.85	-66.55	-13	-53.55
7052H	28.9	-73	1.4	10	7.85	-66.55	-13	-53.55
7933.5V	29	-73	2.1	10.3	8.15	-66.95	-13	-53.95
7933.5H	30.2	-73	2.1	10.3	8.15	-66.95	-13	-53.95
8815V	28	-73	3.1	10.6	8.45	-67.65	-13	-54.65
8815H	28.5	-73	3.1	10.6	8.45	-67.65	-13	-54.65

NOTE: ***Used HPF from the frequencies of 3526 MHz to 8815 MHz***
Used Pre-Amp from the frequencies of 3526 MHz to 8815 MHz
*** Measured noise floor (worse case vertical); H=horizontal and V=vertical**
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft), PASTERNECK
TX Antenna: EMCO 3115, S/N: 2238 (dBi)
RX Antenna: EMCO 3115, S/N: 9001-3245
Pre-Amp: MITEQ, S/N: 646456
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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SECTION 2.1055: FREQUENCY STABILITY

Not Applicable. The Eut is a power amplifier

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13. EUT TEST SETUP PHOTOS

CONDUCTED (FRONT)

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CONDUCTED (BACK)

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4 AMPS HARMONIC TEST

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3 AMPS HARMONIC TEST

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2 AMPS HARMONIC TEST

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1 AMP HARMONIC TEST

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SUBSTITUTION TEST

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