TEST SETUP, PROCEDURE AND RESULT

INSTRUMENTATION LIST

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
30MHz--- 2Ghz	Sunol Sciences	JB1 Antenna	A121003	9/22/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3117	29301	9/12/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	9/12/06
Amplifier 1-26GHz	MITEQ	NSP2600-SP	924341	8/17/06
Spectrum Analyzer, 26.5 GHz	HP	8593EM	3710A00205	1/6/06
Dipole	EMCO	3121C-DB2	22435	3/25/06
Signal Generator 2 -40 GHz	R & S	SMP04	DE 34210	5/2/06
Spectrum Analyzer	HP	E4446A	US42510266	08/25/06
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	03/03/06
RF Filter Section	HP	85420E	3705A00256	03/29/06
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/06

SECTION 2.1046: RF POWER OUTPUT

MEASUREMENT PROCEDURE / TIA/EIA 603B section 2.2.17

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.

3). The output of the test antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.

4). The transmitter shall be placed 0.80 meter above the ground plane, the X, Y, and Z positions shall be tested and the worst case reported. The transmitter shall be switched on with typical modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.

8). The maximum signal level detected by the measuring receiver shall be noted.

9). The transmitter shall be replaced by a tuned dipole or horn antenna (substitution antenna).

10). The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.

11). The substitution antenna shall be connected to a calibrated signal generator.

12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

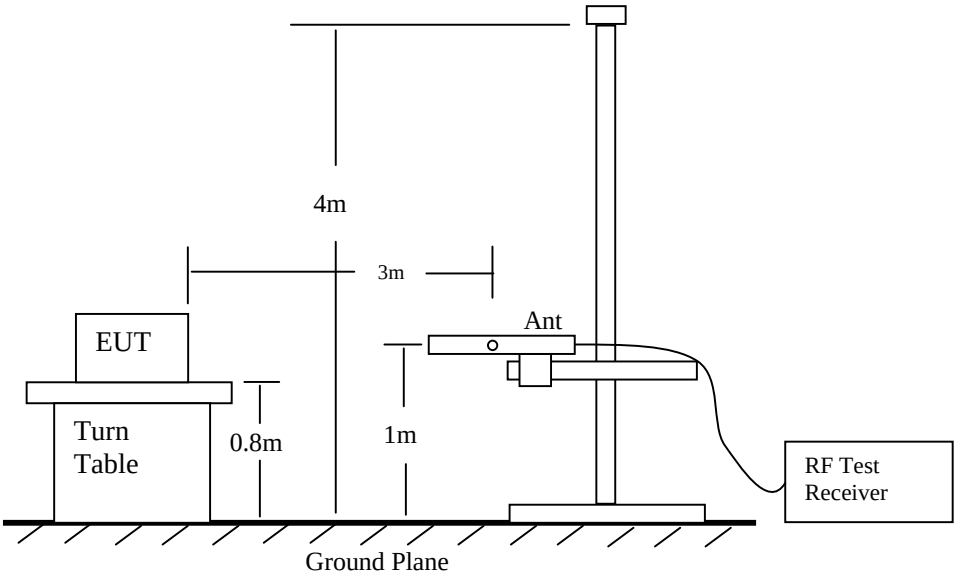
13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

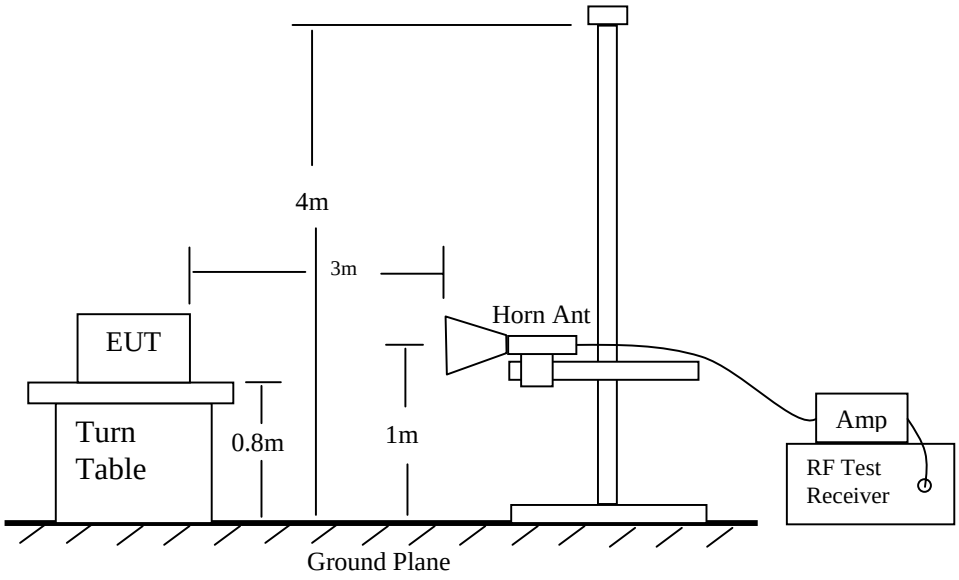
15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

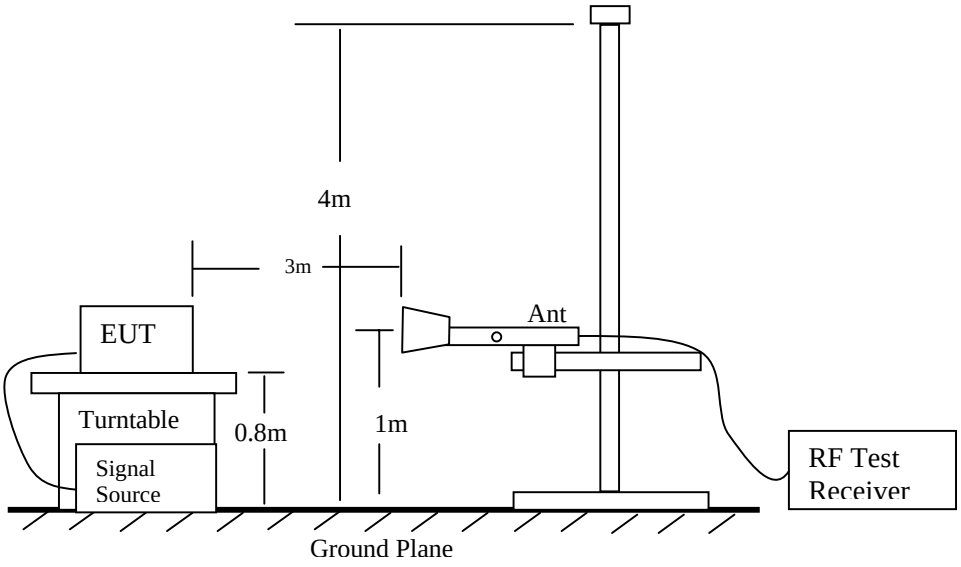
17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.



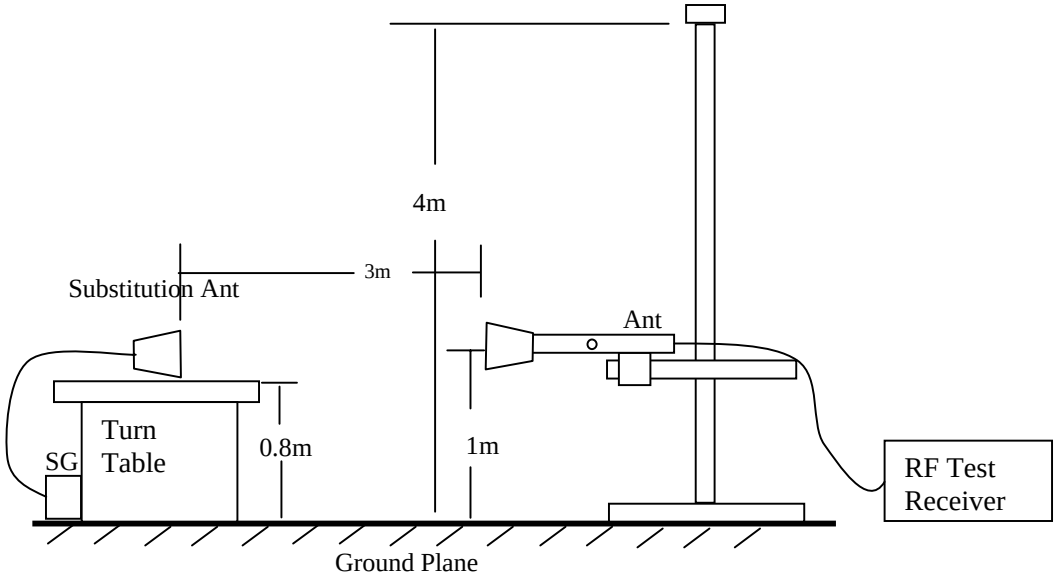
Radiated Emission Measurement 30 to 1000 MHz



Radiated Emission Above 1000 MHz



Radiated Emission Measurement



Radiated Emission – Substitution Method set-u

MEASUREMENT RESULT:

M-Note Metal 850 MHz band

10/21/05 **High Frequency Substitution Measurement**

Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Frank Ibrahim
Project #: 05U3601-1
Company: Sierra Wireless
EUT Descrip.: Express Mini PCI, USB Wireless CDMA modem module installed in M-Note Metal laptop
EUT M/N: MC5720
Test Target: FCC Part 22
Mode Oper: TX ON, Laptop SN: SIVBV1B400000074

Test Equipment: **(RBW=VBW=3MHz, No Preamp)**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
824.70	93.8	V	16.9	0.5	0.0	16.4	38.5	-22.0
824.70	93.4	H	15.0	0.5	0.0	14.5	38.5	-23.9
836.50	93.6	V	17.6	0.6	0.0	17.0	38.5	-21.5
836.50	94.9	H	16.7	0.6	0.0	16.1	38.5	-22.3
848.30	91.9	V	16.5	0.7	0.0	15.8	38.5	-22.7
848.30	94.1	H	16.0	0.7	0.0	15.3	38.5	-23.1

M-Note Plastic 850 MHz band

10/21/05 **High Frequency Substitution Measurement**

Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Frank Ibrahim
Project #: 05U3601-1
Company: Sierra Wireless
EUT Descrip.: Express Mini PCI, USB Wireless CDMA modem module installed in M-Note Plastic laptop
EUT M/N: MC5720
Test Target: FCC Part 22
Mode Oper: TX ON, Laptop SN: SIVBV1B00000009

Test Equipment: **(RBW=VBW=3MHz, No Preamp)**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
824.70	94.3	V	17.3	0.5	0.0	16.8	38.5	-21.6
824.70	99.0	H	20.7	0.5	0.0	20.2	38.5	-18.2
836.50	95.6	V	19.6	0.6	0.0	19.0	38.5	-19.5
836.50	98.5	H	20.3	0.6	0.0	19.7	38.5	-18.7
848.30	95.6	V	20.2	0.7	0.0	19.5	38.5	-18.9
848.30	96.5	H	18.4	0.7	0.0	17.7	38.5	-20.7

M-Note Metal 1900 MHz band

10/21/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Frank Ibrahim
Project #: 05U3601-1
Company: Sierra Wireless
EUT Descrip.: Express Mini PCI, USB Wireless CDMA modem module installed in M-Note Metal laptop
EUT M/N: MC5720
Test Target: FCC Part 24
Mode Oper: TX ON, Laptop SN: SIVBV1B400000074

Test Equipment: **(RBW=VBW=3MHz, No Preamp)**

Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1.85125	87.4	H	10.1	0.9	8.3	17.5	33.0	-15.5
1.85125	86.0	V	8.6	0.9	8.3	16.0	33.0	-17.0
1.88000	87.1	H	10.2	0.9	8.3	17.7	33.0	-15.4
1.88000	85.6	V	7.9	0.9	8.3	15.3	33.0	-17.7
1.90875	84.6	H	8.0	0.9	8.4	15.5	33.0	-17.5
1.90875	84.7	V	7.7	0.9	8.4	15.2	33.0	-17.8

M-Note Plastic 1900 MHz Band

10/21/05 **High Frequency Fundamental Measurement**
Compliance Certification Services, Morgan Hill 5m Chamber Site

Test Engr: Frank Ibrahim
Project #: 05U3601-1
Company: Sierra Wireless
EUT Descrip.: Express Mini PCI, USB Wireless CDMA modem module installed in M-Note Plastic laptop
EUT M/N: MC5720
Test Target: FCC Part 24
Mode Oper: TX ON, Laptop SN: SIVBV1B00000009

Test Equipment: **(RBW=VBW=3MHz, No Preamp)**

Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1.851	87.9	H	10.7	0.9	8.3	18.1	33.0	-15.0
1.851	86.6	V	9.2	0.9	8.3	16.6	33.0	-16.4
1.880	87.0	H	10.2	0.9	8.3	17.6	33.0	-15.4
1.880	87.7	V	10.0	0.9	8.3	17.5	33.0	-15.6
1.909	84.0	H	7.4	0.9	8.4	14.9	33.0	-18.1
1.909	84.0	V	7.0	0.9	8.4	14.5	33.0	-18.5