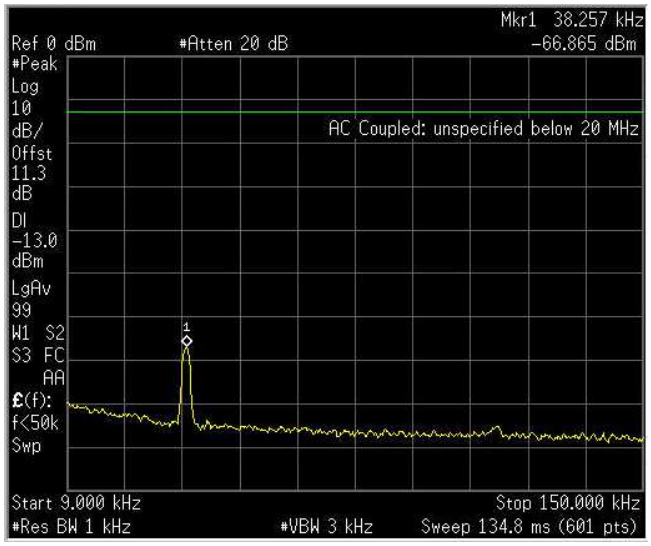
Nemko Italy S.p.A., Via del Carroccio 4, 20046, Biassono, Italy.

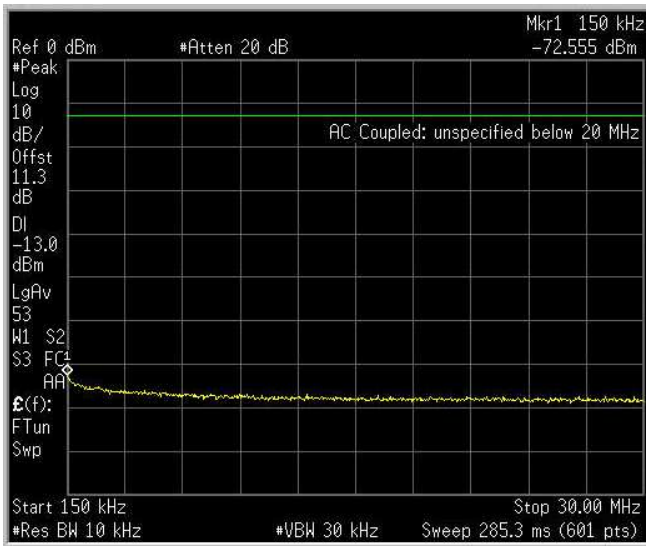
PART 3

Clause 24.238 Spurious emissions at antenna terminal,

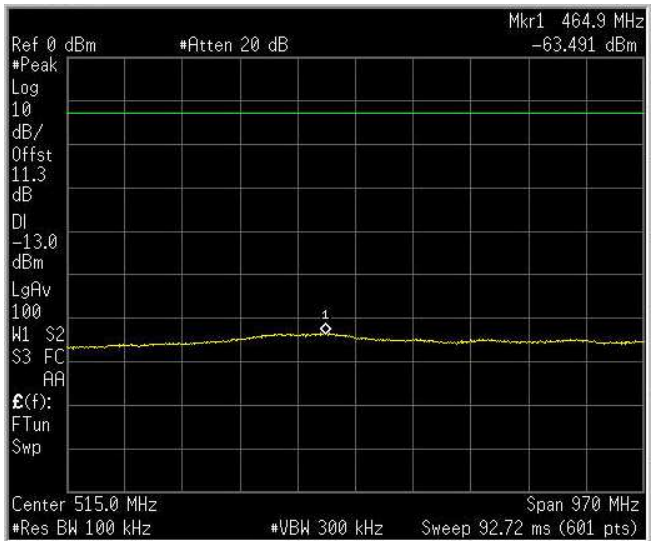
Mod. GSM (Down-link)



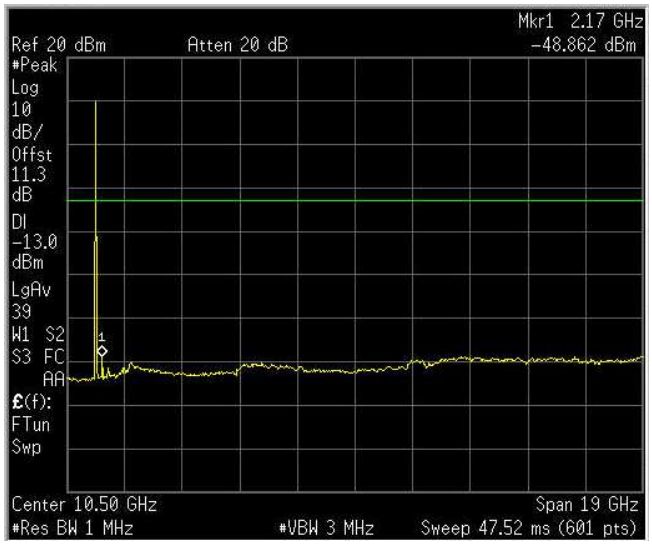
9kHz-150kHz



150kHz-30MHz

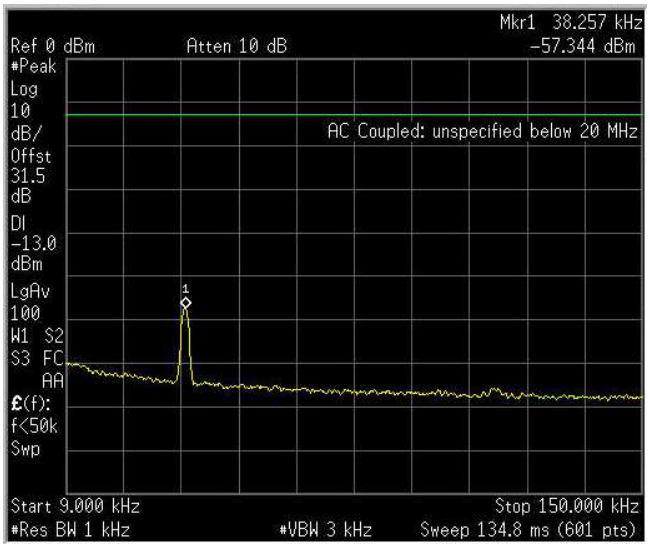


30MHz-1GHz

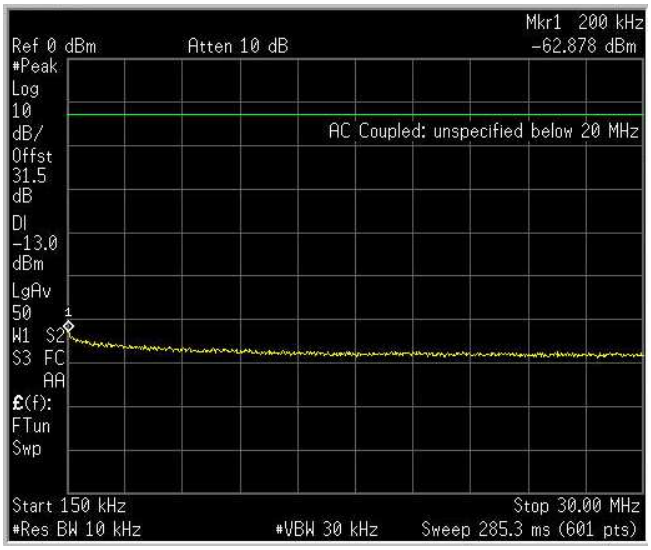


1GHz-20GHz

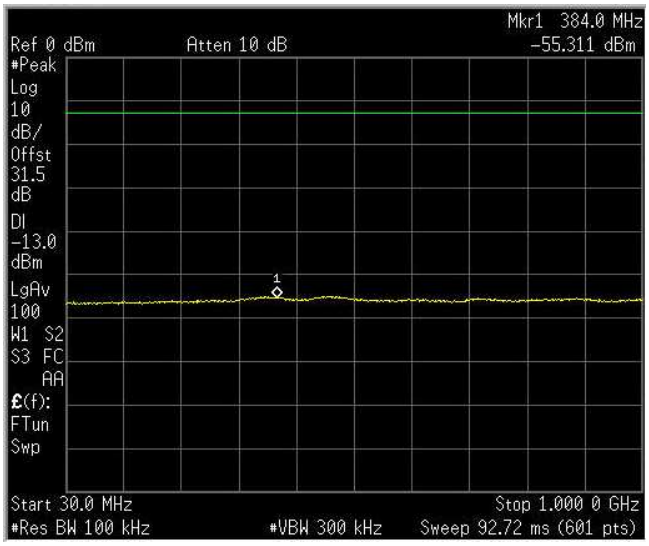
Mod. GSM (Up-link)



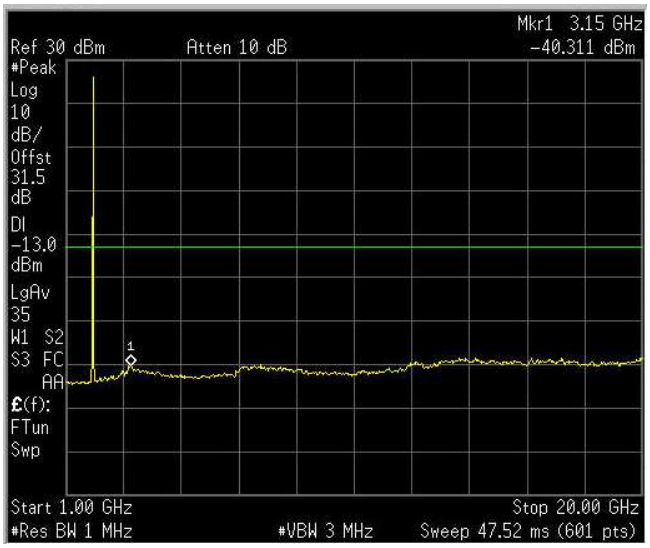
9kHz-150kHz



150kHz-30MHz

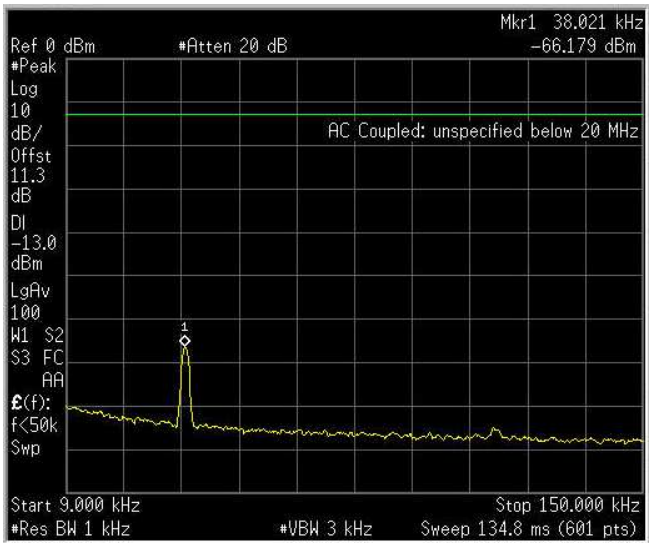


30MHz-1GHz

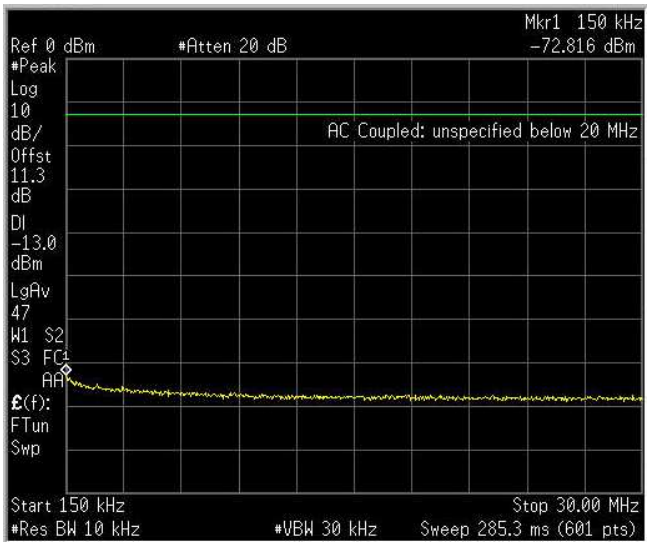


1GHz-20GHz

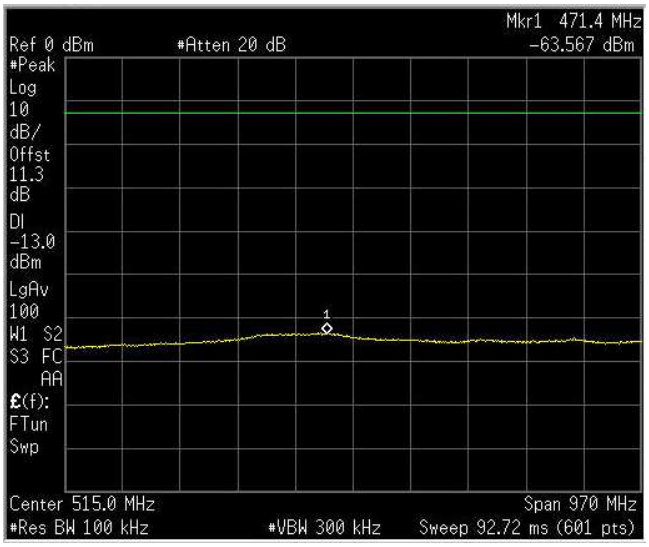
Mod. EDGE (Down-link)



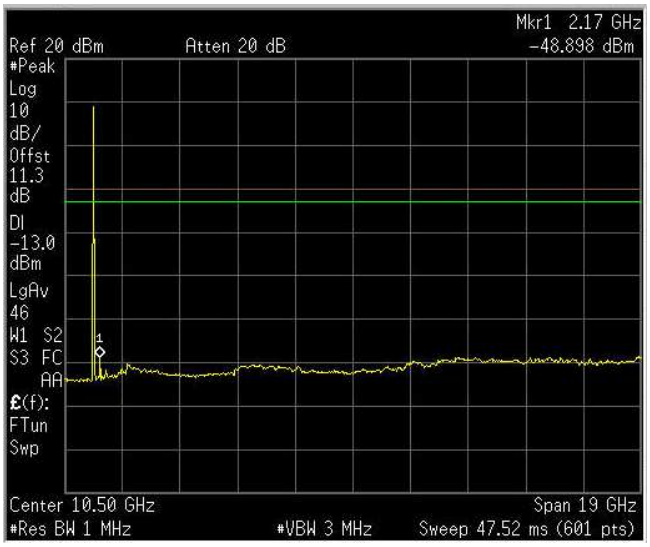
9kHz-150kHz



150kHz-30MHz

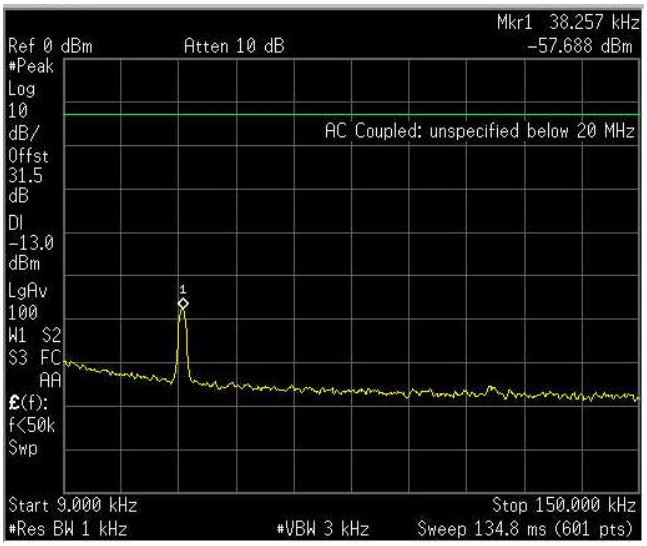


30MHz-1GHz

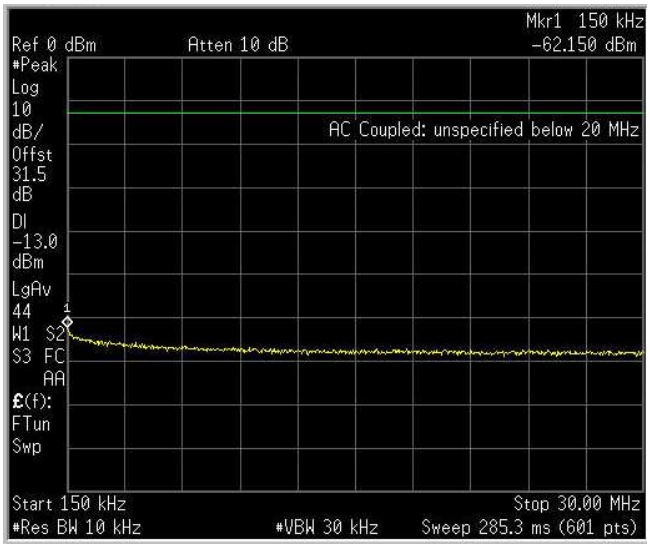


1GHz-20GHz

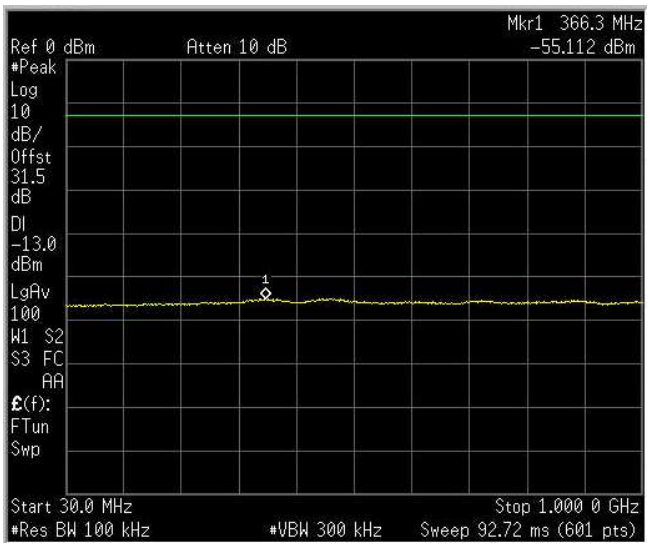
Mod. EDGE (Up-link)



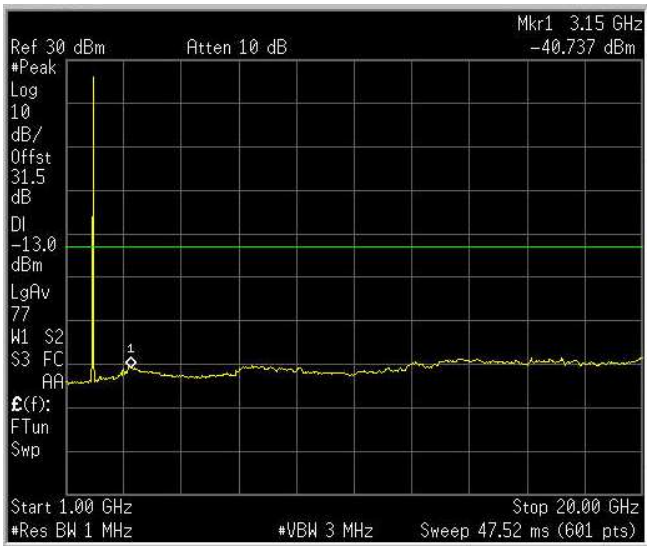
9kHz-150kHz



150kHz-30MHz

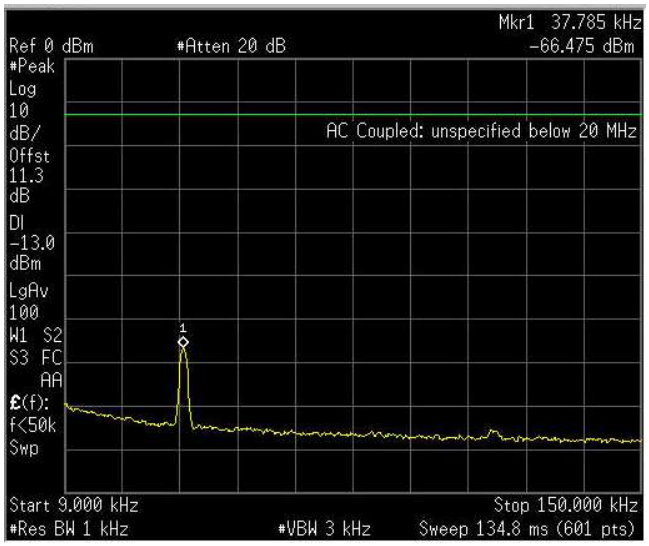


30MHz-1GHz

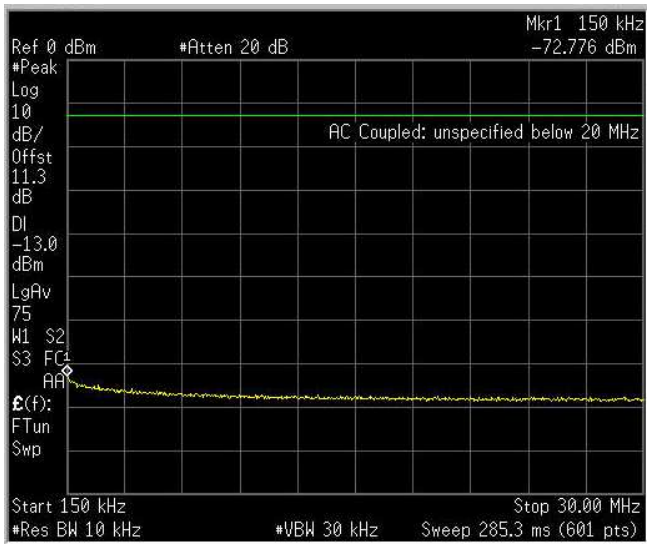


1GHz-20GHz

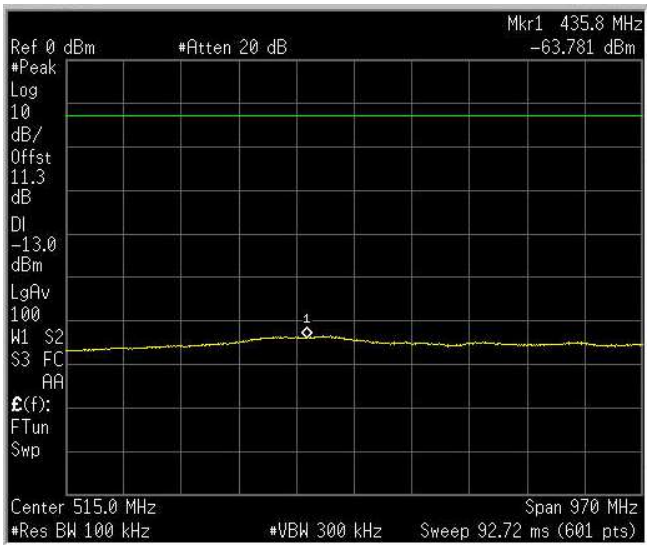
Mod. TDMA (Down-link)



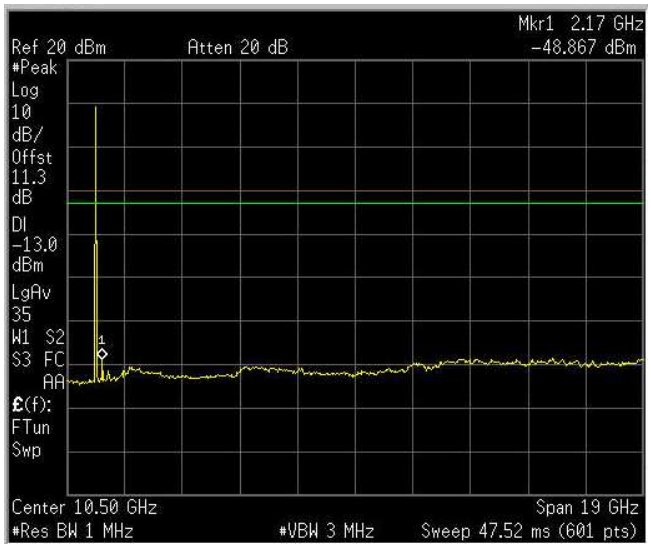
9kHz-150kHz



150kHz-30MHz

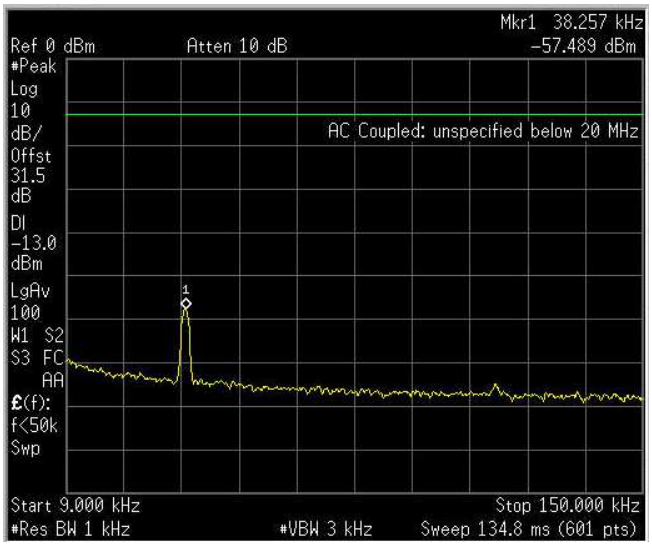


30MHz-1GHz

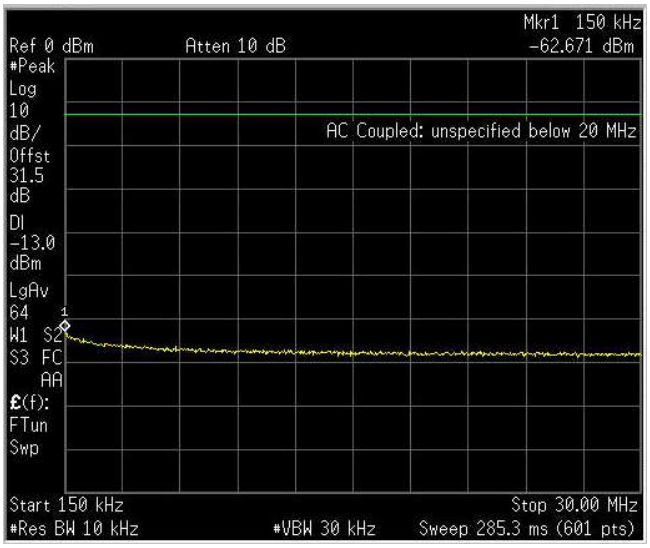


1GHz-20GHz

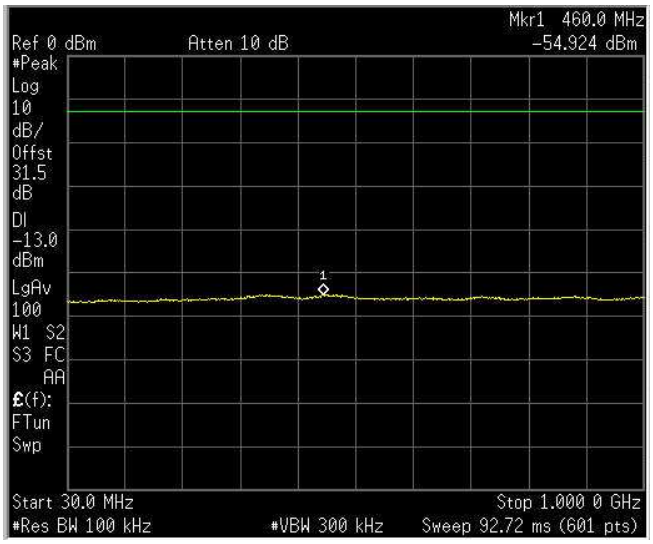
Mod. TDMA (Up-link)



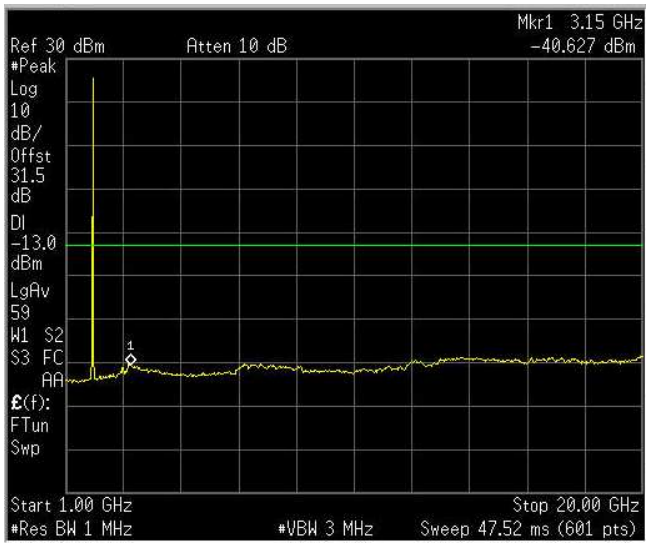
9kHz-150kHz



150kHz-30MHz

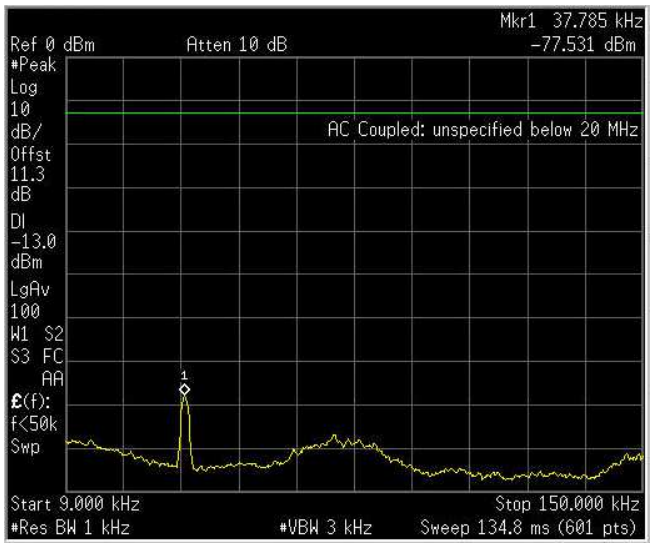


30MHz-1GHz

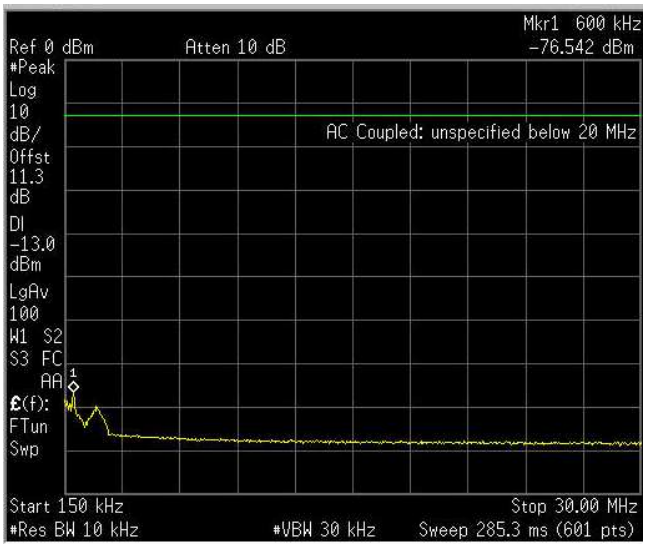


1GHz-20GHz

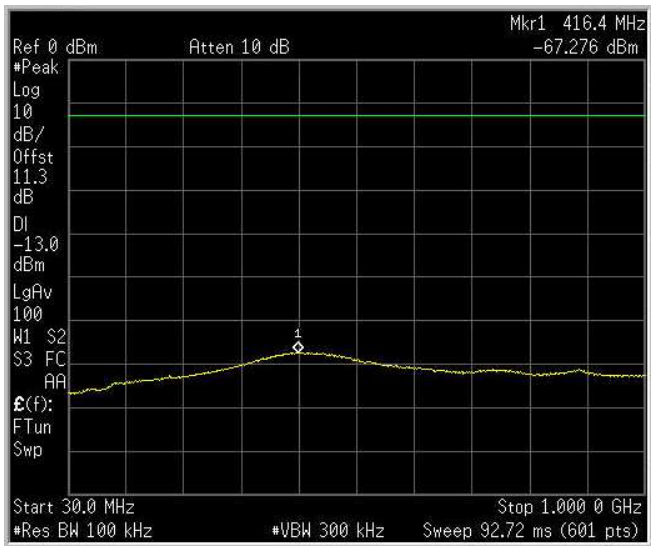
Mod. CDMA (Down-link)



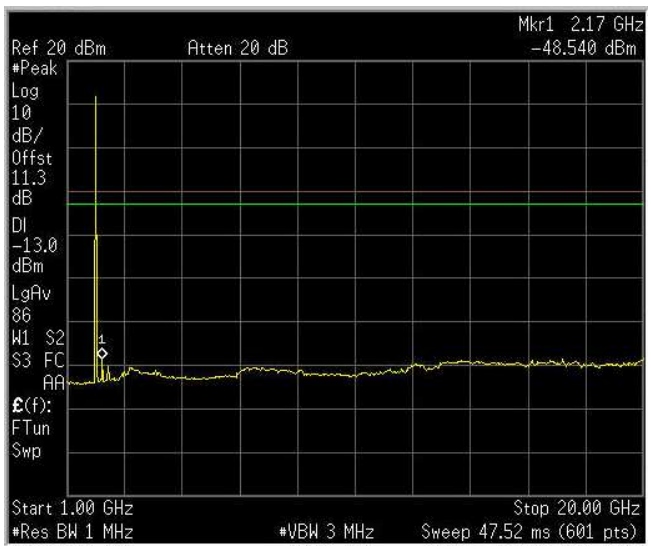
9kHz-150kHz



150kHz-30MHz

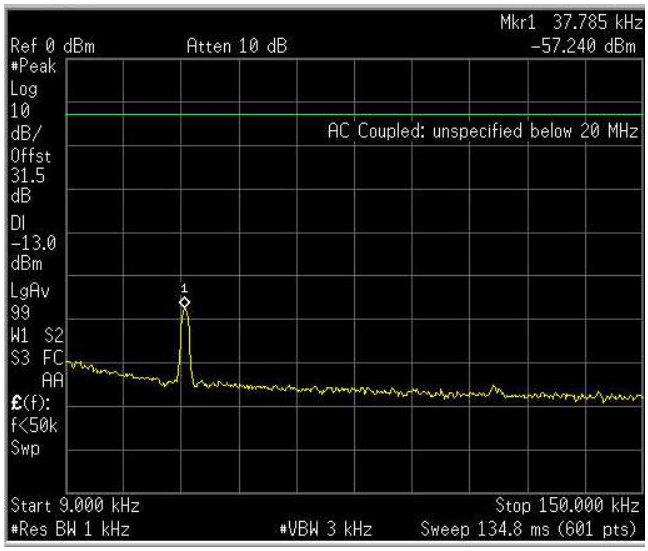


30MHz-1GHz

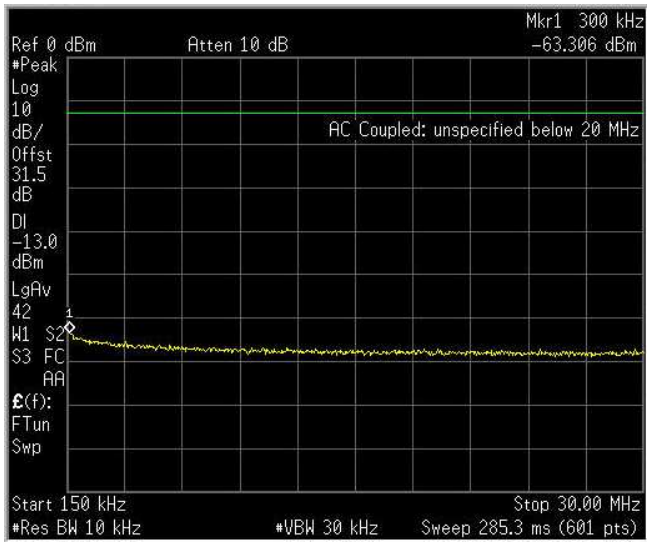


1GHz-20GHz

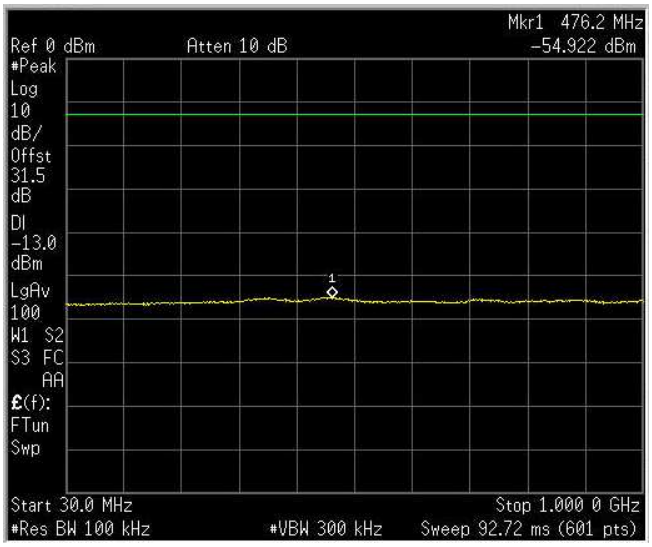
Mod. CDMA (Up-link)



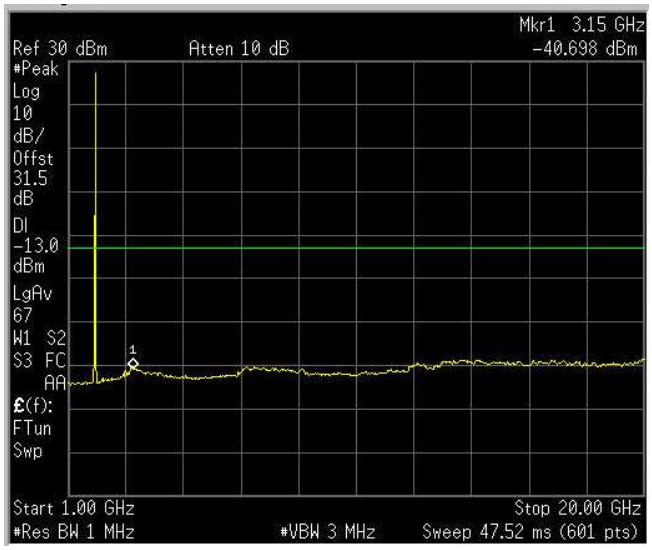
9kHz-150kHz



150kHz-30MHz

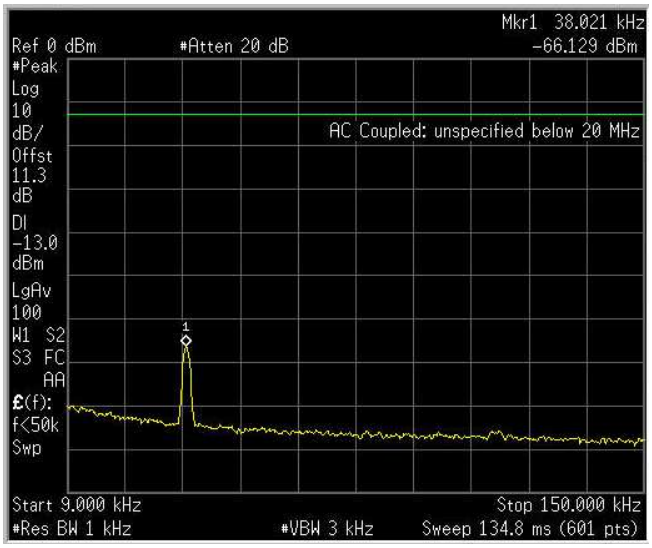


30MHz-1GHz

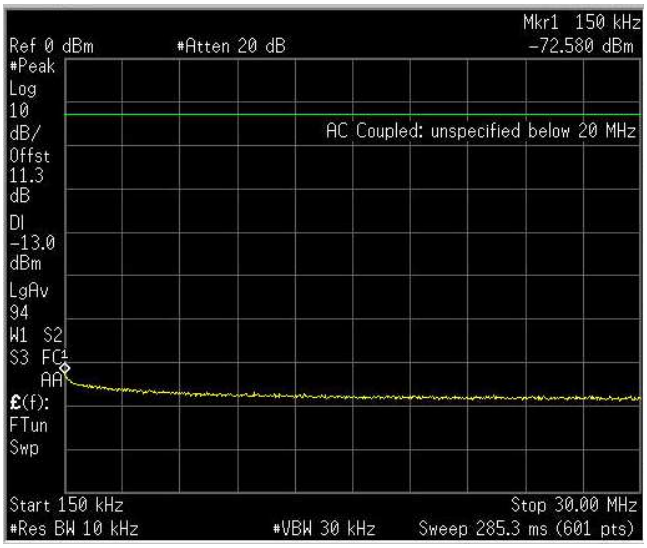


1GHz-20GHz

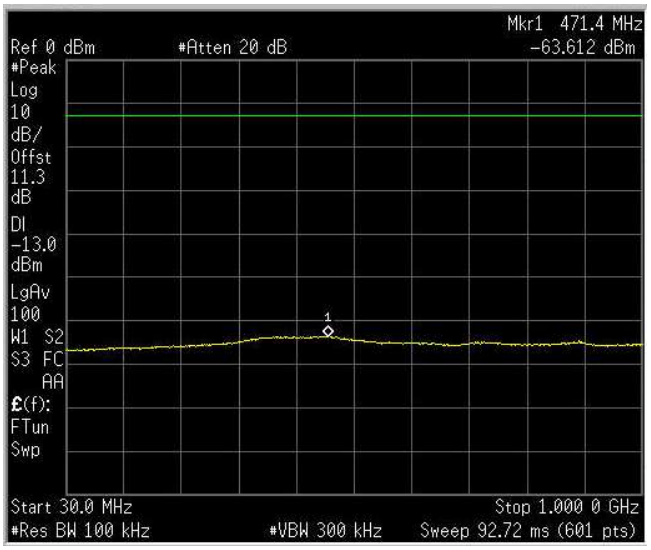
Mod. WCDMA (Down-link)



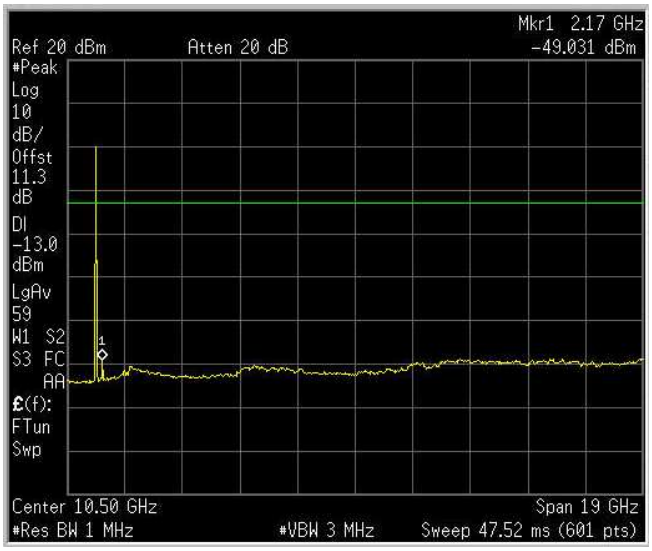
9kHz-150kHz



150kHz-30MHz

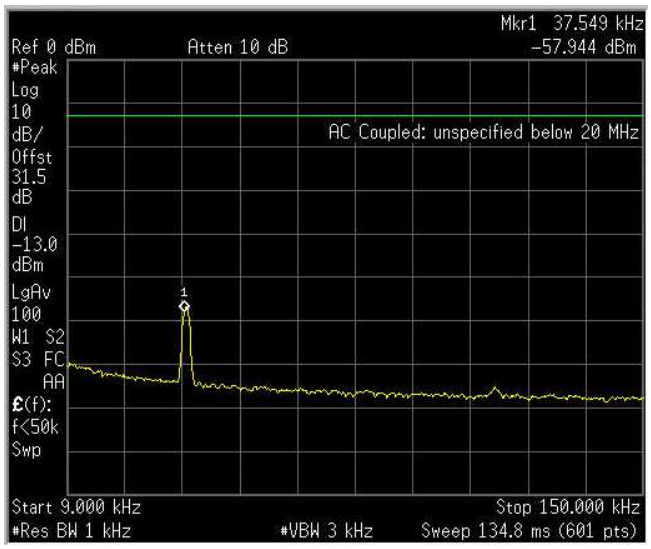


30MHz-1GHz

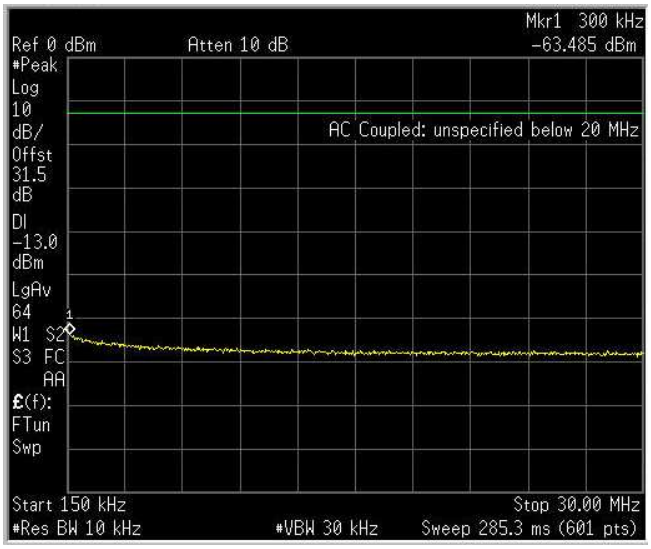


1GHz-20GHz

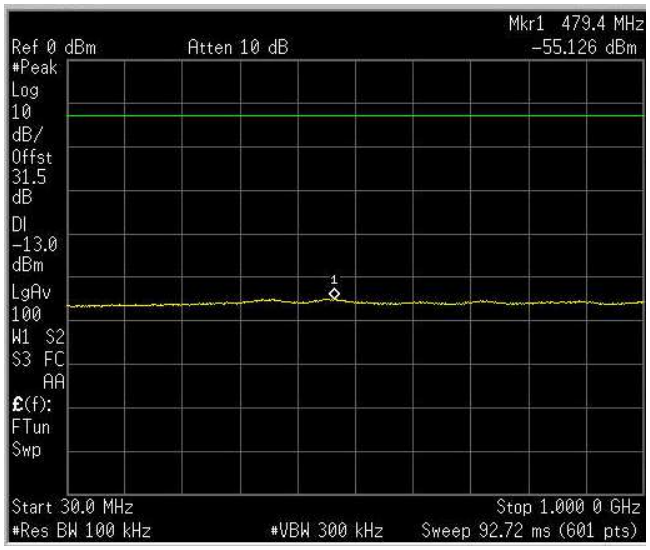
Mod. WCDMA (Up-link)



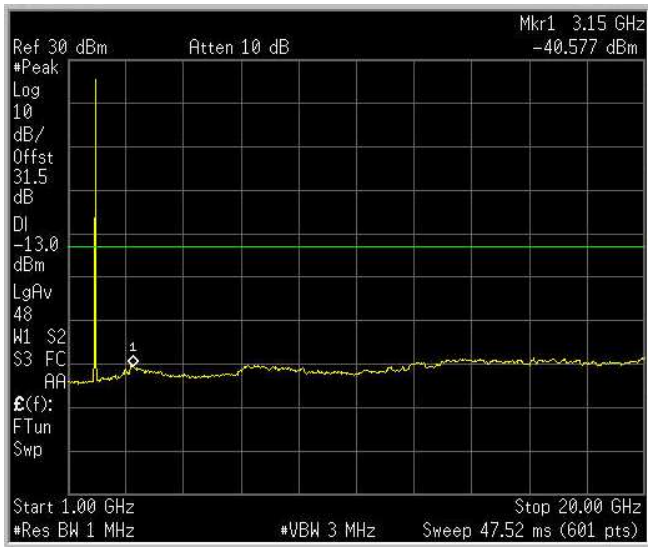
9kHz-150kHz



150kHz-30MHz

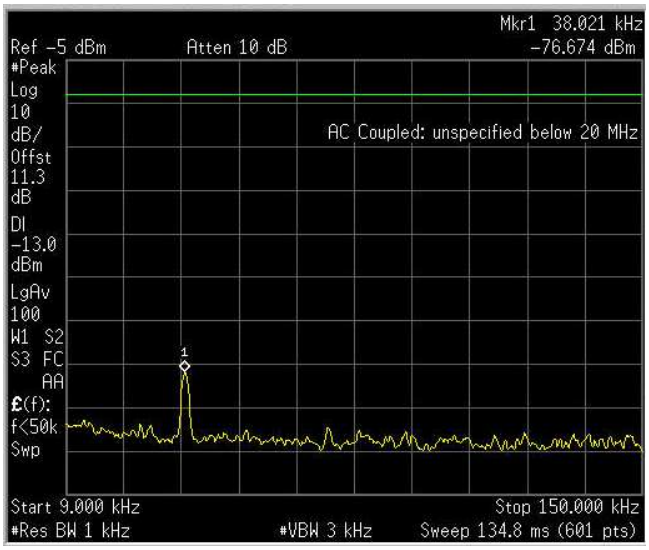


30MHz-1GHz

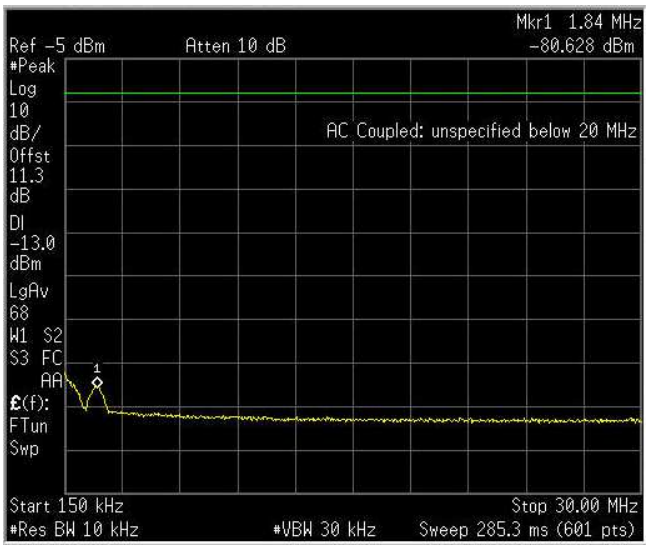


1GHz-20GHz

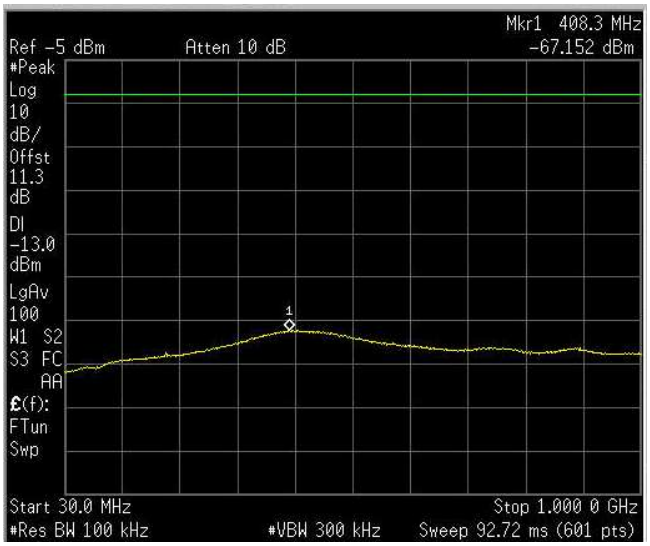
Mod. LTE 1.4MHz (QAM) (Down-link)



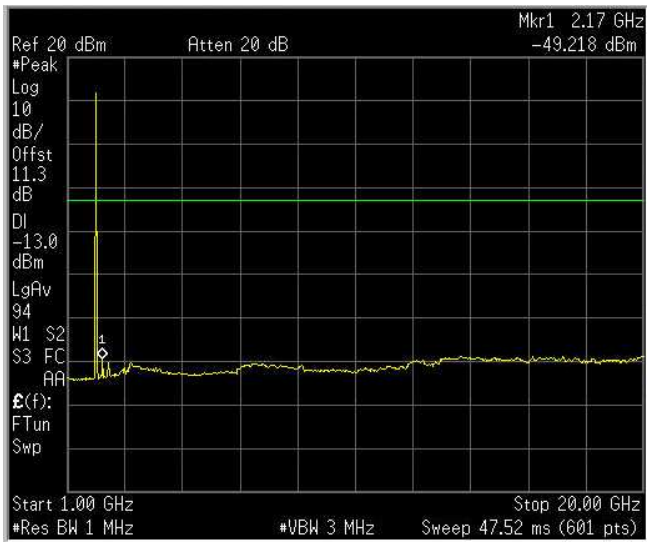
9kHz-150kHz



150kHz-30MHz



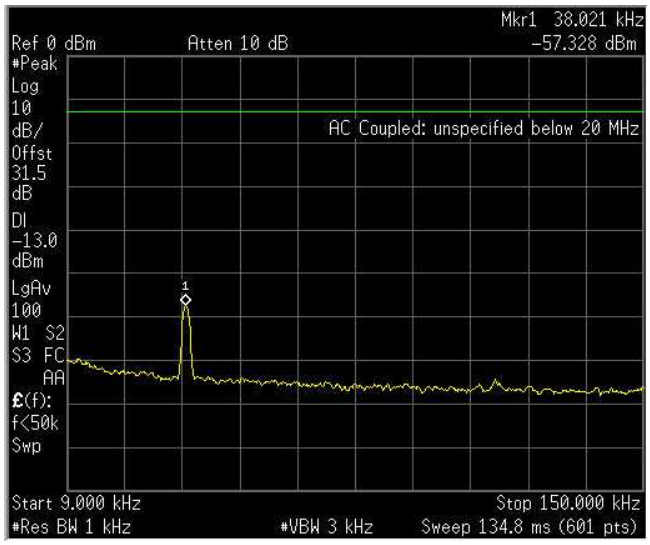
30MHz-1GHz



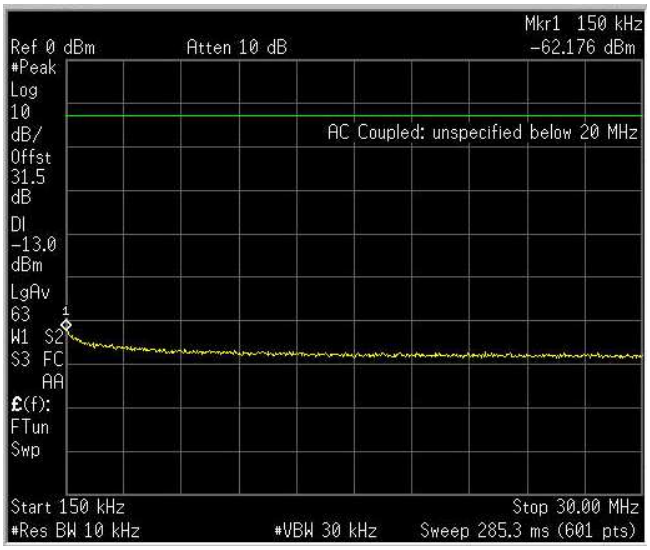
1GHz-20GHz

Only 1,4 QAM (Down-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.

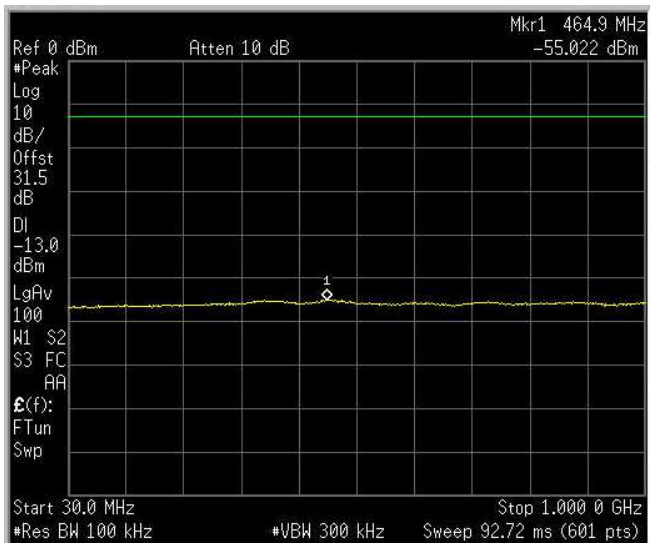
Mod. LTE 1.4MHz (QAM) (Up-link)



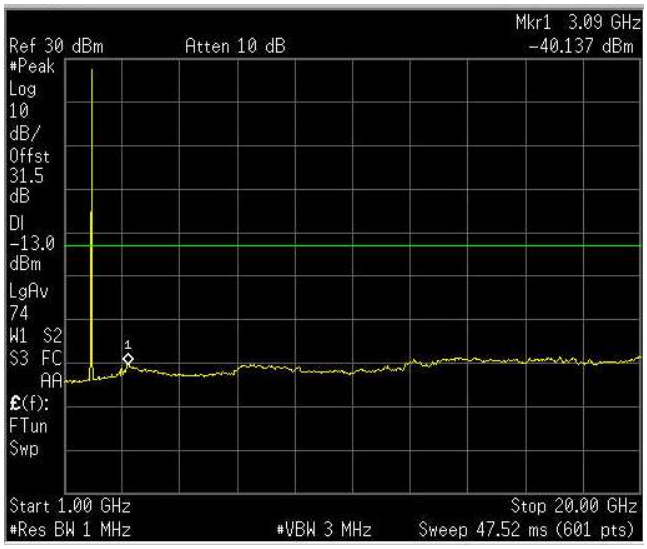
9kHz-150kHz



150kHz-30MHz



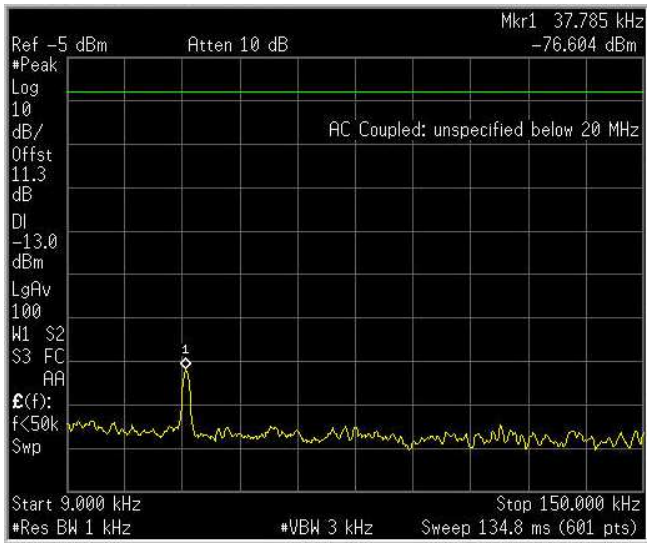
30MHz-1GHz



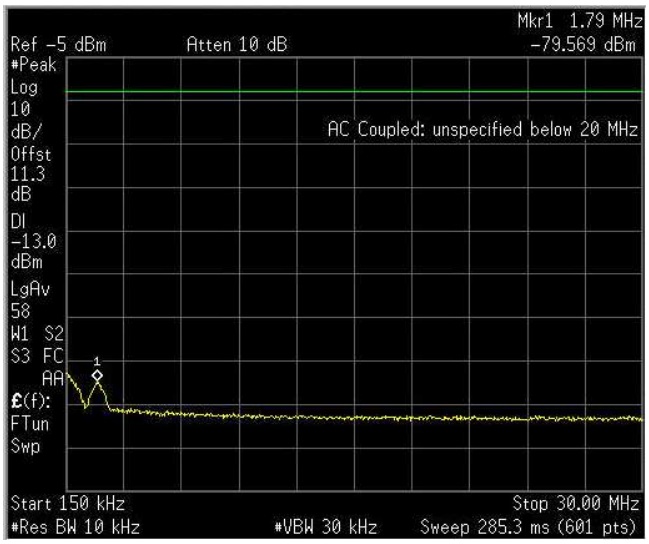
1GHz-20GHz

Only 1,4 QAM (Up-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.

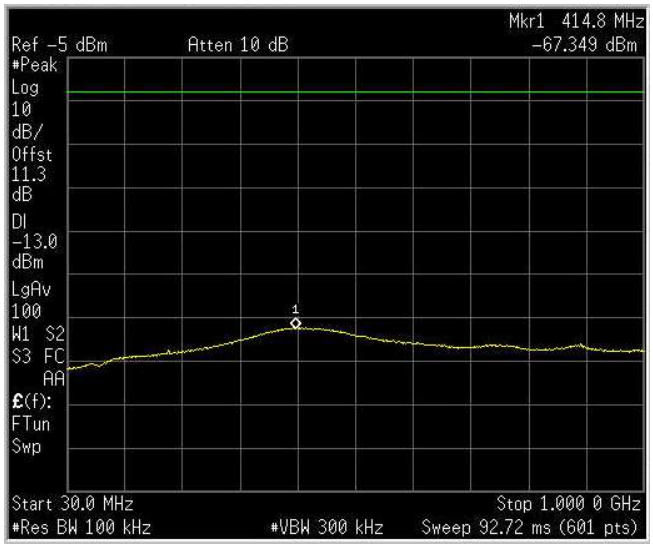
Mod. LTE 1.4MHz (QPSK) (Down-link)



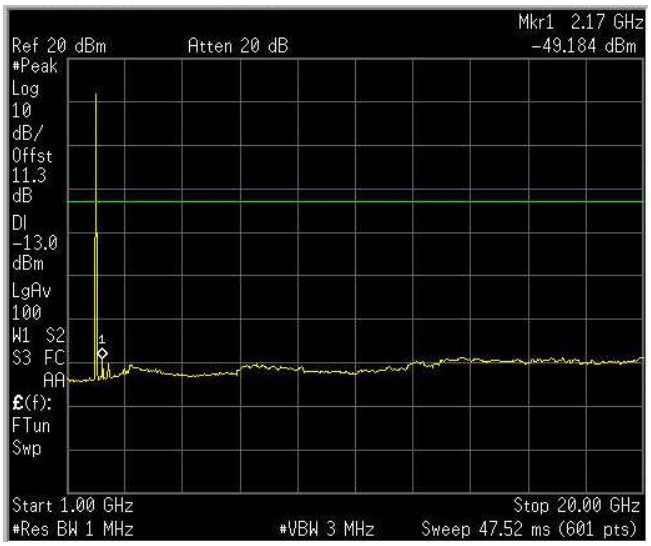
9kHz-150kHz



150kHz-30MHz



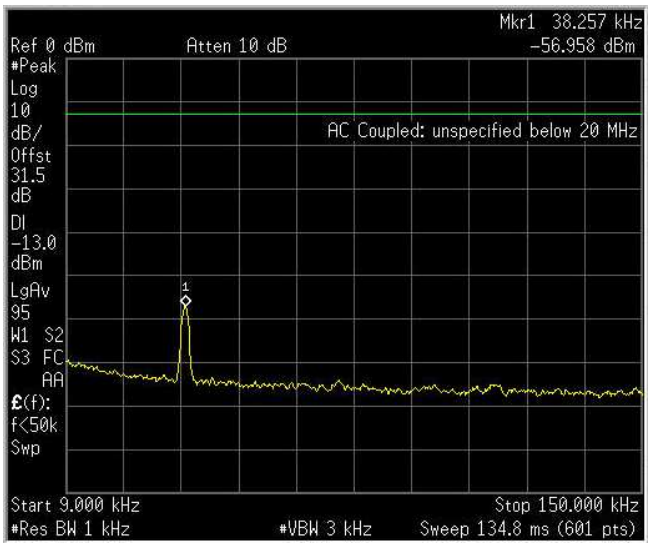
30MHz-1GHz



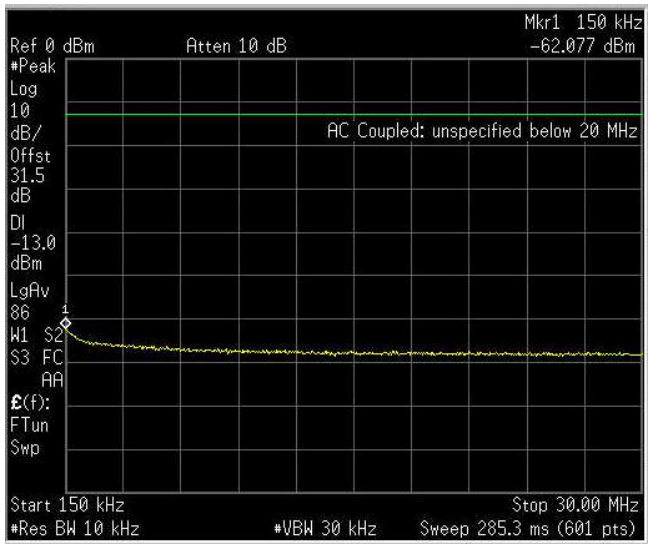
1GHz-20GHz

Only 1,4 QPSK (Down-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.

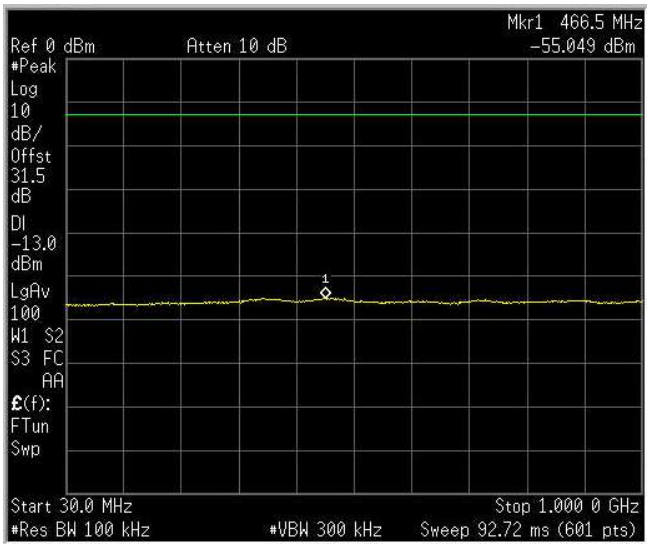
Mod. LTE 1.4MHz (QPSK) (Up-link)



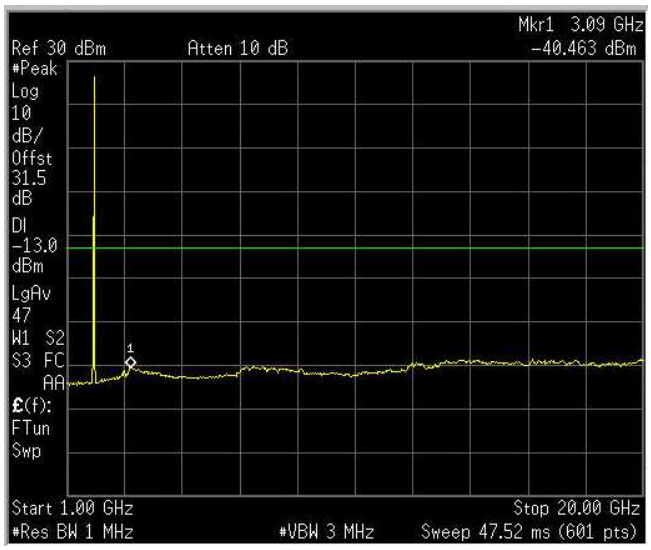
9kHz-150kHz



150kHz-30MHz



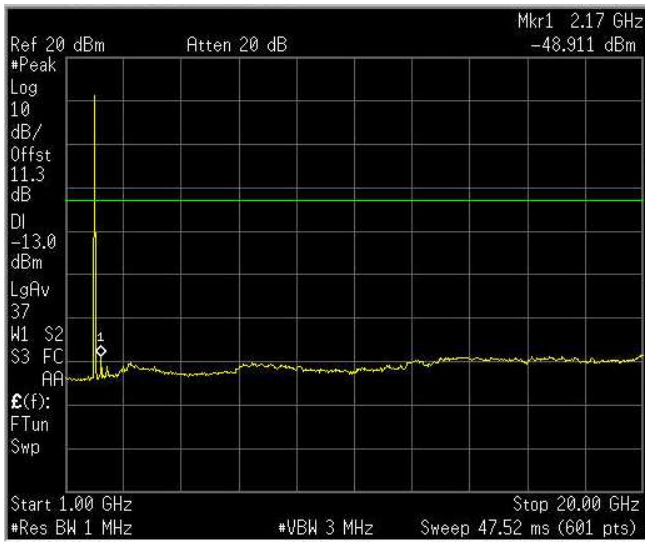
30MHz-1GHz



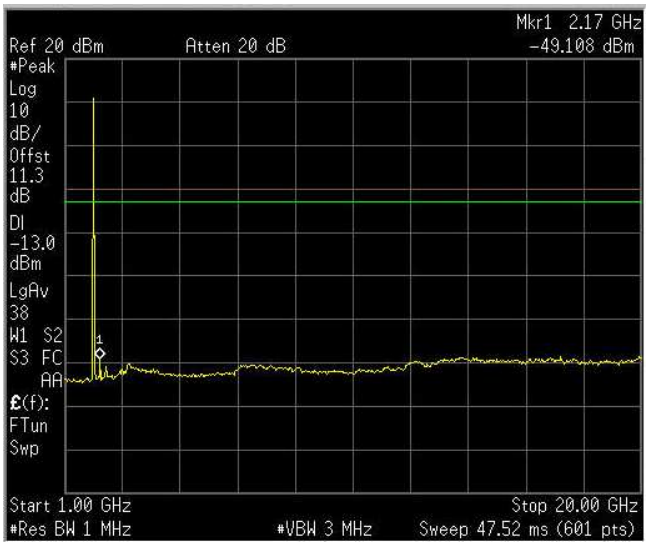
1GHz-20GHz

Only 1,4 QPSK (Up-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.

Mod. LTE 3MHz, only 1G-20G plot (Down-link)

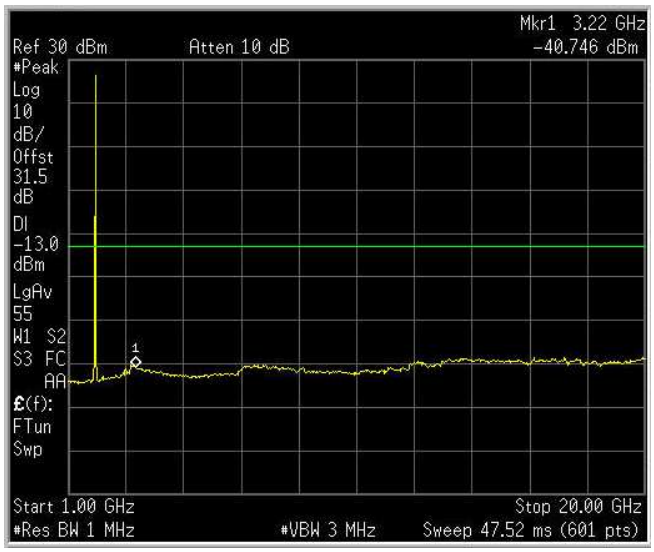


QAM



QPSK

Mod. LTE 3MHz, only 1G-20G plot (Up-link)



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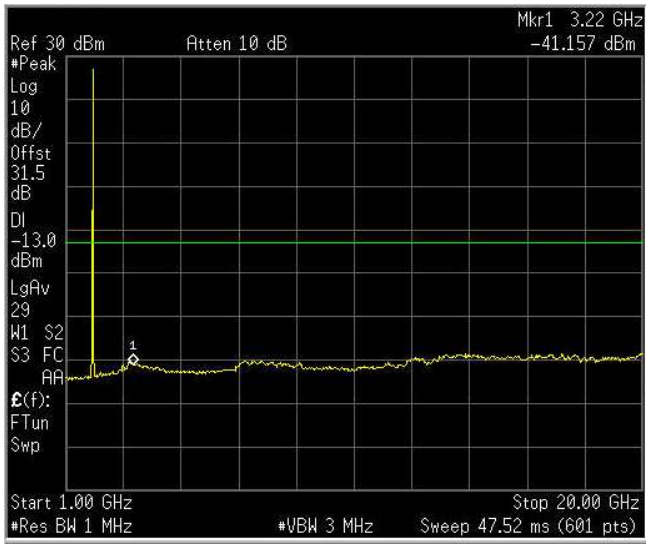
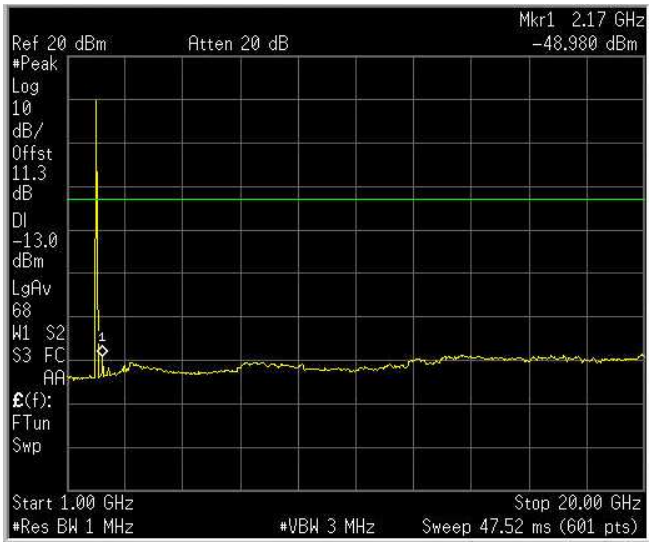


QPSK

Mod. LTE 5MHz, only 1G-20G plot (Down-link)



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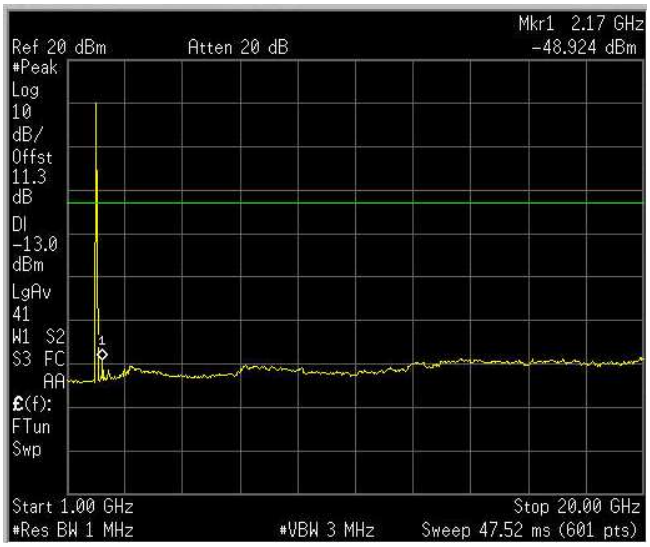
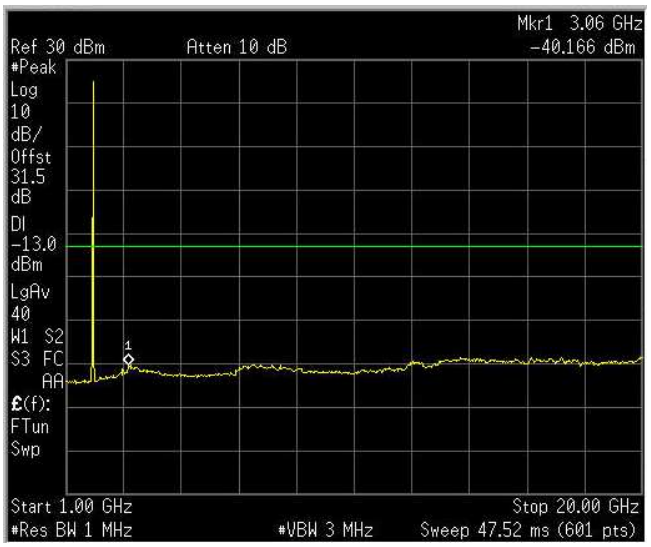


QPSK

Mod. LTE 5MHz, only 1G-20G plot (Up-link)



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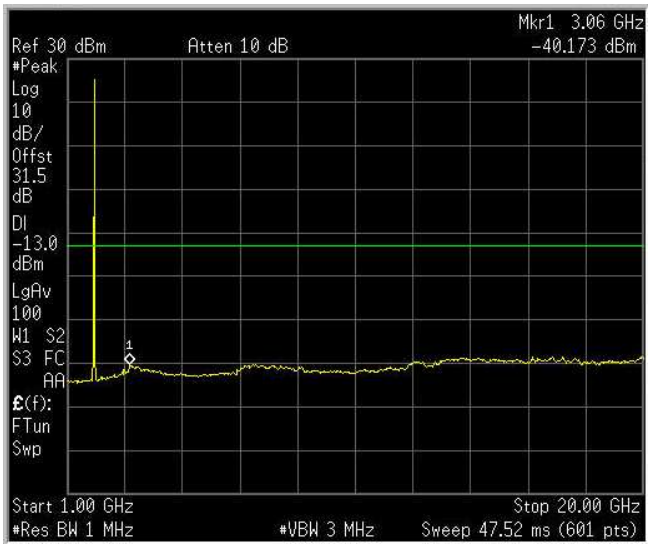
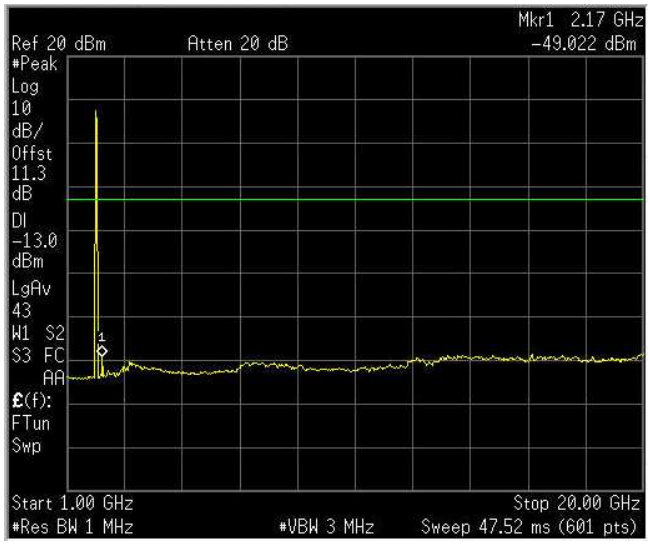


QPSK

Mod. LTE 10MHz, only 1G-20G plot (Down-link)



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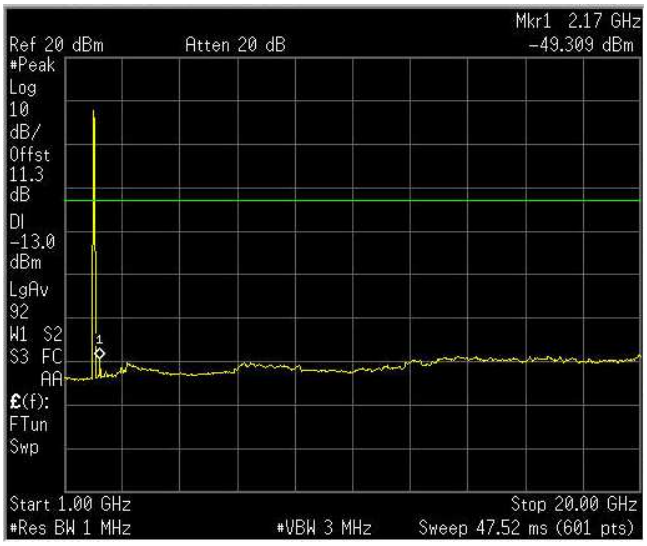
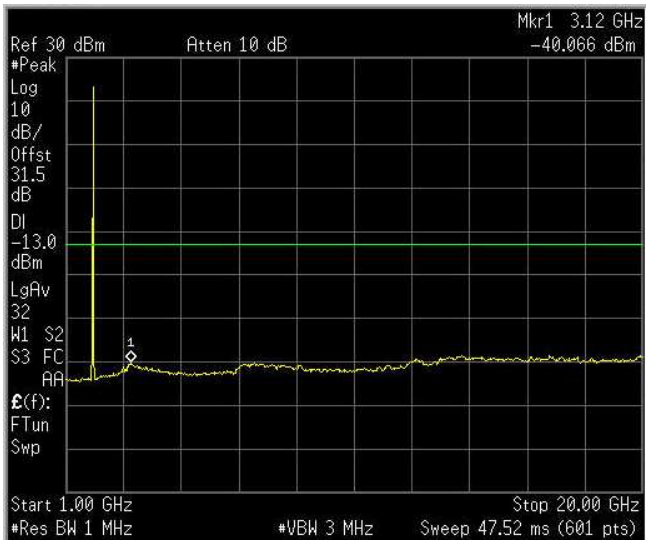


QPSK

Mod. LTE 10MHz, only 1G-20G plot (Up-link)



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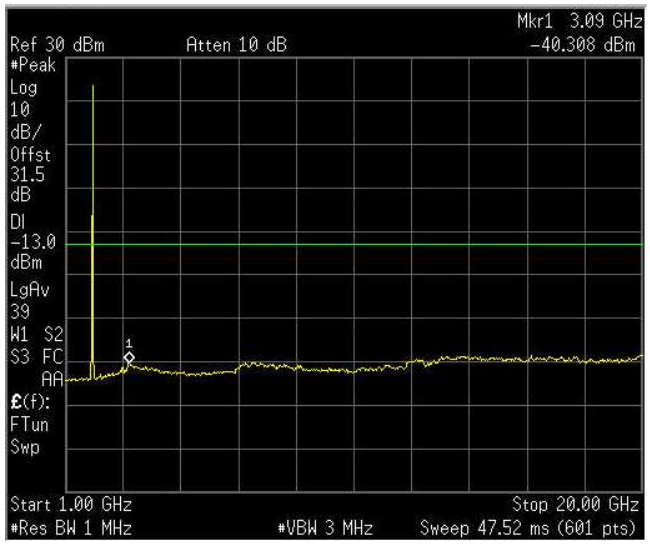
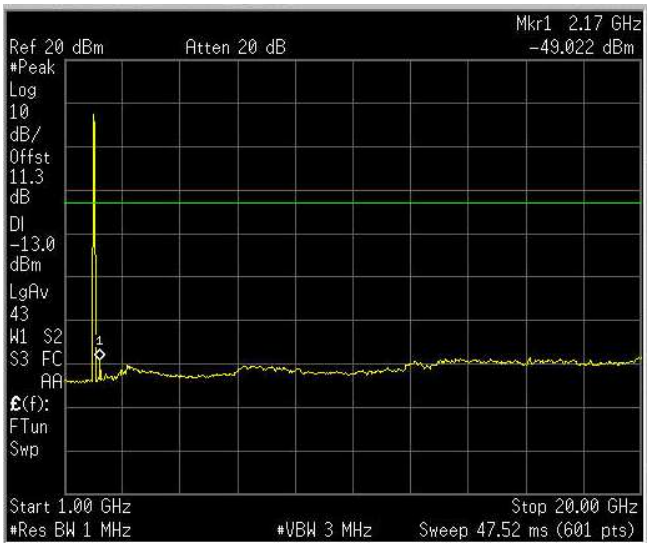


QPSK

Mod. LTE 15MHz, only 1G-20G plot (Down-link)



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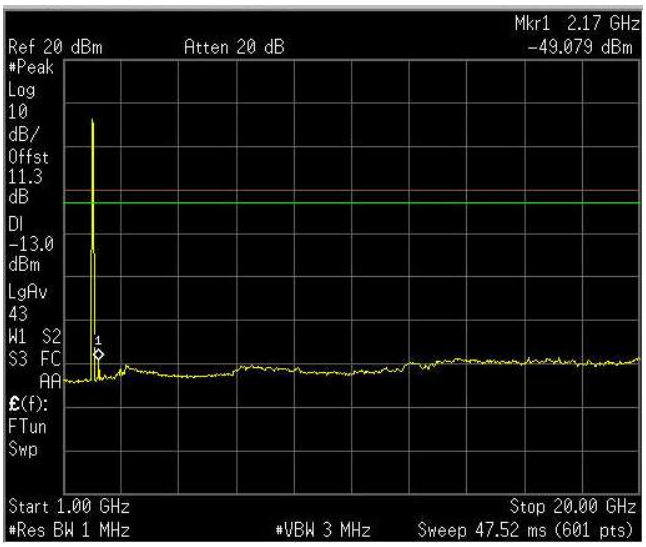

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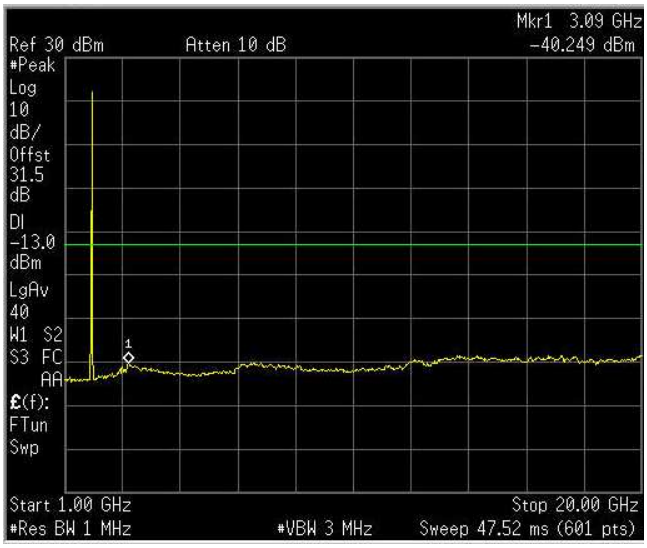

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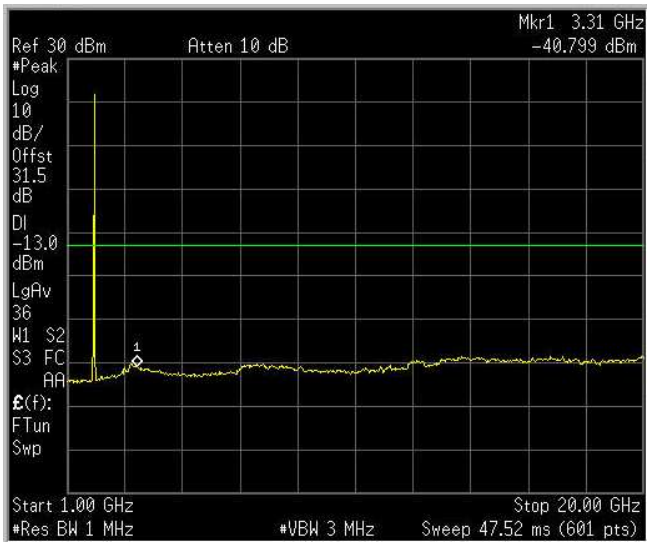
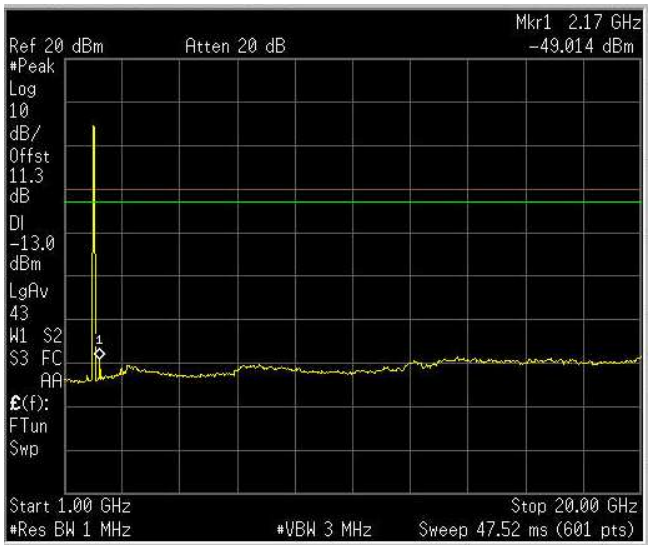


QPSK

Mod. LTE 20MHz, only 1G-20G plot (Down-link)



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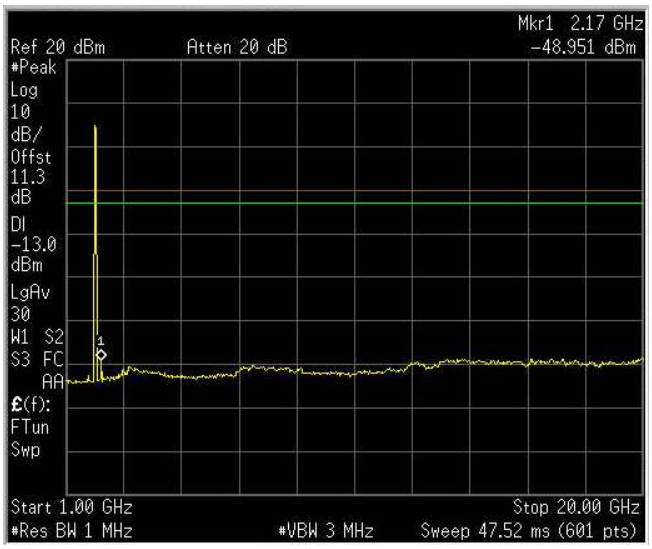

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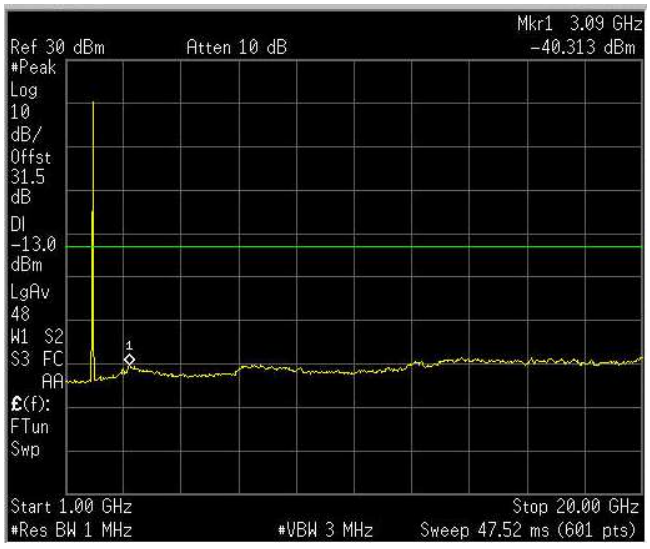

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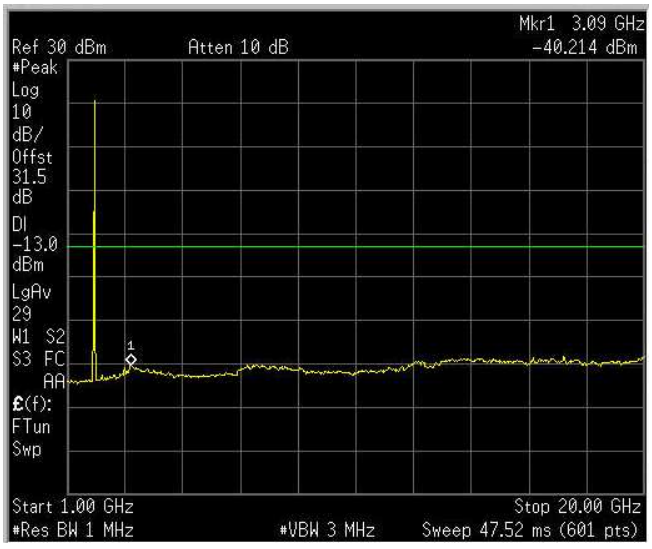


QPSK

Clause 24.238(a) Field strength of spurious radiation

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 Log (P) dB.

Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm	Equivalent field strength limit* at 3 m, dBµV/m
30–10th harmonic	43 + 10 Log(P)	-13	84.4

* - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows:

$E = \sqrt{\frac{30 \times P \times 1.64}{r}}$, where *P* is ERP in W, 1.64 is numeric gain of ideal dipole and *r* is antenna to EUT distance in m.

(b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 1 MHz or 1 percent of emission bandwidth, as specified).

Test date: 2012-06-11

Test results: Pass

Special notes

- The spectrum was searched from 30 MHz up to 10th harmonic
- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- Only the worst data presented in the test report.

The EUT's antenna port was terminated with 50 Ω termination

The D.U.T. was positioned according to the radiated emissions set-up

The D.U.T. antenna connector was terminated by a 50 Ω shielded dummy load.

The spectrum was searched from 30 MHz to 1 GHz (RBW 100 kHz) & 1 GHz (RBW 1 MHz) to the tenth harmonic of the carrier.

There were no emissions detected above the noise floor which was at least 20 dB below the specification limit.

Clause 24.235 Frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Assigned frequency, MHz	Limits
1882.5	26 dBc points including frequency drift shall remain within the authorized frequency block
1962.5	

Test date: 2012-06-11

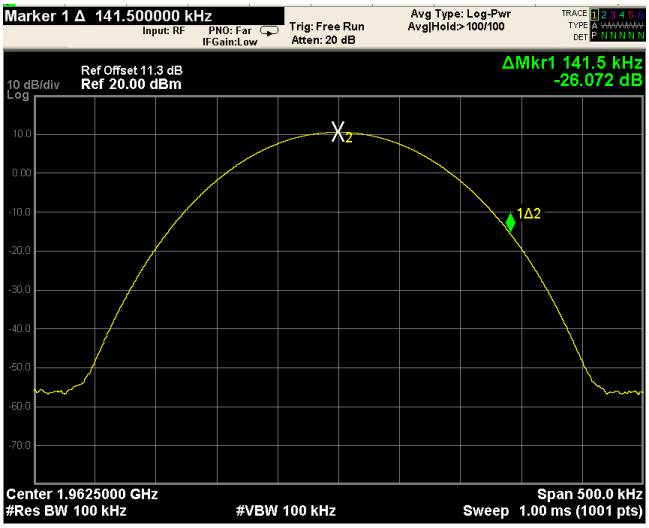
Test results: Pass

Special notes

The resolution bandwidth was set to 100 kHz, video bandwidth was set to 100 kHz

Clause 24.235 Frequency stability, continued

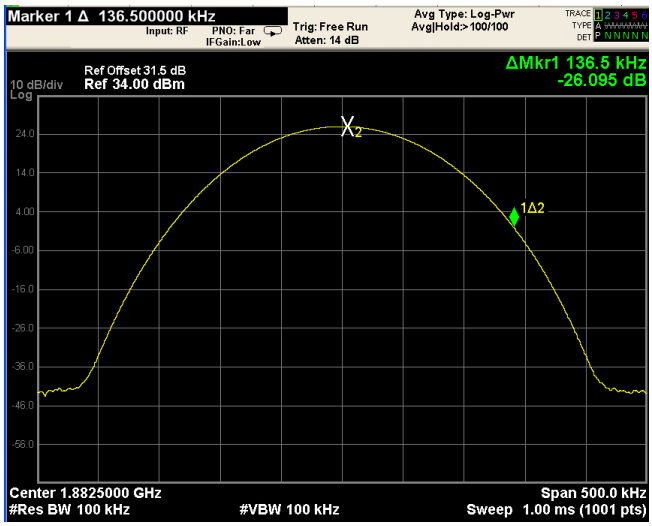
Test data



Down-link

Conditions	Δ Frequency (Hz)	Maximum drift (Hz)
+50 °C, Nominal power	141500	0
+40 °C, Nominal power	141500	0
+30 °C, Nominal power	141500	0
+20 °C, +10% power	141500	0
+20 °C, Nominal power	141500	*Reference*
+20 °C, −10% power	141500	0
+10 °C, Nominal power	141500	0
0 °C, Nominal power	141500	0
−10 °C, Nominal power	141500	0
−20 °C, Nominal power	EUT doesn't work	

Test data



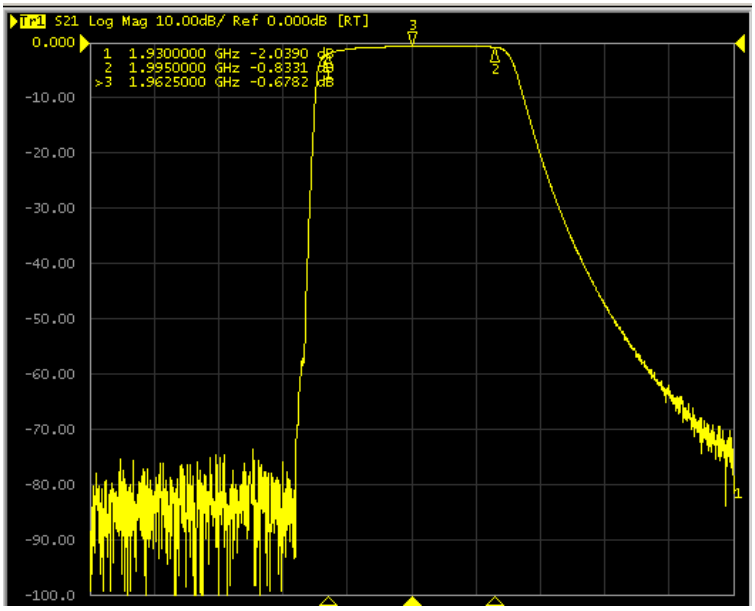
Up-link

Conditions	Δ Frequency (Hz)	Maximum drift (Hz)
+50 °C, Nominal power	136500	0
+40 °C, Nominal power	136500	0
+30 °C, Nominal power	136500	0
+20 °C, +10% power	136500	0
+20 °C, Nominal power	136500	*Reference*
+20 °C, −10% power	136500	0
+10 °C, Nominal power	136500	0
0 °C, Nominal power	136500	0
−10 °C, Nominal power	136500	0
−20 °C, Nominal power	EUT doesn't work	

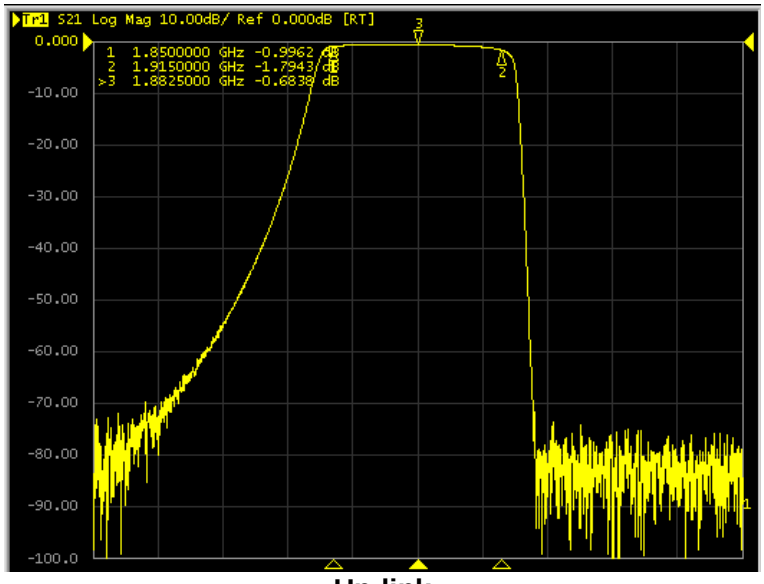
Clause Para NO. 2-11-04/EAB/RF Filter Frequency Response

Test date: 2012-06-11

Test results: Pass

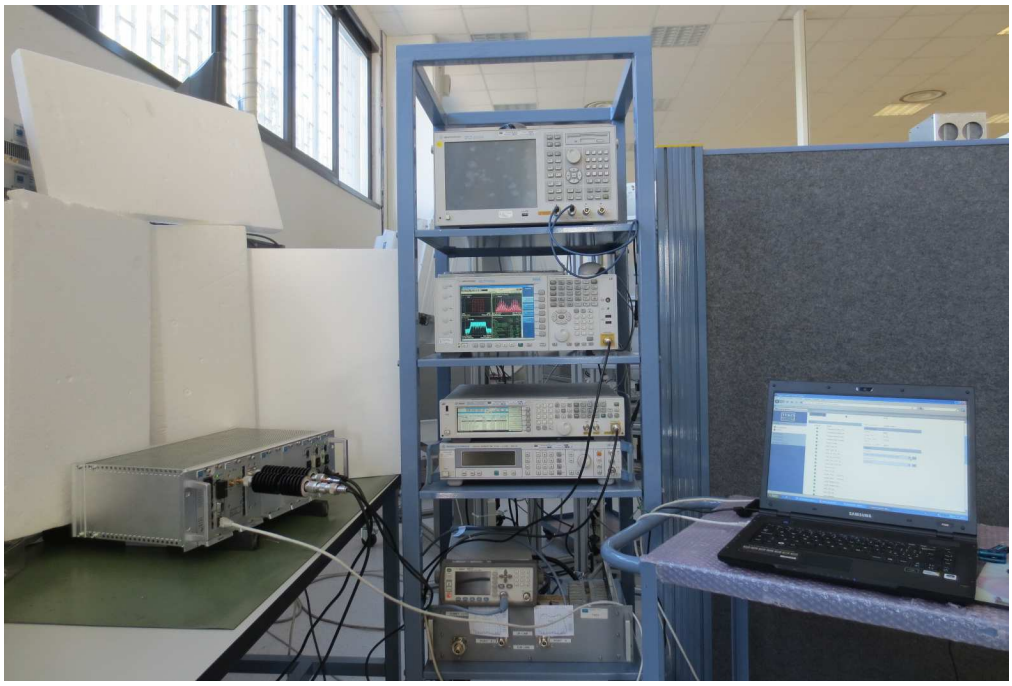


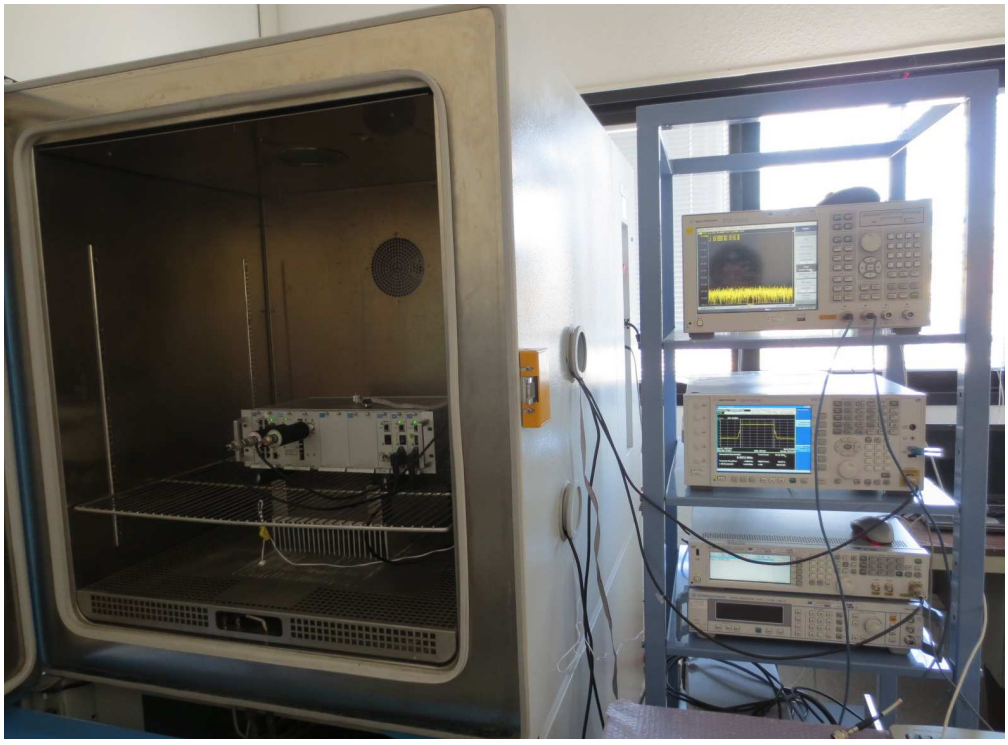
Down-link

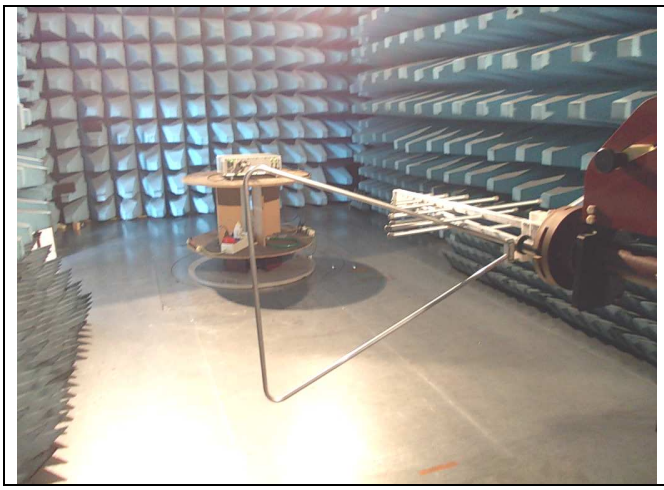


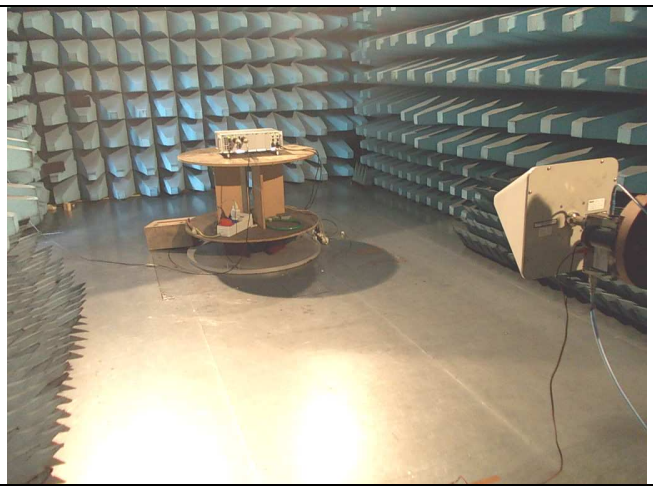
Up-link

Photo Set up









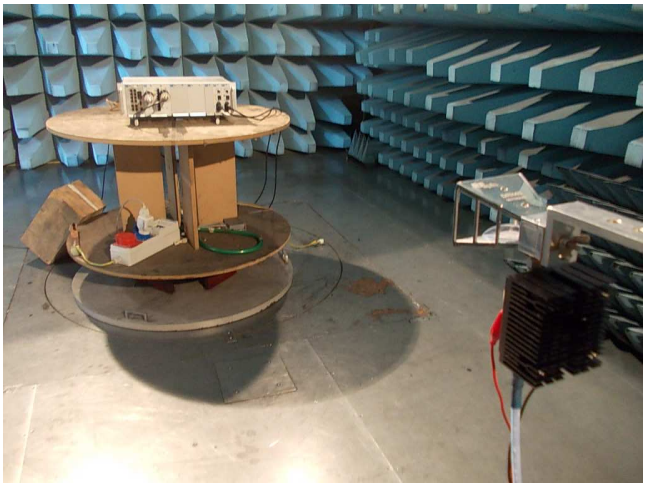


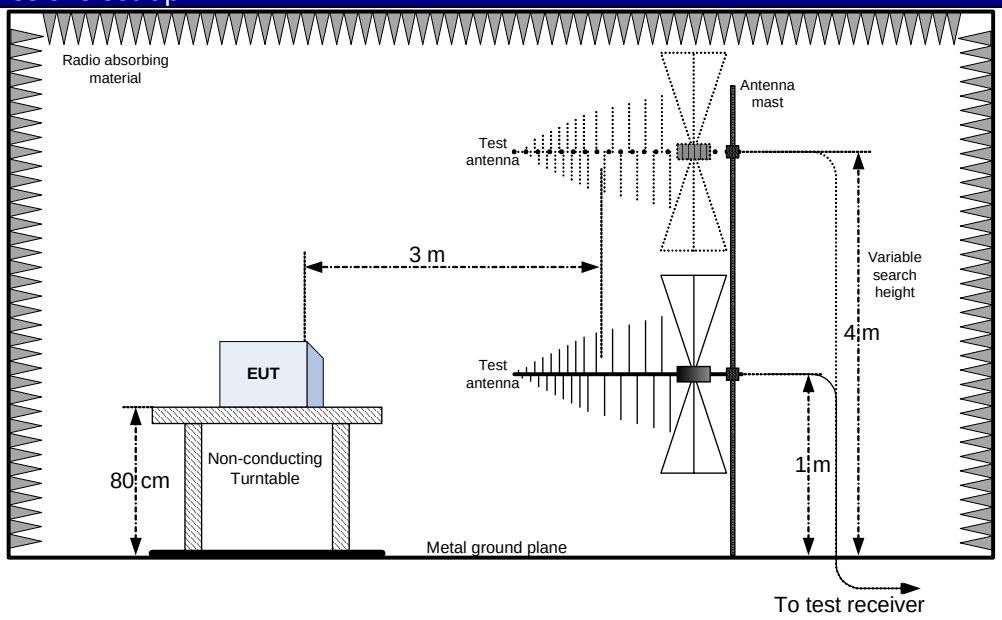
Photo EUT


TSPV-R
TDFE-7SL
TPSUAC


Nemko

Appendix B: Block diagrams of test set-ups

Radiated emissions set-up



Substitution method set-up