



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

Report number: **156523-6TRFWL**

Specification: FCC 24 Subpart E

## ***PART 2***



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

Appendix B: Block diagrams

Report Number: **156523-6TRFWL**

Specification: FCC 24 Subpart E

## Clause 24.238(a) Spurious emissions at antenna terminal

(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  $43 + 10 \text{ Log}(P)$  dB.

Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm
30–10 <sup>th</sup> harmonic	$43 + 10 \text{ Log}(P)$	-13

(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: [2010-09-23](#)

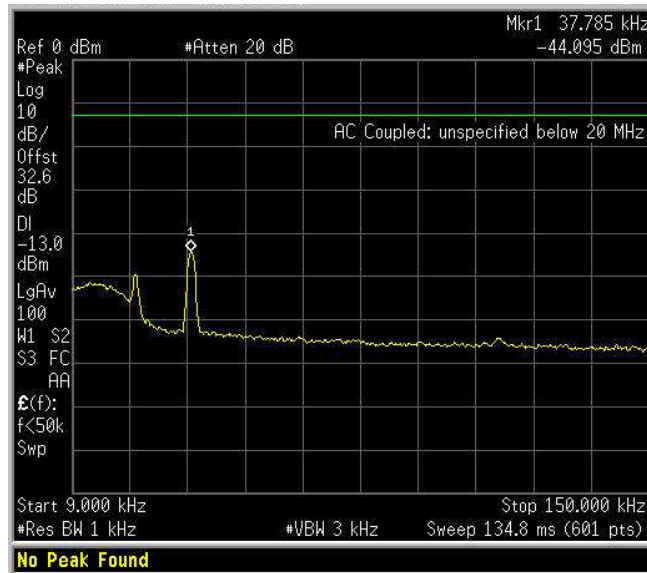
Test results: [Pass](#)

### Special notes

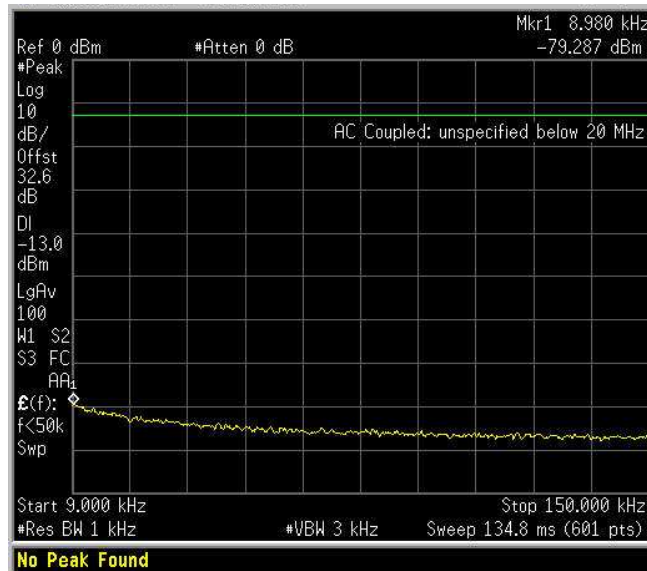
- The spectrum was searched from 30 MHz up to 10<sup>th</sup> harmonic
- Only the worst data presented in the test report.

**Clause 24.238 Out of band spurious emissions at antenna terminal,**

Downlink – 30 kHz TDMA  
9 kHz – 150 kHz



Uplink – 30 kHz TDMA  
9 kHz – 150 kHz

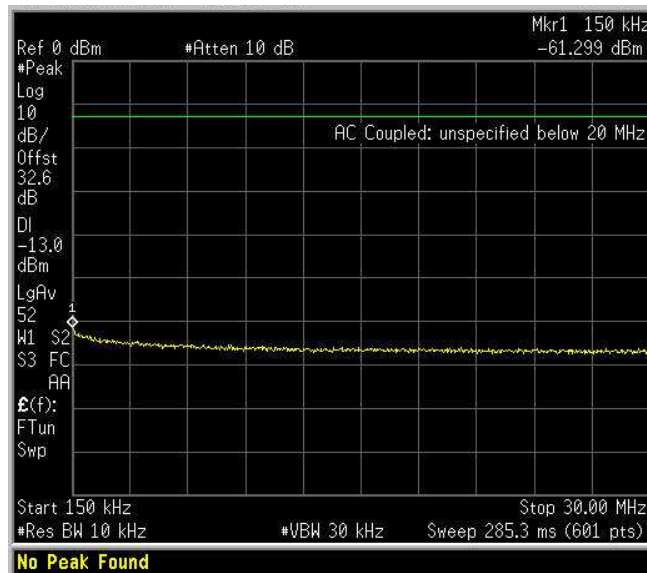




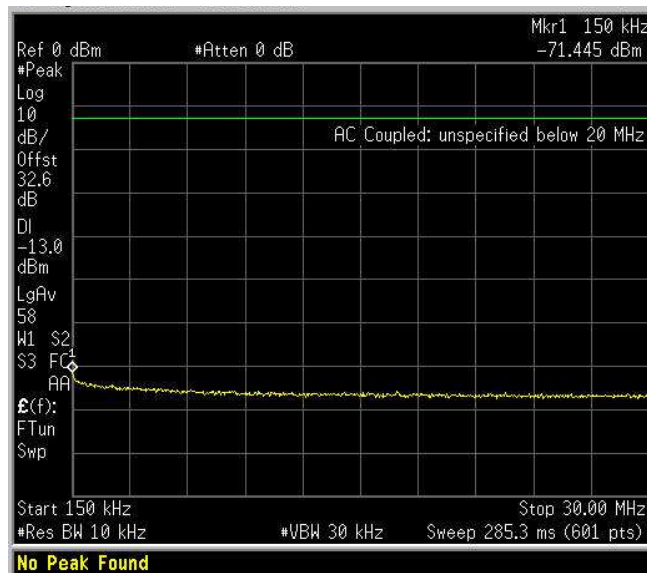
Nemko Italy S.p.A.  
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Test data continued

Spurious Emissions at Antenna Terminals  
Downlink – 30 kHz TDMA  
150 kHz – 30MHz



Spurious Emissions at Antenna Terminals  
Uplink – 30 kHz TDMA  
150 kHz – 30MHz





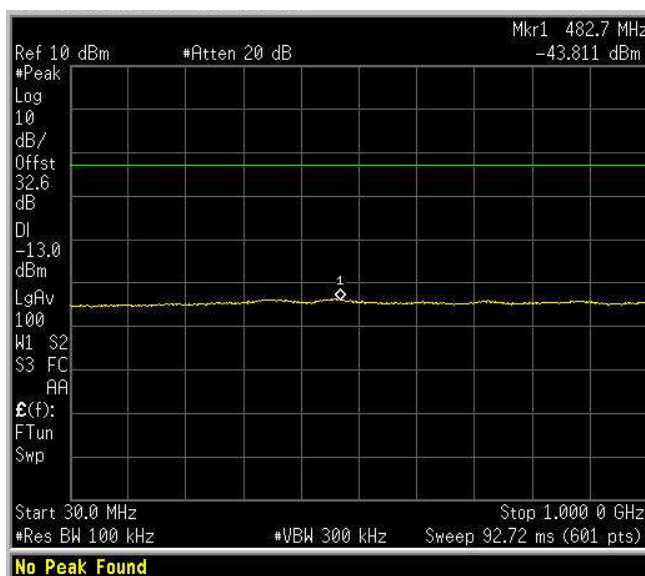
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 30 kHz TDMA

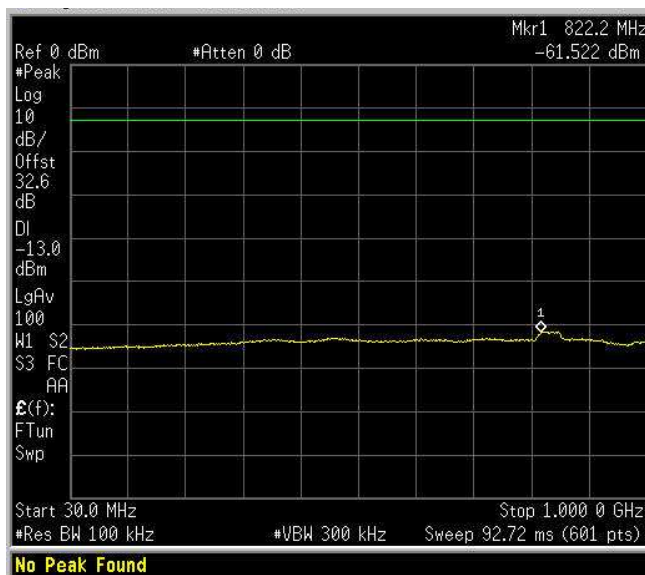
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Uplink – 30 kHz TDMA

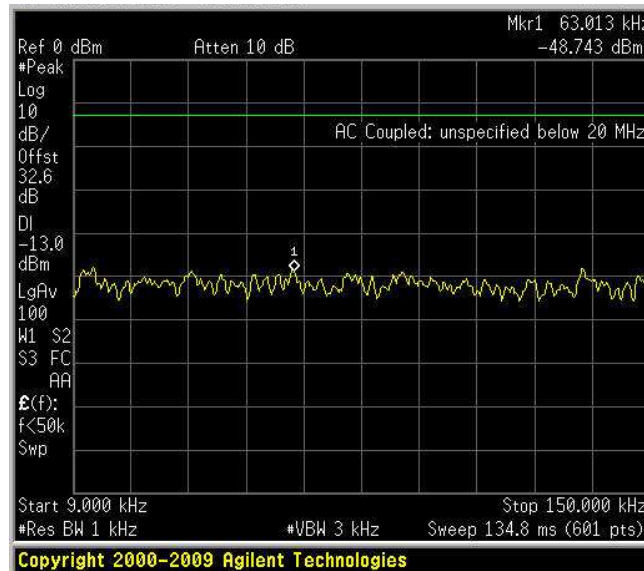
30MHz – 1 GHz



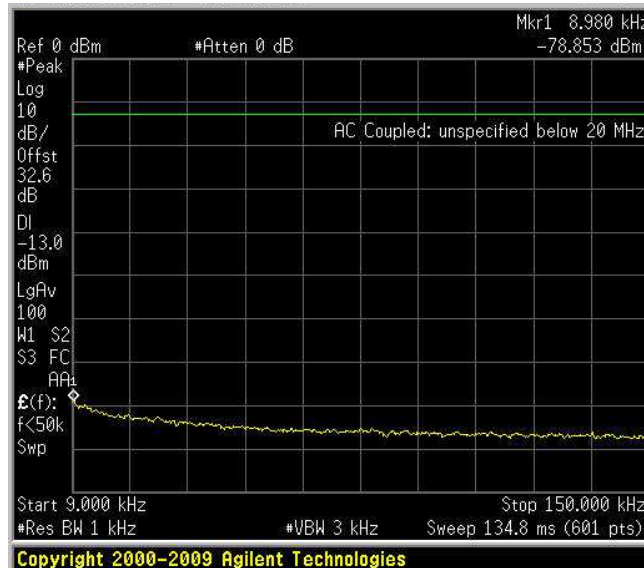


Clause 24.238 Out of band spurious emissions at antenna terminal,

Downlink – 1,4 QAM  
9 kHz – 150 kHz



Uplink – 1,4 QAM  
9 kHz – 150 kHz



Only 1,4 QAM 9kHz-150kHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.



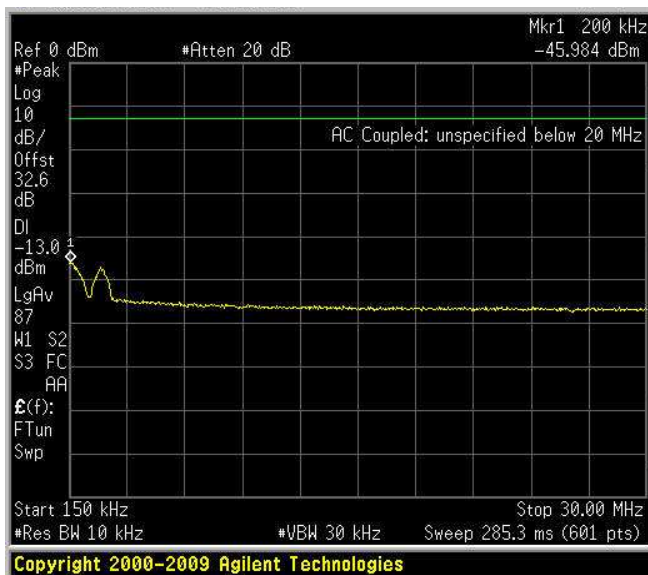
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Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 1,4 QAM

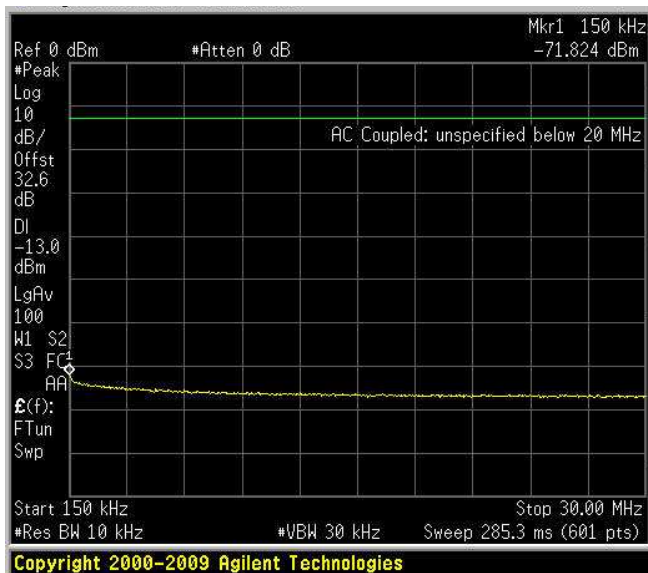
150 kHz – 30MHz



Spurious Emissions at Antenna Terminals

Uplink – 1,4 QAM

150 kHz – 30MHz



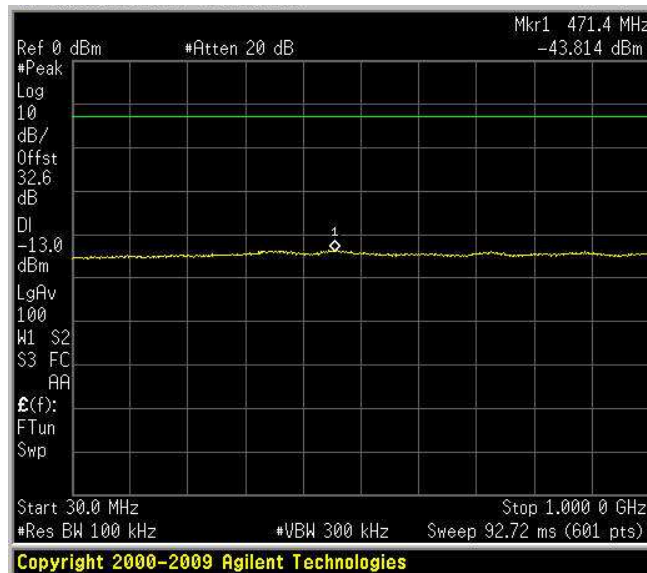
Only 1,4 QAM 150kHz-30MHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.



**Test data continued**
**Spurious Emissions at Antenna Terminals**

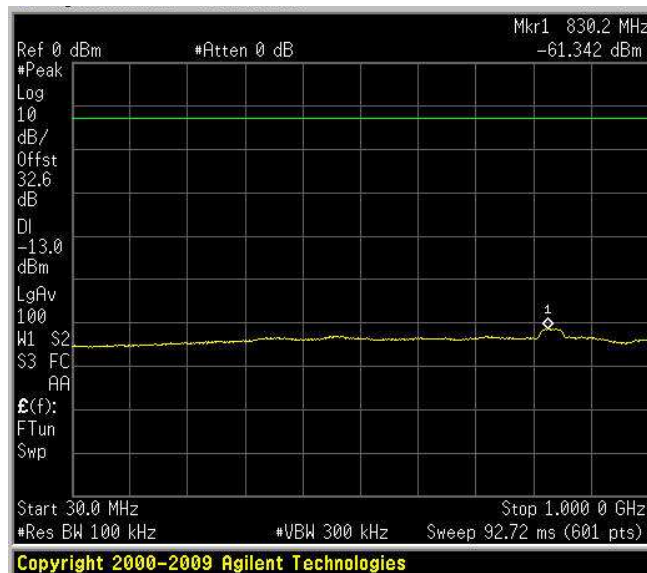
Downlink – 1,4 QAM

30MHz – 1 GHz


**Spurious Emissions at Antenna Terminals**

Uplink – 1,4 QAM

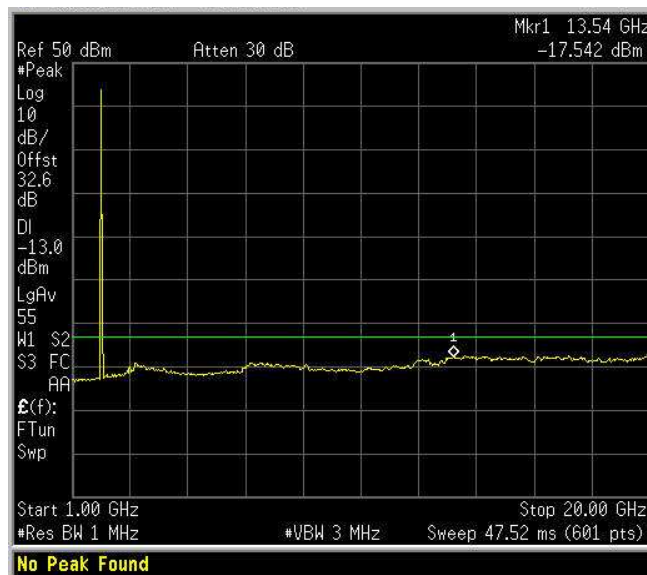
30MHz – 1 GHz



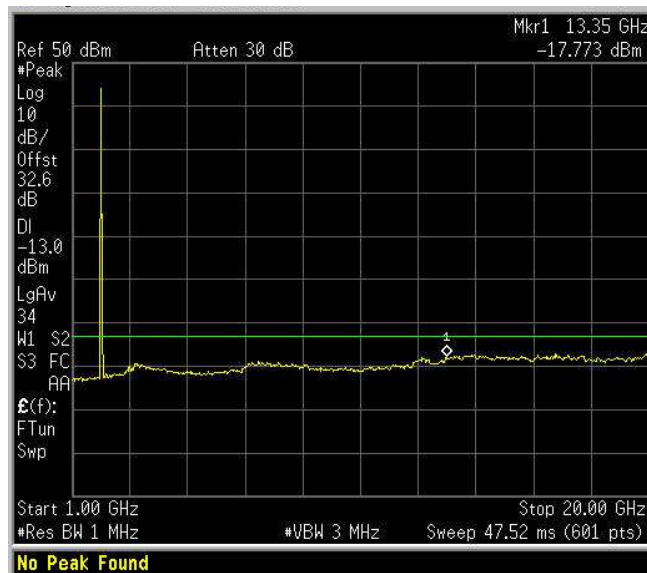
**Only 1,4 QAM 30MHz – 1GHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.**

**Test data continued**

Spurious Emissions at Antenna Terminals  
 Downlink – 1,4 QAM  
 1-20 GHz



Spurious Emissions at Antenna Terminals  
 Downlink – 1,4 QPSK  
 1-20 GHz





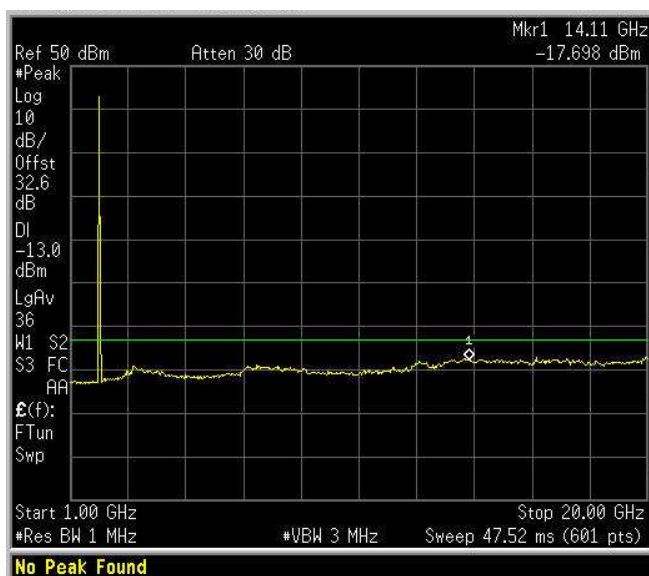
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 3 QAM

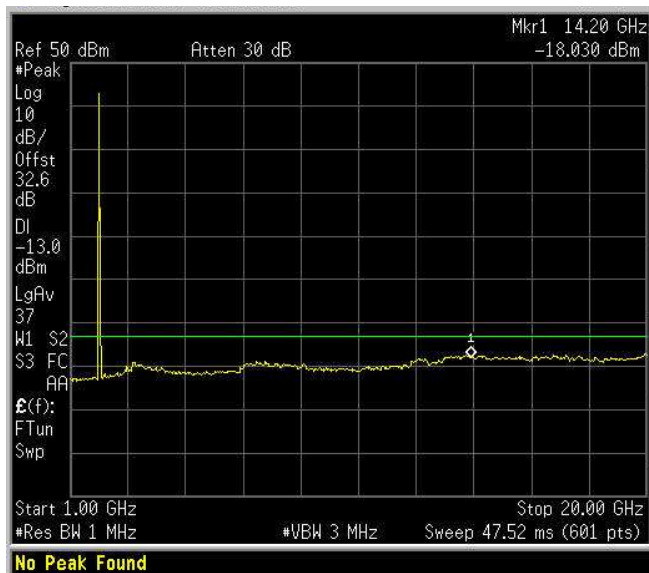
1-20 GHz



Spurious Emissions at Antenna Terminals

Downlink – 3 QPSK

1-20 GHz





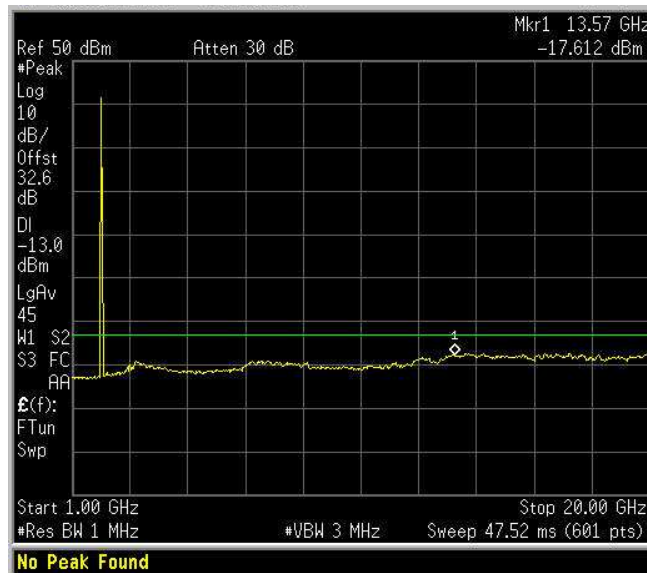
Nemko Italy S.p.A.  
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Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 5 QAM

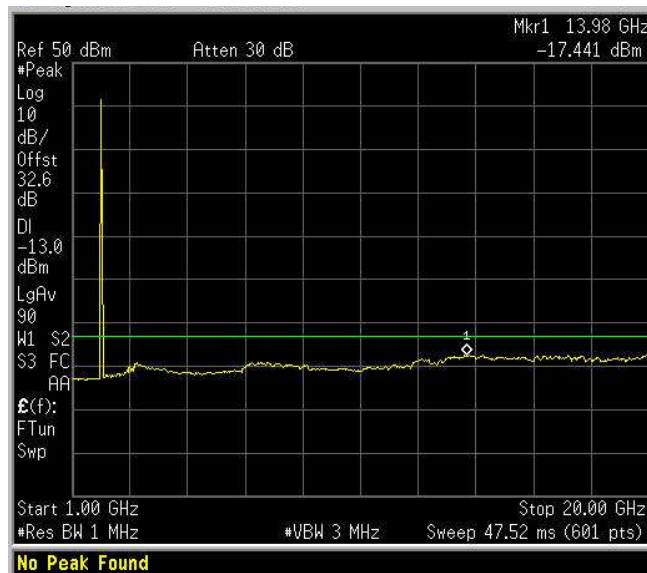
1-20 GHz



Spurious Emissions at Antenna Terminals

Downlink – 5 QPSK

1-20 GHz

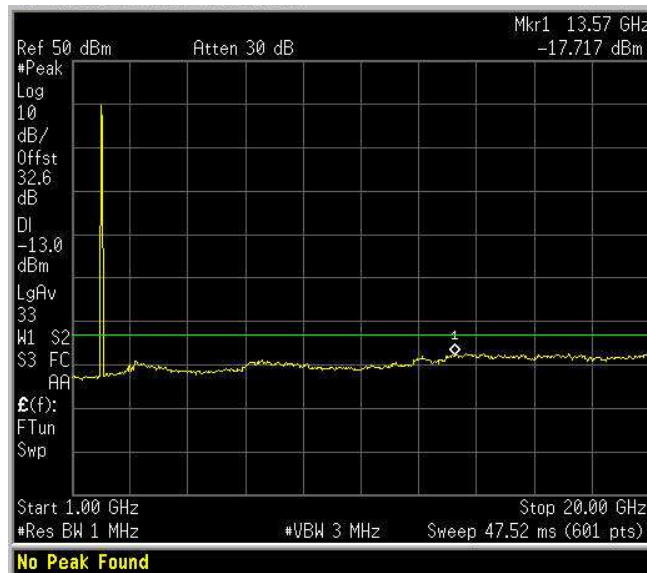




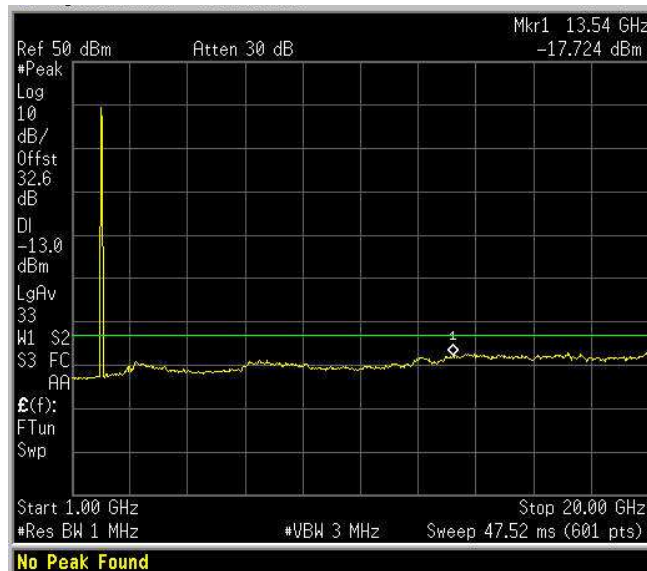
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Test data continued

Spurious Emissions at Antenna Terminals  
Downlink – 10 QAM  
1-20 GHz



Spurious Emissions at Antenna Terminals  
Downlink – 10 QPSK  
1-20 GHz

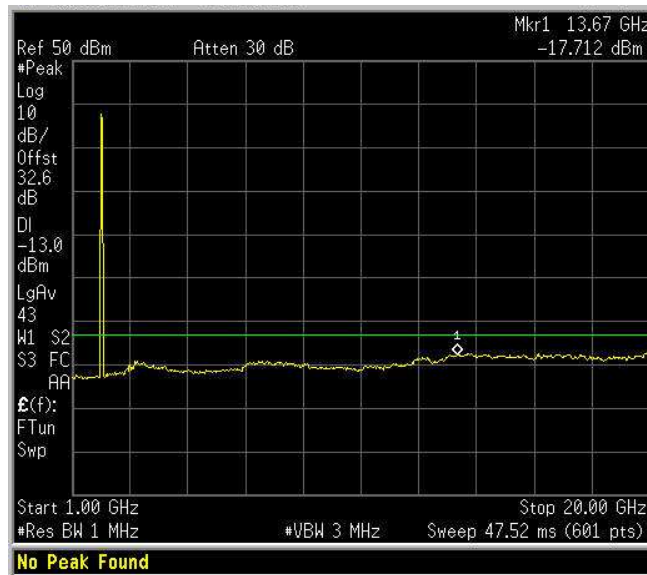




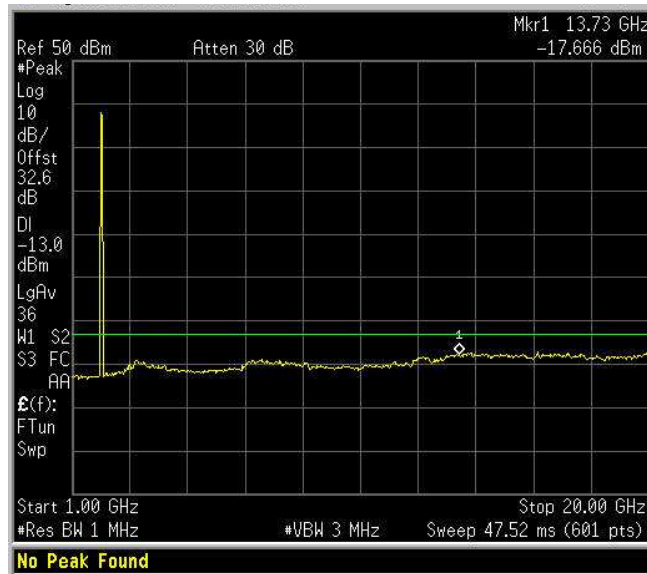
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Test data continued

Spurious Emissions at Antenna Terminals  
Downlink – 15 QAM  
1-20 GHz

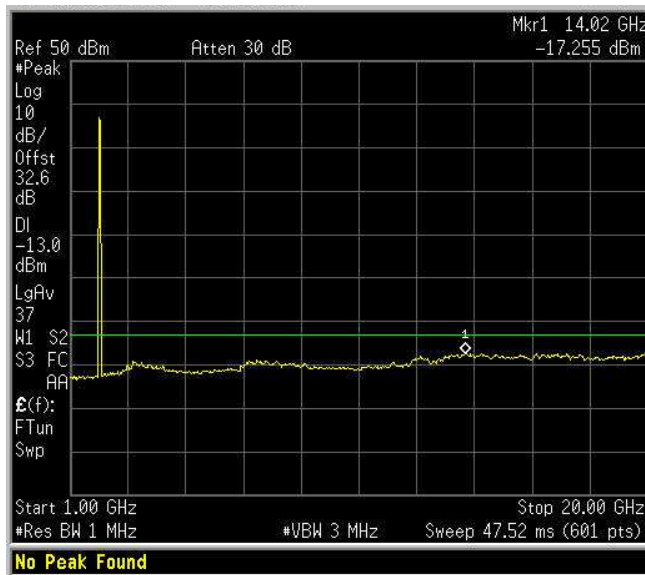


Spurious Emissions at Antenna Terminals  
Downlink – 15 QPSK  
1-20 GHz

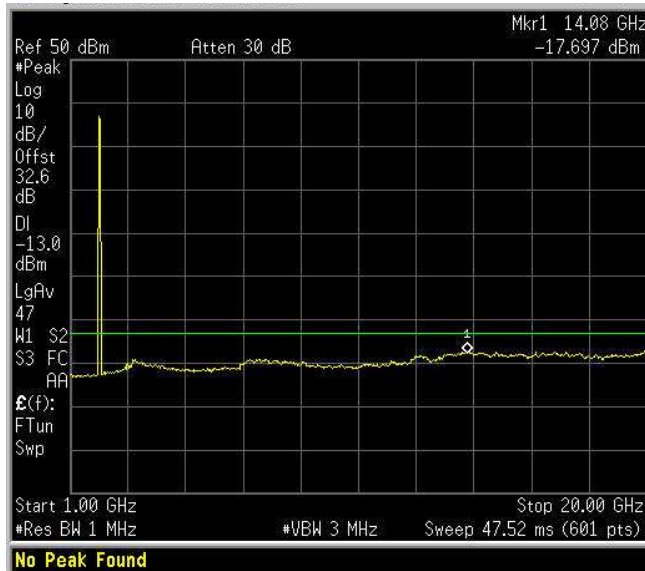


**Test data continued**

Spurious Emissions at Antenna Terminals  
Downlink – 20 QAM  
1-20 GHz



Spurious Emissions at Antenna Terminals  
Downlink – 20 QPSK  
1-20 GHz

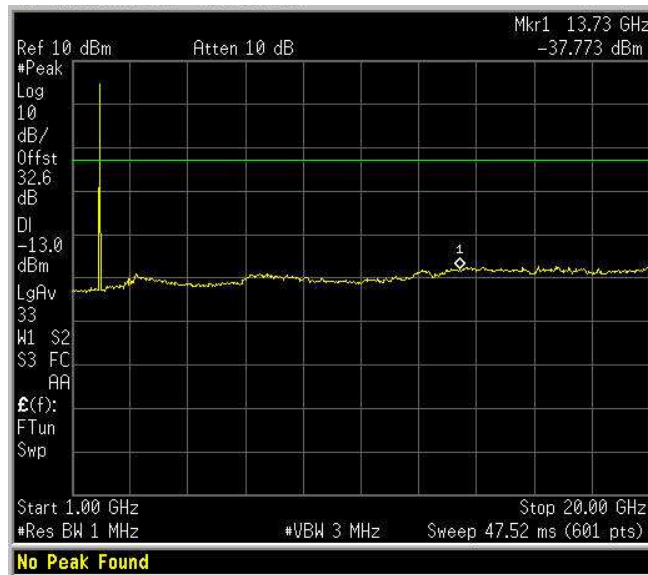


**Test data continued**

## Spurious Emissions at Antenna Terminals

Uplink – 1,4 QAM

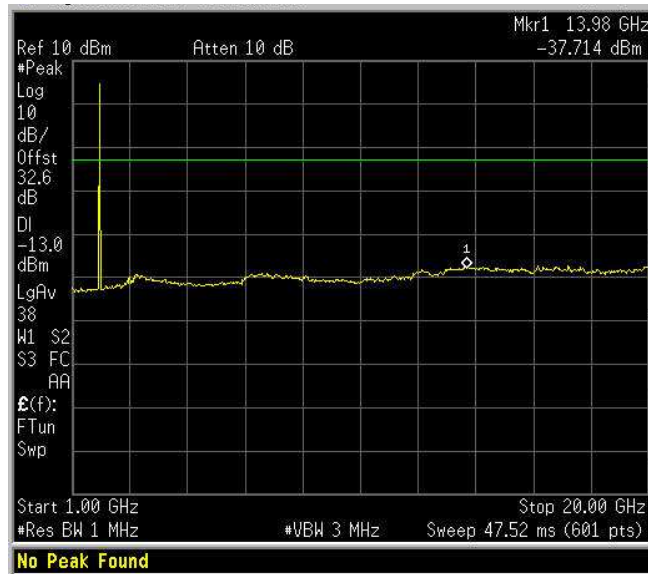
1-20 GHz



## Spurious Emissions at Antenna Terminals

Uplink – 1,4 QPSK

1-20 GHz



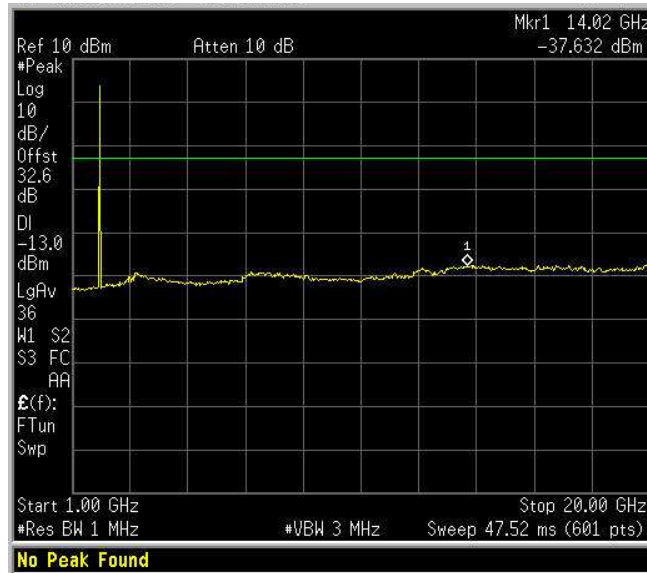




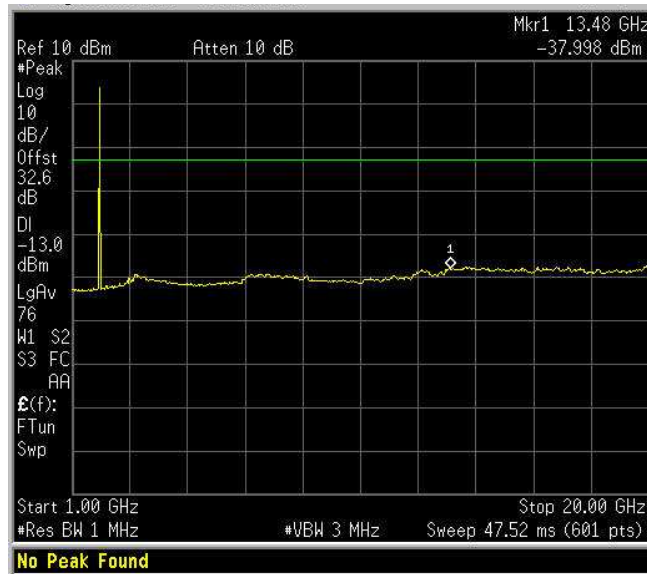
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Test data continued

Spurious Emissions at Antenna Terminals  
Uplink – 3 QAM  
1-20 GHz



Spurious Emissions at Antenna Terminals  
Uplink – 3 QPSK  
1-20 GHz





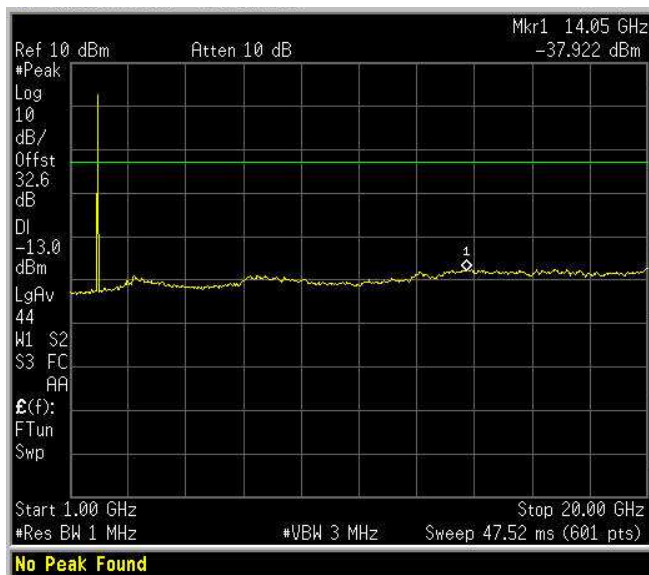
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data continued

Spurious Emissions at Antenna Terminals

Uplink – 5 QAM

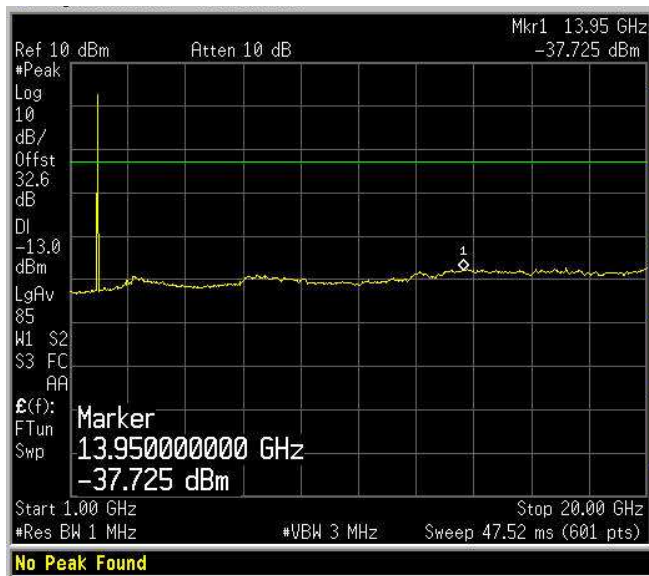
1-20 GHz



Spurious Emissions at Antenna Terminals

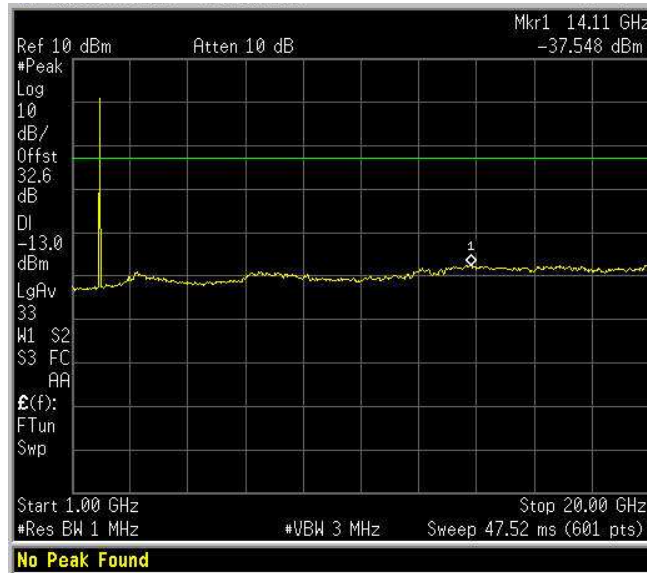
Uplink – 5 QPSK

1-20 GHz

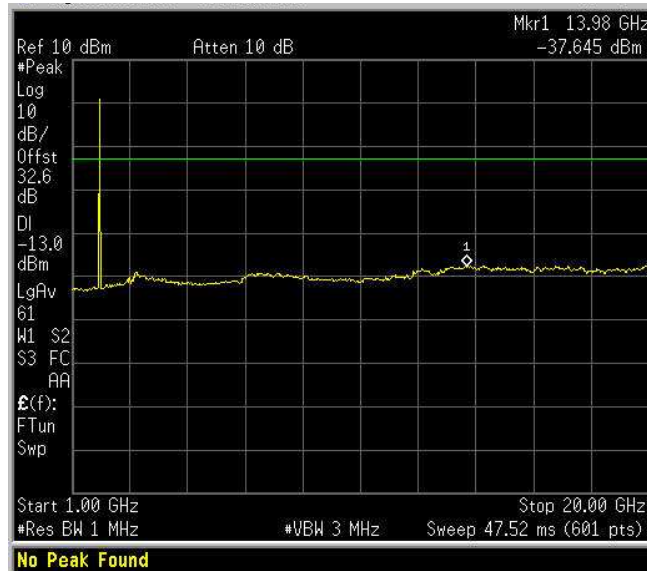


Test data continued

Spurious Emissions at Antenna Terminals  
Uplink – 10 QAM  
1-20 GHz



Spurious Emissions at Antenna Terminals  
Uplink – 10 QPSK  
1-20 GHz





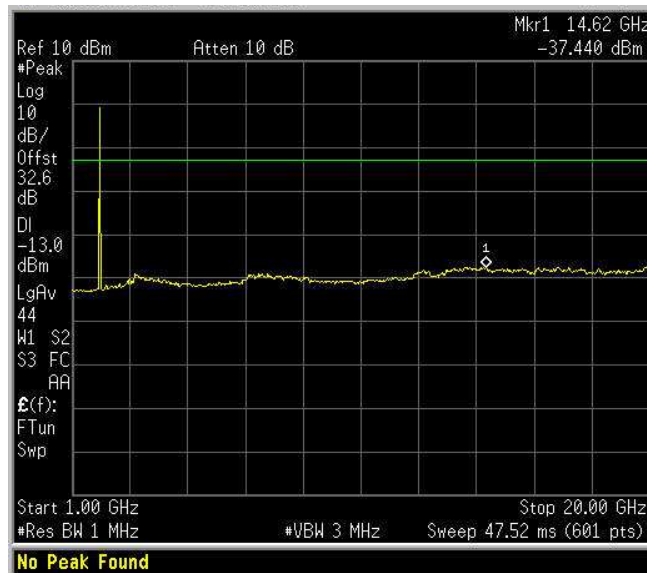
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Test data continued

Spurious Emissions at Antenna Terminals

Uplink – 15 QAM

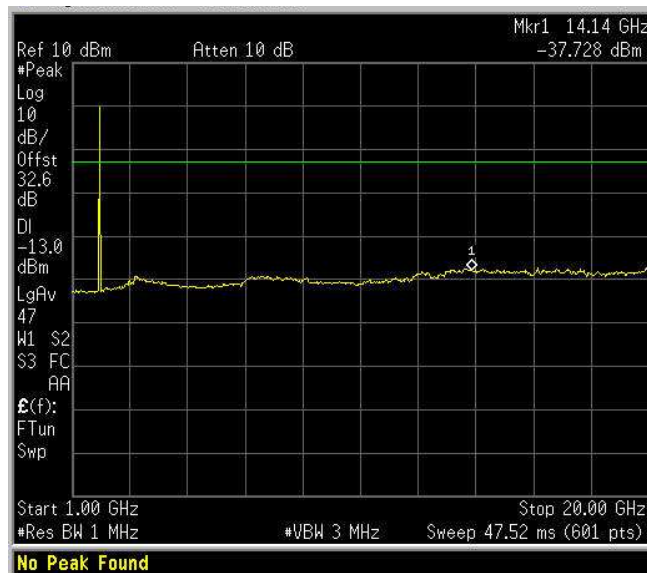
1-20 GHz



Spurious Emissions at Antenna Terminals

Uplink – 15 QPSK

1-20 GHz





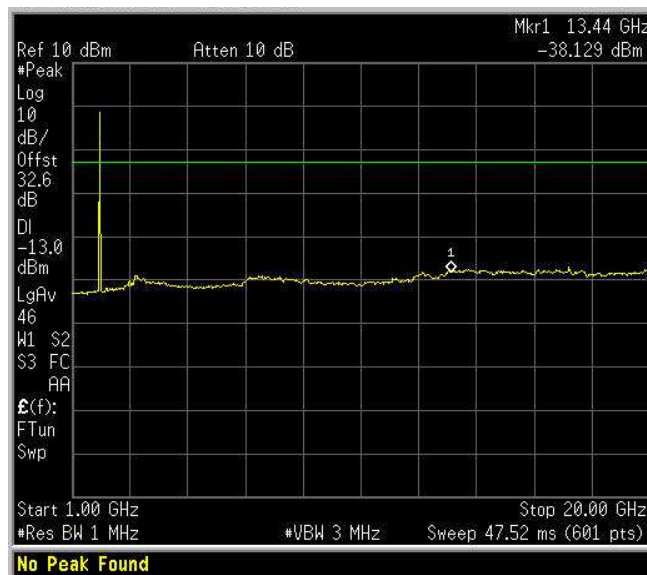
Nemko Italy S.p.A.  
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Test data continued

Spurious Emissions at Antenna Terminals

Uplink – 20 QAM

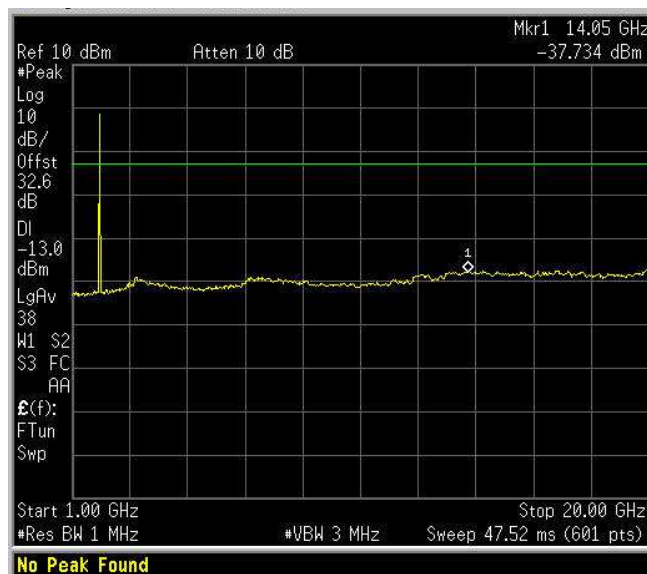
1-20 GHz

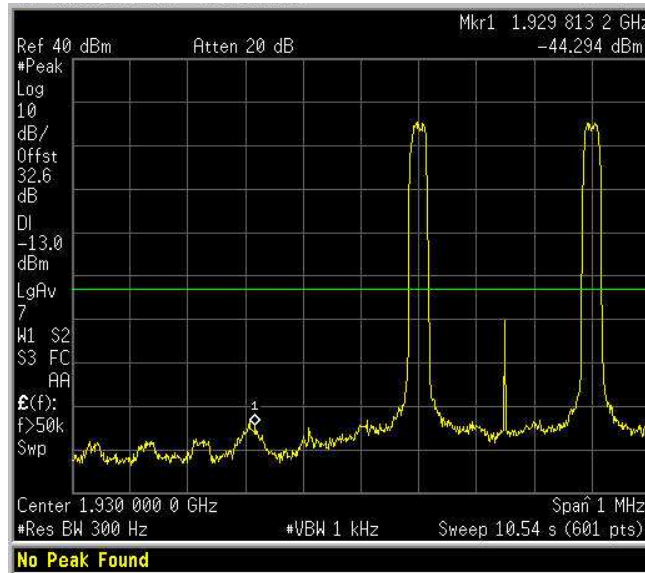
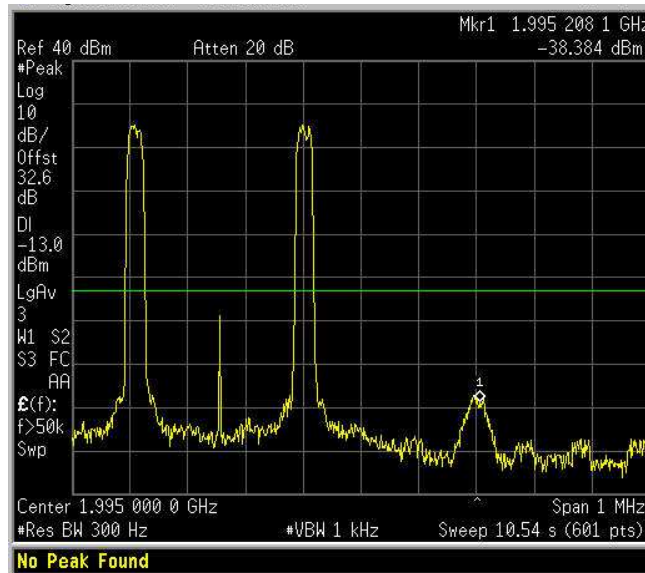


Spurious Emissions at Antenna Terminals

Uplink – 20 QPSK

1-20 GHz



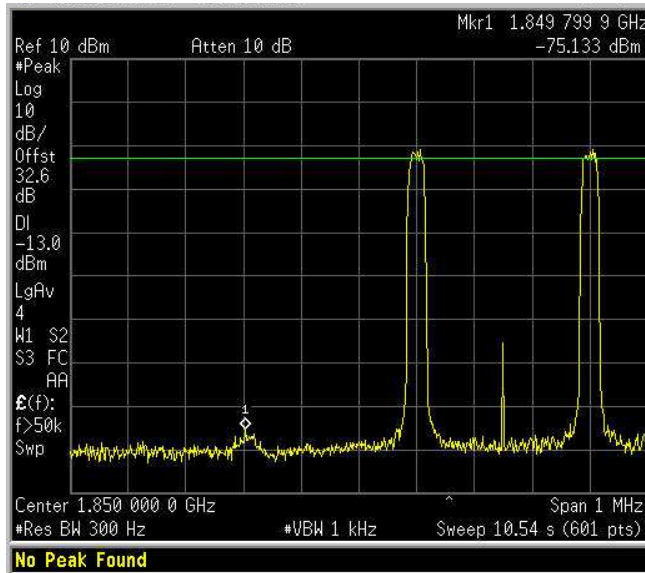
**Test data, continued band edges Inter modulation**Downlink – 30 kHz TDMA  
LOW BAND EDGEDownlink – 30 kHz TDMA  
HIGH BAND EDGE



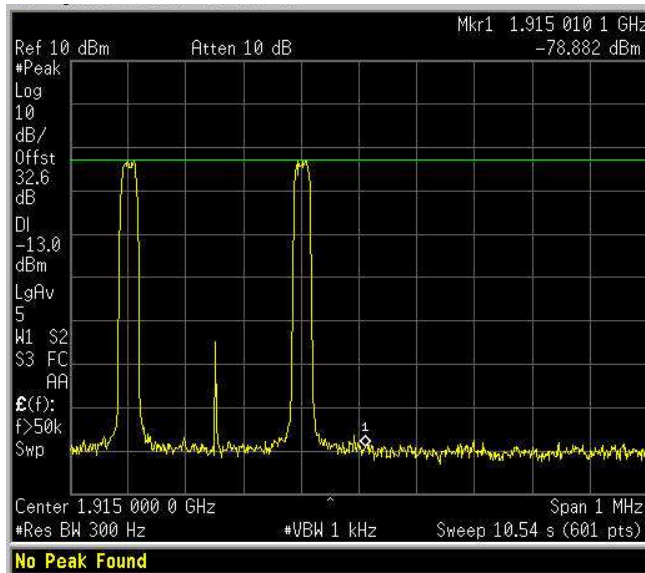
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Uplink – 30 kHz TDMA  
LOW BAND EDGE



Uplink – 30 kHz TDMA  
HIGH BAND EDGE

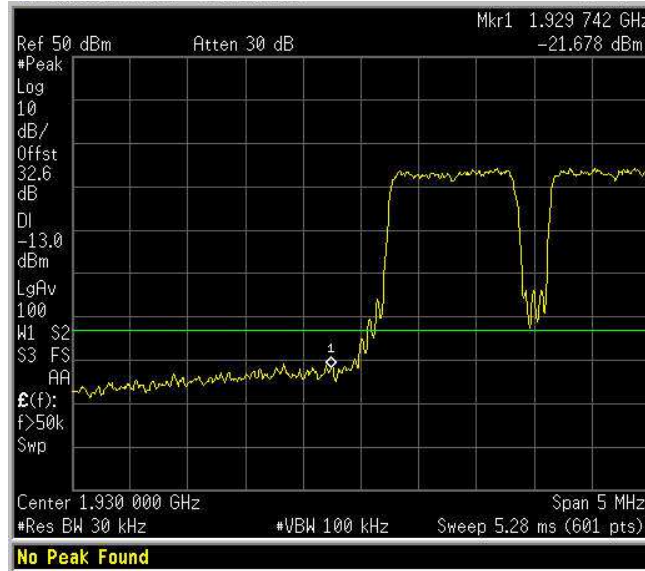




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Test data, continued band edges Inter modulation

Downlink – 1.4 QAM  
LOW BAND EDGE



Downlink – 1.4 QAM  
HIGH BAND EDGE



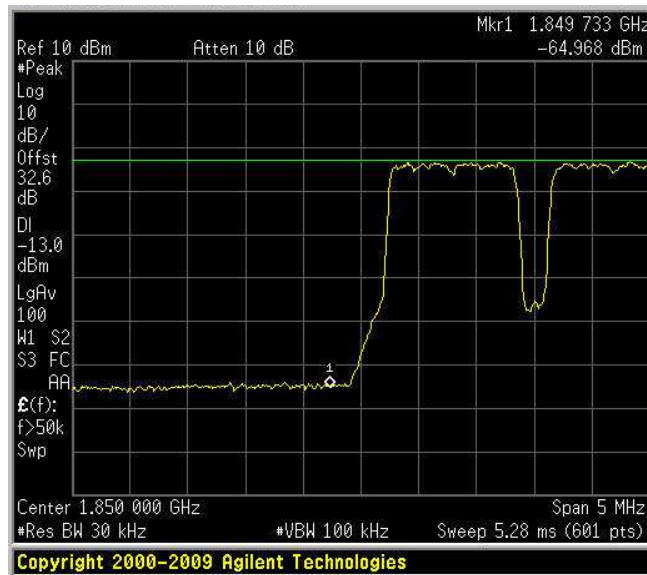




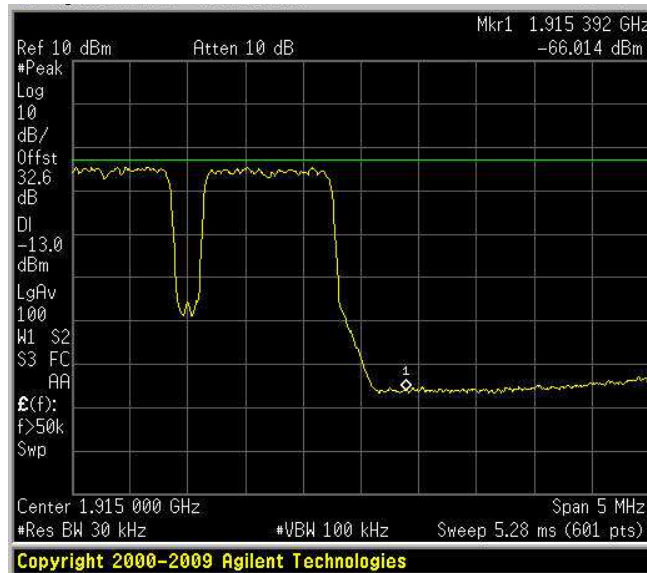
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

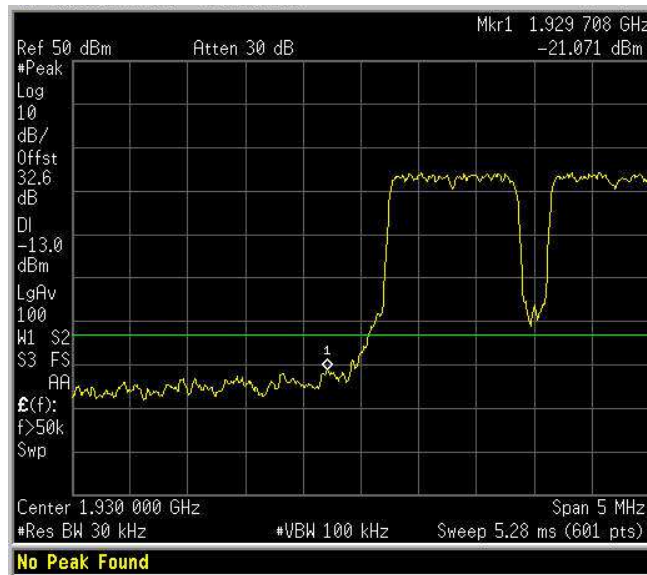
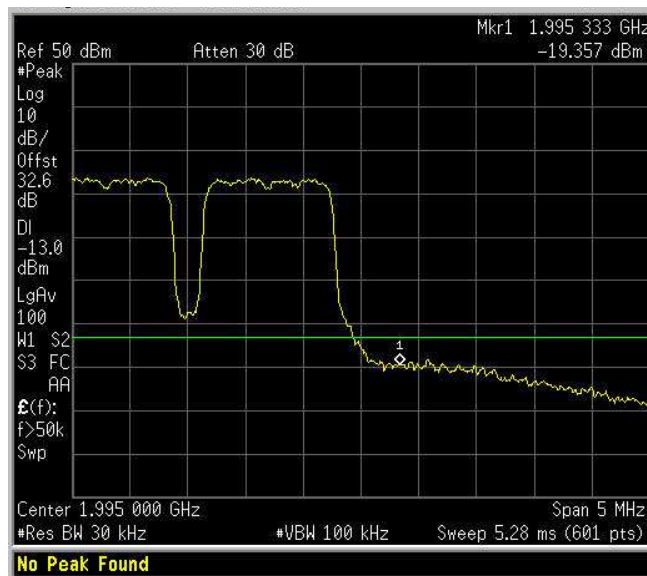
Test data, continued band edges:

Uplink – 1.4 QAM  
LOW BAND EDGE



Uplink – 1.4 QAM  
HIGH BAND EDGE



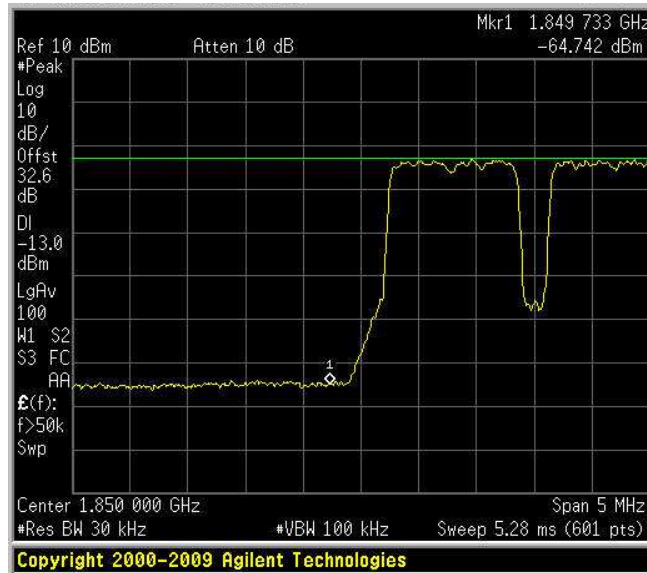
**Test data, continued band edges:**
**Downlink – 1.4 QPSK**
**LOW BAND EDGE**

**Downlink – 1.4 QPSK**
**HIGH BAND EDGE**




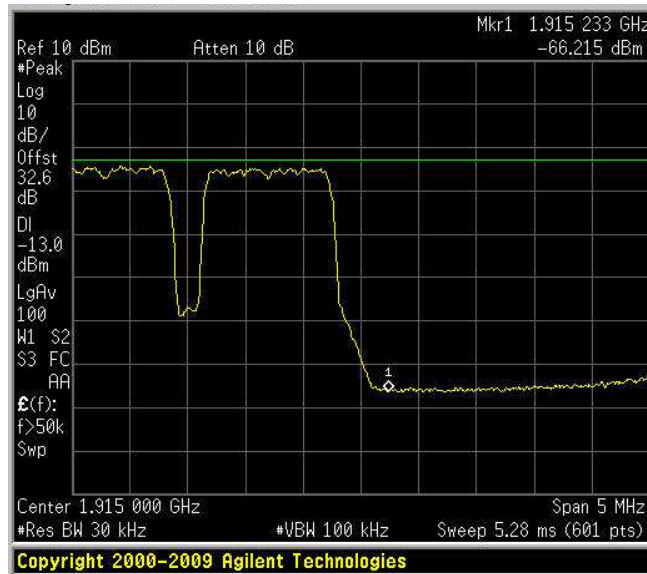
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Uplink – 1.4 QPSK  
LOW BAND EDGE



Uplink – 1.4 QPSK  
HIGH BAND EDGE

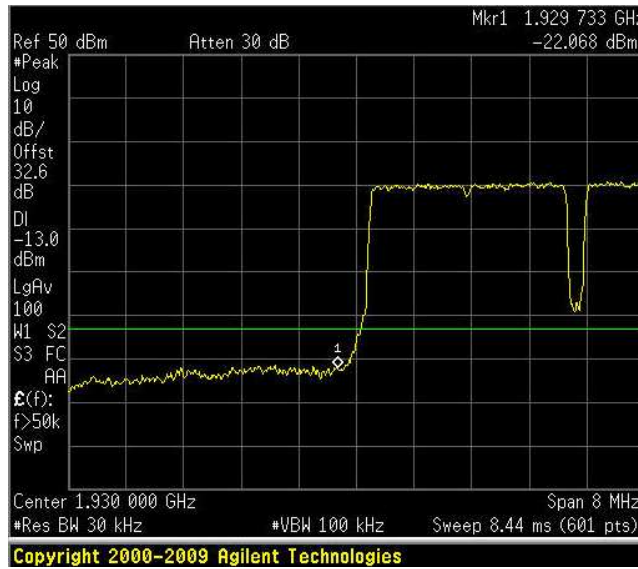




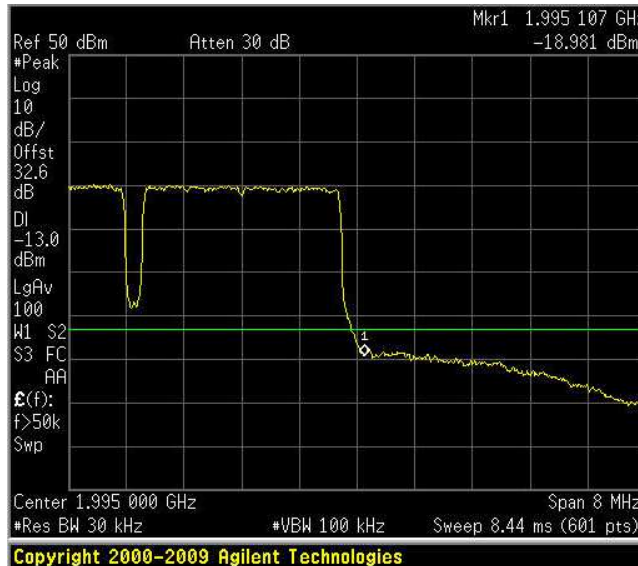
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Downlink – 3 QAM  
LOW BAND EDGE



Downlink – 3 QAM  
HIGH BAND EDGE

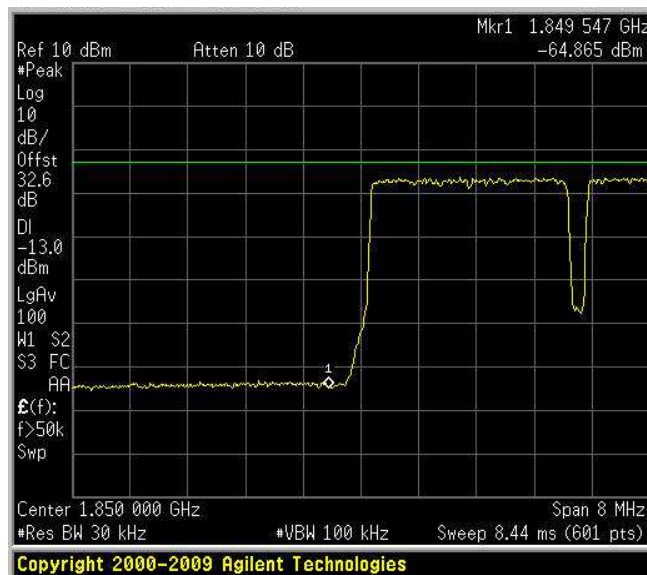




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Test data, continued band edges:

Uplink – 3 QAM  
LOW BAND EDGE



Uplink – 3 QAM  
HIGH BAND EDGE

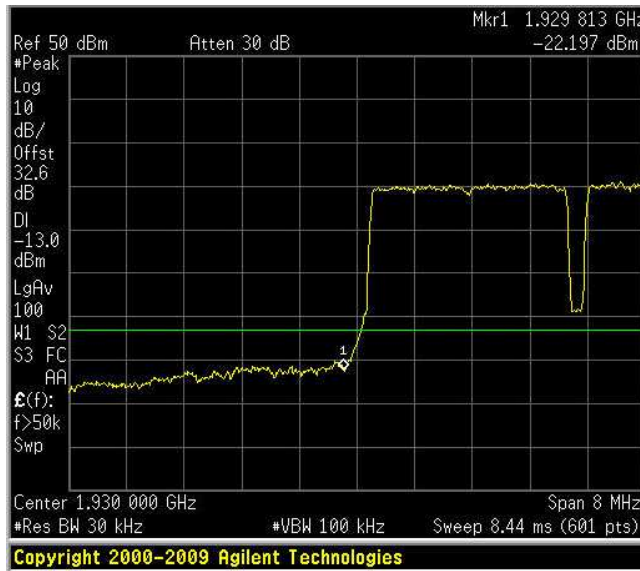




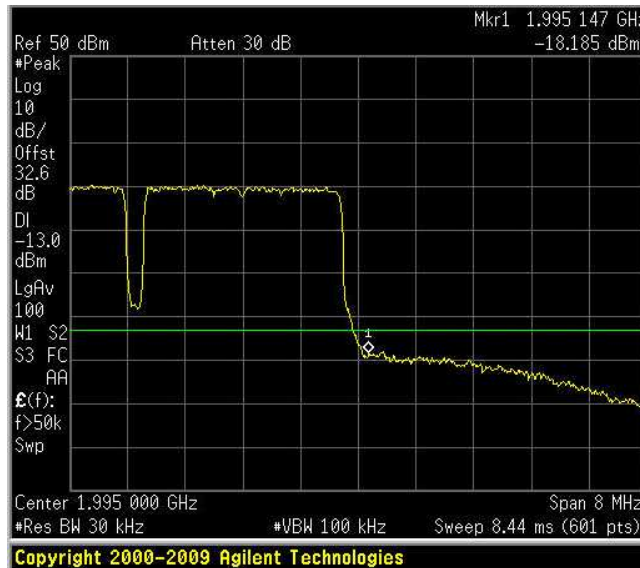
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Downlink – 3 QPSK  
LOW BAND EDGE



Downlink – 3 QPSK  
HIGH BAND EDGE

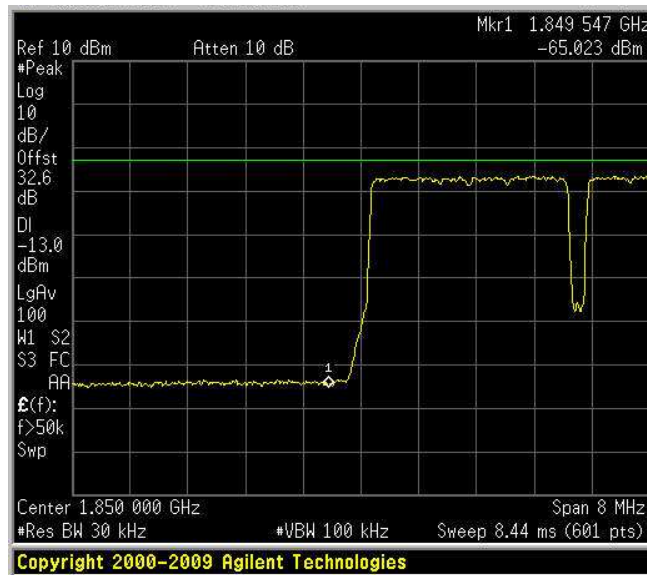




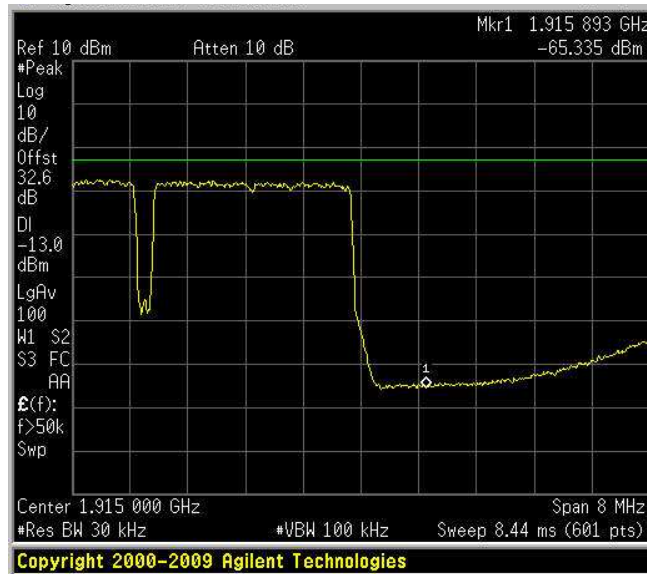
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Uplink – 3 QPSK  
LOW BAND EDGE



Uplink – 3 QPSK  
HIGH BAND EDGE

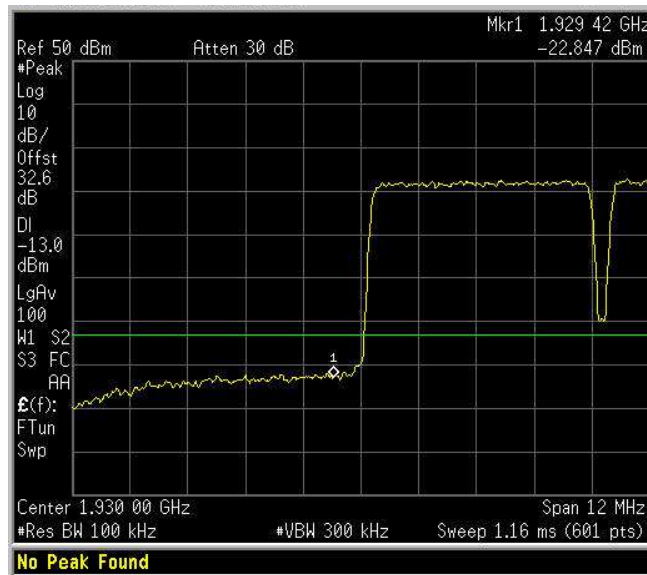




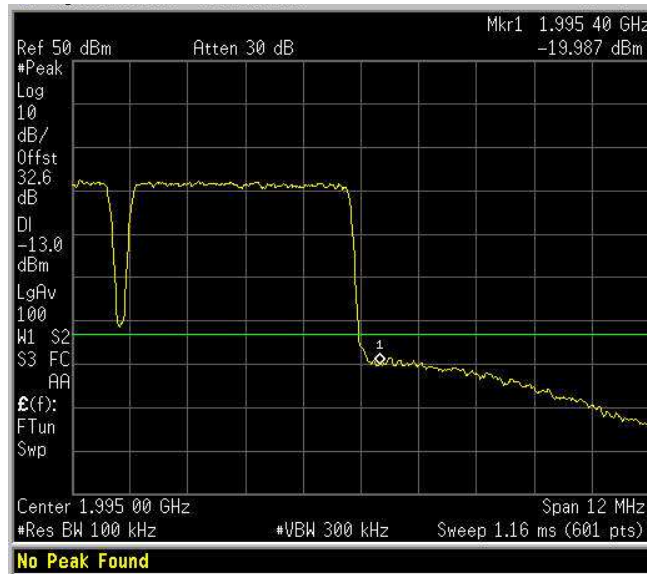
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Downlink – 5 QAM  
LOW BAND EDGE



Downlink – 5 QAM  
HIGH BAND EDGE



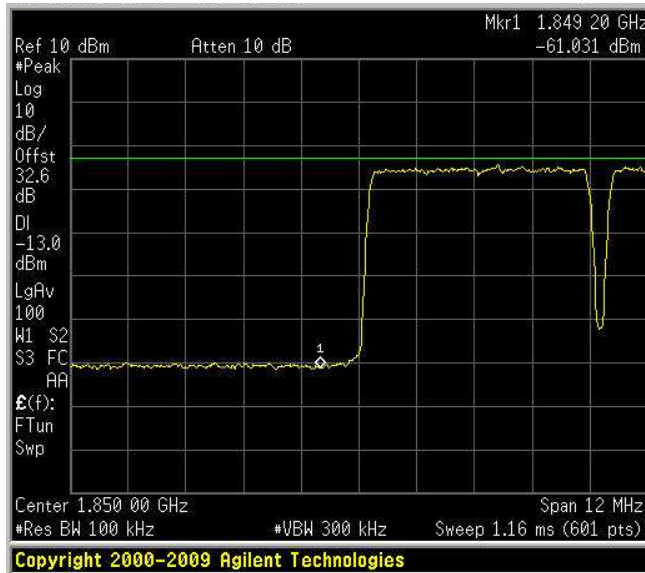




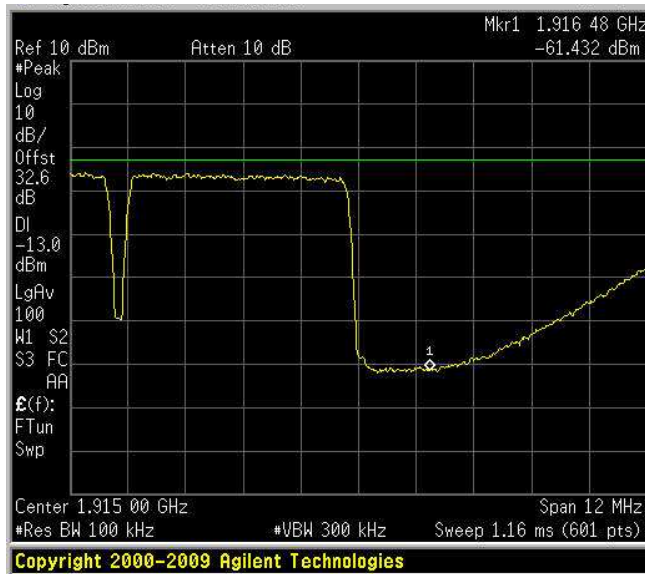
Nemko Italy S.p.A.  
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Test data, continued band edges:

Uplink – 5 QAM  
LOW BAND EDGE



Uplink – 5 QAM  
HIGH BAND EDGE

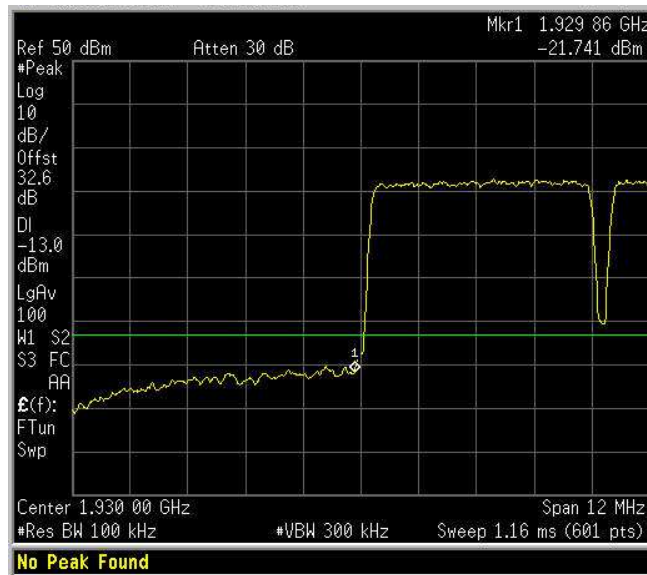




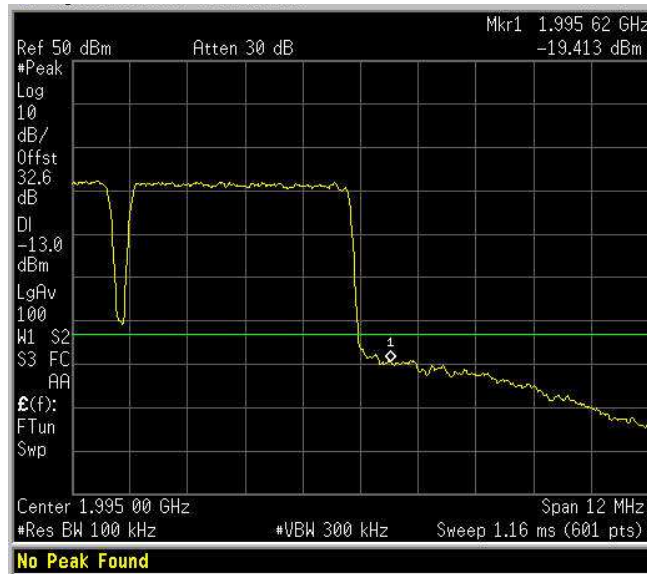
Nemko Italy S.p.A.  
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Test data, continued band edges:

Downlink – 5 QPSK  
LOW BAND EDGE



Downlink – 5 QPSK  
HIGH BAND EDGE

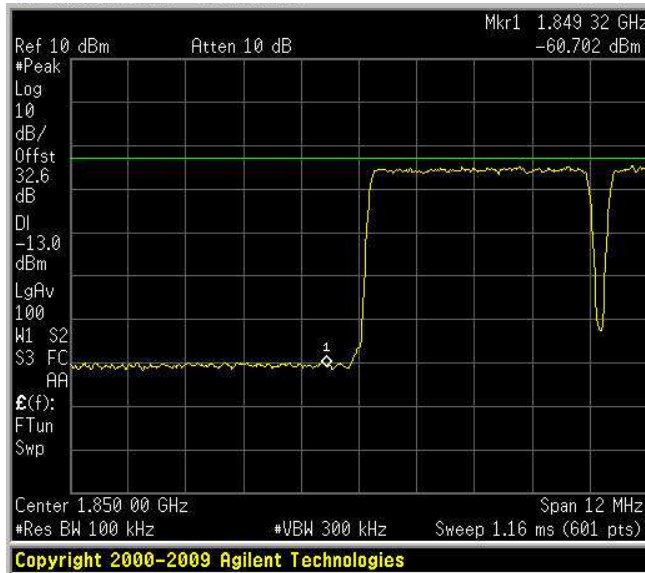




Nemko Italy S.p.A.  
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Test data, continued band edges:

Uplink – 5 QPSK  
LOW BAND EDGE



Uplink – 5 QPSK  
HIGH BAND EDGE



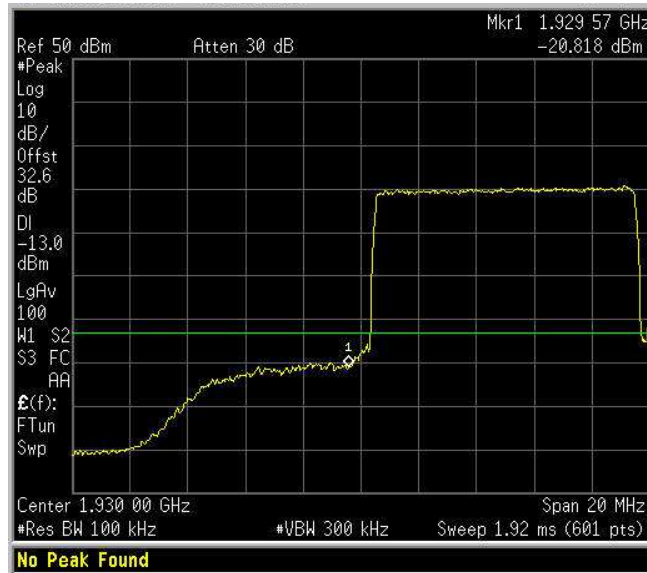


Nemko Italy S.p.A.  
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Test data, continued band edges:

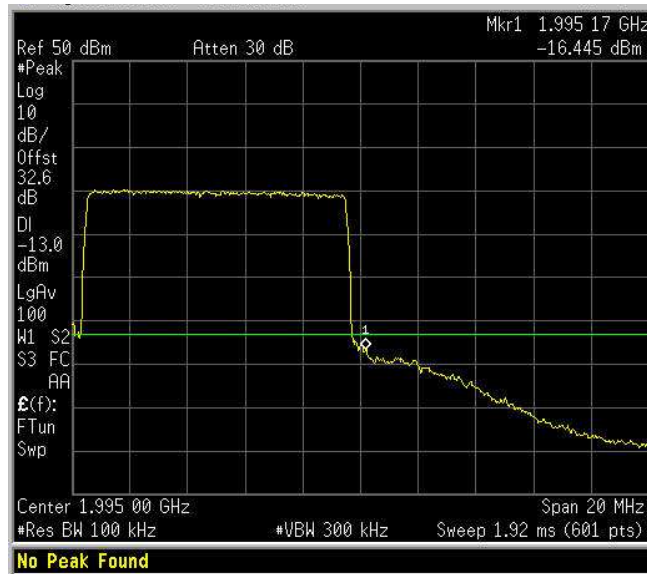
Downlink – 10 QAM

LOW BAND EDGE



Downlink – 10 QAM

HIGH BAND EDGE

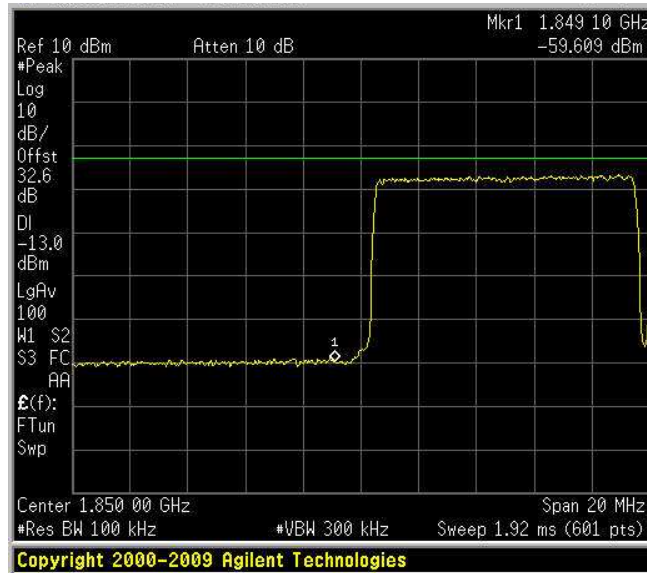




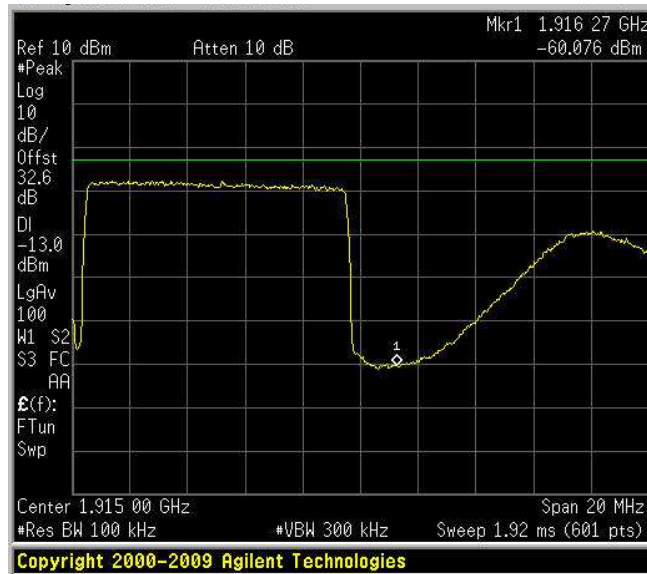
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Uplink – 10 QAM  
LOW BAND EDGE



Uplink – 10 QAM  
HIGH BAND EDGE



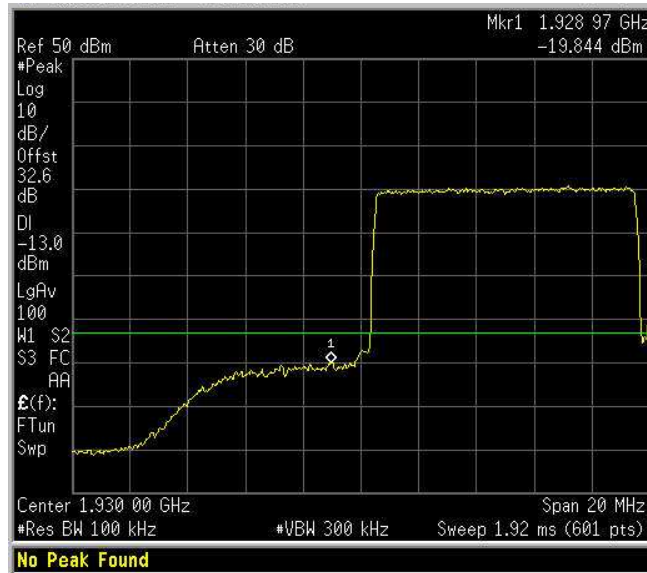


Nemko Italy S.p.A.  
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Test data, continued band edges:

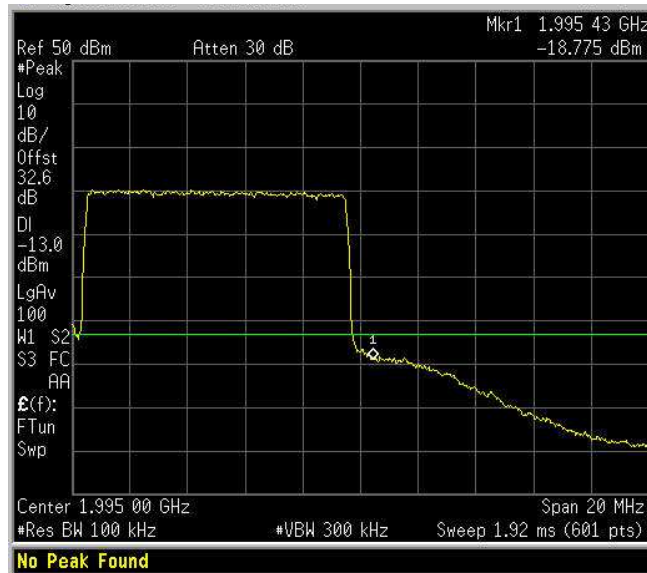
Downlink – 10 QPSK

LOW BAND EDGE



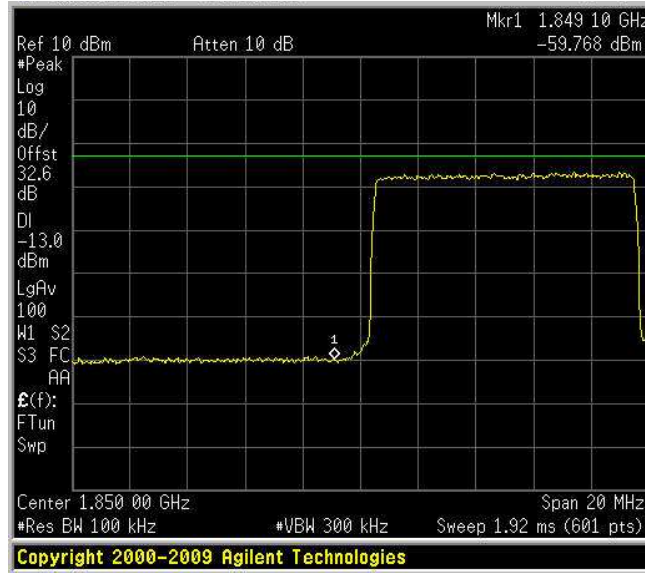
Downlink – 10 QPSK

HIGH BAND EDGE



**Test data, continued band edges:**

Uplink – 10 QPSK  
LOW BAND EDGE



Uplink – 10 QPSK  
HIGH BAND EDGE

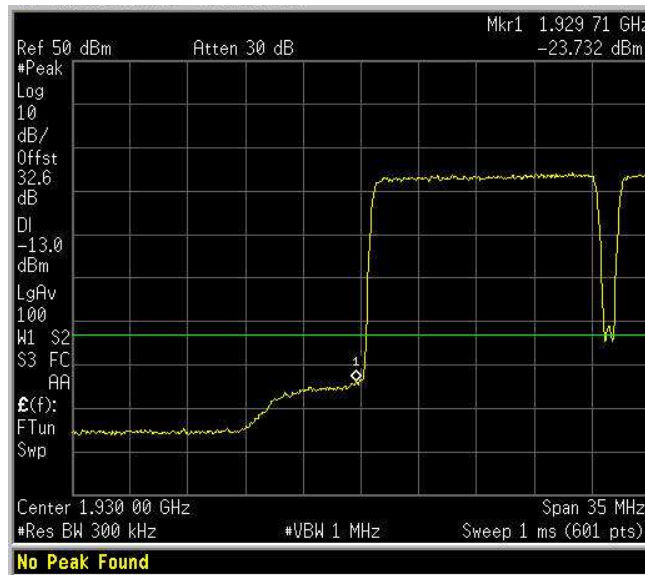




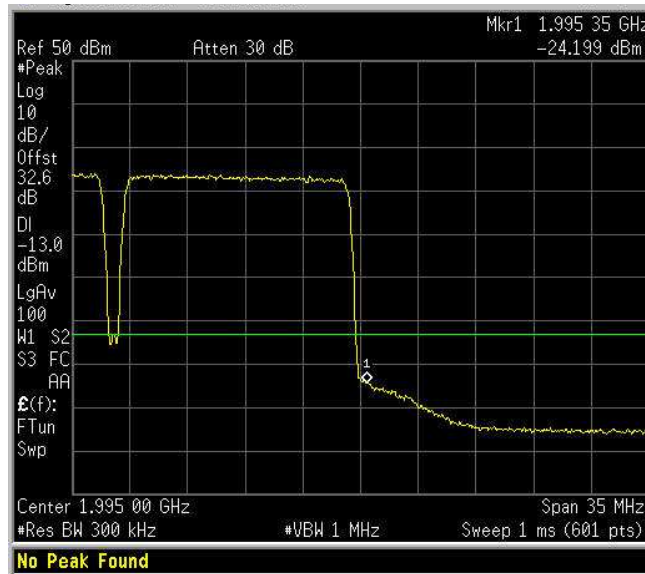
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Downlink – 15 QAM  
LOW BAND EDGE



Downlink – 15 QAM  
HIGH BAND EDGE



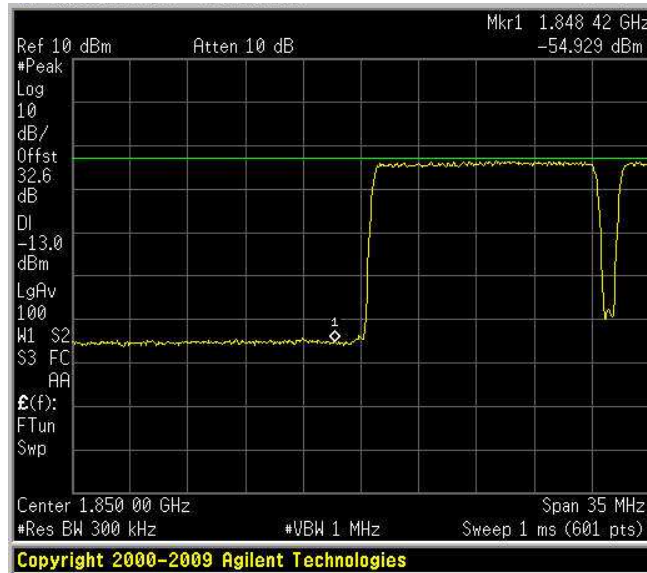




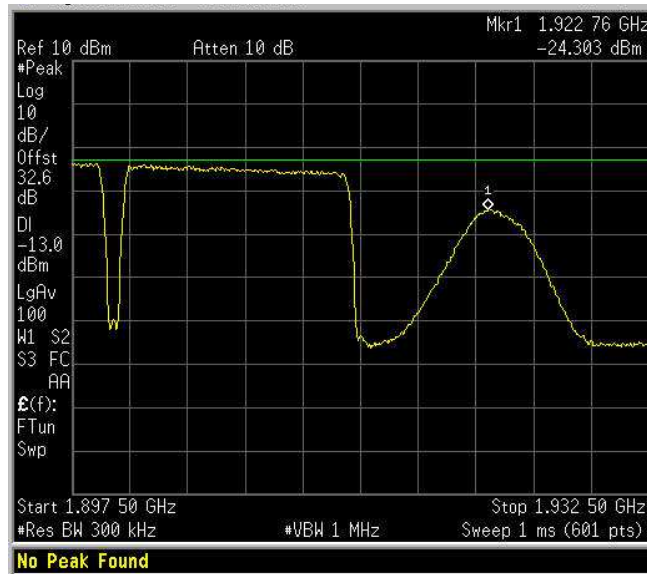
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

**Test data, continued band edges:**

**Uplink – 15 QAM  
LOW BAND EDGE**



**Uplink – 15 QAM  
HIGH BAND EDGE**

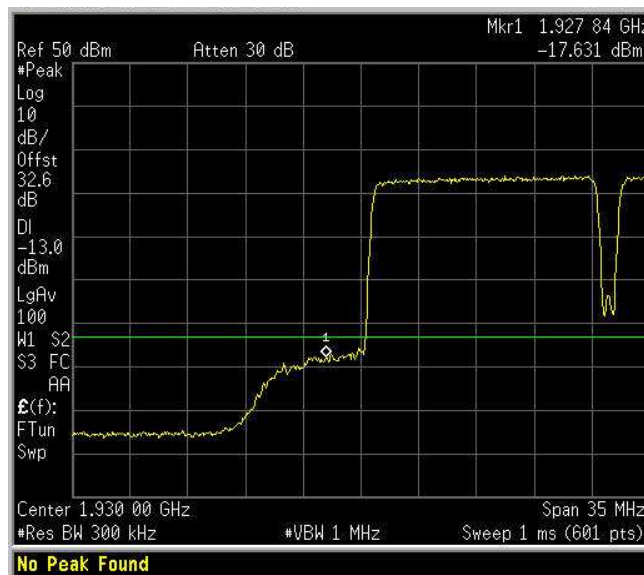




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Test data, continued band edges:

Downlink – 15 QPSK  
LOW BAND EDGE

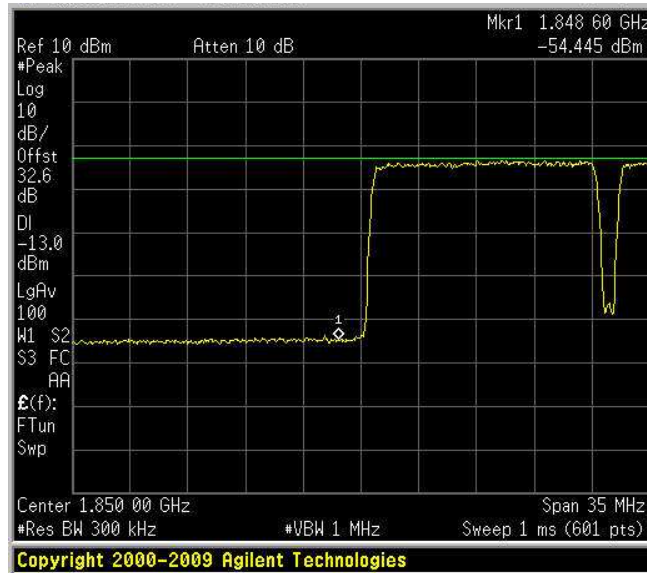


Downlink – 15 QPSK  
HIGH BAND EDGE

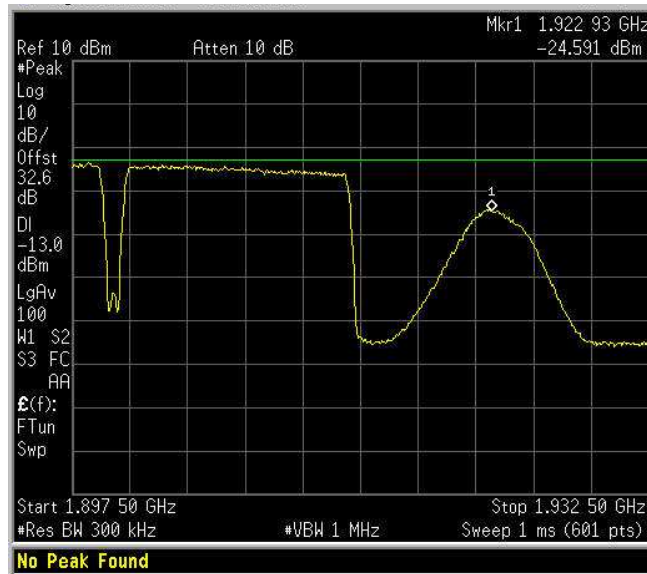


**Test data, continued band edges:**

**Uplink – 15 QPSK  
LOW BAND EDGE**



**Uplink – 15 QPSK  
HIGH BAND EDGE**

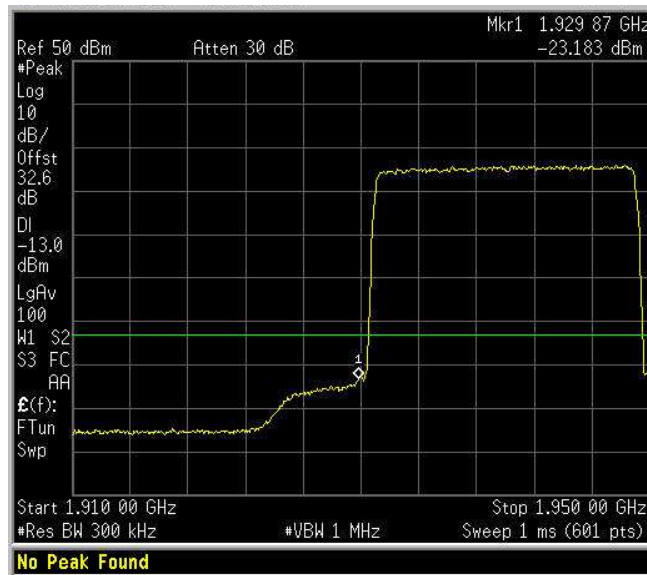




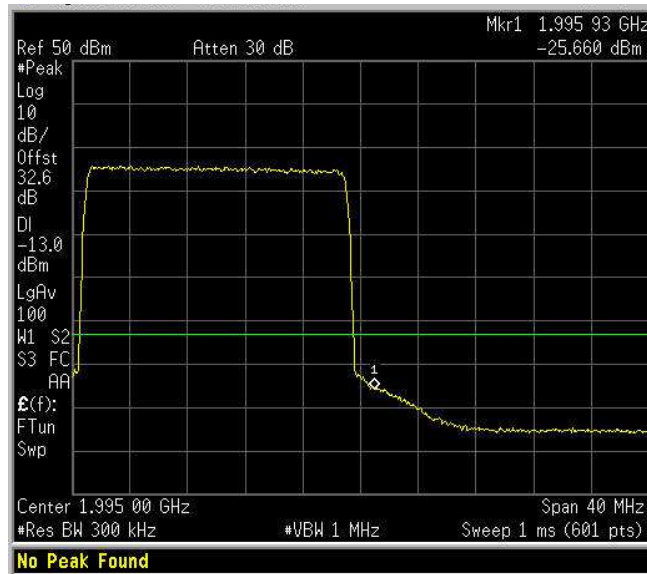
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Downlink – 20 QAM  
LOW BAND EDGE



Downlink – 20 QAM  
HIGH BAND EDGE

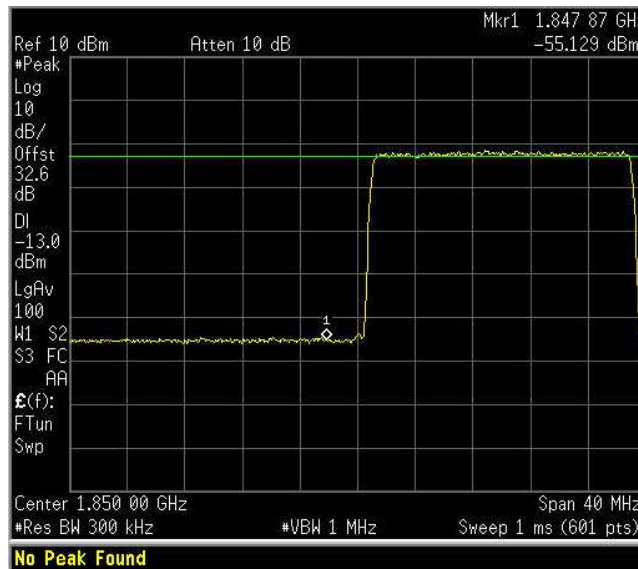




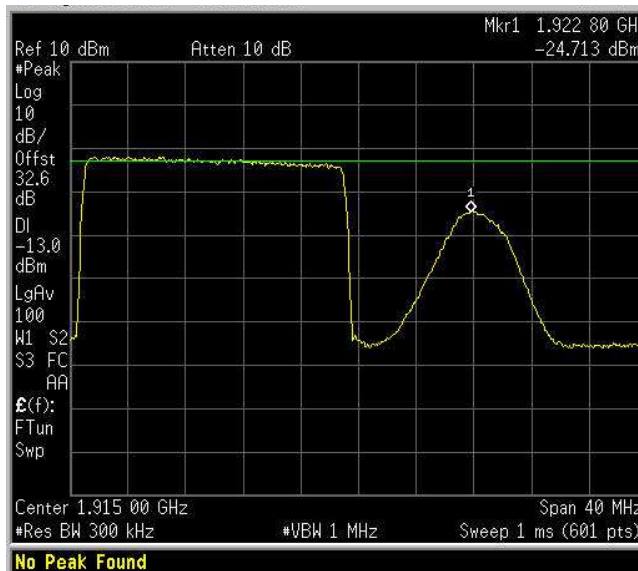
Nemko Italy S.p.A.  
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Test data, continued band edges:

Uplink – 20 QAM  
LOW BAND EDGE



Uplink – 20 QAM  
HIGH BAND EDGE



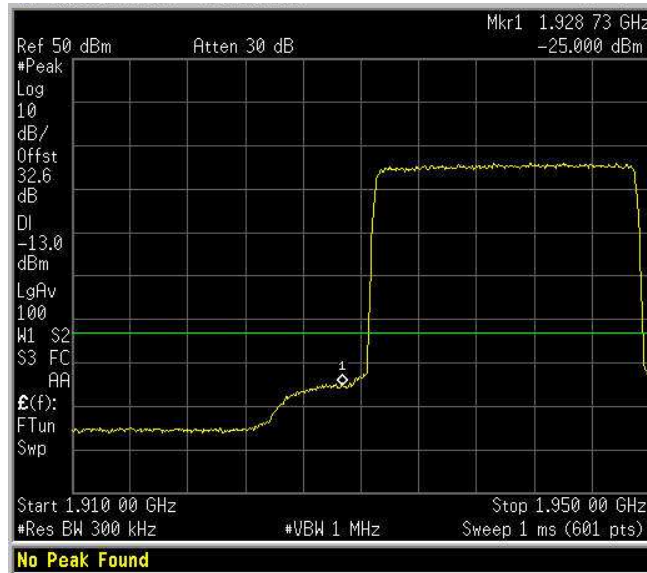


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Test data, continued band edges:

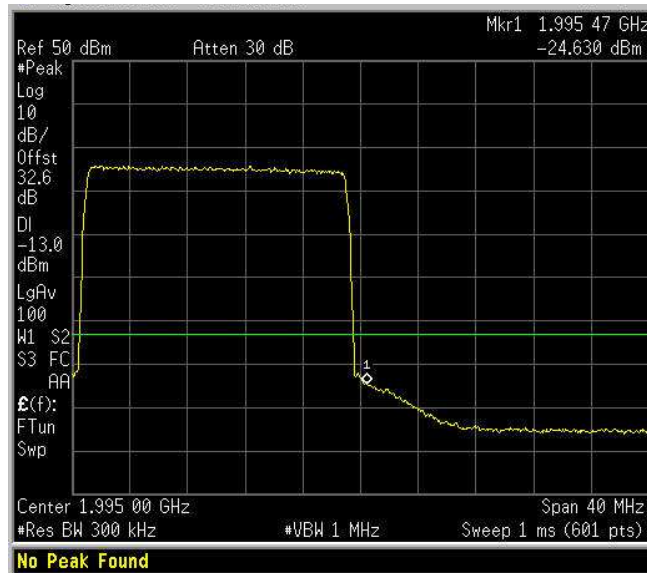
Downlink – 20 QPSK

LOW BAND EDGE



Downlink – 20 QPSK

HIGH BAND EDGE

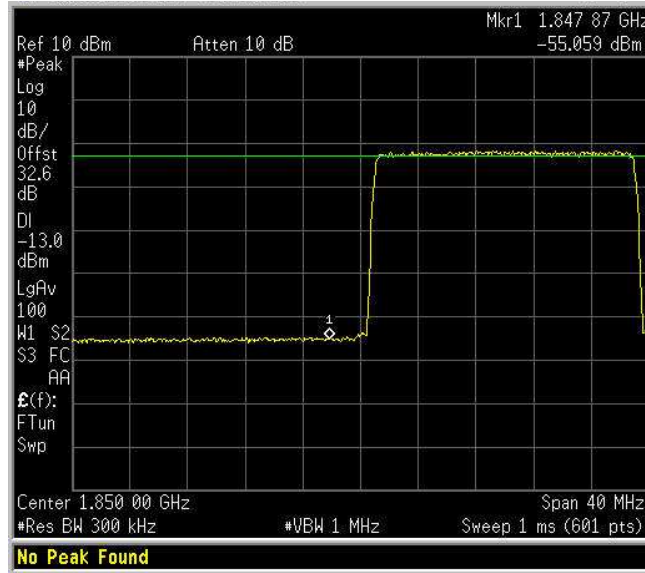




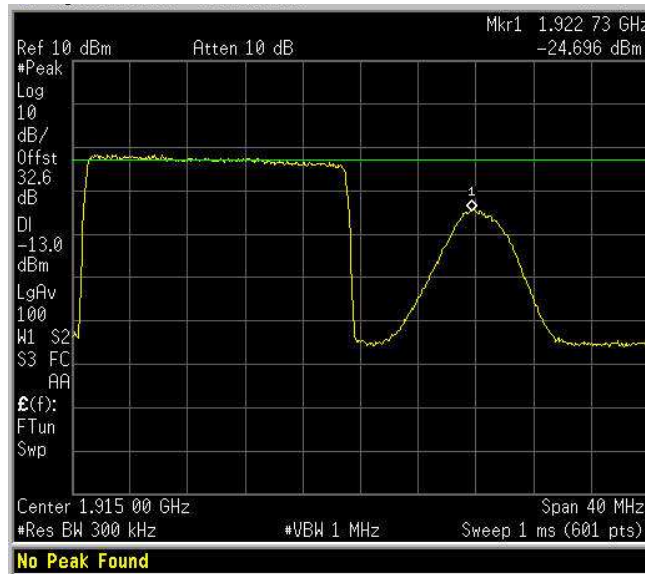
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Test data, continued band edges:

Uplink – 20 QPSK  
LOW BAND EDGE



Uplink – 20 QPSK  
HIGH BAND EDGE



## 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
30–10 <sup>th</sup> 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: --

Test results: Pass: [See test report 131640-6TRFEMC](#)

### 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





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### 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
1850.2	26 dBc points including frequency drift shall remain within the authorized frequency block
1880.0	
1909.8	

Test date: --

Test results: **NOT APPLICABLE** (Modulation & frequency conversion circuitry not in use)

#### 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

Conditions	Frequency (Hz)	Maximum drift (Hz)
+50 °C, Nominal power		
+40 °C, Nominal power		
+30 °C, Nominal power		
+20 °C, +10% power		
+20 °C, Nominal power		<i>Reference</i>
+20 °C, -10% power		
+10 °C, Nominal power		
0 °C, Nominal power		
-10 °C, Nominal power		
-20 °C, Nominal power		



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Appendix B: Block diagrams

Report Number: **156523-6TRFWL**

Specification: FCC 24 Subpart E

Clause Para NO. 2-11-04/EAB/RF

Filter Frequency Response

Test date: 2009-09-25, t.r 131640-6TRFEMC.

Test results: [Pass, see previous test report 131640-6TRFEMC](#)

Photo Set up





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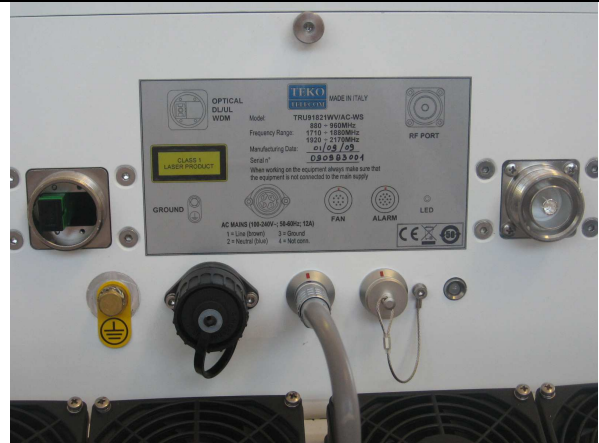
Appendix B: Block diagrams

Report Number: **156523-6TRFWL**

Specification: FCC 24 Subpart E

Photo EUT

REMOTE





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Appendix B: Block diagrams

Report Number: **156523-6TRFWL**

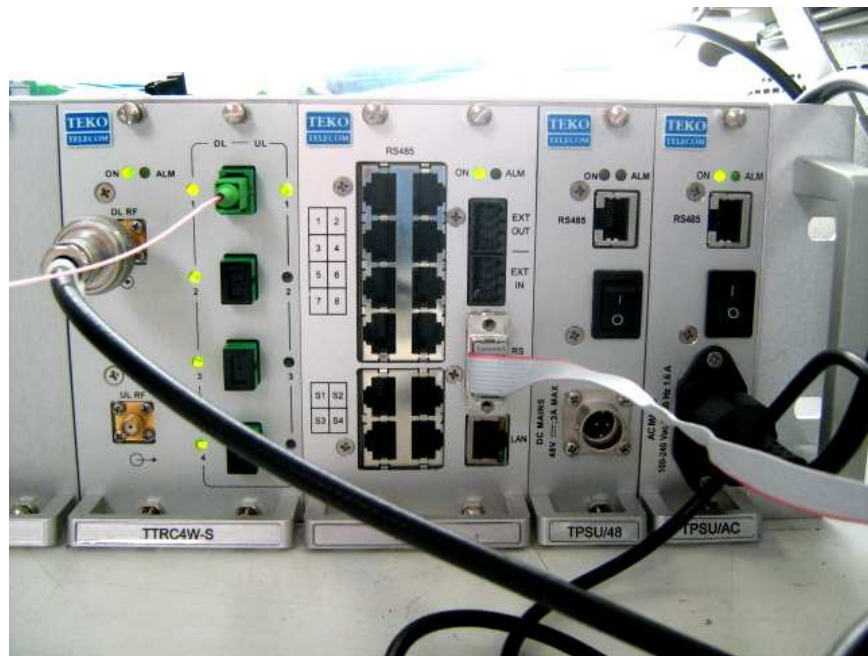
Specification: FCC 24 Subpart E

### MASTER



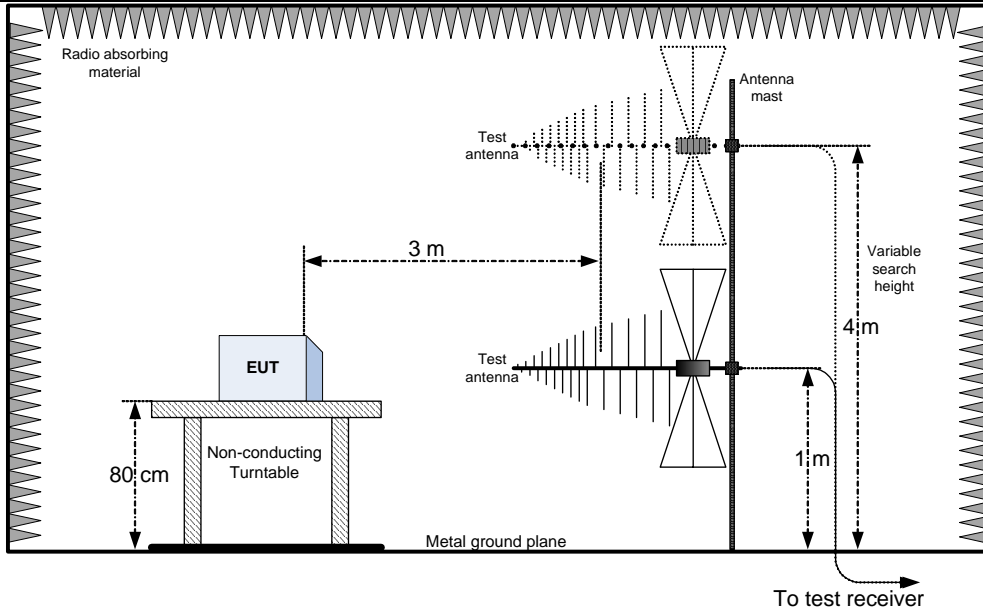


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## Appendix B: Block diagrams of test set-ups

### Radiated emissions set-up



### Substitution method set-up

