

| Report Reference ID: | 332502-11TRFWL |
|----------------------|----------------|
|----------------------|----------------|

| Test specification: | Title 47 – Telecommunication Chapter I – Federal Communications Commission Subchapter B – Common carrier services Part 27 – Miscellaneous wireless communications services |
|---------------------|--|
|---------------------|--|

| Applicant: | TEKO Telecom Srl. Via Meucci, 24/a I-40024 Castel S. Pietro Terme (BO) (Italy) |  |
|------------|--|--|
| Apparatus: | Medium Power Remote Unit   |  |
| Model:     | TRM7E8AE19HAWX23AT   |  |
| FCC ID:    | XM2-MP6B   |  |

| Testing laboratory: | Nemko Italy Spa Via del Carroccio, 4 20853 Biassono (MB) – Italy Telephone: +39 039 2201201 Facsimile: +39 039 2201221 |
|---------------------|--|
|---------------------|--|

|              | Name and title                       | Date       |  |
|--------------|--------------------------------------|------------|--|
| Tested by:   | Curiori &                            | 06/29/2017 |  |
|              | G. Curioni, Wireless/EMC Specialist  |            |  |
| Reviewed by: | Bulu Part                            | 06/29/2017 |  |
|              | P. Barbieri, Wireless/EMC Specialist | 00/20/2011 |  |

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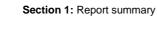
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# Section 1: Report summary

# 1.1 Test specification

**Specifications** 

Part 27 - Miscellaneous wireless communications services

# 1.2 Statement of compliance

### Compliance

In the configuration tested the EUT was found compliant

Yes ⊠ No □

This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Canada Inc. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 27. Radiated tests were conducted in accordance with ANSI C63.4-2003.

# 1.3 Exclusions

Exclusions

None

# 1.4 Registration number

| <b>Test</b> | site | FCC |
|-------------|------|-----|
| ID ni       | ımbı | or  |

176392 (3 m Semi anechoic chamber)

# 1.5 Test report revision history

| •          |  |
|------------|--|
| Revision # | Details of changes made to test report |
| TRF        | Original report issued                 |
| R1TRF      |  |

# 1.6 Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

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# Section 2: Summary of test results

| Part         | Methods                     | Test description                           | Verdict |
|--------------|-----------------------------|--|---------|
|              | § 935210<br>D05v01r01 (3.2) | AGC threshold                              | Pass    |
|              | § 935210<br>D05v01r01 (3.3) | Out of band rejection                      | Pass    |
| §27.53(a)(5) | § 935210<br>D05v01r01 (3.4) | Occupied bandwidth                         | Pass    |
| §27.50(a)    | § 935210<br>D05v01r01 (3.5) | Peak output power at RF antenna connector  | Pass    |
| §27.53(a)    | § 935210<br>D05v01r01 (3.6) | Spurious emissions at RF antenna connector | Pass    |
| §27.53(a)    | § 935210<br>D05v01r01 (3.8) | Radiated spurious emissions                | Pass    |
| §27.54       | § 935210<br>D05v01r01 (3.7) | Frequency stability                        | N/A a)  |

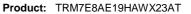
### Notes:

a) NOT APPLICABLE: Modulation/frequency conversion circuitry not in use. No frequency change in EUT (input and output have same frequency)



# Section 3: Equipment under test (EUT) and application details

| 3.1 Applicant of  | details                         |  |  |
|-------------------|---------------------------------|--|--|
| Applicant         | Name:                           | Teko Telecom Srl                                       |  |
| complete          | Federal                         |  |  |
| business name     | Registration                    | 0018963462   |  |
|                   | Number (FRN):                   |  |  |
|                   | Grantee code                    | XM2  |  |
| Mailing address   | Address:                        | Via Meucci, 24/a                                       |  |
|                   | City:                           | Castel S. Pietro Terme                                 |  |
|                   | Province/State:                 | Bologna  |  |
|                   | Post code:                      | 40024  |  |
|                   | Country:                        | Italy  |  |
|                   |                                 |  |  |
| 3.2 Modular ed    | quipment                        |  |  |
| a) Single modular | Single modular approval         |  |  |
| approval          | Yes□                            | No 🖂   |  |
| b) Limited single | Limited single modular approval |  |  |
| modular approval  | Yes 🗌                           | No 🖂   |  |
|                   |                                 |  |  |
| 3.3 Product de    | tails                           |  |  |
| FCC ID            | Grantee code:                   | XM2  |  |
|                   | Product code:                   | -MP6B  |  |
| Equipment class   | B2I                             |  |  |
| Description of    | Booster                         |  |  |
| product as it is  | Model                           | TRM7E8AE19HAWX23AT                                     |  |
| marketed          | name/number:                    |  |  |
|                   | Serial number:                  | 1007061001   |  |
|                   |                                 |  |  |
| 3.4 Application   | purpose                         |  |  |
| Type of           | Original certi                  | fication   |  |
| application       | ☐ Change in id                  | entification of presently authorized equipment         |  |
|                   | Original FCC                    | CID: Grant date:                                       |  |
|                   | ☐ Class II perm                 | nissive change or modification of presently authorized |  |
|                   |                                 |  |  |
|                   | equipment                       |  |  |





# Section 3: Equipment under test

| 3.5 Composite     | /related equipment   |  |
|-------------------|--|--|
| a) Composite      | The EUT is a composite device subject to an additional equipment     |  |
| equipment         | authorization  |  |
|                   | Yes □ No ⊠   |  |
| b) Related        | The EUT is part of a system that operates with, or is marketed with, |  |
| equipment         | another device that requires an equipment authorization              |  |
|                   | Yes □ No ⊠   |  |
| c) Related FCC ID | If either of the above is "yes":                                     |  |
|                   | ☐ has been granted under the FCC ID(s) listed below:                 |  |
|                   | is in the process of being filled under the FCC ID(s) listed below:  |  |
|                   | is pending with the FCC ID(s) listed below:                          |  |
|                   | has a mix of pending and granted statues under the FCC ID(s)         |  |
|                   | listed below:  |  |
|                   | i FCC ID:  |  |
|                   | ii FCC ID:   |  |
|                   |  |  |

| 3.6 Sample inf          | formation  |
|-------------------------|------------|
| Receipt date:           | 06/26/2017 |
| Nemko sample ID number: |            |

| 3.7 EUT techn        | ical specifications   |
|----------------------|---|
| Operating band:      | Down Link: 2350–2360 MHz, Up Link: 2305-2315 MHz  |
| Operating frequency: | Wideband  |
| Modulation type:     | LTE (QAM and QPSK)  |
| Occupied bandwidth:  | LTE: 5 MHz, 10 MHz  |
| Channel spacing:     | standard  |
| Emission designator: | LTE: D7W  |
| RF Output            | Down Link: 33dBm (2W) Up Link: N.A. (The EUT does not transmit over the air in the up-link direction) |
| Gain                 | Down Link: 38dB Up Link: N.A. (The EUT does not transmit over the air in the up-link direction)       |
| Antenna type:        | External Antenna is not provided, equipment that has an external 50 $\Omega$ RF connector             |
| Power source:        | 100-240 Vac   |



Section 3: Equipment under test Product: TRM7E8AE19HAWX23AT

Specification: FCC 27

# Section 3: Equipment under test

| 3.8 Accessories and support equipment |   |  |  |  |  |
|---------------------------------------|---|--|--|--|--|
|                                       | The following information identifies accessories used to exercise the EUT during testing: |  |  |  |  |
| Item # 1                              |   |  |  |  |  |
| Type of equipment:                    | Master Unit - Subrack   |  |  |  |  |
| Brand name:                           | Teko Telecom srl  |  |  |  |  |
| Model name or number:                 | SUB-TRX-PSU   |  |  |  |  |
| Serial number:                        | 101083001   |  |  |  |  |
| Nemko sample number:                  |   |  |  |  |  |
| Connection port:                      |   |  |  |  |  |
| Cable length and type:                |   |  |  |  |  |
| Item # 2                              |   |  |  |  |  |
| Type of equipment:                    | Master Unit – Management Module   |  |  |  |  |
| Brand name:                           | Teko Telecom srl  |  |  |  |  |
| Model name or number:                 | TSPV-R  |  |  |  |  |
| Serial number:                        | 110942253   |  |  |  |  |
| Nemko sample number:                  |   |  |  |  |  |
| Connection port:                      | LAN port  |  |  |  |  |
| Cable length and type:                |   |  |  |  |  |
| Item # 3                              |   |  |  |  |  |
| Type of equipment:                    | Master Unit – Optical Module  |  |  |  |  |
| Brand name:                           | Teko Telecom srl  |  |  |  |  |
| Model name or number:                 | TTRU4W-S-M  |  |  |  |  |
| Serial number:                        | 110679007   |  |  |  |  |
| Nemko sample number:                  |   |  |  |  |  |
| Connection port:                      | DL/UL RF connector (to connect to the base station)                                       |  |  |  |  |
|                                       | Optical port (to connect to remote unit)  |  |  |  |  |
| Cable length and type:                |   |  |  |  |  |
| Item # 4                              |   |  |  |  |  |
| Type of equipment:                    | Master Unit – Power Supply  |  |  |  |  |
| Brand name:                           | Teko Telecom srl  |  |  |  |  |
| Model name or number:                 | TPSU/AC   |  |  |  |  |
| Serial number:                        | 081063004   |  |  |  |  |
| Nemko sample number:                  |   |  |  |  |  |
| Connection port:                      |   |  |  |  |  |
| Cable length and type:                |   |  |  |  |  |
|                                       |   |  |  |  |  |
|                                       |   |  |  |  |  |



Specification: FCC 27

# 3.9 Operation of the EUT during testing

**Details:** 

In down-link direction, normal working at max gain with max RF power output.

# 3.10 EUT setup diagram

In this system, Remote Unit is the EUT. Master Unit includes only management module and optical module (to convert RF signal in optical signal in down link direction and viceversa optical signal in RF signal in up link direction). As described in "Operational description", master unit is connected directly to base station, so the system doesn't use another equipment (under another FCC ID) to exercise the EUT. Signal generator is linked directly to the RF connector of optical module in the Master Unit.

### Test setup for output power, occupied bandwidth, spurious emissions:



### **Procedure**

Connect the signal modulated generator to the input of the EUT, so that the EUT works at the max gain. Raise the input level to the EUT until reach the maximum output power. Connect the spectrum analyzer to the RF output connector of the EUT.



Judgment

None

Specification: FCC 27

Product: TRM7E8AE19HAWX23AT

# 4.1 Modifications incorporated in the EUT Modifications Modifications performed to the EUT during this assessment None Yes ☐, performed by Client ☐ or Nemko ☐ Details: 4.2 Deviations from laboratory tests procedures Deviations Deviations from laboratory test procedures None ☑ Yes ☐ - details are listed below: 4.3 Technical judgment



est conditions **Product**: TRM7E8AE19HAWX23AT

Specification: FCC 27

# Section 5: Test conditions

# 5.1 Deviations from laboratory tests procedures

No deviations were made from laboratory test procedures.

| 5.2 Test condit   | 5.2 Test conditions, power source and ambient temperatures   |  |  |  |  |
|---|--|--|--|--|--|
| Normal temperature, humidity and air pressure test conditions | Temperature: 15–30 °C Relative humidity: 20–75 % Air pressure: 86–106 kPa  |  |  |  |  |
|   | When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.   |  |  |  |  |
| Power supply range:   | The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed. |  |  |  |  |





# Section 5: Test conditions, continued

# 5.3 Measurement uncertainty

Nemko S.p.A. measurement uncertainty has been calculated using the standard CISPR 16-4-2 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements". All calculations can be found in Nemko S.p.A. document WML1002.

| 5.4 Test equ                             | ipment          |                           |                  |           |
|--|-----------------|---------------------------|------------------|-----------|
| Equipment                                | Manufacturer    | Model No.                 | Asset/Serial No. | Next cal. |
| Vector Signal<br>Generator               | Agilent         | N5172B EXG                | MY53051238       | Jan 2018  |
| Vector Signal<br>Generator               | Agilent         | E4438C ESG                | MY45094485       | Ago 2019  |
| Spectrum Analyzer                        | Agilent         | N9030A PXA                | MY53120882       | Nov 2017  |
| Network Analyzer                         | Agilent         | E5071C ENA                | MY46106183       | Ago 2017  |
| V-network                                | R&S             | ESH2-Z5                   | 872 460/041      | 10/2017   |
| Trilog Broad Band<br>Antenna 25-2000 MHz | Schwarzbeck     | VULB 9168                 | VULB 9168-242    | 06/2018   |
| Trilog Broad Band<br>Antenna 25-8000 MHz | Schwarzbeck     | VULB 9162                 | VULB 9162-25     | 07/2018   |
| Antenna 1-18 GHz                         | Schwarzbeck     | STLP 9148                 | STPL 9148-123    | 06/2018   |
| Antenna horn                             | A.H.System Inc. | SAS-574                   | 061106A40        | 10/2017   |
| Preamplifier 18-40 GHz                   | Miteq           | JS44                      | 1648665          | 12/2017   |
| Broadband preamplifier 1-18 GHz          | Schwarzbeck     | BBV 9718                  | 9718-137         | 12/2017   |
| EMI receiver 20 Hz ÷ 8<br>GHz            | R&S             | ESU8                      | 100202           | 04/2018   |
| EMI receiver 20 Hz ÷ 3<br>GHz            | R&S             | ESCI                      | 100888           | 08/2017   |
| Hydraulic revolving platform             | Nemko           | RTPL 01                   | 4.233            | NCR       |
| Turning-table                            | R&S             | HCT                       | 835 803/03       | NCR       |
| Antenna mast                             | R&S             | HCM                       | 836 529/05       | NCR       |
| Controller                               | R&S             | HCC                       | 836 620/7        | NCR       |
| Spectrum Analyzer<br>9kHz ÷ 40GHz        | R&S             | FSEK                      | 848255/005       | 01/2018   |
| Semi-anechoic chamber                    | Nemko           | 10m semi-anechoic chamber | 530              | 10/2018   |
| Shielded room                            | Siemens         | 10m control room          | 1947             | NCR       |
| Semi-anechoic chamber                    | Nemko           | 10m semi-anechoic chamber | 70               | NCR       |
| Shielded Room                            | Siemens         | 3m semi-anechoic chamber  | 3                | NCR       |
| Motor controller                         | Emco            | 1051-25                   | 9012-1559        | NCR       |
| Motor controller                         | Emco            | 1061-1.521                | 9012-1508        | NCR       |
| Antenna Tower                            | Emco            | 2071-2                    | 9601-1940        | NCR       |
| Controller pole/table                    | Emco            | 2090                      | 9511-1099        | NCR       |

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use (\*) Equipment supplied by manufacturer's



Specification: FCC 27

# Appendix A: Test results

# Clause 935210 D05v01 (3.2) AGC threshold

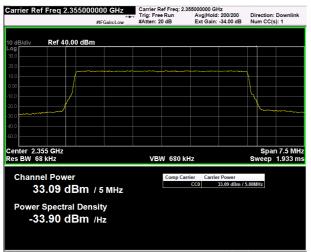
Measure of EUT AGC Threshold

Test date: 06/28/2017
Test results: Pass

### Special notes

Broadband amplifiers: AWGN test signal used (5 MHz LTE channel)

### Test data







AWGN signal, nominal input signal +1 dB



Specification: FCC 27

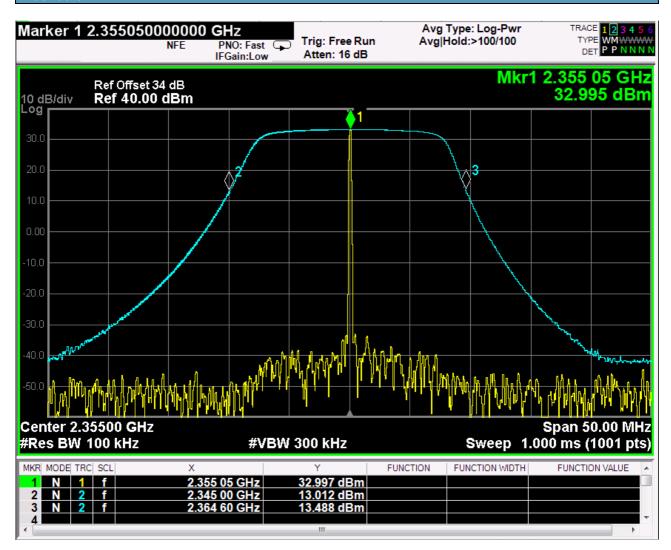
# Clause 935210 D05v01 (3.3) Out of band rejection

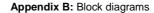
Out of Band Rejection - Test for rejection of out of band signals.

Test date: 06/28/2017
Test results: Pass

Special notes
-

### Test data







Specification: FCC 27

# Clause 27.53(a)(5) Occupied bandwidth

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Test date: 06/28/2017

Test results: Pass

### Special notes

- Broadband amplifiers: AWGN test signal used (5 MHz LTE channel)

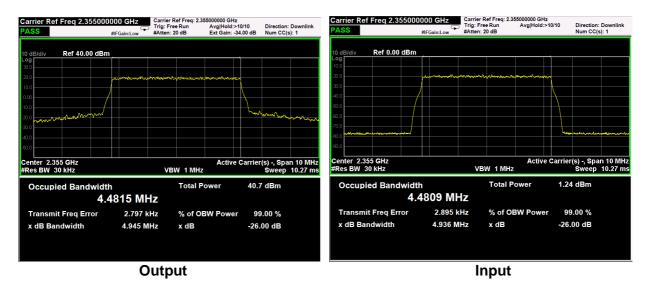
Block diagrams **Product:** TRM7E8AE19HAWX23AT

Specification: FCC 27

# Clause 27.53(a)(5) Occupied bandwidth, continued

# Test data

# AWGN signal, nominal input signal



### AWGN signal, nominal input signal + 3dB



Output Input



Specification: FCC 27

# Clause 27.50(a) Peak output power at RF antenna connector

- § 27.50(a) The following power limits and related requirements apply to stations transmitting in the 2305-2320 MHz band or the 2345-2360 MHz band:
  - (1) Base and fixed stations.
    - (i) For base and fixed stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band:
    - (A) The average equivalent isotropically radiated power (EIRP) must not exceed 2,000 watts within any 5 megahertz of authorized bandwidth and must not exceed 400 watts within any 1 megahertz of authorized bandwidth.
    - (B) The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

Test date: 06/28/2017

Test results: Pass

### Special notes

- Broadband amplifiers: AWGN test signal used (5 MHz LTE channel)



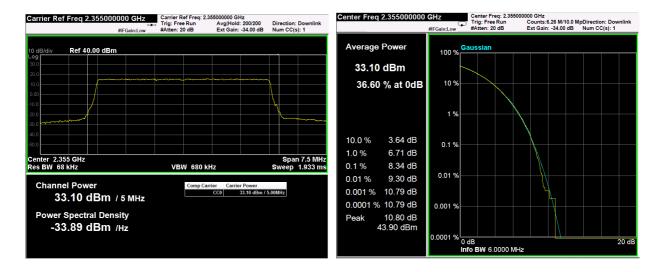
Specification: FCC 27

# Clause 27.50(a) Peak output power at RF antenna connector

Test data

# AWGN signal, nominal input signal

| Test data |                  |                    |                                |                                   |                               |             |
|-----------|------------------|--------------------|--------------------------------|-----------------------------------|-------------------------------|-------------|
| Direction | Modulation       | Frequency<br>(MHz) | RF<br>output<br>Power<br>(dBm) | RF output<br>channel Power<br>(W) | RF output<br>Power<br>(W/MHz) | PAR<br>(dB) |
| Down-link | AWGN (LTE, 5MHz) | 2355.0             | 33.10                          | 2.04                              | 0.41                          | 10.80       |

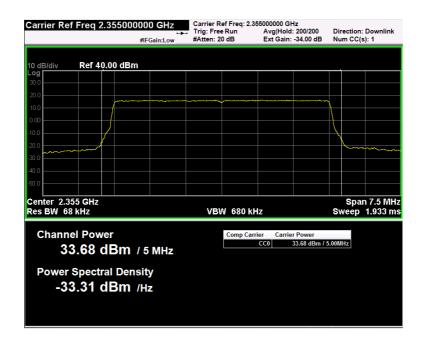


PAR measure is performed by the "CCDF" function installed on Spectrum analyzer that provides average power (the same measured with "Channel power" function), peak power and PAR.



# AWGN signal, nominal input signal + 3dB

| Test data |                  |                    |                                |                                   |                               |
|-----------|------------------|--------------------|--------------------------------|-----------------------------------|-------------------------------|
| Direction | Modulation       | Frequency<br>(MHz) | RF<br>output<br>Power<br>(dBm) | RF output<br>channel Power<br>(W) | RF output<br>Power<br>(W/MHz) |
| Down-link | AWGN (LTE, 5MHz) | 2355.0             | 33.68                          | 2.33                              | 0.47                          |





# Clause 27.53(a) Spurious emissions at RF antenna connector

- (a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:
- (1) For base and fixed stations' operations in the 2305-2320 MHz band and the 2345-2360 MHz band:
- (i) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than 75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz; (ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz; (iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2362.5 MHz, 55 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2367.5 and 2370 MHz, and 75 + 10 log (P) dB above 2370 MHz.
- (5) 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 channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 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). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
- (7) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power;

Test date: 06/28/2017
Test results: Pass

### Special notes

- Broadband amplifiers: AWGN test signal used (5 MHz LTE channel)



Specification: FCC 27

# Clause 27.53 (h) Spurious emissions at RF antenna connector, continued

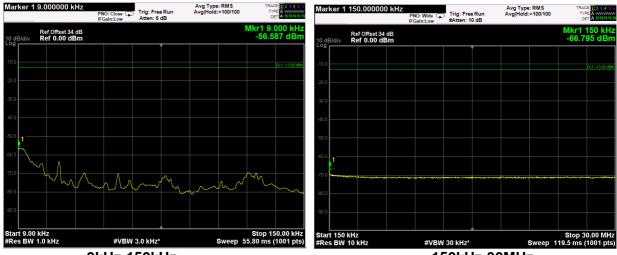
| Test data             |                         |                |                |
|-----------------------|-------------------------|----------------|----------------|
| See Plots below       |                         |                |                |
| Spurious emissions me | easurement results:     |                |                |
| Frequency<br>(MHz)    | Spurious emission (dBm) | Limit<br>(dBm) | Margin<br>(dB) |
| Low channel           |                         |                |                |
| First channel         | Negligible              | -13            |                |
|                       |                         |                |                |
| Mid channel           |                         |                |                |
| 2355 MHz              | Negligible              | -13            |                |
|                       |                         |                |                |
| High channel          |                         |                | l              |
| Last channel          | Negligible              | -13            |                |
|                       |                         |                |                |
| i                     |                         |                |                |



### Test data: spurious emissions at antenna terminal

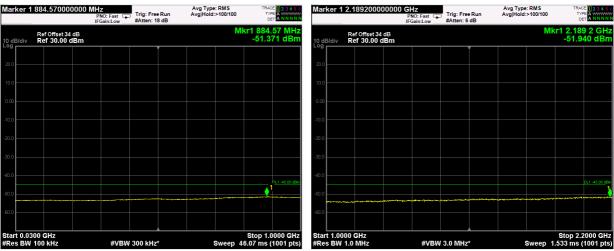
### **AWGN** signal

(Plots are referred to modulated carrier at the Middle Channel)



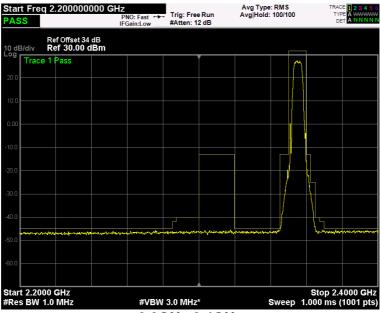
9kHz-150kHz

150kHz-30MHz

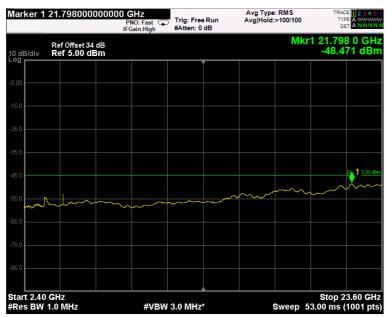


1GHz-2.2GHz





2.2GHz-2.4GHz



2.4GHz-23.6GHz

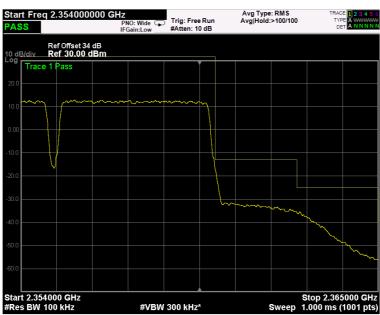


# Test data, continued: band edges Inter modulation

# AWGN signal, nominal input signal



**Low Band Edge** 



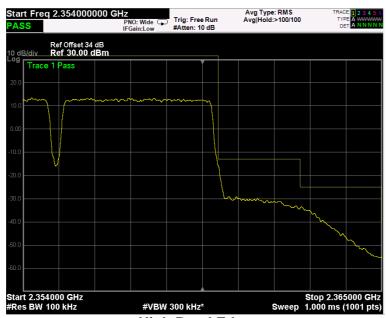
High Band Edge



# AWGN signal, nominal input signal + 3dB



**Low Band Edge** 



**High Band Edge** 



Specification: FCC 27

# Clause 27.53(a) Radiated Spurious emissions

- (a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:
- (1) For base and fixed stations' operations in the 2305-2320 MHz band and the 2345-2360 MHz band:
- (i) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than 75 + 10 log (P) dB on all frequencies between 2320 and 2345 MHz; (ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 70 + 10 log (P) dB on all frequencies between 2287.5 and 2300 MHz, 72 + 10 log (P) dB on all frequencies between 2285 and 2287.5 MHz, and 75 + 10 log (P) dB below 2285 MHz; (iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2362.5 MHz, 55 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2365 and 2367.5 MHz, 72 + 10 log (P) dB on all frequencies between 2367.5 and 2370 MHz, and 75 + 10 log (P) dB above 2370 MHz.
- (5) 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 channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 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). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
- (7) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power;

| Test date: 06/26/2016 |  |  |
|-----------------------|--|--|
| Test results: Pass    |  |  |
|                       |  |  |
| Special notes         |  |  |



Specification: FCC 27

# Clause 27.53(a) Radiated spurious emissions, continued

### Test data

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

The D.U.T. antenna connector was terminated by a 50  $\Omega$  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.

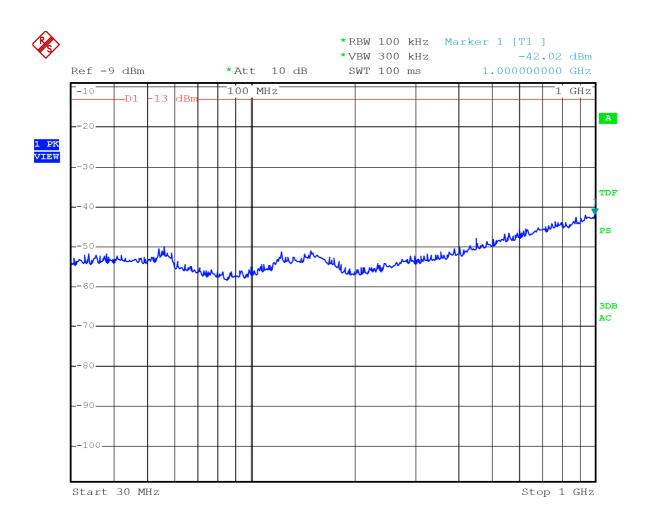
There were no emissions detected above the noise floor which was at least 20 dB below the specification limit.

Spurious emissions measurement results:

| Frequency<br>(MHz)  | Polarization.<br>V/H | Field strength (dBµV/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |  |  |
|---------------------|----------------------|-------------------------|-------------------|----------------|--|--|
| Low channel         |                      | ,                       |                   | ,              |  |  |
|                     |                      |                         |                   |                |  |  |
|                     |                      |                         |                   |                |  |  |
| Mai al ala ara a al |                      |                         |                   |                |  |  |
| Mid channel         | <u> </u>             | <u> </u>                | 1                 | <u> </u>       |  |  |
|                     |                      |                         |                   |                |  |  |
|                     |                      |                         |                   |                |  |  |
| High channel        | High channel         |                         |                   |                |  |  |
|                     |                      |                         |                   |                |  |  |
|                     |                      |                         |                   |                |  |  |
|                     |                      |                         |                   |                |  |  |

Note: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

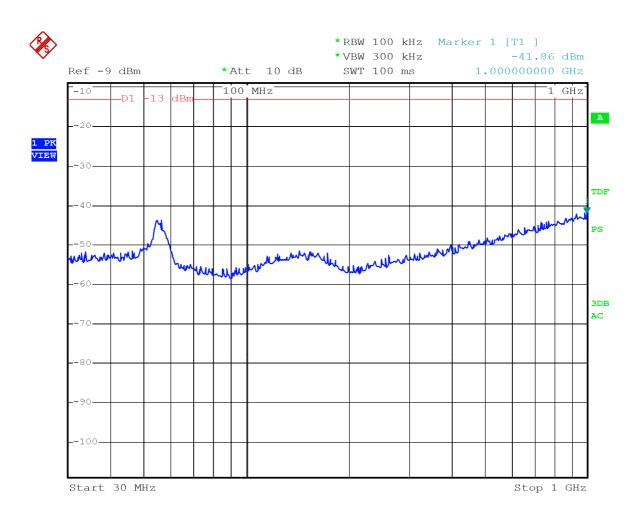




Date: 26.JUN.2017 16:22:47

30MHz-1GHz - H Pol

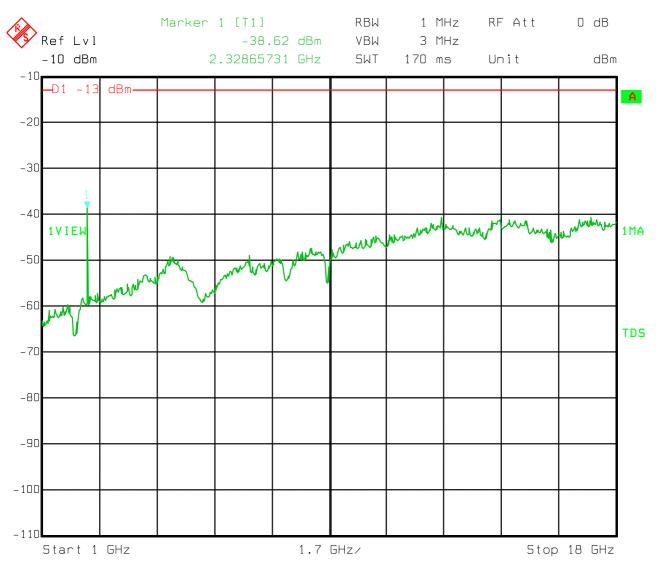




Date: 26.JUN.2017 16:21:25

30MHz-1GHz - V Pol

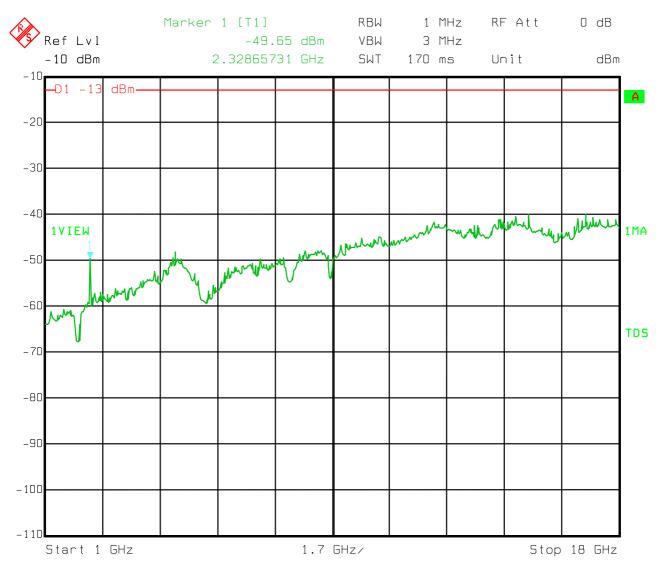




Date: 26.JUN.2017 11:23:03

1GHz-18GHz - H Pol



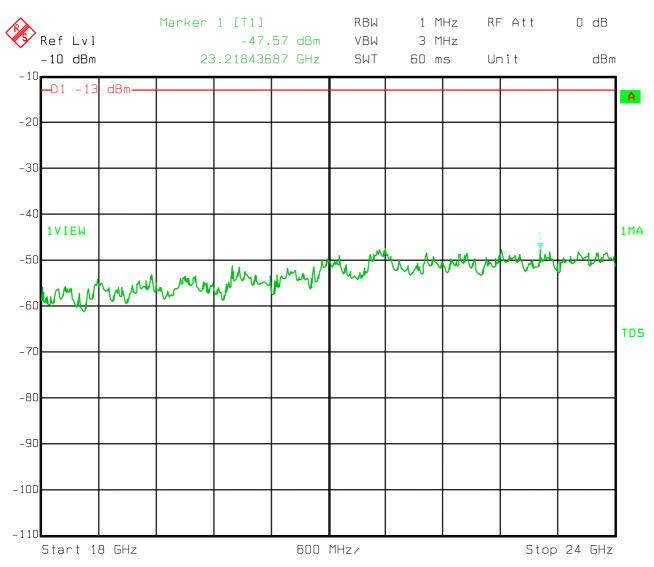


Date: 26.JUN.2017 11:19:22

1GHz-18GHz - V Pol





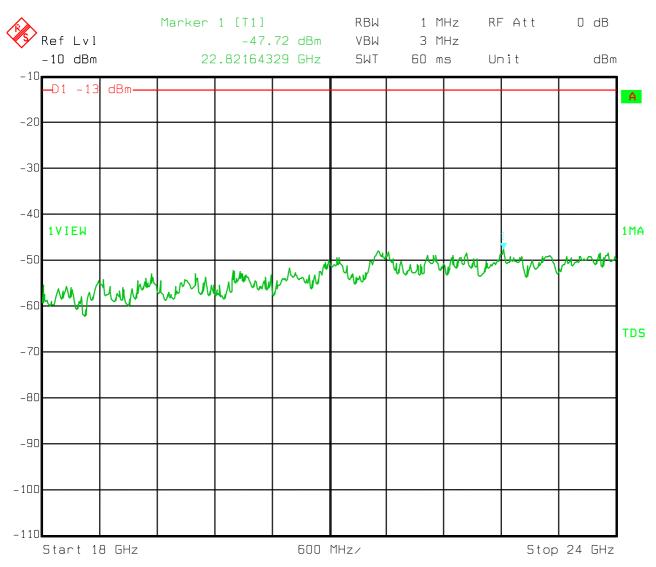


Date: 26.JUN.2017 15:43:30

18GHz-24GHz - H Pol





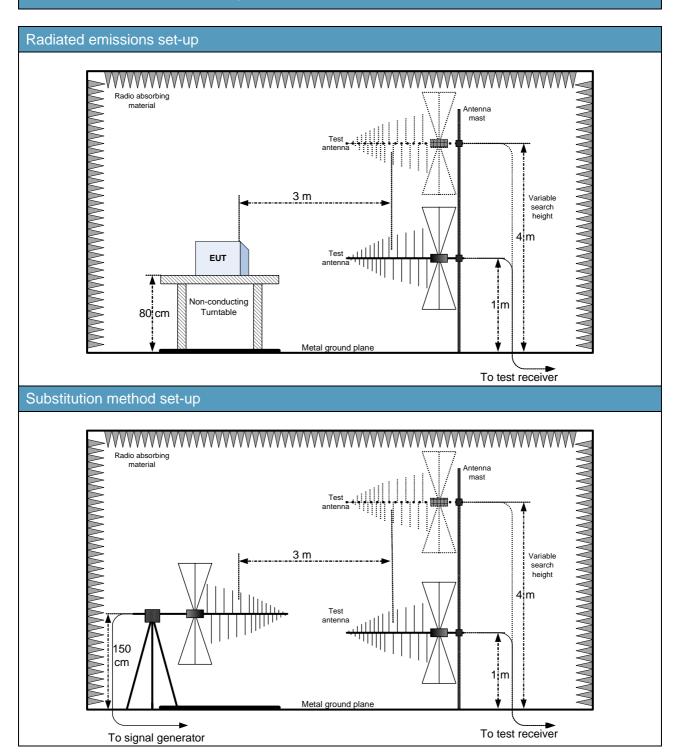


Date: 26.JUN.2017 15:40:52

18GHz-24GHz - V Pol



# Appendix B: Block diagrams of test set-ups

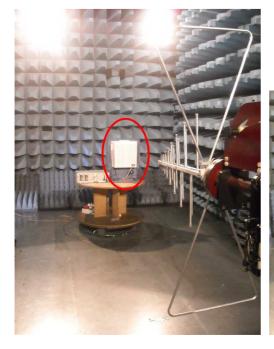




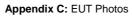
# Appendix C: EUT Photos

# Photo Set up













Product: TRM7E8AE19HAWX23AT

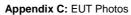




# Photo EUT









Specification: FCC 27



