

Report Reference ID:	309138-3TRFWL
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Test specification:	Title 47 – Telecommunication Chapter I – Federal Communications Commission Subchapter B – Common carrier services Part 27 – Miscellaneous wireless communications services
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Applicant:	TEKO Telecom Srl. Via Meucci, 24/a I-40024 Castel S. Pietro Terme (BO) (Italy)
Apparatus:	Enhanced Power Remote Unit
Model:	TRL8SC1925AT
FCC ID:	XM2- EP8SC1925

Testing laboratory:	Nemko Italy Spa Via del Carroccio, 4 20853 Biassono (MB) – Italy Telephone: +39 039 2201201 Facsimile: +39 039 2201221
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	Name and title	Date
Tested by:	Bulun Part  P. Barbieri, Wireless/EMC Specialist	2016-06-24
Reviewed by:	Curianis	2016-06-24
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# Table of contents

Section 1: 1.1	Report summary  Test specification	
1.2	Statement of compliance	4
1.3	Exclusions	4
1.4	Registration number	4
1.5	Test report revision history	4
1.6	Limits of responsibility	4
<b>Section 2:</b> 2.1	Summary of test results	
<b>Section 3:</b> 3.1	Equipment under test (EUT) and application details	
3.2	Modular equipment	6
3.3	Product details	6
3.4	Application purpose	6
3.5	Composite/related equipment	7
3.6	Sample information	7
3.7	EUT technical specifications	7
3.8	Accessories and support equipment	8
3.9	Operation of the EUT during testing	9
3.10	EUT setup diagram	9
Section 4: 4.1	Engineering considerations	
4.1 4.2	Deviations from laboratory tests procedures	
4.2 4.3	Technical judgment	
_	Test conditions	
5.1	Deviations from laboratory tests procedures	
5.2	Test conditions, power source and ambient temperatures	11
5.3	Measurement uncertainty	12
5.4	Test equipment	12
<b>Appendix</b> Aclause 935	A: Test results210 D05v01 (3.2) AGC threshold	. <b>13</b> 13
Clause 935	210 D05v01 (3.3) Out of band rejection	14
Clause 27.	53(m)(6) Occupied bandwidth	15
Clause 27.	50(h) Peak output power at RF antenna connector	17
Clause 27.	53(m) Spurious emissions at RF antenna connector	20





Clause 27.53(m) Radiated Spurious emissions	25
Appendix B: Block diagrams of test set-ups Appendix C: EUT Photos	33 34



ımmary **Product**: TRL8SC1925AT

Specification: FCC 27

# 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

Test site FCC
ID number

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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Specification: FCC 27

# Section 2: Summary of test results

2.1 FCC Part	Part 27, tes	Test description	Verdict
	§ 935210 D05v01 (3.2)	AGC threshold	Pass
	§ 935210 D05v01 (3.3)	Out of band rejection	Pass
§27.53(m)(6)	§ 935210 D05v01 (3.4)	Occupied bandwidth	Pass
§27.50(h)	§ 935210 D05v01 (3.5)	Peak output power at RF antenna connector	Pass
§27.53(m)	§ 935210 D05v01 (3.6)	Spurious emissions at RF antenna connector	Pass
§27.53(m)	§ 935210 D05v01 (3.8)	Radiated spurious emissions	Pass
§27.54	§ 935210 D05v01 (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)

Nemko

Specification: FCC 27

Product: TRL8SC1925AT

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

3.1 Applicant of	letails	
Applicant	Name:	Teko Telecom Srl
complete	Federal	TERO TELECOTT OTT
business name	Registration	0018963462
baomood namo	Number (FRN):	0010300402
	Grantee code	XM2
Mailing address	Address:	Via Meucci, 24/a
maning data occ	City:	Castel S. Pietro Terme
	Province/State:	Bologna
	Post code:	40024
	Country:	Italy
	Oddiniy.	italy
3.2 Modular ed		
a) Single modular	Single modular approval	
approval	Yes 🗌	No ⊠
b) Limited single	Limited single modular approval	
modular approval	Yes 🗌	No 🗵
3.3 Product de	etails	
FCC ID	Grantee code:	XM2
	Product code:	-EP8SC1925
Equipment class	B2I	
Description of	Booster	
product as it is	Model	TRL8SC1925AT
marketed	name/number:	
	Serial number:	1004837001
3.4 Application	n purpose	
Type of	Original certi	fication
application		entification of presently authorized equipment
	Original FCC	CID: Grant date:
	☐ Class II pern	nissive change or modification of presently authorized
	equipment	-



Specification: FCC 27

# 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	S Sample information		
Receipt date:	2016-06-20		
Nemko sample ID number:			

3.7 EUT techn	ical specifications
Operating band:	Down Link – Up Link: 2496–2690 MHz
Operating frequency:	Wideband
Modulation type:	LTE-TDD (QAM and QPSK)
Occupied bandwidth:	LTE: 5 MHz, 10 MHz, 15 MHz, 20 MHz
Channel spacing:	standard
Emission designator:	LTE: D7W
RF Output	Down Link: 31dBm (1,25W) Up Link: N.A. (The EUT does not transmit over the air in the up-link direction)
Gain	Down Link: 36dB 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: TRL8SC1925AT

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.



Product: TRL8SC1925AT

# 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
Judgment	None



Specification: FCC 27

# Section 5: Test conditions

# Deviations from laboratory tests procedures

No deviations were made from laboratory test procedures.

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.

Vector Signal Generator  Vector Signal Generator  Vector Signal Generator  Agilent  Agilent  E4438C ESG  MY450  Spectrum Analyzer  Agilent  N9030A PXA  MY531  Network Analyzer  Agilent  V-network  R & S  ESH2-Z5  872 46  Trilog Broad Band Antenna 25-2000 MHz  Trilog Broad Band Antenna 25-8000 MHz  Schwarzbeck  VULB 9162  VULB	Serial No.     Next cal.       051238     Jan 2018       094485     Ago 2016       120882     Jun 2016       106183     Jun 2016       50/041     11/2016       9168-242     06/2018       9162-25     07/2018       9148-123     06/2018
Generator         Agilent         NS172B EAG         MY530           Vector Signal Generator         Agilent         E4438C ESG         MY450           Spectrum Analyzer         Agilent         N9030A PXA         MY531           Network Analyzer         Agilent         E5071C ENA         MY461           V-network         R & S         ESH2-Z5         872 46           Trilog Broad Band Antenna 25-2000 MHz         Schwarzbeck         VULB 9168         VULB           Trilog Broad Band Antenna 25-8000 MHz         Schwarzbeck         VULB 9162         VULB           Antenna 1-18 GHz         Schwarzbeck         STLP 9148         STPL 9           Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100202           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	Ago 2016  120882 Jun 2016  106183 Jun 2016  50/041 11/2016  9168-242 06/2018  9162-25 07/2018
Generator         Agilent         E4438C ESG         M1430           Spectrum Analyzer         Agilent         N9030A PXA         MY531           Network Analyzer         Agilent         E5071C ENA         MY461           V-network         R & S         ESH2-Z5         872 46           Trilog Broad Band Antenna 25-2000 MHz         Schwarzbeck         VULB 9168         VULB           Trilog Broad Band Antenna 25-8000 MHz         Schwarzbeck         VULB 9162         VULB           Antenna 1-18 GHz         Schwarzbeck         STLP 9148         STPL 9           Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz + 8 GHz         R&S         ESU8         100202           EMI receiver 20 Hz + 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	Jun 2016 106183 Jun 2016 50/041 11/2016 9168-242 06/2018 9162-25 07/2018
Network Analyzer         Agilent         E5071C ENA         MY461           V-network         R & S         ESH2-Z5         872 46           Trilog Broad Band Antenna 25-2000 MHz         Schwarzbeck         VULB 9168         VULB           Trilog Broad Band Antenna 25-8000 MHz         Schwarzbeck         VULB 9162         VULB           Antenna 1-18 GHz         Schwarzbeck         STLP 9148         STPL 9           Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100203           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	106183     Jun 2016       50/041     11/2016       9168-242     06/2018       9162-25     07/2018
V-network         R & S         ESH2-Z5         872 46           Trilog Broad Band Antenna 25-2000 MHz         Schwarzbeck         VULB 9168         VULB           Trilog Broad Band Antenna 25-8000 MHz         Schwarzbeck         VULB 9162         VULB           Antenna 1-18 GHz         Schwarzbeck         STLP 9148         STPL 9           Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100203           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	50/041     11/2016       9168-242     06/2018       9162-25     07/2018
Trilog Broad Band Antenna 25-2000 MHz         Schwarzbeck         VULB 9168         VULB           Trilog Broad Band Antenna 25-8000 MHz         Schwarzbeck         VULB 9162         VULB           Antenna 1-18 GHz         Schwarzbeck         STLP 9148         STPL 9           Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100202           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	9168-242 06/2018 9162-25 07/2018
Antenna 25-2000 MHz         Schwarzbeck         VOLB 9168         VOLB           Trilog Broad Band Antenna 25-8000 MHz         Schwarzbeck         VULB 9162         VULB           Antenna 1-18 GHz         Schwarzbeck         STLP 9148         STPL 9           Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100203           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	9162-25 07/2018
Antenna 25-8000 MHz         Schwarzbeck         VOLB 9162         VOLB 9162           Antenna 1-18 GHz         Schwarzbeck         STLP 9148         STPL 9           Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100203           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	
Double ridge waveguide horn         RFspin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100200           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100880           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	9148-123 06/2018
waveguide horn         RFSpin         DRH40         061100           Preamplifier 18-40 GHz         Miteq         JS44         164860           Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100203           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	
Broadband preamplifier 1-18 GHz         Schwarzbeck         BBV 9718         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100203           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	6A40 08/2016
1-18 GHz         Scriwarzbeck         BBV 97 18         9718-1           EMI receiver 20 Hz ÷ 8 GHz         R&S         ESU8         100203           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	65 12/2016
GHz         R&S         ESU8         10020.           EMI receiver 20 Hz ÷ 3 GHz         R&S         ESCI         100886           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	137 10/2016
GHz         R&S         ESCI         10088           Hydraulic revolving platform         Nemko         RTPL 01         4.233           Turning-table         R&S         HCT         835 80	2 04/2017
platform RIPL 01 4.233 Turning-table R&S HCT 835 80	8 09/2016
	NCR
Antenna mast R&S HCM 836 52	03/03 NCR
	9/05 NCR
Controller R&S HCC 836 62	20/7 NCR
Spectrum Analyzer 9kHz ÷ 40GHz R&S FSEK 84825	5/005 11/2016
Semi-anechoic chamber Nemko 10m semi-anechoic chamber 530	09/2016
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 9012-1	<u> </u>
Motor controller Emco 1061-1.521 9012-1	559 NCR
Antenna Tower Emco 2071-2 9601-1	
Controller pole/table Emco 2090 9511-1	1508 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: 2016-06-21

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

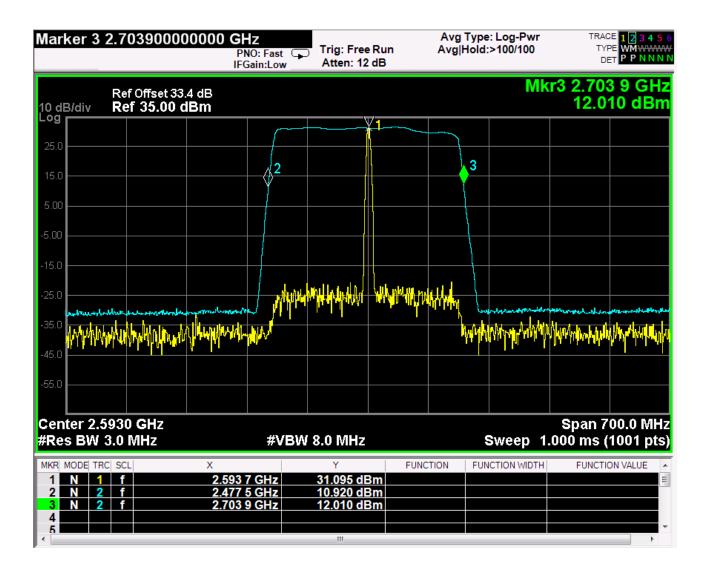
# Clause 935210 D05v01 (3.3) Out of band rejection

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

Test date: 2016-06-21
Test results: Pass

Special notes

#### Test data





Specification: FCC 27

# Clause 27.53(m)(6) 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: 2016-06-21

Test results: Pass

# Special notes

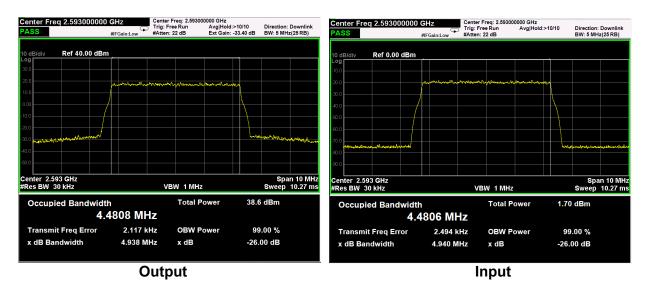
- Broadband amplifiers: AWGN test signal used (5 MHz LTE channel)

Specification: FCC 27

#### Clause 27.53(m)(6) Occupied bandwidth, continued

#### Test data

#### AWGN signal, nominal input signal



# AWGN signal, nominal input signal + 3dB



Output Input



Specification: FCC 27

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

## § 27.50(h) The following power limits shall apply in the BRS and EBS:

- (1) Main, booster and base stations.
  - (i) The maximum EIRP of a main, booster or base station shall not exceed 33 dBW  $\pm$  10log(X/Y) dBW, where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition, except as provided in paragraph (h)(1)(ii) of this section.
  - (ii) If a main or booster station sectorizes or otherwise uses one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern, the maximum EIRP in dBW in a given direction shall be determined by the following formula: EIRP =  $33 \text{ dBW} + 10 \log(\text{X/Y}) \text{ dBW} + 10 \log(360/\text{beamwidth}) \text{ dBW}$ , where X is the actual channel width in MHz, Y is either (i) 6 MHz if prior to transition or the station is in the MBS following transition or (ii) 5.5 MHz if the station is in the LBS and UBS following transition, and beamwidth is the total horizontal plane beamwidth of the individual transmitting antenna for the station or any sector measured at the half-power points.

Test date: 2016-06-21
Test results: Pass

#### Special notes

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



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

Test data

#### AWGN signal, nominal input signal

Test data						
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	RF output Power (W/MHz)	PAR (dB)
Down-link	AWGN (LTE, 5MHz)	2593.0	31.18	1.31	0.26	11.31



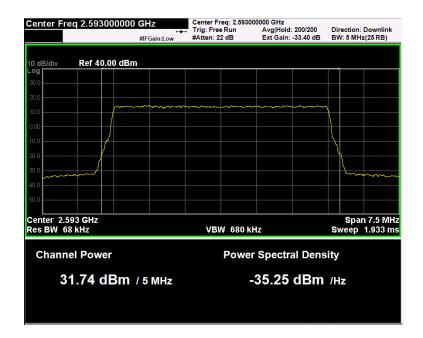
PAR measure is performed by the "CCDF" function installed on Spectrum analyzer that provides average power (the same measured with "Channel power" function), peak power and PAR.



Specification: FCC 27

# AWGN signal, nominal input signal + 3dB

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	RF output Power (W/MHz)		
Down-link	AWGN (LTE, 5MHz)	2593.0	31.74	1.49	0.3		





Specification: FCC 27

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

- (m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.
- (2) For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:
- (6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz 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; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent 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 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 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. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

Test date: 2016-06-21
Test results: Pass

#### Special notes

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



Specification: FCC 27

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

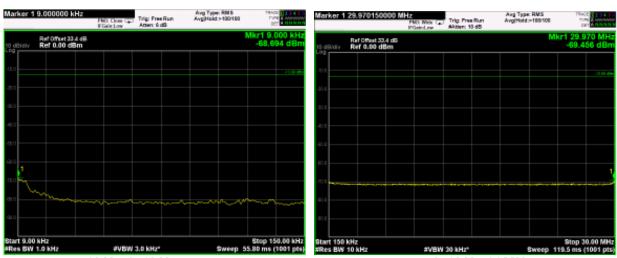
Test data			
See Plots below			
Spurious emissions me	easurement results:		
Frequency (MHz)	Spurious emission (dBm)	Limit (dBm)	Margin (dB)
Low channel			
First channel	Negligible	-13	
Mid channel			
2593 MHz	Negligible	-13	
High channel			
Last channel	Negligible	-13	



#### Test data, continued: spurious emissions at antenna terminal

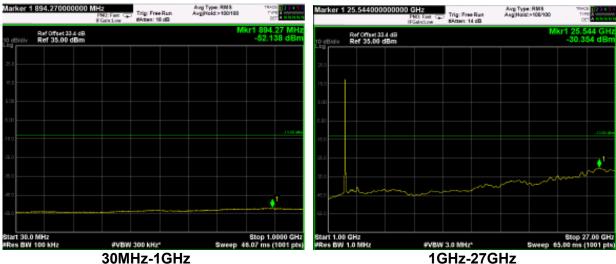
## **AWGN** signal

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



9kHz-150kHz

150kHz-30MHz



1GHz-27GHz



## Test data, continued: band edges Inter modulation

## AWGN signal, nominal input signal



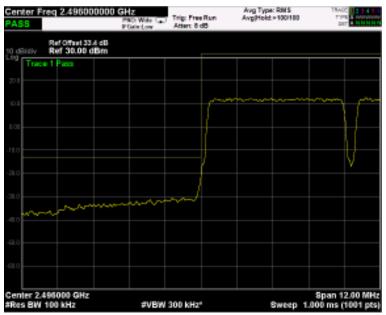
**Low Band Edge** 



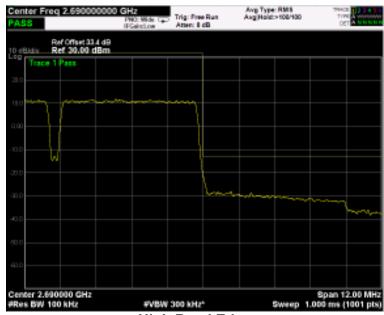
**High Band Edge** 



## AWGN signal, nominal input signal + 3dB



**Low Band Edge** 



**High Band Edge** 



Product: TRL8SC1925AT

## Clause 27.53(m) Radiated Spurious emissions

- (m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.
- (2) For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:
- (6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz 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; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent 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 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 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. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

Test date: 2016-06-20/21	
Test results: Pass	
Special notes	



Specification: FCC 27

#### Clause 27.53(m) 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.

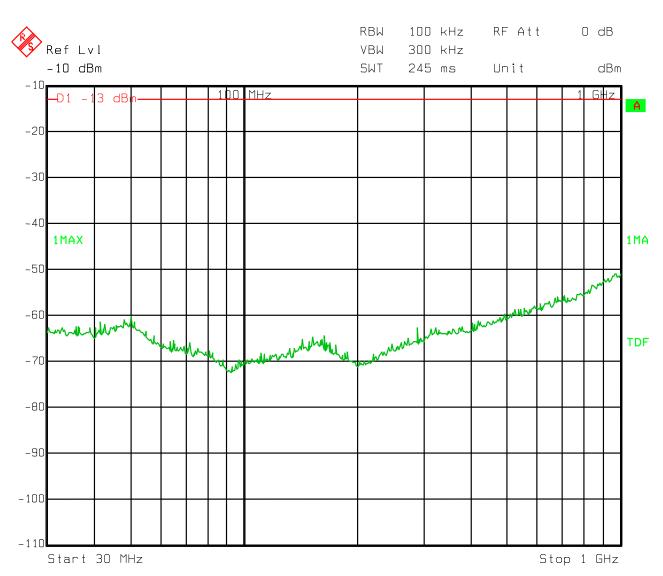
There were no emissions detected above the noise floor which was at least 20 dB below the specification limit.

Spurious emissions measurement results:

Frequency (MHz)	Polarization. V/H	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	
Low channel	VIII	(αυμν/ιιι)	(αυμν/ιιι)	(u <i>b)</i>	
LOW CHAINICI					
Mid channel		L		L	
High channel					
_					

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

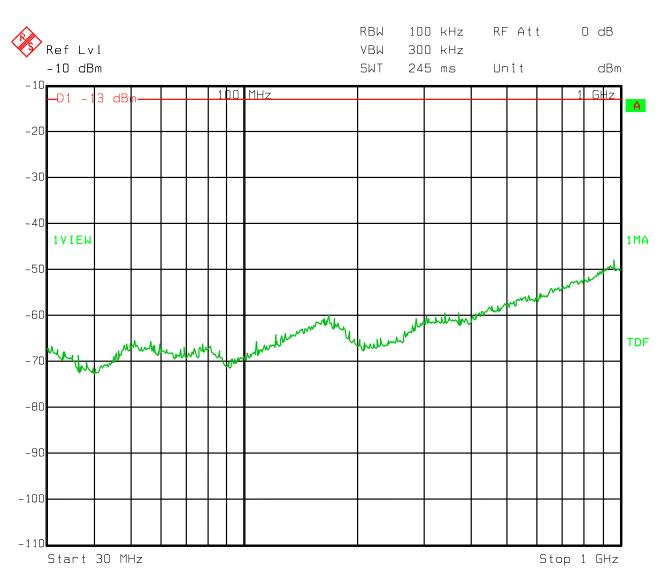




Date: 20.JUN.2016 15:49:30

30MHz-1GHz - H Pol

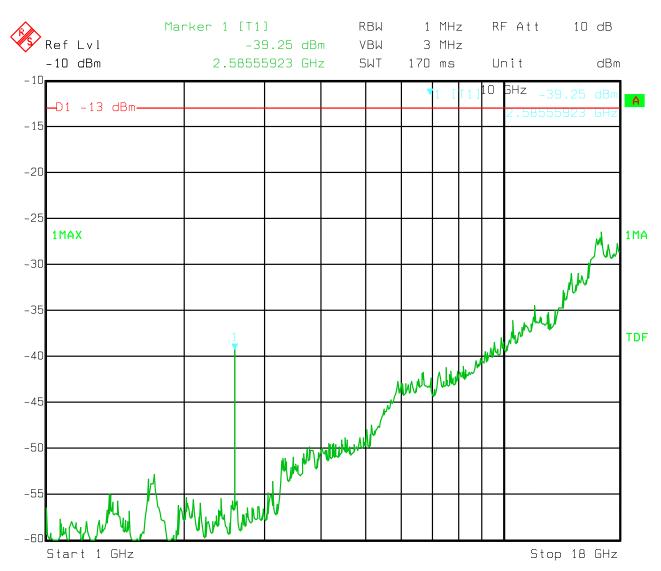




Date: 20.JUN.2016 15:47:58

30MHz-1GHz - V Pol

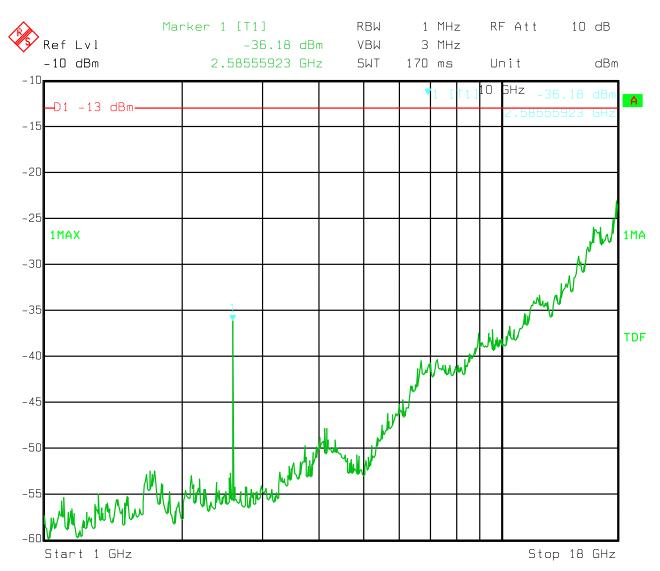




Date: 21.JUN.2016 07:06:42

1GHz-18GHz - H Pol

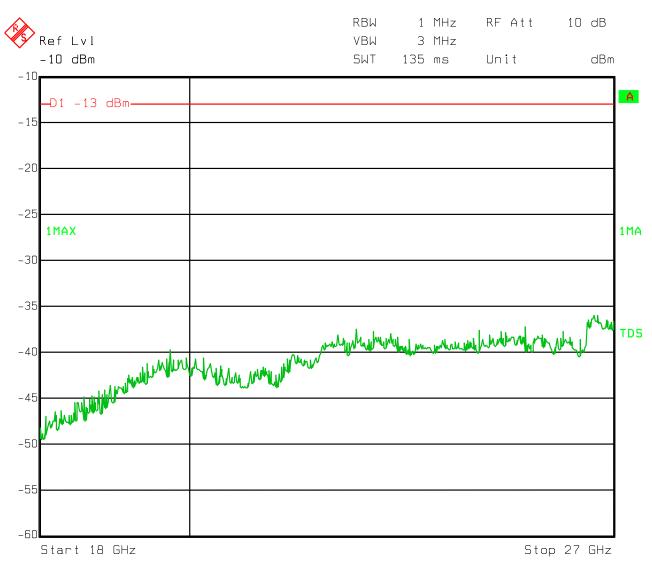




Date: 21.JUN.2016 07:09:27

1GHz-18GHz - V Pol

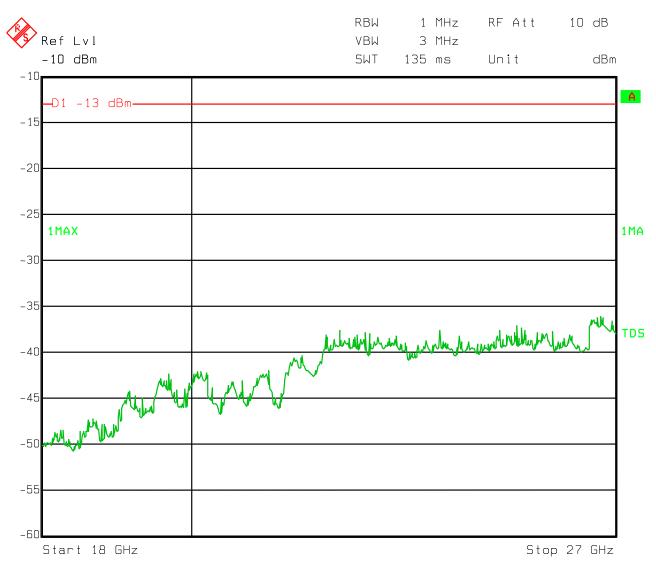




Date: 21.JUN.2016 07:40:34

18GHz-27GHz - H Pol





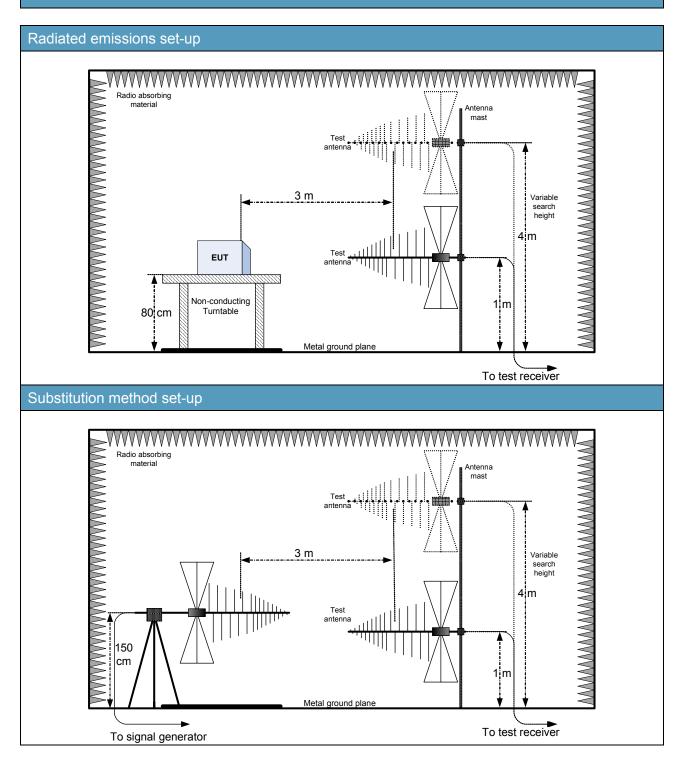
Date: 21.JUN.2016 07:42:09

18GHz-27GHz - V Pol



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# Appendix B: Block diagrams of test set-ups



Nemko

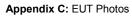
Product: TRL8SC1925AT

Specification: FCC 27

# Appendix C: EUT Photos

## Photo Set up





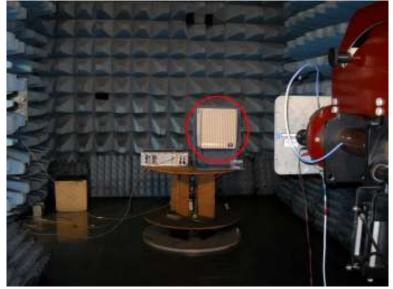
Nemko

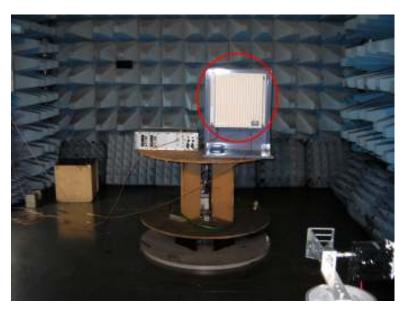




Specification: FCC 27







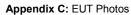


Specification: FCC 27

# Photo EUT









Product: TRL8SC1925AT

