

# Test Report on

SmartFlex BL310

HW: 1.0 SW: 6.3.3 (SVN:32)

According to NAPRD.03 v.6.4

**Test Report Reference:** MDE\_ADVANT\_2102\_PTCRB\_02

**Date:** 2022-03-03

**Test Laboratory:**

7layers GmbH  
Borsigstraße 11  
40880 Ratingen  
Germany

**Note:**

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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A Bureau Veritas Group Company

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## 1 Administrative Data

### 1.1 Project Information

Project Name	MDE_ADVANT_2102
Responsible for Testing	Roseelan Sathiyaseelan
Date of Report	2022-03-03
Testing Time Frame	2022-01-27 to 2022-01-31

Note: All date and time information is reported in UTC.

### 1.2 Applicant Information

Company	Advantech Czech s.r.o.
Address	Sokolska 71 562 04 Usti nad Orlici
Contact Person	Czech Republic Eduard Duskocil

### 1.3 Test Laboratory Information

The following list shows all Locations and Test Resources involved in the generation of test results:

#### **7layers DE, Ratingen, Germany**

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Company Name	7layers GmbH
Address	Borsigstr. 11 40880 Ratingen NRW Germany
Contact	Michael Albert
Phone	+49 2102 749 201
Email	Michael.Albert@bureauveritas.com
Laboratory accreditation no.	DAkKS D-PL-12140-01-01  -02   -03

#### **List of Test Resources**

<b>ID</b>	<b>Name</b>	<b>Responsible</b>	<b>Accreditation Info</b>
1	Radiated Emissions FAR	Marco Kullik Jens Doerwald	DAkKS D-PL-12140-01-01   -02   -03, ISED CAB Identifier: DE0007 (3699A), FCC accreditation registration no.: DE0015

**1.4 Signature of responsible for testing**




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Roseelan Sathiyaseelan

**1.5 Signature of responsible for accreditation scope**




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Michael Albert

**1.6 Revision History**

Report version control			
Version	Release date	Change Description	Version validity
initial	2022-03-03	--	valid
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## 2 Test Object Data

### 2.1 Object Under Test (OUT) Description(s)

The following section lists all Objects Under Test (OUTs) involved during testing.

#### Object Under Test: SmartFlex BL310

Type / Model	SmartFlex BL310
Description	Industrial Cellular Router
Normal Temperature	23 °C
Normal Voltage	12 V

#### Manufacturer:

Company	Advantech Czech s.r.o.
Address	Sokolska 71 562 04 Usti nad Orlici
Contact Person	Czech Republic Eduard Duskocil

## 3 Results

### 3.1 General

**Documentation of tested devices**

Available at the test laboratory.

**Interpretation of the test results**

The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device conforms to the applied standard.

In cases where 'Declaration' is stated, the required documents are available in the manufacturer's product documentation.

In cases where 'not applicable' is stated, the test case requirements are not relevant to the specific equipment implementation.

**Notes**

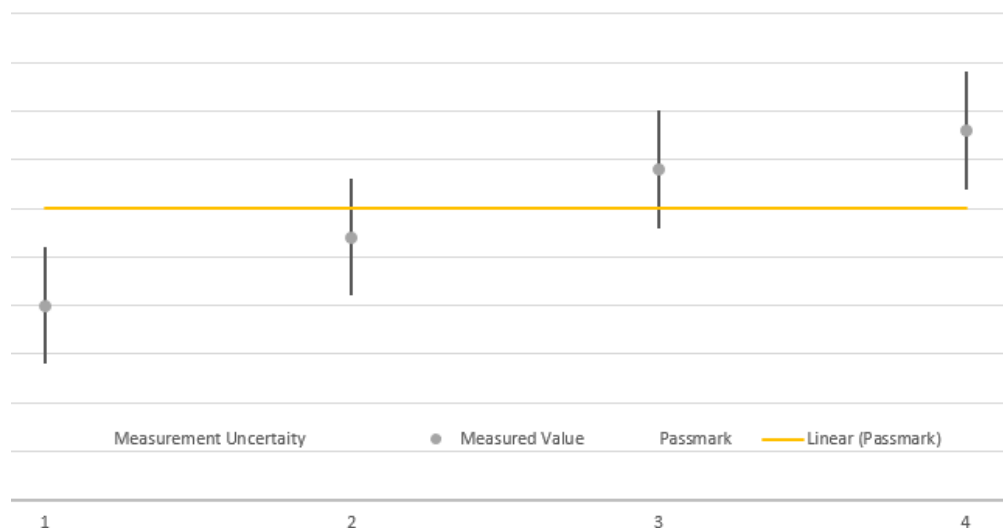
1. This partial report contains the abbreviated information content pertaining to services rendered. Supporting documentation not included herein is maintained and available at the test laboratory.
2. All tests are performed under environmental conditions within the requirements of the specifications. Environmental condition records are available at the test laboratory.
3. Device contains integrated module Quectel EG25-G (HW: R1.0, SW: EG25GGDR07A08M2G)

### 3.2 Measurement uncertainties

Parameter	Uncertainty
Occupied channel Bandwidth	± 5%
Radiated Emissions	30 MHz – 180 MHz: ± 4.4 dB 180 MHz – 26 GHz: ± 2.3 dB
Spurious emissions, conducted	0.2 – 1 dB (*)
Transmitter tests, conducted	0.2 – 0.7 dB (*)
Receiver tests, conducted	0.2 – 0.7 dB (*)
Frequency error, conducted	< 6 Hz (*)
Phase error, conducted	0.6° – 6° (*)
Temperature	± 0.3 °C
Humidity	± 3%
DC and low frequency voltages	± 1.5% + 2 digits
Time	± 5%
Duty Cycle	± 5%

(\*) Depending on the used test resource and the performed test case the uncertainty is in the given range. Detailed documentation is available at 7layers GmbH.

The measurement uncertainties for all parameters are calculated with an expansion factor (coverage factor)  $k = 1.96$ . This means, that the true value is in the corresponding interval with a probability of 95 %.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.



### 3.3 Applicable Quality Policies

<b>Quality Policy</b>	<b>Version</b>	<b>Expiration Date</b>
NAPRD03	6.4	

### 3.4 Applicable Test Specification(s)

Test Specification	3GPP TS 36.124
Version	V16.1.0
Description	ElectroMagnetic Compatibility (EMC) requirements for mobile terminals and ancillary equipment (Release 16)

### 3.5 Result Statistics

Test Specification	Total	Result Verdict					Pass ratio
		Pass	Fail	Declaration	Blocked	Performed	
3GPP TS 36.124	8	8	0	0	0	0	100.00 %

Note: Pass, Declaration, Performed, Fail and Inconclusive results are regarded for the pass ratio calculation. Pass, Performed and Declaration are summarized as Pass results. Fail and Inconclusive are summarized as Fail results. All are summarized as total count (Pass + Declaration + Performed + Fail + Inconclusive). The pass ratio is calculated by the number of Pass results divided by the number of total results. All other results like Error, Not Tested or Blocked are not regarded for the calculation.

### 3.6 Result Summary

#### 3.6.1 Pass Results

#### Test Specification: 3GPP TS 36.124

Test Case Name / Description Test Condition	Category	Verdict	Date	Test Res. ID	Sample/Setup
<b>8.2 / Radiated Emission</b>					
Band = eFDD7, Part = traffic <sup>1</sup>	A	Passed	2022-01-31	TR 1	S02_aa01
Band = eFDD13, Part = traffic <sup>1</sup>	A	Passed	2022-01-28	TR 1	S02_aa01
Band = eFDD12, Part = traffic <sup>1</sup>	A	Passed	2022-01-28	TR 1	S02_aa01
Band = eFDD4, Part = idle	A	Passed	2022-01-28	TR 1	S02_aa01
Band = eFDD4, Part = traffic <sup>1</sup>	A	Passed	2022-01-27	TR 1	S02_aa01
Band = eTDD41, Part = traffic <sup>1</sup>	A	Passed	2022-01-31	TR 1	S02_aa01
Band = eFDD5, Part = traffic <sup>1</sup>	A	Passed	2022-01-28	TR 1	S02_aa01
Band = eFDD25, Part = traffic <sup>1</sup>	A	Passed	2022-01-31	TR 1	S02_aa01

<sup>1</sup> According to PTCRB rules only frequency ranges for harmonics were checked for this test.

## 4 Test Equipment Details

### 4.1 List of Test Equipment

The information shown below is valid for the testing time frame of this test report.

#### Test Resource 1: Radiated Emissions FAR

Description: Radiated Emissions in a fully anechoic room

##### Single Devices of Test Resource Radiated Emissions FAR

Name	Serial Number	Manufacturer		
3160-09	00083069	EMCO Elektronik GmbH		
3160-10	00086675	EMCO Elektronik GmbH		
4HC1600/12750-1.5-KK	9942011	Trilithic		
5HC2700/12750-1.5-KK	9942012	Trilithic		
5HC3500/18000-1.2-KK	200035008	Trilithic		
AFS42-00101800-25-S-42	2035324	Miteq		
AMF-7D00101800-30-10P-R		Miteq		
Fluke 177	86670383	Fluke Europe B.V.		
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>	
	Calibration	2020-04	2022-04	
Name	Serial Number	Manufacturer		
FSW 43	103779	Rohde & Schwarz		
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>	
	Calibration	2021-06	2023-06	
	<i>Software Version</i>	<i>Start Date</i>	<i>End Date</i>	
	Instrument Firmware: 4.21	2019-02-14		
Name	Serial Number	Manufacturer		
HF 907	102444	Rohde & Schwarz		
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>	
	Calibration	2021-09	2024-09	
Name	Serial Number	Manufacturer		
HL 562 ULTRALOG	100609	Rohde & Schwarz GmbH & Co. KG		
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>	
	Calibration	2019-05	2022-05	
Name	Serial Number	Manufacturer		
JS4-18002600-32-5P	849785	Miteq		
Opus 20 THI (8120.00)	115.0318.0802.033	Lufft Mess- und Regeltechnik GmbH		
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>	
	Calibration	2020-10	2022-10	

Name	Serial Number	Manufacturer	
Opus10 TPR (8253.00)	13936	Lufft Mess- und Regeltechnik GmbH	
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>
	Calibration	2021-10	2023-10
Name	Serial Number	Manufacturer	
VLFX-650+	15542	Mini-Circuits	
WHKX 7.0/18G-8SS	09	Wainwright Instruments GmbH	

#### Test System Anechoic Chamber 03 of Test Resource Radiated Emissions FAR

Description:	Anechoic Chamber; 8.8 m x 4.6 m x 4.05 m for Radiated Spurious Emissions and Output Power Measurements		
Manufacturer:	see single devices		
Serial Number:	see single devices		
	<i>Software Version</i>	<i>Start Date</i>	<i>End Date</i>
	SW Update to EMC32 v10.60.10 (additional patch installed)	2020-03-09	

#### Single Devices of Test System Anechoic Chamber 03

Name	Serial Number	Manufacturer	
Anechoic Chamber 03	P26971-647-001-PRB	Albatross Projects	
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>
	Calibration	2021-04	2023-04
Name	Serial Number	Manufacturer	
ASP 1.2/1.8-10 kg	-	Maturo GmbH	
PAS 2.5 - 10 kg	-	Maturo GmbH	
TD1.5-10kg	TD1.5-10kg/024/3790709	Maturo GmbH	
TT 1.5 WI	-	Maturo GmbH	

#### Test System Digital Signalling Devices of Test Resource Radiated Emissions

Description:	Signalling equipment for various wireless technologies.
Manufacturer:	see single devices
Serial Number:	see single devices

#### Single Devices of Test System Digital Signalling Devices

Name	Serial Number	Manufacturer	
CMW 500	167766-By	Rohde & Schwarz GmbH & Co. KG	
	<i>Event</i>	<i>Execution Date</i>	<i>Next Execution</i>
	Calibration	2019-07	2022-07

## 5 Annex

### 5.1 Object Under Test (OUT) Features

Supported Features for Object Under Test: SmartFlex BL310

Name	Short Description
<b>3GPP TS 36.521-2</b>	
A.4.1-1/1	E-UTRA FDD
A.4.1-1/2	E-UTRA TDD
A.4.3-3/1	eFDD1
A.4.3-3/2	eFDD2
A.4.3-3/3	eFDD3
A.4.3-3/4	eFDD4
A.4.3-3/5	eFDD5
A.4.3-3/7	eFDD7
A.4.3-3/8	eFDD8
A.4.3-3/12	eFDD12
A.4.3-3/13	eFDD13
A.4.3-3/18	eFDD18
A.4.3-3/19	eFDD19
A.4.3-3/20	eFDD20
A.4.3-3/25	eFDD25
A.4.3-3/26	eFDD26
A.4.3-3/38	eTDD38
A.4.3-3/39	eTDD39
A.4.3-3/40	eTDD40
A.4.3-3/41	eTDD41
A.4.3-3b/2	UE Power Class 3

### 5.2 Sample aa01

**Sample Name: aa01**

Object Under Test	SmartFlex BL310
Description	Industrial Cellular Router
Serial Number	861861040754635
Hardware Version	1.0
Software Version	6.3.3

Parameter Name	Value
IMEI	861861040754630

### 5.3 Setup Description(s)

For each setup a relation is given to determine if and which samples and auxiliary equipment have been used as part of each respective setup.

Setup	Combination of samples and auxiliary equipment	Description
S02_aa01	aa01, ANC 1, ANC 5, ANC 2, ANC 3, ANC 4	

### 5.4 Auxiliary Equipment

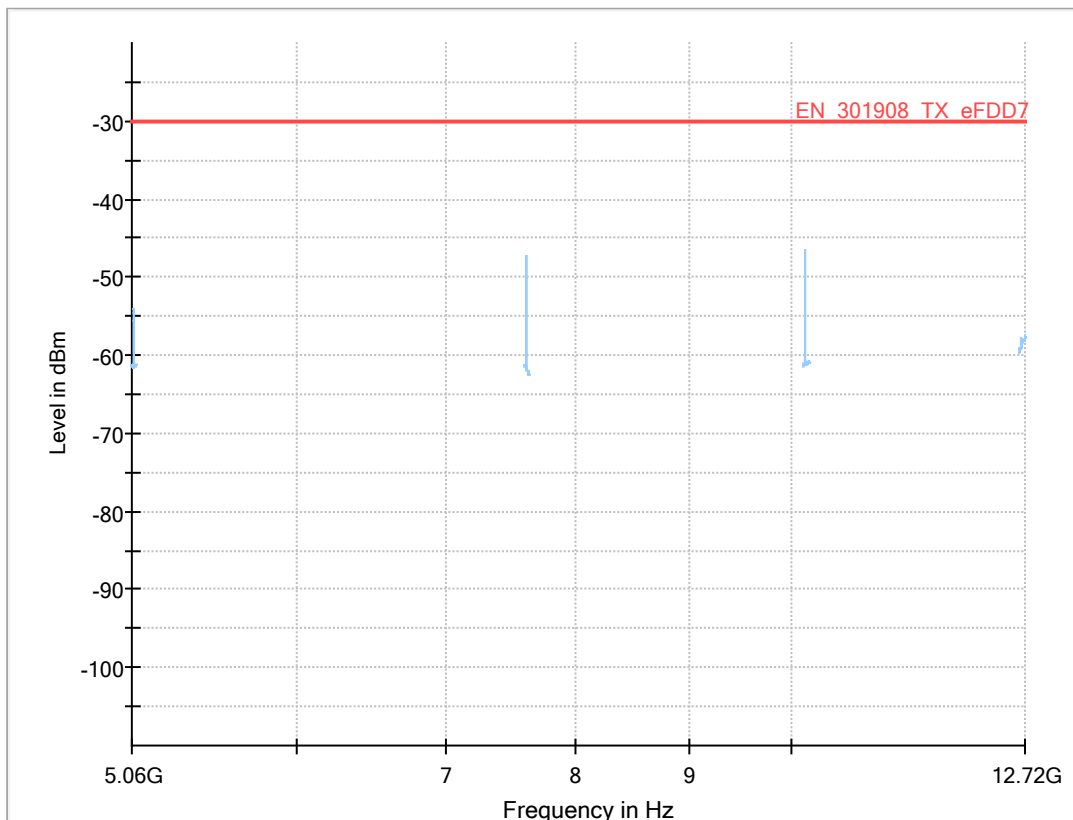
Device	Details (Manufacturer, HW, SW, S/N)	Reason for use
ANC 1	Advantech, Type:2JW0124Z-C868B -	LTE Antenna (ANT/DIV)
ANC 2	P/N: BB-2JW0124Z-C868B Sunny Computer Technology Europe -	ACDC Adapter
ANC 3	P/N: BB-RPS-v3-MO2-M Advantech, AQ-A2458G-FSRPK -	WiFi Antenna
ANC 4	P/N: BB-AW-A2458G-FSRPK Advantech, AP-AGNSS-SMA - P/N: BB-AP-AGNSS-SMA	GPS Antenna
ANC 5	P/N: BB-KD-ETH -	Ethernet cross cable

## 5.5 Result Details

### 8.2 / Radiated Emission

8.2 / Radiated Emission  
 Band = eFDD7, Part = traffic

Sample / Setup: S02\_aa01



### Critical\_Freqs

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth (h)	Elevation	Corr. (dB)
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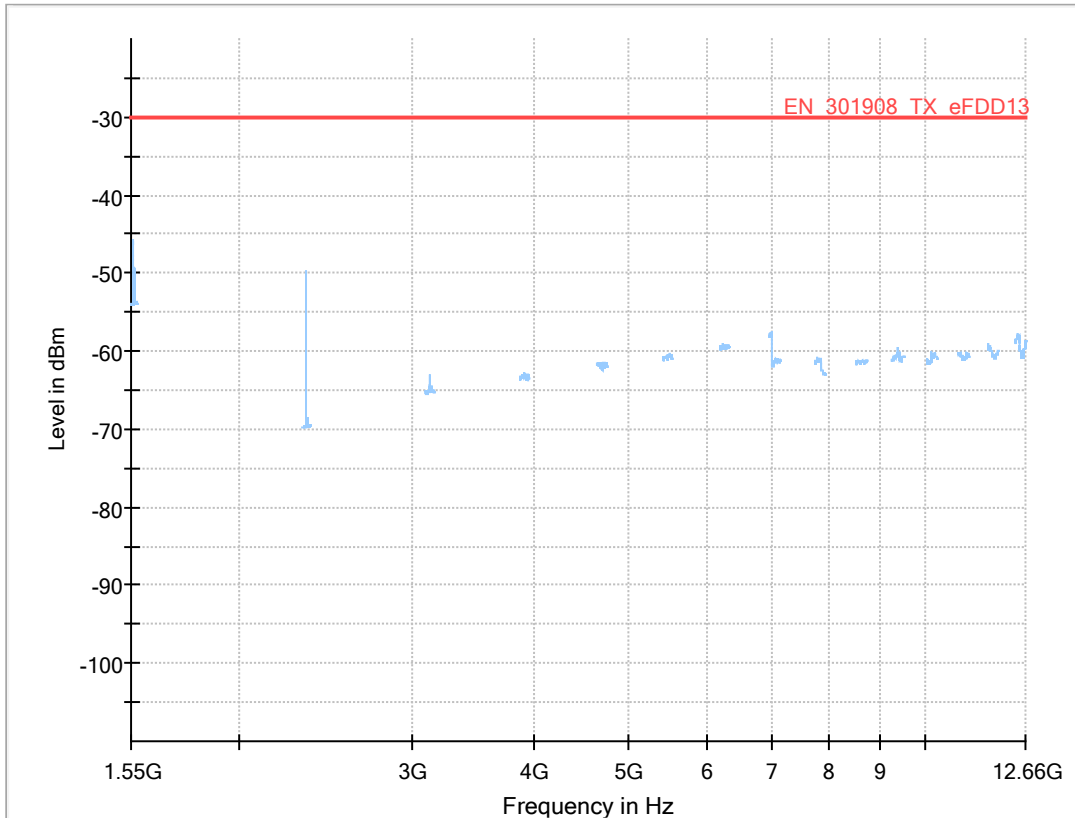
### Final\_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth (h)	Elevation	Corr. (dB)
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8.2 / Radiated Emission  
 Band = eFDD13, Part = traffic

Sample / Setup: S02\_aa01



**Critical Freqs**

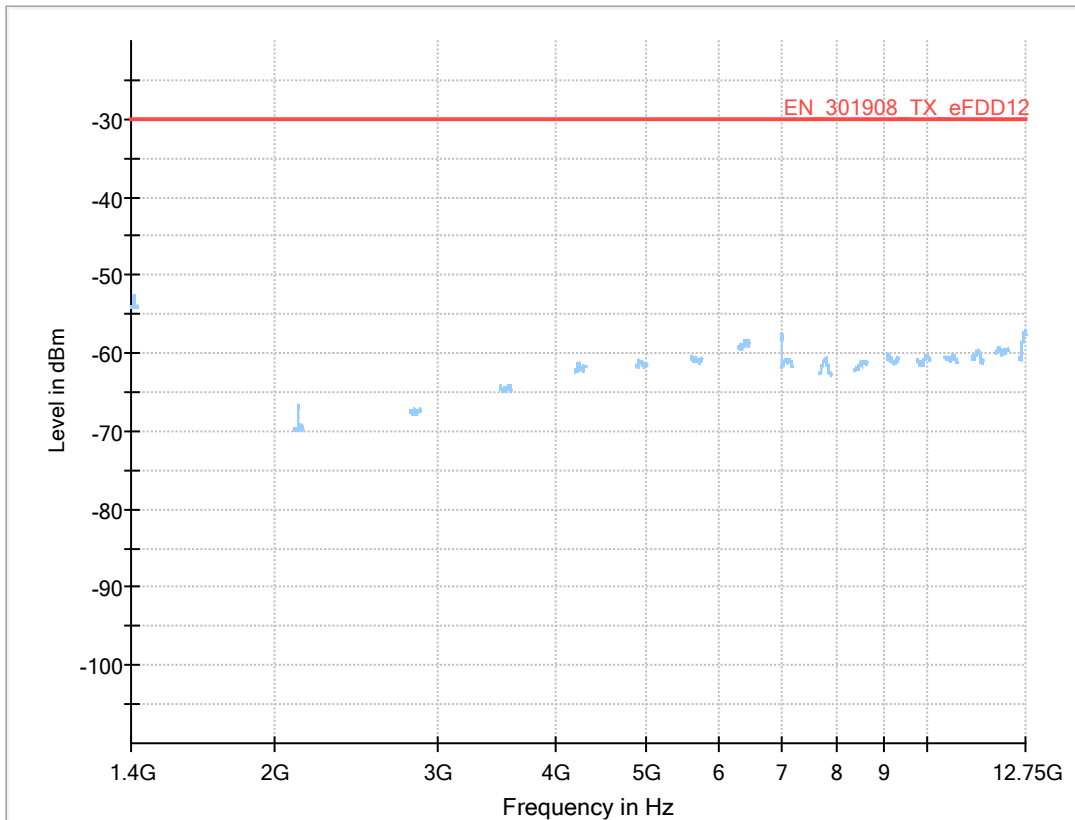
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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**Final Result**

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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8.2 / Radiated Emission  
 Band = eFDD12, Part = traffic

Sample / Setup: S02\_aa01



**Critical Freqs**

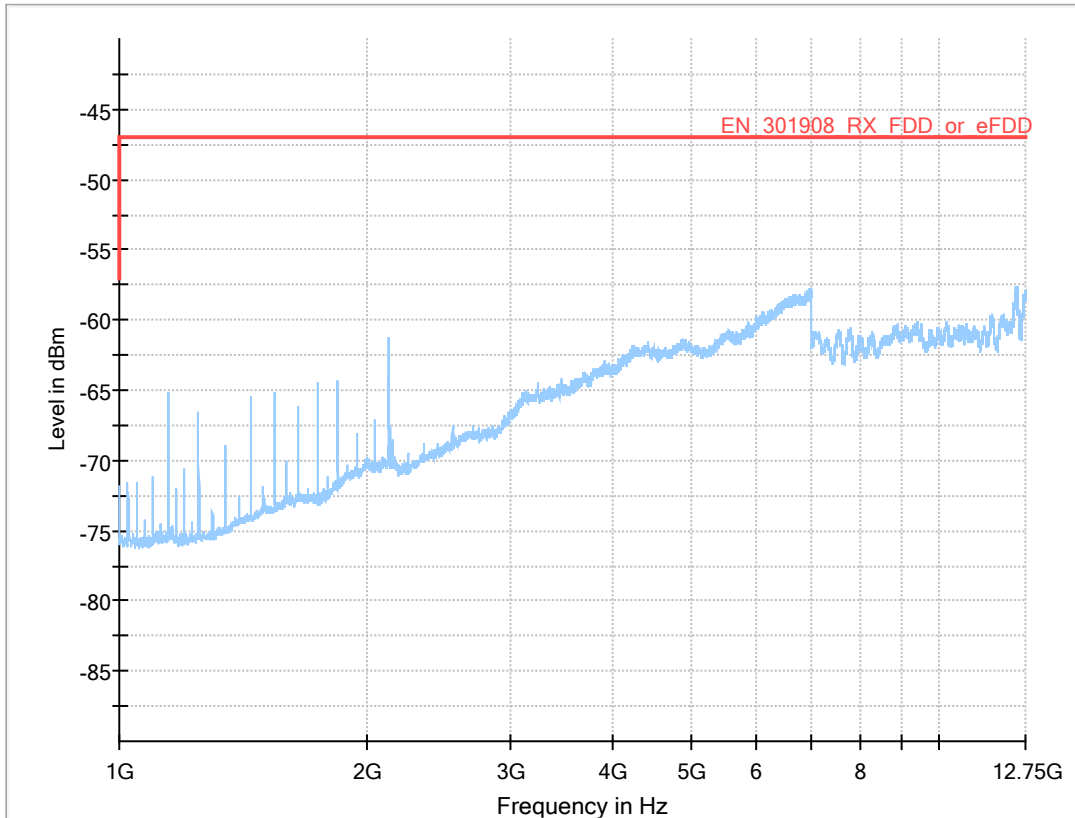
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth (h)	Elevation	Corr. (dB)
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**Final Result**

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth (h)	Elevation	Corr. (dB)
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8.2 / Radiated Emission  
 Band = eFDD4, Part = idle

Sample / Setup: S02\_aa01

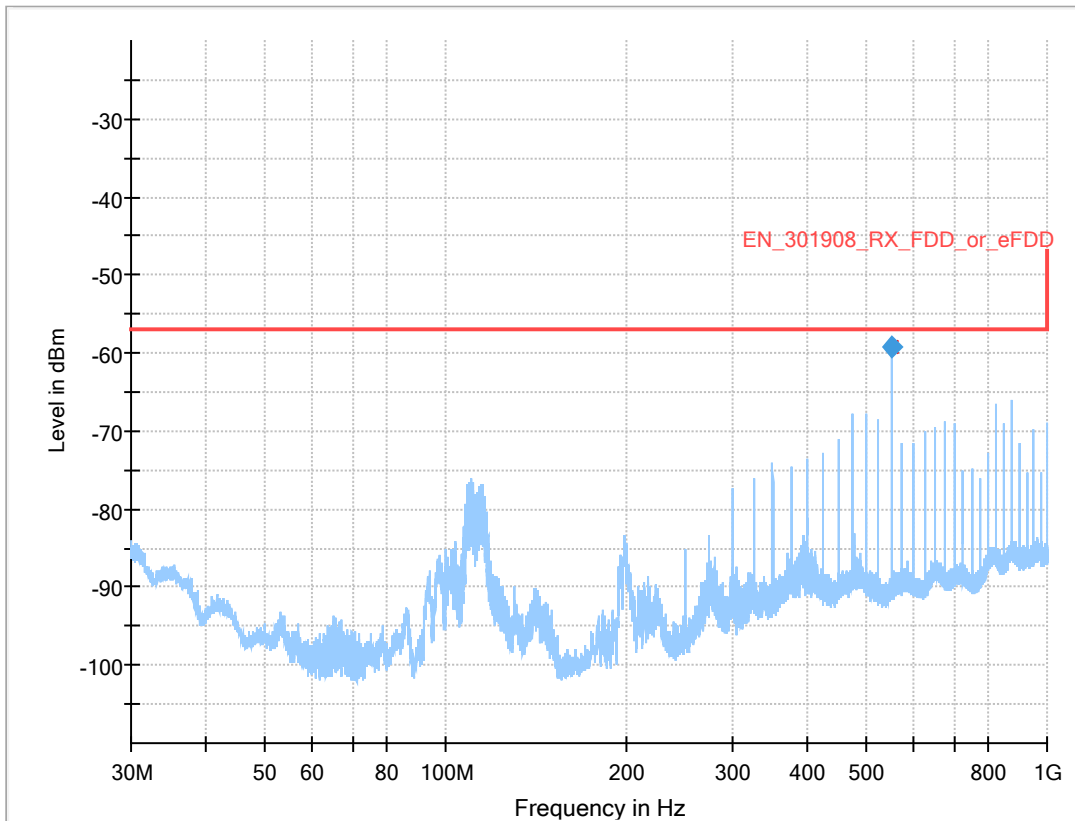


### Critical Freqs

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (Hz)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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### Final Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (Hz)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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### Critical\_Freqs

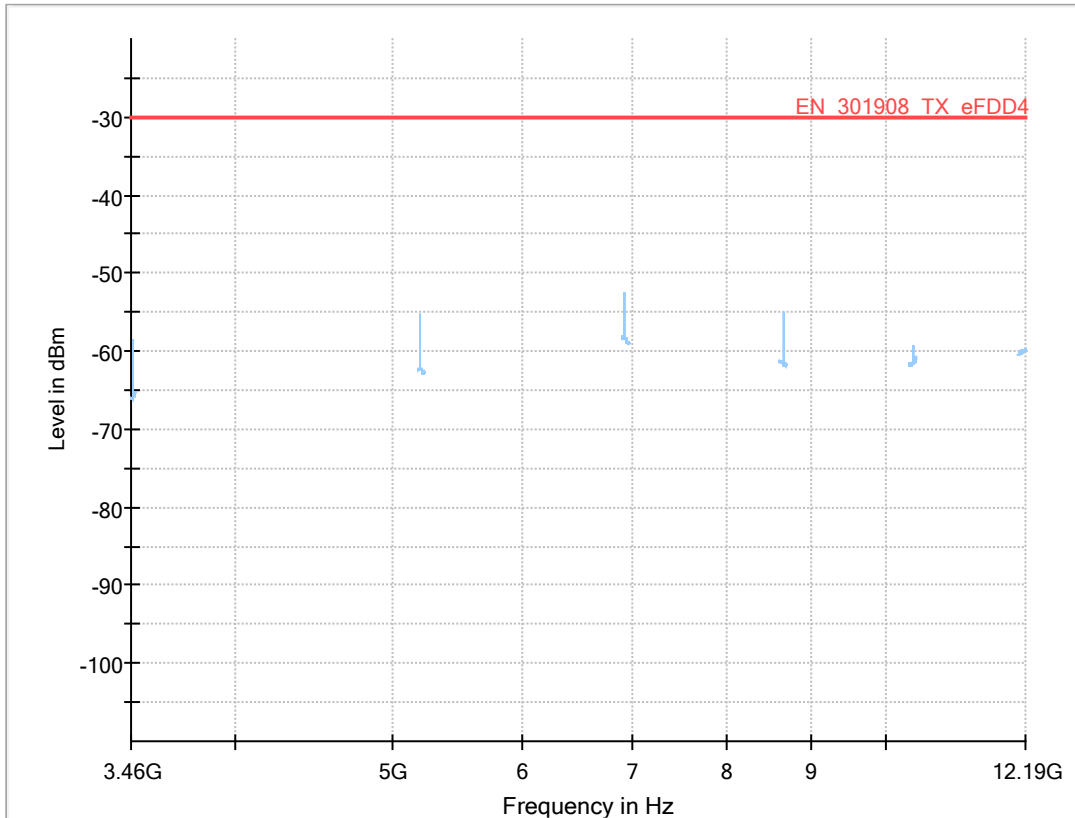
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth	Elevation	Corr. (dB)
549.997	-59.2	-57.00	2.19	---	---	150.0	V	-88.0	72.0	-116.9

### Final\_Result

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth	Elevation	Corr. (dB)
549.997	-59.2	-57.00	2.20	1000.0	100.000	150.0	V	-88.0	72.0	-116.9

8.2 / Radiated Emission  
 Band = eFDD4, Part = traffic

Sample / Setup: S02\_aa01



**Critical Freqs**

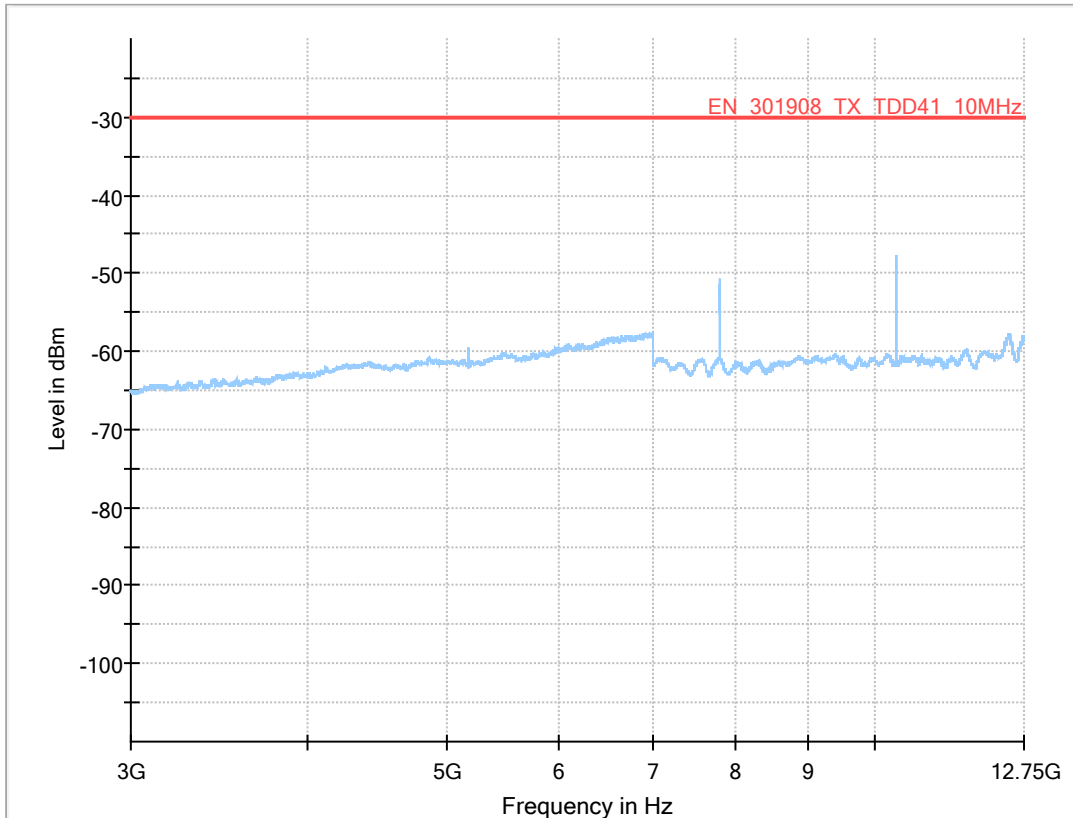
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth (h)	Elevation	Corr. (dB)
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**Final Result**

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth (h)	Elevation	Corr. (dB)
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8.2 / Radiated Emission  
 Band = eTDD41, Part = traffic

Sample / Setup: S02\_aa01



**Critical\_Freqs**

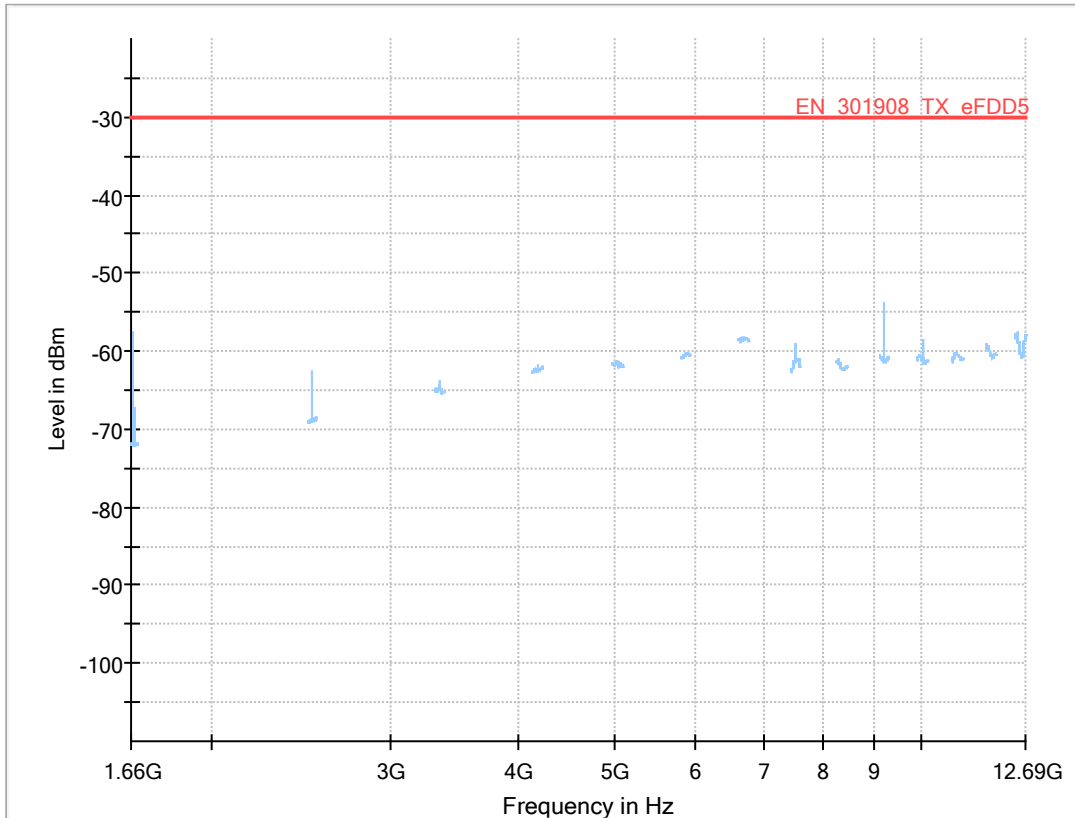
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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**Final\_Result**

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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8.2 / Radiated Emission  
 Band = eFDD5, Part = traffic

Sample / Setup: S02\_aa01



**Critical Freqs**

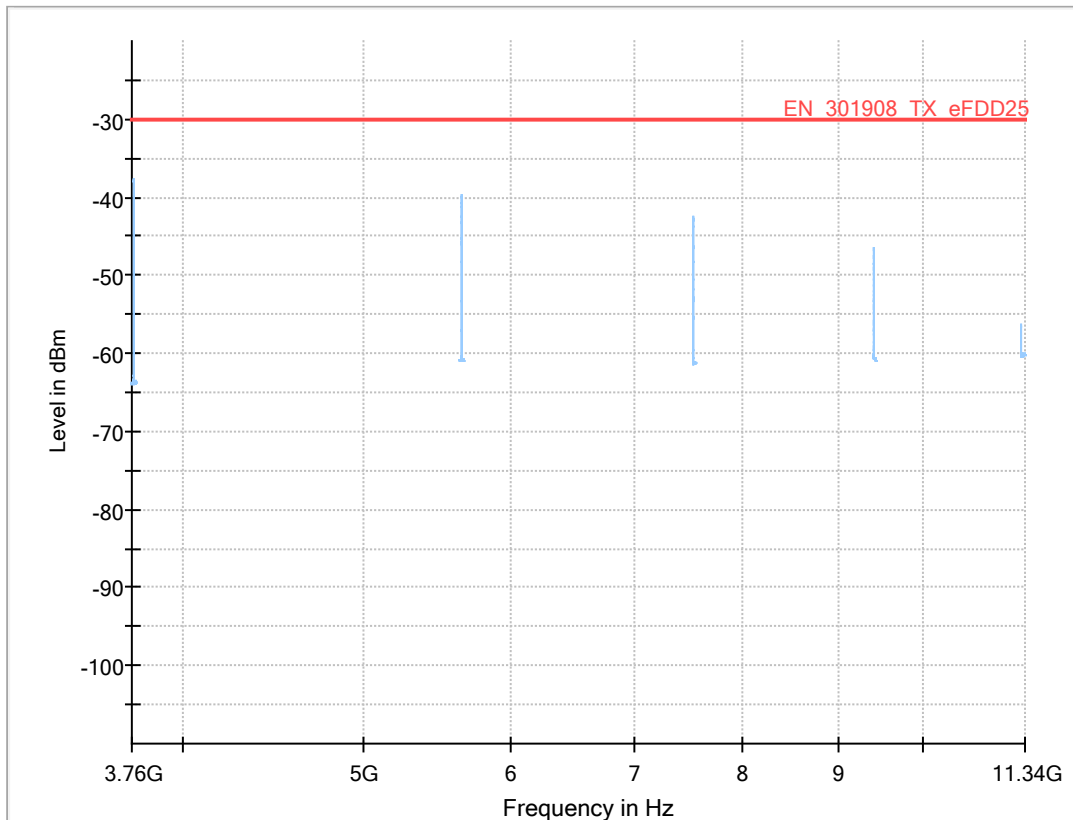
Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (MHz)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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**Final Result**

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (MHz)	Height	Pol	Azimuth	Elevation	Corr. (dB)
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8.2 / Radiated Emission  
 Band = eFDD25, Part = traffic

Sample / Setup: S02\_aa01



**Critical\_Freqs**

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height (t)	Pol	Azimuth (h)	Elevation (n)	Corr. (dB)
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**Final\_Result**

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin	Meas. Time (ms)	Bandwidth (h)	Height (t)	Pol	Azimuth (h)	Elevation (n)	Corr. (dB)
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End of Test Report