

FCC RADIO TEST REPORT

No. 180200074SHA-001

Applicant : TDC USA, INC.
5 Industrial Road Fairfield, NJ 07004 U.S.A.

Manufacturer : TDC USA, INC.
5 Industrial Road Fairfield, NJ 07004 U.S.A.

Product Name : Licensed Mercedes G63 AMG Ride-On

Type/Model : G63 (JJ263)

TEST RESULT : PASS

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2016): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Date of issue: February 26, 2018

Prepared by:



Nemo Li (Project engineer)

Reviewed by:



Daniel Zhao (Reviewer)

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Revision History

Issue No.	Version	Description	Date Issued
180200074SHA-001	Rev. 0	Initial issue of report	February 26, 2018

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name : Licensed Mercedes G63 AMG Ride-On

Type/Model : G63 (JJ263)

Description of EUT : EUT is a remote controller.

Rating : DC 3V

Sample received date : February 01, 2018

Date of test : February 01, 2018 ~ February 26, 2018

1.2 RF Technical Information

Assigned Frequency : 26.96MHz to 27.28MHz
Band

Operating Frequency : 27.145MHz

Type of Modulation : ASK

Number of Channels : 1

Antenna Type : Rod antenna

FCC ID : 2AO7U-60683

1.3 Description of Test Facility

Name : Intertek Testing Services Shanghai
Address : Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone : 86 21 61278200
Telefax : 86 21 54262353

The test facility is recognized, certified, or accredited by these organizations

: CNAS Accreditation Lab
Registration No. CNAS L0139
FCC Accredited Lab
Designation Number: CN1175
IC Registration Lab
Registration code No.: 2042B-1
VCCI Registration Lab
Registration No.: R-4243, G-845, C-4723, T-2252
NVLAP Accreditation Lab
NVLAP LAB CODE: 200849-0
A2LA Accreditation Lab
Certificate Number: 3309.02

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2016)

ANSI C63.10 (2013)

2.2 Mode of operation during the test

While testing transmitting mode of EUT, the continuously transmission was applied.

2.3 Test environment condition:

Temperature:	20-24°C
Humidity:	54-60% RH
Atmospheric Pressure:	101-102kPa

2.4 Test peripherals used

Item No	Description	Manufacturer	Model No.	Serial Number
-	-	-	-	-

2.5 Test software list:

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input type="checkbox"/>	Test Receiver	R&S	ESCS 30	EC 2107	2018-09-12
<input type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2018-12-01
<input type="checkbox"/>	A.M.N.	R&S	ENV 216	EC 3393	2018-07-30
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2018-09-12
<input checked="" type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2018-05-30
<input checked="" type="checkbox"/>	Horn antenna	R&S	HF 906	EC 3049	2018-09-23
<input type="checkbox"/>	Horn antenna	ETS	3117	EC 4792-1	2018-08-24
<input checked="" type="checkbox"/>	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2020-07-09
<input checked="" type="checkbox"/>	Pre-amplifier	R&S	Pre-amp 18	EC5881	2018-06-19
<input checked="" type="checkbox"/>	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2019-01-25
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2018-09-10
<input type="checkbox"/>	Power sensor/Power meter	Agilent	N1911A/ N1921A	EC4318	2018-05-12
<input type="checkbox"/>	Test Receiver	R&S	ESCI 7	EC 4501	2018-09-12
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2019-01-08
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2018-03-09
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3323	2018-06-14
<input type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3324	2018-04-09
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3325	2018-03-23
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 3320	2018-06-28

2.7 Measurement Uncertainty

Test Items	Expanded Uncertainty (k=2) (±)
Radiated Emissions below 1GHz	4.90dB
Radiated Emissions above 1GHz	5.02dB
Power line conducted emission	3.19dB

2.8 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Services Shanghai.

TEST ITEM	FCC REFERANCE	RESULT
Radiated Emissions	15.227 & 15.209	Pass
Power line conducted emission	15.207	NA
Assigned bandwidth	15.215(c)	Pass
Antenna requirement	15.203	Pass

Notes: 1: NA =Not Applicable

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3 Radiated Emissions

Test result: Pass

3.1 Limit

The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209, showed as below:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

3.2 Measurement Procedure

For Radiated emission below 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) Both X and Y axes of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

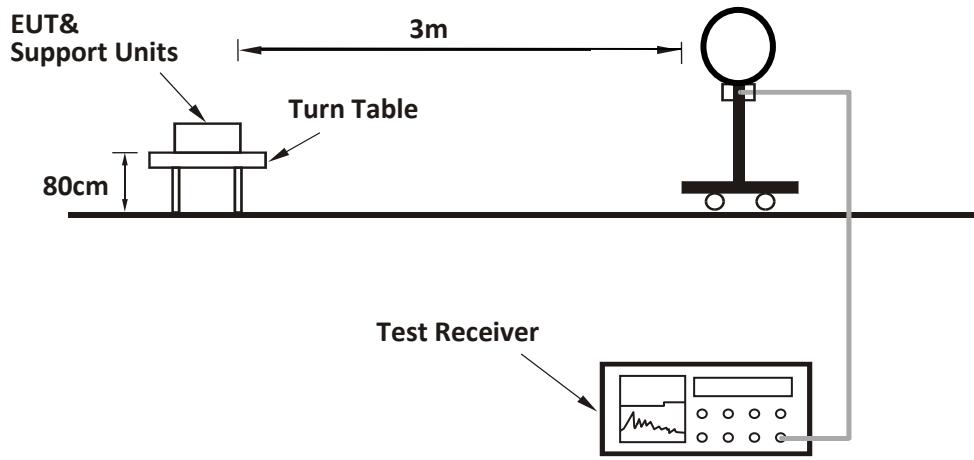
- a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

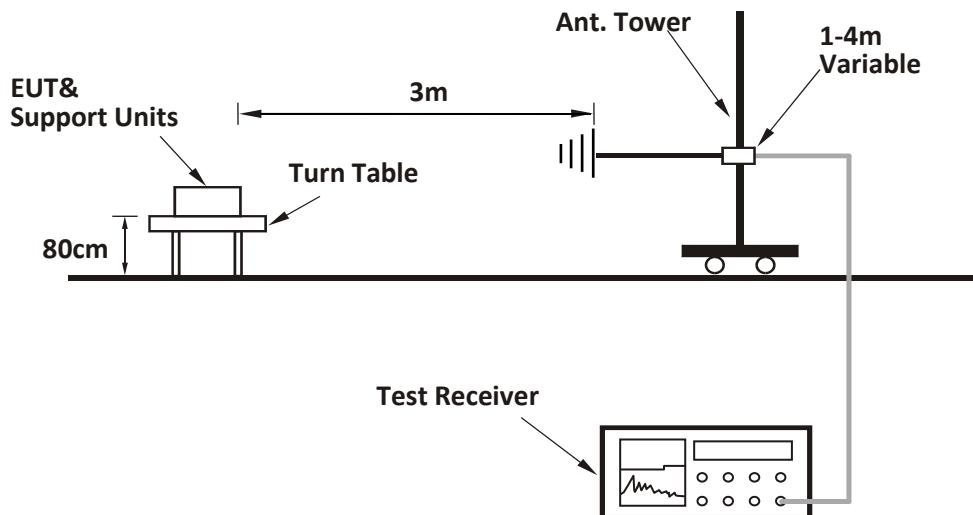
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or $3 \times RBW$ (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported

3.3 Test Configuration

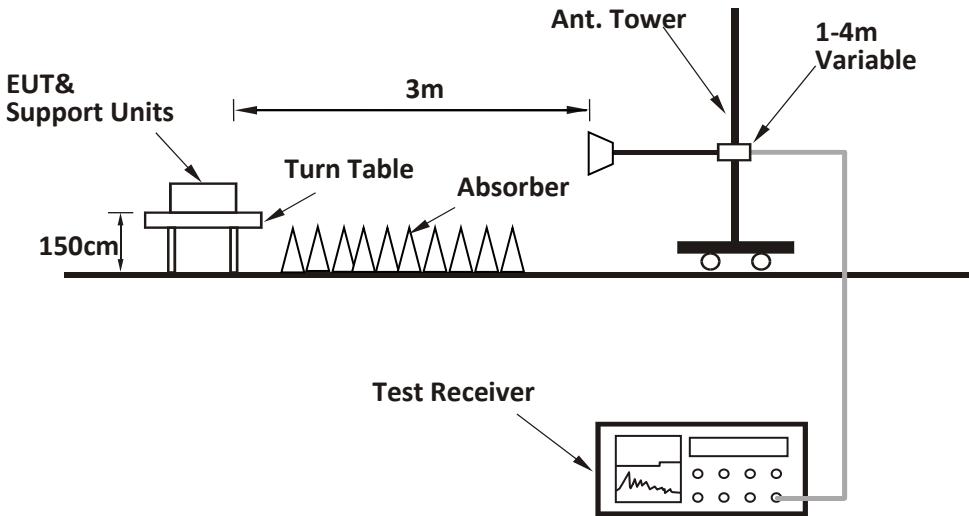
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



For Radiated emission above 1GHz:



3.4 Test Results of Radiated Emissions

The low frequency which started from 9 kHz to 30MHz was pre-scanned and the result was 20dB lower than the limit, so the data was not reported per 15.31(o).

EUT was tested with three direction X, Y and Z, and the worst data was listed in the report.

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
X	27.145	72.41	20.91	80.00	7.59	PK
H	31.78	21.80	18.00	40.00	18.20	PK
H	45.53	14.70	10.70	40.00	25.30	PK
H	76.95	15.40	7.60	40.00	24.60	PK
H	112.30	18.10	12.80	43.50	25.40	PK
H	177.11	17.40	10.50	43.50	26.10	PK
H	306.73	19.80	14.80	46.00	26.20	PK
H	452.06	23.10	18.40	46.00	22.90	PK
H	672.02	27.00	20.80	46.00	19.00	PK
H	954.83	30.60	23.50	46.00	15.40	PK
Y	27.145	78.97	20.91	80.00	1.03	PK
V	31.78	21.30	18.00	40.00	18.70	PK
V	47.49	15.50	9.90	40.00	24.50	PK
V	76.95	15.90	7.60	40.00	24.10	PK
V	120.16	18.70	13.40	43.50	24.80	PK
V	151.58	17.00	11.60	43.50	26.50	PK
V	296.91	19.70	14.60	46.00	26.30	PK
V	444.21	23.80	18.20	46.00	22.20	PK
V	587.58	27.50	20.40	46.00	18.50	PK
V	917.52	30.90	23.20	46.00	15.10	PK

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,
Limit = 40.00dBuV/m.
Then Correct Factor = $30.20 + 2.00 - 32.00 = 0.20$ dB/m;
Corrected Reading = $10\text{dBuV} + 0.20\text{dB/m} = 10.20\text{dBuV/m}$;
Margin = $40.00\text{dBuV/m} - 10.20\text{dBuV/m} = 29.80\text{dB}$.

4 Power line conducted emission

Test result: NA

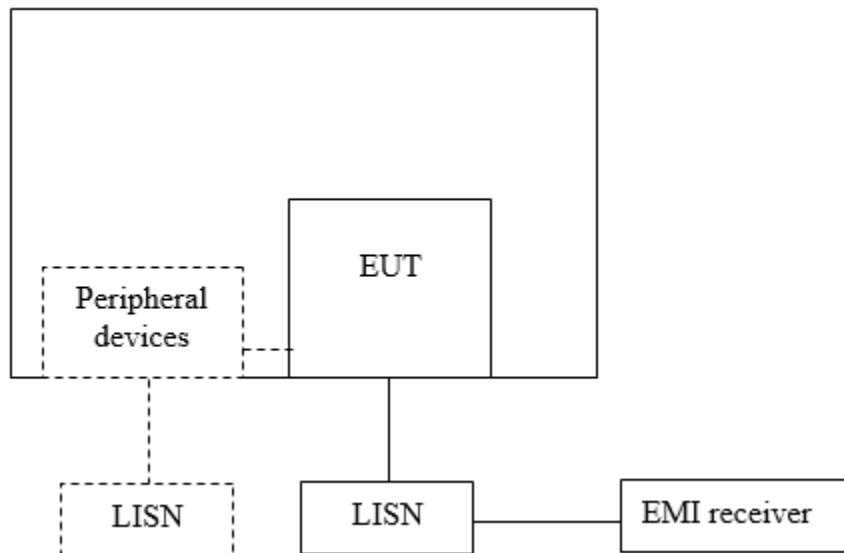
4.1 Measurement Procedure

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

4.2 Test Configuration



4.3 Test Results of Power line conducted emission

Test Curve:

Test Data:

Remark: 1. Correct Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming LISN Factor = 10.00dB, Cable Loss = 2.00dB,
Original Receiver Reading = 10.00dBuV, Limit = 66.00dBuV.
Then Correct Factor = 10.00 + 2.00 = 12.00dB;
Corrected Reading = 10dBuV + 12.00dB = 22.00dBuV;
Margin = 66.00dBuV – 22.00dBuV = 44.00dB.

5 Assigned bandwidth

Test result: Pass

5.1 Limit

Intentional radiators must be designed to ensure that the 20dB bandwidth of the emission is contained within the allocated frequency band.

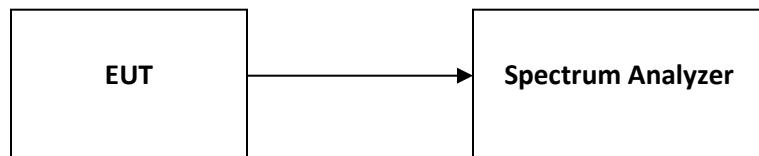
5.2 Measurement Procedure

The 20dB Bandwidth per FCC §15.215(c) is measured using the Spectrum Analyzer.

Set Span = 2 to 3 times the 20dB bandwidth, RBW = approximately 1% of the 20dB bandwidth, VBW>RBW, Sweep = auto, Detector = peak, Trace = max hold.

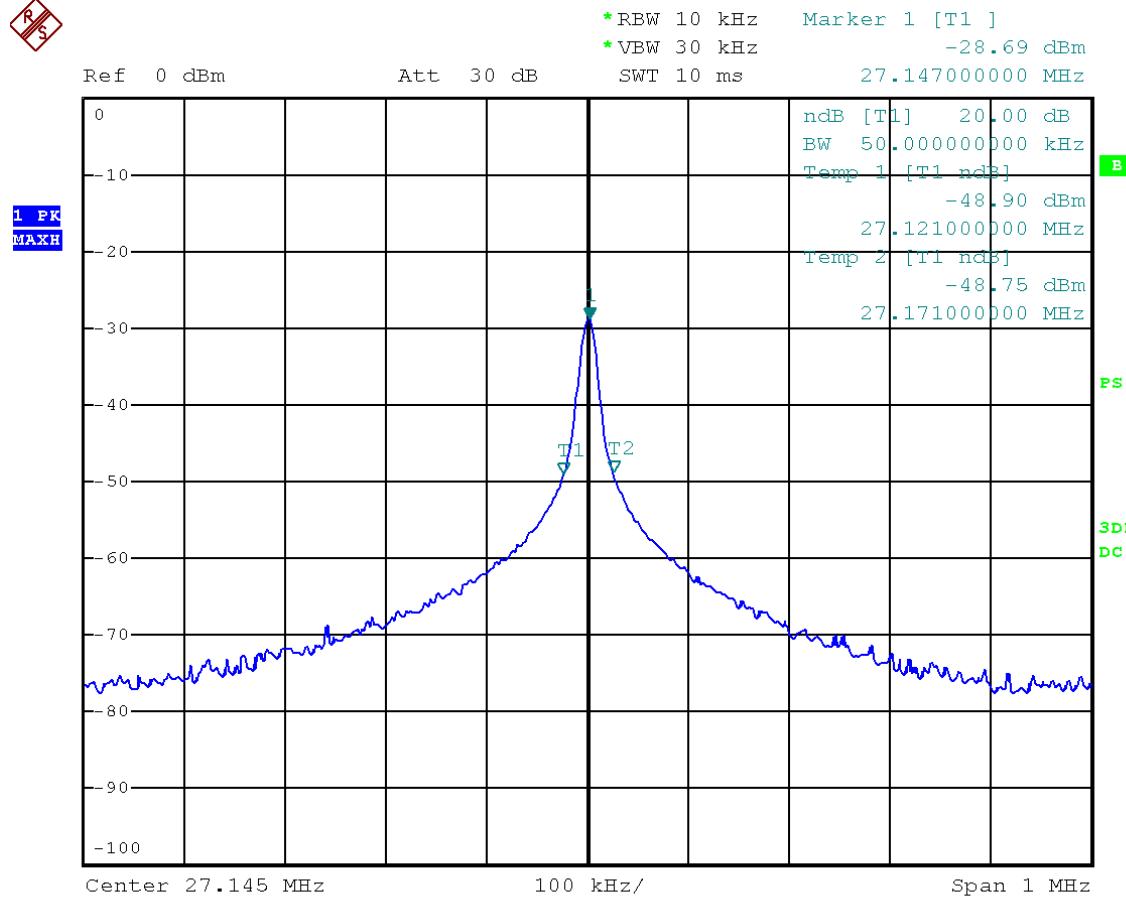
The test was performed at 3 channels (lowest, middle and highest channel).

5.3 Test Configuration



5.4 The results of Assigned bandwidth

Mode	20dB Bandwidth (kHz)	F_L (MHz)	F_H (MHz)
-	50.00	27.121	27.171



Date: 27.FEB.2018 10:48:18

6 Antenna requirement

Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Result:

EUT uses permanently attached antenna to the intentional radiator, so it can comply with the provisions of this section.

***** END *****