Radio Frequency Exposure Evaluation Report

For:
Rohde & Schwarz

Model:
QAR50

Product Description:
QAR50 Quality Automotive Radome Tester

FCC ID: KVW-QAR50

Per:

CFR Part Part1 (1.1307 &1.1310), Part 2 (2.1091)

Report number: EMC_ROHDE-003-22001_FCC_MPE

DATE: 2022-06-09

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1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 &1.1310), Part 2 (2.1091) under worst case conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant).
In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits as stipulated by the above given FCC rule parts based on available specifications for worst case conditions at 20cm distance to the body.

Company	Description	Model #
Rohde & Schwarz	QAR50 Quality Automotive Radome Tester	QAR50

Report reviewed by: TCB Evaluator

Date	Section	Name	Signature
2022-06-09	Compliance	Kevin Wang (Lab Manager)	kevin Wang Digitally signed by: kevin.wang@cetecom.com DN: CN = kevin.wang@cetecom.com Date: 2022.06.09 17:30:16 -07'00'

Responsible for the Report:

Date	Section	Name	Signature
2022-06-09	Compliance	Cheng Song (EMC Engineer)	cheng.song@cetecom.com Digitally signed by: cheng.song@cetecom.com DN: CN = cheng.song@cetecom.com Date: 2022.06.10 10:45:04 -07'00'

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
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Lab Manager:	Kevin Wang
Responsible Project Leader:	Cheng Song

2.2 Identification of the Client / Manufacturer

Client's Name:	Rohde & Schwarz GmbH & Co. KG
Street Address:	Muehldorfstrasse 15
City/Zip Code	Munich / 81671
Country	Germany

Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Assessment

Marketing name:	QAR50
HW Version :	02.10
SW Version :	11.0.2.0
FCC-ID:	KVW-QAR50
Regulatory Band:	Operation frequency range depends on the operation modes listed as below: Default Operation: 76-81GHz, 128 frequencies, ~2.5s cycle time K10 option: 72-82GHz, 256 frequencies, ~2.5s cycle time
Peak Power	1 dBm
Antenna Gain	7.61 dBi
Power Supply/ Rated Operating Voltage Range:	100 – 240VAC
Operating Temperature Range:	Tmin: 5 °C / Tmax: 40 °C
Sample Revision:	☐Prototype Unit; ■Production Unit; ☐Pre-Production

4 RF Exposure Limits and FCC Basic Rules

For the specific described radio apparatus the following basic limits and rules apply for FCC where not indicated differently.

4.1 Power Density Limits acc. to FCC 1.1310(e):

FCC

Frequency Range (MHz)	Power density (mW/cm²)	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100000	1.0	30

4.2 Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 2.1091(c) :

FCC
operating frequency < 1.5GHz: excluded if ERP < 1.5W / 31.8dBm (EIRP: 33.9 dBm);
operating frequency > 1.5GHz: excluded if ERP < 3.0W / 34.8dBm (EIRP: 36.9 dBm);

4.3 RF Exposure Estimation (MPE Estimation)

Having available the source based average output power and peak antenna gain or the ERP/EIRP of the specified device and for a known minimum distance of its radiating structures from the body of persons according to its use cases (at least 20cm) the power density at that distance can be estimated by the following formula for plane-wave equivalent conditions (far-field conditions), when ground reflection is neglected.

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (mW/cm² or W/m²)
P = power input to the antenna (mW or W)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (cm or m)

5 Evaluations

5.1 Analysis of RF Exposure for simultaneous transmission

- Evaluations are based on worst case power density limits for US.
- Calculations are made for 20cm.
- Evaluations are based on Average Power Density which is provided by the customer.

Mode	Frequency GHz	Conducted Power dBm	Antenna Gain dBi	EIRP dBm	EIRP mW	Power Density at 20cm (mW/cm²)	US Limit (mW/cm²)
K10	72	1	7.61	8.61	7.261	0.001	1

Note： The calculation is based on the distance of 20cm

5.2 Conclusion:

The equipment is passing RF exposure requirements for 20cm distance.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
2022-06-09	EMC_ROHDE-003-22001_FCC_MPE	Initial Version	Cheng Song

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