Radio Frequency Exposure Evaluation Report

For:
Rohde & Schwarz

Model:
QAR

Product Description:
Quality Automotive Radome Tester

FCC ID: KVW-QAR

Per:

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

Report number: EMC_ROHDE-001-20001_FCC_ISED_MPE

DATE: 2021-05-27

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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	QAR Quality Automotive Radome Tester	QAR

Report reviewed by: TCB Evaluator

Date	Section	Name	Signature
2021-05-27	Compliance	Kevin Wang (Lab Manager)	kevin.wang@cetecom.com Digitally signed by: kevin.wang@cetecom.com DN: CN = kevin.wang@cetecom.com Date: 2021.05.27 17:41:22 -07'00'

Responsible for the Report:

Date	Section	Name	Signature
2021-05-27	Compliance	Yuchan Lu (EMC Engineer)	Yuchan Lu Digitally signed by: Yuchan Lu DN: CN = Yuchan Lu email = Yuchan.Lu@cetecom.com C = US O = CETECOM Inc. OU = EMC Date: 2021.05.27 17:43:20 -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
Fax:	+1 (408) 586 6299
Lab Manager:	Kevin Wang
Responsible Project Leader:	Yuchan Lu

2.2 Identification of the Client / Manufacturer

Client's Name:	Rohde & Schwarz USA, Inc.
Street Address:	6821 Benjamin Frankline Drive
City/Zip Code	Columbia MD / 21046
Country	USA

Identification of the Manufacturer

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

3 Equipment under Assessment

Marketing name:	QAR
HW Version :	02
SW Version :	5.07.34
FCC-ID:	KVW-QAR
Regulatory Band:	Operation frequency range depends on the operation modes listed as below: K10 option: 74-79GHz, 64 frequencies, 92.16us tx time on single frequency K60 option: 76-81GHz, 64 frequencies, 92.16us tx time on single frequency K100 option: 71-81GHz, 128 frequencies, 92.16us tx time on single frequency Z10 option: 72-82GHz, 64 frequencies, 251us tx time on single frequency
Average power density at 1 m range in front of the panel/Z10 antenna	K10: 80 pW/cm² Z10: 5.12 nW/cm² K60: 80 pW/cm² K100: 150 pW/cm²
Power Supply/ Rated Operating Voltage Range:	200 – 240VAC
Operating Temperature Range:	Tmin: 10 ºC / Tmax: 38 ºC
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 Canada.
- Calculations are made for 20cm.
- Evaluations are based on Average Power Density which is provided by the customer.

Mode	Freq MHz	Average power density at 1 m range in front of the panel/Z10 antenna	Average power density at 1 m range in front of the panel/Z10 antenna (W/m²)	Average power density at 0.2 m range in front of the panel/Z10 antenna (W/m²)	US Limit (W/m²)
K10	74000	80 pW/cm²	0.0000008	0.00002	10
Z10	72000	5.12 nW/cm²	0.0000512	0.00128	10
K60	76000	80 pW/cm²	0.0000008	0.00002	10
K100	71000	150 pW/cm²	0.0000015	0.0000375	10

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
2021-05-27	EMC_ROHDE-001-20001_FCC_MPE	Initial Version	Yuchan Lu

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