

RF EXPOSURE REPORT



Applicant: Realtek Semiconductor Corp.
No.2, Innovation Road II, Hsinchu Science Park, Hsinchu
300, Taiwan

Product Name: Notebook Computer

Brand Name: Microsoft

Model No.: 2016

Model Difference: N/A

Report Number: ER/2021/80110

FCC ID TX2-RTL8822CE

Issue Date: Oct. 04, 2021

Date of EUT Received: Aug. 06, 2021

Approved By

John Yeh

We hereby certify that:

The above equipment was evaluate by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC Rule Part §2.1091.

The results of this report relate to the specific sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By
ER/2021/80110	Rev.00	Original.	Oct. 04, 2021	Revised By: Tiffany Kao

Note:

1、Disclaimer

Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	Notebook Computer	
Brand Name:	Microsoft	
Model No.:	2016	
Model Difference:	N/A	
Radio Test Tool & Version	Realtek MP kit v13.02 / 2000.1061.625.2015	
Normal Test Version	WiFi driver2024.0.10.131	
Power Supply:	7.6Vdc from Rechargeable Lithium-Ion Polymer Battery or 19Vdc from AC/DC Adapter	
	Battery:	Model No.: 916QA145H, Supplier: SMP
	Adapter:	1. Model No.: A18-045N2A, Supplier: Chicony 2. Model No.: PA-1450-26, Supplier: LITEON

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2 DETERMINATION OF MPE EXEMPTION

2.1 Single RF Source

As per §1.1307(c), using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) –

Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)			Minimum Distance			Threshold ERP (W)
fL		fH	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	
0.3	-	1.34	159m	-	35.6m	$1920 R^2$
1.34	-	30	35.6m	-	1.6m	$3450 R^2/f^2$
30	-	300	1.6m	-	159mm	$3.83 R^2$
300	-	1500	159mm	-	31.8mm	$0.0128 R^2f$
1500	-	100000	31.8mm	-	0.5mm	$19.2R^2$

R= minimum separation distance in meter

f = frequency in MHz

2.2 Multiple RF Sources

In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

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2.3 Single RF Source Evaluation Results

Chain B	Frequency (MHz)	Max. tun-up power (dBm)	Peak gain (dBi)	ERP (dBm)	ERP (W)	Permissible Minimum separation distance ($\lambda/2\pi$) (m)	R = actual Minimum separation distance(m)	ERP _{th} (W)	ERP/ERP _{th}
WiFi 2.4GHz	2412	20	1.65	19.5	0.089	0.020	0.187	0.671	0.133
WiFi 5GHz	5180	20.5	2.5	20.85	0.122	0.009	0.187	0.671	0.182
WiFi 5GHz	5260	20.5	2.5	20.85	0.122	0.009	0.187	0.671	0.182
WiFi 5GHz	5500	20.5	2.57	20.92	0.124	0.009	0.187	0.671	0.185
WiFi 5GHz	5745	20.5	2.64	20.99	0.126	0.008	0.187	0.671	0.188

Chain A	Frequency (MHz)	Max. tun-up power (dBm)	Peak gain (dBi)	ERP (dBm)	ERP (W)	Permissible Minimum separation distance ($\lambda/2\pi$) (m)	R = actual Minimum separation distance(m)	ERP _{th} (W)	ERP/ERP _{th}
WiFi 2.4GHz	2412	20	0.98	18.83	0.076	0.020	0.187	0.671	0.113
Bluetooth	2402	6	0.98	4.83	0.003	0.020	0.187	0.671	0.004
WiFi 5GHz	5180	20.5	1.49	19.84	0.096	0.009	0.187	0.671	0.143
WiFi 5GHz	5260	20.5	1.49	19.84	0.096	0.009	0.187	0.671	0.143
WiFi 5GHz	5500	20.5	1.53	19.88	0.097	0.009	0.187	0.671	0.145
WiFi 5GHz	5745	20.5	1.58	19.93	0.098	0.008	0.187	0.671	0.146

Note: For conservativeness, the lowest uplink frequency of each band is used to determine the minimum separation distance of that band. All the single RF source results (ERP) are less than their corresponding threshold (ERP_{th}), so they are exempt from SAR testing.

2.4 Multiple RF Sources Evaluation Results

Simultaneous transmission	Σ ERP/ERP _{th}	Criteria
WiFi 2.4GHz Chain B+A	0.246	1
WiFi 5GHz Chain B+A	0.334	1
WiFi 2.4GHz Chain B + BT	0.137	1
WiFi 5GHz Chain B + BT	0.192	1
WiFi 5GHz Chain B+A + BT	0.338	1

Note:

1. $\Sigma(ERP/ERP_{th})$: This is a summation of [(ERP of RF source / exemption threshold ERP for RF source)]. Considering the collocated transmitters, the aggregated (ERP/ERP_{th}) is smaller than 1, and MPE of collocated transmitters is compliant.

~ End of Report ~

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