

Radio Frequency Exposure Evaluation Report

For:

Ooma Inc.

Model:

OOMA AIRDIAL2 DUAL MODEM

Product Description:

Ooma AirDial 2 Dual Modem

FCC ID: XFT-AIRDIAL2DM

IC: 9769A-AIRDIAL2DM

Applied Rules and Standards:

47 CFR §§1.1307, 1.1310 and 2.1091

FCC KDB 447498 D04 Interim General RF Exposure Guidance v01

ISED RSS-102 Issue 6

Report number: EMC_OOMMA_017_25001_RF_Exposure_Rev1

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1 Assessment

This report assesses RF exposure from the Ooma AirDial 2 Dual Modem for general-public use in an uncontrolled environment. It covers both LTE transmitters, individually and simultaneously, with the specified Quectel YECN028AA antennas at a common minimum antenna-to-person separation of 20.1 cm (201 mm). Maximum product ratings, including tune-up tolerance, and continuous transmission are used.

FCC: The specified mobile configuration meets the exemption criteria in 47 CFR §§1.1307(b)(3)(i)(B), 1.1307(b)(3)(ii)(B) and 2.1091(c) at 20.1 cm. The maximum simultaneous exemption ratio is 0.456 against a criterion of 1.

ISED: Each transmitter meets the RSS-102 Issue 6, section 6.6 FRL exemption limit at 20.1 cm. The maximum combined exemption fraction is 0.755 against a conservative screening criterion of 1. The SAR evaluation path is not applicable at this separation, which is greater than 20 cm.

The selected 201 mm is the closest qualifying common distance in whole millimetres; the ISED boundary is strictly greater than 200 mm. The findings apply to the configuration in Section 3 and installation conditions in Section 5.3. They do not establish transmitter-emission compliance or cover unspecified antenna kits.

Company Name	Product Description	Model No.
Ooma Inc.	Ooma AirDial 2 Dual Modem	OOMA AIRDIAL2 DUAL MODEM

Report Authorized by:

Responsible for the Original Testing Laboratory:

2026-04-30	Compliance	Guangcheng Huang (Senior EMC Engineer)	
Date	Section	Name	Signature

Responsible for the Original Report:

2026-04-30	Compliance	Art Thammanavarat (Lead Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.

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2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Original Report

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2.2 Identification of the Client

Client Firm/Name:	Ooma Inc.
Street Address:	525 Almanor Avenue, Suite 200,
City/Zip Code	Sunnyvale, CA 94085
Country	USA

2.3 Identification of the Manufacturer

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

3 Equipment under Assessment

3.1 EUT Specifications

Product Description:	Ooma AirDial 2 Dual Modem
Model Name :	OOMA AIRDIAL2 DUAL MODEM
HW Version :	HW-V3
SW References:	V11.2 (client specification); 11.0.05 (production BOM). RF configuration: operational description dated 6 August 2026.
FCC ID:	XFT-AIRDIAL2DM
IC:	9769A-AIRDIAL2DM
HVIN	AIRDIAL2DM
PMN	Ooma AirDial 2 Dual Modem
Bands/Modes Supported	Cellular Module 1 Manufacturer: Quectel Wireless Solutions Co., Ltd. Model: EG95-NAXD FCC ID: XMR202008EG95NAXD ISED: 10224A-021EG95NAXD LTE FDD bands: 2, 4, 5, 12, 13, 25, 26
	Cellular Module 2 Manufacturer: Quectel Wireless Solutions Co., Ltd. Model: EC25-AFXD FCC ID: XMR202008EC25AFXD ISED: 10224A-022EC25AFXD LTE FDD bands: 2, 4, 5, 12, 13, 14, 66, 71
Other Radios included in the device	BLE disabled in build software; Wi-Fi not applicable; NFC passive. WCDMA/HSPA not used; GSM/EDGE unsupported.
Power Supply/ Rated Operating Voltage Range	9–33 V DC; nominal 12 V DC; internal backup battery.
Operating Temperature Range	0–40 °C
Assessment Basis	Production configuration and maximum ratings; no individual sample measurement is asserted.
EUT Dimensions	300 mm wide × 60 mm high × 200 mm deep
Intended Use	Fixed installation; at least 20.1 cm (201 mm) from each transmitting antenna to any person.
Note: The information of the EUT specifications in the table above is provided by the client.	

3.2 RF Configuration and Assessment Inputs

The product provides POTS replacement service through wired Ethernet and two LTE connections. Both LTE modems may transmit simultaneously, including while Ethernet is active. Each modem is assessed at its full maximum power, with no credit for network scheduling, traffic loading, power reduction or separation between the two transmit antennas.

Transmit and receive antenna connections

The enclosure MAIN connector carries EC25 MAIN transmission. The enclosure connector labelled DIVERSITY carries EG95 MAIN transmission. Both external YECN028AA antennas therefore transmit. The two internal YF0020FA flex antennas connect to receive-diversity paths and contribute no transmit power.

The production BOM identifies the installed surface-mount modules. The EC25-AFXD MINIPCIE variant named in shared module reports is not an additional installed transmitter. The Quectel authorization letters dated 31 July 2026 establish the module identifiers and permission to use the component data.

Maximum power and antenna gain

The operational description specifies 23 dBm $\pm$ 2 dB at each modem antenna port. The upper rating, 25.0 dBm (316.228 mW), is used for every evaluated band. The component reports corroborate this envelope; the values are maximum ratings, not host conducted-power measurements.

Parameter	617–960 MHz	1710–2170 MHz
Transmit antenna, each path	Quectel YECN028AA	Quectel YECN028AA
Maximum peak gain	1.3 dBi	3.7 dBi
Conducted power, each modem	25.0 dBm / 316.228 mW	25.0 dBm / 316.228 mW
EIRP, each modem	426.580 mW	741.310 mW
ERP, each modem	260.109 mW	452.018 mW
Duty factor / feeder-loss credit	1.00 / 0.00 dB	1.00 / 0.00 dB

Antenna gains are the higher of the free-space and evaluation-board maximum peak gains in the YECN028AA datasheet, section 1.1. No cable-loss or installed-host gain measurement is claimed.

Power conversions: $P = 10^{25/10}$ mW; $EIRP = P \times 10^{G/10}$; $ERP = EIRP / 1.64$, where G is gain in dBi. Calculations retain full precision; displayed values are rounded.

The assessed installation requires at least 20.1 cm (201 mm) from each transmitting antenna to any person. This supports FCC mobile-device classification under §2.1091 and places the host within the ISED section 6.6 distance range. The separation applies with external DC or battery power, including battery-powered placement checks. Alternative antenna kits are outside this assessment.

4 RF Exposure Limits and FCC and ISED Basic Rules

FCC

4.1.1 47 CFR §2.1091(c) and §1.1307(b)(3)(i)(B)

The assessment applies the power-based exemption in 47 CFR §1.1307(b)(3)(i)(B) at 20.1 cm, with FCC KDB 447498 D04 v01. Section 2.1091(c) permits this alternative for mobile devices at 20–40 cm when the ERP Table 1 criterion is not met. For $20 < d \leq 40$ cm, the threshold remains equal to $ERP_{20\text{ cm}}$; no inverse-square distance scaling is applied.

At the common assessment distance $d = 20.1$ cm, the applicable threshold is:

$$P_{th}(\text{mW}) = ERP_{20\text{ cm}}(\text{mW}) = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

Frequency f is expressed in GHz. The comparison power is the larger of maximum conducted power and ERP, including tune-up tolerance. ERP is derived from the documented antenna gain; antenna dimensions are not used to substitute conducted power for unknown ERP.

4.1.2 Standalone exemption

A transmitter meets the power exemption when $\max(P, ERP) / P_{th} \leq 1$. The lowest uplink frequency provides the conservative FCC threshold in each band. The tables in Section 5.1 use the maximum rated power and antenna gain in Section 3.2.

4.1.3 47 CFR §1.1307(b)(3)(ii)(B)

For sources operating within the same time-averaging period, the sum of their fractional contributions to the applicable thresholds must not exceed 1. The general FCC summation is:

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

For this host, both transmitters use the first term only: $P_i = \max(P, ERP)$ and $P_{th,i}$ is the applicable power threshold. One supported band is selected from each modem; mutually exclusive bands within a modem are not summed. The maximum of all 56 band pairs is evaluated in Section 5.3.

The specified configuration is exempt from routine FCC RF exposure evaluation when the calculated criterion is met. A separate MPE or SAR measurement is not required for that exemption finding; the general-population exposure requirements remain applicable.

ISED RSS-102**4.2.1 Applicability and separation boundary**

RSS-102 Issue 6, section 6.3 and Table 11 apply at separations up to and including 20 cm. For B4/B66 at 1710 MHz, the most permissive Table 11 threshold is 318.540 mW in the ">50 mm" column. The maximum EIRP is 741.310 mW, giving a fraction of 2.327. The remaining distance columns are more restrictive. These required modes therefore prevent a common exemption at 20 cm or less.

$$\text{SAR threshold at 1710 MHz} = 298 + (1710 - 835) \times (323 - 298) / (1900 - 835) = 318.540 \text{ mW}.$$

The common minimum is set to 20.1 cm (201 mm). Above 20 cm, the SAR evaluation path is not applicable to this mobile installation and section 6.6 FRL exemption limits apply. The FRL path is used only under that condition. The frequency-dependent exemption threshold is not scaled with distance.

4.2.2 Section 6.6 field reference level exemption limits

For $300 \text{ MHz} \leq f < 6000 \text{ MHz}$, RSS-102 section 6.6 exempts a transmitter from routine FRL evaluation when its source-based, time-averaged maximum EIRP, including tune-up tolerance, does not exceed:

$$P_{\text{ex}} (\text{mW}) = 13.1 \times f^{0.6834}, \text{ with } f \text{ in MHz.}$$

Each transmitter must satisfy $\text{EIRP} / P_{\text{ex}} \leq 1$. EIRP is derived in Section 3.2 from the maximum conducted power and antenna gain. The lowest uplink frequency gives the lowest exemption limit in each band. No duty-factor or feeder-loss reduction is applied.

4.2.3 Simultaneous transmission

In addition to the individual section 6.6 checks, this assessment applies $\sum (\text{EIRP}_i / P_{\text{ex},i}) \leq 1$ as a conservative combined exemption screen. Section 7.1.5 requires all simultaneous transmitters to be accounted for, and section 7.6 uses additive, frequency-normalized exposure ratios. The section 6.6 EIRP thresholds and Table 7 SAR-based power-density reference levels have the same $f^{0.6834}$ dependence, supporting this frequency weighting. The sum expresses the combined fraction of the exemption allowances; it is not a measured field result.

5 Evaluations

5.1 FCC RF Exposure (Standalone)

Assessment distance: 20.1 cm (201 mm) from each antenna to any person. Conducted power: 25.0 dBm per modem. $P_i = \max(\text{conducted power, ERP})$; standalone exemption criterion: $P_i/P_{th} \leq 1$.

EG95-NAXD

LTE Band	Frequency (MHz)	Gain (dBi)	ERP (mW)	P_i (mW)	P_{th} (mW)	Fraction	Exempt
B2	1850	3.7	452.018	452.018	3060.00	0.148	Yes
B4	1710	3.7	452.018	452.018	3060.00	0.148	Yes
B5	824	1.3	260.109	316.228	1680.96	0.188	Yes
B12	699	1.3	260.109	316.228	1425.96	0.222	Yes
B13	777	1.3	260.109	316.228	1585.08	0.200	Yes
B25	1850	3.7	452.018	452.018	3060.00	0.148	Yes
B26	814.7	1.3	260.109	316.228	1661.99	0.190	Yes

EC25-AFXD

LTE Band	Frequency (MHz)	Gain (dBi)	ERP (mW)	P_i (mW)	P_{th} (mW)	Fraction	Exempt
B2	1850	3.7	452.018	452.018	3060.00	0.148	Yes
B4	1710	3.7	452.018	452.018	3060.00	0.148	Yes
B5	824	1.3	260.109	316.228	1680.96	0.188	Yes
B12	699	1.3	260.109	316.228	1425.96	0.222	Yes
B13	777	1.3	260.109	316.228	1585.08	0.200	Yes
B14	788	1.3	260.109	316.228	1607.52	0.197	Yes
B66	1710	3.7	452.018	452.018	3060.00	0.148	Yes
B71	663	1.3	260.109	316.228	1352.52	0.234	Yes

The Band 26 screen uses 814.7 MHz from the updated host FCC Form 731 lower operating range and also bounds the higher cellular-band frequencies. Other rows use conservative uplink band edges. These screening frequencies do not authorize operation outside the applicable national grant.

Conclusion:

Both transmitters meet the standalone FCC power-based exemption criterion at 20.1 cm. The largest fractions are 0.221765 for EG95 B12 and 0.233806 for EC25 B71. Simultaneous operation is assessed in Section 5.3.

5.2 ISED RF Exposure (Standalone)

Assessment distance: 20.1 cm (201 mm). The RSS-102 section 6.6 FRL exemption applies because the separation exceeds 20 cm. EIRP includes tune-up tolerance. The exemption threshold is $13.1 \times f^{0.6834}$ mW, with f in MHz; the criterion is EIRP / threshold ≤ 1 .

EG95-NAXD

LTE Band	Frequency (MHz)	EIRP (mW)	FRL Exemption Threshold (mW)	Fraction	Exempt
B2	1850	741.310	2239.012	0.331	Yes
B4	1710	741.310	2121.782	0.349	Yes
B5	824	426.580	1288.297	0.331	Yes
B12	699	426.580	1151.296	0.371	Yes
B13	777	426.580	1237.613	0.345	Yes
B25	1850	741.310	2239.012	0.331	Yes
B26	824	426.580	1288.297	0.331	Yes

EC25-AFXD

LTE Band	Frequency (MHz)	EIRP (mW)	FRL Exemption Threshold (mW)	Fraction	Exempt
B2	1850	741.310	2239.012	0.331	Yes
B4	1710	741.310	2121.782	0.349	Yes
B5	824	426.580	1288.297	0.331	Yes
B12	699	426.580	1151.296	0.371	Yes
B13	777	426.580	1237.613	0.345	Yes
B14	788	426.580	1249.561	0.341	Yes
B66	1710	741.310	2121.782	0.349	Yes
B71	663	426.580	1110.436	0.384	Yes

All rows use the lowest uplink frequency in the band, which minimizes the section 6.6 threshold. The Canadian B26 row covers 824–849 MHz, consistent with the RSS-132 component data; it does not claim Canadian authorization below 824 MHz.

Conclusion:

Both transmitters meet the standalone ISED FRL exemption criterion at 20.1 cm. The largest fractions are 0.370521 for EG95 B12 and 0.384155 for EC25 B71. The combined exemption screen in Section 5.3 includes simultaneous transmission.

5.3 RF Exposure Test Exemptions for Simultaneous Transmission Sources

Combined assessment

Both modems are included at 100% duty factor and 25.0 dBm maximum conducted power. EG95-NAXD LTE B12 at 699 MHz with EC25-AFXD LTE B71 at 663 MHz governs both jurisdictions and bounds all 56 declared band pairs. No antenna-spacing or time-sharing credit is applied. At the common distance of 20.1 cm:

$$\text{FCC: } (316.227766 / 1425.960) + (316.227766 / 1352.520) = 0.455571$$

$$\text{ISED: } (426.579519 / 1151.296005) + (426.579519 / 1110.436276) = 0.754676$$

Applicable Simultaneous Transmission Sources	Sum of Exemption Fractions	Limit	Exempt
FCC: EG95-NAXD B12 + EC25-AFXD B71	$0.221765 + 0.233806 = 0.455571$	≤ 1	Yes
ISED: EG95-NAXD B12 + EC25-AFXD B71	$0.370521 + 0.384155 = 0.754676$	≤ 1	Yes

Conclusion:

The combined fractions are 0.456 for FCC and 0.755 for ISED after rounding, both below 1. The specified dual-modem configuration meets both RF exposure exemption screens at a common minimum separation of 20.1 cm (201 mm). Routine SAR or FRL testing is not required for this exempt configuration.

The alternative FCC ERP Table 1 screen gives 1.478 at 20.1 cm. It does not govern this finding: the permitted power-based alternative above satisfies the exemption criterion. No free-space field prediction is used.

Minimum common distance

The ISED condition is strictly $d > 200$ mm, so there is no smallest qualifying real-valued distance. This report uses 1 mm reporting resolution; 201 mm is the closest qualifying value at that resolution. Exactly 200 mm remains outside the FRL exemption route and fails the applicable SAR exemption screen.

Operating conditions and assessment scope

Install with the two YECN028AA transmit antennas connected as described in Section 3.2 and with antenna blades vertical. Maintain an actual clearance of at least 20.1 cm (201 mm) from the nearest surface of each transmitting antenna to every person whenever either modem is active, including operation from the backup battery. Installation tolerances shall not reduce this clearance.

Installation instructions shall specify this 201 mm common minimum and the assessed factory dual-modem simultaneous operation, superseding the supplied guide's 20 cm clearance and prohibition on concurrent transmitters. The optional exterior antenna kit, other antenna models and additional co-located transmitters remain outside this assessment.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
2026-04-30	EMC_OOMMA_017_25001_RF_Exposure	Initial Version	Art Thammanavarat
2026-09-08	EMC_OOMMA_017_25001_RF_Exposure_Rev1	Common separation set to 20.1 cm (201 mm). ISED section 6.6 and combined exemption calculations added; methods, conclusions and installation conditions aligned.	Art Thammanavarat

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