



Radio Frequency Exposure Evaluation Report

For:
NexRev LLC

Model Number:
COMMS

Market Name:
Nexus Comms

Product Description:
Intelligent IoT Connectivity Device

FCC ID: 2B00E-NEXUSCOMMS
IC: 33828-NEXUSCOMMS

Per:
CFR Part Part1 (1.1307 &1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISEDC RSS-102 Issue 6

Report number: EMC_NEXRE_002_25001_FCC_ISED_RF_Exposure_Rev1

DATE: 2025-07-24



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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) and IC standard RSS-102 issue 6 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 and IC rule parts based on available specifications for worst case conditions at 20cm distance to the body.

Company	Description	Model #
NexRev LLC	Intelligent IoT Connectivity Device	COMMS

Report Reviewer:

2025-07-24	Compliance	Alvin Ilarina (Senior Manager Regulatory Services)
Date	Section	Name

Responsible for the Report:

2025-07-24	Compliance	Cheng Song (EMC Engineer)
Date	Section	Name

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
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City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
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Senior Manager Regulatory Services:	Alvin Ilarina
Responsible Project Leader:	Shane Hao

2.2 Identification of the Client / Manufacturer

Client's Name:	NexRev LLC
Street Address:	601 Development Drive
City/Zip Code	Plano TX 75074
Country	USA

Identification of the Manufacturer

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

3 Equipment under Assessment

Model No	COMMS
Marketing Name	Nexus Comms
HW Version	4
SW Version	V1.1.0
FCC ID	2B00E-NEXUSCOMMS
IC	33828-NEXUSCOMMS
Product Description	Intelligent IoT Connectivity Device
Radio Information as declared	<p>Cellular Modules</p> <ul style="list-style-type: none">• Model: Nordic Semiconductor nRF9160• Contains FCC ID: 2ANPO00NRF9160• Contains IC: 24529-NRF9160 <p>Bluetooth Modules</p> <ul style="list-style-type: none">• Model: Nordic Semiconductor nRF 52840• Wireless Technology: Bluetooth LE v5.2
Antenna Information as declared	Pulse W1010 Antenna Quectel YE0021AA Antenna (Primary cellular antenna) JoyMax ZWX-721XSA2B Antenna
Power Supply/ Rated Operating Voltage Range	Nominal 24 VAC/DC Range 18 - 30 VAC/DC
Operating Temperature Range	-40 °C to +70 °C
Sample Revision	<input type="checkbox"/> Prototype <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production
EUT Dimensions	12.1cm X 11.8cm X 3.2cm
Weight	<1.0 lb
Note: Details about the Equipment Under Test (EUT) are provided by the client or applicant.	

4 RF Exposure Limits and FCC and IC Basic Rules

4.1 Routine Environmental Evaluation Categorical Exclusion Limits according to FCC 1.1307(b)(3)(i), and FCC 1.1307(b)(3)(ii).

(i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A).

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

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

d = the separation distance (cm);

(C) Or 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)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2R^2$.

(ii) For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) 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.

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

4.2 Field reference level (FRL) exposure exemption limits according to RSS-102 Issue 6, section 6.6

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f0.5$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f0.6834$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.

5 Evaluations

5.1 Analysis of RF Exposure

FCC:

Radio	Tech-Band	Freq-Low _[GHz]	Pwr _[dBm]	Power _[W]	Ant-G _[dBi]	EIRP _[W]	ERP _[W]	ERP _[mW]	FCC 2.1093(c)(1) P _{th} _[mW] = ERP _{20cm}	P/P _{th} ratio
Cellular	LTE 2	1.8550	24.00	0.251	4.40	0.692	0.422	421.70	3060.00	0.138
	LTE 4	1.7150	24.00	0.251	4.40	0.692	0.422	421.70	3060.00	0.138
	LTE 5	0.8290	24.00	0.251	3.30	0.537	0.327	327.34	1691.16	0.194
	LTE 12	0.7040	24.00	0.251	3.30	0.537	0.327	327.34	1436.16	0.228
	LTE 13	0.7820	24.00	0.251	3.30	0.537	0.327	327.34	1595.28	0.205
	LTE 8	0.8850	24.00	0.251	3.30	0.537	0.327	327.34	1805.40	0.181
	LTE 26	0.8190	24.00	0.251	3.30	0.537	0.327	327.34	1670.76	0.196
Radio	Tech-Band	Freq-Low _[GHz]	Pwr _[dBm]	Power _[W]	AG _[dBi]	EIRP _[W]	ERP _[W]	ERP _[mW]	FCC 2.1093(c)(1) P _{th} _[mW] = ERP _{20cm}	P/P _{th} ratio
Bluetooth	LE	2.4020	18.80	0.0759	2.00	0.120	0.073	73.28	3060.00	0.025

The worst-case simultaneous transmission scenario involves LTE Band 12 and BTLE:

TER (Total Exposure Ratio) = 0.253

RF exposure exemption applicable

IC:

Radio	Tech-Band	Freq-Low _[MHz]	Pwr _[dBm]	Power _[W]	Ant-G _[dBi]	EIRP _[W]	EIRP _[mW]	Exemption limit for Routine Evaluation	EIRP _[W] /Limit
Cellular	LTE 2	1855.00	24.00	0.25	4.40	0.69	691.83	2.24	0.308
	LTE 4	1715.00	24.00	0.25	4.40	0.69	691.83	2.13	0.325
	LTE 5	829.00	24.00	0.25	3.30	0.54	537.03	1.29	0.415
	LTE 12	704.00	24.00	0.25	3.30	0.54	537.03	1.16	0.464
	LTE 13	782.00	24.00	0.25	3.30	0.54	537.03	1.24	0.432
	LTE 8	885.00	24.00	0.25	3.30	0.54	537.03	1.35	0.397
	LTE 26	819.00	24.00	0.25	3.30	0.54	537.03	1.28	0.419
Radio	Tech-Band	Freq-Low _[MHz]	Pwr _[dBm]	Power _[W]	Ant-G _[dBi]	EIRP _[W]	EIRP _[mW]	Exemption limit for Routine Evaluation	EIRP _[W] /Limit
Bluetooth	LE	2402.00	18.80	0.0759	2.00	0.12	120.23	2.68	0.045

The worst-case simultaneous transmission scenario involves LTE Band 12 and BTLE:

TER (Total Exposure Ratio) = 0.509

RF exposure exemption applicable

6 Revision History

Date	Report Name	Changes to report	Prepared by
2025-04-21	EMC_NEXRE_002_25001_FCCISED_RF_Exposure	Initial Version	Cheng Song
2025-07-24	EMC_NEXRE_002_25001_FCCISED_RF_Exposure_R ev1	Revised the RF exposure analysis table with the updated worst-case antenna gain.	Cheng Song

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