

TEST REPORT

FCC MPE Test for PSR-78-8527
Class II Permissive Change

APPLICANT
ADRF KOREA, Inc.

REPORT NO.
HCT-RF-2111-FC059

DATE OF ISSUE
November 25, 2021

Tested by
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**TEST
REPORT**

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PSR-78-8527

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Additional Model

-

Applicant

ADRF KOREA, Inc.

5-5, Mojeon-Ri, Backsa-Myun, Icheon-Citi, Kyunggi-Do, Korea

**Eut Type
Model Name**

Repeater

PSR-78-8527

FCC ID

N52-PSR-78-8527

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	November 25, 2021	Initial Release

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr

RF Exposure Statement

1. LIMITS

According to § 1.1310 and § 2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f ²)	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....	f/1500	30
1500 - 100.000.....	1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

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

3. RESULTS

3.1 MPE calculation for standalone operations

[Uplink]

- FirstNet - LTE 10 MHz (Uplink)

Max Peak output Power at antenna input terminal	25.00	dBm
Max Peak output Power at antenna input terminal	316.23	mW
Prediction distance	70.00	cm
Prediction frequency	788.00	MHz
Coupled Gain*(typical)	13.00	dBi
Coupled Gain*(numeric)	19.95	-
Power density at prediction frequency(S)	0.1025	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5253	mW/cm ²

*Coupled Gain = Ant. Peak Gain(dBi) – Cable Loss(dB) = 15 dBi – 2 dB = 13 dBi

- PS Narrowband – P25 Phase 1 (Uplink)

Max Peak output Power at antenna input terminal	25.00	dBm
Max Peak output Power at antenna input terminal	316.23	mW
Prediction distance	70.00	cm
Prediction frequency	799.00	MHz
Coupled Gain*(typical)	13.00	dBi
Coupled Gain*(numeric)	19.95	-
Power density at prediction frequency(S)	0.1025	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5327	mW/cm ²

*Coupled Gain = Ant. Peak Gain(dBi) – Cable Loss(dB) = 15 dBi – 2 dB = 13 dBi

- SMR – P25 Phase 1 (Uplink)

Max Peak output Power at antenna input terminal	25.00	dBm
Max Peak output Power at antenna input terminal	316.23	mW
Prediction distance	70.00	cm
Prediction frequency	809.00	MHz
Coupled Gain*(typical)	14.00	dBi
Coupled Gain*(numeric)	25.12	-
Power density at prediction frequency(S)	0.1290	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5393	mW/cm ²

*Coupled Gain = Ant. Peak Gain(dBi) – Cable Loss(dB) = 16 dBi – 2 dB = 14 dBi

- NPSPAC – P25 Phase 1 (Uplink)

Max Peak output Power at antenna input terminal	25.00	dBm
Max Peak output Power at antenna input terminal	316.23	mW
Prediction distance	70.00	cm
Prediction frequency	806.00	MHz
Coupled Gain*(typical)	14.00	dBi
Coupled Gain*(numeric)	25.12	-
Power density at prediction frequency(S)	0.1290	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5373	mW/cm ²

*Coupled Gain = Ant. Peak Gain(dBi) – Cable Loss(dB) = 16 dBi – 2 dB = 14 dBi

[Downlink]

- FirstNet - LTE 10 MHz (Downlink)

Max Peak output Power at antenna input terminal	28.00	dBm
Max Peak output Power at antenna input terminal	630.96	mW
Prediction distance	30.00	cm
Prediction frequency	758.00	MHz
Antenna Gain(typical)	2.60	dBi
Antenna Gain(numeric)	1.82	-
Power density at prediction frequency(S)	0.1015	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5053	mW/cm ²

- PS Narrowband – P25 Phase 1 (Downlink)

Max Peak output Power at antenna input terminal	28.00	dBm
Max Peak output Power at antenna input terminal	630.96	mW
Prediction distance	30.00	cm
Prediction frequency	769.00	MHz
Antenna Gain(typical)	2.60	dBi
Antenna Gain(numeric)	1.82	-
Power density at prediction frequency(S)	0.1015	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5127	mW/cm ²

- SMR – P25 Phase 1 (Downlink)

Max Peak output Power at antenna input terminal	28.00	dBm
Max Peak output Power at antenna input terminal	630.96	mW
Prediction distance	30.00	cm
Prediction frequency	854.00	MHz
Antenna Gain(typical)	3.90	dBi
Antenna Gain(numeric)	2.45	-
Power density at prediction frequency(S)	0.1369	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5693	mW/cm ²

- NPSPAC – P25 Phase 1 (Downlink)

Max Peak output Power at antenna input terminal	28.00	dBm
Max Peak output Power at antenna input terminal	630.96	mW
Prediction distance	30.00	cm
Prediction frequency	851.00	MHz
Antenna Gain(typical)	3.90	dBi
Antenna Gain(numeric)	2.45	-
Power density at prediction frequency(S)	0.1369	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5673	mW/cm ²

3.2 Simultaneous band emission conditions

[Uplink]

Band	Signal	MPE Ratio (Power density / Limit)	Sum of MPE Ratio	
FirstNet	LTE 10 MHz	0.1951	0.8667	≤ 1
PS Narrowband	P25 Phase 1	0.1924		
SMR	P25 Phase 1	0.2392		
NPSPAC	P25 Phase 1	0.2401		

***Note**

1. The result of each band was applied to the worst value.
2. MPE ratios are calculated as

$$[(\text{Power density}_1 / \text{MPE Limit}) + [(\text{Power density}_2 / \text{MPE Limit}) + \dots]] \leq 1$$

[Downlink]

Band	Signal	MPE Ratio (Power density / Limit)	Sum of MPE Ratio	
FirstNet	LTE 10 MHz	0.2009	0.8808	≤ 1
PS Narrowband	P25 Phase 1	0.1980		
SMR	P25 Phase 1	0.2405		
NPSPAC	P25 Phase 1	0.2414		

***Note**

1. The result of each band was applied to the worst value.
2. MPE ratios are calculated as

$$[(\text{Power density}_1 / \text{MPE Limit}) + [(\text{Power density}_2 / \text{MPE Limit}) + \dots]] \leq 1$$