

TEST REPORT

FCC MPE Test for SDR-33

APPLICANT
ADRF KOREA, Inc.

REPORT NO.
HCT-RF-2006-FC002-R1

DATE OF ISSUE
25 June 2020

Tested by
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Additional Model

-

Applicant**ADRF KOREA, Inc.**

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

**Eut Type
Model Name**

Repeater
SDR-33

FCC ID

N52-SDR-33

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	June 11, 2020	Initial Release
1	June 25, 2020	- Revised the data table. - Added the simultaneous band emission conditions.

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.

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

- Lower 700 MHz – LTE 10 MHz (Uplink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	703.00	MHz
Antenna Gain(typical)	16.00	dBi
Antenna Gain(numeric)	39.81	-
Power density at prediction frequency(S)	0.0518	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4687	mW/cm ²

- Lower 700 MHz – LTE 10 MHz (Downlink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	733.00	MHz
Antenna Gain(typical)	16.00	dBi
Antenna Gain(numeric)	39.81	-
Power density at prediction frequency(S)	0.0518	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4887	mW/cm ²

- Upper 700 MHz – LTE 10 MHz (Uplink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	781.00	MHz
Antenna Gain(typical)	16.00	dBi
Antenna Gain(numeric)	39.81	-
Power density at prediction frequency(S)	0.0518	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5207	mW/cm ²

- Upper 700 MHz – LTE 10 MHz (Downlink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	751.00	MHz
Antenna Gain(typical)	16.00	dBi
Antenna Gain(numeric)	39.81	-
Power density at prediction frequency(S)	0.0518	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5007	mW/cm ²

- Cellular – LTE 10 MHz (Uplink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	829.00	MHz
Antenna Gain(typical)	16.70	dBi
Antenna Gain(numeric)	46.77	-
Power density at prediction frequency(S)	0.0609	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5527	mW/cm ²

- Cellular – LTE 10 MHz (Downlink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	874.00	MHz
Antenna Gain(typical)	16.70	dBi
Antenna Gain(numeric)	46.77	-
Power density at prediction frequency(S)	0.0609	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5827	mW/cm ²

- Broadband PCS – LTE 10 MHz (Uplink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	1855.00	MHz
Antenna Gain(typical)	19.10	dBi
Antenna Gain(numeric)	81.28	-
Power density at prediction frequency(S)	0.1058	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Broadband PCS – LTE 10 MHz (Downlink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	1957.14	MHz
Antenna Gain(typical)	19.10	dBi
Antenna Gain(numeric)	81.28	-
Power density at prediction frequency(S)	0.1058	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Broadband PCS – LTE 20 MHz (Uplink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	1860.00	MHz
Antenna Gain(typical)	19.10	dBi
Antenna Gain(numeric)	81.28	-
Power density at prediction frequency(S)	0.1058	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Broadband PCS – LTE 20 MHz (Downlink)

Max Peak output Power at antenna input terminal	33.50	dBm
Max Peak output Power at antenna input terminal	2238.72	mW
Prediction distance	370.00	cm
Prediction frequency	1957.14	MHz
Antenna Gain(typical)	19.10	dBi
Antenna Gain(numeric)	81.28	-
Power density at prediction frequency(S)	0.1058	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

Simultaneous band emission conditions

Uplink

Band	MPE Ratio (Power density / Limit)	Sum of MPE Ratio	
Lower 700 MHz	0.1105	0.4260	≤ 1
Upper 700 MHz	0.0995		
Cellular	0.1101		
PCS	0.1058		

Downlink

Band	MPE Ratio (Power density / Limit)	Sum of MPE Ratio	
Lower 700 MHz	0.1060	0.4197	≤ 1
Upper 700 MHz	0.1035		
Cellular	0.1045		
PCS	0.1058		

*Note

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

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