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Project Num	17E6742-2d
Quotation	Q17-0205-1b
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Prepared By	Compliance Engineering Ireland
Test Lab Address	Clonross Lane, Derrockstown, Dunshaughlin, Co. Meath, Ireland
Tested By	Michael Kirby
Test Report By	Michael Kirby
FCC Site Registration	92592
IC Site Registration	8517-A2, 8517-A1
Date	4 th Sept 2017
IC Equipment Authorisation	Test Report
EUT Description	RFID Module
FCC ID	SCCNUR21W
IC ID	5137A-NUR21W
Authorised by	John McAuley
Authorised Signature :	

RF Exposure Exhibit– Technical Report

1.0 Overview

This report contains an RF exposure evaluation against test exclusion limits for FCC and IC.

1.1 Fixed / Mobile Application

Manufacturer declaration

Type of antenna “4 patch antenna array”.

Max gain in forward direction = 6dBi

Type of antenna “Cross Dipole antenna”.

Max gain in forward direction = 5dBi

Max Rated power = 30dBm

2.0 Maximum Permissible Exposure FCC

47 CFR Sections 1.1307, 1.1310, 2.1091,

447498 D01 General RF Exposure Guidance v06

2.1.1 Antenna gain of 5dB General population /Un-controlled Environments (FCC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	5	dB
Time Averaging Factor	0	dB
EIRP Peak	35	dBm
EIRP Peak	3162	mW
Prediction distance:	20.4	cm
Prediction frequency:	915	MHz
MPE limit for Uncontrolled/General Population exposure at prediction frequency:	0.610	mW/cm ²
Power density at prediction frequency:	0.605	mW/cm ²
Power density at prediction frequency:	6.047	W/m ²
Test Result	Pass	
Exempt from RF Exposure evaluation		

Notes

The table above shows that for a prediction distance of 20.4cm, RF exposure evaluation is not required.

At a prediction distance of 20cm the power density is 0.629 mW/cm² which is above the RF exposure evaluation limit (FCC)

2.1.2 Antenna gain of 5dB Occupational /Controlled Environments (FCC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	5	dB
Time Averaging Factor	0	dB
EIRP Peak	35	dBm
EIRP Peak	3162	mW
Prediction distance:	20	cm
Prediction frequency:	915	MHz
MPE limit for Controlled/Occupational exposure at prediction frequency:	3.050	mW/cm ²
Power density at prediction frequency:	0.629	mW/cm ²
Power density at prediction frequency:	6.291	W/m ²
Test Result	Pass	
Exempt from RF Exposure evaluation		

Notes

The table above shows that for a prediction distance of 20cm, RF exposure evaluation is not required.

2.2.1 Antenna gain of 6dB General population /Un-controlled Environments (FCC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	6	dB
Time Averaging Factor	0	dB
EIRP Peak	36	dBm
EIRP Peak	3981	mW
Prediction distance:	22.8	cm
Prediction frequency:	915	MHz
MPE limit for Uncontrolled/General Population exposure at prediction frequency:	0.610	mW/cm ²
Power density at prediction frequency:	0.609	mW/cm ²
Power density at prediction frequency:	6.094	W/m ²
Test Result	Pass	
Exempt from RF Exposure evaluation		

Notes

The table above shows that for a prediction distance of 22.8cm, RF exposure evaluation is not required.

At a prediction distance of 20cm the power density is 0.792 mW/cm², which is above the RF exposure evaluation limit (FCC)

2.2.2 Antenna gain of 6dB Occupational /Controlled Environments (FCC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	6	dB
Time Averaging Factor	0	dB
EIRP Peak	36	dBm
EIRP Peak	3981	mW
Prediction distance:	20	cm
Prediction frequency:	915	MHz
MPE limit for Controlled/Occupational exposure at prediction frequency:	3.050	mW/cm ²
Power density at prediction frequency:	0.792	mW/cm ²
Power density at prediction frequency:	7.920	W/m ²
Test Result	Pass	
Exempt from RF Exposure evaluation		

Notes

The table above shows that for a prediction distance of 20cm, RF exposure evaluation is not required.

3.0 Maximum Permissible Exposure IC

Limits for Routine Evaluation — RF Exposure Evaluation

Limits as per RSS 102 Table 6

3.1.1 Antenna Gain 5dBi General population /Un-controlled Environments (IC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	5	dB
EIRP Peak	35	dBm
Time Averaging Factor	0.00	dB
Tune up factor	0	dB
EIRP Peak	35.00	dBm
EIRP Peak	3.16	W
Prediction distance:	30.2	cm
Prediction frequency:	915	MHz
Power density at prediction frequency:	2.76	W/m^2
Power Density Limit for Uncontrolled/General Population exposure at prediction frequency:	2.77	W/m^2
<u>Exempt from RF Exposure Evaluation</u>		

Notes

The table above shows that for a prediction distance of 30.2cm, RF exposure evaluation is not required.

At a prediction distance of 20cm the power density is 6.29 W/m^2 which is above the RF exposure evaluation limit (IC)

3.1.2 Antenna gain of 5dB Occupational /Controlled Environments (IC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	5	dB
EIRP Peak	35	dBm
Time Averaging Factor	0.00	dB
Tune up factor	0	dB
EIRP Peak	35.00	dBm
EIRP Peak	3.16	W
Prediction distance:	20	cm
Prediction frequency:	915	MHz
Power density at prediction frequency:	6.29	W/m^2
Power Density limit for Controlled/Occupational exposure at prediction frequency:	19.53	W/m^2
<u>Exempt from RF Exposure Evaluation</u>		

Notes

The table above shows that for a prediction distance of 20cm, RF exposure evaluation is not required.

3.2.1 Antenna gain of 6dB General population /Un-controlled Environments (IC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	6	dB
EIRP Peak	36	dBm
Time Averaging Factor	0.00	dB
Tune up factor	0	dB
EIRP Peak	36.000	dBm
EIRP Peak	3.98	W
Prediction distance:	33.9	cm
Prediction frequency:	915	MHz
Power density at prediction frequency:	2.76	W/m^2
Power Density Limit for Uncontrolled/General Population exposure at prediction frequency:	2.77	W/m^2
<u>Exempt from RF Exposure Evaluation</u>		

Notes

The table above shows that for a prediction distance of 33.9cm, RF exposure evaluation is not required.

At a prediction distance of 20cm the power density is 7.92 W/m^2, which is above the RF exposure evaluation limit (IC)

3.2.2 Antenna gain of 6dB Occupational /Controlled Environments (IC)

where:

S = power density

P = power input to the 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

$$S = \frac{PG}{4\pi R^2}$$

Conducted Output Power	30	dBm
Antenna Gain	6	dB
EIRP Peak	36	dBm
Time Averaging Factor	0.00	dB
Tune up factor	0	dB
EIRP Peak	36.00	dBm
EIRP Peak	3.98	W
Prediction distance:	20	cm
Prediction frequency:	915	MHz
Power density at prediction frequency:	7.92	W/m^2
Power Density limit for Controlled/Occupational exposure at prediction frequency:	19.53	W/m^2
<u>Exempt from RF Exposure Evaluation</u>		

Notes

The table above shows that for a prediction distance of 20cm, RF exposure evaluation is not required.

End of Report