Company: Rockwell Collins.

Test of: Rockwell Collins SSR-7610

To: FCC CFR 47 Part 1.1310

Report No.: ROCK25-U9_MPE FCC Rev A

MPE/RF EXPOSURE TEST REPORT

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FROM

Test of: Rockwell Collins SSR-7610

To: FCC CFR 47 Part 1.1310

Test Report Serial No.: ROCK25-U9_MPE FCC Rev A

This report supersedes: NONE

Applicant: Rockwell Collins
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TESTING CERT #2381.01

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1. MAXIMUM PERMISSABLE EXPOSURE

Calculations for Maximum Permissible Exposure Levels
Power Density = Pd (mW/cm^2) = EIRP/($4*\pi*d^2$)
EIRP = P * G
P = Peak output power (mW)
G = Antenna numeric gain (numeric)
d = Separation distance (cm)
Numeric Gain = 10 ^ (G (dBi)/10)

The calculations in the table below use the highest conducted power values together with the lowest antenna gain specified for the EUT. These calculations represent worst case in terms of the exposure levels.

Maximum Permissible Exposure

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm^2) @ 20cm	Power Density Limit (mW/cm^2)	Min Calculated safe distance for Limit (cm)	Calculated Power Density (mW/cm^2) @ Safe Distance
836.4 (WCDMA)	0	1.00	20.35	108.39	0.0215	0.5576	20	0.0215
836.5 (LTE Band 5)	0	1.00	19.41	87.30	0.0173	0.5576	20	0.0173

Assessment for simultaneous operation in LTE and WCDMA bands

The Rockwell Collins has two radio modules and can transmit simultaneously in the LTE and WCDMA bands. The following assessment is based on simultaneous operation in the LTE and WCDMA bands.

Freq. Band (MHz)	Total\ Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm^2) E_{ref}	Power Density (mW/cm^2) @New Distance E_i	Summation E_i/E_{ref} (cm)
836.4 (WCDMA)	0	1.00	20.35	108.39	20	0.5576	0.0215	0.0311
836.5 (LTE Band 5)	0	1.00	19.41	87.30	20	0.5576	0.0173	0.0387
							Total Evaluation:	0.070

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^{n} Ei/Eref \leq 1$$

Where
Ei: calculated E-field Strength for transmitter
Eref: E-field strength related limit

Specification - Maximum Permissible Exposure Limits

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500	--	--	f/1500	30
1,500-100,000	--	--	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

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