INQUIRY FCC SCG2228 BASIC

< KDB 484596 DATA REFERENCE >

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VERSION CONTROL

Version	Date	Change log
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1 INTRODUCTION

The product under certification (VARIANT device) is SCG2228 BASIC, with FCC ID: XX6SCG2228X. This is a device with TETRA transmitter.

SEPURA Limited has a very similar product, model SCG2228 PREMIUM (REFERENCE device) certified under the FCC ID: XX6SCG2228M (exactly same main PCB but the model SCG2228 PREMIUM integrate a module that supports BT/Wi-Fi. This module PCB is independent and it is plugged on the main board by a specific connector). The same hardware, same antennas, same frequency and software are used to generate the TETRA signal.

We, SEPURA LIMITED, take full responsibility for the fact that the test data as referenced represents valid data for demonstrating compliance for the variants listed in the application.

2 JUSTIFICATIONS

A tetra mobile radio (reference device) is certified for TETRA bands, Bluetooth 2.4GHz, Bluetooth Low energy and Wi-Fi 2.4GHz bands (Part 2 and Part 90, Part 15C).

The variant tetra mobile radio has identical components as the reference device, and only support TETRA technology (Part 90). The reduced band functionality for a variant is obtained by removing the BT and Wi-Fi module.

Both variants have the same main PCB, same hardware, same antennas, same frequency and same software is used to generate the TETRA signal.

For all these reasons, we consider that the variant device can leverage the test results (Part 90) from the reference device just performing the spot checking explained below.

3 ILUSTRATIONS SIDE BY SIDE

Please, refers to document "*Photographs Side by Side*".

4 SPOT CHECK TEST PLAN

4.1 RADIO FREQUENCY

TETRA

Full testing was performed in the reference device (SCG2228 PREMIUM), test report was completed by an accredited test laboratory in frequency 806 – 824 MHz and 851 – 870 MHz.

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 90, ISED RSS-119 and ISED RSS-GEN is shown below.

Section	Specification Clause				Test Description	Result	Comments/Base Standard
	Part 2	Part 90	RSS-119	RSS-GEN			
Configuration and Mode: Tetra - 806 MHz to 825 MHz							
2.1	2.1046	90.205	5.4	6.12	Maximum Conducted Output Power	Pass	ANCI C63.26: 2015
2.2	2.1047	90.207	5.2	-	Types of Emissions	Pass	
2.3	2.1049	90.209	5.5	6.7	Bandwidth Limitations	Pass	ANSI C63.26: 2015
2.4	2.1051	90.210	5.8	6.13	Spurious Emissions at Antenna Terminals	Pass	
2.5	2.1053	90.210	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
2.6	2.1055	90.213	5.3	6.11	Frequency Stability	Pass	ANSI C63.26: 2015
2.7	-	90.221	5.8.9.1	-	Adjacent Channel Power	Pass	
Configuration and Mode: Tetra - 851 MHz to 870 MHz							
2.1	2.1046	90.205	5.4	6.12	Maximum Conducted Output Power	Pass	ANCI C63.26: 2015
2.2	2.1047	90.207	5.2	-	Types of Emissions	Pass	
2.3	2.1049	90.209	5.5	6.7	Bandwidth Limitations	Pass	ANSI C63.26: 2015
2.4	2.1051	90.210	5.8	6.13	Spurious Emissions at Antenna Terminals	Pass	
2.5	2.1053	90.210	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
2.6	2.1055	90.213	5.3	6.11	Frequency Stability	Pass	ANSI C63.26: 2015
2.7	-	90.221	5.8.9.1	-	Adjacent Channel Power	Pass	

Spot checking was performed in the variant device (SCG2228 BASIC):

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 90, ISED RSS-119 and ISED RSS-GEN is shown below. These tests have been performed as spot-check measurements as per KDB 484596 D01. All other compliance is to be shown as per the report for the "Premium" variant.

Section	Specification Clause				Test Description	Result	Comments/Base Standard
	Part 2	Part 90	RSS-119	RSS-GEN			
Configuration and Mode: Tetra Basic Variant Spot Check - 806 MHz to 825 MHz							
2.1	2.1046	90.205	5.4	6.12	Maximum Conducted Output Power	Pass	ANCI C63.26: 2015
2.2	2.1053	90.210	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
Configuration and Mode: Tetra Basic Variant Spot Check - 851 MHz to 870 MHz							
2.1	2.1046	90.205	5.4	6.12	Maximum Conducted Output Power	Pass	ANCI C63.26: 2015
2.2	2.1053	90.210	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015

Table 2

Comparing the test results in terms of maximum output power:

Tetra - 806 MHz to 825 MHz

Parameter	806.0125 MHz	815 MHz	823.9875 MHz
Conducted Output Power (dBm)	39.075	39.037	39.067
Manufacturer Declared Power (dBm)	40.0	40.0	40.0
Δ from manufacturer Power (dB)	0.925	0.963	0.933
Antenna Gain (dBi)	5.0	5.0	5.0
ERP (dBm)	44.075	44.037	44.067

Table 1 Reference device Maximum output power 806 - 825

Parameter	823.9875 MHz
Conducted Output Power (dBm)	39.002
Manufacturer Declared Power (dBm)	40.0
Δ from manufacturer Power (dB)	0.998
Antenna Gain (dBi)	5.0
ERP (dBm)	44.002

Table 2 Variant device Maximum Output Power 806 - 825

$$Difference = 0.073dBm$$

Tetra - 851 MHz to 870 MHz

Parameter	851.0125 MHz	860 MHz	868.9875 MHz
Conducted Output Power (dBm)	39.030	39.016	39.144
Manufacturer Declared Power (dBm)	40.0	40.0	40.0
Δ from manufacturer Power (dB)	0.970	0.984	0.856
Antenna Gain (dBi)	5	5	5
ERP (dBm)	44.030	44.016	44.144

Table 3 Reference device Maximum Output Power 851 – 870

Parameter	N/A MHz
Conducted Output Power (dBm)	39.052
Manufacturer Declared Power (dBm)	40.0
Δ from manufacturer Power (dB)	0.948
Antenna Gain (dBi)	5
ERP (dBm)	44.052

Table 4 Variant device Maximum Output Power 851 - 870

$$Difference = 0.092\ dBm$$

So, the difference is less than 3 dBm. So we are in compliance with the KDB criteria.

RF EXPOSURE

Full RF exposure assessment has been done for model SCG2228 BASIC variant. So, no Data reference is needed.

4.2 EMC

Full testing has been done for model SCG2228 BASIC variant against FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-21 Edition). So we don't need to leverage any test result from other device.

ANNEX 1: CROSS REFERENCE TABLE

Reference device	Variant device	Key Differences
FCC ID XX6SCG2228M	FCC ID XX6SCG2228X	Both variants share the same main PCB. The Bluetooth / WLAN module is a separate module that plugs into the main PCB. The SCG2228 BASIC without Bluetooth/WLAN module is a subset of the SCG2228 PREMIUM with Bluetooth/WLAN module. With the Bluetooth / WLAN module removed and a reduced key mat and associated bezel. The same hardware, same antennas, same frequency and software are used to generate the TETRA signal.

Rule Part	Test item	Data Reference	Comments
TNB			
FCC 90.205	Maximum Conducted Output Power	**Y**	Full testing for model SCG2228 PREMIUM and spot checking for model SCG2228 BASIC
FCC 90.209	Bandwidth Limitations	**Y**	Full testing for model SCG2228 PREMIUM and this test has not been performed for model SCG2228 BASIC
FCC 90.210	Spurious Emissions at Antenna Terminals	**Y**	Full testing for model SCG2228 PREMIUM and this test has not been performed for model SCG2228 BASIC
FCC 90.210	Frequency stability	**Y**	Full testing for model SCG2228 PREMIUM and this test has not been performed for model SCG2228 BASIC

FCC 90.214	Transient Frequency Behaviour	**Y**	Full testing for model SCG2228 PREMIUM and this test has not been performed for model SCG2228 BASIC
FCC 90.221	Adjacent Channel Power	**Y**	Full testing for model SCG2228 PREMIUM and this test has not been performed for model SCG2228 BASIC
FCC 90.207	Types of Emissions	**Y**	Full testing for model SCG2228 PREMIUM and this test has not been performed for model SCG2228 BASIC
FCC 90.210	Radiated Spurious Emissions	**Y**	Full testing for model SCG2228 PREMIUM and spot checking for model SCG2228 BASIC

Rule Part	**Test item**	**Data Reference**	**Comments**
FCC 2.1091 FCC 2.1093 FCC 1.1310 FCC 1.1307	RF Exposure Exemption evaluation	**N**	Full testing for model SCG2228 PREMIUM and Full testing for model SCG2228 BASIC

Unintentional radiator (EMC) is out of the certification scope.

Rule Part	**Test item**	**Data Reference**	**Comments**
JAB			
FCC 15.107	CE Continuous Conducted emission	**N**	Full testing for model SCG2228 PREMIUM and for model SCG2228 BASIC

FCC 15.109	RE Radiated emission. Electromagnetic field measure	**N**	Full testing for model SCG2228 PREMIUM and for model SCG2228 BASIC

Acceptance Criteria for all test cases
FCC Part 90 (TNB) For the same conditions, we have compared the maximum conducted output power measured in both models. And we have verified that the difference is <3 dB.