

RF Exposure Report



Report No.: FCC-IC_MPE_SL15030401-SPC-017_0402

Supersede Report No.: None

Applicant	:	SpiderCloud Wireless, Inc.
Product Name	:	SpiderCloud Radio Node
Model No.	:	USC8718-M24-K9
RF Exposure Requirements	:	47 CFR §1.1307(b), RSS-102 Issue 5, March 2015
RF Exposure Limits	:	47 CFR §1.1310, RSS-102 Issue 5, March 2015
RF Radiation Exposure Guidelines	:	FCC OST/OET Bulletin Number 65 RSS-102 Issue 5, March 2015
Issue Date	:	05/11/2015
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X]		
Equipment did not comply with the specification []		

This Test Report is Issued Under the Authority of:	
	
David Zhang	Nima Molaei
Test Engineer	Reviewer Engineer
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Issued By:
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Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC-IC_MPE_SL15030401-SPC-017_0402	None	Original	05/11/2015

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: SpiderCloud Wireless, Inc.
Product: Universal Small Cell 8818 LTE/UMTS Module
Model: USC8718-M24-K9

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	SpiderCloud Wireless, Inc.
Applicant Address	:	408 E. Plumeria Drive, San Jose, CA 95134
Manufacturer Name	:	SpiderCloud Wireless, Inc.
Manufacturer Address	:	408 E. Plumeria Drive, San Jose, CA 95134

4 Test site information

Lab performing tests	:	SIEMIC Laboratories
Lab Address	:	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	:	881796
IC Test Site No.	:	4842D-2
VCCI Test Site No.	:	A0133

5 Modification

Index	Item	Description	Note

6 EUT Information

6.1 EUT Description

Product Name	Universal Small Cell 8818 LTE/UMTS Module
Model No.	USC8718-M24-K9
Trade Name	SpiderCloud
Serial No.	15105A44095
Input Power	56VDC
Power Adapter Manu/Model	N/A
Power Adapter SN	-
Hardware version	-
Software version	-
Date of EUT received	04/13/2015
Equipment Class/ Category	PCB, TNB
Operating Frequencies	UMTS: TX (1930 MHz to 1995 MHz), UMTS: RX (1850 MHz to 1915 MHz) LTE: TX (2110 MHz to 2155 MHz), LTE: RX (1710 MHz to 1755 MHz)
Port/Connectors	N/A
Remark	NONE

7 FCC RF Exposure Evaluation

7.1 Limits

RF Exposure Requirements:	47 CFR §1.1307(b)
RF Radiation Exposure Limits:	47 CFR §1.1310
RF Radiation Exposure Guidelines:	FCC OST/OET Bulletin Number 65
EUT Frequency Band:	1500 ~ 100,000 MHz
Power Density Limit:	1 mW/ cm ²

7.2 MPE Calculation Formula

Equation: $S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$
 Where, S = Power Density
 P = Power Input to Antenna
 G = Antenna Gain
 R = distance to the center of radiated antenna

7.3 MPE Calculations

Radio Mode	Frequency (MHz)	Meas Output Power (dBm)	Antenna Gain (dBi)	Power Density (mw/cm ²)	Max tune-up Power (dBm)	Scaled Power Density (mw/cm ²)	Power Density Limit(mw/cm ²)
UMTS Band 2	1930-1995	20.52	2	0.036	22.7	0.059	1
LTE Band 4	2110-2155	20.94	2	0.039	22.7	0.058	1

Note: LTE and UMTS doesn't transmit simultaneously.

Total max Power density= 0.059 mW/cm² < 1mW/ cm²

7.4 MPE Calculation Results

The Above Result(s) show that the Device complies with the MPE requirement(s).

8 IC RF Exposure Evaluation

8.1 RSS-102 2.5.1, Exemption from Routine Evaluation Limits – SAR Evaluation

(a) Portable device –

When the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in below table.

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in below table are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in below table are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in below Table, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

8.2 RSS-102, 2.5.2, Exemption from Routine Evaluation Limits – RF Exposure Evaluation

(b) Mobile device –

- **below 20 MHz** and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than **1 W** (adjusted for tune-up tolerance);
- at or **above 20 MHz** and **below 48 MHz** and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than **$4.49/f^{0.5}$ W** (adjusted for tune-up tolerance), where f is in MHz;
- at or **above 48 MHz** and **below 300 MHz** and the source-based, time-averaged maximum e.i.r.p. of the device is **equal to or less than 0.6 W** (adjusted for tune-up tolerance);
- at or **above 300 MHz** and **below 6 GHz** and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than **$1.31 \times 10^{-2} f^{0.6834}$ W** (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

8.3 RF Exposure Evaluation

Radio Mode	Frequency (MHz)	Meas Output Power (dBm)	Antenna Gain (dBi)	Max tune-up Power (dBm)	Max e.i.r.p (dBm)	Max e.i.r.p (W)
UMTS Band 2	1930-1995	20.52	2	22.7	24.7	0.295
LTE Band 4	2110-2155	20.94	2	22.7	24.7	0.295

8.4 RF Exposure Evaluation Result

EUT is mobile device operating at frequency above 300MHz and below 6 GHz, and the maximum e.i.r.p (0.295 W) is less than $(1.31 \times 10^{-2} f^{0.6834} = 2.3 \text{ W})$, Per RSS-102, 2.5.2, it's exempted from routine evaluation limit.

Annex A. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurements
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2