

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT DFS TEST REPORT

Applicant:	FUJITSU CONNECTED TECHNOLOGIES Ltd.		
Product Name:	1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan Smart Phone		
Brand Name:	FUJITSU		
Model No.:	F-01L		
Model Difference:	N/A		
FCC ID:	2AQYEFMP167		
Report Number:	ER/2018/70058		
FCC Rule Part:	§15.407, Cat: NII		
Issue Date:	Sep. 20th, 2018		
Date of Test:	Aug. 28th, 2018 ~ Sep.14th, 2018		
Date of EUT Received:	Aug. 28th, 2018		

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Tested Bv:

Marcus Tseng

Marcus Tseng / Engineer

Approved By:

Blue Yang / Supervisor





Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/70058	Rev.00	Initial creation of docu- ment	All	Sep. 20th, 2018	Stefanie Yu / Clerk

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/tems_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



Contents

1	GEN	IERAL INFORMATION	
	1.1	Product Description	4
	1.2	Test Methodology of Applied Standards	
	1.3	Test Facility	
	1.4	Special Accessories	6
	1.5	Equipment Modifications	6
2	SUM	IMARY OF TEST RESULT	7
3	MEA	SUREMENT UNCERTAINTY	7
4	TPC	and DFS MEASUREMENT	
	_	TPC: Standard Applicable	
		DFS: Standard Applicable	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留別天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/tems_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document is unautive to a prevoked except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or ap-normand is unautive to and reference more the partice of the larger.

pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



GENERAL INFORMATION 1

1.1 **Product Description**

General:

Product Name:	Smart Phone		
Brand Name:	FUJITSU		
Model No.:	F-01L		
Model Difference:	N/A		
Product SW/HW version:	V01R028Ae / V2.1.0		
	3.8Vdc fron from AC/D0	n Rechargeable Li-ion Battery or 5Vdc /9Vdc /12Vdc C Adapter	
Power Supply:	Battery:	Model No.: CA54310-0075-A1, Supplier: FUJITSU CONNECTED TECHNOLOGIES LIMITED	
	Adapter:	Model No.: AC Adapter 06 Supplier: NTT docomo	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/tems_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號



WLAN 5GHz:

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (Avg.) (dBm)	Modulation Technology	
	5150~5250		11.32		
а	5250~5350	4	11.34	OFDM	
	5470~5725	12	11.29		
n_HT	5150~5250	4	HT: 11.34 (Worst Case)		
ac_VHT	5250~5350	4	HT: 11.25 (Worst Case)	OFDM	
20M	5470~5725	11	HT: 11.36 (Worst Case)		
n HT	5150~5250	2	HT: 11.46 (Worst Case)		
ac_VHT	5250~5350	2	HT: 11.37 (Worst Case)	OFDM	
40M 5470~5725		5	HT: 11.58 Worst Case)		
\ // IT	5150~5250	1	11.07		
ac_VHT 80M	5250~5350	1	11.01	OFDM	
5470~5725		2	11.18		
Antenna Designation 5GHz 5GHz			le Antenna -2dBi (5150MHz-5250MHz) -2dBi (5250MHz-5350MHz) -2dBi (5470MHz-5725MHz)		
Modulation type64QAM, 16QAM, QPSK, B256QAM for OFDM in 802.		QAM, QPSK, BPSK for OFDM OFDM in 802.11ac only			
Transitior	n Rate:	802.11 a: 6/9 802.11 n_20 802.11 n_40 802.11 ac_2 802.11 ac_4	9/12/18/24/36/48/54 Mbps MHz: 6.5 – 72.2Mbps MHz: 13.5 – 150Mbps OMHz: 6.5 –86.7Mbps OMHz: 13.5 –200Mbps OMHz: 29.3 – 433.3Mbps		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/tems_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號



1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407 FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 FCC KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02 All test items have been performed and record as per the above standards.

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Number and Designation are: 509634 / TW0001.

Special Accessories 1.4

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



SUMMARY OF TEST RESULT 2

FCC Rules	Description Of Test	Result
§15.407(h)	TPC and DFS Measurement	Compliant

MEASUREMENT UNCERTAINTY 3

Test Items	Uncertainty
TPC and DFS Measurement	+/- 123.36 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless the level is stated the results structure in this terreport results an piece) rester and state and the state of a structure in the state and structure in the structure in

pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號



TPC AND DFS MEASUREMENT

4.1. TPC: Standard Applicable

According to §15.407(h)(1), Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

4.1.1. Result: N/A, The output power is less than 500mW.

4.2. **DFS: Standard Applicable**

According to §15.407(h)(2) and FCC KDB 905462 D02, Radar Detection Function of Dynamic Frequency Selection (DFS).

Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is -62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

(i) Operational Modes. The DFS requirement applies to the following operational modes:

(A) The requirement for channel availability check time applies in the master operational mode.

(B) The requirement for channel move time applies in both the master and slave operational modes.

(ii) Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.

(iii) Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

(iv) Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d

pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



4.2.1. Limit Table 1: Applicability of DFS requirements prior to use of a channel

	Operational Mode			
Requirement	Master	Client(without radar detection)	Client(with radar detection)	
Non-occupancy Period	Yes	Yes	Yes	
DFS Detection Thresh- old	Yes	Not required	Yes	
Channel Availability Check Time	Yes	Not required	Not required	
U-NII Detection Bandwidth	Yes	Not required	Yes	

Table 2: Applicability of DFS requirements during normal operation

_	Operational Mode		
Requirement	Master Device or Client with Radar Detection	Client Without Radar Detection	
DFS Detection Threshold	Yes	Not required	
Cannel Closing Transmis- sion time	Yes	Yes	
Channel Move time	Yes	Yes	
U-NII Detection Bandwidth	Yes	Not required	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號



Additional requirements for devices with multiple bandwidth mode	Master Device or Client with Radar Detection	Client Without Radar Detection			
U-NII Detection Band- width and Statistical Performance Check	All BW modes must be tested	Not required			
Channel Move Time and Channel Closing Trans- mission Time	Test using widest BW mode availableTest using the widest BW mode available for the link				
All other tests Any single BW mode Not required					
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.					

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/tems_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



Table 3:

Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
$EIRP \ge 200 \text{ milliwatt}$	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01

Devices	DFS Threshold	
Devices with an e.i.r.p. < 200 mW AND a	-62 dBm	
Power Spectral Density < 10 dBm/MHz		
Devices with	-64 dBm	
$200 \text{ mW} \le \text{e.i.r.p.} \le 1 \text{ W}$		
Note: The detection threshold power is the received power, averaged over a 1-microsecond		
reference to a 0 dBi antenna.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
	See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U- NII 99% transmission power bandwidth. See Note 3.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless the level is stated the results structure in this terreport results an piece) rester and state and the state of a structure in the state and structure in the structure in pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law



Table 5: Radar Test Waveforms Short Pulse Radar

Radar	Pulse	PRI	Number of Pulses	Minimum	Minimum
Type	Width	(µsec)		Percentage of	Number
	(µsec)			Successful	of
				Detection	Trials
0	1	1428	18	See Note 1	See Note
					1
1	1	Test A: 15 unique	$\left(\begin{pmatrix} 1 \end{pmatrix} \right)$	60%	30
		PRI values	360		
		randomly selected	Roundun		
		from the list of 23	(19.10 ⁶)		
		PRI values in	$\left(\overline{\mathbf{PRI}_{\mu \text{sec}}} \right)$		
		Table 5a	((µsec /)		
		Test B: 15 unique			
		PRI values			
		randomly selected			
		within the range			
		of 518-3066 µsec,			
		with a minimum			
		increment of 1			
		µsec, excluding			
		PRI values			
		selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
	(Radar Types			80%	120
Note 1: Sh	ort Pulse Rad	ar Type 0 should be u	sed for the detection ba	ndwidth test, ch	annel move
time, and c	hannel closing	g time tests.			

Long Pulse Radar

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of Pulses per Burst	Number of <i>Bursts</i>	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000- 2000	1-3	8-20	80%	30

Frequency Hopping Radar

Radar	Pulse	PRI	Pulses	Hopping	Hopping	Minimum	Minimum					
Туре	Width	(µsec)	per	Rate	Sequence	Percentage of	Number of					
	(µsec)		Hop	(kHz)	Length	Successful	Trials					
					(msec)	Detection						
6	1	333	9	0.333	300	70%	30					

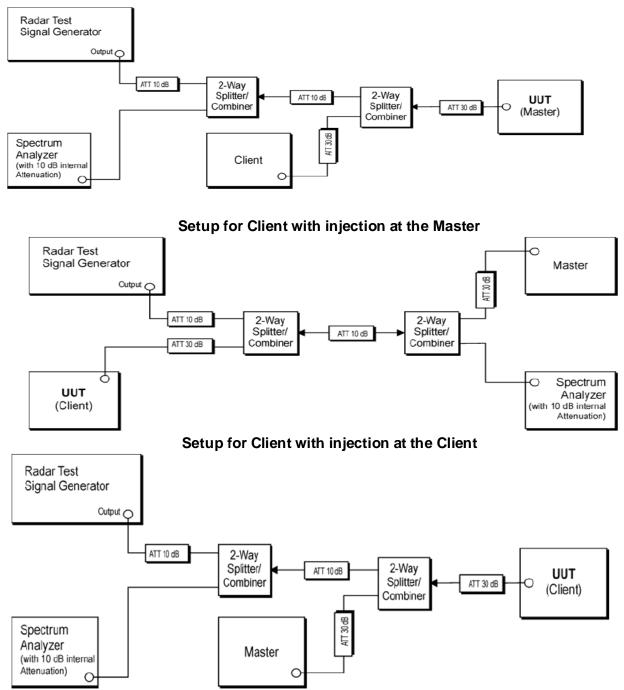
The applicant of this given application confirms that information regarding the parameters of the detected Radar Waveforms is not available to the end user.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless the level is stated the results structure in this terreport results an piece) rester and state and the state of a structure in the state and structure in the structure in pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



4.2.2. Test Setup



Setup for Master with injection at the Master

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



	Conducted Emission Test Site													
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.									
PXA Spectrum Analyzer	Agilent	N9030A	MY53120760	Apr. 09th, 2018	Apr. 08th, 2019									
Signal Generator	Agilent	N5172B	MY53050661	Apr. 05th, 2018	Apr. 04th, 2019									
Power Splitter	Mini-Circuits	ZN2PD-9G-S+	N/A	Jan. 2nd, 2018	Jan. 1st, 2019									
Power Splitter	Mini-Circuits	ZN2PD-9G-S+	N/A	Jan. 2nd, 2018	Jan. 1st, 2019									
Attenuator	Agilent	8495B	3308A22470	Jan. 2nd, 2018	Jan. 1st, 2019									
Attenuator	HP	8494B	2812A170605	Jan. 2nd, 2018	Jan. 1st, 2019									
Notebook	Lenovo	T440P	P0000564	N/A	N/A									
Accece Ponit	Cisco	AIR-LAP1262N-A- K9	FTX1605E1G1 FCC ID:LDK102073	N/A	N/A									

4.2.3. Test Equipment Used:

4.2.4. Description of EUT:

EUT operates over the 5250-5350MHz and 5470-5725MHz ranges and EUT is a slave device (client equipment) w/o radar detection and DFS capability.

EUT has no TPC mechanism implemented with no adjustment of lowest, and highest power, but the level of power emission stays at fixed level.

The EUT utilizes the 802.11a/n 40M architecture, with a nominal channel bandwidth of 40MHz WLAN traffic is generated by streaming the mpeg file from the master to slave in full monitor video mode using the media player.

The rated output power of the master unit is >23dBm(EIRP).therefore the required interference threshold level is -62dBm.after correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is -62dBm, and the master device as employed for the applicable DFS test is CISCO router whose FCC ID= 2AQYEFMP167

While calibrate the path on antenna port of DFS test equipment (master), measurements equipments (spectrum) is ensured to be 50 Ohms, and therefore verification on antenna gain measurement can be ignored.

Conducted test was performed with appropriate adjustment, and calibration to ensure power from DFS simulator injects to antenna port of DFS test equipment (DFS) is -62dBm

Message or files that is used for communication between Master and Client:

IP based system:

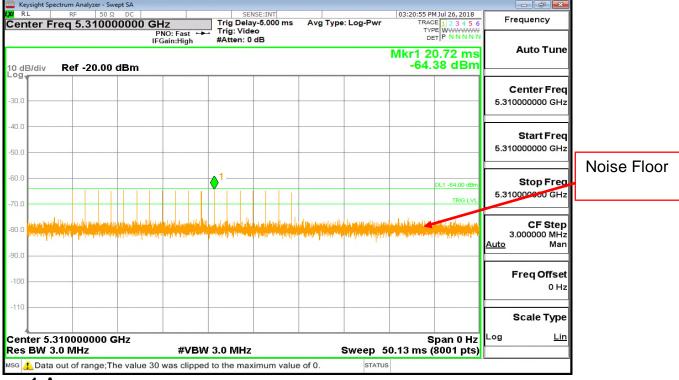
For the required channel loading, the full motion, 30 frames per second MPEG video file from http://ntiacsd.ntia.doc.gov/dfs/ was streamed from a network on a test bench (server of the storage to download the mandatory format of Video file), via the DFS Master device, to the UE (mobile phone).

Unless otherwise stated the results showing in this result report relief only to the sample(s) result sample(s) are retained to so days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sqs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms and conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sqs.com/terms a-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



4.2.5. Test results Calibration plots for each of the required radar waveforms Radar type 0



Radar type 1-A



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless the level is stated the results structure in this terreport results an piece) rester and state and the state of a structure in the state and structure in the structure in pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Radar type 1-B

Key	sight Spect	trum A		er - S		DC								-	SF	NSE	INT	-								03:3	22:14	PM 1u	l 26, 2018				
Cen	ter Fre	eq (5.31				0	PN	10:		st ←	•	Т	rig:	Dela Vid	ay-1 eo	0.0		s	A	vg Ty	/pe	: Log	g-Pwr		1	TR/		2345 ////////////////////////////////////	6 ₩-	Fi	requen	су
10 dE	3/div	Ref	-20	0.00) d	Bm	1	IFG	iair	n:Hig	gh		#/	Atte	en: () ac	,								I		r1 :	28.	99 m I dBn	s		Auto	Tu
-30.0																																Cente 000000	
-40.0 -50.0																						_									5.31	Star	
-60.0									1 - 																			DL	1 -64.00 dBi TRIG LV		5.31	Stop	
80.0	particilititati Inna inpolece								46,				, , , , , , , , , , , , , , , , , , ,		4 [29] 4				110			11 /***	ol ano on sus	n fan Frank Merikan	Loop II Later - A	an ta	li ballena ganatena	kata das attendense	(Maliford) (Ma Anti-errotajor		uto (CF 3.00000	= S 00 M
90.0																																Freq	Off
-110																																Scale	
	ter 5.3 BW 3.0			00	Gŀ	z				#	VBI	Ar	3 1	0 N	н								-		40	• •			an 0 H: 01 pts	<u> </u>	og		

Radar type 2

Keysight Spectrum Analyzer - Swept SA					
RL RF 50 Ω DC enter Freq 5.3100000		SENSE:INT Trig Delay-800.0 µs Trig: Video	Avg Type: Log-Pwr	03:22:45 PM Jul 26, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWWW	Frequency
dB/div Ref -20.00 dBi	IFGain:High	#Atten: 0 dB		Det P NNNN Mkr1 3.530 ms -64.09 dBm	Auto Tu
0.0					Center Fr 5.310000000 G
.0					Start Fr 5.310000000 0
.0				DL1 -64,00 dBm TRIG LVL	Stop F 5.310000000 (
.o eyandarinnid terminin dibidi. Ardibiliya jali di rejit kalimini kar	an a			trading magazikat na kaoperana dia Interatika magazikat pelipikat kapalar	CF Si 3.000000 M <u>Auto</u> M
10					Freq Off
10					Scale Ty
enter 5.310000000 GHz es BW 3.0 MHz	#VBW	3.0 MHz	Sweep 8	Span 0 Hz .000 ms (8001 pts)	Log

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/tems_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



Radar type 3

Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω DC	SENSE:INT		03-23-32 PM Iul 26-2018	
enter Freq 5.310000000	PNO: Fast +++ Trig: Video	Avg Type: Log-Pwr	TYPE WWWWW	Frequency
0 dB/div Ref -20.00 dBm	IFGain:High #Atten: 0 dB		Mkr1 1.935 ms -64.26 dBm	Auto Tun
0 g				Center Fre 5.310000000 GH
50.0				Start Fr 5.310000000 G
70.0			DL1 -64.00 dBm TRIG LVL	Stop Fr 5.310000000 G
90.0 <mark>1.600 (2003) (2006) (2006) (2006) (2007) (200</mark>	an sa mpanipana mpana mpananga kapinan An sa mpanipana mpana papa na pananga kapinan	na dina pungkalakkan punkkan pungkan bakan pu	nappalludolasjanovneta Jeloviteljuterovnitelje ^k a	CF Sto 3.000000 M <u>Auto</u> M
100				Freq Offs 0
110				Scale Typ
Center 5.310000000 GHz Res BW 3.0 MHz	#VBW 3.0 MHz	Swaan 1	Span 0 Hz 0.13 ms (8001 pts)	Log <u>L</u>

Radar type 4

										ght Spectrum /	
Frequency	03:24:18 PM Jul 26, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWWW	e: Log-Pwr	Avg Type	NSE:INT ay-1.000 ms eo	Trig Dela	Z O: Fast +++	00 GH			er Freq :	ente
Auto Tur	Mkr1 1.704 ms -64.12 dBm				#Atten: 0	ain:High	IFGa	dBm	f -20.00	div Re f	0 dB/
Center Fre 5.310000000 GH											. og 30.0 –
Start Fr 5.310000000 G											40.0 —
Stop Fr 5.310000000 G	DL1 -64.00 dBm TRIG LVL										:0.0 '0.0
CF Sto 3.000000 M Auto M	u sharkh haidan, safa badtan yarka 1 yu dhan pilana tarafa ku hyika kalana ()	narhydyddynwy Dwely <mark>dae</mark> rholadau	na prina populari na Pr Dalah pilak inda di k	harteerheinster Argebieder	tellessteatopp datifijkspålad	naling te <mark>and a</mark> dd				handidan <mark>n</mark>	
Freq Offs 0											100 -
Scale Ty											110 —
										r 5.3100	4

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/tems_and_conditions.htm</u> and, for elec-tronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134號



Radar type 5

	Spectrum A	nalyzer - Sw	ept SA									
Center	Freq 5	.31000		GHz PNO: Fast +	Trig Delay	0	Avg Ty	pe: Log-Pwr	IV			Frequency
10 dB/di [,]	Ref	-20.00		IFGain:High	#Atten: 0 d	iB				2 10.67 s 0.01 dB		Auto Tune
-30.0		20.00									5.3	Center Freq 10000000 GHz
-50.0 -60.0 -70.0		3			1				2∆3	DL1 -64.00 dBm TRIG LVL	5.3	Start Free 10000000 GHz
-90.0 -100 -110											5.3	Stop Fred 10000000 GHz
	5.31000 / 3.0 MH		GHz	#VB	W 3.0 MHz			Sweep	15.00 s	Span 0 Hz (8001 pts)	Auto	CF Step 3.000000 MHz Man
1 Ν 2 Δ3 3 F 4 5	1 t	(Δ)	~	6.954 s 10.67 s (Δ 1.496 s	-64.17 dB) 0.01 d -64.60 dB	m IB			FUNC	E		Freq Offsel 0 Hz
6 7 8 9 10											Log	Scale Type
11 <	to out of	rongo:Tk	a volue ?	20 was alian	ed to the maxi	mum volu	o of 0	STATU		+		
^{⋈sg} <u>1</u> Da /pe 6		range, n	le value 3	so was clipp	ed to the maxi	mum valu	e or 0.	STATUS	5			
Keysight	Spectrum A	nalyzer - Sw	ept SA									
Center	_R , Freq 5	50 Ω .31000	00000 0	PNO: Fast +	Trig Delay	, · ·	Avg Ty	pe: Log-Pwr	IR/	PM 1ul 26 2018 AUE 1 2 3 4 5 6 YPE WWWWWW DET P N N N N N		Frequency
10 dB/div	Dof	-20.00		IFGain:High	#Atten: 0 d	18			Mkr1	799.0 µs .13 dBm		Auto Tune
Log	REI	-20.00										Center Fred

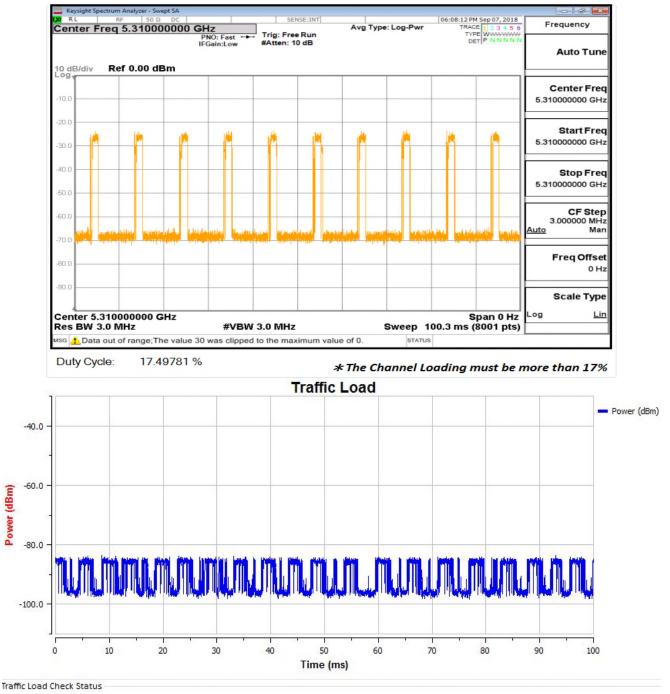
30 C 5.310000000 GHz 40. Start Freq 5.310000000 GHz -50.0 -60.0 Stop Freq DL1 -64.00 dB 5.310000000 GHz TRIG LV عنيه العربية والمراجع المراجع المراجع المراجع المتعاملين المتعام والمتعام والمتعار والمتعار والمتعار CF Step -80.0 3.000000 MHz in and popular provided in the fact that the provide provide state of the second state in the second state Man Auto -90.0 Freq Offset -100 0 Hz Scale Type Lin Center 5.310000000 GHz Span 0 Hz Log Sweep 8.000 ms (8001 pts) Res BW 3.0 MHz #VBW 3.0 MHz sg 🦺 Data out of range; The value 30 was clipped to the maximum value of 0. STATUS

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號



WLAN Payload



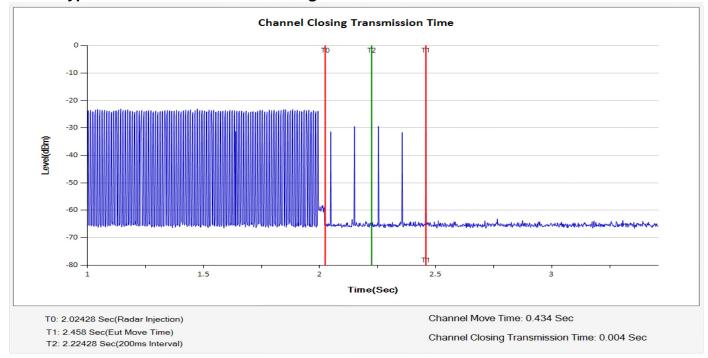
Duty Cycle (%): 46.17

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

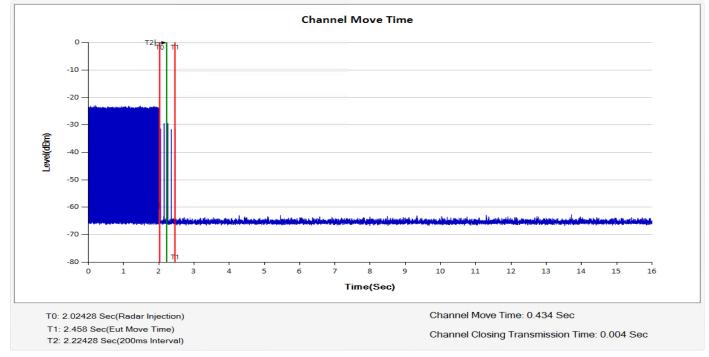
No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.





Radar Type 1 Channel Move and Closing Transmission Time - 1





Verdict: Note: narrowing the sweep time as the good engineering process for the verification of transmission closing in 200ms

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號 SGS Taiwan Ltd.



Non-occupancy Period (without radar detection)

	Spectrum	Analyzer	- Swept SA										- 6 💌
Center	Freq		50 Ω DC			SENSE:	Avg	а Туре	e: Log-Pwr	TRAC	M Sep 07, 2018	Fre	quency
10 dB/div	Re	f 10.0)0 dBm	PNO: Fas IFGain:Lo		#Atten: 20 dE				DI Mkr1 1	.800 ks 3.67 dB		Auto Tune
-10.0	×2												e nter Freq 000000 GHz
-30.0 -40.0 -50.0							lans down the field former of the				1Δ2		Start Freq 000000 GHz
-60.0 -70.0 -80.0													Stop Freq 000000 GHz
Center : Res BW	3.0 N	IHz	0 GHz	#\	/BW	3.0 MHz	FUNCTION		Sweep 2	2.000 ks (pan 0 Hz 8001 pts) NVALUE	3.0 <u>Auto</u>	CF Step 000000 MHz Mar
1 Δ2 2 F 3 4 5 6 7		(Δ)		1.800 ks 97.50 s	(Δ)	-43.67 dB -8.31 dBm					E	F	req Offsei 0 Hz
6 7 8 9 10													cale Type
10						m						Log	Lin
MSG									STATUS				

Verdict:

To verify whether channel is unavailable to be operated in 30 minutes. 1.8ks = 1800s = 1800 s/min /60 = 30minute

~ End of Report ~

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

Unless other west stated the results structure in this discreption results and people of the discreption and people of the d pearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. SGS Taiwan Ltd. No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號