

DFS PORTION of FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone with BT/BLE, DTS/UNII a/b/g/n/ac

MODEL NUMBER: SM-A145M/DS, SM-A145M, SM-A145MB/DS and SM-A145MB

MODEL TESTED: SM-A145M/DS

FCC ID: A3LSMA145M

REPORT NUMBER: 14586572-E6V1

ISSUE DATE: 2023-01-20

Prepared for SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA

> Prepared by UL VERIFICATION SERVICES INC. 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 319-4000 FAX: (510) 661-0888



Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-01-20	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone with BT/BLE, DTS/UNII a/b/g/n/ac
MODEL:	SM-A145M/DS, SM-A145M, SM-A145MB/DS and SM-A145MB
MODEL TESTED:	SM-A145M/DS
SERIAL NUMBER:	R93TA0007KH
DATE TESTED:	DECEMBER 16, 2022
	APPLICABLE STANDARDS

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
DFS Portion of CFR 47 Part 15 Subpart E	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

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Doug Anderson Test Engineer CONSUMER TECHNOLOGY DIVISION UL Verification Services Inc.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the DFS portion of FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC KDB 789033, KDB 905462 D02 and D03.

3. SUMMARY OF TEST RESULTS

Requirement Description	Result	Remarks
DFS Portion of FCC 47 CFR PART 15 SUBPART E	Complies	

4. REFERENCE DOCUMENTS

Measurements of transmitter parameters as referenced in this report and all other manufacturer's declarations relevant to the RF test requirements are documented in UL Verification Services report number 14586572-E5V1.

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

5. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
	Building 1: 47173 Benicia Street,	US0104	2324A	550739
\boxtimes	Fremont, California, USA			
	Building 2: 47266 Benicia Street,	US0104	2324A	550739
	Fremont, California, USA			
	Building 4: 47658 Kato Rd, Fremont,	US0104	2324A	550739
	California, USA			

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6. DECISION RULES AND MEASUREMENT UNCERTAINTY

6.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

6.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement).

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7. MODEL DIFFERENCES

7.1. INTRODUCTION

This test report covers 4 model numbers: SM-A145M/DS, SM-A145M, SM-A145MB/DS and SM-A145MB. The DFS results are based upon the DFS performance of the model tested, SM-A145M/DS.

7.2. MODEL DIFFERENCES

The manufacturer hereby declares that the characteristics of the hardware and software in models SM-A145M/DS, SM-A145M, SM-A145MB/DS and SM-A145MB are as follows:

Hardware:

- The antenna, chipset, and remaining parts are the same.
- The layout of WiFi related parts is the same.

Software:

- The software operation method and firmware are the same with the exception that KNOX security software is installed on models SM-A145MB/DS and SM-A145MB/DS.
- The function for DFS is the same.

The differences in the hardware and software are summarized in the table below:

Model	SIM Tray	KNOX Security Software
SM-A145M/DS	Double SIM	No
SM-A145M	Single SIM	No
SM-A145MB/DS	Double SIM	Yes
SM-A145MB	Single SIM	Yes

Additionally, the conducted target transmit power of each model is the same therefore the radiated transmit power is about the same.

The differences listed above do not have any influence upon the DFS performance of the models covered by this report and therefore the DFS test results documented for model SM-A145M/DS for may be applied as representative to models SM-A145M, SM-A145MB/DS and SM-A145MB.

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8. DYNAMIC FREQUENCY SELECTION

8.1. OVERVIEW

8.1.1. LIMITS

<u>FCC</u>

§15.407 (h), FCC KDB 905462 D02 "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION" and KDB 905462 D03 "U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY".

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

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	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

Requirement	Operationa	Operational Mode			
	Master	Client (without DFS)	Client (with DFS)		
DFS Detection Threshold	Yes	Not required	Yes		
Channel Closing Transmission Time	Yes	Yes	Yes		
Channel Move Time	Yes	Yes	Yes		
U-NII Detection Bandwidth	Yes	Not required	Yes		

Additional requirements for	Master Device or Client with Radar DFS	Client (without DFS)		
devices with multiple bandwidth modes	Rauai DFS	(without DI 3)		
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required		
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test 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 all 20 MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.				

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Table 3: Interference Threshold values, Master or Client incorporating In-ServiceMonitoring

Maximum Transmit Power	Value		
	(see notes)		
E.I.R.P. ≥ 200 mill watt	-64 dBm		
E.I.R.P. < 200 mill watt and	-62 dBm		
power spectral density < 10 dBm/MHz			
E.I.R.P. < 200 mill watt that do not meet power spectral	-64 dBm		
density requirement			
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.			
Note 3: E.I.R.P. is based on the highest antenna gain. For MI	MO devices refer to KDB		

Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.

Table 4: DFS Response requirement values	

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + approx. 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 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

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.

Table 5 – Short Pulse Radar Test Waveforms

Radar	Pulse	PRI	Pulses	Minimum	Minimum
Туре	Width	(usec)		Percentage	Trials
	(usec)			of Successful	
				Detection	
0	1	1428	18	See Note 1	See Note
					1
1	1	Test A: 15 unique		60%	30
		PRI values randomly			
		selected from the list	Roundup:		
		of 23 PRI values in	{(1/360) x (19 x 10 ⁶ /PRI _{usec})}		
		table 5a			
		Test B: 15 unique			
		PRI values randomly			
		selected within the			
		range of 518-3066			
		usec. With a			
		minimum increment			
		of 1 usec, 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
		Aggregate (Radar T	ypes 1-4)	80%	120
Note 1:	Short P	ulse Radar Type 0 shou	Id be used for the Detection Bai	ndwidth test, Ch	annel
Move 7	<i>ime</i> , and	Channel Closing Time to	ests.		

Table 6 – Long Pulse Radar Test Signal

			10010 0	Lengi				
	Radar	Pulse	Chirp	PRI	Pulses	Number	Minimum	Minimum
	Waveform	Width	Width	(µsec)	per	of	Percentage	Trials
	Туре	(µsec)	(MHz)		Burst	Bursts	of Successful	
							Detection	
Ī	5	50-100	5-20	1000-	1-3	8-20	80%	30
				2000				

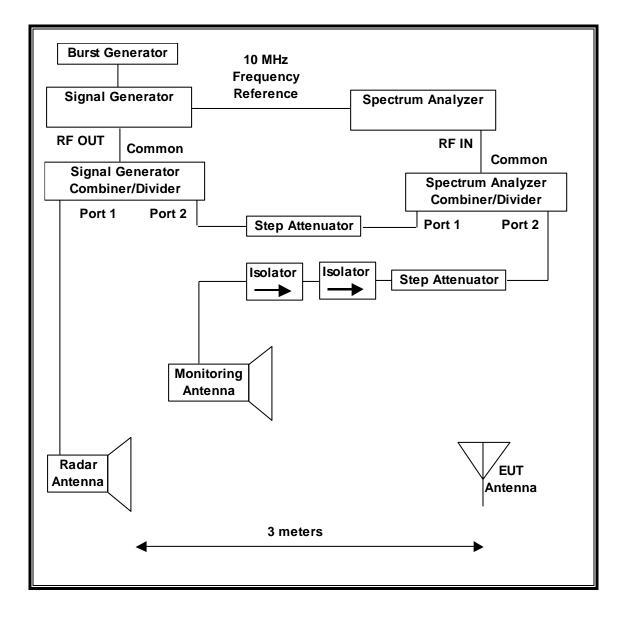
Table 7 – Frequency Hopping Radar Test Signal

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

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8.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



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SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 1, 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

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ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. Traffic that meets or exceed the minimum loading requirement is streamed from the Master device to the Slave Device. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST								
Description	Manufacturer	Model	ID No.	Cal Due				
Spectrum Analyzer, PXA, 3Hz to 8.4GHz	Keysight	N9030A	150667	01/27/23				
Signal Generator, MXG X-Series RF Vector	Keysight	N5182B	215999	02/08/23				
Frequency Extender	Keysight	N5182BX	213906	12/29/22				

Note: An MXG series Signal Generator and separate external Frequency Extender module are shown in the preceding test system block diagram as a stand-alone Signal Generator.

8.1.3. TEST AND MEASUREMENT SOFTWARE

The following test and measurement software was utilized for the tests documented in this report:

TEST SOFTWARE LIST						
Name	Version	Test / Function				
Aggregate Time-PXA	3.1	Channel Loading and Aggregate Closing Time				
PXA Read	3.1	Signal Generator Screen Capture				
SGXProject.exe	1.7	Radar Waveform Generation and Download				

8.1.4. TEST ROOM ENVIRONMENT

The test room temperature and humidity shall be maintained within normal temperature of 15~35 °C and normal humidity 20~75% (relative humidity).

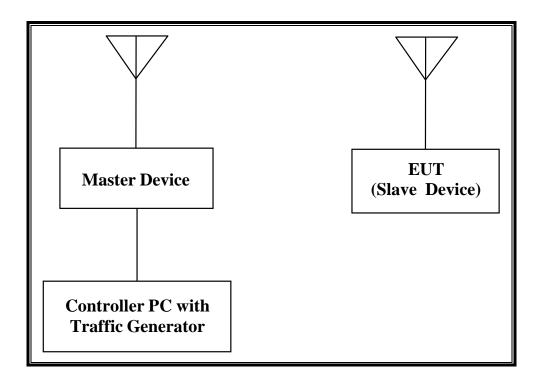
ENVIRONMENT CONDITION

Parameter	Value
Temperature	23.7 °C
Humidity	26 %

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8.1.5. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST									
Description	Manufacturer	Model	Serial Number	FCC ID					
802.11ac Dual Band Wireless	Cisco	AIR-CAP3702E-	FTX181570A6	LDK102087					
Access Point (Master Device)		A-K9							
P.O.E. Injector (Master)	Phihong	POE30U-560(G)	PHI170102N2	DoC					
Notebook PC (Controller)	Lenovo	Туре 4236-В92	PB-HEX04 12/05	DoC					
AC Adapter (Controller PC)	Lenovo	42T4418	11S42T4418Z1ZG	DoC					
			WG08R90M						

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8.1.6. DESCRIPTION OF EUT

For FCC the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 11.79 dBm EIRP in the 5250-5350 MHz band and 12.53 dBm EIRP in the 5470-5725 MHz band.

The manufacturer has declared that the only antenna assembly utilized with the EUT has a gain of -4.04 dBi in the 5250-5350 MHz band and -3.11 dBi in the 5470-5725 MHz band.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses one transmitter/receiver chain connected to an antenna to perform radiated tests.

WLAN traffic that meets or exceeds the minimum required loading was generated by transferring a data stream from the Master Device to the Slave Device using iPerf version 2.0.5 software package.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11ac architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

Channel puncturing is not supported by the EUT.

TDLS (Tunneled Direct Link Setup) mode, called "WiFi Direct" by the manufacturer, is supported by the EUT but does not use frequencies in the 5250-5350 MHz or 5470-5725 MHz bands.

The software installed in the EUT is Android version 13.0.

The software installed in the access point is AP3G2-K9W7-M Version 15.3(3)JAB.

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UNIFORM CHANNEL SPREADING

This is requirement not applicable to Slave Devices.

OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The software installed in the access point is AP3G2-K9W7-M Version 15.3(3)JAB.

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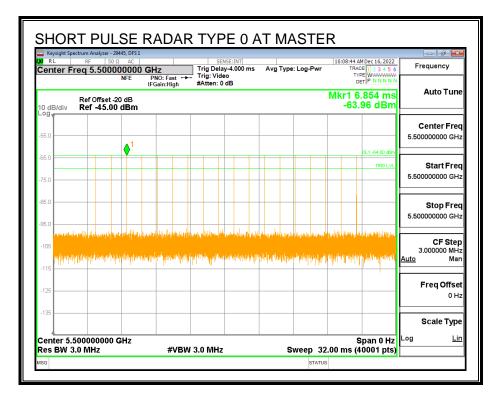
8.2. **RESULTS FOR 20 MHz BANDWIDTH**

8.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

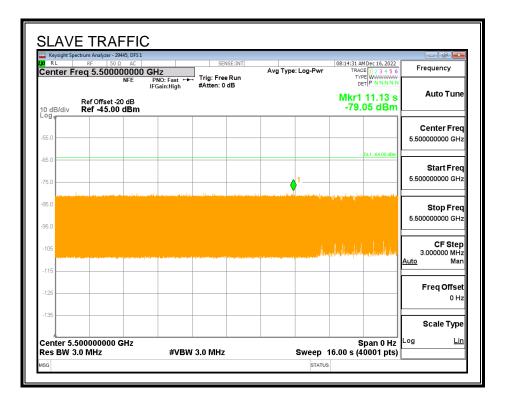
8.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



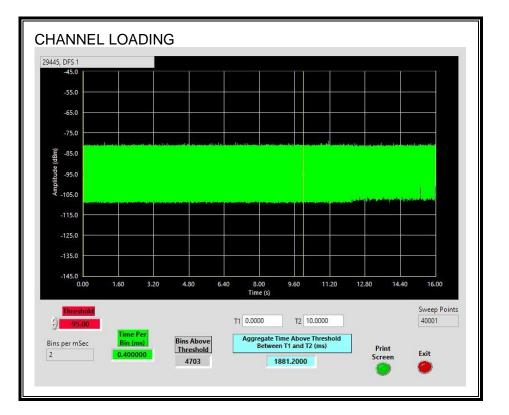
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TRAFFIC



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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 18.81%

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8.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

8.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time	Limit
(sec)	(sec)
0.0796	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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MOVE TIME

	pectrum Analyzer - 2								
RL enter F	RF 50	Ω AC 000000 GHz		SENSE:INT	Avg Type:	Log-Pwr		Dec 16, 2022	Frequency
	100 0.0000	NFE PNO: Fa IFGain:Hi		: Free Run en: 0 dB	•		TYPE	PNNNN	
0 dB/div	Ref Offset Ref -45.0					Δ	/lkr1 79 -16	.60 ms .02 dB	Auto Tune
og	1101 1010								
5.0	W//						D	L1 -64.00 dBm	Center Fred
5.0	102								5.50000000 GHz
'5.0									
5.0									Start Free
5.0	All of the second second	فمادر والإرباط والأن والمروا	in Antonikos Alberantosi	لاستأسرا والمتروي والمراجع	han mankilika aansi	like to a station of a	والأربية والمراجع	alunale	5.50000000 GH
105									
115									Stop Fred
125									5.50000000 GH
135									
	.500000000							an 0 Hz	CF Step
les BW	3.0 MHz	#	VBW 3.0 I	ИHz	S	weep 16	6.00 s (40		3.000000 MH Auto Mar
		×	Y	6.02 dB	UNCTION FUNC	TION WIDTH	FUNCTION	N VALUE	<u>Auto</u> Mar
1 Δ2 2 F	1 t (Δ) 1 t	79.60 m 1.644		6.02 dB 31 dBm					FO #
3									Freq Offse 0 Ha
5								E	01.
7									0
8 9									Scale Type
10									Log <u>Lir</u>
1									

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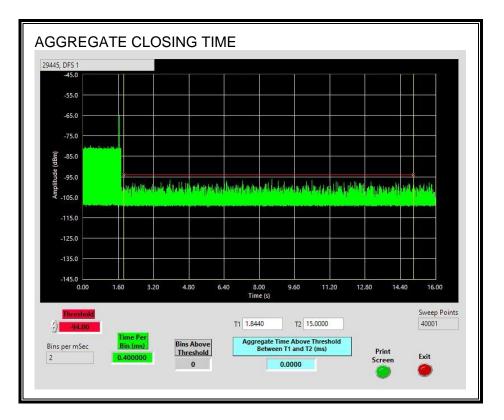
CHANNEL CLOSING TIME

Keysight Spectrum Analyzer - 29445, DFS 1 R L RF 50 Ω AC enter Freq 5.500000000 C C C) GHz		vg Type: Log-Pwr	08:24:53 AM Dec 16, 2022 TRACE 1 2 3 4 5 6	Frequency
NFE	PNO: Fast +++ Trig: V IFGain:High #Atter			DET P N N N N	
Ref Offset -20 dB dB/div Ref -45.00 dBm			Δ	Mkr1 200.0 ms -36.96 dB	Auto Tuno
pg					Center Free
5.0					5.50000000 GH
5.0 2				DL1 -64.00 dBm TRIG LVL	Start Free
5.0					5.500000000 GH
5.0					
50					Stop Free 5.50000000 GH
In the second	ultible does the 162	and molecular late	ndalmanna a daethallar na b	honenatrionalanalantan	
	alan-dalarah layan di saya, mbot a dhah. d	na bila sa ana dang ang nag dag dan sa pabla.	<mark>ta, kinetantin Life, da. ₁₉96, najid,</mark> 21	ada Mandria and Anglin and San Palayan <mark>da si she</mark>	CF Step 3.000000 MH <u>Auto</u> Mar
13					Freq Offse
125					0 H
135					Scale Type
enter 5.500000000 GHz				Span 0 Hz	Log <u>Li</u> r

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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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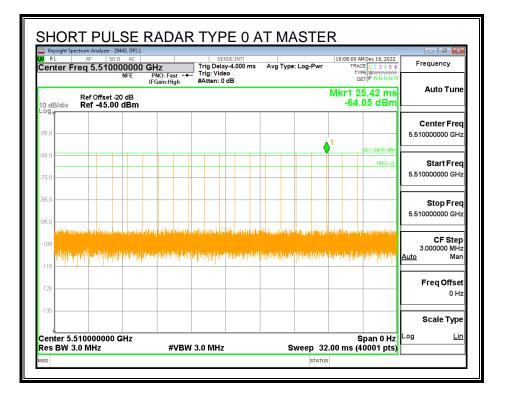
8.3. **RESULTS FOR 40 MHz BANDWIDTH**

8.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

8.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



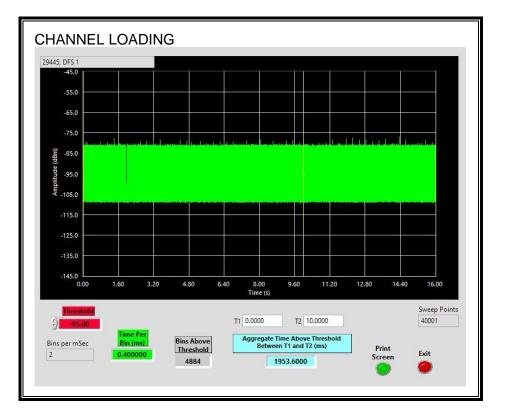
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TRAFFIC

X RL	RF 50 9	9445, DFS 1 Ω AC		SEN	SE:INT			09:21:14 4	M Dec 16, 2022	
center	Freq 5.5100	NFE PI	IO: Fast 🔸	Trig: Free	Run	Avg Type	e: Log-Pwr	TRAI	DE 1 2 3 4 5 6 PE WWWWWWW ET P NNNN	Frequency
Ref Offset 20 dB Mkr114.35 s 10 dB/div Ref -45.00 dBm -76.82 dBm										Auto Tune
-55.0										Center Freq 5.510000000 GHz
-65.0									0L1 -64.00 dBm	Start Freq 5.510000000 GHz
-85.0			1 - Canada (rada postena da un latarit				Stop Freq 5.510000000 GHz
-105			1	1) (a - 1) (a - 1)		da fa ti seda a1 ar		1		CF Step 3.000000 MHz <u>Auto</u> Man
										Freq Offset 0 Hz
-125										

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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 19.53%

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8.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

8.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time	Limit
(sec)	(sec)
0.1692	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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MOVE TIME

	ectrum Analyzer								
RL	RF 5	50 Ω AC	CH2	SENS	E:INT	vg Type: Log-Pw		AM Dec 16, 2022	Frequency
enteri	184 3.3 10	NFE	PNO: Fast ↔ IFGain:High	Trig: Free F #Atten: 0 d	Run		TΥ		
0 dB/div	Ref Offset Ref -45.0						ΔMkr1 1 -2	69.2 ms 1.94 dB	Auto Tune
og 5.0									O - rate a Face
	×//							DL1 -64.00 dBm	Center Freq 5.510000000 GHz
5.0	×2								5.51000000 GH2
5.0	<u></u>			+					
15.0				+ +					Start Fred
5.0	Alos 17	- Karilan as	to a la collación	Unit of the state	الريار أراد معاركة معاركة	المراجع والمراجع		U. Marine Jacob	5.510000000 GHz
105	ataWidaa	and King Made	la buat hand polineaus an	ALL	Alebu Cash, Mikilika	drahellinangting	Rod House Charles	dini al Al-Al-Inter	
115				++					04 E
125									Stop Fred
135									5.510000000 GH;
	.51000000	0 GHz	<i>4</i> 0 (D)			•		Span 0 Hz	CF Step
es BW .	3.0 MHz		#VBI	W 3.0 MHz		Sweep) 16.00 s (4		3.000000 MH: Auto Mar
		Х	169.2 ms (Δ	Y) -21.94 d	FUNCTION	FUNCTION WID	TH FUNCT	ION VALUE	<u>Auto</u>
2 F	1 t (Δ) 1 t		169.2 ms (Δ 1.639 s	-65.09 dBr					
3									Freq Offse
5									0 H:
6 7									
8									Scale Type
9									Log <u>Lir</u>
10									

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CHANNEL CLOSING TIME

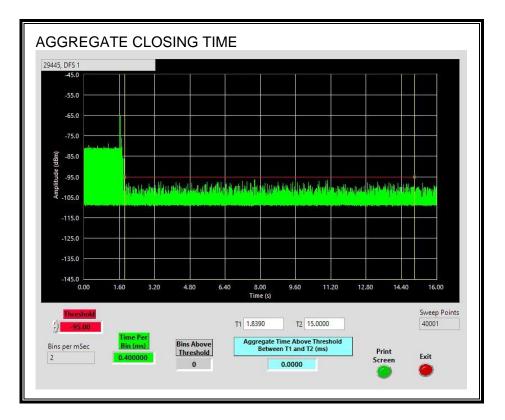
Keysight Spectrum Analyzer - 29445, DFS 1 R L RF 50 Ω AC	SENSE:IN		08:38:06 AM Dec 16, 2022	Frequency					
enter Freq 5.51000000 NFE	PNO: Fast +++ Trig: Video	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET P N N N N N	Trequency					
Ref Offset-20 dB ∆Mkr1 200.0 ms 0 dB/div Ref 45.00 dBm -36.49 dB									
og -				Center Free					
5.0			DL1 -64.00 dBm	5.510000000 GH					
5.0 2			TRIG LVL	Start Free 5.510000000 GH					
5.0				Stop Free 5.51000000 GH					
115		thippelite is particular particular testilor and by particular and particular in the testing of the state of	han sa hu an ha shadikari ku yilan. An an ana shekari s	CF Step 3.000000 MH <u>Auto</u> Mar					
125				Freq Offse 0 H					
135				Scale Type					
enter 5.510000000 GHz es BW 3.0 MHz	#VBW 3.0 MHz		Span 0 Hz 0.0 ms (40001 pts)	Log <u>Lir</u>					

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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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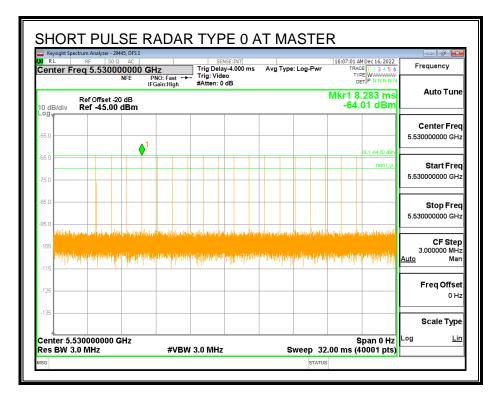
8.4. **RESULTS FOR 80 MHz BANDWIDTH**

8.4.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

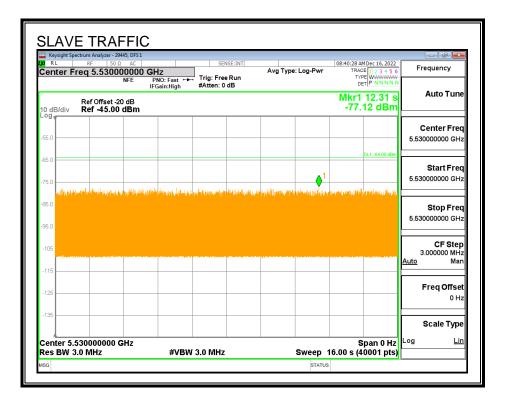
8.4.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



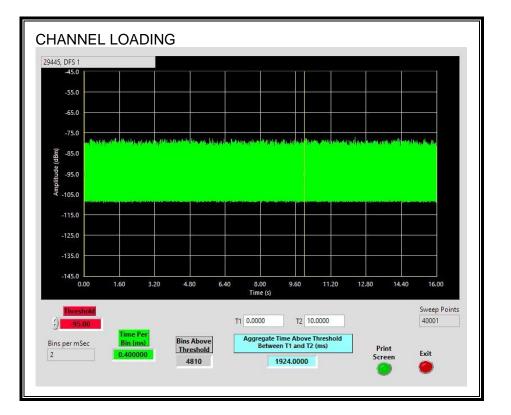
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TRAFFIC



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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 19.24%

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8.4.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

8.4.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time	Limit
(sec)	(sec)
0.0776	10

Aggregate Channel Closing Transmission Time	Limit
(msec)	(msec)
0.0	60

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MOVE TIME

	rum Analyzer - 29445, D						- 0 💌
enter Fre	RF 50 Ω A		SENS	Avg	Type: Log-Pwr	08:44:13 AM Dec 16, 2022 TRACE 1 2 3 4 5 6	
	NFE	PNO: Fast IFGain:High				DET P N N N N	1
	Ref Offset -20 dE				Δ	Mkr1 77.60 ms -16.05 dB	Auto Tune
) dB/div pg	Ref -45.00 dB	m				-16.05 0B	
5.0							Center Free
5.0	102					DL1 -64.00 dBm	5.530000000 GH
5.0							
5.0							Start Free
5.0	and the sealer	and the second address to the second s	ad what we had the day	الارادال والمعالم المراد	فأواليا والأوريقا وأوترها	Netter Republic to the property of the pro-	5.530000000 GH
105							
25							Stop Free
35							5.530000000 GH
enter 5.53 es BW 3.0	30000000 GHz		BW 3.0 MHz		Sween	Span 0 Hz (40001 pts) s	CF Step 3.000000 MH
KRI MODE TRO		# V	SW J.O MINZ	FUNCTION	Sweep	FUNCTION VALUE	Auto Mar
1 Δ2 1	t (Δ)	77.60 ms	(Δ) -16.05 dl	3	PONCTION WIDTH	FUNCTION VALUE	
2 F 1 3	t	1.605 s	-65.14 dBr	1			Freq Offse
4 5						=	0 H
6 7							
8							Scale Type
9 0 1							Log <u>Lir</u>
						*	

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CHANNEL CLOSING TIME

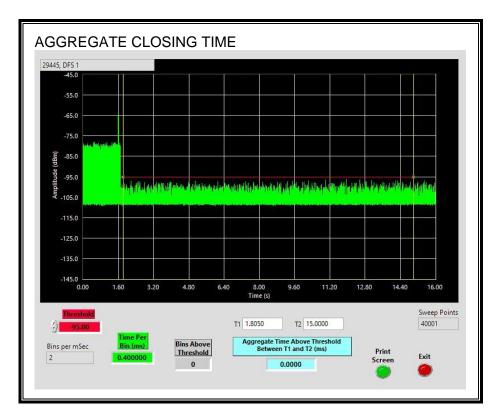
RL RF RL RF	50 Ω AC	7		Avg Type: Log-Pwr	08:48:07 AM Dec 16, 2022 TRACE 1 2 3 4 5 6	Frequency		
	NFE PNO	D: Fast +++ Trig: Vic in:High #Atten:			DET P N N N N	-		
Ref Offset -20 dB ΔMkr1 200.0 ms 0 dB/div Ref -45.00 dBm -36.45 dB								
g						Center Free		
5.0					DL1 -64.00 dBm	5.530000000 GH		
5.0 2					TRIG LVL	Start Free 5.530000000 GH		
5.0						Stop Fre 5.530000000 GH		
i Miller gehieren		V			li la pet la captar de la compositore. Notes de la compositoria	0.000		
				lann i sunad i sa di sa di sun di sun di su		3.000000 MH <u>Auto</u> Ma		
125						Freq Offse 0 H		
35						Scale Type		
enter 5.5300000	00 GHz				Span 0 Hz	Log <u>Li</u> i		

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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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8.4.5. NON-OCCUPANCY PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.

Cen	L Iter	Free	RF ຊ 5.5 :		AC 0000 G			ENSE:INT	Avg Type	: Log-Pwr	TRA	M Dec 16, 2022 CE 1 2 3 4 5 6 PE WWWWWWW	Frequency
NFE PN0: Fast → IFGain:High Trig: Free Run #Atten: 0 dB Trig: Free Run Dell'P NNNNN Ref Offset -20 dB AMkr1 1.800 ks -45.07 dB 10 dB/div Ref 45.00 dBm -45.07 dB									Auto Tune				
55.0													Center Free 5.530000000 GH
65.0 75.0	///////////////////////////////////////	2										DL1 -64.00 dBm	Start Free 5.530000000 GH
35.0 35.0													Stop Free 5.530000000 GH
105			n y Alli ha	NAD N	IL III II	abelana)	nte fonder og som en som e Som en som en	handhir dha	o parte de la constante de la c La constante de la constante de	alinikhaityy	na piliku		CF Step 3.000000 MH <u>Auto</u> Mar
125													Freq Offse 0 H
135													Scale Type

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