

TEST REPORT

Report Number : 4790632299-E10V2

- Applicant : SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
 - Model : SM-A546V
 - FCC ID : A3LSMA546V
- **EUT Description :** GSM/WCDMA/LTE 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax and NFC
- Test Standard(s) : FCC PART 96.47

Date Of Issue: 2023-01-30

Prepared by:

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-01-25	Initial Issue	SunGeun Lee
V2	2023-01-30	Updated to address TCB's question	SunGeun Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax and NFC.
MODEL:	SM-A546V
FCC ID:	A3LSMA546V
SERIAL NUMBER:	R3CTA0AXMZN
DATE TESTED:	2022-12-20
	APPLICABLE STANDARDS
S	TANDARD TEST RESULTS
FCC	PART 96.47 Complies

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL Korea, Ltd. By:

Tested By:

Seokhwan Hong Suwon Lab Engineer UL Korea, Ltd.

Sungeun Lee Suwon Lab Engineer UL Korea, Ltd.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC Part 96.47, KDB 940660 D01 Part 96 CBRS Eqpt v03 and WINNF-TS-0122-v1.0.2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
Chamber 1(3m semi-anechoic chamber)
Chamber 2(3m semi-anechoic chamber)
Chamber 3(3m semi-anechoic chamber)
Chamber 4(3m Full-anechoic chamber)
Chamber 5(3m Full-anechoic chamber)

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

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4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. 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.)

4.3. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax and NFC. This test report addresses the WWAN operational mode.

5.2. SOFTWARE AND FIRMWARE

The test utility software used during testing was WINNF-TS-0122 V1.0.2

5.3. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List									
Description	Manufacturer	Model	Serial Number	FCC ID					
Charger	SAMSUNG	EP-TA800	R37T7WW84Y9SEA	N/A					
Data Cable	SAMSUNG	EP-DN980	GH39-02116A	N/A					

I/O CABLES

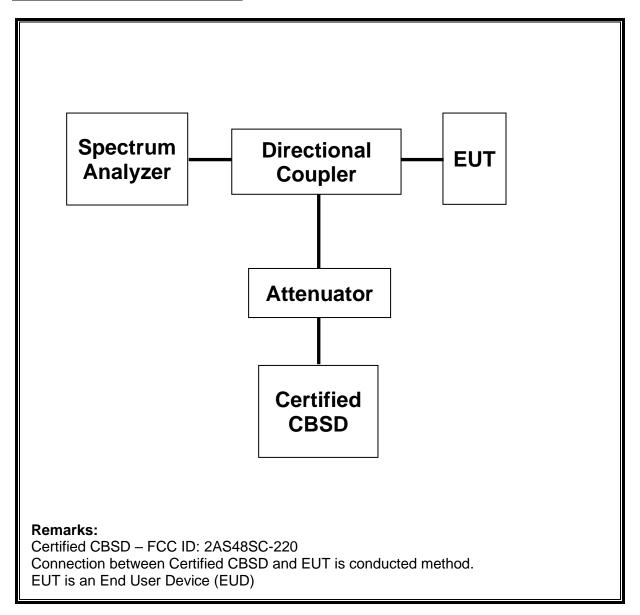
	I/O Cable List							
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks		
1	DC Power	1	C to C Type	Shielded	1.0 m	N/A		

TEST SETUP

The standalone EUT connected to a certified CBSD and Spectrum Analyzer and an RF cable respectively.

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SETUP DIAGRAM OF TEST SYSTEM



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6. 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	S/N	Cal Due					
Spectrum Analyzer, EXA	Agilent (Keysight) Technologies	N9010A	MY54200580	2023-08-01					
Step Attenuator	Keysight	8494B	MY42155321	2023-08-02					
Step Attenuator	Keysight	8496B	MY42149783	2023-08-02					
Directional Coupler	KRYTAR	1850	164428	2023-08-01					

Test Software							
Description	Manufacturer	Model	Version Number				
Laptop (SAS – WINNForum Test Harness)	SAMSUNG	NT550XDA-KC58G	2.0				

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7. END USER DEVICE ADDITIONAL REQUIREMENT

7.1. TEST REQUIREMENT

FCC Part 96.47

- (a) End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.
- An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

8. TEST PROCEDURE AND EUT CONFIGURATION

KDB 940660 D01 Part 96 CBRS v03, WINNF-TS-0122 V1.0.2

Additional requirements are required to End-User Device LTE Band 48 device base on CBSD protocol. During the test, the EUT and its companion certified CBSD (FCC ID: 2AS48SC-220) device communicate with each other.

Configuration	Frequency (MHz)	Power (dBm/MHz)	Bandwidth (MHz)
1	3560 - 3580	8	20
2	3600 – 3620	16	20

Configuration 1

- a) Setup WINNF.PT.C.HBT.1 with 3560MHz-3580MHz and power level 8 dBm/MHz
- b) Enable AP service from companion device.
- c) Check EUT Transmitter Frequency and power
- d) Disable AP service from companion device and check EUT stop transmission within 10s.

Configuration 2

- a) Setup WINNF.PT.C.HBT.1 with 3600MHz-3620MHz and power level 16 dBm/MHz
- b) Enable AP service from companion device.
- c) Check EUT Transmitter Frequency and power
- d) Disable AP service from companion device and check EUT stop transmission within 10s.

TEST RESULTS

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8.1. END USER DEVICE CONFIGURATION 1 (3560MHz - 3580MHz; MaxEIRP: 8 dBm/MHz)

Keysight Spectrum A	malyzer - Swep	ot SA									
RF	50 Ω	AC	PNO: Fast IFGain:Low		Trig: Free Atten: 10		Avg Type Avg Hold	ALIGN AUTO e: Log-Pwr : 100/100	TR	PM Dec 20, 2022 ACE 1 2 3 4 5 YPE M WWWW DET P N N N N	Frequency
0 dB/div Ref	⁷ 0.00 dB	m						Mkr		00 GHz 039 dBm	
20.0											Center Fre 3.625000000 GH
	Mr.mawrl	2									Start Fre 3.550000000 GH
70.0 <mark>herender (</mark>		LA Mardanew	Mheren where	pryclan, or	ሌ ሳ ሎሳዮ-ቀሌቶፕክ _ለ ቅ	lenthan Anlage	ulandaran ana ana ana ana ana ana ana ana ana	server lever of the	Mannal Lor	nater Antronology	Stop Fre 3.700000000 GH
tart 3.55000 (GHz								Stop 3.3	70000 CH-	z CF Ste
Res BW 1.0 N		X	#V	BW 3	8.0 MHz Y			Sweep 1	.000 ms	(1000 GHZ (1001 pts	
Income Income<			#V 00 GHz 00 GHz	-	8.0 MHz 55.907 dE 63.039 dE	FUI 3m		Sweep 1	.000 ms	(1001 pts	15.000000 MH <u>Auto</u> Ma Freq Offse
Instruction) 00 GHz	-	Y 55.907 dE	FUI 3m		Sweep 1	000 ms	(1001 pts) 15.000000 MH
Image: Non-Section Image:) 00 GHz	-	Y 55.907 dE 63.039 dE	3m 3m		Sweep 1	000 ms	(1001 pts	15.000000 MH <u>Auto</u> Ma Freq Offse

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Keysight Sp	pectrum Analyzer - Swept S					
	RF 50 Ω A	PNO: Fast +++	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	04:17:35 PM Dec 20, 2022 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
dB/div	Ref 0.00 dBm	IFGain:Low	Atten: 10 dB		ΔMkr3 10.00 s -28.87 dB	Auto Tur
9 1.0 1.0						Center Fre 3.570000000 Gi
.0 <u></u>		3∆1				Start Fr 3.570000000 G
0 0						Stop Fr 3.570000000 G
s BW	3.570000000 GHz 1.0 MHz	#VBW	3.0 MHz	•	Span 0 Hz 60.00 s (1001 pts)	CF Ste 1.000000 MI <u>Auto</u> M
N Δ1 Δ1	$\begin{array}{ccc} 1 & t \\ 1 & t \\ 1 & t & (\Delta) \\ 1 & t & (\Delta) \\ \end{array}$	× 6.120 s 2.220 s (Δ) 10.00 s (Δ)	-38.27 dBm -28.14 dB -28.87 dB	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offs
				STATUS	S	
1 G DTE:	Authorized CDC	<u>Stop Or</u> D sends a signal		hin 10 second N		

Marker 2-1 Delta: Time elapsed since signal to stop LTE transmission. EUD has stopped transmission. Marker 3-1 Delta: 10 seconds has elapsed since CBSD has sent a signal to stop LTE transmission to EUT.

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8.2. END USER DEVICE CONFIGURATION 2 (3600MHz - 3620MHz; MaxEIRP: 16 dBm/MHz)

10 gB/div Ref 0.00 dBm -60.987 dBm 10 g -60.987 dBm -60.987 dBm 10 g -60.987 dBm 3.6250000 gl 30 g -60.987 dBm -60.987 dBm 10 g -60.987 dBm -60.987	📕 Keysight Spectru	ım Analyzer - Sw	ept SA					
Auto Tur 0 db/div Ref 0.00 dBm -60.987 dBm 0 db/div -60.987 dBm -60.987 dBm 0 db/div 1 2 1 db/div 1 2 1 db/div 1 1 1 db/d		RF 50 Ω	AC		Trig: Free Run	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE M WWWW	Frequency
Center Fin 3.62500000 G 3.62500000 G 3.62500000 G 3.62500000 G 3.62500000 G 3.62500000 G 3.6250000 G 3.62000 GHz 4.60.997 dBm 4.60.997 dBm 5.60.997 dBm 5.60.9		Ref 0.00 d	Bm	IFGain:Low	Atten. 10 db	Mkr		Auto Tun
Image: Start Fill Start Fill Image: Start Star	20.0			,M				Center Fre 3.625000000 GH
Bit of the set of the se	\$0.0				2			Start Fre 3.550000000 GH
Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (1001 pts) 15.00000 Mi Image: State Sta	0.0	Kundahandhe		-second leaded		าระหาร์สองรีร ให้เหมาใหญ่ เมาร์สองรีร การการการการการการการการการการการการการก	the mar and the states	Stop Fre 3.700000000 G⊦
1 N 1 f 3.600 00 GHz -50.739 dBm 2 N 1 f 3.600 00 GHz -60.987 dBm 3 4 -60.987 dBm -60.987 dBm -60.987 dBm 4 -60.987 dBm -60.987 dBm -60.987 dBm -60.987 dBm 5 - - -60.987 dBm -60.987 dBm -60.987 dBm 6 - - - -60.987 dBm -60.987 dBm -60.987 dBm 6 -	Res BW 1.0	0 MHz		#VBW		•	.000 ms (1001 pts)	CF Ste 15.000000 MH <u>Auto</u> Ma
Image: Comparison of the second stratus Image: Comparison Mode Ima	2 N 1 3 4 5 5 6 7 8 9						E	FreqOffse 0 H
evice.X_QUCELL_CBRS.Grant.1.GrantID = 461819762 evice.X_QUCELL_CBRS.Grant.1.Status = Authorized evice.X_QUCELL_CBRS.Grant.1.LowFrequency = 3600000000 evice.X_QUCELL_CBRS.Grant.1.HighFrequency = 3620000000 evice.X_QUCELL_CBRS.Grant.1.MaxEIRP = 16000								
evice.X_QUCELL_CBRS.Grant.1.HeartbeatInterval = 60	evice.X evice.X evice.X evice.X evice.X evice.X	(_QUCEL (_QUCEL (_QUCEL (_QUCEL (_QUCEL	_L _C _L _C _L _C _L _C _L _C _L _C	BRS.Grar BRS.Grar BRS.Grar BRS.Grar BRS.Grar BRS.Grar	nt.1.Grant nt.1.Statu nt.1.LowFr nt.1.HighF nt.1.MaxEl nt.1.Grant	is = Authoriz equency = 36 requency = 3 RP = 16000 ExpireTime =	ed 00000000 620000000 2022-12-27T	_ 00:55:57Z

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						/zer - Swept SA		/sight
Frequency	04:11:58 PM Dec 20, 2022 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	ALIGN AUTO g Type: Log-Pwr		SENSE:I	PNO: Fast	50 Ω AC	RF	
Auto Tui	ΔMkr3 10.00 s -37.65 dB			Atten: 10 dB	IFGain:Low	.00 dBm	Ref (3/div
Center Fr 3.610000000 G								
Start Fr 3.610000000 G					3∆1	2Δ1		
Stop Fr 3.61000000 G	o, 20140 - 21 Juni - 10 gal - 21 - 21 - 21 - 21 - 21 - 21 - 21 - 2			80000-00800000000000000000000000000000				
CF Sto 1.000000 M	Span 0 Hz 60.00 s (1001 pts)	Sweep		3.0 MHz	#VBW	000 GHz	.610000 1.0 MH:	
Auto M Freq Offs 0	FUNCTION VALUE	FUNCTION WIDTH	FUNCTIO	Y -27.60 dBm -37.97 dB -37.65 dB	6.060 s 1.140 s (Δ) 10.00 s (Δ)		RC SCL 1 t 1 t 1 t 1 t	<u>N</u> Ν Δ1 Δ1
				III				

Marker 2-1 Delta: Time elapsed since signal to stop LTE transmission. EUD has stopped transmission.

Marker 3-1 Delta: 10 seconds has elapsed since CBSD has sent a signal to stop LTE transmission to EUT.

END OF REPORT

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