

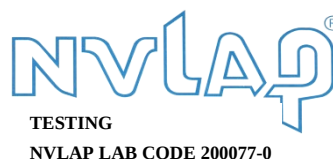
FCC 15.247 & RSS-247 2.4GHz Test Report

for

LG Electronics Inc.

**222, LG-ro, Jinwi-myeon Pyeongtaek-Si, Gyeonggi-Do,
17709 Republic of Korea**

Product Name : Notebook Computer
Model Name : (1)17Z90U (2)17ZD90U (3)17ZB90U (4)17ZG90U
(5)17Z90UB (6)17ZD90UB (7)17ZB90UB (8)17ZG90UB
Brand : LG
FCC ID : 2BO3L-17Z90U
IC : 2703H-17Z90U



The test report is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

TABLE OF CONTENTS

Description	Page
TEST REPORT.....	4
1. REVISION RECORD OF TEST REPORT	5
2. SUMMARY OF TEST RESULTS	6
3. GENERAL INFORMATION	7
3.1. Description of Application	7
3.2. Description of EUT	8
3.3. Reference Test Guidance.....	9
3.4. Antenna Information	9
3.5. EUT Specifications Assessed in Current Report	10
3.6. Description of Key Components	11
3.7. Test Configuration.....	13
3.8. Output Power Setting	14
3.9. Tested Supporting System List.....	15
3.10. Setup Configuration.....	15
3.11. Operating Condition of EUT	15
3.12. Description of Test Facility	16
3.13. Measurement Uncertainty	17
4. MEASUREMENT EQUIPMENT LIST	18
4.1. Conducted Emission Measurement	18
4.2. Radiated Emission Measurement	18
4.3. RF Conducted Measurement	19
5. CONDUCTED EMISSION	20
5.1. Block Diagram of Test Setup	20
5.2. Conducted Emission Limit	20
5.3. Test Procedure	20
5.4. Test Results	20
6. RADIATED EMISSION	21
6.1. Block Diagram of Test Setup	21
6.2. Radiated Emission Limits.....	22
6.3. Test Procedure	23
6.4. Measurement Result Explanation.....	24
6.5. Test Results	24
7. 20DB/OCCUPIED BANDWIDTH	25
7.1. Block Diagram of Test Setup	25
7.2. Specification Limits.....	25
7.3. Test Procedure	25
7.4. Test Results	25
8. CARRIER FREQUENCY SEPARATION	26
8.1. Block Diagram of Test Setup	26
8.2. Specification Limits.....	26
8.3. Test Procedure	26
8.4. Test Results	26
9. TIME OF OCCUPANCY.....	27
9.1. Block Diagram of Test Setup	27
9.2. Specification Limits.....	27
9.3. Test Procedure	27



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9.4. Test Results	27
10. NUMBER OF HOPPING CHANNELS	28
10.1. Block Diagram of Test Setup	28
10.2. Specification Limits.....	28
10.3. Test Procedure	28
10.4. Test Results	28
11. MAXIMUM PEAK OUTPUT POWER	29
11.1. Block Diagram of Test Setup	29
11.2. Specification Limits.....	29
11.3. Test Procedure	29
11.4. Test Results	29
12. EMISSION LIMITATIONS	30
12.1. Block Diagram of Test Setup	30
12.2. Specification Limits.....	30
12.3. Test Procedure	30
12.4. Test Results	30
13. DEVIATION TO TEST SPECIFICATIONS	31

APPENDIX A TEST DATA AND PLOTS

APPENDIX B TEST PHOTOGRAPHS



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TEST REPORT

Applicant : LG Electronics Inc.
EUT Description
(1) Product : Notebook Computer
(2) Model : (1)17Z90U (2)17ZD90U (3)17ZB90U (4)17ZG90U
(5)17Z90UB (6)17ZD90UB (7)17ZB90UB (8)17ZG90UB
(3) Brand : LG
(4) Power Supply : DC 20V, 3.25A

Applicable Standards:

Title 47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 5) +A2, February 2021
RSS-247 (Issue 3), August 2023

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2025. 10. 15

Reviewed by:

Sabrina Wang

(Sabrina Wang/Administrator)

Approved by:

Johnny Hsueh

(Johnny Hsueh/Deputy Manager)



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1. REVISION RECORD OF TEST REPORT

Edition No	Issued Date	Revision Summary	Report Number
0	2025. 10. 15	Original Report	EM-F250530

2. SUMMARY OF TEST RESULTS

Rule		Description	Results
FCC	IC		
15.207	RSS-Gen §8.8	Conducted Emission	PASS
15.247(d)/15.205	RSS-Gen §8.9 RSS-247 §5.5	Radiated Band Edge and Radiated Spurious Emission	PASS
15.247(a)(1)	RSS-247 §5.1(a)	20dB/Occupied Bandwidth	PASS
15.247(a)(1)	RSS-247 §5.1(b)	Carrier Frequency Separation	PASS
15.247(a)(1)(iii)	RSS-247 §5.1(d)	Time of Occupancy	PASS
15.247(a)(1)(iii)	RSS-247 §5.1(d)	Number of Hopping Channels	PASS
15.247(b)(1)	RSS-247 §5.1(b)	Maximum Peak Output Power	PASS
15.247(d)	RSS-247 §5.5	Conducted Band Edges and Conducted Spurious Emission	PASS
15.203	---	Antenna Requirement	Compliance
Note: The uncertainties value is not used in determining the result.			

3. GENERAL INFORMATION

The EUT's information described in this section are all provided by the applicant.

3.1. Description of Application

Applicant	LG Electronics Inc. 222, LG-ro, Jinwi-myeon Pyeongtaek-Si, Gyeonggi-Do, 17709 Republic of Korea
Product	Notebook Computer
Brand	LG
Model	(1)17Z90U (2)17ZD90U (3)17ZB90U (4)17ZG90U (5)17Z90UB (6)17ZD90UB (7)17ZB90UB (8)17ZG90UB The details of differences description refer to below table. Note: Model (1)17Z90U (2)17ZD90U (3)17ZB90U (4)17Z90UB (5)17ZD90UB (6)17ZB90UB is for ISED application.

Table: Model different list

Model Series	Model Number	Sales Customers	Appearance Color	Touch Pad
17Z90U Series	17Z90U	General Customers	(1)Black (2)White	(1)LITE-ON, SP8B00B31 (2)ELAN, SD082A-34H0
	17ZD90U	General Customers		
	17ZB90U	B2B Customers		
	17ZG90U	General Customers		
17Z90UB Series	17Z90UB	General Customers	Brown	LITE-ON, SP8E02B
	17ZD90UB	General Customers		
	17ZB90UB	B2B Customers		
	17ZG90UB	General Customers		

3.2. Description of EUT

Test Model	17Z90U		
Serial Number	N/A		
Power Rating	DC 20V, 3.25A		
Software Version	XY (X, Y can be 0 to 9 for different SW version not influence RF parameter)		
RF Features	WLAN: 802.11 a/b/g/n/ac/ax/be Bluetooth: BT and BLE (BT6.0)		
Transmit Type	2.4 GHz Bands		
	802.11b	1T1R	
	802.11g	1T1R	
	802.11n-HT20/40	2T2R	
	802.11ax-HE20/40	2T2R	
	802.11be-EHT20/40	2T2R	
	BT/BLE	2T2R	
	U-NII Bands		
	802.11a	1T1R	
	802.11n-HT20/40	2T2R	
	802.11ac-VHT20/40/80/160	2T2R	
	802.11ax-HE20/40/80/160	2T2R	
	802.11be-EHT20/40/80/160	2T2R	
	WLAN 6E Bands		
	802.11ax-HE20/40/80/160	2T2R	
	802.11be-EHT20/40/80/160/320	2T2R	
The MIMO is uncorrelated and supported SDM (Spatial Division Multiplexing) mode only. This radio device doesn't support beamforming and Cyclic Delay Diversity (CDD).			
Sample Status	Trial sample		
Test Sample	Sample No.	Test Item	Firmware
	01	AC Conduction, RSE, RF Conducted	N/A
Date of Receipt	2025. 08. 20		
Date of Test	2025. 09. 04 ~ 22		
Interface Ports of EUT	• One HDMI Port • Two USB Type C Ports • One Earphone Port • Two USB 3.0 Ports		
Accessories Supplied	• AC Adapter • USB C Cable • LAN Gender		

Note: Pursuant ISO 17025:2017 section 7.8.2, Audix Technology Corp. does not assume responsibility for all EUT's information including RF features, transmit type, antenna information...etc are provided by customer.

3.3. Reference Test Guidance

ANSI C63.10-2020 & ANSI C63.10-2020 + Cor.1-2023

3.4. Antenna Information

No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain(dBi)	
					Main	AUX
1.	L1LRF019-CS-H	LUXSHARE-ICT	Mono-pole	2400~2500	5.4	3.1
				5150~5250	2.7	5.3
				5250~5350	3.7	5.3
				5470~5725	4.0	4.7
				5725~5800	2.9	4.7
				5850	1.9	4.7
				5925~6425	2.1	6.8
				6425~6525	0.5	3.3
				6525~6825	2.6	3.8
				6925~7125	2.2	4.6
According to KDB 662911 D01 d) ii), transmit signals are completely uncorrelated, then Directional gain = $10 \log[(10^{G1/10} + 10^{G2/10} + \dots + 10^{GN/10})/N_{ANT}]$ dBi Note 1. 2.4G: Directional gain = 2400~2500MHz: Directional gain = $10 \log[(10^{5.4/10} + 10^{3.1/10})/2]$ = 4.4dBi Note 2. 5G: Directional gain = 5150 ~ 5250MHz: = $10 \log[(10^{2.7/10} + 10^{5.3/10})/2]$ = 4.19dBi 5250 ~ 5350MHz: = $10 \log[(10^{3.7/10} + 10^{5.3/10})/2]$ = 4.57dBi 5725 ~ 5800MHz: = $10 \log[(10^{2.9/10} + 10^{4.7/10})/2]$ = 3.89dBi 5850MHz: = $10 \log[(10^{1.9/10} + 10^{4.7/10})/2]$ = 3.52dBi Note 3. UNII Band (WLAN 6G): 5925~6425MHz: Directional gain = $10 \log[(10^{2.1/10} + 10^{6.8/10})/2]$ = 5.06dBi 6425~6525MHz: Directional gain = $10 \log[(10^{0.5/10} + 10^{3.3/10})/2]$ = 2.12dBi 6525~6825MHz: Directional gain = $10 \log[(10^{2.6/10} + 10^{3.8/10})/2]$ = 3.24dBi 6925~7125MHz: Directional gain = $10 \log[(10^{2.2/10} + 10^{4.6/10})/2]$ = 3.56dBi						

3.5. EUT Specifications Assessed in Current Report

Mode	Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (Mbps)
Bluetooth	2402-2480	79	FHSS (GFSK, $\pi/4$ DQPSK, 8-DPSK)	1/2/3

Channel List							
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

3.6. Description of Key Components

3.6.1. For the All Component Lists

Item	Supplier	Model / Type	Character
System	Microsoft	Win10 Home / Pro	---
		Win11 Home / Pro	---
Main Board	LG	1xZ90U MAIN	Manufacturer: #1 Hannstar Board Tech (Jiang Yin) Corp., Ltd. #2 Elec&Eltek Company (MCO) Limited. #3 Changzhou Aohong Electronics Co., Ltd.
SUB Board	LG	17Z90U/90UB/95U SUB B/D	Manufacturer: #1 Hannstar Board Tech (Jiang Yin) Corp., Ltd. #2 Elec&Eltek Company (MCO) Limited. #3 Changzhou Aohong Electronics Co., Ltd.
CPU (Socket: BGA2540)	Intel	Ultra X9 388H	4.0GHz
	Intel	Ultra X7 358H	3.7GHz
	Intel	Ultra 5 338H	3.7GHz
	Intel	Ultra 7 355	3.3GHz
	Intel	Ultra 5 325	3.1GHz
17" LCD Panel	LG Display	LP170WQ1	Resolution: 2560 x 1600, 60Hz
Storage (SSD)	SAMSUNG	---	256GB / 512GB / 1TB
	Longsys	---	256GB / 512GB / 1TB
	SK hynix	---	256GB / 512GB / 1TB
	Phison	---	256GB / 512GB / 1TB
Memory (RAM)	SAMSUNG	---	16GB / 32GB LPDDR5x(On Board)
	Longsys	---	16GB / 32GB LPDDR5x(On Board)
	SK hynix	---	16GB / 32GB LPDDR5x(On Board)
Battery Pack	LG	LB3122MM	77Wh, DC 15.52V, 4963mAh
	BYD	LB3122MN	77Wh, DC 15.52V, 4963mAh
WLAN Combo Card	Intel	BE211D2W	WLAN and BT, 2x2 PCIe M.2 1216-soldered down module FCC ID: PD9BE211D2 IC: 1000M-BE211D2
WLAN Combo Antenna	LG (LUXSHARE-ICT)	L1LRF019-CS-H	PCB, Mono-pole Type Main/Aux
Keyboard	LITE-ON	SN8D02B	100key
Touch Pad	LITE-ON	SP8B00B31	90U
	ELAN	SD082A-34H0	90U
	LITE-ON	SP8E02B	90UB
Web Camera	Luxvisions	ABG213N3A	IR/RGB (FHD)
	Chicony	CKFPE28	IR/RGB (FHD)
LAN Gender (Type C to LAN)	SUZHOU MEC ELECTRONICS	80-5946-111	(White) 10/100 Megabit Ethernet
		80-5946-101	(Black) 10/100 Megabit Ethernet
	ARIN TECH CO. LTD	GD-08MF-36-WH-LP10	(White) 10/100 Megabit Ethernet
		GD-08MF-36-BK-LP11	(Black) 10/100 Megabit Ethernet
	HUIZHOU DEHONG TECHNOLOGY CO.,LTD.	370-50713	(White) 10/100 Megabit Ethernet
		370-50714	(Black) 10/100 Megabit Ethernet
	Type C to LAN: Shielded, Undetached		
	ARIN TECH CO. LTD	GD-08MF-50-WH-LP12	(White) 10/100/1000 Megabit Ethernet
		GD-08MF-50-BK-LP13	(Black) 10/100/1000 Megabit Ethernet
	Type C to LAN: Shielded, Undetached		
	SUZHOU MEC ELECTRONICS	80-5946-230-FA	(White) 10/100/1000 Megabit Ethernet
		80-5946-240-FA	(Black) 10/100/1000 Megabit Ethernet
	Type C to LAN: Shielded, Undetached		

Item	Supplier	Model / Type	Character
AC Adapter	LG (PI ELECTRONICS)	LP65WFC20P-NJ	(B = Black),(W = White) I/P: AC 100-240V, 1.6A, 50-60Hz O/P:DC 5V,3A(15W) or DC 9V, 3A(27W)or DC 15V,3A (45W) or DC 20V,3.25A (65W) US Type: Wall-Mounted: (2C)
	#1 Type C Cable(3A) #2 Type C Cable (5A)		

Remark: For more detailed features description, please refer to the manufacturer's specifications or the user manual.

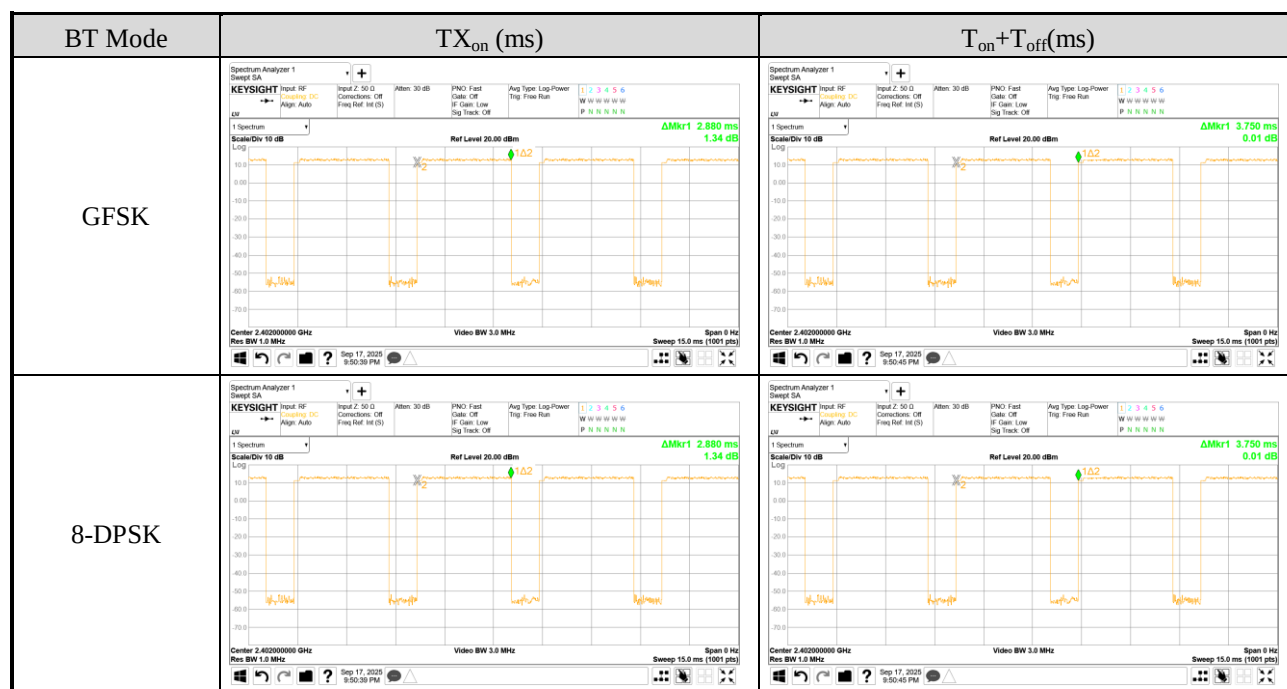
3.6.2. The EUT collocates with following worst components, which are used to establish a basic configuration of system during test:

SKU (Mode)			1
Main Board		LG, 1xZ90U MAIN	V
SUB Board		LG, 17Z90U/90UB/95U SUB B/D	V
CPU		Intel, Ultra X7 358H	V
17" LCD Panel		LG Display, LP170WQ1	V
Storage (SSD)		PHISON, 1TB	V
		Longsys, 1TB	V
Memory (RAM)		SAMSUNG, 32GB	V
Battery Pack		BYD, LB3122MN	V
Keyboard		LITE-ON, SN8D02B	V
Touch Pad		LITE-ON, SP8E02B	V
Web Camera		Luxvisions, ABG213N3A	V
WLAN Combo Card		Intel, BE211D2W	V
WLAN Combo Antenna		LG (LUXSHARE-ICT), L1LRF019-CS-H	V
Type C	AC Adapter	LG (PI ELECTRONICS), LP65WFC20P-NJ	V
	Link to LAN Gender	ARIN (10/100/1000Mbps)	V

3.7. Test Configuration

BT Mode	TX _{on} (ms)	TX _{on+off} (ms)	Duty Cycle (x)	Duty Cycle Factor [10log(1/x)] (dB)
GFSK	2.880	3.750	0.768	1.146
8-DPSK	2.880	3.750	0.768	1.146

Note: When duty cycle is less than 98% (0.98) that duty cycle factor 10log(1/x) is needed to add in conducted test items measured in average detector.



Item	Mode
AC Conduction Test Case	Normal Operation

Item	Mode	Data Rate	Test Channel
Radiated Test Case	Radiated Spurious Emission (30MHz~1GHz) ^{Note 1,2}	GFSK	3Mbps
	Radiated Band Edge ^{Note1}	GFSK	3Mbps
	Radiated Spurious Emission ^{Note1 & 2}	GFSK	3Mbps

Item	Mode	Data Rate	Test Channel
Conducted Test Case	20dB/Occupied Bandwidth	GFSK	1Mbps
		8-DPSK	3Mbps
	Carrier Frequency Separation	GFSK	1Mbps
		8-DPSK	3Mbps
	Time of Occupancy	GFSK	1Mbps
		8-DPSK	3Mbps
	Number of Hopping Channels	GFSK	1Mbps
		8-DPSK	3Mbps
	Maximum Peak Output Power	GFSK	1Mbps
		8-DPSK	3Mbps
	Band Edges	GFSK	1Mbps
		8-DPSK	3Mbps
	Spurious Emission	GFSK	1Mbps
		8-DPSK	3Mbps

Note 1: ☐ Mobile Device ☒ Portable Device and 3 axis were assessed. The worst scenario for Radiated Spurious Emission as follow: ☒ Lie ☐ Side ☐ Stand

Note 2: We performed testing of the highest and lowest data rate.

3.8. Output Power Setting

Centre Frequency (MHz)	Power Setting			
	GFSK		8-DPSK	
	AUX	Main	AUX	Main
2402	15.000	15.000	12.500	12.500
2441	15.000	15.000	12.500	12.500
2480	15.000	15.000	12.500	12.500

3.9. Tested Supporting System List

3.9.1. Support Peripheral Unit

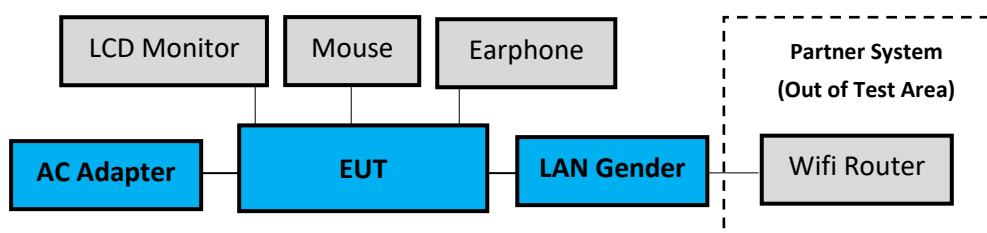
No.	Product	Brand	Model No.	Serial No.	Approval
1.	LCD Monitor	DELL	U2718Qb	CN-0M5R5F-QDC00-99P-04DL	N/A
2.	USB Mouse	ASUS	MU96UOB	N/A	N/A
3.	Earphone	APPLE	N/A	N/A	N/A
Partner System					
4.	WiFi Router	ASUS	RT-BE96U	RBIG6G200822ZT7	FCC ID: MSQ-RTBE6G00

3.9.2. Cable Lists

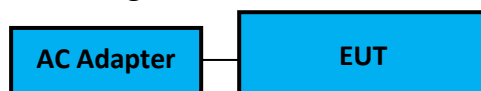
No.	Cable Description Of The Above Support Units
1.	HDMI Cable: Shielded, Detachable, 1.8m AC Power Cord: Unshielded, Detachable, 1.8m
2.	USB Cable: Unshielded, Undetachable, 1.8 m
3.	Earphone Cable: Unshielded, Undetachable, 1.2m
4.	AC adapter: M/N: LP65WFC20P-NJ DC Power Cable: Unshielded, Detachable, 1.8m, Bonded two ferrite cores AC Power Cord: Unshielded, Detachable, 1.1m LAN cable: Unshielded, Detachable, 3.0m
5.	LAN cable: Unshielded, Detachable, 1.8m

3.10. Setup Configuration

3.10.1. EUT Configuration for Power Line & Radiated Emission



3.10.2. EUT Configuration for RF Conducted Test Items



3.11. Operating Condition of EUT

Test program “DRTU” is used for enabling EUT BT function under continues transmitting and choosing data rate/ channel.

3.12. Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 491, Zhongfu Rd., Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: attemc_report@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2017 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724
Test Facilities	FCC OET Designation Number under APEC MRA by NCC is : TW1724 ISED CAB Identifier Number under APEC TEL MRA by NCC is TW1724 (1) No.8 Shielded Room (2) No.1 3m Semi Anechoic Chamber

3.13.Measurement Uncertainty

The measurement uncertainty levels have been estimated as specified in ETSI TR 100 028-2001

Test Items/Facilities			Frequency Range	Uncertainty
Conduction Test	☐	No. 7 Shielded Room	9kHz-150kHz	±3.7dB
			150kHz-30MHz	±3.4dB
	☒	No. 8 Shielded Room	9kHz-150kHz	±3.7dB
			150kHz-30MHz	±3.4dB
Radiation Test	☒	No.1 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.0dB
			200MHz-1000MHz, 3m, Horizontal	±4.0dB
			30MHz-200MHz, 3m, Vertical	±4.8dB
			200MHz-1000MHz, 3m, Vertical	±4.5dB
			1GHz-6GHz, 3m	±4.2dB
			6GHz-18GHz, 3m	±4.0dB
	☐	No.3 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.3dB
			200MHz-1000MHz, 3m, Horizontal	±4.0dB
			30MHz-200MHz, 3m, Vertical	±4.7dB
			200MHz-1000MHz, 3m, Vertical	±4.5dB
			1GHz-6GHz, 3m	±4.7dB
			6GHz-18GHz, 3m	±4.4dB
	☐	No.4 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±3.9dB
			200MHz-1000MHz, 3m, Horizontal	±3.9dB
			30MHz-200MHz, 3m, Vertical	±4.6dB
			200MHz-1000MHz, 3m, Vertical	±4.3dB
			1GHz-6GHz, 3m	±4.6dB
			6GHz-18GHz, 3m	±4.1dB
	☐	No.5 3m Semi Anechoic Chamber	30MHz-200MHz, 3m, Horizontal	±4.4dB
			200MHz-1000MHz, 3m, Horizontal	±4.2dB
			30MHz-200MHz, 3m, Vertical	±4.9dB
			200MHz-1000MHz, 3m, Vertical	±5.1dB
			1GHz-6GHz, 3m	±4.4dB
			6GHz-18GHz, 3m	±4.0dB
	Radiated emissions (18GHz-40GHz)		18GHz-40GHz, 3m	±3.6dB

Remark : Uncertainty = $k_{uc}(y)$

Test Item	Uncertainty
20dB Bandwidth	±0.48%
99% Occupied Bandwidth	±0.38%
Carrier Frequency Separation	±0.2kHz
Time of Occupancy	±2.6%
Maximum peak Output power	± 0.8dB
Conducted Emission Limitations	±1.24 dB

4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESR3	101774	2025.01.03	1 Year
2.	A.M.N.	R&S	ENV432	101567	2025.06.04	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-1370-9	2025.02.05	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	100354	2024.12.07	1 Year
5.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.8 S/R	2025.04.09	1 Year
6.	Signal Cable	Yeida	RG/58AU	CE-08	2025.09.03	1 Year
7.	Test Software	Audix	e3	V9 18621a	N.C.R.	N.C.R.

4.2. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2025.08.07	1 Year
2.	Spectrum Analyzer	Keysight	N9020B	MY57120357	2025.02.04	1 Year
3.	Test Receiver	R&S	ESCS30	100338	2025.06.14	1 Year
4.	Amplifier	HP	8447D	2944A06305	2024.12.16	1 Year
5.	Microwave Preamplifier	HP	8449B	3008A01284	2025.07.07	1 Year
6.	Microwave Amplifier	Keysight	83051A	MY56480113	2025.09.05	1 Year
7.	Loop antenna	TESEQ	HLA 6121	60478	2025.06.05	1 Year
8.	Bilog Antenna	TESEQ	CBL6112D	33821	2025.02.08	1 Year
9.	Horn Antenna	EMCO	3115	9112-3775	2025.05.06	1 Year
10.	Horn Antenna	COM-POWER	AH-840	101092	2025.01.09	1 Year
11.	2.4GHz Notch Filter	K&L Microwave	7NSL10-2441.5/E13 0.5-O/O	1	2025.04.10	1 Year
12.	High-Pass Filter	Microwave	H3G018G1	484796	2025.04.10	1 Year
13.	Coaxial Cable	MIYAZAKI	5D2W	RE-11	2025.01.03	1 Year
14.	Coaxial Cable	HUBER+SUHNER	RG223/U	RE-33	2025.06.10	1 Year
15.	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 106	RE-14	2025.01.03	1 Year
16.	Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	RE-30	2025.08.19	1 Year
17.	Digital Thermo-Hygro Meter	iMax	HTC-1	No.1 3m A/C	2025.04.09	1 Year
18.	Test Software	Audix	e3	V9 18621a	N.C.R.	N.C.R.

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4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Keysight	N9010B	MY65100101	2025.05.05	1 Year
2.	Spectrum Analyzer	Keysight	N9010B	MY65100102	2025.05.14	1 Year
3.	Power Meter	Anritsu	ML2495A	1145008	2025.06.04	1 Year
4.	Power Sensor	Anritsu	MA2411B	1126096	2025.06.04	1 Year
5.	Power meter	Anritsu	ML2495A	2127005	2024.11.19	1 Year
6.	Power meter	Anritsu	ML2495A	2127004	2024.11.30	1 Year
7.	Digital Thermo-Hygro Meter	iMax	HTC-1	RF-03	2025.04.09	1 Year

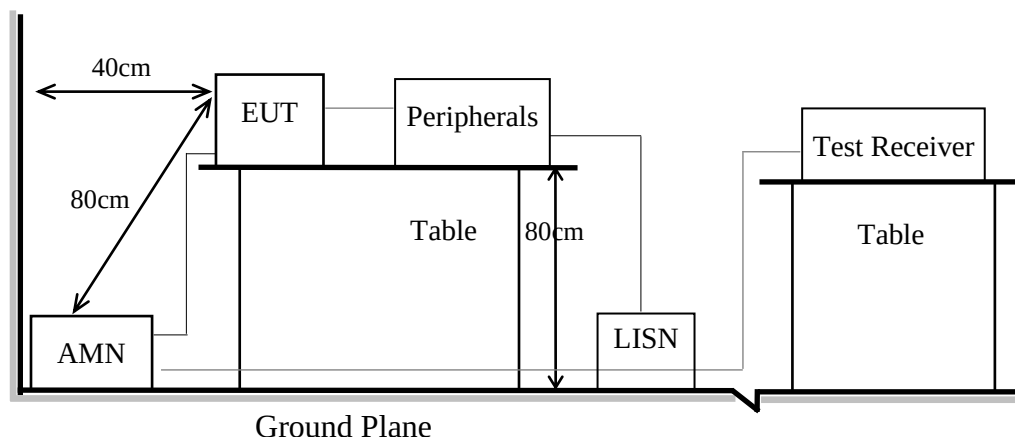
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.10

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.

2.: The lower limit applies to the band edges.

5.3. Test Procedure

- 5.3.1. To set up the EUT as indicated in ANSI C63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.
- 5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).
- 5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)
- 5.3.4. Checking frequency range from 150kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Test Results

Please refer to Appendix A.

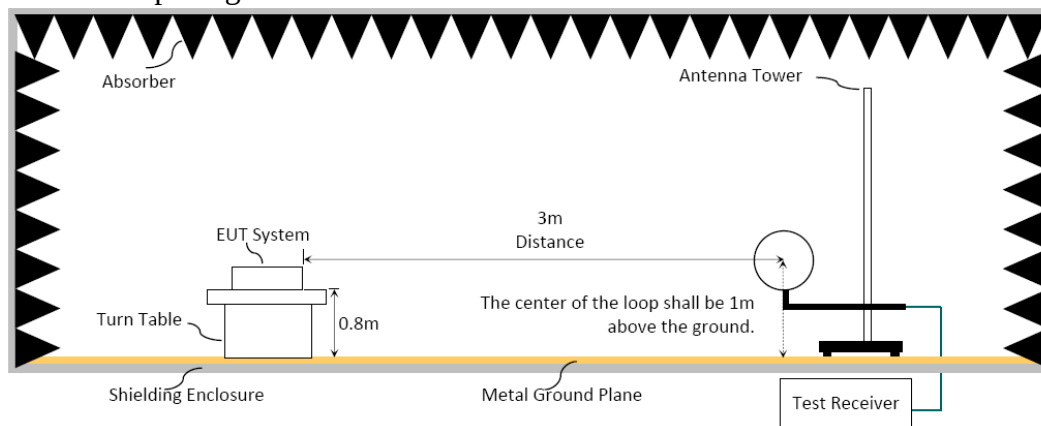
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

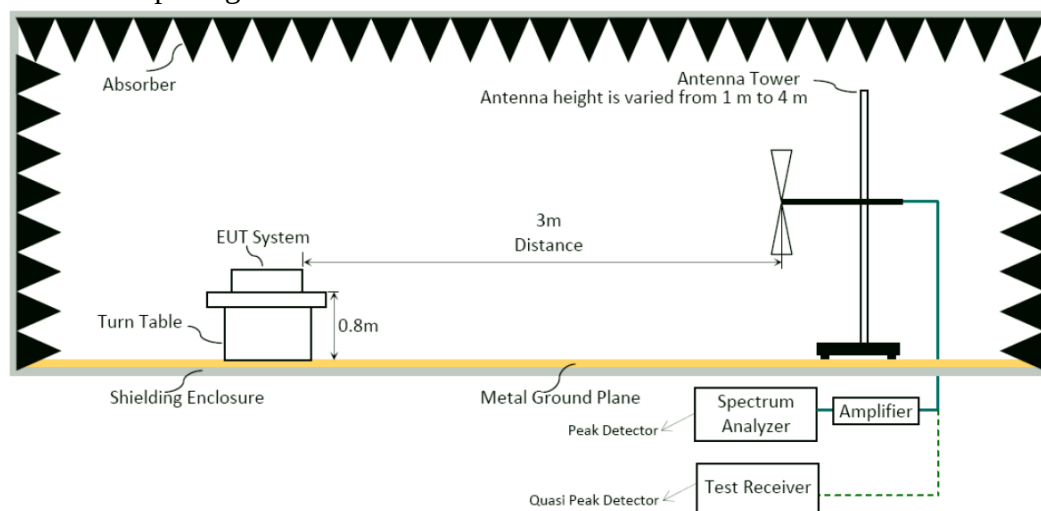
6.1.1. Block Diagram of EUT

Indicated as section 3.10

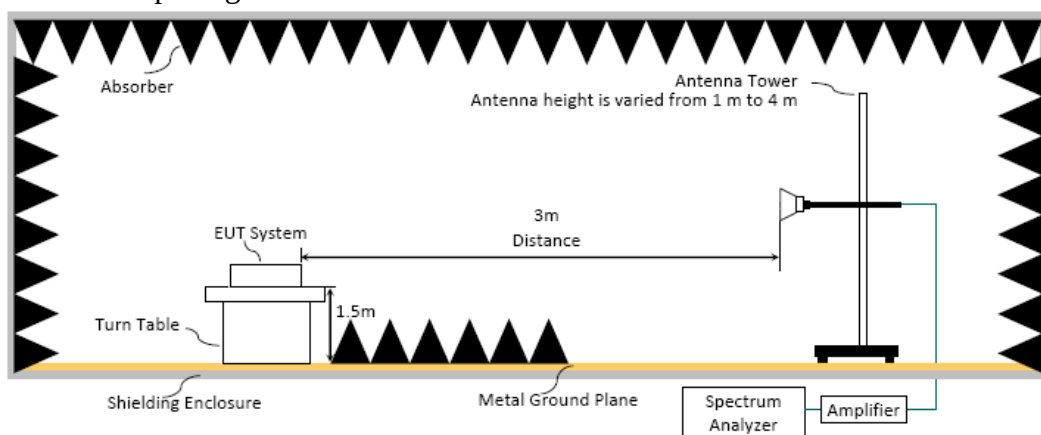
6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000MHz



6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205/RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified as below.

Frequency (MHz)	Distance(m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6-20 log f(kHz)	2400/f kHz
0.490 - 1.705	30	87.6-20 log f(kHz)	24000/f kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dB μ V/m (Peak) 54.0 dB μ V/m (Average)	

Remark : (1) dB μ V/m = 20 log (μ V/m)

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turntable which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2020 & ANSI C63.10-2020 + COR.1-2023 regulation.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 25GHz:

The EUT setup on the turn table which has 80cm (for 30-1000MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2020 & ANSI C63.10-2020 + COR.1-2023 regulation.

Frequency below 1GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120KHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

Note 1: When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required, otherwise using Q.P. for final measurement.

Note 2: When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.

Frequency above 1GHz to 10th harmonic(up to 25 GHz):

Peak Detector:

- (1) RBW = 1MHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.

Note: When peak-detected value is lower than limit that the measurement using the average detector is not required, otherwise using average detector for final measurement.

Average Detector:**☒ Option 1:**

(1) RBW = 1MHz

(2) VBW $\geq 1/T$. (Duty Cycle $< 98\%$, when duty cycle presented in section 3.7)

Mode	TX _{on} (ms)	1/ TX _{on} (kHz)	VBW(>1/ TX _{on}) (Hz)
GFSK	2.880	0.347	360
8-DPSK	2.880	0.347	360

(3) VBW = 10Hz (Duty Cycle $\geq 98\%$, when duty cycle presented in section 3.7)

(4) Sweep time = auto.

(5) Trace mode = max hold.

(6) Allow sweeps to continue until the trace stabilizes.

☐ Option 2:

Average Emission Level = Peak Emission Level + D.C.C.F.

6.4. Measurement Result Explanation

☒ Peak Emission Level (dB μ V/m) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) + Reading (dB μ V).

☒ Average Emission Level (dB μ V/m) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) + Reading (dB μ V).

☐ Average Emission Level (dB μ V/m) = Peak Emission Level (dB μ V/m) + DCCF (dB)
Duty Cycle Correction Factor (DCCF) (dB) = $20\log(TX_{on}/TX_{on+off})$ presented in section 3.7.

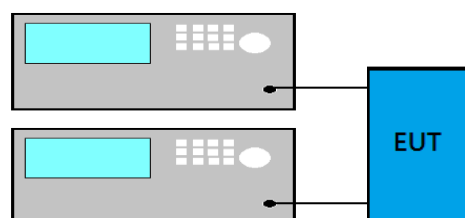
☐ ERP (dBm) = Peak Emission Level (dB μ V/m) - 95.2dB - 2.14dB

6.5. Test Results

Please refer to Appendix A.

7. 20DB/OCCUPIED BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

7.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2020 & ANSI C63.10-2020 + COR.1-2023:

For 20dB Bandwidth

- (1) Set Span range 2~5 times the OBW
- (2) Set RBW close to 1% to 5% of OBW.
- (3) Set $VBW \geq 3 \times RBW$.
- (4) Detector = Peak.
- (5) Trace mode = Max hold.
- (6) Sweep = Auto couple.
- (7) Allow the trace to stabilize.
- (8) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

For 99% Occupied Bandwidth

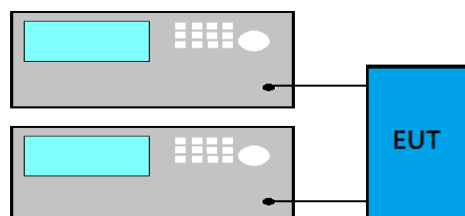
- (9) Set Span range 1.5~5 times the OBW
- (10) Set RBW close to 1% to 5% of OBW.
- (11) Set $VBW \geq 3 \times RBW$.
- (12) Detector = Peak.
- (13) Trace mode = Max hold
- (14) Sweep = Auto couple.
- (15) Allow the trace to stabilize.

7.4. Test Results

Please refer to Appendix A

8. CARRIER FREQUENCY SEPARATION

8.1. Block Diagram of Test Setup



8.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output no greater than 125mW.

8.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2020 & ANSI C63.10-2020 + COR.1-2023:

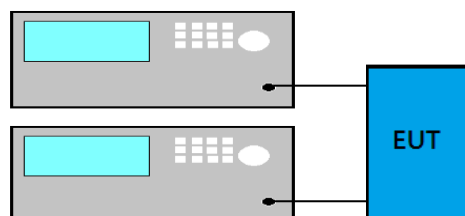
- (1) Span = Wide enough to capture the peaks of two adjacent channels
- (2) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- (3) $VBW \geq RBW$
- (4) Sweep = Auto
- (5) Detector function = Peak
- (6) Trace = Max hold
- (7) Allow the trace to stabilize.

8.4. Test Results

Please refer to Appendix A

9. TIME OF OCCUPANCY

9.1. Block Diagram of Test Setup



9.2. Specification Limits

Frequency hopping systems in the 2400-2483.5MHz shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by number of hopping channels employed.

9.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2020 & ANSI C63.10-2020 + COR.1-2023:

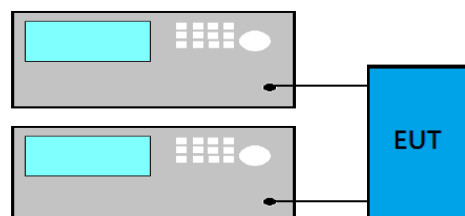
- (1) Span: Zero span, centered on a hopping channel.
- (2) RBW shall be $\leq$ channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected transmission time per hop.
- (3) Sweep time: Set so that the start of the first transmission and end of the last transmission for the hop are clearly captured. Setting the sweep time to be slightly longer than the hopping period per channel (hopping period = $1/\text{hopping rate}$) should achieve this.
- (4) Use a video trigger, where possible with a trigger delay, so that the start of the transmission is clearly observed. The trigger level might need adjustment to reduce the chance of triggering when the system hops on an adjacent channel.
- (5) Detector function: Peak.
- (6) Trace: Clear-write, single sweep.
- (7) g) Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.

9.4. Test Results

Please refer to Appendix A

10. NUMBER OF HOPPING CHANNELS

10.1. Block Diagram of Test Setup



10.2. Specification Limits

Frequency hopping systems in the 2400-2483.5MHz shall use at least 15 non-overlapping Frequency hopping systems which use fewer than 20 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels.

10.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2020 & ANSI C63.10-2020 + COR.1-2023:

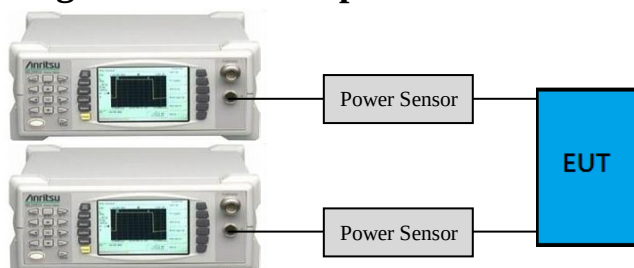
- (1) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- (2) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- (3) VBW $\geq$ RBW
- (4) Sweep = Auto
- (5) Detector function = Peak
- (6) Trace = m=Max hold
- (7) Allow the trace to stabilize.

10.4. Test Results

Please refer to Appendix A

11. MAXIMUM PEAK OUTPUT POWER

11.1. Block Diagram of Test Setup



11.2. Specification Limits

The Limits of maximum Peak Output Power for frequency hopping systems in 2400-2483.5MHz is: 1Watt. (30dBm) , and E.I.R.P.: 4Watt (36dBm)

11.3. Test Procedure

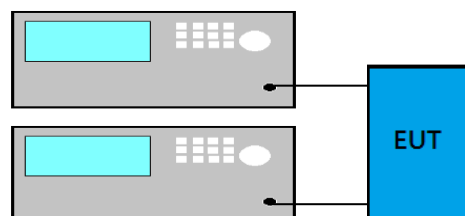
EUT is connected to power sensor and record the maximum output power.

11.4. Test Results

Please refer to Appendix A

12. EMISSION LIMITATIONS

12.1. Block Diagram of Test Setup



12.2. Specification Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in Section 15.209(a)/RSS-Gen Section 8.9 table 4 is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a)/RSS-Gen Section 8.10 table 6,, must also comply with the radiated emission limits specified in Section 15.209(a)/RSS-Gen Section 8.9 table 4 (See Section 15.205(c)).

12.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10-2020 & ANSI C63.10-2020 + COR.1-2023:

- (1) Set span wide enough to capture the peak level of the in-band emission and all spurious emissions; up to 10th harmonic.
- (2) RBW = 100 kHz
- (3) VBW $\geq$ RBW
- (4) Sweep = Auto
- (5) Detector function = Peak
- (6) Trace = Max hold

12.4. Test Results

Please refer to Appendix A



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13. DEVIATION TO TEST SPECIFICATIONS

【NONE】



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APPENDIX A

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APPENDIX A

TEST DATA AND PLOTS

(Model: 17Z90U)



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APPENDIX B

TEST PHOTOGRAPHS

(Model: 17Z90U)