

TEST REPORT

Applicant Name: JVCKENWOOD Corporation
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Report Number: SZ1240322-14970E-RF-00
FCC ID: K44523500

Test Standard (s)

FCC PART 90

Sample Description

Product Type: UHF FM TRANSCEIVER
Model Name: PKT-300-K
Multiple Model(s) No.: N/A
Trade Mark: N/A
Date Received: 2024/03/22
Issue Date: 2024/06/19

Test Result:

Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Bruce Lin

Bruce Lin
RF Engineer

Approved By:

Nancy Wang

Nancy Wang
RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZ1240322-14970E-RF-00	Original Report	2024/06/19

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	UHF FM TRANSCEIVER
Tested Model	PKT-300-K
Multiple Model(s)	N/A
SKU Number	019048240101, 019048240095
Frequency Range	450MHz - 470MHz
Rated Transmit Power	High Power: 2Watts, Low Power: 0.5Watts
Channel separation	12.5kHz
Modulation Technique	FM
Antenna Specification [#]	1.0dBi (provided by the applicant)
Voltage Range	DC 4.7V from charger or DC 3.6V from battery DC 5.5V from adapter for charger
Sample serial number	2J3P-1 (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	Model: KSC-44SL Input: AC 100-240V~50/60Hz, 0.5A Output: DC 5.5V, 0.8A

Accessories:

Part No.	Description
PKT-300-K	UHF FM TRANSCEIVER
KSC-44SL	AC Adapter
KSC-50CR	Charger pocket
KNB-81L	Li-ion Battery Pack
KBH-23	Belt Clip Holster
KBH-14	Belt Clip
KBH-20	Belt Clip
KBH-21	Belt Clip (Long)
KMC-21A	Speaker Microphone
KMC-45D	Speaker Microphone
EMC-3	Clip Microphone
KHS-7/7C	Single-Muff Headset
KHS-7A/7C	Single-Muff Headset w/ In-line
KHS-8BL	2-wire Palm Mic w/Earphone
KHS-9BL	3-wire Palm Mic w/Earphone
KHS-10D-BH	Heavy-duty Behind the Headset
KHS-10D-OH	Heavy-duty Over the Headset
KHS-22A	Headset w/ VOX & PTT
KHS-26	Earbud In-line PTT Headset
KHS-27A	D-Ring In-line PTT Headset
KHS-31C	C-Ring Ear Hanger w/ PTT & Mic
KEP-2	Earphone Kit for KMC-21

Objective

This test report is in accordance with Part 2, and Part 90 of the Federal Communication Commissions rules.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2, Sub-part J as well as the following individual parts:

Part 90 – Private Land Mobile Radio Service

Applicable Standards: ANSI C63.26-2015 and ANSI TIA-603-E-2016.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Frequency		213.55 Hz(k=2, 95% level of confidence)
RF output power, conducted		0.72 dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.75 dB(k=2, 95% level of confidence)
Audio Frequency Response		0.1dB
Low Pass Filter Response		1.2dB
Modulation Limiting		1%
Radiated Emissions	30MHz~200MHz (Horizontal)	4.48dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	4.55dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	4.85dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.05dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.35dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.44dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.16dB(k=2, 95% level of confidence)
Temperature		±1°C
Humidity		±1%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a test mode which has been done in the factory.

Equipment Modifications

No modification was made to the EUT.

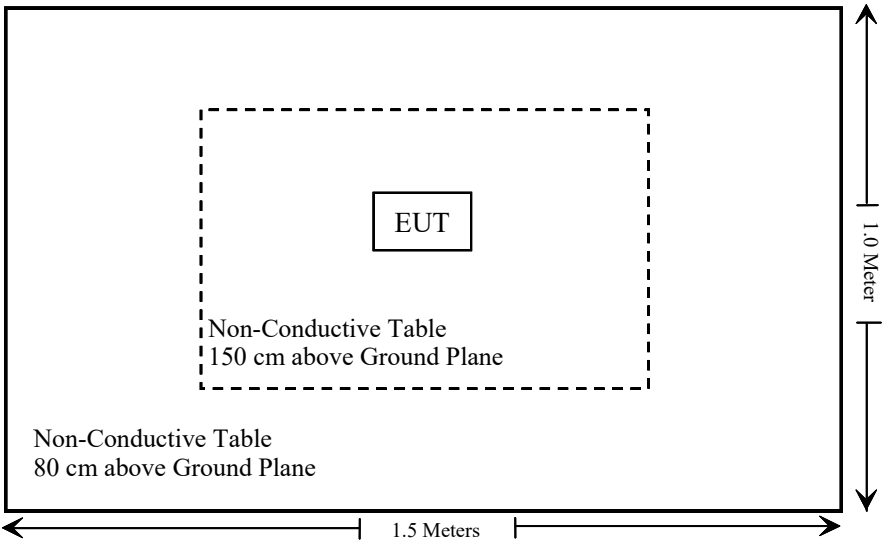
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
FCC §1.1307 & §2.1093	RF Exposure	Compliant
§2.1046; §90.205	RF Output Power	Compliant
§2.1047; §90.207	Modulation Characteristic	Compliant
§2.1049; §90.209; §90.210	Occupied Bandwidth & Emission Mask	Compliant
§2.1051;§90.210	Spurious Emission at Antenna Terminal	Compliant
§2.1053;§90.210	Spurious Radiated Emissions	Compliant
§2.1055;§90.213	Frequency Stability	Compliant
§90.214	Transient Frequency Behavior	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2023/06/08	2024/06/07
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber Cable 1	F-03-EM236	2023/08/03	2024/08/02
Unknown	Cable	Chamber Cable 4	EC-007	2023/08/03	2024/08/02
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
COM-POWER	Pre-amplifier	PA-122	181919	2023/06/29	2024/06/28
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2026/07/25
A.H.System	Horn Antenna	SAS-200/571	135	2021/07/14	2024/07/13
Unknown	RF Cable	KMSE	0735	2023/10/08	2024/10/07
Unknown	RF Cable	UFA147	219661	2023/10/08	2024/10/07
Unknown	RF Cable	XH750A-N	J-10M	2023/10/08	2024/10/07
Agilent	Signal Generator	N5183A	MY50140588	2023/12/18	2024/12/17
Unknown	1.3G High Pass filter	1.3GHz	101120	2023/08/03	2024/08/02
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200982	2023/12/18	2024/12/17
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	2024/01/16	2025/01/15
HP	RF Communication test set	8920B	US36141849	2024/01/16	2025/01/15
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2023/06/08	2024/06/07
Fluke	Digital Multimeter	287	19000011	2024/05/21	2025/05/20
WEINSCHL	30dB Attenuator	58-30-33	PS509	2023/07/04	2024/07/03
Unknown	RF Cable	65475	01670515	2023/07/04	2024/07/03
R&S	Signal Analyzer	FSIQ26	837405/023	2024/01/08	2025/01/07

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307&§2.1093 - RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: SZ1240322-14970E-20.

FCC §2.1046 & §90.205 - RF OUTPUT POWER

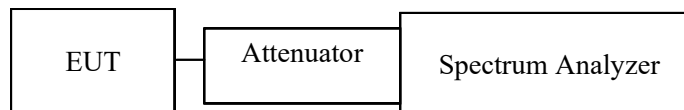
Applicable Standard

FCC §2.1046 and §90.205

Test Procedure

According to ANSI C63.26-2015 section 5.2.3.3

Conducted RF Output Power:



Note: The path loss from EUT to Spectrum Analyzer has included in the result.

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

Spectrum Analyzer Setting:

R B/W	Video B/W
100 kHz	300 kHz

Test Data

Environmental Conditions

Temperature:	25~25.2 °C
Relative Humidity:	45~46 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang from 2024-05-16 to 2024-06-19.

Test Mode: Transmitting

Test Result: Pass. Please refer to following table and plots.

High POWER:

Modulation Mode	Channel Separation	f _c (MHz)	Reading (dBm)	Limit (dBm)
Analog (FM)	12.5kHz	450.0125	32.99	33.0
		460	32.88	33.0
		469.9875	32.73	33.0

Low POWER:

Modulation Mode	Channel Separation	f _c (MHz)	Reading (dBm)	Limit (dBm)
Analog (FM)	12.5kHz	450.0125	27.16	27.78
		460	26.91	27.78
		469.9875	26.73	27.78

Note 1: according to FCC § 90.203(j)(4), applications for part 90 certification of transmitters designed to operate on frequencies in the 421-512 MHz band should be capable of operating on channels of 6.25 kHz or less, except for hand-held transmitters with an output power of two watts or less.

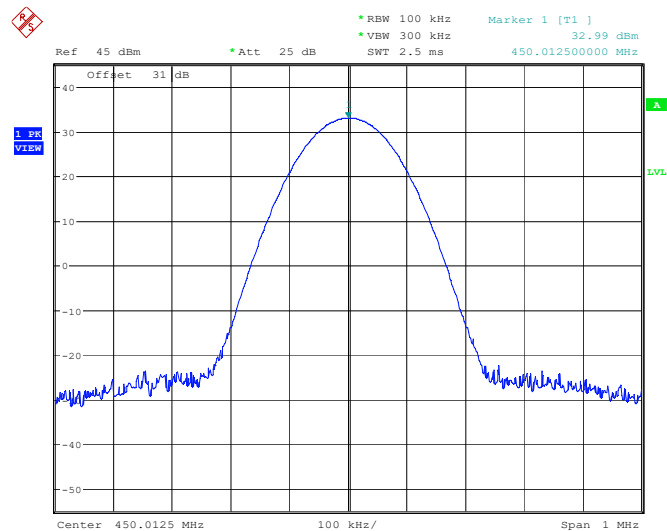
Note 2: The output power shall not exceed by more than 20 percent the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

Note 3: the rated High Power is 2W, the rated Low Power is 0.5W.

Analog 12.5 KHz

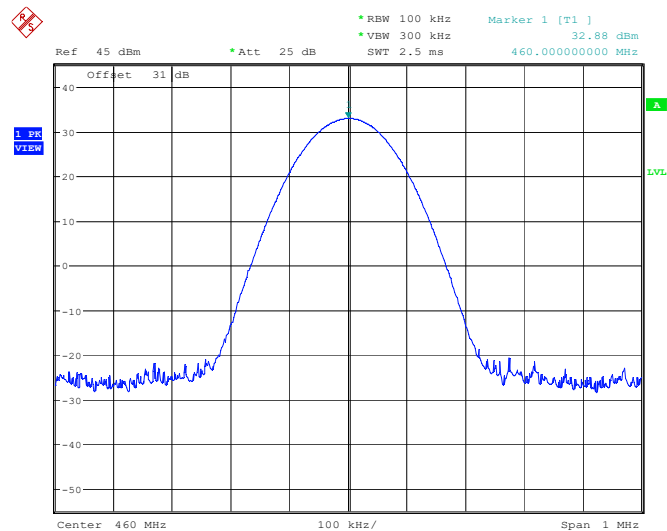
High POWER:

Frequency 450.0125 MHz



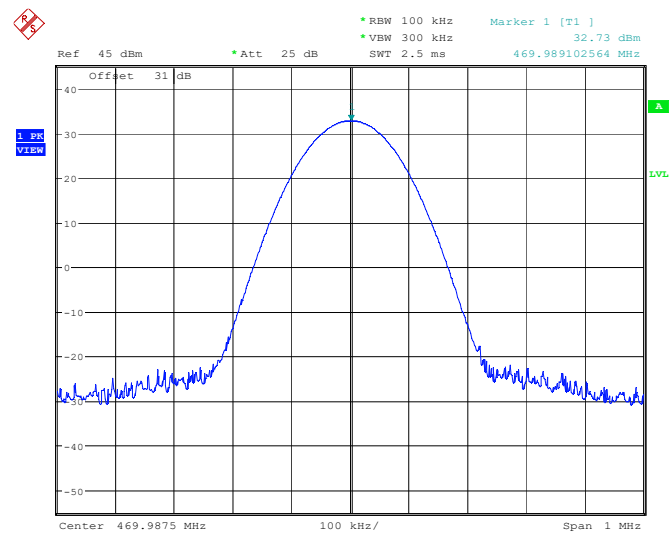
ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 16.MAY.2024 16:25:44

Frequency 460 MHz



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 16.MAY.2024 16:28:59

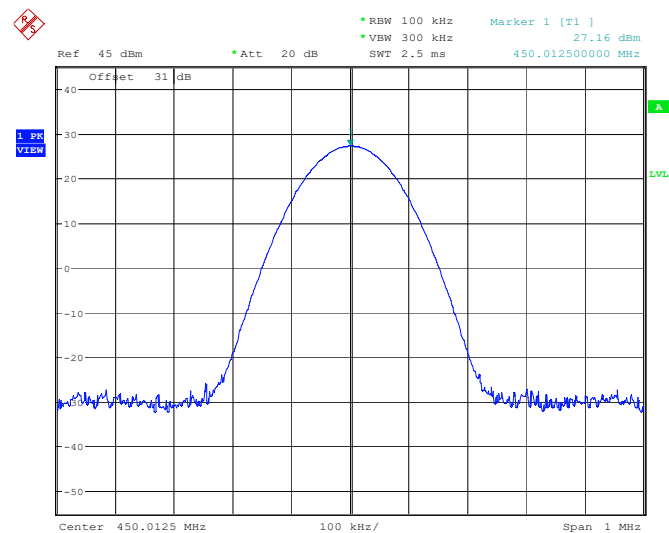
Frequency 469.9875 MHz



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 16.MAY.2024 16:29:50

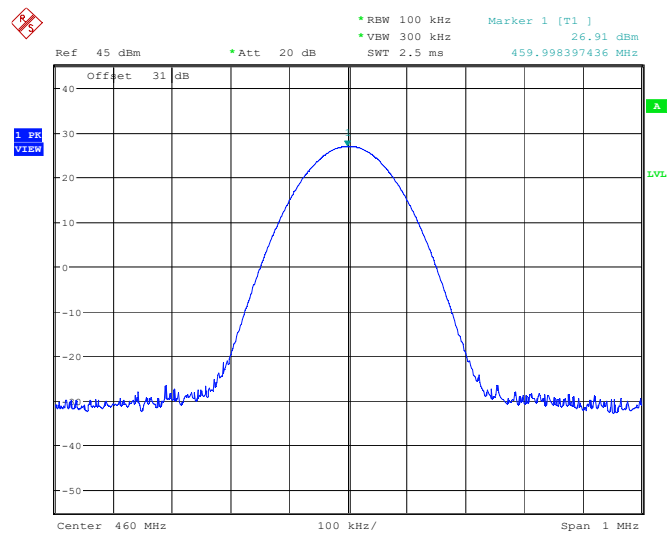
Low POWER:

Frequency 450.0125 MHz



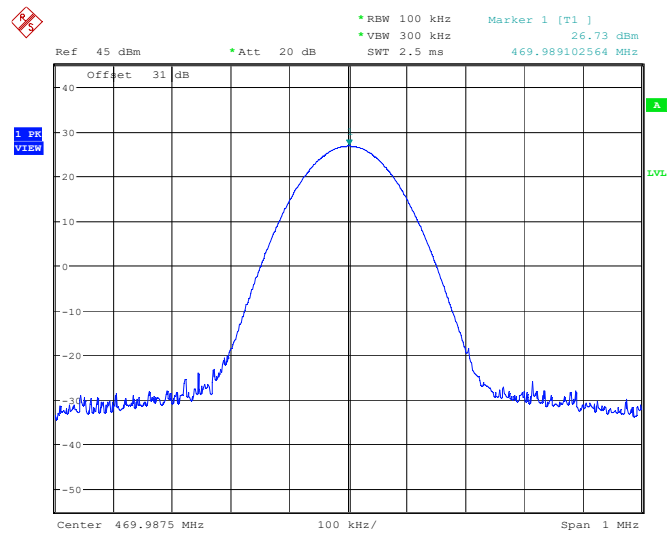
ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 19.JUN.2024 10:35:01

Frequency 460 MHz



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 19.JUN.2024 10:05:01

Frequency 469.9875 MHz



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 19.JUN.2024 10:36:23

FCC §2.1047 & §90.207 - MODULATION CHARACTERISTIC

Applicable Standard

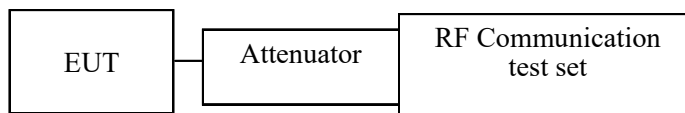
FCC§2.1047 and §90.207:

- (a) Equipment which utilizes voice modulated communication shall show the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz. for equipment which is required to have a low pass filter, the frequency response of the filter, or all of the circuitry installed between the modulation limited and the modulated stage shall be supplied.
- (b) Equipment which employs modulation limiting, a curve showing the percentage of modulation versus the modulation input voltage shall be supplied.

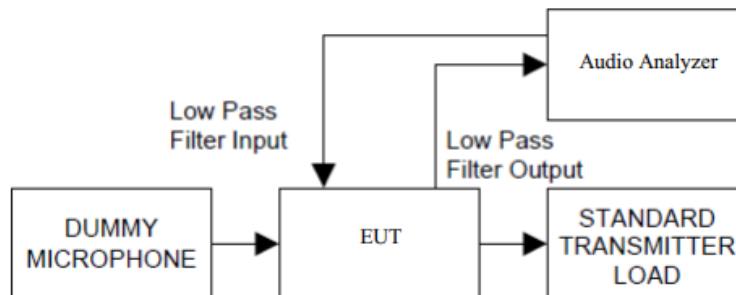
Test Procedure

Test Method: ANSI TIA-603-E-2016 section 2.2.3 for modulation limiting
ANSI TIA-603-E-2016 section 2.2.6 for audio frequency response
ANSI TIA-603-E-2016 section 2.2.15 for Audio Low Pass Filter Response

For modulation limiting and audio frequency response:



For Audio Low Pass Filter Response:



Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	46 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang on 2024-05-16.

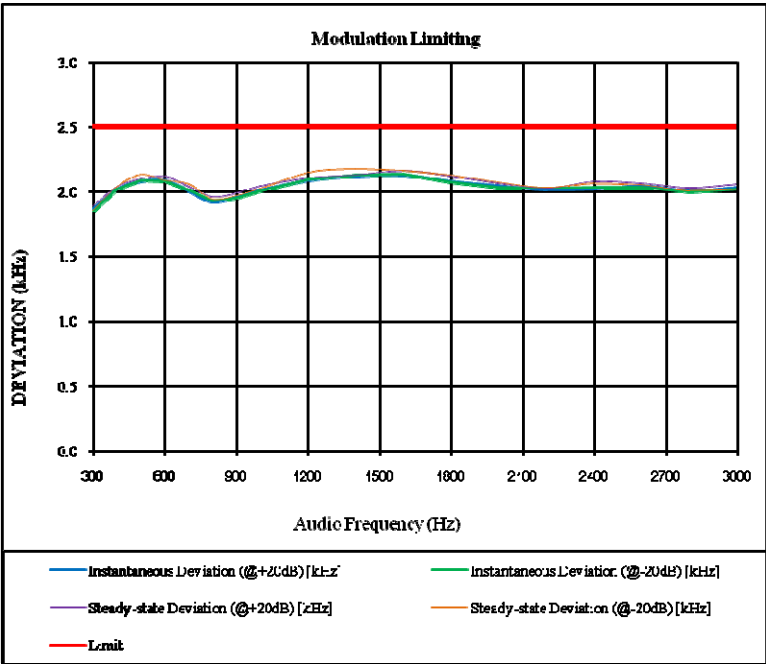
Test Mode: Transmitting

Test Result: Pass. Please refer to the following tables and plots.

Analog Modulation:**MODULATION LIMITING**

Carrier Frequency: 460MHz, Separation: 12.5 kHz

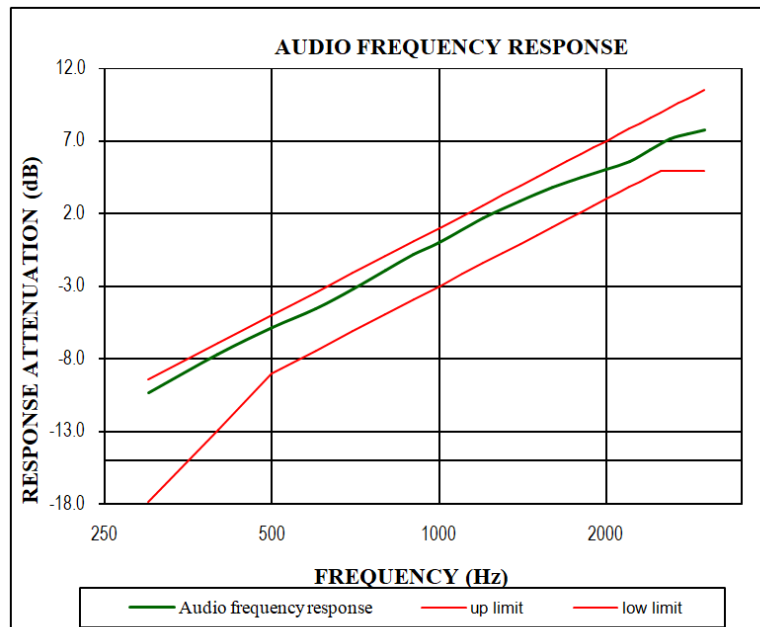
Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	Peak Positive Deviation [kHz]	Peak Negative Deviation [kHz]	Peak Positive Deviation [kHz]	Peak Negative Deviation [kHz]	
300	1.869	1.848	1.891	1.854	2.500
400	2.021	2.016	2.041	2.036	2.500
500	2.08	2.088	2.099	2.131	2.500
600	2.086	2.079	2.118	2.086	2.500
700	2.002	2.012	2.036	2.061	2.500
800	1.924	1.932	1.966	1.945	2.500
900	1.956	1.951	1.993	1.973	2.500
1000	2.008	2.002	2.045	2.025	2.500
1200	2.088	2.092	2.107	2.150	2.500
1400	2.119	2.125	2.128	2.175	2.500
1600	2.126	2.135	2.161	2.159	2.500
1800	2.082	2.071	2.121	2.124	2.500
2000	2.042	2.029	2.068	2.069	2.500
2200	2.014	2.023	2.025	2.033	2.500
2400	2.021	2.034	2.080	2.066	2.500
2600	2.042	2.030	2.063	2.049	2.500
2800	2.007	1.998	2.033	2.006	2.500
3000	2.029	2.015	2.061	2.018	2.500



Audio Frequency Response

Carrier Frequency: 460MHz, Separation: 12.5 kHz

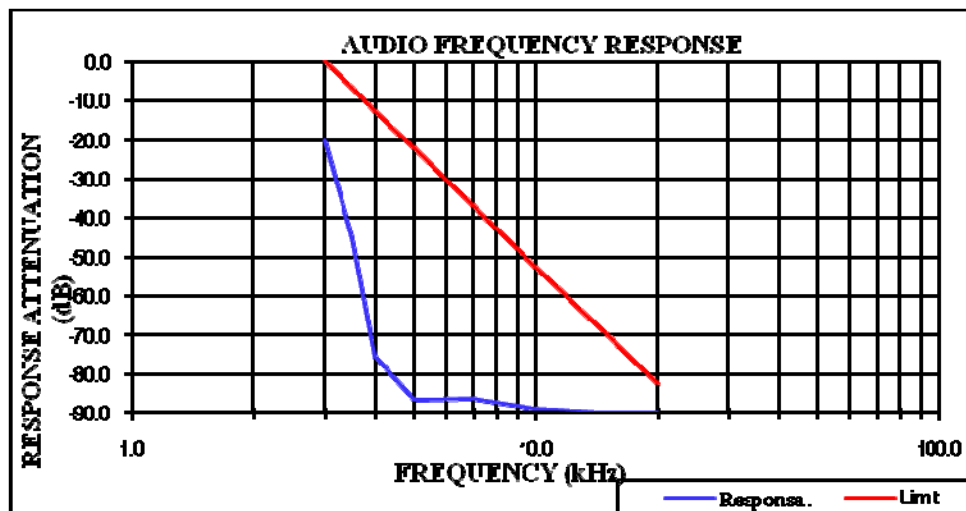
Audio Frequency (Hz)	Response Attenuation (dB)
300	-10.34
400	-7.66
500	-5.85
600	-4.55
700	-3.20
800	-1.89
900	-0.82
1000	0.00
1200	1.67
1400	2.89
1600	3.77
1800	4.51
2000	5.04
2200	5.60
2400	6.38
2600	7.14
2800	7.47
3000	7.78



Audio frequency lows pass filter response

Carrier Frequency: 460MHz, Separation: 12.5 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
3.0	-20.4	0.0
3.5	-45.2	-6.7
4.0	-75.5	-12.5
5.0	-86.6	-22.2
7.0	-86.2	-36.8
10.0	-88.6	-52.3
15.0	-89.7	-69.9
20.0	-90.1	-82.5



FCC §2.1049 & §90.209 & §90.210 - OCCUPIED BANDWIDTH & EMISSION MASK

Applicable Standard

FCC §2.1049 and §90.210

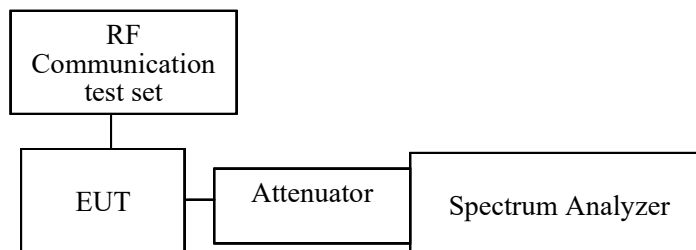
Emission Mask D - 12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- 1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 , 0dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626 kHz but no more than 12.5 kHz, at least 7.27 ($f_d - 2.88$ kHz) dB.
- 3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz at least: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

Test Procedure

According to ANSI C63.26-2015 section 5.4

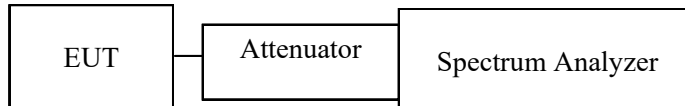
Analog mode:



Note: The path loss from EUT to Spectrum Analyzer has included in the result.

- a) Connect the equipment as illustrated.
- b) Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth: 100Hz for 12.5Hz Channel spacing, 200Hz for 25Hz Channel spacing .
 - 2) Video Bandwidth at least 10 times the resolution bandwidth.
 - 3) Sweep Speed slow enough to maintain measurement calibration.
 - 4) Detector Mode = Positive Peak.
 - 5) Span that will allow proper viewing of the test bandwidth.
- c) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency. Key the transmitter, and set the level of the unmodulated carrier to a full scale reference line. This is the 0 dB reference for the measurement.
- d) Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation. The input level shall be established at the frequency of maximum response of the audio modulating circuit. Transmitters employing digital modulation techniques that bypass the limiter and the audio low-pass filter shall be modulated as specified by the manufacturer.

- e) Path loss for the measurement included.
- f) Measured the 26dB bandwidth, and use the spectrum analyzer Occupied bandwidth function to measurement the 99% Occupied bandwidth, save the plot
- g) Record the resulting spectrum analyzer presentation of the emission level with an on-line recording device or in a photograph. It is recommended that the emission limit be drawn on the plotted graph or photograph. The spectrum analyzer presentation is the sideband spectrum

Digital mode:

- a) Program and set radio to operate in desire test frequency and digital mode with modulation.
- b) Connect the equipment as illustrated.
- c) Adjust the spectrum analyzer for the following settings:
- 1) Resolution Bandwidth: 100Hz.
 - 2) Video Bandwidth at least 10 times the resolution bandwidth.
 - 3) Sweep Speed slow enough to maintain measurement calibration.
 - 4) Detector Mode = Positive Peak.
 - 5) Span that will allow proper viewing of the test bandwidth.
- d) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency. Key the transmitter, and set the level of the unmodulated carrier to a full scale reference line. This is the 0 dB reference for the measurement.
- e) Path loss for the measurement included in plot
- f) Measured the 26dB bandwidth, and use the spectrum analyzer Occupied bandwidth function to measurement the 99% Occupied bandwidth, save the plot
- g) Record the resulting spectrum analyzer presentation of the emission level with an on-line recording device or in a photograph. It is recommended that the emission limit be drawn on the plotted graph or photograph. The spectrum analyzer presentation is the sideband spectrum

Test Data**Environmental Conditions**

Temperature:	25~25.2 °C
Relative Humidity:	45~46 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang from 2024-05-10 to 2024-06-19

Test mode: Transmitting

Test Result: Pass. Please refer to the following tables and plots.

High POWER:

Modulation Mode	Channel Separation	f_c	High Power Level	
			99% Occupied Bandwidth	26 dB Bandwidth
		MHz	kHz	kHz
Analog (FM)	12.5kHz	450.0125	9.936	10.256
		460	9.936	10.288
		469.9875	9.856	10.369

Low POWER:

Modulation Mode	Channel Separation	f_c	High Power Level	
			99% Occupied Bandwidth	26 dB Bandwidth
		MHz	kHz	kHz
Analog (FM)	12.5kHz	450.0125	9.856	10.401
		460	9.936	10.321
		469.9875	9.856	10.401

Note:

Emission bandwidth was based on calculation method instead of measurement.

Emission Designator: Per CFR 47 §2.201& §2.202, $BW = 2M + 2D$

For FM Mode (Channel Spacing: 12.5 kHz)

Emission Designator: 11K0F3E

In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.

$BW = 2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} = 11K0$

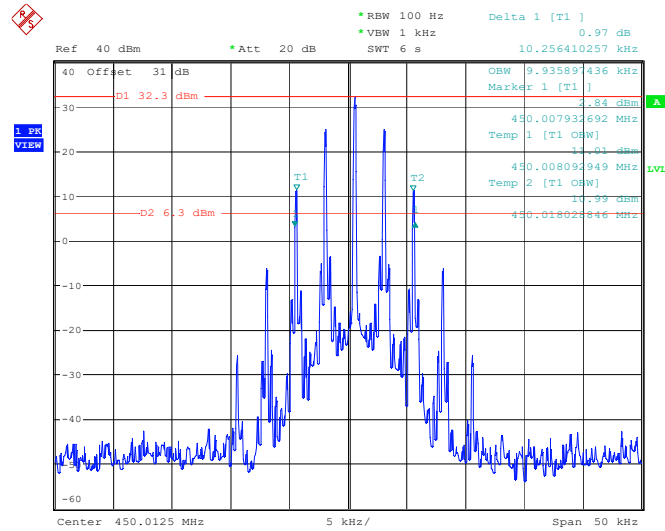
F3E portion of the designator represents an FM voice transmission

Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

Analog 12.5 KHz

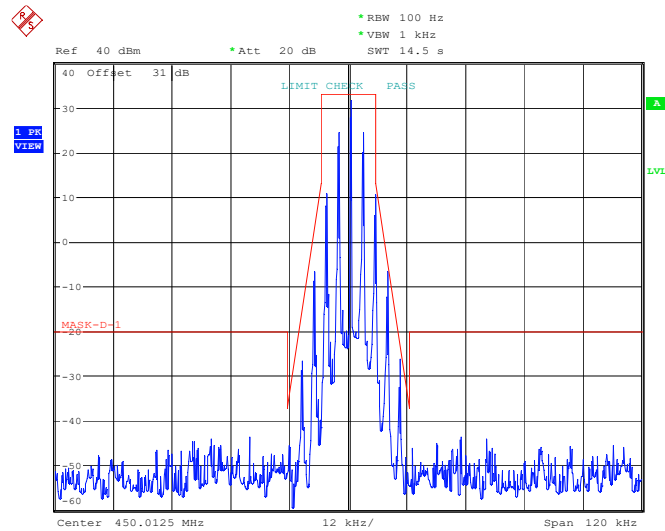
High POWER:

Frequency 450.0125 MHz: 99% Occupied & 26 dB Bandwidth



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 10.MAY.2024 11:22:16

Frequency 450.0125 MHz: Emission Mask D



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 10.MAY.2024 13:51:09

* RBW 100 Hz Delta 1 [T1]
 * VBW 1 kHz 3.22 dB
 * Att 20 dB SWT 6 s 10.288461538 kHz

Ref 40 dBm Offset 31 dB
 D1 32.1 dBm
 D2 6.1 dBm

1 PR
 VIEW

OBW 9.935897436 kHz
 Marker 1 [T1]
 1.62 dBm
 459.99540641 MHz
 Temp 1 [T1 OBW]
 10.97 dBm
 459.995592949 MHz
 Temp 2 [T1 OBW]
 10.87 dBm
 460.065522846 MHz

T1
 T2

Center 460 MHz 5 kHz/
 Span 50 kHz

ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 10.MAY.2024 11:27:59

Ref 40 dBm Att 20 dB RBW 100 Hz VBW 1 kHz SWT 14.5 s

40 Offset 31 dB

1 PK VIEW

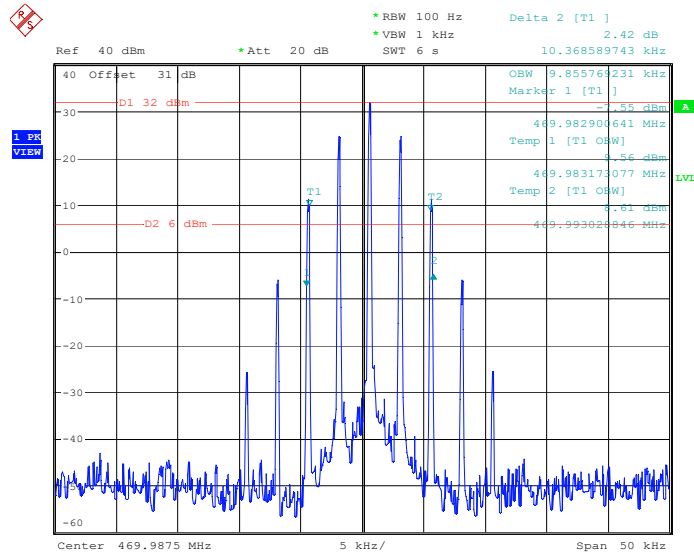
LIMIT CHECK PASS

MASK-D-1

Center 460 MHz 12 kHz/ Span 120 kHz

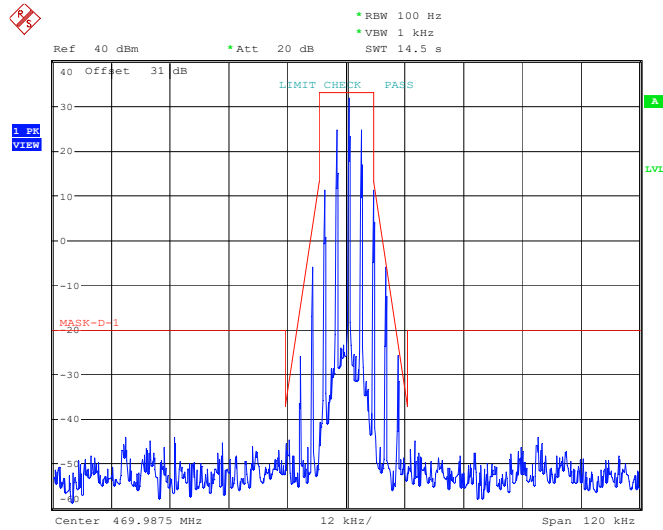
ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 10.MAY.2024 14:00:05

Frequency 469.9875 MHz: 99% Occupied & 26 dB Bandwidth



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
 Date: 15.MAY.2024 14:35:39

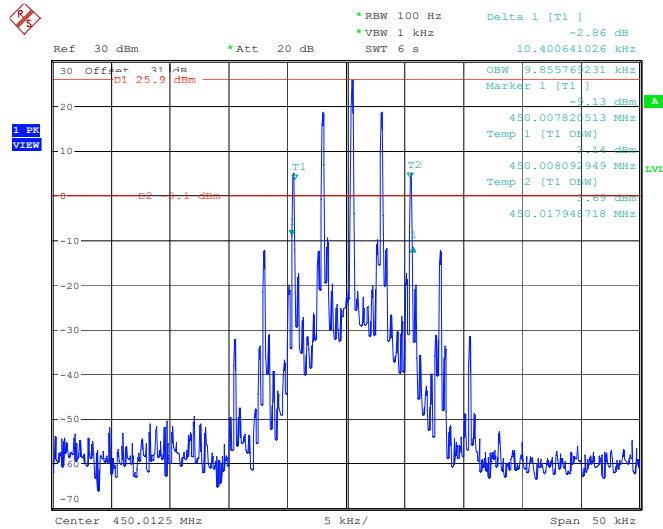
Frequency 469.9875 MHz: Emission Mask D



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
 Date: 15.MAY.2024 14:14:48

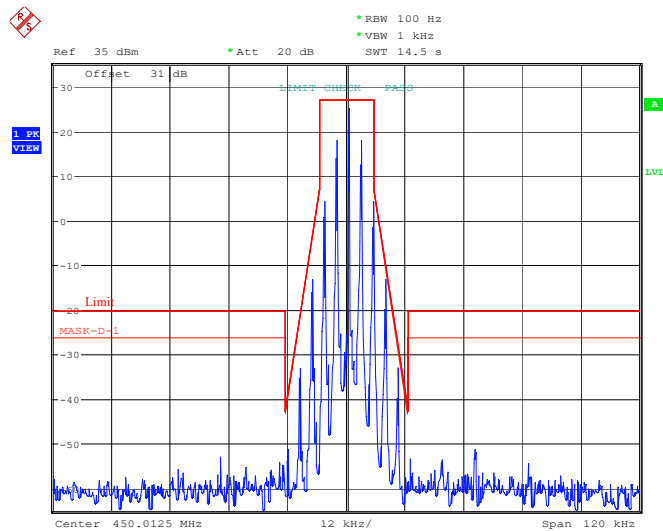
Low POWER:

Frequency 450.0125 MHz: 99% Occupied & 26 dB Bandwidth



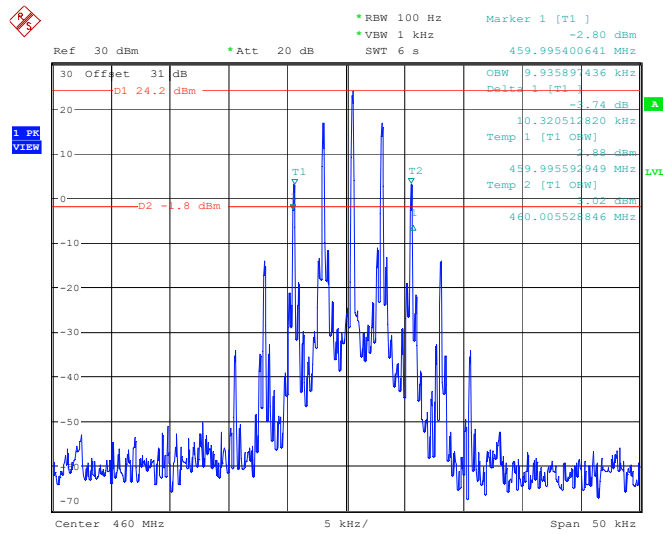
ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 19.JUN.2024 11:57:26

Frequency 450.0125 MHz: Emission Mask D



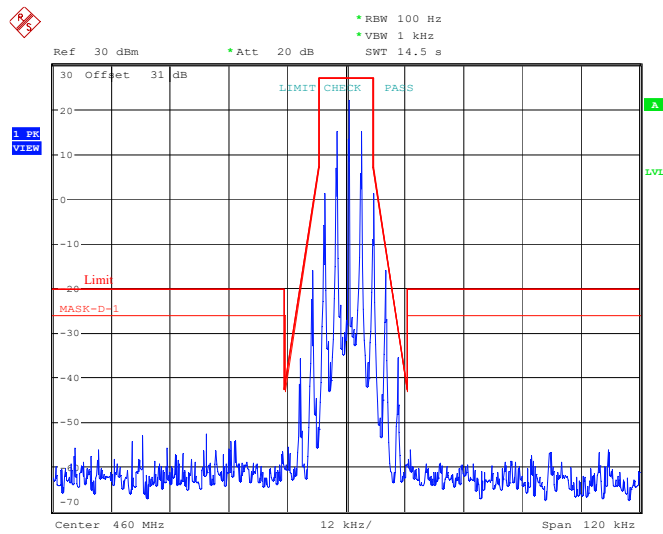
ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 19.JUN.2024 13:41:03

Frequency 460 MHz: 99% Occupied & 26 dB Bandwidth



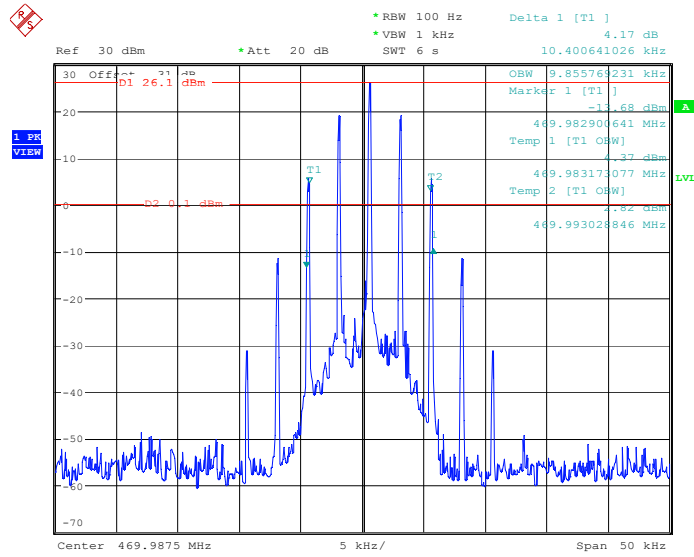
ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 19.JUN.2024 11:59:11

Frequency 460 MHz: Emission Mask D



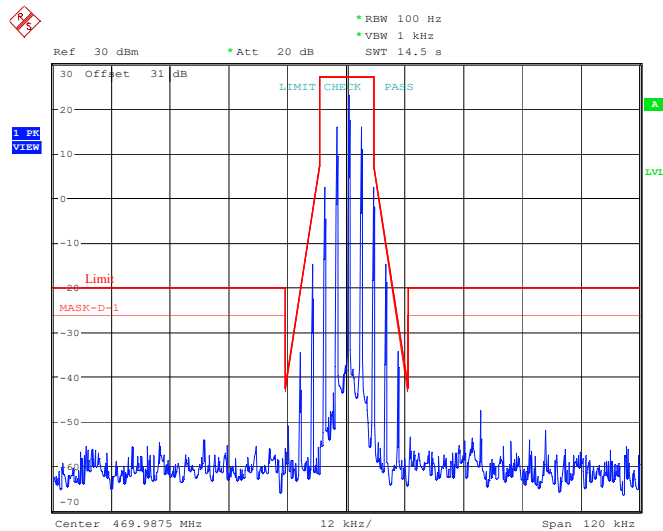
ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 19.JUN.2024 13:42:38

Frequency 469.9875 MHz: 99% Occupied & 26 dB Bandwidth



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
 Date: 19.JUN.2024 13:09:08

Frequency 469.9875 MHz: Emission Mask D



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
 Date: 19.JUN.2024 13:44:15

FCC §2.1051 & §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

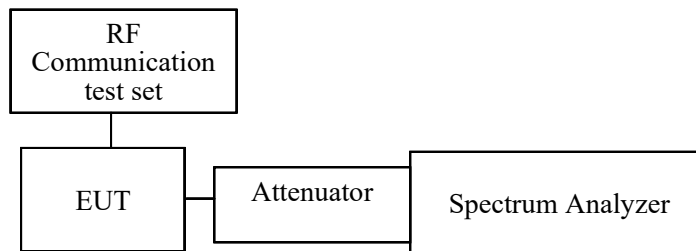
Applicable Standard

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- 1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 , 0 dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626 kHz but no more than 12.5 kHz, at least $7.27 (f_d - 2.88 \text{ kHz})$ dB.
- 3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

Test Procedure

According to ANSI C63.26-2015 section 5.7



Note: The path loss from EUT to Spectrum Analyzer has included in the result.

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100kHz for below 1GHz, and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	46 %
ATM Pressure:	101 kPa

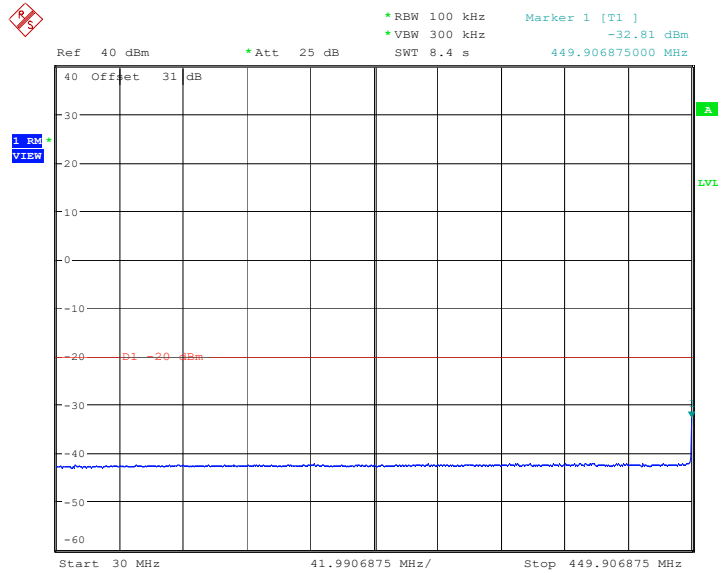
The testing was performed by Cheeb Huang on 2024-05-09.

Test Mode: Transmitting, worst case for high power level.

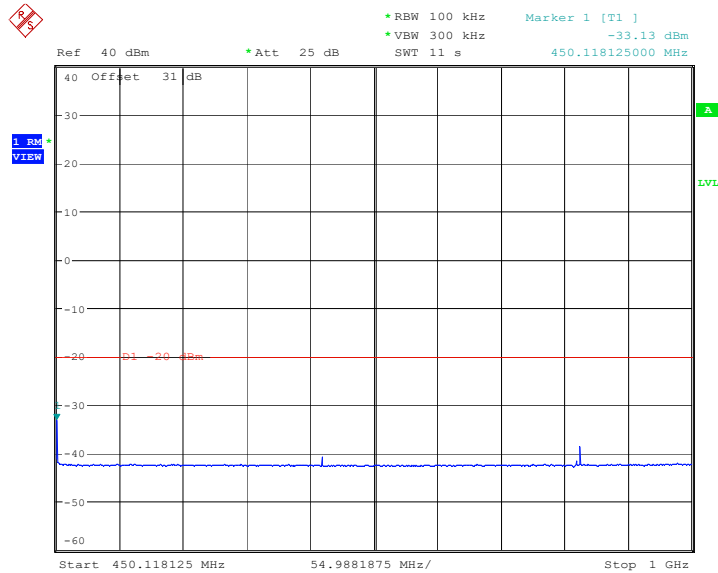
Test Result: Pass. Please refer to the following plots.

Analog 12.5KHz

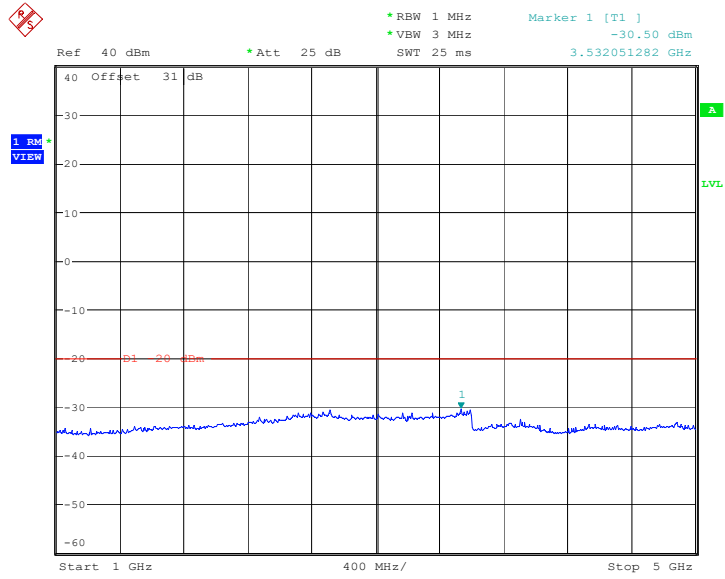
Low Channel



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:19:16

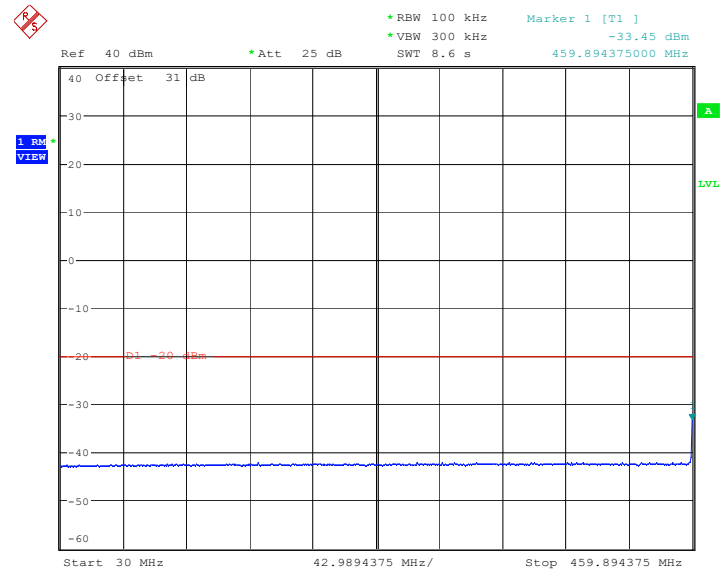


ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:21:03

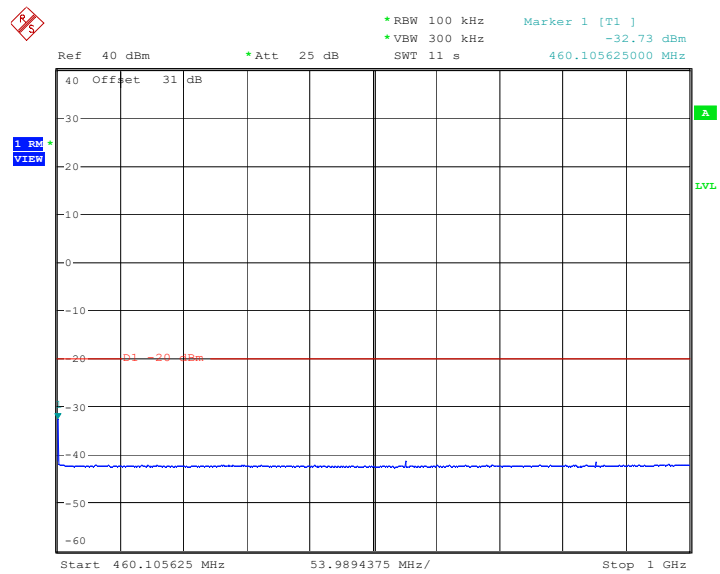


ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:51:37

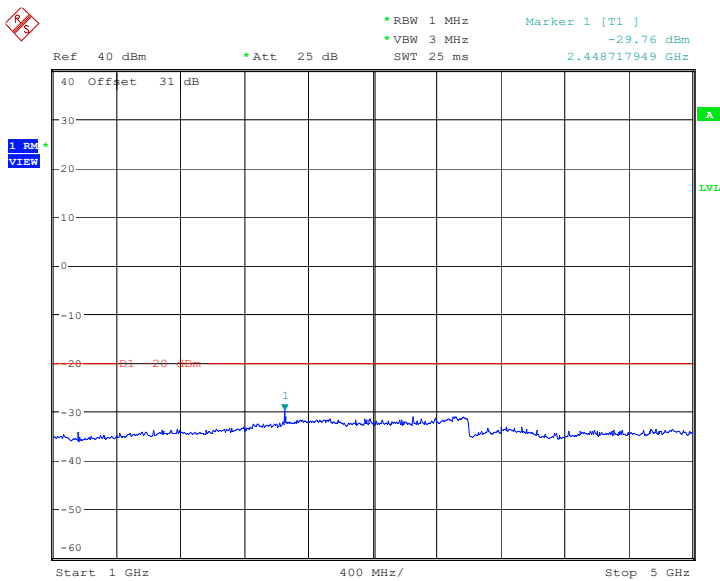
Middle Channel



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:24:18

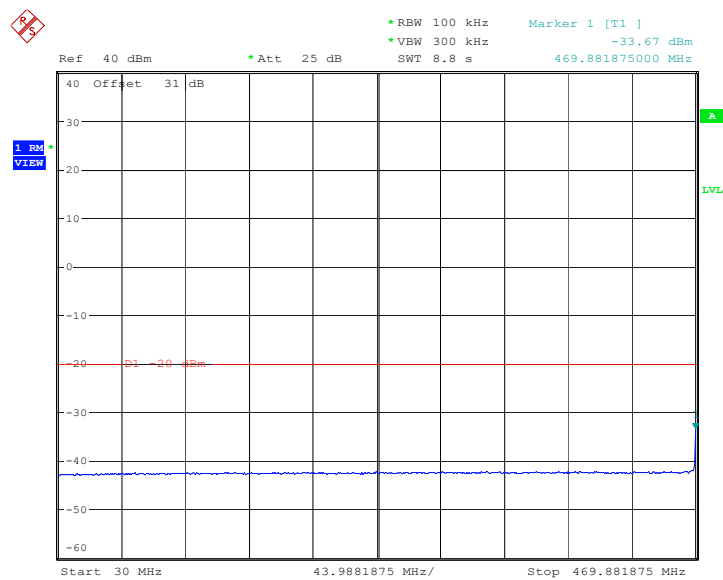


ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:26:04

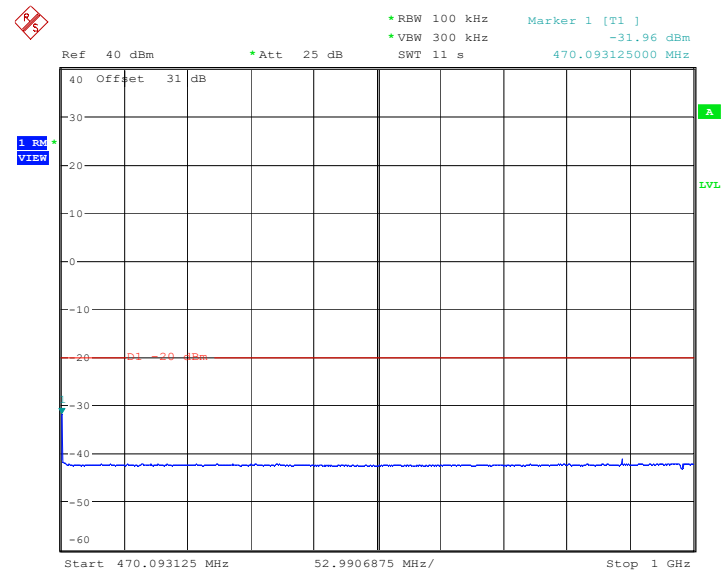


ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:51:03

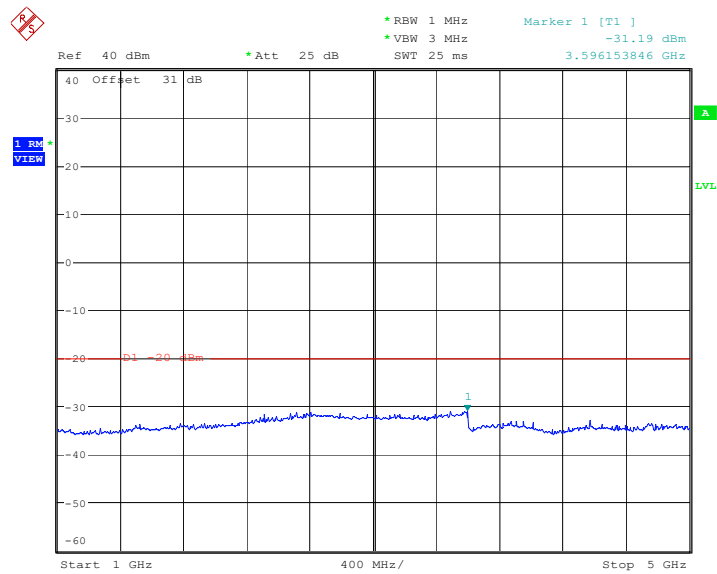
High Channel



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:28:07



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:29:22



ProjectNo.:SZ1240322-14970E-RF Tester:Cheeb Huang
Date: 9.MAY.2024 16:49:56

FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053 and §90.210

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB = 50 + 10 Log₁₀ (power out in Watts) for EUT with a 12.5 kHz channel bandwidth.

Test Data

Environmental Conditions

Temperature:	25~25.6 °C
Relative Humidity:	50 %
ATM Pressure:	101 kPa

The testing was performed by Warren Huang on 2024-04-26 for below 1GHz and Dylan Yang on 2024-05-17 for above 1GHz.

Test Mode: Transmitting, worst case for high power level.

Note: Scan with X-axis, Y-axis, Z-axis, the worst case Y-axis was recorded

Test Result: Pass. Please refer to the following tables.

30MHz-1GHz:

Frequency (MHz)	Receiver Reading (dBm)	Polar (H/V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd)			
Analog 12.5KHz								
450.0125 MHz								
900.02	22.58	H	-42.8	1.33	0.0	-44.13	-20	24.13
900.02	26.31	V	-38.8	1.33	0.0	-40.13	-20	20.13
460 MHz								
920.00	22.13	H	-43.2	1.33	0.0	-44.53	-20	24.53
920.00	25.57	V	-39.5	1.33	0.0	-40.83	-20	20.83
469.9875 MHz								
939.25	23.26	H	-42.2	1.36	0.0	-43.56	-20	23.56
939.25	25.76	V	-37.3	1.36	0.0	-38.66	-20	18.66

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

Above 1GHz:

Frequency (MHz)	Receiver Reading (dBm)	Polar (H/V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)			
Analog 12.5KHz								
450.125MHz								
1350.04	47.83	H	-59.9	0.80	7.90	-52.80	-20	32.80
1350.04	54.22	V	-54.2	0.80	7.90	-47.10	-20	27.10
1800.05	52.12	H	-55.4	0.90	8.40	-47.90	-20	27.90
1800.05	53.19	V	-54.9	0.90	8.40	-47.40	-20	27.40
2250.06	54.08	H	-53.3	1.10	9.40	-45.00	-20	25.00
2250.06	49.47	V	-58.0	1.10	9.40	-49.70	-20	29.70
2700.08	51.27	H	-55.6	1.10	9.00	-47.70	-20	27.70
2700.08	48.62	V	-58.0	1.10	9.00	-50.10	-20	30.10
3150.09	59.97	H	-46.0	1.20	7.60	-39.60	-20	19.60
3150.09	55.19	V	-50.5	1.20	7.60	-44.10	-20	24.10
3600.10	64.21	H	-41.5	1.30	10.90	-31.90	-20	11.90
3600.10	58.94	V	-46.5	1.30	10.90	-36.90	-20	16.90
4050.11	58.53	H	-46.0	1.40	10.60	-36.80	-20	16.80
4050.11	52.74	V	-51.8	1.40	10.60	-42.60	-20	22.60
460MHz								
1380.00	49.21	H	-58.5	0.80	7.90	-51.40	-20	31.40
1380.00	55.92	V	-52.5	0.80	7.90	-45.40	-20	25.40
1840.00	55.07	H	-52.4	0.90	8.40	-44.90	-20	24.90
1840.00	50.69	V	-57.4	0.90	8.40	-49.90	-20	29.90
2300.00	53.28	H	-54.1	1.10	9.40	-45.80	-20	25.80
2300.00	50.57	V	-56.9	1.10	9.40	-48.60	-20	28.60
2760.00	58.26	H	-48.3	1.20	9.20	-40.30	-20	20.30
2760.00	53.29	V	-53.0	1.20	9.20	-45.00	-20	25.00
3220.00	65.62	H	-40.4	1.20	7.60	-34.00	-20	14.00
3220.00	59.49	V	-46.2	1.20	7.60	-39.80	-20	19.80
3680.00	72.32	H	-33.1	1.30	11.00	-23.40	-20	3.40
3680.00	69.28	V	-36.0	1.30	11.00	-26.30	-20	6.30
4140.00	61.78	H	-42.7	1.40	10.60	-33.50	-20	13.50
4140.00	54.52	V	-50.0	1.40	10.60	-40.80	-20	20.80

Frequency (MHz)	Receiver Reading (dBm)	Polar (H/V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
469.9875MHz								
1409.96	48.38	H	-59.3	0.80	7.90	-52.20	-20	32.20
1409.96	59.94	V	-48.5	0.80	7.90	-41.40	-20	21.40
1879.95	52.74	H	-54.6	1.00	8.00	-47.60	-20	27.60
1879.95	55.78	V	-52.3	1.00	8.00	-45.30	-20	25.30
2349.94	56.06	H	-51.3	1.10	9.40	-43.00	-20	23.00
2349.94	57.73	V	-49.7	1.10	9.40	-41.40	-20	21.40
2819.93	62.28	H	-44.3	1.20	9.20	-36.30	-20	16.30
2819.93	54.51	V	-51.8	1.20	9.20	-43.80	-20	23.80
3289.91	67.95	H	-38.0	1.30	8.80	-30.50	-20	10.50
3289.91	63.59	V	-42.1	1.30	8.80	-34.60	-20	14.60
3759.90	71.71	H	-33.4	1.30	10.70	-24.00	-20	4.00
3759.90	63.52	V	-41.5	1.30	10.70	-32.10	-20	12.10
4229.89	59.46	H	-45.0	1.40	10.80	-35.60	-20	15.60
4229.89	53.63	V	-50.7	1.40	10.80	-41.30	-20	21.30

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

FCC §2.1055 & §90.213 - FREQUENCY STABILITY

Applicable Standard

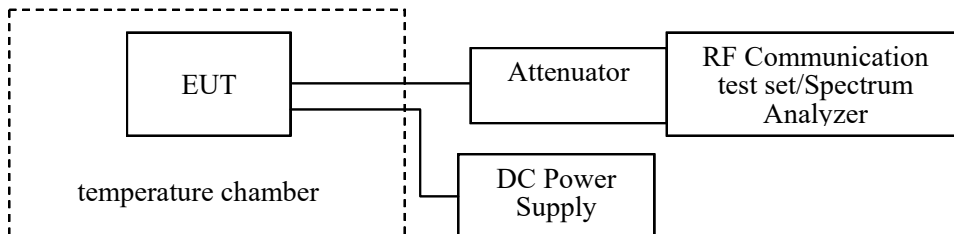
FCC §2.1055 and §90.213

Test Procedure

According to ANSI C63.26-2015 section 5.6

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The power cable and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.



Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	46 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang on 2024-05-16.

Test Mode: Transmitting, worst case for high power level.

Test Result: Pass. Please refer to the following tables.

For Analog

fc =		460	MHz 12.5K	
Temperature	Voltage	Reading	Frequency Error	Limit
°C	V _{DC}	MHz	ppm	ppm
-30	3.6	460.0000600	0.13	2.5
-20		459.9995100	-1.07	
-10		459.9996200	-0.83	
0		459.9998300	-0.37	
10		459.9995100	-1.07	
20		459.9998300	-0.37	
30		459.9996200	-0.83	
40		459.9998700	-0.28	
50		459.9994900	-1.11	
20	3.4	460.0000400	0.09	2.5
20	4.2	459.9994800	-1.13	

Note: the extreme voltage was provided by the applicant.

FCC §90.214 - TRANSIENT FREQUENCY BEHAVIOR

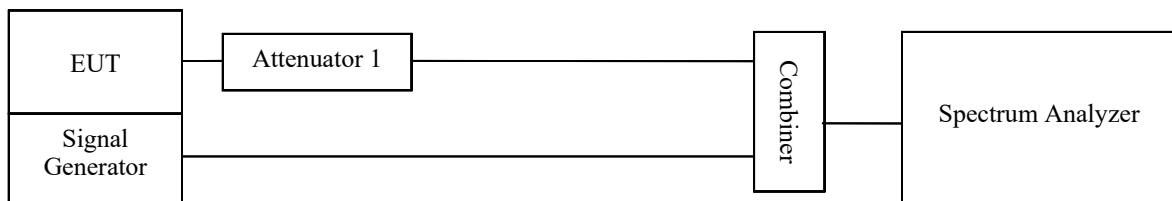
Applicable Standard

Regulations: FCC §90.214

Test method: ANSI C63.26-2015 clause 6.5.2.2

Test Procedure

- Connect the EUT and test equipment as shown on the following block diagram.
- Verify RF attenuator power rating for EUT providing adequate protection to the combining network and measurement equipment. Instrumentation linearity shall be confirmed per item j) of 4.2.3..
- Tune spectrum analyzer center frequency to EUT frequency and span to at least 100 kHz. Set amplitude according to EUT RF power
- Switch transmitter on and adjust settings in accordance with step c); switch transmitter to the off position.
- Set analyzer to FM mode; re-tune analyzer to EUT frequency and span according to step c), while in FM demodulation mode.
- An RF test signal of the same frequency as the EUT from the signal generator shall be modulated by a frequency of 1 kHz with a deviation equal to plus or minus the value of the channel spacing (separation). The RF signal strength shall be adjusted allowing the analyzer to demodulate the signal in FM mode.
- Adjust analyzer x axis to capture at least 100 ms of demodulated signal.
- Adjust analyzer y axis for the correct deviation amplitude.
- The analyzer display should show a continuous 1 kHz signal and the channel spacing deviation amplitude.
- Change analyzer settings to single sweep and external trigger. For newer analyzers, the channel bandwidth might have to be adjusted for the correct sample rate and sweep speed.
- Turn on EUT and adjust analyzer to display desired signal by adjusting trigger settings and considerations in step j). Turn off EUT.
- Repeat step k) until optimum set-up is achieved.



Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	46 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang on 2024-05-16.

Test Result: Pass. Please refer to the following tables and plots.

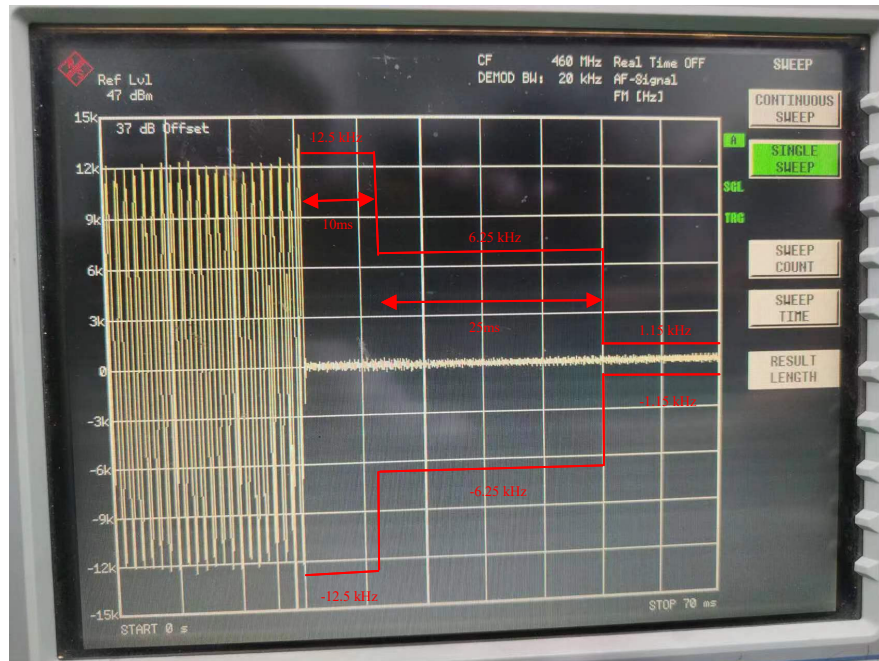
Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
12.5	10(t1)	± 12.5kHz	Pass
	25(t2)	± 6.25kHz	
	10(t1)	± 12.5kHz	

Note: During the time from the end of t₂ to the beginning of t₃, the frequency difference not exceed the limits specified in §90.213

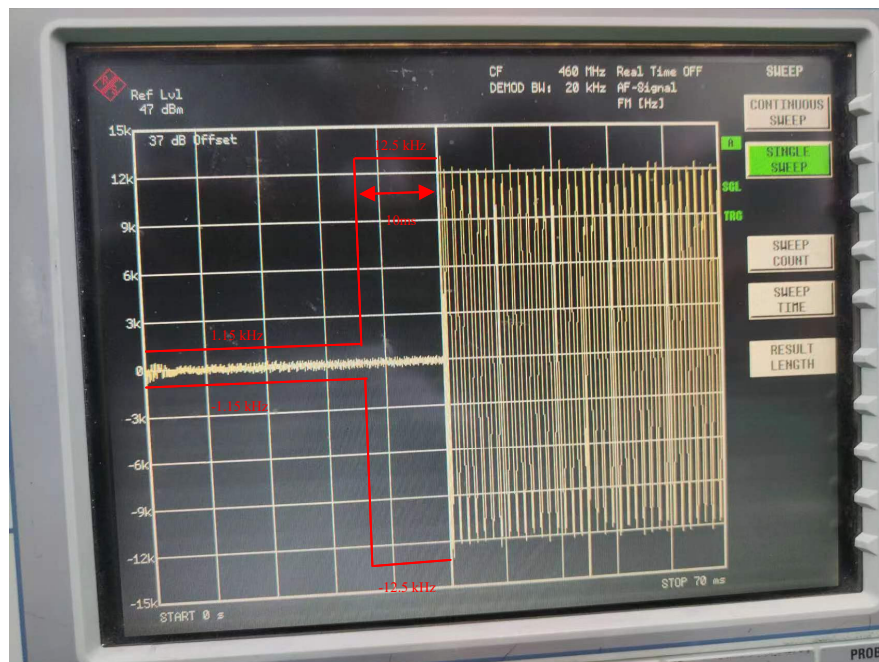
For 460MHz 12.5kHz mode, the limit is 460MHz*+/-2.5ppm=+/-1.15kHz

For Analog 12.5KHz

Turn on



Turn off



EUT PHOTOGRAPHS

Please refer to the attachment SZ1240322-14970E-RF External photo and SZ1240322-14970E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment SZ1240322-14970E-RF Test Setup photo.

******* END OF REPORT *******