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TIMCO ENGINEERING, Inc.

An IIA Company

FCC CFR 47 Part 90 Test Report

APPLICANT	KP ELECTRONIC SYSTEMS LTD.
ADDRESS	P.O. BOX 42 TEFEN INDUSTRIAL PARK, 24959 ISRAEL
FCC ID	H78KPWERII
MODEL NUMBER	WERII
PRODUCT DESCRIPTION	WIRELESS ELECTRICAL REGISTER
DATE SAMPLE RECEIVED	04/02/2019
FINAL TEST DATE	04/03/2019
TESTED BY	Tim Royer
APPROVED BY	Franklin Rose
TEST RESULTS	☒ PASS ☐ FAIL

Report Number	Report Version	Description	Issue Date
690AUT19 PT90_TestReport_	Rev1	Initial Report	04/03/2019
	Rev2	Updated page 5	04/23/2019
	Rev3	Updated Emission Masks	05/7/2019

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.

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GENERAL REMARKS

Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.

☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669
Designation #: US1070

Tested b

Sr. EMC Engineer
EMC-003838-NE

Name and Title	Tim Royer, Project Manager/Testing Engineer
Date	04/02/2019

Reviewed and Approved by:

Name and Title	Franklin Rose, Project Manager / EMC Testing Technician
Date	04/05/2019

GENERAL INFORMATION

EUT Description	WIRELESS ELECTRICAL REGISTER
FCC ID	H78KPWERII
Model Number	WERII
Operating Frequency	430.0-470.275 MHz
Test Frequencies	430, 450, 470.275 MHz
Type of Emission	11K2F3E (Narrowband Digital FM)
Modulation	FM
EUT Power Source	☐ 110–120Vac/50– 60Hz
	☒ DC Power (13.8 V)
	☐ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☒ Fixed
	☐ Mobile
	☐ Portable
Antenna Connector	BNC
Test Conditions	The temperature was 26ºC Relative humidity of 50%.
Modification to the EUT	No Modification to EUT.
Test Exercise	The EUT was placed in continuous transmit and was operated in “Test Mode” for digital emissions tests.
Applicable Standards	ANSI/TIA 603-E:2016, ANSI C63.26 (2015), FCC CFR 47 Part 2, Part 90
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA. Designation #: US1070

RESULTS SUMMARY

Rule Part No.	Test Item	Results
2.1046(a), 90.205(g),(h),(i)	RF Power Output	**PASS**
2.1033(c)(4), 90.209(b)(5)	Modulation Characteristics	**N/A**
2.1047(a)	Audio Frequency Response and Low Filter	**N/A**
2.1047(b)	Modulation Limiting	**N/A**
2.1049 (c)	Occupied Bandwidth	**PASS**
90.210(d)(1), (2)	Emission Masks	**PASS**
2.1051(a), 90.210(d)(3)	Spurious Emissions at Antenna Terminals	**PASS**
2.1053(a), 90.210(d)(3)	Field Strength of Spurious Emissions	**PASS**
2.1055(a)(2), 90.213	Frequency Stability < 5 ppm	**PASS**
90.214	Transient Frequency Response	**N/A**

RF POWER OUTPUT

FCC Rule Parts: FCC Part 2.1046(a), 90.205(g), (h), (i)

(g) *421-430 MHz.* Limitations on power and antenna heights are specified in §90.279.

(a) Base station authorizations in the 421-430 MHz band will be subject to Effective Radiated Power (ERP) and Effective Antenna Height (EAH) limitations as shown in the table below. ERP is defined as the product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction. EAH is calculated by subtracting the Assumed Average Terrain Elevation (AATE) as listed in table 7 of §90.619 from the antenna height above mean sea level.

LIMITS OF EFFECTIVE RADIATED POWER (ERP) CORRESPONDING TO EFFECTIVE ANTENNA HEIGHTS (EAH) OF BASE STATIONS IN THE 421-430 MHZ BAND

Effective antenna height (EAH) in meters (feet)	Maximum effective radiated power (ERP) (watts)
0-152 (0-500)	250
Above 152-305 (above 500-1000)	150
Above 305-457 (above 1000-1500)	75
Above 457-610 (above 1500-2000)	40
Above 610-762 (above 2000-2500)	20
Above 762-914 (above 2500-3000)	15
Above 914-1219 (above 3000-4000)	10
Above 1219 (above 4000)	5

RF POWER OUTPUT

(h) *450-470 MHz.* (1) The maximum allowable station effective radiated power (ERP) is dependent upon the station's antenna HAAT and required service area and will be authorized in accordance with table 2. Applicants requesting an ERP in excess of that listed in table 2 must submit an engineering analysis based upon generally accepted engineering practices and standards that includes coverage contours to demonstrate that the requested station parameters will not produce coverage in excess of that which the applicant requires.

(2) Applications for stations where special circumstances exist that make it necessary to deviate from the ERP and antenna heights in Table 2 will be submitted to the frequency coordinator accompanied by a technical analysis, based upon generally accepted engineering practices and standards, that demonstrates that the requested station parameters will not produce a signal strength in excess of 39 dBu at any point along the edge of the requested service area. The coordinator may then recommend any ERP appropriate to meet this condition.

(3) An applicant for a station with a service area radius greater than 32 km (20 mi) must justify the requested service area radius, which may be authorized only in accordance with table 2, note 4. For base stations with service areas greater than 80 km, all operations 80 km or less from the base station will be on a primary basis and all operations outside of 80 km from the base station will be on a secondary basis and will be entitled to no protection from primary operations.

TABLE 2—450-470 MHZ—MAXIMUM ERP/REFERENCE HAAT FOR A SPECIFIC SERVICE AREA RADIUS

	Service area radius (km)									
	3	**8**	**13**	**16**	**24**	**32**	**40[4]**	**48[4]**	**64[4]**	**80[4]**
Maximum ERP (w)[1]	2	100	[2]500	[2]500	[2]500	[2]500	[2]500	[2]500	[2]500	[2]500
Up to reference HAAT (m)[3]	15	15	15	27	63	125	250	410	950	2700

[1]Maximum ERP indicated provides for a 39 dBu signal strength at the edge of the service area per FCC Report R-6602, Fig. 29 (See §73.699, Fig. 10 b).

[2]Maximum ERP of 500 watts allowed. Signal strength at the service area contour may be less than 39 dBu.

[3]When the actual antenna HAAT is greater than the reference HAAT, the allowable ERP will be reduced in accordance with the following equation: $ERP_{allow} = ERP_{max} \times (HAAT_{ref} / HAAT_{actual})^2$.

[4]Applications for this service area radius may be granted upon specific request with justification and must include a technical demonstration that the signal strength at the edge of the service area does not exceed 39 dBu.

(i) *470-512 MHz.* Power and height limitations are specified in §§90.307 and 90.309.

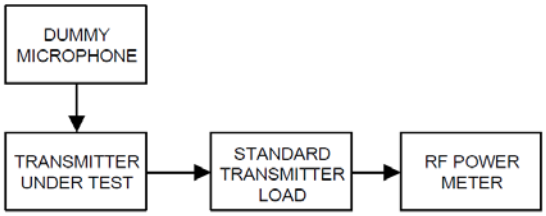
§90.307 Protection criteria.

The tables and figures listed in §90.309 shall be used to determine the effective radiated power (ERP) and antenna height of the proposed land mobile base station and the ERP for the associated control station (control station antenna height shall not exceed 31 meters (100 feet) above average terrain (AAT)).

(c) Mobile units and control stations operating on the frequencies available for land mobile use in any given urbanized area shall afford protection to co-channel and adjacent channel television stations in accordance with the values set forth in table C in §90.309 and paragraph (d) of this section except for channel 15 in New York, NY, and Cleveland, OH, and channel 16 in Detroit, MI, where protection will be in accordance with the values set forth in table D in §90.309 and paragraph (d) of this section.

RF POWER OUTPUT

Method of Measurement: TIA-603-E, 2.2.1



Test Data: Power Measurement Table

Peak Power Output	
Frequency (MHz)	**dBm**
430.00	30.32
450	30.58
470.275	30.49

Part 2.1033 (c)(8) DC Input into Final Amplifier

INPUT POWER: (3.4 V) (0.7 A) = **2.38 Watts**

Result: Meets Requirements

OCCUPIED BANDWIDTH

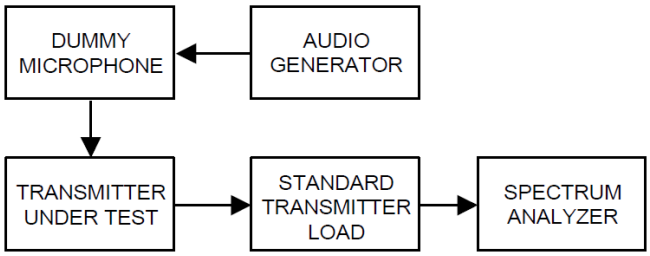
FCC Rule Parts: 2.1049 (c)

(c) Radiotelephone transmitters equipped with a device to limit modulation or peak envelope power shall be modulated as follows. For single sideband and independent sideband transmitters, the input level of the modulating signal shall be 10 dB greater than that necessary to produce rated peak envelope power.

(1) Other than single sideband or independent sideband transmitters—when modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulating circuit.

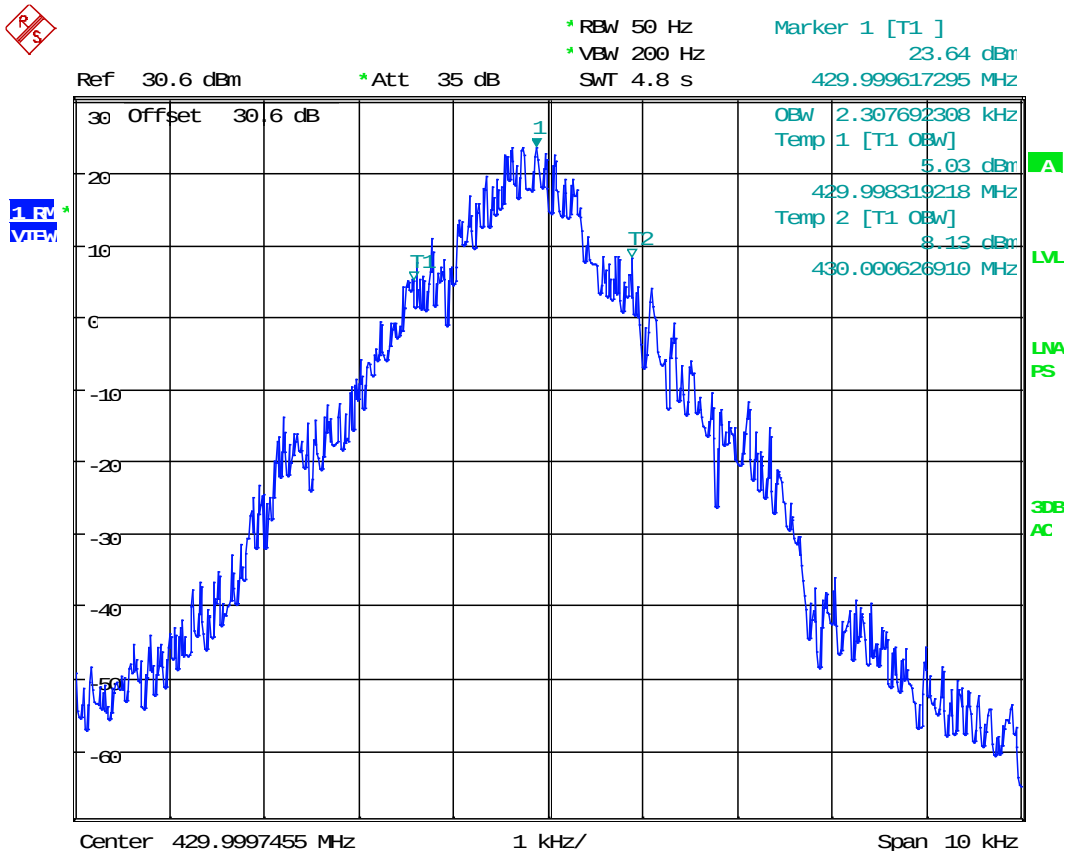
Method of Measurement: ANSI C63.26, 5.4.4 (using Test Setup from TIA 603-E 2.2.11, below)

Note: The receiver's automatic 99% Occupied Bandwidth function was used. The function is identical in operation to ANSI C63.26, 5.4.4, Step e).



OCCUPIED BANDWIDTH 99%

Test Data: 2K30F1D



Date: 29.MAR.2019 14:20:35

99% OBW = 2.3 kHz

OCCUPIED BANDWIDTH 99%

EMISSION MASKS

FCC Rule Parts: 90.210(d)(1), (2)

APPLICABLE EMISSION MASKS

Frequency band (MHz)	Mask for equipment with audio low pass filter	Mask for equipment without audio low pass filter
421-512[2 5]	B, D, or E	C, D, or E

[2]Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth must meet the requirements of Emission Mask E.

[5]Equipment may alternatively meet the Adjacent Channel Power limits of §90.221.

Requirements:

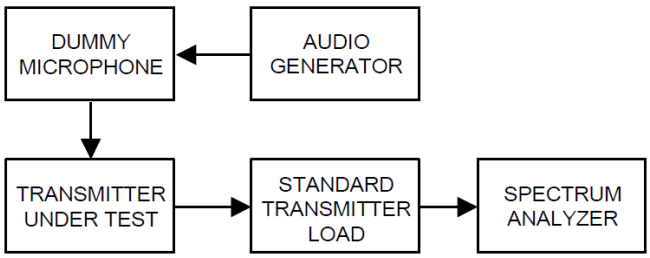
(e) *Emission Mask E—6.25 kHz or less channel bandwidth equipment.* For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0: Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(f_d−3 kHz) or 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

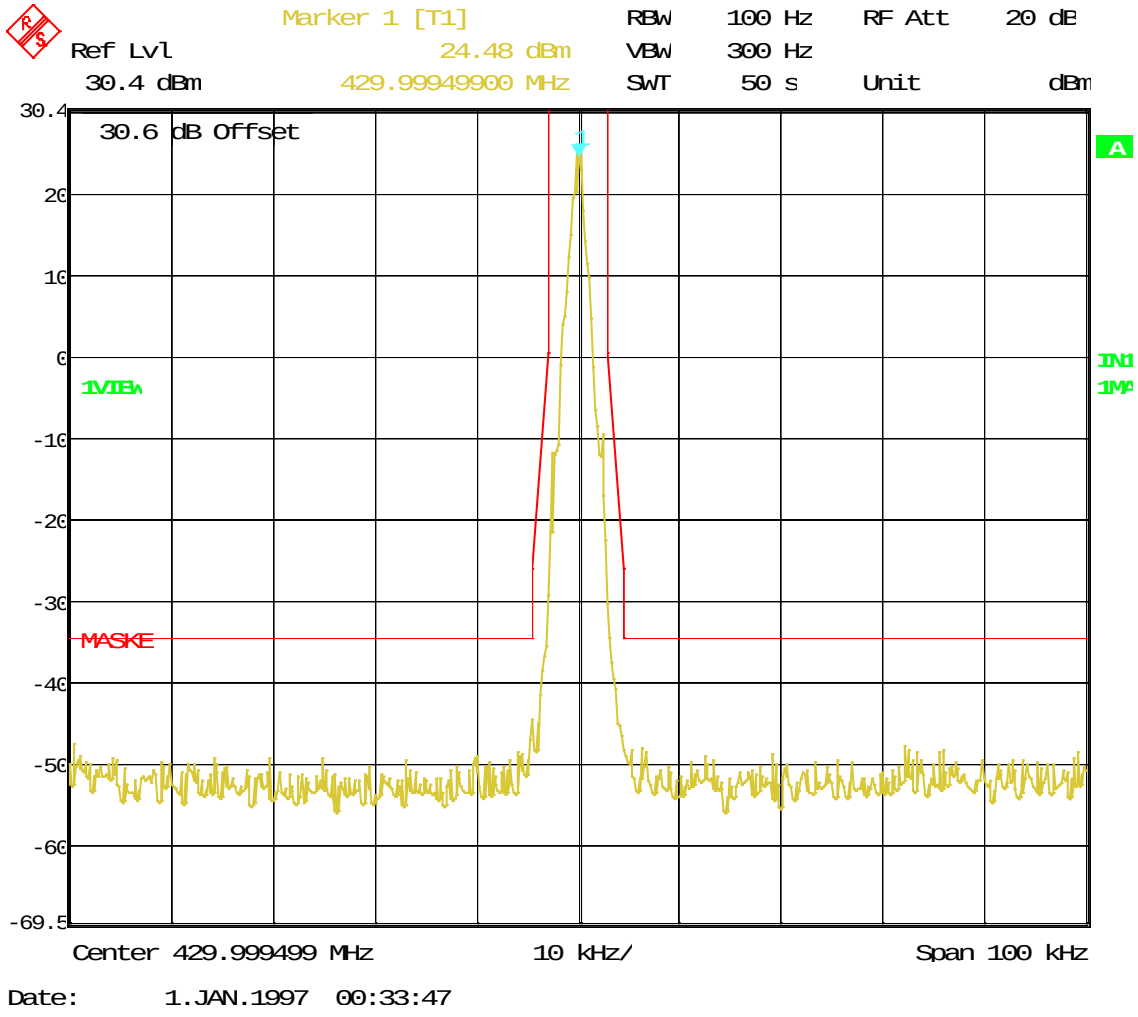
(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

Method of Measurement: ANSI C63.26, 5.4.4 (using Test Setup from TIA 603-E 2.2.11, below)



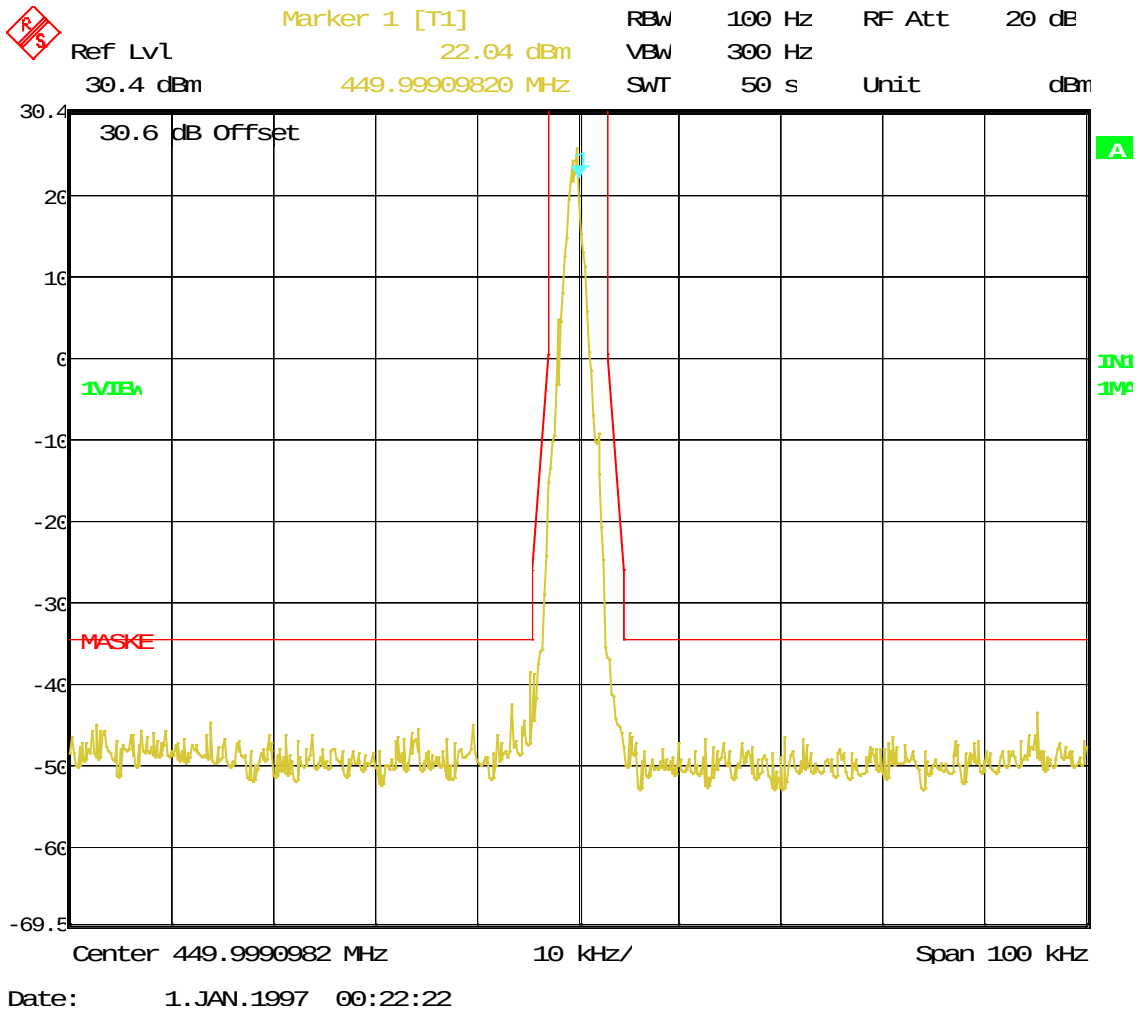
EMISSION MASK E - NARROWBAND FM (6.25 kHz)

Test Data: 430 MHz



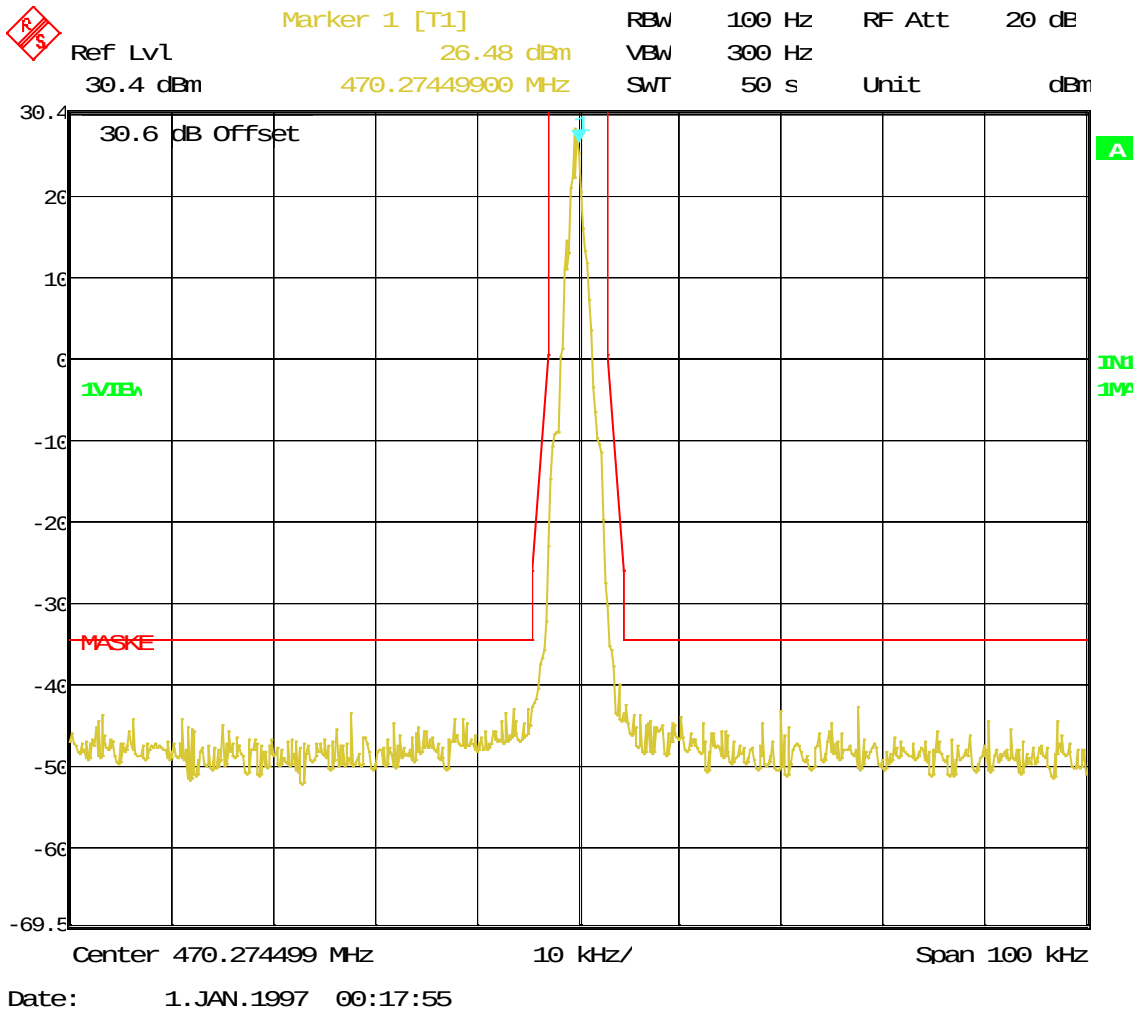
EMISSION MASK E

Test Data: 450 MHz



EMISSION MASK E

Test Data: 470.275 MHz



SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

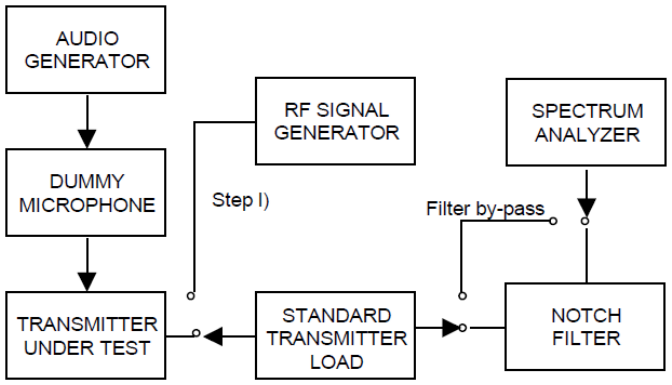
FCC Rule Parts: FCC Part 2.1051(a), 90.210(d)(3)

Requirements:

(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.

Method of Measurement: ANSI/TIA-603-E

Test Procedure: TIA 603-E, 2.2.13



SPURIOUS EMISSIONS - NARROWBAND FM (12.5 kHz)

Test Data: 430 MHz

Spurious Conducted Emissions, Narrowband FM (12.5 kHz), Mask D Limit (≥250% Authorized BW)		High Power	
		dBm	30.32
		Watts	1.08
		Limit (dBm)	-20
Frequency (MHz)		Peak (dBm)	Margin (dB)
Fundamental	430.0000	30.32	0.00
2nd Harmonic	860.0000	-32.44	**12.44**
3rd Harmonic	1290.0000	-35.82	**15.82**
4th Harmonic	1720.0000	-27.30	**7.30**
5th Harmonic	2150.0000	-32.00	**12.00**
6th Harmonic	2580.0000	-43.02	**23.02**
7th Harmonic	3010.0000	-51.15	**31.15**
8th Harmonic	3440.0000	-51.17	**31.17**
9th Harmonic	3870.0000	-51.03	**31.03**
10th Harmonic	4300.0000	-45.97	**25.97**

* Indicates Noise Floor of Measurement

Result: Meets Requirement

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Test Data: 450 MHz

Spurious Conducted Emissions, Narrowband FM (12.5 kHz), Mask D Limit (≥250% Authorized BW)		High Power	
		dBm	30.58
		Watts	1.14
		Limit (dBm)	-20
Frequency (MHz)		Peak (dBm)	Margin (dB)
Fundamental	450.0000	30.58	0.00
2nd Harmonic	900.0000	-35.11	**15.11**
3rd Harmonic	1350.0000	-33.91	**13.91**
4th Harmonic	1800.0000	-40.31	**20.31**
5th Harmonic	2250.0000	-39.59	**19.59**
6th Harmonic	2700.0000	-48.38	**28.38**
7th Harmonic	3150.0000	-55.50	**35.5 ***
8th Harmonic	3600.0000	-48.80	**28.80**
9th Harmonic	4050.0000	-50.26	**30.26**
10th Harmonic	4500.0000	-42.01	**22.01**

* Indicates Noise Floor of Measurement

Result: Meets Requirement

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Test Data: 470.275 MHz

Spurious Conducted Emissions, Narrowband FM (12.5 kHz), Mask D Limit (≥250% Authorized BW)		High Power	
		dBm	30.49
		Watts	1.12
		Limit (dBm)	-20
Frequency (MHz)		Peak (dBm)	Margin (dB)
Fundamental	470.2750	30.49	0.00
2nd Harmonic	940.5500	-37.60	**17.60**
3rd Harmonic	1410.8250	-25.91	**5.91**
4th Harmonic	1881.1000	-35.93	**15.93**
5th Harmonic	2351.3750	-46.34	**26.34**
6th Harmonic	2821.6500	-47.60	**27.60**
7th Harmonic	3291.9250	-56.79	**36.79**
8th Harmonic	3762.2000	-53.51	**33.51**
9th Harmonic	4232.4750	-42.07	**22.07**
10th Harmonic	4702.7500	-39.68	**19.68**

* Indicates Noise Floor of Measurement

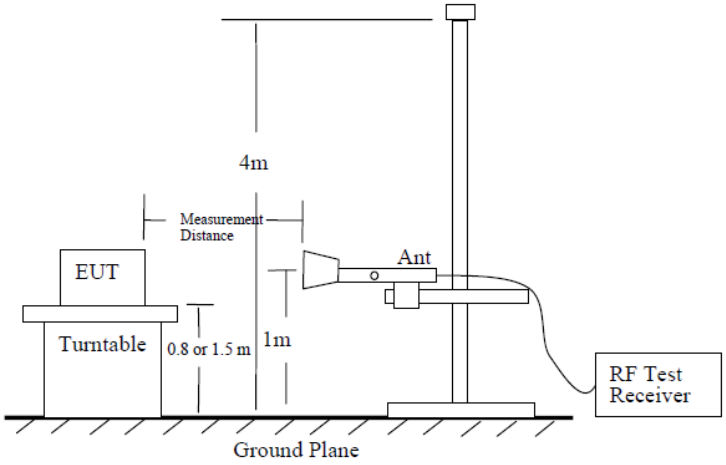
Result: Meets Requirement

FIELD STRENGTH OF SPURIOUS EMISSIONS

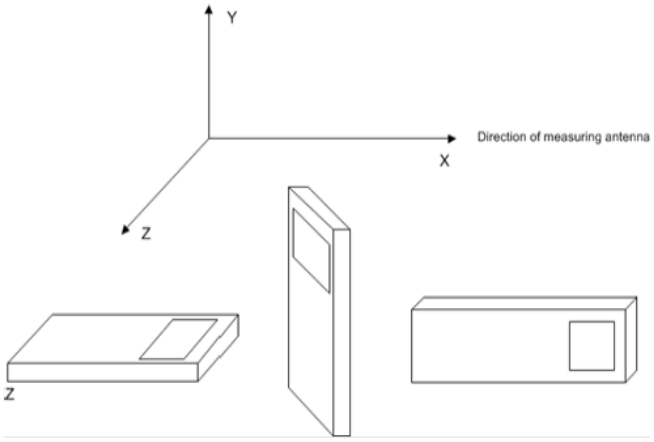
FCC Rule Parts: FCC Part 2.1053(a), 90.210(d)(3)

Method of Measurement: ANSI C63.26, 5.5.4

Test Site Setup:



EUT Orientation(s):



Note: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from the lowest frequency generated internally to at least the tenth harmonic of the fundamental. This test was conducted in accordance with the standard listed above using the substitution method. Measurements were made at the test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669. The measurements below represent the worst case of all the frequencies tested.

Note: The six (6) highest emissions or more of each worst-case operational modes of the EUT are represented below. Emissions 20 dB below the limit are not required to be reported.

FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Data: 430 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Field Strength (dBµV/m)	ERP (dBm)	Margin (dB)
430.00	130.80	26.614	**-70.763**	50.76
430.00	143.33	28.840	**-68.537**	48.54
430.00	860.00	59.550	**-37.827**	17.83
430.00	860.00	58.310	**-39.067**	19.07
430.00	1290.00	68.516	**-28.861**	8.86
430.00	1290.00	70.636	**-26.741**	6.74
430.00	1720.00	58.426	**-38.951**	18.95
430.00	1720.00	57.156	**-40.221**	20.22
430.00	2150.00	64.894	**-32.483**	12.48
430.00	2150.00	60.484	**-36.893**	16.89
430.00	2580.00	59.961	**-37.416**	17.42
430.00	2580.00	59.081	**-38.296**	18.30
430.00	3010.00	59.021	**-38.356**	18.36
430.00	3010.00	57.091	**-40.286**	20.29
430.00	3440.00	58.614	**-38.764**	18.76
430.00	3440.00	58.424	**-38.954**	18.95
430.00	3870.00	56.349	**-41.028**	21.03
430.00	3870.00	52.769	**-44.608**	24.61
430.00	4300.00	50.392	**-46.985**	26.99
430.00	4300.00	50.392	**-46.985**	26.99

Result: Meets Requirement

FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Data: 450 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Field Strength (dBµV/m)	ERP (dBm)	Margin (dB)
450.00	124.53	25.018	**-72.359**	52.36
450.00	124.53	66.578	**-30.799**	10.80
450.00	900.00	58.720	**-38.657**	18.66
450.00	900.00	63.280	**-34.097**	14.10
450.00	1350.00	57.690	**-39.687**	19.69
450.00	1350.00	69.480	**-27.897**	7.90
450.00	1800.00	72.842	**-24.535**	4.54
450.00	1800.00	55.872	**-41.505**	21.51
450.00	2250.00	56.450	**-40.927**	20.93
450.00	2250.00	63.620	**-33.757**	13.76
450.00	2700.00	58.040	**-39.337**	19.34
450.00	2700.00	58.840	**-38.537**	18.54
450.00	3150.00	58.188	**-39.189**	19.19
450.00	3150.00	57.408	**-39.969**	19.97
450.00	3600.00	57.830	**-39.547**	19.55
450.00	3600.00	48.100	**-49.277**	29.28
450.00	4050.00	56.344	**-41.033**	21.03
450.00	4050.00	48.884	**-48.493**	28.49
450.00	4500.00	56.070	**-41.307**	21.31
450.00	4500.00	49.530	**-47.847**	27.85

Result: Meets Requirement

FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Data: 470.275 MHz

Tuned Frequency (MHz)	Emission Frequency (MHz)	Field Strength (dBµV/m)	ERP (dBm)	Margin (dB)
470.28	45.52	25.456	**-71.921**	51.92
470.28	77.67	21.379	**-75.998**	56.00
470.28	940.60	60.591	**-36.786**	16.79
470.28	940.60	61.071	**-36.306**	16.31
470.28	1410.80	41.894	**-55.483**	35.48
470.28	1410.80	41.804	**-55.573**	35.57
470.28	1881.10	61.737	**-35.640**	15.64
470.28	1881.10	59.217	**-38.160**	18.16
470.28	2351.40	67.312	**-30.065**	10.06
470.28	2351.40	61.242	**-36.135**	16.13
470.28	2821.70	59.483	**-37.894**	17.89
470.28	2821.70	59.343	**-38.034**	18.03
470.28	3291.90	58.827	**-38.550**	18.55
470.28	3291.90	58.907	**-38.470**	18.47
470.28	3762.20	50.933	**-46.444**	26.44
470.28	3762.20	55.613	**-41.764**	21.76
470.28	4232.50	49.565	**-47.813**	27.81
470.28	4232.50	53.955	**-43.423**	23.42
470.28	4702.80	50.118	**-47.259**	27.26
470.28	4702.80	53.668	**-43.709**	23.71

Result: Meets Requirement

FREQUENCY STABILITY

FCC Rule Parts: FCC Part 2.1055(a)(2), 90.213

MINIMUM FREQUENCY STABILITY

[Parts per million (ppm)]

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
421-512	[7] [11] [14] 2.5	[8] 5	[8] 5

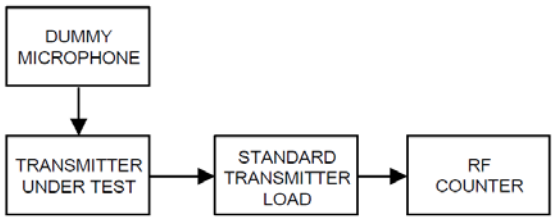
[7] In the 421-512 MHz band, fixed and base stations with a 12.5 kHz channel bandwidth must have a frequency stability of 1.5 ppm. Fixed and base stations with a 6.25 kHz channel bandwidth must have a frequency stability of 0.5 ppm.

[8] In the 421-512 MHz band, mobile stations designed to operate with a 12.5 kHz channel bandwidth must have a frequency stability of 2.5 ppm. Mobile stations designed to operate with a 6.25 kHz channel bandwidth must have a frequency stability of 1.0 ppm.

[11] Paging transmitters operating on paging-only frequencies must operate with frequency stability of 5 ppm in the 150-174 MHz band and 2.5 ppm in the 421-512 MHz band.

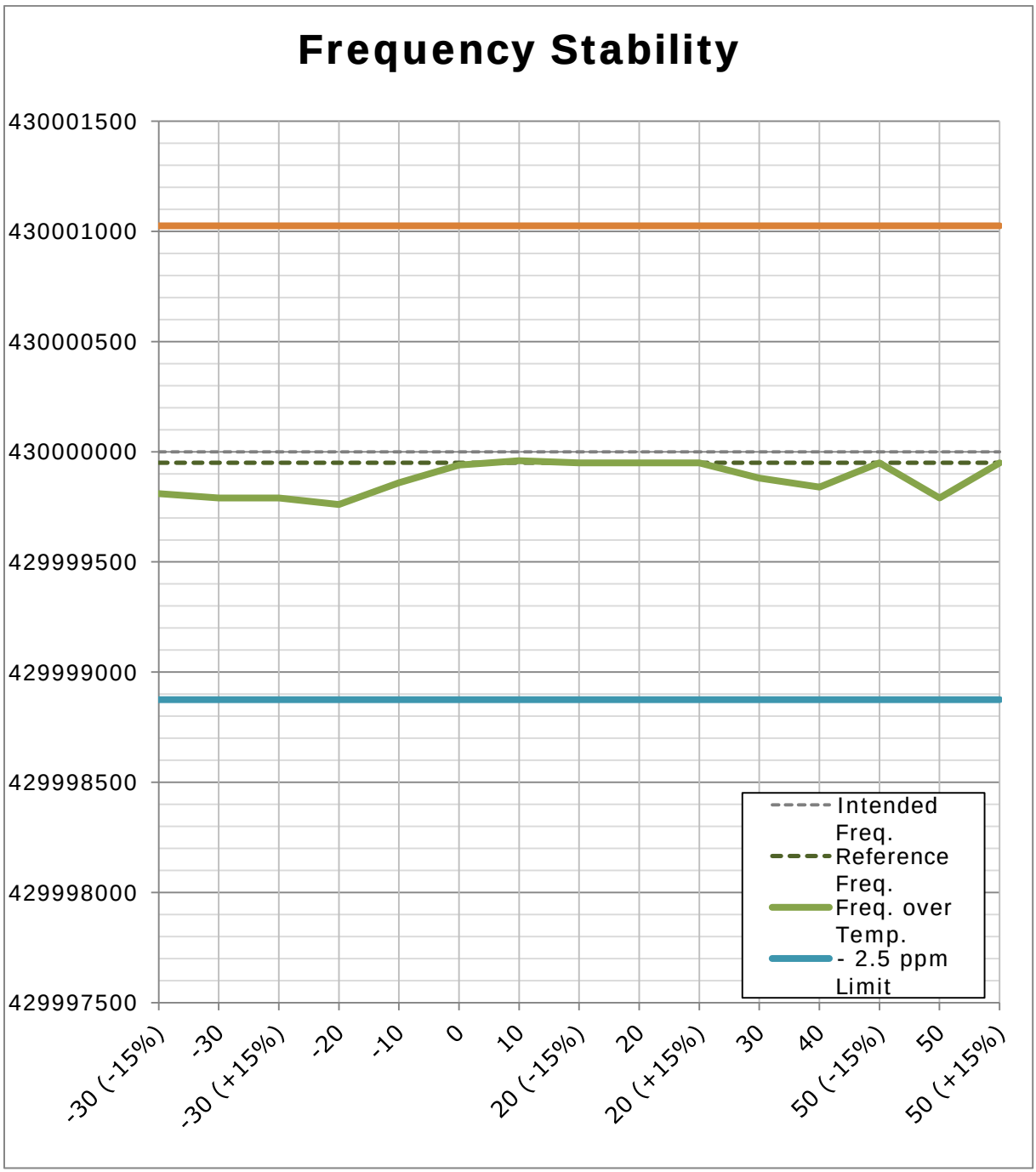
[14] Control stations may operate with the frequency tolerance specified for associated mobile frequencies.

Method of Measurements: TIA 603-E, 2.2.2



FREQUENCY STABILITY

Test Data: Frequency Error Measurement Plot



FREQUENCY STABILITY

Test Data: Frequency Error Measurement Table

430 MHz				
		Limit:	2.5	ppm
Temperature (°C)	**Supplied Voltage (VDC)**	**Intended Frequency (Hz)**	**Measured Reference Frequency (Hz)**	**Deviation (Hz)**
20°C (reference)	3.4	430000000	429999950	50

@ 20°C (reference)				
Supplied Voltage (%)	**Supplied Voltage (VDC)**	**Frequency (Hz)**	**Deviation (Hz)**	**PPM**
-15%	2.89	429999950	0	0.000
15%	3.91	429999950	0	0.000

@ -30°C				
Supplied Voltage (%)	**Supplied Voltage (VDC)**	**Frequency (Hz)**	**Deviation (Hz)**	**PPM**
-15%	2.89	429999810	140	0.326
15%	3.91	429999790	160	0.372

@ 50°C				
Supplied Voltage (%)	**Supplied Voltage (VDC)**	**Frequency (Hz)**	**Deviation (Hz)**	**PPM**
-15%	2.89	429999950	0	0.000
15%	3.91	429999950	0	0.000

Temperature (°C)	**Supplied Voltage (VDC)**	**Frequency (Hz)**	**Deviation (Hz)**	**PPM**
50	3.4	429999800	150.00000	0.349
40	3.4	429999840	110.00000	0.256
30	3.4	429999880	70.00000	0.163
20	3.4	429999950	0.00000	0.000
10	3.4	429999960	10.00000	-0.023
0	3.4	429999940	10.00000	0.023
-10	3.4	429999860	90.00000	0.209
-20	3.4	429999760	190.00000	0.442
-30	3.4	429999790	160.00000	0.372

RESULT: Meets Requirements

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16–4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: "Uncertainty in EMC Measurements" and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

Test Items	Measurement Uncertainty	Notes
RF Frequency Accuracy	± 49.5 Hz	(1)
RF Conducted Power	±0.93dB	(1)
Conducted spurious emission of transmitter valid up to 40GHz	±1.86dB	
Occupied Bandwidth	±2.65%	
Audio Frequency Response	±1.86dB	
Modulation limiting	±1.88%	
Radiated RF Power	±1.4dB	
Maximum frequency deviation: Within 300 Hz and 6kHz of audio freq. Within 6kHz and 25kHz of audio Freq.	 ±1.88% ±2.04%	
Rad Emissions Sub Meth up to 26.5GHz	±2.14dB	
Adjacent channel power	±1.47dB	(1)
Transient Frequency Response	±1.88%	
Temperature	±1.0°C	(1)
Humidity	±5.0%	

Notes: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Coaxial Cable - BMBM-0065-01 Black DC-2G	Belden		BMBM-0065-01	07/18/18	07/18/20
Antenna: Biconical 1096	Eaton	94455-1	1096	08/01/17	08/01/19
Antenna: Log-Periodic 1122	Electro-Metrics	LPA-25	1122	07/26/17	07/26/19
Temperature Chamber LARGE	Tenney Engineering	TTRC	11717-7	N/A	N/A
Frequency Counter Small Chamber	HP	5385A	3242A07460	08/22/17	08/22/19
Coaxial Cable - Chamber 3 cable set (backup)	Micro-Coax	Chamber 3 cable set (backup)	KMKM-0244-02 KMKM-0670-01 KFKF-0197-00	N/A	N/A
CHAMBER	Panashield	3M	N/A	12/31/17	12/31/19
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	00041534	03/01/17	03/01/20
Software: Field Strength Program	Timco	N/A	Version 4.10.7.0	N/A	N/A
Antenna: Passive Loop	EMCO	6512	9706-1211	07/26/17	07/26/19
Type K J Thermometer	Martel	303	080504494	11/02/17	11/02/19
EMI Test Receiver R & S ESIB 40	Rohde & Schwarz	ESIB 40	100274	08/18/16	08/18/19
EMI Test Receiver R & S ESU 40	Rohde & Schwarz	ESU 40	100320	04/01/16	04/01/20
Attenuator N 20dB 20W DC-12G	Narda	768-20-SP	155	07/10/17	07/10/19
Attenuator N 20dB 20W DC-12G	Narda	768-20-SP	344	07/10/17	07/10/19
Attenuator BNC 10dB DC-2G	MiniCircuits	HAT-10+	#54	07/14/17	07/14/19
Bore-sight Antenna Positioning Tower	Sunol Sciences	TLT2	N/A	N/A	N/A
Tunable Notch Filter 250-850 MHz	Eagle	TNF-200	250-850 MHz (#19)	11/19/17	11/19/19
Terminator N 20W DC-18G	Narda	8205	#14	04/06/17	04/06/20
Attenuator BNC 6dB 50Ohm DC-2G	Mini-Circuits	HAT-6+	#53	07/14/17	07/14/19
Attenuator N 30dB 100W DC-6G	Pasternack	PE7214-30	#109	05/24/17	05/23/19
DC Power Supply	HP	6286A	1744A03842	N/A	N/A

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

END OF TEST REPORT