Itron, Inc.

EMC TEST REPORT FOR

AMR Transceiver Device for Communicating with Utility Meters Models: IMRC-INTand IMRC-EXT

Tested to The Following Standards:

FCC Part 101 Subpart C Fixed Microwave Services

Report No.: 103955-29

Date of issue: August 5, 2020



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Itron, Inc. 2111 N. Molter Road Liberty Lake WA 99019 **REPORT PREPARED BY:**

Terri Rayle CKC Laboratories, Inc. 5046 Sierra Pines Drive Mariposa, CA 95338

Representative: Jay Holcomb Customer Reference Number: 208224

DATE OF EQUIPMENT RECEIPT: DATE(S) OF TESTING: Project Number: 103955

June 11, 2020 Juen 11-12, 2020 and July 15-16, 2020

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

Steve -7 Bet

Steve Behm Director of Quality Assurance & Engineering Services CKC Laboratories, Inc.



Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S): CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.19
EMITest Immunity	5.03.10

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Japan
Canyon Park, Bothell, WA	US0081	US1022	A-0136
Brea, CA	US0060	US1025	A-0136
Fremont, CA	US0082	US1023	A-0136
Mariposa, CA	US0103	US1024	A-0136

*CKC's list of NIST designated countries can be found at: https://standards.gov/cabs/designations.html



SUMMARY OF RESULTS

Standard / Specification: FCC Part 2 / 101 Subpart C

Test Procedure	Description	Modifications	Results
2.1055 / 101.107(a)	Frequency Tolerance	NA	Pass
2.1049 / 101.109(c)	Bandwidth	NA	Pass
2.1051 / 101.111(a)(5)	Emissions Limitations- Conducted	NA	Pass
2.1053 / 101.111(a)(5)	Emissions Limitations- Radiated	NA	Pass
2.1046 / 101.113	Transmitter Power Limitations	NA	Pass
2.1047	Modulation Characteristics	NA	NA1

NA = Not Applicable

NA1 = Not applicable because the EUT does not employ any modulation types outlined in the rules.

ISO/IEC 17025 Decision Rule

The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions

No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions

Note: EUT with internal antenna and EUT with external antenna use the same modulation and channel configuration. The only difference between them is the power output. Hence, the data measured on the internal antenna unit can be used for both except RF conducted power and spurious emissions.



EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:			
Device	Manufacturer	Model #	S/N
AMR transceiver device for	ltron, Inc.	IMRC-INT	66034285
communicating with utility meters			
10" Tablet	Panasonic	FZ-G1	NA
Automobile Adapter	Lind Electronics, Inc.	PA1555-2155 FB	NA
Power Distribution Box	ltron, Inc.	Generic	NA
12Vdc AC Adapter	Husky	FW 1288	NA
Support Equipment:			
Device	Manufacturer	Model #	S/N
Power Supply	Topward	6306D	988614

Configuration 2

Equipment Testea:			
Device	Manufacturer	Model #	S/N
10" Tablet	Panasonic	FZ-G1	NA
Automobile Adapter	Lind Electronics, Inc.	PA1555-2155 FB	NA
Power Distribution Box	ltron, Inc.	Generic	NA
AMR transceiver device for	ltron, Inc.	IMRC-EXT	66034368
communicating with utility meters			

Support Equipment:

Device	Manufacturer	Model #	S/N
Power Supply	Topward	6306D	988614

Configuration 3

Equipment Testea:			
Device	Manufacturer	Model #	S/N
AMR transceiver device for	ltron, Inc.	IMRC-INT	66034283
communicating with utility meters			
Power Distribution Box	ltron, Inc.	Generic	NA
10" Tablet	Panasonic	FZ-G1	NA
Automobile Adapter	Lind Electronics, Inc.	PA1555-2155 FB	NA
5Vdc AC Adapter	zip	SG-511	NA
Support Equipment:			
Device	Manufacturer	Model #	S/N
Power Supply	Topward	6306D	988614



Configuration 4

Equipment Tested:			
Device	Manufacturer	Model #	S/N
AMR transceiver device for	ltron, Inc.	IMRC-INT	66034283
communicating with utility meter	S		
Power Distribution Box	ltron, Inc.	Generic	NA
Automobile Adapter	Lind Electronics, Inc.	PA1555-2155 FB	NA
5Vdc AC Adapter	zip	SG-511	NA
7" Tablet	Panasonic	FZ-M1	NA
Support Equipment:			
Device	Manufacturer	Model #	S/N
Power Supply	Topward	6306D	988614

Configuration 5

Manufacturer	Model #	S/N
ltron, Inc.	Generic	NA
Lind Electronics, Inc.	PA1555-2155 FB	NA
Panasonic	FZ-G1	NA
ltron, Inc.	IMRC-EXT	66034368
	Manufacturer Itron, Inc. Lind Electronics, Inc. Panasonic Itron, Inc.	ManufacturerModel #Itron, Inc.GenericLind Electronics, Inc.PA1555-2155 FBPanasonicFZ-G1Itron, Inc.IMRC-EXT

Device	Manufacturer	Model #	S/N
Power Supply	Topward	6306D	988614
50ohm load	Generic	NA	NA

Configuration 6 *Equipment Tested*:

Equipment Testea:				
Device	Manufacturer	Model #	S/N	
Power Distribution Box	Itron, Inc.	Generic	NA	
Automobile Adapter	Lind Electronics, Inc.	PA1555-2155 FB	NA	
AMR transceiver device for communicating with utility meters	ltron, Inc.	IMRC-EXT	66034368	
7" Tablet	Panasonic	FZ-M1	NA	
Support Equipment:				

Device	Manufacturer	Model #	S/N
Power Supply	Topward	6306D	988614
50ohm load	Generic	NA	NA



General Product Information:

Product Information	Manufacturer-Provided Details		
Equipment Type:	Stand-Alone Equipment		
Type of Wideband System:	Land-Mobile Transmitter and Receiver (27.41-960 MHz) (MAS transmitter)		
Operating Frequency Range:	952.0-959.85MHz		
Number of Hopping Channels:	NA		
Modulation Type(s):	24.76-57.78Hz AM		
Maximum Duty Cycle:	100%		
Number of TX Chains:	1		
Antonno Coini	Internal, directional 2dBi		
Antenna Gain.	External, Vehicular mount 5dBi monopole, 3dBi Rubber Duck		
Beamforming Type:	NA		
Antenna Connection Type:	Integral/External Connector		
Nominal Input Voltage:	Internal antenna unit: 5VDC Adapter		
Nominal input voltage.	External antenna unit: 13.8VDC (7 to 18VDC)		
	Arm Version: 7.73.00.01		
Firmware / Software used for Test:	DSP Version: 5.76.00.07		
Filliwale / Softwale used for Test.	FPGA Version: 3.02		
	MC3 SuperRaptor Test ver.4.0.3.5		
	7" tablet – Panasonic FZ-M1		
	FCC ID: ACJ9TGWL15B IC: 216A-CFWL15B		
	contains:		
	FCC ID: ACJ9TGWW13B3 IC: 216A-CFWW13B		
Tablets FCC ID:			
	10" tablet – Panasonic FZ-G1		
	FCC ID: ACJ9TGWL15A IC: 216A-CFWL15A		
	contains:		
	FCC ID: ACJ9TGWW13B1 IC: 216A-CFWW13B		



EUT and Accessory Photo(s)



IMRC-INT for Conducted



IMRC-INT





IMRC-EXT



3dBi Antenna





5dBi Antenna



5VDC Adapter





12VDC Adapter



Power Distribution





Tablet Power Adapter



Tablet #1





Tablet #2

Support Equipment Photo(s)



12VDC Power Supply



Block Diagram(s) of Test Setup

Test Setup Block Diagram





FCC Part(s) 101 Subpart C

2.1055 / 101.107(a) Frequency Tolerance

Test Setup / Conditions					
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen		
Test Method:	ANSI C63.26 (2015), Section 5.6	Test Date(s):	6/12/2020		
Configuration:	on: 1				
Test Setup:	The EUT is placed inside temperature chamber. The EUT is connected to an external power supply and set to transmit continuously. Operating frequency: 952-959.85MHz Frequency range of measurement: 952. 956. 959.85MHz				

Environmental Conditions					
Temperature (^o C)	25	Relative Humidity (%):	46		

Test Equipment						
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due	
01878	Temperature Chamber	Thermotron Corp.	S 1.2 Mini-Max	3/26/2019	3/26/2021	
02869	Spectrum Analyzer	Agilent	E4440A	7/25/2019	7/25/2020	
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/22/2019	10/22/2021	
P07338	Cable	Pomona	2249-Y-240	12/24/2019	12/24/2021	



Test Data

Temperature (ºC)	Voltage	Frequency (MHz)	Frequency Tolerance (%)	Limit (%)	Results
-30	V _{Nominal}	951.998441	0.0000445	0.00015	
-20	V _{Nominal}	951.998498	0.0000386	0.00015	
-10	V _{Nominal}	951.998673	0.0000202	0.00015	
0	V _{Nominal}	951.998976	0.0000117	0.00015	
10	$V_{Nominal}$	951.998964	0.0000104	0.00015	
20	$V_{Minimum}$	951.998865	0.0000000	0.00015	Pass
20	V _{Nominal}	951.998865	0.0000000	0.00015	
20	V _{Maximum}	951.998865	0.0000000	0.00015	
30	V _{Nominal}	951.998761	0.0000109	0.00015	
40	V _{Nominal}	951.998642	0.0000234	0.00015	
50	V _{Nominal}	951.998662	0.0000213	0.00015	
Nominal Fre	quency:	951.998865			

Temperature (ºC)	Voltage	Frequency (MHz)	Frequency Tolerance (%)	Limit (%)	Results
-30	$V_{Nominal}$	955.998516	0.0000430	0.00015	
-20	V _{Nominal}	955.998615	0.0000326	0.00015	
-10	V _{Nominal}	955.998787	0.0000146	0.00015	
0	V _{Nominal}	955.998968	0.0000043	0.00015	
10	V _{Nominal}	955.998982	0.0000058	0.00015	
20	V _{Minimum}	955.998927	0.0000000	0.00015	Pass
20	V _{Nominal}	955.998927	0.0000000	0.00015	
20	V _{Maximum}	955.998927	0.0000000	0.00015	
30	V _{Nominal}	955.998703	0.0000234	0.00015	
40	V _{Nominal}	955.998633	0.0000308	0.00015	
50	V _{Nominal}	955.998642	0.0000298	0.00015	
Nominal Fre	quency:	955.998927			

Temperature (ºC)	Voltage	Frequency (MHz)	Frequency Tolerance (%)	Limit (%)	Results
-30	V _{Nominal}	959.848519	0.0000426	0.00015	
-20	V _{Nominal}	959.848638	0.0000302	0.00015	
-10	V _{Nominal}	959.848807	0.0000126	0.00015	
0	V _{Nominal}	959.848962	0.0000035	0.00015	
10	V _{Nominal}	959.848972	0.0000046	0.00015	
20	VMinimum	959.848928	0.0000000	0.00015	Pass
20	V _{Nominal}	959.848928	0.0000000	0.00015	
20	V _{Maximum}	959.848928	0.0000000	0.00015	
30	V _{Nominal}	959.848677	0.0000261	0.00015	
40	V _{Nominal}	959.848630	0.0000310	0.00015	
50	V _{Nominal}	959.848653	0.0000287	0.00015	
Nominal Fre	quency:	959.848928			



Measurements performed at input voltage Vnominal ± 15%. (AC Input) Measurements performed at input voltage according to manufacturer specification. (DC Input)

Parameter	Value
V _{Nominal} :	115VAC / 12VDC
V _{Minimum} :	97VAC / 7VDC
V _{Maximum} :	133VAC / 18VDC

Note: see 101.107(a), note 5 for limit reference.

Test Setup Photo(s)



Inside Temperature Chamber





Outside Temperature Chamber



2.1049 / 101.109(c) Bandwidth

Test Setup/Conditions					
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen		
Test Method:	ANSI C63.26 (2015), Section 5.4	Test Date(s):	6/11/2020		
Configuration:	1				
Test Setup:	The EUT is placed on test bench and connected to an external power supply. USB port is connected to a touchscreen computer. The computer is sending command to the EUT using software MC3 SuperRaptor Test ver.4.0.3.5. The EUT is set to continuously transmit.				
	Operating frequency: 952-959.85MHz				
	Frequency range of measurement: 952-959.85MHz				
	RBW=10Hz, VBW=30Hz (24Hz AM modulation)				
	RBW=68Hz, VBW=220Hz (57Hz AN	A modulation)			

Environmental Conditions					
Temperature (^o C)	24.9	Relative Humidity (%):	33		

	Test Equipment						
Asset# Description Manufacturer Model Cal Date							
02869	Spectrum Analyzer	Agilent	E4440A	7/25/2019	7/25/2020		
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/22/2019	10/22/2021		
P07243	Cable	H&S	32022-29094K-	5/29/2020	5/29/2022		
107245	Cabic		29094K-24TC	5,25,2020	3,23,2022		

Test Data Summary-99% Bandwidth					
Frequency (MHz)	Modulation	Measured (kHz)	Limit* (kHz)	Results	
952.0	24.76 Hz AM	0.929	<12.5	Pass	
956.0	24.76 Hz AM	0.967	<12.5	Pass	
959.85	24.76 Hz AM	0.965	<12.5	Pass	
952.0	57.78 Hz AM	5.542	<12.5	Pass	
956.0	57.78 Hz AM	5.785	<12.5	Pass	
959.85	57.78 Hz AM	5.783	<12.5	Pass	

*See note 5 in the standard which references 101.147(b)(1) to (4)



Plot(s)



Low Channel 24Hz



Middle Channel 24Hz





High Channel 24Hz



Low Channel 57Hz





Middle Channel 57Hz



High Channel 57Hz



Test Setup Photo(s)





2.1051 / 101.111(a)(5) Emissions Limitations - Conducted

Test Conditions / Setup

Test Setup/Conditions					
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen		
Test Method:	ANSI C63.26 (2015), Section 5.7	Test Date(s):	7/15/2020		
Configuration:	1 and 2				
Test Setup:	The EUT is placed on test bench and connected to an external power supply. USB port is connected to a touchscreen computer. The computer is sending command to the EUT using software MC3 SuperRaptor Test ver.4.0.3.5 The EUT is set to continuously transmit.				
	Power setting: 4W				
	Operating frequency: 952-959.85MHz				
	Frequency range of measurement	= 9kHz-10GHz			
	RBW=62Hz*, VBW=20Hz (within +	/- 15kHz of authorized	bandwidth)		
	RBW=100kHz, VBW=300kHz (ou	tside of +/-15kHz o	of authorized bandwidth, 9kHz-		
	1000MHz)				
	RBW=1MHz, VBW=3MHz (1-10GH	z)			
	*Per Reference Bandwidth definit	ion on section 3.1, RBV	V=1% OBW.		

Environmental Conditions						
Temperature (^o C)	24	Relative Humidity (%):	45			

Test Equipment						
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due	
02869	Spectrum Analyzer	Agilent	E4440A	7/25/2019	7/25/2020	
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/22/2019	10/22/2021	
P07243	Cable	H&S	32022-29094K- 29094K-24TC	5/29/2020	5/29/2022	



Test Data

Spurious emissions outside of +/- 15kHz of authorized bandwidth-Configuration 1				
Frequency (MHz)	Measure power (dBm)	Limit (dbm)	Result	
1904	-38.2	-20	Pass	
1912	-39.0	-20	Pass	
1920	-39.2	-20	Pass	
2856	-35.9	-20	Pass	
2868	-36.9	-20	Pass	
2879.5	-36.8	-20	Pass	
6664	-39.5	-20	Pass	
6692	-40.4	-20	Pass	
6718.95	-41.1	-20	Pass	

Spurious emissions outside of +/- 15kHz of authorized bandwidth-Configuration 2				
Frequency (MHz)	Measure power (dBm)	Limit (dbm)	Result	
1904	-42.7	-20	Pass	
1912	-45.4	-20	Pass	
1920	-46.2	-20	Pass	
2856	-38.8	-20	Pass	
2868	-39.3	-20	Pass	
2879.5	-39.9	-20	Pass	
6664	-46.1	-20	Pass	
6692	-43.8	-20	Pass	
6718.95	-42.8	-20	Pass	

Note: Data is recorded with the worst-case modulation. Measurement Uncertainty: 0.67dB



Limit Line for Spurious Conducted Emission

REQUIRED ATTENUA	ΓΙΟΝ	=	50+10 LOG P DB
Limit line (dBuV)	= '	V dBuv -	Attenuation
$V_{\rm dBuV}$	=	=	$20 \log \frac{V}{1 \times 10^{-6}}$
	=	=	$20 \left(\text{Log V} - \text{Log 1 x } 10^{-6} \right)$
	=	=	$20 \text{ Log V} - 20 \text{ Log 1 x } 10^{-6}$
	=	=	$20 \log V - 20(-6)$
	=	=	20 Log V +120
Attenuatio n		=	50+10 Log P
	:	=	$50 + 10 \operatorname{Log} \frac{\operatorname{V}^2}{\operatorname{R}}$
	:	=	$50+10\left(\operatorname{Log}\operatorname{V}^2-\operatorname{Log}\operatorname{R}\right)$
	:	=	$50+10(2 \operatorname{Log} V - \operatorname{Log} R)$
	:	=	50 + 20 Log V - 10 Log R
Limit line	= ,	V dBuv -	Attenuation
	:	=	20 Log V + 120 – (55 + 20 Log V – 10Log R)
_	201001	=	20 Log V + 120 - 55 - 20 Log V + 10 Log R
-	ZU LUG V	+ 120 -	$120 - 50 + 10 \log 50$ Note : R = 50 O
	:	=	120 - 50 + 16.897
	:	=	87 dBuV (-20dBm) at any power level



Emissions Mask Plot(s)























































Test Setup Photo(s)



Configuration 1



Configuration 2



2.1053 / 101.111(a)(5) Emissions Limitations - Radiated

Test Setup/Conditions					
Test Location:	Brea Lab A	Test Engineer:	Don Nguyen		
Test Method:	ANSI C63.26 (2015), Section 5.5	Test Date(s):	7/16/2020		
Configuration:	3, 4, 5, and 6				
Test Setup:	The EUT is placed on turn table connected to a touchscreen com using software MC3 SuperRaptor The EUT is set into continuous tran The EUT is rotated in three ort orientation. For external antenna unit, antenna Operating frequency: 952-959.85M Frequency range of measurement RBW=100kHz, VBW=300kHz (ou 1000MHz) RBW=1MHz, VBW=3MHz (1-10GH The worst case emission were veri in emission level was observed.	and connected to ex puter. The computer Fest ver.4.0.3.5 Insmitting mode. Inogonal orientations. In port is terminated with MHz = 9kHz-10GHz tside of +/-15kHz co z) fied with power supply	ternal power supply. USB port is is sending command to the EUT Data represents the worst-case ith 50ohm load. of authorized bandwidth, 9kHz-		

Environmental Conditions						
Temperature (^o C)	24.3	Relative Humidity (%):	36			

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
00314	Loop Antenna	EMCO	6502	4/13/2020	4/13/2022
P05198	Cable	Belden	8268	12/4/2018	12/4/2020
P05281	Attenuator	Weinschel	1B	4/7/2020	4/7/2022
01993	Biconilog Antenna	Chase	CBL6111C	6/11/2019	6/11/2021
00309	Preamp	HP	8447D	12/24/2019	12/24/2021
P05050	Cable	Pasternack	RG223/U	12/24/2018	12/24/2020
02869	Spectrum Analyzer	Agilent	E4440A	7/25/2019	7/25/2020
00786	Preamp	HP	83017A	5/20/2020	5/20/2022
00849	Horn Antenna	ETS	3115	3/17/2020	3/17/2022
P06360	Cable	Andrew	L1-PNMNM-48	8/8/2019	8/8/2021
P07243	Cable		32022-29094K-	5/29/2020	5/29/2022
			29094K-24TC		
03169	High Pass Filter	SMI	HM1155-11SS	5/8/2019	5/8/2021



Test Data

Spurious emissions outside of +/-15kHz of authorized bandwidth-				
Configuration 3 Internal Antenna	a+10in tablet			
Frequency (MHz)	Measure power (dBuV/m)	Limit (dBuV/m)	Result	
1904	47.2	75.2	Pass	
1912	46.9	75.2	Pass	
1919.7	46.9	75.2	Pass	
6664	56.9	75.2	Pass	
6692	57.9	75.2	Pass	
6718.95	58.8	75.2	Pass	

Spurious emissions outside of +/-15kHz of authorized bandwidth-				
Configuration 4 Internal Antenna	a+7in tablet			
Frequency (MHz)	Measure power (dBuV/m)	Limit (dBuV/m)	Result	
1904	47.6	75.2	Pass	
1912	47.0	75.2	Pass	
1919.7	46.5	75.2	Pass	
6664	56.5	75.2	Pass	
6692	58.3	75.2	Pass	
6718.95	58.7	75.2	Pass	

Spurious emissions outside of +/-15kHz of authorized bandwidth						
Configuration 5 External Antenn	a+10in tablet					
Frequency (MHz) Measure power (dBuV/m) Limit (dBuV/m) Result						
2879.55	43.3	75.2	Pass			
3808	43.7	75.2	Pass			
3824	43.5	75.2	Pass			
6664	52.0	75.2	Pass			
6692	54.2	75.2	Pass			
6718.95	53.9	75.2	Pass			

Spurious emissions outside of +/-15kHz of authorized bandwidth						
Configuration 6 External Antenn	Configuration 6 External Antenna+7in tablet					
Frequency (MHz)	Measure power (dBuV/m)	Limit (dBuV/m)	Result			
2879.55	43.0	75.2	Pass			
3808	43.3	75.2	Pass			
3824	43.7	75.2	Pass			
6664	51.6	75.2	Pass			
6692	54.7	75.2	Pass			
6718.95	54.2	75.2	Pass			

Measurement Uncertainty: 3.73dB

Conversion to EIRP limit

E(dBuV/m)=P(dBm)-20log(3)+104.77



Test Setup Photo(s)



7" Tablet



X Axis, IMRC-INT





X Axis, IMRC-INT



Y Axis, IMRC-INT





Z Axis, IMRC-INT



Above 1GHz, IMRC-INT





X Axis, IMRC-EXT



X Axis, IMRC-EXT





Y Axis, IMRC-EXT



Z Axis, IMRC-EXT





Above 1GHz, IMRC-EXT



Above 1GHz, IMRC-EXT



2.1046 / 101.113 Transmitter Power Limitations

Test Conditions / Setup							
Test Location:	Brea Lab D	Test Engineer:	Don Nguyen				
Test Method:	ANSI C63.26 (2015), Section 5.2	Test Date(s):	6/11/2020				
Configuration:	1 and 2						
Test Setup:	The EUT is placed on test bench USB port is connected to a touchs EUT using software MC3 SuperRap The EUT is set to continuously tran Power setting: 4W Operating frequency: 952 to 959.8 Frequency of measurement: 952 to RBW=300kHz VBW=910kHz Note: There are two EUTs with th optional receivers in one of ther receivers as it is the worst-case co	. Input voltage is 13.8 screen tablet. The com otor Test ver.4.0.3.5 nsmit. 35MHz to 959.85MHz e same transmitter. Th n. The EUT used for to onfiguration.	Wdc from external power supply. Inputer is sending command to the ne difference between them is the this test is the one with optional				

Environmental Conditions					
Temperature (^o C)	24	Relative Humidity (%):	43		

Test Equipment							
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due		
02869	Spectrum Analyzer	Agilent	E4440A	7/25/2019	7/25/2020		
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/22/2019	10/22/2021		
07742	Cable	LLOC	32022-29094K-	5/29/2020	5/29/2022		
P07245		паз	29094K-24TC				



Test Data Summary - RF Conducted Measurement-								
Configuratio	Configuration 1 (internal antenna)							
Frequency (MHz)	Modulation	Max Ant. Gain (dBi)	Measured (dBm)	EIRP (dBm)	Limit (dBm)	Limit (dBW)	Results	
952.0	24.76 Hz AM	2	29.27	31.27	≤44	≤14	Pass	
956.0	24.76 Hz AM	2	29.15	31.15	≤44	≤14	Pass	
959.85	24.76 Hz AM	2	29.09	31.09	≤44	≤14	Pass	
952.0	57.78 Hz AM	2	29.22	31.22	≤44	≤14	Pass	
956.0	57.78 Hz AM	2	29.15	31.15	≤44	≤14	Pass	
959.85	57.78 Hz AM	2	29.10	31.10	≤44	≤14	Pass	

Test Data Summary - RF Conducted Measurement-							
Configuration 2 (external antenna)							
Frequency (MHz)	Modulation	Max Ant. Gain (dBi)	Measured (dBm)	EIRP (dBm)	Limit (dBm)	Limit (dBW)	Results
952.0	24.76 Hz AM	5	24.40	29.40	≤44	≤14	Pass
956.0	24.76 Hz AM	5	22.25	27.25	≤44	≤14	Pass
959.85	24.76 Hz AM	5	19.86	24.86	≤44	≤14	Pass
952.0	57.78 Hz AM	5	24.40	29.40	≤44	≤14	Pass
956.0	57.78 Hz AM	5	22.23	27.23	≤44	≤14	Pass
959.85	57.78 Hz AM	5	19.85	24.85	≤44	≤14	Pass



Plot(s)



Configuration 1, Low Channel 24Hz









Configuration 1, High Channel 24Hz



Configuration 1, Low Channel 57Hz





Configuration 1, Middle Channel 57Hz



Configuration 1, High Channel 57Hz





Configuration 2, Low Channel 24Hz



Configuration 2, Middle Channel 24Hz





Configuration 2, High Channel 24Hz



Configuration 2, Low Channel 57Hz





Configuration 2, Middle Channel 57Hz



Configuration 2, High Channel 57Hz



Test Setup Photo(s)



Configuration 1



Configuration 2