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FCC 47 CFR PART 15 SUBPART C AND ANSI C63.10: 2013

TEST REPORT

For

Wireless Water Leak Sensor

Model: BR35-HW



Issued for

Verkada Inc

405 E. 4th Ave., San Mateo, California, United States, 94401

Issued by Compliance Certification Services Inc. Tainan Lab. No.8, Jiucengling, Xinhua Dist., Tainan City, Taiwan Issued Date: December 17, 2021

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Report No.: TMTN2110000501NR

REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	November 22, 2021	Initial Issue	ALL	Gina Lin
01	December 01, 2021	See the following note rev.01	ALL	Gina Lin
02	December 15, 2021	See the following note rev.02	Page 22 Page 30, 31	Gina Lin
03	December 17, 2021	See the following note rev.03	Page 17, 25	Gina Lin

Note:

Rev.01 Issue Date: December 01, 2021
 Revise Typo.
 Update Test Data of 6db Bandwidth & Conducted Spurious Emission.

- Rev.02 Issue Date: December 15, 2021
 Update Calculation formula of Duty Factor.
 Update Test Data of Conducted Spurious Emission.
- Rev.03 Issue Date: December 17, 2021 Update Test Procedure.



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Report No.: TMTN2110000501NR 1. TEST REPORT CERTIFICATION

Applicant	:	Verkada Inc 405 E. 4th Ave., San Mateo, California, United States, 94401
Manufacturer	:	Vision Automobile Electronics Industrial Co Ltd. No.78, Gongye 3rd Rd., Technology Industrial Park, Tainan , Taiwan , 70955
Equipment Under Test Model Brand	:	Wireless Water Leak Sensor BR35-HW
Date of Test	:	October 22, 2021 ~ October 26, 2021

APPLICABLE STANDARD		
STANDARD	TEST RESULT	
FCC Part 15 Subpart C AND ANSI C63.10: 2013	No non-compliance noted	
Statements of Conformity		
Determining compliance shall be based on the results of the compliance measurement,		

not taking into account measurement instrumentation uncertainty.

FCC Standard Section	Report Section	Test Item	Result
15.247(a)	8.1	6dB BANDWIDTH	Pass
15.247(b)	8.2	MAXIMUM PEAK OUTPUT POWER	Pass
-	8.3	DUTY CYCLE	-
15.247(e)	8.4	POWER SPECTRAL DENSITY	Pass
15.247(d)	8.5	CONDUCTED SPURIOUS EMISSION	Pass
15.205(a)	8.6	RADIATED EMISSIONS	Pass
15.207(a)	8.7	POWERLINE CONDUCTED EMISSIONS	N/A

Approved by:

Eric Huang Section Manager



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2. EUT DESCRIPTION

Product Name	Wireless Water Leak Sensor
Model	BR35-HW
Brand	Verkada
Received Date	October 21, 2021
Frequency Range	915.0MHz ~915.7MHz
Transmit Power	3.81dBm (2.40mW)
Channel Spacing	0.35 MHz
Channel Number	3 Channels
Transmit Data Rate	80kbps
Type of Modulation	OQPSK
Antenna Type	Type: Wire Antenna Model: BR35 Manufacturer: N/A Gain: -2.93 dBi
Power Rating	3Vdc (Powered from battery)
MCU CHIP Brand /Model	MCP6541T-I/ Microchip
RF Module Brand /Model	EFR32MG13/ Silicon Labs
Software Version	Rev.0
Firmware Version	1.100
Temperature Range	-20°C ~ +60°C
Reported Date	November 08, 2021

REMARK:

1. The sample (**BR35-HW**) selected for test was engineering sample that approximated to production product and was provided by manufacturer.

2. This submittal(s) (test report) is intended for FCC ID: **<u>2AWUU6053201</u>**, filing to comply with Section 15.207,

15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

3. For more details, please refer to the User's manual of the EUT.



3. DESCRIPTION OF TEST MODES

The EUT is a Wireless Water Leak Sensor .

The RF chipset is manufactured by Silicon Labs.

The antenna peak gain -2.93 dBi (highest gain) were chosen for full testing.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	915
Middle	915.35
High	915.7

Radiated Emission Test (Below 1 GHz):

- ☑ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Example Selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type
Low, Mid, High	OFDM	OQPSK

Radiated Emission Test (Above 1 GHz):

- ☑ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Example Selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type
Low, Mid, High	OFDM	OQPSK

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Bandedge Measurement :

- ☑ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Example Selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type
Low, Mid, High	OFDM	OQPSK

Antenna Port Conducted Measurement :

- ☑ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Example Selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type
Low, Mid, High	OFDM	OQPSK



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4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 and FCC CFR 47 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.8, Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW1109).



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5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada (TW1109)
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, <u>http://www.ccsrf.com</u>



5.5 MEASUREMENT EQUIPMENT USED

For §8.6

	Chamber 966 Room (Radiation Test)								
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due				
Active Loop Antenna	ETS-LINDREN	6502	8905-2356	09/06/2021	09/05/2023				
Bilog Antenna With 6dB Attenator	SUNOL SCIENCES & EMCI	JB1 & N-6-06	A070506-1 & AT-N0681	10/07/2021	10/06/2022				
Cable	Suhner	SUCOFLEX104PEA	20520/4PEA&O6	01/29/2021	01/28/2022				
Double Ridged Guide Horn Antenna	ETS-LINDGREN	3116	00078900	03/30/2021	03/29/2022				
EMI Test Receiver	R&S	ESCI	100960	02/05/2021	02/04/2022				
Horn Antenna	Com-Power	AH-118	071032	05/04/2021	05/03/2022				
MXA Signal Analyzer	KEYSIGHT	N9020A	MY56060171	08/23/2021	08/22/2022				
Pre-Amplifier	EMCI	EMC012645	980098	01/29/2021	01/28/2022				
Pre-Amplifier	HP	8447F	2443A01683	01/19/2021	01/18/2022				
Pre-Amplifier	Com-Power	PAM-840A	461378	07/05/2021	07/04/2022				
Type N coaxial cable	Suhner	CHA9513	6	01/19/2021	01/18/2022				
Notch Filter	MICRO-TRONICS	BRM50702-01	018	N.C.R	N.C.R				
Software		Excel(ccs-o6-2020	v1.1) [,] e3(v6.10122	22)					

For §8.1~8.5

Chamber 966 Room (Conducted Test)							
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
EXA Spectrum Analyzer	KEYSIGHT	N9020A	MY56060171	08/23/2021	08/22/2022		
Power Meter	Anritsu	ML2487A	6K00003888	05/18/2021	05/17/2023		
Power Sensor	Anritsu	MA2491A	033265	05/18/2021	05/17/2023		
SMA Cable + 10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/29/2021	01/28/2022		
Software		Exc	el(ccs-o6-2020	v1.1)			

For §8.7

Conducted Emission room #1							
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
-	-	-	-	-			
-	-	-	-	-			
-	-	-	-	-			
Test S/W			-				



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6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report

has been calibrated in accordance with the manufacturer's recommendations,

and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.3456dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±2.6828dB
Radiated Emission, 1 to 8 GHz	± 2.6485dB
Radiated Emission, 8 to 18 GHz	± 2.6852dB
Radiated Emission, 18 to 26.5 GHz	± 2.6485dB
Radiated Emission, 26 to 40 GHz	± 3.0295dB
Power Line Conducted Emission	±1.91dB
Band Width	136.49kHz
Peak Output Power MU	±1.904dB
Band Edge MU	±0.302dBuV
Channel Separation MU	361.69Hz
Duty Cycle MU	0.064ms
Frequency Stability MU	0.223kHz

Uncertainty figures are valid to a confidence level of 95%, K=2



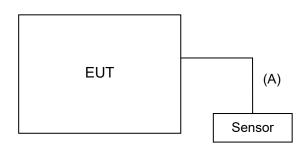
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7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

FOR RF TEST



7.2 SUPPORT EQUIPMENT

RF test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	N/A	N/A	N/A	N/A	N/A

No.	Signal cable descr	iption
А	Sensor	Unshielded, 2.1m, 1pcs.

REMARK:

- 1. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7.3 EUT OPERATING CONDITION

RF Setup

- 1. Set up a whole system as the setup diagram.
- 2. Turn on power.



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8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6dB BANDWIDTH

<u>LIMIT</u>

§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

TEST SETUP



TEST PROCEDURE

- 1. Set resolution bandwidth (RBW) = 100kHz
- 2. Set the video bandwidth (VBW) \geq 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



TEST RESULTS

No non-compliance noted.

Model Name	BR35-HW	Test By	Ted Huang
Temp & Humidity	26.5℃, 45%	Test Date	2021/10/26

TX mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	915	512	500	PASS
Middle	915.35	518	500	PASS
High	915.7	512	500	PASS

NOTE :

1. At finial test to get the worst-case emission at 80kbps long.

2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.



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6dB BANDWIDTH

	CH	Low		
				- 5 💌
X/RL RF 50Ω AC	SENSE:INT SC		08:18:51 AM Nov 26, 2021	Frequency
Center Freq 915.000000 MHz		#Avg Type: RMS Avg Hold:>10/10	TRACE 1 2 3 4 5 6	Frequency
PN	O: Wide Trig: Free Run Gain:Low #Atten: 30 dB	Avginoid.>10/10	TYPE MWWWWW DET P P A N N N	
		Mkr	1 914.842 MHz	Auto Tune
Ref Offset 10.89 dB 10 dB/div Ref 30.89 dBm			2.790 dBm	
	· · · · · · · · · · · · · · · · · · ·			
				Center Freq
20.9				915.000000 MHz
				010.000000 11112
10.9				
10.5	▲ 1			Start Freq
0.890		~		914.000000 MHz
0.690	-6.00) dB		
	512	kHz 🔪 🛛		
-9.11				Stop Freq
				916.000000 MHz
-19.1				
				CF Step
-29.1				2.452000000 GHz
			Yr.	Auto <u>Man</u>
-39.1			"WWULL	
			v.	Eron Offer
-49.1				Freq Offset
				0 Hz
-59.1				
				Scale Type
Center 915.000 MHz			Span 2.000 MHz	Log <u>Lin</u>
#Res BW 100 kHz	#VBW 300 kHz	Sweep 1.	.000 ms (1001 pts)	
MSG		STATUS		
		Mid		
M Keysight Spectrum Analyzer - Swent SA	CH	Mid		
www. Keysight Spectrum Analyzer - Swept SA	CH		08:17:16 AM Nov 26, 2021	
X RL RF 50 Ω AC Center Freq 915.350000 MHz	SENSE:INT SC	URCE OFF ALIGN AUTO	TRACE 1 2 3 4 5 6	Frequency
RL RF 50 Ω AC Center Freq 915.350000 MHz PN	SENSE:INT SC	DURCE OFF ALIGN AUTO		
X RL RF 50Ω AC Center Freq 915.350000 MHz PN IFG	O: Wide	URCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10	TRACE 1 2 3 4 5 6 TYPE M M WWW DET P P A N N N	1
20 RL RF 50 Ω AC Center Freq 915.350000 MHz PN IFC Ref Offset 10.89 dB 10 dB/div Ref 30.89 dBm	SENSE:INT SC	URCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10	TRACE 1 2 3 4 5 6	Frequency
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22 RL RF 50Ω AC Center Freq 915.350000 MHz PN IFG Ref Offset 10.89 dB 10 dB/div Ref 30.89 dBm	SENSE:INT SC	URCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P A NN N 1 915.514 MHz	Frequency Auto Tune
RL RF ISO Q AC Center Freq 915.350000 MHz PN PN PN PN PO IO dB/div Ref Offset 10.89 dB BM	SENSE:INT SC	URCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P A NN N 1 915.514 MHz	Frequency Auto Tune Center Freq
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RL RF [50 Ω AC Center Freq 915.350000 MPz PN PN PC Ito dB/div Ref Offset 10.89 dB Ref 30.89 dBm Ref 30.89 dBm 20.9 10.9 10.9 10.9 10.9 10.9	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P A NN N 1 915.514 MHz	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq
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RL RF ISO Q. AC Center Freq 915.350000 MHz PN Photos Photos Ited Ref Offset 10.89 dB 20.9 Ref 30.89 dB 10.9 Ref 30.89 dB 0.890 Ref 30.89 dB	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P A NN N 1 915.514 MHz	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq
XI RL RF ISO Q. AC Center Freq 915.350000 MHz PN PN PN P0 B10.089 dB B10.089 dB B10.089 dB B10.089 dB 10.9 0.690 0.690 0.690 0.690 0.690	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P A NN N 1 915.514 MHz	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz
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RL RF [50 Ω AC Center Freq 915.350000 MHz PN Ph Pr 0 dB/div Ref Offset 10.89 dB 20.9	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P A NN N 1 915.514 MHz	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz CF Step 2.452000000 GHz
RL RF ISO Q. AC Center Freq 915.350000 MHz Physical Science	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P A NN N 1 915.514 MHz	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz
RL RF ISO Q. AC Center Freq 915.350000 ML PN PN PN IO dB/div Ref Offset 10.89 dB 20.9 IO dB/div 10.9 IO dB/div 9.80 IO dB/div 10.9 IO dB/div 10.9 IO dB/div 9.11 IO dB/div	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 123456 TYPE 123456 TYPE PANN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz CF Step 2.452000000 GHz
RL RF ISO Q. AC Center Freq 915.350000 MHz PN Propriation Propriation 10 dB/div Ref Offset 10.89 dB 20.9 0.800 10.9 0.800 9.11 0.800 -39.1	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 123456 TYPE 123456 TYPE PANN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz CF Step 2.452000000 GHz
RL RF ISO Q. AC Center Freq 915.350000 MHz PN Propriation PN 10 dB/div Ref Offset 10.89 dB 20.9 0.890 10.9 0.900 9.11 0.911 -19.1 0.911	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 123456 TYPE 123456 TYPE PANN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz CF Step 2.45200000 GHz Auto
RL RF ISO Q. AC Center Freq 915.350000 MPN IFC PN IFC 10 dB/div Ref Offset 10.89 dB Ref 30.89 dBm 20.9	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 123456 TYPE 123456 TYPE PANN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz CF Step 2.45200000 GHz Auto Man
RL RF ISO Q. AC Center Freq 915.350000 MHz PN Propriation Propriation 10 dB/div Ref Offset 10.89 dB 20.9 0.800 0.800 0.900 9.11 0.911 -39.1	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 123456 TYPE 123456 TYPE PANN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 GHz Auto Man Freq Offset 0 Hz
RL RF ISO Q. AC Center Freq 915.350000 ME PN PN Ico PN PN Ico Ref Offset 10.89 dB Ref 30.89 dBm Ico Ref 30.89 dBm Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico Ico	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 123456 TYPE 123456 TYPE PANN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz CF Step 2.45200000 GHz Auto Man
RL RF ISO Q. AC Center Freq 915.350000 ME PN PN Ref Offset 10.89 dB Log Ref Offset 10.89 dB 20.9 Image: Construction of the second secon	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNCE OFF ALIGN AUTO #Avg Type: RMS Avg Hold:>10/10 Mkr	TRACE 12 34 5 6 TYPE 12 34 5 6 TYPE P A NNN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 GHz Auto Man Freq Offset 0 Hz
RL RF ISO Q. AC Center Freq 915.350000 MHz PN Program PN 10 dB/div Ref Offset 10.89 dB 20.9 0 10.9 0 0.890 0 .9.11 0 .9.21 0 .9.31 0 .9.11 0 <	C: Wide C Trig: Free Run #Atten: 30 dB 	UNRE OFF	TRACE 12 3 4 5 6 TYPE P A N N N 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz CF Step 2.45200000 GHz Auto Man Freq Offset 0 Hz Scale Type
RL RF ISO Q. AC Center Freq 915.350000 ML PN Ico PN Ico 10 dB/div Ref Offset 10.89 dB Ref 30.89 dBm 20.9 0 0 10.9 0 0 0.890 0 0 9.11 0 0 -39.1	O: Wide Trig: Free Run ain:Low #Atten: 30 dB	UNRE OFF	TRACE 12345.6 TYPE P A NNN 1 915.514 MHz 2.276 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 914.350000 MHz Stop Freq 916.350000 MHz 2.45200000 GHz Auto Man Freq Offset 0 Hz Scale Type



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Keysight Sp	ectrum Analyzer - Sw RF 50 Ω			0.00			ALIGN AUTO	00:20:21 4	MN26 2021	- 6 -
	req 915.700	0000 MHz	: IO: Wide 🕞 Sain:Low	1		#Avg Typ Avg Hold	e: RMS	TRAC	M Nov 26, 2021 DE 1 2 3 4 5 6 PE M WM WWW ET P P A N N N	Frequency
0 dB/div	Ref Offset 10 Ref 30.89 (.89 dB	sain:Low	#Atten: 30			Mk		358 MHz 35 dBm	Auto Tun
. og 20.9										Center Fre 915.700000 MH
890				<u> </u>	-6.00 d					Start Fre 914.700000 MH
9.11			/		512 kH	2				Stop Fre 916.700000 MH
29.1 39.1										CF Ste 2.452000000 GH Auto <u>Ma</u>
49.1										Freq Offse 0 H
59.1										Scale Typ
	15.700 MHz 100 kHz		40 (D)4	300 kHz			.	Span 2	.000 MHz (1001 pts)	Log <u>Li</u>



8.2 MAXIMUM PEAK OUTPUT POWER

<u>LIMIT</u>

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

§ 15.247(b) (4) Except as shown in paragraphs (c) of this section , if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST SETUP



TEST PROCEDURE

The tests were performed in accordance with KDB 558074 D01 v05r02 8.3.1.

11.9.1.1(ANSI C63.10) Measurement Procedure PK2:

- a) Set the RBW \geq DTS bandwidth.
- b) Set VBW \geq [3 \times RBW].
- c) Set span \geq [3 \times RBW].
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

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TEST RESULTS

No non-compliance noted

Model Name	BR35-HW	Test By	Ted Huang
Temp & Humidity	26.5℃, 45%	Test Date	2021/10/26

TX mode

Channel	Channel Frequency (MHz)	Frequency Peak Power Pe		Pass / Fail
Low	915	2.06	30.00	PASS
Middle	915.35	3.81	30.00	PASS
High	915.7	1.94	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 80kbps long.
 2. The cable assembly insertion loss of 10.89dB (including 10 dB pad and 0.89 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

Average Power Data

TX mode

Channel	Channel Frequency (MHz)	Average Power (dBm)		
Low	915	1.32		
Middle	915.35	3.21		
High	915.7	1.04		



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MAXIMUM PEAK OUTPUT POWER

				C	CHL	WO				
	pectrum Analyzer - Sw									- 5 💌
XI RL Center F	RF 50 Ω	AC 0000 MH	7	SENS	E:INT SOUR	#Avg Typ	ALIGN AUTO	TRA	M Oct 26, 2021	Frequency
	Ref Offset 10	P IF	NO: Fast 🕞	Trig: Free F #Atten: 20	Run dB	Avg Hold		TY D		Auto Tune
10 dB/div	Ref 20.89 (2.0	63 dBm	
10.9					. 4					Center Freq 915.000000 MHz
.890										Start Freq 913.500000 MHz
-19.1										Stop Freq 916.500000 MHz
-39.1										CF Step 915.350000 MHz Auto <u>Man</u>
-59.1										Freq Offset 0 Hz
-69.1										Scale Type
	15.000 MHz							Span 3	.000 MHz	Log <u>Lin</u>
	(CISPR) 1 M	Hz	#VBW	3.0 MHz			Sween 1	.000 ms i	(1001 pts)	
									()	E
15G							STATUS			<u> </u>
Keysight Sp	pectrum Analyzer - Sw				CHN	∕lid	STATUS	•		
••• Keysight Sp	pectrum Analyzer - Sw RF 50 Ω Freq 915.350	AC 0000 MH: P	Z NO: Fast ⊂ Gain:Low	SENS	E:INT SOUR	∕lid	ALIGN AUTO DE: RMS	08:28:42 A	M Oct 26, 2021 DE 1 2 3 4 5 6 PE M WWWW ET P P A N N N	Frequency
Keysight Sp Z RL Center F	RF 50 Ω	AC 0000 MH: P IF .89 dB	NO: Fast 🗔	SENS	E:INT SOUR	/id CE OFF AVG TYP	ALIGN AUTO De: RMS I:>10/10	08:28:42 A TRAI TY D r1 915.5	M Oct 26, 2021 CE 1 2 3 4 5 6 PE M WWW	1
Keysight Sp RL Center F	RF 50 Ω Freq 915.350 Ref Offset 10	AC 0000 MH: P IF .89 dB	NO: Fast 🗔	SENS	E:INT SOUR	/id CE OFF AVG TYP	ALIGN AUTO De: RMS I:>10/10	08:28:42 A TRAI TY D r1 915.5	M Oct 26, 2021 2E 1 2 3 4 5 6 PE M WWWW ET P P A N N N 518 MHZ	Frequency
Keysight Sp RL Center F 10 dB/div og 10.9 10.9	RF 50 Ω Freq 915.350 Ref Offset 10	AC 0000 MH: P IF .89 dB	NO: Fast 🗔	SENS	E:INT SOUR Run dB	/id CE OFF AVG TYP	ALIGN AUTO De: RMS I:>10/10	08:28:42 A TRAI TY D r1 915.5	M Oct 26, 2021 2E 1 2 3 4 5 6 PE M WWWW ET P P A N N N 518 MHZ	Frequency Auto Tune Center Freq
Keysight Sp RL Center F	RF 50 Ω Freq 915.350 Ref Offset 10	AC 0000 MH: P IF .89 dB	NO: Fast 🗔	SENS	E:INT SOUR Run dB	/id CE OFF AVG TYP	ALIGN AUTO De: RMS I:>10/10	08:28:42 A TRAI TY D r1 915.5	M Oct 26, 2021 2E 1 2 3 4 5 6 PE M WWWW ET P P A N N N 518 MHZ	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 913.850000 MHz
Keysight Sp R L Center F 10 99 10.9 99.11 -19.1 -39.1	RF 50 Ω Freq 915.350 Ref Offset 10	AC 0000 MH: P IF .89 dB	NO: Fast 🗔	SENS	E:INT SOUR Run dB	/id CE OFF AVG TYP	ALIGN AUTO De: RMS I:>10/10	08:28:42 A TRAI TY D r1 915.5	M Oct 26, 2021 2E 1 2 3 4 5 6 PE M WWWW ET P P A N N N 518 MHZ	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 913.850000 MHz Stop Freq 916.850000 MHz CF Step 915.350000 MHz
20 RL Center F 10 dB/div Log 10.9 .0.90 .0.90	RF 50 Ω Freq 915.350 Ref Offset 10	AC 0000 MH: P IF .89 dB	NO: Fast 🗔	SENS	E:INT SOUR Run dB	/id CE OFF AVG TYP	ALIGN AUTO De: RMS I:>10/10	08:28:42 A TRAI TY D r1 915.5	M Oct 26, 2021 2E 1 2 3 4 5 6 PE M WWWW ET P P A N N N 518 MHZ	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 913.850000 MHz Stop Freq 916.850000 MHz CF Step 915.350000 MHz
Keysight Sr RL Center F	RF 50 Ω Freq 915.350 Ref Offset 10	AC 0000 MH: P IF .89 dB	NO: Fast 🗔	SENS	E:INT SOUR Run dB	/id CE OFF AVG TYP	ALIGN AUTO De: RMS I:>10/10	08:28:42 A TRAI TY D r1 915.5	M Oct 26, 2021 2E 1 2 3 4 5 6 PE M WWWW ET P P A N N N 518 MHZ	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 913.850000 MHz Stop Freq 916.850000 MHz Auto Man Freq Offset 0 Hz
Keysight Sr RL Center F 10.9 9 10.9 9.11 19.1 19.1 69.1 69.1 69.1 Center 9	RF 50 Ω Freq 915.350 Ref Offset 10	AC 0000 MH2 9000 MH2 189 dB 18m	NO: Fast C	SENS	E:INT SOUR Run dB	Aid #Avg Typ Avg Hold	ALIGN AUTO De: RMS I:>10/10	06:28:42 A TRAITY TY 1915.{ 3.8	MOCT 26, 2021 THE [1 2 3 4 5 6 THE MAXIMUM THE P A N IN 318 MHz 09 dBm 09 dBm 09 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 913.850000 MHz Stop Freq 916.850000 MHz CF Step 915.350000 MHz Auto Man



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RL	RF 50 Ω AC Feq 915.700000 M	Hz	SENSE:INT SC	#Avg Type: RMS	08:36:04 AM Oct 26, 2021 TRACE 1 2 3 4 5 6	
ontor 1		PNO: Fast 😱 IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg[Hold:>10/10	DET P P A N N N	1
0 dB/div	Ref Offset 10.89 dB Ref 20.89 dBm			Mk	1 915.844 MHz 1.935 dBm	
10.9			_ 1			Center Fre 915.700000 MH
9.11			_			Start Fre 914.200000 MH
29.1						Stop Fre 917.200000 M⊦
19.1						CF Ste 915.350000 M⊦ Auto <u>Ma</u>
i9.1						Freq Offso 0 ⊦
	15.700 MHz (CISPR) 1 MHz	#\/D\//	3.0 MHz	Swoon 1	Span 3.000 MHz .000 ms (1001 pts)	Scale Typ



8.3 DUTY CYCLE

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<u>LIMIT</u>

Nil (No dedicated limit specified in the Rules) **TEST EQUIPMENTS**

TEST SETUP



TEST PROCEDURE

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)



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TEST RESULTS

No non-compliance noted.

TEST DATA

Model Name	BR35-HW	Test By	Ted Huang
Temp & Humidity	26.5℃, 45%	Test Date	2021/10/26

	us	Times	Ton	Total Ton time(ms)
Ton1	5900	1	5900	
Ton2		0	0	
Ton3			0	5.9
Тр				100

Ton	5.9
Tp(Ton+Toff)	100
Duty Cycle	0.059
Duty Factor	-24.58

Duty Factor = 20log(Duty Cycle)



TEST PLOT

<u>Plot</u>

Kernisht Ca	ectrum Analyzer - Si		CHI	-011		
R L		Ω AC	SENSE:INT SO	JRCE OFF ALIGN AUTO	04:34:29 AM Oct 21, 2021	
	reg 915.00		Trig Delay-1.000 m		TRACE 1 2 3 4 5 6	Frequency
	100 010100	PNO: Fast +	Trig: Video		DET P P A N N N	
		IFGain:Low	#Atten: 10 dB		DEILLERANNIN	Auto Tune
				4	∆Mkr1 5.900 ms	AutoTune
dB/div	Ref 106.99	9 dBµV			-0.60 dB	
9						Center Fre
						915.000000 MH
	≜ 1∆2					510.000000 1111
	*				TRIG LVL	Start Fre
						915.000000 MH
7.0						
7.0						Stop Fre
						915.000000 MH
7.0						
						CF Step
.0						433.920000 MH
						Auto <u>Ma</u>
7.0 V	happen	hillowing the state of the	rinerway and the physical street		Periodern Using Aurorit Verlie	
						Freq Offse
						0 H
'.O						Scale Typ
	15.000000 M 1.0 MHz		W 3.0 MHz	Sweep	Span 0 Hz 100.0 ms (1001 pts)	Log <u>Li</u>

						CH N	lid				
		Analyzer - Swe									
RL enter	Frea	F 50 Ω 915.350	AC 000 MH:	7	Trig Dela	ISE:INT SOUR		ALIGN AUTO e: RMS	TRA	M Oct 21, 2021 CE 1 2 3 4 5 6	Frequency
			Р	- NO:Fast ↔ Gain:Low	Trig: Vide #Atten: 1				TY D	PE WWMWWW ET P P A N N N	
dB/div	Re	f 106.99		Jam.Low					∆Mkr1 5	.900 ms 0.04 dB	Auto Tu
^{,a}											Contor En
7.0											Center Fr 915.350000 M
	∣ ≜1∆	2									510.00000 1
7.0	┦┤									TRIG LVL	Start Fr
7.0											915.350000 M
7.0											Stop Fr
7.0											915.350000 M
											CF Ste
7.0											915.000000 M
7.0											Auto <u>M</u>
/.0	Abol	al Million and All And	Minister of the second s	Marinalla	****	Angeness	undrahanhanhanhanha		how the man with		
7.0						1 - 11	- hus set t			1	Freq Offs
7.0											Scale Ty
enter 9	915.3	50000 MH	7						5	Span 0 Hz	Log <u>I</u>
		PR) 1 MI		#VBW	3.0 MHz		:	Sweep	100.0 ms		
з								STATU	JS		

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RL			m Analyz RF	50 Ω	AC 000 MI				NSE:INT SOUR	CE OFF	ALIGN AUTO		AM Oct 21, 2021	Frequency
en		Tec	915	.7000		PNO: Fas IFGain:Lo			éo			T) [PE WWMWWW DET P P A N N N	Auto Tu
) dB	/div	R	ef 10	6.99 (lBμV						4		5.900 ms -0.02 dB	Autoru
														Center Fr
7.0	w//	Å	1Δ2											915.700000 M
7.0	** 2												TRIG LVL	Start Fr
7.0	+													915.700000 M
7.0	+					_								Stop Fr
7.0	-													915.700000 M
7.0	_					_						-		CF St 915.000000 M
7.0	_													Auto <u>N</u>
7.0	м	W	Waley Not	nghan	den al and	Marcheldlaup	septility	lenfelikterroughi	y trining and	hand an an a fille	ha-spattelfthygyh	have all he	webienelyelulate	Freq Offs
7.0														0
r.u														Scale Ty
			0000	0 MH 1 MH				3.0 MHz					Span 0 Hz (1001 pts)	Log



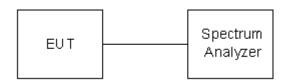
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8.4 POWER SPECTRAL DENSITY

<u>LIMIT</u>

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST SETUP



TEST PROCEDURE

The tests were performed in accordance with KDB 558074 D01 v05r02 8.4.

11.10.2 (ANSI C63.10) Measurement Procedure PKPSD:

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the *DTS bandwidth*.
- 3. Set the RBW to: $3 \text{ kHz} \le \text{RBW} \le 100 \text{ kHz}$.
- 4. Set the VBW \geq 3*RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



TEST RESULTS

Model Name	BR35-HW	Test By	Ted Huang
Temp & Humidity	26.5℃, 45%	Test Date	2021/10/26

TX mode

Channel	Frequency (MHz)	PPSD/3kHz (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	915	-10.49	8.00	-18.49	PASS
Middle	915.35	-8.64	8.00	-16.64	PASS
High	915.7	-9.68	8.00	-17.68	PASS

NOTE: 1. At finial test to get the worst-case emission at 80kbps long.

2. The cable assembly insertion loss of 10.89dB (including 10 dB pad and 0.89 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



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POWER SPECTRAL DENSITY (TX MODE)

					CH L	.ow				
L <mark>XI</mark> RL	pectrum Analyzer - Swep RF 50 Ω	AC		SEI	NSE:INT SOUP		ALIGN AUTO		M Oct 26, 2021	Erequency
	req 915.000	000 MHz	IO: Wide 😱	Trig: Free	e Run	#Avg Type Avg Hold:	e: RMS	TRA	CE 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 10.8 Ref 20.89 dl	IFG 89 dB	Gain:Low	#Atten: 2		-		915.16	1 0 MHz 86 dBm	Auto Tune
10.9										Center Freq 915.000000 MHz
-9.11	a. D. anthe	1 - 1 A MA	Maket	As poil on Ah A.	and A	ha man	MM.	↓1 nh		Start Freq 914.750000 MHz
-19.1 -29.1	words of starting and	VV VV	elise room	and an and		Mar and a	. Duration. Co	, marker , a	when white	Stop Freq 915.250000 MHz
-39.1										CF Step 915.350000 MHz Auto <u>Man</u>
-59.1										Freq Offset 0 Hz
	15.0000 MHz								500.0 kHz	Scale Type
	(-6dB) 3 kHz		#VBW	10 kHz		ę	Sweep 1	1	(1001 pts)	
#Res BW #SG Keysight Sp # RL	pectrum Analyzer - Swep RF 50 Ω	AC			CH N		STATUS ALIGN AUTO	08:30:17/	M Oct 26, 2021	Frequency
Keysight Sp X RL Center F	r (-6dB) 3 kHz pectrum Analyzer - Swep RF 50 Ω Freq 915.3500 Ref Offset 10.8	AC DOO MHz PN IFG 39 dB		SET	NSE:INT SOUF	Mid	ALIGN AUTO e: RMS >10/10	08:30:17 / TRA T) E 915.50	MOCT 26, 2021 CE [1 2 3 4 5 6 PE M WH WW ET P P A NN N 9 0 MHZ	Frequency
Keysight Sp Keysight Sp Keysight Sp RL Center F	ectrum Analyzer - Swep RF 50Ω Freq 915.3500	AC DOO MHz PN IFG 39 dB	O: Wide C	SEP	NSE:INT SOUF		ALIGN AUTO e: RMS >10/10	08:30:17 / TRA T) E 915.50	M Oct 26, 2021 CE [1 2 3 4 5 6 (PE M WH WW W DET P P A N N N	Frequency Auto Tune Center Freq
Keysight Sg Keysight Sg RL Conter F Conter F 10 dB/div Og	pectrum Analyzer - Swee	AC PN IFG BM	O: Wide C	SEP	NSE:INT SOUF		ALIGN AUTO e: RMS >10/10	08:30:17 / TRA T) E 915.50	MOCt 26, 2021 CE 11 2 3 4 5 6 PE M MM WWW TF P P A NN N 9 0 MHz 341 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq
Keysight Sg Keysight Sg RL Conter F Conter F 10 dB/div Og	r (-6dB) 3 kHz pectrum Analyzer - Swep RF 50 Ω Freq 915.3500 Ref Offset 10.8	AC PN IFG BM	O: Wide C	SEP Trig: Fret #Atten: 2	NSE:INT SOUF		ALIGN AUTO E: RMS >10/10 Mkr1	08:30:17 / TRA T) E 915.50	MOCT 26, 2021 CE [1 2 3 4 5 6 PE M WH WW ET P P A NN N 9 0 MHZ	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 915.100000 MHz Stop Freq
Keysight Sg Msg X RL Center F 10 dB/div 0.890 -9.11 -19.11	pectrum Analyzer - Swee	AC PN IFG BM	O: Wide C	SEP Trig: Fret #Atten: 2	NSE:INT SOUF		ALIGN AUTO E: RMS >10/10 Mkr1	08:30:17 / TRA T) E 915.50	MOCt 26, 2021 CE 11 2 3 4 5 6 PE M MM WWW TF P P A NN N 9 0 MHz 341 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 915.100000 MHz Stop Freq 915.600000 MHz CF Step 915.350000 MHz
Keysight Sg Ite discrete for the second s	pectrum Analyzer - Swee	AC PN IFG BM	O: Wide C	SEP Trig: Fret #Atten: 2	NSE:INT SOUF		ALIGN AUTO E: RMS >10/10 Mkr1	08:30:17 / TRA T) E 915.50	MOCt 26, 2021 CE 11 2 3 4 5 6 PE M MM WWW TF P P A NN N 9 0 MHz 341 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 915.100000 MHz Stop Freq 915.500000 MHz CF Step 915.350000 MHz Auto <u>Man</u>
#Res BW Msg Iteration Iterati	pectrum Analyzer - Swee	AC PN IFG BM	O: Wide C	SEP Trig: Fret #Atten: 2	NSE:INT SOUF		ALIGN AUTO E: RMS >10/10 Mkr1	08:30:17 / TRA T) E 915.50	MOCt 26, 2021 CE 11 2 3 4 5 6 PE M MM WWW TF P P A NN N 9 0 MHz 341 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 915.100000 MHz Stop Freq 915.500000 MHz CF Step 915.350000 MHz Auto Man Freq Offset 0 Hz
Keysight Sp 20 RL Center F 10.9 -9.11 -9.11 -29.1 -39.1 -69.1 -69.1 -69.1 -69.1 Center 9	pectrum Analyzer - Swep	AC PN IFG BM	C: Wide C	SEP Trig: Fret #Atten: 2	NSE:INT SOUF	Mid #Avg Type Avg Hold:	ALIGN AUTO : RMS >10/10 Mkr1	08:30:17/ TRA TT 915.50 -8.€	M Oct 26, 2021 CE [1 2 3 4 5 6 PPE M WWWWW 9 0 MHz 341 dBm 0 0 MHz 341 dBm	Frequency Auto Tune Center Freq 915.350000 MHz Start Freq 915.100000 MHz Stop Freq 915.500000 MHz CF Step 915.350000 MHz Auto Man



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RL RF	50 Ω AC 15.700000 MI	47	SENSE:INT SOU	RCE OFF ALIGN AU #Avg Type: RMS	TO 08:47:43 AM Oct 26, 2021 TRACE 1 2 3 4 5 6	Frequency
		PNO: Wide C Trig:	Free Run en: 20 dB	Avg Hold:>10/10	DET P P A N N N	
0 dB/div Ref)ffset 10.89 dB 20.89 dBm			Mkr1 9	15.537 787 5 MHz -9.683 dBm	Auto Tun
og						Center Fre 915.700000 MH
390	ANY WAY A MAN JAN	under and the work	An arrive to r	hummerine	Marghan and with a	Start Fre 915.450000 M⊦
9.1 WWWWWWWW	WW. OHN P.	All and a second second			ang file service and a second a service of the second second second second second second second second second s	Stop Fre 915.950000 M⊦
9.1						CF Ste 915.350000 M⊦ Auto <u>Ma</u>
9.1						Freq Offso 0 H
9.1					Span 500.0 kHz	Scale Typ



8.5 CONDUCTED SPURIOUS EMISSION

<u>LIMITS</u>

§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 900MHz band.

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TEST RESULTS

OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

Model Name	BR35-HW	Test By	Ted Huang
Temp & Humidity	26.5℃, 45%	Test Date	2021/10/26

AL W SOL AL Issue of participation Issue of participation Prequency Prequency Prequency Prequency Author Tur 0 Bellow Max with the set of the set				CHL	_OW	(30M	Hz~1	10GH	lz)		
Enter Freq 915.000000 MHz (Feam.tow) Trig: Freq Run Axighide3:100 Avg Type RMS Type Press Type Press <thtype press<="" th=""> Type Press Type Pres<</thtype>					-				00.000		- 6 -
Auglidid Trg: Pre-Rum Auglidid Trg: Pre-Rum Ref Orset 10.9 d/B Mikr1 914.842 MHz 2.790 dBm 0 dBdiv Ref 30.89 dBm Center Frr 0 dBdiv Stop Fre 91.000000 MH 0 dBdiv Stop Fre 91.000000 MH 0 dBdiv Ref 30.89 dBm CF Ste 0 dBdiv Ref 30.80 dBm Center Frr 0 dBdiv Ref 30.80 dBm Stop Fre 0 dBdiv Ref 30.80 dBm Center Fri 0 dBdiv Ref 30.80 dBm Stop Fre 0 dBdiv Ref 30.89 dBm Stop Fre 0 dBdiv Ref 30.89 dBm Stop Fre 0 dBdiv Ref 30.89 dBm Stop Fre 0 dBdiv <td< td=""><td></td><td></td><td></td><td></td><td>SEN</td><td>ISE:INT SOUR</td><td></td><td></td><td>TRAC</td><td>E123456</td><td>Frequency</td></td<>					SEN	ISE:INT SOUR			TRAC	E123456	Frequency
0 geldiv Ref 30.89 dBm 2.790 dBm 0 geldiv Ref 30.89 dBm 2.790 dBm 0 geldiv Ref 30.89 dBm Center Fre 915.00000 MH 0 geldiv 1	Jenner Fl	54 515.000	PNO: \	Wide 😱 :Low				l:>10/10	TYP DE	E MWMWWW T P P A N N N	Auto T
203 1<	10 dB/div -°g							Mł			Auto Tur
30 5:00 dB 5:00 dB 5:00 dB 31 5:12 kHz 5:20 dB 5:20 kHz 5:00 dB 31 5:12 kHz 5:20 kHz	20.9										Center Fre 915.000000 MH
880 -5.00 dB 913.00000 WH 811 512 KHz -5.00 dB Stop Fre 811 512 KHz -5.00 dB -5.00 dB 811 -5.00 dB -5.00 dB -5.00 dB 91 -5.00 dB -5.00 dB -5.00 dB 91 -5.00 dB -5.00 dB -5.00 dB 91 -5.00 dB -5.00 dB -5.00 dB 92 -5.00 dB -5.00 dB -5.00 dB 92 -5.00 dB -5.00 dB -5.00 dB 93 -5.00 dB -5.00 dB -5.00 dB 94 -5.00 dB -5.00 dB <	10.9				<u>*1</u>						Start Fre
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Auto Ma Auto Ma Auto Ma FreqOffs 04 05 04 05 04 05 04 05 04 05 04 05 05 05 05 05 05 05 05 05 05	-29.1										
49.1 0.1 69.1 0.1 69.1 0.1 69.1 0.1 69.1 0.1 69.1 0.1 69.1 0.1 69.1 0.1 60.1 0.1 60.1 0.1 60.1 0.1 61.1 0.1 62.1 0.1 63.1 0.1 64.1 0.1 65.1 0.1 65.1 0.1 65.1 0.1 65.1 0.1 65.1 0.1 65.1 0.1 65.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 7.1 0.1 <t< td=""><td>-39.1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>more and a second</td><td></td></t<>	-39.1									more and a second	
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Center 915.000 MHz Span 2.000 MHz Log Res BW 100 KHz #VBW 300 KHz Sweep 1.000 ms (1001 pts) Iog Iog<	-59.1	_									
Res BW 100 KHz #VBW 300 kHz Sweep 1.000 ms (1001 mts) SG STATUS SG STATUS Start Freq 850.000000 MHz SENSE:NT SOURCE OFF ALLEM AUTO 09:49:10 AMDE: 14, 221 AVg1Hold:>10/10 Frequency Ref Offset 10.89 dB Mkr1 914.845 00 MHz Frequency 0 dBdiv Ref Offset 10.89 dB 0.11 1 0 dBdiv Ref Offset 10.89 dB 0.11 1 0 dBdiv Ref Offset 10.89 dB Center Freq 925.000000 MHz 0 dBdiv Ref Offset 10.89 dB Center Freq 925.000000 MHz 0 dBdiv Ref Offset 10.89 dB Center Freq 925.000000 MHz 0 dBdiv Ref Offset 10.89 dB Start Freq 850.000000 MHz 0 dBdiv Ref Offset 10.89 dB 0.11 1 0 dBdiv Ref Offset 10.89 dB Ref Offset 10.89 dB 0 dBdiv Ref Offset 10.80 dB Ref Offset 10.80 dB 1 d1 d1	Contor 01	6 000 MH-							Snon 2		
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RL RF 50.2. AC SENSE:INT [SOURCE OFF ALION AUTO (96:49:10 AUDoc 14, 2021) Start Freq 850.000000 MHz Trig: Freq Run Avg Type: RMS Trace: [J3:45:5] Frequency PNO: Fast Trig: Freq Run Avg Type: RMS Trace: [J3:45:5] Frequency 0 dB/div Ref Offset 10.89 dB Mkr1 914.845 00 MHZ Auto Tur 0 dB/div Ref Offset 10.89 dB 2.358 dBm Center Fre 0 g 1 1 1 1 1 0 dB/div Ref Offset 10.89 dB 0.41 1 1 1 0 g 1 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>STATU</td><td>IS</td><td></td><td></td></td<>								STATU	IS		
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9.11					♦ ¹						925.000000 MH
19.1 2 3 1]						Start Er
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#Res BW 100 kHz #VBW 300 kHz Sweep 16.00 ms (40001 pts) 5.32000000 GA 1 <td>-19.1</td> <td></td> <td>er at hydry, i china di, i</td> <td><u>2</u></td> <td>Antes</td> <td></td> <td></td> <td>a late ya bisa an is</td> <td>Ja Česta da te kolej kre</td> <td>العربية وياد 100 M</td> <td>Stop Fre</td>	-19.1		er at hydry, i china di, i	<u>2</u>	Antes			a late ya bisa an is	Ja Česta da te kolej kre	العربية وياد 100 M	Stop Fre
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	-19.1 -29.1 -39.1 -49.1 -59.1 Start 0.85 #Res BW MIRE MODE IF 1 N 1 3 N 1 4 -5	5000 GHz 100 kHz 100 kHz	X 914.845 00 M 902.000 M	#VBW (300 kHz 2.358 dE 51.923 dE	FUN Bm 3m	s	-	6.00 ms (4	0001 pts)	Stop Fre 1.00000000 Gł CF Ste 5.32000000 Gł Auto <u>Mi</u> Freq Offs
	.19.1	5000 GHz 100 kHz 100 kHz	X 914.845 00 M 902.000 M	#VBW (300 kHz 2.358 dE 51.923 dE	FUN Bm 3m	s	-	6.00 ms (4	0001 pts)	Stop Fre 1.00000000 GF 5.32000000 GF Auto <u>Ma</u> Freq Offs 0 F
SG STATUS	.19.1	5000 GHz 100 kHz 100 kHz	X 914.845 00 M 902.000 M	#VBW (300 kHz 2.358 dE 51.923 dE	FUN Bm 3m	s	-	6.00 ms (4	0001 pts)	Stop Fre 1.00000000 GH CF Ste 5.32000000 GH Auto Ma Freq Offs: 0 H Scale Typ



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	ectrum Analyzer									- 7
Start Fre		50 Ω AC 000 MHz			SE:INT SOUR	#Avg Typ		TRAC	MDec 14, 2021 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset Ref 30.8	IF t 10.89 dB	NO:Fast ⊂ Gain:Low	Trig: Free #Atten: 30		Avg Hold		kr1 914.	84 MHz 64 dBm	Auto Tune
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-9.11 -19.1 -29.1		4							-17.21 dBm	Start Fre 30.000000 MH
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Start 0.03 #Res BW	100 kHz		#VB	W 300 kHz	FUNC		weep 95	4.7 ms (4	.000 GHz 0001 pts)	CF Ste 5.320000000 GH Auto <u>Ma</u>
1 N 1 2 N 1 3 N 1 4 N 1 5 6	f f f f	× 914.8 902.00 928.000 0 1.829 8	0 MHz	1.864 dB -51.478 dB -53.202 dB -23.192 dB	m m m			FUNCTION		Freq Offse 0 ⊦
7 8 9 10										Scale Typ
MSG				III			STATUS	60	• •	Log <u>Li</u>



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Report No.: TMTN2110000501NR

				CF	I Mid	(301)	ИHz~1	0011	Z)			
Keysight Sp R L	ectrum Ana RF	lyzer - Swept 50 Ω				SENSE:INT S	DURCE OFF	ALIGN AUTO	08:17:16	AM Nov 26, 202	1	6
enter F			00 MH2		Tria P	ree Run	#Avg Typ Avg Hold	e:RMS	TR/	ACE 1 2 3 4 5	6 Freque	ncy
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		fset 10.8						Mk		514 MH 276 dBn	41	o Tun
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Res BW				#VB	W 300 k	Hz	;	Sweep '	.000 ms		-11	<u>L</u>
Res BW	100 kH	<b>1Z</b> Iyzer - Swept		#VB	W 300 ki			STATU	1.000 ms s	(1001 pts		
Res BW SG Keysight Sp	<b>100 kH</b> eectrum Ana RF	<b>Iz</b> Iyzer - Swept	AC	#VB		SENSE:INT S	DURCE OFF	STATU	08:27:27	(1001 pts	1 6 Freque	- J - D
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Res BW           3G           Keysight Sp           RL           itart Free           0 dB/div           20.9           10.9           9.11           19.1	100 kH RF eq 850. Ref O	Iz  yzer - Swept   50 Ω 000000 ffset 10.8	AC D MHz PI IF( 9 dB	NO: Fast	→ Trig: F #Atter	SENSE:INT SI	DURCE OFF	ALIGN AUTO e: RMS :>10/10	1.000 ms s 08:27:27 TRU T 915.238	(1001 pts AM Nov 26, 202 ACE 1 2 3 4 5 YPE MWMWW DET P P A N N 8 75 MH	1 6 Freque N Aut 925.0000	o Tun er Fre
Res         BW           sq         .           keysight Sp         .           Itart Free         .           0 dB/div         .           90         .           10.9         .           9.11         .           9.11         .           9.11         .           9.11         .	100 kH RF eq 850. Ref O	Iz  yzer - Swept   50 Ω 000000 ffset 10.8	AC D MHz PI IF( 9 dB	NO: Fast C Gain:Low	→ Trig: F #Atter	SENSE:INT SI	DURCE OFF	ALIGN AUTO e: RMS :>10/10	1.000 ms s 08:27:27 TRU T 915.238	(1001 pts AM Nov 26, 202 ACE [12] 3 4 5 Yee M WAWWAN Detr   P P A N N 3 75 MH: 375 dBn	1     6       Freque       N       Aut       925.0000       Sta	o Tun er Fre
Res         BW           sc	100 kl Ref 0 Ref 0	1z  yzer - Swept 50 Ω 0000000 ffset 10.8 80.89 dE	AC D MHz PI IF( 9 dB	NO: Fast	→ Trig: F #Atter	SENSE:INT SI	DURCE OFF	ALIGN AUTO e: RMS :>10/10	1.000 ms s 08:27:27 TRU T 915.238	(1001 pts AM Nov 26, 202 ACE [12] 3 4 5 Yee M WAWWAN Detr   P P A N N 3 75 MH: 375 dBn	1         6         Freque           N         Aut           925.0000         Sta           850.0000         Sta	o Tun o Tun er Fre 000 MH rt Fre 000 MH
Res BW           3G           Keysight Sp           RL           Itart Free           0 dB/div           20.9           9           10.9           9.11           19.1           29.1           39.1	100 kl Ref 0 Ref 0	Iz  yzer - Swept   50 Ω 000000 ffset 10.8	AC D MHz PI IF( 9 dB	NO: Fast C Gain:Low	→ Trig: F #Atter	SENSE:INT SI	DURCE OFF	ALIGN AUTO e: RMS :>10/10	1.000 ms s 08:27:27 TRU T 915.238	(1001 pts AM Nov 26, 202 ACE [12] 3 4 5 Yee M WAWWAN Detr   P P A N N 3 75 MH: 375 dBn	1         6         Freque           N         Aut         925.0000           1         Sta         850.0000	o Tun o Tun er Fre 000 M⊢ urt Fre 000 M⊢
Res         BW           SG         Reysight Sp           RL         Itart Free           0 dB/div         Og           20.9	100 kF	iz iyzer - Swept 50 Ω 0000000 ffset 10.8 80.89 dE 0 0 0 0 0 0 0 0 0 0 0 0 0	AC D MHz PI IF( 9 dB	NO: Fast C Gain:Low	→ Trig: F #Atter	SENSE:INT SI	DURCE OFF	ALIGN AUTO e: RMS :>10/10	I.000 ms	(1001 pts AM Nov 26, 202 CCE [12] 3 4 5 YPE M WW WW ET P P A NN 375 dBn 	1         6         Freque           N         Aut           925.0000         Sta           850.0000         Sta           1.0000000         Sta	
Res         BW           SG         Image: Start Free           Image: Start Free         Image: Start Start 0.83           0 dB/div         9           10.9         9           10.9         9           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1           9.11         1	100 kł ectrum Ana RF eq 850. Ref O Ref C L L L L L L L L L L L L L	1z 1yzer - Swept 50 Ω 0000000 ffset 10.8 80.89 dE 1 1 1 1 1 1 1 1 1 1 1 1 1	AC D MHz PI IF( 9 dB	NO: Fast C Gain:Low	Trig: F #Atter	SENSE:INT SI	DURCE OFF   #Avg Typ Avg Hold:	STATU ALIGN AUTO e: RMS >10/10 Mkr1 9	I.000 ms	(1001 pts AM Nov 26, 202 AM Nov 26, 202 AM Nov 26, 202 AM Nov 26, 202 TPE M MANNAN 3 75 MH: 375 MH: 377	1         Freque           N         Aut           2         Cent           925.0000         Sta           850.00000         Sta           2         C	Contractions of the second sec
Res BW           SG           Keysight Sp           RL           Itart Free           0 dB/div           29           0.10.9           9.11           19.1           29.1           39.1           9.11           19.1           29.1           39.1           51.1           Start 0.84           Res BW	100 kH	1z 1yzer - Swept 50 Ω 0000000 ffset 10.8 80.89 dE 1 1 1 1 1 1 1 1 1 1 1 1 1	AC D MHz PI IF( 9 dB	NO: Fast C Gain:Low	→ Trig: F #Atter	SENSE:INT SI	DURCE OFF   #Avg Typ Avg Hold:	statu ALICA AUTO e: RMS >10/10 Mkr1 9	I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5	(1001 pts AM Nov 25, 202 AM	1         Freque           N         Aut           2         Cent           925.0000         Sta           850.00000         Sta           2         C	С С С С С С С С С С С С С С С С С С С
Res         BW           SG         SG           Keysight Sp         RL           Start Free         Start Free           0 dB/div         Start Free           0 dB/div         9           10.9         9           9.11         9           19.1         9           59.1         9           59.1         9           59.1         9           10.9         9           10.1         9           19.1         9           19.1         9           19.1         9           19.1         9           19.1         9           19.1         9           10.9         9           11.0         9           12.1         9           13.1         9           14.1         9           14.1         9           15.1         9           14.1         9           14.1         9           15.1         9           16.1         10	100 kH	1z	AC DMHz P PIFI 9 dB BM	NO: Fast C Gain:Low	Trig: F #Atter	SENSE:INT SI Free Run : 30 dB	DURCE OFF   #Avg Typ Avg Hold:	statu ALICA AUTO e: RMS >10/10 Mkr1 9	I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5	(1001 pts AM Nov 26, 202 AM Nov 26, 202 AM Nov 26, 202 AM Nov 26, 202 TPE M MANNAN 3 75 MH: 375 MH: 377	1         6         Freque           N         Aut           925.0000         Sta           850.0000         Sta           0         2           1.0000000         C           2         2           2         2           2         2           2         2           2         2.4520000           Auto         2	©
Res         BW           So         So           Keysight Sp         RL           Start Free         Start Free           0 dB/div         90           20.9	100 kH ectium Ann RF Ref 0 Ref 0 Ref 1 5000 G 5000 G 100 kH	1z	AC   D MHz P  IF( 9 dB 3m 	NO: Fast C Gain:Low	Trig: F #Atter	SENSE:INT SI Free Run : 30 dB	DURCE OFF   #Avg Typ Avg Hold:	statu ALICA AUTO e: RMS >10/10 Mkr1 9	I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5	(1001 pts AM Nov 25, 202 AM	1         6         Freque           N         Aut           925.0000         Sta           850.0000         Sta           0         2           1.0000000         C           2         2           2         2           2         2           2         2           2         2.4520000           Auto         2	о Тип о Тип ег Fre 000 МН рр Fre 000 GH F Ste 000 GH <u>Ма</u>
Res         BW           SG         Keysight Sp           C Reysight Sp         RL           Start Free         Start Free           0 dB/div         99           10.9	100 kH           Ref 0           Ref 2           Solor G           Solo	1z	AC   D MHz P  IF( 9 dB 3m 	NO: Fast Gain:Low	Trig: F #Atter	SENSE:INT SI Free Run : 30 dB	DURCE OFF   #Avg Typ Avg Hold:	statu ALICA AUTO e: RMS >10/10 Mkr1 9	I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5	(1001 pts AM Nov 25, 202 AM	1         6         Freque           N         Aut           925.0000         Sta           850.0000         Sta           0         2           1.0000000         C           2         2           2         2           2         2           2         2           2         2.4520000           Auto         2	©
Res         BW           SG         Keysight Sp           C Reysight Sp         RL           D GB/div         SG           20.9         SG           10.9         SG           9.11         SG           10         SG	100 kH           Ref 0           Ref 2           Solor G           Solo	1z	AC   D MHz P  IF( 9 dB 3m 	NO: Fast Gain:Low	Trig: F #Atter	SENSE:INT SI Free Run : 30 dB	DURCE OFF   #Avg Typ Avg Hold:	statu ALICA AUTO e: RMS >10/10 Mkr1 9	I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5	(1001 pts AM Nov 25, 202 AM	1         6         Freque           N         Aut         925.000           Sta         850.000         Sta           Auto         Freque         Cent           F         Sta         Sta           Sta         Sta         Sta           F         Sta         Sta           F         Sta         Sta           F         Sta         Sta	о Тип о Тип ег Fre 000 Мн иrt Fre 000 Gh FSte Ma 0 Г f Ste 0 г h
Res         BW           SG         Keysight Sp           RL         Itart Free           0         CB/div           20.9	100 kH           Ref 0           Ref 2           Solor G           Solo	1z	AC   D MHz P  IF( 9 dB 3m 	NO: Fast Gain:Low	Trig: F #Atter	SENSE:INT SI Free Run : 30 dB	DURCE OFF   #Avg Typ Avg Hold:	statu ALICA AUTO e: RMS >10/10 Mkr1 9	I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5	(1001 pts AM Nov 25, 202 AM	1         6         Freque           N         Aut         925.000           Sta         850.000         Sta           Auto         Freque         Cent           F         Sta         Sta           Sta         Sta         Sta           F         Sta         Sta           F         Sta         Sta           F         Sta         Sta	су о Тиг о
Res BW           3G           Keysight Sp           RL           Itart Free           0 dB/div           20.9           10.9           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11           9.11 <td< td=""><td>100 kH           Ref 0           Ref 2           Solor G           Solo</td><td>1z</td><td>AC   D MHz P  IF( 9 dB 3m </td><td>NO: Fast Gain:Low</td><td>Trig: F #Atter</td><td>SENSE:INT SI Free Run : 30 dB</td><td>DURCE OFF   #Avg Typ Avg Hold:</td><td>statu ALICA AUTO e: RMS &gt;10/10 Mkr1 9</td><td>I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5</td><td>(1001 pts AM Nov 25, 202 AM Nov 25, 202 AM</td><td>1         6         Freque           N         Aut         925.000           Sta         850.000         Sta           Auto         Freque         Cent           F         Sta         Sta           Sta         Sta         Sta           F         Sta         Sta           F         Sta         Sta           F         Sta         Sta</td><td></td></td<>	100 kH           Ref 0           Ref 2           Solor G           Solo	1z	AC   D MHz P  IF( 9 dB 3m 	NO: Fast Gain:Low	Trig: F #Atter	SENSE:INT SI Free Run : 30 dB	DURCE OFF   #Avg Typ Avg Hold:	statu ALICA AUTO e: RMS >10/10 Mkr1 9	I.000 ms s 08:27:27 TRU T 0915.238 1.8 1.8 5 5 5 5 5 5 5 5 5 5 5 5 5	(1001 pts AM Nov 25, 202 AM	1         6         Freque           N         Aut         925.000           Sta         850.000         Sta           Auto         Freque         Cent           F         Sta         Sta           Sta         Sta         Sta           F         Sta         Sta           F         Sta         Sta           F         Sta         Sta	



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Keysight Spectrum Analyzer - S					
RL RF 50 art Freq 30.0000	O MHz PNO: Fast	SENSE:INT S	OURCE OFF ALIGN AUTO #Avg Type: RMS AvglHold:>10/10	08:26:08 AM Nov 26, 2021 TRACE 1 2 3 4 5 6 TYPE MWHWWW	
Ref Offset	IFGain:Lov		0.	et   P P A N N N Ikr1 915.34 MHz -1.729 dBm	Auto Tu
0.9 0.9 190					Center F 5.015000000 0
	<b>↓</b>			-17.72 dBm	Start F 30.000000 M
1.1 1.1 1.1					Stop F 10.000000000
art 0.030 GHz Res BW 100 kHz		BW 300 kHz	· · ·	Stop 10.000 GHz 54.7 ms (40001 pts)	CF S 2.452000000 Auto
R         MODE         TRC         SCL           1         N         1         f           2         N         1         f           3         N         1         f           4         N         1         f           5         -         -         -           6         -         -         -	× 915.34 MHz 902.000 MHz 928.00 MHz 1.831 08 GHz	-1.729 dBm -50.370 dBm -49.704 dBm -22.817 dBm	FUNCTION FUNCTION WIDTH		Freq Off
7 8 9 0					Scale T
1					Log



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Report No.: TMTN2110000501NR

				СН	Hig	gh (	30M	Hz~	10GH	lz)		
Keysight S												- 5 💌
Center	RF Frea 9	50 Ω	AC   0000 MHz	,		SENS	E:INT SOUR	#Ava Tv	ALIGN AUTO pe: RMS	08:20:21 A	M Nov 26, 2021	Frequency
Contor	iioqu	,10.700	P	NO:Wide 🔾		g: Free F tten: 30		AvgHold	d:>10/10	TYF	E 1 2 3 4 5 6 E M WM WWW T P P A N N N	
			IFC	Gain:Low	#01	tten. 30	ub		ML	r1 915.8		Auto Tune
10 dB/div	Ref	Offset 10 30.89 c	.89 dB								35 dBm	
	KCI	JU.89 L				•						
												Center Freq
20.9					+				+			915.700000 MHz
10.9							<b>≜</b> 1		-			Start Freq
0.000					h							914.700000 MHz
0.890				->			-6.00 d					
-9.11							512 kH	Z				
-5.11				P					$\mathbf{X}$			Stop Freq
-19.1												916.700000 MHz
-29.1		/			_					$\rightarrow$		CF Step 2.45200000 GHz
	M											Auto <u>Man</u>
-39.1	anangeral				-						man	
												Freq Offset
-49.1												0 Hz
-59.1					+							Scale Type
												Scale Type
Center 9											.000 MHz	Log <u>Lin</u>
#Res B₩	V 100 H	kHz		#VB	N 300	kHz			Sweep 1	1.000 ms (	1001 pts)	
MSG									STATUS	s		
		analyzer - Swe	ept SA									
Keysight S	RF	50 Ω	AC		_	SENS	E:INT SOUR		ALIGN AUTO	08:22:40 AI	MNov 26, 2021	
	RF	50 Ω	AC 00 MHz PI	NO: Fast C		g: Free F	Run	CE OFF #Avg Ty Avg Hold	ALIGN AUTO	08:22:40 AI	M Nov 26, 2021 E 1 2 3 4 5 6 E M WH WWW	
Keysight S	RF	50 Ω	AC 00 MHz PI	NO: Fast ⊂ Gain:Low	Trie #At		Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 Al TRAC TYF DE	E 1 2 3 4 5 6 PE M WH WWW T P P A N N N	Frequency
Keysight S	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	NO: Fast C Gain:Low	Tria #A1	g: Free F	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 MWMWWW P P A N N N OO MHZ	
Keysight S	eq 850 Ref	50 Ω 0.00000	AC DO MHZ PI IFC	NO: Fast C Gain:Low	Tri #At	g: Free F	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 PE M WH WWW T P P A N N N	Frequency
Keysight S XI RL Start Fro 10 dB/div	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	NO: Fast C Gain:Low	Trig #A1	g: Free F	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 MWMWWW P P A N N N OO MHZ	Frequency
Keysight S XI RL Start Fro 10 dB/div Log	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	NO: Fast C Gain:Low	Triț #A1	g: Free F	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 MWMWWW P P A N N N OO MHZ	Frequency Auto Tune
Keysight S W RL Start Fro 10 dB/div Log	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	NO: Fast C Gain:Low	Tria #A1	g: Free F Itten: 30	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 MWMWWW P P A N N N OO MHZ	Frequency Auto Tune Center Freq
Keysight S     Keysight S     Keysight S     Start Fro     10 dB/div     Log     20.9     10.9	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	NO: Fast C Gain:Low	Tri #A1	g: Free F Itten: 30	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 E M W W W T P P A NN N 69 dBm	Frequency Auto Tune Center Freq 925.000000 MHz
Keysight S           X         RL           Start Fr           10 dB/div           20.9           10.9           0.890	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	NO: Fast C Gain:Low	Trie #A1	g: Free F Itten: 30	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 MWMWWW P P A N N N OO MHz	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq
Keysight S           XI         RL           Start Fr           20.9	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	NO: Fast C Gain:Low		g: Free F Itten: 30	Run	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 E M W W W T P P A NN N 69 dBm	Frequency Auto Tune Center Freq 925.000000 MHz
Keysight S           10 dB/div           20.9           10.9           0.890           -9.11           -19.1	eq 850 Ref	50 Ω 0.00000 Offset 10	AC DO MHZ PI IFC	Gain:Low		g: Free F Itten: 30	Run dB	#Avg Ty	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A TRAC TYF DE 015.865	E 1 2 3 4 5 6 E M W W W T P P A NN N 69 dBm	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz
Keysight S           20         RL           Start Fr           10 dB/div           20.9           10.9           0.890           -9.11           -19.1           -29.1           -39.1	Ref Ref	50 Ω 0.00000 Offset 10 ' 30.89 (	AC   P   IFG .89 dB JBm	NO: Fast C Sain:Low	Trig #A1	g: Free F Itten: 30	Run dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i>>10/10 Mkr1 S	08:22:40 A	EI 123456 MWMWWW TPPANNN <b>00 MHz</b> 69 dBm -16.47 dBn	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz Stop Freq
Keysight S           20         RL           Start Fr           10 dB/div           20.9           10.9           0.890           -9.11           -19.1           -29.1           -39.1	Ref Ref	50 Ω 0.00000 Offset 10	AC DO MHz PI IFC	Gain:Low		g: Free F Itten: 30	Run dB	#Avg Tyj Avg Hold	ALIGN AUTO pe: RMS d:>10/10	08:22:40 A	EI 123456 MWMWWW TPPANNN <b>00 MHz</b> 69 dBm -16.47 dBn	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz
Keysight S           ID         dB/div           Log         20.9           10.9         9           0.890         9           -9.11         -           -9.1         -           -39.1         -           -49.1         -           -59.1         -	Ref Ref	0.00000	AC   P   IFG .89 dB JBm	Gain:Low	Trink the second	g: Free F Itten: 30	Run dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i>>10/10 Mkr1 S	08:22:40 AA	EI 12 3 4 5 6 EMWHWWWF FT P P A NNN 60 MHz 69 dBm 	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz Stop Freq
Keysight S           TRL           Start Fr           10 dB/div           20.9           10.9           0.890           -9.11           -19.1           -29.1           -39.1           -39.1           -59.1           Start 0.8           Start 0.8	Ref Ref 85000 0	0.00000	AC   P   IFG .89 dB JBm	2	#A1	g: Free Fitten: 30	Run dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S	08:22:40 Al TRAC TVD 0915.865 2.90	EI 12 3 4 5 6 EM WARNWENT FT P P A N N N OO MHZ 69 dBm 	Frequency Auto Tune Center Freq 925.00000 MHz Start Freq 850.00000 MHz 1.0000000 GHz CF Step
Keysight S           10 dB/div           10 dB/div           20.9           10.9           0.890           -9.11           -19.1           -29.1           -39.1           -39.1           -59.1           Start 0.8           #Res BV	Ref Ref 85000 0	0.00000	AC   PI PI PI PI PI PI PI PI PI PI	2	#A1	g: Free Fiten: 30	Run dB ∧3	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 EM WARNING TP P A NNN 00 MHz 69 dBm 	Frequency           Auto Tune           Center Freq           925.000000 MHz           Start Freq           850.000000 MHz           Stop Freq           1.000000000 GHz           2.45200000 GHz
Keysight S           7         RL           Start Fri           10 dB/div           20.9           10.9           0.890           9.11           -19.1           -29.1           -39.1           -49.1           Start 0.8           #Res BV	Ref Ref Ref 35000 0 V 100 1	0.00000	AC   PI IFC 89 dB 18m 18m 18m 18m 18m 18m 18m 18m	2 2 #VB	#A1	g: Free Fitten: 30	Run dB ∧3 Func	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S	08:22:40 AI	EI 12 3 4 5 6 EM WARNWENT FT P P A N N N OO MHZ 69 dBm 	Frequency Auto Tune Center Freq 925.00000 MHz Start Freq 850.00000 MHz 1.0000000 GHz CF Step
Keysight S           20         RL           Start Fr         10 dB/div           Log         20.9           10.9         0.890           9.11         -           -9.11         -           -9.11         -           -9.11         -           -9.1         -           -9.1         -           Start 0.8         -           Start 0.8         -           -9.1         -           -9.1         -           -1.1         -           -29.1         -           -39.1         -           -59.1         -           Start 0.8         -           -1         -	RF eq 850	0.00000	AC 00 MHz PI IFC 89 dB 18m 915.865 01 920.000 01	2 #VB1 0 MHz 0 MHz	#A1	g: Free k tten: 30	Aun dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 EM WARNING TP P A NNN 00 MHz 69 dBm 	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz 1.00000000 GHz 2.45200000 GHz Auto Man
Keysight S           10 dB/div           10 dB/div           20.9           10.9           0.890           -9.11           -19.1           -29.1           -39.1           -39.1           -39.1           -89.1           -89.1           -9.11           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -9.1           -10.8           -10.8           -11.4           -11.4           -12.1           -13.1           -1           -2           -3           -3	RF eq 850	0.00000	AC 00 MHz PI IFC 89 dB 1Bm 1Bm	2 #VB1 0 MHz 0 MHz	#A1	g: Free J tten: 30	Aun dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 EM WARNING TP P A NNN 00 MHz 69 dBm 	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz 1.000000000 GHz 1.00000000 GHz 2.45200000 GHz Auto Man Freq Offset
Keysight S           27         RL           Start Fr           10         dB/div           20.9            10.9            0.890            -9.11            -9.1            -9.1            -9.1            -9.1            -9.1            Start 0.8            #Res BV            1         1           2         N           3         1           4         5	RF eq 850	0.00000	AC 00 MHz PI IFC 89 dB 18m 915.865 01 920.000 01	2 #VB1 0 MHz 0 MHz	#A1	g: Free k tten: 30	Aun dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 EM WARNING TP P A NNN 00 MHz 69 dBm 	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz 1.00000000 GHz 2.45200000 GHz Auto Man
Keysight S           27         RL           Start Fr           10         dB/div           20.9            10.9            0.890            -9.11            -9.1            -9.1            -9.1            -9.1            -9.1            Start 0.8            #Res BV            1         1           2         N           3         1           4         5	RF eq 850	0.00000	AC 00 MHz PI IFC 89 dB 18m 915.865 01 920.000 01	2 #VB1 0 MHz 0 MHz	#A1	g: Free k tten: 30	Aun dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 EM WARNING TP P A NNN 00 MHz 69 dBm 	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz 1.00000000 GHz 1.00000000 GHz Auto Man Freq Offset 0 Hz
Keysight S           20 RL           Start Fr           10 dB/div           20 9           10.9           0.90           10.9           0.91           -9.11           -19.1           -29.1           -39.1           -59.1           Start 0.8           #Res BV           1 N           2 N           3 N           4           5           1 N           2 N           3 N           4           5           6           7           8	RF eq 850	0.00000	AC 00 MHz PI IFC 89 dB 18m 915.865 01 920.000 01	2 #VB1 0 MHz 0 MHz	#A1	g: Free k tten: 30	Aun dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 6 EN WARNEN ET P P A N N N OO MHz 69 dBm 	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz 1.000000000 GHz 1.00000000 GHz 2.45200000 GHz Auto Man Freq Offset
Keysight S           10 dB/div           Log           20.9           10.9           0.890           9.11           -19.1           -29.1           -39.1           -59.1           Start 0.8           #Res BV           11           2           1           2           1           2           3           4           6           7           9           10	RF eq 850	0.00000	AC 00 MHz PI IFC 89 dB 18m 915.865 01 920.000 01	2 #VB1 0 MHz 0 MHz	#A1	g: Free k tten: 30	Aun dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 6 EN WARNEN ET P P A N N N OO MHz 69 dBm 	Frequency Auto Tune Center Freq 925.000000 MHz Start Freq 850.000000 MHz 1.00000000 GHz 1.00000000 GHz Auto Man Freq Offset 0 Hz
Keysight S           20 RL           Start Fr           10 dB/div           20 9           10.9           0.900           9.11           -19.1           -29.1           -39.1           -59.1           Start 0.8           #Res BV           1 N           2 N           3 N           4           5           1 N           2 N           3 N           4           5           7           8	RF eq 850	0.00000	AC 00 MHz PI IFC 89 dB 18m 915.865 01 920.000 01	2 #VB1 0 MHz 0 MHz	#A1	g: Free k tten: 30	Aun dB	#Avg Tyj Avg Hold	ALIGN ALITO pe: RMS i:>10/10 Mkr1 S 	08:22:40 AI	EI 12 3 4 5 6 6 EN WARNEN ET P P A N N N OO MHz 69 dBm 	Frequency         Auto Tune         Center Freq         925.000000 MHz         Start Freq         Stop Freq         1.000000000 GHz         CF Step         2.45200000 GHz         Auto       Man         Freq Offset         Offset         Scale Type



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	ectrum Analyzer									- 5 💌
Start Fre		50 Ω AC 000 MHz			SE:INT SOUR	ACE OFF #Avg Typ AvalHold		TRA	M Nov 26, 2021 CE 1 2 3 4 5 6 PE M WM WWW	Frequency
10 dB/div	Ref Offse Ref 30.8	t 10.89 dB 89 dBm	PNO: Fast IFGain:Low	#Atten: 30		Arginola		• kr1 915	.83 MHz 52 dBm	Auto Tune
20.9 10.9 0.890	1									Center Fred 5.015000000 GHz
-9.11 -19.1 -29.1		4							-16.47 dBm	Start Free 30.000000 MHz
-39.1 -49.1 -59.1	2 ³				a de contra de la co				a kon ante en este da el	Stop Fred 10.000000000 GHz
Start 0.03 #Res BW	100 kHz	X	#VE	300 kHz	FUN	S CTION FUR	<u> </u>	4.7 ms (4	0000 GHz 0001 pts)	CF Step 2.452000000 GH: Auto <u>Mar</u>
1 N 1 2 N 1 3 N 1 4 N 1 5 6	f f f f	902 928.00	5.83 MHz .000 MHz 0 00 MHz 1 08 GHz	1.752 dE -52.031 dE -50.796 dE -25.764 dE	8m 8m				E	Freq Offse 0 Ha
6 7 8 9 10 11										Scale Type
MSG				m			STATUS	•	•	



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### 8.6 RADIATED EMISSIONS

### **8.6.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS**

#### <u>LIMITS</u>

§ 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	(2)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



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§ 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)		
30 - 88	100 **	3		
88 - 216	150 **	3		
216 - 960	200 **	3		
Above 960	500	3		

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz, However, operation within these frequency bands is permitted under other sections of this Part, e-g, Sections 15.231 and 15.241.

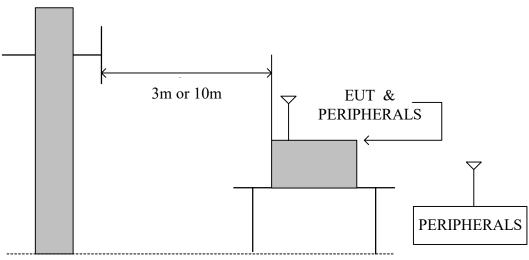
§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.



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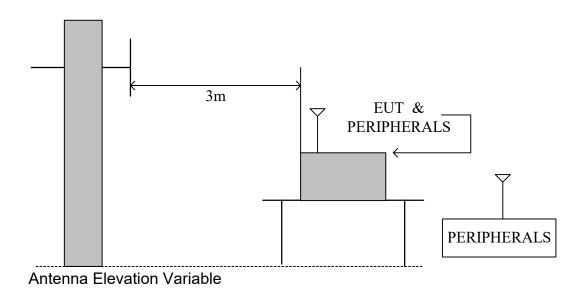
## TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 to 1GHz.



Antenna Elevation Variable

The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.





### TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8/1.5 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. White measuring the radiated emission below 1GHz, the EUT was set 3/10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. White measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. The tests were performed in accordance with KDB 558074 D01 v05r02.

### NOTE :

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
- 3. Average value=Peak value + Duty factor.
- No emission is found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)

## TEST RESULTS

No non-compliance noted.

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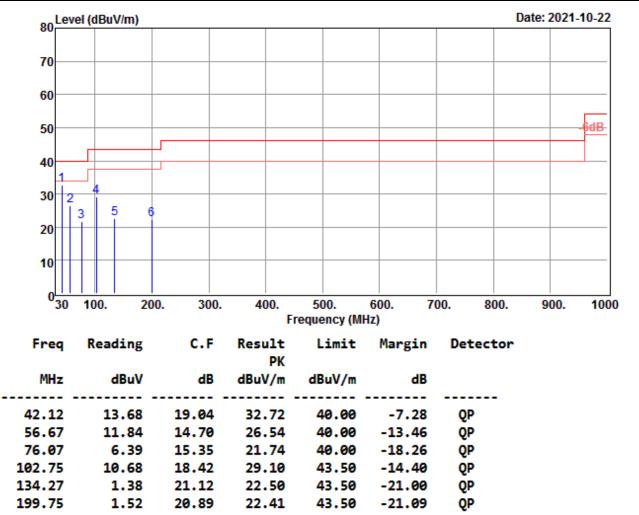
Report No.: TMTN2110000501NR

# 8.6.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Product Name	Wireless Water Leak Sensor	Test Date	2021/10/22
Model	BR35-HW	Test By	Ted Huang
Test Mode	ТХ	TEMP& Humidity	26.5°∁/56%

### Horizontal

(The chart below shows the highest readings taken from the final data.)



**Remark:** 

- 1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
- 2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
- 3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
- 4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 5. Emission at 3m Level=Meter Reading +Antenna Factor +Cable Loss Margin= Emission at 3m Level -Limits
- 6. That the limit for signals below 1GHz is a QP limit and peak readings are below the QP limit.
- 7. The fundamental signal is not shown in the test data because measurements at fundamental frequency are shown separately and were ignored during the 30 1000 MHz scan.

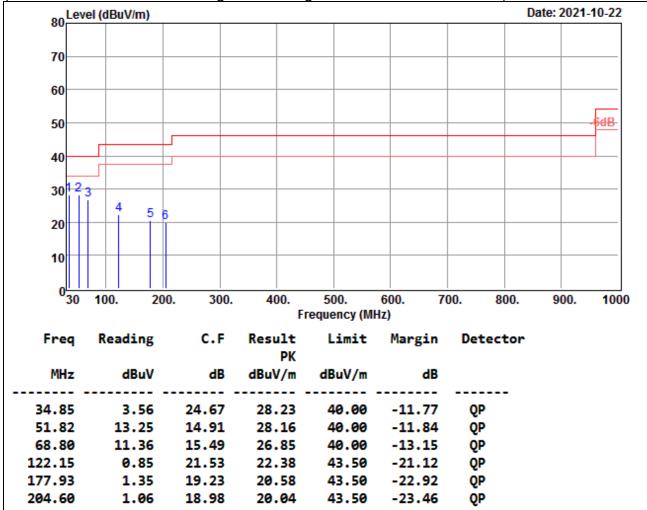


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Report No.: TM	Report No.: TMTN2110000501NR							
Product Name	Wireless Water Leak Sensor	Test Date	2021/10/22					
Model	BR35-HW	Test By	Ted Huang					
Test Mode	ТХ	TEMP& Humidity	26.5℃/56%					

Vertical

(The chart below shows the highest readings taken from the final data.)



Remark:

- 1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
- 2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
- 3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
- 4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 5. Emission at 3m Level=Meter Reading +Antenna Factor +Cable Loss Margin= Emission at 3m Level -Limits
- 6. That the limit for signals below 1GHz is a QP limit and peak readings are below the QP limit.
- 7. The fundamental signal is not shown in the test data because measurements at fundamental frequency are shown separately and were ignored during the 30 1000 MHz scan.



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# 8.6.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	Wireless Water Leak Sensor	Test Date	2021/10/26
Model	BR35-HW	Test By	Ted Huang
Test Mode	TX (CH Low)	TEMP& Humidity	26.5℃, 45%

		TX mod	e / CH L	_ow	Measure	ement	Distance a	at 3m 🛛 H	lorizontal	polarity
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
	1829.68	86.85	29.24	3.50	44.29	0.80	76.10	84.32	-8.22	Р
	1829.68	-	-	-	-	-	51.52	64.32	-12.80	А
*	2745.53	71.21	30.15	4.12	43.49	0.87	62.85	74.00	-11.15	Р
*	2745.53	-	-	-	-	-	38.27	54.00	-15.73	А
*	3659.41	72.49	30.59	4.67	42.89	0.27	65.14	74.00	-8.86	Р
*	3659.41	-	-	-	-	-	40.55	54.00	-13.45	А
*	4575.85	62.49	32.34	5.29	42.63	0.20	57.69	74.00	-16.31	Р
*	4575.85	-	-	-	-	-	33.11	54.00	-20.89	А
	5488.88	64.49	33.90	5.86	42.67	0.40	61.97	74.00	-12.03	Р
	5488.88	-	-	-	-	-	37.39	54.00	-16.61	А
	6406.45	59.35	35.31	6.19	42.73	0.24	58.35	74.00	-15.65	Р
	6406.45	-	-	-	-	-	33.77	54.00	-20.23	А
*	7318.68	55.04	39.11	6.59	42.29	0.27	58.72	74.00	-15.28	Р
*	7318.68	-	-	-	-	-	34.14	54.00	-19.86	А
*	8236.55	57.01	38.76	6.77	41.08	0.28	61.74	74.00	-12.26	Р
*	8236.55	-	-	-	-	-	37.16	54.00	-16.84	А

		TX mod	e / CH L	_ow	Measur	ement	at 3m	Vertical polarity		
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
	1829.68	81.74	29.24	3.50	44.29	0.80	70.99	75.66	-4.67	Р
	1829.68	-	-	-	-	-	46.41	55.66	-9.25	А
*	2745.57	61.52	30.15	4.12	43.49	0.87	53.16	74.00	-20.84	Р
*	2745.57	-	-	-	-	-	28.58	54.00	-25.42	А
*	3659.22	69.59	30.59	4.67	42.89	0.27	62.23	74.00	-11.77	Р
*	3659.22	-	-	-	-	-	37.65	54.00	-16.35	А
*	4575.71	60.78	32.34	5.29	42.63	0.20	55.98	74.00	-18.02	Р
*	4575.71	-	-	-	-	-	31.40	54.00	-22.60	А
	5489.20	63.36	33.90	5.86	42.67	0.40	60.85	74.00	-13.15	Р
	5489.20	-	-	-	-	-	36.27	54.00	-17.73	А
	6406.24	56.65	35.31	6.19	42.73	0.24	55.66	74.00	-18.34	Р

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	6406.24	-	-	-	-	-	31.07	54.00	-22.93	А
*	7318.44	54.99	39.11	6.59	42.29	0.27	58.67	74.00	-15.33	Р
*	7318.44	-	-	-	-	-	34.08	54.00	-19.92	А
*	8236.36	55.39	38.76	6.77	41.08	0.28	60.13	74.00	-13.87	Р
*	8236.36	-	-	-	-	-	35.54	54.00	-18.46	А

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High pass-1G Filter Insertion Loss.

Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz. Average level=Peak level + Duty factor 2.

3.

4. The result basic equation calculation is as follow: Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit The other emission levels were 20dB below the limit

5.

6 The test limit distance is 3m limit.

7 *=Restricted bands of operation



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Report No.: TMTN2110000501NR

Product Name	Wireless Water Leak Sensor	Test Date	2021/10/26
Model	BR35-HW	Test By	Ted Huang
Test Mode	TX (CH Middle)	<b>TEMP&amp; Humidity</b>	26.5℃, 45%

	-	TX mode	/ CH Mi	ddle	Measure	ement	Distance a	at 3m 🛛	Horizontal polarity		
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark	
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)	
	1831.12	83.11	29.25	3.50	44.29	0.81	72.37	87.00	-14.63	Р	
	1831.12	-	-	-	-	-	47.79	67.00	-19.21	А	
*	2746.60	70.08	30.15	4.12	43.49	0.87	61.72	74.00	-12.28	Р	
*	2746.60	-	I	-	-	I	37.13	54.00	-16.87	А	
*	3660.81	72.64	30.59	4.67	42.89	0.27	65.28	74.00	-8.72	Р	
*	3660.81	-	I	-	-	I	40.70	54.00	-13.30	А	
*	4577.68	62.17	32.35	5.29	42.63	0.20	57.37	74.00	-16.63	Р	
*	4577.68	-	I	-	-	I	32.79	54.00	-21.21	А	
	5492.99	64.75	33.90	5.87	42.67	0.40	62.24	74.00	-11.76	Р	
	5492.99	-	I	-	-	I	37.66	54.00	-16.34	А	
	6406.44	58.65	35.31	6.19	42.73	0.24	57.66	74.00	-16.34	Р	
	6406.44	-	I	-	-	I	33.08	54.00	-20.92	А	
*	7321.56	59.11	39.12	6.59	42.29	0.27	62.80	74.00	-11.20	Р	
*	7321.56	-	-	-	-	-	38.22	54.00	-15.78	А	
*	8239.40	52.96	38.76	6.77	41.08	0.28	57.69	74.00	-16.31	Р	
*	8239.40	-	-	-	-	-	33.11	54.00	-20.89	А	

I										
	-	TX mode	/ CH Mic	ddle	Measur	ement	/ertical p	ertical polarity		
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
	1830.92	80.34	29.25	3.50	44.29	0.81	69.61	77.14	-7.53	Р
	1830.92	-	-	-	-	-	45.02	57.14	-12.12	А
*	2746.58	64.91	30.15	4.12	43.49	0.87	56.55	74.00	-17.45	Р
*	2746.58	-	-	-	-	-	31.97	54.00	-22.03	А
*	3660.73	66.28	30.59	4.67	42.89	0.27	58.93	74.00	-15.07	Р
*	3660.73	-	-	-	-	-	34.34	54.00	-19.66	А
*	4577.50	60.24	32.35	5.29	42.63	0.20	55.44	74.00	-18.56	Р
*	4577.50	-	-	-	-	-	30.86	54.00	-23.14	А
	5490.92	60.58	33.90	5.87	42.67	0.40	58.06	74.00	-15.94	Р
	5490.92	-	-	-	-	-	33.48	54.00	-20.52	А
	6408.58	57.17	35.32	6.19	42.73	0.24	56.19	74.00	-17.81	Р
	6408.58	-	-	-	-	-	31.60	54.00	-22.40	А

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	Repo	ort No.:	TMTN211	0000501NR					Rev.:	03
*	7321.64	55.51	39.12	6.59	42.29	0.27	59.21	74.00	-14.79	Р
*	7321.64	-	-	-	-	-	34.63	54.00	-19.37	А
*	8239.15	53.24	38.76	6.77	41.08	0.28	57.97	74.00	-16.03	Р
*	8239.15	-	-	-	-	-	33.39	54.00	-20.61	А

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High pass-1G Filter Insertion Loss.

Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz. 2.

Average level=Peak level + Duty factor З.

4. The result basic equation calculation is as follow: Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit The other emission levels were 20dB below the limit

5.

6 The test limit distance is 3m limit.

7 *=Restricted bands of operation



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Report No.: TMTN2110000501NR

Product Name	Wireless Water Leak Sensor	Test Date	2021/10/26
Model	BR35-HW	Test By	Ted Huang
Test Mode	TX (CH High)	<b>TEMP&amp; Humidity</b>	26.5℃, 45%

	TX mode / CH High				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
	1831.09	86.04	29.25	3.50	44.29	0.81	75.30	88.31	-13.01	Р
	1831.09	-	-	-	-	-	50.72	68.31	-17.59	А
*	2746.59	72.73	30.15	4.12	43.49	0.87	64.38	74.00	-9.62	Р
*	2746.59	-	-	-	-	-	39.79	54.00	-14.21	А
*	3662.15	74.80	30.59	4.67	42.89	0.27	67.45	74.00	-6.55	Р
*	3662.15	-	-	-	-	-	42.87	54.00	-11.13	А
*	4577.50	61.24	32.35	5.29	42.63	0.20	56.45	74.00	-17.55	Р
*	4577.50	-	-	-	-	I	31.86	54.00	-22.14	А
	5495.16	65.68	33.90	5.87	42.67	0.40	63.18	74.00	-10.82	Р
	5495.16	-	-	-	-	I	38.59	54.00	-15.41	А
	6410.85	59.46	35.32	6.19	42.73	0.24	58.47	74.00	-15.53	Р
	6410.85	-	-	-	-	I	33.89	54.00	-20.11	А
*	7324.03	56.70	39.13	6.59	42.28	0.27	60.40	74.00	-13.60	Р
*	7324.03	-	-	-	-	-	35.82	54.00	-18.18	А
*	8242.52	54.16	38.76	6.77	41.07	0.28	58.89	74.00	-15.11	Р
*	8242.52	-	-	-	-	-	34.31	54.00	-19.69	А

	TX mode / CH High				Measurement Distance at 3m				Vertical	polarity
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(P/Q/A)
	1831.76	84.52	29.25	3.50	44.29	0.81	73.79	80.10	-6.31	Р
	1831.76	-	I	-	-	I	49.21	60.10	-10.89	А
*	2747.63	66.24	30.15	4.12	43.49	0.87	57.88	74.00	-16.12	Р
*	2747.63	-	I	-	-	I	33.30	54.00	-20.70	А
*	3662.17	68.61	30.59	4.67	42.89	0.27	61.26	74.00	-12.74	Р
*	3662.17	-	-	-	-	-	36.68	54.00	-17.32	Α
*	4579.29	60.51	32.35	5.29	42.63	0.20	55.72	74.00	-18.28	Р
*	4579.29	-	-	-	-	-	31.13	54.00	-22.87	А
	5493.17	61.01	33.90	5.87	42.67	0.40	58.50	74.00	-15.50	Р
	5493.17	-	-	-	-	-	33.92	54.00	-20.08	Α
	6408.79	57.34	35.32	6.19	42.73	0.24	56.35	74.00	-17.65	Р
	6408.79	-	-	-	-	-	31.77	54.00	-22.23	Α

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*	7324.00	54.58	39.13	6.59	42.28	0.27	58.29	74.00	-15.71	Р
*	7324.00	-	-	-	-	-	33.71	54.00	-20.29	А
*	8239.62	54.64	38.76	6.77	41.08	0.28	59.37	74.00	-14.63	Р
*	8239.62	-	-	-	-	-	34.79	54.00	-19.21	А

REMARK:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High pass-1G Filter Insertion Loss.

Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz. 2.

Average level=Peak level + Duty factor З.

4. The result basic equation calculation is as follow: Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit The other emission levels were 20dB below the limit

5.

6 The test limit distance is 3m limit.

7 *=Restricted bands of operation



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# 8.7 POWERLINE CONDUCTED EMISSIONS

## <u>LIMITS</u>

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

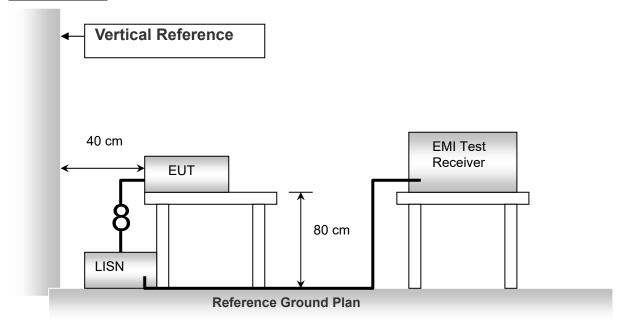
The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted limit (dBµv)				
	Quasi-peak	Average			
0.15 - 0.5	66 to 56	56 to 46			
0.5 - 5	56	46			
5 - 30	60	50			



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## **TEST SETUP**



## TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.10.

The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.

Line conducted data is recorded for both NEUTRAL and LINE.

## TEST RESULTS

No non-compliance noted.

※ This EUT is not connected to AC Source directly. Not applicable for this test.



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# 9. ANTENNA REQUIREMENT

# 9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

# 9.2 ANTENNA CONNECTED CONSTRUCTION

Type: Wire Antenna Model: BR35 Manufacturer: N/A Gain: -2.93 dBi

=== END of Report ===