Temperature:25 °C			Humidity:	50%		
Test By:		PEI		Test Date:	September 04, 2020	
Test Resu	lt:	PASS				
			TX 802.1	1b Mode		
Frequency		Po	wer Density (dB	m)	Limit	Result
(MHz)	ANT A(dBm)		ANT B(dBm)	TOTAL(dBm)	(dBm)	Result
2412	-5.976		-5.518	- E	8	PASS
2437	-6.216		-5.399		8	PASS
2462	-6.359		-6.179		8	PASS

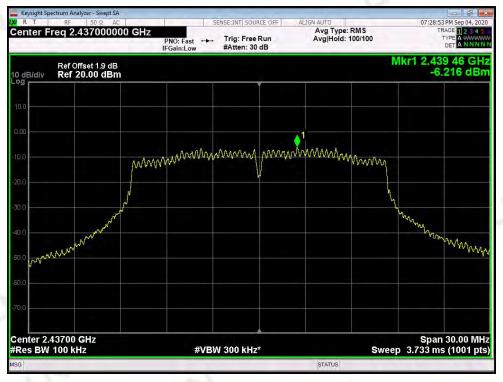
Antenna A

802.11g Low Channel

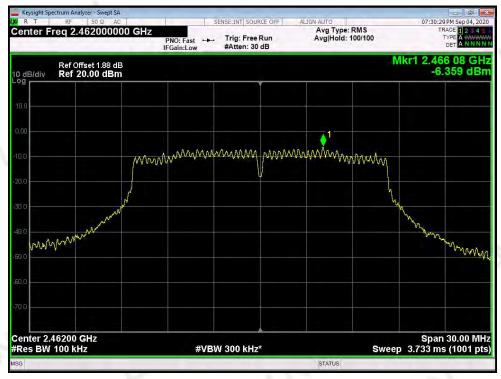


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802.11g Middle Channel



802.11g High Channel

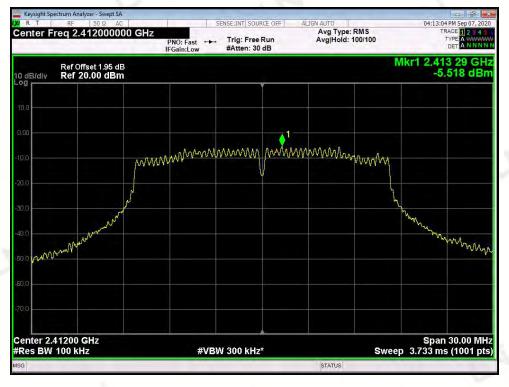


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Antenna B

802.11g Low Channel



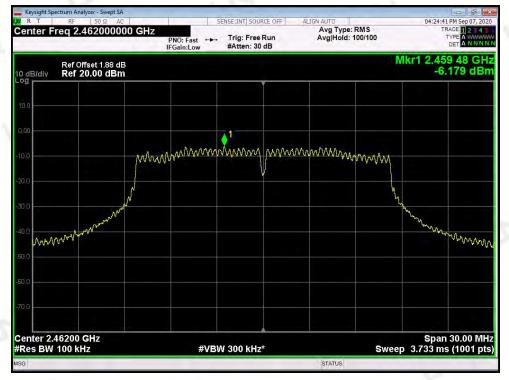
802.11g Middle Channel



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802.11g High Channel

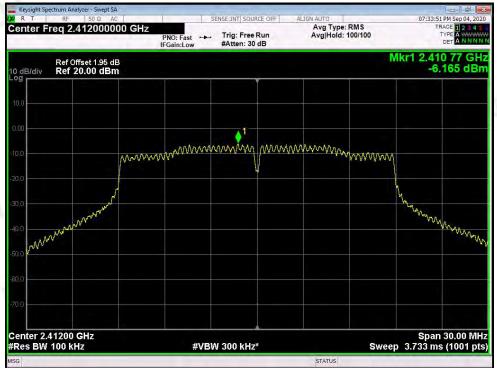


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Temperature:		25 ℃		Humidity:	50%	
Test By:		PEI		Test Date:	September 04, 2020	
Test Result: PA		PASS				
			TX 802.11n	HT20 Mode		
Frequency		Power Density (dBm)		m)	Limit	Result
(MHz)	ANT A(dBm)		ANT B(dBm)	TOTAL(dBm)	(dBm)	Result
2412	-6.165		-6.056	-5.593	8	PASS
2437	-6.602		-6.311	-5.997	8	PASS
2462	-6.349		-6.533	-5.924	8	PASS

Antenna A

802.11n(HT20) Low Channel







802.11n(HT20) Middle Channel

802.11n(HT20) High Channel

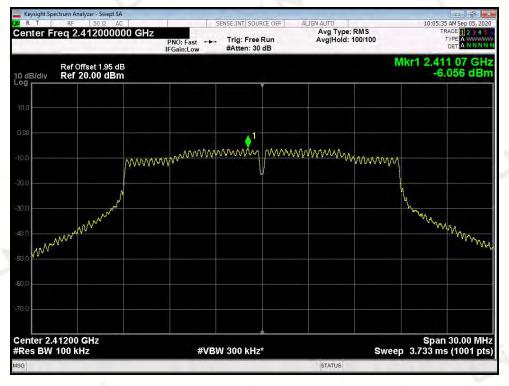


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Antenna B

802.11n(HT20) Low Channel



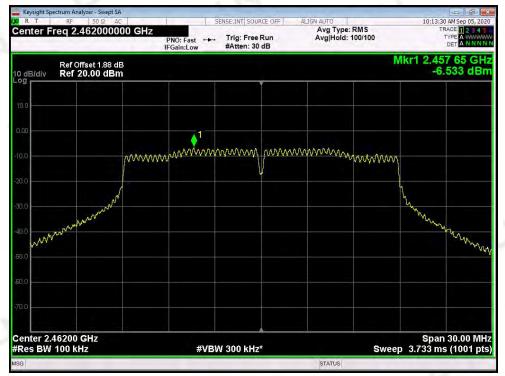
802.11n(HT20) Middle Channel



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802.11n(HT20) High Channel



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Temperature:		25 ℃		Humidity:	50%	
Test By:		PEI		Test Date:	September 04, 2020	
Test Result: PAS		PASS			·	
			TX 802.11n	HT40 Mode		
Frequency		Power Density (dBi		Sm)	Limit	Result
(MHz)	ANT A(dBm)		ANT B(dBm)	TOTAL(dBm)	(dBm)	Result
2422	-9.56		-9.173	-9.572	8	PASS
2437	-9.861		-9.618	-9.328	8	PASS
2452	-9.744		-9.579	-9.296	8	PASS

Antenna A

Regigtif Spectrum Analyzer - Swept SA Conter Freq 2.422000000 GHz Sense Entit Source OFF Alten Auto Or-HotZPM Sep 04, 2020 Center Freq 2.422000000 GHz PNO: Fast Trig: Free Run Heldin Low Trig: Free Run AvglHold: 100/100 Nkr1 2.429 50 GHz Trig: Free Run Source OFF 0 dB/dtv Ref Offset 1.94 dB Mkr1 2.429 50 GHz 9.560 dBm 9.560 dBm 100 GB/dtv Ref 20.00 dBm 1 1 1 00 Mixing Mining Mi

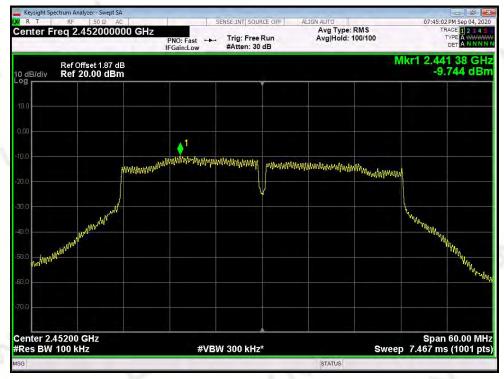
802.11n(HT40) Low Channel

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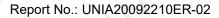
802.11n(HT40) Middle Channel



802.11n(HT40) High Channel



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Antenna B

802.11n(HT40) Low Channel



802.11n(HT40) Middle Channel



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802.11n(HT40) High Channel



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Band Edge and Conducted Spurious Emissions

9.1Requirement and Measurement Procedure

In any 100KHz 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 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

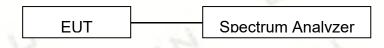
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below.

A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
	Peak	1 MHz	3 MHz
Above 1000	A	4 Mile	If D≥98 then VBW ≥ 3*RBW,
	Average	1 MHz	If D≤98 then VBW ≥1/T

9.2Test SET-UP (Block Diagram of Configuration)



9.3Measurement Results

The test plots and table showed all spurious emission and up to the tenth harmonic was measured and they were found to be at least 20dB below the highest level of the desired power in the passband. Please refer to below plots.

Note: We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 1Mbps for 802.11b mode and 6Mbps for 802.11g mode and MCS0 for 802.11n mode.

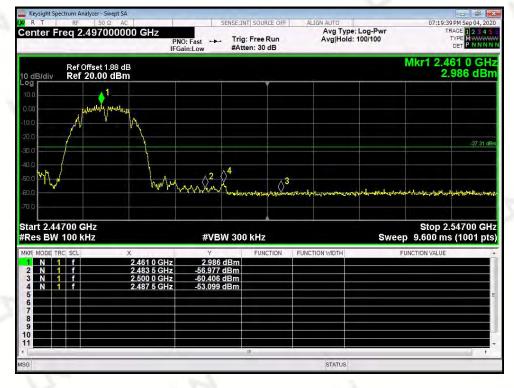


Antenna A Band Edge

802.11b Low Channel



802.11b High Channel



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802.11g Low Channel



802.11g High Channel



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LNi

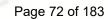
802.11n(HT20) Low Channel



802.11n(HT20) High Channel



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802.11n(HT40) Low Channel



802.11n(HT40) High Channel

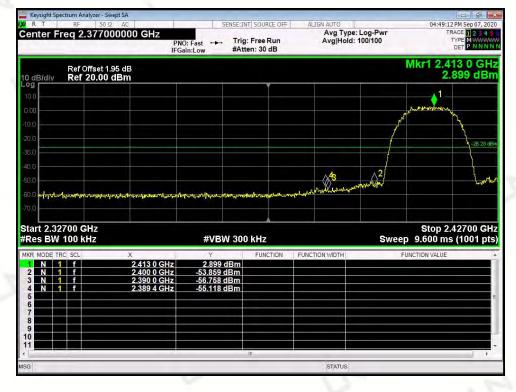


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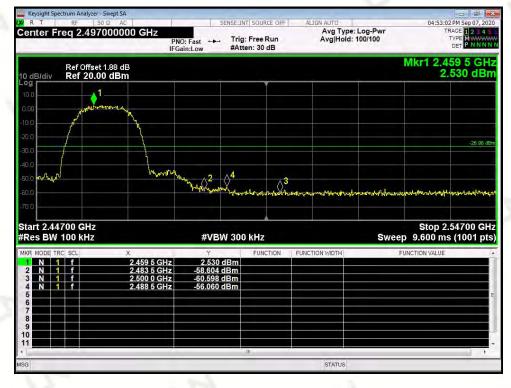


Antenna B Band Edge

802.11b Low Channel



802.11b High Channel



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802.11g Low Channel



802.11g High Channel



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802.11n(HT20) Low Channel



802.11n(HT20) High Channel



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802.11n(HT40) Low Channel



802.11n(HT40) High Channel

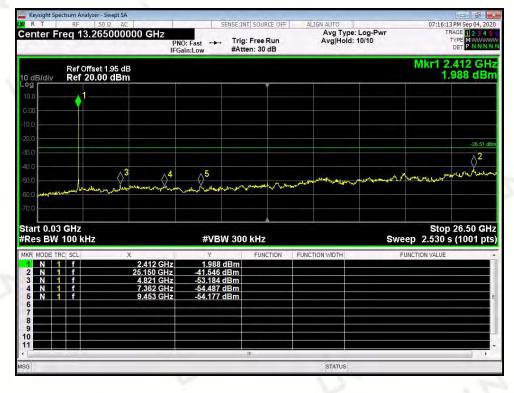


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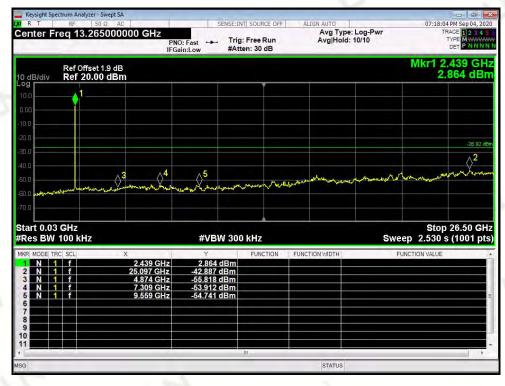


Conducted Spurious Emissions Antenna A

802.11b Low Channel

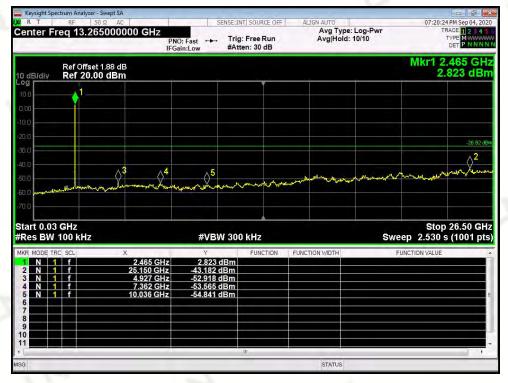


802.11b Middle Channel

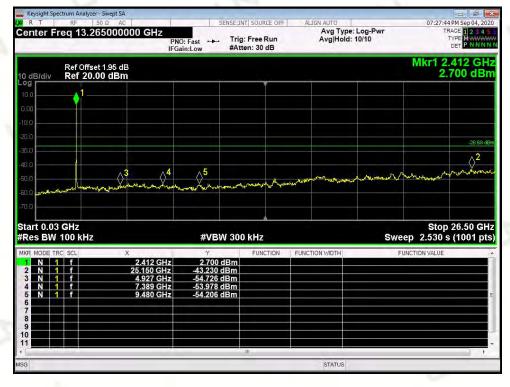


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802.11b High Channel

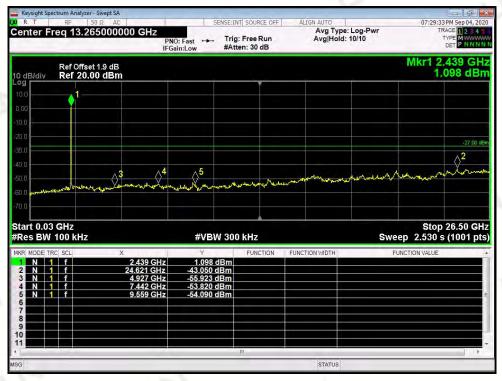


802.11g Low Channel

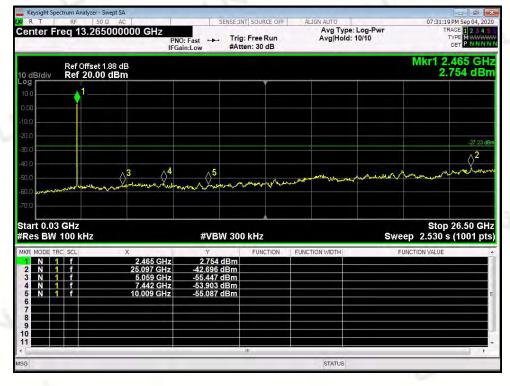


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802.11g Middle Channel



802.11g High Channel



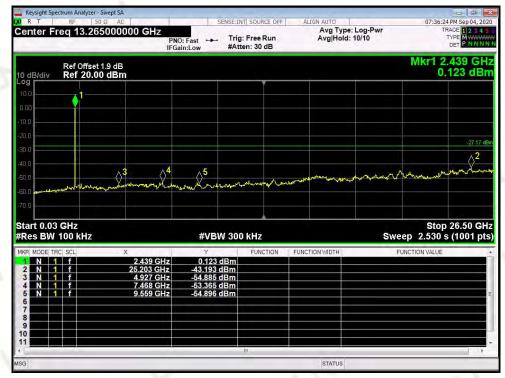
深圳市优耐检测技术有限公司 Shenzhen United Testing Technology Co.,Ltd. United Testing Technology(Hong Kong) Limited



Keysight! TRACE Avg Type: Log-Pwr Avg|Hold: 10/10 Center Freg 13.265000 10 GHz Trig: Free Run #Atten: 30 dB PNO: Fast +++ Mkr1 2.412 GHz -0.074 dBm Ref Offset 1.95 dB Ref 20.00 dBm 10 dE og \Diamond^4 0⁵ A^3 Start 0.03 GHz #Res BW 100 kHz Stop 26.50 GHz Sweep 2.530 s (1001 pts) #VBW 300 kHz FUNCTION FUNCTION WIDTH 26. 55.416 dBm 53.940 dBm 1 f 1 f -53.506 dBm Ň 9,453 GHz STATUS

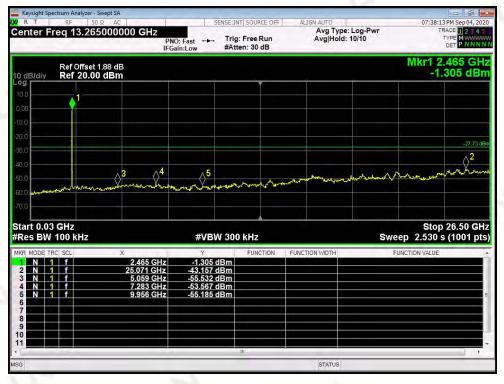
802.11n HT20 Low Channel

802.11n HT20 Middle Channel

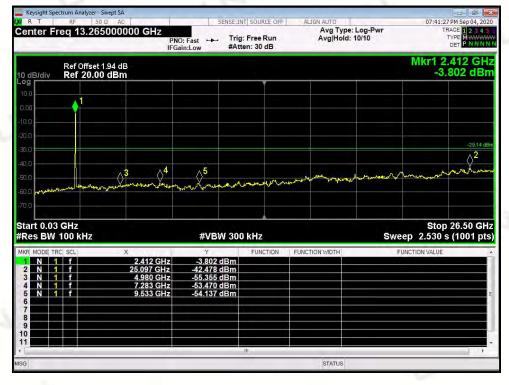


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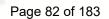
802.11n HT20 High Channel



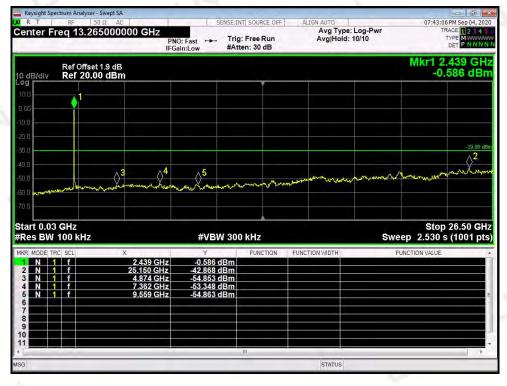
802.11n HT40 Low Channel



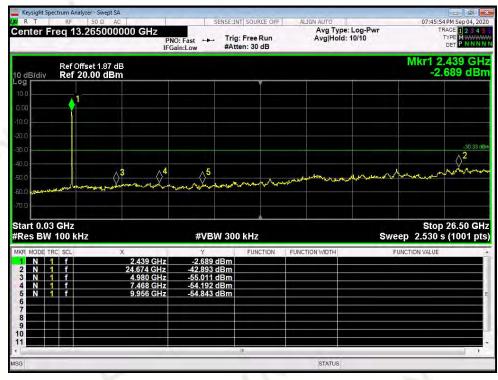
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802.11n HT40 Middle Channel



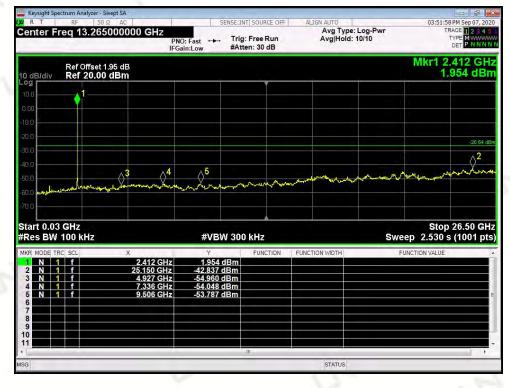
802.11n HT40 High Channel



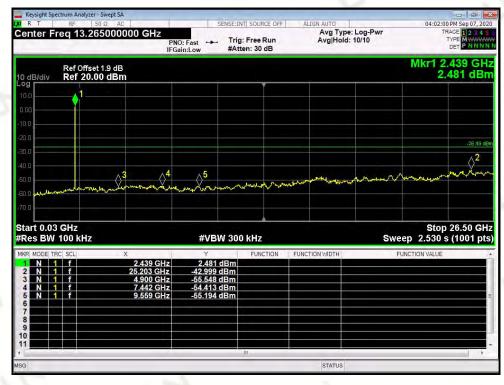
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Antenna B 802.11b Low Channel

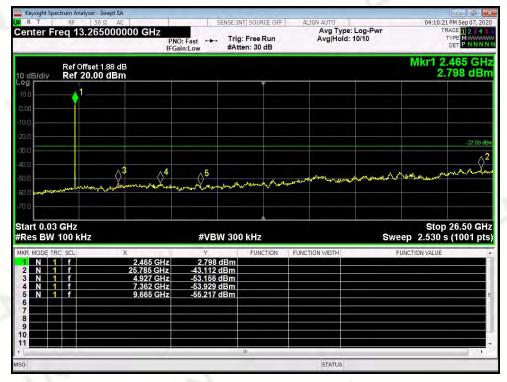


802.11b Middle Channel

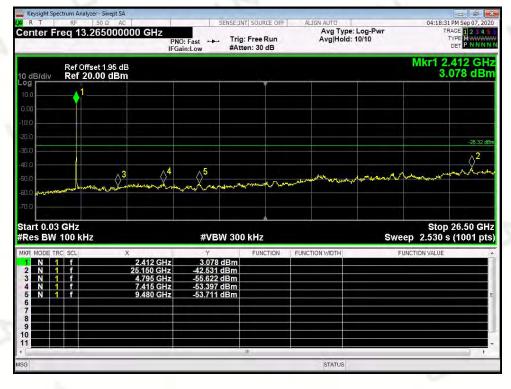


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802.11b High Channel

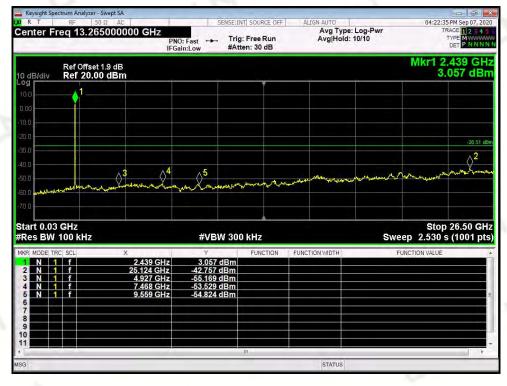


802.11g Low Channel

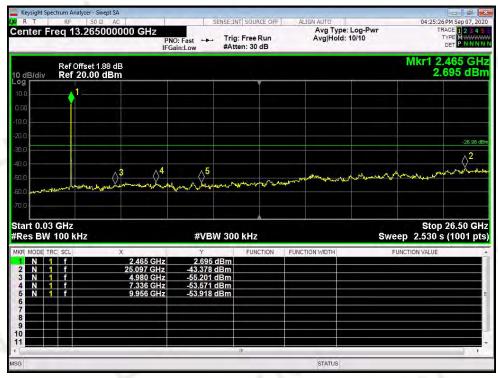


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802.11g Middle Channel

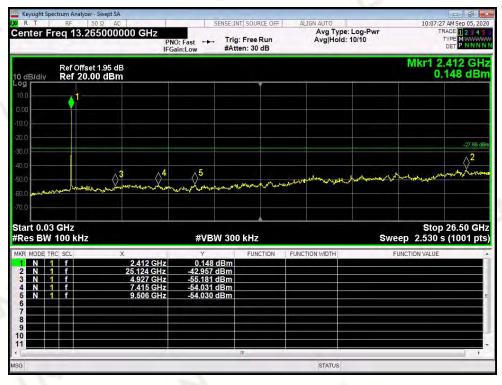


802.11g High Channel

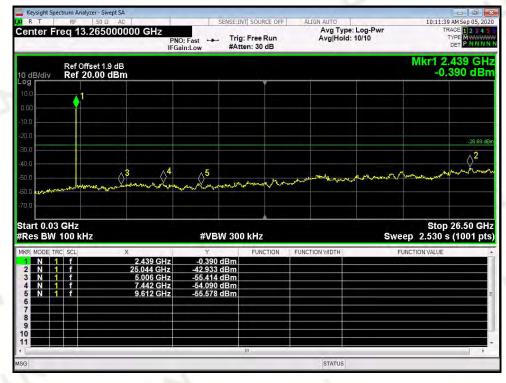


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802.11n HT20 Low Channel



802.11n HT20 Middle Channel

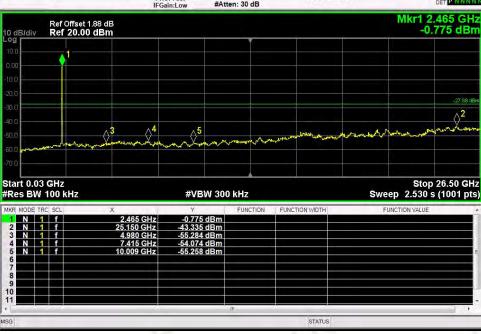


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Avg Type: Log-Pwr Avg|Hold: 10/10

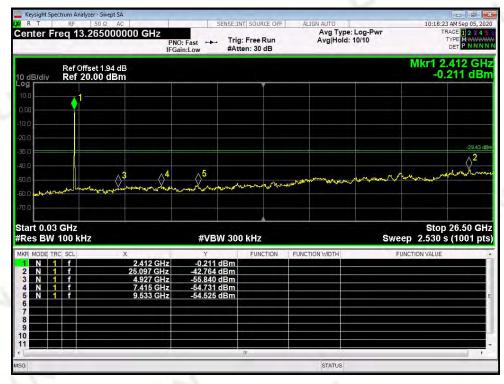
0:14:19 AM Se TRACE

Keysight R **Center Freq** PNO: Fast +++ Trig: Free Run IFGain:Low #Atten: 30 dB Ref Offset 1.88 dB Ref 20.00 dBm



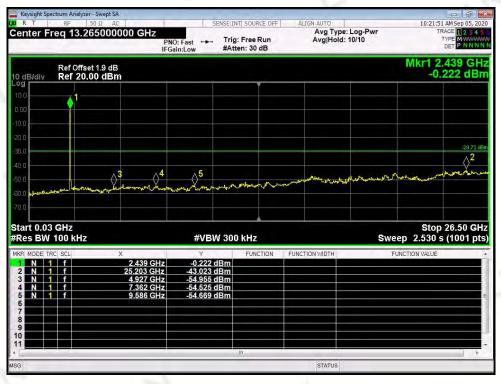
802.11n HT20 High Channel

802.11n HT40 Low Channel

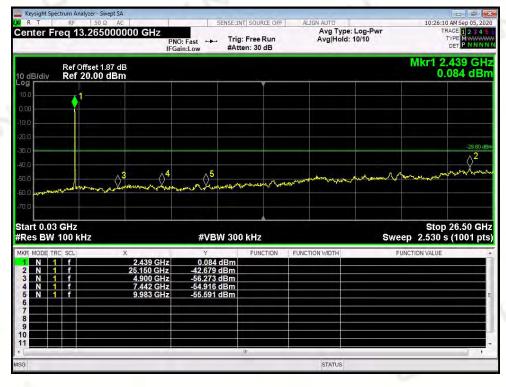


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802.11n HT40 Middle Channel



802.11n HT40 High Channel

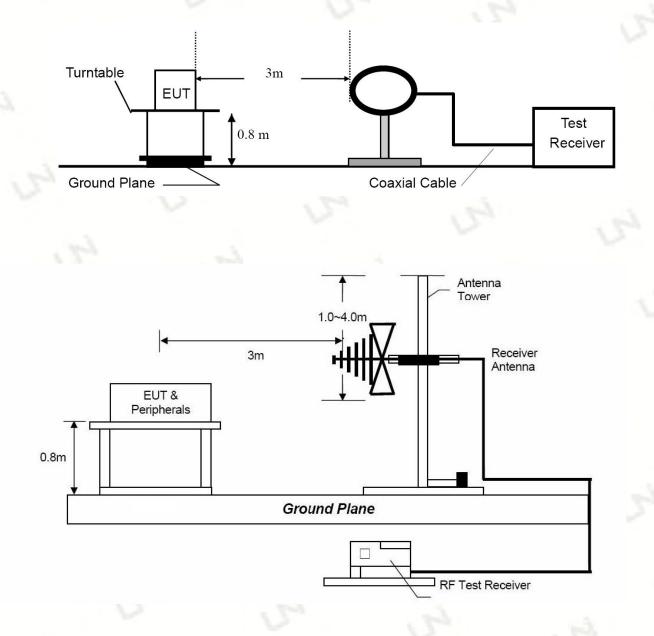


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10. Radiated Spurious Emissions and Restricted Bands

10.1 Test SET-UP (Block Diagram of Configuration)

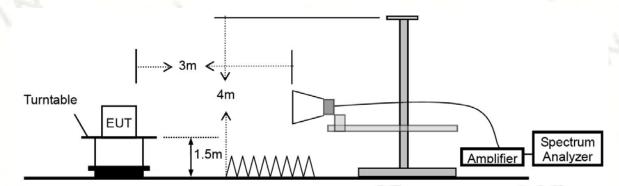
10.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



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- 10.2 Measurement Procedure
 - a. Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
 - b. For the radiated emission test above 1GHz:

The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test. 深圳市优耐检测技术有限公司

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
	Peak	1 MHz	3 MHz
Above 1000	A	4 MUL	If D≥98 then VBW ≥ 3*RBW,
	Average	1 MHz	If D≤98 then VBW ≥1/T

10.3 Limit

Frequency range	Distance Meters	Field Strengths Limit (15.209)
MHz		μV/m
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

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

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
- (4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.
- (5) §15.247(d) specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

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Report No.: UNIA20092210ER-02

10.4 Measurement Results

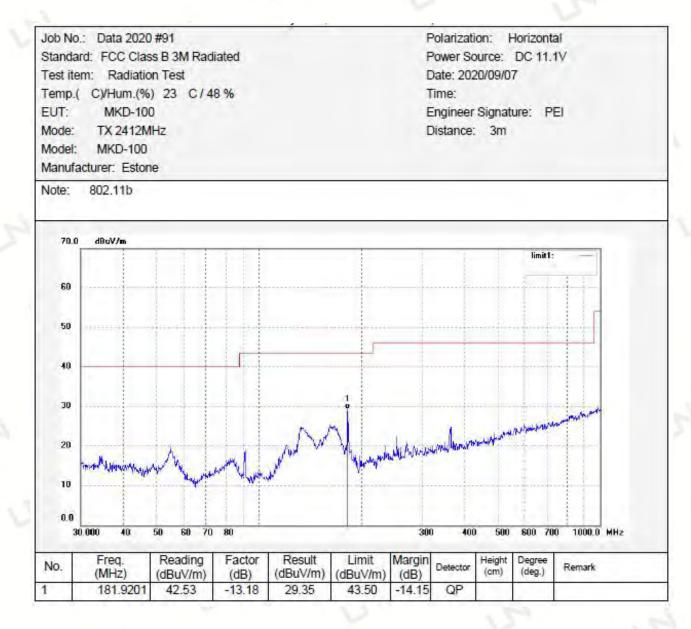
Pass

Please refer to following plots of the worst case

Note:

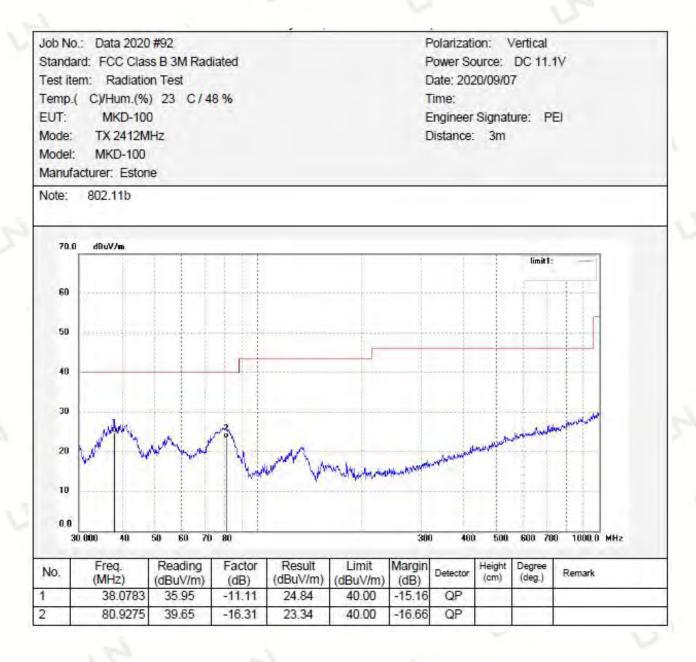
- 1. We tested 802.11b/g/n mode the all data rate and recorded the worst case data for this channel to be 1Mbps for 802.11b mode and 6Mbps for 802.11g mode and MCS0 for 802.11n mode.
- 2. Below 30MHz, the emissions are lower than 20dB below the allowable limit. Therefore, 9kHz-30MHz data were not recorded.

MDK-100	2	
	Polarization:	Horizontal
MDK-100	Temperature:	23 °C
802.11b	Humidity:	48 %
30MHz-1GHz	Test By:	PEI
3m	Test Voltage	DC 11.1V
TX 2412MHz	Test Results:	PASS
	MDK-100 802.11b 30MHz-1GHz 3m	MDK-100Temperature:802.11bHumidity:30MHz-1GHzTest By:3mTest Voltage



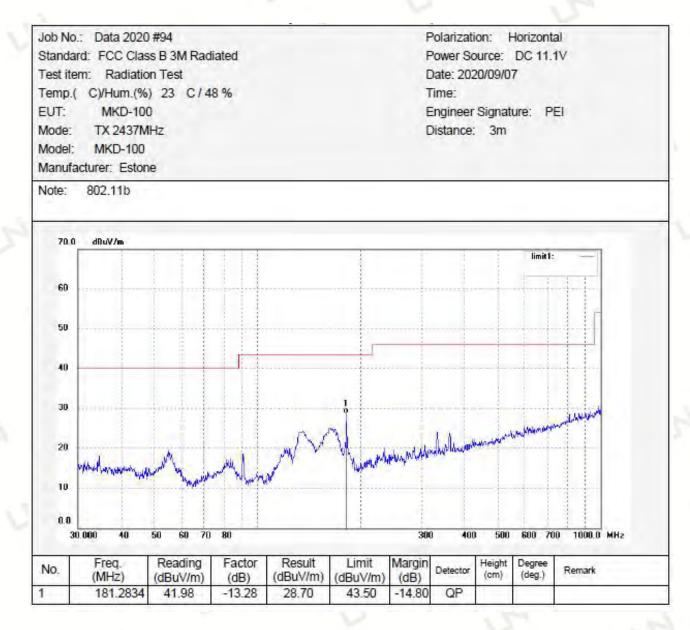
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MDK-100	Polarization:	Vertical	-
MDK-100	Temperature:	23 ℃	12
802.11b	Humidity:	48 %	
30MHz-1GHz	Test By:	PEI	
3m	Test Voltage	DC 11.1V	
TX 2412MHz	Test Results:	PASS	
	MDK-100 802.11b 30MHz-1GHz 3m	MDK-100Temperature:802.11bHumidity:30MHz-1GHzTest By:3mTest Voltage	MDK-100 Temperature: 23 °C 802.11b Humidity: 48 % 30MHz-1GHz Test By: PEI 3m Test Voltage DC 11.1V



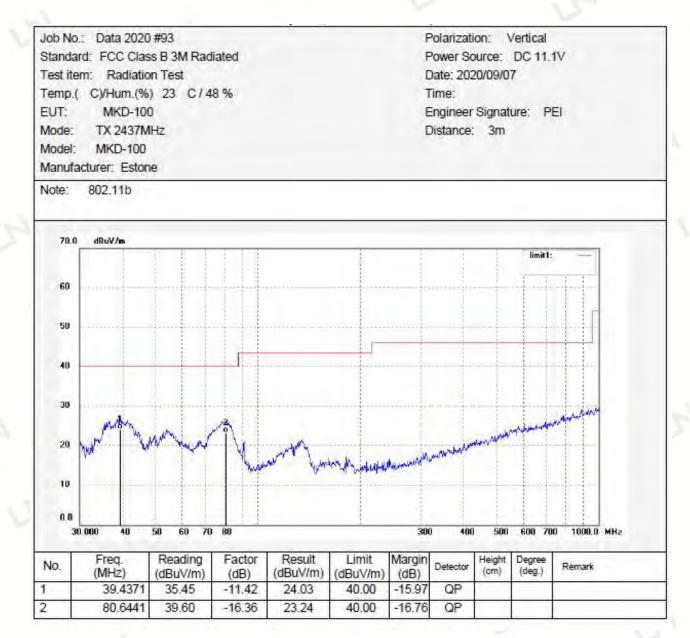
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E.U.T:	MDK-100	Polarization:	Horizontal	5
Model No.:	MDK-100	Temperature:	23 ℃	
Modulation Type:	802.11b	Humidity:	48 %	
Frequency Range:	30MHz-1GHz	Test By:	PEI	
Test Distance:	3m	Test Voltage	DC 11.1V	1
Test Mode:	TX 2437MHz	Test Results:	PASS	



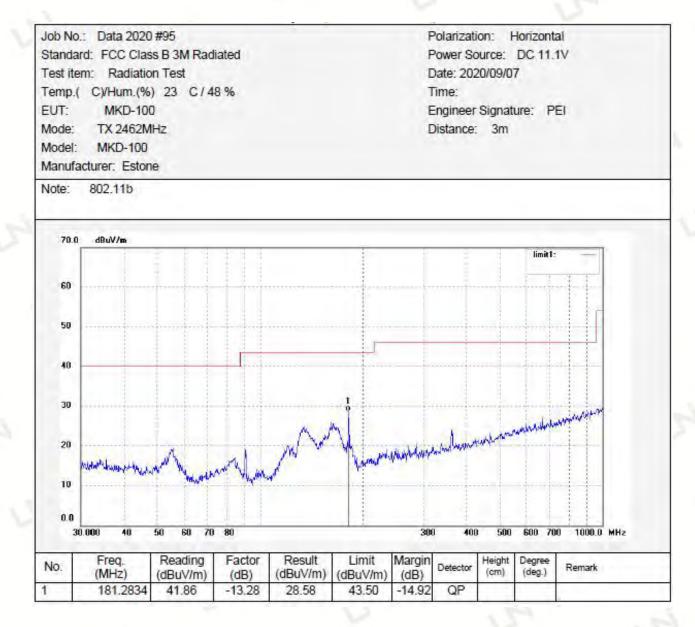
深圳市优耐检测技术有限公司 Shenzhen United Testing Technology Co.,Ltd. United Testing Technology(Hong Kong) Limited

MDK-100	Polarization:	Vertical	1
MDK-100	Temperature:	23 ℃	121
802.11b	Humidity:	48 %	
30MHz-1GHz	Test By:	PEI	
3m	Test Voltage	DC 11.1V	
TX 2437MHz	Test Results:	PASS	
	MDK-100 802.11b 30MHz-1GHz 3m	MDK-100Temperature:802.11bHumidity:30MHz-1GHzTest By:3mTest Voltage	MDK-100 Temperature: 23 °C 802.11b Humidity: 48 % 30MHz-1GHz Test By: PEI 3m Test Voltage DC 11.1V



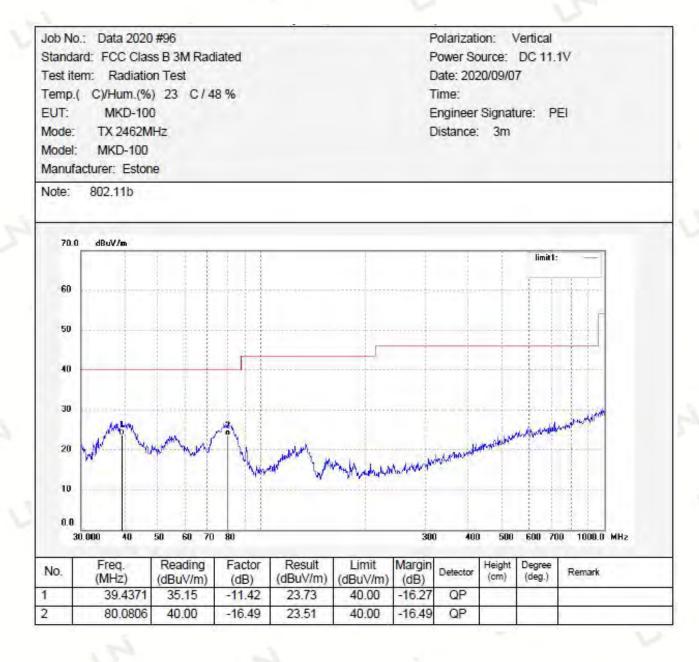
深圳市优耐检测技术有限公司 Shenzhen United Testing Technology Co.,Ltd. United Testing Technology(Hong Kong) Limited

MDK-100	Polarization:	Horizontal	1
MDK-100	Temperature:	23 ℃	12
802.11b	Humidity:	48 %	
30MHz-1GHz	Test By:	PEI	
3m	Test Voltage	DC 11.1V	
TX 2462MHz	Test Results:	PASS	
	MDK-100 802.11b 30MHz-1GHz 3m	MDK-100Temperature:802.11bHumidity:30MHz-1GHzTest By:3mTest Voltage	MDK-100Temperature:23 °C802.11bHumidity:48 %30MHz-1GHzTest By:PEI3mTest VoltageDC 11.1V



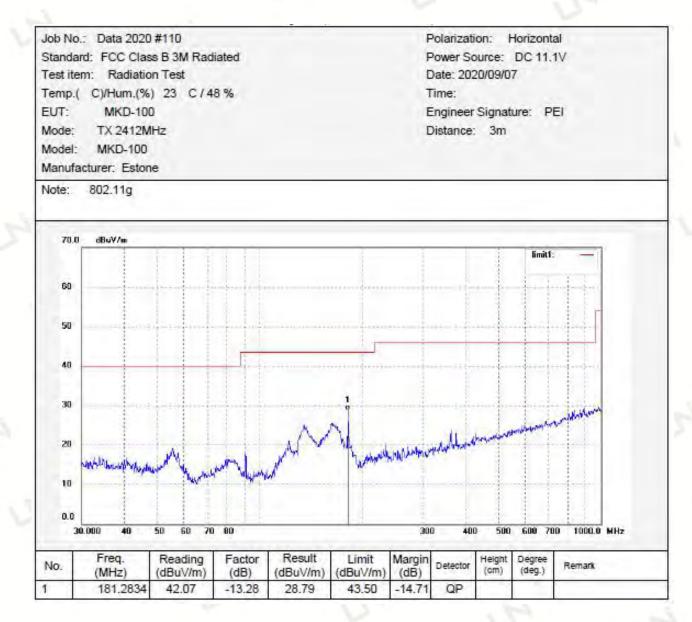
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-	Polarization:	Vertical
J	emperature:	23 ℃
н	lumidity:	48 %
IGHz T	est By:	PEI
т	est Voltage	DC 11.1V
MHz T	est Results:	PASS
	H 1GHz T T	Humidity: 1GHz Test By: Test Voltage



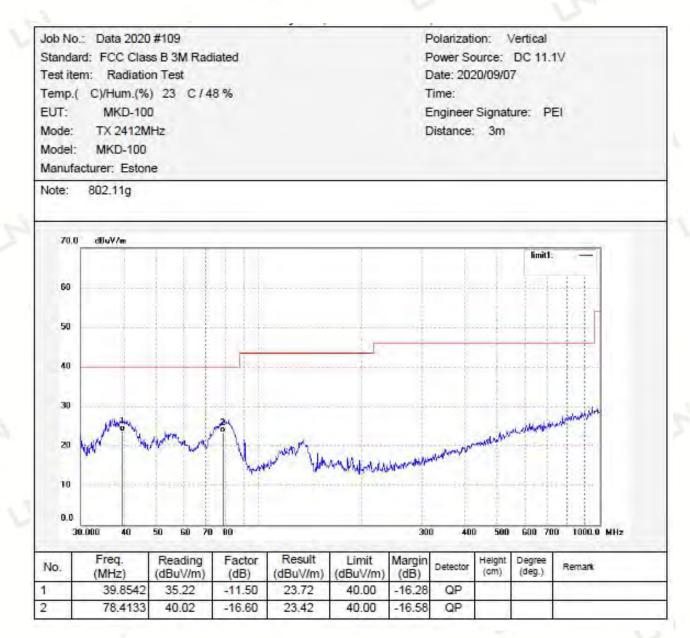
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E.U.T:	MDK-100	Polarization:	Horizontal	5
Model No.:	MDK-100	Temperature:	23 ℃	
Modulation Type:	802.11g	Humidity:	48 %	
Frequency Range:	30MHz-1GHz	Test By:	PEI	
Test Distance:	3m	Test Voltage	DC 11.1V	1
Test Mode:	TX 2412MHz	Test Results:	PASS	



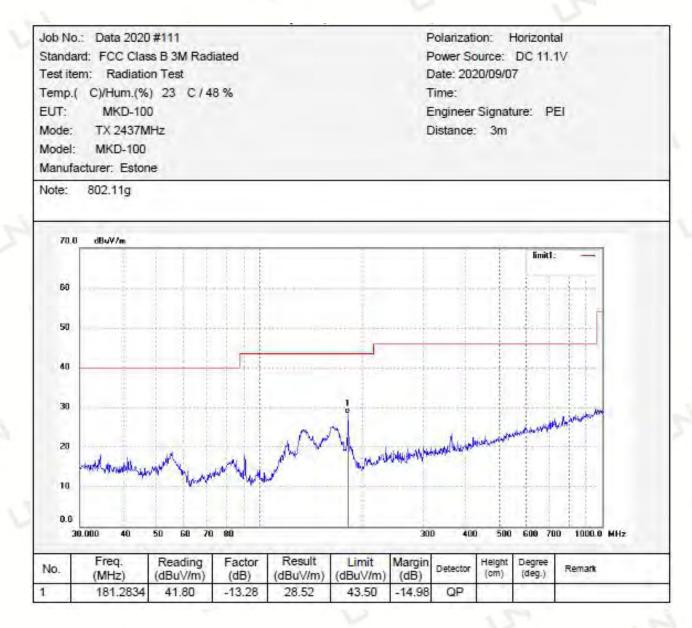
深圳市优耐检测技术有限公司 Shenzhen United Testing Technology Co.,Ltd. United Testing Technology(Hong Kong) Limited

MDK-100	Polarization:	Vertical
MDK-100	Temperature:	23 °C
802.11g	Humidity:	48 %
30MHz-1GHz	Test By:	PEI
3m	Test Voltage	DC 11.1V
TX 2412MHz	Test Results:	PASS
	MDK-100 802.11g 30MHz-1GHz 3m	MDK-100Temperature:802.11gHumidity:30MHz-1GHzTest By:3mTest Voltage



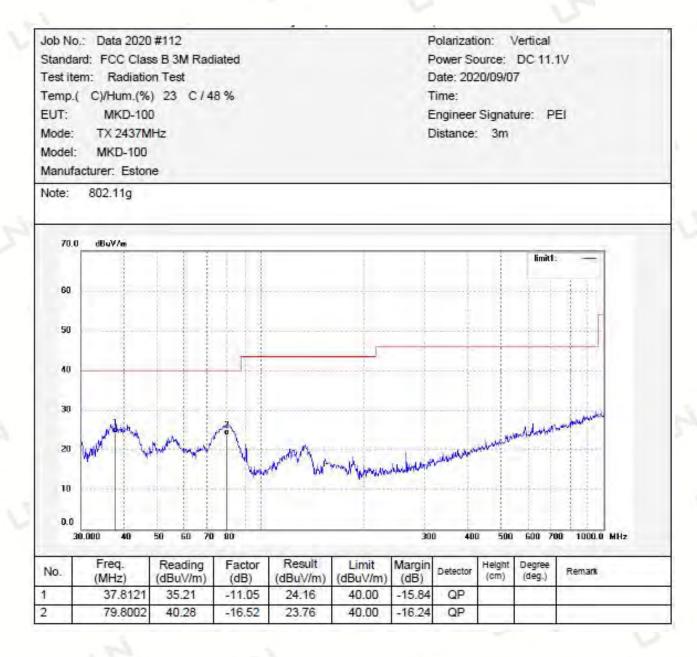
深圳市优耐检测技术有限公司 Shenzhen United Testing Technology Co.,Ltd. United Testing Technology(Hong Kong) Limited

E.U.T:	MDK-100	Polarization:	Horizontal	5
Model No.:	MDK-100	Temperature:	23 °C	
Modulation Type:	802.11g	Humidity:	48 %	
Frequency Range:	30MHz-1GHz	Test By:	PEI	
Test Distance:	3m	Test Voltage	DC 11.1V	1
Test Mode:	TX 2437MHz	Test Results:	PASS	



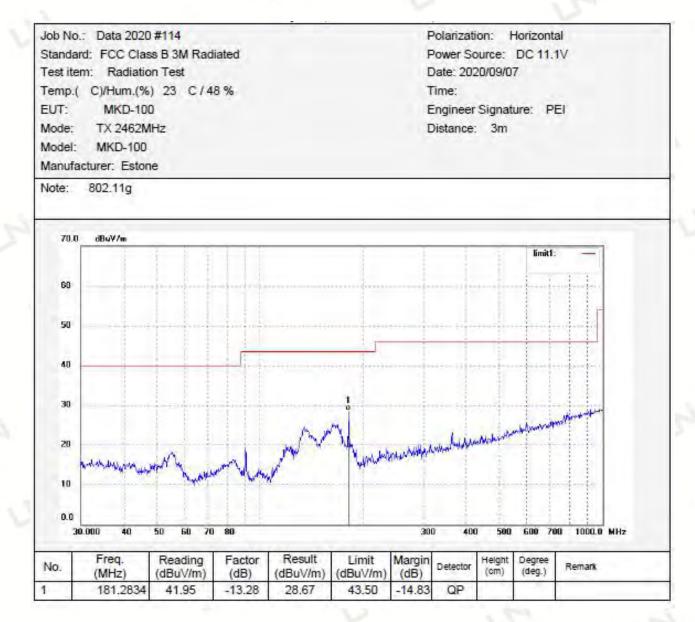
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E.U.T:	MDK-100	Polarization:	Vertical	5
Model No.:	MDK-100	Temperature:	23 ℃	
Modulation Type:	802.11g	Humidity:	48 %	
Frequency Range:	30MHz-1GHz	Test By:	PEI	
Test Distance:	3m	Test Voltage	DC 11.1V	_
Test Mode:	TX 2437MHz	Test Results:	PASS	



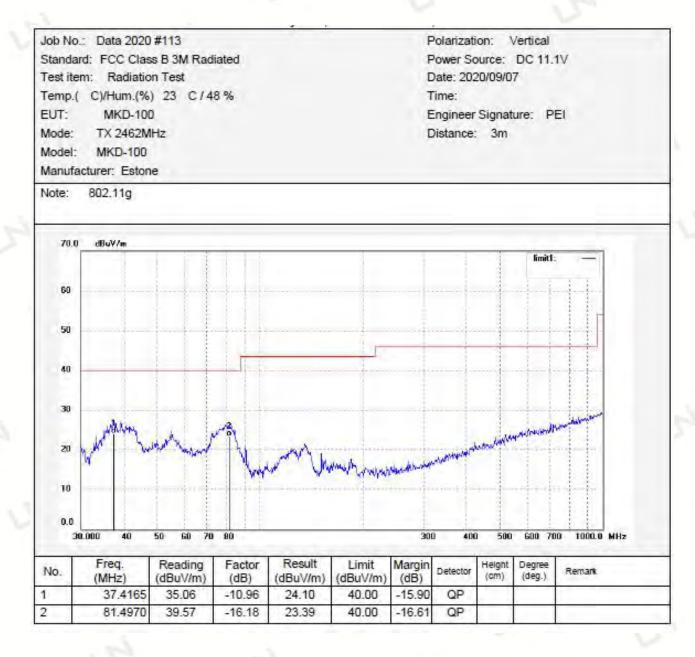
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E.U.T:	MDK-100	Polarization:	Horizontal	
Model No.:	MDK-100	Temperature:	23 ℃	
Modulation Type:	802.11g	Humidity:	48 %	
Frequency Range:	30MHz-1GHz	Test By:	PEI	
Test Distance:	3m	Test Voltage	DC 11.1V	
Test Mode:	TX 2462MHz	Test Results:	PASS	



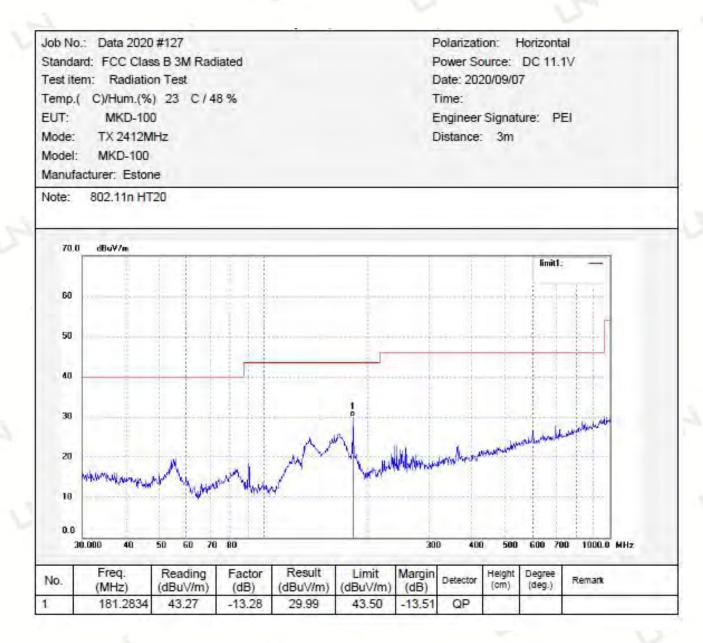
深圳市优耐检测技术有限公司 Shenzhen United Testing Technology Co.,Ltd. United Testing Technology(Hong Kong) Limited

MDK-100	Polarization:	Vertical
MDK-100	Temperature:	23 °C
802.11g	Humidity:	48 %
30MHz-1GHz	Test By:	PEI
3m	Test Voltage	DC 11.1V
TX 2462MHz	Test Results:	PASS
	MDK-100 802.11g 30MHz-1GHz 3m	MDK-100Temperature:802.11gHumidity:30MHz-1GHzTest By:3mTest Voltage



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E.U.T:	MDK-100	Polarization:	Horizontal
Model No.:	MDK-100	Temperature:	23 ℃
Modulation Type:	802.11n HT20	Humidity:	48 %
Frequency Range:	30MHz-1GHz	Test By:	PEI
Test Distance:	3m	Test Voltage	DC 11.1V
Test Mode:	TX 2412MHz	Test Results:	PASS



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