PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. +1.410.290.6652 / Fax +1.410.290.6654
http://www.pctestlab.com



FCC TEST RESULTS

FCC ID	ZNFM710H ZNFH700
Date	3/7/2017

Please note that the results below are not finalized and the data is subject to change.

Test Case	Band/Mode	Test Case	Frequency (MHz)	ZNFM710H	ZNFH700	Verdict
1	Pt. 22	ERP	848.80	29.37 dBm	29.46 dBm	Share
2	Pt. 22	RSE	1697.60	-41.73 dBm	-43.14 dBm	Share
3	Pt. 24	EIRP	1850.2	31 dBm	28.56 dBm	Share
4	Pt. 24	RSE	3700.40	-50.99 dBm	-53.31 dBm	Share
5	Pt. 27 (700MHz)	ERP	714.50	17.43 dBm	17.56 dBm	Share
6	Pt. 27 (700MHz)	RSE	1429	-61.19 dBm	-58.90 dBm	Share
7	Pt. 27 (1750MHz)	EIRP	1732.5	23.97 dBm	24.17 dBm	Share
8	Pt. 27 (1750MHz)	RSE	3465	-58.22 dBm	-57.20 dBm	Share
9	Pt. 27 (2.5GHz)	EIRP	2505	20.04 dBm	21.47 dBm	Share
10	Pt. 27 (2.5GHz)	RSE	5010	-56.64 dBm	-58.10 dBm	Share
11	2.4 GHz WLAN	Band Edge	2390	47.48 dBuV	48.82 dBuV	Share
12	2.4 GHz WLAN	RSE	4824	45.04 dBuV/m	47.00 dBuV/m	Share
13	5 GHz WLAN	Band Edge	5460	46.23 dBuV	46.04 dBuV	Share
14	5 GHz WLAN	RSE	11400	50.06 dBuV/m	50.35 dBuV/m	Share
15	Bluetooth	Band Edge	2483.50	35.67 dBuV	36.72 dBuV	Share
16	Bluetooth	RSE	4960	36.15 dBuV/m	36.04 dBuV/m	Share
17	RFID	In Band Power	13.56	7.04 dBuV/m	7.79 dBuV/m	Share
18	RFID	RSE	40.68	16.43 dBuV/m	19.36 dBuV/m	Share



Test Case 1: FCC Part 22 ERP (GSM 850 MHz)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
848.80	GPRS850	H	150	92	30.02	-0.65	29.37	0.865	38.45	-9.08

GSM ERP (ZNFM710H)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
848.80	GPRS850	H	214	184	30.40	-0.94	29.46	0.883	38.45	-8.99

GSM ERP (ZNFH700)



Test Case 2: FCC Part 22 RSE (GSM 850 MHz)

OPERATING FREQUENCY:	848.80		MHz	
CHANNEL:	251			
MEASURED OUTPUT POWER:	29.37	dBm =	0.865	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	42.37	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1697.60	H	100	112	-47.85	6.12	-41.73	71.1

GSM RSE-High Channel (ZNFM710H)

OPERATING FREQUENCY:	848.80		MHz	
CHANNEL:	251			
MEASURED OUTPUT POWER:	29.46	dBm =	0.883	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	42.46	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1697.60	H	160	196	-49.26	6.12	-43.14	72.6

GSM RSE - High Channel (ZNFH700)



Test Case 3: FCC Part 24 EIRP (GSM 1900 MHz)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	H	150	204	21.88	9.12	31.00	1.259	33.01	-2.01

GSM EIRP (ZNFM710H)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	H	150	204	23.74	4.82	28.56	0.718	33.01	-4.45

GSM EIRP (ZNFH700)



Test Case 4: FCC Part 24 RSE (GSM 1900 MHz)

OPERATING FREQUENCY:	1850.20			MHz
CHANNEL:	512			
MEASURED OUTPUT POWER:	31.00	dBm	= 1.259	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	44.00		dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3700.40	H	112	146	-61.02	10.03	-50.99	82.0

GSM RSE - Low Channel (ZNFM710H)

OPERATING FREQUENCY:	1850.20			MHz
CHANNEL:	512			
MEASURED OUTPUT POWER:	28.56	dBm	= 0.718	W
MODULATION SIGNAL:	GPRS (GMSK)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	41.56		dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3700.40	H	160	232	-63.34	10.03	-53.31	81.9

GSM RSE-Low Channel (ZNFH700)



Test Case 5: FCC Part 27 ERPE (LTE 700 MHz)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
714.50	3	QPSK	H	150	83	1 / 14	18.42	-0.99	17.43	34.77	-17.34
714.50	3	16-QAM	H	150	83	1 / 14	16.94	-0.99	15.95	34.77	-18.82

Band 12 ERP (ZNFM710H)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
714.50	3	QPSK	H	150	89	1 / 14	18.55	-0.99	17.56	34.77	-17.21
714.50	3	16-QAM	H	150	89	1 / 14	17.12	-0.99	16.13	34.77	-18.64

Band 12 ERP (ZNFH700)



Test Case 6: FCC Part 27 RSE (LTE 700 MHz)

OPERATING FREQUENCY:	714.50	MHz		
CHANNEL:	23165			
MEASURED OUTPUT POWER:	17.43	dBm	=	0.055 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	3.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	30.43	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1429.00	H	147	49	-67.21	6.02	-61.19	78.6

Band 12 RSE – High Channel (ZNFM710H)

OPERATING FREQUENCY:	714.50	MHz		
CHANNEL:	23165			
MEASURED OUTPUT POWER:	17.56	dBm	=	0.057 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	3.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	30.56	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1429.00	H	112	110	-64.92	6.02	-58.90	76.5

Band 12 RSE – High Channel (ZNFH700)



Test Case 7: FCC Part 27 EIRP (LTE 1700 MHz)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1732.50	10	QPSK	H	150	13	1 / 0	18.56	5.41	23.97	30.00	-6.03
1732.50	10	16-QAM	H	150	13	1 / 0	17.38	5.41	22.79	30.00	-7.21

Band 4 EIRP (ZNFM710H)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1732.50	10	QPSK	H	150	47	1 / 49	18.76	5.41	24.17	30.00	-5.83
1732.50	10	16-QAM	H	150	47	1 / 49	16.65	5.41	22.06	30.00	-7.94

Band 4 EIRP (ZNFH700)



Test Case 8: FCC Part 27 RSE (LTE 1700 MHz)

OPERATING FREQUENCY:	1732.50	MHz		
CHANNEL:	20175			
MEASURED OUTPUT POWER:	23.97	dBm	=	0.249 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.97	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3465.00	H	103	146	-68.00	9.77	-58.22	82.2

Band 4 RSE – Mid Channel (ZNFM710H)

OPERATING FREQUENCY:	1732.50	MHz		
CHANNEL:	20175			
MEASURED OUTPUT POWER:	24.17	dBm	=	0.261 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	37.17	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3465.00	H	101	340	-66.98	9.77	-57.20	81.4

Band 4 RSE – Mid Channel (ZNFH700)



Test Case 9: FCC Part 27 EIRP (LTE 2500 MHz)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2505.00	10	QPSK	H	150	106	1 / 49	14.29	5.75	20.04	33.01	-12.97
2505.00	10	16-QAM	H	150	106	1 / 49	12.61	5.75	18.36	33.01	-14.65

Band 7 EIRP (ZNFM710H)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2505.00	10	QPSK	H	150	106	1 / 49	15.72	5.75	21.47	33.01	-11.54
2505.00	10	16-QAM	H	150	106	1 / 49	14.00	5.75	19.75	33.01	-13.26

Band 7 EIRP (ZNFH700)



Test Case 10: FCC Part 27 RSE (LTE 2500 MHz)

OPERATING FREQUENCY:	2505.00	MHz		
CHANNEL:	20800			
MEASURED OUTPUT POWER:	20.04	dBm	=	0.101 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	55 + 10 log10 (W)	45.04	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5010.00	H	396	289	-67.81	11.17	-56.64	76.7

Band 7 RSE – Low Channel (ZNFM710H)

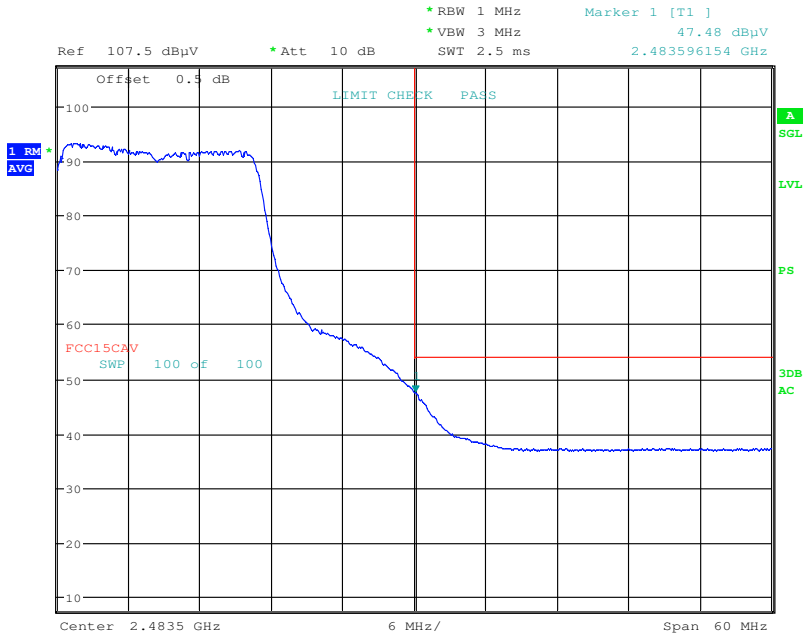
OPERATING FREQUENCY:	2505.00	MHz		
CHANNEL:	20800			
MEASURED OUTPUT POWER:	21.47	dBm	=	0.140 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	55 + 10 log10 (W)	46.47	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5010.00	H	-	-	-69.27	11.17	-58.10	79.6

Band 7 RSE – Mid Channel (ZNFH700)

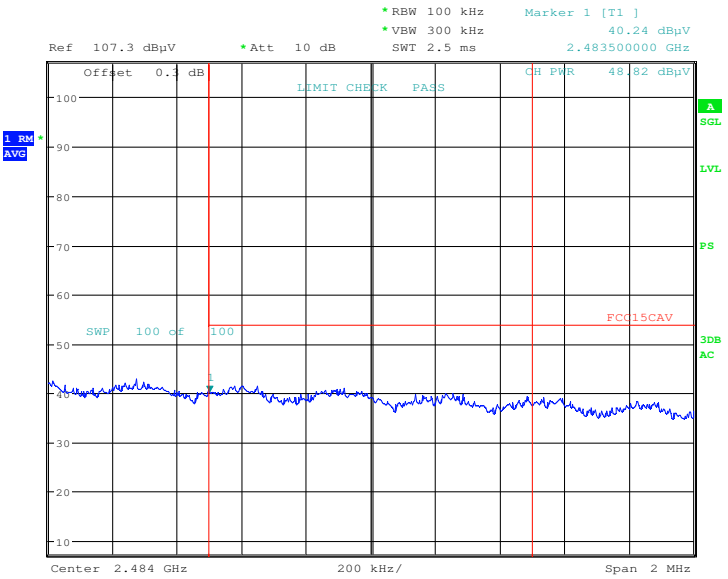


Test Case 11: WLAN BE



Date: 16.MAR.2017 12:49:02

WLAN 802.11g (ZNFM710H)



Date: 15.FEB.2017 12:56:29

WLAN 802.11g (ZNFH700)



Test Case 12: WLAN RSE

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	Avg	H	100	137	-62.59	0.63	45.04	53.98	-8.93
4824.00	Peak	H	100	137	-55.02	0.63	52.61	73.98	-21.36

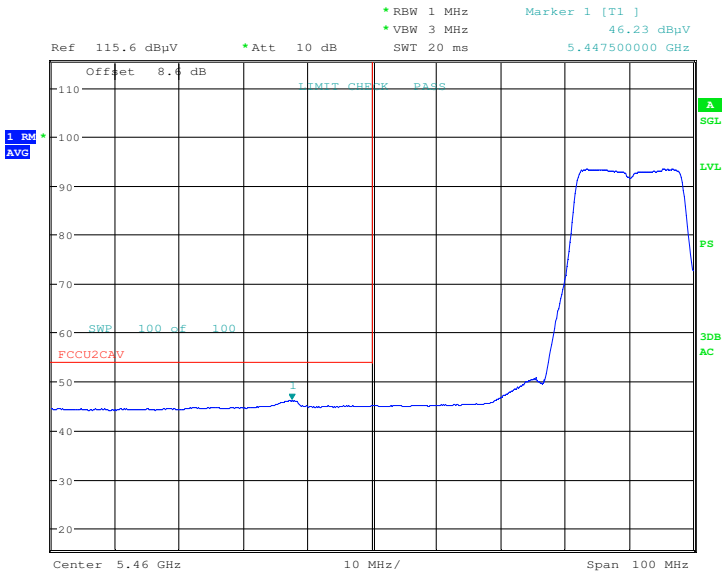
WLAN 802.11b Ch. 1 (ZNFM710H)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	Avg	H	100	226	-60.63	0.63	47.00	53.98	-6.97
4824.00	Peak	H	100	226	-56.00	0.63	51.63	73.98	-22.34

WLAN 802.11b Ch. 1 (ZNFH700)

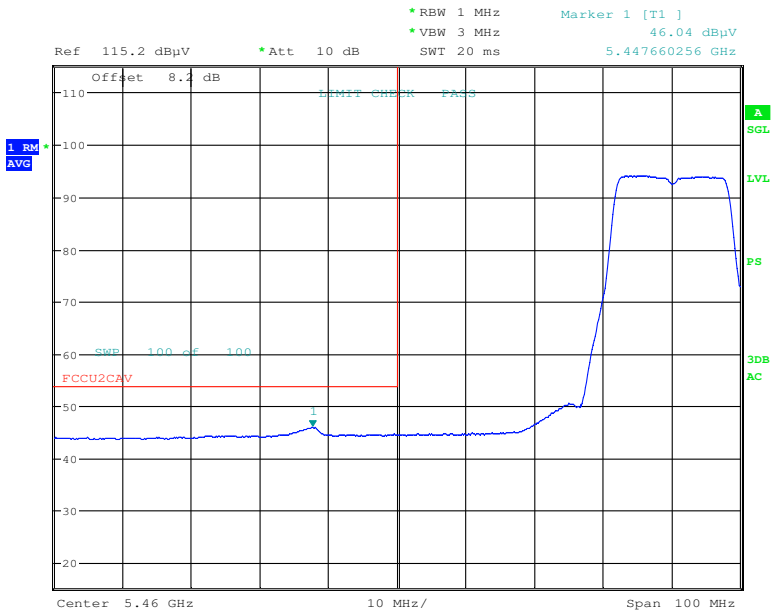


Test Case 13: UNII BE



Date: 3.MAR.2017 19:37:44

802.11a 20MHz Lower Band Edge(ZNFM710H)



Date: 15.FEB.2017 13:29:24

802.11a 20MHz Lower Band Edge (ZNFH700)



Test Case 14: UNII RSE

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
11400.00	Average	H	120	217	-70.95	14.01	0.00	50.06	53.98	-3.92
11400.00	Peak	H	120	217	-59.52	14.01	0.00	61.49	73.98	-12.49

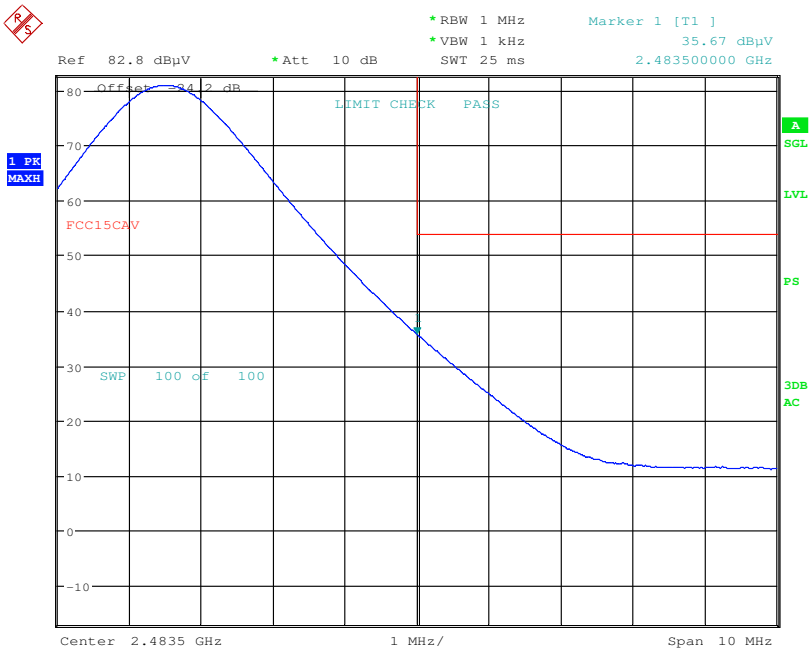
UNII 802.11a Ch. 140 (ZNFM710H)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
11400.00	Average	H	113	69	-70.66	14.01	0.00	50.35	53.98	-3.63
11400.00	Peak	H	113	69	-58.92	14.01	0.00	62.09	73.98	-11.89

UNII 802.11a Ch. 140 (ZNFH700)

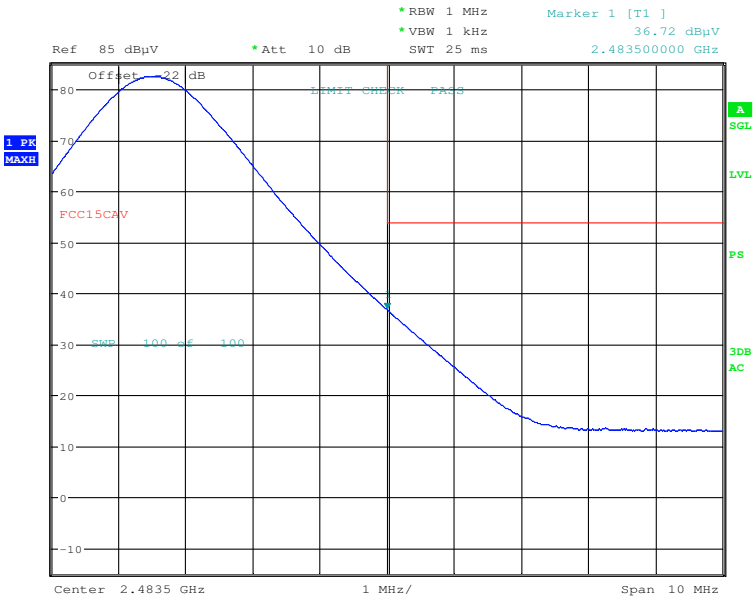


Test Case 15: BT BE



Date: 7.MAR.2017 19:54:20

Bluetooth High Band Edge (ZNFM710H)



Date: 28.FEB.2017 18:54:35

Bluetooth high Band Edge (ZNFH700)



Test Case 16: BT RSE

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	-	-	-71.51	0.66	36.15	53.98	-17.83
4960.00	Peak	H	-	-	-57.57	0.66	50.09	73.98	-23.89

Bluetooth RSE Ch 78 (ZNFM710H)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Avg	H	-	-	-71.62	0.66	36.04	53.98	-17.94
4960.00	Peak	H	-	-	-57.89	0.66	49.77	73.98	-24.21

Bluetooth RSE Ch78 (ZNFH700)



Test Case 17: RFID in Band

Frequency [MHz]	Antenna Position	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	30m Field Strength [dBµV/m]	Limit [µV/m]	Limit [dBµV/m]	Margin [dB]
13.560	X	110	350	-74.85	14.89	47.04	7.04	15848.00	84.00	-76.96

In Band Power (ZNFM710H)

Frequency [MHz]	Antenna Position	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	30m Field Strength [dBµV/m]	Limit [µV/m]	Limit [dBµV/m]	Margin [dB]
13.560	X	110	176	-74.10	14.89	47.79	7.79	15848.00	84.00	-76.21

In Band Power (ZNFH700)

Test Case 18: RFID Out of Band

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
40.68	V	-	-	-74.80	-15.77	16.43	40.00	-23.57

RSE (ZNFM710H)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
40.68	V	-	-	-71.87	-15.77	19.36	40.00	-20.64

RSE (ZNFH700)