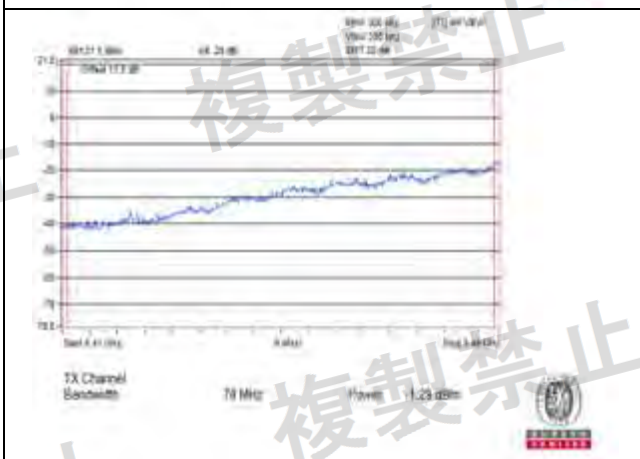
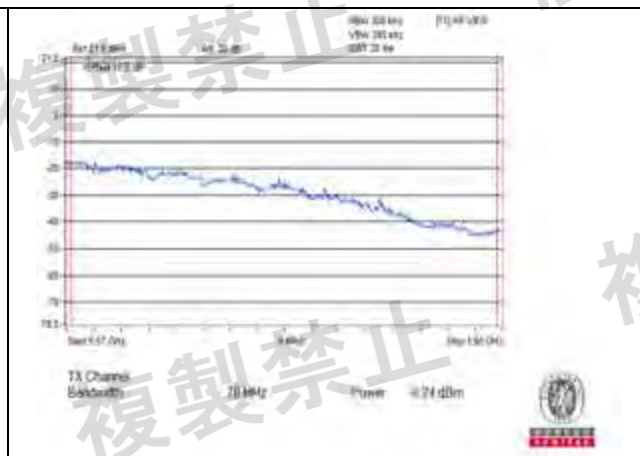
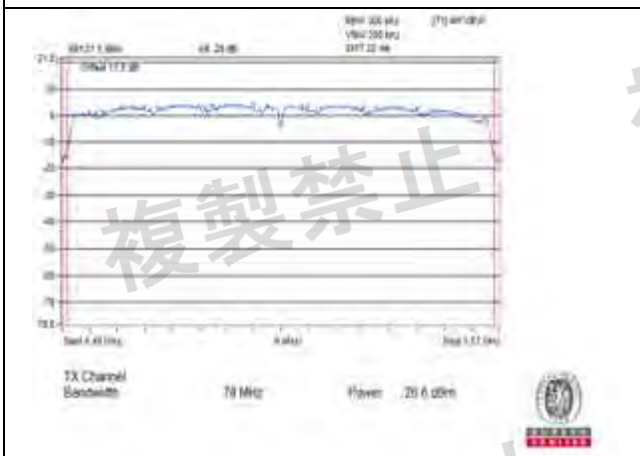




Vmin.

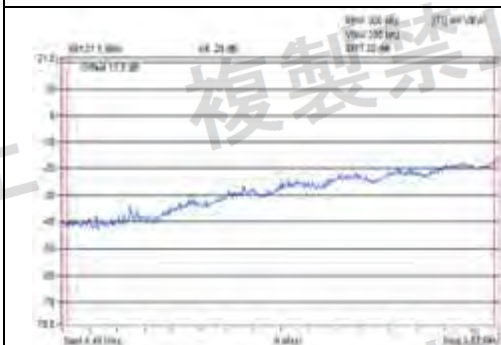
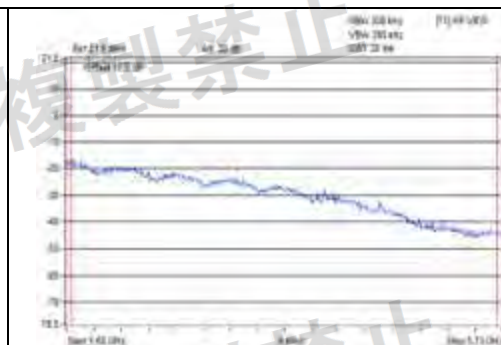
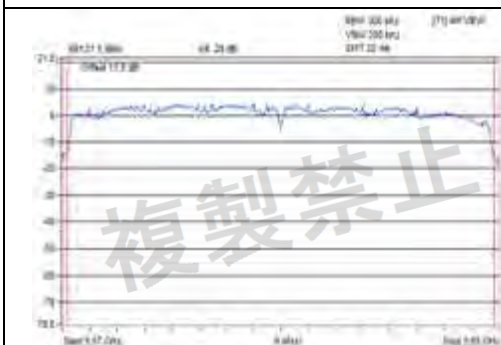
Channel 106





Vmin.

Channel 122





4.6 Antenna Power Measurement

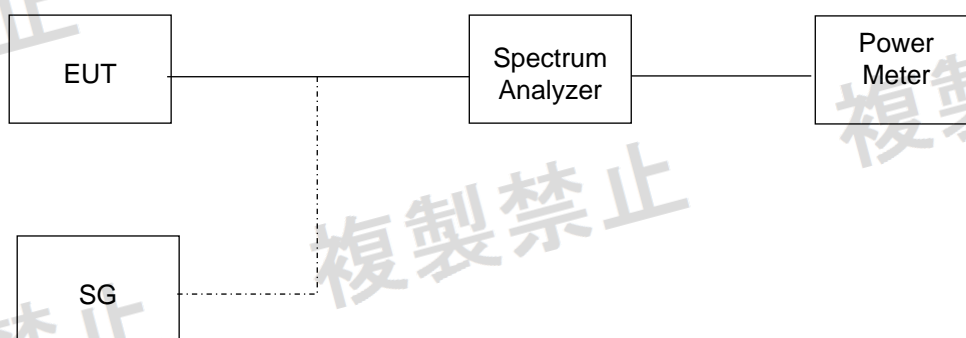
4.6.1 Limits of Antenna Power

W52 band			
Mode	802.11a / 802.11n (HT20)	802.11n (HT40)	802.11ac (VHT80)
Output power	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P	10mW/MHz	5mW/MHz	2.5mW/MHz

W53 band			
Mode	802.11a / 802.11n (HT20)	802.11n (HT40)	802.11ac (VHT80)
Output power	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P (with TPC)	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P (without TPC)	5mW/MHz	2.5mW/MHz	1.25mW/MHz

W56 band			
Mode	802.11a / 802.11n (HT20)	802.11n (HT40)	802.11ac (VHT80)
Output power	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P (with TPC)	50mW/MHz	25mW/MHz	12.5mW/MHz
E.I.R.P (without TPC)	25mW/MHz	12.5mW/MHz	6.25mW/MHz

4.6.2 Test Setup





4.6.3 Test Results

W52 band:

802.11a:

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
36	5180	6.282	6.055	6.578	10
48	5240	6.578	6.340	6.762	10
Rated power		7.0mW/MHz			
Tolerance of antenna power		1.40mW/MHz ~ 8.40mW/MHz			
Measurement uncertainty		± 1.11dB			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
36	5180	8.632	8.32	9.038	10
48	5240	9.038	8.711	9.291	10
Measurement uncertainty		± 1.11dB			

Note: The value of radiated RF output densities are "calculated" values.



W53 band:

802.11a:

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
52	5260	6.778	6.503	6.654	10
64	5320	6.578	6.518	6.443	10
Rated power		7.0mW/MHz			
Tolerance of antenna power		1.40mW/MHz ~ 8.40mW/MHz			
Measurement uncertainty		± 1.11dB			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
52	5260	9.313	8.935	9.143	10
64	5320	9.038	8.956	8.853	10
Measurement uncertainty		± 1.11dB			

Note: The value of radiated RF output densities are "calculated" values.



W56 band:

802.11a:

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
100	5500	8.976	8.712	9.101	10
120	5600	9.059	8.997	9.249	10
140	5700	9.207	9.313	8.956	10
Rated power		8.50mW/MHz			
Tolerance of antenna power		4.25mW/MHz ~ 12.75mW/MHz			
Measurement uncertainty		± 1.11dB			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
100	5500	12.333	11.971	12.505	50
120	5600	12.447	12.362	12.709	50
140	5700	12.651	12.796	12.306	50
Measurement uncertainty		± 1.11dB			

Note: The value of radiated RF output densities are "calculated" values.



W52 band:

802.11n (HT20):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
36	5180	7.000	7.048	6.731	10
48	5240	7.196	7.114	7.065	10
Rated power		7.0mW/MHz			
Tolerance of antenna power		1.40mW/MHz ~ 8.40mW/MHz			
Measurement uncertainty		± 1.11dB			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
36	5180	9.618	9.684	9.249	10
48	5240	9.888	9.775	9.708	10
Measurement uncertainty		± 1.11dB			

Note: The value of radiated RF output densities are "calculated" values.



W53 bands:

802.11n (HT20):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
52	5260	6.778	6.856	6.856	10
64	5320	6.731	7.000	6.936	10
Rated power		7.0mW/MHz			
Tolerance of antenna power		1.40mW/MHz ~ 8.40mW/MHz			
Measurement uncertainty		± 1.11dB			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
52	5260	9.313	9.420	9.420	10
64	5320	9.249	9.618	9.530	10
Measurement uncertainty		± 1.11dB			

Note: The value of radiated RF output densities are "calculated" values.



W56 band:

802.11n (HT20):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
100	5500	9.143	9.185	9.508	10
120	5600	9.574	9.730	9.574	10
140	5700	9.596	9.574	9.464	10
Rated power		10.0mW/MHz			
Tolerance of antenna power		5mW/MHz ~ 15mW/MHz			
Measurement uncertainty		± 1.11dB			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
100	5500	12.563	12.621	13.064	50
120	5600	13.155	13.369	13.155	50
140	5700	13.185	13.155	13.004	50
Measurement uncertainty		± 1.11dB			

Note: The value of radiated RF output densities are "calculated" values.



W52 band:

802.11n (HT40):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
38	5190	3.192	3.127	3.063	5
46	5230	3.320	3.282	3.320	5
Rated power		3.40mW/MHz			
Tolerance of antenna power		0.68mW/MHz ~ 4.08mW/MHz			
Measurement uncertainty		$\pm 1.11\text{dB}$			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
38	5190	4.386	4.297	4.209	5
46	5230	4.562	4.510	4.562	5
Measurement uncertainty		$\pm 1.11\text{dB}$			

Note: The value of radiated RF output densities are "calculated" values.



W53 band:

802.11n (HT40):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
54	5270	3.178	3.170	3.105	5
62	5310	3.320	3.366	3.320	5
Rated power		3.40mW/MHz			
Tolerance of antenna power		0.68mW/MHz ~ 4.08mW/MHz			
Measurement uncertainty		$\pm 1.11\text{dB}$			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
54	5270	4.367	4.356	4.266	5
62	5310	4.562	4.625	4.562	5
Measurement uncertainty		$\pm 1.11\text{dB}$			

Note: The value of radiated RF output densities are "calculated" values.



W56 band:

802.11n (HT40):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
102	5510	4.396	4.237	4.509	5
118	5590	4.678	4.787	4.722	5
134	5670	4.678	3.557	3.615	5
Rated power		5.00mW/MHz			
Tolerance of antenna power		2.5mW/MHz ~ 7.5mW/MHz			
Measurement uncertainty		± 1.11dB			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
102	5510	6.040	5.822	6.196	25
118	5590	6.428	6.578	6.488	25
134	5670	6.428	4.887	4.967	25
Measurement uncertainty		± 1.11dB			

Note: The value of radiated RF output densities are "calculated" values.



W52 and W53 bands:

802.11ac (VHT80):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
42	5210	1.600	1.542	1.574	2.5
58	5290	1.528	1.486	1.553	2.5
Rated power		1.6mW/MHz			
Tolerance of antenna power		0.32mW/MHz ~ 1.92mW/MHz			
Measurement uncertainty		$\pm 1.11\text{dB}$			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
42	5210	2.198	2.119	2.163	2.5
58	5290	2.100	2.042	2.134	2.5
Measurement uncertainty		$\pm 1.11\text{dB}$			

Note: The value of radiated RF output densities are "calculated" values.



W56 bands:

802.11ac (VHT80):

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
106	5530	1.695	1.734	1.679	2.5
122	5610	1.742	1.742	1.695	2.5
Rated power		2.0mW/MHz			
Tolerance of antenna power		1.00mW/MHz ~ 3.00mW/MHz			
Measurement uncertainty		$\pm 1.11\text{dB}$			

Monopole antenna with 1.38dBi

Environmental Conditions		25 deg.C, 60% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power Density (mW/MHz)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW/MHz)
		24Vdc	26.4Vdc	21.6Vdc	
106	5530	2.329	2.383	2.307	12.5
122	5610	2.394	2.394	2.329	12.5
Measurement uncertainty		$\pm 1.11\text{dB}$			

Note: The value of radiated RF output densities are "calculated" values.

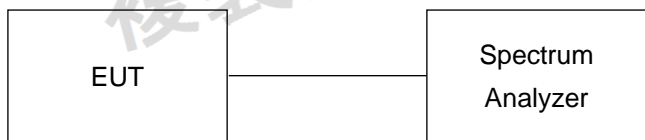


4.7 Spurious Emission for Receiver

4.7.1 Limits of Spurious Emission for Receiver

Frequencies (MHz)	Limit
Below 1GHz	$\leq 4\text{nW}$ (-54dBm)
Above 1GHz	$\leq 20\text{nW}$ (-47dBm)

4.7.2 Test Setup





4.7.3 Test Result

W52 and W53 bands:

802.11a:

Environmental Conditions		25 deg.C, 68% RH					
Test Channel		CH36 (5180MHz)		CH48 (5240MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	746.830	0.009977nW	729.850	0.006457nW	4nW	Pass
	Above 1GHz	25856.250	2.18273nW	25881.250	2.103778nW	20nW	Pass
Vmax.	Below 1GHz	256.980	0.00455nW	556.710	0.005333nW	4nW	Pass
	Above 1GHz	21918.750	2.157744nW	22031.250	2.466039nW	20nW	Pass
Vmin.	Below 1GHz	746.100	0.011641nW	574.890	0.006053nW	4nW	Pass
	Above 1GHz	22112.500	1.931968nW	22087.500	2.36592nW	20nW	Pass
Test Channel		CH52 (5260MHz)		CH64 (5320MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	508.450	0.005023nW	406.840	0.005188nW	4nW	Pass
	Above 1GHz	22093.750	2.133045nW	21975.000	2.506109nW	20nW	Pass
Vmax.	Below 1GHz	154.640	0.004467nW	184.230	0.005902nW	4nW	Pass
	Above 1GHz	25743.750	2.280342nW	21931.250	2.355049nW	20nW	Pass
Vmin.	Below 1GHz	628.730	0.006026nW	684.750	0.004764nW	4nW	Pass
	Above 1GHz	25756.250	1.86638nW	22050.000	2.037042nW	20nW	Pass

Note: 1. The worst value in each frequency range v.s. each channel has been marked by boldface.

2. The spectrum plots are attached on the following pages.



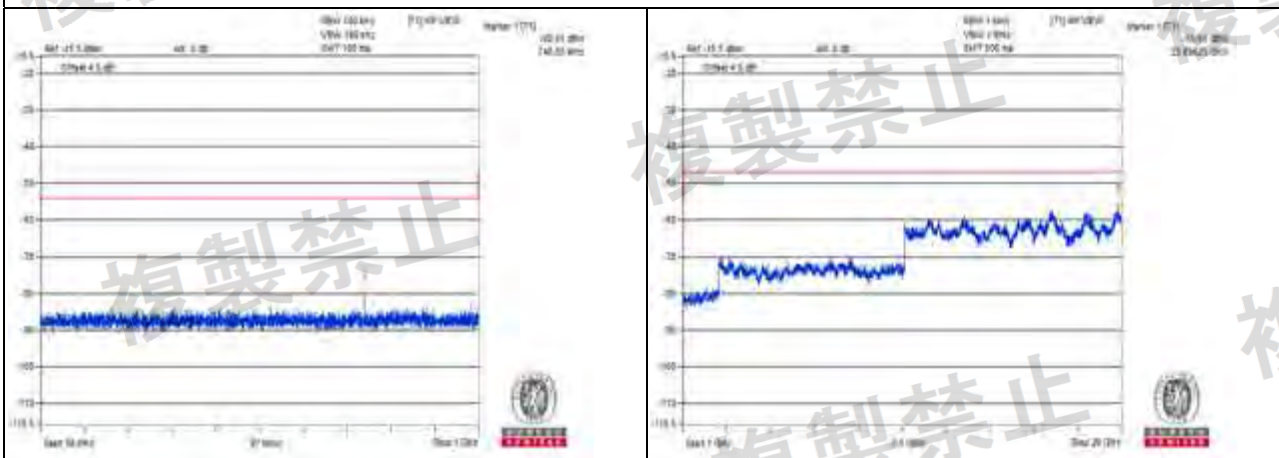
W56 band:
802.11a:

Environmental Conditions		25 deg.C, 68% RH					
Test Channel		CH100 (5500MHz)		CH120 (5600MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	513.300	0.004753nW	395.690	0.00507nW	4nW	Pass
	Above 1GHz	25712.500	3.155005nW	25843.750	2.511886nW	20nW	Pass
Vmax.	Below 1GHz	963.380	0.004898nW	812.300	0.005297nW	4nW	Pass
	Above 1GHz	22006.250	2.037042nW	22037.500	1.931968nW	20nW	Pass
Vmin.	Below 1GHz	763.800	0.004656nW	862.740	0.005458nW	4nW	Pass
	Above 1GHz	25793.750	1.940886nW	22037.500	2.642409nW	20nW	Pass
Test Channel		CH140 (5700MHz)				Limit	Result
Test Condition	Frequency Range	Frequency (MHz)		Measured Value (nW)			
normal	Below 1GHz	562.280		0.005445nW		4nW	Pass
	Above 1GHz	22050.000		2.152782nW		20nW	Pass
Vmax.	Below 1GHz	830.730		0.005035nW		4nW	Pass
	Above 1GHz	22106.250		2.027683nW		20nW	Pass
Vmin.	Below 1GHz	727.180		0.005321nW		4nW	Pass
	Above 1GHz	25756.250		1.887991nW		20nW	Pass

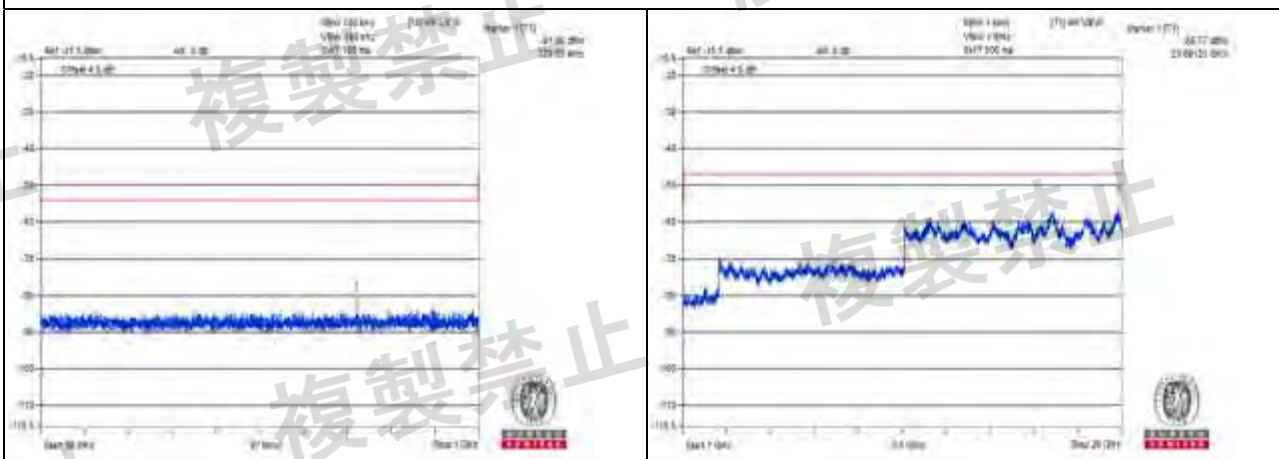
- Note:
1. The worst value in each frequency range v.s. each channel has been marked by boldface.
 2. The spectrum plots are attached on the following pages.



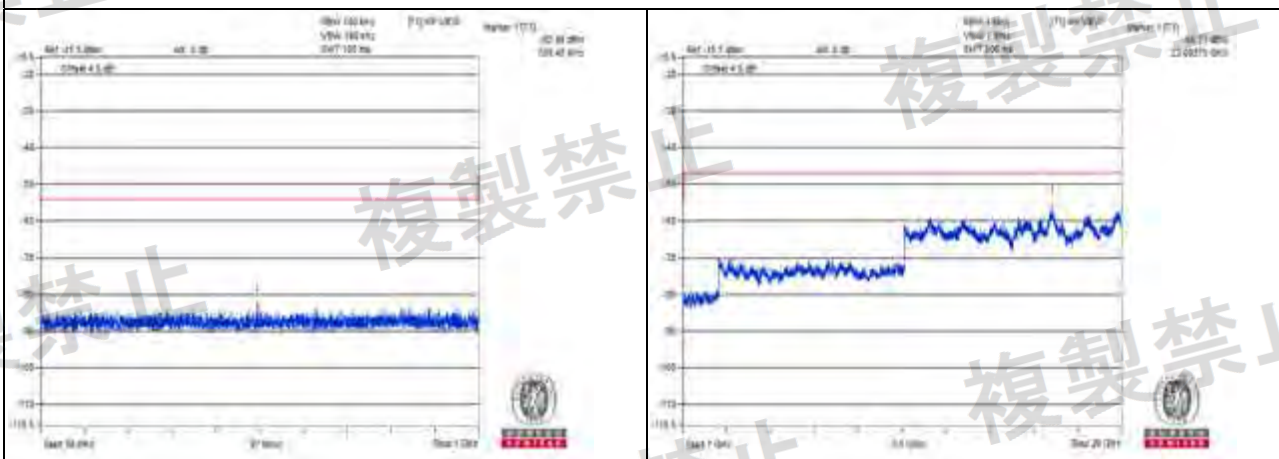
Vnormal



Channel 36



Channel 48

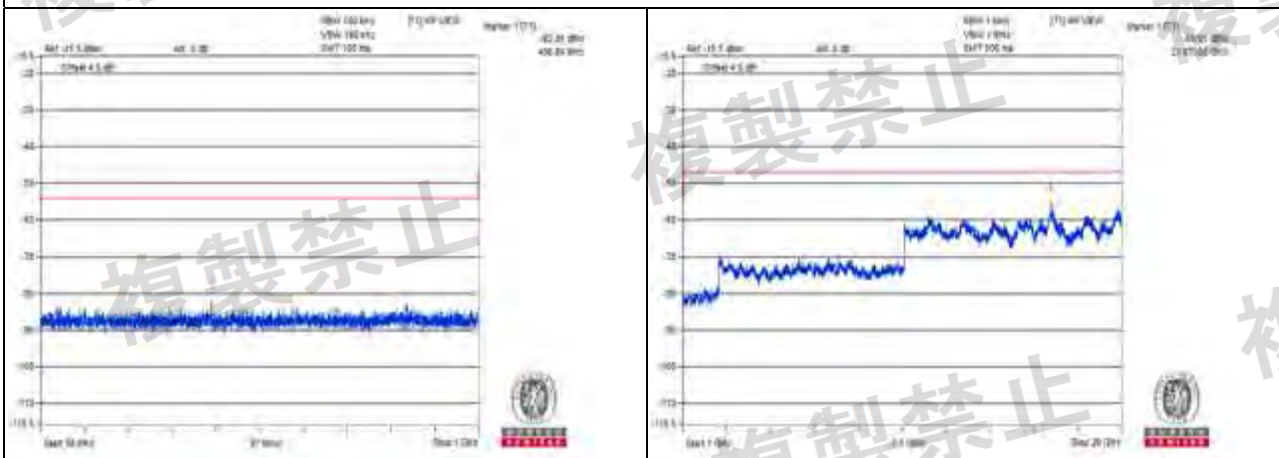


Channel 52

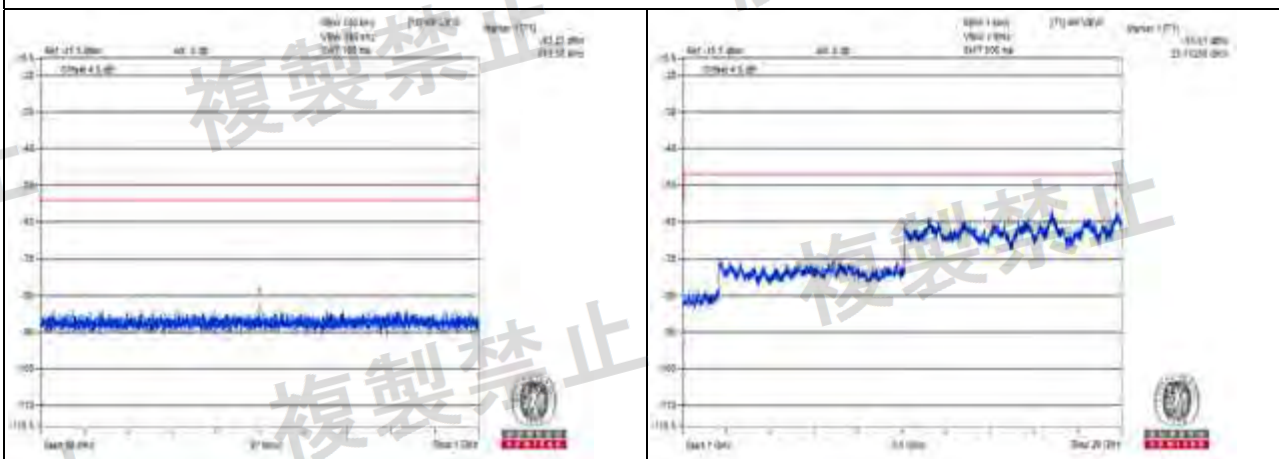
Measurement uncertainty: $\pm 3.93\text{dB}$



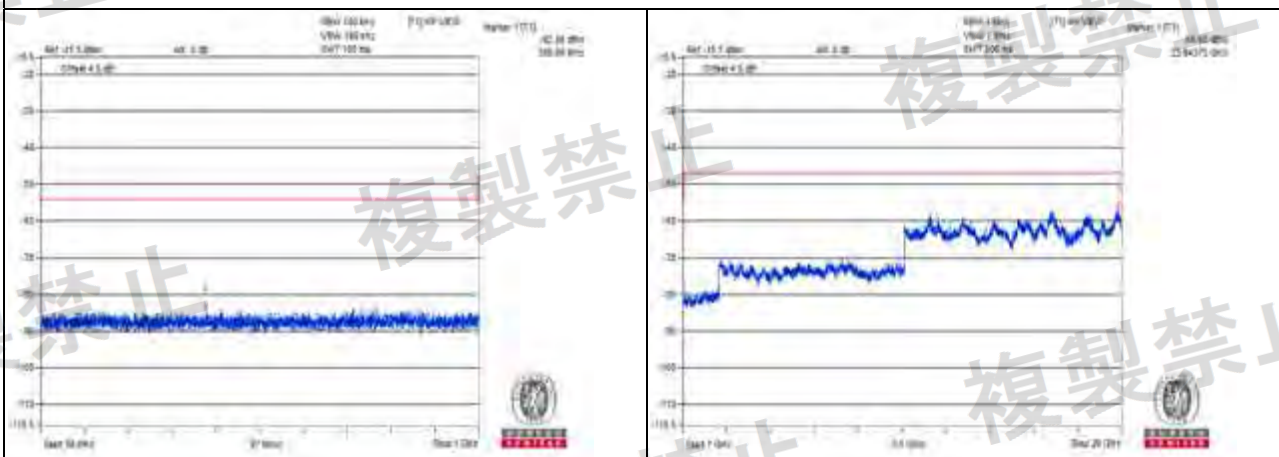
Vnormal



Channel 64



Channel 100

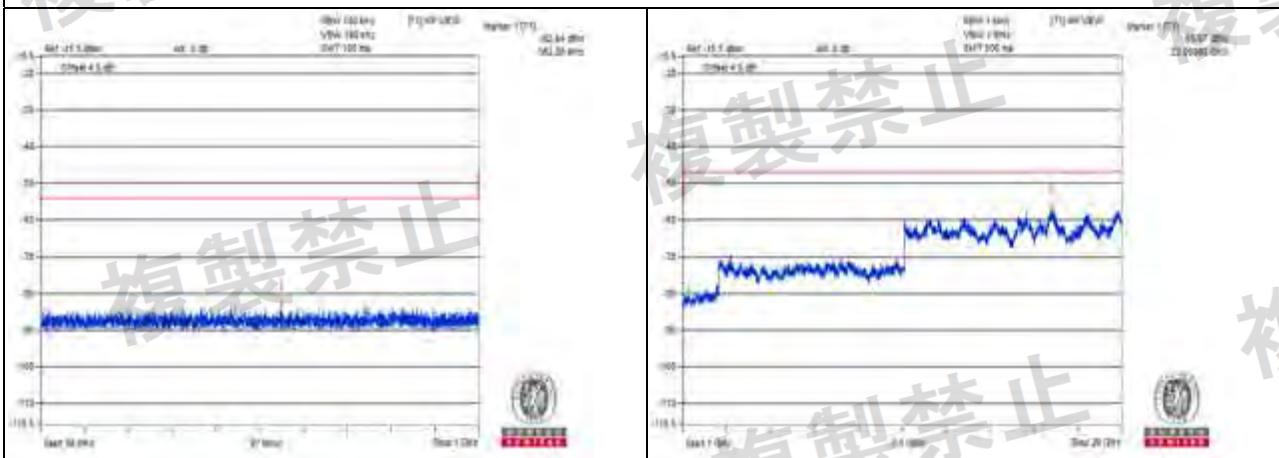


Channel 120

Measurement uncertainty: $\pm 3.93\text{dB}$



Vnormal

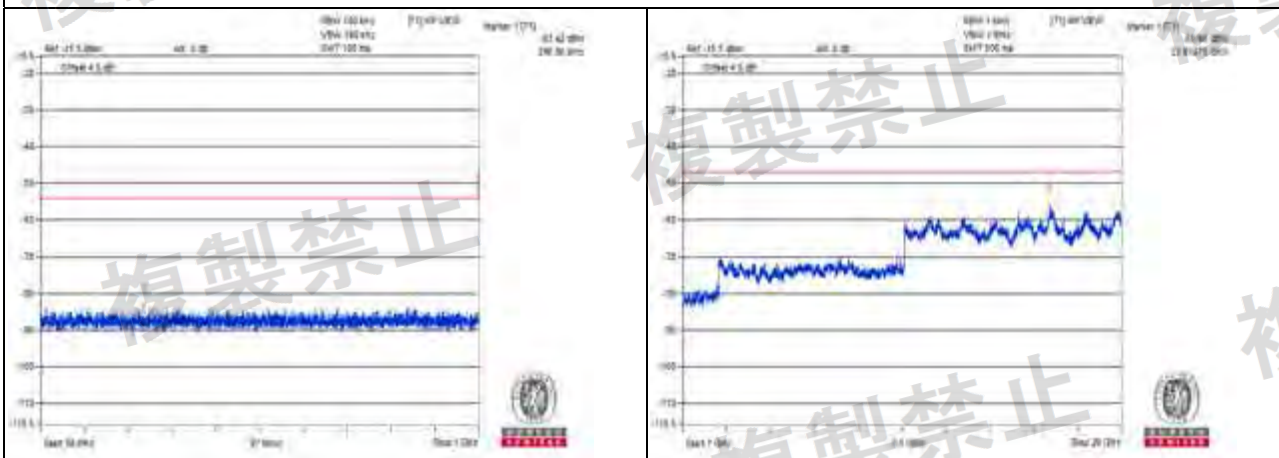


Channel 140

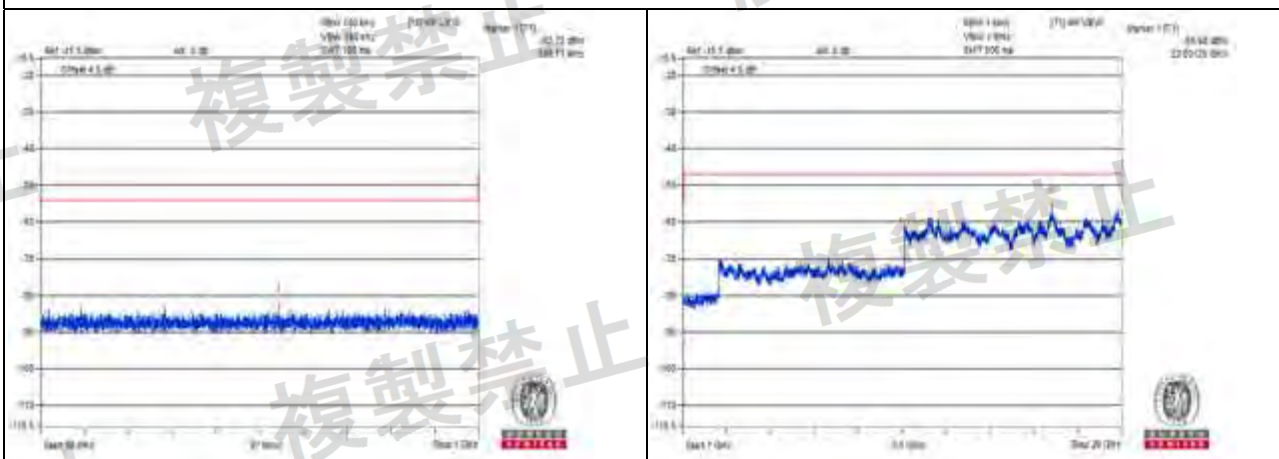
Measurement uncertainty: $\pm 3.93\text{dB}$



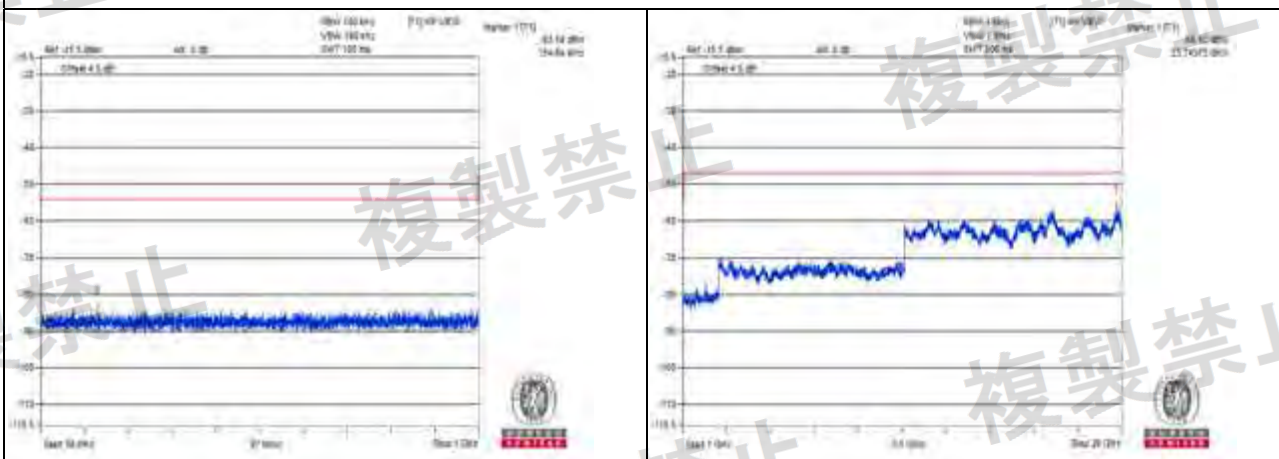
Vmax.



Channel 36



Channel 48

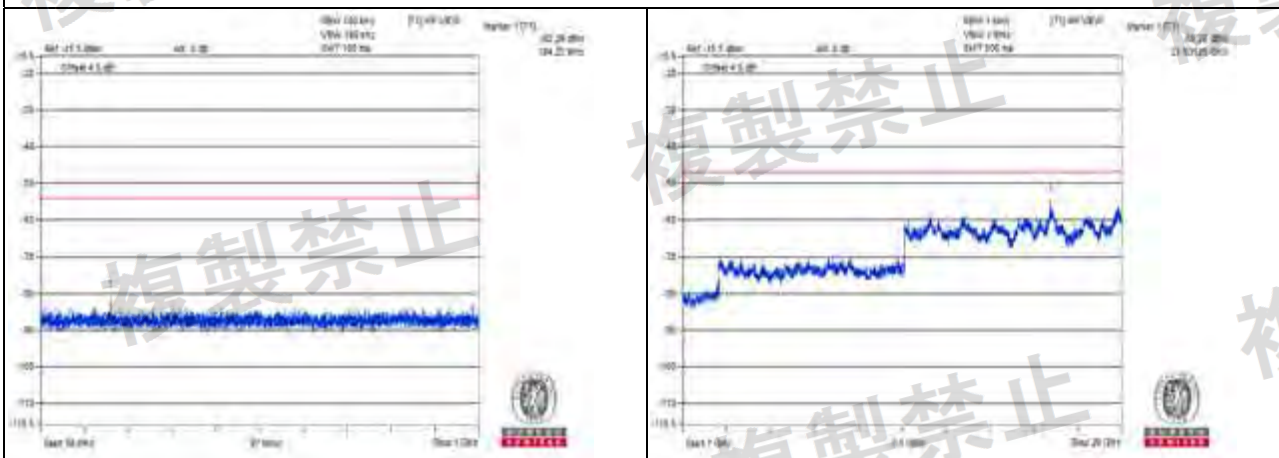


Channel 52

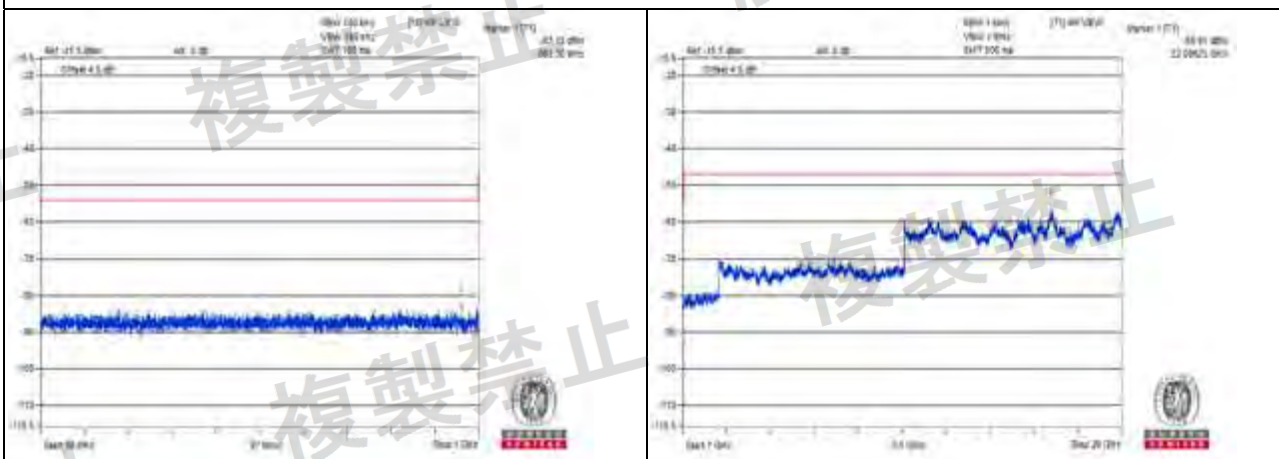
Measurement uncertainty: $\pm 3.93\text{dB}$



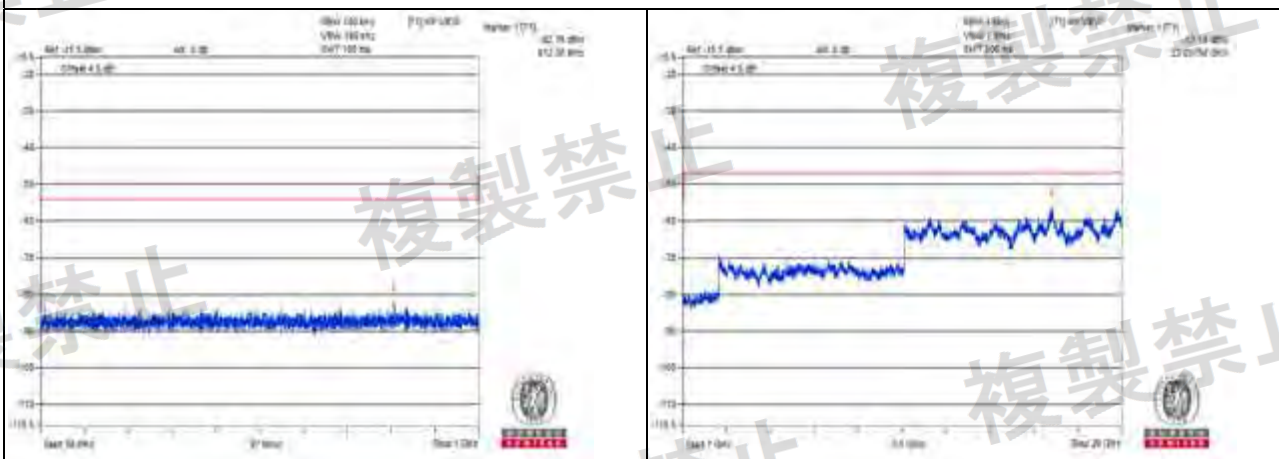
Vmax.



Channel 64



Channel 100

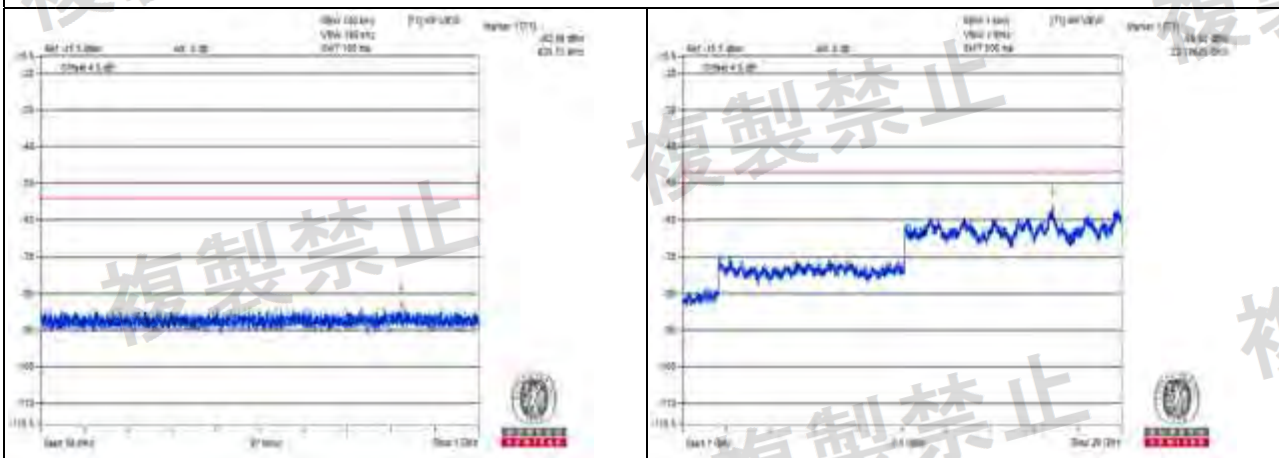


Channel 120

Measurement uncertainty: $\pm 3.93\text{dB}$



Vmax.

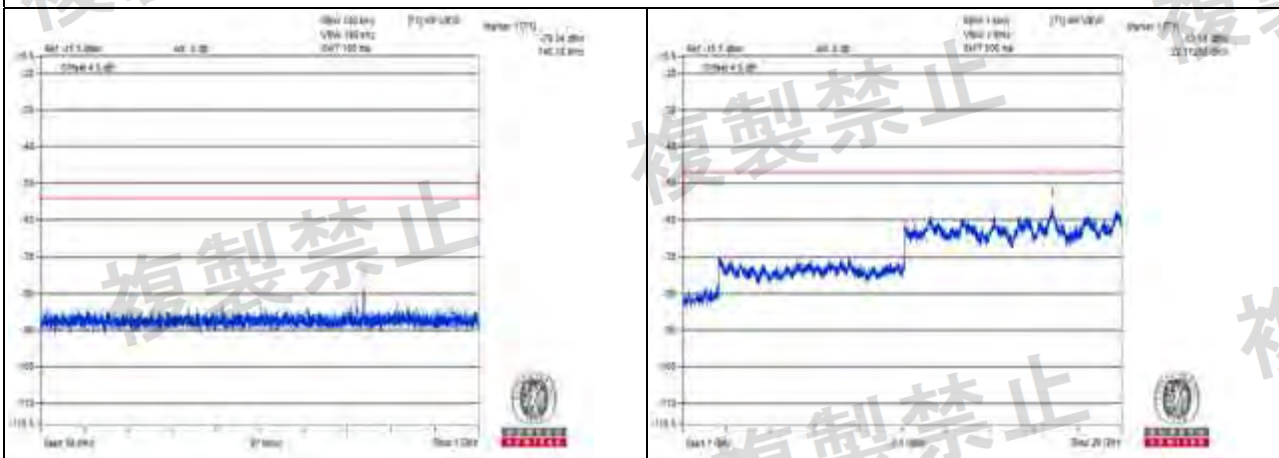


Channel 140

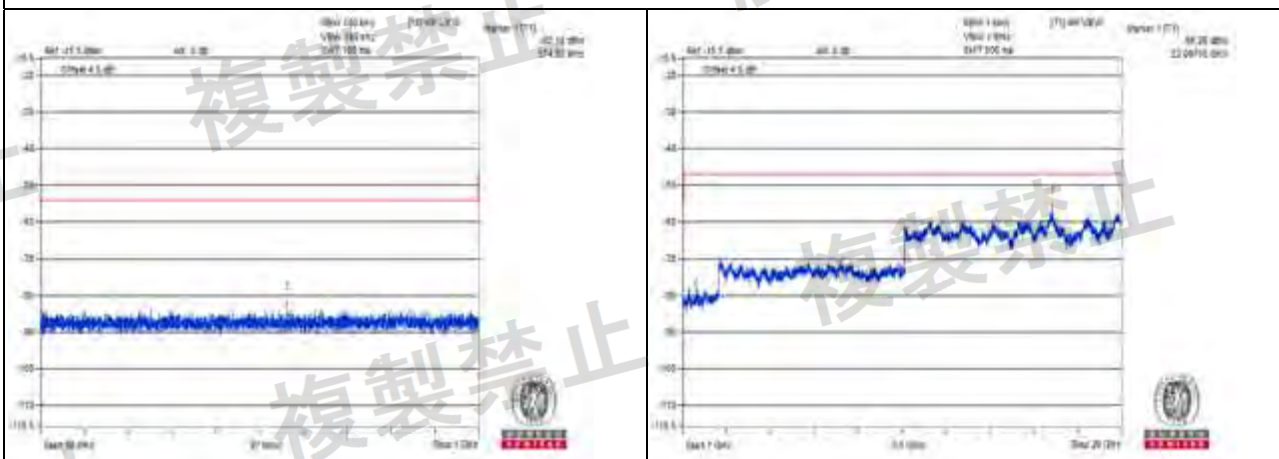
Measurement uncertainty: $\pm 3.93\text{dB}$



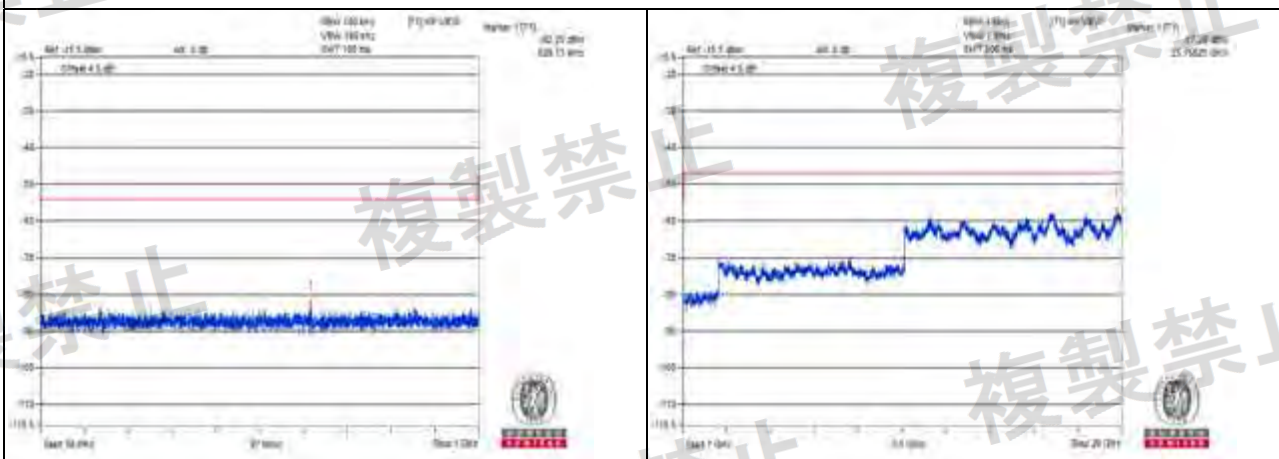
Vmin.



Channel 36



Channel 48

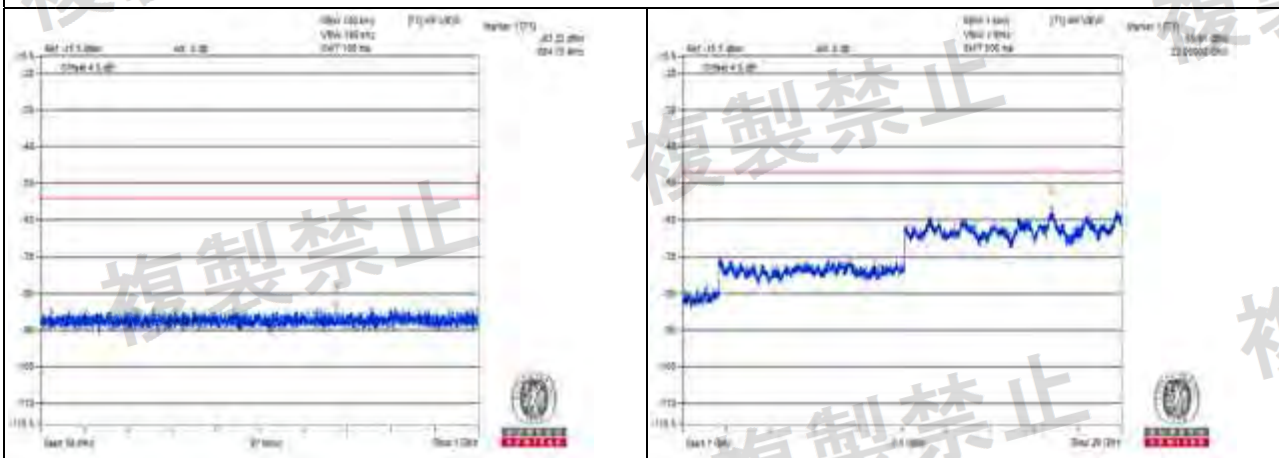


Channel 52

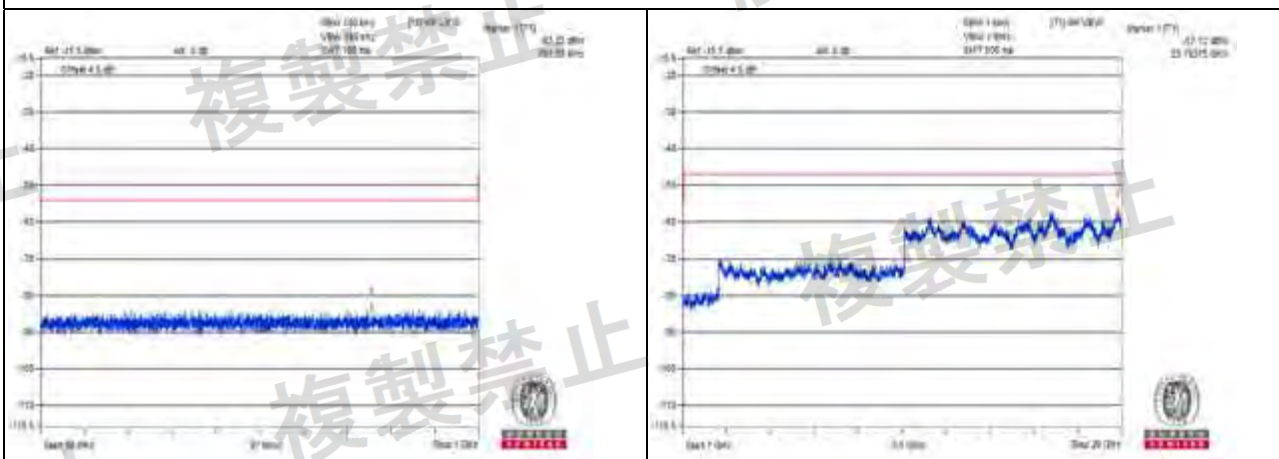
Measurement uncertainty: $\pm 3.93\text{dB}$



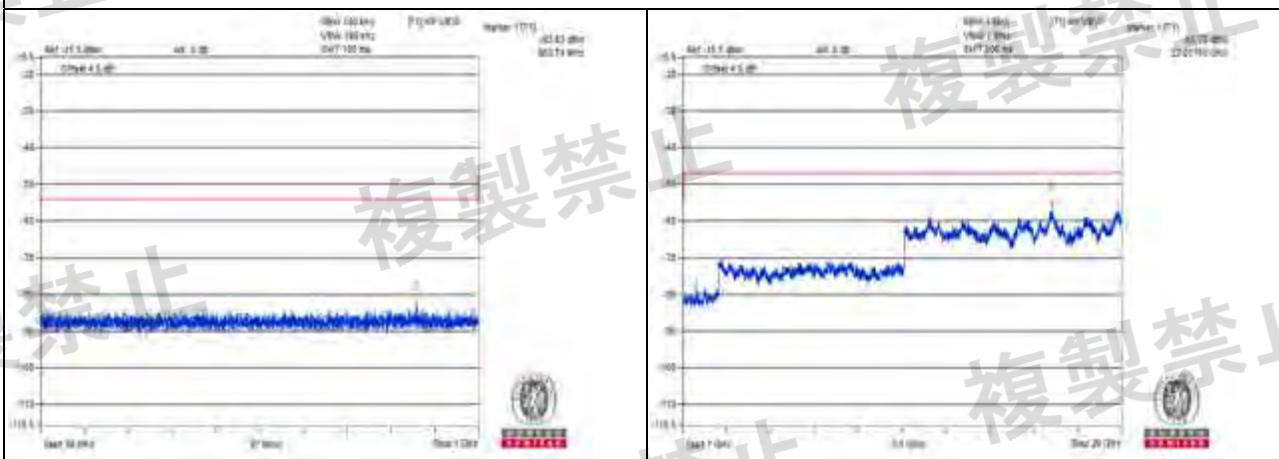
Vmin.



Channel 64



Channel 100

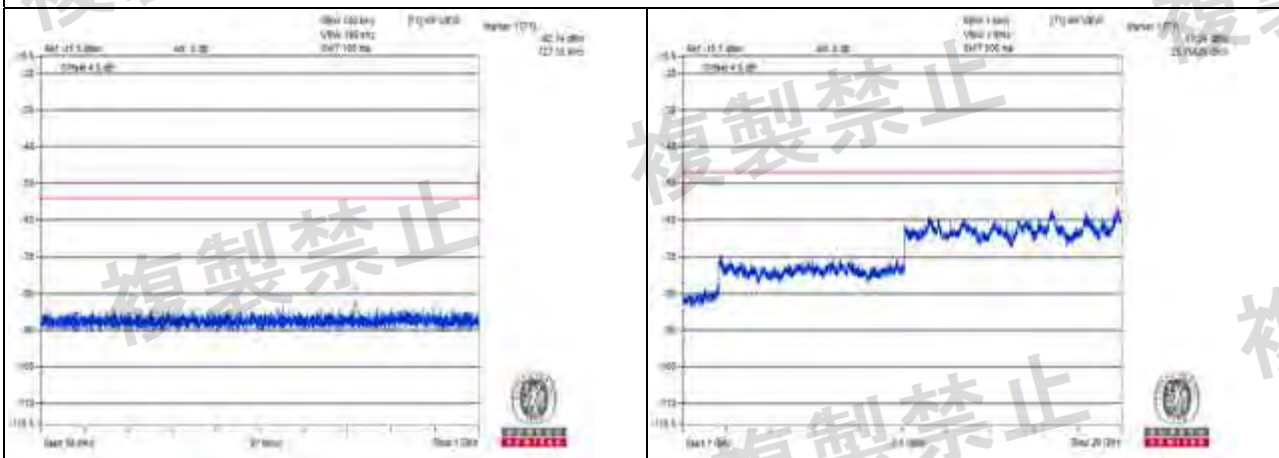


Channel 120

Measurement uncertainty: $\pm 3.93\text{dB}$



Vmin.



Channel 140

Measurement uncertainty: $\pm 3.93\text{dB}$



W52, W53 bands:

802.11n (HT40):

Environmental Conditions		25 deg.C, 68% RH					
Test Channel		CH38 (5190MHz)		CH46 (5230MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	573.680	0.004977nW	422.850	0.004688nW	4nW	Pass
	Above 1GHz	25806.250	2.089296nW	25800.000	1.836538nW	20nW	Pass
Vmax.	Below 1GHz	375.070	0.004909nW	170.400	0.004732nW	4nW	Pass
	Above 1GHz	25818.750	1.883649nW	22081.250	2.079697nW	20nW	Pass
Vmin.	Below 1GHz	710.450	0.005546nW	427.210	0.004966nW	4nW	Pass
	Above 1GHz	25843.750	2.42661nW	22062.500	2.09894nW	20nW	Pass
Test Channel		CH54 (5270MHz)		CH62 (5310MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	279.770	0.004742nW	162.640	0.004732nW	4nW	Pass
	Above 1GHz	25850.000	2.269865nW	25743.750	2.398833nW	20nW	Pass
Vmax.	Below 1GHz	288.020	0.005309nW	354.950	0.00471nW	4nW	Pass
	Above 1GHz	22018.750	2.259436nW	25806.250	2.477422nW	20nW	Pass
Vmin.	Below 1GHz	58.850	0.004742nW	160.700	0.004932nW	4nW	Pass
	Above 1GHz	22062.500	2.108628nW	25837.500	2.42661nW	20nW	Pass

Note:

1. The worst value in each frequency range v.s. each channel has been marked by boldface.
2. The spectrum plots are attached on the following pages.



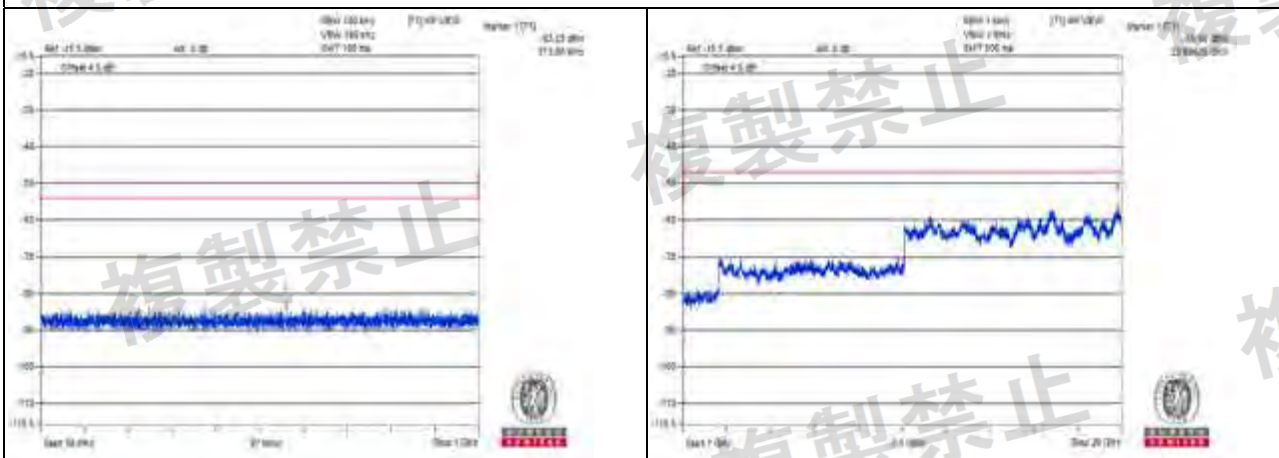
W56 band:
802.11n (HT40):

Environmental Conditions		25 deg.C, 68% RH					
Test Channel		CH102 (5510MHz)		CH118 (5590MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	978.170	0.004977nW	532.700	0.004887nW	4nW	Pass
	Above 1GHz	22100.000	2.108628nW	21893.750	1.815516nW	20nW	Pass
Vmax.	Below 1GHz	518.880	0.005248nW	847.220	0.004864nW	4nW	Pass
	Above 1GHz	25843.750	1.782379nW	25762.500	2.027683nW	20nW	Pass
Vmin.	Below 1GHz	181.560	0.005768nW	663.160	0.004831nW	4nW	Pass
	Above 1GHz	25812.500	2.06063nW	22100.000	2.013724nW	20nW	Pass
Test Channel		CH134 (5670MHz)				Limit	Result
Test Condition	Frequency Range	Frequency (MHz)		Measured Value (nW)			
Vnormal	Below 1GHz	327.790		0.005483nW		4nW	Pass
	Above 1GHz	22093.750		2.032357nW		20nW	Pass
Vmax.	Below 1GHz	574.890		0.006607nW		4nW	Pass
	Above 1GHz	22050.000		2.564484nW		20nW	Pass
Vmin.	Below 1GHz	746.340		0.012162nW		4nW	Pass
	Above 1GHz	25625.000		2.243882nW		20nW	Pass

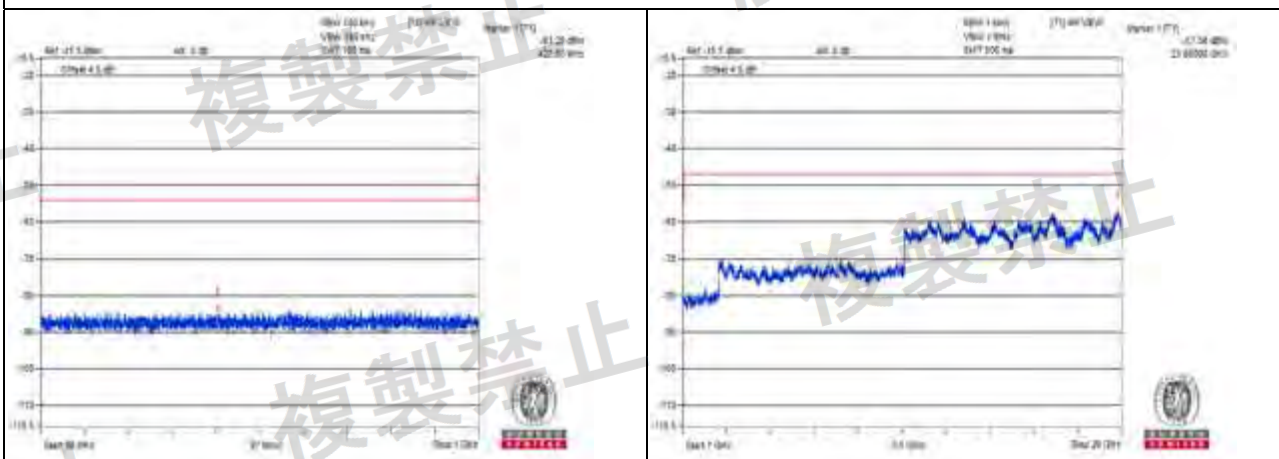
- Note:
1. The worst value in each frequency range v.s. each channel has been marked by boldface.
 2. The spectrum plots are attached on the following pages.



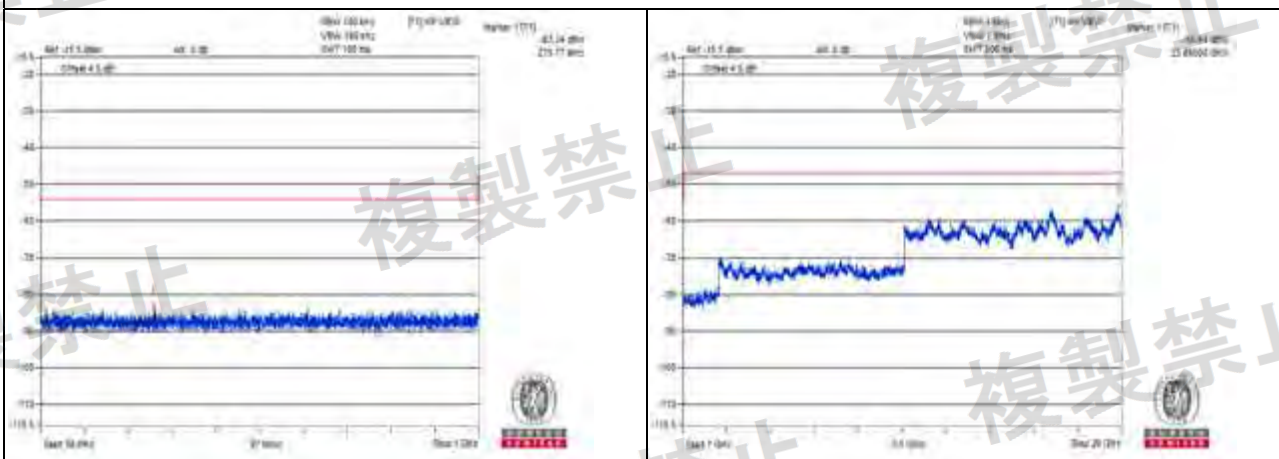
Vnormal



Channel 38



Channel 46

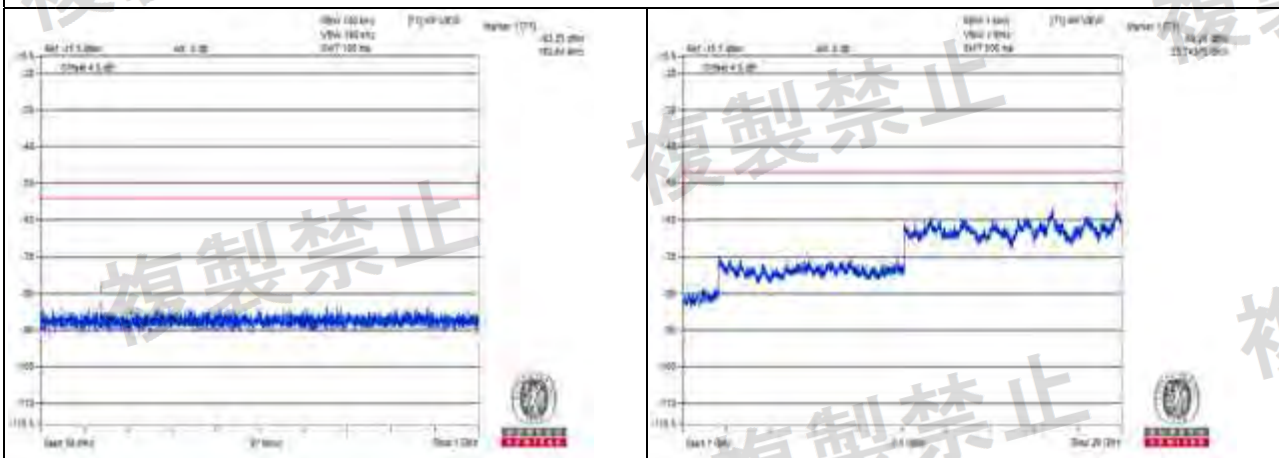


Channel 54

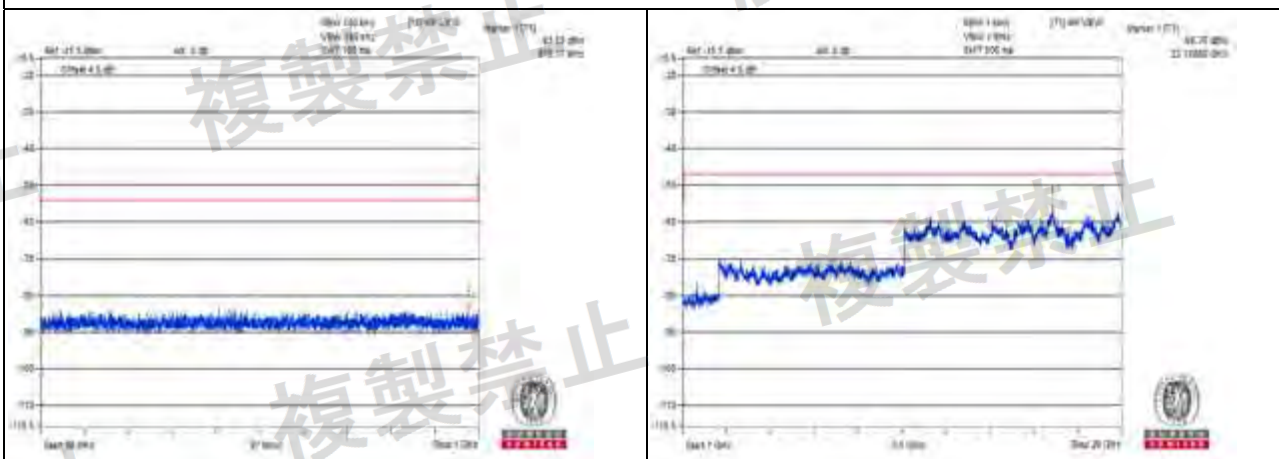
Measurement uncertainty: $\pm 3.93\text{dB}$



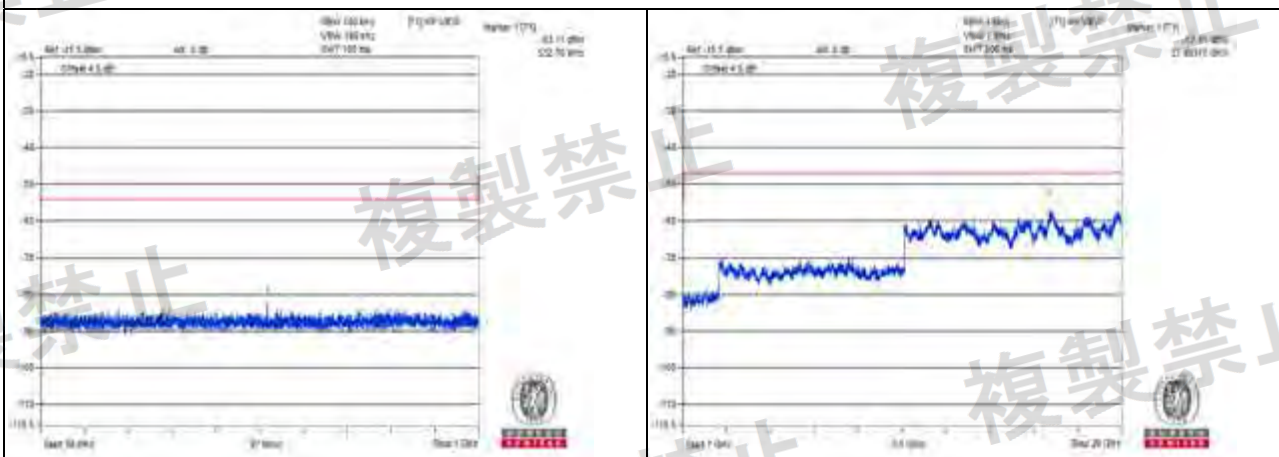
Vnormal



Channel 62



Channel 102

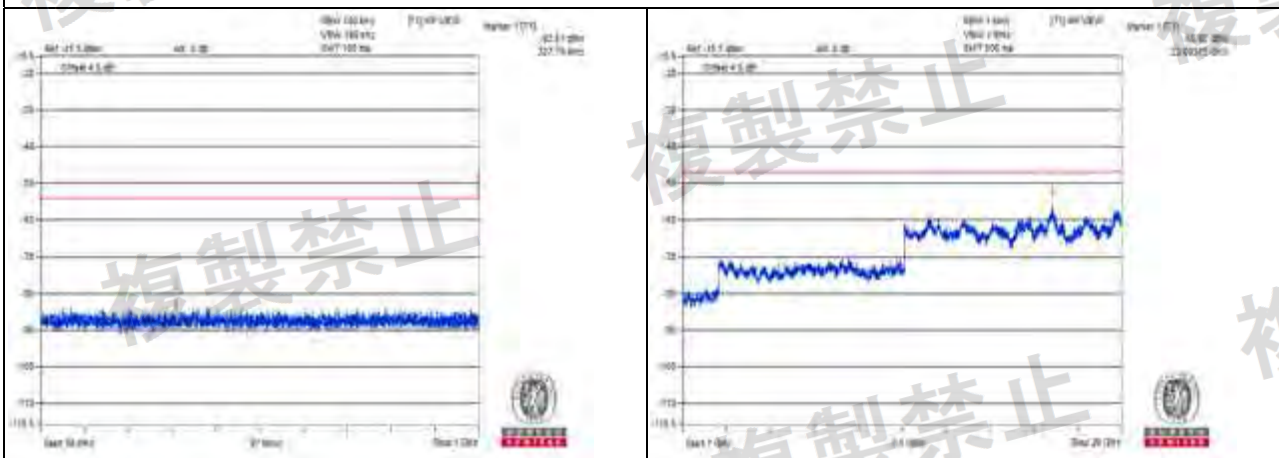


Channel 118

Measurement uncertainty: $\pm 3.93\text{dB}$



Vnormal

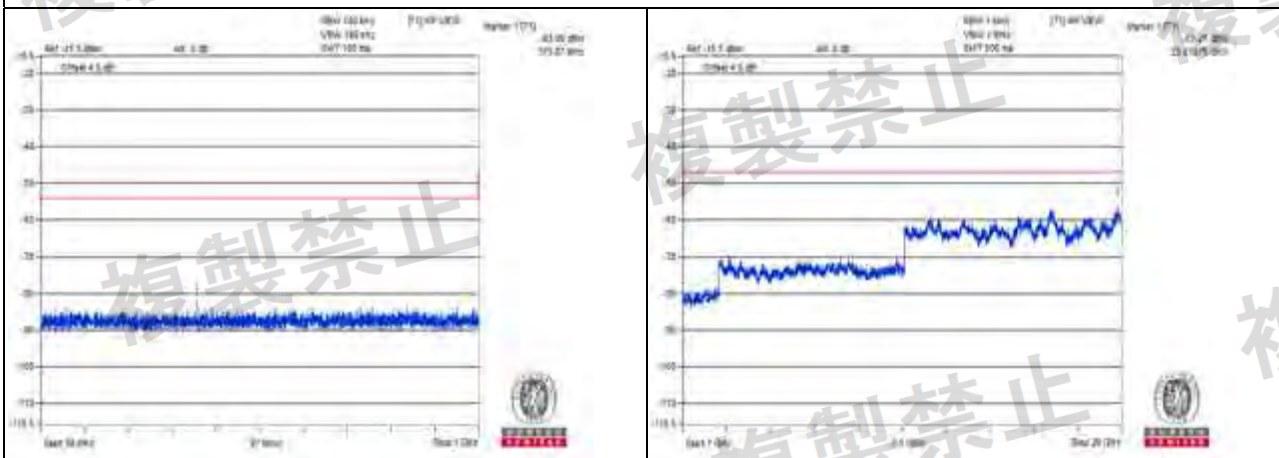


Channel 134

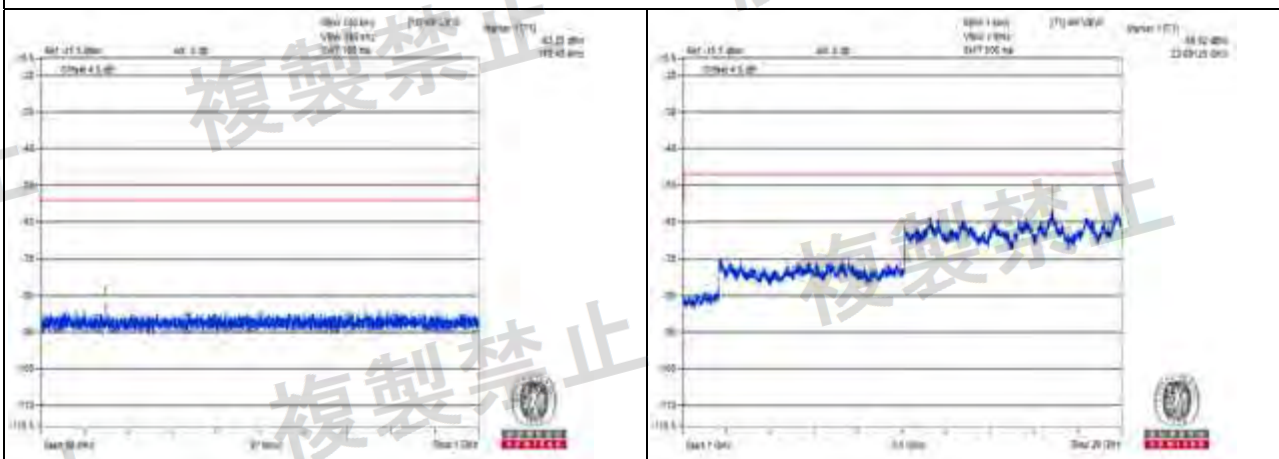
Measurement uncertainty: $\pm 3.93\text{dB}$



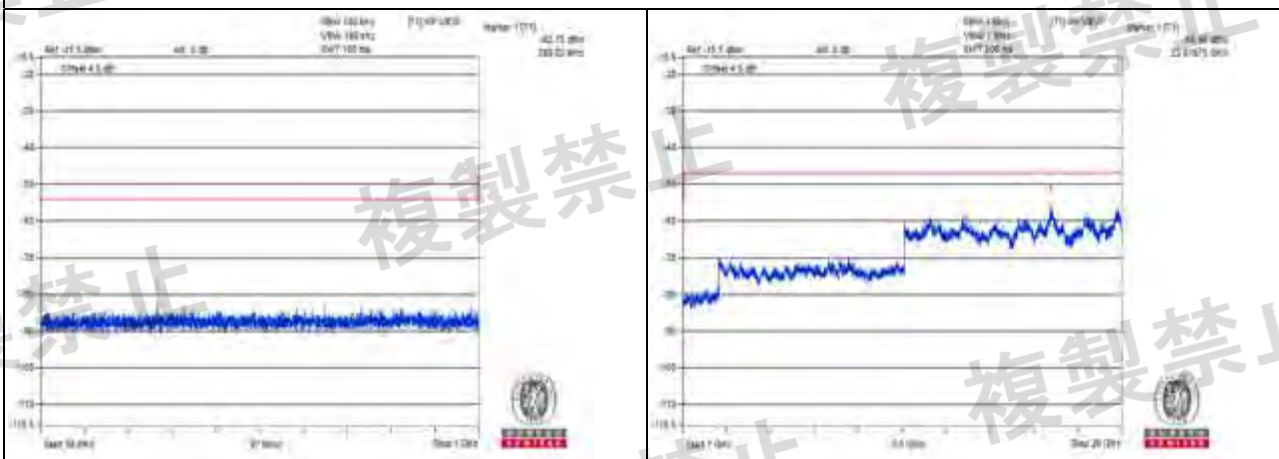
Vmax.



Channel 38



Channel 46

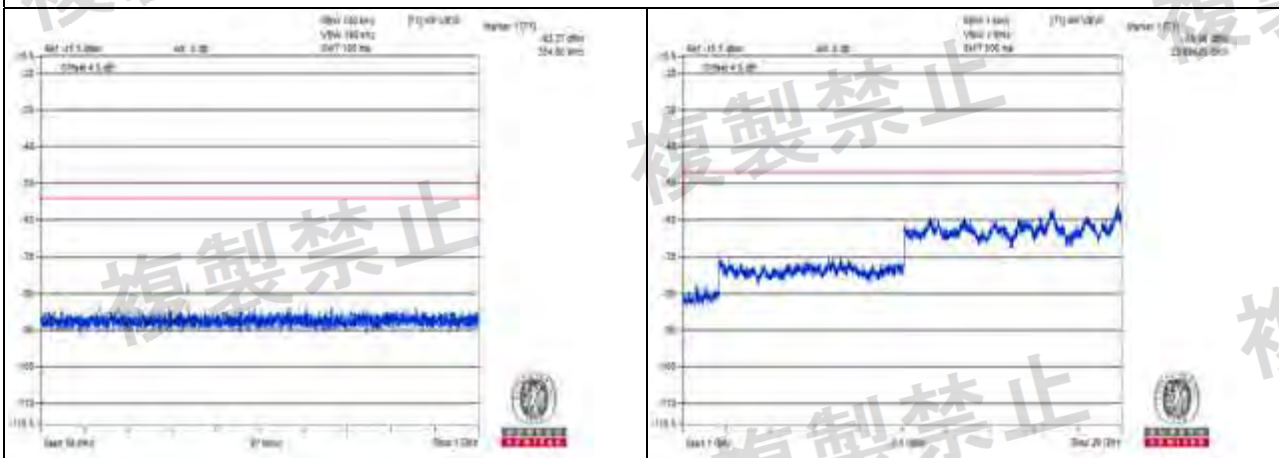


Channel 54

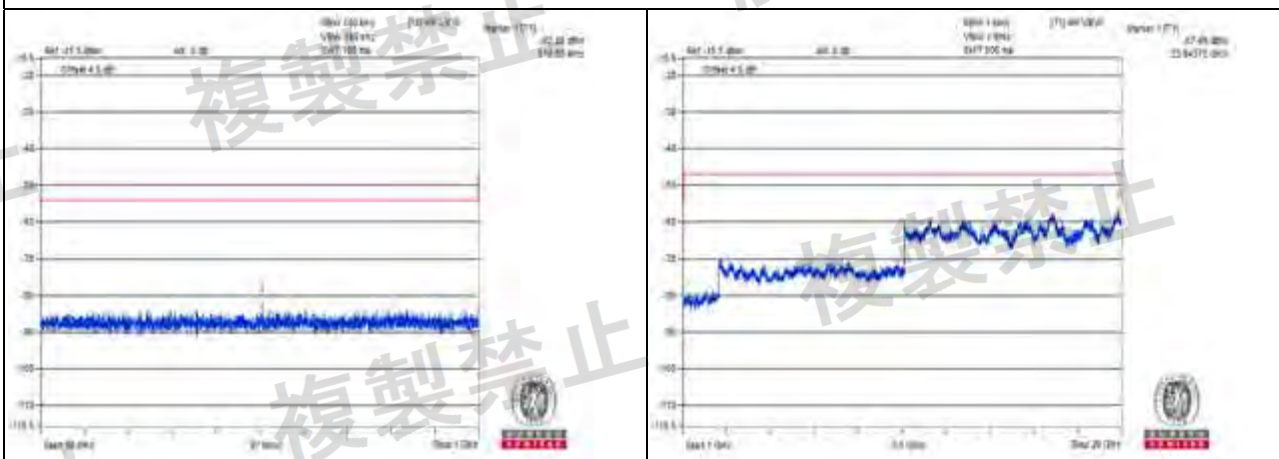
Measurement uncertainty: $\pm 3.93\text{dB}$



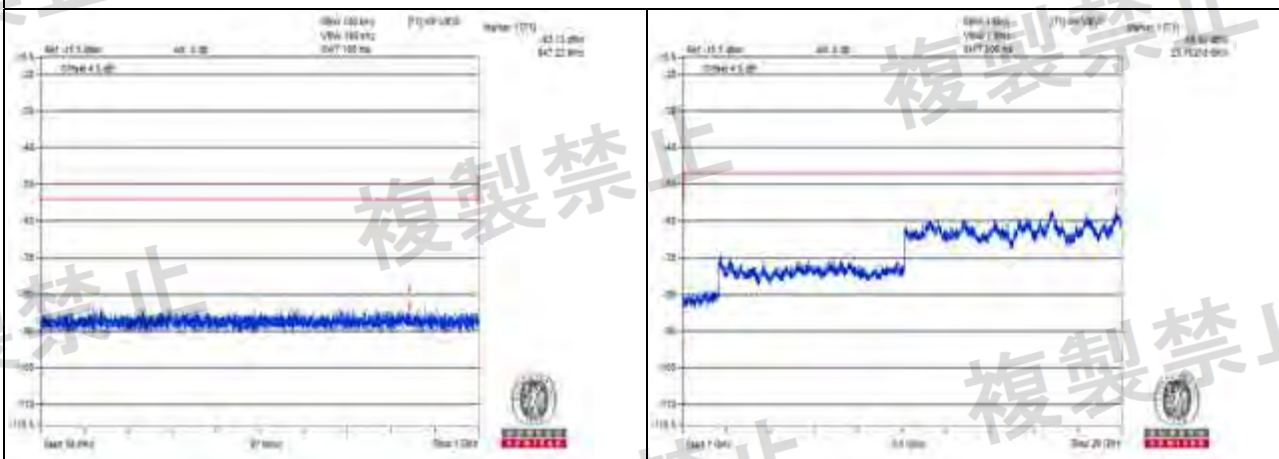
Vmax.



Channel 62



Channel 102

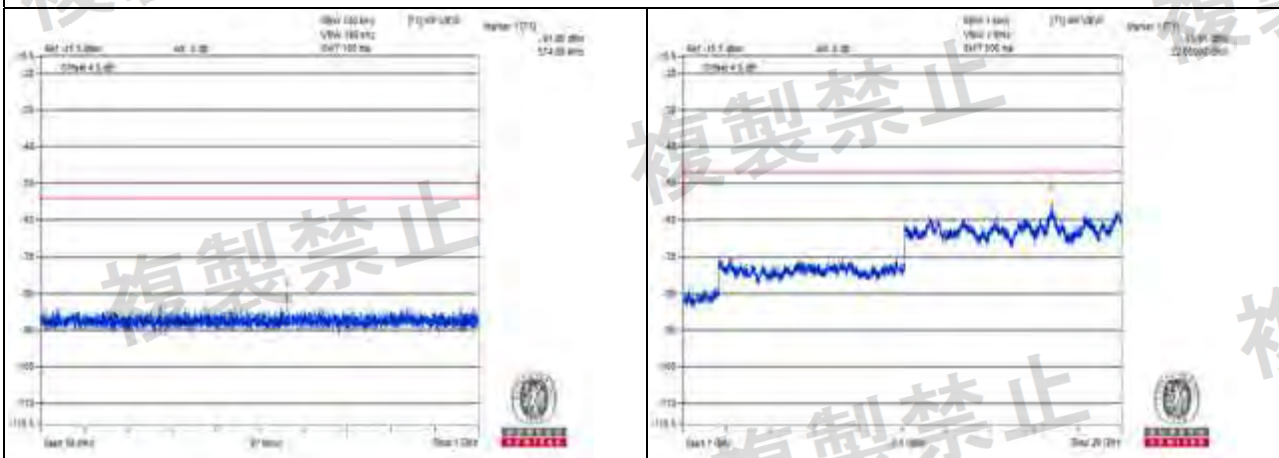


Channel 118

Measurement uncertainty: $\pm 3.93\text{dB}$



Vmax.

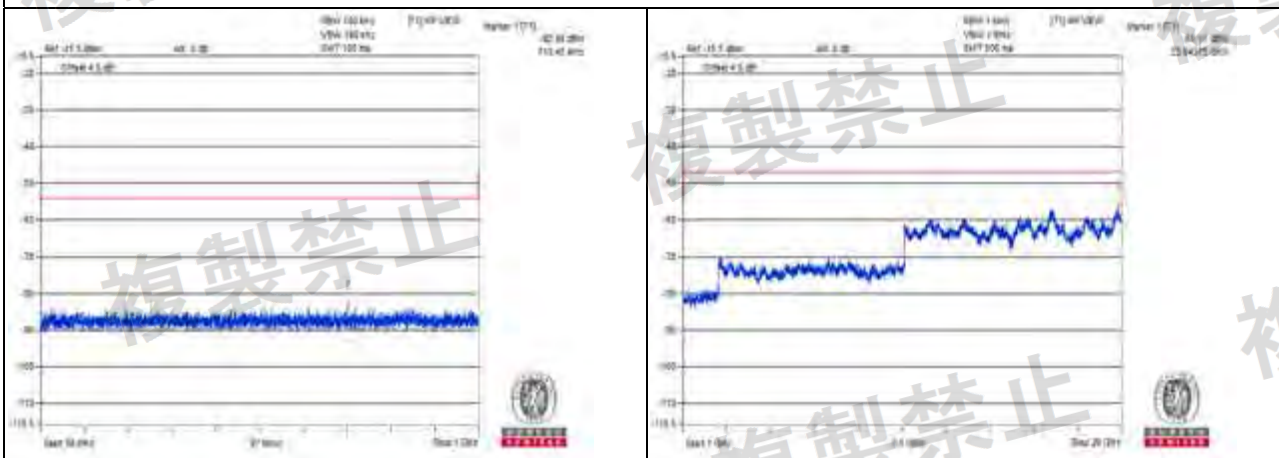


Channel 134

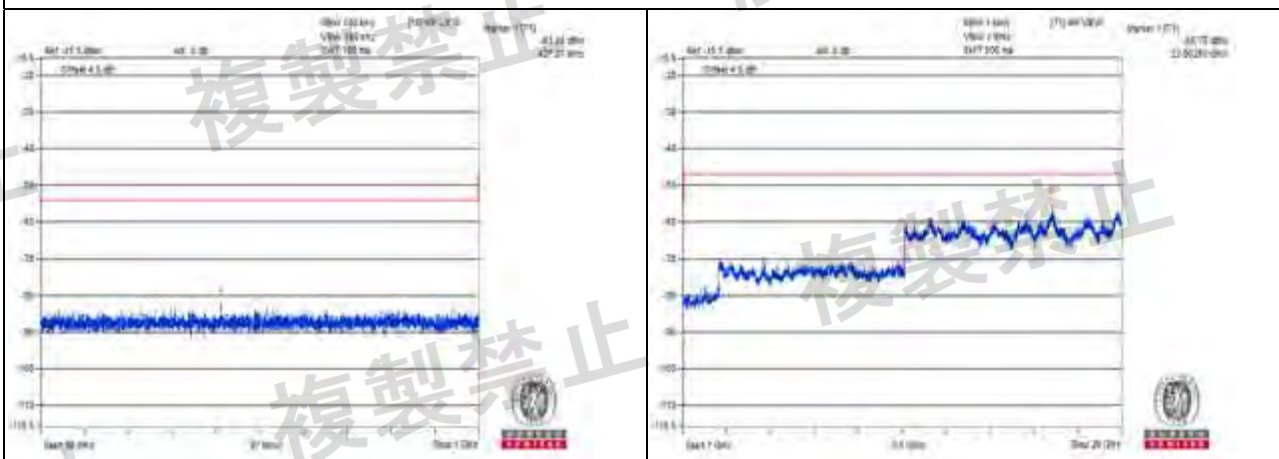
Measurement uncertainty: $\pm 3.93\text{dB}$



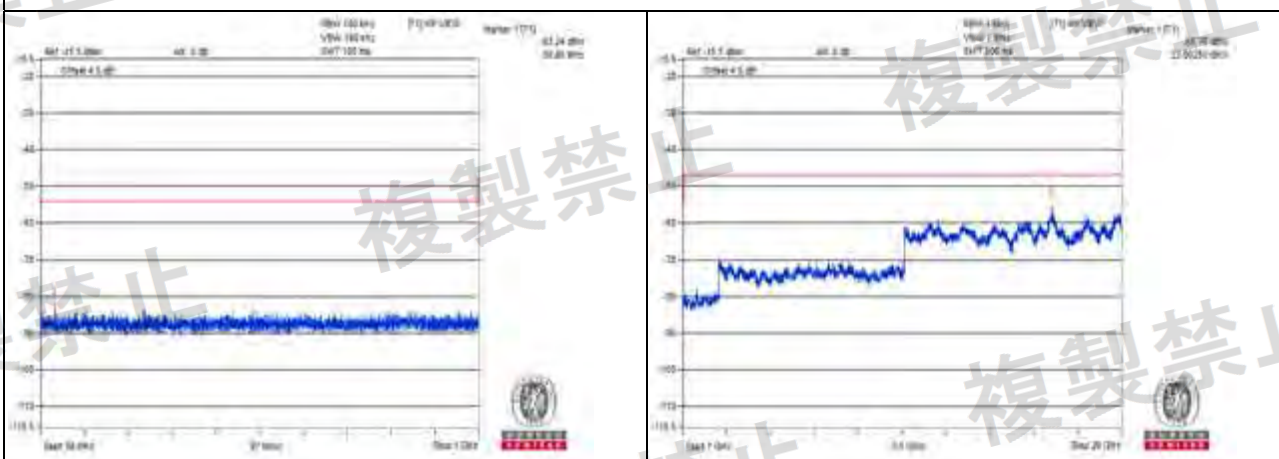
Vmin.



Channel 38



Channel 46

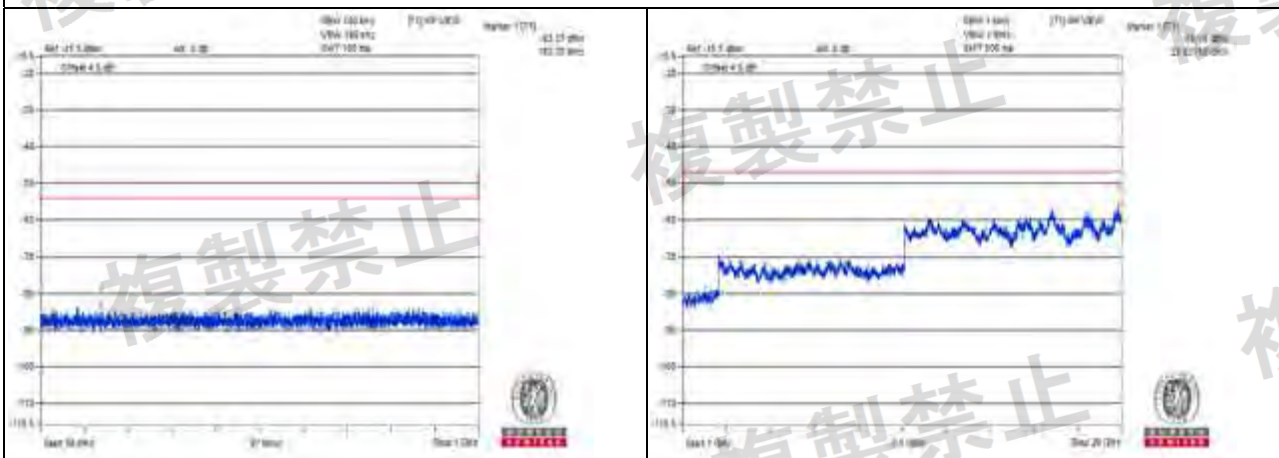


Channel 54

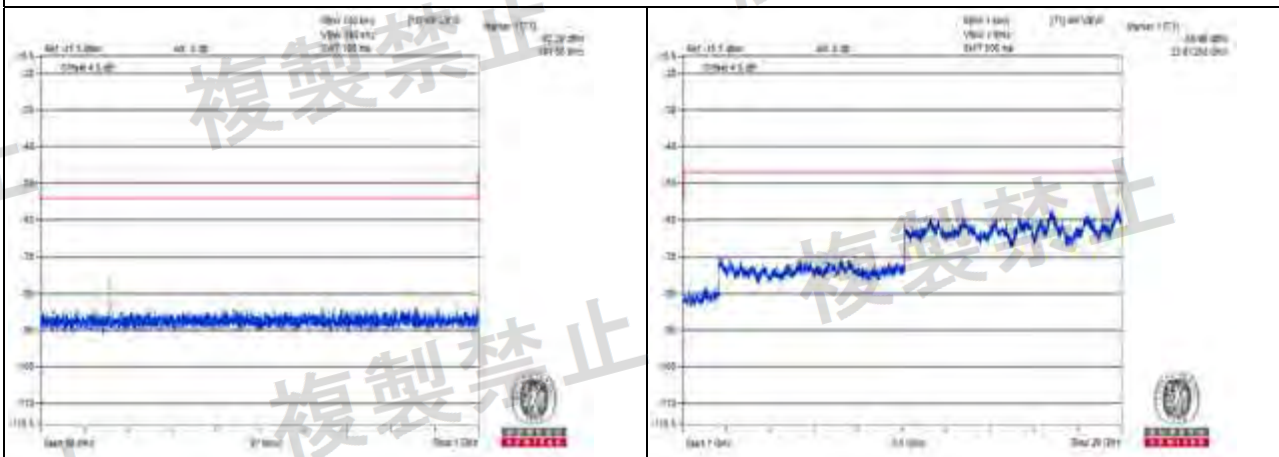
Measurement uncertainty: $\pm 3.93\text{dB}$



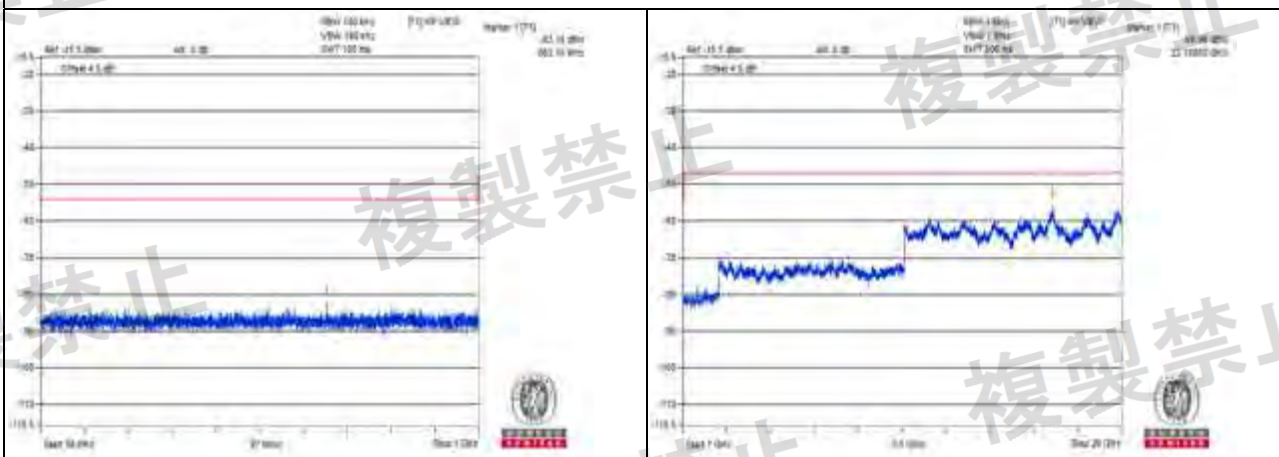
Vmin.



Channel 62



Channel 102

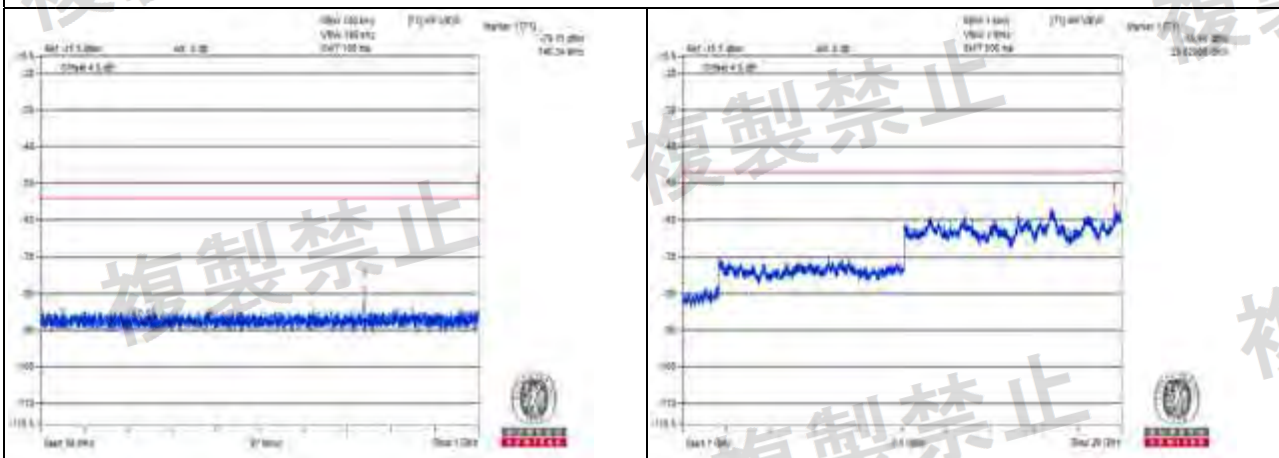


Channel 118

Measurement uncertainty: $\pm 3.93\text{dB}$



Vmin.



Channel 134

Measurement uncertainty: $\pm 3.93\text{dB}$



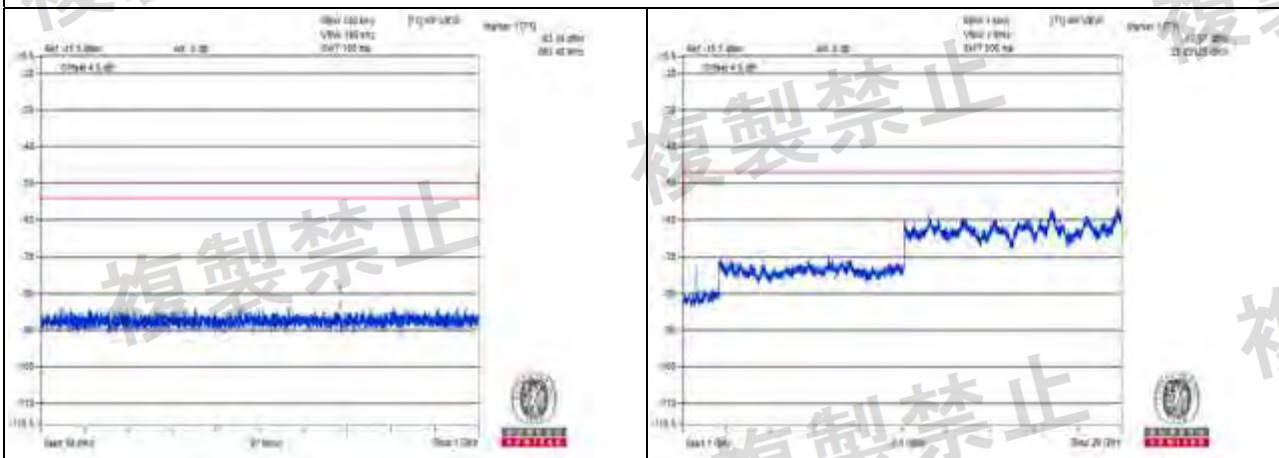
W52, W53 and W56 bands:
802.11ac (VHT80)

Environmental Conditions		25 deg.C, 68% RH					
Test Channel		CH42 (5210MHz)		CH58 (5290MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	693.480	0.004808nW	214.540	0.004898nW	4nW	Pass
	Above 1GHz	25831.250	1.96336nW	25787.500	2.301442nW	20nW	Pass
Vmax.	Below 1GHz	410.480	0.004887nW	283.650	0.005035nW	4nW	Pass
	Above 1GHz	21962.500	1.972423nW	22037.500	2.192805nW	20nW	Pass
Vmin.	Below 1GHz	615.880	0.005834nW	832.910	0.005821nW	4nW	Pass
	Above 1GHz	25837.500	2.37684nW	22056.250	2.540973nW	20nW	Pass
Test Channel		CH106 (5530MHz)		CH122 (5610MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (nW)	Frequency (MHz)	Measured Value (nW)		
Vnormal	Below 1GHz	464.070	0.005236nW	546.040	0.005224nW	4nW	Pass
	Above 1GHz	25768.750	2.162719nW	25812.500	2.070141nW	20nW	Pass
Vmax.	Below 1GHz	537.550	0.005728nW	666.560	0.004732nW	4nW	Pass
	Above 1GHz	22037.500	2.618183nW	25850.000	2.074914nW	20nW	Pass
Vmin.	Below 1GHz	262.070	0.005152nW	268.860	0.005702nW	4nW	Pass
	Above 1GHz	25843.750	2.249055nW	21987.500	2.055891nW	20nW	Pass

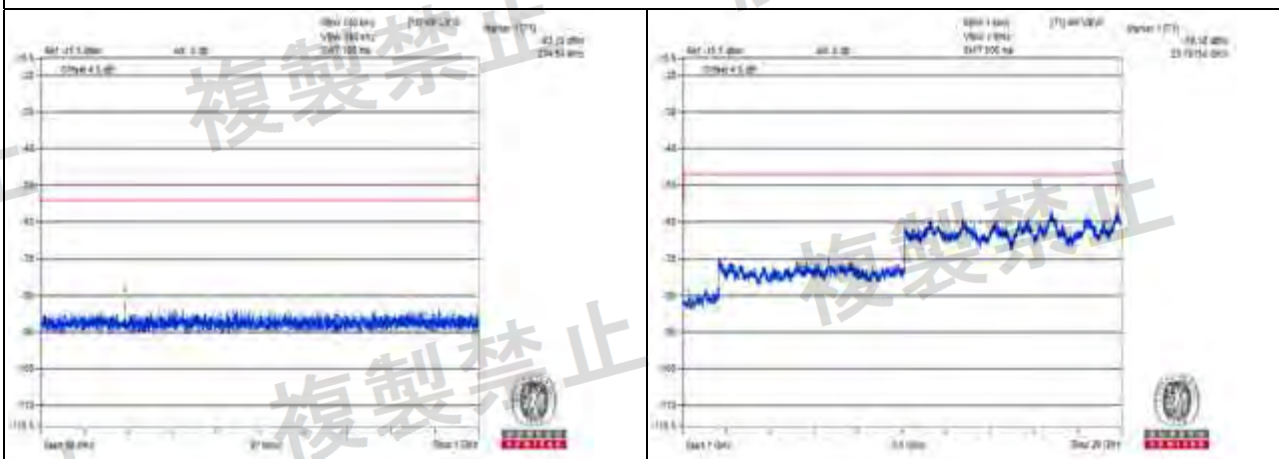
- Note:
1. The worst value in each frequency range v.s. each channel has been marked by boldface.
 2. The spectrum plots are attached on the following pages.



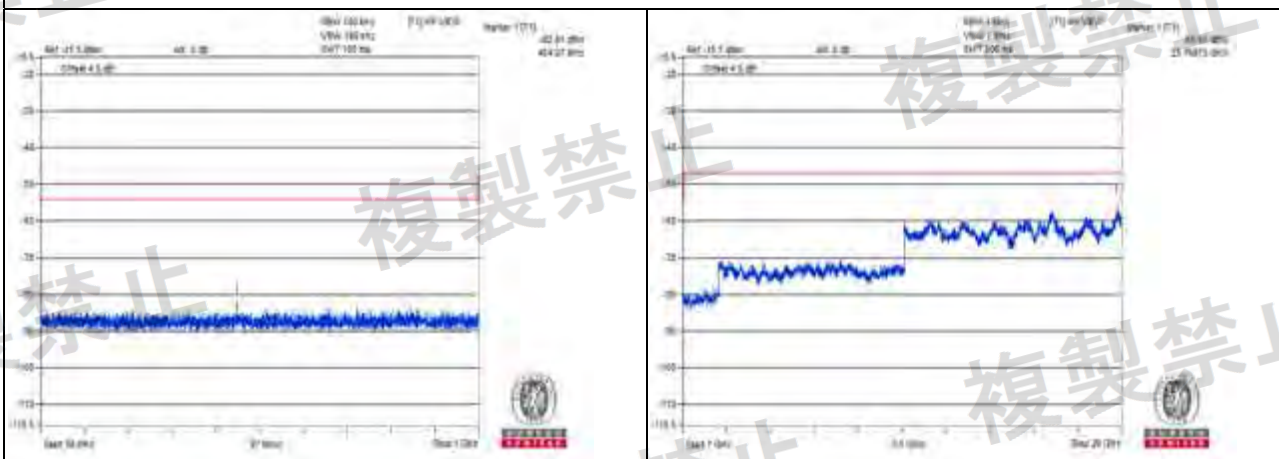
Vnormal



Channel 42



Channel 58

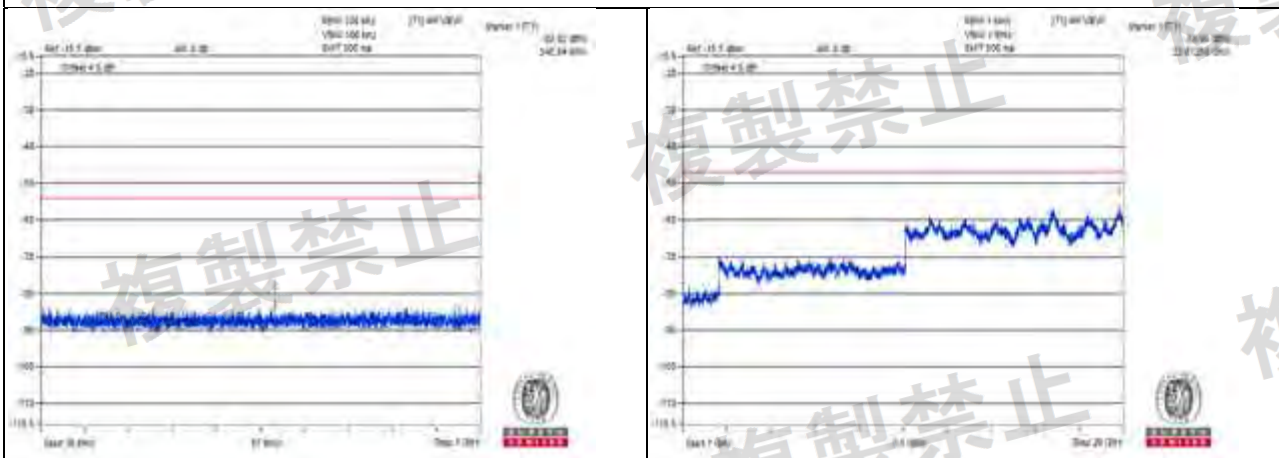


Channel 106

Measurement uncertainty: $\pm 3.93\text{dB}$



Vnormal

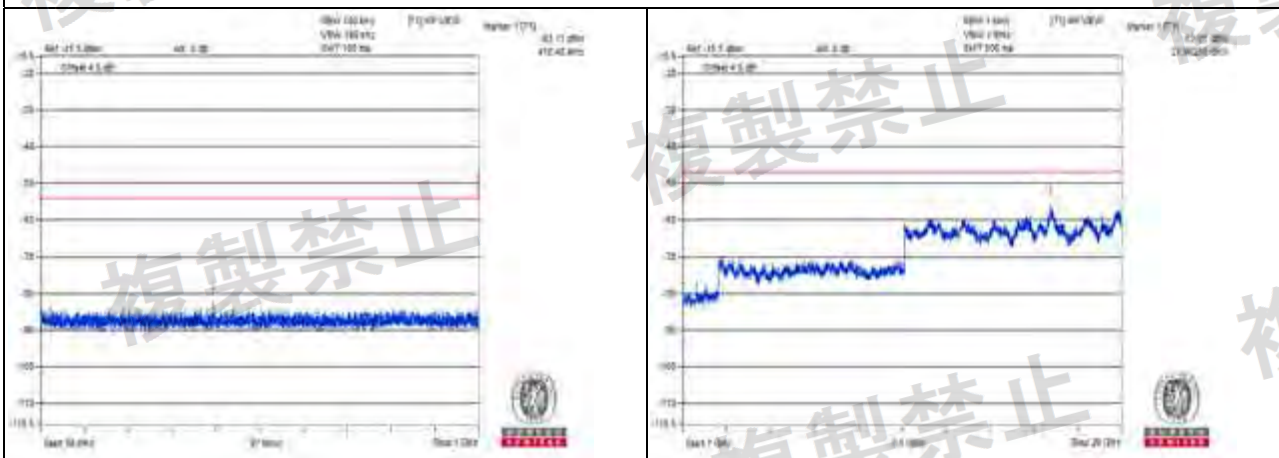


Channel 122

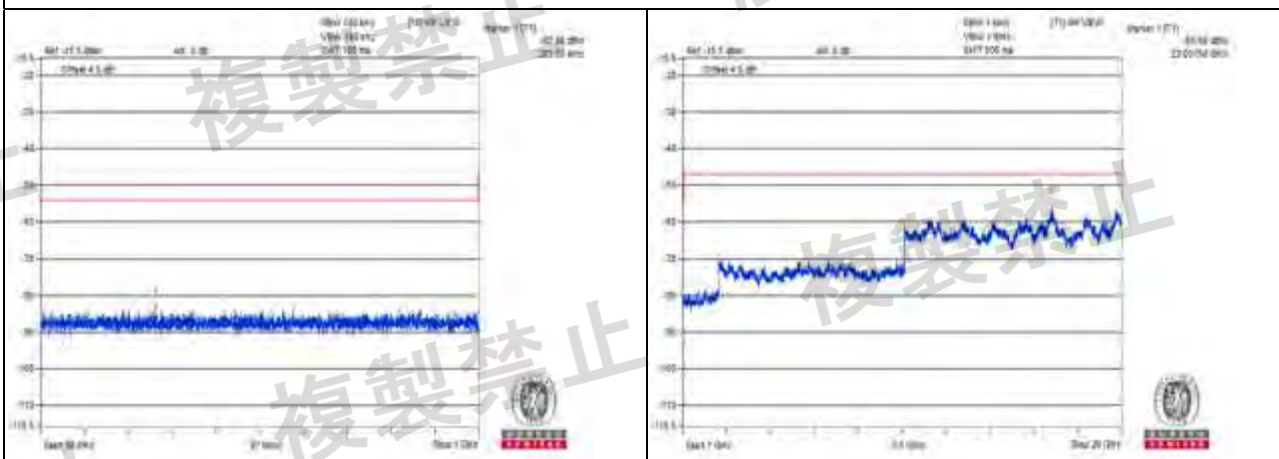
Measurement uncertainty: $\pm 3.93\text{dB}$



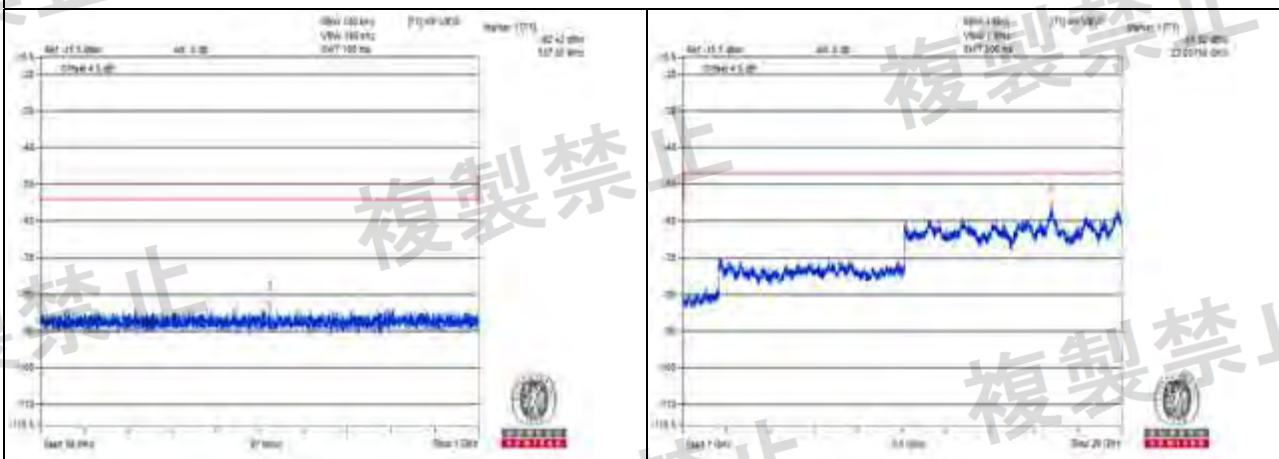
Vmax.



Channel 42



Channel 58

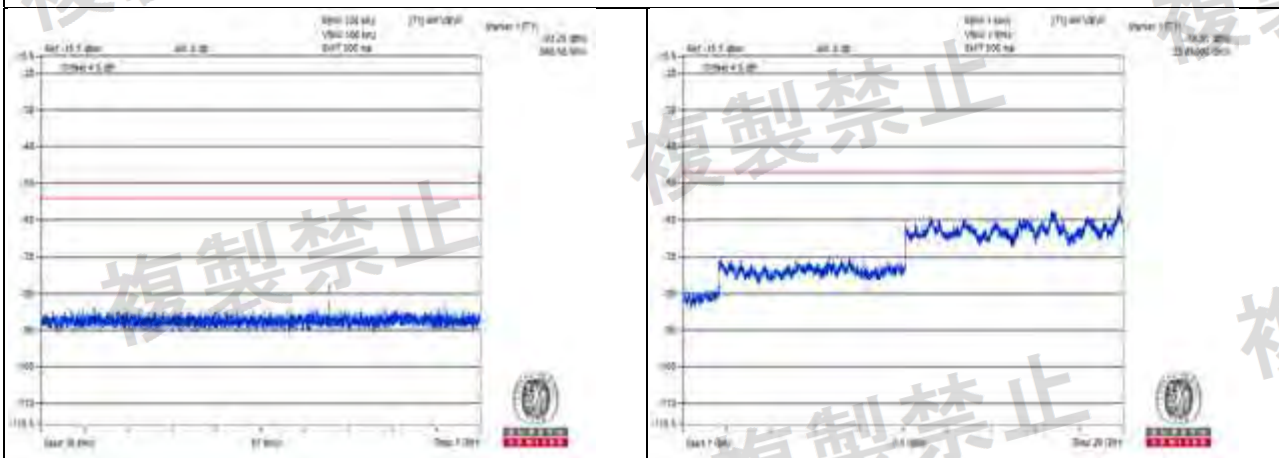


Channel 106

Measurement uncertainty: $\pm 3.93\text{dB}$



Vmax.

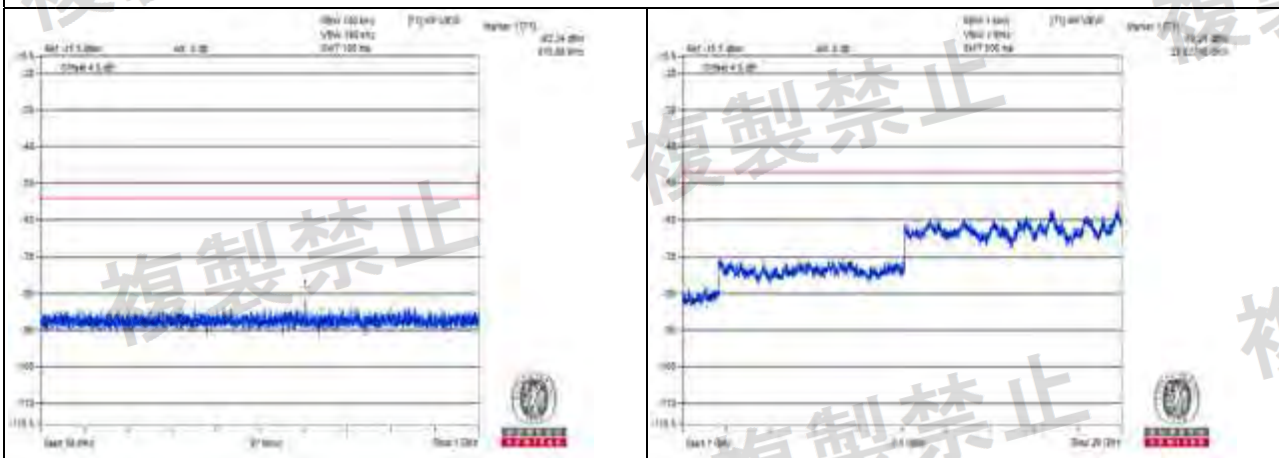


Channel 122

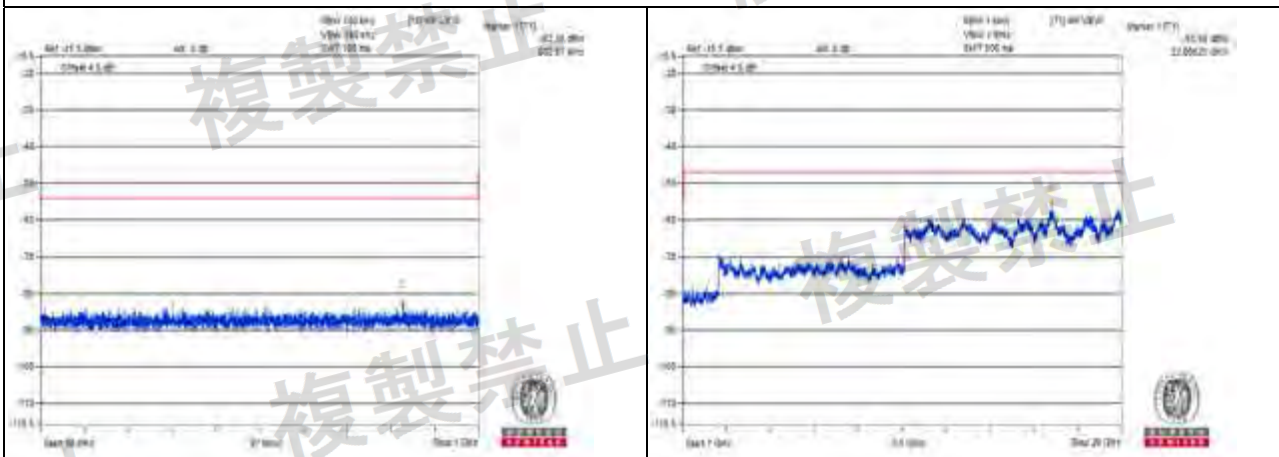
Measurement uncertainty: $\pm 3.93\text{dB}$



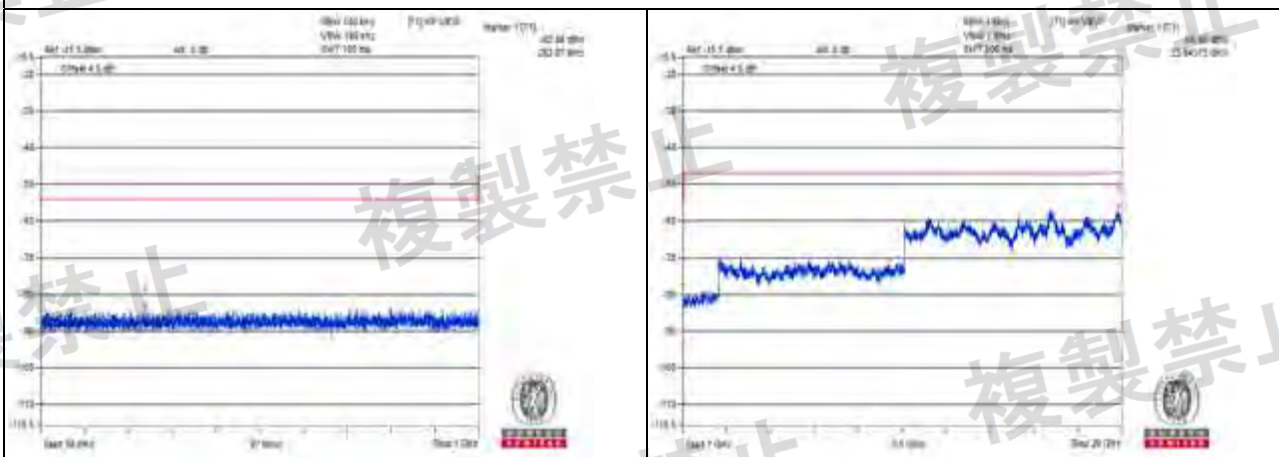
Vmin.



Channel 42



Channel 58

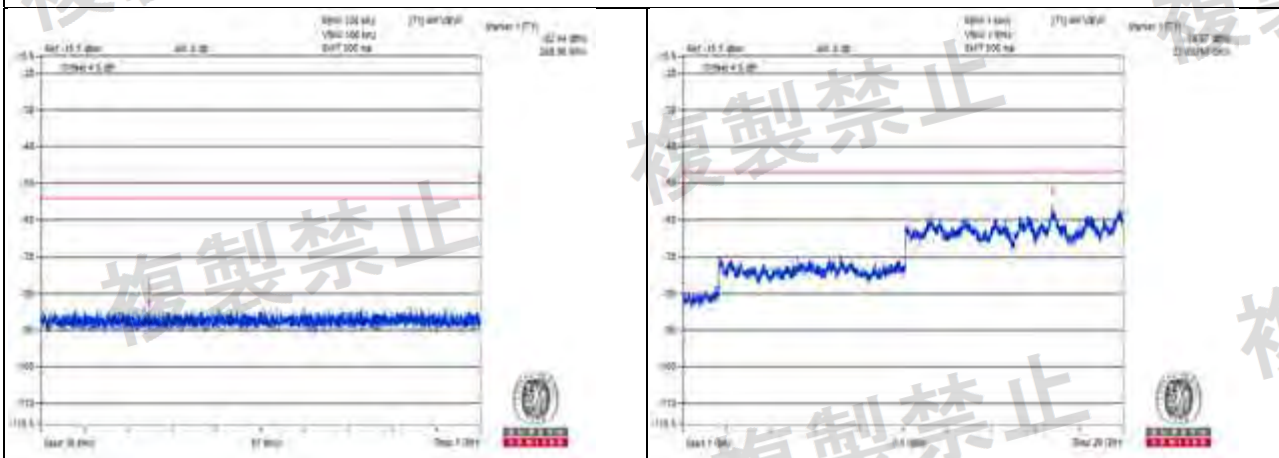


Channel 106

Measurement uncertainty: $\pm 3.93\text{dB}$



Vmin.



Channel 122

Measurement uncertainty: $\pm 3.93\text{dB}$

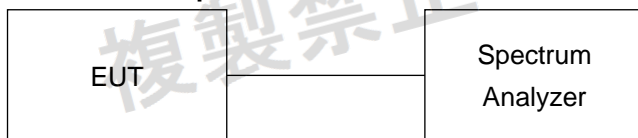


4.8 Burst Length

4.8.1 Limits of Burst Length

Frequencies (MHz)	Limit
Transmitter Operating	$\leq 4\text{ms}$

4.8.2 Test Setup





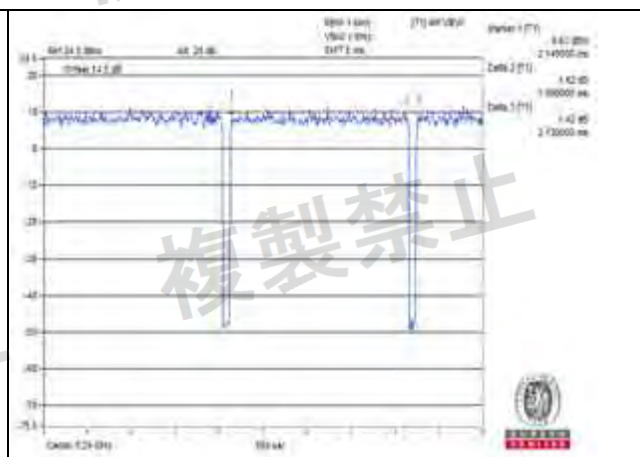
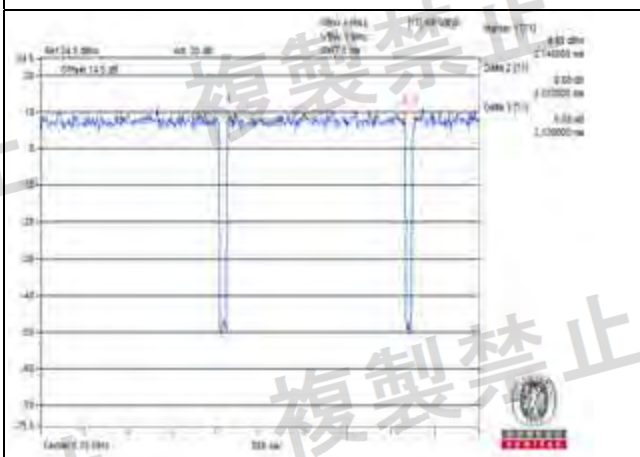
4.8.3 Test Result

W52 & W53 bands:

802.11a:

Environmental Conditions	25 deg.C, 68% RH			
Test Condition	Burst Length (ms)			
	CH 36 5180MHz	CH 48 5240MHz	CH 52 5260MHz	CH 64 5320MHz
Vnormal	2.01	1.99	2.02	2.02
Vmax.	2.00	2.01	2.01	2.00
Vmin.	1.99	2.00	1.98	1.99

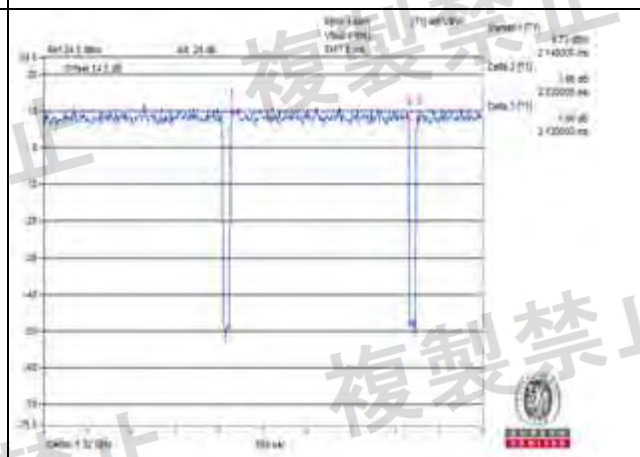
Vnormal



Channel 36



Channel 48



Channel 52

Channel 64

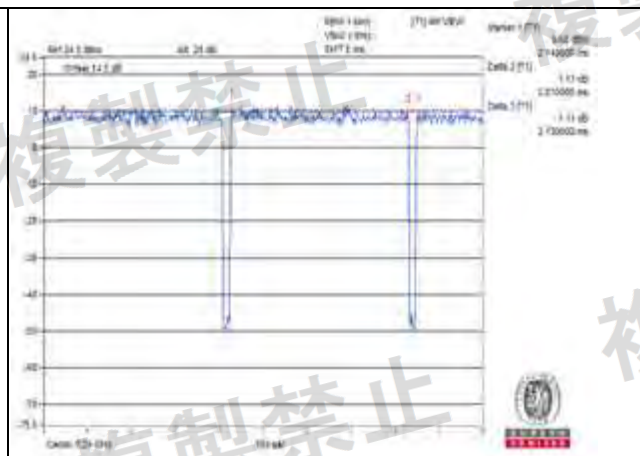
Measurement uncertainty: ± 0.01 dB



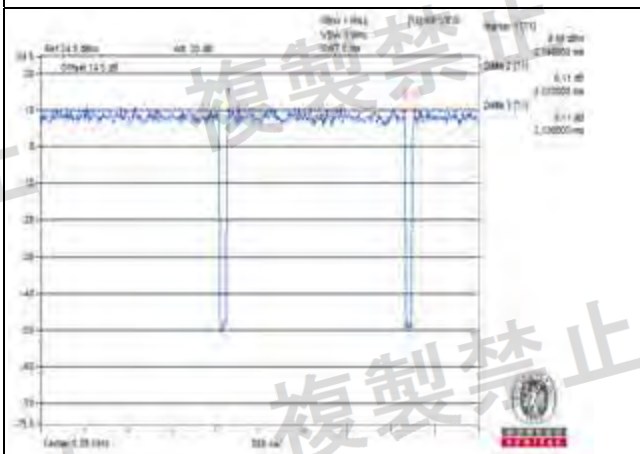
Vmax.



Channel 36



Channel 48



Channel 52

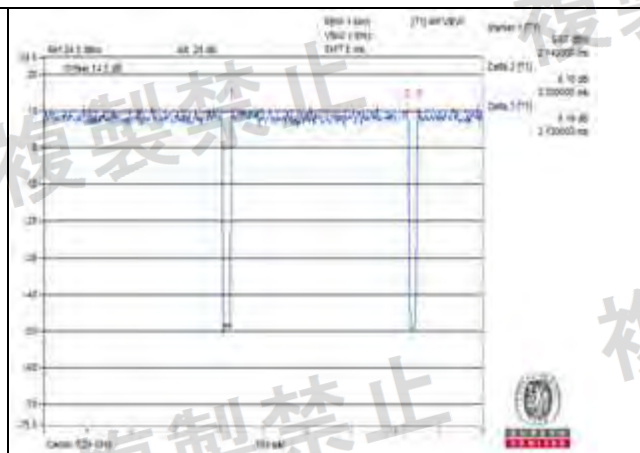


Channel 64

Measurement uncertainty: ± 0.01 dB

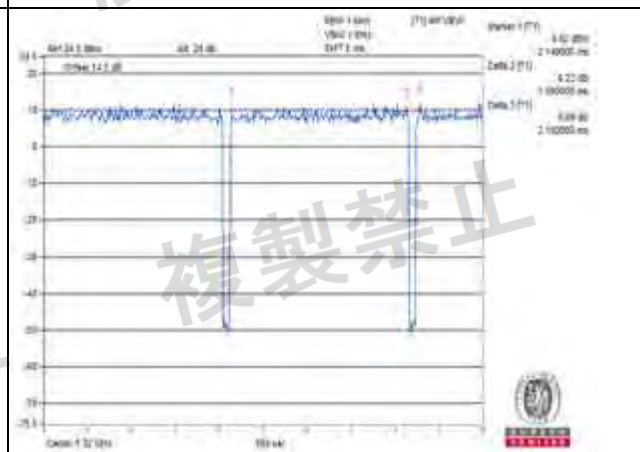
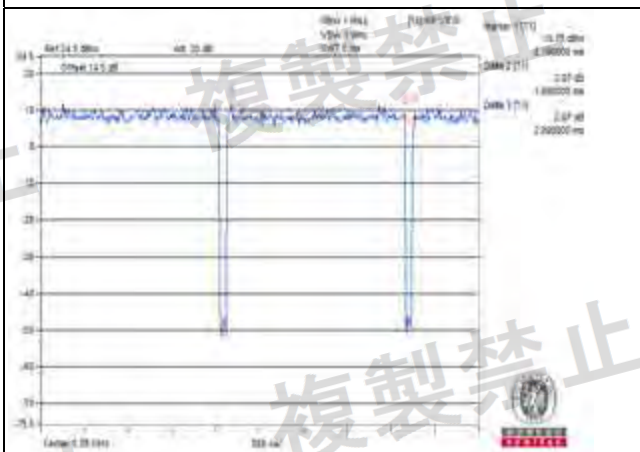


Vmin.



Channel 36

Channel 48



Channel 52

Channel 64

Measurement uncertainty: ± 0.01 dB



W52 & W53 bands:
802.11n (HT20):

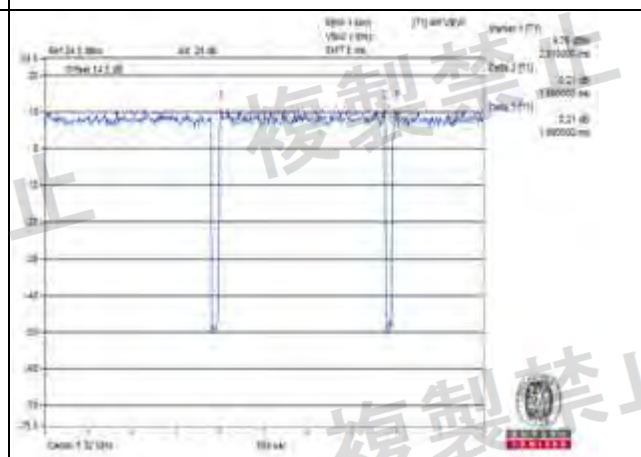
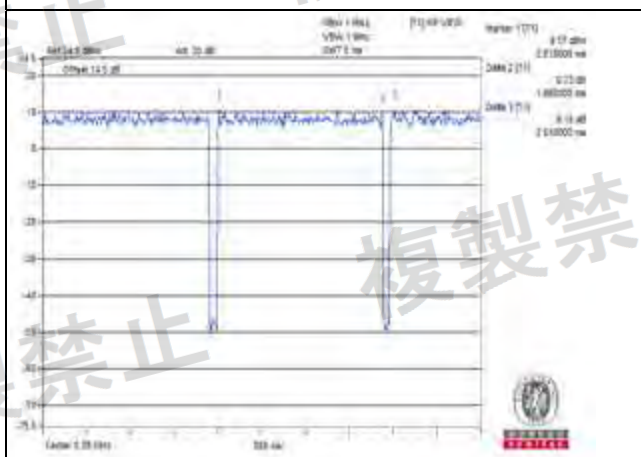
Environmental Conditions	25 deg.C, 68% RH			
Test Condition	Burst Length (ms)			
	CH 36 5180MHz	CH 48 5240MHz	CH 52 5260MHz	CH 64 5320MHz
Vnormal	1.86	1.86	1.86	1.86
Vmax.	1.84	1.86	1.86	1.85
Vmin.	1.85	1.84	1.84	1.87

Vnormal



Channel 36

Channel 48



Channel 52

Channel 64

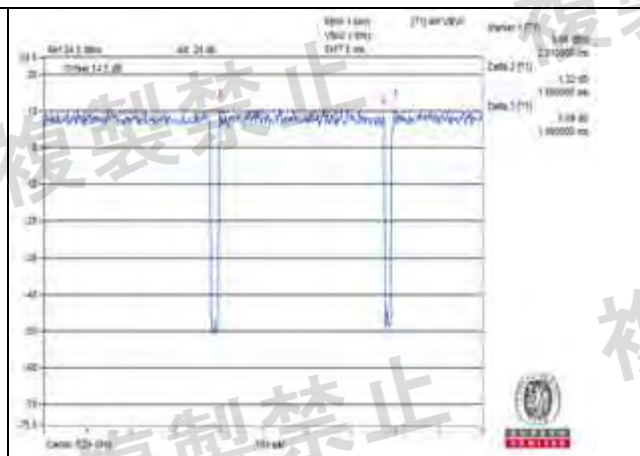
Measurement uncertainty: ± 0.01 dB



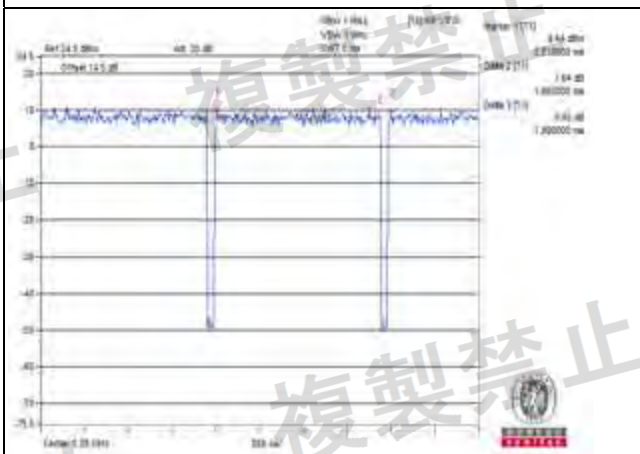
Vmax.



Channel 36



Channel 48



Channel 52



Channel 64

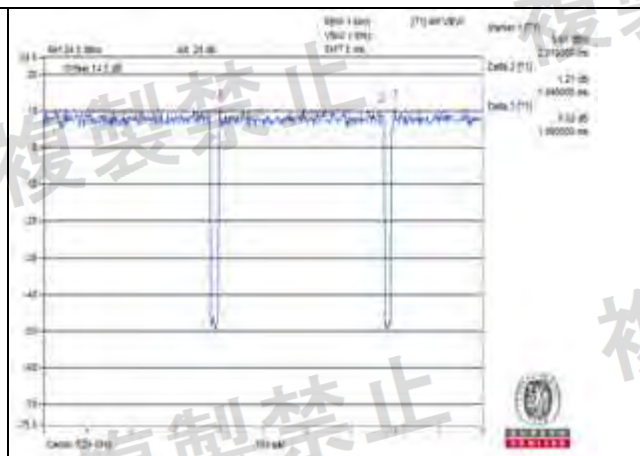
Measurement uncertainty: ± 0.01 dB



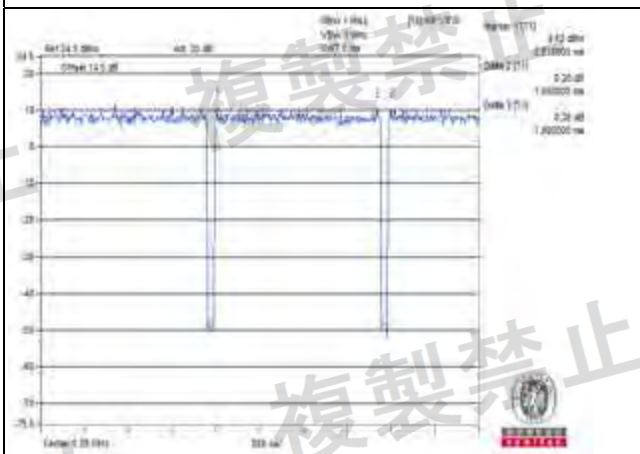
Vmin.



Channel 36



Channel 48



Channel 52



Channel 64

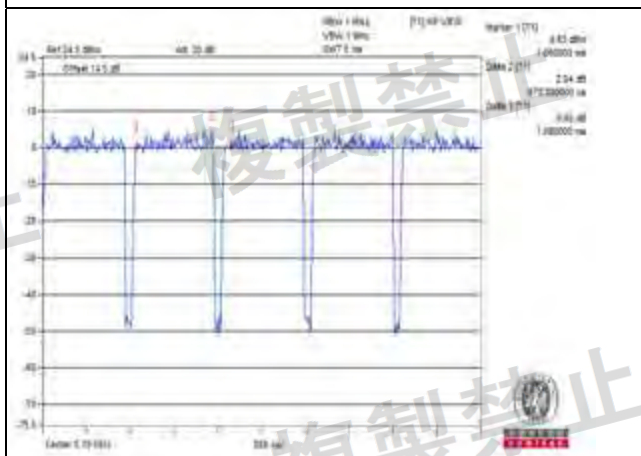
Measurement uncertainty: $\pm 0.01\text{dB}$



W52 & W53 bands:
802.11n (HT40):

Environmental Conditions	25 deg.C, 68% RH			
Test Condition	Burst Length (ms)			
	CH 38 5190MHz	CH 46 5230MHz	CH 54 5270MHz	CH 62 5310MHz
Vnormal	0.87	0.84	0.88	0.87
Vmax.	0.86	0.88	0.89	0.89
Vmin.	0.87	0.88	0.88	0.87

Vnormal



Channel 38

Channel 46



Channel 54

Channel 62

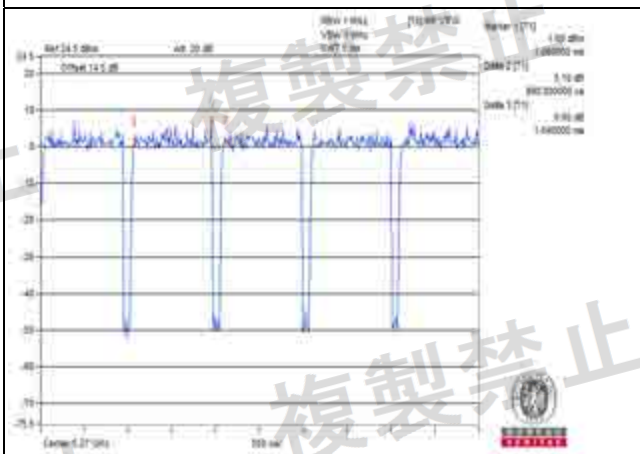
Measurement uncertainty: ± 0.01 dB



Vmax.



Channel 38



Channel 46



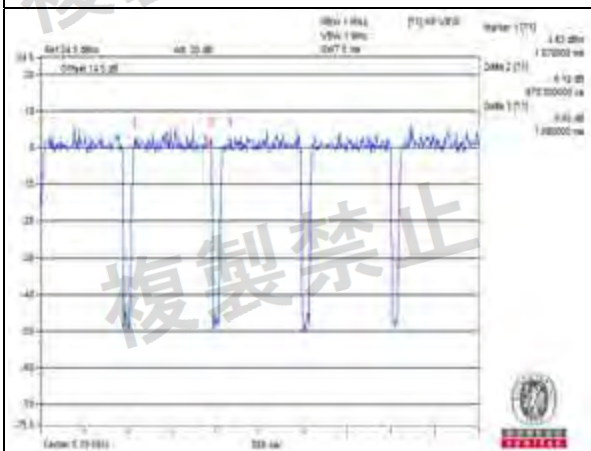
Channel 54

Channel 62

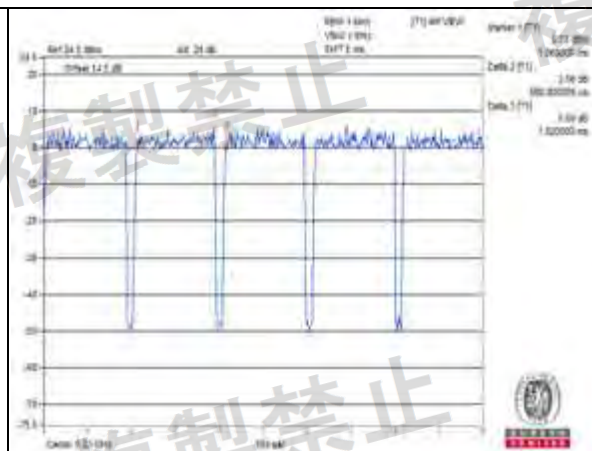
Measurement uncertainty: $\pm 0.01\text{dB}$



Vmin.



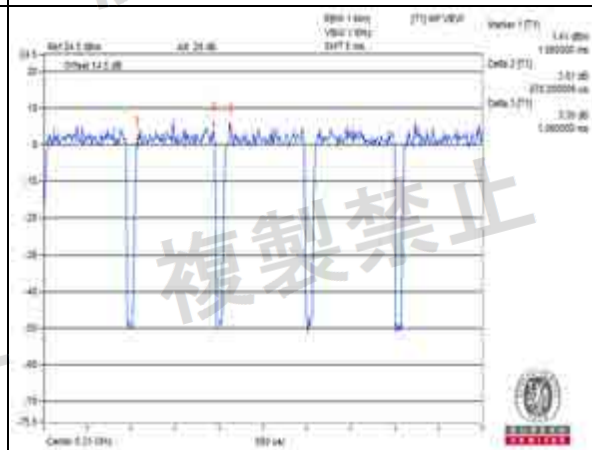
Channel 38



Channel 46



Channel 54



Channel 62

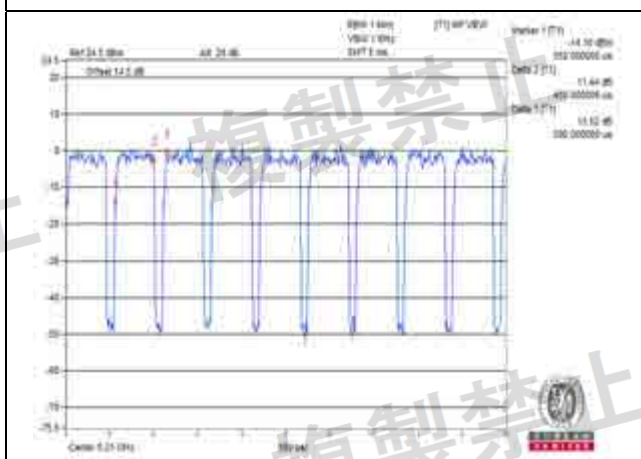
Measurement uncertainty: $\pm 0.01\text{dB}$



W52 & W53 bands:
802.11ac (VHT80):

Environmental Conditions	25 deg.C, 68% RH	
Test Condition	Burst Length (ms)	
	CH 42 5210MHz	CH 58 5290MHz
Vnormal	0.45	0.45
Vmax.	0.44	0.37
Vmin.	0.42	0.43

Vnormal



Channel 42



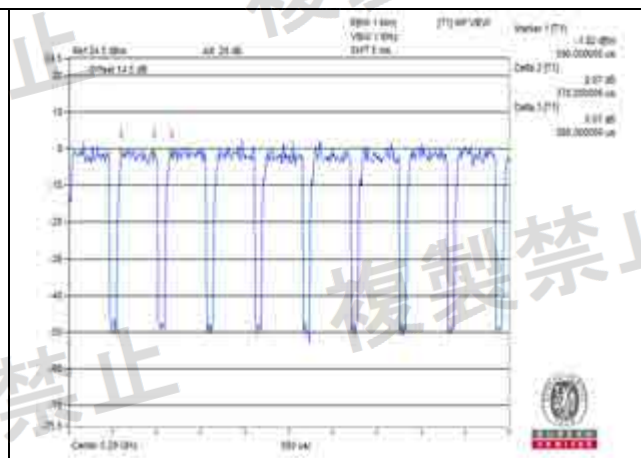
Channel 58

Measurement uncertainty: $\pm 0.01\text{dB}$

Vmax.



Channel 42

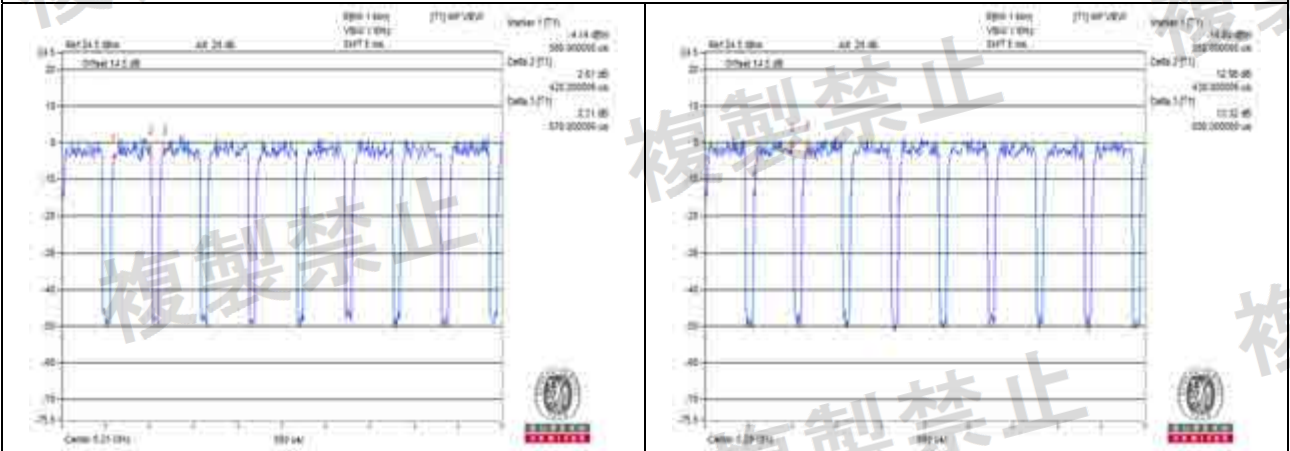


Channel 58

Measurement uncertainty: $\pm 0.01\text{dB}$



V_{min}.



Channel 42

Channel 58

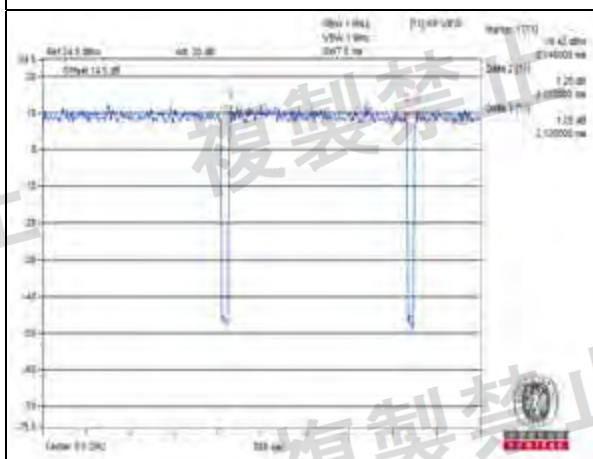
Measurement uncertainty: ± 0.01 dB



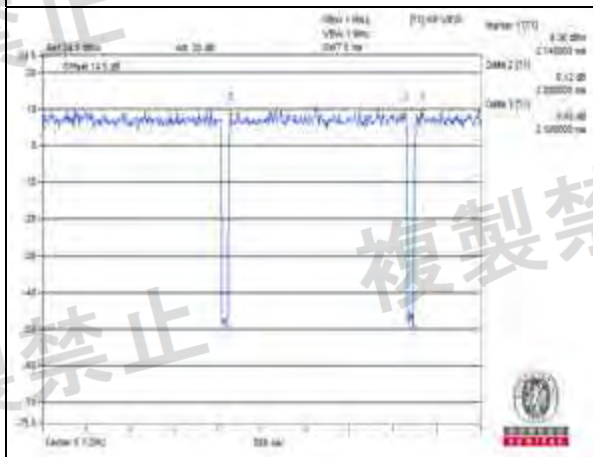
W56 band:
802.11a:

Environmental Conditions	25 deg.C, 68% RH		
Test Condition	Burst Length (ms)		
	CH 100 5500MHz	CH 120 5600MHz	CH140 5700MHz
Vnormal	2.01	2.02	2.00
Vmax.	1.99	2.01	2.00
Vmin.	2.01	2.02	2.01

Vnormal



Channel 100



Channel 120



Channel 140

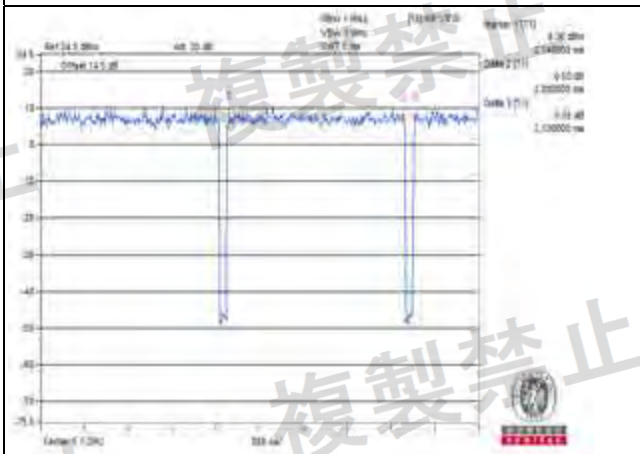
Measurement uncertainty: ± 0.01 dB



Vmax.



Channel 100



Channel 120

Channel 140

Measurement uncertainty: $\pm 0.01\text{dB}$



W56 band:
802.11n (HT20):

Environmental Conditions	25 deg.C, 68% RH		
Test Condition	Burst Length (ms)		
	CH 100 5500MHz	CH 120 5600MHz	CH140 5700MHz
Vnormal	1.86	1.85	1.86
Vmax.	1.86	1.85	1.83
Vmin.	1.85	1.86	1.85

Vnormal



Channel 100



Channel 120



Channel 140

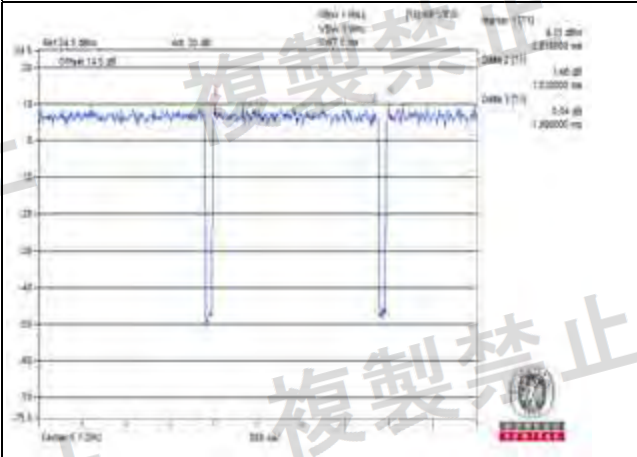
Measurement uncertainty: $\pm 0.01\text{dB}$



Vmax.



Channel 100



Channel 120

Channel 140

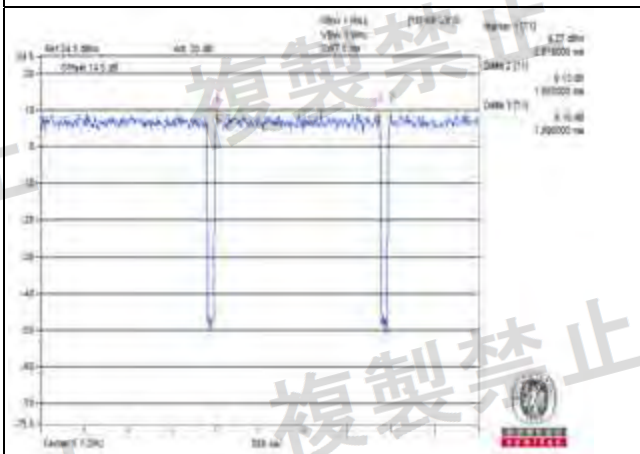
Measurement uncertainty: $\pm 0.01\text{dB}$



Vmin.



Channel 100



Channel 120

Channel 140

Measurement uncertainty: $\pm 0.01\text{dB}$



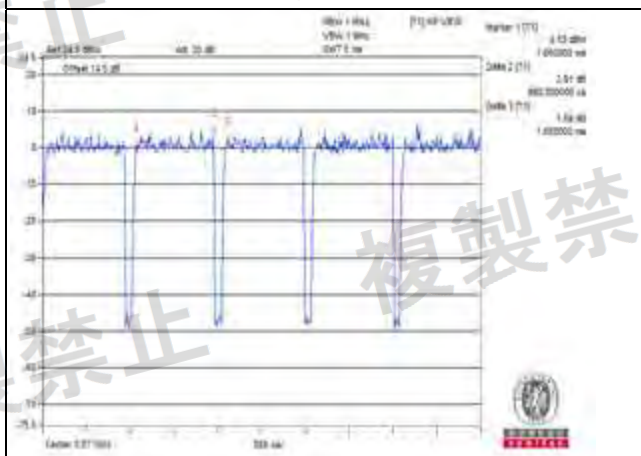
W56 band:
802.11n (HT40):

Environmental Conditions	25 deg.C, 68% RH		
Test Condition	Burst Length (ms)		
	CH 102 5510MHz	CH 118 5590MHz	CH 134 5670MHz
Vnormal	0.88	0.87	0.89
Vmax.	0.90	0.87	0.87
Vmin.	0.88	0.90	0.89

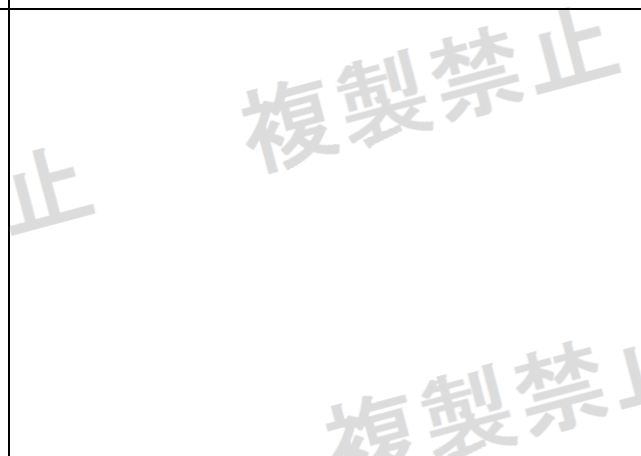
Vnormal



Channel 102



Channel 118



Channel 134

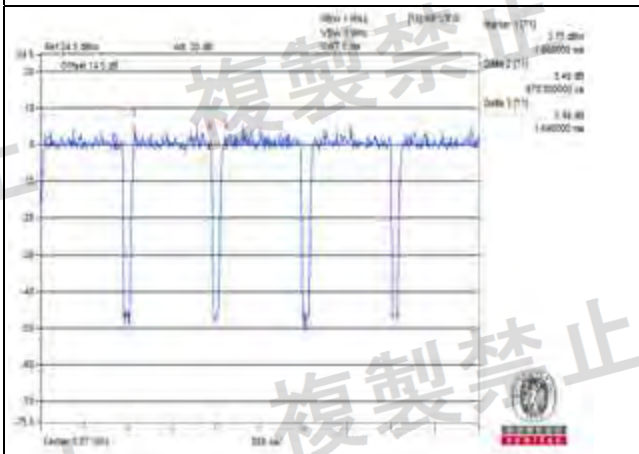
Measurement uncertainty: ± 0.01 dB



Vmax.



Channel 102



Channel 118



Channel 134

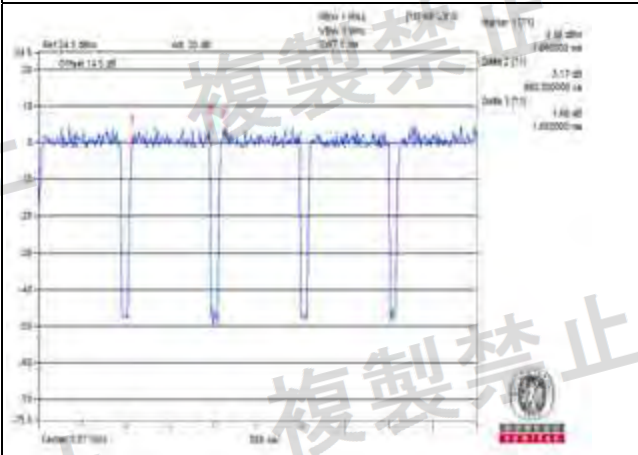
Measurement uncertainty: $\pm 0.01\text{dB}$



Vmin.



Channel 102



Channel 118



Channel 134

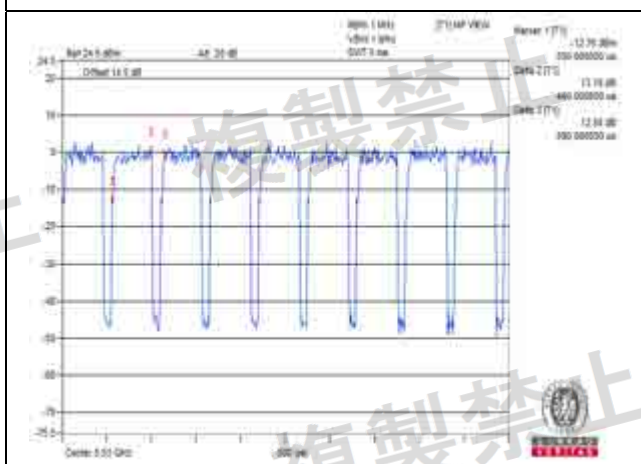
Measurement uncertainty: $\pm 0.01\text{dB}$



W56 band:
802.11ac (VHT80):

Environmental Conditions	25 deg.C, 68% RH	
Test Condition	Burst Length (ms)	
	CH 106 5530MHz	CH 122 5610MHz
Vnormal	0.44	0.45
Vmax.	0.42	0.45
Vmin.	0.42	0.44

Vnormal

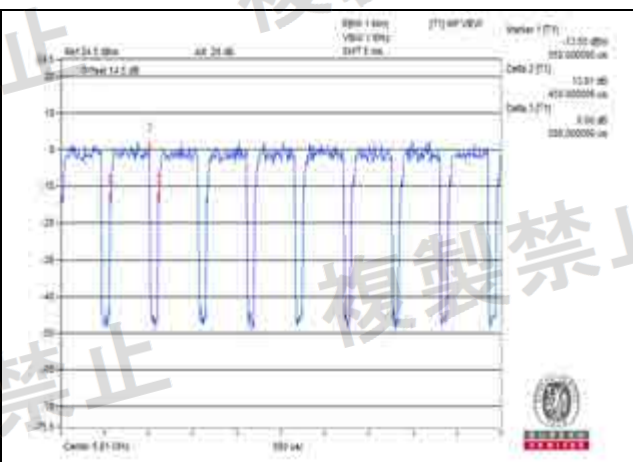


Channel 106

Channel 122

Measurement uncertainty: $\pm 0.01\text{dB}$

Vmax.



Channel 106

Channel 122

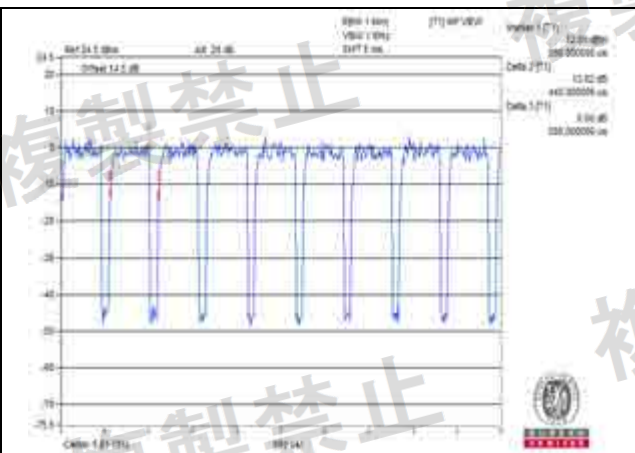
Measurement uncertainty: $\pm 0.01\text{dB}$



V_{min}.



Channel 106



Channel 122

Measurement uncertainty: ± 0.01 dB

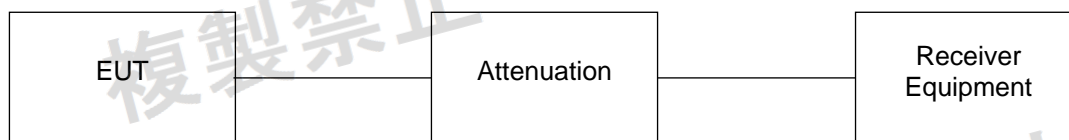


4.9 Interference Prevention Function

4.9.1 Limits of Interference Prevention Function

Radio equipment used mainly on the same premises and automatically transmits or receives identification code.

4.9.2 Test Setup



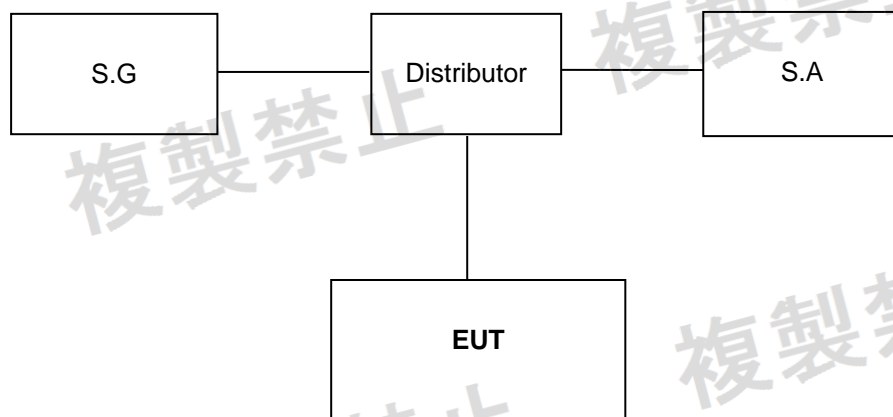
4.9.3 Test Results

Environmental Conditions	25 deg.C, 60% RH
Link Mode	Test Result
Normal	Pass



4.10 Carrier Sense Capability

4.10.1 Measuring System Block Diagram



4.10.2 Measuring Operation Procedures

- Turn the standard signal generator output OFF. Leave the equipment under test to be ready for transmission and verify the transmission with the spectrum analyzer.
- Set the equipment under test to the receiving state.
- Turn the standard signal generator ON and leave the equipment under test to be ready for transmission and verify with the spectrum analyzer that no transmission is being made.



4.10.3 Level of the Ambient Carrier

802.11a:

Frequency (MHz)	Pcs (dBm)	C.F (dB)	S.G Level
5180	-50.84	11.13	-39.71
5240	-50.94	11.15	-39.79
5260	-50.97	11.21	-39.76
5320	-51.07	11.31	-39.76
5500	-51.36	11.49	-39.87
5600	-51.51	11.56	-39.95
5700	-51.67	11.61	-40.06

Note:

Pcs (dBm) = $22.79 + Gr - 20\log(F)$.

Gr: Antenna gain (0.66dBi).

F: Transmission frequency (MHz).

C.F = Distributor loss + cable loss.

802.11n (HT20):

Frequency (MHz)	Pcs (dBm)	C.F (dB)	S.G Level
5180	-50.84	11.15	-39.69
5240	-50.94	11.16	-39.78
5260	-50.97	11.23	-39.74
5320	-51.07	11.32	-39.75
5500	-51.36	11.50	-39.86
5600	-51.51	11.57	-39.94
5700	-51.67	11.62	-40.05

Note:

Pcs (dBm) = $22.79 + Gr - 20\log(F)$.

Gr: Antenna gain (0.66dBi).

F: Transmission frequency (MHz).

C.F = Distributor loss + cable loss.



802.11n (HT40):

Frequency (MHz)	Pcs (dBm)	C.F (dB)	S.G Level
5190	-50.85	11.15	-39.70
5230	-50.92	11.16	-39.76
5270	-50.99	11.24	-39.75
5310	-51.05	11.31	-39.74
5510	-51.37	11.49	-39.88
5590	-51.50	11.56	-39.94
5670	-51.62	11.59	-40.03

Note:

Pcs (dBm) = 22.79 + Gr - 20log(F).

Gr: Antenna gain (0.66dBi).

F: Transmission frequency (MHz).

C.F = Distributor loss + cable loss.

802.11ac (VHT80):

Frequency (MHz)	Pcs (dBm)	C.F (dB)	S.G Level
5210	-50.89	11.16	-39.73
5290	-51.02	11.25	-39.77
5530	-51.40	11.53	-39.87
5610	-51.53	11.57	-39.96

Note:

Pcs (dBm) = 22.79 + Gr - 20log(F).

Gr: Antenna gain (0.66dBi).

F: Transmission frequency (MHz).

C.F = Distributor loss + cable loss.

4.10.4 Test Result

Pass

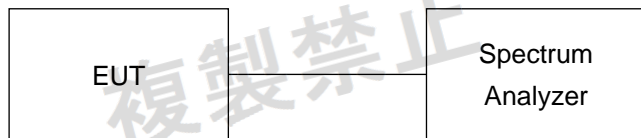


4.11 Number of Carriers within 1 MHz Bandwidth in OFDM

4.11.1 Limit of Number of Carriers

For each 1MHz bandwidth in OFDM, there should be at least 1 carrier.

4.11.2 Test Setup



4.11.3 Test Result

About OFDM Technical, one OFDM Channel will have 52 sub-carriers. At present, we observe this product via the spectrum, and we know that there are 3 carriers in 1 MHz bandwidth in OFDM.



5 Photographs of the Test Configuration





Appendix - Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Fax: 886-2-26051924

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Fax: 886-3-6668323

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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