

15. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

15.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

802.11a Max. output power

802.11a MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	7.63	7.68	7.37	12.33	17.113	20.21	PASS
44	5220	7.83	7.93	7.04	12.39	17.334	20.21	PASS
48	5240	8.01	7.62	7.21	12.40	17.365	20.21	PASS
52	5260	12.63	11.99	11.11	16.73	47.048	20.21 or 11+10log(B) = 24.21	PASS
60	5300	12.67	11.59	11.61	16.76	47.402	20.21 or 11+10log(B) = 24.17	PASS
64	5320	12.13	11.75	11.72	16.64	46.152	20.21 or 11+10log(B) = 24.09	PASS
100	5500	14.52	13.97	12.99	18.64	73.167	20.21 or 11+10log(B) = 24.24	PASS
116	5580	14.12	13.96	13.3	18.58	72.091	20.21 or 11+10log(B) = 24.25	PASS
140	5700	14.36	14.02	13.51	18.75	74.963	20.21 or 11+10log(B) = 24.19	PASS
149	5745	14.7	14.93	14.06	19.35	86.098	26.23	PASS
157	5785	16.38	16.44	15.1	20.79	119.866	26.23	PASS
165	5825	16.34	16.37	15.25	20.79	119.900	26.23	PASS

MPE Prediction (802.11a 5150~5250)

MIMO gain= $G+(10 \log N)=5+4.77=9.77\text{dBm}$

Max. output power including tune-up tolerancel:	12.40	(dBm)
Max. output power including tune-up tolerancel:	17.378008	(mW)
Duty cycle:	95.74	(%)
Maximum Pav :	16.637705	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5240	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.031	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.031 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5240MHz.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11a 5250~5350)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Max. output power including tune-up tolerancel:	16.76	(dBm)
Max. output power including tune-up tolerancel:	47.424199	(mW)
Duty cycle:	95.74	(%)
Maximum Pav :	45.403928	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5300	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.086	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.086 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5300MHz.		

MPE Prediction (802.11a 5470~5725)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Max. output power including tune-up tolerancel:	18.75	(dBm)
Max. output power including tune-up tolerancel:	74.989421	(mW)
Duty cycle:	95.74	(%)
Maximum Pav :	71.794872	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5700	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.136	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.136 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5700MHz.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11a 5725~5850)

MIMO gain= $G+(10 \log N)=5+4.77=9.77\text{dBm}$

Max. output power including tune-up tolerancel:	20.79	(dBm)
Max. output power including tune-up tolerancel:	119.94993	(mW)
Duty cycle:	95.74	(%)
Maximum Pav :	114.84006	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5825	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.217	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.217 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 5825MHz.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

802.11n_HT20M Max. output power

802.11n_HT20_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	8.2	7.9	7.63	12.69	18.567	20.21	PASS
44	5220	7.89	8.12	7.4	12.58	18.134	20.21	PASS
48	5240	8.17	7.74	7.43	12.56	18.038	20.21	PASS
52	5260	7.85	7.54	6.99	12.25	16.771	20.21 or 11+10log(B) = 24.29	PASS
60	5300	7.72	7.02	7.1	12.06	16.079	20.21 or 11+10log(B) = 24.23	PASS
64	5320	7.31	6.73	7.33	11.90	15.500	20.21 or 11+10log(B) = 24.39	PASS
100	5500	11.3	10.99	10.49	15.71	37.244	20.21 or 11+10log(B) = 24.17	PASS
116	5580	11.23	10.73	10.83	15.71	37.210	20.21 or 11+10log(B) = 24.33	PASS
140	5700	10.98	11.09	10.95	15.78	37.829	20.21 or 11+10log(B) = 24.22	PASS
149	5745	14.87	15.11	14.22	19.52	89.548	26.23	PASS
157	5785	16.78	16.93	15.65	21.26	133.689	26.23	PASS
165	5825	16.41	16.61	15.37	20.93	124.001	26.23	PASS

MPE Prediction (802.11n_HT20 5150~5250)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Max. output power including tune-up tolerancel:	12.69	(dBm)
Max. output power including tune-up tolerancel:	18.578045	(mW)
Duty cycle:	90.77	(%)
Maximum Pav :	16.863291	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.032	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.032 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5180MHz.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11n_HT20 5250~5350)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Max. output power including tune-up tolerancel:	12.25	(dBm)
Max. output power including tune-up tolerancel:	16.78804	(mW)
Duty cycle:	90.77	(%)
Maximum Pav :	15.238504	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5260	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.029	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.029 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5260MHz.		

MPE Prediction (802.11n_HT20 5470~5725)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Max. output power including tune-up tolerancel:	15.78	(dBm)
Max. output power including tune-up tolerancel:	37.844258	(mW)
Duty cycle:	90.77	(%)
Maximum Pav :	34.351233	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5700	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.065	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.065 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 5700MHz.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11n_HT20 5725~5850)**MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$**

Max. output power including tune-up tolerancel:	21.26	(dBm)
Max. output power including tune-up tolerancel:	133.65955	(mW)
Duty cycle:	90.77	(%)
Maximum Pav :	121.32278	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5785	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.229	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.229 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 5785MHz.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

802.11n_HT40M Max. output power

802.11n_HT40_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1	CHAIN 2				
38	5190	7.53	7.63	7.02	12.17	16.492	20.21	PASS
46	5230	7.68	7.78	7.05	12.29	16.929	20.21	PASS
54	5270	8.9	8.53	8.03	13.27	21.244	20.21 or 11+10log(B) = 27.28	PASS
62	5310	8.58	7.94	8.17	13.01	19.996	20.21 or 11+10log(B) = 27.35	PASS
102	5510	11.76	11.22	10.92	16.09	40.600	20.21 or 11+10log(B) = 27.34	PASS
110	5550	11.35	11.04	11.05	15.92	39.087	20.21 or 11+10log(B) = 27.21	PASS
134	5670	11.7	11.47	11.3	16.26	42.309	20.21 or 11+10log(B) = 27.31	PASS
151	5755	12.4	12.31	11.74	16.93	49.328	26.23	PASS
159	5795	15.29	15.36	14.25	19.77	94.770	26.23	PASS

802.11ac_VHT40M Max. output power

802.11ac_VHT40_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1	CHAIN 2				
38	5190	7.5	7.55	6.75	12.05	16.043	20.21	PASS
46	5230	7.72	7.78	6.95	12.27	16.868	20.21	PASS
54	5270	8.88	8.57	7.93	13.25	21.130	20.21 or 11+10log(B) = 27.28	PASS
62	5310	8.51	7.86	8.1	12.94	19.662	20.21 or 11+10log(B) = 27.35	PASS
102	5510	11.65	11.13	10.87	16.00	39.812	20.21 or 11+10log(B) = 27.34	PASS
110	5550	11.35	11.07	10.97	15.90	38.942	20.21 or 11+10log(B) = 27.21	PASS
134	5670	11.75	11.52	11.24	16.28	42.457	20.21 or 11+10log(B) = 27.31	PASS
151	5755	15.12	15.26	14.53	19.75	94.462	26.23	PASS
159	5795	15.3	15.33	14.22	19.75	94.428	26.23	PASS

MPE Prediction (802.11n_HT40 5150~5250)

MIMO gain= $G+(10 \log N)=5+4.77=9.77\text{dBm}$

Max. output power including tune-up tolerancel:	12.29	(dBm)
Max. output power including tune-up tolerancel:	16.943378	(mW)
Duty cycle:	83.83	(%)
Maximum Pav :	14.203634	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5230	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.027	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.027 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5230MHz.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11n_HT40 5250~5350)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Average output power at antenna input terminal:	13.27	(dBm)
Average output power at antenna input terminal:	21.232445	(mW)
Duty cycle:	83.83	(%)
Maximum Pav :	17.799158	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5270	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.034	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.034 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5270MHz.		

MPE Prediction (802.11ac_VHT40 5470~5725)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Average output power at antenna input terminal:	16.28	(dBm)
Average output power at antenna input terminal:	42.461956	(mW)
Duty cycle:	83.83	(%)
Maximum Pav :	35.595858	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5670	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.067	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.067 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5670MHz.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11n_HT40 5725~5850)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Average output power at antenna input terminal:	19.77	(dBm)
Average output power at antenna input terminal:	94.841846	(mW)
Duty cycle:	83.83	(%)
Maximum Pav :	79.50592	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5795	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.150	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.15 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 5795MHz.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

802.11ac VHT80M Max. output power

802.11ac VHT80 MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1	CHAIN 2				
42	5210	8.45	8.01	7.07	12.65	18.416	20.21	PASS
58	5290	7.57	7.49	7.05	12.15	16.395	20.21 or $11+10\log(B) = 30.42$	PASS
106	5530	7.64	7.01	7.16	12.05	16.031	20.21 or $11+10\log(B) = 30.44$	PASS
122	5610	7.33	6.87	6.51	11.69	14.749	20.21 or $11+11\log(B) = 30.38$	PASS
155	5775	6.81	6.92	6.41	11.49	14.093	26.23	PASS

MPE Prediction (802.11ac_VHT80 5150~5250)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Average output power at antenna input terminal:	12.65	(dBm)
Average output power at antenna input terminal:	18.40772	(mW)
Duty cycle:	51.45	(%)
Maximum Pav :	9.4707719	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5210	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.018	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.018 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5210MHz.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11ac_VHT80 5250~5350)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Average output power at antenna input terminal:	12.15	(dBm)
Average output power at antenna input terminal:	16.405898	(mW)
Duty cycle:	51.45	(%)
Maximum Pav :	8.4408344	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5290	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.016	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.016 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5290MHz.		

MPE Prediction (802.11ac_VHT80 5470~5725)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Average output power at antenna input terminal:	12.05	(dBm)
Average output power at antenna input terminal:	16.032454	(mW)
Duty cycle:	51.45	(%)
Maximum Pav :	8.2486975	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5530	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.016	(mW/cm ²)
Measurement Result		
The predicted power density level at 20 cm is 0.016 mW/cm ² .		
This is below the uncontrolled exposure limit of 1 mW/cm ² at 5530MHz.		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group

MPE Prediction (802.11ac_VHT80 5725~5850)

MIMO gain= $G+(10 \log N)= 5+4.77= 9.77\text{dBm}$

Average output power at antenna input terminal:	11.49	(dBm)
Average output power at antenna input terminal:	14.092888	(mW)
Duty cycle:	51.45	(%)
Maximum Pav :	7.2507909	(mW)
Peak Antenna gain (Maximum):	9.77	(dBi)
Peak Antenna gain (linear):	9.4841846	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5775	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.014	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.014 mW/cm².

This is below the uncontrolled exposure limit of 1 mW/cm² at 5775MHz.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Taiwan Ltd.

台灣檢驗科技股份有限公司

No.134,WuKungRoad,NewTaipeiIndustrialPark,WukuDistrict,NewTaipeiCity,Taiwan24803/新北市五股區新北產業園區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

Member of SGS Group