

## RF Test Report

**Report No.:** REBBUI-WTW-P21040655D-1

**Test Model:** RTL8852BE

**Received Date:** 2022/1/19

**Issued Date:** 2022/2/16

**Applicant:** Realtek Semiconductor Corp.

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Hsin Chu Laboratory

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**Test Location :** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan



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### Release Control Record

Issue No.	Description	Date Issued
REBBUI-WTW-P21040655D-1	Original release.	2022/2/16

## 1 Certificate of Conformity

**Product:** 11ax RTL8852BE Combo module

**Brand:** REALTEK

**Test Model:** RTL8852BE

**Applicant:** Realtek Semiconductor Corp.

**Standards:** EN 300 328 V2.2.2 (2019-07)

EN 301 893 V2.1.1 (2017-05)

Draft EN 301 893 V2.1.44 (2021-06)

This report is issued as a supplementary report. This report shall be used combined together with its original report.

**Prepared by :** Phoenix Huang , **Date:** 2022/2/16  
Phoenix Huang / Specialist

**Approved by :** Clark Lin , **Date:** 2022/2/16  
Clark Lin / Technical Manager

## 2 General Information

### 2.1 General Description of EUT

Product	11ax RTL8852BE Combo module
Brand	REALTEK
Test Model	RTL8852BE
Status of EUT	Engineering sample
Nominal Voltage	3.3Vdc from host equipment
Voltage Operation Range	Vnom= 3.3Vdc
Temperature Operating Range	-20°C ~ 70°C
Modulation Type	<b>For WLAN:</b> CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz 1024QAM for OFDMA in 11ax HE mode <b>For BT-EDR:</b> GFSK, $\pi/4$ -DQPSK, 8DPSK <b>For BT-LE:</b> GFSK
Modulation Technology	<b>For WLAN:</b> DSSS, OFDM, OFDMA <b>For BT-EDR:</b> FHSS <b>For BT-LE:</b> DTS
Transfer Rate	<b>For WLAN:</b> 802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201 Mbps <b>For BT-EDR:</b> Up to 3Mbps <b>For BT-LE:</b> Up to 2Mbps
Operating Frequency	<b>For WLAN:</b> <b>2.4GHz:</b> 2.412 ~ 2.472GHz <b>5GHz:</b> 5.18 ~ 5.24 GHz, 5.26 ~ 5.32 GHz, 5.50 ~ 5.72 GHz, 5.745 ~ 5.825 GHz <b>For BT-EDR:</b> 2.402GHz ~ 2.480GHz <b>For BT-LE:</b> 2.402GHz ~ 2.480GHz
Number of Channel	<b>For WLAN:</b> <b>2.4GHz:</b> 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 13, 802.11n (HT40), VHT40, 802.11ax (HE40): 9 <b>5GHz:</b> 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 25 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 12 802.11ac (VHT80), 802.11ax (HE80): 6 <b>For BT-EDR:</b> 79 <b>For BT-LE:</b> 40
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is issued as a supplementary report to BV CPS report as below test reports:

Function	Report No.
WLAN_2.4GHz	REBBUI-WTW-P21040655C-1
WLAN_5GHz_Band 1~3	
WLAN_Strddle Channel & 5GHz_Band 4	
BT-EDR	
BT-LE	
DFS	

2. The difference compared with original report is adding antennas and according to EUT's specification, there is no need to be re-tested.

Original								
Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Frequency Range (GHz)	Ant. Type	Connector Type	Cable Length (mm)
1	Chain 0	ARISTOTLE	RFA-27-JP326-MHF4300	3.5	2.4~2.4835	PIFA	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
	Chain 1	ARISTOTLE	RFA-27-JP326-MHF4300	3.5	2.4~2.4835	PIFA	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
2	Chain 0	ARISTOTLE	RFA-27-C38H1-MHF4300	3	2.4~2.4835	Dipole	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
	Chain 1	ARISTOTLE	RFA-27-C38H1-MHF4300	3	2.4~2.4835	Dipole	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
3	AWAN	DC33002JT00 (AYP6Y-100187)(Main) DC33002JT10 (AYP6Y-100188)(Aux)	PIFA	1.83 1.83	2.93 2.90	1.09 1.52	1.65 2.37	Kangshuo (MHF-B13L-N-01)	330 460
4	AWAN	DC33002JV00 (AYP6Y-100185)(Main) DC33002JV10 (AYP6Y-100186)(Aux)	PIFA	1.95 1.92	2.91 2.45	1.09 1.52	1.75 2.30	Kangshuo (MHF-B13L-N-01)	385 525
5	High-Tek Electronics Co., Ltd	DC33002JA00 (0ACCN020015N)(Main) DC33002JA10 (0ACCN020016N)(Aux)	PIFA	1.79 1.77	2.85 2.23	3.00 1.64	1.70 2.59	SpeedTeh C87P132-0002-H	330 460
6	High-Tek Electronics Co., Ltd	DC33002JC00 (0ACCN020017N)(Main) DC33002JC10 (0ACCN020018N)(Aux)	PIFA	1.86 1.97	2.97 2.97	1.37 1.87	2.11 2.95	SpeedTeh C87P132-0002-H	385 525
7	Shenzhen South Star Technology Ltd	DC33002NT00 (N12-7896-R0A)(Main) DC33002NT10 (N12-7897-R0A)(Aux)	PIFA	1.72 1.61	0.94 -0.24	1.19 1.66	1.81 2.44	MHF-B13L-N-01	330 460
8	Shenzhen South Star Technology Ltd	DC33002NU00 (N12-7898-R0A)(Main) DC33002NU10 (N12-7899-R0A)(Aux)	PIFA	1.67 1.92	0.50 -0.48	0.54 0.47	0.81 0.74	MHF-B13L-N-01	385 535
9	INPAQ Corporation	6036B0317101(WA-P-LE-02-041)(Main) 6036B0317001(WA-P-LE-02-042)(Aux)	PIFA	0.86 1.30	0.74 1.78	0.52 1.17	0.80 1.80	I-PEX MHF-4L	143 423
10	AWAN	6036B0311701(AUP6Y-100116)(Main) 6036B0311601(AUP6Y-100115)(Aux)	PIFA	1.22 1.88	2.37 2.18	0.43 1.05	0.69 1.66	I-pex 20565-001R-13	143 423
11	Luxshare-IC T Corporation	DC33001XX00(Main) DC33001XX00(Aux)	PIFA	1.83 1.91	2.96 2.82	0.73 0.73	1.15 1.16	i-pex(MHF)	245 245
12	Speedwire	DC33001XV00(Main) DC33001XV00(Aux)	PIFA	1.79 1.88	2.52 2.59	0.72 0.72	1.13 1.12	i-pex(MHF)	245 245
13	AWAN	DQ60AUP6Y03(AUP6Y-200000)(Main) DQ60AUP6Y03(AUP6Y-200000)(Aux)	PIFA	-1.42 -2.24	1.65 -1.14	1.56 1.88	2.51 3.20	I-pex 20565-001R-13	473 753
14	INPAQ Corporation	DQ60PLBLB16 (WA-P-LBLB-02-078)(Main) DQ60PLBLB16 (WA-P-LBLB-02-078)(Aux)	PIFA	-1.45 -1.24	0.31 0.85	1.74 2.33	2.71 3.61	I-PEX MHF-4L	473 753
15	AWAN	DQ600000000+AQC6Y-100000(Main) DQ620002300(Aux)	Dipole PIFA	2.03 -0.24	2.87 2.59	0.36 0.28	0.59 0.45	Reverse SMA (RF Cable: I-pex(20565-001R-13)) I-pex(20565-001R-13)	N/A (RF Cable:135) 110



Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
16	AWAN	DQ600000000+AEC6M-10000(Main) DQ600000000+AEC6M-10000(Aux)	Dipole	2.49 2.87	2.58 2.88	0.36 0.36	0.59 0.59	Reverse SMA (RF Cable: I-pex(20565-001R-13))	N/A (RF Cable:149) N/A (RF Cable:149)
17	AWAN	AYF6Y-100192(DC330020B00)(Main) AYF6Y-100193(DC330020B10)(Aux)	PIFA	1.98 1.57	1.96 -0.30	0.47 1.10	0.70 1.71	I-pex 20565-001R-13	152 350
18	Shenzhen South Star Technology Ltd	N12-7967-R0A(DC330020C00)(Main) N12-7968-R0A(DC330020C10)(Aux)	PIFA	1.96 1.49	2.98 2.97	0.42 0.97	0.63 1.51	Kangshuo MHF-B13-N-01	152 350
19	Hong-Bo	DQ602378500 (260-23785)(Main) DQ602378500 (260-23785)(Aux)	PIFA	1.39 1.57	2.19 0.63	1.49 1.80	2.35 2.72	Cocentra (ANC01131-451) Cocentra (20632-001R-37)	509 759
20	High-Tek Electronics Co., Ltd	DQ60ACQD083 (0ACQD019114N)(Main) DQ60ACQD083 (0ACQD019114N)(Aux)	PIFA	-2.52 -2.44	1.35 -0.46	1.41 1.74	2.41 2.83	SpeedTech C87P115-00002-H	509 759
21	INPAQ Corporation	DQ60PLBLB41 (WA-P-LBLB-02-113)(Main) DQ60PLBLB41 (WA-P-LBLB-02-113)(Aux)	PIFA	-1.64 -0.23	-0.39 -1.18	1.57 2.09	2.55 3.25	I-PEX MHF-4L	509 759
22	HongBO Luxshare-IC T Corporation	260-28173+260-28095(Main) L01RF312-DT-H(Aux)	Dipole PIFA	2.3 1.16	1.29 4.34	0.47 0.55	0.73 0.86	Reverse SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 225
23	HongBO Luxshare-IC T Corporation	260-28173+260-28095(Main) L01RF129-DT-H(Aux)	Dipole PIFA	2.3 2.49	1.29 3.53	0.47 0.55	0.73 0.86	Reverse SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 225
24	HONGBO	260-28173+260-28095(Main) 260-28174(Aux)	Dipole PIFA	2.38 0.7	3.85 1.25	0.48 0.2	0.8 0.32	Reverse SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 55



Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
25	HONGBO	260-28095+260-28173(Main) 260-28186(Aux)	Dipole PIFA	2.38 2.60	3.85 2.77	0.48 0.20	0.80 0.33	Reverse SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 55
26	HongBo Corporation	260-28175(Main) 260-28183(Aux)	PIFA	3.0 2.68	4.72 4.39	1.28 0.66	2.4 0.9	IPEX (20565-001R-13)	500 260
27	HongBo Corporation	260-28175(Main) 260-28182(Aux)	PIFA	3.0 2.78	4.72 4.7	1.28 0.45	2.4 0.74	IPEX (20565-001R-13)	500 180
28	HongBo	260-28185(Main) 260-28184(Aux)	PIFA	3 2.71	4.87 4.34	1.25 0.8	2.1 1.3	IPEX4	500 320
29	HONG-BO	6036B0310801(00-2602749250)(Main) 6036B0311001(00-2602749350)(Aux)	PIFA	-0.73 -0.65	0.6 2.92	0.84 0.96	1.32 1.51	I-PEX (20565-001R-13) I-PEX (20632-001R-37)	330 457
30	WNC	6036B0307401 (81EABL15.G06)(Main) 6036B0308201 (81EABL15.G07)(Aux)	PIFA	-2.78 -2.37	1.17 0.07	0.92 1.06	1.43 1.64	I-PEX (20565-001R-13) I-PEX (20632-001R-37)	330 457
31	HONG-BO	6036B0310101(00-3302700150)(Main) 6036B0310901(00-3302700050)(Aux)	PIFA	0.64 -1.25	1.47 1.48	0.92 0.96	1.44 1.48	I-PEX (20565-001R-13L)	361 483
32	WNC	6036B0306501(81ELA215.G02)(Main) 6036B0306201(81ELA215.G01)(Aux)	PIFA	-1.36 -1.19	0.67 0.24	1.00 1.33	1.49 1.99	I-PEX (20565-001R-13)	361 483
33	HONG-BO	6036B0309301(00-2602750450)(Main) 6036B0308501(00-2602750550)(Aux)	PIFA	1.13 0.83	0.93 2.85	1 1.15	1.58 1.8	I-PEX (20565-001R-13)	395 547
34	WNC	6036B0306101(81EABL15.G18)(Main) 6036B0306301(81EABL15.G19)(Aux)	PIFA	-3.68 -1.53	1.71 2.22	1.09 1.51	1.70 2.35	I-PEX (20565-001R-13) I-PEX (20632-001R-37)	395 547
35	HONG-BO	6036B0309101(00-3302700750)(Main) 6036B0309201(00-3302700650)(Aux)	PIFA	2.81 1.01	2.21 2.50	1.02 1.42	1.71 2.14	I-PEX (20565-001R-13L)	430 560
36	WNC	6036B0307501 (81ELA215.G08)(Main) 6036B0307801 (81ELA215.G07)(Aux)	PIFA	0.35 -0.53	1.39 -0.26	1.20 1.56	1.87 2.40	I-PEX (20565-001R-13)	430 560

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
37	HONG-BO	6036B0309501(00-2602749650)(Main) 6036B0309001(00-2602749750)(Aux)	PIFA	-1.04 -0.15	2.28 1.34	0.98 1.13	1.47 1.71	I-PEX (20565-001R-13) I-PEX (20632-001R-37)	392 539
38	WNC	6036B0307301(81EABL15.G10)(Main) 6036B0307101(81EABL15.G11)(Aux)	PIFA	-3.34 -3.78	1.15 2.54	1.09 1.24	1.62 1.86	I-PEX (20565-001R-13) I-PEX (20632-001R-37)	393 540
39	HONG-BO	6036B0308601(00-3302700350)(Main) 6036B0308701(00-3302700250)(Aux)	PIFA	0.85 0.95	2.52 2.20	1.02 1.45	1.71 2.25	I-PEX (20565-001R-13L)	456 587
40	WNC	6036B0306701(81ELA215.G04)(Main) 6036B0307201(81ELA215.G03)(Aux)	PIFA	-0.9 -1.81	0.77 -0.94	1.20 1.57	1.86 2.45	I-PEX (20565-001R-13)	456 587.5
41	High-Tek Electronics Co., Ltd	DQ602103400(0ACQD021034N)(Main) DQ602103400(0ACQD021034N)(Aux)	PIFA	-0.04 -2.18	2.95 2.92	0.41 0.88	0.62 1.34	SpeedTech C87P115-00002-H	110 290
42	AWAN	DQ60AUP6Y03(AUP6Y-200000)(Main) DQ60AUP6Y03(AUP6Y-200000)(Aux)	PIFA	-1.42 -2.24	1.65 -1.14	1.56 1.88	2.51 3.20	I-PEX (20565-001R-13)	473 753
43	INPAQ Corporation	DQ60PLBLB16 (WA-P-LBLB-02-078)(Main) DQ60PLBLB16 (WA-P-LBLB-02-078)(Aux)	PIFA	-1.45 -1.24	0.31 0.85	1.74 2.33	2.71 3.61	I-PEX MHF-4L	473 753
44	Luxshare-ICT Corporation	DC33001VP00(Main) DC33001VP00(Aux)	PIFA	1.88 1.92	2.99 2.85	0.61 0.61	0.94 0.95	ipex(MHF)	250 250
45	Luxshare-ICT Corporation	L01RF062-DT-R+L01RF138-DT-H(Main) L01RF312-DT-H(Aux)	PIFA	3.03 1.16	4.29 4.34	0.47 0.55	0.73 0.86	Reverse SMA (RF Cable:IPEX4 ) IPEX4	N/A (RF Cable:190) 225
46	LUXSHARE-ICT	L01RF138-DT-H + L01RF062-DT-R(Main) L01RF297-CS-H(Aux)	PIFA	2.48 -0.13	4.32 4.25	0.47 0.14	0.71 0.21	Reverse SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 45.5

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
47	LUXSHARE-ICT	L01RF138-DT-H + L01RF062-DT-R(Main) L20RF037-YT-H(Aux)	PIFA	2.48 0.97	4.32 4.38	0.47 0.16	0.71 0.25	Reverse SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 54.2
48	Luxshare-ICT Corporation	L01RF062-DT-R+L01RF138-DT-H(Main) L01RF129-DT-H(Aux)	PIFA	3.03 2.49	4.29 3.53	0.47 0.55	0.73 0.86	Reverse SMA (RF Cable:IPEX4) IPEX4	N/A (RF Cable:190) 225
49	Luxshare-ICT Corporation	L01RF135-DT-H(Main) L01RF134-DT-H(Aux)	PIFA	2.92 2.34	4.48 4.72	1.23 0.64	1.92 0.99	IPEX4	500 260
50	Luxshare-ICT Corporation	L01RF137-DT-H(Main) L01RF136-DT-H(Aux)	PIFA	2.13 2.33	4.36 3.88	1.23 0.78	1.92 1.22	IPEX4	500 320
51	LUXSHARE-ICT	DC33001V400(Main) DC33001V500(Aux)	PIFA	3.03 3.17	3.05 2.03	0.77 1.28	1.16 1.94	i-pex(MHF)	313 522
52	Speed Wireless Technical Co., LTD.	DC33001V200(Main) DC33001V300(Aux)	PIFA	2.03 2.07	2.95 1.71	1.05 1.76	1.64 2.86	i-pex(MHF)	313 522
53	Shanghai Amphenol Airwave Communication Electronics Co.,Ltd	DC33001W000(Main) DC33001W000(Aux)	PIFA	1.7 1.9	3.0 3.4	0.5 1.0	0.7 1.6	LUXSHARE-C87P115-0002-H	153 383
54	LUXSHARE-ICT	DC33001XZ00(Main) DC33001XZ00(Aux)	PIFA	2.86 2.38	3.89 3.48	0.38 0.94	0.59 1.47	SPEEDTECH (C87P115-0002-H)	153 383
55	Speed Wireless Technical Co., LTD.	DC33001XY00(Main) DC33001XY00(Aux)	PIFA	0.72 1.73	3.22 4.26	0.45 1.12	0.67 1.77	SpeedtechC87P115	153 383
56	LUXSHARE-ICT	DC33001XU00(Main) DC33001XU00(Aux)	PIFA	2.55 2.16	3.80 4.10	0.37 0.97	0.58 1.52	IPEX	151 394
57	INPAQ	DC33001XS00(Main) DC33001XS00(Aux)	PIFA	2.85 2.98	2.90 2.60	0.88 1.41	1.37 2.68	I-PEX (20565-001R-13)	151 394
58	Speed Wireless Technical Co., LTD.	DC33001XT00(Main) DC33001XT00(Aux)	PIFA	0.93 2.47	3.41 3.54	0.61 1.05	0.96 1.65	SpeedtechC87P115	151 394

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
59	High-Tek Electronics Co., Ltd	DQ602103900 (0ACQD021039N)(Main) DQ602103900 (0ACQD021039N)(Aux)	PIFA	2.97 2.99	2.95 2.20	1.25 1.70	1.83 2.49	CM 958-C413-W -B-Bu-A0	335 455
60	High-Tek Electronics Co., Ltd	DQ602104300 (0ACQD021043N)(Main) DQ602104300 (0ACQD021043N)(Aux)	PIFA	1.07 0.89	2.97 2.66	1.42 1.93	2.21 2.81	CM 958-C413-W -B-Bu-A0	380 515
61	VSO	821-101-01211492(Main) 821-101-01211493(Aux)	PIFA	1.82 0.73	2.72 2.50	0.91 1.22	1.39 1.87	IPEX (20565-001R -13)	325 435
62	VSO	821-101-01211490(Main) 821-101-01211491(Aux)	PIFA	1.53 1.44	2.94 2.32	1.23 1.54	1.89 2.37	IPEX (20565-001R -13)	415 525
63	Innowave	DQ600068006(Main) DQ600068006(Aux)	PIFA	-1.02 -0.91	0.14 0.14	1.76 2.61	2.91 4.11	958-C413-Y- B-Bu-Ao	531 742
64	Pulse electronics	DQ601666000(Main) DQ601666000(Aux)	PIFA	0.92 0.63	0.14 0.94	1.70 2.00	2.77 2.97	IPEX 20565	531 742
65	AWAN	DQ60AUP6Y04 (AUP6Y-200001)(Main) DQ60AUP6Y04 (AUP6Y-200001)(Aux)	PIFA	-0.71 -3.13	-0.45 -0.89	1.35 1.70	2.05 2.81	IPEX (20565-001R -13)	410 678
66	INPAQ Corporation	DQ60PLBLB17 (WA-P-LBLB-02-079)(Main) ) DQ60PLBLB17 (WA-P-LBLB-02-079)(Aux)	PIFA	-1.58 -2.10	2.08 0.90	1.51 2.13	2.35 3.45	I-PEX MHF-4L	410 678
67	HONG-BO	DQ602381300 (260-23813)(Main) DQ602381300 (260-23813)(Aux)	PIFA	-0.47 -1.40	0.35 -0.25	0.77 1.25	1.15 1.86	IPEX (20565-001R -13)	301 488
68	HONG-BO	DQ602348801 (350-23488)(Main) DQ602348801 (350-23488)(Aux)	PIFA	0.72 -0.74	2.04 1.78	0.75 1.46	1.17 2.29	IPEX (20565-001R -13)	293 573
69	WNC	DQ6215G2600 (81ELA215.G26)(Main) DQ6215G2600 (81ELA215.G26)(Aux)	PIFA	-1.43 -1.22	0.16 0.27	0.81 1.59	1.27 2.44	IPEX (20565-001R -13)	293 573
70	WNC	DQ6L15G4401(81EABL15. G44)(Main) DQ6L15G4401(81EABL15. G44)(Aux)	PIFA	1.81 -0.17	2.49 1.48	0.69 1.13	1.03 1.73	IPEX (20565-001R -13)	248 407
71	HONG-BO	DQ602349201(350-23492)( Main) DQ602349201(350-23492)( Aux)	PIFA	2.44 -0.94	2.51 2.94	0.63 1.27	0.99 1.99	IPEX (20565-001R -13)	248 497
72	HONG-BO	DQ602381400(260-23814)( Main) DQ602381400(260-23814)( Aux)	PIFA	-0.19 -0.82	2.96 1.91	1.12 1.65	1.76 2.60	IPEX (20565-001R -13)	380 563
73	WNC	DQ6L15G4301(81EABL15. G43)(Main) DQ6L15G4301(81EABL15. G43)(Aux)	PIFA	-0.13 -0.92	2.46 1.47	1.05 1.56	1.57 2.40	IPEX (20565-001R -13)	380 563

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
74	HONG-BO	DQ602381500(260-23815)(Main) DQ602381500(260-23815)(Aux)	PIFA	1.30 -0.66	2.97 0.15	1.15 1.69	1.81 2.62	IPEX (20565-001R-13)	392 575
75	WNC	DQ6L15G4601(81EABL15.G46)(Main) DQ6L15G4601(81EABL15.G46)(Aux)	PIFA	-0.36 -1.64	2.20 0.40	1.09 1.60	1.70 2.45	IPEX (20565-001R-13)	392 575
76	HONG-BO	DQ602381200(260-23812)(Main) DQ602381200(260-23812)(Aux)	PIFA	0.02 -0.40	2.51 2.90	0.63 1.04	0.99 1.63	IPEX (20565-001R-13)	248 407
77	WNC	DQ6L15G4500(81EABL15.G45)(Main) DQ6L15G4500(81EABL15.G45)(Aux)	PIFA	-0.75 -0.71	2.56 2.4	0.84 1.35	1.25 2.11	IPEX (20565-001R-13)	301 488
78	HONG-BO	DQ602348901(350-23489)(Main) DQ602348901(350-23489)(Aux)	PIFA	2.43 -0.43	2.09 2.80	0.75 1.46	1.17 2.18	IPEX (20565-001R-13)	293 573
79	WNC	DQ6215G2500(81ELA215.G25)(Main) DQ6215G2500(81ELA215.G25)(Aux)	PIFA	0.89 0.61	1.85 0.49	0.81 1.59	1.27 2.48	IPEX (20565-001R-13)	293 573
80	WNC	DQ6215G2700(81ELA215.G27)(Main) DQ6215G2700(81ELA215.G27)(Aux)	PIFA	-0.31 -1.17	2.27 2.48	0.69 1.38	1.07 2.12	IPEX (20565-001R-13)	248 497
81	HONG-BO	DQ602349101(350-23491)(Main) DQ602349101(350-23491)(Aux)	PIFA	2.42 -1.36	2.00 2.10	0.63 1.27	0.94 1.97	IPEX (20565-001R-13)	248 497
82	WNC	DQ6215G2800(81ELA215.G28)(Main) DQ6215G2800(81ELA215.G28)(Aux)	PIFA	1.85 -1	2.38 2.02	0.69 1.38	1.07 2.15	IPEX (20565-001R-13)	248 497
83	Speedwire	DC33001VN00(Main) DC33001VN00(Aux)	PIFA	1.69 1.75	2.83 2.98	0.69 0.69	1.13 1.07	i-pex(MHF)	250 250
84	Speed Wireless technology Co.,Ltd.	F-0G-XZ-0300-000-K0(Main) F-0G-XZ-0300-000-K0(Aux)	PIFA	1.65 1.88	2.91 2.89	0.66 0.86	1 1.39	Speed-tech(宣德) C87P115	212.3 277.8
85	Shenzhen ZhongTianXun Communication Technology Shares Co.,LTD	2.00005163(Main) 2.00005163(Aux)	PIFA	1.65 1.88	2.91 2.89	0.66 0.86	1.00 1.39	IPEX 4	212.3 277.8
86	Speed Wireless technology Co.,Ltd.	F-0G-XZ-0299-000-K0(Main) F-0G-XZ-0299-000-K0(Aux)	PIFA	2.89 2.81	3.79 2.74	0.93 1.18	1.51 1.80	Speed-tech(宣德) C87P115	300.5 380.4



Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
87	ShenzZhen ZhongTianXun Communication Technology Shares Co.,LTD	2.00005169(Main) 2.00005169(Aux)	PIFA	2.89 2.81	3.79 2.74	0.93 1.18	1.51 1.80	KANGSHUO (康碩) MHF-B13-N-01	300.5 380.4
88	High-Tek Electronics Co., Ltd	DQ60ACQD085(0ACQD020002N)(Main) DQ60ACQD085(0ACQD020002N)(Aux)	PIFA	-1.81 -2.38	-0.67 0.36	1.09 1.63	1.7 2.54	SpeedTech C87P115-00002-H	395 589
89	Hong-Bo	DQ602378300(260-23783)(Main) DQ602378300(260-23783)(Aux)	PIFA	-1.68 -1.84	0.09 -0.73	1.16 1.73	1.80 2.58	Cocentra ANCO1131-451	395 589
90	MAG.LAYER S scientifictechnics co,LTD	PCA-8020-25GC7-A1(DC33002G500)(Main) PCA-8020-25GC7-A1(DC33002G500)(Aux)	PIFA	0.05 0.57	2.87 -0.09	0.69 0.94	1.06 1.49	IPEX MHF-B13-N-01 (康碩)	233 317
91	Yageo	DC33002G400(ANTA0LC13952WLAN1)(Main) DC33002G400(ANTA0LC13952WLAN1)(Aux)	PIFA	0.51 0.91	2.36 -1.39	0.75 1.02	1.22 1.65	IPEX 20565	233 317
92	High-Tek Electronics Co., Ltd	0ACCN020001N(DC33002G300)(Main) 0ACCN020002N(DC33002G310)(Aux)	PIFA	-2.47 -2.19	1.75 -2.84	0.75 1.00	1.18 1.72	SpeedTech C87P115-00002-H	273 363
93	MAG.LAYER S scientifictechnics co,LTD	PCA-3010-25GC7-A1(DC33002G600)(Main) PCA-5010-25GC7-A1(DC33002G610)(Aux)	PIFA	-0.02 1.12	2.02 -1.44	0.85 1.12	1.30 1.71	IPEX MHF-B13-N-01 (康碩)	285 375
94	WNC	DQ6B15GAP00+DQ6P15G1000(Main) DQ6P15G1000(Aux)	Dipole PIFA	0.98 -1.49	2.44 1.06	0.36 0.28	0.61 0.46	Reverse SMA (RF Cable:IPEX) (20565-001R-13) IPEX (20565-001R-13)	N/A (RF Cable : 135) 110
95	WNC	DQ6B15GAP00+DQ6B15GB200(Main) DQ6B15GAP00+DQ6B15GB200(Aux)	Dipole	0.68 0.55	2.25 1.68	0.36 0.36	0.61 0.61	Reverse SMA (RF Cable:IPEX) (20565-001R-13)) Reverse SMA (RF Cable : IPEX) (20565-001R-13)	N/A (RF Cable : 149) N/A (RF Cable : 149)

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
96	WNC	DQ6P15G1100(Main) DQ6P15G1100(Aux)	PIFA	-0.17 -2.10	2.24 0.65	0.42 0.89	-1.11 1.37	IPEX (20565-001R-13)	110 290
97	HONGBO LUXSHARE-ICT	260-28095+260-28173(Main) L01RF297-CS-H(Aux)	Dipole PIFA	2.38 -0.13	3.85 4.25	0.48 0.14	0.80 0.21	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:1 90) 45.5
98	HONGBO LUXSHARE-ICT	L01RF062-DT-R +260-28173(Main) L01RF297-CS-H(Aux)	Dipole PIFA	2.38 -0.13	3.85 4.25	0.48 0.14	0.80 0.21	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:1 90) 45.5
99	LUXSHARE-ICT HONGBO	L01RF138-DT-H + L01RF062-DT-R(Main) 260-28174(Aux)	PIFA	2.48 0.47	4.32 1.25	0.70 0.20	0.71 0.32	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:1 90) 55
100	HongBO/ Luxshare-ICT Corporation Luxshare-ICT Corporation	L01RF062-DT-R+260-28173(Main) L01RF312-DT-H(Aux)	Dipole PIFA	2.3 1.16	1.29 4.34	0.47 0.55	0.73 0.86	R-SMA (RF Cable:IPEX4) IPEX (20565-001R-13)	N/A (RF Cable:1 90) 225
101	LUXSHARE-ICT	L01RF138-DT-H +260-28095(Main) L01RF297-CS-H(Aux)	PIFA	2.48 -0.13	4.32 4.25	0.47 0.14	0.71 0.21	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:1 90) 45.5



Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
102	HongBO Luxshare-ICT	260-28173+260-28095(Main) L20RF037-YT-H(Aux)	Dipole PIFA	2.38 0.97	3.85 4.38	0.48 0.16	0.80 0.25	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 54.2
103	HongBO/Luxshare-ICT Corporation Luxshare-ICT Corporation	260-28095+L01RF138-DT-H(Main) L01RF312-DT-H(Aux)	PIFA	3.03 1.16	4.29 4.34	0.47 0.55	0.73 0.86	R-SMA (RF Cable:IPEX4) IPEX4	N/A (RF Cable:190) 225
104	HongBO/Luxshare-ICT Corporation Luxshare-ICT Corporation	L01RF062-DT-R+260-28173(Main) L01RF129-DT-H(Aux)	Dipole PIFA	2.3 2.49	1.29 3.53	0.47 0.55	0.73 0.86	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 225
105	Luxshare-ICT Corporation HongBo Corporation	L01RF135-DT-H(Main) 260-28182(Aux)	PIFA	2.92 2.78	4.48 4.7	1.23 0.45	1.92 0.74	I-PEX 4	500 180
106	HongBO/Luxshare-ICT Corporation Luxshare-ICT Corporation	260-28095+L01RF138-DT-H(Main) L01RF129-DT-H(Aux)	PIFA	3.03 2.49	4.29 3.53	0.47 0.55	0.73 0.86	R-SMA (RF Cable:IPEX4) IPEX4	N/A (RF Cable:190) 225
107	LUXSHARE-ICT HONGBO	260-28173+L01RF062-DT-R(Main) 260-28186(Aux)	Dipole PIFA	2.38 2.60	3.85 2.77	0.48 0.20	0.8 0.33	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 55





Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
108	LUXSHARE/ HONGBO HONGBO	260-28173+ L01RF062-DT-R(Main) 260-28174(Aux)	Dipole PIFA	2.38 0.70	3.85 1.25	0.48 0.20	0.80 0.32	R-SMA (RF Cable:IPEX (20565-001R -13)) IPEX  (20565-001R -13)	N/A (RF Cable:1 90) 55
109	HONGBO LUXSHARE- ICT	260-28173+ L01RF062-DT-R(Main) L20RF037-YT-H(Aux)	Dipole PIFA	2.38 0.48	3.85 4.38	0.97 0.16	0.80 0.25	R-SMA (RF Cable:IPEX (20565-001R -13)) IPEX  (20565-001R -13)	N/A (RF Cable:1 90) 54.2
110	HongBo Corporation Luxshare-IC T Corporation	260-28175(Main) L01RF134-DT-H(Aux)	PIFA	3.0 2.34	4.72 4.72	1.28 0.64	2.4 0.99	IPEX (20565-001R -13)	500 260
111	HongBo Luxshare-IC T Corporation	260-28175(Main) L01RF136-DT-H(Aux)	PIFA	3.00 2.33	4.87 3.88	1.25 0.78	2.1 1.22	IPEX4	500 320
112	Luxshare-IC T Corporation HongBo Corporation	L01RF135-DT-H(Main) 260-28183(Aux)	PIFA	2.92 2.68	4.48 4.39	1.23 0.66	1.92 0.9	IPEX4	500 260
113	Luxshare-IC T Corporation HongBo Corporation	L01RF137-DT-H(Main) 260-28184(Aux)	PIFA	2.13 2.71	4.36 4.34	1.23 0.8	1.92 1.3	IPEX4	500 320
114	LUXSHARE- ICT HONGBO	L01RF138-DT-H + 260-28095(Main) 260-28186(Aux)	PIFA	2.48 2.60	4.32 2.77	0.47 0.20	0.71 0.33	R-SMA (RF Cable:IPEX (20565-001R -13)) IPEX  (20565-001R -13)	N/A (RF Cable:1 90) 55

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
115	LUXSHARE-ICT HONGBO	L01RF138-DT-H + 260-28095(Main) 260-28174(Aux)	PIFA	2.48 0.70	4.32 1.25	0.47 0.20	0.71 0.32	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 55
116	LUXSHARE-ICT	L01RF138-DT-H + 260-28095(Main) L20RF037-YT-H(Aux)	PIFA	2.48 0.97	4.32 4.38	0.47 0.16	0.71 0.25	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 54.2
117	LUXSHARE-ICT HONGBO	L01RF138-DT-H + L01RF062-DT-R(Main) 260-28186(Aux)	PIFA	2.48 2.60	4.32 2.77	0.47 0.20	0.71 0.33	R-SMA (RF Cable:IPEX (20565-001R-13)) IPEX (20565-001R-13)	N/A (RF Cable:190) 55
118	INPAQ TECHNOLOGY CO., LTD.	DAM-J7-H-DB-800-10-34(Main) DAM-J7-H-DB-800-10-34(Aux)	Dipole	1.64 1.65	1.15 1.12	N/A	N/A	RP-SMA (RF Cable:IPEX MHF4) RP-SMA (RF Cable:IPEX MHF4)	800 (RF Cable:42) 800 (RF Cable:42)
119	LUXSHARE-ICT	LA9RF251-CS-H(Main) LA9RF251-CS-H(Aux)	Dipole	0.4 -0.8	0.1 2.7	2.21 2.21	3.54 3.54	RP-SMA (RF Cable:IPEX) RP-SMA (RF Cable:IPEX)	800 (RF Cable:42) 800 (RF Cable:42)
120	INPAQ TECHNOLOGY CO., LTD.	DAM-I3-H1-M2-800-10-66(Main) DAM-I3-H1-M2-800-10-66(Aux)	Dipole	0.71 2.73	1.6 1.79	N/A	N/A	RP-SMA (RF Cable:IPEX) RP-SMA (RF Cable:IPEX)	800 (RF Cable:42) 800 (RF Cable:42)

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
121	LUXSHARE-ICT	LA9RF059-CS-H(Main) LA9RF059-CS-H(Aux)	Dipole	1.23 -0.1	3.93 4.55	1.84 1.75	4.21 3.97	RP-SMA (RF Cable:IPEX) RP-SMA (RF Cable:IPEX)	800 (RF Cable: 42) 800 (RF Cable: 42)
122	INPAQ Corporation	025.901SQ.0011 (WA-P-LE-02-008)(Main) 025.901SQ.0001 (WA-P-LE-02-007)(Aux)	PIFA	0.53 1.46	0.96 1.44	0.99 1.32	1.54 2.05	I-PEX MHF-4L	360 550
123	WNC	025.901SW.0001 (81EABD15.G46)(Main) 025.901SV.0001 (81EABD15.G45)(Aux)	PIFA	1.52 -1.13	1.88 1.86	0.84 1.28	1.25 2.00	IPEX	360 550
<b>Newly Antenna</b>									
Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
124	High-Tek Electronics Co., Ltd	DC33002OM20(0ACCN021053N)(Main) DC33002OM30(0ACCN021054N)(Aux)	PIFA	2.87 2.74	2.84 2.88	0.64 0.87	1.10 1.36	SpeedTeh (C87P115-000 02-H)	232 315
125	Pulse	DC33002OP00(TZ2204D)(Main) DC33002OP10(TZ2204E)(Aux)	PIFA	2.82 2.57	2.81 2.75	0.77 1.04	1.21 1.56	IPEX (20565-001R-1 3)	232 315
126	High-Tek Electronics Co., Ltd	DC33002OM00(0ACCN021051N)(Main) DC33002OM10(0ACCN021052N)(Aux)	PIFA	2.71 2.66	2.77 2.74	0.64 0.87	1.08 1.46	SpeedTeh (C87P115-000 02-H)	232 315
127	Pulse	DC33002OO00(TZ2203D)(Main) DC33002OO10(TZ2203E)(Aux)	PIFA	1.85 0.28	2.77 2.02	0.77 1.04	1.20 1.56	IPEX (20565-001R-1 3)	232 315
128	Cortec	AN2450-5511BRS +SMASFR8-3100B-4AX00I(Main) AN2450-5511BRS +SMASFR8-3100B-4AX00I(Aux)	Dipole	2.14 2.14	3.61 3.61	N/A N/A	N/A N/A	RP-SMA (RF Cable:lpex) RP-SMA (RF Cable:lpex)	109 (RF Cable: 100) 109 (RF Cable: 100)
129	High-Tek Electronics Co., Ltd	(NB Mode)219HCTN12198(Main) (NB Mode)219HCTN12197(Aux)	PIFA	0.91 2.37	2.84 2.94	1.31 1.05	2.16 1.61	CM (958-C437-CM -B-YHU-AO)	535 430
		(TB Mode)219HCTN12198(Main) (TB Mode)219HCTN12197(Aux)	PIFA	1.84 0.80	2.86 2.68	1.31 1.05	2.00 1.74	CM (958-C437-CM -B-YHU-AO)	535 430
130	Wistron Neweb Corporation	(NB Mode)48EABP01.SGCLOC(Main) (NB Mode)48EABP02.SGCLOC(Aux)	PIFA	1.84 0.47	2.17 2.84	1.00 1.24	1.50 1.95	IPEX(MHF-4L)	430 535
		(TB Mode)48EABP01.SGCLOC(Main) (TB Mode)48EABP02.SGCLOC(Aux)		-1.59 -0.54	2.84 1.11	1.00 1.24	1.56 1.95		IPEX(MHF-4L)

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
131	High-Tek Electronics Co., Ltd	DQ602103400(0ACQD021034N)(Main) DQ602103400(0ACQD021034N)(Aux)	PIFA	-0.04 -1.12	2.95 2.90	0.41 0.71	0.62 1.17	Caimei (958-C413-W-B-Bu-A0) Caimei (958-C437-CM-B-HU-A0)	110 290
132	WNC	DQ6P15G1100(81EABP15.G11)(Main) DQ6P15G1100(81EABP15.G11)(Aux)	PIFA	-0.17 -1.15	2.24 2.78	0.42 0.66	0.65 1.00	I-pex (20565-001R-13)	110 290
133	High-Tek Electronics Co., Ltd	025.9020H.0001(0ACAR021025N)(Main) 025.9020I.0001(0ACAR021026N)(Aux)	PIFA	1.99 2.66	2.93 2.38	0.93 1.44	1.54 2.20	CM (958-C437-CM-B-YHU-AO)	380 590
134	INPAQ	025.9020J.0001(WA-P-LE-02-060)(Main) 025.9020K.0001(WA-P-LE-02-061)(Aux)	PIFA	2.26 1.73	1.66 1.52	1.05 1.42	1.57 2.27	I-PEX(MHF-4L)	380 590
135	NISSEI ELECTRIC CO.,LTD	CP800140(Main) CP800140(Aux)	PIFA	1.52 0.38	2.21 1.89	N/A	N/A	I-PEX(MHF4L)	315 555
136	NISSEI ELECTRIC CO.,LTD	CP800133(Main) CP800133(Aux)	PIFA	1.51 0.37	2.80 2.59	N/A	N/A	I-PEX(MHF4L)	347 624
137	ACON	6036B0213401(ANP6Y-100221)(Main) 6036B0213301(ANP6Y-100222)(Aux)	PIFA	-0.14 -2.14	1.68 -1.04	1.39 2.34	2.24 3.76	I-Pex (20565-001R-13)	422 710
138	Wistron Neweb Corporation	6036B0213601(81EAA415.GEK)(Main) 6036B0213501(81EAA415.GEL)(Aux)	PIFA	0.06 -1.10	-0.79 -1.03	1.57 2.50	2.33 3.87	IPEX (20565-001R-13)	422 710
139	Yageo Corporation	6036B0213001(ANTA0HV12461WLAN1)(Main) 6036B0212901(ANTA0HV12461WLAN2)(Aux)	PIFA	-0.34 -0.55	-1.81 -2.95	1.35 2.28	2.09 3.73	IPEX (20565-001R-13)	422 710
140	ShenZhen ZhongTianXun Communication Technology Shares Co.,LTD	2.00004826(Main) 2.00004826(Aux)	PIFA	0.58 -0.54	1.82 0.44	0.92 1.26	1.49 1.93	KANGSHUO(康硕) MHF-B13-N-01	270 378
141	Shenzhen South Star Technology Co., LTD	N12-7313-R0A(Main) N12-7313-R0A(Aux)	PIFA	1.46 2.78	2.41 3.46	0.82 1.09	1.27 1.69	kexincheng(科信成) IPEX	270 379
142	MAG.LAYERS	DC33002JX00(PCA-4007-25GC7-A1)(Main) DC33002JX10(PCA-4007-25GC7-A2)(Aux)	PIFA	0.91 0.27	0.71 0.93	1.97 2.52	2.94 3.76	kangshuo (MHF-B13-N-01)	672 859
143	Pulse	DC330020F00(TZ2106D)(Main) DC330020F10(TZ2106E)(Aux)	PIFA	0.95 1.64	1.93 -0.32	1.93 2.50	2.69 3.51	IPEX (20565-001R-13)	640 830
144	High-Tek Electronics Co., Ltd	DC330020E00(0ACCN021031N)(Main) DC330020E10(0ACCN021032N)(Aux)	PIFA	1.98 1.95	2.05 1.16	1.94 2.51	2.96 3.58	SpeedTeh (C87P115-00002-H)	640 830
145	INPAQ Corporation	6036B0295201(WA-P-LB-02-841)(Main) 6036B0295001(WA-P-LB-02-840)(Aux)	PIFA	-0.67 0.26	-0.82 -0.55	2.86 2.19	4.64 3.41	IPEX (20565-001R-13)	915 585

Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
146	WNC	6036B0294901(81EABD15.G54)(Main) 6036B0295101(81EABD15.G53)(Aux)	PIFA	1.19 2.47	0.63 0.99	2.38 1.75	3.51 2.86	IPEX (20565-001R-13)	915 585
147	HONG-BO	6036B0319701(00-2602752250)(Main) 6036B0319601(00-2602752150)(Aux)	PIFA	-0.98 -1.05	2.15 1.28	-0.91 -1.43	-1.35 -2.25	IPEX	355 560
148	WNC	6036B0319901(81EABL15.G65)(Main) 6036B0319801(81EABL15.G64)(Aux)	PIFA	-1.56 -2.48	1.21 0.24	0.99 1.55	1.54 2.39	IPEX (20565-001R-13)	355 560
149	INPAQ	025.90205.0001(WA-P-LE-02-059)(Main) 025.90204.0001(WA-P-LE-02-058)(Aux)	PIFA	2.30 1.16	-0.20 0.32	0.76 0.76	1.24 1.15	I-PEX	315 315
150	High-Tek Electronics Co., Ltd	025.901ZU.0001(0ACAR021016N)(Main) 025.901ZV.0001(0ACAR021015N)(Aux)	PIFA	-0.69 -0.84	-0.89 -0.75	0.95 0.95	1.46 1.46	Caimei (958-C413-W-B-Bu-A0)	315 315
151	AWAN	AYP6Y-100225(DC33002LY00)(Main) AYP6Y-100226(DC33002LY10)(Aux)	PIFA	2.24 1.74	2.17 0.96	1.96 2.06	2.79 3.25	I-pex (20565-001R-13)	570 739
152	High-Tek Electronics Co., Ltd	0ACCN021006N(DC33002LA00)(Main) 0ACCN021007N(DC33002LA10)(Aux)	PIFA	2.55 2.50	-0.59 0.37	2.03 2.06	3.21 3.12	SpeedTeh (C87P132-00002-H)	570 739
153	AWAN	AYP6Y-100227(DC33002LZ00)(Main) AYP6Y-100228(DC33002LZ10)(Aux)	PIFA	3.11 1.18	1.18 1.53	1.87 2.08	3.01 3.22	I-pex (20565-001R-13)	620 835
154	High-Tek Electronics Co., Ltd	0ACCN021008N(DC33002LB00)(Main) 0ACCN021009N(DC33002LB10)(Aux)	PIFA	1.41 1.38	-1.44 0.10	2.21 2.33	3.49 3.52	SpeedTeh (C87P132-00002-H)	620 835
155	AWAN	025.901Z6.0001(AYP6Y-100261)(Main) 025.901Z5.0001(AYP6Y-100260)(Aux)	PIFA	2.80 1.31	3.91 4.02	0.35 0.52	0.54 0.79	I-pex (20565-001R-13)	113 165
156	WNC	025.901Z2.0001(81EABR15.G22)(Main) 025.901Z1.0001(81EABR15.G21)(Aux)	PIFA	2.19 2.33	2.35 2.51	0.45 0.7	0.67 1.03	IPEX	126 193
157	HIGH-TEK HARNESS ENTERPRISE CO., LTD	0ACCN018036N(DC330029M00)(Main) 0ACCN018037N(DC330029M10)(Aux)	PIFA	-2.3 -2.5	-0.12 -3.13	1.401 2.175	2.165 3.361	SpeedTeh (C87P115-00002-H)	525 815
158	Hong-Bo	260-24269(DC33002BD00)(Main) 260-24270(DC33002BD10)(Aux)	PIFA	1.05 0.60	0.25 0.26	1.54 2.40	2.30 3.72	I-PEX (20565-001R-13)	525 815
159	Wistron Neweb Corporation	81EAA415.GHY(DC330029N00)(Main) 81EAA415.GHZ(DC330029N10)(Aux)	PIFA	-0.52 0.43	1.31 0.70	1.91 2.85	2.86 4.20	IPEX (20565-001R-13)	525 815
160	AWAN	AYP6Y-200046(DC33002OJ00)(Main) AYP6Y-200046(DC33002OJ00)(Aux)	PIFA	2.24 2.73	2.14 2.31	0.61 0.78	1.03 1.31	I-pex (20565-001R-13)	245 312



Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
161	inpaq Corporation	WA-F-LBLB-04-080(Main) WA-F-LBLB-04-080(Aux)	PIFA	2.8 2.6	4.79 4.61	0.67 1.25	1.09 2.03	IPEX	220 413
162	Luxshare-ICT Corporation	L01RF338-NB-H(Main) L01RF338-NB-H(Aux)	PIFA	2.93 2.43	4.68 4.41	0.54 1.01	0.85 1.58	IPEX4	220 413
163	High-Tek Electronics Co., Ltd	DC33002OI00(0ACCN021033N)(Main) DC33002OI00(0ACCN021033N)(Aux)	PIFA	2.92 2.87	2.91 2.95	0.68 0.86	0.80 1.46	SpeedTeh (C87P115-000 02-H)	245 312
164	Shenzhen South Star Technology Ltd	DC33002O000(N12-7952-R0A)(Main) DC33002O000(N12-7952-R0A)(Aux)	PIFA	1.66 1.61	2.68 2.47	0.65 0.88	0.96 1.35	Kangshuo (MHF-B13-N-0 1)	233 317
165	Shenzhen South Star Technology Ltd	DC33002O400(N12-7955-R0A)(Main) DC33002O410(N12-7956-R0A)(Aux)	PIFA	1.86 1.84	2.98 1.72	0.53 0.99	0.79 1.54	Kangshuo (MHF-B13-N-0 1)	192 357
166	Shenzhen South Star Technology Ltd	DC33002O200(N12-7953-R0A)(Main) DC33002O210(N12-7954-R0A)(Aux)	PIFA	1.32 0.92	2.80 2.42	0.76 1.01	1.18 1.50	Kangshuo (MHF-B13-N-0 1)	273 363
167	High-Tek Electronics Co., Ltd	DC33002O500(0ACCN021029N)(Main) DC33002O510(0ACCN021030N)(Aux)	PIFA	1.51 -0.32	2.92 2.90	0.58 1.08	0.90 1.65	I-PEX4	192 357
168	High-Tek Electronics Co., Ltd	DC33002O100(0ACCN021025N)(Main) DC33002O100(0ACCN021025N)(Aux)	PIFA	2.23 -0.02	2.91 2.98	0.71 0.96	1.08 1.47	SpeedTeh (C87P115-000 02-H)	233 317
169	High-Tek Electronics Co., Ltd	DC33002O300(0ACCN021026N)(Main) DC33002O310(0ACCN021027N)(Aux)	PIFA	-1.00 -1.09	-1.19 -0.06	0.83 1.1	1.18 1.7	SpeedTeh (C87P115-000 02-H)	273 363
170	AWAN	025.9020M.0001(Main) 025.9020N.0001(Aux)	PIFA	2.74 1.51	2.63 2.95	0.33 0.88	0.47 1.31	I-pex (20565-001R-1 3)	105 285
171	High-Tek Electronics Co., Ltd	025.9020M.0011(0ACAR021021N)(Main) 025.9020N.0011(0ACAR021022N)(Aux)	PIFA	2.81 2.73	2.99 2.98	0.39 1.07	0.61 1.65	SpeedTeh (C87P115-000 02-H)	105 285
172	WNC	025.9020M.0021(Main) 025.9020N.0021(Aux)	PIFA	1.87 2.24	2.95 2.96	0.46 1.10	0.70 1.70	IPEX-20565	105 285
173	AWAN	025.9020O.0001(Main) 025.9020P.0001(Aux)	PIFA	1.72 1.51	2.98 2.90	0.35 1.05	0.52 1.47	I-pex (20565-001R-1 3)	100 300
174	High-Tek Electronics Co., Ltd	025.9020O.0011(0ACAR021023N)(Main) 025.9020P.0011(0ACAR021024N)(Aux)	PIFA	-0.66 2.68	2.99 2.84	0.37 1.12	0.56 1.74	SpeedTeh (C87P115-000 02-H)	100 300
175	WNC	025.9020O.0021(Main) 025.9020P.0021(Aux)	PIFA	1.25 1.97	2.93 2.65	0.44 1.15	0.68 1.78	IPEX-20565	100 300
176	WNC	81EABS15.G54(DC33002PG00)(Main) 81EABS15.G55(DC33002PG10)(Aux)	PIFA	2.48 1.21	1.41 0.17	1.57 2.06	2.28 2.95	IPEX 20565	611.5 799.5
177	WNC	81EABS15.G40(DC33002OK00)(Main) 81EABS15.G41(DC33002OK10)(Aux)	PIFA	2.54 2.53	2.93 2.96	1.15 1.99	1.80 2.97	IPEX 20565	416 718
178	WNC	81EABS15.G19(DC33002OD00)(Main) 81EABS15.G20(DC33002OD10)(Aux)	PIFA	2.35 2.83	3.16 2.06	1.30 3.36	2.05 3.85	IPEX 20565	450 780
179	Speed	DC33001VQ00(Main) DC33001VQ10(Aux)	PIFA	1.36 3.01	2.26 1.84	1.56 2.16	2.33 3.35	IPEX(MHF)	532 735
180	LUXSHARE-ICT	DC33001VM00(Main) DC33001VM10(Aux)	PIFA	1.94 2.34	1.28 1.04	1.33 1.83	2.07 2.85	IPEX(MHF)	532 735



Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
181	INPAQ	DC33001VZ00(Main) DC33001VZ10(Aux)	PIFA	1.77 1.06	0.74 -0.15	1.81 1.8	3.0 3.0	IPEX(MHF)	532 735
182	ChangShu HongBo Telecommunication Technology Co., Ltd	DC33001X200(Main) DC33001X210(Aux)	PIFA	1.74 0.75	2.14 1.60	1.83 2.48	2.75 3.51	IPEX(MHF)	610 825
183	LUXSHARE-ICT	DC33001X100(Main) DC33001X110(Aux)	PIFA	1.48 1.02	2.23 1.28	1.50 1.50	2.33 2.33	IPEX(MHF)	610 825
184	Speed	DC33001X000(Main) DC33001X010(Aux)	PIFA	1.18 2.46	3.03 0.96	1.79 2.42	2.67 3.82	IPEX(MHF)	610 825
185	LUXSHARE-ICT	DC33001SX00(Main) DC33001SX00(Aux)	PIFA	-0.77 -1.23	-0.53 1.10	0.63 0.63	0.96 0.98	SPEEDTECH (C87P115)	250 250
186	Speed Wireless Technical Co., LTD.	DC33001SV00(Main) DC33001SV00(Aux)	PIFA	-0.12 0.34	2.89 2.32	0.93 1.18	1.46 1.98	SPEEDTECH (C87P115)	250 250
187	ChangShu HongBo Telecommunication Technology Co., Ltd	DC33001ST00(00-2602810500)(Main) DC33001ST00(00-2602810500)(Aux)	PIFA	-1.37 -1.45	-1.53 -0.28	1.2 1.2	1.6 1.8	Speedtech (C87P115-000 0X-H)	295 295
188	LUXSHARE-ICT	DC33001SU00(Main) DC33001SU00(Aux)	PIFA	-2.36 -1.85	-0.60 1.06	0.72 0.72	1.12 1.12	SPEEDTECH (C87P115)	295 295
189	Speed Wireless Technical Co.,LTD.	DC33001SM00(Main) DC33001SM00(Aux)	PIFA	1.60 1.69	2.00 2.10	0.92 1.07	1.38 1.60	SPEEDTECH (C87P115)	295 295
190	LUXSHARE-ICT	DC33001SZ00(Main) DC33001SZ00(Aux)	PIFA	-2.66 -0.38	0.74 1.41	0.77 0.77	1.21 1.20	SPEEDTECH (C87P115)	315 315
191	Speed Wireless Technical Co., LTD.	DC33001T000(Main) DC33001T000(Aux)	PIFA	0.01 0.49	1.83 2.86	0.92 1.19	1.38 1.77	SPEEDTECH (C87P115)	315 315
192	Amphenol	DC33001PX00(TKC456-15-000-R)(Main) DC33001PX10(TKC457-15-000-R)(Aux)	PIFA	2.33 1.67	3.57 3.46	0.71 1.01	0.99 1.52	I-pex	265 347
193	LUXSHARE-ICT	DC33001PV00(Main) DC33001PV10(Aux)	PIFA	2.96 2.41	3.58 3.57	0.64 0.84	0.98 1.33	I-Pex	265 347
194	Speed Wireless Technical Co., LTD.	DC33001PU00(Main) DC33001PU10(Aux)	PIFA	2.88 2.35	2.65 2.62	0.78 1.02	1.16 1.58	I-Pex	265 347
195	Amphenol	DC33001MM00(TKB456-15-000-R)(Main) DC33001MM10(TKB456-15-000-R)(Aux)	PIFA	2.86 1.28	3.98 3.56	0.79 1.03	1.06 1.38	I-pex	265 347





Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
196	LUXSHARE-ICT	DC33001ML00(Main) DC33001ML10(Aux)	PIFA	2.65 2.72	3.85 3.78	0.64 0.84	1.00 1.33	I-pex	265 347
197	Speed Wireless Technical Co., LTD.	DC33001MK00(Main) DC33001MK10(Aux)	PIFA	2.43 2.42	3.47 1.35	0.78 1.01	1.21 1.51	I-pex	265 345
198	Speed Wireless Technical Co., LTD.	DC33001XG00(Main) DC33001XG00(Aux)	PIFA	2.11 2.73	2.92 2.95	0.8 0.94	1.2 1.42	Speedtech (C87P115)	300 300
199	LUXSHARE-ICT	DC33001XJ00(Main) DC33001XJ00(Aux)	PIFA	2.87 2.76	4.28 4.00	0.80 0.95	1.24 1.49	SPEEDTECH (C87P115)	300 300
200	Shanghai Amphenol Airwave Communication Electronics Co.,Ltd	DC33001XL00(Main) DC33001XL00(Aux)	PIFA	2.81 1.68	3.20 3.85	0.9 1.1	1.2 1.5	Speedtech (C87P115)	300 300
201	LUXSHARE-ICT	DC33001XK00(Main) DC33001XK00(Aux)	PIFA	1.77 2.62	4.25 3.92	0.95 1.10	1.48 1.72	Speedtech (C87P115)	348 350
202	Speed Wireless Technical Co., LTD.	DC33001XH00(Main) DC33001XH00(Aux)	PIFA	1.62 1.43	2.95 2.72	0.91 1.06	1.38 1.6	Speedtech (C87P115)	348 350
203	Shanghai Amphenol Airwave Communication Electronics Co.,Ltd	DC33001XM00(Main) DC33001XM00(Aux)	PIFA	2.86 2.81	3.76 3.58	1.1 1.3	1.5 1.7	Speedtech (C87P115)	348 350
204	AWAN	DC33001XQ00(Main) DC33001XQ10(Aux)	PIFA	1.95 1.66	1.92 1.02	0.21 0.70	0.36 1.19	I-PEX	85 280
205	INPAQ	DC33001XN00(Main) DC33001XN10(Aux)	PIFA	1.95 1.66	1.92 1.02	0.21 0.70	0.36 1.19	I-PEX	85 280
206	INPAQ	DC33001XP00(Main) DC33001XP10(Aux)	PIFA	2.93 -0.07	2.34 0.42	0.47 1.01	0.80 1.73	I-PEX	188.3 405.3
207	AWAN	DC33001XR00(AYP6Y-100271)(Main) DC33001XR10(AYP6Y-100272)(Aux)	PIFA	2.93 -0.07	2.34 0.42	0.47 1.01	0.80 1.73	I-PEX	188.3 405.3
208	INPAQ	DC33001W500(Main) DC33001W510(Aux)	PIFA	0.45 -1.68	2.04 1.22	1.5 1.2	2.5 2.3	IPEX	458.5 413.7
209	Speed Wireless Technical Co., LTD.	DC33001W400(Main) DC33001W410(Aux)	PIFA	2.36 2.87	3.23 2.67	1.34 1.21	2.09 1.79	IPEX	458.5 413.7
210	Chilisin	DC33002PE00(BTMA00301025GC7A01)(Main) DC33002PE10(BTMA00301025GC7A02)(Aux)	PIFA	1.86 1.98	2.85 2.04	1.00 1.38	1.52 2.19	I-pex (20565-001R-13)	350 470



Ant. Set	Brand	Model	Ant. Type	2.4GHz Peak gain with cable loss (dBi)	5GHz Peak gain with cable loss (dBi)	Cable Loss 2.4G (dB)	Cable Loss 5G (dB)	Connector Type	Cable Length (mm)
211	LUXSHARE-ICT	DC33001TR00(Main) DC33001TR00(Aux)	PIFA	0.70 3.03	3.08 3.21	0.41 0.95	0.63 1.44	IPEX	140 379
212	SAA	DC33001TS00(Main) DC33001TS00(Aux)	PIFA	-0.06 1.52	3.07 1.56	0.59 1.43	0.81 2.06	IPEX	140 379
213	Speed Wireless Technical Co., LTD.	DC33001TQ00(Main) DC33001TQ00(Aux)	PIFA	-0.30 2.67	3.55 2.53	0.34 0.93	0.53 1.41	IPEX	140 379
214	Pulse	DC33002PK00(TZ22061)(Main) DC33002PK10(TZ22064)(Aux)	PIFA	1.79 1.85	2.71 2.01	1.05 1.42	1.40 1.98	Kangshuo (MHF-B13L-N-01)	350 470
215	INPAQ	DC33001PA00(Main) DC33001PB00(Aux)	PIFA	0.43 -4.04	-1.03 0.09	1.36 1.23	2.15 2.20	I-pex (20565-001R-13)	456 413.5
216	Speed Wireless Technical Co., LTD.	DC33001PA00(Main) DC33001PB00(Aux)	PIFA	1.51 0.63	1.95 -0.52	1.34 1.21	2.00 1.89	IPEX	456 413.5

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

4. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

## Appendix - Information of 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 accredited and approved according to ISO/IEC 17025.

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

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