

USER MANUAL

WLAN + BT Combo Module

Model Name: WCBN4506R

	Liteon P/N	Sony P/N
Type A	AAZ100162G0	1-493-092-11
Type B	AAZ100171G0	1-493-092-21

Version 1.1

***Author:** Kaysa Lee*

Change History

Revision	Date	Author	Change List
Version 1.0	2015 / 09 / 01	Kaysa Lee	Initial release
Version 1.1	2015 / 09 / 21	Kaysa Lee	Update Product Picture/MAC Label format(size)

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1 PRODUCT OVERVIEW

1.1 DESCRIPTION

WCBN4506R is a WLAN +BT Combo module which using MTK Chipset MT7662RU

1.2 FEATURES

- Operate at 2.4GHz / 5GHz band
- 300Mbps PHY Rate Support
- 2T2R Mode
- 20MHz Bandwidth Support (2.4G) , 40MHz Bandwidth Support (5G)
- USB 2.0 support for data rates up to 12Mbps full speed and 480Mbps high speed
- IEEE standards support: IEEE 802.11a/b/g and 802.11n
- 802.11i- WEP 64/128, AES, TKIP
- RoHS compliance
- Low Halogen compliance

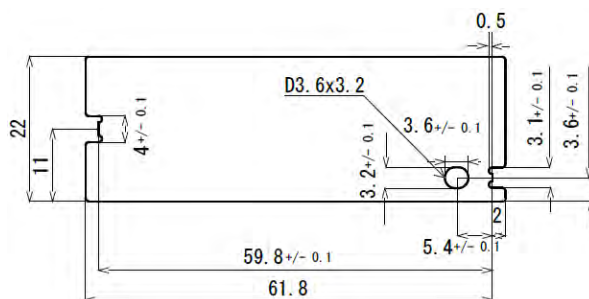
1.3 GENERAL SPECIFICATIONS

Main Chipset	MT7662RU
Standard	IEEE 802.11a/b/g/n , Bluetooth 4.2
Bus Interface	USB 2.0
Form Factor	63.8mm x 22mm x 5.4mm
Weight	7.4g (A) 6.5g (B)
Data Rate	WiFi: 802.11b: CCK, DQPSK, DBPSK 802.11a, 802.11g: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK Bluetooth: GFSK, $\pi/4$ -DQPSK and 8-DPSK
Frequency Range	2.400 ~ 2.4835 GHz 5.150 ~ 5.85GHz
Receive Sensitivity	WiFi: 11b @ 11Mbps: (Max.): -85dBm , (Typical) : -89.5dBm (PER<8%) 11g @ 54Mbps: (Max.): -69dBm , (Typical) : -76dBm (PER<10%) 11n @ MCS7 (2.4g HT20): (Max.): -67dBm , (Typical) : -74.5dBm (PER<10%) 11n @ MCS7 (5g HT20): (Max.): -67dBm , (Typical) : -73.5dBm (PER<10%) 11n @ MCS7 (5g HT40): (Max.): -64dBm , (Typical) : -70dBm (PER<10%) Bluetooth: 1DH5 BDR: (Max.): -86 dBm , (Typical): -95.5 dBm (BER < 0.1%) 2DH5 EDR: (Max.): -86 dBm , (Typical): -92.5 dBm (BER < 0.01%) 3DH5 EDR: (Max.): -80 dBm , (Typical): -86 dBm (BER < 0.10%) BLE : (Max.): -90dBm , (Typical): -97dbBm (PER<30.8%)

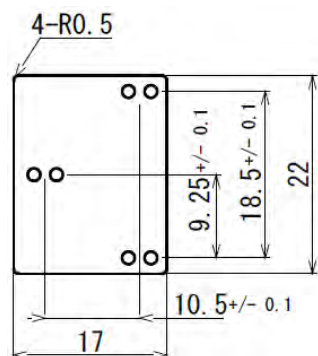
Temperature & Humidity	Normal Test Condition: 25 +/- 2deg.C , 65 +/- 2% RH Operating: -10 to 45 deg.C (2x2 mode), -10 to 60 deg.C (1x2 mode) Storage: -40 to 85 deg.C
Operating Voltage	3.3V ±10% I/O supply voltage
Current Consumption	Typical: 500mA (2x2 mode) Max: 650mA (2x2 mode) Min: 450mA (2x2 mode)
Antenna Type	Type A: Antenna PWB (WiFi) + IPEX MHF RF connector x 1 (BT) Type B: IPEX MHF RF connector x 3 (WIFI + BT)

1.4 BOARD OUTLINE

WIFI Board:



Antenna Board:



unit : mm

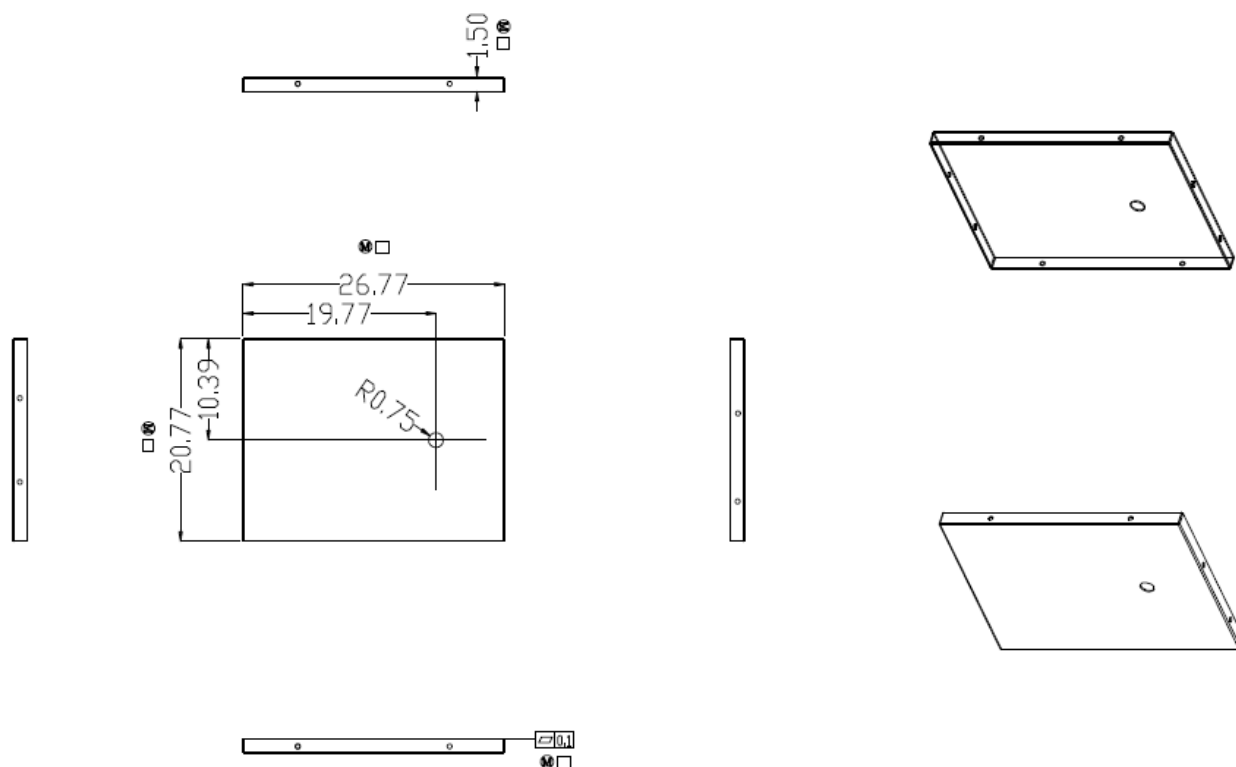
All dimension tolerances without specification are +/- 0.2 mm, except routing area +/- 0.25mm.

1.5 PCB INFORMATION

No.	Item	Vendor #1		Vendor #2
1	PWB Supplier	APCB		PIOTEK
2	ID Mark	323K380024YD (module)	323K381022YD (antenna)	323K380024AD (module) 323K381022AD (antenna)
3	PWB Supplier UL File No.	E85792	E85792	E220370
4	PWB Material Supplier	GRACE	Nanya	Nanya
5	PWB Material	GA-HF-15	NPG-150N	NPG-150N
6	PWB Material Supplier UL File No.	E186152	E98983	E98983
7	Flame Class	94V-0	94V-0	94V-0
8	Rated Temperature (Max Operation Temp.)	TG-150	TG-150	TG-150

1.6 SHIELDING

COVER:



1.8 WARNINGS

FCC Statement:

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures.

Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without C2P.

This device is restricted for indoor use.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.

Additional testing and certification may be necessary when multiple modules are used.

20 cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20 cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: PPQ-WCBN4506R ". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

IC Statement:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.

Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without reassessment permissive change.

Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

The maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate.

le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5725-5850 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

Dynamic Frequency Selection (DFS) for devices operating in the bands 5250- 5350 MHz, 5470-5600 MHz and 5650-5725 MHz.

Sélection dynamique de fréquences (DFS) pour les dispositifs fonctionnant dans les bandes 5250-5350 MHz, 5470-5600 MHz et 5650-5725 MHz.

The maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit.

le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limite de p.i.r.e.

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

For indoor use only.

Pour une utilisation en intérieur uniquement.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This radio transmitter (IC: 4491A-WCBN4506R) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (IC: 4491A-WCBN4506R) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Table for Filed Antenna

Set	Ant.	Brand Holder	Model Name	Antenna Type	Connector	Remark
1	1	SONY corporation	WCBN4506R	PIFA Antenna	N/A	Only for EUT 2 WiFi use
	2	SONY corporation	WCBN4506R	PIFA Antenna	N/A	Only for EUT 2 WiFi use
2	3	SONY corporation	WCBN4506R	Dipole Antenna	I-PEX	For EUT 1 WiFi and BT use For EUT 2 BT use
	4	SONY corporation	WCBN4506R	Dipole Antenna	I-PEX	For EUT 1 WiFi and BT use For EUT 2 BT use
3	5	Waka manufacturing Co.,Ltd.	01S1072-00	Dipole Antenna	I-PEX	Only for EUT 1 WiFi use
	6	Waka manufacturing Co.,Ltd.	01S1072-00	Dipole Antenna	I-PEX	Only for EUT 1 WiFi use

Set	Ant.	Gain (dBi)						Cable Length [mm]
		BT-2.4GHz	WiFi-2.4GHz	WiFi-5GHz Band 1	WiFi-5GHz Band 2	WiFi-5GHz Band 3	WiFi-5GHz Band 4	
1	1	-	0.71	1.81	1.81	2.14	1.8	N/A
	2	-	0.13	0.72	1.78	2.12	1.67	N/A
2 Note1	3	1.61	1.61	2.13	2.13	2.31	2.68	100-910mm Note2
	4	1.61	1.61	2.13	2.13	2.31	2.68	100-910mm Note2
3 Note1	5	-	2.06	2.41	2.87	1.89	2.7	90mm
	6	-	2.06	2.41	2.87	1.89	2.7	90mm

Note: 1. Gain with cable loss

2. Table for Cable loss Information

I-PEX Plug : Normal Type

Cable No.	Model Cable Color : Black	Cable No.	Model Cable Color : Gray	Cable No.	Model Cable Color : White	Brand	Cable Length [mm]	Phi [mm]	Connector Type	Cable Loss					
										2.4 GHz	2.45 GHz	2.5 GHz	5.15 GHz	5.5 GHz	5.85 GHz
1	822FKQ1000000001H1	83	822EKR1000000001H1	165	822EKP1000000001H1	I-PEX	100	1.13	MHF	0.51	0.51	0.52	0.79	0.80	0.82
2	822FKQ1100000001H1	84	822EKR1100000001H1	166	822EKP1100000001H1	I-PEX	110	1.13	MHF	0.54	0.54	0.55	0.84	0.85	0.87
3	822FKQ1200000001H1	85	822EKR1200000001H1	167	822EKP1200000001H1	I-PEX	120	1.13	MHF	0.57	0.57	0.58	0.88	0.90	0.92
4	822FKQ1300000001H1	86	822EKR1300000001H1	168	822EKP1300000001H1	I-PEX	130	1.13	MHF	0.60	0.60	0.62	0.93	0.94	0.97
5	822FKQ1400000001H1	87	822EKR1400000001H1	169	822EKP1400000001H1	I-PEX	140	1.13	MHF	0.63	0.64	0.65	0.98	0.99	1.02
6	822EKQ1500000001H1	88	822EKR1500000001H1	170	822EKP1500000001H1	I-PEX	150	1.13	MHF	0.67	0.67	0.68	1.02	1.04	1.07
7	822EKQ1600000001H1	89	822EKR1600000001H1	171	822EKP1600000001H1	I-PEX	160	1.13	MHF	0.70	0.70	0.71	1.07	1.09	1.12
8	822EKQ1700000001H1	90	822EKR1700000001H1	172	822EKP1700000001H1	I-PEX	170	1.13	MHF	0.73	0.73	0.74	1.11	1.14	1.17
9	822EKQ1800000001H1	91	822EKR1800000001H1	173	822EKP1800000001H1	I-PEX	180	1.13	MHF	0.76	0.76	0.77	1.16	1.18	1.22
10	822EKQ1900000001H1	92	822EKR1900000001H1	174	822EKP1900000001H1	I-PEX	190	1.13	MHF	0.79	0.79	0.81	1.21	1.23	1.27
11	822EKQ2000000001H1	93	822EKR2000000001H1	175	822EKP2000000001H1	I-PEX	200	1.13	MHF	0.82	0.83	0.84	1.25	1.28	1.32
12	822EKQ2100000001H1	94	822EKR2100000001H1	176	822EKP2100000001H1	I-PEX	210	1.13	MHF	0.85	0.86	0.87	1.30	1.33	1.37
13	822EKQ2200000001H1	95	822EKR2200000001H1	177	822EKP2200000001H1	I-PEX	220	1.13	MHF	0.88	0.89	0.90	1.35	1.37	1.42
14	822EKQ2300000001H1	96	822EKR2300000001H1	178	822EKP2300000001H1	I-PEX	230	1.13	MHF	0.91	0.92	0.93	1.39	1.42	1.47
15	822EKQ2400000001H1	97	822EKR2400000001H1	179	822EKP2400000001H1	I-PEX	240	1.13	MHF	0.95	0.95	0.96	1.44	1.47	1.52
16	822EKQ2500000001H1	98	822EKR2500000001H1	180	822EKP2500000001H1	I-PEX	250	1.13	MHF	0.98	0.98	1.00	1.48	1.52	1.57
17	822EKQ2600000001H1	99	822EKR2600000001H1	181	822EKP2600000001H1	I-PEX	260	1.13	MHF	1.01	1.02	1.03	1.53	1.57	1.62
18	822EKQ2700000001H1	100	822EKR2700000001H1	182	822EKP2700000001H1	I-PEX	270	1.13	MHF	1.04	1.05	1.06	1.58	1.61	1.67
19	822FKQ2800000001H1	101	822EKR2800000001H1	183	822EKP2800000001H1	I-PEX	280	1.13	MHF	1.07	1.08	1.09	1.62	1.66	1.72
20	822FKQ2900000001H1	102	822EKR2900000001H1	184	822EKP2900000001H1	I-PEX	290	1.13	MHF	1.10	1.11	1.12	1.67	1.71	1.77
21	822FKQ3000000001H1	103	822EKR3000000001H1	185	822EKP3000000001H1	I-PEX	300	1.13	MHF	1.13	1.14	1.15	1.72	1.76	1.82
22	822FKQ3100000001H1	104	822EKR3100000001H1	186	822EKP3100000001H1	I-PEX	310	1.13	MHF	1.16	1.17	1.19	1.76	1.81	1.87
23	822FKQ3200000001H1	105	822EKR3200000001H1	187	822EKP3200000001H1	I-PEX	320	1.13	MHF	1.19	1.21	1.22	1.81	1.85	1.92
24	822FKQ3300000001H1	106	822EKR3300000001H1	188	822EKP3300000001H1	I-PEX	330	1.13	MHF	1.23	1.24	1.25	1.85	1.90	1.97
25	822EKQ3400000001H1	107	822EKR3400000001H1	189	822EKP3400000001H1	I-PEX	340	1.13	MHF	1.26	1.27	1.28	1.90	1.95	2.02
26	822EKQ3500000001H1	108	822EKR3500000001H1	190	822EKP3500000001H1	I-PEX	350	1.13	MHF	1.29	1.30	1.31	1.95	2.00	2.07
27	822EKQ3600000001H1	109	822EKR3600000001H1	191	822EKP3600000001H1	I-PEX	360	1.13	MHF	1.32	1.33	1.34	1.99	2.05	2.12
28	822EKQ3700000001H1	110	822EKR3700000001H1	192	822EKP3700000001H1	I-PEX	370	1.13	MHF	1.35	1.36	1.38	2.04	2.09	2.17
29	822EKQ3800000001H1	111	822EKR3800000001H1	193	822EKP3800000001H1	I-PEX	380	1.13	MHF	1.38	1.39	1.41	2.09	2.14	2.22
30	822EKQ3900000001H1	112	822EKR3900000001H1	194	822EKP3900000001H1	I-PEX	390	1.13	MHF	1.41	1.43	1.44	2.13	2.19	2.27
31	822EKQ4000000001H1	113	822EKR4000000001H1	195	822EKP4000000001H1	I-PEX	400	1.13	MHF	1.44	1.46	1.47	2.18	2.24	2.32
32	822EKQ4100000001H1	114	822EKR4100000001H1	196	822EKP4100000001H1	I-PEX	410	1.13	MHF	1.47	1.49	1.50	2.23	2.28	2.37
33	822EKQ4200000001H1	115	822EKR4200000001H1	197	822EKP4200000001H1	I-PEX	420	1.13	MHF	1.51	1.52	1.53	2.27	2.33	2.42
34	822EKQ4300000001H1	116	822EKR4300000001H1	198	822EKP4300000001H1	I-PEX	430	1.13	MHF	1.54	1.55	1.57	2.32	2.38	2.47
35	822EKQ4400000001H1	117	822EKR4400000001H1	199	822EKP4400000001H1	I-PEX	440	1.13	MHF	1.57	1.58	1.60	2.36	2.43	2.52
36	822EKQ4500000001H1	118	822EKR4500000001H1	200	822EKP4500000001H1	I-PEX	450	1.13	MHF	1.60	1.62	1.63	2.41	2.48	2.57
37	822FKQ4600000001H1	119	822EKR4600000001H1	201	822EKP4600000001H1	I-PEX	460	1.13	MHF	1.63	1.65	1.66	2.46	2.52	2.62
38	822FKQ4700000001H1	120	822EKR4700000001H1	202	822EKP4700000001H1	I-PEX	470	1.13	MHF	1.66	1.68	1.69	2.50	2.57	2.67
39	822FKQ4800000001H1	121	822EKR4800000001H1	203	822EKP4800000001H1	I-PEX	480	1.13	MHF	1.69	1.71	1.72	2.55	2.62	2.72
40	822EKQ4900000001H1	122	822EKR4900000001H1	204	822EKP4900000001H1	I-PEX	490	1.13	MHF	1.72	1.74	1.76	2.60	2.67	2.77
41	822EKQ5000000001H1	123	822EKR5000000001H1	205	822EKP5000000001H1	I-PEX	500	1.13	MHF	1.75	1.77	1.79	2.64	2.72	2.82
42	822EKQ5100000001H1	124	822EKR5100000001H1	206	822EKP5100000001H1	I-PEX	510	1.13	MHF	1.79	1.81	1.82	2.69	2.76	2.87
43	822EKQ5200000001H1	125	822EKR5200000001H1	207	822EKP5200000001H1	I-PEX	520	1.13	MHF	1.82	1.84	1.85	2.73	2.81	2.92
44	822EKQ5300000001H1	126	822EKR5300000001H1	208	822EKP5300000001H1	I-PEX	530	1.13	MHF	1.85	1.87	1.88	2.78	2.86	2.97
45	822EKQ5400000001H1	127	822EKR5400000001H1	209	822EKP5400000001H1	I-PEX	540	1.13	MHF	1.88	1.90	1.91	2.83	2.91	3.02
46	822EKQ5500000001H1	128	822EKR5500000001H1	210	822EKP5500000001H1	I-PEX	550	1.13	MHF	1.91	1.93	1.95	2.87	2.96	3.07
47	822EKQ5600000001H1	129	822EKR5600000001H1	211	822EKP5600000001H1	I-PEX	560	1.13	MHF	1.94	1.96	1.98	2.92	3.00	3.12
48	822EKQ5700000001H1	130	822EKR5700000001H1	212	822EKP5700000001H1	I-PEX	570	1.13	MHF	1.97	2.00	2.01	2.97	3.05	3.17
49	822EKQ5800000001H1	131	822EKR5800000001H1	213	822EKP5800000001H1	I-PEX	580	1.13	MHF	2.00	2.03	2.04	3.01	3.10	3.22
50	822EKQ5900000001H1	132	822EKR5900000001H1	214	822EKP5900000001H1	I-PEX	590	1.13	MHF	2.03	2.06	2.07	3.06	3.15	3.27
51	822EKQ6000000001H1	133	822EKR6000000001H1	215	822EKP6000000001H1	I-PEX	600	1.13	MHF	2.07	2.09	2.11	3.11	3.20	3.32
52	822EKQ6100000001H1	134	822EKR6100000001H1	216	822EKP6100000001H1	I-PEX	610	1.13	MHF	2.10	2.12	2.14	3.15	3.24	3.36
53	822EKQ6200000001H1	135	822EKR6200000001H1	217	822EKP6200000001H1	I-PEX	620	1.13	MHF	2.13	2.15	2.17	3.20	3.29	3.41
54	822EKQ6300000001H1	136	822EKR6300000001H1	218	822EKP6300000001H1	I-PEX	630	1.13	MHF	2.16	2.18	2.20	3.24	3.34	3.46
55	822EKQ6400000001H1	137	822EKR6400000001H1	219	822EKP6400000001H1	I-PEX	640	1.13	MHF	2.19	2.22	2.23	3.29	3.39	3.51
56	822EKQ6500000001H1	138	822EKR6500000001H1	220	822EKP6500000001H1	I-PEX	650	1.13	MHF	2.22	2.25	2.26	3.34	3.43	3.56
57	822EKQ6600000001H1	139	822EKR6600000001H1	221	822EKP6600000001H1	I-PEX	660	1.13	MHF	2.25	2.28	2.30	3.38	3.48	3.61
58	822EKQ6700000001H1	140	822EKR6700000001H1	222	822EKP6700000001H1	I-PEX	670	1.13	MHF	2.28	2.31	2.33	3.43	3.53	3.66
59	822EKQ6800000001H1	141	822EKR6800000001H1	223	822EKP6800000001H1	I-PEX	680	1.13	MHF	2.31	2.34	2.36	3.48	3.58	3.71
60	822EKQ6900000001H1	142	822EKR6900000001H1	224	822EKP6900000001H1	I-PEX	690	1.13	MHF	2.34	2.37	2.39	3.52	3.63	3.76
61	822EKQ7000000001H1	143	822EKR7000000001H1	225	822EKP7000000001H1	I-PEX	700	1.13	MHF	2.38	2.41	2.42	3.57	3.67	3.81
62	822EKQ7100000001H1	144	822EKR7100000001H1	226	822EKP7100000001H1	I-PEX	710	1.13	MHF	2.41	2.44	2.45	3.61	3.72	3.86
63	822EKQ7200000001H1	145	822EKR7200000001H1	227	822EKP7200000001H1	I-PEX	720	1.13	MHF	2.44	2.47	2.49	3.66	3.77	3.91
64	822FKQ7300000001H1	146	822EKR7300000001H1	228	822EKP7300000001H1	I-PEX	730	1.13	MHF	2.47	2.50	2.52	3.71	3.82	3.96
65	822FKQ7400000001H1	147	822EKR7400000001H1	229	822EKP7400000001H1	I-PEX	740	1.13	MHF	2.50	2.53	2.55	3.75	3.87	4.01
66	822FKQ7500000001H1	148	822EKR7500000001H1	230	822EKP7500000001H1	I-PEX	750	1.13	MHF	2.53	2.56	2.58	3.80	3.91	4.06
67	822														

I-PEX Plug : Smooth Insert Type

Cable No.	Model Cable Color : Black	Cable No.	Model Cable Color : Gray	Cable No.	Model Cable Color : White	Brand	Cable Length [mm]	Phi (mm)	Connector Type	Cable Loss					
										2.4 GHz	2.45 GHz	2.5 GHz	5.15 GHz	5.5 GHz	5.85 GHz
247	822EKQ1000000001H3	329	822EKR1000000001H3	411	822EKP1000000001H3	I-PEX	100	1.13	MHF	0.51	0.51	0.52	0.79	0.80	0.82
248	822EKQ1100000001H3	330	822EKR1100000001H3	412	822EKP1100000001H3	I-PEX	110	1.13	MHF	0.54	0.54	0.55	0.84	0.85	0.87
249	822EKQ1200000001H3	331	822EKR1200000001H3	413	822EKP1200000001H3	I-PEX	120	1.13	MHF	0.57	0.57	0.58	0.88	0.90	0.92
250	822EKQ1300000001H3	332	822EKR1300000001H3	414	822EKP1300000001H3	I-PEX	130	1.13	MHF	0.60	0.60	0.62	0.93	0.94	0.97
251	822EKQ1400000001H3	333	822EKR1400000001H3	415	822EKP1400000001H3	I-PEX	140	1.13	MHF	0.63	0.64	0.65	0.98	0.99	1.02
252	822EKQ1500000001H3	334	822EKR1500000001H3	416	822EKP1500000001H3	I-PEX	150	1.13	MHF	0.67	0.67	0.68	1.02	1.04	1.07
253	822EKQ1600000001H3	335	822EKR1600000001H3	417	822EKP1600000001H3	I-PEX	160	1.13	MHF	0.70	0.70	0.71	1.07	1.09	1.12
254	822EKQ1700000001H3	336	822EKR1700000001H3	418	822EKP1700000001H3	I-PEX	170	1.13	MHF	0.73	0.73	0.74	1.11	1.14	1.17
255	822EKQ1800000001H3	337	822EKR1800000001H3	419	822EKP1800000001H3	I-PEX	180	1.13	MHF	0.76	0.76	0.77	1.16	1.18	1.22
256	822EKQ1900000001H3	338	822EKR1900000001H3	420	822EKP1900000001H3	I-PEX	190	1.13	MHF	0.79	0.79	0.81	1.21	1.23	1.27
257	822EKQ2000000001H3	339	822EKR2000000001H3	421	822EKP2000000001H3	I-PEX	200	1.13	MHF	0.82	0.83	0.84	1.25	1.28	1.32
258	822EKQ2100000001H3	340	822EKR2100000001H3	422	822EKP2100000001H3	I-PEX	210	1.13	MHF	0.85	0.86	0.87	1.30	1.33	1.37
259	822EKQ2200000001H3	341	822EKR2200000001H3	423	822EKP2200000001H3	I-PEX	220	1.13	MHF	0.88	0.89	0.90	1.35	1.37	1.42
260	822EKQ2300000001H3	342	822EKR2300000001H3	424	822EKP2300000001H3	I-PEX	230	1.13	MHF	0.91	0.92	0.93	1.39	1.42	1.47
261	822EKQ2400000001H3	343	822EKR2400000001H3	425	822EKP2400000001H3	I-PEX	240	1.13	MHF	0.95	0.95	0.96	1.44	1.47	1.52
262	822EKQ2500000001H3	344	822EKR2500000001H3	426	822EKP2500000001H3	I-PEX	250	1.13	MHF	0.98	0.98	1.00	1.48	1.52	1.57
263	822EKQ2600000001H3	345	822EKR2600000001H3	427	822EKP2600000001H3	I-PEX	260	1.13	MHF	1.01	1.02	1.03	1.53	1.57	1.62
264	822EKQ2700000001H3	346	822EKR2700000001H3	428	822EKP2700000001H3	I-PEX	270	1.13	MHF	1.04	1.05	1.06	1.58	1.61	1.67
265	822EKQ2800000001H3	347	822EKR2800000001H3	429	822EKP2800000001H3	I-PEX	280	1.13	MHF	1.07	1.08	1.09	1.62	1.66	1.72
266	822EKQ2900000001H3	348	822EKR2900000001H3	430	822EKP2900000001H3	I-PEX	290	1.13	MHF	1.10	1.11	1.12	1.67	1.71	1.77
267	822EKQ3000000001H3	349	822EKR3000000001H3	431	822EKP3000000001H3	I-PEX	300	1.13	MHF	1.13	1.14	1.15	1.72	1.76	1.82
268	822EKQ3100000001H3	350	822EKR3100000001H3	432	822EKP3100000001H3	I-PEX	310	1.13	MHF	1.16	1.17	1.19	1.76	1.81	1.87
269	822EKQ3200000001H3	351	822EKR3200000001H3	433	822EKP3200000001H3	I-PEX	320	1.13	MHF	1.19	1.21	1.22	1.81	1.85	1.92
270	822EKQ3300000001H3	352	822EKR3300000001H3	434	822EKP3300000001H3	I-PEX	330	1.13	MHF	1.23	1.24	1.25	1.85	1.90	1.97
271	822EKQ3400000001H3	353	822EKR3400000001H3	435	822EKP3400000001H3	I-PEX	340	1.13	MHF	1.26	1.27	1.28	1.90	1.95	2.02
272	822EKQ3500000001H3	354	822EKR3500000001H3	436	822EKP3500000001H3	I-PEX	350	1.13	MHF	1.29	1.30	1.31	1.95	2.00	2.07
273	822EKQ3600000001H3	355	822EKR3600000001H3	437	822EKP3600000001H3	I-PEX	360	1.13	MHF	1.32	1.33	1.34	1.99	2.05	2.12
274	822EKQ3700000001H3	356	822EKR3700000001H3	438	822EKP3700000001H3	I-PEX	370	1.13	MHF	1.35	1.36	1.38	2.04	2.09	2.17
275	822EKQ3800000001H3	357	822EKR3800000001H3	439	822EKP3800000001H3	I-PEX	380	1.13	MHF	1.38	1.39	1.41	2.09	2.14	2.22
276	822EKQ3900000001H3	358	822EKR3900000001H3	440	822EKP3900000001H3	I-PEX	390	1.13	MHF	1.41	1.43	1.44	2.13	2.19	2.27
277	822EKQ4000000001H3	359	822EKR4000000001H3	441	822EKP4000000001H3	I-PEX	400	1.13	MHF	1.44	1.46	1.47	2.18	2.24	2.32
278	822EKQ4100000001H3	360	822EKR4100000001H3	442	822EKP4100000001H3	I-PEX	410	1.13	MHF	1.47	1.49	1.50	2.23	2.28	2.37
279	822EKQ4200000001H3	361	822EKR4200000001H3	443	822EKP4200000001H3	I-PEX	420	1.13	MHF	1.51	1.52	1.53	2.27	2.33	2.42
280	822EKQ4300000001H3	362	822EKR4300000001H3	444	822EKP4300000001H3	I-PEX	430	1.13	MHF	1.54	1.55	1.57	2.32	2.38	2.47
281	822EKQ4400000001H3	363	822EKR4400000001H3	445	822EKP4400000001H3	I-PEX	440	1.13	MHF	1.57	1.58	1.60	2.36	2.43	2.52
282	822EKQ4500000001H3	364	822EKR4500000001H3	446	822EKP4500000001H3	I-PEX	450	1.13	MHF	1.60	1.62	1.63	2.41	2.48	2.57
283	822EKQ4600000001H3	365	822EKR4600000001H3	447	822EKP4600000001H3	I-PEX	460	1.13	MHF	1.63	1.65	1.66	2.46	2.52	2.62
284	822EKQ4700000001H3	366	822EKR4700000001H3	448	822EKP4700000001H3	I-PEX	470	1.13	MHF	1.66	1.68	1.69	2.50	2.57	2.67
285	822EKQ4800000001H3	367	822EKR4800000001H3	449	822EKP4800000001H3	I-PEX	480	1.13	MHF	1.69	1.71	1.72	2.55	2.62	2.72
286	822EKQ4900000001H3	368	822EKR4900000001H3	450	822EKP4900000001H3	I-PEX	490	1.13	MHF	1.72	1.74	1.76	2.60	2.67	2.77
287	822EKQ5000000001H3	369	822EKR5000000001H3	451	822EKP5000000001H3	I-PEX	500	1.13	MHF	1.75	1.77	1.79	2.64	2.72	2.82
288	822EKQ5100000001H3	370	822EKR5100000001H3	452	822EKP5100000001H3	I-PEX	510	1.13	MHF	1.79	1.81	1.82	2.69	2.76	2.87
289	822EKQ5200000001H3	371	822EKR5200000001H3	453	822EKP5200000001H3	I-PEX	520	1.13	MHF	1.82	1.84	1.85	2.73	2.81	2.92
290	822EKQ5300000001H3	372	822EKR5300000001H3	454	822EKP5300000001H3	I-PEX	530	1.13	MHF	1.85	1.87	1.88	2.78	2.86	2.97
291	822EKQ5400000001H3	373	822EKR5400000001H3	455	822EKP5400000001H3	I-PEX	540	1.13	MHF	1.88	1.90	1.91	2.83	2.91	3.02
292	822EKQ5500000001H3	374	822EKR5500000001H3	456	822EKP5500000001H3	I-PEX	550	1.13	MHF	1.91	1.93	1.95	2.87	2.96	3.07
293	822EKQ5600000001H3	375	822EKR5600000001H3	457	822EKP5600000001H3	I-PEX	560	1.13	MHF	1.94	1.96	1.98	2.92	3.00	3.12
294	822EKQ5700000001H3	376	822EKR5700000001H3	458	822EKP5700000001H3	I-PEX	570	1.13	MHF	1.97	2.00	2.01	2.97	3.05	3.17
295	822EKQ5800000001H3	377	822EKR5800000001H3	459	822EKP5800000001H3	I-PEX	580	1.13	MHF	2.00	2.03	2.04	3.01	3.10	3.22
296	822EKQ5900000001H3	378	822EKR5900000001H3	460	822EKP5900000001H3	I-PEX	590	1.13	MHF	2.03	2.06	2.07	3.06	3.15	3.27
297	822EKQ6000000001H3	379	822EKR6000000001H3	461	822EKP6000000001H3	I-PEX	600	1.13	MHF	2.07	2.09	2.11	3.11	3.20	3.32
298	822EKQ6100000001H3	380	822EKR6100000001H3	462	822EKP6100000001H3	I-PEX	610	1.13	MHF	2.10	2.12	2.14	3.15	3.24	3.36
299	822EKQ6200000001H3	381	822EKR6200000001H3	463	822EKP6200000001H3	I-PEX	620	1.13	MHF	2.13	2.15	2.17	3.20	3.29	3.41
300	822EKQ6300000001H3	382	822EKR6300000001H3	464	822EKP6300000001H3	I-PEX	630	1.13	MHF	2.16	2.18	2.20	3.24	3.34	3.46
301	822EKQ6400000001H3	383	822EKR6400000001H3	465	822EKP6400000001H3	I-PEX	640	1.13	MHF	2.19	2.22	2.23	3.29	3.39	3.51
302	822EKQ6500000001H3	384	822EKR6500000001H3	466	822EKP6500000001H3	I-PEX	650	1.13	MHF	2.22	2.25	2.26	3.34	3.43	3.56
303	822EKQ6600000001H3	385	822EKR6600000001H3	467	822EKP6600000001H3	I-PEX	660	1.13	MHF	2.25	2.28	2.30	3.38	3.48	3.61
304	822EKQ6700000001H3	386	822EKR6700000001H3	468	822EKP6700000001H3	I-PEX	670	1.13	MHF	2.28	2.31	2.33	3.43	3.53	3.66
305	822EKQ6800000001H3	387	822EKR6800000001H3	469	822EKP6800000001H3	I-PEX	680	1.13	MHF	2.31	2.34	2.36	3.48	3.58	3.71
306	822EKQ6900000001H3	388	822EKR6900000001H3	470	822EKP6900000001H3	I-PEX	690	1.13	MHF	2.34	2.37	2.39	3.52	3.63	3.76
307	822EKQ7000000001H3	389	822EKR7000000001H3	471	822EKP7000000001H3	I-PEX	700	1.13	MHF	2.38	2.41	2.42	3.57	3.67	3.81
308	822EKQ7100000001H3	390	822EKR7100000001H3	472	822EKP7100000001H3	I-PEX	710	1.13	MHF	2.41	2.44	2.45	3.61	3.72	3.86
309	822EKQ7200000001H3	391	822EKR7200000001H3	473	822EKP7200000001H3	I-PEX	720	1.13	MHF	2.44	2.47	2.49	3.66	3.77	3.91
310	822EKQ7300000001H3	392	822EKR7300000001H3	474	822EKP7300000001H3	I-PEX	730	1.13	MHF	2.47	2.50	2.52	3.71	3.82	3.96
311	822EKQ7400000001H3	393	822EKR7400000001H3	475	822EKP7400000001H3	I-PEX	740	1.13	MHF	2.50	2.53	2.55	3.75	3.87	4.01
312	822EKQ7500000001H3	394	822EKR7500000001H3	476	822EKP7500000001H3	I-PEX	750	1.13	MHF	2.53	2.56	2.58			

This module is intended for OEM integrator. The OEM integrator is still responsible for the IC compliance requirement of the end product, which integrates this module.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20 cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX IC : 4491A-WCBN4506R ".

Japan Statement:

5GHz product for indoor use only.

CE Statement:

This equipment complies with EU radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

NCC 警語:

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。