

# **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 date 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

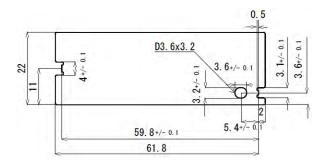
Main Chipset	MT7662RU
Standard	IEEE 802.11a/b/g/n , Bluetooth 4.2
Bus Interface	USB 2.0
Form Factor	63.8mm x 22mm x 5.4mm
Weight	7.4g (A) 6.5g (B)
Data Rate	WiFi: 802.11b: CCK, DQPSK, DBPSK 802.11a, 802.11g: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK Bluetooth: GFSK, $\pi$ /4-DQPSK and 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%)



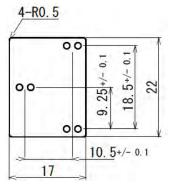
Temperature & Humidity	Normal Test Condition: 25 +/- 2deg.C , 65 +/- 2% RH Operating: -10 to 45 deg.C (2x2 mode), -10 to 60 deg.C (1x2 mode) Storage: -40 to 85 deg.C
Operating Voltage	3.3V ±10% I/O supply voltage
Current Consumption	Typical: 500mA (2x2 mode) Max: 650mA (2x2 mode) Min: 450mA (2x2 mode)
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:**



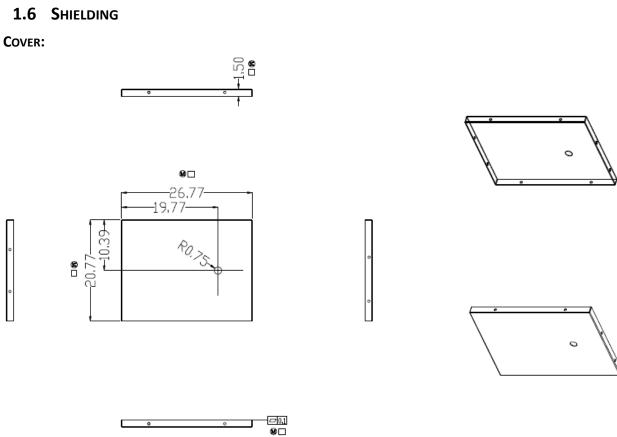
unit: mm

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



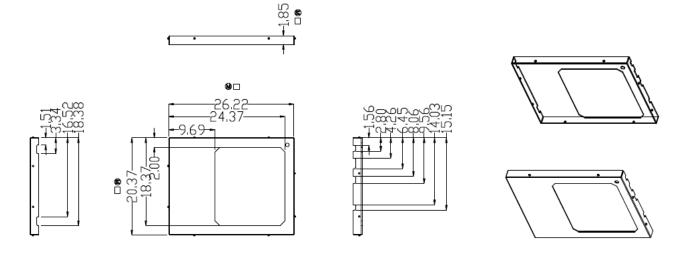
# 1.5 PCB INFORMATION

No.	Item	Vend	lor #1	Vendor #2
1	PWB Supplier	AF	СВ	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





# Frame:



# NOTE:

- 1.THICKNESS OF MATERIAL:洋白铜 T=0.15MM
- $2.MARKED \square$  IS CONTROL DIMENSIONS AND CTF ITEMS
- 3.Marked (M) IS THE CRITICAL DIMENSION

# 1.7 PIN CONFIGURATION

. Pin		UART version 10Pin											
PIII	Name	Туре	Description										
1	GND	<del>-</del>	Ground										
2	DM	I/O	USB Data -										
3	DP	I/O	USB Data +										
4	RST_L	l	Ground										
5	SYNC	0	SYNC Signal										
	J111C		GPIO11(MT7662RU Pin44)										
6	VCC	PWR	3.3V										
7	VCC	PWR	3.3V										
8	GND	-	Ground										



### 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.

Refering 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
2	4	SONY corporation	WCBN4506R	Dipole Antenna	I-PEX	For EUT 1 WiFi and BT use For EUT 2 BT use
2	5	Waka manufacturing Co.,Ltd. 01S1072-0		Dipole Antenna	I-PEX	Only for EUT 1 WiFi use
3	6	Waka manufacturing Co.,Ltd.	01S1072-00	Dipole Antenna	I-PEX	Only for EUT 1 WiFi use

		Gain (dBi)													
Set	Ant.	BT-2.4GHz	M:E: 2 4CHz	WiFi-5GHz	WiFi-5GHz	WiFi-5GHz	WiFi-5GHz	Cable Length							
		B1-2.4GHZ	WiFi-2.4GHz	Band 1	Band 2	Band 3	Band 4	[mm]							
1	1 -		0.71	1.81	1.81	2.14	1.8	N/A							
1	2	-	0.13	0.72	1.78	2.12 1.67		N/A							
	2	3 1.61	1.61	2.13	2.13	2.31	2.68	100-910mm							
2	3	1.01	1.01	2.13	2.13	2.31	2.08	Note2							
Note1	4	1.61	1.61	2.13	2.13	2.31	2.68	100-910mm							
	4	1.01	1.01	2.15	2.15	2.31	2.06	Note2							
3	5	ı	2.06	2.41	2.87	1.89	2.7	90mm							
Note1	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   Cabl							Cable		Cable Loss							
STATES    STATES							Brand		Phi [mm]		2.4	2.45			5.5	5.85
2	140.		140.		140.									7.1		
3   15790   3000000011   185   20786   100000011   1976   1300   131   148   667   277   038   038   049	-	and the state of t		NEED CO. 12 CO. 10 CO.	400				_				-			
A   D. STOCK   D. ST																
S.   PERFOL   DESCRIPTION   197   REPRETATION   198   DESCRIPTION   198   199   191   19																
To   Color																
8 EXEMPLICATIONSCOPPINE 90 EXCENSIONSCOPPINE 1712 EXCENSIONSCOPPINE 1920 133 May 074 073 074 115 134 117 17 EXCENSIONSCOPPINE 1712 132 133 May 074 073 074 115 134 117 17 EXCENSIONSCOPPINE 1712 132 133 May 074 075 077 115 138 131 117 117 117 117 117 117 117 117 117																
9 EZERGE/ERONDOULLY 91 EZERGE/ERONDOULLY 178 EZERGE/ERONDOULLY 179 189 131 MART 079 0.78 0.77 118 132 127 127 128 101 EZERGE/ERONDOULLY 178 EZERGE/ERONDOU																
10   SCHOOL   SCHOO																
11																
1.5																
14																
15																
16																
17   1821   18																
39   \$278000000001H    101   \$279000000001H    184   \$27600000001H    184   \$27600000001H    187   286   28760000001H    185   \$28760000001H    187   28760000001H    187   287600000001H    187   28760000001H    187   28760000001H    187   287600000001H    187   2876000000001H    187   287600000001H    18																
20																
27   1379KY 000000001H   168   2379KR 000000001H   169   2379KR 000000001H   169   2379KR 00000001H   169   2379KR 0000001H   169   2379KR 00000																
22																
23																
28			105				I-PEX	320		MHF						
28		822EKQ3300000001H1							1.13							
27 8228Kg980000001H1 199 8228Kg98000001H1 191 8228Kg980000001H1 191 8228Kg990000001H1 191 8228Kg990000001H1 192 8228Kg990000001H1 192 8228Kg990000001H1 193 8238Kg990000001H1 193 8228Kg990000001H1 193 8228Kg990000001H1 193 8228Kg990000001H1 193 8238Kg990000001H1 193 8238Kg9900000001H1 193 8238Kg9900000001H1 193 8238Kg9900000001H1																
28				77474 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7												
82268(380000001H1 111 822268(3800000001H1 198 82269(390000001H1 PEX 380 113 MFF 138 139 141 120 92 214 120 227 131 82255(300000001H1 113 8255(300000001H1 113 8255(3000000001H1 113 8255(3000000001H1 113 8255(3000000001H1 113 8255(300000000000000000000000000000000000																
32		822EKQ3900000001H1	112	822EKR3900000001H1	194	822EKP3900000001H1	I-PEX		1.13	MHE						2.27
33																
34																
Section   Sect																
822ECQ-450000000111   118   822ECM-450000000111   109   822ECM-450000000111   109   822ECM-450000000111   109   822ECM-450000000111   101																
8 822EKQ7400000001H1 120 822EKR490000001H1 203 822EKR490000001H1 1-PEK 470 1.13 MHF 1.66 1.68 1.69 2.50 2.57 2.67 2.77 4.0 822EKQ490000001H1 121 822EKR490000001H1 1-PEK 490 1.13 MHF 1.72 1.74 1.76 2.60 2.67 2.77 4.0 822EKQ590000001H1 124 822EKR590000001H1 205 822EKP5900000001H1 1-PEK 490 1.13 MHF 1.72 1.74 1.76 2.60 2.67 2.77 4.0 822EKQ5100000001H1 124 822EKR590000001H1 205 822EKP5900000001H1 1-PEK 500 1.13 MHF 1.79 1.81 1.82 2.69 2.76 2.87 4.0 822EKQ5100000001H1 125 822EKR590000001H1 207 822EKP5900000001H1 1-PEK 510 1.13 MHF 1.79 1.81 1.82 1.84 1.82 2.69 2.76 2.87 4.0 822EKQ5100000001H1 1.27 822EKP5900000001H1 1-PEK 510 1.13 MHF 1.87 1.88 2.78 2.81 2.92 4.0 822EKQ5100000001H1 1.27 822EKP5900000001H1 1-PEK 510 1.13 MHF 1.85 1.87 1.88 2.78 2.81 2.92 4.0 822EKQ5100000001H1 1.27 822EKP5900000001H1 1-PEK 510 1.13 MHF 1.85 1.87 1.88 2.78 2.81 2.92 4.0 822EKQ5100000001H1 1.27 822EKP5900000001H1 1-PEK 510 1.13 MHF 1.85 1.87 1.88 2.78 2.80 2.99 4.0 822EKQ5100000001H1 1.27 822EKP5900000001H1 1-PEK 540 1.13 MHF 1.91 1.99 1.95 2.87 2.90 3.07 4.0 822EKQ5500000001H1 1.28 822EKP5900000001H1 1-PEK 540 1.13 MHF 1.91 1.99 1.95 2.87 2.90 3.07 4.0 822EKQ5500000001H1 1.29 822EKP5900000001H1 1-PEK 540 1.13 MHF 1.91 1.99 1.95 2.87 2.90 3.07 3.17 4.0 822EKQ5500000001H1 1.10 822EKR5900000001H1 1.10 822EKR59000000001H1 1.10 822EKR5900000001H1 1.10 822EKR59000000001H1 1.10 822E	36	822EKQ4500000001H1	118		200				1.13		1.60	1.62	1.63		2.48	2.57
98 822EKQ480000001H1 121 822EKR480000001H1 204 822EKR480000001H1 1-PEK 480 11.3 MHF 1.69 1.71 1.72 1.74 1.76 2.60 2.67 2.77 41 822EKQ500000001H1 123 822EKR5900000001H1 206 822EKP500000001H1 1-PEK 490 11.3 MHF 1.75 1.77 1.76 2.60 2.67 2.77 42 822EKQ500000001H1 124 822EKR5900000001H1 208 822EKP500000001H1 1-PEK 500 11.3 MHF 1.75 1.77 1.76 2.60 2.76 2.87 42 822EKQ500000001H1 124 822EKR5900000001H1 208 822EKP500000001H1 1-PEK 510 11.3 MHF 1.75 1.77 1.78 1.81 1.82 2.69 2.76 2.87 42 822EKQ500000001H1 125 822EKR5900000001H1 208 822EKP500000001H1 1-PEK 510 11.3 MHF 1.82 1.84 1.85 2.73 2.81 2.92 44 822EKQ500000001H1 127 822EKR5900000001H1 208 822EKP500000001H1 1-PEK 510 11.3 MHF 1.85 1.87 1.88 2.78 2.86 2.97 45 822EKQ500000001H1 127 822EKR5900000001H1 1-PEK 510 11.3 MHF 1.85 1.87 1.88 2.78 2.86 2.97 45 822EKQ500000001H1 128 822EKR5900000001H1 1.20 822EKP500000001H1 1-PEK 530 11.3 MHF 1.91 1.93 1.93 1.87 2.66 3.07 47 822EKQ500000001H1 1.28 822EKR5900000001H1 1-PEK 530 11.3 MHF 1.91 1.93 1.95 2.87 2.96 3.07 47 822EKQ500000001H1 1.28 822EKP5000000001H1 1-PEK 530 11.3 MHF 1.94 1.95 1.95 2.87 2.96 3.07 3.07 47 822EKQ5000000001H1 1.28 822EKP5000000001H1 1-PEK 530 11.3 MHF 1.94 1.95 1.95 2.87 2.96 3.07 3.07 4.9 822EKQ5000000001H1 1.13 822EKP58000000001H1 1-PEK 530 11.3 MHF 1.94 1.95 1.95 2.87 2.92 3.00 3.12 4.9 822EKQ5000000001H1 1.13 822EKP58000000001H1 1.21 822EKP5800000001H1 1-PEK 530 11.3 MHF 1.94 1.95 1.95 2.87 2.92 3.00 3.12 4.9 822EKQ5000000001H1 1.13 822EKP58000000001H1 1.21 822EKP58000000001H1 1.14 822EKP58000000001H1 1.14 822EKP58000000001H1 1.14 822EKP58000000001H1 1.14 822EKP58000000001H1 1.14 822EKP5800000001H1 1.14 822EKP5800000001H1 1.14 822EKP58000000001H1 1.14 822EKP580000000001H1 1.14 822EKP58000000001H1 1.14 822EKP58000000001H1 1.14 822EKP580000000001H1 1.14 822EKP580000000001H1 1.14 822EKP580000000001H1 1.14 822EKP58000000000000001H1 1.14 822EKP58000000000001H										-						
832EKQ5900000001H1   128   822EKS900000001H1   205   822EKS9100000001H1   1PEX   500   113   MHF   172   174   176   2.60   2.67   2.77																
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50   822EKQ6900000001H1   132   822EKR900000001H1   214   822EKR900000001H1   1PEX   590   113   MHF   2.07   2.09   2.11   3.11   3.20   3.32   3	48				212		1-PEX	570		MHF	1.97				3.05	
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58         822EKQ6700000001H1         140         822EKR6700000001H1         228         822EKQ6800000001H1         141         822EKR6800000001H1         223         822EKP6800000001H1         142         822EKR6800000001H1         142         822EKR6800000001H1         142         822EKR6900000001H1         142         822EKR6900000001H1         142         822EKR6900000001H1         142         822EKR6900000001H1         142         822EKR6900000001H1         142         822EKR6900000001H1         142         822EKR69000000001H1         142         822EKR7000000001H1         142         822EKR7000000001H1         143         822EKR7000000001H1         143         822EKR7000000001H1         144         822EKR7000000001H1         144         822EKR7000000001H1         144         822EKR7100000001H1         144         822EKR7100000001H1         144         822EKR7100000001H1         144         822EKR7100000001H1         144         822EKR7200000001H1         144         822EKR7200000001H1         144         822EKR7300000001H1         144         822EKR7300000001H1         144         822EKR7300000001H1         144         822EKR7300000001H1         144         144         144         144         144         144         144         144         144         144         144         144         144         144         144 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																
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71 822EKQ800000001H1 153 822EKR800000001H1 235 822EKP800000001H1 1-PEX 800 1.13 MHF 2.69 2.72 2.74 4.03 4.15 4.31 72 822EKQ8100000001H1 154 822EKR8100000001H1 236 822EKQ8100000001H1 1-PEX 810 1.13 MHF 2.75 2.77 4.08 4.20 4.36 4.36 4.36 4.36 4.36 4.36 4.36 4.36																
72 822EKQ8100000001H1 154 822EKR8100000001H1 236 822EKP8100000001H1 1-PEX 810 1.13 MHF 2.75 2.75 2.77 4.08 4.20 4.36 73 822EKQ8200000001H1 155 822EKR8200000001H1 237 822EKQ820000001H1 1-PEX 820 1.13 MHF 2.75 2.79 2.80 4.12 4.25 4.41 7.25 8.22EKQ8200000001H1 1-PEX 820 1.13 MHF 2.78 2.82 2.83 4.17 4.30 4.46 7.5 822EKQ840000001H1 1-PEX 820 1.13 MHF 2.78 2.82 2.83 4.17 4.30 4.45 7.5 822EKQ840000001H1 1-PEX 820 1.13 MHF 2.81 2.85 2.87 4.22 4.34 4.51 7.6 822EKQ850000001H1 1-PEX 820 1.13 MHF 2.81 2.85 2.87 4.22 4.34 4.51 7.6 822EKQ8500000001H1 1-PEX 820 1.13 MHF 2.84 2.88 2.90 4.26 4.39 4.56 7.7 822EKQ8500000001H1 1-PEX 820 1.13 MHF 2.87 2.91 2.93 4.31 4.44 4.61 7.8 822EKQ8500000001H1 1-PEX 820 1.13 MHF 2.87 2.91 2.93 4.31 4.44 4.61 7.8 822EKQ8500000001H1 1-PEX 820 1.13 MHF 2.87 2.91 2.93 4.31 4.44 4.61 7.8 822EKQ8500000001H1 1-PEX 820 1.13 MHF 2.87 2.91 2.99 4.36 4.49 4.66 7.9 822EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 2.99 4.40 4.54 4.71 8.22EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 2.99 4.40 4.54 4.71 8.22EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 8.8 82EKQ8500000001H1 1-PEX 820 1.13 MHF 2.																
73   8.22EKQ8200000001H1   155   8.22EKR8300000001H1   237   8.22EKP8300000001H1   1-PEX   8.20   1.13   MHF   2.75   2.79   2.80   4.12   4.25   4.41     74   8.22EKQ8300000001H1   156   8.22EKR8300000001H1   238   8.22EKP8300000001H1   1-PEX   8.30   1.13   MHF   2.78   2.82   2.83   4.17   4.30   4.46     75   8.22EKQ8400000001H1   157   8.22EKR8400000001H1   239   8.22EKP8400000001H1   1-PEX   8.40   1.13   MHF   2.81   2.85   2.87   4.22   4.34   4.51     76   8.22EKQ8500000001H1   158   8.22EKR8500000001H1   240   8.22EKP8500000001H1   1-PEX   8.50   1.13   MHF   2.84   2.88   2.90   4.26   4.39   4.56     77   8.22EKQ8600000001H1   159   8.22EKR8600000001H1   241   8.22EKP8500000001H1   1-PEX   8.50   1.13   MHF   2.87   2.91   2.93   4.31   4.44   4.61     78   8.22EKQ8500000001H1   160   8.22EKR8500000001H1   242   8.22EKP8700000001H1   1-PEX   8.70   1.13   MHF   2.90   2.94   2.96   4.36   4.49   4.66     79   8.22EKQ8500000001H1   161   8.22EKR8500000001H1   243   8.22EKP8500000001H1   1-PEX   8.70   1.13   MHF   2.97   2.99   4.40   4.54   4.71     80   8.22EKQ8500000001H1   162   8.22EKR8500000001H1   244   8.22EKP8500000001H1   1-PEX   8.70   1.13   MHF   2.97   3.01   3.02   4.45   4.58   4.76     81   8.22EKQ85000000001H1   163   8.22EKR8500000001H1   245   8.22EKP8500000001H1   1-PEX   8.70   1.13   MHF   3.00   3.04   3.06   4.49   4.63   4.81   4.82																
75 822EKQ840000001H1 157 822EKR840000001H1 239 822EKP840000001H1 1-PEX 840 1.13 MHF 2.81 2.85 2.87 4.22 4.34 4.51 76 822EKQ8500000001H1 158 822EKR8500000001H1 240 822EKP8500000001H1 1-PEX 850 1.13 MHF 2.84 2.88 2.90 4.26 4.39 4.56 77 822EKQ8600000001H1 159 822EKR8500000001H1 1-PEX 850 1.13 MHF 2.87 2.91 2.93 4.31 4.44 4.61 78 822EKQ870000001H1 160 822EKR870000001H1 242 822EKQ8600000001H1 1-PEX 870 1.13 MHF 2.90 2.94 2.96 4.36 4.49 4.66 79 822EKQ8800000001H1 161 822EKQ8800000001H1 242 822EKQ8800000001H1 1-PEX 880 1.13 MHF 2.94 2.97 2.99 4.40 4.54 4.71 80 822EKQ890000001H1 162 822EKQ800000001H1 244 822EKQ8800000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 81 822EKQ8900000001H1 163 822EKQ800000001H1 244 822EKQ800000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 81 822EKQ800000001H1 163 822EKQ800000001H1 245 822EKQ9000000001H1 1-PEX 870 1.13 MHF 3.00 3.04 3.06 4.49 4.63 4.81																
76 822EKQ850000001H1 158 822EKR850000001H1 240 822EKP850000001H1 1-PEX 850 1.13 MHF 2.84 2.88 2.90 4.26 4.39 4.56 77 822EKQ860000001H1 159 822EKR860000001H1 241 82EKP860000001H1 1-PEX 860 1.13 MHF 2.87 2.91 2.93 4.31 4.44 4.61 822EKP870000001H1 1-PEX 870 1.13 MHF 2.90 2.94 2.96 4.36 4.49 4.66 79 822EKQ870000001H1 161 822EKR870000001H1 242 82EKP870000001H1 1-PEX 870 1.13 MHF 2.90 2.94 2.96 4.36 4.49 4.66 82 82EKP870000001H1 1-PEX 870 1.13 MHF 2.90 2.94 2.96 4.36 4.49 4.66 82 82EKP870000001H1 1-PEX 870 1.13 MHF 2.90 2.94 2.96 4.36 4.49 4.66 82 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP87000000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 83 82EKP8700000001H1 1-PEX 870 1.13 MHF 2.97 3.01 3.02 4.45 4.81 82EKP8700000001H1 1-PEX 870																
77 822EKQ860000001H1 159 822EKR860000001H1 241 822EKP860000001H1 1-PEX 860 1.13 MHF 2.87 2.91 2.93 4.31 4.44 4.61 78 822EKQ870000001H1 160 822EKR8700000001H1 242 822EKP8700000001H1 1-PEX 870 1.13 MHF 2.90 2.94 2.96 4.36 4.49 4.66 79 822EKQ8800000001H1 161 822EKR8800000001H1 243 822EKP8800000001H1 1-PEX 800 1.13 MHF 2.94 2.97 2.99 4.40 4.54 4.76 80 822EKQ8900000001H1 162 822EKR8900000001H1 244 82EKP8800000001H1 1-PEX 890 1.13 MHF 2.97 3.01 3.02 4.45 4.76 81 822EKQ8900000001H1 163 822EKQ8900000001H1 245 82EKP8900000001H1 1-PEX 900 1.13 MHF 3.00 3.04 3.06 4.49 4.63 4.81																
78 822EKQ870000001H1 160 822EKR870000001H1 242 822EKP870000001H1 1-PEX 870 1.13 MHF 2.90 2.94 2.96 4.36 4.49 4.66 79 822EKQ8800000001H1 161 822EKR8800000001H1 1-PEX 880 1.13 MHF 2.94 2.97 2.99 4.40 4.54 4.71 80 2.2EKQ880000000001H1 162 82EKQ8800000001H1 1-PEX 80 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 81 82EKQ8900000001H1 1-PEX 80 1.13 MHF 3.00 3.04 3.06 4.49 4.63 4.81					-											
79 822EKQ880000001H1 161 822EKR800000001H1 243 822EKP800000001H1 1-PEX 880 1.13 MHF 2.94 2.97 2.99 4.40 4.54 4.71 80 822EKQ8900000001H1 162 822EKR8900000001H1 244 822EKP8900000001H1 1-PEX 890 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 81 822EKQ9000000001H1 163 822EKP9000000001H1 245 822EKP9000000001H1 1-PEX 900 1.13 MHF 3.00 3.04 3.06 4.49 4.63 4.81																
80 822EKQ8900000001H1 162 822EKR8900000001H1 244 822EKP8900000001H1 1-PEX 890 1.13 MHF 2.97 3.01 3.02 4.45 4.58 4.76 81 822EKQ9000000001H1 163 822EKR9000000001H1 245 822EKP9000000001H1 1-PEX 900 1.13 MHF 3.00 3.04 3.06 4.49 4.63 4.81																
	80	822EKQ8900000001H1	162		244				1.13			3.01	3.02	4.45		
82   822EKQ910000001H1   164   822EKR910000001H1   246   822EKP910000001H1   1-PEX   910   1.13   MHF   3.03   3.07   3.09   4.54   4.68   4.86																
	82	822EKQ9100000001H1	164	822EKR9100000001H1	246	822EKP9100000001H1	I-PEX	910	1.13	MHF	3.03	3.07	3.09	4.54	4.68	4.86



I-PEX Plug: Smooth Insert Type

* 11							Cable	1				Cabl	e Loss		
No.	Model Cable Color : Black	Cable No.	Model Cable Color : Gray	Cable No.	Model Cable Color : White	Brand	Length	Phi [mm]	Connector - Type	2.4	2.45	2.5 GHz	5.15 GHz	5.5 GHz	5.85
247	822EKQ1000000001H3	329	822EKR100000001H3	411	822EKP1000000001H3	I-PEX	[mm] 100	1.13	MHF	GHz 0.51	0.51	0.52	0.79	GHz 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	822EKQ120000001H3	331	822EKR1200000001H3	413	822EKP1200000001H3	I-PEX	120	1.13	MHF	0.57	0.57	0.58	0.88	0.90	0.92
250 251	822EKQ1300000001H3	332	822EKR1300000001H3 822EKR1400000001H3	414	822EKP1300000001H3 822EKP140000001H3	I-PEX	130	1.13	MHF	0.60	0.60	0.62	0.93	0.94	1.02
252	822EKQ140000001H3 822EKQ150000001H3	334	822EKR1500000001H3	415	822EKP150000001H3	I-PEX	150	1.13	MHF	0.67	0.67	0.68	1.02	1.04	1.02
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
256 257	822EKQ1900000001H3 822EKQ2000000001H3	338	822EKR1900000001H3 822EKR2000000001H3	420 421	822EKP1900000001H3 822EKP2000000001H3	I-PEX I-PEX	190 200	1.13	MHF	0.79	0.79	0.81	1.21	1.23	1.27
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
261 262	822EKQ240000001H3 822EKQ2500000001H3	343	822EKR2400000001H3 822EKR2500000001H3	425 426	822EKP240000001H3 822EKP2500000001H3	I-PEX I-PEX	240 250	1.13	MHF	0.95	0.95	1.00	1.44	1.47	1.52
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
266 267	822EKQ2900000001H3 822EKQ3000000001H3	348 349	822EKR2900000001H3 822EKR3000000001H3	430 431	822EKP2900000001H3 822EKP3000000001H3	I-PEX I-PEX	290 300	1.13	MHF	1.10	1.11	1.12	1.67	1.71	1.77
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 822EKQ3500000001H3	353 354	822EKR3400000001H3 822EKR3500000001H3	435 436	822EKP3400000001H3 822EKP3500000001H3	I-PEX I-PEX	340 350	1.13	MHF	1.26	1.27	1.28	1.90	2.00	2.02
273	822EKQ360000001H3	355	822EKR360000001H3	437	822EKP360000001H3	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
276 277	822EKQ3900000001H3 822EKQ4000000001H3	358 359	822EKR3900000001H3 822EKR4000000001H3	440 441	822EKP3900000001H3 822EKP4000000001H3	I-PEX	390 400	1.13	MHF	1.41	1.43	1.44	2.13	2.19	2.27
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	822EKQ430000001H3	362	822EKR4300000001H3	444	822EKP4300000001H3	I-PEX	430	1.13	MHF	1.54	1.55	1.57	2.32	2.38	2.47
281	822EKQ4400000001H3	363 364	822EKR4400000001H3 822EKR4500000001H3	445 446	822EKP4400000001H3	I-PEX I-PEX	440 450	1.13	MHF	1.57	1.58	1.60	2.36	2.43	2.52
283	822EKQ4500000001H3 822EKQ4600000001H3	365	822EKR4600000001H3	447	822EKP4500000001H3 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
286 287	822EKQ4900000001H3 822EKQ5000000001H3	368 369	822EKR4900000001H3 822EKR5000000001H3	450 451	822EKP4900000001H3 822EKP5000000001H3	1-PEX	490 500	1.13	MHF	1.72	1.74	1.76	2.60	2.67	2.77
288	822EKQ5100000001H3	370	822EKR5100000001H3	452	822EKP5100000001H3	1-PEX	510	1.13	MHF	1.79	1.81	1.82	2.69	2.76	2.87
289	822EKQ5200000001H3	371	822EKR5200000001H3	453	822EKP5200000001H3	1-PEX	520	1.13	MHF	1.82	1.84	1.85	2.73	2.81	2.92
290	822EKQ5300000001H3	372	822EKR5300000001H3	454	822EKP5300000001H3	1-PEX	530	1.13	MHF	1.85	1.87	1.88	2.78	2.86	2.97
291 292	822EKQ5400000001H3 822EKQ5500000001H3	373 374	822EKR5400000001H3 822EKR5500000001H3	455 456	822EKP5400000001H3 822EKP5500000001H3	1-PEX	540 550	1.13	MHF	1.88	1.90	1.91	2.83	2.91	3.02
293	822EKQ560000001H3	375	822EKR560000001H3	457	822EKP560000001H3	1-PEX	560	1.13	MHF	1.94	1.96	1.98	2.92	3.00	3.12
294	822EKQ5700000001H3	376	822EKR5700000001H3	458	822EKP5700000001H3	1-PEX	570	1.13	MHF	1.97	2.00	2.01	2.97	3.05	3.17
295	822EKQ5800000001H3	377	822EKR5800000001H3	459	822EKP5800000001H3	1-PEX	580	1.13	MHF	2.00	2.03	2.04	3.01	3.10	3.22
296 297	822EKQ5900000001H3 822EKQ6000000001H3	378 379	822EKR5900000001H3 822EKR6000000001H3	460 461	822EKP5900000001H3 822EKP6000000001H3	1-PEX	590 600	1.13	MHF	2.03	2.06	2.07	3.06	3.15	3.27
298	822EKQ6100000001H3	380	822EKR6100000001H3	462	822EKP6100000001H3	1-PEX	610	1.13	MHF	2.10	2.12	2.14	3.15	3.24	3.36
299	822EKQ6200000001H3	381	822EKR6200000001H3	463	822EKP6200000001H3	1-PEX	620	1.13	MHF	2.13	2.15	2.17	3.20	3.29	3.41
300	822EKQ6300000001H3	382	822EKR6300000001H3	464	822EKP6300000001H3	1-PEX	630	1.13	MHF	2.16	2.18	2.20	3.24	3.34	3.46
301	822EKQ6400000001H3 822EKQ6500000001H3	383	822EKR6400000001H3 822EKR6500000001H3	465 466	822EKP6400000001H3 822EKP6500000001H3	1-PEX	640 650	1.13	MHF	2.19	2.22	2.23	3.29 3.34	3.39	3.51 3.56
303	822EKQ6600000001H3	385	822EKR6600000001H3	467	822EKP6600000001H3	1-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	MHE	2.28	2.31	2.33	3.43	3.53	3.66
305 306	822EKQ6800000001H3 822EKQ6900000001H3	387	822EKR6800000001H3 822EKR6900000001H3	469 470	822EKP6800000001H3 822EKP6900000001H3	1-PEX	680 690	1.13	MHF	2.31	2.34	2.36	3.48	3.58	3.71
306	822EKQ6900000001H3 822EKQ7000000001H3	389	822EKR6900000001H3	470	822EKP6900000001H3	1-PEX	700	1.13	MHF	2.34	2.37	2.39	3.52	3.67	3.76
308	822EKQ7100000001H3	390	822EKR7100000001H3	472	822EKP7100000001H3	1-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	392 393	822EKR7300000001H3	474 475	822EKP7300000001H3 822EKP7400000001H3	I-PEX	730	1.13	MHF	2.47	2.50	2.52	3.71	3.82	3.96 4.01
311	822EKQ7400000001H3 822EKQ7500000001H3	393	822EKR7400000001H3 822EKR7500000001H3	476	822EKP7400000001H3 822EKP7500000001H3	I-PEX	750	1.13	MHF.	2.50	2.56	2.55	3.75	3.87	4.01
313	822EKQ7600000001H3	395	822EKR7600000001H3	477	822EKP7600000001H3	I-PEX	760	1.13	MHF	2.56	2.60	2.61	3.85	3.96	4.11
314	822EKQ7700000001H3	396	822EKR7700000001H3	478	822EKP7700000001H3	I-PEX	770	1.13	MHF	2.59	2.63	2.64	3.89	-4.01	4.16
315	822EKQ7800000001H3	397	822EKR7800000001H3 822EKR7900000001H3	479 480	822EKP7800000001H3	1-PEX	780	1.13	MHF	2.62	2.66	2.68	3.94	4.06	4.21
316 317	822EKQ7900000001H3 822EKQ8000000001H3	398 399	822EKR8000000001H3	480	822EKP7900000001H3 822EKP8000000001H3	I-PEX	790 800	1.13	MHF.	2.66	2.69	2.71	3.98 4.03	4.11	4.26 4.31
318	822EKQ8100000001H3	400	822EKR8100000001H3	482	822EKP8100000001H3	I-PEX	810	1.13	MHF	2.72	2.75	2.77	4.08	4.20	4.36
319	822EKQ8200000001H3	401	822EKR8200000001H3	483	822EKP8200000001H3	I-PEX	820	1.13	MHF	2.75	2.79	2.80	4.12	4.25	4.41
320	822EKQ830000001H3	402	822EKR8300000001H3	484	822EKP8300000001H3	1-PEX	830	1.13	MHF.	2.78	2.82	2.83	4.17	4.30	4.46
321	822EKQ8400000001H3 822EKQ8500000001H3	403	822EKR8400000001H3 822EKR8500000001H3	485 486	822EKP8400000001H3 822EKP8500000001H3	I-PEX	840 850	1.13	MHF	2.81	2.85	2.87	4.22	4.34	4.51
323	822EKQ860000001H3	405	822EKR8600000001H3	487	822EKP8600000001H3	I-PEX	860	1.13	MHF	2.87	2.91	2.93	4.31	4.44	4.61
324	822EKQ8700000001H3	406	822EKR8700000001H3	488	822EKP8700000001H3	I-PEX	870	1.13	MHF	2.90	2.94	2.96	4.36	4.49	4.66
325	822EKQ880000001H3	407	822EKR8800000001H3	489	822EKP8800000001H3	I-PEX	880	1.13	MHF	2.94	2.97	2.99	4.40	4.54	4.71
326 327	822EKQ8900000001H3 822EKQ9000000001H3	408	822EKR8900000001H3 822EKR9000000001H3	490	822EKP8900000001H3 822EKP9000000001H3	I-PEX	890 900	1.13	MHF	2.97 3.00	3.01	3.02	4.45	4.58	4.76
328	822EKQ9100000001H3	410	822EKR9100000001H3	492	822EKP9100000001H3		910	1.13	MHF.	3.03	3.07	3.09	4.54	4.68	4.86

- 3. The EUT has three sets of antennas and there are two antennas for each set.
- 4. Set 2~3 are the same type antenna. Only the highest gain antenna (Set 2 for Bluetooth, 5G Band3, Set 3 for 2.4G, 5G Band 1, 2, 4) was selected to test and record in this report.



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。