



Final Report



HOLTEK SEMICONDUCTOR BC7262 BT BEACON INTEROPERABILITY TEST

Company Name: **Holtek Semiconductor Inc.**

Model Name: **BC7262**

Product Type: **Bluetooth Module**

Project ID: **BTM-HOK-DVT-004**

Version Update: **2023-03-07**

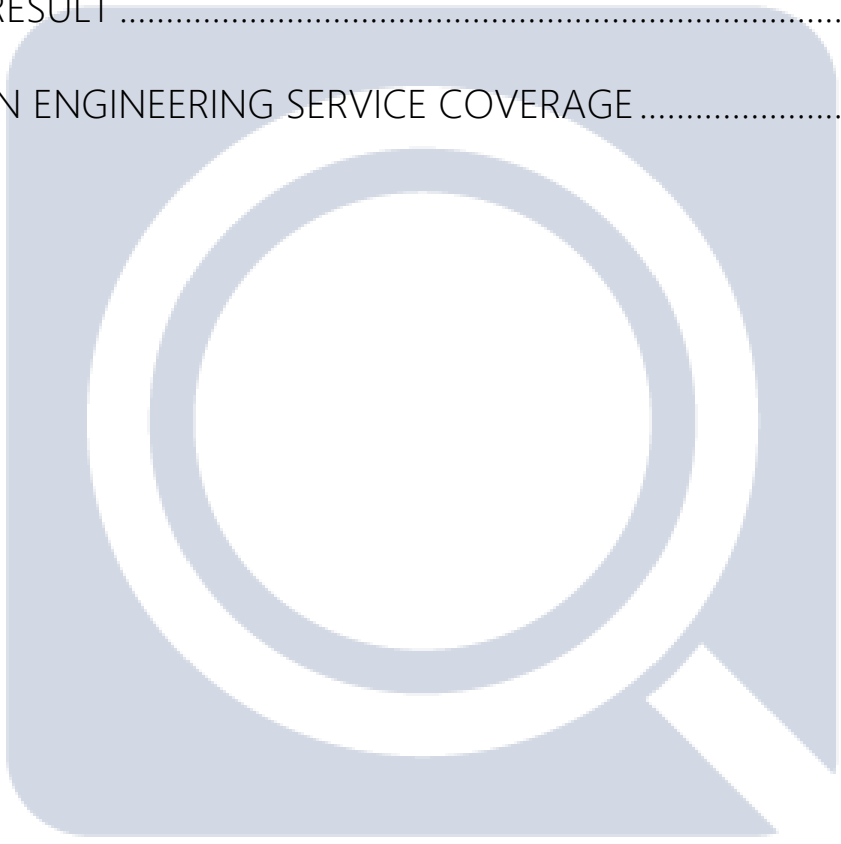
PREPARED BY

ALLION LABS, INC.

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EXECUTIVE SUMMARY

As an international product validation and consulting engineering company, Allion Labs, Inc. (Allion) keeps pace with all the latest technology with specialized teams composed of experts in hardware and software analysis. These experts composed this test proposal, which focuses on Connection and Function testing of Holtek BC7262 BT Beacon. This proposal outlines the overall methodology suggested by our expert staff, including detailed descriptions of both the test plan and test environment.

The following table lists potential risks and possible causes for Holtek BC7262 BT Beacon. Our test experts compiled this information to guide the proposal design process based on their prior test experience, customer consultation, and independent research. As a rule, Allion recommends that quality testing begin at the early design stage, since at this point in the process; there is greater freedom to alter the design with minimal impacts on downstream project schedules and associated costs.

POTENTIAL RISKS	CRITICAL POINTS
Accuracy of BLE Beacon	- Signals from a beacon are not detected - Bluetooth signal is attenuated, or lessened



TEST SYNOPSIS

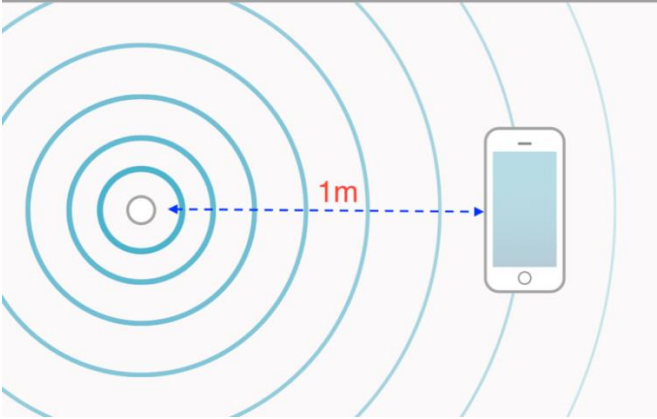
A. TEST SCOPE:

To ensure that the Holtek Semiconductor Inc. BC7262 BT Beacon passes standard-quality validations, Allion proposes the following test plan consisting of various test items in the following testing category:

a. BLE Beacon Compatibility Test

Detailed test contents will be described in the following sections:

a. BLE Beacon Compatibility Test

Test Item	Description
BLE Beacon Compatibility Test	● Install nRF Beacons App ➢ Install the nRF Beacons App from App Store/Play Store ➢ Launch the App ➢ There are no unexpectedly quits, stops responding, or won't open ● Scanning DUT ➢ Install the beacon and have it emitting a signal ➢ Put the Mobile Phone at a distance of 1 meter. ➢ Launch the App ➢ Verify the beacon is detected by the Mobile phone, gather the RSSI and Interval values reported in the App. 

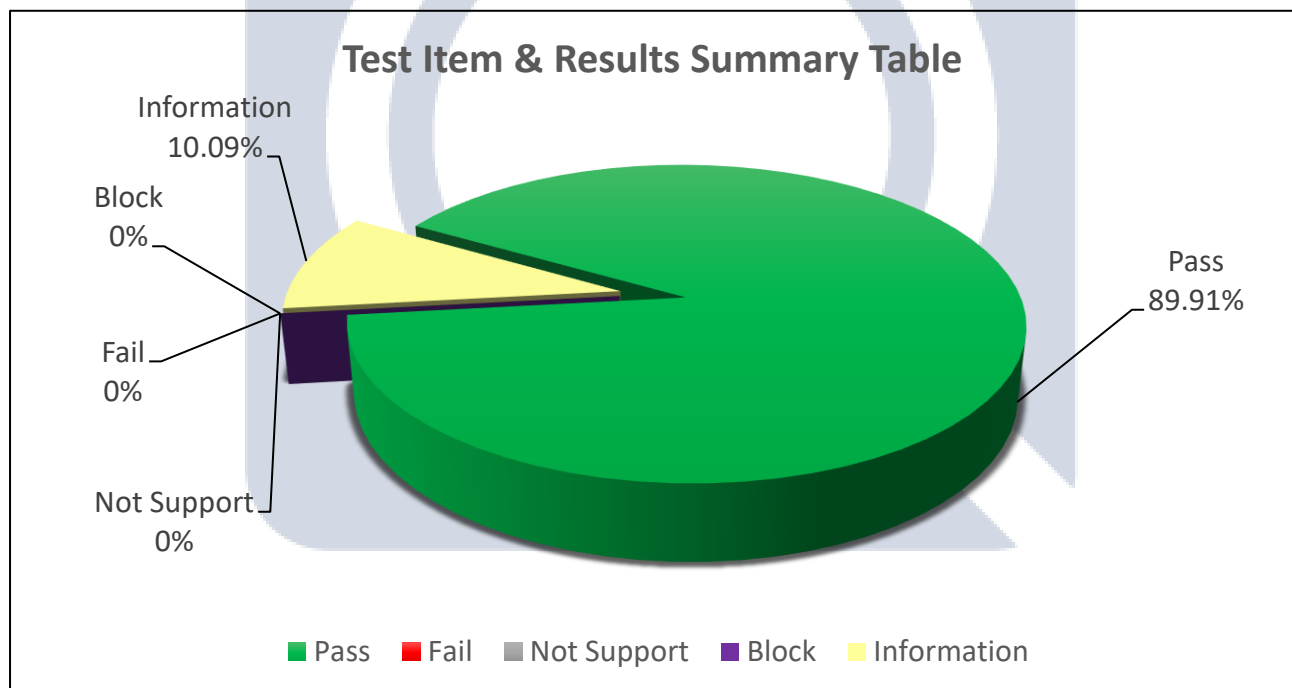


B. TEST SUMMARY:

1. Test Item & Results Summary Table

Allion has created testing scope of Holtek BC7262 BT Beacon product for total 2378 test items, total of 2138 items are pass, total of 0 items are fail, total of 0 items need to verify, total of 0 items are not support and total of 240 items are information, total of 0 items was block to test. The following analysis can summarize all test items result status under each test category.

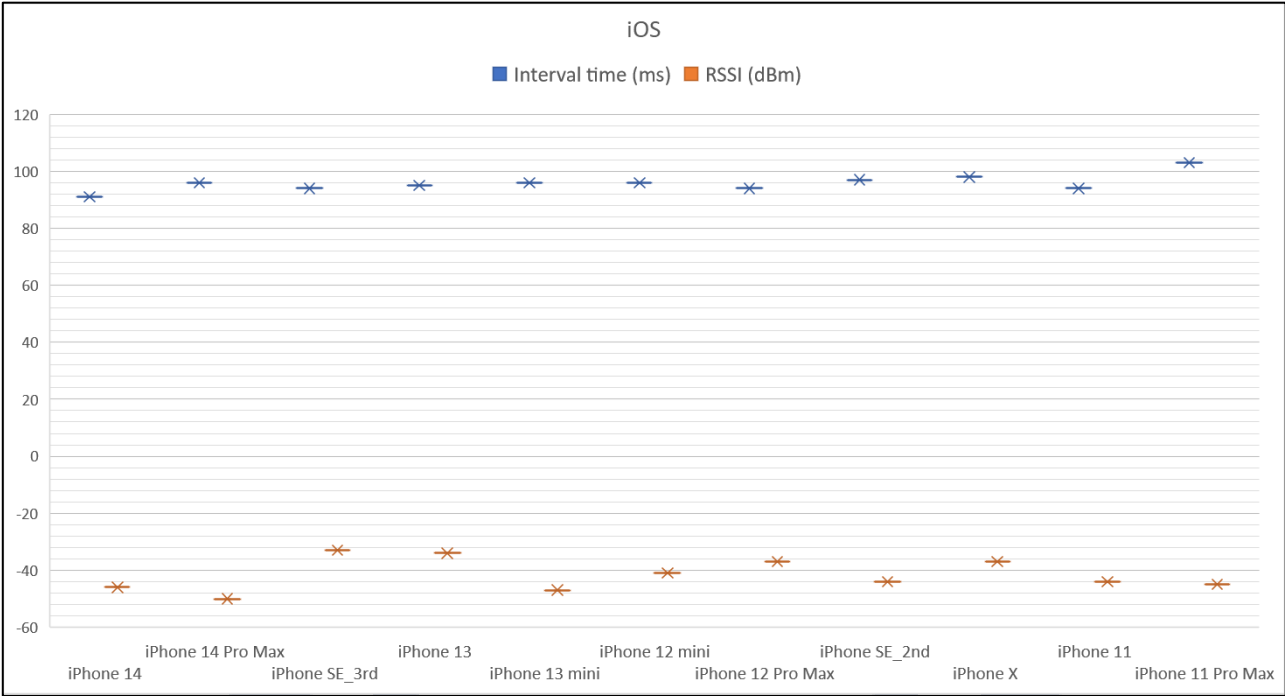
Test Item & Results Summary Table						
Test Coverage	Sub-total	Complete				
		Pass	Fail	Not Support	Block	Information
Compatibility Test	2378	2138	0	0	0	240
Total	2378	2138	0	0	0	240
Ratio (%)	100%	89.91%	0.00%	0.00%	0.00%	10.09%

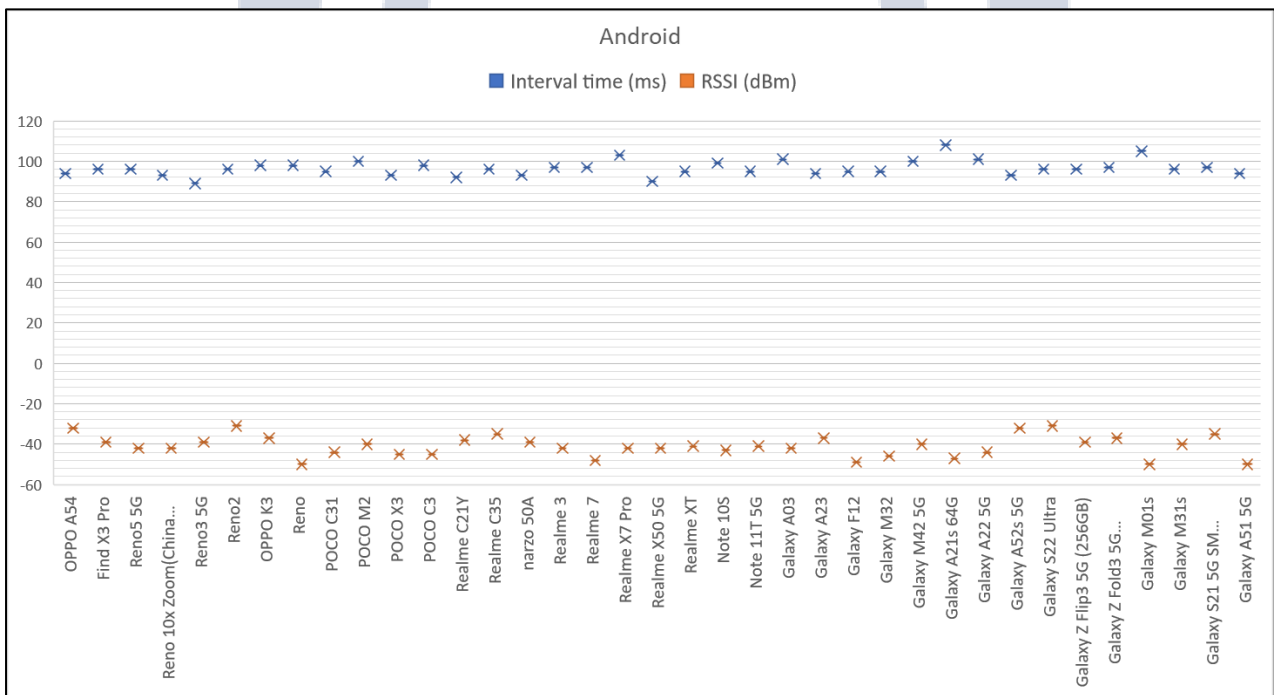
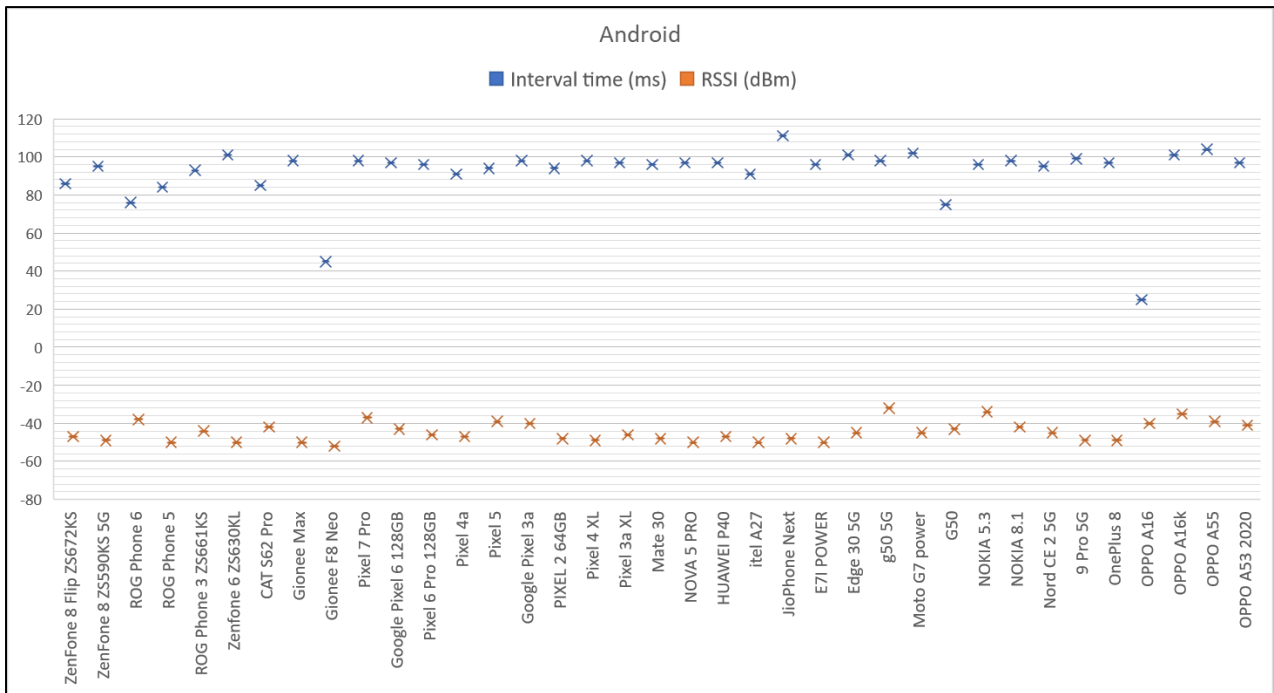


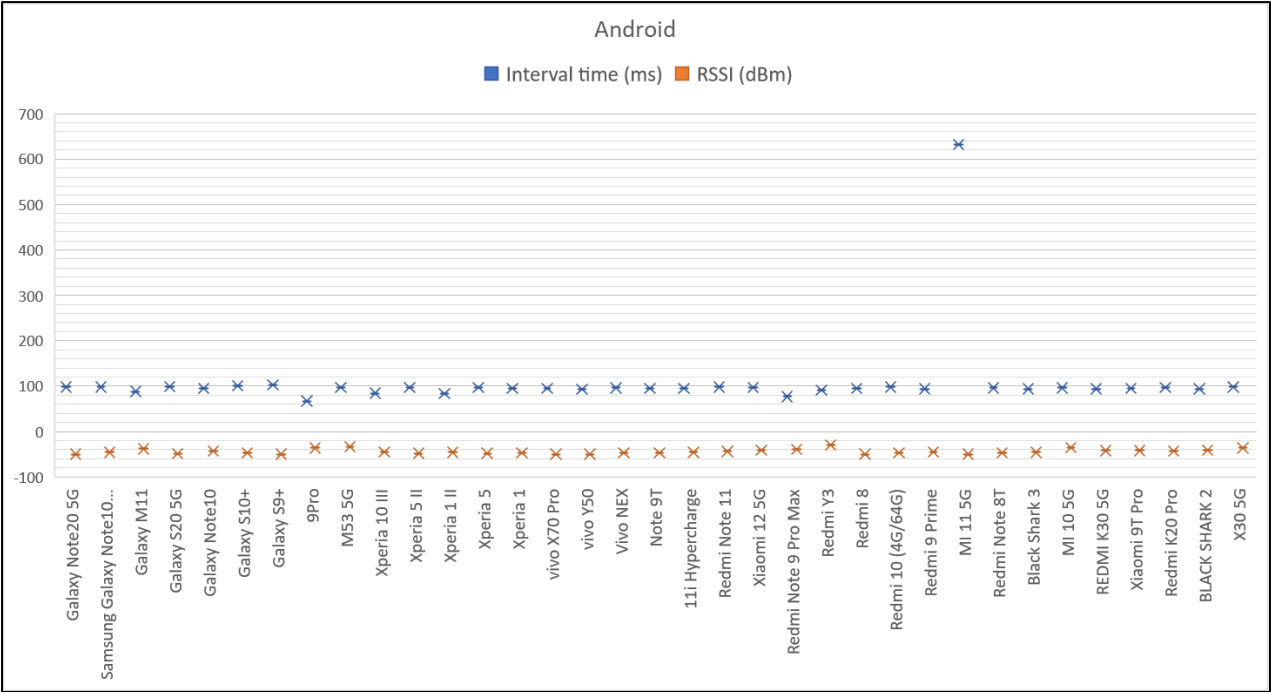


2. Measurement Data Analysis

The following analysis shows both the RSSI and the interval times for DUT on all mobile phones.









DEVICE CONFIGURATION

In this validation project, the following Hardware, Software and Operating System will be applied and used.

Test Configurations:

Mobile Phone List: (120)

No.	Brand	Model Name	Bundle OS	Bluetooth Spec	CPU Model
1	Apple	iPhone 14	iOS 16.2	5.3	A15 Bionic
2	Apple	iPhone 14 Pro Max	iOS 16.1.1	5.3	A16 Bionic
3	Apple	iPhone SE_3rd	iOS 16.2	5	A15
4	Apple	iPhone 13	iOS 16.2	5	A15 Bionic
5	Apple	iPhone 13 mini	iOS 15.5	5.2	A15 Bionic
6	Apple	iPhone 12 mini	iOS 15.6.1	5	A14 Bionic
7	Apple	iPhone 12 Pro Max	iOS 16.0.2 (20A380)	5	A14 Bionic
8	Apple	iPhone SE_2nd	iOS 16.0	5	A13 Bionic(7 nm+)
9	Apple	iPhone X	iOS 15.5(19F77)	5	A11 Bionic
10	Apple	iPhone 11	iOS 16.0.2	5	A13 Bionic
11	Apple	iPhone 11 Pro Max	iOS 15.6	5	A13 Bionic
12	ASUS	ZenFone 8 Flip ZS672KS	Android 11	5.2	Snapdragon 888
13	ASUS	ZenFone 8 ZS590KS 5G	Android 11	5.2	Snapdragon 888
14	ASUS	ROG Phone 6	Android 12	5.2	Snapdragon 8+ Grn1 (SM8475)
15	ASUS	ROG Phone 5	Android 11	5.2	Snapdragon 888
16	ASUS	ROG Phone 3 ZS661KS	Android 10	5.1	Snapdragon 865+
17	ASUS	Zenfone 6 ZS630KL	Android 10.0.0	5	Snapdragon 855
18	CAT	CAT S62 Pro	Android 11	5	SDM660 Snapdragon 660 1.9GHz
19	Gionee	Gionee Max	Android 10	4.2	SC9863A
20	Gionee	Gionee F8 Neo	Android 10	4.2	Unisoc SC9863
21	Google	Pixel 7 Pro	Android 13	5.2	GS201
22	Google	Google Pixel 6 128GB	Android 12	5.2	Tensor
23	Google	Pixel 6 Pro 128GB	Android 13	5.2	Tensor
24	Google	Pixel 4a	Android 13	5	Snapdragon 730G
25	Google	Pixel 5	Android 11.0.0	4	Snapdragon 765G
26	Google	Google Pixel 3a	Android 10	5	QualcommR Snapdragon 670
27	Google	PIXEL 2 64GB	Android 10.0.0	5	Snapdragon 835



No.	Brand	Model Name	Bundle OS	Bluetooth Spec	CPU Model
28	Google	Pixel 4 XL	Android 11	5	Snapdragon 855 processor
29	Google	Pixel 3a XL	Android 12	5	Snapdragon 670
30	HUAWEI	Mate 30	Android 10	5.1	Kirin 990
31	HUAWEI	NOVA 5 PRO	Android 10	5	Kirin 980
32	HUAWEI	HUAWEI P40	HarmonyOS 2.0.0, Android 10	5.1	Kirin 990 5G
33	itel	itel A27	Android 11	4.2	ARM Cortex-A53
34	JioPhone	JioPhone Next	Android 10	4.1	Qualcomm Snapdragon QM215
35	Motorola	E7I POWER	Android 10	4.2	P35
36	Motorola	Edge 30 5G	Android 12	5.2	Snapdragon 778G+
37	Motorola	g50 5G	Android 11	5	Dimensity 700
38	Motorola	Moto G7 power	Android 10.0.0	4.2	Snapdragon 632
39	Nokia	G50	Android 12	5	Snapdragon 480
40	Nokia	NOKIA 5.3	Android 10.0.0	4.2	Snapdragon 665
41	Nokia	NOKIA 8.1	Android 10.0.0	5	Snapdragon 710
42	OnePlus	Nord CE 2 5G	Android 11	5.2	Mediatek MT6877 Dimensity 900
43	Oneplus	9 Pro 5G	Android 11	5.1	Snapdragon 888
44	OnePlus	OnePlus 8	Android 10	5.1	Snapdragon 865
45	OPPO	OPPO A16	Android 11	5	Mediatek MT6765G Helio G35
46	OPPO	OPPO A16k	Android 11	5	MT6765G
47	OPPO	OPPO A55	Android 11	5	MT6765
48	OPPO	OPPO A53 2020	Android 10	5	S460
49	OPPO	OPPO A54	Android 11	5	MT6765
50	OPPO	Find X3 Pro	Android 12, ColorOS V12	5.2	Snapdragon 888
51	OPPO	Reno5 5G	Android 11	5.1	Snapdragon 765G
52	OPPO	Reno 10x Zoom(China Version)	Android 10	5	Snapdragon 855
53	OPPO	Reno3 5G	Android 10	5	天玑 1000L
54	OPPO	Reno2	Android 10.0.0	5	Snapdragon 730G
55	OPPO	OPPO K3	Android 10.0.0	5	Snapdragon 710
56	OPPO	Reno	Android 10.0.0	5	Snapdragon 710



No.	Brand	Model Name	Bundle OS	Bluetooth Spec	CPU Model
57	POCO	POCO C31	Android 11 RP1A.200720.011	5	Mediatek MT6765G Helio G35
58	POCO	POCO M2	Android 10	5	Mediatek MT6769V/CU Helio G80
59	POCO	POCO X3	Android 10	5	Qualcomm SM7150-AC Snapdragon 732G (8 nm)
60	POCO	POCO C3	Android 10, MIUI 12	5	Helio G35
61	Realme	Realme C21Y	Android 11	5	Unisoc T610
62	Realme	Realme C35	Android 11	5	Tiger T616
63	Realme	narzo 50A	Android 12	5	MT6769Z Helio G85
64	Realme	Realme 3	Android 10	4.2	MT6771 Helio P60
65	Realme	Realme 7	Android 10, Realme UI 2.0	5	Helio G95
66	Realme	Realme X7 Pro	Android 10	5	MediaTek Dimensity 1000+
67	Realme	Realme X50 5G	Android 10	5	SDM765 Snapdragon 765G
68	Realme	Realme XT	Android 10	5	Snapdragon 712
69	Redmi	Note 10S	Android 12 SP1A.210812.016	5	Mediatek Helio G95
70	Redmi	Note 11T 5G	Android 11	5.1	Mediatek MT6833P Dimensity 810
71	Samsung	Galaxy A03	Android 11	5	Unisoc T606
72	Samsung	Galaxy A23	Android 12	5	Qualcomm SM6225 Snapdragon 680 4G
73	Samsung	Galaxy F12	Android 12	5	Exynos 850
74	Samsung	Galaxy M32	Android 12	5	Mediatek MT6769V/CU Helio G80
75	Samsung	Galaxy M42 5G	Android 12	5	Qualcomm SM7225 Snapdragon 750G 5G
76	Samsung	Galaxy A21s 64G	Android 11	5	Exynos 850
77	Samsung	Galaxy A22 5G	Android 11	5	天璣 700
78	Samsung	Galaxy A52s 5G	Android 12	5	Snapdragon 778G (SM7325)
79	Samsung	Galaxy S22 Ultra	Android 13	5.2	Snapdragon 8 Gen 1



No.	Brand	Model Name	Bundle OS	Bluetooth Spec	CPU Model
80	Samsung	Galaxy Z Flip3 5G (256GB)	Android 12	5.1	Snapdragon 888 5G
81	SONY	Xperia 1	Android 12	5.2	Snapdragon 888 5G
82	Samsung	Galaxy M01s	Android 11	4.2	Mediatek MT6762 Helio P22 (12 nm)
83	Samsung	Galaxy M31s	Android 12	5	Exynos 9611
84	Samsung	Galaxy S21 5G SM-G9910ZADBRI	Android 12	5	Snapdragon 888
85	Samsung	Galaxy A51 5G	Android 12	5	Exynos 980
86	Samsung	Galaxy Note20 5G	Android 12	5	Snapdragon 865+
87	Samsung	Samsung Galaxy Note10 Lite	Android 10	5	Exynos 9810
88	Samsung	Galaxy M11	Android 12	4.2	Snapdragon 450
89	Samsung	Galaxy S20 5G	Android 13	5	Snapdragon 865
90	Samsung	Galaxy Note10	Android 12	5	Snapdragon 855
91	Samsung	Galaxy S10+	Android 12.0.0	5	Exynos 9820
92	Samsung	Galaxy S9+	Android 10	5	Exynos 9810
93	Realme	9 Pro	Android 13	5.1	Snapdragon 695
94	Samsung	Galaxy M53	Android 13	5.2	MediaTek Dimensity 900
95	SONY	Xperia 10 III	Android 11	5.1	Snapdragon 690
96	SONY	Xperia 5 II	Android 11	5.1	Snapdragon 865
97	SONY	Xperia 1 II	Android 12	5.1	Snapdragon 865
98	SONY	Xperia 5	Android 10	5.2	Snapdragon 855
99	SONY	Xperia 1	Android™ 9 Pie3	5	Qualcomm® 驍龍™ 855 行動平台 4
100	vivo	vivo X70 Pro	Android 11	5.2	MediaTek MT6893 Dimensity 1200
101	vivo	vivo Y50	Android 10	5	Snapdragon 665
102	Vivo	Vivo NEX	Android 10	5	Snapdragon 845
103	Xiaomi	Note 9T	Android 10 QKQ1.200830.002	5.1	Kryo 260
104	Xiaomi	11i Hypercharge	Android 12 SP1A.210812.016	5.2	Mediatek Dimensity 920
105	Xiaomi	Redmi Note 11	Android 12 SKQ1.21103.001	5	Snapdragon 680
106	Xiaomi	Xiaomi 12 5G	Android 12	5.2	Snapdragon 8 Gen 1
107	Xiaomi	Redmi Note 9 Pro Max	Android 10	5	Snapdragon 720G
108	Xiaomi	Redmi Y3	Android 10	4.2	Snapdragon 632



No.	Brand	Model Name	Bundle OS	Bluetooth Spec	CPU Model
109	Xiaomi	Redmi 8	Android 10	5	Snapdragon 439
110	Xiaomi	Redmi 10 (4G/64G)	Android 11, MIUI 12.5	5.1	Helio G88
111	Xiaomi	Redmi 9 Prime	Android 10	5	Helio G80
112	Xiaomi	MI 11 5G	Android 11, MIUI 12	5.2	Snapdragon 888
113	Xiaomi	Redmi Note 8T	Android 10	4.2	Snapdragon 665
114	Xiaomi	Black Shark 3	Android 10	5	Snapdragon 865
115	Xiaomi	MI 10 5G	Android 10	5.1	Snapdragon 865
116	Xiaomi	REDMI K30 5G	Android 10	5.1	SDM765 Snapdragon 765G
117	Xiaomi	Xiaomi 9T Pro	Android 10.0.0	5	Snapdragon 855
118	Xiaomi	Redmi K20 Pro	Android 10.0.0	5	Snapdragon 855 SM8150
119	Xiaomi	BLACK SHARK 2	Android 10	5	Snapdragon 855
120	Nokia	X30 5G	Android 12	5.1	Snapdragon 695



TEST RESULT

Holtek BC7262 BT Beacon IOP Test

-	: Not execution
P	: Pass
F	: Fail
B	: Block
N/A	: Not Support
V	: Verify
I(value)	: Information
	: No need to execute

No.	1	2	3	4	5	6
[Brand Name]	Apple	Apple	Apple	Apple	Apple	Apple
[Model Name]	iPhone 14	iPhone 14 Pro Max	iPhone SE_3rd	iPhone 13	iPhone 13 mini	iPhone 12 mini
OS	✕The OS information of mobile phone/ tablet is for reference only. All mobile phone/ tablet will be tested on its latest OS since we do OS update for mobile devices on every month regularly. (Except for some projects with particular reasons.)					
iOS	iOS 16.2	iOS 16.1.1	iOS 16.2	iOS 16.2	iOS 15.5	iOS 15.6.1
CPU	A15 Bionic	A16 Bionic	A15	A15 Bionic	A15 Bionic	A14 Bionic
Bluetooth Spec	5.3	5.3	5.0	5.0	5.2	5.0
DUT ID	109083-01	109083-02	109083-01	109083-01	109083-02	109083-02
Engineer ID	109083	T22044	109083	109083	T22044	T22044
Please refer to the "BC7262 BT Beacon IOP Test 20230213.pdf"						
DUT Pre-Setup	J1 Jumper: 3.3V					
	J2: Jumper					
	SW1 switch ON					
Compatibility Test	Install the "nRF Connect App for Mobile" from App Store/Play Store	P	P	P	P	P
	Enable the Bluetooth function on Mobile phone/ Tablet	P	P	P	P	P
	Power on the DUT	P	P	P	P	P
	DUT vs. Mobile phone/ Tablet distance: 1m	P	P	P	P	P
	Launch the App	P	P	P	P	P
	Tap the "Scan" on App	P	P	P	P	P
	Press and hold the "key1" button on DUT, LED1 flash continuously	P	P	P	P	P
	Find the name "BC7262" on list	P	P	P	P	P
	Release the "key1" button after scanning successful, LED1 flashing stop	P	P	P	P	P
	Check the company code(0xFFFF) and manufacturer(0x0203BC7262)	P	P	P	P	P
	Check the RSSI and Interval time	P	P	P	P	P
	Record the RSSI (-25 ~ -60dBm)	I(-46 dBm)	I(-50 dBm)	I(-33 dBm)	I(-34 dBm)	I(-41 dBm)
	Record the Interval time (20ms ~ 800ms)	I(91 ms)	I(96 ms)	I(94 ms)	I(95 ms)	I(96 ms)
	Tap the "Clone" and "Advertiser" on App (Android)					
	Modify the Broadcast device name: BC7262 and tap the "Edit" on App (Android)					
	Modify the Interval time: 160, Tx Power: 1 (Android)					
	Check the Interval time and Tx Power modify successful (Android)					
	Tab the "Peripheral" and "Add Advertiser" on App (iOS)	P	P	P	P	P
	Modify the Broadcast device name: BC7262 and tap the "Done" on App (iOS)	P	P	P	P	P
	Enable the "Broadcast" on App	P	P	P	P	P
	LED1, LED2, LED3 will Irregular flashing after enabling broadcast successful	P	P	P	P	P
	Test finished, Power off the DUT	P	P	P	P	P



[illegible]

[illegible]

[illegible]





117	118	119	120
Xiaomi	Xiaomi	Xiaomi	Nokia
Xiaomi 9T Pro	Redmi K20 Pro	BLACK SHARK 2	X30 5G
Android 10.0.0	Android 10.0.0	Android 10	Android 12
Snapdragon 855	Snapdragon 855 SM8150	Snapdragon 855	Snapdragon 695
5.0	5.0	5.0	5.1
109083-02	109083-01	109083-01	109083-01
T22044	T22044	T22044	109083
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
I(-42 dBm)	I(-43 dBm)	I(-41 dBm)	I(-36 dBm)
I(95 ms)	I(97 ms)	I(94 ms)	I(98 ms)
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P
P	P	P	P



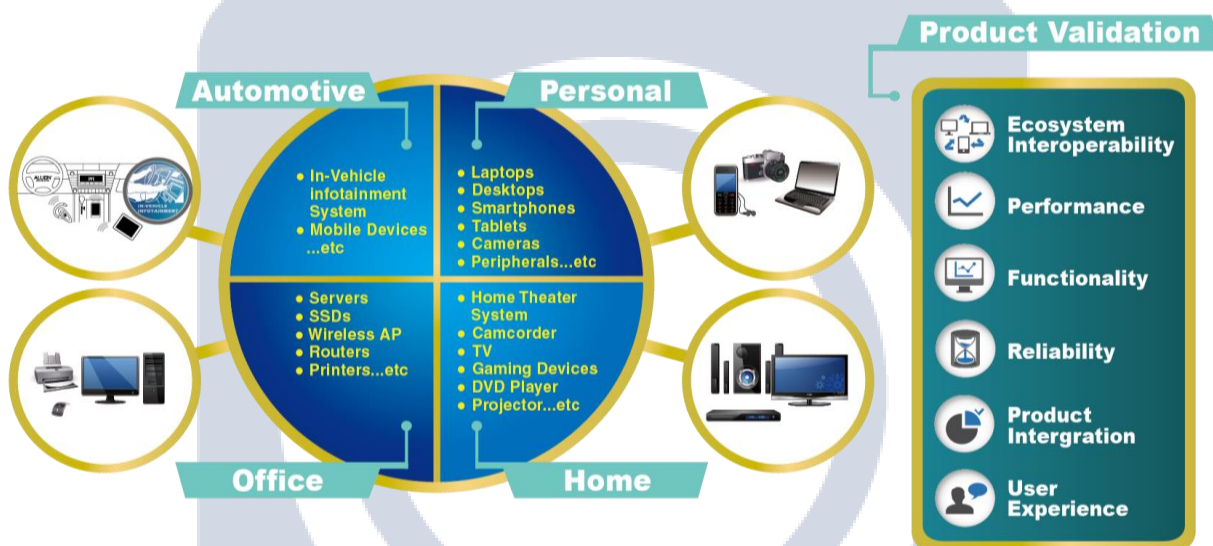
ALLION ENGINEERING SERVICE COVERAGE

A. ENGINEERING SERVICE

1. All-Embracing Product Validation Scope

Allion's customized validation plans could cover a range of firmware/hardware of validation requirement stage and help determine whether the product will work properly in its intended environment.

Through cooperating closely with clients to develop, manage and administer our customized validation and certification programs, Allion ensures that our market partners are in sync with performance standards.



2. Ecosystem Validation – Interoperability

Interoperability testing allows you to bilaterally verify the compliance of your products with the digital ecosystem convergence.



- **Scenario-based IOT** cover the full scope of test matrix (HW&SW) for all the validation configurations
- Design the **customized test plans and test cases** for a variety of device categories reflect the real user scenarios
- **10,000+ test tolls, terminal equipments & CE devices** for organizing, performing & analyzing test campaigns for IOT



3. Software & User Experience Optimization

Understanding our user experience is now more important than ever, Allion has sophisticated methodologies to design suitable test cases and can also enhanced the user satisfaction of your product.

4. Cable & Connector Testing: all-dimensional validation

- Speed / High Frequency Test
- Electrical Test
- Mechanical Test
- Environmental Test
- Certification / Pre-certification Test

5. LOGO & Compliance Program: over 30 standard logos

Bus



RF & Application



OS, Content





6. MARKETING ADVANTAGE

