

TEST REPORT



Dt&C Co., Ltd.

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC2506-0036

2. Customer

- Name (FCC) : BLUEBIRD INC. / Name (IC) : BLUEBIRD INC.
- Address (FCC) : 3F, 115, Irwon-ro, Gangnam-gu, Seoul, 06355, Korea
Address (IC) : 3F, 115, Irwon-ro, Gangnam-gu Seoul 06355 Korea (Republic Of)

3. Use of Report : Spot Check Verification Test

4. Product Name / Model Name : Enterprise Full Touch Handheld Computer / S50

FCC ID : SS4S50F1

IC : 22515-S50F1

5. FCC Regulation(s): Part 15.225, Part 15.247

IC Standard(s): RSS-210 Issue 11, RSS-247 Issue 3, RSS-Gen Issue 5

Test Method used: KDB558074 D01v05r02, ANSI C63.10-2013

6. Date of Test : 2024-05-23 ~ 2024-05-28

7. Location of Test : Permanent Testing Lab On Site Testing

8. Testing Environment : See appended test report.

9. Test Result : Refer to the attached test result.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

This test report is not related to KOLAS accreditation.

Affirmation	Tested by Name : SeungMin Gil 	Technical Manager Name : JaeJin Lee
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2025 . 06 . 26 .

Dt&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2506-0036	Jun. 26, 2025	Initial issue	SeungMin Gil	JaeJin Lee

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1. General Information

1.1. Description of EUT

Product Name	Enterprise Full Touch Handheld Computer
Model Name(s)	S50, S70
HVIN(Hardware Version Identification Number)	S5S7W1
FVIN(Firmware Version Identification Number)	R1.10
EUT Serial Number	Conducted: S50ANLBBA010, Radiated: S50ANLBBA013
Power Supply	DC 3.85 V

1.2. Declaration by the applicant / manufacturer

N/A

1.3. Testing Laboratory

Dt&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042.

The test site complies with the requirements of Part 2.948 according to ANSI C63.4-2014.

- FCC & IC MRA Designation No. : KR0034

- ISED#: 5740A

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1.4. Testing Environment

Ambient Condition

▪ Temperature	+21 °C ~ +23 °C
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▪ Relative Humidity	+38 % ~ +42 %
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1.5. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014 and ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated emission (1 GHz Below)	5.0 dB (The confidence level is about 95 %, $k = 2$)
Radiated emission (1 GHz ~ 18 GHz)	4.8 dB (The confidence level is about 95 %, $k = 2$)
Radiated emission (18 GHz Above)	5.7 dB (The confidence level is about 95 %, $k = 2$)

1.6. Test Equipment List

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	23/12/15	24/12/15	MY50410399
Spectrum Analyzer	Agilent Technologies	N9020A	23/06/23	24/06/23	US47360812
Spectrum Analyzer	Agilent Technologies	N9020A	23/12/15	24/12/15	MY50110097
DC Power Supply	Agilent Technologies	66332A	23/12/15	24/12/15	GB37470191
Blue Tooth Tester	TESCOM	TC-3000C	23/12/15	24/12/15	3000C000678
Multimeter	FLUKE	17B+	23/12/15	24/12/15	36390701WS
Signal Generator	Rohde Schwarz	SMBV100A	23/12/15	24/12/15	255571
Signal Generator	ANRITSU	MG3695C	23/12/15	24/12/15	173501
Thermohygrometer	BODYCOM	BJ5478	23/12/15	24/12/15	120612-1
Thermohygrometer	BODYCOM	BJ5478	23/12/15	24/12/15	090205-4
Thermohygrometer	BODYCOM	BJ5478	23/06/23	24/06/23	N/A
Loop Antenna	ETS-Lindgren	6502	23/11/09	24/11/09	00060496
Hybrid Antenna	Schwarzbeck	VULB 9160	23/12/15	24/12/15	3362
Horn Antenna	ETS-Lindgren	3117	23/06/23	24/06/23	00143278
Horn Antenna	A.H.Systems Inc.	SAS-574	23/06/23	24/06/23	155
PreAmplifier	tsj	MLA-0118-B01-40	23/12/15	24/12/15	1852267
PreAmplifier	tsj	MLA-1840-J02-45	23/06/23	24/06/23	16966-10728
PreAmplifier	H.P	8447D	23/12/15	24/12/15	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000-15000-40SS	23/06/23	24/06/23	8
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300-18000-60SS	23/06/23	24/06/23	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	23/06/23	24/06/23	3
Power Splitter	Anritsu	K241B	23/12/15	23/12/15	016681
Attenuator	Hefei Shunze	SS5T2.92-10-40	23/06/23	24/06/23	16012202
Attenuator	Aeroflex/Weinschel	56-3	23/06/23	24/06/23	Y2370
Attenuator	SMAJK	SMAJK-2-3	23/06/23	24/06/23	3
Attenuator	SMAJK	SMAJK-2-3	23/06/23	24/06/23	2
Attenuator	Aeroflex/Weinschel	86-10-11	23/06/23	24/06/23	408
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	23/12/15	24/12/15	1338004 1911481
Cable	DT&C	Cable	24/01/03	25/01/03	G-2
Cable	HUBER+SUHNER	SUCOFLEX 100	24/01/03	25/01/03	G-3
Cable	DT&C	Cable	24/01/03	25/01/03	G-4
Cable	OMT	YSS21S	24/01/03	25/01/03	G-5
Cable	Junkosha	MWX241	24/01/03	25/01/03	mmW-1
Cable	Junkosha	MWX241	24/01/03	25/01/03	mmW-4
Cable	HUBER+SUHNER	SUCOFLEX100	24/01/03	25/01/03	M-1
Cable	HUBER+SUHNER	SUCOFLEX100	24/01/03	25/01/03	M-2
Cable	JUNKOSHA	MWX241/B	24/01/03	25/01/03	M-3
Cable	JUNKOSHA	J12J101757-00	24/01/03	25/01/03	M-7
Cable	HUBER+SUHNER	SUCOFLEX106	24/01/03	25/01/03	M-9
Test Software	tsj	Radiated Emission Measurement	NA	NA	Version 2.00.0185
3m Semi Anechoic Chamber	SYC	3m-SAC	23/06/14(NSA) 24/06/14(NSA) 23/06/20(VSWR) 24/06/19(VSWR)	24/06/14(NSA) 25/06/14(NSA) 24/06/20(VSWR) 25/06/19(VSWR)	3m-SAC-1
3m Semi Anechoic Chamber	SYC	3m-SAC	24/02/07(NSA) 24/01/19(VSWR)	25/02/07(NSA) 25/01/19(VSWR)	3m-SAC-2

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.

Note2: The cable is not a regular calibration item, so it has been calibrated by Dt&C itself.

2. Explanations for Reference Test Data

2.1. Introduction

The purpose of this report is to refer to the reference device test data for the variant device according to KDB 484596 D01v02r03.

The subject device of this application (FCC ID: SS4S50W1, IC: 22515-S50W1) is electrically identical to the the reference device (FCC ID: SS4S50F1, IC: 22515-S50F1) for the portions of the circuitry corresponding to the data being re-used. Based on their similarity, the FCC Part 15C (Equipment class: DTS, DSS, DXX) referencing the parent device's result and to spot-check, following the FCC KDB 484596 D01v02r03.

The applicant takes full responsibility that the test data as referenced in test report represent compliance for FCC ID: SS4S50W1, IC: 22515-S50W1.

2.2. Explain the Differences

The variant device(FCC ID: SS4S50W1, IC: 22515-S50W1) uses the same materials, form factors, PCB layouts, components as reference device(FCC ID: SS4S50F1, IC: 22515-S50F1)). And the all components and RF circuits for WLAN/BT(BDR,EDR, LE)/NFC of variant device are the same as reference device.

The difference between the variant device and reference device is as below:

- Removed WWAN(GSM/WCDMA/LTE/5G NR) components

2.3. Spot Check Verification Data

KDB 484596 D01v02r03 Section 3

The variant filings must demonstrate that the referenced test data remain valid for the variant device by including spot-check measurements that meet the following criteria:

- Spot-check measurements shall be made in correspondence to the worst-case scenario reported in the reference device filing, i.e., for those conditions that are the closest to non-compliance.
- Spot-check measurements, while being always compliant with the applicable rule part(s) for the test under consideration, may show a deviation d_{dB} from the reference data no larger than 3 dB (applicable for both field and power quantities):

$$d_{dB} = | V_{dB} - R_{dB} | \leq 3 \text{ dB} , (1)$$

where between V_{dB} , the variant spot-check level in dB, and R_{dB} is the corresponding measurement level in dB for the reference model.

- An alternative to the limit of eq. (1) is available, and is based on considering how far the reference data R_{dB} is from the compliance threshold C_{dB} (also expressed in dB), for the particular test under consideration. In this case, if $M_{dB} = |C_{dB} - R_{dB}|$ is the margin in dB from the compliance limit, a spot check may be considered acceptable when the deviation d_{dB} from the reference data satisfies the following condition:

$$d_{dB} = | V_{dB} - R_{dB} | \leq (3 + M_{dB} / 20) \text{ dB} , \text{ for } 0 \leq M_{dB} \leq 60 \text{ dB}$$

. (2)

$$d_{dB} = | V_{dB} - R_{dB} | = 6 \text{ dB} , \text{ for } M_{dB} > 60 \text{ dB}$$

When using the option in eq. (2), d_{dB} increases linearly from 3 dB to 6 dB (as shown in Fig. 2):

- for $M_{dB} = 0$ dB, then $d_{dB} = 3$ dB, that is when R_{dB} is right at the compliance threshold C_{dB} , thus the margin $M_{dB} = 0$ and the variant can only be allowed to go lower than R_{dB} ;
- for $M_{dB} = 60$ dB, then $d_{dB} = 6$ dB, i.e., the reference model data is 60 dB below the compliance threshold M_{dB} .

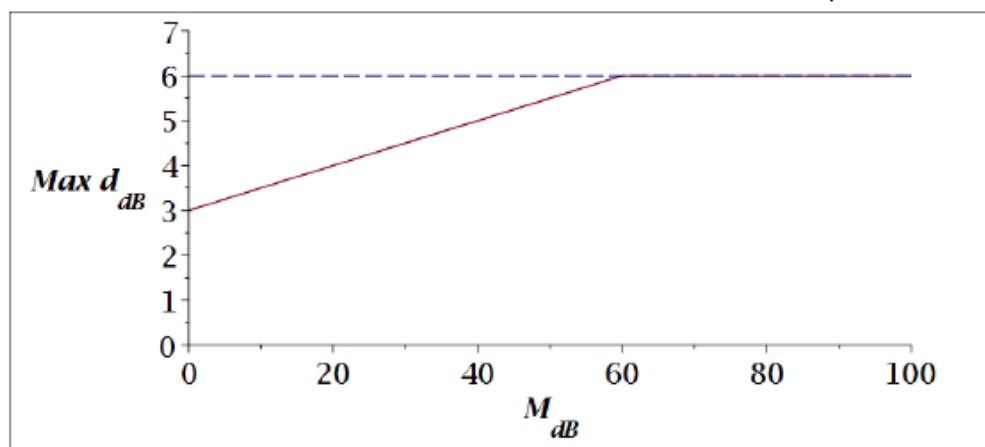


Figure 2 – The piecewise linear function for the maximum spot-check deviation, as given by eq. (2)

Comparison results between reference device and variant device

Peak Conducted Output Power

Capability (Equipment Class)	Mode	TX Frequency(MHz)	FCC ID: SS4S50F1 Reference Device Result(dBm)	FCC ID: SS4S50W1 Variant Device Result(dBm)	Deviation (dB)
Bluetooth (DSS)	1 Mbps	2402	7.87	7.85	-0.02
		2441	8.49	8.48	-0.01
		2480	7.64	7.48	-0.16
Bluetooth LE (DTS)	2 Mbps	2402	6.77	6.84	0.07
		2440	7.05	7.13	0.08
		2480	6.88	6.89	0.01

Note: The variant spot-check level meek KDB 484596D01 v02r03 Section 3 eq.(1).

Radiated Test Items

Capability (Equipment Class)	Mode	TX Freq. (MHz)	Tones/RU Index	Test item	Detector Mode	FCC ID: SS4S50F1 Reference Device		FCC ID: SS4S50W1 Variant Device		Deviation (dB)
						Frequency (MHz)	Result (dBuV/m)	Frequency (MHz)	Result (dBuV/m)	
NFC (DXX)	ASK	13.56	-	In-band emission	Peak	13.56	63.80	13.56	62.15	-1.65
	ASK	13.56	-	Out-of band emission	Peak	40.67	30.80	40.67	31.87	1.07
Bluetooth (DSS)	1 Mbps	2480	-	Band edge	Peak	2489.37	58.32	2484.53	57.25	-1.07
	1 Mbps	2402	-	Spurious emission	Peak	4803.80	52.02	4804.40	52.01	-0.01
Bluetooth LE (DTS)	2 Mbps	2480	-	Band edge	Average	2492.47	49.36	2483.83	49.12	-0.24
	2 Mbps	2480	-	Spurious emission	Average	4958.83	43.85	4959.50	44.00	0.15

Note: The variant spot-check level meek KDB 484596D01 v02r01 Section 3 eq.(1).

2.4. Reference Section

Reference FCC ID: **SS4S50F1**

Equipment Class	Capability	FCC Rule part	Frequency Range(MHz)	Exhibit type	Report title	Reference Section
DXX	NFC	15.225	13.56	Original Grant	Test Report(DXX-NFC)	All sections
DSS	Bluetooth(BDR/EDR)	15.247	2402 ~ 2480 MHz	Original Grant	Test Report(DSS-BT)	All sections
DTS	Bluetooth LE	15.247	2402 ~ 2480 MHz	Original Grant	Test Report(DTS-LE)	All sections

- END -