試験報告書
TEST REPORT

Report number 報告書番号 : DRTTEC1810-0183(1)
Issue date 発行日 : 2018年 10月 15日

申請者 *Applicant*	:	**Bluebird Inc.** (Dogok-dong, SEI Tower 13,14)39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea
供試装置	:	Enterprise Full Touch Handheld Computer
型式又は名称 *Model name*	:	EF401
測定日 *Date of test*	:	2018-08-06 ~ 2018-08-22
試験設備名 *Name of facility*	:	**DT&C Co., Ltd.** 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935
試験結果 *Test results*	:	適合

この試験報告書における測定結果は試験された装置にのみ該当します。
また、完全な複製を除き、当試験所の文書による承認なしに、報告書の一部分だけを複製することを禁止します。

測定者;
Tested by;
MyungHoon Lee X

承認者;
Authorized by;
Geunki Son X

1. Summary of Test

1. Purpose of test

Ordinance on Technical Standards Conformity Certification of Specified Radio Equipment
5.6GHz Band wide band low power data communication System

2. Standards

Certification Ordinance Article 2 Clause 1 Item19-3-2

1) Test Methods

Ministry of Internal Affairs and Communications Notification Article 88 Appendix 45

2) Deviation from standards

None

3. List of applied test to the EUT

Article 88 Appendix 45	Classification of EUT	Condition	Result
1	Voltage fluctuation	Conducted	PASS
3	Frequency Tolerance	Conducted	PASS
4	Occupied Bandwidth	Conducted	PASS
5	Unwanted (Spurious) Emission Strength	Conducted	PASS
6	RF Output Power Tolerance	Conducted	PASS
7	Adjacent Channel Leakage Power and Out-of-Band Leakage Power	Conducted	PASS
8	Secondary Emitted Radio Wave Strength	Conducted	PASS
9	Interference Prevention Function	Conducted	PASS
10	Transmission Burst Length	Conducted	PASS
11	Transmission Power Control Function (TPC)	Conducted	N/A
12	Carrier Sensing Function	Conducted	PASS
14	Dynamic Frequency Selection Function(DFS)	Conducted	N/A

1) Test set up

Table-Top

2) Modification to the EUT by laboratory

None

2. Test Information

1. Applicant

Bluebird Inc.

2. Equipment under test
Enterprise Full Touch Handheld Computer

3. Model number
EF401

4. Serial number
Identical prototype

5. Size

(W) 68 x (D) 15.9 x (H) 136.3 mm

6. Terminal limitation
- 10 °C ~ + 50 °C

7. RF Specification Frequency range
802.11a/n(HT20)/ac(VHT20) : 5500 MHz ~ 5700 MHz
802.11n(HT40)/ac(VHT40) : 5510 MHz ~ 5670 MHz
802.11ac(VHT80) : 5530 MHz ~ 5610 MHz

8. Number of RF Channels
20 MHz interval 11 Channel, 40 MHz interval 5 Channel, 80 MHz interval 2 Channel

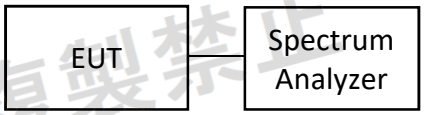
9. Modulation method & Data rate

Refer to the attached Test Result

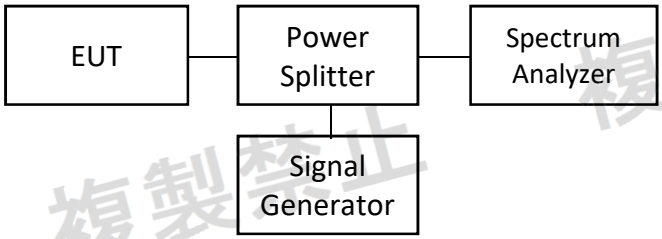
10. Variation of the family model(s)
None

3. Configuration of equipment

1. Frequency tolerance, RF output power tolerance, Spread bandwidth, Unwanted(Spurious) emission strength, Secondary emitted radio wave strength



2. Carrier Sensing Function



4. 試驗結果

Test results

Environment of test room	Date of test	2018-08-06 ~ 2018-08-22
	Temperature	20 ~ 25 °C
	Humidity	45 ~ 48 %

Peak Antenna Gain	1.463	dBi
Declaration Output Power	0.730	mW/MHz
	-1.3668	dBm/MHz
E.I.R.P	**1.0224**	mW/MHz
	0.0962	**dBm/MHz**
Input Power Voltage	3.80	VDC

Tested Circit Insertion Loss	Tx1	0	dB
	Tx2	0	dB
Transmission Time	ON TIME (1sec or less)	1.276	msec
	OFF TIME (0.1sec or more)	0.198	msec
	Ratio	87%	%
Packet Type (Mode)		OFDM	mode

Test category ；	5GHz Band Low-Power Data Communication System 802.11 n (HT 20)
The reason why the tests are performed only at rated voltage :	When the input voltage to receiver RF circuit varies below ± 1% as the input voltage from the external power supply to the receiver varies ± 10% (excluding power supply).

Measurement Channel	Ch.	100	120	140		
Measurement Frequency	MHz	5500	5600	5700	Result	Limit
Frequency Measurements(Tx1)	MHz	5500.013184848	5600.013765920	5700.013083028	**----**	----
Frequency Toleranc(Tx1)	ppm	2.4	2.5	2.3	**PASS**	±20×10-6(20ppm)
Occupied Bandwidth(Tx1)	MHz	18.01	18.125	18.037	**PASS**	19.7MHz or below
RF Output Power(Tx1)	mW/MHz	0.519573	0.504251	0.539072	**PASS**	10mW/MHz or below
RF Output Power (Tx1)or(Tx1+2)or(Tx1+2+3)or(Tx1+2+3+4)	mW/MHz	0.519573	0.504251	0.539072	**PASS**	10mW/MHz or below
RF Output Power Tolerance (Tx1)or(Tx1+2)or(Tx1+2+3)or(Tx1+2+3+4)	%	-28.8	-30.9	-26.2	**PASS**	+50% to -50%

Measurement Channel		Ch.	100	120	140		
Measurement Frequency		MHz	5500	5600	5700	Result	Limit
Unwanted (Spurious) Emission Strength(Tx1)	30MHz to 5455MHz	uW/MHz	0.019	0.002	0.002	**PASS**	2.5uW/MHz or below
		MHz	5448.26	3062.93	3598.52	-----	----
	5745MHz to 26GHz	uW/MHz	0.058	0.068	0.052	**PASS**	2.5uW/MHz or below
		MHz	24748.45	25554.03	25983.93	-----	----
Adjacent Channel Leakage Power (Tx1)	cf	dB	8.909	8.738	8.850	**----**	----
	cf -20MHz	dB	-37.829	-36.908	-36.570	**PASS**	-25dBc or below
	cf +20MHz	dB	-37.939	-37.088	-37.080	**PASS**	-25dBc or below
	cf -40MHz	dB	-44.389	-44.268	-44.020	**PASS**	-40dBc or below
	cf +40MHz	dB	-44.519	-43.748	-43.560	**PASS**	-40dBc or below

Report Number; DRTTEC1810-0183(1)

Measurement Channel		Ch.	100	120	140		
Measurement Frequency		MHz	5500	5600	5700	Result	Limit
Out-Band Leakage Power (Tx1)	5455 to 5460MHz	uW/MHz	0.005	0.003	0.003	**PASS**	2.5uW/MHz or below
		MHz	5455.6066	5456.8146	5455.4183	----	----
	5460 to 5470MHz	uW/MHz	0.039	0.003	0.003	**PASS**	12.5uW/MHz or below
		MHz	5467.6024	5469.4970	5466.7873	----	----
	5725 to 5740MHz	uW/MHz	0.004	0.003	0.238	**PASS**	12.5uW/MHz or below
		MHz	5739.5620	5735.2561	5725.0357	----	----
	5740 to 5745MHz	uW/MHz	0.003	0.003	0.014	**PASS**	2.5uW/MHz or below
		MHz	5744.5650	5743.7240	5740.9641	----	----

Report Number; DRTTEC1810-0183(1)

Measurement Channel		Ch.	100	120	140		
Measurement Frequency		MHz	5500	5600	5700	Result	Limit
Secondary Emitted Radio Wave Strength (Rx1)	30MHz to 1000MHz	nW	0.005	0.004	0.005	**PASS**	4nW or below
		MHz	946.91	977.88	854.10	**----**	----
	1GHz to 10GHz	nW	0.089	0.072	0.082	**PASS**	20nW or below
		MHz	7608.46	7630.60	6387.46	**----**	----
	10GHz to 26GHz	nW	2.582	2.679	2.748	**PASS**	20nW or below
		MHz	25217.83	25534.43	25595.34	**----**	----
Burst Length of Transmitted Signals			1.276	1.276	1.276	**PASS**	4ms or below
Carrier Sensing Function			Good	Good	Good	**PASS**	100mV/m
Transmission Power Control Function			Good	Good	Good	**PASS**	3dB
Interference Prevention Function			Good			**PASS**	

5． 測定機器リスト

Measurement equipment list

USE	Equipment	Company	Model No.	Serial No.	Calibrated by	Cal. Method	Cal. Due	Cal. Date
X	Spectrum Analyzer	Agilent Technologies	N9020A	MY50410357	MPC	ハ©	Dec. 28, 2018	Dec. 28, 2017
X	DC Power Supply	Agilent Technologies	66332A	US37476998	MPC	ハ©	Dec. 27, 2018	Dec. 27, 2017
X	Signal Generator	Anritsu	MG3695C	173501	MPC	ハ©	Feb. 12, 2019	Feb. 12, 2018
X	Signal Generator	Rohde Schwarz	SMBV100A	255571	MPC	ハ©	Dec. 27, 2018	Dec. 27, 2017
X	Thermohygrometer	BODYCOM	BJ5478	120612-1	MPC	ハ©	Jan. 3, 2019	Jan. 3, 2018
X	Multimeter	FLUKE	17B	26030065WS	MPC	ハ©	Dec. 26, 2018	Dec. 26, 2017
X	Power Splitter	Anritsu	K241B	1301181	MPC	ハ©	Dec. 27, 2018	Dec. 27, 2017

Note1: "X" は使用した測定機器です。
"X" used equipment.

Note2: 較正期限は、較正を行った日の翌月から起算して1年以内です。
The validity of measurement equipment is one year from the first day of the following month of the calibration date.

Note3: 較正方法 ...
Cal.Method ...

イ)：国立研究開発法人情報通信研究機構（NICT）（以下「機構」という。）又は第百二条の十八第一項の指定較正機関（TELEC,インターテックジャパン、キーサイト）が行う較正
a)： Calibration conducted by the National Institute of Information and Communications Technology〜NICT〜 or a designated calibration agency under Article 102-18 paragraph (1)〜 Telecom Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc〜.

ロ)：計量法 （平成四年法律第五十一号）第百三十五条 又は第百四十四条 の規定に基づく校正（JCSS校正）
b)： Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)〜Japan Calibration Service System〜

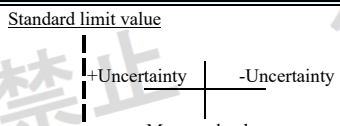
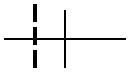
ハ)：外国において行う較正であつて、機構又は第百二条の十八第一項の指定較正機関（TELEC,インターテックジャパン、キーサイト）が行う較正に相当するもの
c)： Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)〜 Telecom Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc〜.

ニ)：イからハまでのいずれかに掲げる較正等を受けたものを用いて行う較正等
d)： Calibration conducted by using other equipment that listed above from a) to c)

6. 測定の不確かさ

About uncertainty of measured value

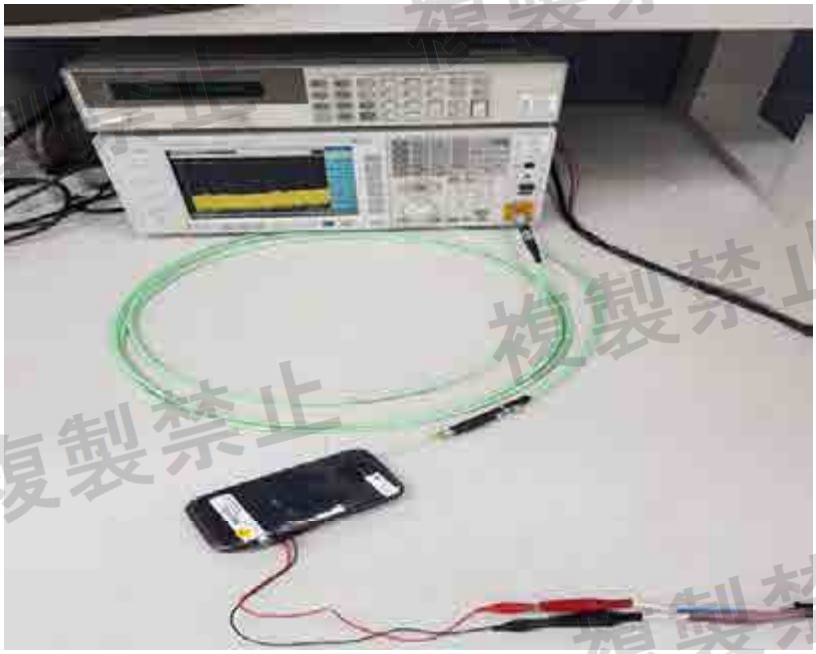
Parameter	Uncertainty
Total RF power conducted	1.30 dB
Spurious emissions conducted	0.92 dB
Temperature	0.4 C
Humidity	2%

Judge	Measured value and standard limit value
PASS	**Case1**  Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2  Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	**Case3**  Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4  Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

7. 測定写真

Photographs

Conducted Measurement Photo(1)



Conducted Measurement Photo(2)

8. 測定チャート

Test chart

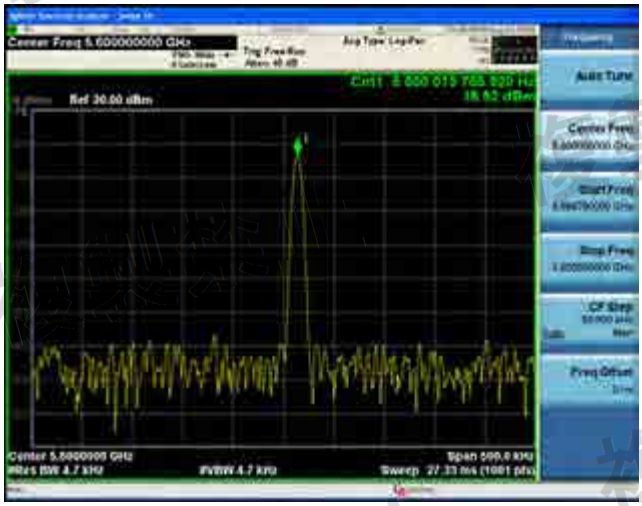
8.1 周波数偏差

Frequency tolerance

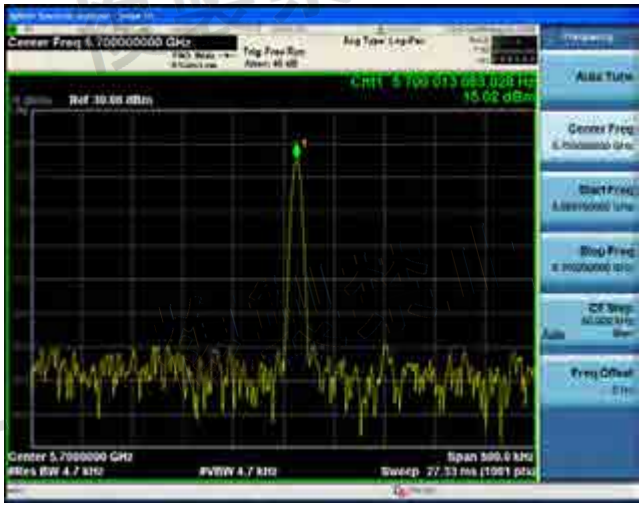
Tx1

Ch.100: 5500MHz

Ch.120: 5600MHz



Ch.140: 5700MHz

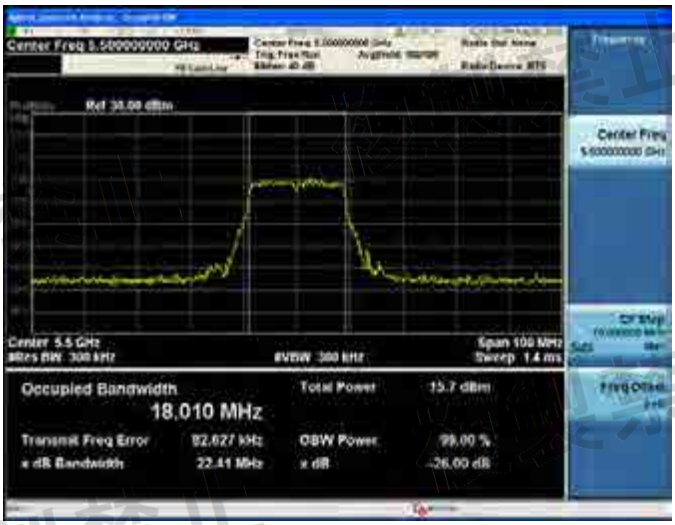


8.2 占有周波数帯幅

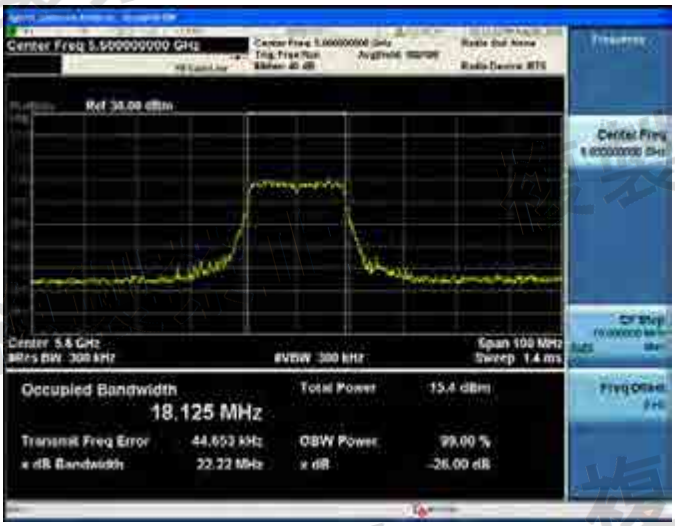
Occupied bandwidth

Tx1

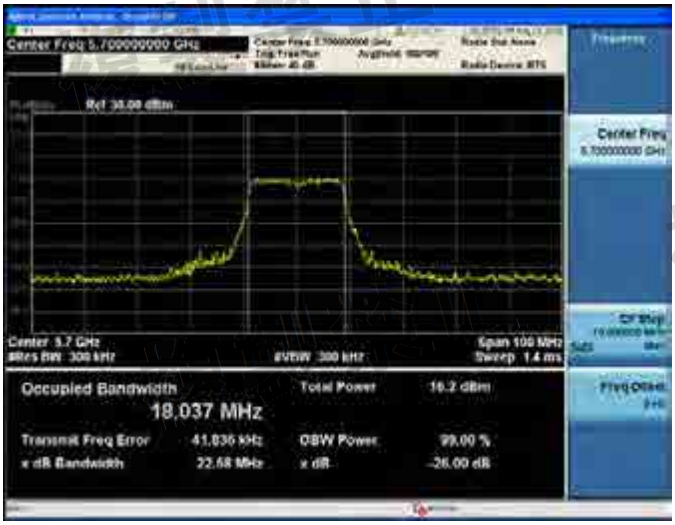
Ch.100: 5500MHz



Ch.120: 5600MHz



Ch.140: 5700MHz



8.3 空中線電力の偏差

RF output power tolerance

Tx1

Ch.100: 5500MHz

Ch.120: 5600MHz

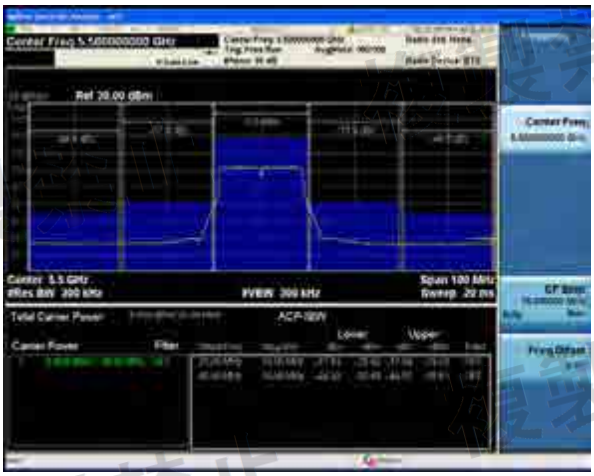
Ch.140: 5700MHz

8.4 隣接チャネル漏洩電力

Adjacent Channel Leakage Power

Tx1

Ch.100: 5500MHz



Ch.120: 5600MHz

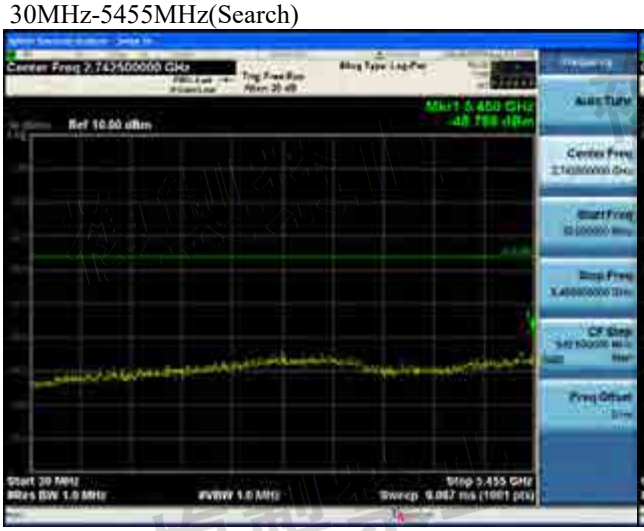
Ch.140: 5700MHz

8.5 スプリアス発射又は不要発射の強度
Unwanted(Spurious) emission strength

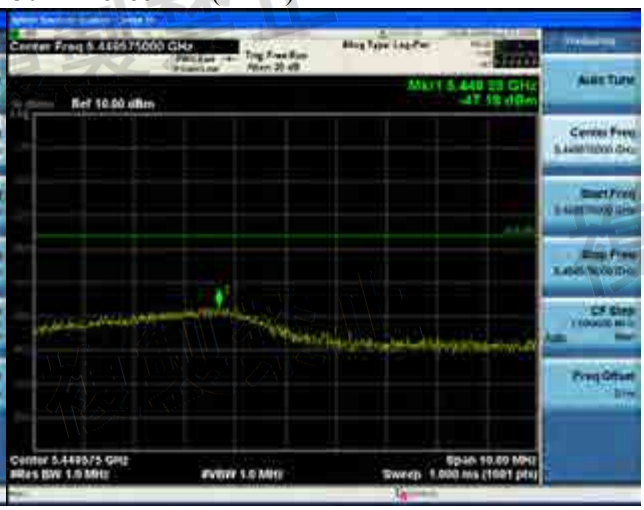
1X1

Ch.100: 5500MHz

30MHz-5455MHz(Search)

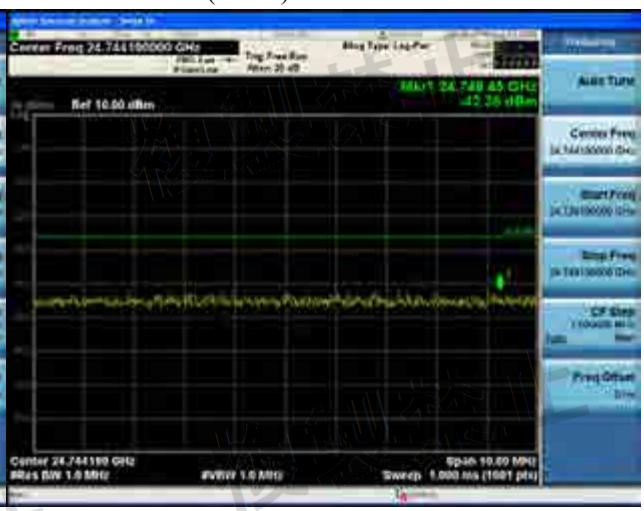


30MHz-5455MHz(Detail)



5745MHz-26GHz(Search)

5745MHz-26GHz(Detail)



Ch.120: 5600MHz

30MHz-5455MHz(Search)

30MHz-5455MHz(Detail)

5745MHz-26GHz(Search)

5745MHz-26GHz(Detail)

Ch.140: 5700MHz

30MHz-5455MHz(Search)

30MHz-5455MHz(Detail)

5745MHz-26GHz(Search)

5745MHz-26GHz(Detail)

8.6 帶域外漏洩電力

Out-band leakage power

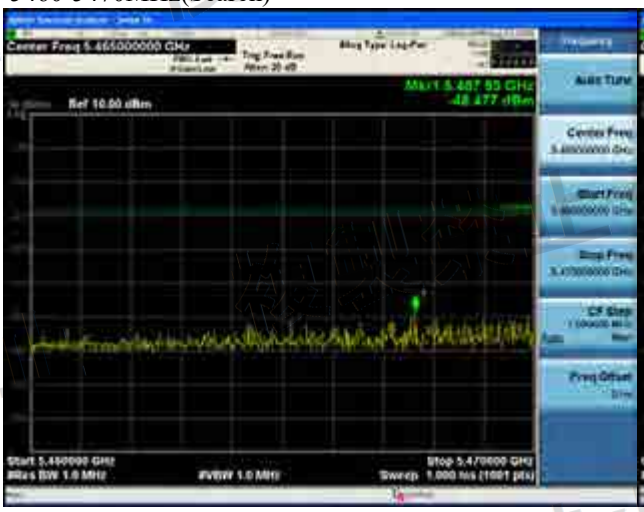
Tx1

Ch.100: 5500MHz

5455-5460MHz(Search)

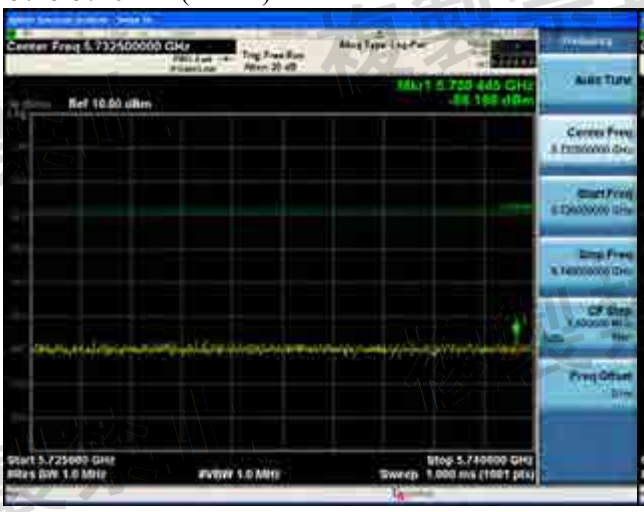
5455-5460MHz(Detail)

5460-5470MHz(Search)



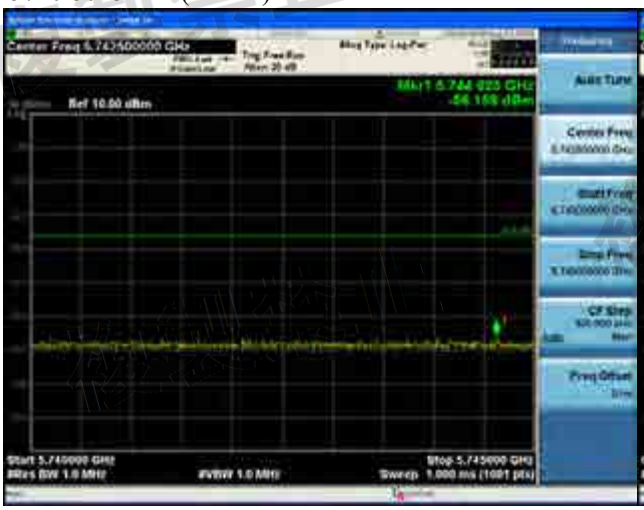
5460-5470MHz(Detail)

5725-5740MHz(Search)



5725-5740MHz(Detail)

5740-5745MHz(Search)



5740-5745MHz(Detail)

Ch.120: 5600MHz

5455-5460MHz(Search)

5455-5460MHz(Detail)

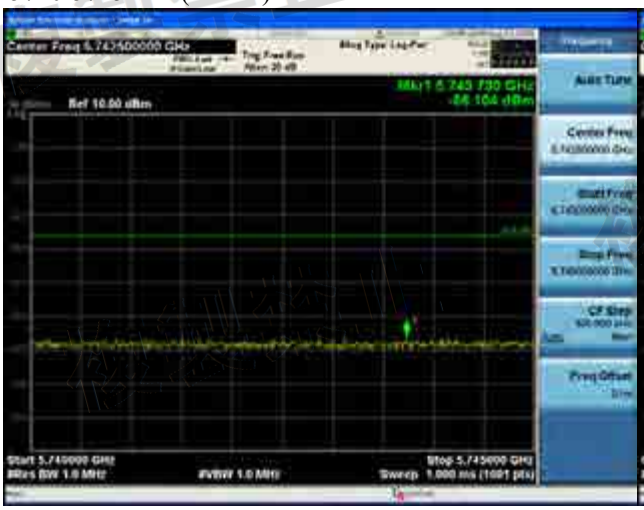
5460-5470MHz(Search)

5460-5470MHz(Detail)

5725-5740MHz(Search)

5725-5740MHz(Detail)

5740-5745MHz(Search)



5740-5745MHz(Detail)

Ch.140: 5700MHz

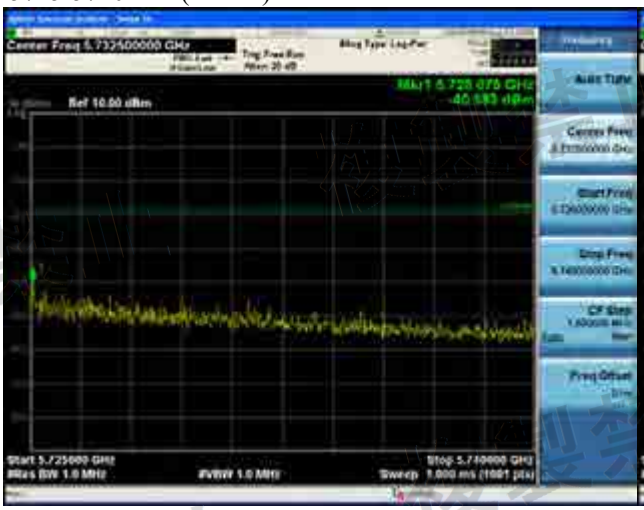
5455-5460MHz(Search)

5455-5460MHz(Detail)

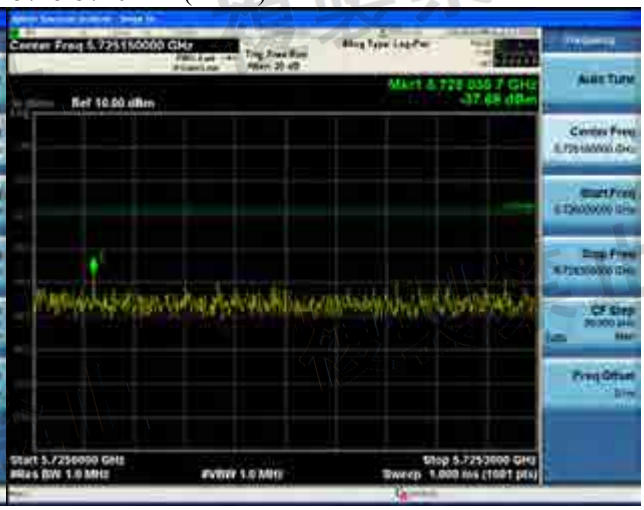
5460-5470MHz(Search)

5460-5470MHz(Detail)

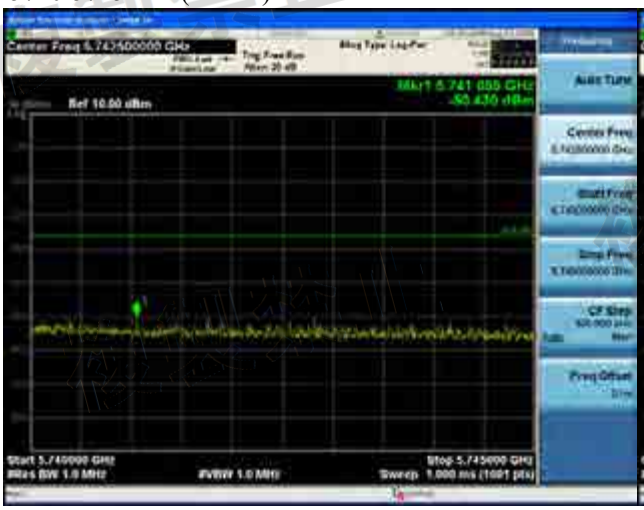
5725-5740MHz(Search)



5725-5740MHz(Detail)



5740-5745MHz(Search)



5740-5745MHz(Detail)

8.7 副次的に発する電波等の限度

Secondary emitted radio wave strength

Rx1

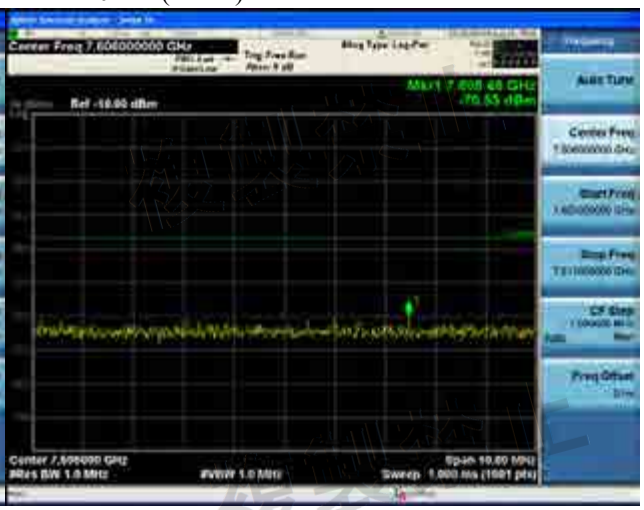
Ch.100: 5500MHz

30MHz-1GHz(Search)

30MHz-1GHz(Detail)

1GHz-10GHz(Search)

1GHz-10GHz(Detail)



10GHz-26GHz(Search)

10GHz-26GHz(Detail)

Ch.120: 5600MHz

30MHz-1GHz(Search)

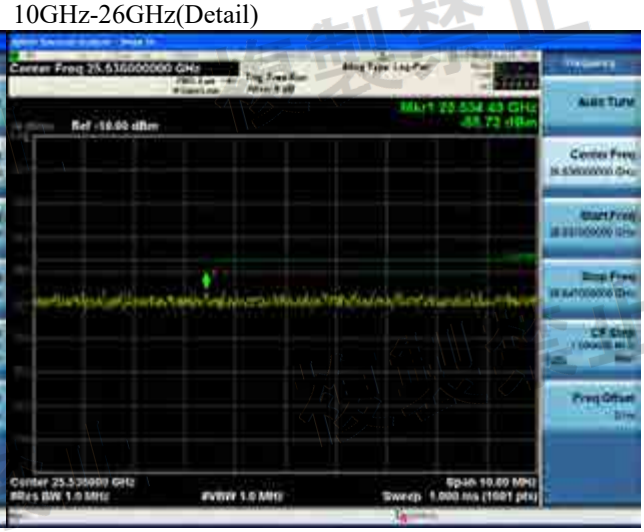
30MHz-1GHz(Detail)

1GHz-10GHz(Search)

1GHz-10GHz(Detail)

10GHz-26GHz(Search)

10GHz-26GHz(Detail)



Ch.140: 5700MHz

30MHz-1GHz(Search)

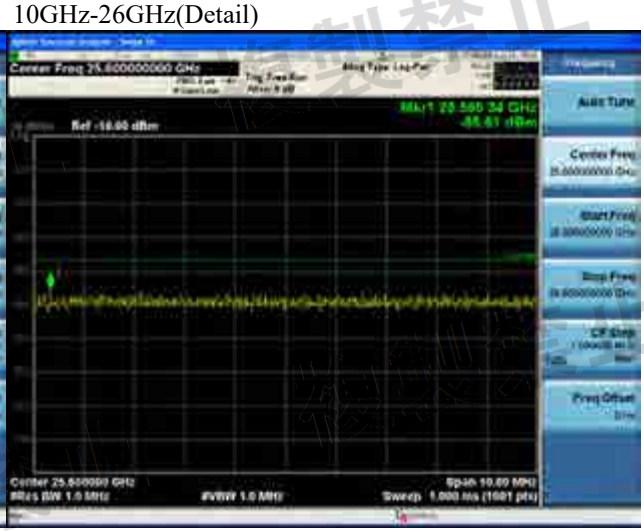
30MHz-1GHz(Detail)

1GHz-10GHz(Search)

1GHz-10GHz(Detail)

10GHz-26GHz(Search)

10GHz-26GHz(Detail)

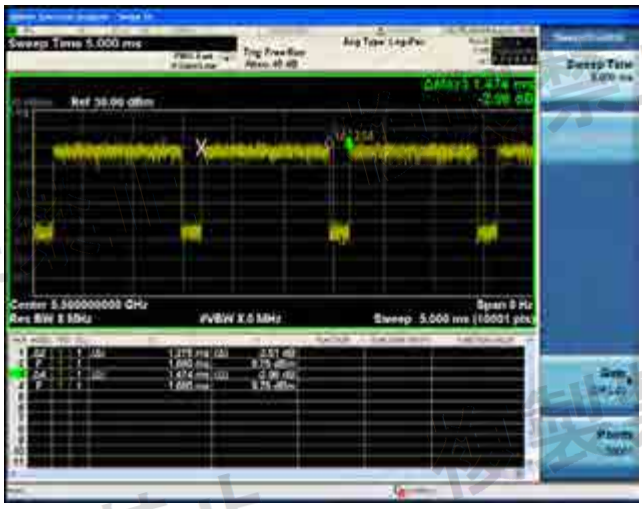


8.8 送信バースト長

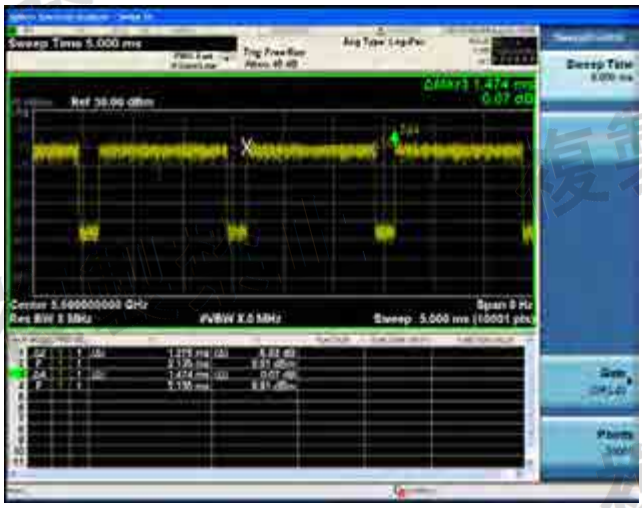
Burst length of transmitted signals

Tx1

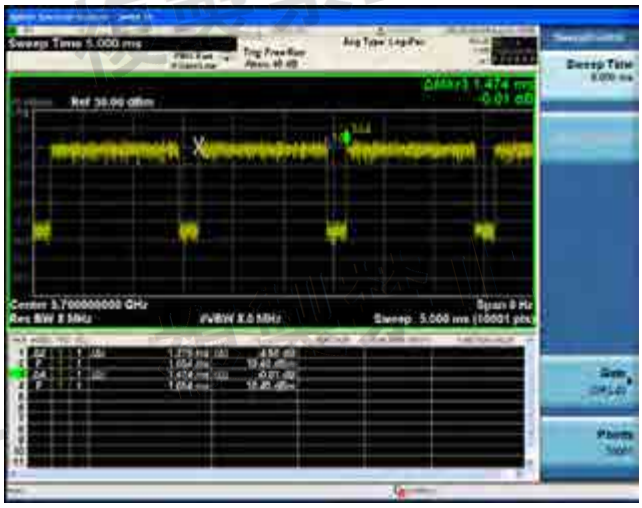
Ch.100: 5500MHz



Ch.120: 5600MHz



Ch.140: 5700MHz



9. Laboratory description

1. Location

Name: DT&C Co., Ltd.
Address: 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935s
Fax: +81-031-321-2855

2. Accreditation and Registration

1) VLAC
Accreditation No.: N/A

2) NVLAP
LAB CODE: N/A

3) BSMI
Laboratory Code: N/A

4) Industry Canada

Site number	Facility	Expiration date
5740A-4	DT&C Co., Ltd.	2020-10-16
-	-	-
-	-	-

5) VCCI Council

Registration number	Expiration date
-	-

6) KOLAS

Registration number	Expiration date
KT393	2021-01-13