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 : DRTFCC2412-0136

2. Customer

- Name (FCC) : DASAN Networks, Inc. / Name (IC) : DASAN Networks, Inc.
- Address (FCC) : DASAN Tower, 49, Daewangpangyo-ro644Beon-gil, Bundang-gu, Seongnam-si, South Korea 13493

  Address (IC) : DASAN Tower, 49, Daewangpangyo-ro644Beon-gil, Bundang-gu, Seongnam-si/Gyeonggi-do, 13493 Korea (Republic Of)

3. Use of Report : FCC & ISED Certification

4. Product Name / Model Name : RC-TGU / RC-TGU (300611-02665)
   FCC ID : 2AXDMTGU5GWIFI6
   IC : 26419-TGU5GWIFI6

5. FCC Regulation(s): Part 22, 24, 27
   ISED Standard(s): RSS-132 Issue 4, 133 Issue 7, 139 Issue 4
   Test Method Used : KDB971168 D01v03r01, ANSI/TIA-603-E-2016, ANSI C63.26-2015

6. Date of Test : 2024.10.10 ~ 2024.11.21

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

8. Testing Environment : See appended test report.

9. Test Result : Refer to 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 (Signature)	Technical Manager Name : JaeJin Lee (Signature)

2024 . 12 . 11 .

Dt&C Co., Ltd.

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2412-0136	Dec. 11, 2024	Initial issue	SeungMin Gil	JaeJin Lee

Table of Contents

1. GENERAL INFORMATION

Equipment Class	PCS Licensed Transmitter(PCB)
Product Name	RC-TGU
Model Name	RC-TGU (300611-02665)
Add Model Name	-
FVIN(Firmware Version Identification Number)	V0.10
EUT Serial Number	No specified
Power Supply	DC 12, 24V

Antenna Information (WCDMA)

Band	Internal Chip Antenna 1 (dBi)	External Antenna 1 (dBi)
5 (WCDMA 850)	0.6	**0.7**
4 (WCMDA 1700)	**2.6**	0.6
2 (WCDMA 1900)	**4.4**	0.6

Note: The antenna gain was corrected for path loss from the conducted feed point to the antenna terminal.

Mode	Tx Frequency (MHz)	Conducted Output Power		ERP		EIRP	
		Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
WCDMA850	826.4 ~ 846.6	22.62	0.183	21.17	0.131	-	-
WCDMA1700	1 712.4 ~ 1 752.6	23.41	0.219	-	-	26.01	0.399
WCDMA1900	1 852.4 ~ 1 907.6	22.21	0.166	-	-	26.61	0.458

2. INTRODUCTION

2.1. EUT DESCRIPTION

This device supports the following capabilities:
Bluetooth LE, 2.4/5GHz WLAN, WCDMA, LTE/LTE up-link carrier aggregation, 5G NR(FR1)/5G NR up-link carrier aggregation and ENDC
5G NR supports SCS 15 kHz for FDD Band and SCS 30 kHz for TDD Band.

2.2. TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+22 ℃ ~ +24 ℃
▪ Relative Humidity	44 % ~ 50 %

2.3. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.4. MEASUREMENT UNCERTAINTY

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

Parameter	Measurement uncertainty
Antenna-port conducted emission	0.9 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (Below 1 GHz)	5.0 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (1 GHz ~ 18 GHz)	4.8 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (Above 18 GHz)	5.0 dB (The confidence level is about 95 %, k = 2)

2.5. TEST FACILITY

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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Telephone	:	+ 82-31-321-2664
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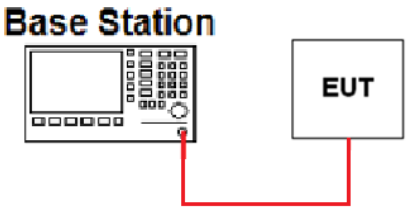
3. DESCRIPTION OF TESTS

3.1. MAXIMUM OUTPUT POWER

- Conducted Output Power

Test Set-up



Test Procedure

- **KDB971168 D01v03r01 - Section 5.2**
- **ANSI C63.26-2015 – Section 5.2.4.2**

When an average power meter is used to perform RF output power measurements, the fundamental condition that measurements be performed only over durations of active transmissions at maximum output power level applies. Thus, an average power meter can always be used to perform the measurement when the EUT can be configured to transmit continuously.
If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98%), then the following options can be implemented to facilitate measurement of the average power with an average power meter:
a) A gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only during active transmission bursts at maximum output power levels.
b) A conventional average power meter with no signal gating capability can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than or equal to ±2%) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to [10 log (1/duty cycle)]. See 5.2.4.3.4 for guidance with respect to measuring the transmitter duty cycle.

- ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

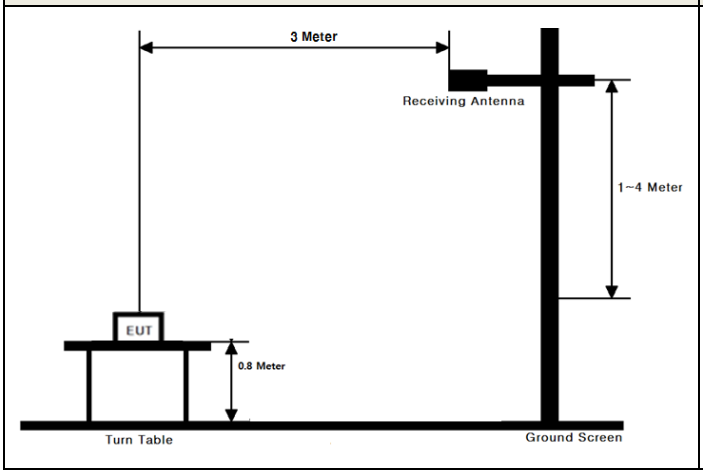
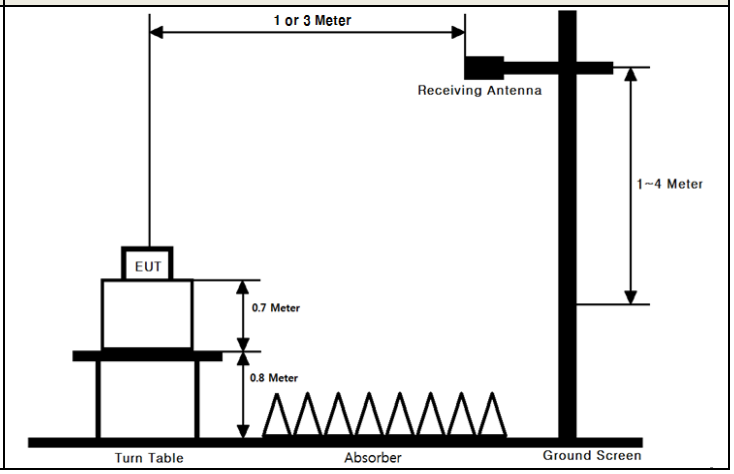
Test Procedure

- **KDB971168 D01v03r01 - Section 5.6**
- **ANSI C63.26-2015 – Section 5.2.5.5**

Determining ERP and EIRP from conducted RF output power measurement results
ERP or EIRP = $P_{Meas} + G_T - L_C$
where:
ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);
P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;
G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

3.2. UNDESIRABLE EMISSIONS

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 0.8 or 1.5 meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **KDB971168 D01v03r01 - Section 5.8**
- **ANSI C63.26-2015 – Section 5.5**

Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = RMS & Trace mode = Average
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

4. LIST OF TEST EQUIPMENT

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	MY48010133
DC power supply	DIGITAL	DPR-303D	24/06/05	25/06/05	0120044
Multimeter	FLUKE	17B+	23/12/15	24/12/15	36390701WS
Radio Communication Analyzer	Agilent Technologies	E5515C	23/12/15	24/12/15	MY47510649
Thermohygrometer	BODYCOM	BJ5478	23/12/15	24/12/15	120612-1
Thermohygrometer	BODYCOM	BJ5478	23/12/15	24/12/15	090205-4
Signal Generator	Rohde Schwarz	SMBV100A	23/12/15	24/12/15	255571
Signal Generator	ANRITSU	MG3695C	23/12/15	24/12/15	173501
Loop Antenna	ETS-Lindgren	6502	24/11/08	26/11/08	00060496
Bilog Antenna	Schwarzbeck	VULB 9160	23/12/15	24/12/15	3362
HORN ANT	ETS	3117	23/12/15	24/12/15	00140394
HORN ANT	A.H.Systems	SAS-574	24/06/11	25/06/11	155
PreAmplifier	H.P	8447D	23/12/15	24/12/15	2944A07774
PreAmplifier	Agilent	8449B	23/12/15	24/12/15	3008A02108
PreAmplifier	A.H.Systems Inc.	PAM-1840VH	24/06/05	25/06/05	163
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	23/12/15	24/12/15	7
High-pass filter	Wainwright	WHKX10-2838-3300-18000-60SS	23/12/15	24/12/15	2
High-pass filter	Wainwright	WHKX6-6320-8000-26500-40CC	23/12/15	24/12/15	2
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	MWX221	24/01/03	25/01/03	M-4
Cable	JUNKOSHA	MWX221	24/01/03	25/01/03	M-5
Cable	JUNFLON	J12J101757-00	24/01/03	25/01/03	M-7
Cable	HUBER+SUHNER	SUCOFLEX104	24/01/03	25/01/03	M-8
Cable	HUBER+SUHNER	SUCOFLEX106	24/01/03	25/01/03	M-9
Cable	JUNKOSHA	MWX315	24/01/03	25/01/03	M-10
Cable	JUNKOSHA	MWX241	24/01/03	25/01/03	mmW-1
Cable	JUNKOSHA	MWX241	24/01/03	25/01/03	mmW-4

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.

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Status Note 1
2.1046	-	Conducted Output Power	N/A	C
22.913(a)	RSS-132 [5.4]	Effective Radiated Power	< 7 Watts max. ERP	C
24.232(c)	RSS-133 [5.5]	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP	C
27.50(d.4)	RSS-139 [5.5]	Equivalent Isotropic Radiated Power	< 1 Watts max. EIRP	C
2.1053 22.917(a) 24.238(a) 27.53(h)	RSS-132 [5.5] RSS-133 [6.5] RSS-139 [5.6]	Undesirable Emissions	> 43 + 10log$_{10}$ (P) dB for all out-of-band emissions	C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable
Note 2: This device uses the certified module.(FCC ID: XMR2022RM520NGL, IC: 10224A-022RM520NGL)
Please refer to the module test report for conducted signal test items. The conducted output power was verified to be the same as module.
Note 3: All antenna configuration were investigated and worst case data were reported.

6. EMISSION DESIGNATOR AND SAMPLE CALCULATION

A. For substitution method

1) The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1 GHz respectively above ground.
2) The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3) Vary the measurement antenna height through 1 m to 4 m and the rotate EUT through 360° in order to determine the maximum emission level.
4) Record the measured emission level and frequency using the available test method.
5) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
6) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude. And adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the previously measured emission level.
7) The conducted power at the terminal of the substitute antenna is measured.
8) Record the level at substituted antenna terminal.
9) The result is calculated as below;

Result: EIRP(dBm) = Level at Substitute antenna terminal + Substitute Antenna Gain (dBi)
Result: ERP(dBm) = Level at Substitute antenna terminal + Substitute Antenna Gain (dBd)
Where, TX Antenna Gain (dBd) = TX Antenna Gain (dBi) - 2.15 dB

7. TEST RESULTS

7.1. MAXIMUM OUTPUT POWER

- Test Notes

1) EIRP = Conducted Output Power(dBm) + Antenna gain(dBi)
ERP = EIRP – 2.15(dB)

WCDMA 850 data
External Antenna 1

Band	Channel	Frequency (MHz)	Conducted Output Power (dBm)	EUT Antenna Gain(dBi)	EIRP (dBm)	ERP (dBm)
WCDMA 850	4132	826.4	22.53	0.7	23.23	21.08
WCDMA 850	4183	836.6	22.60	0.7	23.30	21.15
WCDMA 850	4233	846.6	22.62	0.7	23.32	21.17

WCDMA 1700 data
Internal Chip Antenna 1

Band	Channel	Frequency (MHz)	Conducted Output Power (dBm)	EUT Antenna Gain(dBi)	EIRP (dBm)	ERP (dBm)
WCDMA 1700	1312	1 712.4	23.36	2.6	25.96	-
WCDMA 1700	1412	1 732.4	23.37	2.6	25.97	-
WCDMA 1700	1513	1 752.6	23.41	2.6	26.01	-

WCDMA 1900 data
Internal Chip Antenna 1

Band	Channel	Frequency (MHz)	Conducted Output Power (dBm)	EUT Antenna Gain(dBi)	EIRP (dBm)	ERP (dBm)
WCDMA 1900	9262	1 852.4	22.16	4.4	26.56	-
WCDMA 1900	9400	1 880.0	22.21	4.4	26.61	-
WCDMA 1900	9538	1 907.6	22.12	4.4	26.52	-

7.2. UNDESIRABLE EMISSIONS

- Test Notes

1) This EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA inactive at 12.2 kbps RMC and TPC bits set to “1”.
2) The worst case data is reported.
3) No other spurious and harmonic emissions were reported greater than listed emissions.
4) Limit = -13dBm
5) For Band below 1GHz:
   Result(dBm) = Level at Substitute antenna terminal(dBm) + Substitute Antenna Gain (dBd)
   For Band above 1GHz:
   Result(dBm) = Level at Substitute antenna terminal(dBm) + Substitute Antenna Gain (dBi)

- WCDMA850 data

Internal chip antenna 1

Tx Freq. (MHz)	Freq. (MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)	Note
826.4	1 654.41	V	-63.90	3.53	-60.37	-13.00	47.37	-
	2 479.25	V	-66.05	3.78	-62.27	-13.00	49.27	-
	3 306.68	V	-66.92	5.54	-61.38	-13.00	48.38	-
	4 131.12	H	-69.40	7.03	-62.37	-13.00	49.37	-
836.6	1 674.62	V	-62.04	3.59	-58.45	-13.00	45.45	-
	2 507.88	V	-66.33	3.74	-62.59	-13.00	49.59	-
	3 345.04	V	-67.52	5.69	-61.83	-13.00	48.83	-
	4 184.92	H	-68.83	7.01	-61.82	-13.00	48.82	-
846.6	1 694.85	V	-60.28	3.65	-56.63	-13.00	43.63	-
	2 540.36	V	-66.41	3.76	-62.65	-13.00	49.65	-
	3 386.11	V	-67.56	5.88	-61.68	-13.00	48.68	-
	4 232.26	H	-68.79	7.03	-61.76	-13.00	48.76	-

External antenna 1

Tx Freq. (MHz)	Freq. (MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)	Note
846.6	1 691.51	V	-64.48	3.64	-60.84	-13.00	47.84	-
	2 538.99	V	-66.51	3.76	-62.75	-13.00	49.75	-
	3 384.27	V	-67.78	5.87	-61.91	-13.00	48.91	-
	4 232.46	H	-68.96	7.03	-61.93	-13.00	48.93	-

- WCDMA1700 data

Internal chip antenna 1

Tx Freq. (MHz)	Freq. (MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Note
1 712.4	3 426.02	V	-66.65	8.17	-58.48	-13.00	45.48	-
	5 136.92	H	-68.41	10.07	-58.34	-13.00	45.34	-
	6 850.29	H	-66.83	11.19	-55.64	-13.00	42.64	-
	8 563.48	V	-67.14	13.15	-53.99	-13.00	40.99	-
1 732.4	3 466.03	V	-66.43	8.26	-58.17	-13.00	45.17	-
	5 196.08	H	-68.00	10.09	-57.91	-13.00	44.91	-
	6 928.51	H	-66.91	11.18	-55.73	-13.00	42.73	-
	8 660.90	V	-67.26	13.17	-54.09	-13.00	41.09	-
1 752.6	3 506.82	V	-65.40	8.32	-57.08	-13.00	44.08	-
	5 256.94	H	-68.05	10.16	-57.89	-13.00	44.89	-
	7 012.21	H	-67.25	11.25	-56.00	-13.00	43.00	-
	8 762.70	V	-67.03	13.14	-53.89	-13.00	40.89	-

External antenna 1

Tx Freq. (MHz)	Freq. (MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Note
1 752.6	3 506.31	V	-66.64	8.32	-58.32	-13.00	45.32	-
	5 258.88	H	-68.05	10.16	-57.89	-13.00	44.89	-
	7 011.10	H	-67.29	11.25	-56.04	-13.00	43.04	-
	8 764.02	V	-67.05	13.14	-53.91	-13.00	40.91	-

- WCDMA1900 data

Internal chip antenna 1

Tx Freq. (MHz)	Freq. (MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Note
1 852.4	3 705.12	V	-68.98	8.30	-60.68	-13.00	47.68	-
	5 556.58	H	-67.23	10.63	-56.60	-13.00	43.60	-
	7 409.06	H	-67.52	12.01	-55.51	-13.00	42.51	-
	9 260.56	V	-63.99	13.26	-50.73	-13.00	37.73	-
1 880	3 760.33	V	-68.47	8.28	-60.19	-13.00	47.19	-
	5 639.89	H	-67.03	10.72	-56.31	-13.00	43.31	-
	7 519.49	H	-67.80	12.10	-55.70	-13.00	42.70	-
	9 399.40	V	-62.95	13.21	-49.74	-13.00	36.74	-
1 907.6	3 814.25	V	-68.12	8.36	-59.76	-13.00	46.76	-
	5 721.99	H	-66.10	10.74	-55.36	-13.00	42.36	-
	7 631.30	H	-67.87	12.07	-55.80	-13.00	42.80	-
	9 538.29	V	-62.41	13.22	-49.19	-13.00	36.19	-

External antenna 1

- WCDMA1900 data

Tx Freq. (MHz)	Freq. (MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Note
1 907.6	3 815.08	V	-68.00	8.37	-59.63	-13.00	46.63	-
	5 723.31	V	-68.06	10.74	-57.32	-13.00	44.32	-
	7 630.72	H	-68.20	12.07	-56.13	-13.00	43.13	-
	9 538.93	V	-62.32	13.22	-49.10	-13.00	36.10	-