

# TEST REPORT

## Part 22 Subpart H, Part 24 Subpart E

**Equipment under test** ARI

**Model name** PTAG13-C43G

**FCC ID** SOZPTAG13-C43G

**Contains Module FCC ID** R17CC864-DUAL

**Applicant** Petari Inc.

**Manufacturer** Petari Inc.

**Date of test(s)** 2013.02.20 ~ 2013.03.15

**Date of issue** 2013.04.04

**Issued to**

**Petari Inc.**

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**Issued by**

**KES Co., Ltd.**

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### Revision history

Revision	Date of issue	Test report No.	Description
-	2013.04.04	KES-RF-13T0002	Initial



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### 1.0 General product description

Equipment under test	ARI
Model name	PTAG13-C43G
Serial number	N/A
Frequency Range	Cellular: 824.70 MHz ~ 848.31 MHz(TX), 869.70 MHz ~ 893.31 MHz(RX) PCS: 1851.25 MHz ~ 1908.75 MHz(TX), 1931.25 MHz ~ 1988.75 MHz(TX) Zigbee: 2405 MHz ~ 2480 MHz(TX/RX)
Modulation technique	GMSK(CDMA), O-QPSK(Zigbee)
Antenna type & gain	CDMA: Fixed type( PIFA antenna) // 1.8 dBi Zigbee: Fixed type(PCB antenna) // 2.5 dBi

### 1.1 Test frequency

	Low channel	Middle channel	High channel
Cellular (MHz)	824.70	836.52	848.31
PCS (MHz)	1 851.25	1 880.00	1 908.75

### 1.2 Information about variant model

N/A

### 1.3 Device modifications

N/A

### 1.4 Test facility

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The open area test site is constructed in conformance with the requirements ANSI C63.4-2003.

### 1.5 Laboratory accreditations and listings

Country	Agency	Scope of accreditation	Certificate No.
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	343818
KOREA	KC	EMI (10 meter Open Area Test Site and two conducted sites) Radio (3 & 10 meter Open Area Test Sites and one conducted site)	KR0100
CANADA	IC	3 & 10 meter Open Area Test Sites and one conducted site	4769B-1



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### 2.0 Summary of tests

Section in FCC Part 22, 24	Test item	Status
22.913(a) 24.232(c)	RF radiated output power	C
22.917(a) 24.238(a)	Spurious radiated emission	C

Note 1: C=Complies NC=Not complies NT=Not tested NA=Not applicable

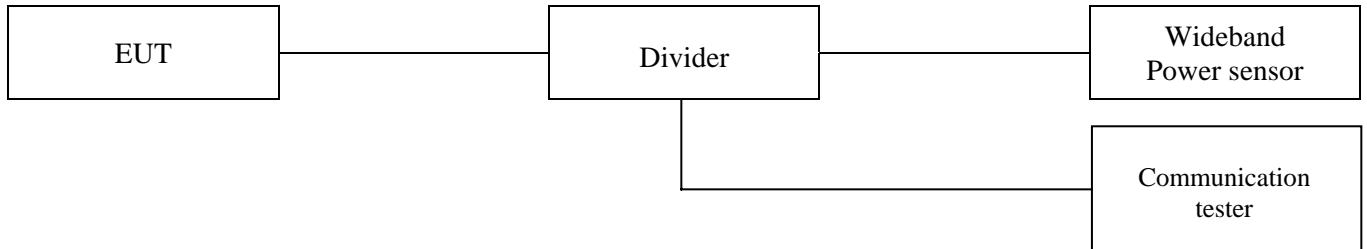
### Statement:

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2003).

## 2.1 Test data

### 2.1.1 Conducted output power

Connected the EUT to Communications tester(CMU 200) as below. Set the EUT transmit the maximum power at the wanted channel via CMU 200. The test was performed using the average power measure under all configurations and the highest power was recorded.

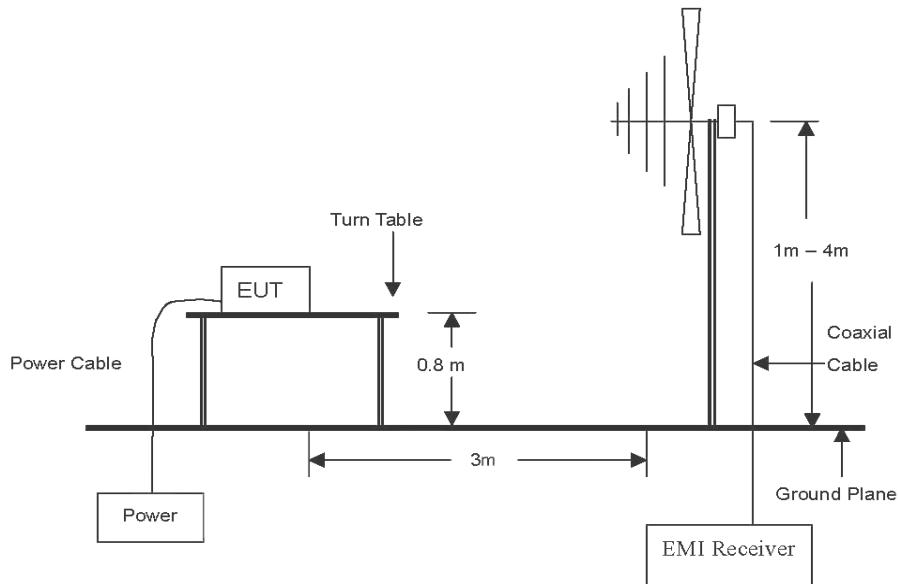


Band	Channel	SO2	SO2	SO55	SO55	TDSO (F+Sch)	TDSO (F-Sch)
		RC1/1	RC3/3	RC1/1	RC3/3	RC3/3	RC3/3
Cellular (dBm)	1013	24.87	24.96	24.89	24.90	<b>25.20</b>	25.16
	363	24.86	24.95	24.85	24.86	24.90	24.86
	777	24.60	24.77	24.61	24.70	24.96	24.95
PCS (dBm)	25	24.48	24.48	24.40	24.43	<b>24.51</b>	24.50
	600	24.31	24.36	24.29	24.30	24.28	24.22
	1175	24.39	24.41	24.37	24.38	24.44	24.47

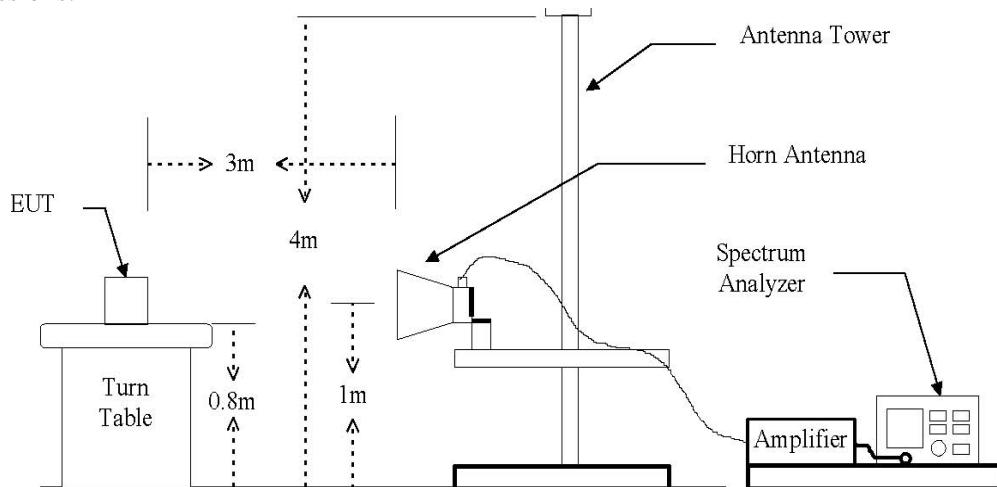
### 2.1.2 RF radiated output power & spurious radiated emission

#### Test setup

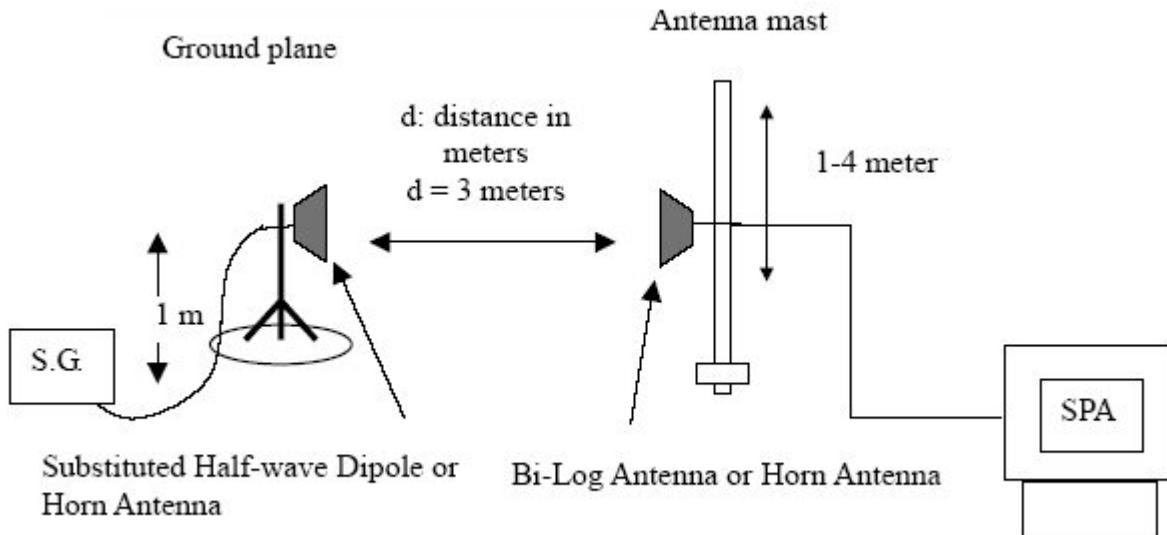
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 18 GHz emissions.



The diagram below shows the test setup for substituted method



#### Test procedure : Based on ANSI/TIA 603C: 2004

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. During the measurement of the EUT, the resolution bandwidth was to 1 MHz and the average bandwidth was set to 1 MHz.
5. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
7. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. The EUT was replaced by half-wave dipole (824~849 MHz) or horn antenna (1850 ~1910 MHz) connected to a signal generator.
11. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
13. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.



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14. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

### Limit

FCC §22.913(a), the ERP of mobile transmitters must not exceed 7 watts. FCC §24.232(c) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.



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### Test results for E.I.R.P. (E.R.P.)

#### A. Cellular

Frequency (MHz)	Ant. Pol. (H/V)	S.G. Level (+ amp) (dBm)	Correction factor (dB)	E.R.P. (dBm)	(W)
824.70	H	21.30	2.72	24.02	0.252
836.52	H	21.40	2.79	24.19	0.262
848.31	H	21.60	2.76	24.36	0.272
824.70	V	15.40	2.72	18.12	0.064
836.52	V	16.60	2.79	19.39	0.086
848.31	V	16.50	2.76	19.26	0.084

#### B. PCS

Frequency (MHz)	Ant. Pol. (H/V)	S.G. Level (+ amp) (dBm)	Correction factor (dB)	E.R.P. (dBm)	(W)
1851.25	H	15.80	8.34	24.14	0.259
1880.00	H	16.30	8.35	24.65	0.291
1908.75	H	16.20	8.39	24.59	0.287
1851.25	V	13.30	8.34	21.64	0.145
1880.00	V	15.30	8.35	23.65	0.231
1908.75	V	14.30	8.39	22.69	0.185

Remark;

1. Correction factor: Substitution antenna gain – Tx cable loss
2. E.R.P. & E.I.R.P = S.G. Level + correction factor
3. The E.R.P. & E.I.R.P was measured in three orthogonal EUT position(x-axis, y-axis and z-axis).  
Worst cases are Y-axis.



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### Test results for spurious radiated emission.

- Test mode: Cellular
- Measured output power:  $25.20 \text{ dBm} = 0.331 \text{ W}$
- Distance: 3 m
- Limit:  $43 + 10\log_{10}(W) = 38.19 \text{ dBc}$

#### A. Cellular

Channel	Frequency	Ant. Pol.	S.G. Level (+ amp)	Correction factor	E.R.P.	dBc	Margin
	(MHz)	(H/V)	(dBm)	(dB)	(dBm)		(dB)
Low	1649.7	H	-58.00	5.39	-52.61	76.63	38.44
Middle	1671.5	H	-56.00	5.36	-50.64	74.83	36.64
Middle	1671.5	V	-64.00	5.36	-58.64	77.95	39.76
High	1696.8	H	-52.00	5.37	-46.63	70.99	32.80
High	1696.2	V	-64.00	5.37	-58.63	77.87	39.68

Remark;

1. Correction factor: Substitution antenna gain(dBd) – Tx cable loss
2. E.R.P. & E.I.R.P = S.G. Level + correction factor
3. The E.R.P. & E.I.R.P was measured in three orthogonal EUT position(x-axis, y-axis and z-axis).  
Worst cases are Y-axis.

- Test mode: PCS
- Measured output power: 24.51 dBm = 0.282 W
- Distance: 3 m
- Limit:  $43 + 10\log_{10}(W) = 37.50$  dBc

### B. PCS

Channel	Frequency	Ant. Pol.	S.G. Level (+ amp)	Correction factor	E.I.R.P.	dBc	Margin
	(MHz)	(H/V)	(dBm)	(dB)	(dBm)		(dB)
Low	3702.2	H	-59.70	9.81	-49.89	74.03	36.53
Low	3701.7	V	-57.70	9.81	-47.89	69.57	32.07
Middle	3759.9	H	-55.70	9.82	-45.88	70.53	33.03
Middle	3759.4	V	-53.70	9.82	-43.88	67.56	30.06
High	3816.4	H	-53.70	9.93	-43.77	68.36	30.86
High	3816.4	V	-55.70	9.93	-45.77	68.41	30.91
High	5726.7	H	-57.30	10.05	-47.25	71.84	34.34
High	5726.7	V	-58.30	10.05	-48.25	70.89	33.39

Remark;

1. Correction factor: Substitution antenna gain(dBi) – Tx cable loss
2. E.R.P. & E.I.R.P = S.G. Level + correction factor
3. The E.R.P. & E.I.R.P was measured in three orthogonal EUT position(x-axis, y-axis and z-axis).  
 Worst cases are Y-axis.



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### Appendix A. Test equipment used for test

Equipment	Manufacturer	Model	Calibration due.
Spectrum Analyzer	R&S	FSV30	2014.01.09
8360B Series Swept Signal Generator	HP	83630B	2013.06.06
Dipole Antenna	SCHWARZBECK	UHAP	2013.04.29
Dipole Antenna	SCHWARZBECK	UHAP	2013.04.29
Horn Antenna	A.H. System	SAS-571	2013.09.07
Horn Antenna	Schwarzbeck	BBHA 9121 D	2013.12.06
Loop Antenna	R&S	HFH2-Z2.335.4711.52	2013.03.10
High Pass Filter	WEINSCHEL	WHKX11.2/15G-6TT	2013.09.14
High Pass Filter	Wainwright Instrument	WHJS3000-10TT	2014.01.10
Preamplifier	HP	8449B	2013.08.02
Preamplifier	HP	8447F	2014.02.27
Wideband Power Sensor	R&S	NRP-Z81	2014.01.09
Radio communication tester	R&S	CMU 200	2013.12.10
Power Divide	WEINSCHEL	1515	2013.05.04

### Peripheral devices

Device	Manufacturer	Model No.	Serial No.
-	-	-	-

**Appendix B. Test setup photo****Radiated field emissions**

End of test report