

R051-24-10-103051-5/A Ed. 1

“This report cancels and replaces the test report N°R051-24-10-103051-5/A Edition 0”

RADIO test report

**according to standard:
FCC Part 15**

**Equipment under test:
M2M tracking system CV90-J8100
Co-location measurements**

**Company:
TES Electronic Solutions**

DISTRIBUTION: Mr LE TORC'H

Company: TES Electronic Solutions

Number of pages: 13 including 2 annexes

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			Name	Visa	Name	Visa
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PRODUCT: M2M tracking system CV90-J8100

Reference / model: CV90-J8100

Trade mark: Qualcomm Incorporated

Serial number: not communicated

MANUFACTURER: TES Electronic Solutions

COMPANY SUBMITTING THE PRODUCT:

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DATE(S) OF TEST: 18 December 2010

TESTING LOCATION: EMITECH ATLANTIQUE laboratory at ANGERS (49) FRANCE
EMITECH ATLANTIQUE open area test site in LA POUEZE (49)
FRANCE
FCC Registration Number: 101696/FRN: 0006 6490 08

TESTED BY: M. DUMESNIL

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1. INTRODUCTION

This report presents the results of radio test carried out on the following equipment: M2M tracking system CV90-J8100 – Co-location measurements, in accordance with normative reference.

2. PRODUCT DESCRIPTION

Class: B (residential environment)

Utilization: tracking unit with Bluetooth and GSM functions

Power source: 12 Vd.c

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.
They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

FCC Part 15 (2009) Radio Frequency Devices

ANSI C63.4 (2003) Methods of Measurement of Radio-Noise Emissions from Low-voltage Electrical and Electronics Equipment in the range of 9 kHz to 40 GHz.

4. TEST METHODOLOGY

Radio performance tests procedures given in part 15:

Subpart B –Unintentional Radiators

Paragraph 107: conducted limits

Paragraph 109: radiated emission limits

Paragraph 111: antenna power conduction limits for receivers

Subpart C – Intentional Radiators

Paragraph 203: antenna requirement

Paragraph 207: conducted limits

Paragraph 209: radiated emission limits; general requirements

5. TESTS RESULTS SUMMARY

5.1 unintentional radiator (subpart B)

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAP	NAs	
FCC Part 15.107	CONDUCTED LIMITS			X		
FCC Part 15.109	RADIATED EMISSION LIMITS				X	
FCC Part 15.111	ANTENNA POWER CONDUCTED LIMITS FOR RECEIVER			X		

NAP: Not Applicable

NAs: Not Asked

5.2 intentional radiator (subpart C)

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAP	NAs	
FCC Part 15.203	ANTENNA REQUIREMENTS	X				Note 1
FCC Part 15.207	CONDUCTED LIMITS			X		
FCC Part 15.209	RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS	X				Note 2

NAP: Not Applicable

NAs: Not Asked

Note 1: Dedicated antenna. Professionally installed equipment.

Note2: Unwanted emissions levels are all below the fundamental emission field strength level.
Measurements are realized with Bluetooth and GSM modules transmitting simultaneously.

Conclusion:

The sample of M2M tracking system CV90-J8100 submitted to the tests complies with the regulations of the standard FCC Part 15 in accordance with the limits or criteria defined in this report.

6. RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS

Standard: FCC Part 15

Test procedure: paragraph 209

Test equipments:

TYPE	BRAND	EMITECH NUMBER
Test receiver	Rohde & Schwarz ESH3	1058
Test receiver	Rohde & Schwarz ESVS10	1219
Spectrum analyzer	Rohde & Schwarz FSP40	4088
Loop antenna	EMCO 6502	1406
Biconical antenna	Hewlett Packard 11966 C	0728
Log periodic antenna	Rohde & Schwarz HL 223	1999
Double ridged guide antenna	Electrometrics EM 6961	1204
Double ridged guide antenna	Electrometrics EM 6961	1938
Preamplifier 1 to 18 GHz	DBS Microwave DB97-1852	2648
High pass filter	Micro-tronics HPM11630	6609
Open area test site	EMITECH	1274
Power source	Hewlett Packard E3610A	4195
Multimeter	Fluke 77-2	0812
Low noise amplifier 2-18 GHz	Microwave DB	1922
High pass filter	Filtek HP12/3200-5AA	
Radio communication tester	Rohde & Schwarz CMD55	3591
Meteo station meteostar	Bioblock Scientific	0943

Test set up:

The system is tested in an open area test site (OATS).

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuths correspond to the front of the equipment under test.

Frequency range: From 9 kHz to 10th harmonic of the highest frequency.

Detection mode: Quasi-peak ($F < 1$ GHz) Average ($F > 1$ GHz)

Bandwidth: 120 kHz ($F < 1$ GHz) 1 MHz ($F > 1$ GHz)

Distance of antenna: 3 meters

Antenna height: 1 to 4 meters

Antenna polarization: vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment under test is blocked in continuous transmission mode, modulated by internal data signal, at the highest output power level which the transmitter is intended to operate. The Bluetooth and GSM modules are transmitting simultaneously.

Results:

Ambient temperature (°C): 15
Relative humidity (%): 75

Power source: 12 Vd.c

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi-Peak A: Average	Antenna height (cm)	Azimuth (degree)	resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBμV/m)	Limits (dBμV/m)	Margin (dB)
902.4 ①	QP	226	0	120	H	126.9	/	/
2402 ②	P	124	179	1000	H	107.9	/	/
3304.4	P	157	269	1000	V	61.1	74	12.9
3304.4	A	157	269	1000	V	32.9	54	21.1

① GSM carrier

② Bluetooth carrier

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi-Peak A: Average	Antenna height (cm)	Azimuth (degree)	resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBμV/m)	Limits (dBμV/m)	Margin (dB)
1755.8 ①	P	120	214	1000	H	127.5	/	/
2402 ②	P	117	194	1000	V	103.4	/	/
4157.8	P	169	171	1000	H	69.9	74	4.1
4157.8	A	169	171	1000	H	35.3	54	18.7

① GSM carrier

② Bluetooth carrier

Note: any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

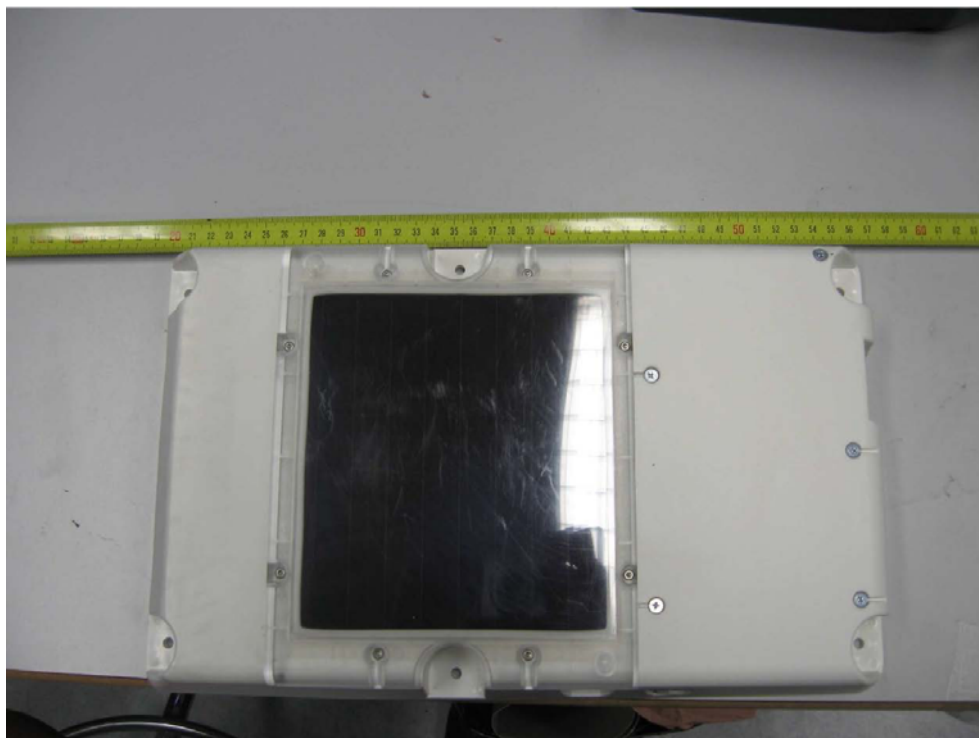
Test conclusion:

RESPECTED STANDARD

□□□ End of report, 2 annexes to be forwarded □□□

ANNEX 1: PHOTOS OF THE EQUIPMENT UNDER TEST

TOP VIEW OF THE EUT



BOTTOM VIEW OF THE EUT



INTERNAL VIEW

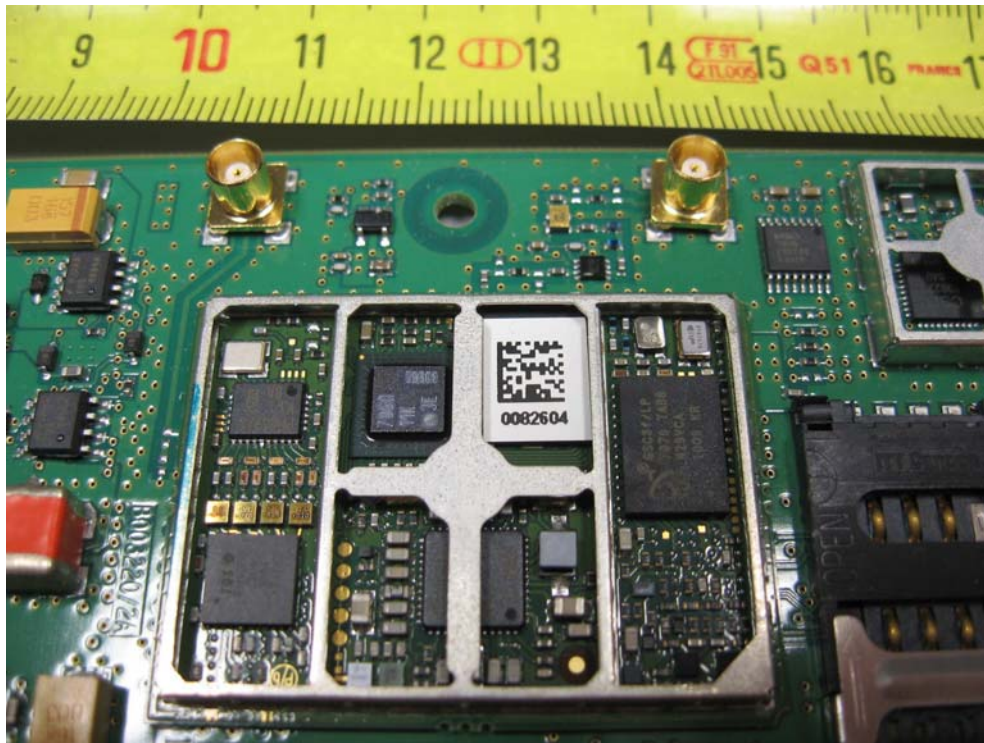


BT antenna

GSM antenna

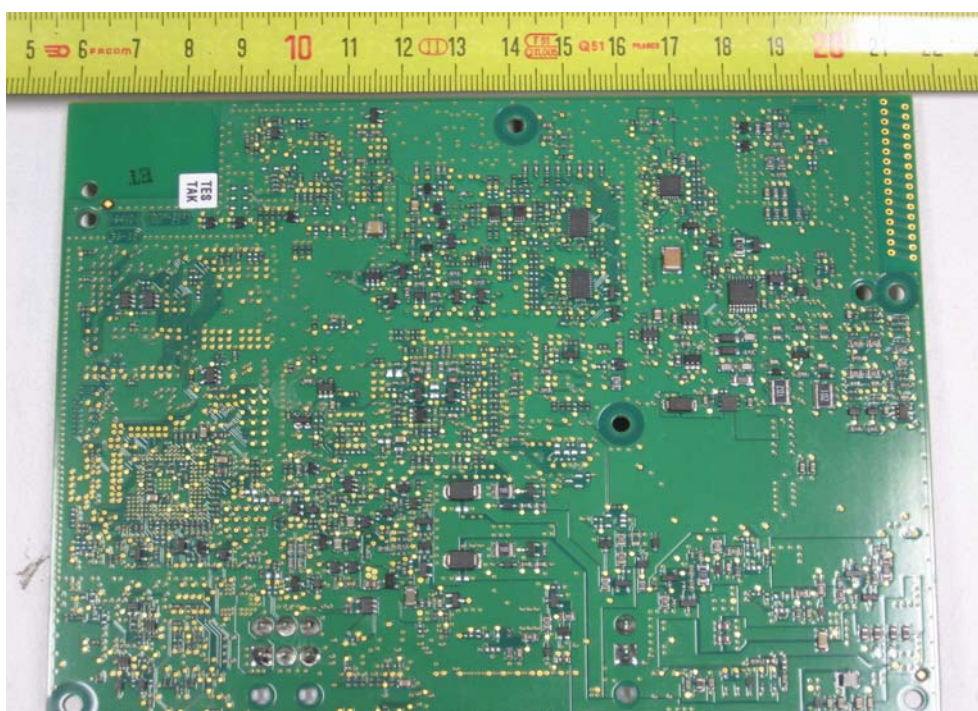
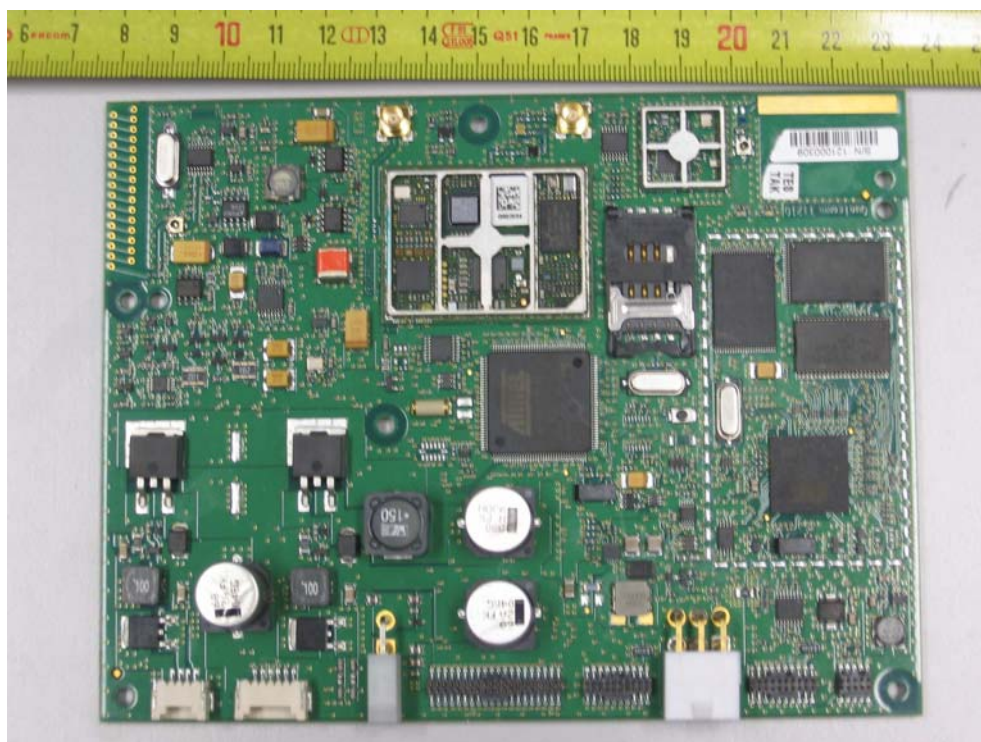
GPS antenna

GSM MODULE



BT MODULE





ANNEX 2: TEST SET UP AND OPEN AREA TEST SITE

RADIATED MEASUREMENTS



OPEN AREA TEST SITE

