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**RA-06-24014-2/A Ed. 0**

## FCC CERTIFICATION RADIO Measurement Technical Report

standard to apply:  
FCC Part 15.247

Equipment under test:  
**HANDSFREE CAR KIT FOR BLUETOOTH  
PHONES WITH COLOR LCD AND GPS  
FUNCTION  
3400 LS GPS**


FCC ID :  
**RKXCK3400**

Company:  
**PARROT**

**DISTRIBUTION: Mr GUERRAB**

**Company: PARROT**

**Number of pages: 26 including 4 annexes**

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SIEGE SOCIAL : EMITECH S.A.

***PRODUCT:*** **HANDSFREE CAR KIT FOR BLUETOOTH PHONES WITH  
COLOR LCD AND GPS FUNCTION**

**Reference / model:** 3400 LS GPS (Mute V4 with Xanthi 2)

**Serial number:** not communicated

***MANUFACTURER:*** Not communicated

***COMPANY SUBMITTING THE PRODUCT:***

**Company:** PARROT

**Address:** 174, quai de Jemmapes  
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**Responsible:** Mr GUERRAB

***DATES OF TEST:*** 17 and 18 January 2006

***TESTING LOCATION:*** EMITECH ATLANTIQUE laboratory at ANGERS (49) FRANCE  
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FRANCE

Registration Number by FCC: 101696/FRN: 0006 6490 08

***TESTED BY:*** L. BERTHAUD

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## 1.INTRODUCTION

This document presents the result of RADIO test carried out on the following equipment: HANDSFREE CAR KIT FOR BLUETOOTH PHONES WITH COLOR LCD AND GPS FUNCTION, 3400 LS GPS in accordance with normative reference.

## 2.PRODUCT DESCRIPTION

ITU Emission code: 1M00F7D

Class: B (residential environment)

Utilization: handsfree car kit for Bluetooth phone with GPS functions

Antenna type: incorporated antenna

Operating frequency range: I.S.M. band from 2400 MHz to 2483.5 MHz

Number of channels: 79

Channel spacing: 1 MHz

Frequency generation:  SAW Resonator  Crystal  Synthetiser

Modulation: Frequency Hopping Spread Spectrum  
 Amplitude  Digital  Frequency  Phase

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 (2005) Code of Federal Regulations  
Title 47 - Telecommunication  
Chapter 1 - Federal Communications Commission  
Part 15 - Radio frequency devices  
Subpart C - Intentional Radiators

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:

- Paragraph 33: frequency range of radiated measurements
- Paragraph 35: measurement detector functions and bandwidths
- Paragraph 205: restricted bands of operation
- Paragraph 207: conducted limits
- Paragraph 209: radiated emission limits; general requirements
- Paragraph 247: operation within the bands 2400-2483.5 MHz

**5.ADD ATTACHMENTS FILES**

- “Synoptic “***
- “Block diagram “***
- “External photos and Product labeling “***
- “Assembly of components “***
- “Internal photos “***
- “Layout pcb “***
- “Bil of materials “***
- “Schematics “***
- “Product description “***
- “User guide “***

**6. TESTS AND CONCLUSIONS**

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAP	NAs	
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS			X		Note 4
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				Note 5
FCC Part 15.247	OPERATION WITHIN THE BAND 2400-2483.5 MHz					
FCC Part 15.247	(a) (1) <i>hopping mode</i>	X				Note 1
FCC Part 15.247	(a) (1) (iii) <i>average time of occupancy</i>	X				Note 2
FCC Part 15.247	(b) (1) <i>max output power</i>	X				Note 6
FCC Part 15.247	(c) <i>operation with directional antenna</i>			X		Note 3
FCC Part 15.247	(d) <i>intentional radiator</i>	X				
FCC Part 15.247	(e) <i>peak power spectral density</i>	X				Note 6
FCC Part 15.247	(f) <i>hybrid system</i>			X		
FCC Part 15.247	(g)	X				Note 7
FCC Part 15.247	(h)	X				
FCC Part 15.247	(i) <i>RF exposure compliance</i>	X				Note 8

NAP: Not Applicable

NAs: Not Asked

Note 1: see annex 1, the frequency hopping system have hopping channel carrier frequencies separated by 1 MHz. The system hop to channel frequencies from a pseudo randomly ordered list of hopping frequencies. Each frequency is used equally on the average by the transmitter, and separated by a minimum of 20 dB bandwidth of the hopping channel.

Note 2: the frequency hopping system use more than 15 channels.  
 The timing by channel is 423 μs (see annex 2).  
 During 79 channels × 0.4 s (part 15) = 31.6 s, any channel is used 320 times, then  
 320 × 423 μs = 135.36 ms, thus the average time of occupancy on any channel is less than 400 ms within a period of 0.4 s multiplied by the number of hopping channels employed, in normal operating mode.

Note 3: the antenna gain is less than 6 dBi.

Note 4: battery source power.

Note 5: see FCC part 15.247 (d).

Note 6: for information only, conducted measurement is not possible (integral antenna), so we used the substitution method in open field.

Note 7: speech application.

Note 8: this type of equipment uses less than 0.5 W of output power with a high signal transmitting duty factor (section 3 from Oet 65c).

**Conclusion:**

The sample of HANDSFREE CAR KIT FOR BLUETOOTH PHONES WITH COLOR LCD AND GPS FUNCTION, CK3400 LS GPS 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.

**7. PEAK OUTPUT POWER****Standard:** FCC Part 15**Test procedure:** paragraph 15.247**Test equipment:**

TYPE	BRAND	EMITECH NUMBER
Spectrum analyzer FSP 40	Rohde & Schwarz	4088
Diode detector ODZ0004A	Omniyig	2469
Oscilloscope THS 720	Tektronix	0940
Power source E3610A	Hewlett Packard	4195
Antenna RGA60	Electrometrics	1938
Antenna RGA60	Electrometrics	1204
Open site	EMITECH	1274
Radio frequency generator SME06	Rohde & Schwarz	1669
High pass filter HPM11630	Micro-tronics	1673
Low-noise amplifier 1 to 18 GHz	ALC	2648
Power meter 8541B	Gigatronics	3479
Power sensor 80401A	Gigatronics	3182

**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 azimuth corresponds to the front of the equipment under test.

We use for this measure outdoor test site, by substitution method. The measuring distance between the equipment and the test antenna is 3 m. The antenna have been oriented in the two polarizations, we have recorded only highest level.

In first the spectrum analyzer is replaced by a diode detector which is connected to the vertical channel of an oscilloscope.

The equipment under test is substituted by a signal generator with a calibrated double ridged guide antenna, and its level adjusted such that the deviation of the Y-trace of the oscilloscope reaches the level obtained with the E.U.T.

The output power level of the signal generator is measured with a calibrated RF power meter.

Then a measurement of the electro-magnetic field is realized, with a resolution bandwidth and video bandwidth adjusted at 1 MHz.

**Distance of antenna:** 3 meters**Antenna height:** 1 to 4 meters**Antenna polarization:** vertical and horizontal**Equipment under test operating condition:**

The equipment is blocked in continuous transmission mode at the highest output power level which the transmitter is intended to operate, modulated by internal data signal.

**Results:**

Ambient temperature (°C): 19  
 Relative humidity (%): 63

Polarization of test antenna: horizontal (height: 138 cm)  
 Position of equipment: flat position (azimuth: 198 degrees)

Sample N° 1

		<b>Peak Output Power radiated at these frequencies (W): from 2402 MHz to 2480 MHz</b>	<b>Limits (W)</b>
<b>Normal test conditions</b>	Nominal power source (V): 12	$3.59 \times 10^{-4}$	1*

\* the frequency hopping systems use at least 75 hopping channel.

Sample n° 1 Channel 1 (2402 MHz)

		<b>Level dBμV</b>	<b>Cable loss dB</b>	<b>Antenna factor dB</b>	<b>Electro-magnetic field (dBμV/m):</b>	<b>P* (W)</b>
<b>Normal test conditions</b>	Nominal power source (V): 12	54.64	4.31	27.46	86.41	$1.31 \times 10^{-4}$

\*  $P = (E \times d)^2 / (30 \times G_p)$  with  $d = 3$  m and  $G_p = 1$

Sample n° 1 Channel 40 (2441 MHz)

		<b>Level dBμV</b>	<b>Cable loss dB</b>	<b>Antenna factor dB</b>	<b>Electro-magnetic field (dBμV/m):</b>	<b>P* (W)</b>
<b>Normal test conditions</b>	Nominal power source (V): 12	53.70	4.31	27.46	85.47	$1.06 \times 10^{-4}$

\*  $P = (E \times d)^2 / (30 \times G_p)$  with  $d = 3$  m and  $G_p = 1$

Sample n° 1 Channel 79 (2480 MHz)

		<b>Level dBμV</b>	<b>Cable loss dB</b>	<b>Antenna factor dB</b>	<b>Electro-magnetic field (dBμV/m):</b>	<b>P* (W)</b>
<b>Normal test conditions</b>	Nominal power source (V): 12	53.37	4.31	27.46	85.14	$0.98 \times 10^{-4}$

\*  $P = (E \times d)^2 / (30 \times G_p)$  with  $d = 3$  m and  $G_p = 1$

**Test conclusion:**

RESPECTED STANDARD



**8. PEAK POWER DENSITY**

**Standard:** FCC Part 15

**Test procedure:** paragraph 15.247

**Test equipment used:**

TYPE	MANUFACTURER	EMITECH NUMBER
Spectrum analyzer FSP 40	Rohde & Schwarz	4088
Power source E3610A	Hewlett Packard	4195
Open site	Emitech	1274
Radiofrequency generator SME06	Rohde & Schwarz	1669
Antenna RGA-60	Electrometrics	1938
Antenna RGA-60	Electrometrics	1204
Power meter 8541B	Gigatronics	3479
Power sensor 80401A	Gigatronics	3182

**Measured condition:**

We used the same method of the peak output power, but the oscilloscope and the diode is replaced by a spectrum analyzer used in combination with an RF power meter.

Resolution bandwidth: 3 kHz

Video bandwidth: 10 kHz

**Test operating condition of the equipment:**

The equipment is blocked in continuous transmission mode at the highest output power level which the transmitter is intended to operate, modulated by internal data signal.

**Results:**

Ambient temperature (°C): 19

Relative humidity (%): 63

Power source: 12 V.d.c.

Sample n° 1 Channel 1

	<b>Peak power density at frequency: 2402 MHz</b>
<b>Normal test conditions</b>	-19.78 dBm
<b>Limits</b>	+8 dBm

Sample n° 1 Channel 40

	<b>Peak power density at frequency: 2441 MHz</b>
<b>Normal test conditions</b>	-22.74 dBm
<b>Limits</b>	+8 dBm

Sample n° 1 Channel 79

	<b>Peak power density at frequency: 2480 MHz</b>
<b>Normal test conditions</b>	-19.4 dBm
<b>Limits</b>	+8 dBm

**Test conclusion:**

RESPECTED STANDARD

**9.RADIATED EMISSION OF TRANSMITTER****Standard:** FCC Part 15**Test procedure:** paragraph 15.205  
paragraph 15.209  
paragraph 15.247**Test equipment:**

TYPE	BRAND	EMITECH NUMBER
Test receiver ESH3	Rohde & Schwarz	1058
Test receiver ESVS 10	Rohde & Schwarz	1219
Spectrum analyzer FSP 40	Rohde & Schwarz	4088
Loop antenna	EMCO	1406
Biconical antenna HP 11966C	Hewlett Packard	728
Log periodic antenna HL 223	Rohde & Schwarz	1999
Open site	Emitech	1274
Antenna RGA-60	Electrometrics	1204
Low-noise amplifier	Microwave DB	1922
High pass filter HP12/3200-5AA	Filtek	
Antenna WR42	IMC	1939
Power source E3610A	Hewlett Packard	4195

**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 azimuth corresponds to the front of the equipment under test.

**Frequency range:** from 9 kHz to harmonic 10 ( $F_{\text{carrier}} \leq 10 \text{ GHz}$ )**Detection mode:** Quasi-peak ( $F < 1 \text{ GHz}$ )  
Peak ( $F > 1 \text{ GHz}$ )**Bandwidth:** 120 kHz ( $F < 1 \text{ GHz}$ ) or 100 kHz, following 15.205 or 15.247  
1 MHz ( $F > 1 \text{ GHz}$ ) or 100 kHz, following 15.205 or 15.247**Distance of antenna:** between 30 m and 3 m according the frequencies and the limits.**Antenna height:** 1 to 4 meters**Antenna polarization:** vertical and horizontal**Equipment under test operating condition:**

The equipment is blocked in continuous transmission mode at the highest output power level which the transmitter is intended to operate, modulated by internal data signal.

**Results:**

Ambient temperature (°C): 19.5

Relative humidity (%): 64

Power source: 12 Vd.c.

The polarity column refers to the antenna polarity at which the maximum emissions level is measured.

FREQUENCIES (MHz)	Antenna height (cm)	Azimuth (degree)	resolution bandwidth (kHz)	Video bandwidth (Hz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4804	237	84	1000	10	H	47.12	53.98*	6.86
4882	240	78	1000	10	H	43.18	53.98*	10.8
4960	232	6	1000	10	H	51.76	53.98*	2.22

\* restricted bands of operation in 15.205, this limit corresponding at the 15.209 section.

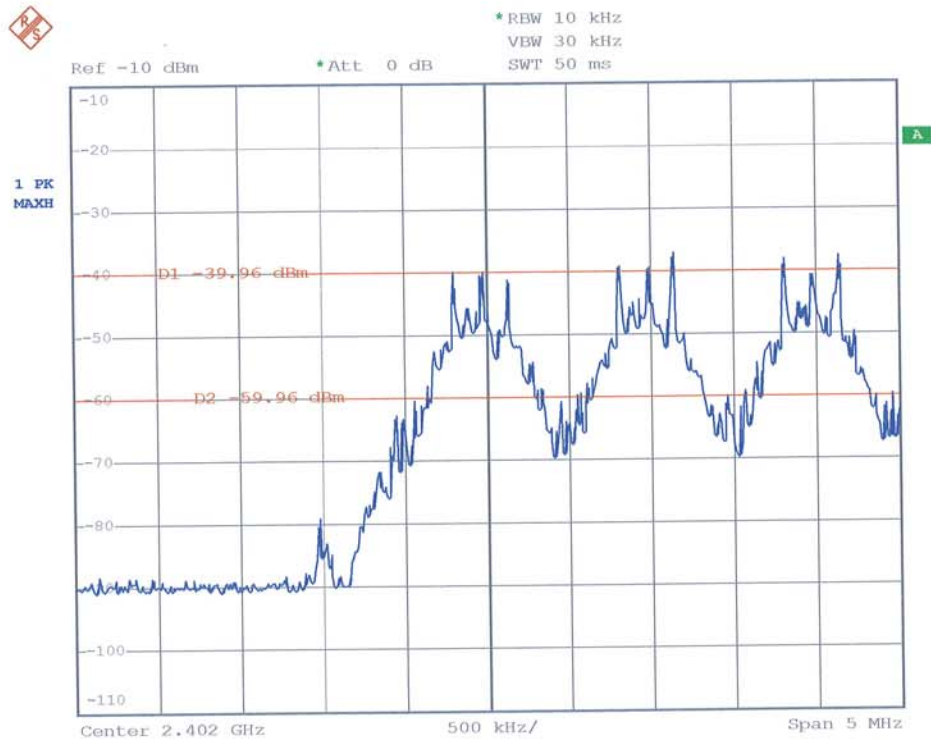
Applicable limits: 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the power produced by the equipment, in 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating. In addition radiated emissions which fall in the restricted band, as defined in section 15.205 (c), must also comply with the radiated emission limits specified in section 15.209 (a).

**TEST CONCLUSION:**

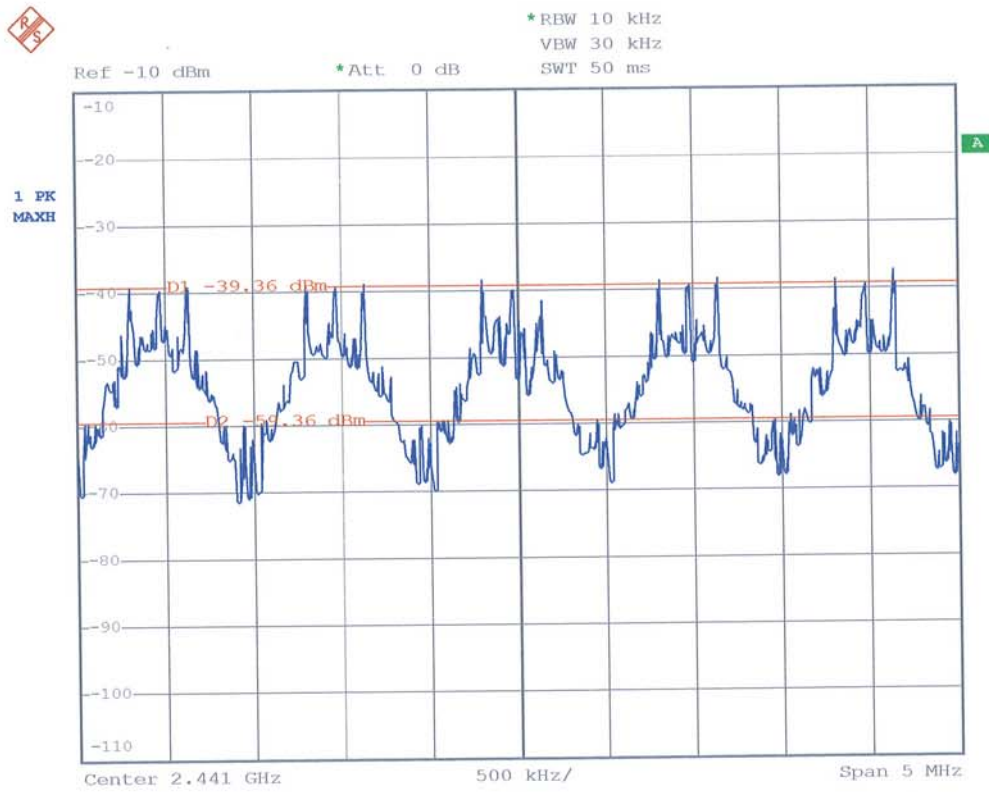
RESPECTED STANDARD

End of report, 4 annexes to be forwarded

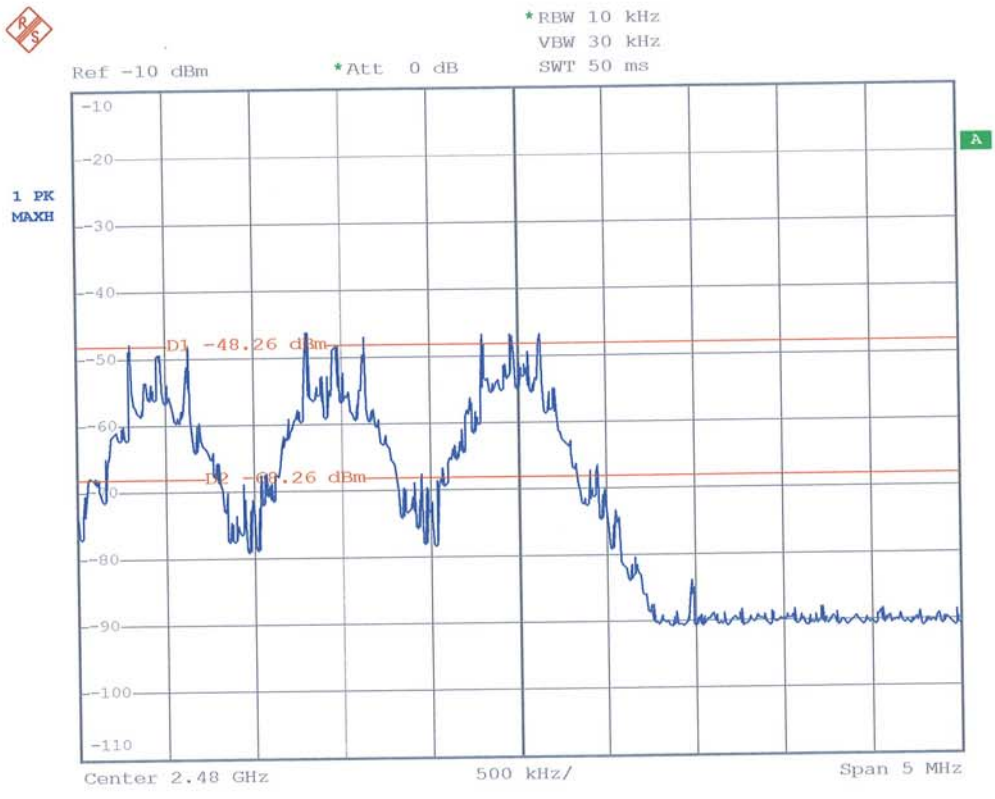
# ANNEX 1: CHANNEL SEPARATION



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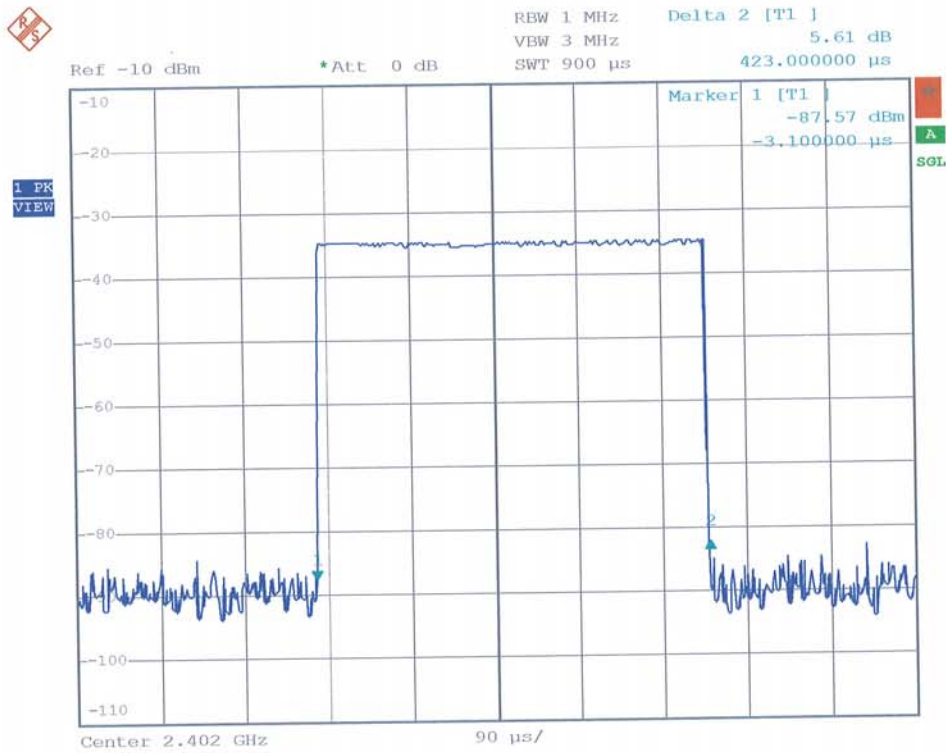


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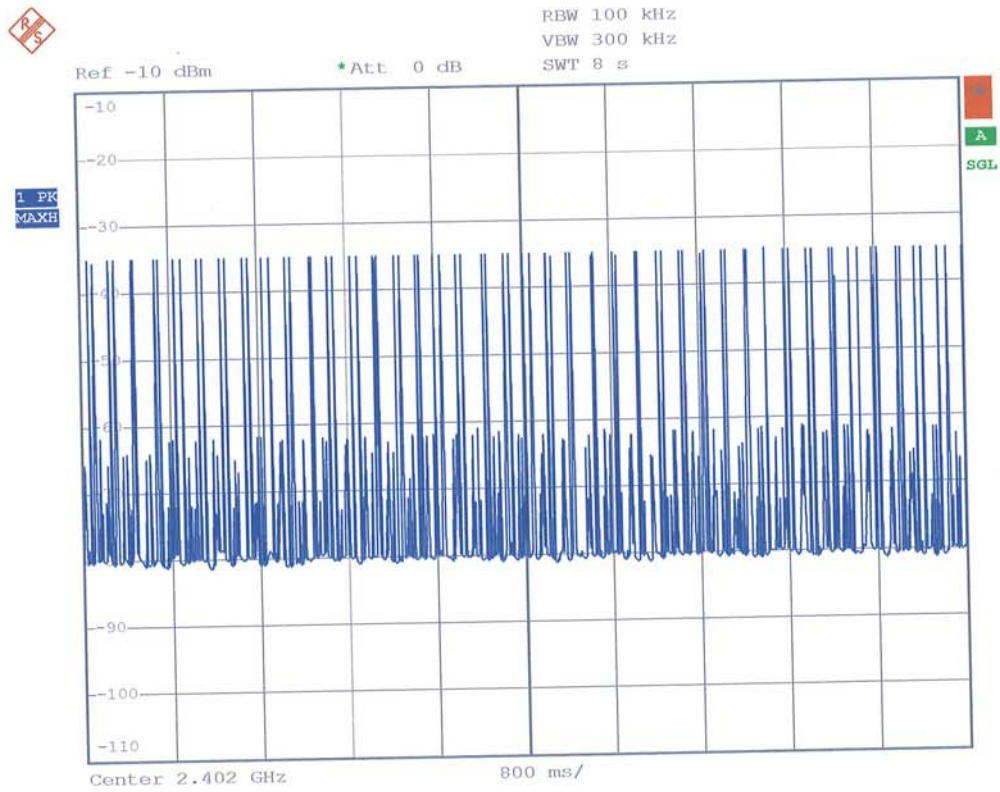
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## ANNEX 2: AVERAGE TIME OF OCCUPANCY ON ANY FREQUENCY

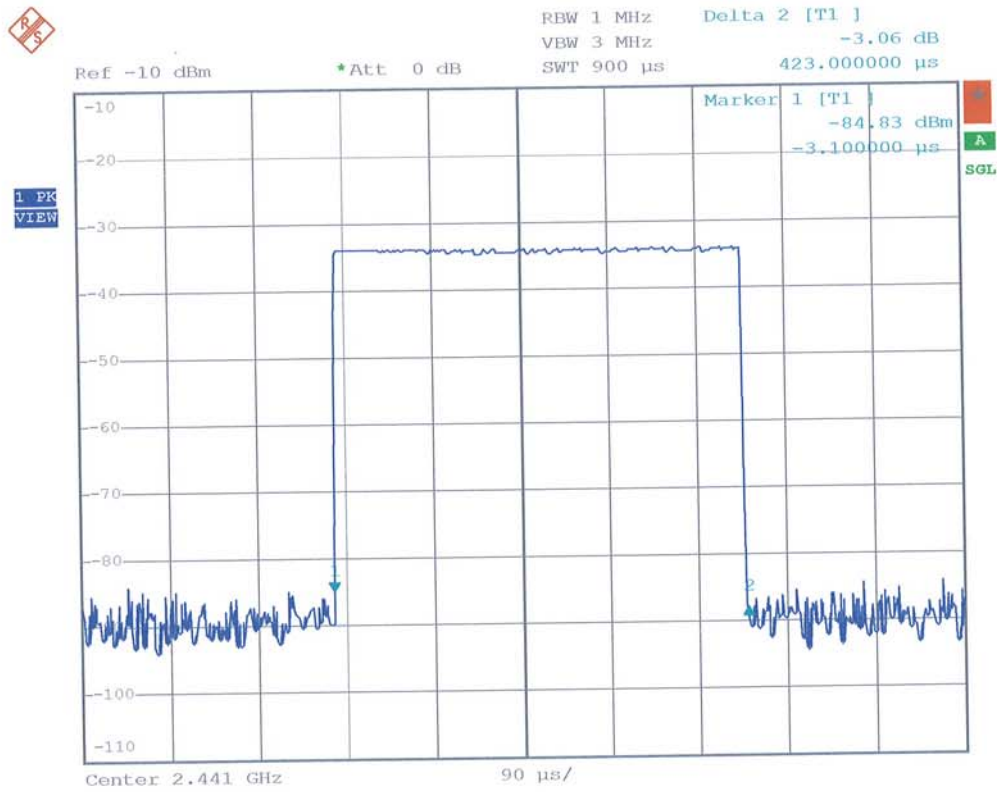


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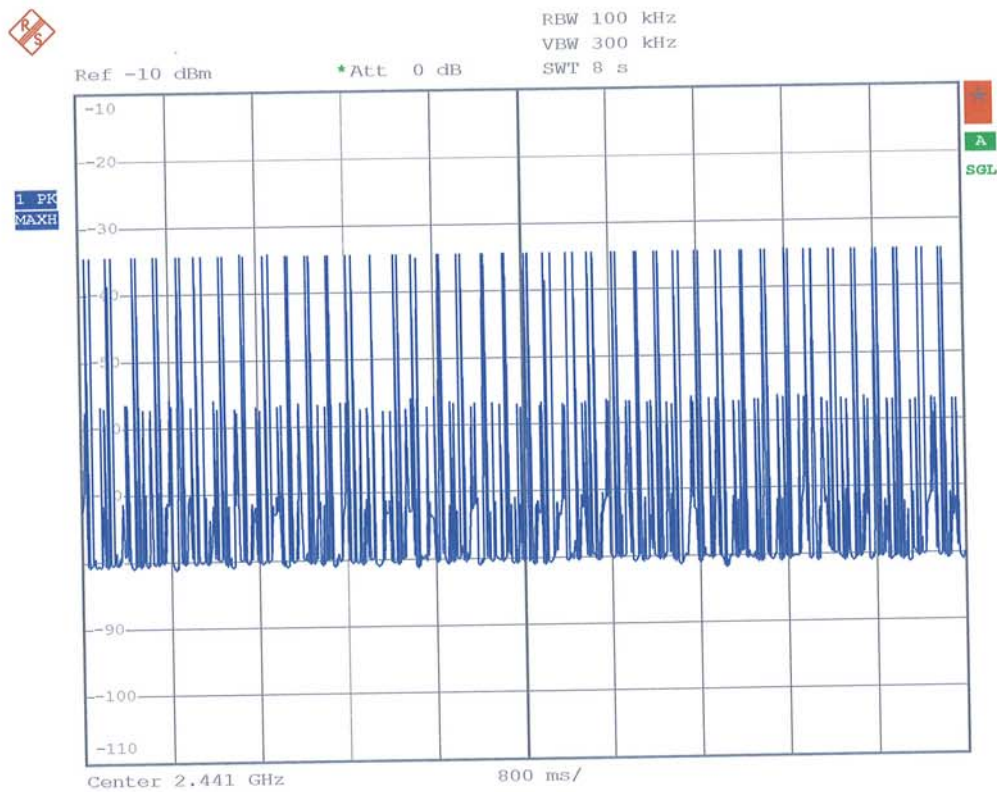




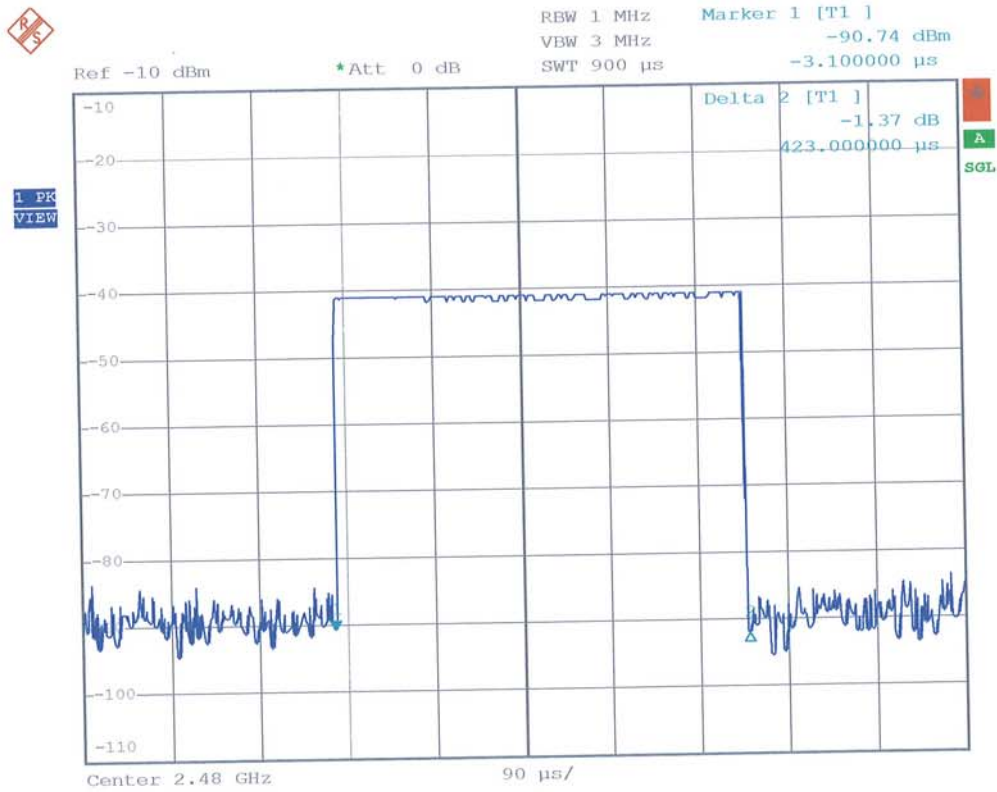
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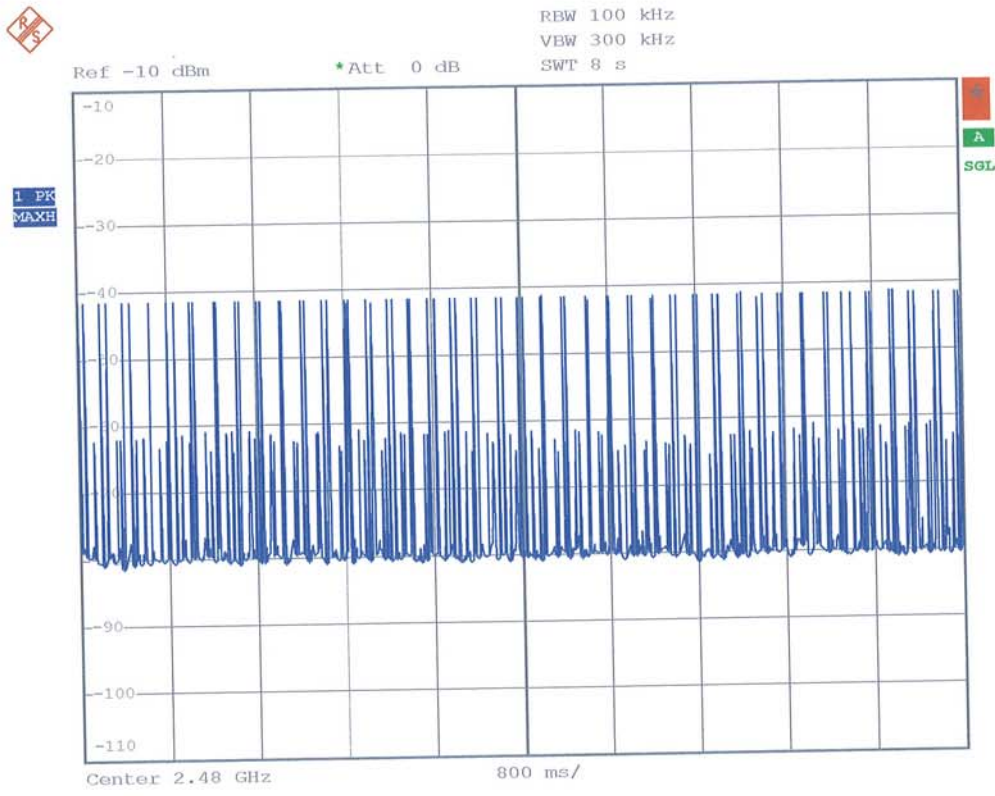
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