



R041-08-102607-1A - DM / CHB

*This report cancels and replaces test report ref R041-08-102607-1A Ed 0*

## RADIO TESTS REPORT

According to (the) standard(s) :

RSS-210 Issue 7 (2007)  
& FCC Part 15 (2007)

Equipment under test:

Transmitter WUS for motorcycle's tyres –  
WUS MOTO 080012000 –  
IC: 6450A-S108001  
FCC ID: T45S108001

Company:



LDL Technology

Ed. 1

Diffusion: Mr GUERIN

(Company: LDL Technology)

Number of pages: 13 including 1 annex

Ed.	Date	Modified page(s)	Written by		Technical verification		Quality approval	
			Name	Visa	Name	Visa	Name	Visa
1	28-Aug-08	1, 5 and 7	David MONTAULON		Régis GONZALEZ		Olivier HEYER	

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*NAME OF THE EQUIPMENT UNDER TEST (E.U.T):* Transmitter WUS for motorcycle's tyres -  
WUS MOTO 080012000

*Serial number* : 0801339A (Permanent emission)  
080133A6 (Emission each 5s)

*Part number* : None

*Software Version* : None

*MANUFACTURER'S NAME* : LDL Technology

*APPLICANT'S ADDRESS:*

*Company:* LDL Technology

*Adress:* 3 rue Hermès  
31520 RAMONVILLE St-AGNE  
FRANCE

*Person(s) present during the tests:* Nobody

*Responsible:* Mr GUERIN

*DATE(S) OF TEST(S)* : July, the 10<sup>th</sup> and 15<sup>th</sup> of 2008

*TEST(S) LOCATION(S)* : Emitech Grand Sud Laboratory in Vendargues (34)  
Open Area Test Site in Salinelles (30)  
IC filing number: 6290  
FCC Registration number: 812719

*TEST(S) SUPERVISOR* : Nobody

*TEST(S) OPERATOR(S)* : David MONTAULON

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**1. INTRODUCTION**

This document submits the results of Radio tests performed on the equipment Transmitter WUS for motorcycle's tyres - WUS MOTO 080012000 according to the document(s) listed below.

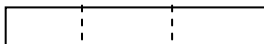
**2. REFERENCE DOCUMENT(S)**

RSS-210 Issue 7 (2007)	Low-power – Licence exempt Radiocommunication devices (all frequency bands): category 1 equipment
FCC Part 15 (2007)	Code of Federal Regulations Title 47 – Telecommunications Chapter 1 – Federal Communications Commission Part 15 – Radio frequency devices Subpart C – Intentional Radiators
RSS-Gen Issue 2 (June 2007)	General requirements and information for the Certification of radiocommunication equipment
ANSI C 63.4 (2003)	American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

**3. EQUIPMENT UNDER TEST CONFIGURATION AND DESCRIPTION**

Equipment under test (E.U.T.) description: Pressure of motorcycle's tyres is transmitted from wheels (wheel unit sensor transmitter) to receiver on handle bar. Equipment is stand alone and has no wire.

Cycle and operating mode during emission tests: Transmitter is on permanent no modulated emission excepted for bandwidth measurement.



Wheel unit sensor transmitter  
(WUS MOTO 080012000)

Equipment modifications applied during tests: No

**4. EQUIPMENT CHARACTERISTIC**

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IC: 6450A-S108001

FCC ID: T45S108001

ITU emission code: 100KF1D

Utilization: Pressure of motorcycle's tyres is transmitted from wheels (wheel unit sensor transmitter) to receiver on handle bar. Equipment is stand alone and has no wire.

Antenna type: Integrated wire antenna

Operating frequency: 315 MHz

Number of channels: 1

Channel spacing: Not concerned

Frequency generation:  SAW Resonator  Crystal  SynthetizerModulation:  Amplitude (pulsed modulated device)  Digital  Frequency  Phase

Power source: 1 x BR2032 (3 V) battery

**5. EQUIPMENT UNDER TEST CONFIGURATION SCHEME**

Equipment is set out on a wooden table at 0.8 m of the ground plane (see Photograph(s) in annex 1).

**6. SUMMARY OF TEST RESULTS**

Tests designation or section		Results satisfying?	Comments
15.33	Frequency range of radiated measurement	-	Considered
15.35	Measurement detector functions and bandwidths	-	Considered
15.203	Antenna requirement	YES	Nota 1
15.205 and Table 1 of RSS-210	Restricted bands of operation	YES	
15.209 and Table 2 of RSS-210	Radiated emission limits, general requirements	YES	Considered
15.231 and Annex 1 of RSS 210 Momentarily Operated Devices and Remote Control	Periodic operation in the band 40.66 40.70 MHz and above 70 MHz		
	a) and A.1.1.1.) Transmission requirements	YES	Requirements of e) is used
	b) and A 1.1.2.) Radiated emission	N.A.	Requirements of e) is used
	c) and A 1.1.3.) Occupied bandwidth	YES	Nota 2
	d) and A 1.1.4.) Frequency tolerance	N.A.	E.U.T. does not transmit in the band 40.60 – 40.70 MHz
	e) and A 1.1.5.) Periodic alternate field strength measurement	YES	Nota 3

N.P.: Not Performed.

N.A.: Not Applicable.

Sample submitted to the tests complies with the regulations of the standard FCC part 15 (2007) and with the requirements of RSS-210 (2007) according to limits specified in this tests report.

*Nota 1:* Internal antenna without connector

*Nota 2:* The bandwidth of the emission at 20 dBc is 97.5 kHz (see Photo(s) in annex), less than 0.25 % (787.5 kHz) of the center frequency (315MHz)

*Nota 3:* Calculation of field strength limit of fundamental (315 MHz):  
 $16.6667 \text{ (F)} - 2833.3333 = 2416.7 \text{ } \mu\text{V/m} = 67.60 \text{ dB}\mu\text{V/m}$   
The transmission consist of three 10ms words long about 122ms and 164ms apart. Word duration is about 10.13ms (in the worst case) (see Photo(s) in annex).  
Total Burst duration of each transmission is 300 ms every minute (see Photo(s) in annex).

## 7. RADIATED ELECTRIC FIELD MEASUREMENT

Standard: RSS-210 Issue 7 (2007) & FCC part 15 (2007)

Test method: ANSI C 63.4 (2003)

Test method deviation: No

Measured condition: Measure applies on open area test site. Test antenna is oriented in vertical and horizontal polarization; product is rotated through 360° in the horizontal plane. Highest levels are recorded. Measuring distance between equipment and test antenna is 3 m.

Instrumentation test List:

CATEGORY	BRAND	TYPE	N° EMITECH
Antenna	Rohde & Schwarz	HL 223	3126
Antenna	Emco	Horn 3117	5456
Cable		N-6m	3610
Cable		N-5m	2715
Cable		N-17m	3620
OATS	Emitech	Salinelles	3482
Preamplifier	Microwave	HF	2165
Receiver	Agilent Technologies	Agilent E7405A	2161

Resolution bandwidth used on Open Area Test Site:

Frequency band	Resolution Bandwidth	Detection mode
$30 \text{ MHz} \leq F < 1 \text{ GHz}$	120 kHz	Peak
$1 \text{ GHz} \leq F \leq 3.15 \text{ GHz}$	1 MHz	Peak

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Test operating condition of the equipment: Carrier Permanent emission

Results: See Boards hereafter

TEST LOCATION : Open area test site SALINELLES (30)

RADIATED EMISSION : Electric field

TEST DISTANCE : 3 m

INITIAL POSITION : 0° see photo in annex 1

*VERTICAL POLARISATION*

	Frequency (MHz)	Azimuth (Degrees)	Antenna Height (cm)	Measure (dBµV/m) without DCF	Duty Cycle Factor (*) (dB)	Measure (dBµV/m) with DCF	Standard Limit (dBµV/m)	Comments
Fundamental	315.00	268	100	64.94	-19.80	45.14	67.60	C
H2	630.00	76	100	52.99	-19.80	33.19	54.00	C
H3	945.00	0	100	47.71	-19.80	27.91	54.00	C
H4	1260.00	146	100	44.96	-19.80	25.16	54.00	C
H5	1575.00	160	100	45.52	-19.80	25.72	54.00	C
H6	1890.00	60	100	37.77	-19.80	17.97	54.00	C
H7	2205.00	165	100	47.48	-19.80	27.68	54.00	C
H8	2520.00	50	165	56.11	-19.80	36.31	54.00	C
H9	2835.00	169	165	55.62	-19.80	35.82	54.00	C
H10	3150.00	124	130	40.11	-19.80	20.31	54.00	C

C = Compliant

NC = Not compliant

*HORIZONTAL POLARISATION*

	Frequency (MHz)	Azimuth (Degrees)	Antenna Height (cm)	Measure (dBµV/m) without DCF	Duty Cycle Factor (*) (dB)	Measure (dBµV/m) with DCF	Standard Limit (dBµV/m)	Comments
Fundamental	315.00	145	100	74.98	-19.80	55.18	67.60	C
H2	630.00	330	200	51	-19.80	31.2	54.00	C
H3	945.00	0	100	44.71	-19.80	27.91	54.00	C
H4	1260.00	220	100	45.48	-19.80	25.68	54.00	C
H5	1575.00	0	100	52.08	-19.80	32.28	54.00	C
H6	1890.00	220	250	38.26	-19.80	18.46	54.00	C
H7	2205.00	0	340	47.59	-19.80	27.79	54.00	C
H8	2520.00	300	221	56.33	-19.80	36.53	54.00	C
H9	2835.00	147	190	51.82	-19.80	32.02	54.00	C
H10	3150.00	330	100	41.73	-19.80	21.93	54.00	C

C = Compliant

NC = Not compliant

(\*) Duty Cycle correction Factor is  $20 \text{ Log } (10.13/100) = -19.8\text{dB}$



**8. OCCUPIED BANDWIDTH**

Standard: RSS-210 Issue 7 (2007) & FCC part 15 (2007)

Test method: RSS-Gen Issue 2 (2007) & FCC part 15 (2007)

Test method deviation: No

Measured condition: A magnetic field near probe detects the maximum field near equipment (relative measurement).

Instrumentation test List:

CATEGORY	BRAND	TYPE	N° EMITECH
Antenna	EMITECH	Near field probe	4653
Receiver	HP	8590L	2001

Resolution bandwidth used:

Frequency band	Span	Resolution Bandwidth (theoretical)	Resolution Bandwidth (used)	Vidéo Bandwidth (theoretical)	Vidéo Bandwidth (used)
315MHz	1.5MHz	>15kHz	30kHz	>30kHz	100kHz

Occupied bandwidth is measured at at 99% (Generally about 20dB down the carrier). Span is selected in order to see all modulation signals around the carrier. Resolution bandwidth is as equal as 1% of selected span but never less. Video bandwidth is at least three times resolution bandwidth.

Test operating condition of the equipment: modulated emission

Limits: 787.5kHz (0.25% from the center frequency)

Results: Occupied bandwidth is measured at 97.5kHz (see photo in annex)

**□□□ End of Report – 1 annex to be forwarded □□□**

# **ANNEX: PHOTOGRAPH(S)**

Equipment Under Test (E.U.T.) PHOTOGRAPH(S):

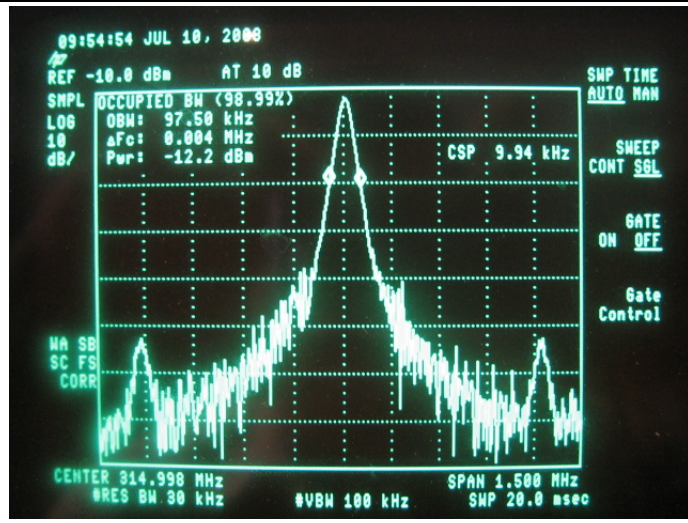
Transmitter (WUS) for motorcycle's tyres - WUS MOTO 080012000

<p>E.U.T.</p>	
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OATS measurement



Occupied bandwidth



Transmission burst

