ENAC ENSAYOS Nº 465/LE1003

RE-BAL006_1205220_SWE_ FA_RSG_ON_03072012

REGISTER OF THE RESULTS OF THE MEASUREMENTS OF THE BALISE I-O CHARACTERISTICS DEBRIS: FREE AIR

Date	Modification/ Description	Authors
03/07/2012	Test execution and Test report	Adrian Vlad/Jose Hierro/Pedro Agudo
-/-/2012	Revised	
-/-/2012	Technical Approval	

1. - TEST CONDITIONS

1	Balise Manufacter	SWE
2	Balise Size	REDUCED
3	Balise Serial Number	1205220
4	Ambient Temperature (ºC)	OK
5	Relative Humidity (%)	OK
6	Atmospheric pressure into the limits	OK
7	Layout and calibration update of the devices Checking	OK
8	Switch APT motors off and Zeros	OK
9	Debris	**Free Air**
10	**Reference Power level P_{27RL}**	**-19,13**
11	**Reference Power level P_{42RL}**	**-34,01**

2. - USED TOOLS

2.1. - INSTRUMENTS

- Cables RG214 /U with connectors Type N, Length = 10 m
- Ferrites TN36/23/15-4A11,TN36/23/15-3C11, TN36/23/15-3E25, TN36/23/15-3C90

The following list includes suitable test equipment:

2.1.1. - Electronic Equipment

STOCK NUMBER	EQUIPMENT	MARK	MODEL	USED
1E	Impedance/Network/Spectrum Analyzer	AGILENT	4395A	
2E	S-PARAMETER TEST SET	AGILENT	87511	
10E	SIGNAL GENERATOR	RHODE & SCHWARZ	STM 02	x
7E	ARBITRARY WAVE GENERATOR	SONY/ TEKTRONIX	AWG 520	X
9E	ARBITRARY WAVE GENERATOR	SONY/ TEKTRONIX	AWG 2005	
18E	ATTENUATOR	NARDA	773-6	x
40E	AMPLIFIER	KALMUS	KAA2040	x
69E	ATTENUATOR	DICONEX	3Db 250w	x
3E	POWER METER	RHODE & SCHWARZ	NRVD	X
42E	POWER SENSOR	RHODE & SCHWARZ	NRV-Z5	X
21E	PREAMPLIFIER	MINI CIRCUITS	15542 ZFL-500	X
53E	LOW PASS FILTER	MINI CIRCUITS	BLP-10.7	X
6E	VECTOR SIGNAL ANALYZER	HEWLETT PACKARD	89410ª	X

54E	LOW PASS FILTER	MINI CIRCUITS	BLP-10.7	X
24E	CURRENT PROBE	TEKTRONIX	CT-2	X
20E	OSCILLOSCOPE	LECROY	7356	X
70E	OSCILLOSCOPE	LECROY	WAVEPRO	
8E	ARBITRARY WAVE GENERATOR	SONY/TECTRONIX	AWG520	
80E	ATTENUATOR	NARDA	773-6	X
61E	AMPLIFIER	AR	100ª250A 100W	X
12E	ATTENUATOR	NARDA	769-10	X
27E	SIGNAL GENERATOR	RHODE&SCHWARZ	STM02	X
80E	ATTENUATOR	NARDA	773-6	X
62E	AMPLIFIER	AR	40AD1 40W	X
31E	ATTENUATOR	NARDA	765-3	X
63E	RETURN LOSS CARD	PROTOTYPE	NA	X
23E	DIRECTIONAL COUPLER	AR	DC2800	
25E	MEDIDOR DE SALINIDAD Y TEMPERATURA	PRIMO 2	PRIMO 2	
64E	CAJA CALIBRACION C4	PROTOTYPE	NA	
65E	DIGITIZER CARD	NI	PCI-5122	
67E	CLIMATIC CHAMBER	CTS	C-70/600	

2.1.2. - Reference Devices

STOCK NUMBER	EQUIPMENT	MARK	USED
1R	STANDARD TEST ANTENNA	PROTOTYPE	X
2R	MODIFIED TEST ANTENNA	PROTOTYPE	
11R	ACTIVATION ANTENNA	PROTOTYPE	
9R	4,2MHz ANTENNA	PROTOTYPE	X
8R	CURRENT SENSE BALUN	PROTOTYPE	
16R	GENERAL PURPOSE BALUN	PROTOTYPE	X
17R	GENERALPURPOSE BALUN	PROTOTYPE	X
18R	GENERALPURPOSE BALUN	PROTOTYPE	X
6R	REDUCED SIZE REFERENCE LOOP	R17	
3R	REDUCED SIZE REFERENCE LOOP	R19	
3R	STANDARD SIZE REFERENCE LOOP	S21	
5R	STANDARD SIZE REFERENCE LOO	S17	

2.2. - CALIBRATION DATA

To perform this test is necessary to have the data from the following calibration:

RC-BAL008_R19_FA_02022012

RC-BAL009_R19_FA_07022012

And the data of the following tests to obtain the parameters A, B, C and D:

RE-BAL001_1205220_SWE_FA_27062012

RE-BAL004_1205220_SWE_FA_27062012

The parameters are:

	A	B	C	D
Parameters	0,58	0,75	1,83	0

2.3. - CHARACTERISTICS OF THE SIGNALS USED DURING THE TEST

2.3.1. - INTERFACE C SIGNALS

1	**C1 SIGNAL CHARACTERISTICS**		
2	**LEVEL V_2 (Vpp) =** 16V	**MDR =** 564,48 kbits/s	**JITTER =** <60ns
3	**AWG520**	Waveform for Telegram Type 1	TP1_TG17.wfm
		Amplitude (V)	0,3
		Offset (V)	0
		Clock (MS/s)	200
4	**C6 SIGNAL CHARACTERISTICS**		
5	**LEVEL V_{pp} =** 22 V		
6	**SMT01 Generator**	Sinusoidal signal	8,82KHz

2.4. - SOFTWARE PROGRAMS

These measurements have been taken in automatic mode. The program name is:

INPUT_OUTPUT_6_4.vi

3. - TEST RESULTS

LABORATORIO DE EUROBALIZA

INPUT-OUTPUT CHARACTERISTICS TEST

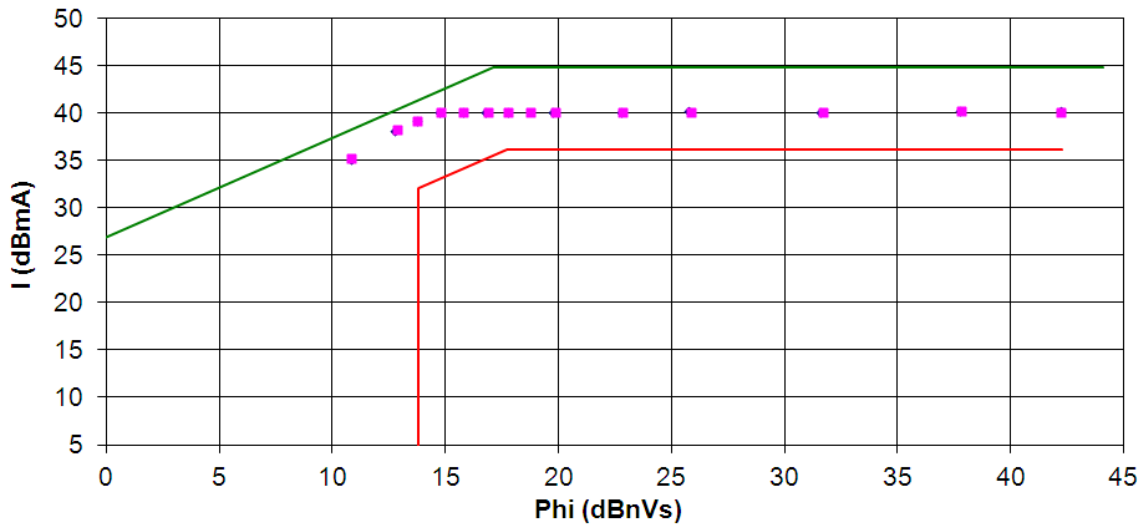
Balise Type		Reduced				Manufacturer		SWE	
Balise Serial Number		1205220				Debris		Free air	
I_{u2} Level(mA)		59				Observations			
Flux Phide1 level(nVs)		4,9				RSG ON			
Calculated Ref. P_{42RL} (dBm)		-34,01							
Calculated Ref. P_{27RL} (dBm)		-19,13							
P_{CS} Offset (dB)	P_{CS} calculed (dBm)	P_{CS} (dBm)		P_{42} (dBm)		Flux calculed (dBnVs)		I_{loop} calculed (dBmA)	
		Up	Down	Up	Down	Up	Down	Up	Down
-3,00	-22,13	-22,128	-22,08	-34,299	-34,227	10,806	10,854	35,128	35,2
-1,00	-20,13	-20,18	-20,08	-31,303	-31,202	12,754	12,854	38,124	38,225
0,00	-19,13	-19,172	-19,172	-30,23	-30,245	13,762	13,762	39,197	39,182
1,00	-18,13	-18,184	-18,11	-29,332	-29,292	14,75	14,824	40,095	40,135
2,00	-17,13	-17,166	-17,17	-29,277	-29,298	15,768	15,764	40,15	40,129
3,00	-16,13	-16,162	-16,07	-29,281	-29,283	16,772	16,864	40,146	40,144
4,00	-15,13	-15,18	-15,154	-29,29	-29,29	17,754	17,78	40,137	40,137
5,00	-14,13	-14,18	-14,162	-29,285	-29,295	18,758	18,772	40,142	40,132
6,00	-13,13	-13,17	-13,084	-29,29	-29,275	19,764	19,85	40,137	40,152
9,00	-10,13	-10,178	-10,08	-29,283	-29,302	22,756	22,854	40,144	40,125
12,00	-7,13	-7,17	-7,09	-29,267	-29,287	25,764	25,844	40,16	40,14
18,00	-1,13	-1,338	-1,218	-29,274	-29,294	31,596	31,716	40,153	40,133
24,00	4,87	4,84	4,878	-29,269	-29,247	37,774	37,812	40,158	40,18
28,50	9,37	9,31	9,31	-29,257	-29,274	42,244	42,244	40,17	40,153
	STD MEAN	0	0	0	0				
	STD MAX	0,01	0,01	0,01	0,01				
	STD MIN	0	0	0	0				
	A	B	C	D					
Parameters	0,58	0,75	1,83	0					

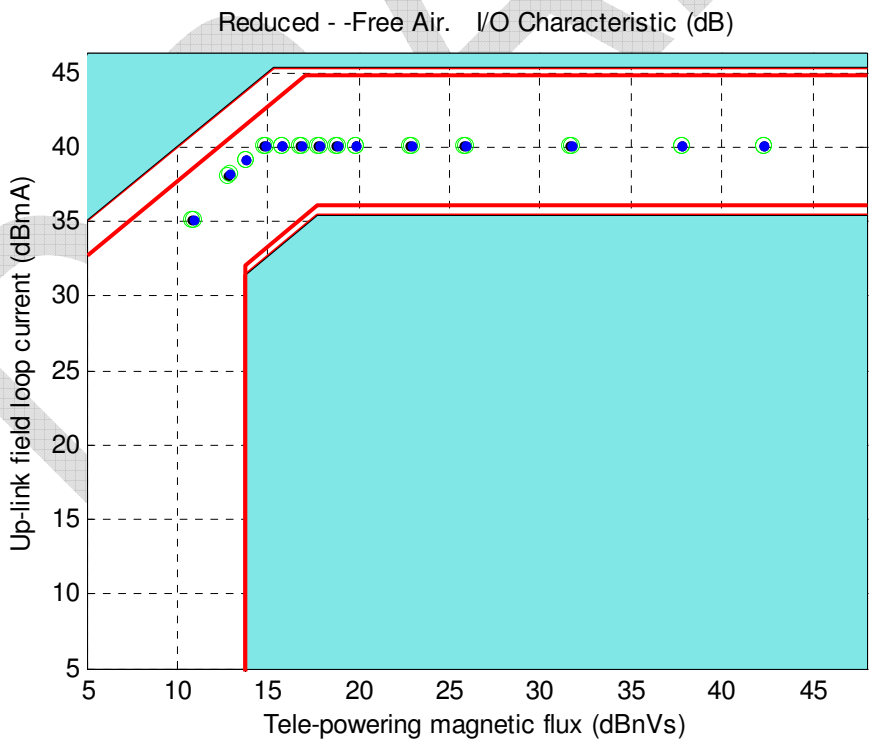
STARTING TIME	9:32
FINISH TIME	10:27
DATE	07/03/2012

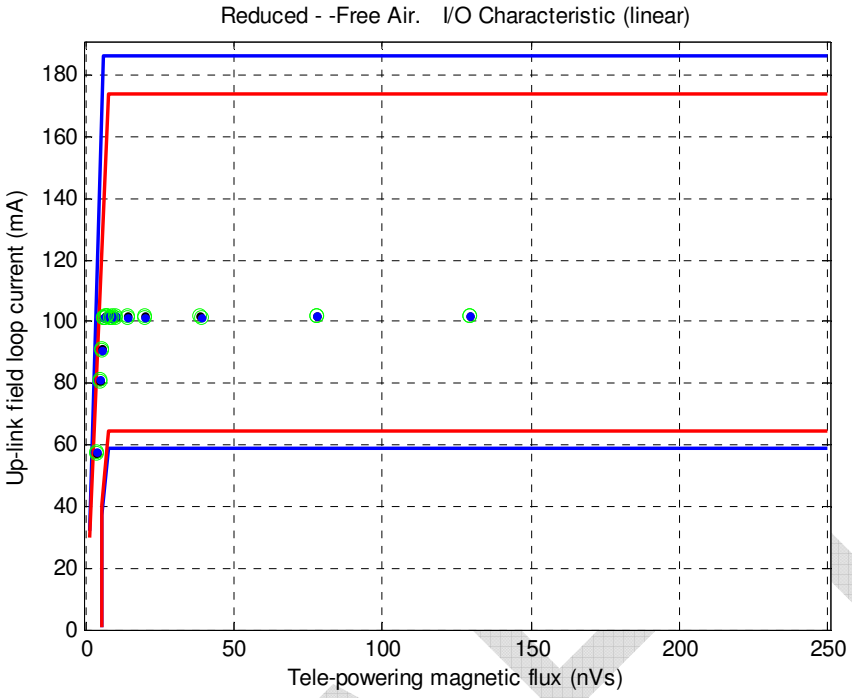
LABORATORIO DE EUROBALIZA

INPUT-OUTPUT CHARACTERISTICS TEST

Balise Type		Reduced		Manufacturer	SWE
Balise Serial Number		1205220		Debris	Free air
Date	07/03/2012	Time	10:27	Observations:	RSG ON







IO CHARACTERISTIC EVALUATION

File name:	RE-BAL006-1205220-SWE-FA-RSG-ON-03072012.xls
Date:	07/03/2012
Manufacturer:	SWE
Balise:	1205220
Size & class:	Reduced--
Debris:	Free Air
EVALUATION DATE:	17-Jul-2012
Number of points out of limits, upper limit:	0
Number of points out of limits, low er limit:	0
Slope in saturation zone (dB/dB):	-0.0017037
Test Result:	**PASS**

4. RESULTS EVALUATION

The evaluation criterion is pointed out in the Subset-085, section 4.2.4.4. The balise response shall be inside the area limited by red and green lines of the graphic shown in the previous section.

A summary table is shown below:

Balise data	**MANUFACTURER:** **SWE** **PRODUCT NUMBER:** **SERIAL NUMBER:** **111207-P4** **REVISION :** ***LIF NUMBER:*** ***1205220***
	EVALUATION
IO CHARACTERISTIC WITH *FREE AIR RSG ON*	**PASS**

4. - COMMENTS AND INCIDENCES

Date and Time of the Measurement: 03/07/2012
Calibration Technical Instruction: ITC-BAL008: Calibration for the Telepowering flux for Input-output characteristics Measurements ITC-BAL009: Calibration for the Up-Link current for Input-output characteristics Measurements **Test Technical Instruction:** ITE-BAL006: Measurements of the Balise Input to Output Characteristics
File as: **FILE NAME**: RE-BAL006_1205220_SWE_FA_RSG_ON_03072012.doc **ELECTRONIC FOLDER**: Test Registers of the Electronic Folder
COMMENTS AND INCIDENCES: