SPIRE-ALE-DOC-003048

HERSCHEL / PLANCK

Herschel FM EMC Conducted Emissions Data Collection

H-P-2-ASP-TN-1406

Product Code : 000 000

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1	15/10/2007	Document creation	M. Burlas

TABLE OF CONTENTS

1. SCOPE

The purpose of this document is to give all the data about previous EMC CE tests in order to help the EMC team to deem the results at system level that will be done on the Herschel S/C.

2. DOCUMENTS

2.1 APPLICABLE DOCUMENTS

[AD01] H-P-1-ASPI-SP-0037 issue 04, EMC Specification

2.2 REFERENCE DOCUMENTS

[RD01] H-P-RP-AI-0176 issue 01, Herschel PFM SVM – EMC Confidence Test Report

[RD02] H-P-RP-AI-0166 issue 01, Conducted susceptibility CM on RWL's TOCO and TD lines Test Report

[RD03] H-P-4-ETCA-CM-0086, TWTA X band Compliance Matrix

[RD04] H-P-4-GAF-TR-0050, Autonomous Star Tracker EMC Test report

[RD05] BOLC FM PSU EMC test report SE-PACS-HPPSU-T-6

[RD06] HERS-PACS-RP-CGS-014, PACS PFM EMC Test Report for DPUs/ICU

[RD07] PACS-ME-TR-038, PACS CQM/AVM ILT EMC Test Report

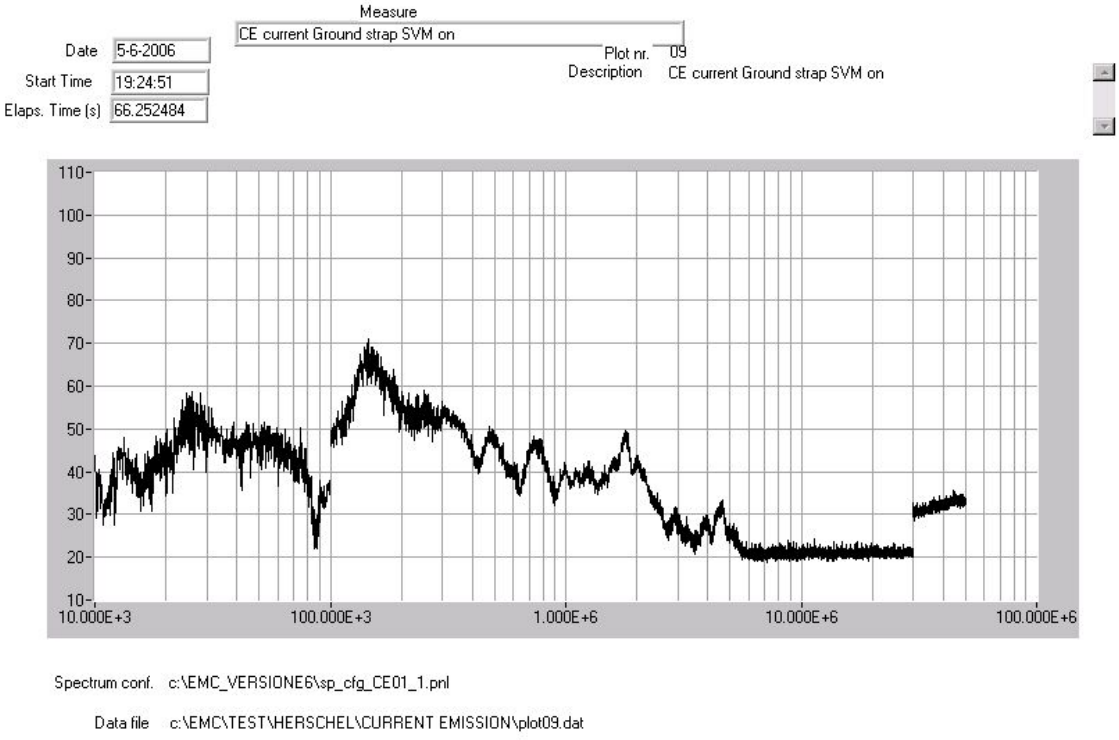
[RD08] NLR-CR-2007-208, EMC measurements and tests on the LCU

[RD09] HERS-HIFI-RP-CGS-017, HIFI DPUs/ICU PFM EMC Tests report

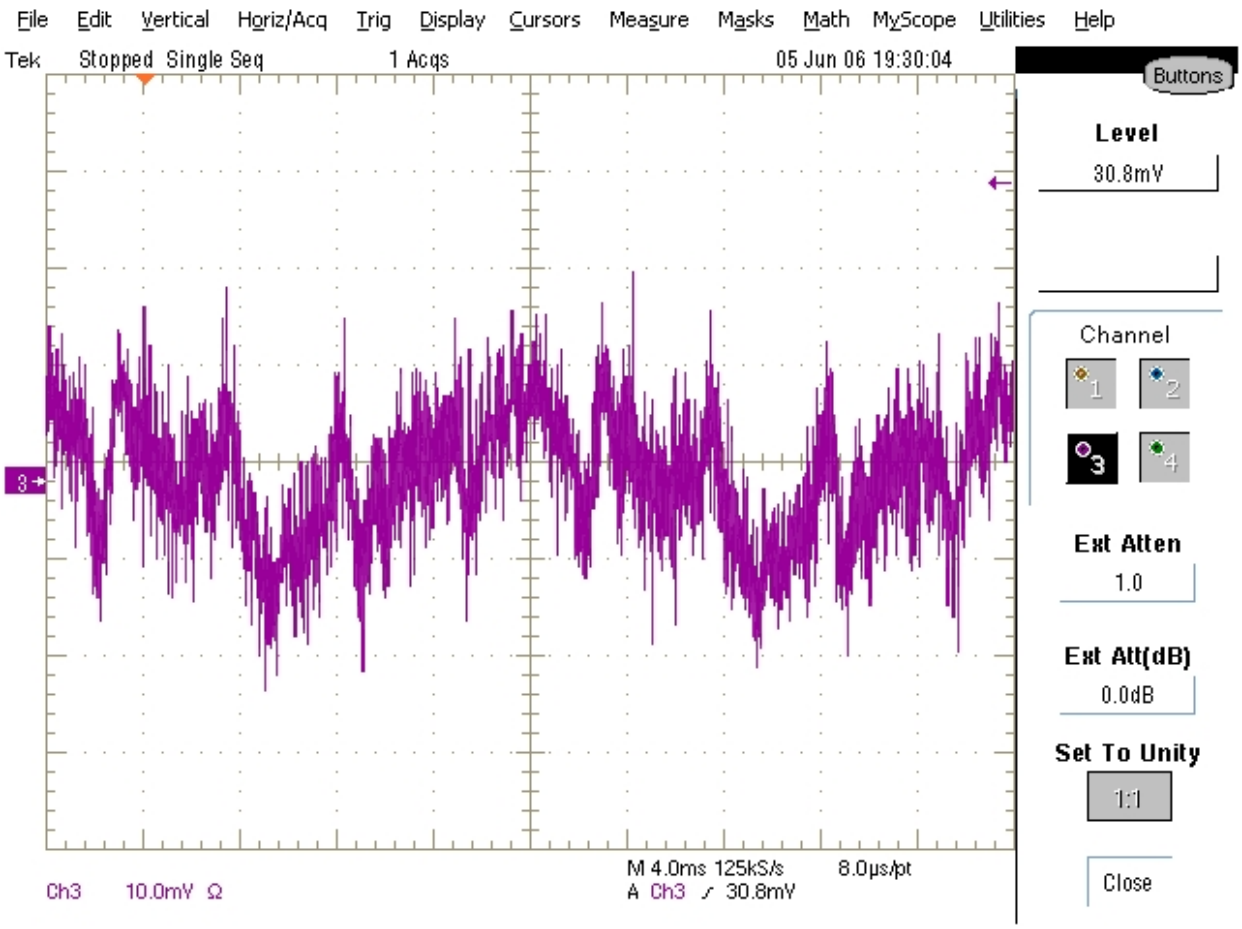
[RD10] HSPIR-PSU-REE-DA0018814-V-ASTR, HSPSU SPIRE EMC Tests report

3. CONDUCTED EMISSIONS DATA COMING FROM LOWER LEVEL TESTS

3.1 Noise on ground strap



N.B.: Those measurements have been performed on SVM sub system in TAS-I premises. For the further EMC tests only the maximum level has to be noticed and the spectrum is expected to be quite different at S/C level.

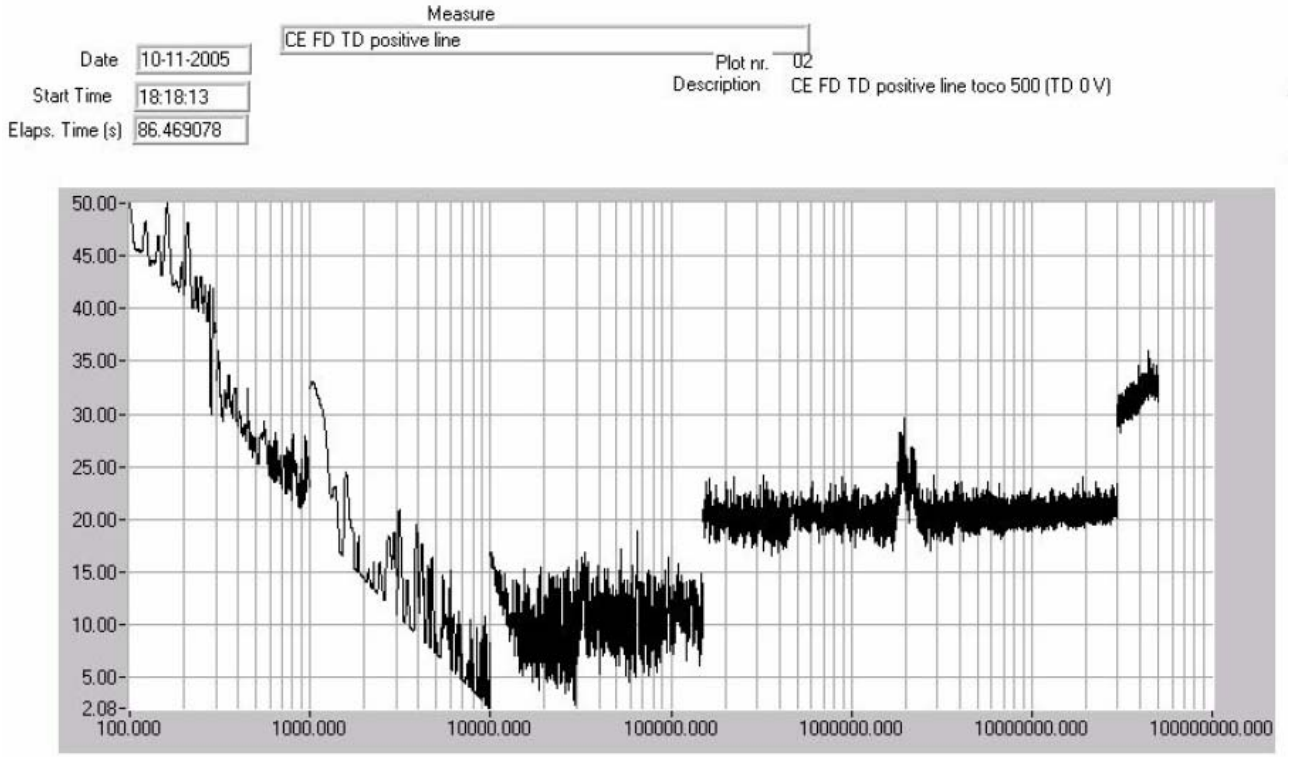


Plot: current noise time domain (10 mA/div) on ground strap_1; SVM ON

3.2 ACC signal lines for RWLs

3.2.1 TD line

3.2.1.1 Current on positive line



3.2.1.2 Current on return line common to TOCO and TD

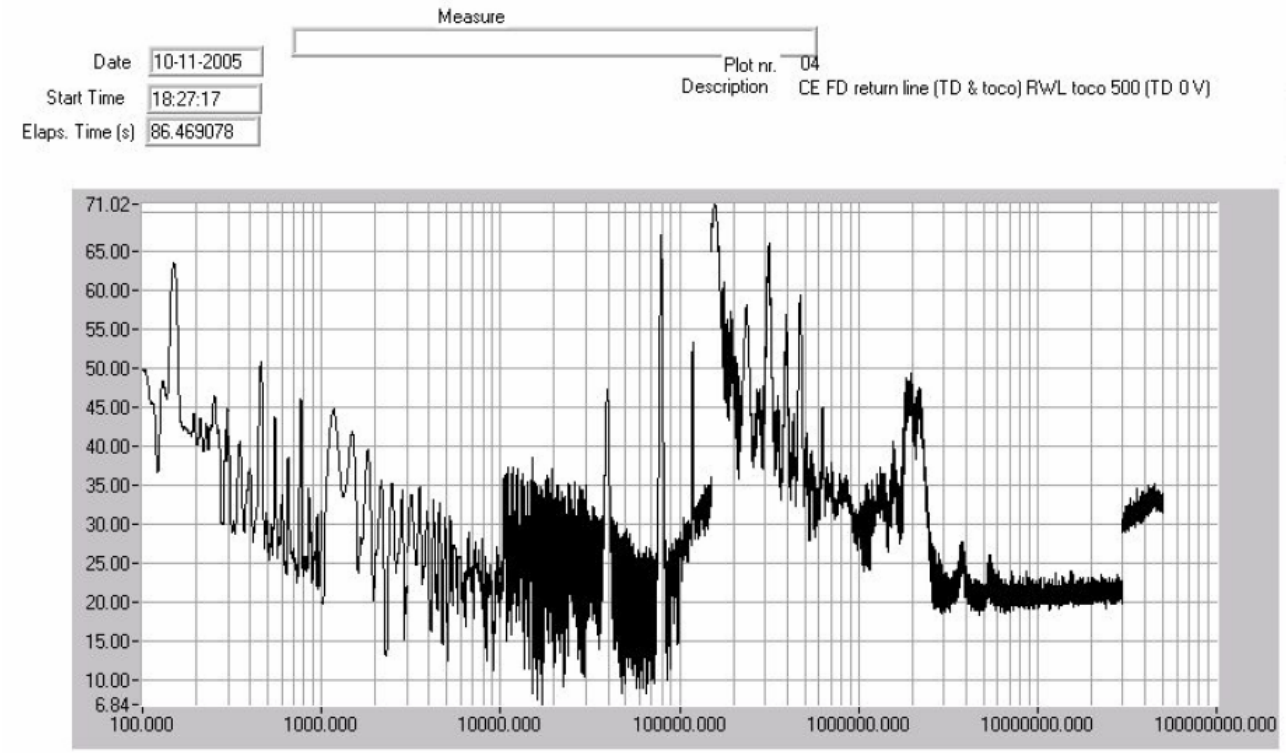
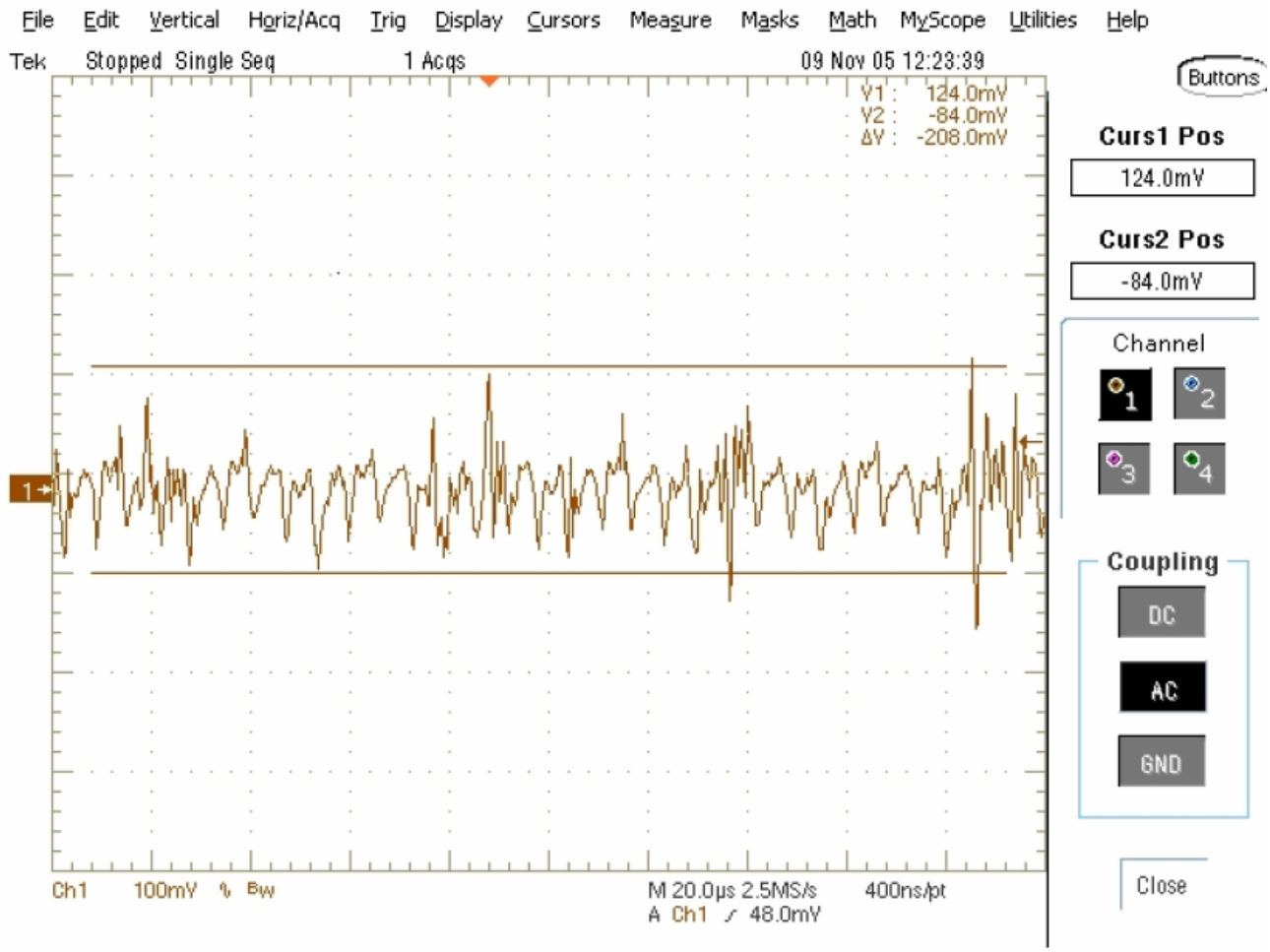


Fig.6.2-9 ToCo set to "500", with TD 0Volt, return line (common to ToCO and TD).

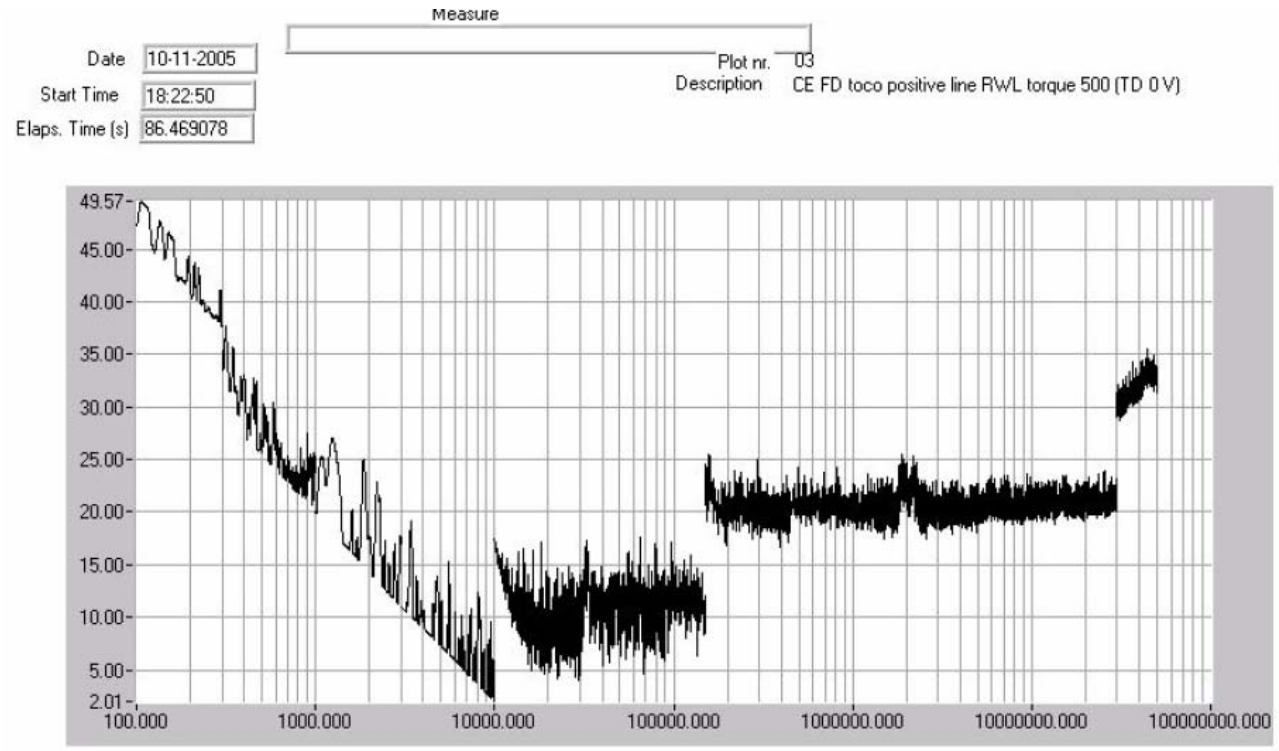
3.2.1.3 Voltage



l Ripple on TD Lines, with maximum level of ToCo applied (TLM read 4000)

3.2.2 TOCO line

3.2.2.1 Current on positive line



ig.6.2-8 ToCo set to "500", with TD 0Volt, ToCo positive line.

3.2.2.2 Current on return line

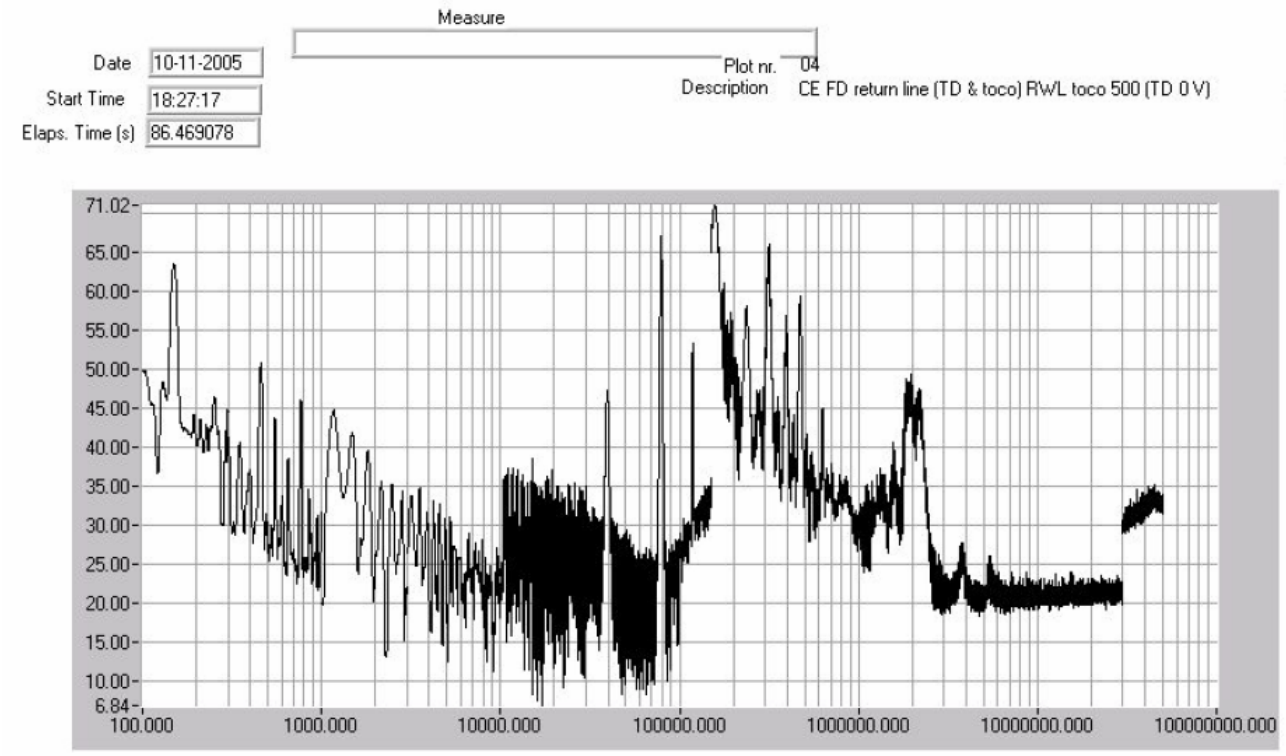


Fig.6.2-9 ToCo set to "500", with TD 0Volt, return line (common to ToCO and TD).

3.2.2.3 Voltage

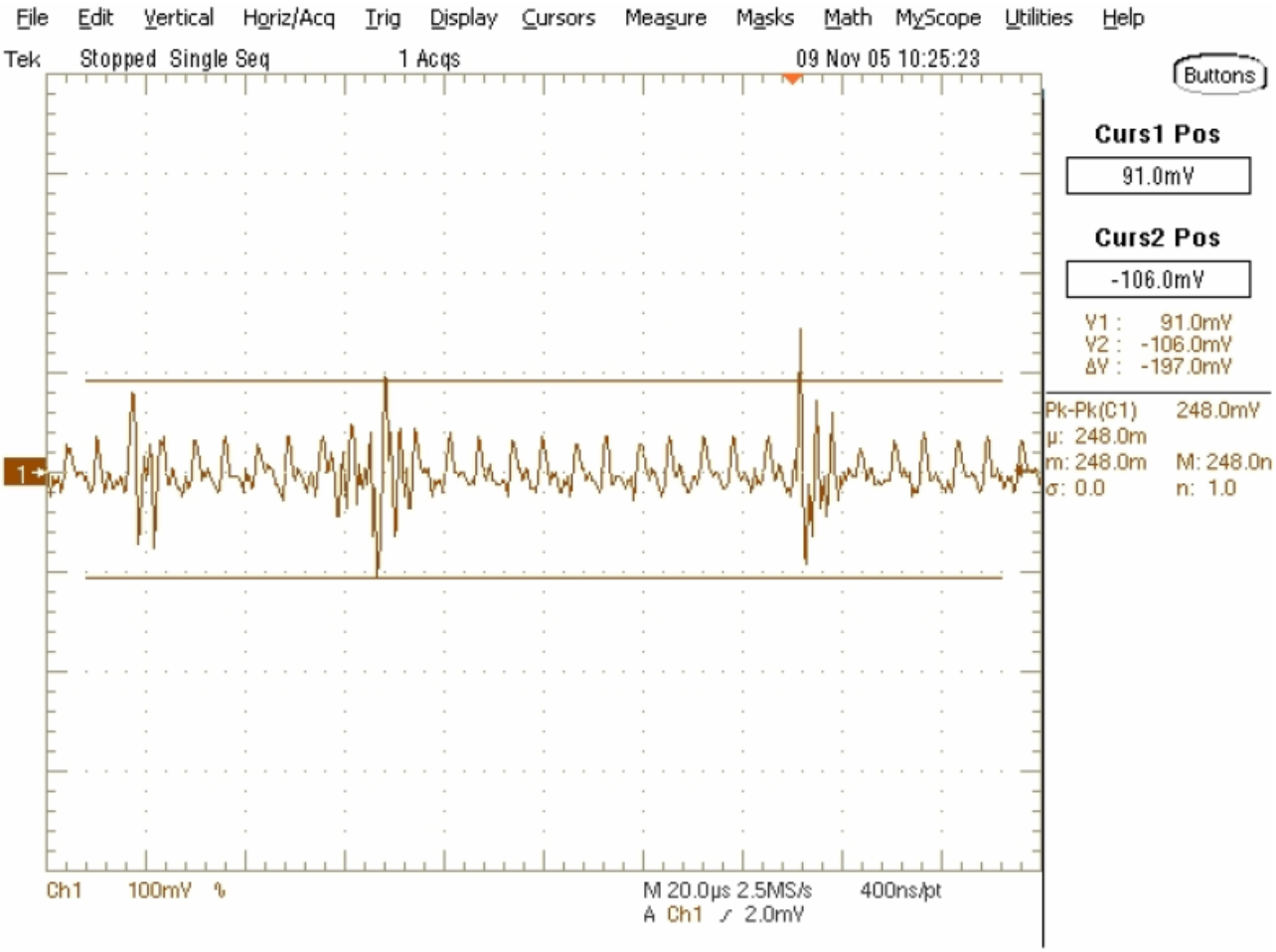
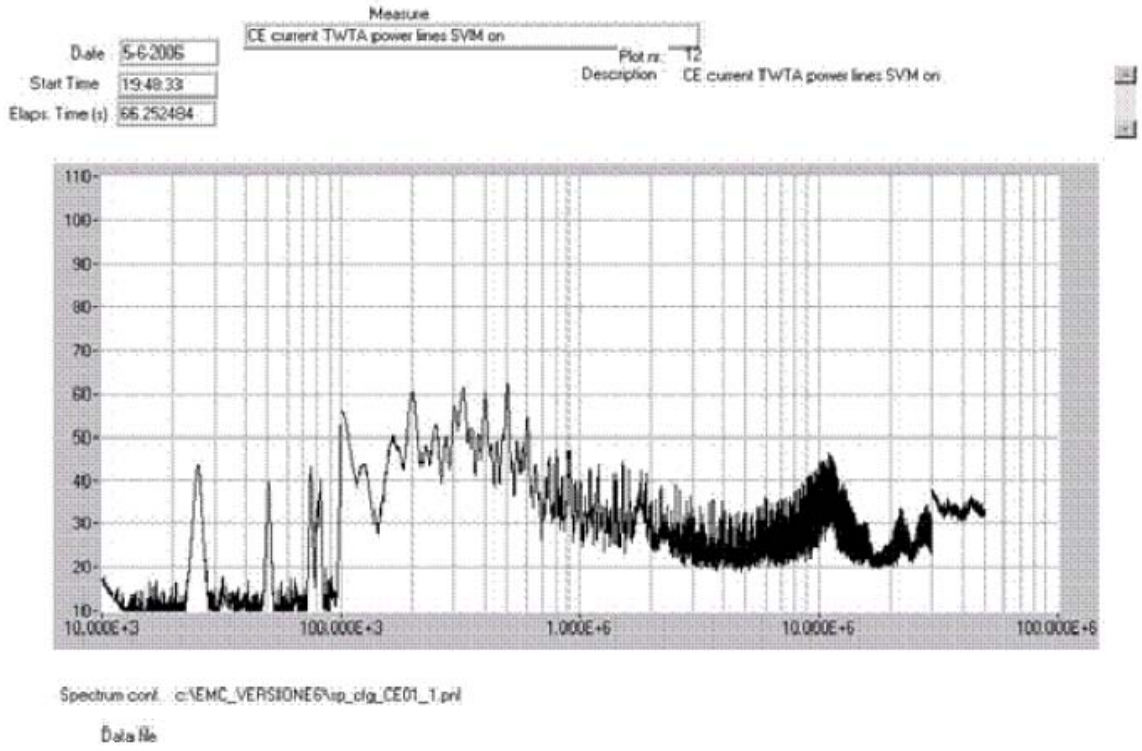


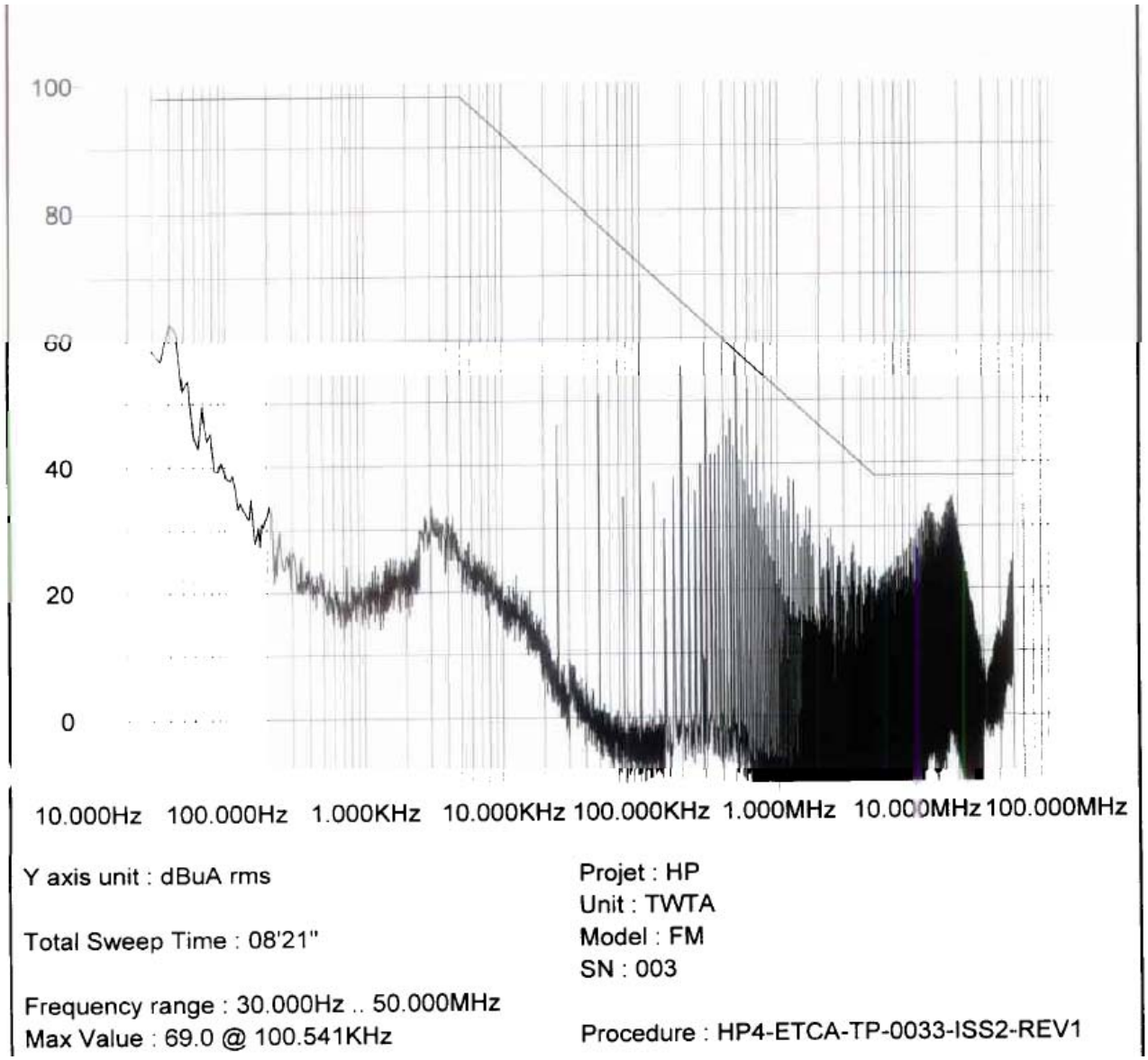
Fig.6.2-3 RWL ON, ToCo set to "0" (scale division 20us)

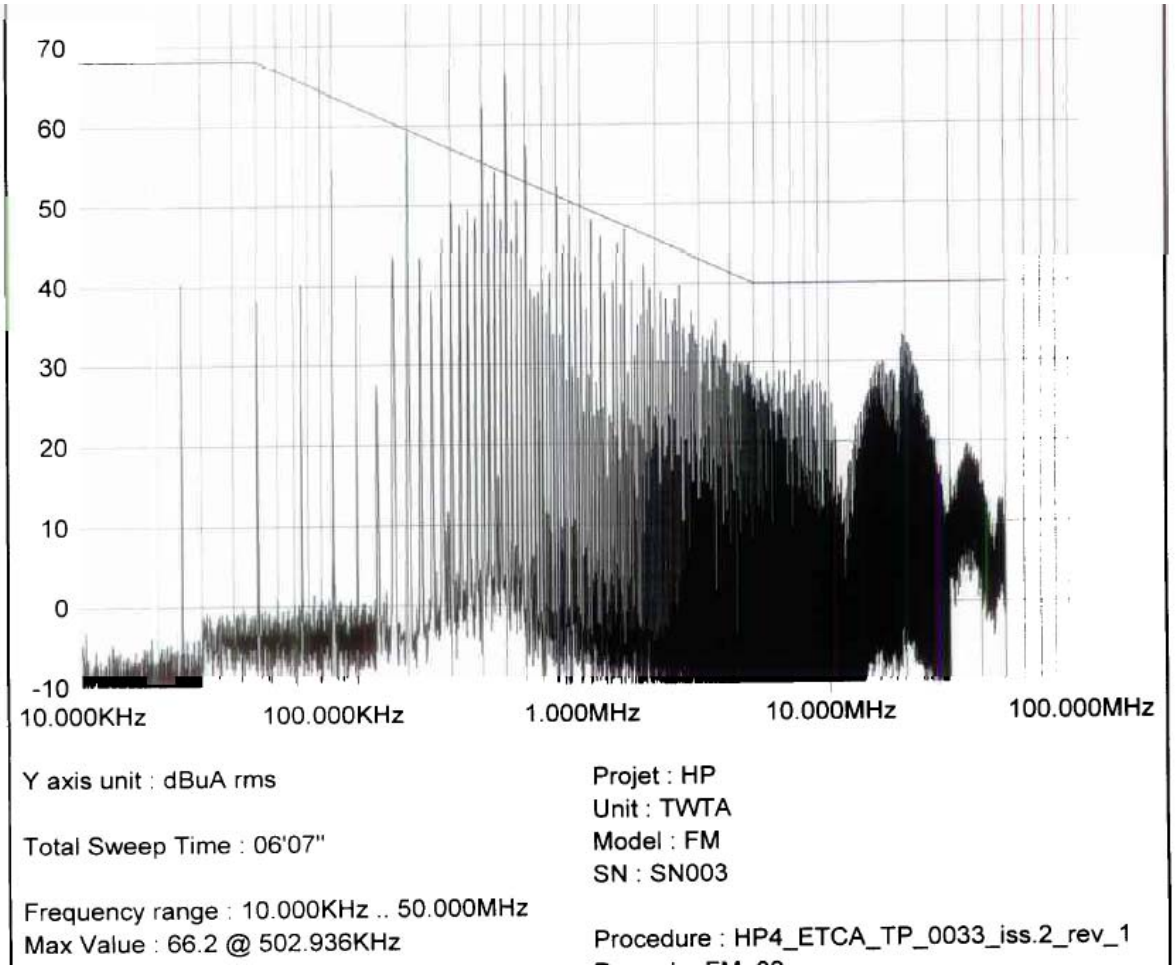
3.3 TWTA

3.3.1 Current

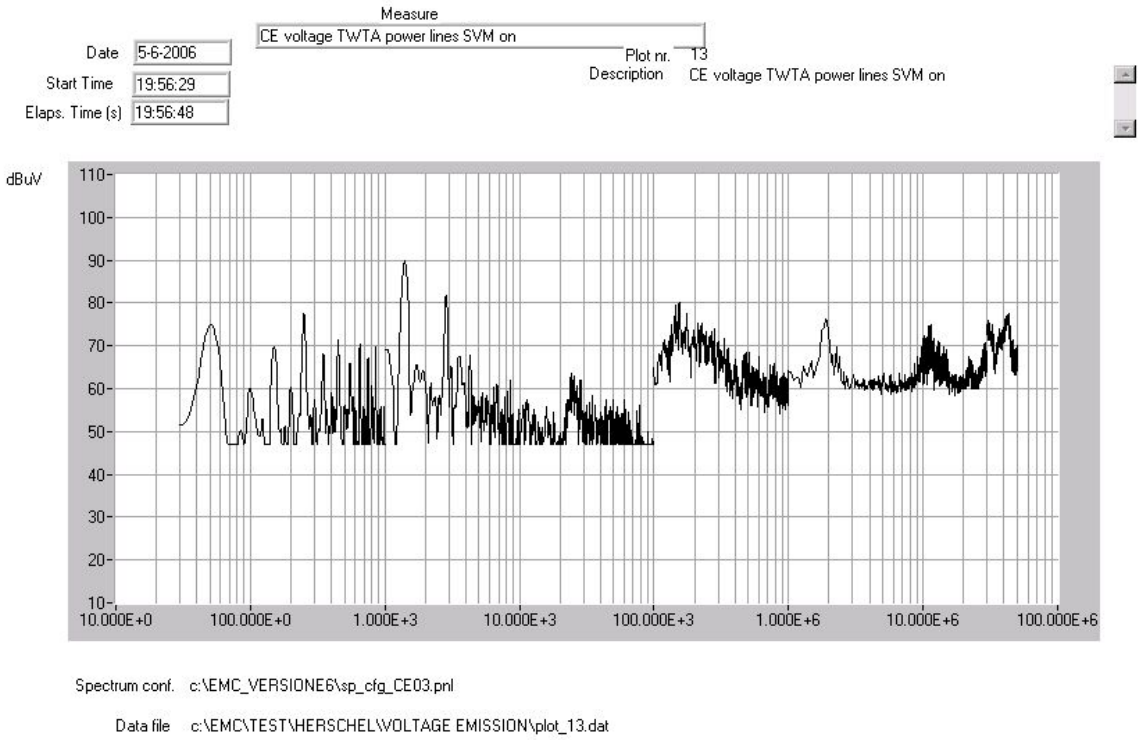


Plot: CE current frequency domain (dBµA) on TWTA power lines; SVM ON



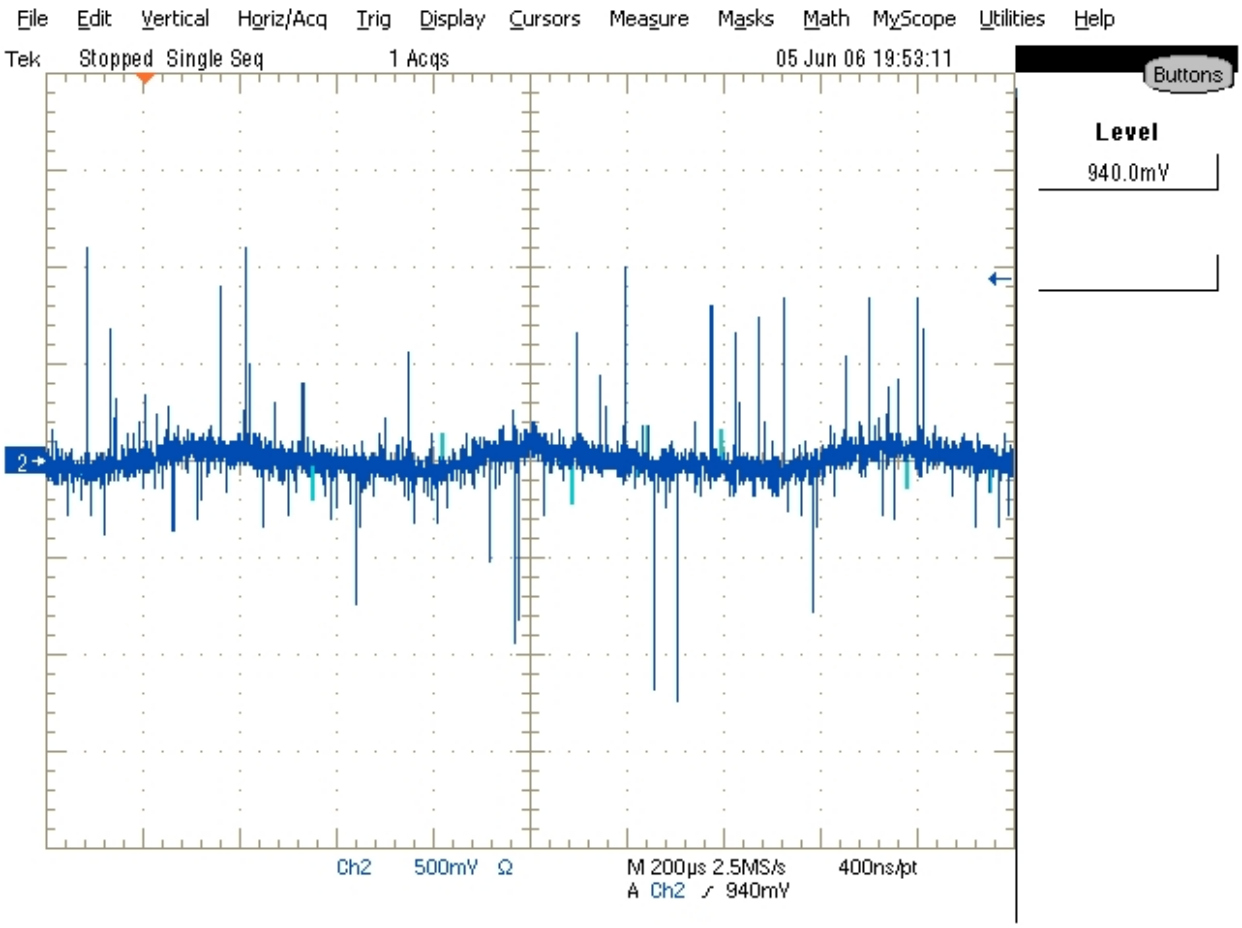


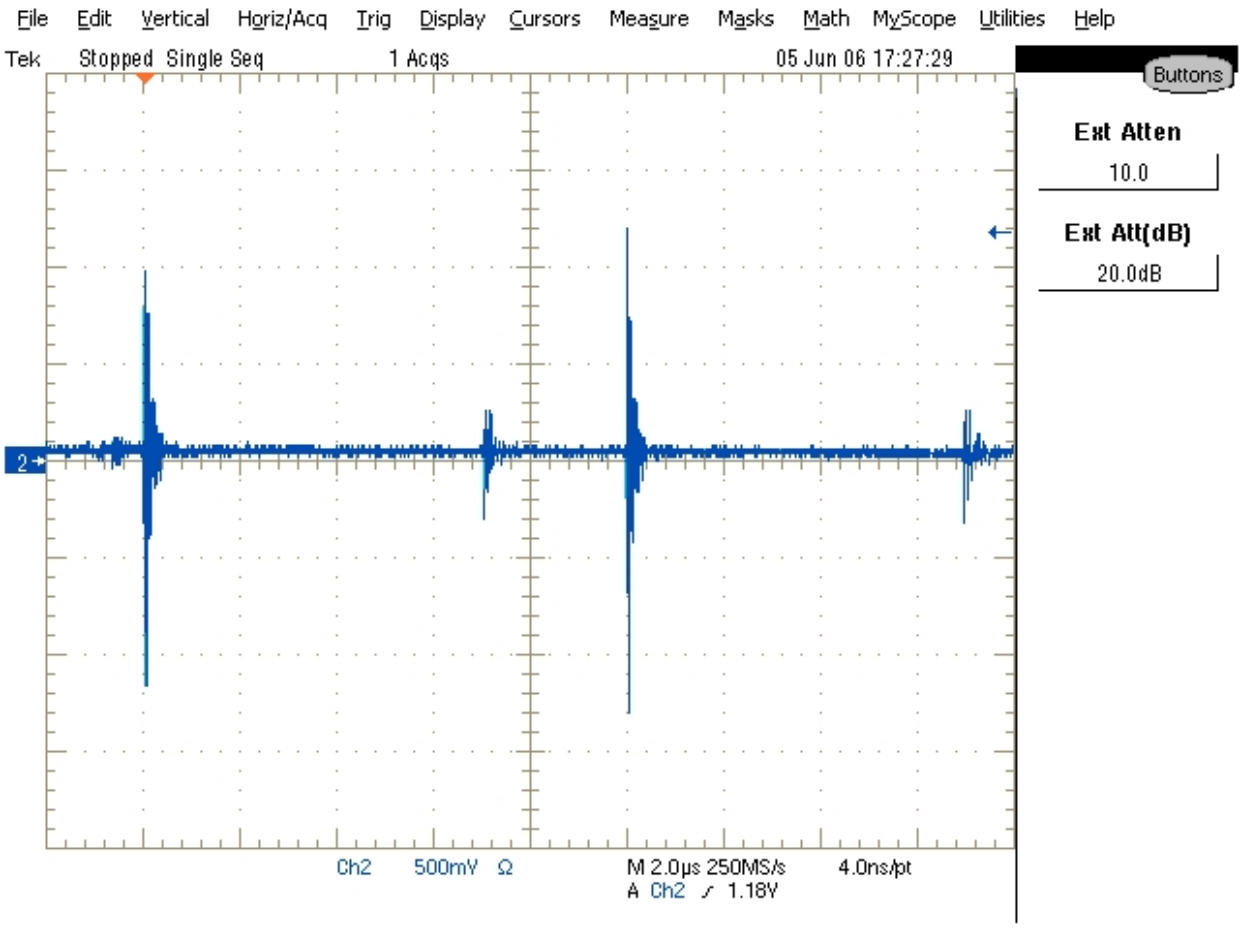
3.3.2 Voltage

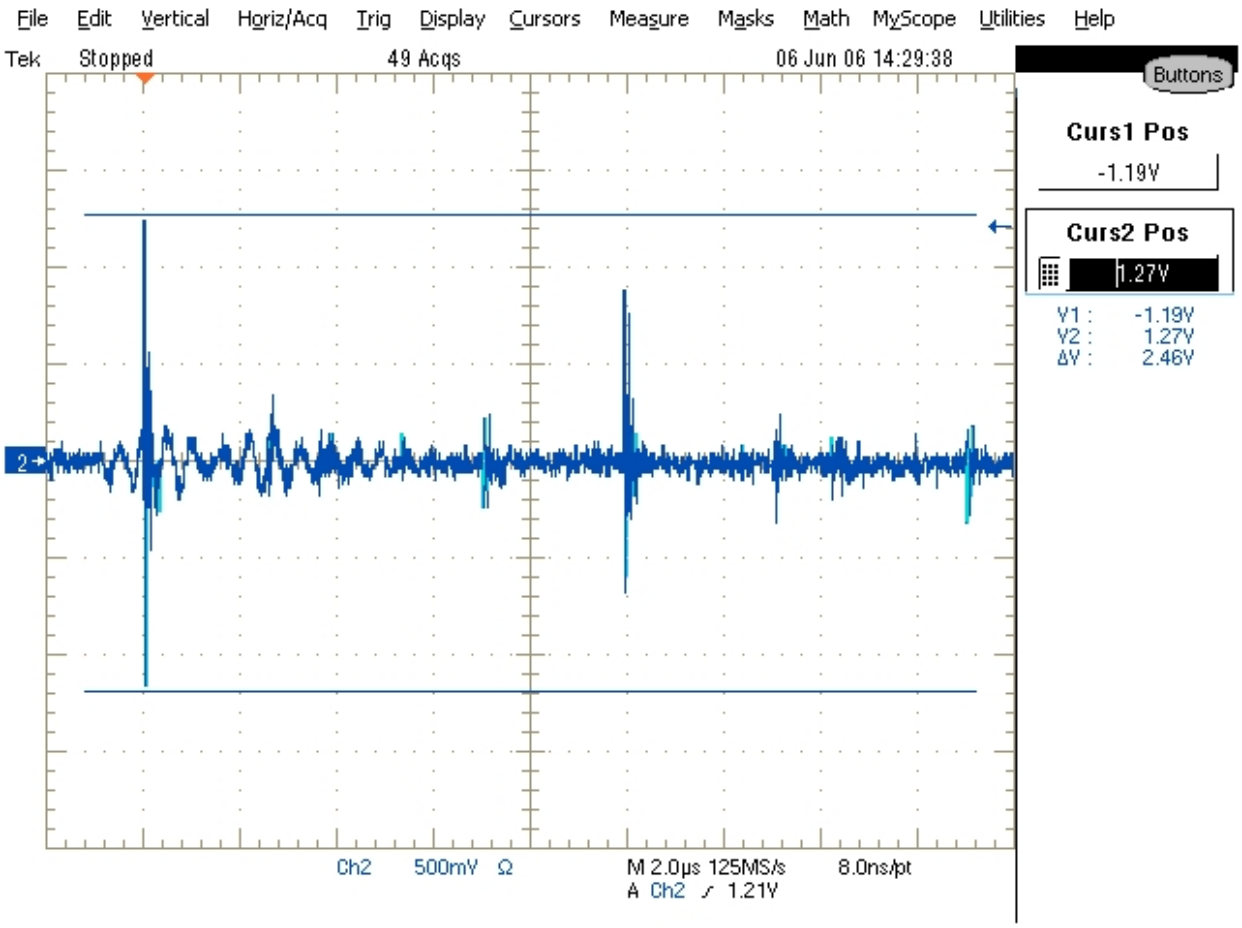


Spectrum conf. c:\EMC_VERSIONE6\sp_cfg_CE03.pnl

Data file c:\EMC\TEST\HERSCHEL\VOLTAGE EMISSION\plot_13.dat

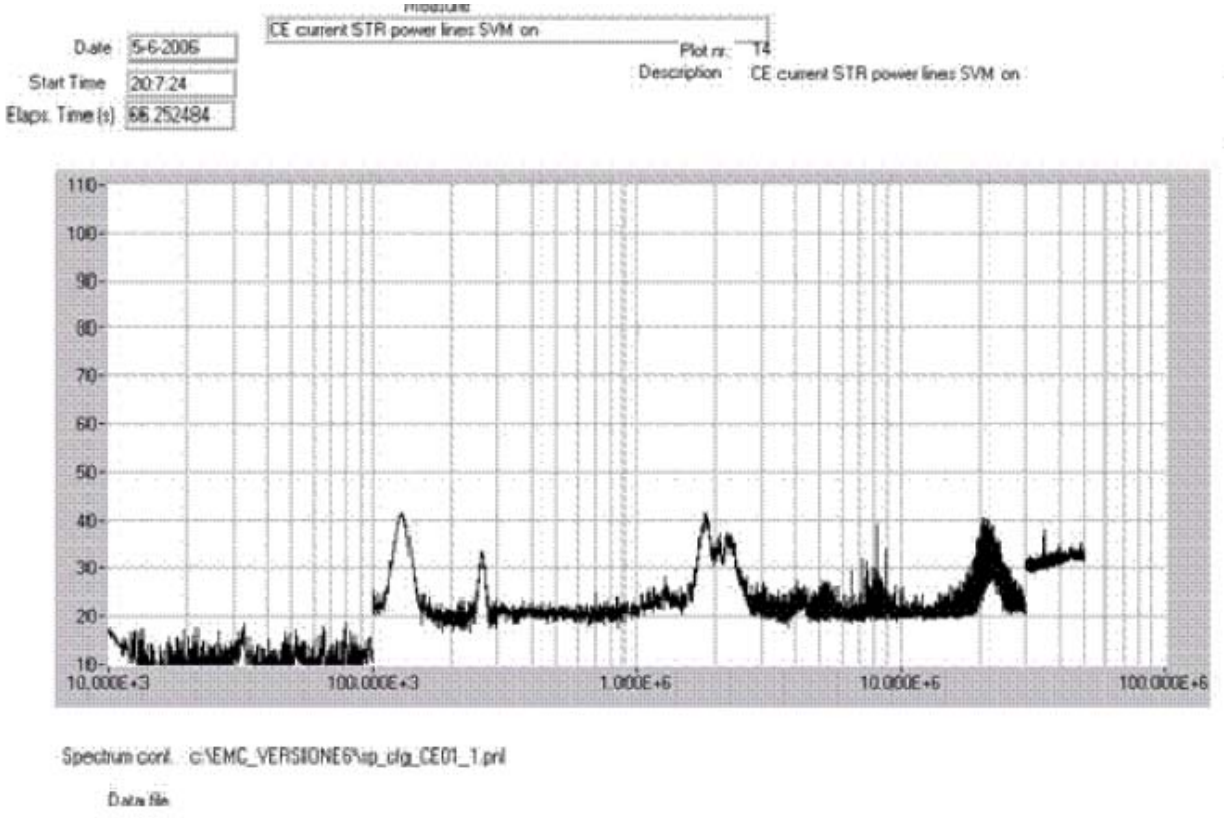






3.4 STR

3.4.1 Current



lot: CE current frequency domain (dBμA) on STR power lines; SVM ON

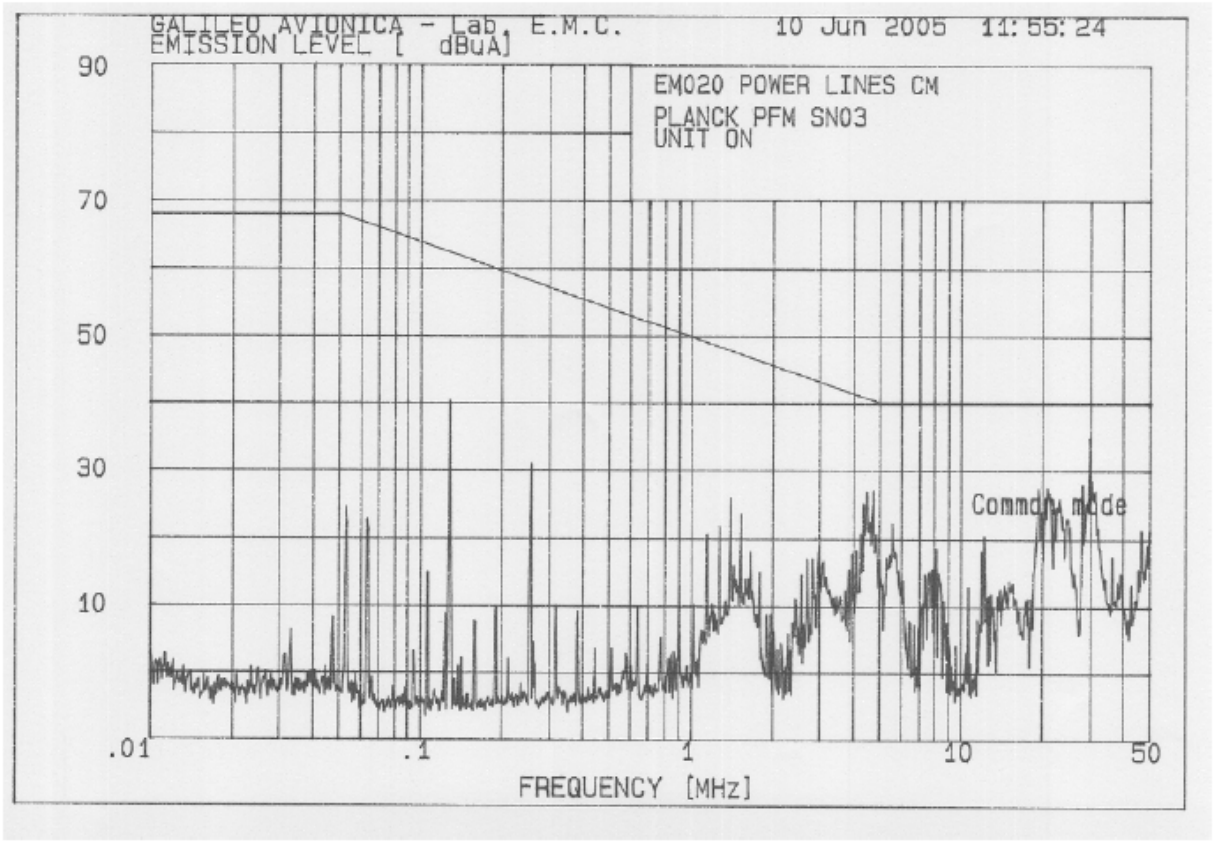


Fig. 5.2.2-3 CE primary power NB [30Hz – 50MHz] CM

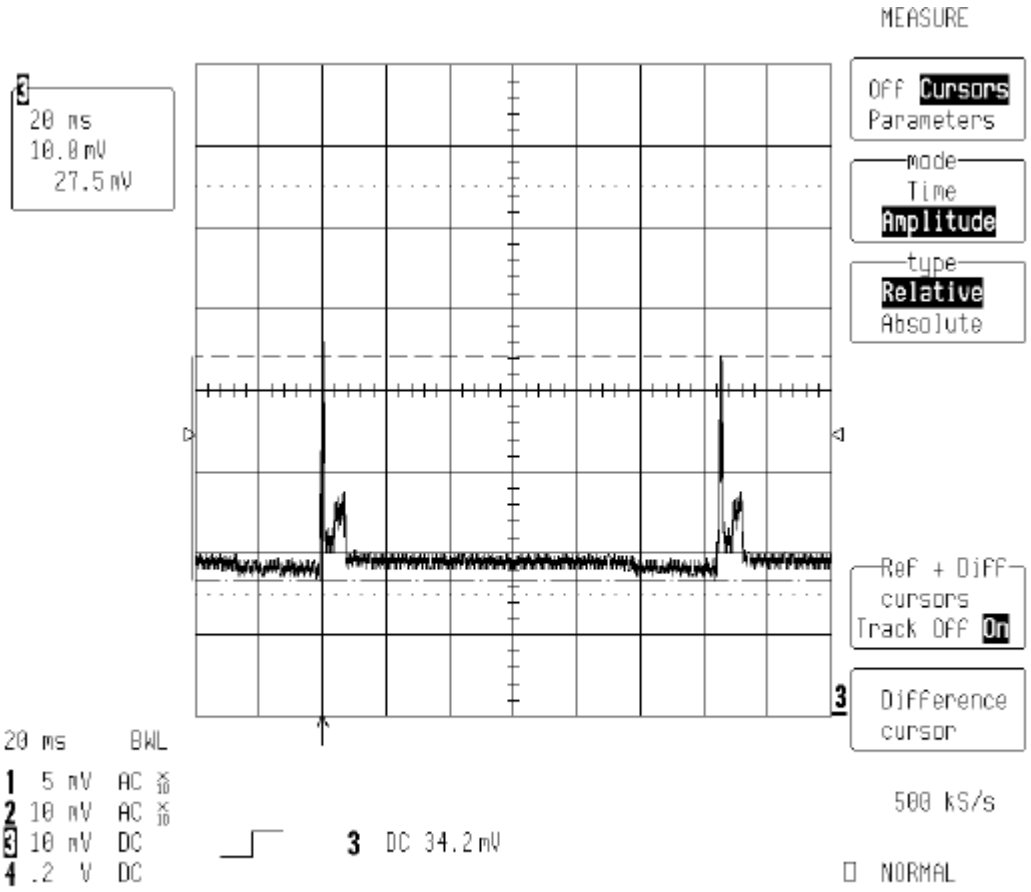
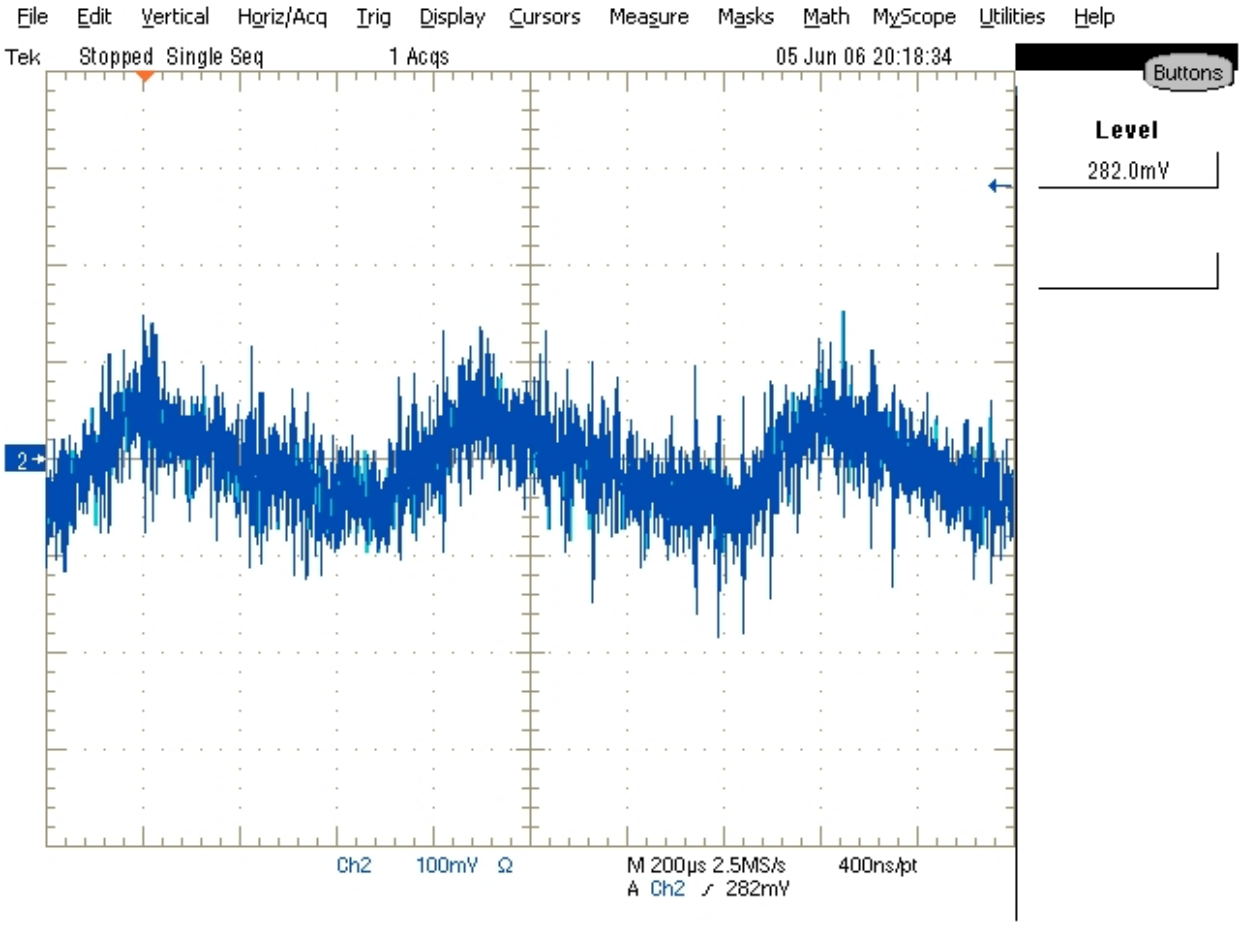


Fig. 5.2.4-4 Current STB mode 20ms/div 200mA/div DM

3.4.2 Voltage



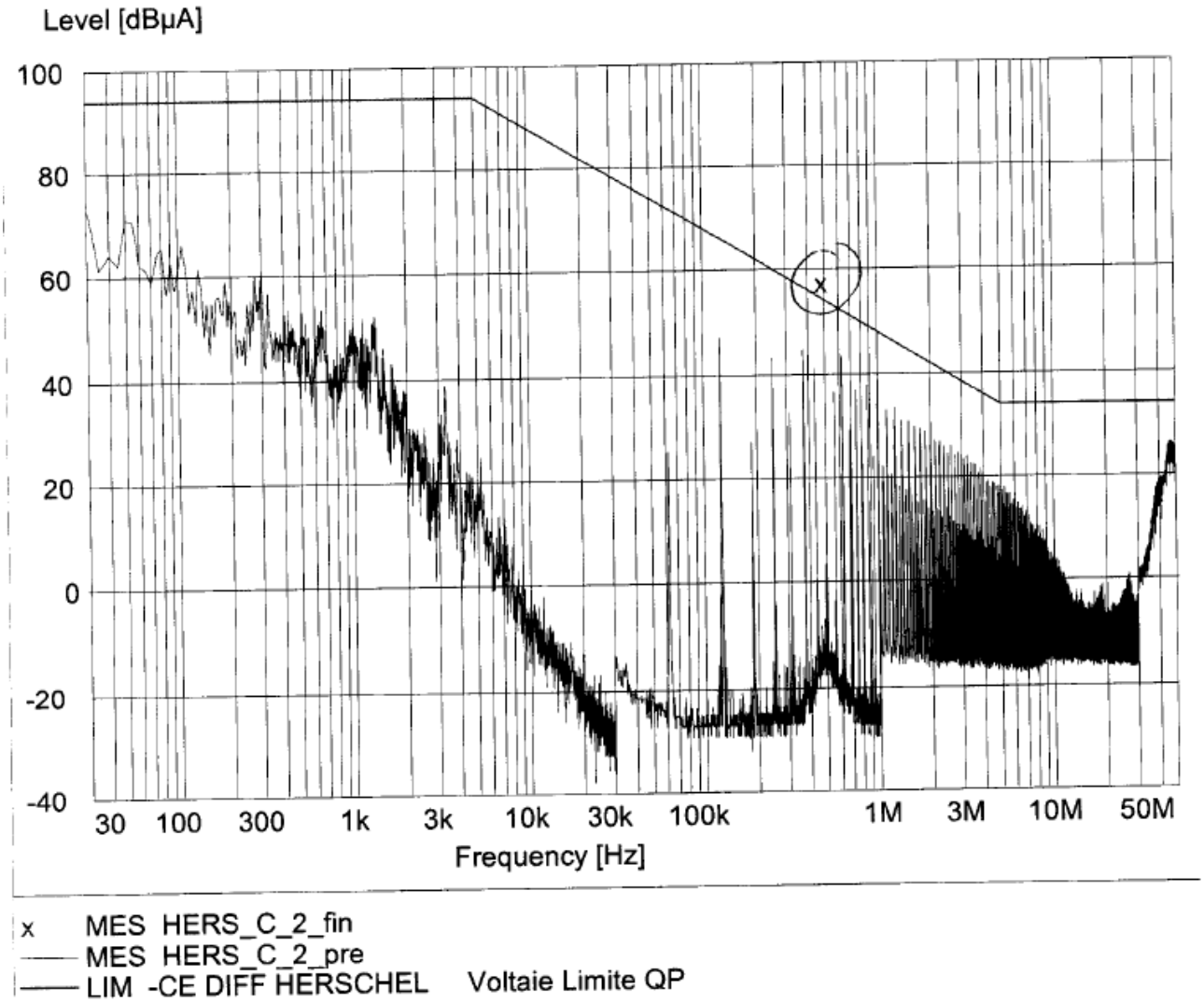
3.5 PACS/SPU

3.5.1 Current

CE DIFF

SPU1

EUT: HESCHEL SPU



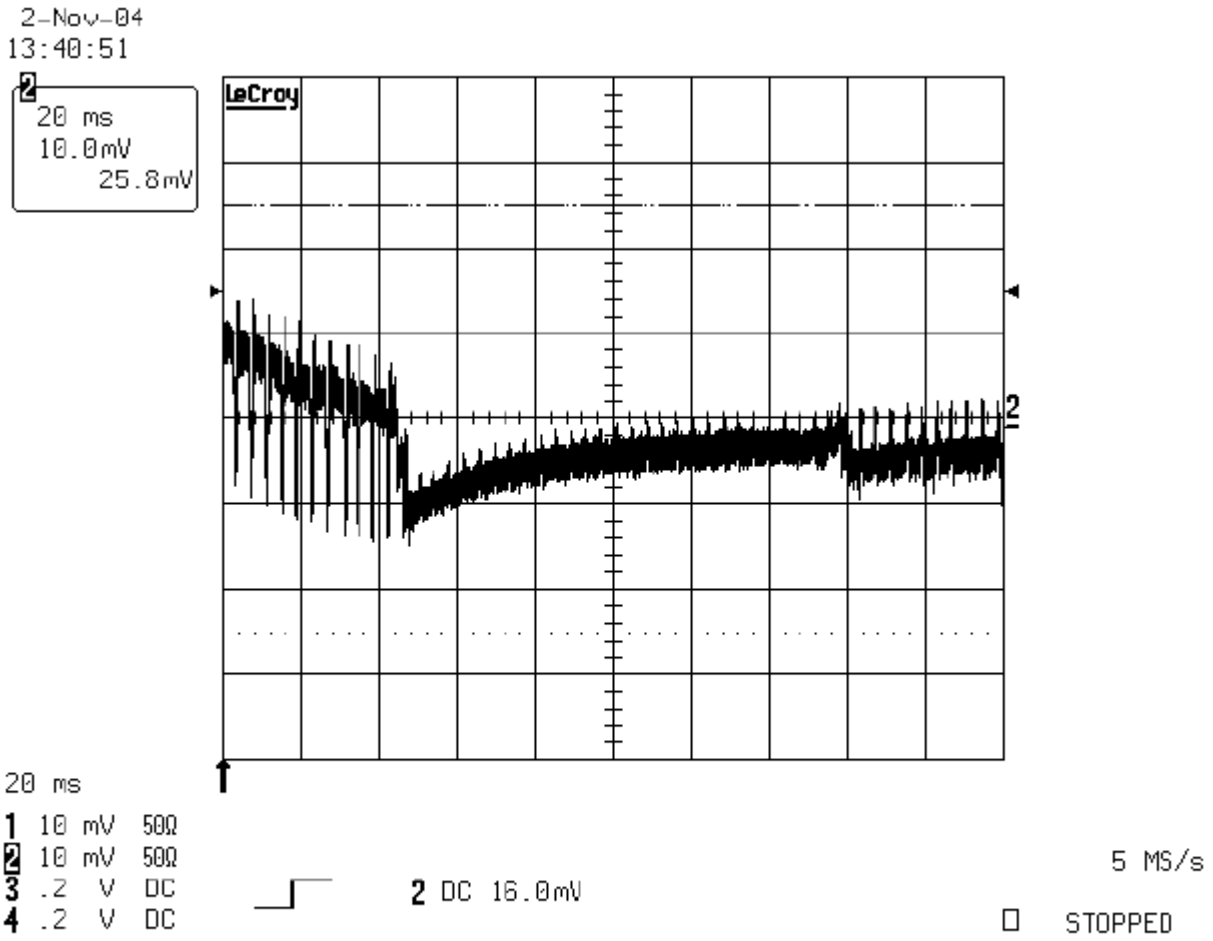


Figure 4-20: SPU DM current ripple in most noisy mode

Scale : 100mA/div

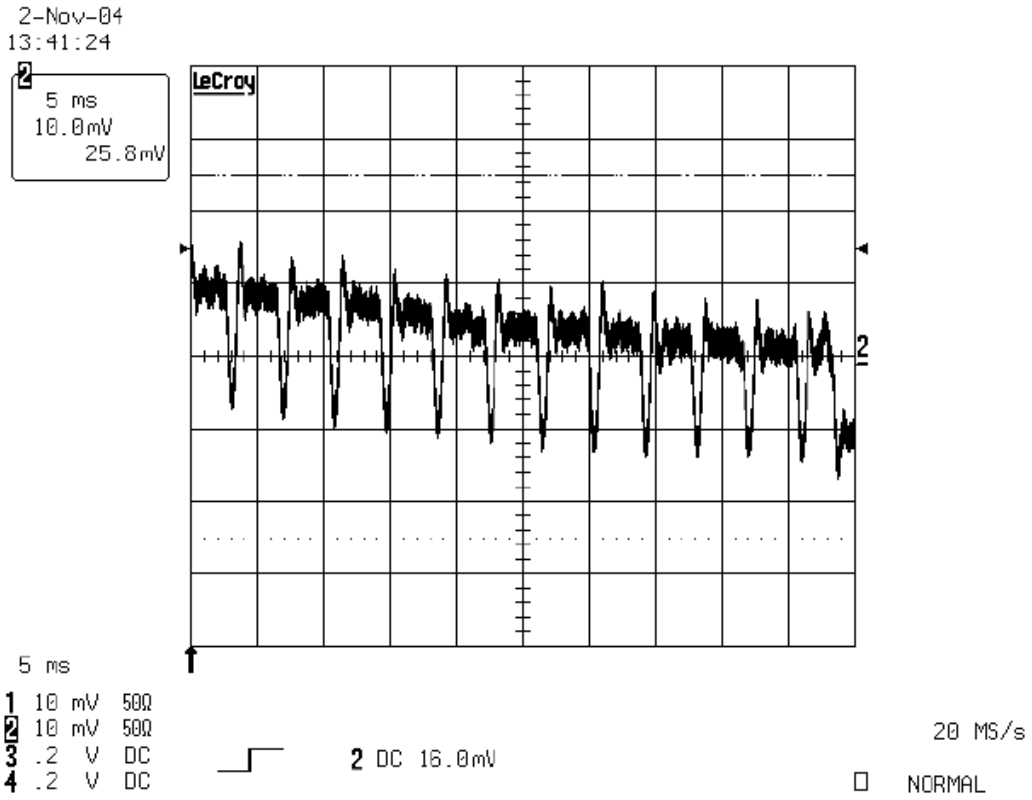


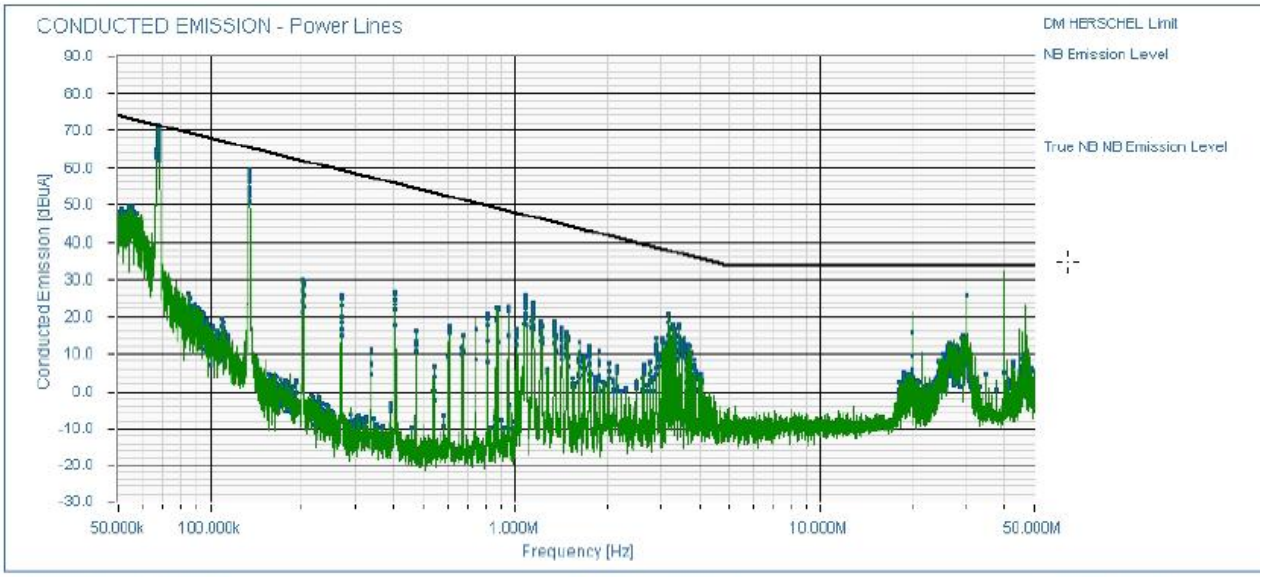
Figure 4-21: SPU DM current ripple in most noisy mode, time scale changed

3.6 PACS/DPU

3.6.1 Current

Customer: CARLO GAVAZZI SPACE ITALIA SpA
Model: PFM
Operating Mode: 26Vdc operational mode

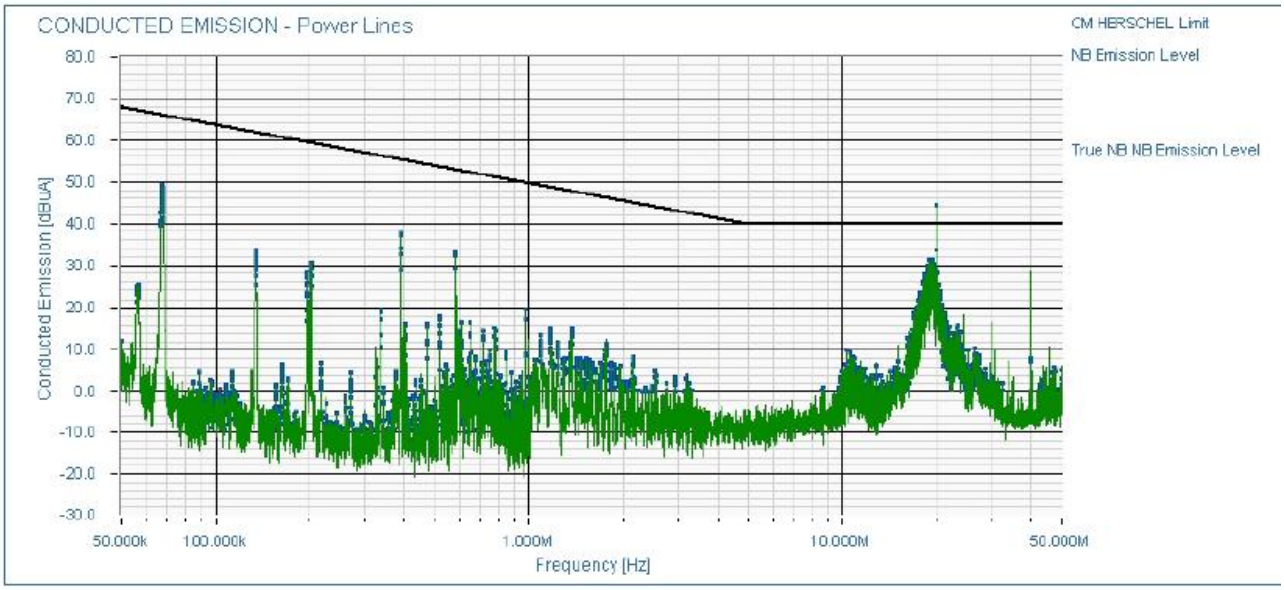
EUT: Satellite Equipement
Number: 20-PACS-00.00



Resolution Bandwidth: various
Detector: Positive Peak
Sensor: PCL 25

Customer: CARLO GAVAZZI SPACE ITALIA SpA
Model: PFM
Operating Mode: 28Vdc operational mode

EUT: Satellite Equipement
Number: 20-PACS-00.00



Resolution Bandwidth: various
Detector: Positive Peak
Sensor: PCL 25

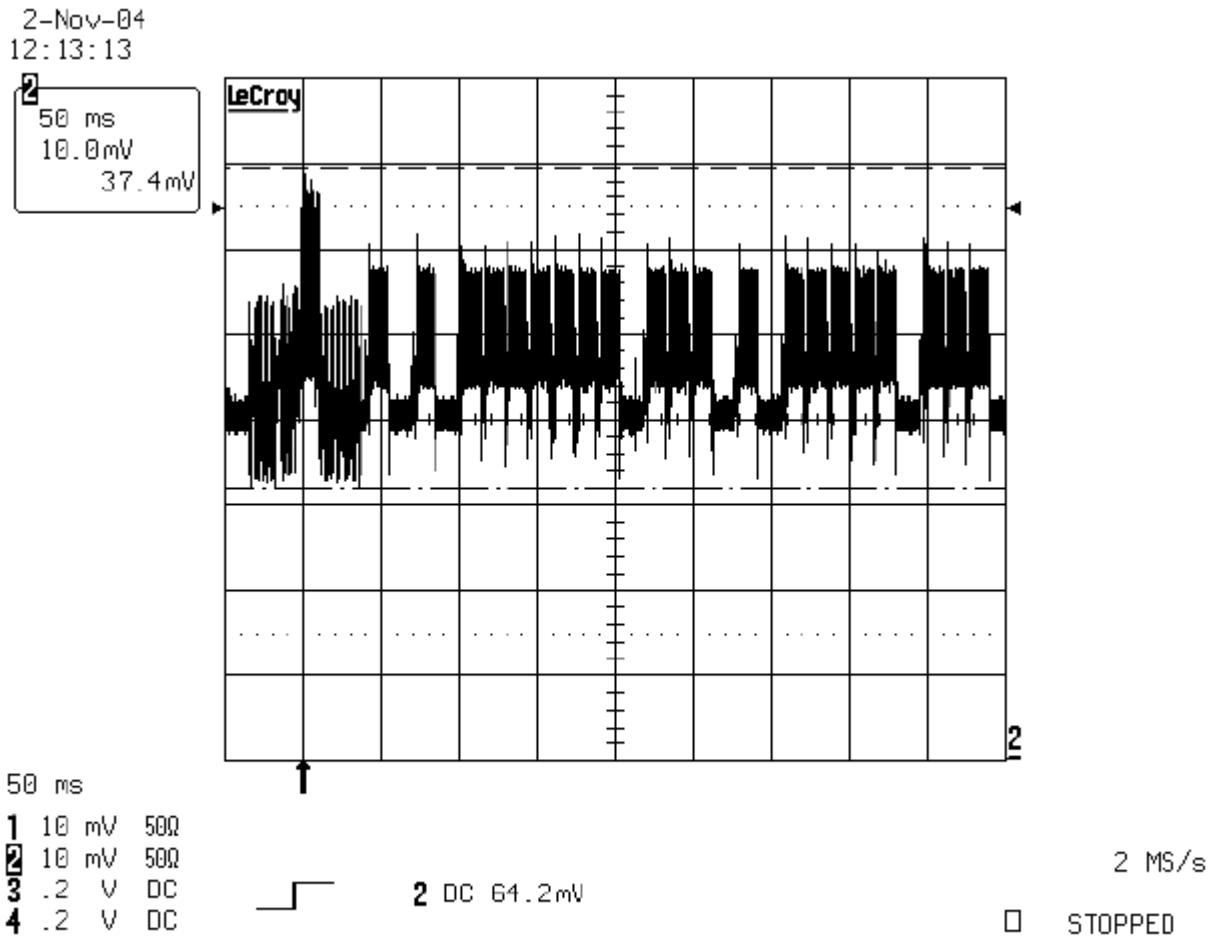
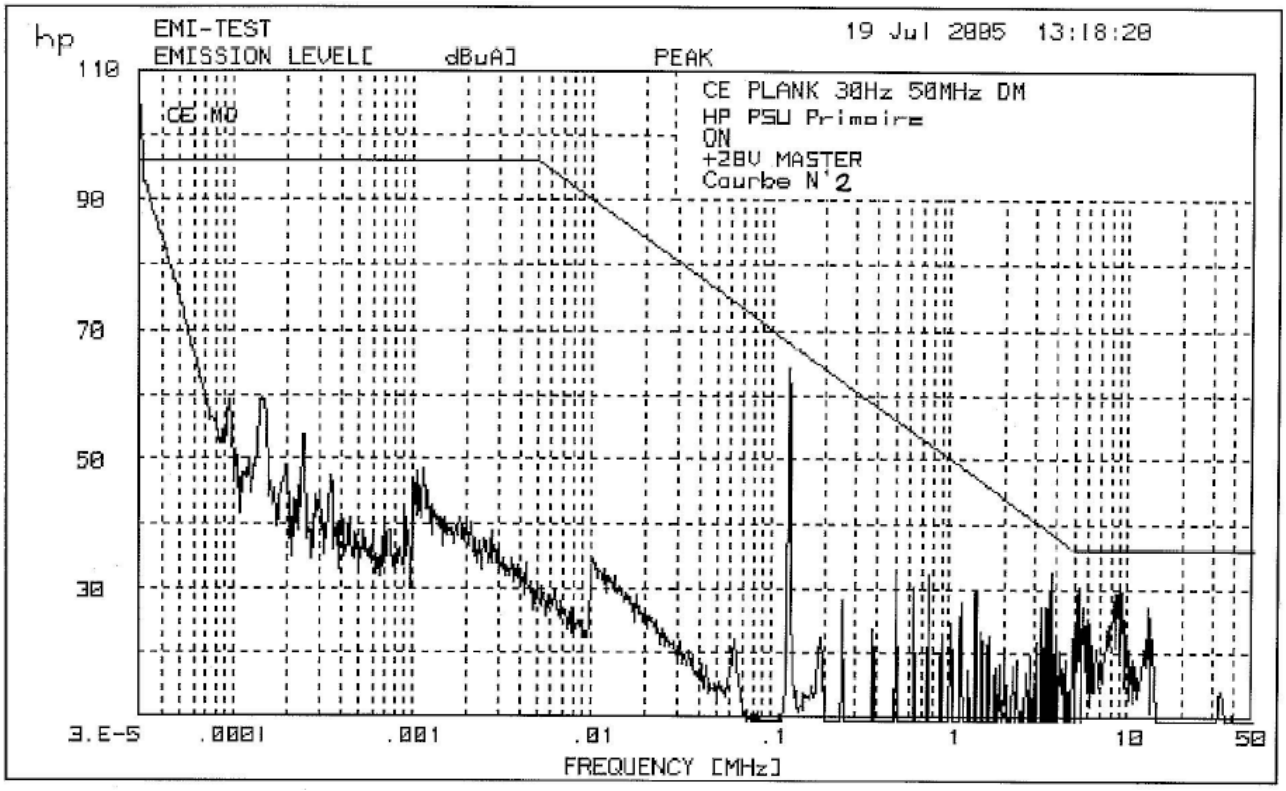


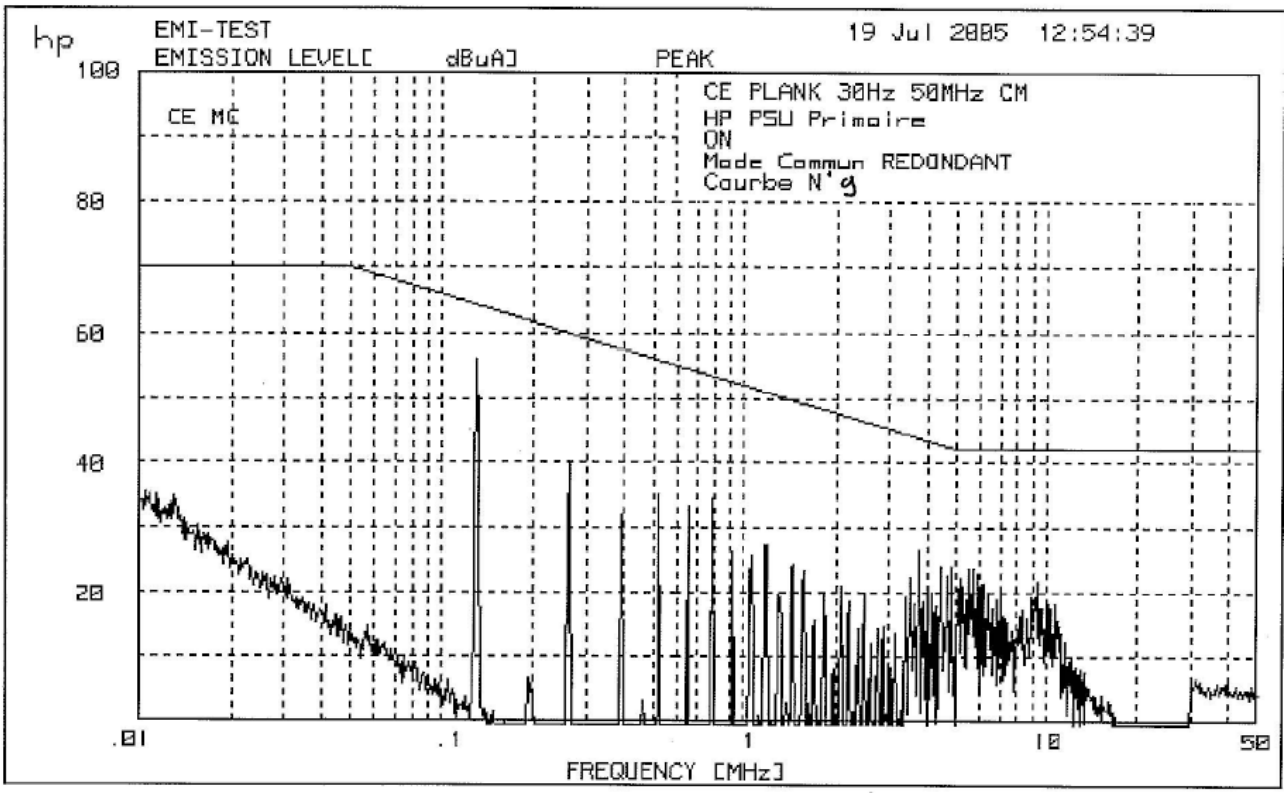
Figure 4-18: DPU DM current ripple in most noisy mode

Scale : 100 mA/div

3.7 PACS/BOLC

3.7.1 Current





3.8 PACS/DECMEC

3.8.1 Current

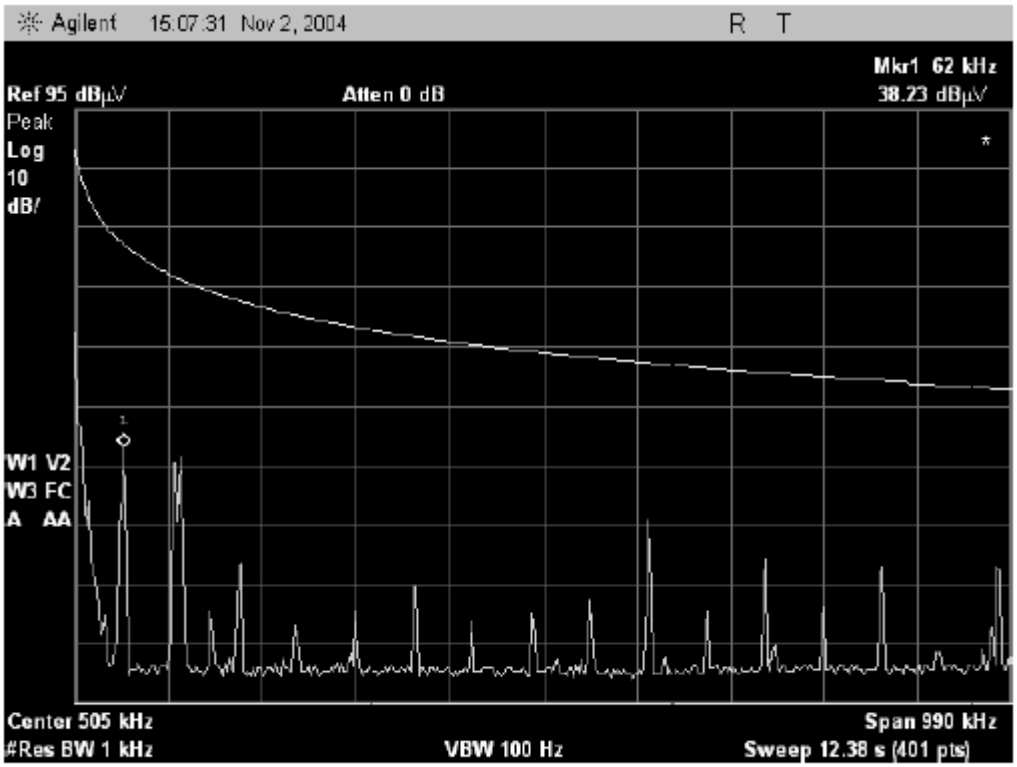


Figure 4-9: DECMEC DM PS 10 kHz – 1 MHz

Scale in dBuA rms

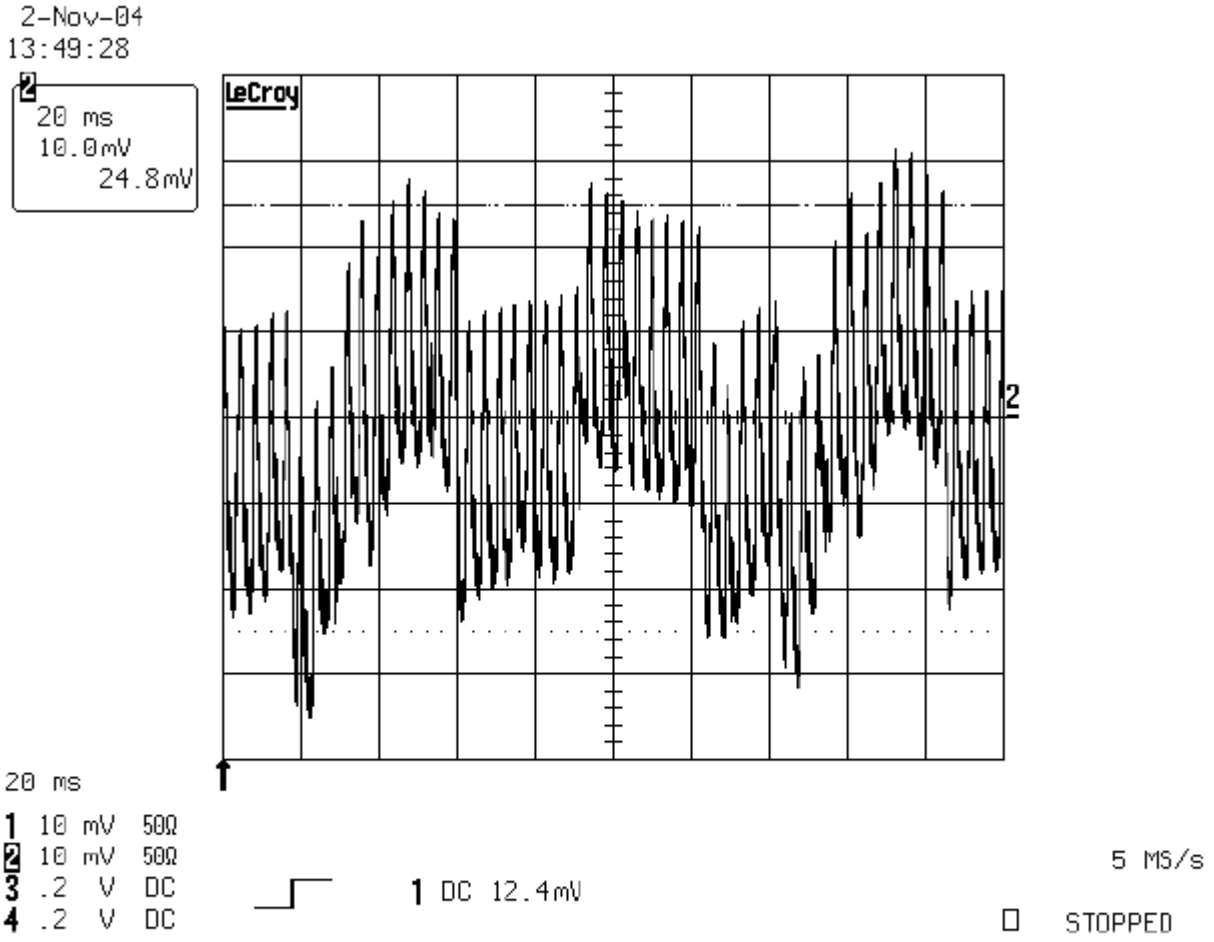
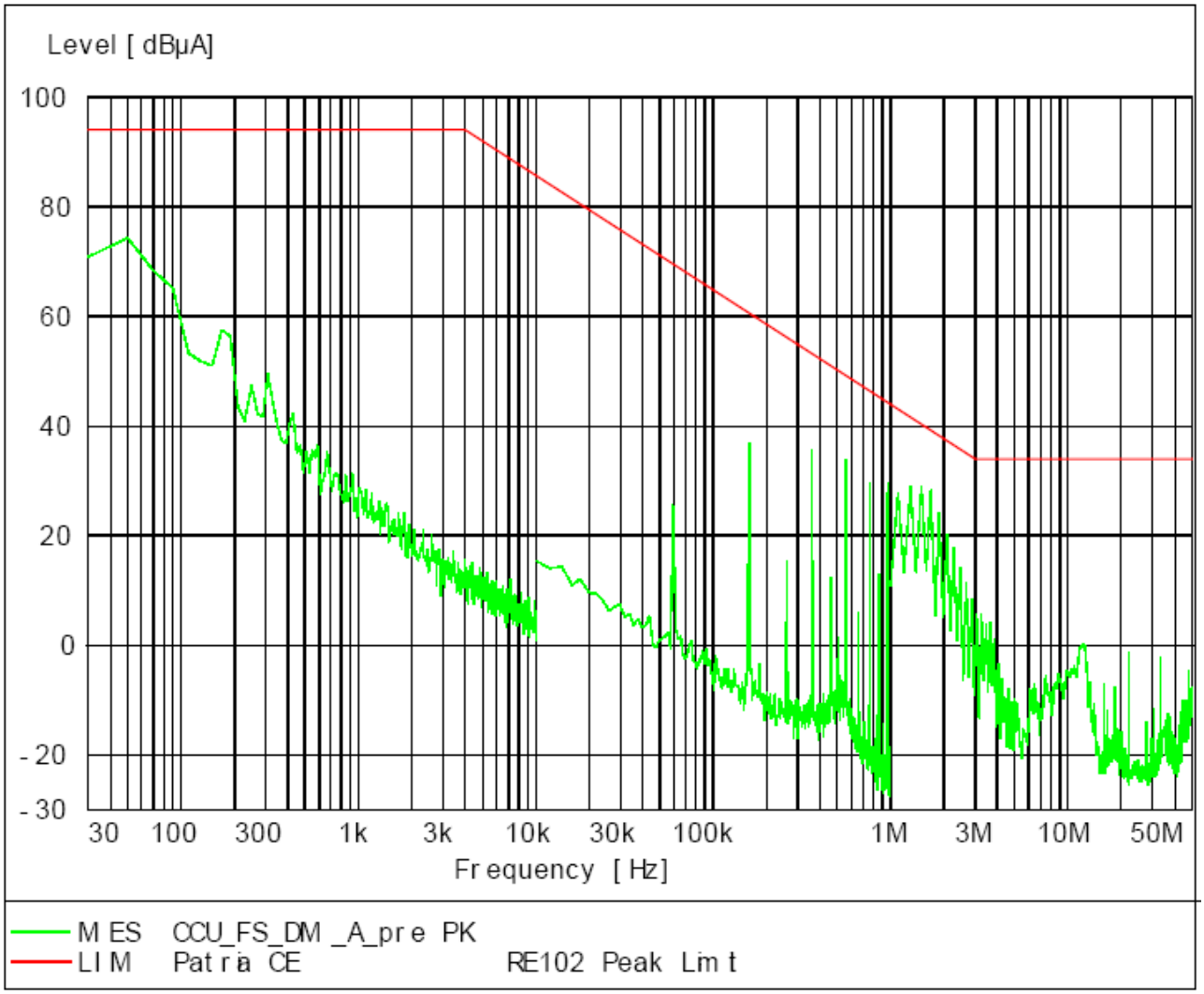


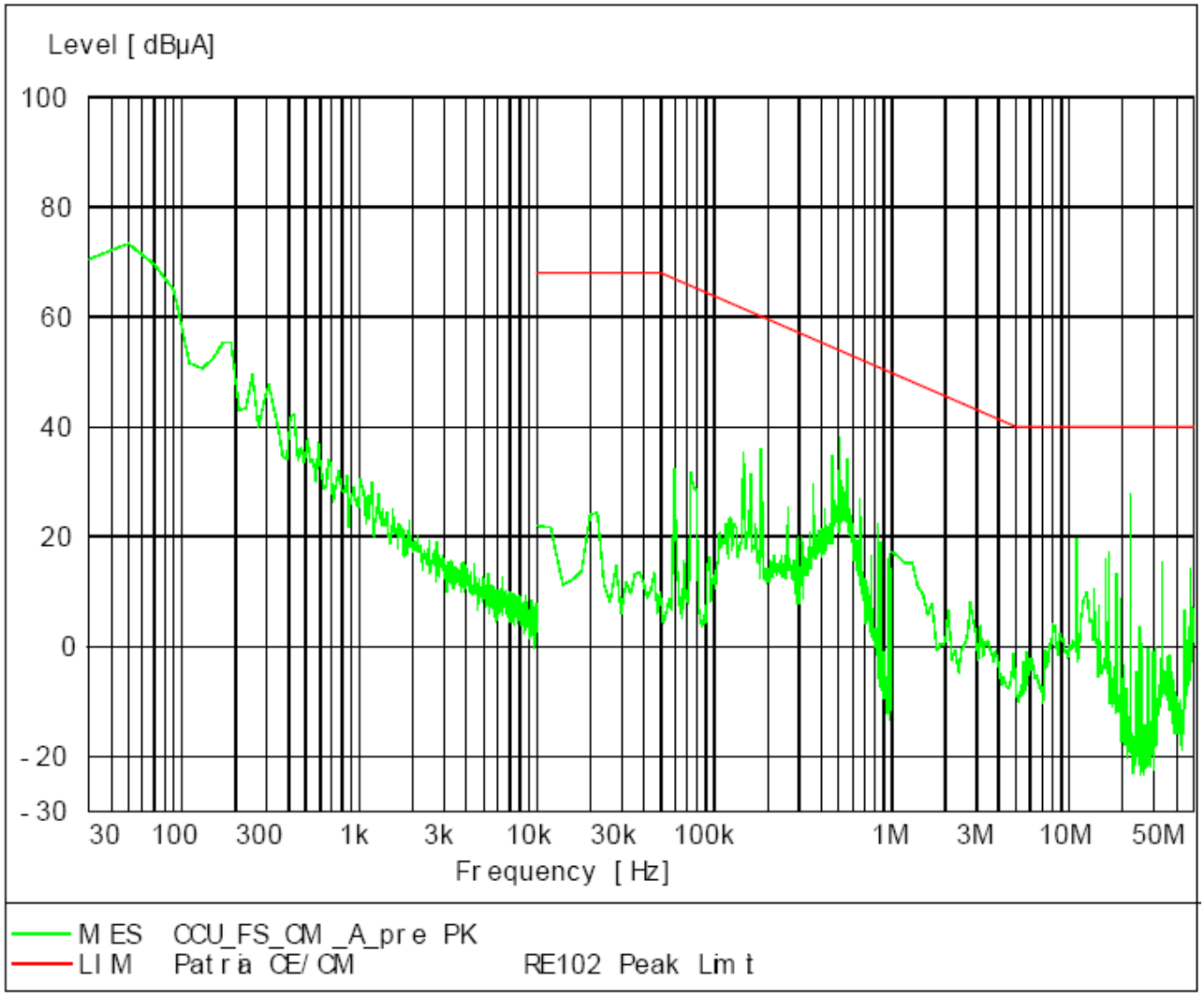
Figure 4-22: DECMEC DM current ripple in most noisy mode

Scale : 10 mA/div

3.9 CCU

3.9.1 Current





3.9.2 Voltage

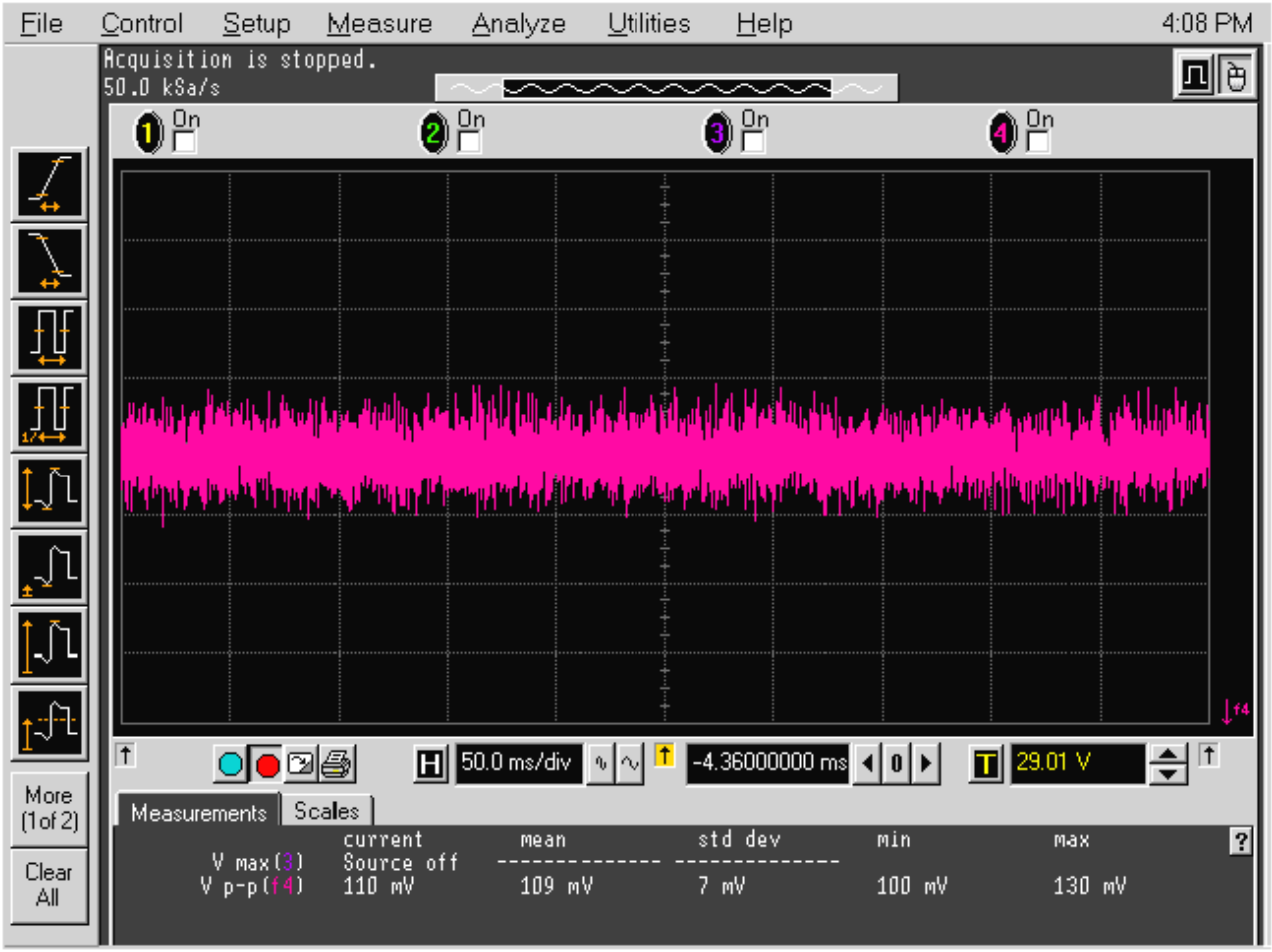


Figure 5-10. BB Voltage, CCU A, Ripple

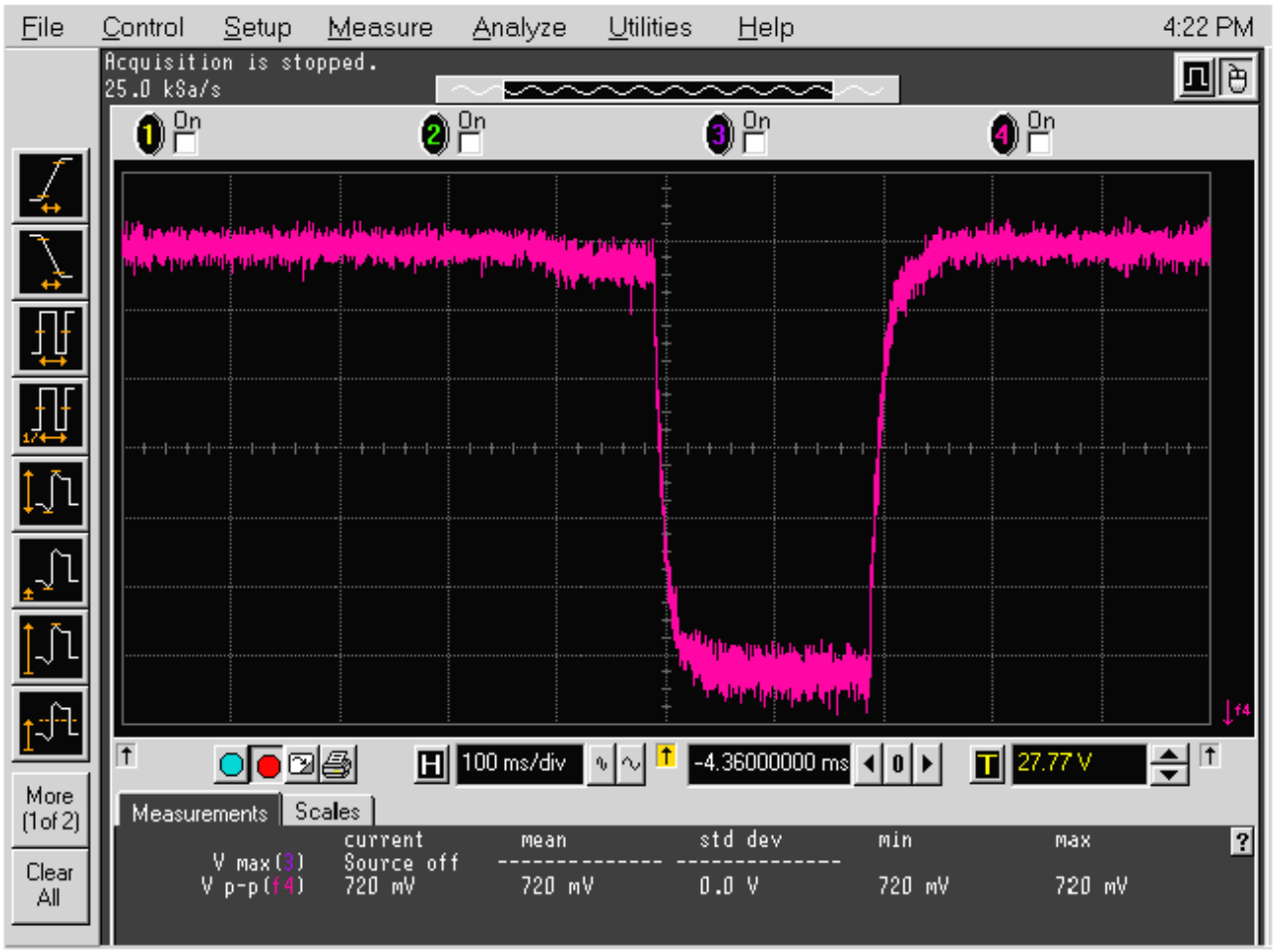
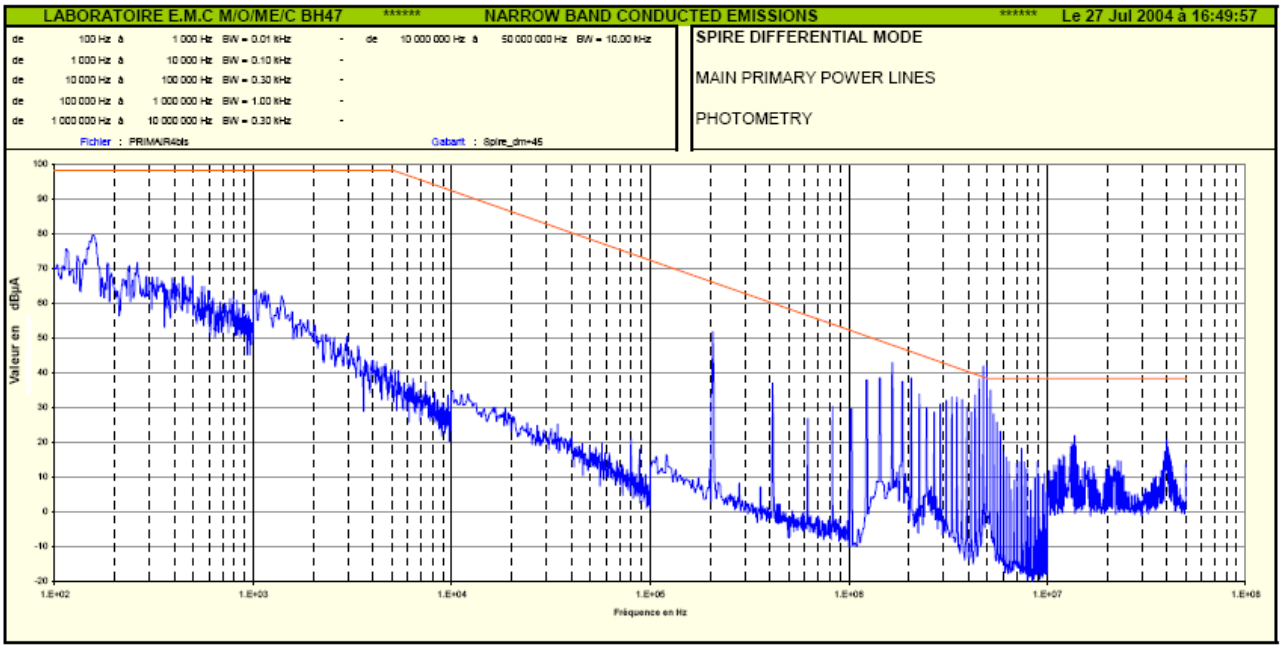


Figure 5-11. BB Voltage, CCU A, Spike

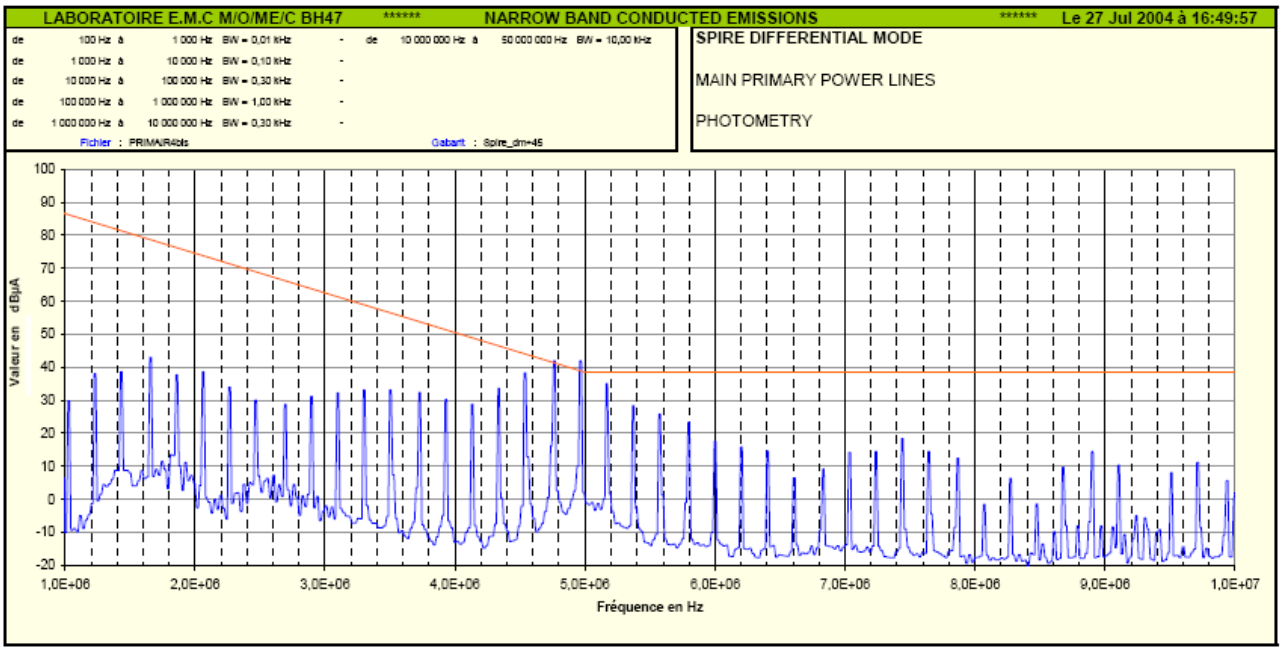
3.10 SPIRE/HSFCU

3.10.1 Current

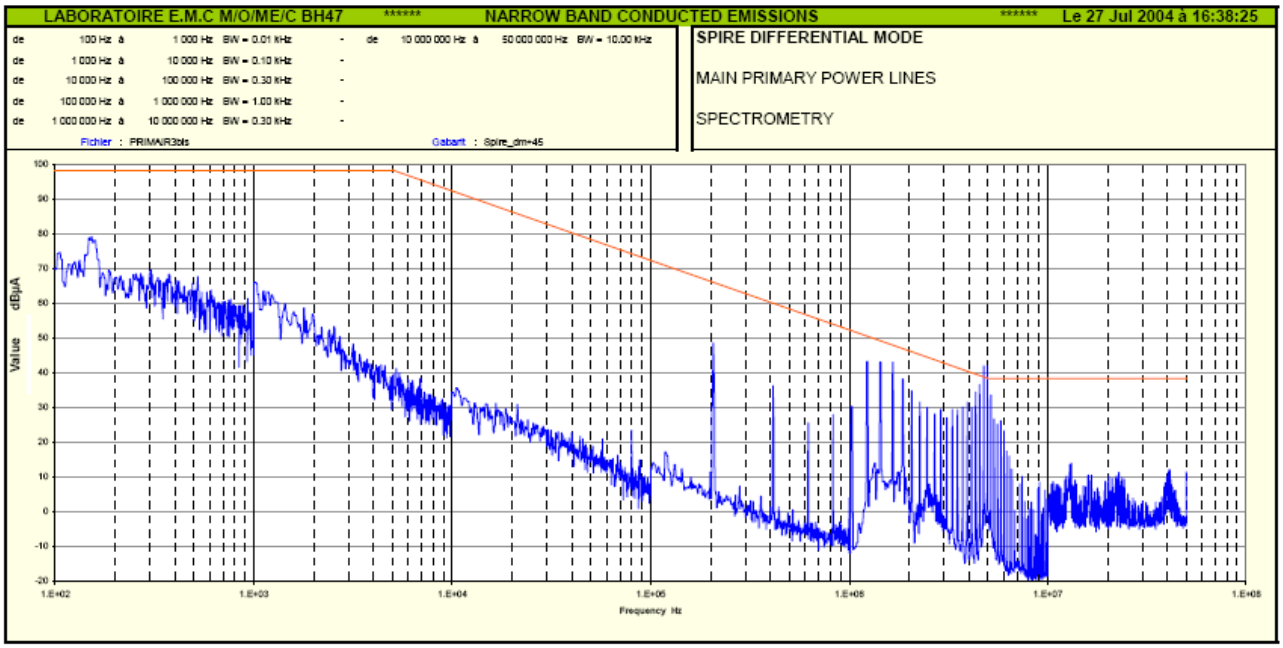
CURVE 5.1-1 : DIFFERENTIAL MODE – MAIN – PHOTOMETRY



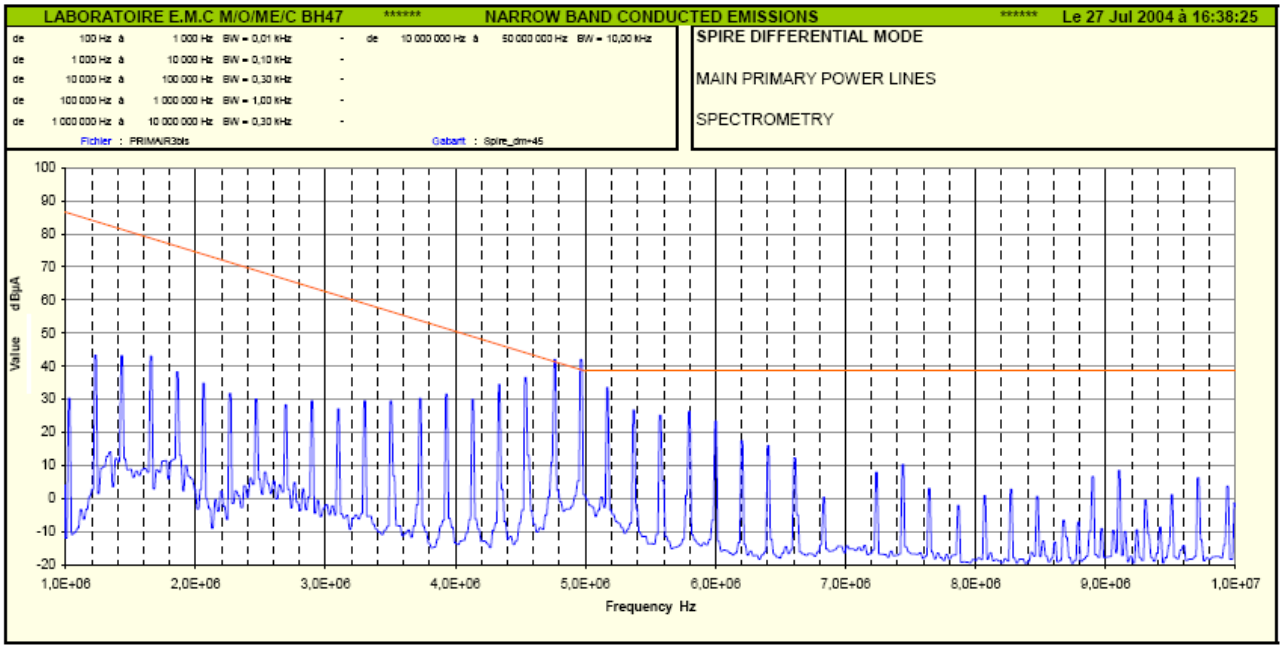
CURVE 5.1-2 : ZOOM OF THE CURVE BEFORE



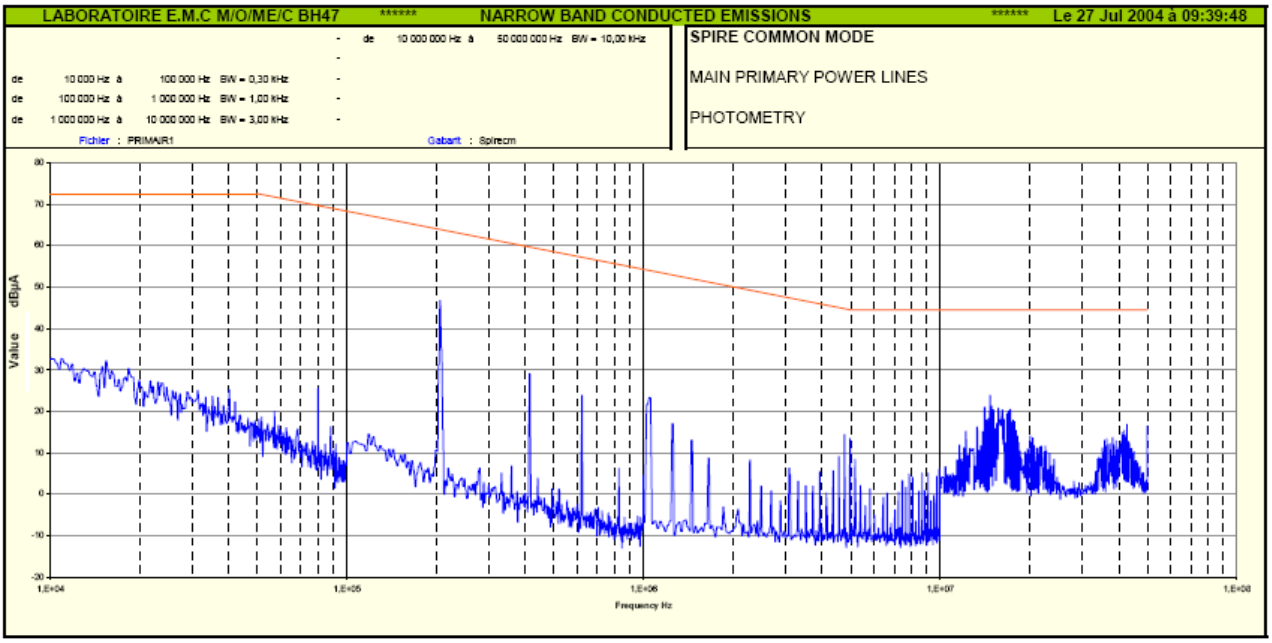
CURVE 5.1-3 : DIFFERENTIAL MODE – MAIN – SPECTROMETRY



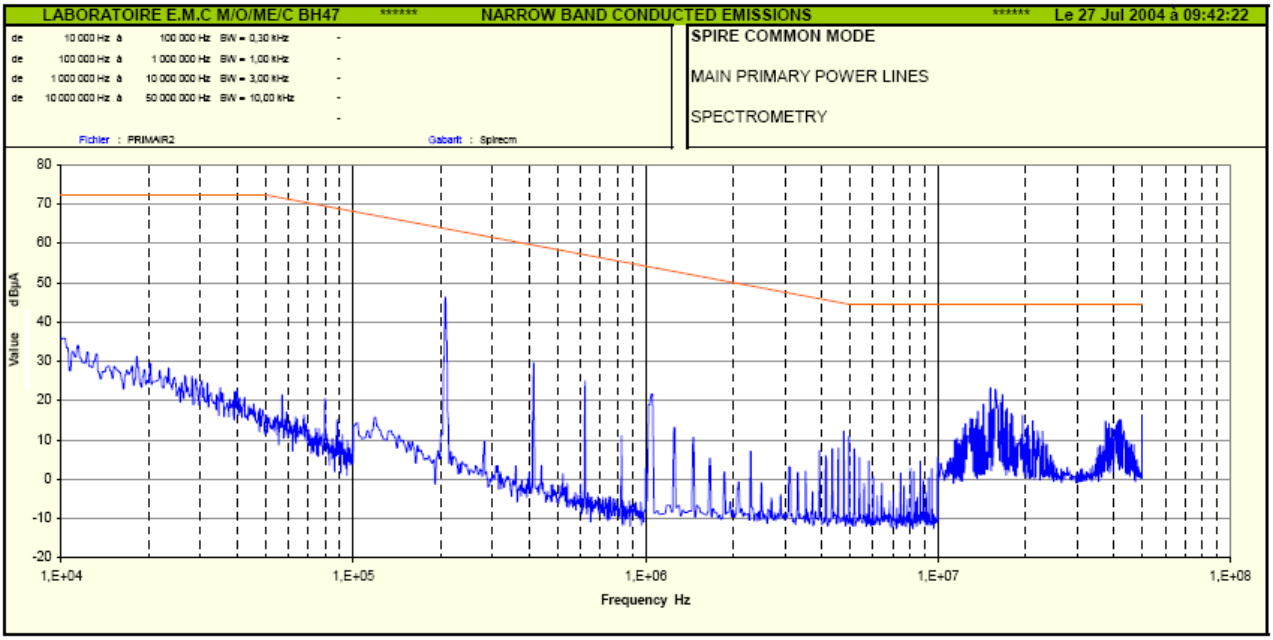
CURVE 5.1-4 : ZOOM OF THE CURVE BEFORE



CURVE 5.1-7 : COMMON MODE – MAIN – PHOTOMETRY



CURVE 5.1-8 : COMMON MODE – MAIN – SPECTROMETRY



3.11 HIFI/DPU-ICU

3.11.1 Current

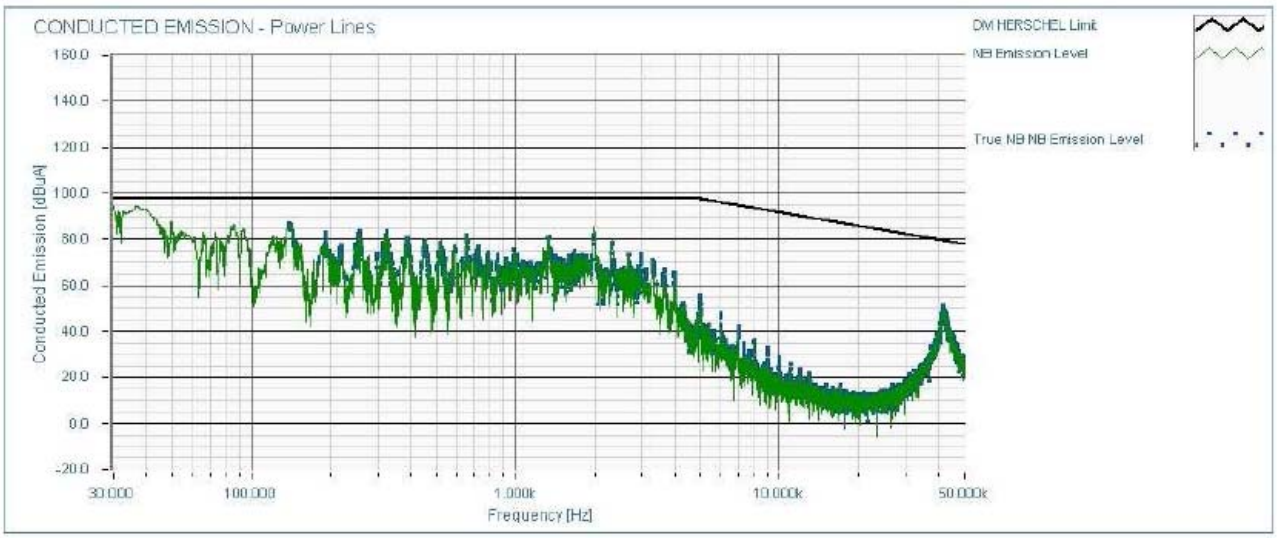


Figure 1-3: Conducted Emission on Input Power Line @ 28V – Differential Mode 30Hz ÷ 50kHz

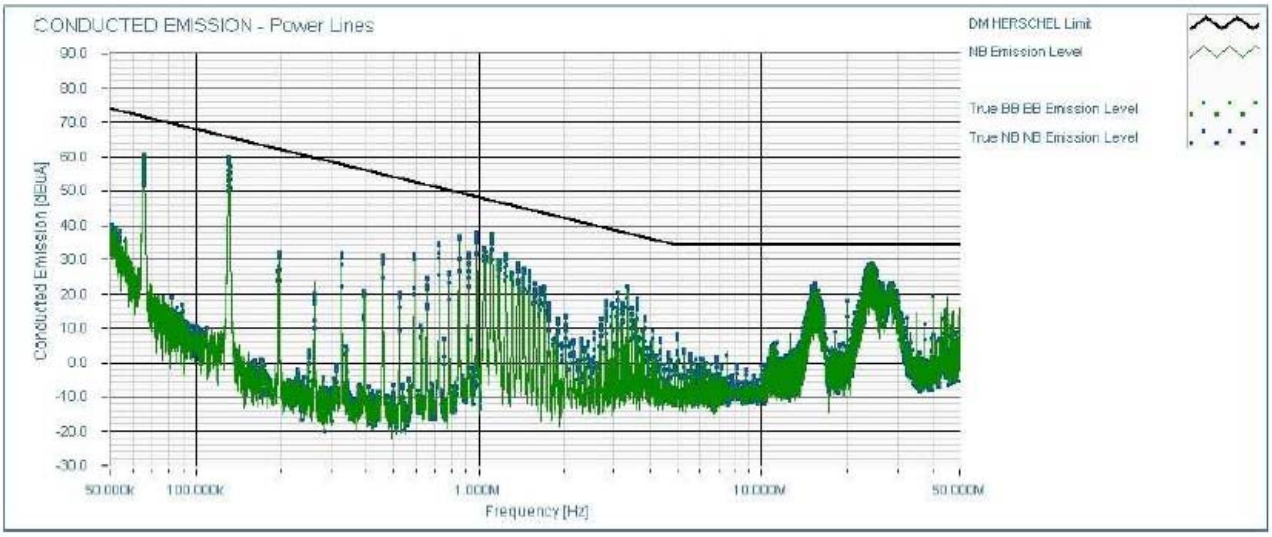


Figure 1-4: Conducted Emission on Input Power Line @ 28V – Differential Mode 50kHz ÷ 50MHz

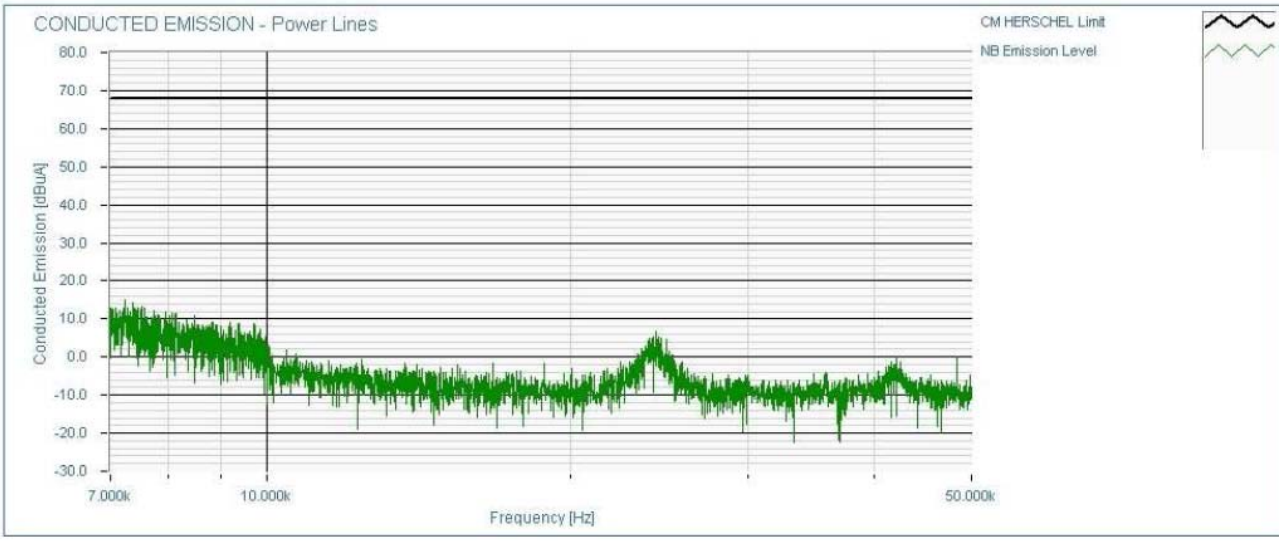


Figure 1-11: Conducted Emission on Input Power Line @ 28V – Common Mode 10kHz ÷ 50kHz

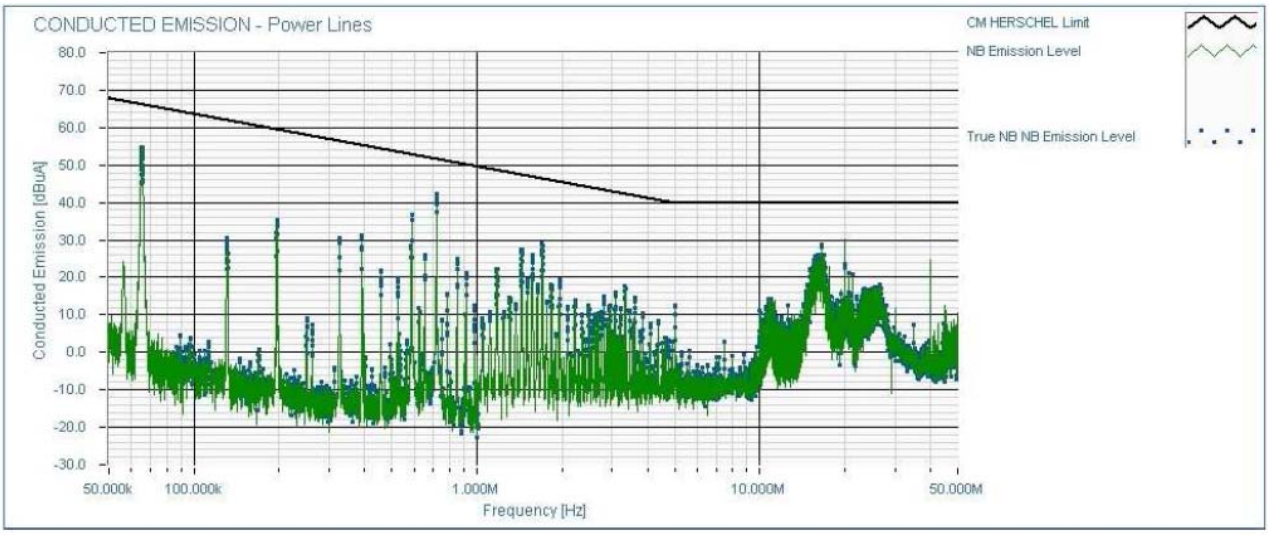


Figure 1-12: Conducted Emission on Input Power Line @ 28V – Common Mode 50kHz ÷ 50MHz

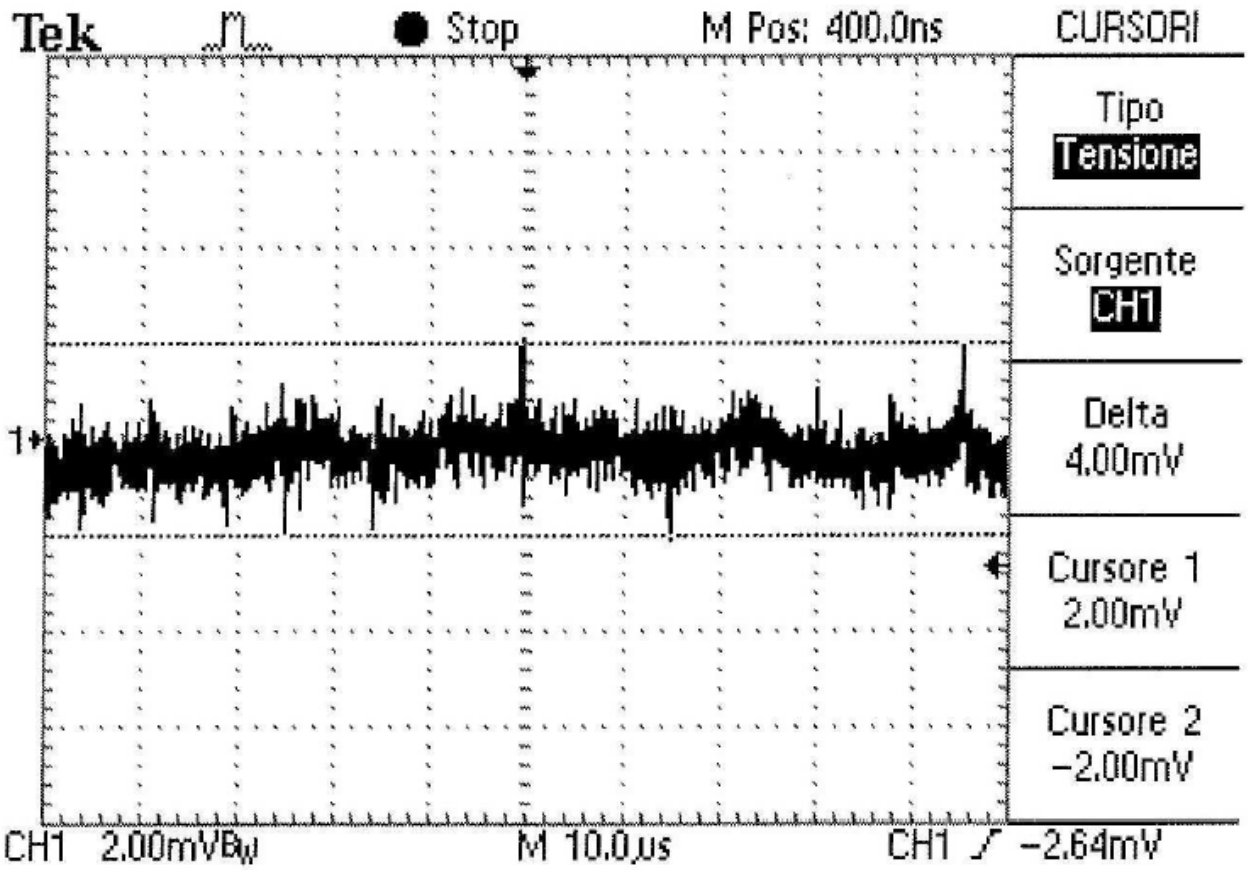
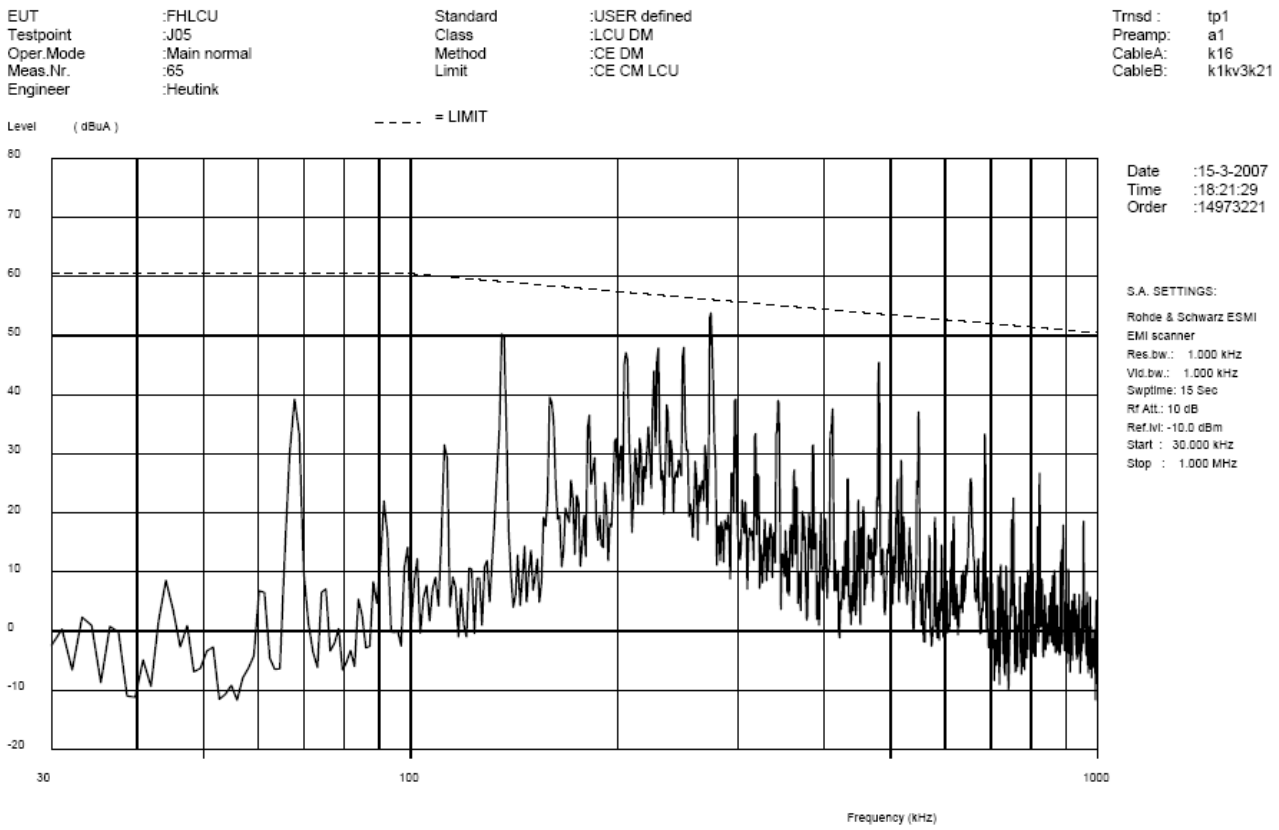


Figure 1-14: Current Spike on Input Power Line

Scale : 20 mA/div

3.12 HIFI/LCU

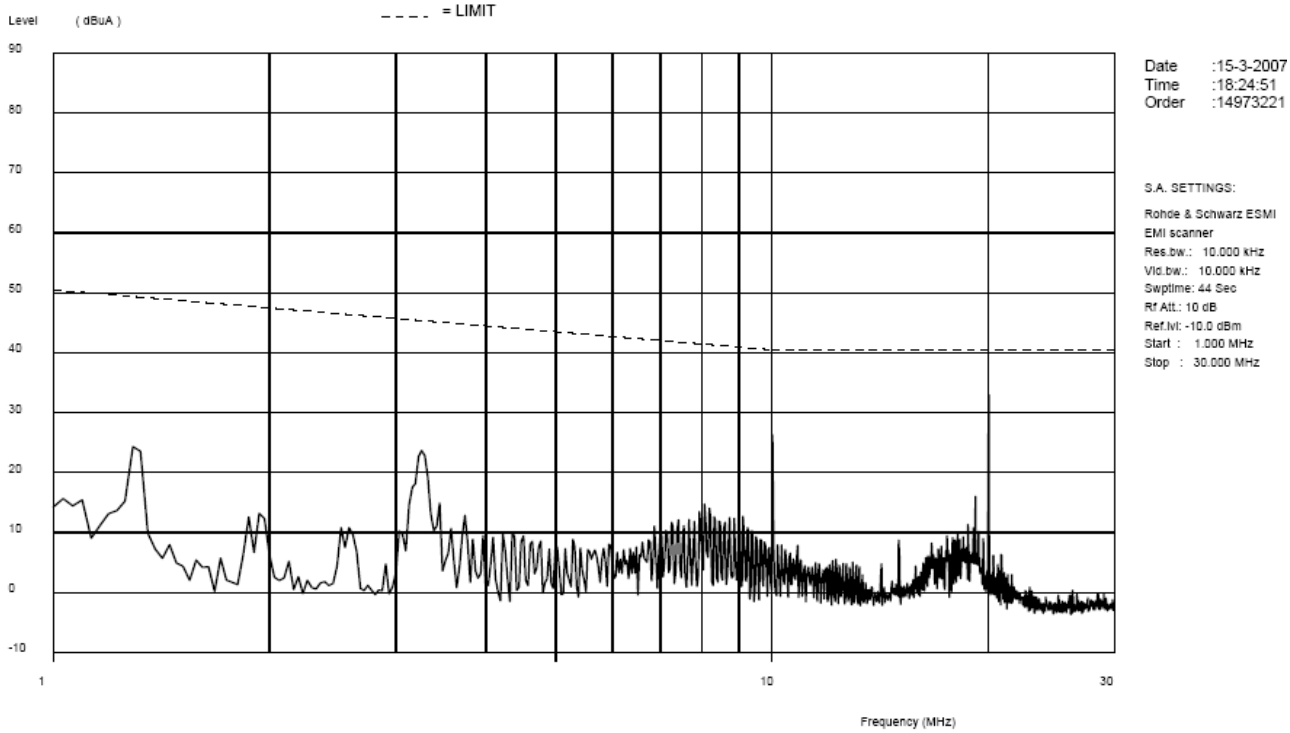
3.12.1 Current



EUT :FHLCU
Testpoint :J05
Oper.Mode :Main normal
Meas.Nr. :66
Engineer :Heutink

Standard :USER defined
Class :LCU DM
Method :CE DM
Limit :CE CM LCU

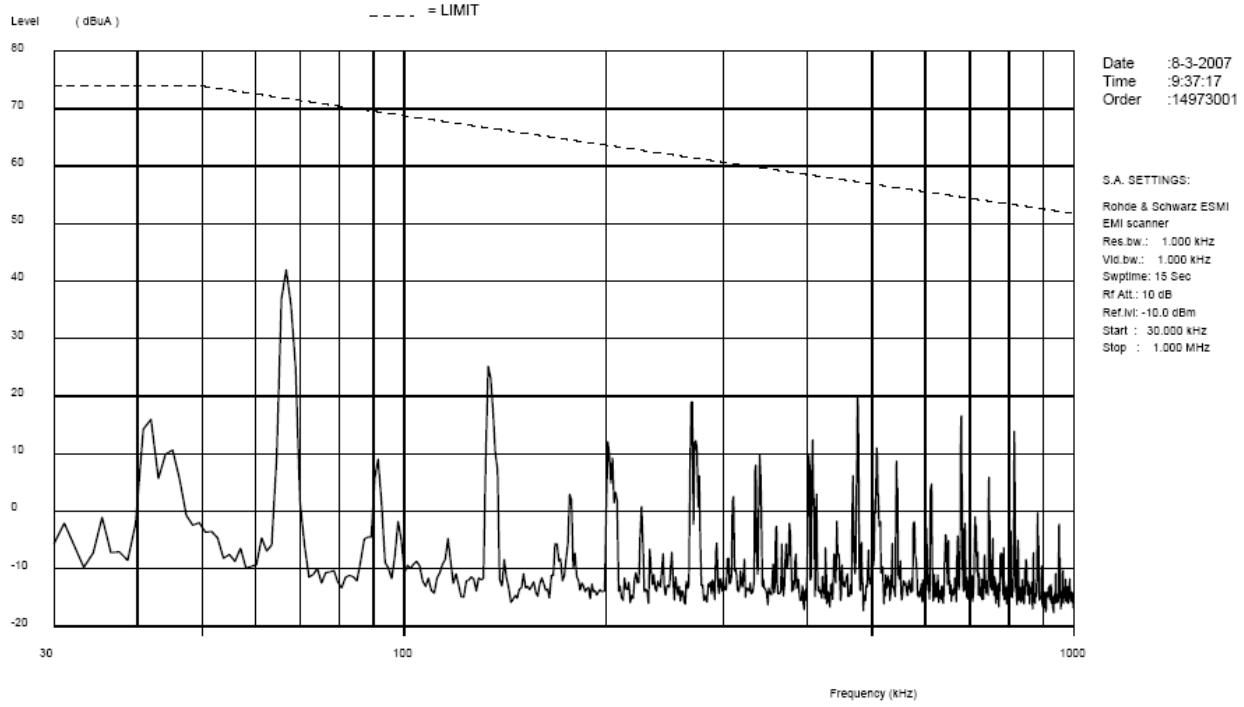
Trnsd : tp1
Preamp: a1
CableA: k16
CableB: k1kv3k2



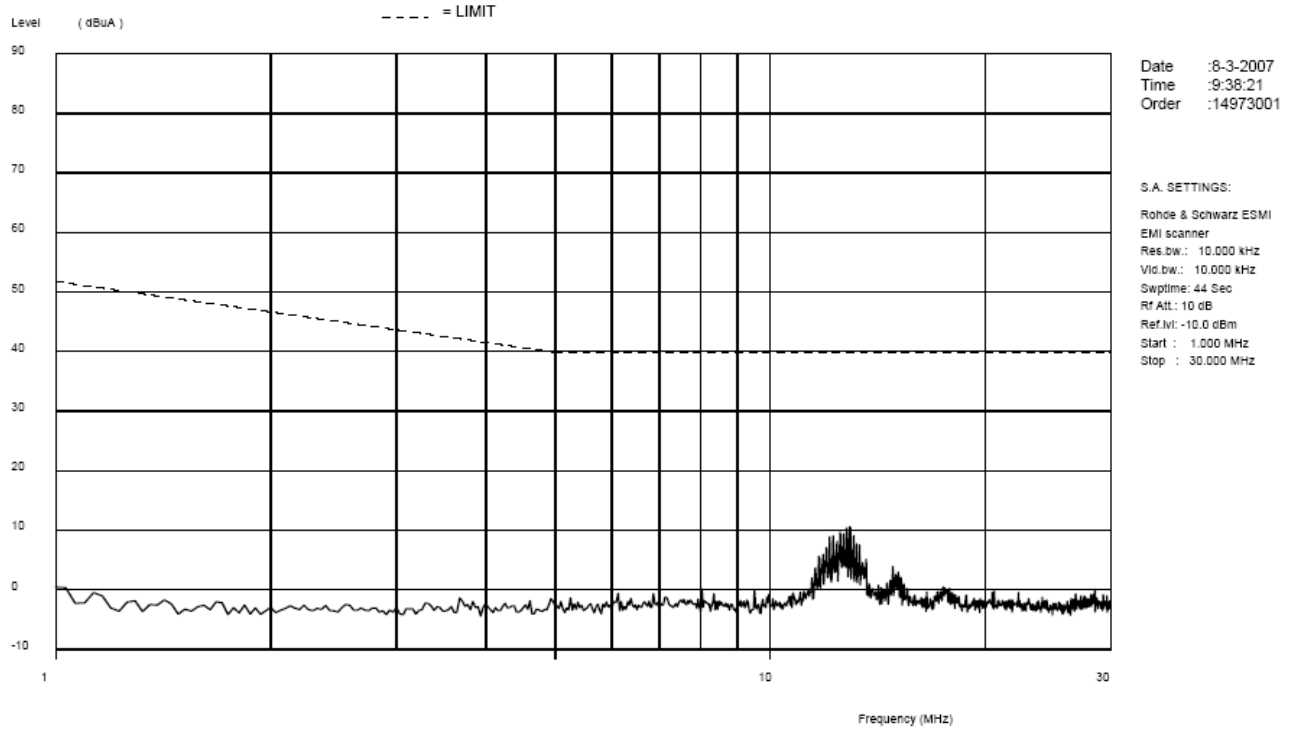
EUT :FHLCU
Testpoint :Power CM
Oper.Mode :Redundant normal
Meas.Nr. :62
Engineer :Heutink

Standard :USER defined
Class :LCU CM
Method :CE CM
Limit :CE CM LCU

Trnsd : tp1
Preamp: a1
CableA: k16
CableB: k1kv3k21



EUT	:FHLCU	Standard	:USER defined	Trnsd :	tp1
Testpoint	:Power CM	Class	:LCU CM	Preamp:	a1
Oper.Mode	:Redundant normal	Method	:CE CM	CableA:	k16
Meas.Nr.	:63	Limit	:CE CM LCU	CableB:	k1kv3k21
Engineer	:Heutink				



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