

Test Report

HERSCHEL

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**SPIRE LPU Electrical Integration Test Report** 

CI-No:

Prepared by:

A. Koppe

22.10.2007

Checked by:

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Distribution:

See Distribution List (last page)

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Doc. No:

HP-2-ASED-TR-0218

Issue: Date: 1

26.10.2007

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# 0 Test Summary

Instrument tested: SPIRE LPU

Model:

FM

S/N: CI:

112 200 ......

Applied Test procedure:

HP-2-ASED-TP-0169, issue 1

### **Summary and Conclusion:**

The procedure which covers the SVM power interface on connectors P/J41 and P/J42 to the SPIRE LPU has been successfully executed.

The bonding resistance of the LPU box to the panel ground has been improved from initially 21.9 mOhm to 3.7 mOhm by the integration of an additional bond strap (see HP-2-ASED-NC-3728).

The LPU high level pulse commands were not available on the HERSCHEL CCS and therefore PLANCK commands have been used instead without problems (see HP-2-ASED-NC-3703).

# Following NCR's had been raised.

HP-2-ASED-NC-3703	SPIRE LPU High Level Pulse commands not executed	
HP-2-ASED-NC-3728	SPIRE LPU Ground resistance too high	

### Open Issues:

none

Doc. No:

HP-2-ASED-TR-0218

issue:

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Date:

26.10.2007

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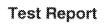


Issue	Date	Sheet	Description of Change	Release
1	22.10.07		Initial issue	

Doc. No: HP-2-ASED-TR-0218

Issue:

Date: 26.10.2007







# **Table of Content**

0	TES	T SUMMARY	2
Ą	sco	PE	5
2	OBJ	ECTIVE	6
	2.1 2.2	GENERAL OVERVIEW	
3	DOC	UMENTS/DRAWINGS	8
	3.1 3.2 3.3	APPLICABLE DOCUMENTS REFERENCE DOCUMENTS OTHER DOCUMENTS	. 8
4	CON	FIGURATION AND REQUIREMENTS	. 9
	4.1 4.2 4.2.1 4.2.2 4.2.3 4.2.4	ESD constraints	.9
5	CON	DITIONS	11
	5.1 5.2 5.3 <i>5.3.1</i> <i>5.3.2</i> <i>5.3.3</i>	Special Equipment for IDAS:	11 12 12 13
6	VERI	FICATION REQUIREMENTS AND STEP BY STEP PROCEDURE	14
	6.3		14 14 15 16
7	STEE	PRYSTEP PROCEDURE	10

Dec. No:

HP-2-ASED-TR-0218

Issue:

Date:

26.10.2007

Page:







# 1 Scope

This procedure details the general rules and necessary steps to be followed during the electrical integration and test of the Herschel SPIRE Launch Lock Unit on the SVM –Z panel. The LPU is directly mounted to the SPIRE FCU.

This procedure is relevant for the connection of the LPU to the SVM power interface on connectors P/J41 and P/J42. The electrical interface of the LPU to the FCU is covered by a respective instrument procedure (RD4) since it affects an instrument internal interface and is, hence, performed by SPIRE personnel with ASED support.

Doc. No: HP-2-ASED-TR-0218

26.10.2007

Issue: 1

Date:

Page:



# 2 Objective

### 2.1 General Overview

The purpose of this integration steps is to install and test the relevant electrical interfaces of the SPIRE LPU and to mate the harness connectors to the units. A detailed electrical connection diagram of the SPIRE LPU is given in Fig. 2.1-1 below.

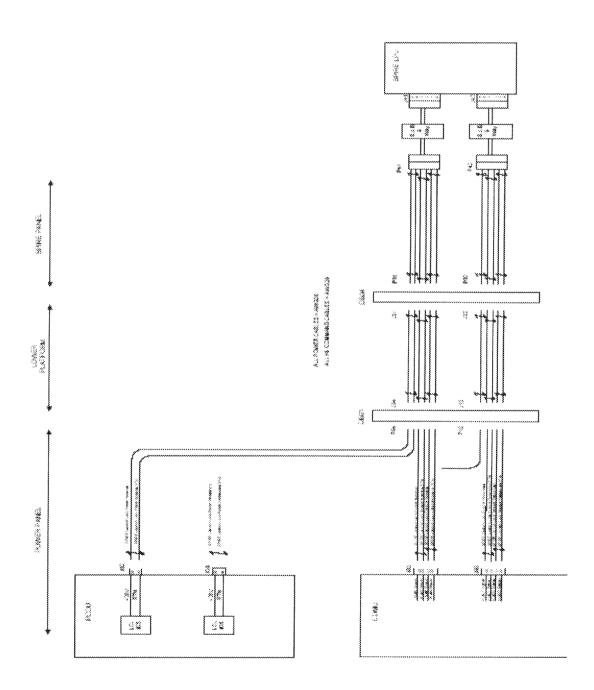


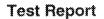
Figure 2.1-1: Electrical Connection Diagram of the Herschel SPIRE LPU

Doc. No: HP-2-ASED-TR-0218

Issue: 1 Date: 26.10.2007

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# 2.2 Test Specimen

The test specimen to be integrated by this procedure is the SPIRE LPU on the HERSCHEL satellite.

The details are listed in following "Test Article List".

Test Article List						
Name	Name HSLPU CI Number 112 200					
Serial No.		Model	FM			
Drawing No.	SPI-MEC-82-DO-01-D	Change. St.	Iss. A			
Remarks		***************************************				

Doc. No: HP-2-ASED-TR-0218

Issue:

Date: 26.10.2007

and EXAMPLS:



# 3 Documents/Drawings

# 3.1 Applicable Documents

No.	Document Name	Document Number	Issue/Revision
AD1	PA-Plan	HP-2-ASED-PL-0007	2-1
AD2	SPIRE-ICD	SCI-PT-IIDB/SPIRE-	3-3
		02124	4
AD3	SPIRE Launch Lock Unit - SVM Electrical Integration Specification	H-P-2-ASP-TS-1431	1

### 3.2 Reference Documents

No.	Document Name	Document Name Document Number	
RD1	SPIRE LPU Electrical Design	LAM.PJT.SPI.SPT.0 70724_01	1 rev.1
RD2	ESD – Regeln für HERSCHEL PLM und Integrations- Aktivitäten	HP-2-ASED-PR-0062	1
RD3	LPU Mounting Procedure on the SPIRE E-box	LAM.SSP.SPI.PRC.0 70911_02	1.0

### 3.3 Other Documents

NA

Doc. No:

HP-2-ASED-TR-0218

Issue:

3

Date: 26.10.2007

and FMAHP-0-



# **Configuration and Requirements**

#### 4.1 **PLM Configuration**

The SPIRE LPU is mounted to the SPIRE FCU acc. to RD3, the S/C Harness is prepared but not connected.

The S/C must be arounded.

#### 4.2 **Test Setup**

### **IDAS-5 Configuration during tests:**

IDAS-5 Test Heads are connected via test adapters to the relevant

"Unit under Test" - Connectors. For current measurements (Inrush and Steady-State) a current probe will be used.

The IDAS-Rack must be grounded to the SVM panel ground.

#### 4.2.1 Test Environment

The tests shall be performed in Cl. 100 000 Clean Room

#### 4.2.2 **ESD** constraints

During handling and connection to the SPIRE LPU the ESD precautions acc. to RD2 have to be applied, e.g. personnel must be grounded.

ESD caps shall be installed on the SPIRE FCU as required.

The SVM must be grounded.

#### 4.2.3 **QA Requirements**

In general the PA Plan shall be followed (see AD1).

Quality Assurance will be a major part of AIT activities in order to ensure that all activities are performed in a controlled manner and documented in accordance with the corresponding requirements.

The main AIT-QA tasks are as follows:

- assurance that activities are performed in accordance with released procedures
- release of hardware for integration/testing

HP-2-ASED-TR-0218 Doc. No:

Issue: 1 Date: 26.10.2007

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Page:







- witnessing of all AIT activities and environmental conditions
- performance of visual inspections
- application of non-conformance reporting system and relevant logbooks
- preparation and performance of KIP's/MIP's/TRP's and PTR's
- to assure that materials/parts/units etc. are traceable
- hazard identification and tracking.

#### 4.2.4 **Documentation Requirements**

All data, results and possible special events received during this test have to be entered into the integration report

### **Sequence Diary**

The obtained records shall be marked with

- date of the test
- title of the procedure
- identification number of procedure
- test article identification number

Each activity and operation has to be entered in the log sheets.

#### **Summary of Deviation**

- In the event that the specimen exhibits any major failure or deviations from the requirement this procedure shall not be further executed and a NCR shall be raised.
- Testing shall be continued only upon authorisation of Product Assurance and Project engineering acc. to the NCR decision.

#### **Post Test Documentation**

After performance of the activities the summary sheets must be filled-in.

A copy of the filled-in summary sheets (see para 6.2 and 6.3) has to be incorporated to the summary report for the integration.

After end of integration a test report shall be written.

Doc. No: HP-2-ASED-TR-0218

Issue:

26.10.2007 Date:



# Conditions

#### 5.1 Personnel

Responsibility	Name / Organization
Test Manager	none
Test Engineer	A. Koppe / ASED
EGSE Operator	S. Hamer / Terma
Support Engineer	S. Sonn / ASED
PA Responsible	Th. Schmidt / ASED
Customer Representative	K. Goodey / ESA
SPIRE Representative	none

#### 5.2 Environmental

Environmental	Nominal	Actual	P	N
Clean Room Class	100 000	100	V	
Temperature	(22±3) °C	19.9°C	V	
Rel. Humidity	4060 %	48.5 %	V	
Pressure	ambient	ambient	7	

Note: Clean room class acc. to Federal Standard 209 E

HP-2-ASED-TR-0218 Doc. No:

Issue:

Date: 26.10.2007







#### **GSE Equipment and Tools** 5.3

### 5.3.1 EGSE

EGSE List					
Item	Manuf.	Model No.	SN No.	Invent No.	Next Calib
Power-SCOE	Sat. Services	•	CI3A 2210- SE840/30	NA	NA
CDMU-SCOE	Sat. Services	~	CI3A 2200- SE841/01	NA	NA
TM/TC DFE					
CCS					

Test Equipment List					
Item	Manuf.	Model No.	SN No.	Invent No.	Next Calib.
IDAS-Rack	ASTRIUM	2			
Scope	LeCroy	LC584 AM	10539		21.02.08
Current-Probe	Tektronix	A6302XL	B0103879		10.10.07
Probe-Amplifier	Tektronix	TM5003	B030378		21.02.08
Test-Head 1	ASTRIUM		······································		
Test-Head 2	ASTRIUM				
Multimeter					

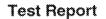
Doc. No:

HP-2-ASED-TR-0218

Issue:

Date:

26.10.2007







# 5.3.2 Special Equipment for IDAS:

Test Adaptors for following connector-types shall be available:

- Connector: DEMA 9s/9p No. 9D

### 5.3.3 Test Software Status

The actual IDAS Software Status is:

Software Status	Version	Remark
IDAS5.	V4.6.1	(i.e. IDAS5.V4.6.1.exe)
CCS test S/W		
HPSDB		

Dec. Not HP-2-ASED-TR-0218

Issue:

Date: 26.10.2007

Page:







# 6 Verification Requirements and Step by Step Procedure

# 6.1 Verification Requirements/Tolerances

### 6.1.1 Bonding Verification

Each bond strap shall have a resistance of R ≤ 2.5 mOhm.

### 6.1.2 Voltage/Current Verification

Bus-Voltage: 27.5....28.14 V

Inrush Current: < 1.0 A for < 5 ms

Steady State Current: < 0.17 A

Pin Allocation: Conn. J41 -Prim. Power; Pin 4; Return; Pin 5

Conn. J42 -Prim. Power: Pin 4; Return: Pin 5

Conn. J41 -HL#5 Cmd: Pin 1; Return: Pin 2

Conn. J41 -HL#6 Cmd: Pin 7; Return: Pin 8

Conn. J42 -HL#21 Cmd: Pin 1; Return: Pin 2

Conn. J42 -HL#22 Cmd: Pin 7; Return: Pin 8

Doc. No: HP-2-ASED-TR-0218

Issue: 1

Date: 26.10.2007

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# 6.2 Procedure Variation Summary

		Test Change	Curr. No.: Date: 18.10.07 Page 1	of 1
Test designation		Test Procedure	Issue	Rev.
LPU Input Power Veril	ication	HP-2-ASED-TP-0169	1	
Test step changed		Reason for Change		
Step 7.1.1.4		Change of measurement type for	wider range	
Step 7.1.1.5		Change of measurement type for	wider range	
Step 7.2.1.5		Change of high level TC		
Step 7.2.1.7		Change of high level TC		
Step 7.2.1.9		Change of high level TC		
Step 7.2.1.11		Change of high level TC		
Step 7.2.2.2		Change of measurement type		
Step 7.2.2.3		Change of measurement type		
Step 7.2.2.4		Change of measurement type		
Step 7.2.2.5		Change of measurement type		
Step 7.3.1.6		Change of high level TC		
Step 7.3.1.16		Change of high level TC		
Step 7.3.1.19		Change of high level TC		
Step 7.3.1.21		Change of high level TC		
Step 7.3.2.2		Change of measurement type		
Step 7.3.2.3		Change of measurement type		
Step 7.3.2.4		Change of measurement type		
Step 7.3.2.5		Change of measurement type		
Step 7.3.2.6		Change of high level TC		
Step 7.3.2.7		Change of high level TC		
Prepared by:	Resp.	Test Leader	Project Engineer	Vision 1980
PA/QA	Prime		Customer	

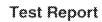
Table 6.2-1: Procedure Variation Sheet

Doc. No: HP-2-ASED-TR-0218

ssue: 1

Date: 26.10.2007

Page:







#### Non Conformance Report (NCR) Summary 6.3

NCR - No.	NCR - Title	Date	Open Closed	PA sig.
HP-2-ASED-NC-3703	SPIRE LPU High Level Pulse commands not executed	16.10.07	open	v.y.
HP-2-ASED-NC-3728	SPIRE LPU Ground Resistance too high	26.10.07	closed	
			<b>V</b>	
			XX	

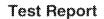
Table 6.3-1: Non-Conformance Record Sheet

Doc. No:

HP-2-ASED-TR-0218

Issue:

Date: 26.10.2007 and EMMHP.D.







#### **Procedure Sign Off Sheet** 6.4

This test has been successfully performed and all open issues are covered by NCR's or Procedure Variations.

	Date	Signature
Test Manager	18.10.07	Ay Clopy
Operator	1/1/10 OX	<u> </u>
PA Responsible	18. W. Jz	<u> </u>
ESA Representative		

HP-2-ASED-TR-0218 Doc. No:

Issue:

26.10.2007 Date:

Page:





# HERSCHEL

# 7 Step by Step Procedure

Step by Step Procedure created with IDAS.

Doc. No: HP-2-ASED-TR-0218

Issue:

Date: 26.10.2007 Settions(a001727/Deskton/Werkbank/HERSCHE) (Dokumentation/Renorts)



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Report

Doc. No.: HP-2-ASED-TR-0218

SPIRE-LPU Unit

Pilename: HP-2-ASED-TR-0218-1.doc

Date: 18.10.2007

Herschel

Model: FM

Par: 7.1 Grounding Measurement

19 Sheet:

St-No	Sub-	Test – Step - Description	Meas.	Min.Nom.	Max.Nom.	Phys.	Actual		p
	St		Туре	Value	Value	Unit	Value	St	
1.1		Preconditions:				***************************************			
1.2		Ensure that the SPIRE WIH is connected to all units							
.3		Ensure that the SPIRE SIH is connected							
.4		Measure according to a four-point measurement the resistance between: - HSLPU and HSFCU housing							
	1	RESISTANCE	000.022	0,00	30,00	mOhm	21,10	МА	Р
.5		Measure according to a four-point measurement the resistance between: - HSLPU and SVM panel GND							
	1	RESISTANCE	000.022 After integra	0,00 on of addition	30,00 al bond strap	mOhm mOhm	21,90 3,7	MA MA	N
									-
									-
					***************************************				
				•	•				
'not I	Acation	Tast.Eng. & Konna		L Track	Managar	1	Dota	<u>i</u>	L

Test-Location: ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.:

A. Koppe OCOE-Operator: S. Hamer Test_Manager: A. Koppe

Date: 16.10.2007



# EADS Astrium GmbH

Herschel

Report

Filename: HP-2-ASED-TR-0218-1,doc

Essue:

Doc. No.: HP-2-ASED-TR-0218

Date: 18.10.2007

Unit: SPIRE-LPU

Model: FM

Par: 7.2 Unloaded Input Verification

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St-No	Sub- St	Test – Step - Description		Лeas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value		P N			
1.1		Verification of unloaded Input Power LPU											
1.2		Connect IDAS-5 Testhead-1 via 9-pole adapter No. 9D to the interface conn	nector HSLPU P41										
1.3		Connect IDAS-5 Testhead -2 via 9-pole adapter No. 9D to the interface con-	nector HSLPU P42										
1.4		Switch ON SVM											
1.5		Switch ON LCL #25 for the Nominal LPU Power issue TC: DC25D170 ZCI02999 - temporary				***************************************							
1.6		Measure the voltage between the following pins aConnector: P/J41 4 5											
	1	VOLTAGE-DC	C	)20.018	27.50	28,14	Volt	28,14	СМ	р			
1.7		Switch OFF LCL #25 for the Nominal LPU Power issue TC: DC25B170 ZCI42999 - temporary				***************************************							
1.8		Measure the voltage between the following pins aConnector: P/J41					***************************************						
	1	5 VOLTAGE-DC	G	)20.017	-0,50	0,50	_Volt	0.00	СМ	р			
1.9		Switch ON LCL #26 for the Nominal Redundant LPU Power issue TC: DC26D170 ZCA42999 - temporary											
1.10		Measure the voltage between the following pins bConnector: P/J42 4					***************************************						
	1	5 VOLTAGE-DC	0	20.018	27,50	28,14	_Volt	28,14	СМ	۵.			
Test-Li ASED-	ocation FN	1,000			Test	Manager: oppe		Date					



ASED-FN

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PA_Resp.:

Th. Schmidt

Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

A. Koppe

Date: 18.10.2007

16.10.2007

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SPIRE-LPU Unit: FM

Model:

Par: 7.2 Unloaded Input Verification

21 Sheet!

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St-No :	Sub- St	Test – Step - Description			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	P N
.11		Switch OFF LCL #26 for the Nominal Redundant LPU Power issue TC: DC25B170 ZCA42999 - temporary								***************************************	
.12		Measure the voltage between the following pins bConnector: P/J42									
	1	5 VOLTAGE-DC			020.017	-0,50	0,50	Volt	0,00	СМ	Р
2.1		Unloaded HL Command Input Verification									
Test-Loc		DA Dava . The Code militar	Test-Eng.:	A. Koppe	<u> </u>		_ _Manager:		Date	<u> </u>	<u></u>

OCOE-Öperator: S. Hamer



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Report

Filename: HP-2-ASED-TR-0218-1.dox

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

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Unit SPIRE-LPU

Model:

FM

Par: 7.2 Unloaded Input Verification

22 Sheet:

St	Ma Kin	10.4	}	***************************************		m		•			·		Duect.	La La		***************************************	
Measure and record the oscilloscope trace when activating the HLSS "DCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 2 pull-solling the HLSS "DCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 2 pull-solling the HLSS "DCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 2 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 2 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and 2 a Connector, P3041 1 pull-solling the HLSS "BCT01170 (HLCS)" command on P41 between pin 1 and	OVI-IC					rest – St	ep - Descripti	ion			Meas.	Min.Nom.	Max.Nom.	Phys.	Actual	C-	P
PAT between pin 1 and 2 socomeeters PAJ41  1		₩.					•••••••••••••••••••••••••••••••••••••••	•••••			туре	value	value	Unit	Value	St	N
F@level(¶) 172.13 ps  18 ms  1 50 mV 500 % P3 58 mV 500 % 3 58 mV 500 % 4 58 mV 500 %  1 50 mV 500 % 1 50 mV 500 %	2.2	2 3 4 5	P41 betweer aConnector: 1 2 PULSDURA UPPER-LEV LOWER-LEV RISE-TIME FALL-TIME TRIGGERSL 18-0ct-07 8:00:15 10:0 v	TION EL /EL OPE MT 041, 895			activating the I	AEP G	MOTE. ENABLE 93 TO	i)" command on	041.005 041.005 041.005 041.005 041.005	22,00 -0,10 50,00 50,00 10,00	29,00 2,00 500,00 500,00 10,00	_Volt _Volt µsec µsec _Volt	26,67 25,31 0,00 111,68 160,35 10,00	PM PM PM PM PM PM	77 77 77 77 77 77
Test-Location:  ASED-FN  PA_Resp.: Th. Schmidt  Test-Eng.: A. Koppe  Test_Manager: Date: OCOE-Operator: S. Hamer  A. Koppe  A. Koppe  16.10,200			1 58 mV 500 2 58 mV 500 3 58 mV 500 4 68 mV 500	F@level( <b>A</b> )	172.13	, ha		0 s	STOPPED  PSI-Eng.:	А. Корре							



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Report

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

Unit SPIRE-LPU Filename: HP-2-ASED-TR-0218-1.doc

		rschel			Mod	el: F	M	Par:	7.2 Unk	aded Input Verific	tion			Sheet:	23			
St-No Su St	ub- I					Tes	t - Ste	p - De	scription	:		Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	
	18 - 1	:36 2:::::::::::::::::::::::::::::::::::	r@ievel	( <b>A</b> )		71111111111111111111111111111111111111				REMOTE ENABLE  00 TO LOCAL  590 MS/s  C STOPPED		Type	Value	Value	Unit	Value	5;	
Test-Local ASED-FN	ition:		PA_Re	sp.:	Th. 8	Schmi	dt			Test-Eng.: OCOE-Operate	A. Koppe r: S. Hamei	r :	Tes A. K	 t_Manager: loppe	1	 Dat 16.1	<u> </u> e: 10.200	]



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Report

Doc. No.: HP-2-ASED-TR-0218

Unit:

SPIRE-LPU

Filename: HP-2-ASED-TR-0218-1.doc

Issue:

Date: 18.10.2007

Herschel

Par: 7.2 Unloaded Input Verification Model: FM

Sibert   24   Step   24   St
18-0ct-07 NT 641.006 Step 7.2.2.2 REMOTE ENABLE 8:89:59 10-12
4 50 mV 500 % P SC 18.8 V



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Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

Unit SPIRE-LPU

		Herschel	Model: FM	Par: 7.2 Unio	aded Input Verific:	ation			Sheet:	25			
St-No	Sub- St		Test - S	tep - Description			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	-
St-No		Measure and record the oscil P41 between pin 7 and 8 aConnector: P/J41 7 8 PULSDURATION UPPER-LEVEL LOWER-LEVEL RISE-TIME FALL-TIME TRIGGERLEVEL TRIGGERSLOPE 18-0ct-07 MT 041.005 S 8:84:00 10 ms 10.0 V	lloscope trace when			.C6)* command on			Max.Nom.	Phys.		PM PM PM PM PM PM	
		r@level( <b>A</b> ) F@level( <b>A</b> ) 10 ms 1 50 mV 500 5. <b>2</b> 50 mV 500 5. <b>3</b> 50 mV 500 5.	115.95 ps 172.47 ps DC 10.0 V	**	2.5 MS/s 3 STOPPEO								
	cation				Test-Eng.:	A. Koppe		Tool	Manager:		Date		~

Test-Location: ASED-FN

PA_Resp.:

Th. Schmidt

lest-Eng.: OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe

Date: 16.10.2007 EADS

ASED-FN

# EADS Astrium GmbH

PA_Resp.:

Th. Schmidt

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16.10.2007

Herschel

Unit: SPIRE-LPU

Model: FMPar: 7.2 Unloaded Input Verification

A. Koppe

	ARTIGUES				aded Input Verification			Sheet:	26		
-No Sub- St			Test	<ul> <li>Step - Description</li> </ul>		Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St
	18-0ct-67 8:04:27 <b>1:1-2</b> 16:0 V		Step 7.2.2.3		REMOTE ENABLE  GO TO LOCAL	туре	value	value	Unii	Value	<i>D</i>
	50 ys 1 50 mV 500 } 2 50 mV 500 } 3 50 mV 500 } 4 50 mV 500 }	r@level( <b>f</b> )	109.813 ps		500 MS/s ] STOPPEO						
st-Location	7:	PA Resn	· Th Schmid		Test-Eng.: A, K	oppe		_Manager:		Date	3;

OCOE-Operator: S. Hamer



ASED-FN

# **EADS** Astrium GmbH

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SPIRE-LPU Unit

	Herschel		Mode	l: FM	Par:	7.2 Unloa	aded Input Verification			Sheet:	27			
-No Sub St	~			Test - S	tep - Des	scription		Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	-
	18-0ct-87 8:04:44	MT 941.885	Step 7.2.	2.3			REMOTE ENABLE							
	(1-2 50 ps 10.0 V						00 TG LOCAL		***************************************					
									***************************************					
				*					***************************************					
		F@level( <b>§</b> )	161.52	<b>1</b> 5 ys					***************************************					
	50 µs 1 50 mV 500 ; <b>2</b> 50 mV 500 ; <b>3</b> 50 mV 500 ; <b>4</b> 50 mV 500 ;	* * *	<b>1</b> DC 18.8	i V		Ē	500 MS/s 1 STOPPED						***************************************	
													***************************************	
										13 200 200 200 200 200 200 200 200 200 20				
t-Locatio	n.					***************************************	Test-Eng.: A. Kop	)na	Toci			Date	~:	

OCOE-Operator: S. Hamer

EADS

# EADS Astrium GmbH

Unit:

SPIRE-LPU

Report

Doc. No.: HP-2-ASED-TR-0218

Filename: HP-2-ASED-TR-0218-1.doc

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Date: 18.10.2007

Herschel

Model: FM Par: 7.2 Unloaded Input Verification

28 Sheet:

	7 ~ .	γ	***************************************							······	•••••	SBCCI.	48	***************************************	******	******
St-No	Sub- St				Tes	st – Ste	p - Desc	ription		Meas.	Min.Nom			Actual	Ç-	Р
	31		***************************************							Туре	Value	Value	Unit	Value	St	1
2.4	1234567	Measure and on P42 betwee bConnector:  1 2 PULSDURATUPPER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER-LEVIOWER	een pin 1 ar P/J42 TON EL EL VEL VEL OPE	nd 2		when a	activating	the HL#	21 "DCT01170 (HLC21)" command REMOTE ENABLE  GO TO LOCAL	d 041,005 041,005 041,005 041,005 041,005 041,005	24.00 22,00 -0,10 50,00 10,00 1,00	28,00 29,00 2,00 500,00 10,00 1,00	msec _Voit _Voit µsec _Voit _Pos	26,66 25,36 -0,10 112,48 159,17 10,00 1,00	PM PM PM PM PM	
	ocation	16 ms 1 50 mV 500 ; 2 50 mV 500 ; 3 50 mV 500 ; 4 50 mV 500 ;	n@level( <b>8</b> ) f@level( <b>8</b> )	1 00	18.72 ps 51.72 ps				2.5 MS/s ) STOPPED							
ASED-		1.	PA_Resp	.: Ti	n. Schmi	dt			Test-Eng.: A. Koppe OCOE-Operator: S. Hamer		Te A.	st_Manager: Koppe		Date 16.1	e: 10.200	ļ.



## **EADS** Astrium GmbH

Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issec:

Date: 18.10.2007

SPIRE-LPU Unit:

Par: 7.2 Unloaded Input Verification

Sheet:

Herschel Model: FM Phys. C-St-No Sub-Test - Step - Description Meas. Min,Nom. Max.Nom. Actual р St N St Туре Value Value Value Unit 18-0ct-87 MT 041.005 Step 7.2.2.4 REMOTE ENABLE 8:05:22 (1-2----- LeCroy GO TO 58 ÿs 18.0 V LOCAL r@level(#) 112.479 µs 50 µs 1 50 mV 500 % **2** 50 mV 500 % **3** 50 mV 500 % **1** 00 10.0 V **4** 50 mV 500 % 500 MS/s C STOPPED

Test-Location: ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.: OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe

Date: 16.10.2007 EADS

## **EADS** Astrium GmbH

Report

Filename: HP-2-ASED-TR-0218-1,doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

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Unit: SPIRE-LPU

				ded Input Verification			Sheet!	30		
lo Sub- St		Test - Ste	p - Description		Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St
18-0±t-87 8:05:30	MT 041.085 S	itap 7.2.2.4		REMOTE ENABLE	16.5		V (4,05		value	- 101
@:1-2===== 50 ps 10 0 V	ecroy			GO TO LOCAL						
	+ * * * * • • • • • • • • • • • • • • •		A							
		+ + + + + + + + + + + + + + + + + + +								
	f@level( <b>A</b> )	159.168 ps								
50 ps 1 50 mV 500 3 2 50 mV 500 3 3 50 mV 500 3 4 50 mV 500 3	, , , <u>1</u>	00 10 0 V	ō.	500 MS/a STOPPED						
										***************************************

Test-Location: ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.; A. Koppe OCOE-Operator: S. Hamer

Test_Manager: A. Koppe

Date: 16.10.2007



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Filename: HP-2-ASED-TR-0218-1.doc

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Issue:

Date: 18.10.2007

Herschel

Unit: SPIRE-LPU FM

Model:

Par: 7.2 Unloaded Input Verification

						aca mpar vermean	* 8. 8				<i>5</i> 1			
St-No	Sub- St			Test – S	Step - Description			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value		P N
2.5		Measure and on P42 betwood P42	een pin 7 and 8 P/J42 FION EL /EL VEL OPE MT 841.885 S	loscope trace whe		REMOTE ENABLE  GO TO LOCAL	22)" command							N H H H H H H H
		16 ms 1 58 mV 500 2 58 mV 500 3 58 mV 500 4 50 mV 500	io io io 1 1 1	DC 18.8 V	0	2.5 MS/s STOPPED								
Test-Lo		3:	PA_Resp.:	Th. Schmidt		Test-Eng.: OCOE-Operator:	A. Koppe S. Hamer			Manager: oppe		Date 16.1	) 3: 0.2001	L 7

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# EADS Astrium GmbH

Herschel

Report

Filename: HP-2-ASED-TR-0218-1.dox

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

Unit: SPIRE-LPU

Model: FM

Par: 7.2 Unloaded Input Verification

8.86.2 (36.826.2	Model. PM Par. 7.2 Unloaded input vertication		Sheet:	32	
-No Sub- St	Test – Step - Description	Meas. Min.No Type Value	m. Max.Nom. Value	Phys. Actu Unit Valu	ai C- e Si
	Step 7.2.2.5  REMOTE ENABLE  GD TO LOCAL	Type Value	Value	Unit Valu	e St
r@level 60 ps 1 50 mV 500 (m 2 50 mV 500 3m 3 50 mV 500 3m 4 50 mV 500 3m					
t-Location:	Test-Eng.: A. Kopp		est Manager:		Date:

ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.: A. Koppe OCOE-Operator: S. Hamer

Test_Manager: A. Koppe

Date: 16.10.2007



# EADS **Astrium GmbH**

Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

Herschel

SPIRE-LPU Unit:

Madal 7.2 Holowied Ionat Verification

	Herschel		Model: FM	Par: 7.2 Unlo	aded Input Verification	n			Sheet:	33			
St-No Sub- St			Test -	Step - Description			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	
	18-0ct-97 8:06:13		Step 7.2.2.5		REMOTE ENABLE								
	4:1-2 58 µs 18.8 V	F@level(#)	159.245 µs		GO TO LOCAL								***************************************
	58 ps 1 58 mV 592 à 1 58 mV 592 à 3 58 mV 592 à 4 58 mV 592 à	* * *		{	500 MS/s ] STOPPEO								***************************************
est-Location					Test-Eng.:	A Konna		Tool	Bionzano		Date		*
esi-Localior SED-FN	1.	PA_Resp.:	Th. Schmidt		OCOE-Operator:	A. Koppe S. Hamer		A. K	_Manager: oppe			e: 10.200	Ĩ

EADS

ASED-FN

# EADS **Astrium GmbH**

PA_Resp.:

Th. Schmidt

Report

Doc. No.: HP-2-ASED-TR-0218

Issue:

A. Koppe

Filename: HP-2-ASED-TR-0218-1.doc

Date: 18.10.2007

17.10.2007

Herschel

Unit: SPIRE-LPU

Model:  $\mathbf{F}\mathbf{M}$ 

Par: 7.3 Loaded Input Verification

34 Sheet:

1

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St-No	Sub-	Test – Step - Description	Meas.	Min.Nom. Value	Max.Nom. Value	Phys.	Actual	Ç-	F
******************	<u>~ </u>		Туре	Value	value	Unit	Value	St	+
.1		Loaded Power Input Verification							
2		Connect IDAS-5 Testhead-1 via 9-pole adapter No. 9D between the interface connectors HSLPU P/J41	***************************************						
		Connect IDAS-5 Testhead-2 via 9-pole adapter No. 9D between the interface connectors HSLPU P/J42							
		Clip current probe to pin 04 of the adapter between P/J41, direction: into box							
)		Record inrush and steady state current on TC request							
	L ocation			Test	 _Manager:		Date	<u></u>	~
ED-	FN	PA Resp. Th Schmidt OCOF Opportunity & Hamor							

OCOE-Operator: S. Hamer



EADS Astrium GmbH

Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

Herschel

Umit: SPIRE-LPU

Model:

FM Par: 7.3 Loaded Input Verification

Sheet: 35

			141(A)(C)		compar venneanen				Sheet	33			
St-No Sub St	b-		Test -	Step - Description			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	PN
.6	Switch ON L issue TC: De expected va (0 A before I	HL cmd activation < 1.0 A and < 5m < 0.17 A)	ominal FCU Powe 99 - temporary 1,				18.7	1 40 50 50				TO 9	
1 2 3 4	aConnector: 004 CURR-dl/dt CURRENT-I CURRENT-I TRIGGERLE 17-0ct-87 11:58:33	PEAK DC EVEL	tep 7.3.1.6 Cu	irr. 8.858 A/Oiv	REMOTE ENABLE		034.014 034.014 034.014 034.014	0,00 0,00 0,00 0,00 0,10	0,50 1,00 0,20 0,10	_A/µs _Amp _Amp _Amp	0,00 0,01 0,00 0,10	PM PM PM	F
***************************************		4444			Channel 1 current Channel 2								
	(8: 1 2 ms 16.3mV	Sinct (C)	-2 99000 ms		Channel A Channel B voltage						***************************************		
	2 ms 1 18 mV 500 8 50 mV AC 3 50 mV AC 4 50 mV AC	First(C) last(C) maximum(C) minimum(C)	-2 80000 ms 18.8000 ms 2.5mV -2.5mV	•	18 MS/s) auto		**************************************	0.000		***************************************		***************************************	
Test-Location	ion:	PA_Resp.:	Th. Schmidt		Test-Eng.: OCOE-Operator:	A. Koppe S. Hamer	1		 _Manager: oppe	<u> </u>	Date 17.1	 : 0.200	 7

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EADS Astrium GmbH

Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

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Date: 18.10.2007

Herschel

Unit SPIRE-LPU

Model EM

Par 7 3 Loaded Input Verification

		rierschei		Par: 7.3 Loaded Input Verification			Sheet:	36			İ
St-No	Sub- St		Test – Ster	o - Description	Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	P N
1.7		aConnector: 004	Current Measurement P/J41								
	†	CURRENT-C 17-0ct-0? 12:19:48 10:0mV	C MT 030.011 Step 7.3.1.7 Curr.	8.818 A/Div REMOTE ENABLE GO TO LUCAL Channel I	030.011	0,00	170,00	mAmp	46,28	PM	P
				Channel 2 Channel A							
		<u> </u>	pkpk(1) 5.0mV msan(1) 46.28mV sdev(1) 8.52mV rms(1) 46.28mV ampl(1) 38 5.0mV	Channel 0 voltage							
		18 mV 588 2 50 mV AC 3 50 mV AC 4 50 mV AC	1 00 30.8mV	10 к5/s О сторрео							
1.8		Measure the aConnector: 4 5	voltage between the following pins P/J41								
	4	VOLTAGE-D			020.018	27,50	28,14	Volt	28,10	СМ	Р
Test-Lo		::	PA_Resp.: Th, Schmidt	Test-Eng.: A. Ko OCOE-Operator: S. Ha	ppe mer	Test A. Kı	_Manager: oppe		Date 17.1	9: 0.200	 17



EADS Astrium GmbH

PA_Resp.:

Th. Schmidt

Report

Par: 7.3 Loaded Input Verification

Doc. No.: HP-2-ASED-TR-0218

Tassue: 1 Date: 18.10.2007

Unit: SPIRE-LPU

FM

Model:

Filename: HP-2-ASED-TR-0218-1.doc

Sheet: 37

A. Koppe

17.10.2007

Herschel

St-No	Sub- St					T	est -	Step	- Des	criptic	on.			Meas. Type	Min.Nom. Value	Max.Nom.	Phys. Unit	Actual Value	C- St
.9	1 2 3 4	Inrush current Activation of H Issue TC: DC' aConnector: F 004 CURR-dI/dt CURRENT-PI CURRENT-DI TRIGGERLEV	HL#5 cm T01170 (?/J41 EAK C /EL	d (HL5)	t after i	reques	st of ID)AS						034.014 034.014 034.014 034.014	0,00 0,00 0,00 0,00 0,10	0,50 1,00 0,20 0,10	_A/µs _Amp _Amp _Amp	0,00 0,01 0,00 0,10	PM PM PM
		17-0ct-07 12:54:33 6 ms 10.8mV	50mA										REMOTE ENABLE GO TO LOCAL						
		(3:3-4 5 ms 10.8 V										7	Channel 2					***************************************	***************************************
			J.		+++	++++		* * * * * * * *	+++	++++	++++	++++	Channel A						***************************************
													Channel 8 voltage						
		r.																	
		5 ma 1 18 mV 580 2 58 mV AC 3 58 mV 580 4 58 mV 580	X 180	!	gove	0 0 5.	SmV					:	5 MS/s] STOPPED					***************************************	***************************************
Test-Lo	cation				~~	. O.A.						est-Er	g.: A. Koppe				<u> </u>	Date	



Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issuc:

Date: 18.10.2007

Herschel

SPIRE-LPU Unit:

Model: FM

Par: 7.3 Loaded Input Verification

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t-No S	Sub- St			Test – St	ep - Descriptio	n		Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	
0		aConnector: 004	Current Measu P/J41	urement										
		2 s 10 mV 500 2 50 mV AC 3 50 mV AC	pkpk(1) mean(1) sdev(1) nms(1) amp1(1) #k	Step 7.3.1.7 Curr.	0.010 A/Uiv	Channel 1 Channel 2 Channel B Voitage 10 kS/s STUPPED		030.011	0,00	170,00	mAmp	46,28	PM	
est-Loc	ation					Test-Eng.:	A. Koppe			Manager:		Date		

ASED-FN

PA_Resp.:

Th. Schmidt

OCOE-Operator: A. Koppe

Test_Manager: A. Koppe



EADS Astrium GmbH

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SPIRE-LPU Unit:

Filename: HP-2-ASED-TR-0218-Ldoc

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Date: 18.10.2007

Herschel

Model: FMPar: 7.3 Loaded Input Verification

39 Sheet:

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St-No	Sub- St				٦	est – St	ep - D	escrip	ption				Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	PN
, ** ***	1 2	Inrush current Activation of h Issue TC: DC aConnector: F 004 CURR-dI/dt CURRENT-PI	HL#6 cmd T01170 (F 2/J41 EAK		er reque	st of IDAS	}						034.014 034.014	0,00 0,00	0,50 1,00	_A/µs _Amp	0,00 0,01	PM PM	200, 200,
	3	CURRENT-DI TRIGGERLEN 17-Oct-07 12:56:36	C /EL 50mA,									REMOTE ENABLE	034.014 034.014	0,00 0,10	0,20 0,10	_Amp _Amp	0,00 0,10	PM PM	****
		5 ms 10.0mV (8:3-4										LOCAL Channel 1 current				***************************************	000000000000000000000000000000000000000		
		5 ms 10.0 V	J.									Channel 2							000000000000000000000000000000000000000
			++++									Channel A					***************************************		
							· · ·					Channel B voltage		***************************************	***************************************			***************************************	
	***************************************													***************************************	***************************************				***************************************
	***************************************	5 ms 1 10 mV 500 2 50 mV 60 3 50 mV 500 4 50 mV 500) ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	*	1 00	5.0mV						5 MS/s O STOPPEO							***************************************
Γest-Lα ASED-	L ocation FN		PA_Res	p.:	Th. Sch	ımidt				Test-l OCO	Eng.: E-Op	A. Koppe erator: S. Hamer			 _Manager: loppe		Dat 17.	<u>_</u> e: 10.200	



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Unit: SPIRE-LPU

Model: FM

Par: 7.3 Loaded Input Verification

		woder rist rar: 7.3 Loaded input verification			Sheet:	40			
St-No	Sub- St	Test – Step - Description	Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	
.12		Steady State Current Measurement aConnector: P/J41 004							***************************************
	1	CURRENT-DC 17-Dct-07 MT 038.811 Step 7.3.1.12 Curr. 8.850 A/Div REMOTE ENABLE 10:59:28	030.011	0,00	170,00	mAmp	-0,74	PM	
		10. GmV ECTON GO TO LOCAL							***************************************
		Channel Current							
		Channel 2							
		Channel 9							
		Chernel 8 voltage							
		pkpk(1) 4.4mV mean(1) -0.79mV mdav(1) 0.46mV nms(1) 8.27mV nms(1) 8.27mV				***************************************		***************************************	***************************************
		# 10 mV 900 2 50 mV AC 3 50 mV AC # 50 mV AC 1 DC 30,0mV # 50 mV AC 0 STOPPED				***************************************			alabelia de la constanta de la
13		Remove current probe							MANAGEMENT
4		Clip current probe to pin 04 of the adapter between P/J42, direction: into box							
15		Record inrush and steady state current on TC request							
est-Lo	cation	Test-Eng.: A, Ko			Manager:		Date		

ASED-FN

PA_Resp.:

Th. Schmidt

OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe



Herschel

Report

Doc. No.: HP-2-ASED-TR-0218

Issue:

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SPIRE-LPU

Unit

Model: FM Par: 7.3 Loaded Input Verification

Filename: HP-2-ASED-TR-0218-1.doc

41 Sheet:

1

14 8 1 18				,	,	₩.		,
St-No Sub-	Test – Step - Descriptio	in .	Meas.	Min.Nom.	Max.Nom.	Phys.	Actual	C-
St	Inrush current measurement after request of IDAS Switch ON LCL #26 for the Nominal FCLPU Power issue TC: DC26D170 ZCA02999 - temporary expected values: 0 A (0 A before HL cmd activation, max. inrush < 1.0 A and < 5msec, steady state < 0.17 A) bConnector: P/J42 004	FEMOTE ENABLE GO TO LOCAL Current Channel 2 Channel B voltage	034.014 034.014 034.014 034.014	0,00 0,00 0,00 0,00 0,00 0,10		_A/µs _Amp _Amp _Amp	0,00 0,01 0,00 0,10	PM PM PM
est-Location:	1 18 mV 560 2 58 mV 9C 3 58 mV 560 &	5 M5/s D STOPPED Test-Eng.: A. Koppe		7	Manager:		Date	

lest-Location: ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.: OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe



Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

Herschel

Unit: SPIRE-LPU

Model: FM

Par: 7.3 Loaded Input Verification

Sheet: 42

St-No	Sub- St			:	- Description		Meas. Type	Min.Nom. Value	Sheet: Max.Nom. Value	42 Phys. Unit	Actual Value		P
1.17		bConnector: 004	Current Measi P/J42	urement									
	1	CURRENT-D 17-0ct-07 13:03:36	C MT 030.011	Step 7.3.1.17 Curr.	8.858 A/8jy	REMOTE ENABLE	030.011	0,00	170,00	mAmp	-0,70	PM	1 N
		.2 s 16.8mV	LECTOY .			\$0 T0 L.0CAL							
						Channel current	***************************************						
						Chennel 2							
						Channel A							
						Channel 8 voltage							
		\$ \$	pkpk(1) mean(1) sdev(1) cms(1) ampl(1) #K	4, 4 mV -G. 76 mV G. 46 mV B. 84 mV 4, 4 mV									
		10 mV 500 2 50 mV AC 3 50 mV AC 4 50 mV AC		\$ 00 38.9mV	Ę	100 k5/s 1 Auto							
1.18		Measure the bConnector: 004 005	voltage betwee P/J42	en the following pins									
	1	VOLTAGE-D	C				020.018	27,50	28,14	_Volt	28,14	СМ	l b
Test-Lo): }:	PA_Resp.:	Th. Schmidt		Test-Eng.: A. Ko	pppe	Tesi			Date	0.200	



Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

SPIRE-LPU Unit

		Herschel			M	odel:	FM	Pa	ır: "	7.3 Lo	aded	I Input	Ver	ification			Sheet:	43			
St-No	Sub- St					T	est – S	itep -	· Des	criptic	n				Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	P
1.19	orb.	Inrush curren Activation of I Issue TC: DC aConnector: I 004 CURR-dI/dt	HL#21 cn :T01170 (nd		reques	st of IDA	NS							034.014	0,00	0,50	_A/µs	0,00		W b
	3 4	CURRENT-P CURRENT-D TRIGGERLE 17-0ct-07 13:09:36	С	div/									į	REMOTE ENABLE	034.014 034.014 034.014	0,00 0,00 0,10	1,00 0,20 0,10	_Amp _Amp _Amp	0,01 0,00 0,10	Pi Pi	M P M P M P
		0 5 ma 10.0mV	<u>LeCro</u> y		~~									GO TO LOCAL							
			J											Channel I current				***************************************			
		0:3-4 5 ms 10.0 V												Channel 2							
		\									•			Channel A				***************************************			
				*										Channel B voltage							
													8								
				•			‡														
		5 ms 10 mV 560 2 56 mV 600 3 56 mV 500 4 56 mV 500	198 198		1	DC 10	1.0mV						О	5 MS/s STOPPEO							
Test-L ASED-	ocation FN		PA_Res	sp.:	Th	ı. Schi	midt			***************************************		Test-E OCOE		.: A. Koppe perator: S. Hamer			t_Manager: (oppe			te: 10.20)07



Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

Unit: SPIRE-LPU

		Herschel		Model: FM	Par: 7.3 Load	led Input Verificati	on			Sheet:	44	Date. * O, x	
	Sub- St			Test – S	tep - Description			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St
20		bConnector: 004	Current Measu P/J42	rement									
	1	CURRENT-D 17-0ot-87 13:12:11	MT 030.011 S	Step 7.3 1.20 Cur	rr. 8.859 A/0;v	REMOTE ENABLE		030.011 *) needs to b	0,00 e multiplied by	170,00 a factor of 3	mAmp due to probe	33,87 *) amplifier se	PM tting
		.2 s 18.9mV	JaCrou .			GO TO LOCAL							
						Channel current							
			********	+++++++++++++++++++++++++++++++++++++++	++ ++++ ++++	Chennel 2							
						Charmel A							
						Channel 8 voltage							
		.2 s	pkpk() mean() sdev() rms() ampl() %	4.4 mW 33.87mV 8.46mV 33.87mV 4.4mV									
		10 mV 500 2 58 mV AC 3 58 mV AC 4 58 mV AC	1	DC 38 0mV		100 k5/s O auto							
***************************************					,	О аито		***************************************					
t-Loc	cation	:				Test-Eng.:	A. Koppe		Test	Manager:		Date	<u></u>

ASED-FN

PA_Resp.:

Th. Schmidt

l est-Eng.: OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe



Report

Doc. No.: HP-2-ASED-TR-0218

SPIRE-LPU Unit:

Filename: HP-2-ASED-TR-0218-1.doc

Issue:

Date: 18.10.2007

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Model: FM Par: 7.3 Loaded Input Verification

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St-No	Sub- St				i	Τє	st – Stei	p - Desi	cription	1			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	P N
1.21	***************************************	Inrush current Activation of H Issue TC: DC aConnector: F 004	łL#22 cm T01170 (nd		equest	of IDAS						***************************************						
	1 2 3 4	CURR-di/dt CURRENT-PI CURRENT-DI TRIGGERLEV 17-0ct-07 13:15:36	3	/div								REMOTE ENABLE	034.014 034.014 034.014 034.014	0,00 0,00 0,00 0,00 0,10	0,50 1,00 0,20 0,10	_A/µs _Amp _Amp _Amp	0,00 0,01 0,00 0,10	PM PM PM PM	4
		5 ms 10.8mV	LeCros	•			‡					GO TO LOCAL							
			J				, , , , , , , ,					Channel 1 current						***************************************	
		***************************************					‡					Channel 2						***************************************	
			++++				*					Channel A							
												Channel B voitage							
							‡												
		5 me 11 10 mV 500 2 50 mV AC 3 50 mV AC 4 50 mV AC	********	t	1	DC 5.	emV		i.	.\$.1	I 5 MS/s D STOPPEO							
Test-L ASED-			PA_Res	sp.:	Th.	Schn	nidt			Te O(st-Eng	g.: A. Koppe Operator: S. Hamer			t_Manager: (oppe		Dat	<u> </u> e: 10.200	⊥)7

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Herschel

Report

Doc. No.: HP-2-ASED-TR-0218

Unit SPIRE-LPU

FM

Model:

Filename: HP-2-ASED-TR-0218-1.doc

Issue:

Date: 18.10.2007

Sheet:

Par: 7.3 Loaded Input Verification 46 St-No Sub-Test - Step - Description Meas. Min.Nom. Phys. Actual Max.Nom. C- P St Type Value Value St N Unit Value Steady State Current Measurement 1.22 bConnector: P/J42 004 CURRENT-DC 030.011 0.00 170,00 mAmp -0,67 PM N MT 038.811 Step ?.3.1.22 Curr. 0.850 A/DIV REMOTE ENABLE 17-0ct-07 13:17:27 · 0---LeCroy 60 TO **"**.2 s LOCAL. 10.0mV Channel 1 current Channel 2 Channel A Channel B voltage pkpk(1) mean(1) -8.67mV sdev(1) 0.46mV rms(1) 9.81mV .2 s ampl(1) #6 4.4mb/ 11 18 mV 500 2 58 mV AC 3 50 mV AC 100 kS/s 1 00 38.0mV 4 58 mV AC O AUTO 1,23 Remove current probe

Test-Location: ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.: OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe



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Report

Par: 7.3 Loaded Input Verification

Doc. No.: HP-2-ASED-TR-0218

Date: 18.10.2007

Herschel

Unit: SPIRE-LPU

Model: FM

Filename: HP-2-ASED-TR-0218-1.doc

47 Sheet:

Essue:

			178170361. 8.178	a one - 7. Dancour	a mpac removement				Sheet:	4/		
St-No Sub-	~		Test - S	Step - Description			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St
2.1 2.3 4 5 6 7		pin 1 and 2 P/J41 ION EL EL VEL	illoscope trace whe	n activating the HL#	5 "DCT01170 (HL5)" co	ommand on	041.005 041.005 041.005 041.005 041.005 041.005	24,00 22,00 -0,10 50,00 10,00 1,00	28,00 29,00 2,00 500,00 500,00 10,00 1,00	msec _Voit _Voit _usec _Voit _Pos	26,66 24,69 -0,10 112,70 143,69 10,00 1.00	PM PM PM PM PM
	18 ms 1 50 mV 900 } 2 58 mV 900 } 3 58 mV 900 } 4 50 mV 900 }		00 19.6 V	Face A	2.5 MS/s) STOPPED							
Test-Locatio ASED-FN	on:	PA_Resp.:	Th. Schmidt		Test-Eng.: OCOE-Operator:	A. Koppe S. Hamer	i.		_Manager: oppe		Date 17.1	3: 0.2007

ASED-FN

EADS Astrium GmbH

PA_Resp.:

Th. Schmidt

SPIRE-LPU

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Report

Doc. No.: HP-2-ASED-TR-0218

Issue:

A. Koppe

Date: 18.10.2007

17.10.2007

Filename: HP-2-ASED-TR-0218-1.dox

Herschel Model: FM Par: 7.3 Loaded Input Verification 48 Sheet: St-No Sub-Test - Step - Description Max.Nom. Meas. Phys. Min.Nom. C-Actual St Type Value Value St N Value Unit MT 041.895 Step 7.3.2.2 18-0ct-07 REMOTE ENABLE 8:10:18 @:1-2===== LeCroy 60 TO ‴50 µ̃s 10.0 V LOCAL (assessamme n@level(∰) 112.784 ps 50 µs 1 58 mV 500 in 8 58 mV 500 in 3 58 mV 500 in 1 00 18.8 V 4 50 mV 500 in 500 MS/s O STOPPED Test-Location: Test-Eng.: A. Koppe Test_Manager: Date:



Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

lssue:

Date: 18.10.2007

Unit:

SPIRE-LPU

	Herschel		4			I Input Verificatio				49		
No Sub- St			T	est – Step - D	escription		Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St
	18-Oct-87 8:10:27	MT 641.005	Step 7.3.2.2			REMOTE ENABLE						
	@:1-2 58 µs 18.6 V	F@level(#)	143. 692 μ			03 T0 L0CAL						
	50 ps 1 50 mV 500 & 2 50 mV 500 & 3 50 mV 500 & 4 50 mV 500 &				Ü	500 MS/s STOPPED						

Test-Location: ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.: OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe

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Report

D∞. No.: HP-2-ASED-TR-0218

Unit

SPIRE-LPU

Filename: HP-2-ASED-TR-0218-1.doc

Issue:

Date: 18.10.2007

Herschel

Model: FM Par: 7.3 Loaded Input Verification

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Ot 81	~ ·	T			Mark.		***************************************		en region i carricorrent	***************************************	····		~~~~~	50			
	Sub- St			***************************************	Test	- Step	o - Desc	ription			Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	F
.3	1 2 3 4 5 6 7	Measure and P41 betweer aConnector: 7 8 PULSDURAT UPPER-LEV LOWER-LEV RISE-TIME FALL-TIME TRIGGERSL 18-0ct-07 8:10:52 (1:1-2	Pin 7 and 8 P/J41 FION EL /EL VEL OPE MT 841.885			hen ac	ctivating !	the HL#	6 "DCT01170 (HL6)" c REMOTE ENABLE 00 T0 LOCAL	ommand on	041.005 041.005 041.005 041.005 041.005 041.005	24,00 22,00 -0,10 50,00 10,00 1,00	28,00 29,00 2,00 500,00 10,00 1,00	msec Volt _Volt _usec Volt Pos	26,65 24,69 0,00 112,57 146,11 10,00 1,00	PM PM PM PM PM PM	
		10 ms 1 50 eV 500; 2 50 eV 500; 3 50 eV 500; 4 50 eV 500;	r@level(A) F@level(A)	158	.23 pe .37 pe			0	2.5 MS∕s STOPPED								
est-Lo SED-F		;	PA_Resp.:	Th.	Schmidt				Test-Eng.: OCOE-Operator:	A. Koppe S. Hamer			 _Manager: oppe	·	Date 17,1	.: 0.2007	 7



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PA_Resp.:

Th. Schmidt

Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

17.10.2007

Unit: SPIRE-LPU

A. Koppe

N. I.	C. L.	Herschel		1,1400				ed Input Verification	Meas.	Min.Nom.		51 Phys.	Actual	C-	
-No	St				iesi:	step - De	scription		Type	Value	Max.Nom. Value	Unit	Value	St	
*		18-0ct-87 8:11:00	MT 841.095	Step 7.3	1.2.3			REMOTE ENABLE							•
			LECTON .					GO TO LOCAL	***************************************						
						4++++	**::	!							

			r@level(A)	112.5	673 ys				***************************************	***************************************					
		50 µs 1 50 mV 500 & \$ 50 mV 500 & 3 50 mV 500 & 4 50 mV 500 &	· · ·	1 OC 10.	6 V		3	500 MS/s] STOPPEO							

	cation		•••••					Test-Eng.: A. Kop		TTAN	t_Manager:		Dai		

ASED-FN

EADS Astrium GmbH

PA_Resp.:

Th. Schmidt

Unit:

SPIRE-LPU

Report

Doc. No.: HP-2-ASED-TR-0218

Issue:

A. Koppe

Date: 18.10.2007

17.10.2007

Filename: HP-2-ASED-TR-0218-1.doc

Sheet!

Herschel Model: FM Par: 7.3 Loaded Input Verification St-No Sub-Test - Step - Description TPhys. Meas. Min.Nom. Max.Nom. Actual C-₽ St Туре Value Value Unit Value St N 18-0ct-07 MT 841.005 Step 7.3 2.3 REMOTE ENABLE 8:11:09 (1-2===== 50 ys 10.0 V tecroy 60 10 LOCAL F@level(**8**) 146.(09 µs 58 ps 1 50 mV 500 5. 2 50 mV 500 5. 3 50 mV 500 5. 1 00 10.0 V 4 50 mV 500 5. 500 MS/s O STOPPEO Test-Location: Test-Eng.: A. Koppe Test_Manager: Date:



EADS Astrium GmbH

Report

Par: 7.3 Loaded Input Verification

Doc. No.: HP-2-ASED-TR-0218

Date: 18.10.2007

Herschel

SPIRE-LPU Unit: FM

Model:

Filename: HP-2-ASED-TR-0218-1.doc

53 Sheet:

Issue:

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St-No	Sub-		Test – Step - Description	1	Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St	۲ ۱
4	1 2 3 4 5 6 7	Measure and P42 between bConnector: I 1 2 PULSDURAT UPPER-LEVE LOWER-LEVE FALL-TIME TRIGGERS I 18-0ct - 97 8:11:36 I 18-95 10:8 V	P/J42 TON EL TEL VEL OPE MT 841.886 Step 7.3.2.4	#21 *DCT01170 (HL21)* command on REMOTE ENABLE 60 TO LOCAL	041.005 041.005 041.005 041.005 041.005 041.005	24,00 22,00 -0,10 50,00 50,00 10,00 1,00	28,00 29,00 2,00 500,00 10,00 1,00	msec _Voit _Voit µsec µsec _Voit _Pos	26,65 24,94 -0,10 114,86 141,24 10,00 1,00	PM PM PM PM PM	
***************************************		16 ms 1 50 mV 500 g 1 50 mV 500 g 3 50 mV 500 g 4 50 mV 500 g	** **	2.5 MS/s D STOPPED							
Test-Li ASED-):	PA_Resp.: Th. Schmidt	Test-Eng.: A. Koppe OCOE-Operator: S. Hamer			_Manager: loppe		Date 17.1	e: 0.200	7

ASED-FN

EADS Astrium GmbH

PA_Resp.:

Th. Schmidt

Report

Dec. No.: HP-2-ASED-TR-0218

Unit:

SPIRE-LPU

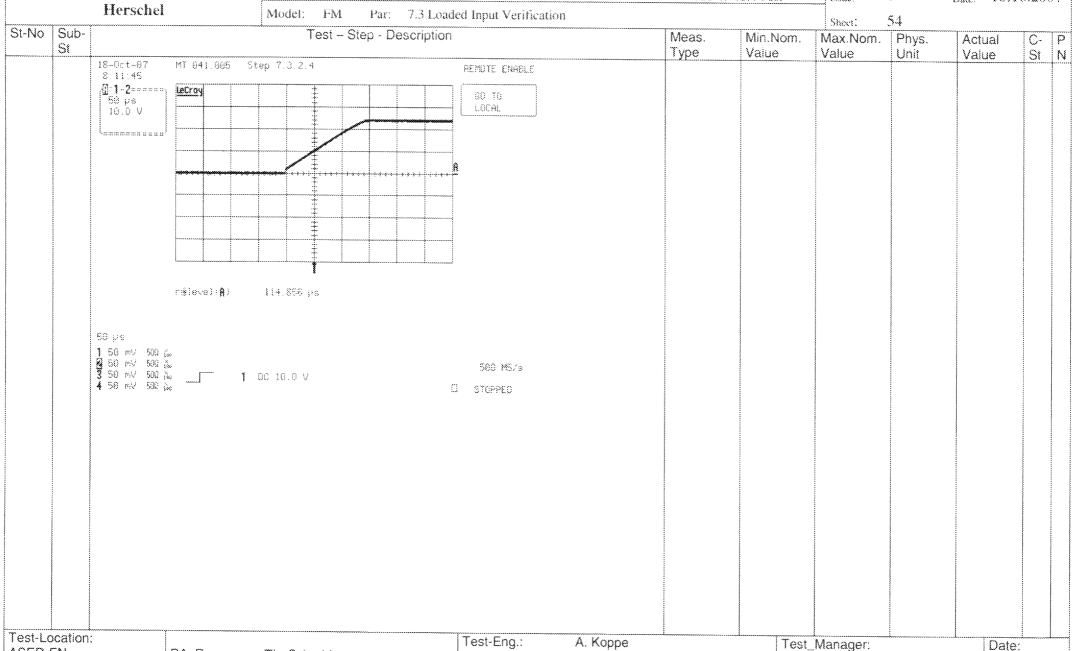
Filename: HP-2-ASED-TR-0218-1.doc

Issue:

Date: 18.10.2007

17.10.2007

A. Koppe





Report

Doc. No.: HP-2-ASED-TR-0218

Issue:

18.10.2007

Unic SPIRE-LPU

Filename: HP-2-ASED-TR-0218-1.doc

No Sub-
St

Test-Location: ASED-FN

PA_Resp.:

Th. Schmidt

Test-Eng.: OCOE-Operator: S. Hamer

A. Koppe

Test_Manager: A. Koppe

ASED-FN

EADS Astrium GmbH

PA_Resp.:

Th. Schmidt

Report

Doc. No.: HP-2-ASED-TR-0218

Issue:

A. Koppe

Date: 18.10.2007

17.10.2007

Herschel

Unit: SPIRE-LPU

Model: FM

FM Par: 7.3 Loaded Input Verification

7.7656367

Filename: HP-2-ASED-TR-0218-1.doc

Sheet: 56

	Sub- St	Test – Step - Description	Meas. Type	Min.Nom. Value	Sheet Max.Nom, Value	56 Phys. Unit	Actual Value	C- St	
2.5		Measure and record the oscilloscope trace when activating the HL#22 "DCT01170 (HL22)" command on P42 between pin 7 and 8 bConnector: P/J42 7 8 PULSDURATION UPPER-LEVEL LOWER-LEVEL RISE-TIME FALL-TIME FALL-TIME FALL-TIME FALL-TIME FALL-TIME (Schieber 1977) 1 18 18 18 19 18 19 19 19 19 19 19 19 19 19 19 19 19 19			Max.Nom.	Phys.			NAMES 1
		1 50 mV 500 % 2 50 mV 500 % 3 50 mV 500 %1 DC 10.0 V 4 50 mV 500 %							
Test-Loc ASED-F		Test-Eng.: A. Koppe PA Resp.: Th Schmidt OCOE Operator: S. Homov		Test	Manager:		Date	:	



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Report

Filename: HP-2-ASED-TR-0218-1.doc

Doc. No.: HP-2-ASED-TR-0218

Issue:

Date: 18.10.2007

17.10.2007

PA_Resp.:

Th. Schmidt

SPIRE-LPU

Unit

A. Koppe

	Herschel		1			oaded Input Verification				57		
No Sub- St				Test - Ste	o - Descript	ion	Meas. Type	Min.Nom. Value	Max.Nom. Value	Phys. Unit	Actual Value	C- St
	18-0ct-07 8:14:48	MT 941.995	Step 7.3.2	.5		REMOTE ENABLE						
***************************************		So TO LOCAL										
	50 pm 1 50 mV 500 g 1 50 mV 500 g 3 50 mV 500 g 4 50 mV 500 g	r@level(\$)				500 MS/s Ü STOPPED						

EADS Astrium GmbH

Report

Doc. No.: HP-2-ASED-TR-0218

Unit

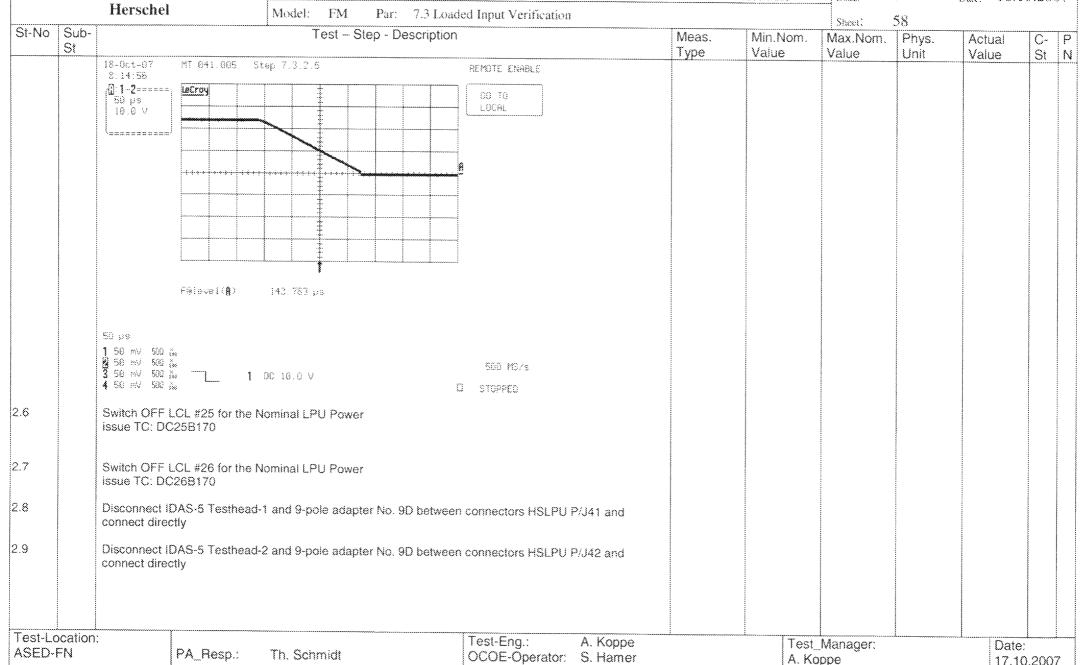
SPIRE-LPU

Filename: HP-2-ASED-TR-0218-1.doc

Issue:

Date: 18.10.2007

17.10.2007





Test Report

HERSCHEL

END OF DOCUMENT

Doc. No: HP-2-ASED-TR-0218

lssee: 1 Date: 22.10.2007



Test Report

HERSCHEL

	Name	Dep./Comp.		Name	Dep./Camp.
	Alberti von Mathias Dr.	ASG23	X	Schmidt Thomas	AED15
	Baldock Richard	FAE12		Schweickert Gunn	ASG23
<i>f</i> .	Barlage Bernhard	AED13		Sonn Nico	ASG51
	Bayer Thomas	ASA42		Steininger Eric	AED32
	Brune Holger	ASA45	X	Stritter Rene	AEDH
	Edelhoff Dirk	AED2		Suess Rudi	OTN/ASA44
	Fehringer Alexander	ASG13	1	Theunissen Martijn	DSSA
X	Fricke Wolfgang Dr.	AED 65		Vascotto Riccardo	HE Space
	Geiger Hermann	ASA42		Wagner Klaus	ASG23
×	Grasl Andreas	OTN/ASA44	X	Wietbrock Walter	AET12
	Grasshoff Brigitte	AET12		Wöhler Hans	ASG23
	Hamer Simon	Тенва		Wössner Ulrich	ASE252
	Hanka, Erhard	FIS52		Zurostein Armin	ASQ42
	Hendrikse Jeffrey	HE Space	I		and the same of th
×	Hendry David	Terma			
	Hengstler Reinhold	ASA42			
	Hinger Jürgen	ASG23			
	Hohn Rüdiger	AED65			
	Hölzle Edgar Dr.	AED32			
	Hopfgarten Michael	AED32			
	Huber Johann	ASA42			
×	Hund Walter	ASE252			
X	tiller Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG23			
~~~	Kalde Clemens	ASM2	X	ESA/ESTEC	ESA
	Kettner Bernbard	AET42	Χ	Thales Alenia Space Cannes	TAS-F
	Klenke Uwe	ASG72		Thales Alenia Space Torino	TAS-I
	Knoblauch August	AET32			
	Koelle Markus	ASA43		Instruments:	
X	Koppe Axel	AED312		MPE (PACS)	MPE
	Kroeker Jürgen	AED65		RAL (SPIRE)	RAL
	La Giola Valentina	Terma		SRON (HIFI)	SRON
<u> </u>	Lang Jürgen	ASE252	<b></b>		
<u> X</u>	Langenstein Rolf	AED15			
	Langfermann Michael	ASA41		Subcontractors:	
	Martin Olivier	ASA43		Austrian Aerospace	AAE
	Maekisch Jan	ASA43		Austrian Aerospace	AAEM
	Much Christoph	ASA43		BOC Edwards	восе
	Müller Jörg	ASA42		Dutch Space Solar Arrays	DSSA
X	Müller Martin	ASA43		EADS Astrium Sub-Subsyst. & Equipment	ASSE
	Pietroboni Karin	AED65		EADS CASA Espacio	CASA
***************************************	Platzer Wilhelm	ABD2		EADS CASA Espacio	ECAS
	Reichle Konrad	ASA42		European Test Services	ETS
	Runge Axel	OTN/ASA44		Patria New Technologies Oy	PANT
	Sauer Maximilian Dr.	AED65		SENER Ingenieria SA	SEN
	Schink Dietmar	AED32		Thales Alenia Space, Antwerp	TAS-ETCA

Doc. No: HP-2-ASED-TR-0218

Issuc:

Date: 22.10.2007