

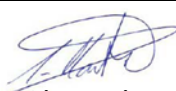
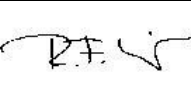


SOLAR ORBITER ENERGETIC PARTICLE DETECTOR

EPT-HET FM Configuration Item

Data List /As Built Configuration List

Document ID: SO-EPD-KIE-LI-0011
Issue: 1
Revision: 0
Date: 29/02/2016

Signature not needed if electronically approved by route					
Written	Checked	Approved Configuration Control	Approved QA	Approved Experiment Manager	Approved Principal Investigator
 César Martín 29/02/2016	 Robert F. Wimmer 29/02/2016	 César Martín 29/02/2016	 NAME4 Date and Signature	 NAME5 Date and Signature	 NAME6 Date and Signature

File: SO-EPD-KIE-LI-0011_iss1_rev0_EPT-HET_FM_CIDL-ABCL.doc

Pages: 24

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CHANGES RECORD

Issue	Revision	Date	Modified by	Section / Paragraph modified	Change implemented
1	0	29/02/2016	C. Martin	All	Initial release

TABLE OF CONTENTS

Contents

1.	APPLICABLE AND REFERENCE DOCUMENTS	5
1.1.	Applicable Documents	5
1.2.	Reference Documents.....	5
2.	SCOPE	8
3.	GLOSARY AND DEFINITIONS.....	9
3.1.	Acronyms and Abbreviations	9
4.	ORGANISATION	12
4.1.	Responsibility	12
4.2.	Configuration accounting.....	12
4.3.	Software Version Number Method.....	12
4.4.	Hardware marking and labeling	12
5.	RFD RFW AND NCR STATUS LIST	13
5.1.	RFDs.....	13
5.2.	NCRs	15
6.	DOCUMENTATION STATUS LIST	20
6.1.	General.....	20
6.2.	Documentation structure.....	20
6.3.	Document nomenclature	22
6.4.	All documents	23
7.	PICTURES	24
7.1.	EPT-HET FM Assembly.....	24

1. APPLICABLE AND REFERENCE DOCUMENTS

1.1. *Applicable Documents*

ID.	Title	Reference	Iss./Rev.
[AD-1]	Experiment Interface Document part A	SOL-EST-RCD-0050	5/0
[AD-2]	EPD Product Assurance Plan	SO-EPD-PA-0001	3/4
[AD-3]	EPD Cleanliness and Contamination Control Plan	SO-EPD-PO-PL-0005	4/0
[AD-4]	Experiment Interface Document part B	SO-EPD-PO-IF-0001	4/0 DRAFT

Table 1-1: Applicable Documents

1.2. *Reference Documents*

Ref	Filename	Code	Description	Date
PCB MANUFACTURING DOCUMENTS				
[RD-1.]	EPT-PREAMPS-OHB-XI-01-Signed.pdf EPT-PREAMPS-OHB-XK-02_signed.pdf EPT-PREAMPS-OHB-XB-01_02_signed.pdf EPTpreamp_FMparts list_signed.pdf	---	EPT preamp boards manufacturing documents	MIP on 27.11.2015
[RD-2.]	HET-PREAMPS-OHB-XI-01-Signed.pdf HET-PREAMPS-OHB-XK-02_signed.pdf HET-PREAMPS-OHB-XB-01_02_signed.pdf HETpreamp_FMparts list_signed.pdf	---	HET preamp boards manufacturing documents	MIP on 27.11.2015
[RD-3.]	EPT-HET-Analog-Board-OHB-XI-11_signed.pdf EPT-HET-Analog-Board-OHB-XB-11_signed.pdf EPT-HET-Analog-Board-OHB-XK-11_signed.pdf EPT-HET-Analog-Board-OHB-XK-12_signed.pdf HET-EPT-FM_ANALOG_ADC_SHAPER_PARTSLIST_signed.pdf	---	EPT-HET analog boards manufacturing documents	MIP on 05.02.2016

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 6 de 19

[RD-4.]	EPT-HET-Digital-Board-OHB-XI-11_signed.pdf EPT_HET-Digital-Board-OHB-XB-11_signed.pdf EPT_HET-Digital-Board-OHB-XE-11_signed.pdf EPT_HET-Digital-Board-OHB-XK-11_signed.pdf EPT_HET-Digital-Board-OHB-XK-12_signed.pdf EPT_HET-Digital-Board-OHB-XK-13_signed.pdf EPT-HET-DIGITAL- BOARD-FM-PARTS LIST_signed.pdf	---	EPT-HET digital boards manufacturing documents	MIP on 05.02.2016
[RD-5.]	EPT_HET-LVPS-Board-OHB-XI-11_signed.pdf EPT-HET-LVDS-Board-OHB-XK-12_signed.pdf EPT-HET-LVDS-Board-OHB-XK-13_signed.pdf EPT-HET-LVPS-Board-OHB-XB-11_signed.pdf EPT-HET-LVPS-Board-OHB-XK-11_signed.pdf EPT-HET_LVPS-FM_Partslist_Signed.pdf	---	EPT-HET LVPS boards manufacturing documents	MIP on 05.02.2016
MICD				
[RD-6.]	EPD_EPTHET_22122015_5-4_SO-EPD-KIE-DR-0001_fm.zip	SO-EPD-KIE-DR-0001	EPT-HET MICD and CAD	08.02.2016
LISTS				
[RD-7.]	SO-EPD-KIE-LI-0050-iss3_rev0-EPT-HET-STEP-EEE_list.pdf	SO-EPD-KIE-LI-0050	Electronic, Electrical and Electromechanical Components List (EEE)	15.03.2016
[RD-8.]	SO-EPD-KIE-LI-0061_iss5_rev4_epthet-step_dml.xlsx	SO-EPD-KIE-LI-0061	Declared Material List	05.10.2015
[RD-9.]	SO-EPD-KIE-LI-0062_iss5_rev4_epthet-step_dmpl.xlsx	SO-EPD-KIE-LI-0062	Declared Mechanical Part List	05.10.2015
[RD-10.]	SO-EPD-KIE-LI-0063_iss5_rev5_epthet-step_dpl.xlsx	SO-EPD-KIE-LI-0063	Declared Processes List	05.10.2015
PLANS				
[RD-11.]	SO-EPD-KIE-PL-0031_iss1_rev0_EPT-HET-STEP_ESD_plan.pdf	SO-EPD-KIE-PL-0031	EPT-HET and STEP ESD plan	16.02.2016
[RD-12.]	SO-EPD-KIE-PL-0032_iss1_rev0_MIPs_KIPs_FM_plan.pdf	SO-EPD-KIE-PL-0032	EPT-HET & STEP MIP-KIP plan	15.12.2015
PROCEDURES				
[RD-13.]	SO-EPD-KIE-PR-0015_iss1_rev0_HET_FM-FS_Crystal_Wrapping_procedure.pdf	SO-EPD-KIE-PR-0015	HET FM/FS crystal wrapping procedure	23.07.2015

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 7 de 19

[RD-14.]	SO-EPD-KIE-PR-0019_iss1_rev0_EPT-HET1-FM-Assembly-Procedure.pdf	SO-EPD-KIE-PR-0019	EPT-HET1 FM Assembly Procedure	24.11.2015
[RD-15.]	SO-EPD-KIE-PR-0020_iss1_rev0_EPT-HET2-FM-Assembly-Procedure.pdf	SO-EPD-KIE-PR-0020	EPT-HET2 FM Assembly Procedure	25.11.2015
[RD-16.]	SO-EPD-KIE-PR-0023_iss1_rev4_HET_Coaxcable_soldering_photodiode.pdf	SO-EPD-KIE-PR-0023	Soldering procedure for coax cable and photodiodes	11.11.2015
[RD-17.]	SO-EPD-KIE-PR-0024_iss1_rev1_soldering_coax-thermistors-HET-sensor.pdf	SO-EPD-KIE-PR-0024	Soldering procedure of coax cables and thermistors for HET sensor head	11.11.2015
[RD-18.]	SO-EPD-KIE-PR-0025_iss1_rev0_soldering-MDM15-EPT-HET.pdf	SO-EPD-KIE-PR-0025	Soldering of the MDM15 for EPT-HET. Survival heaters and thermistors	26.02.2016
[RD-19.]	SO-EPD-KIE-PR-0027_iss1_rev0_EPT-HET_STEP_general-scotch-weld-application-procedure.pdf	SO-EPD-KIE-PR-0027	EPT-HET & STEP Scotch weld application procedure	18.11.2015
[RD-20.]	SO-EPD-KIE-PR-0029_iss1_rev1_EPT-HET-STEP_Thermistor-soldering_procedure.pdf	SO-EPD-KIE-PR-0029	Procedure for thermistor soldering	26.02.2016
[RD-21.]	SO-EPD-KIE-PR-0030_iss1_rev0_FM_FPGA_programing_procedure.pdf	SO-EPD-KIE-PR-0030	FM FPGA programing procedure	16.12.2015
[RD-22.]	SO-EPD-KIE-PR-0031_iss1_rev0_EPT-HET-STEP_Iridite_touch-up_repair.pdf	SO-EPD-KIE-PR-0031	Preparation of Iridite 14-2 Solution and Touch-Up Repair Process	17.02.2016
REPORTS				
[RD-23.]	SO-EPD-KIE-RP-0044_iss1_rev0_EPT-HET1_FM_sensor_head_KIP_report.pdf	SO-EPD-KIE-RP-0044	EPT-HET1 FM sensor head KIP report	29.02.2016
[RD-24.]	SO-EPD-KIE-RP-0045_iss1_rev0_EPT-HET2_FM_sensor_head_KIP_report.pdf	SO-EPD-KIE-RP-0045	EPT-HET2 FM sensor head KIP report	29.02.2016
TEST PROCEDURES				
[RD-25.]	SO-EPD-KIE-TP-0016_iss1_rev0_HET-FM-FS-Crystal-test-procedure.pdf	SO-EPD-KIE-TP-0016	HET FM-FS crystal package test procedure	23.07.2015
[RD-26.]	SO-EPD-KIE-TP-0027_iss1_rev0_EPT_FM_preamp_board_test_procedure.pdf	SO-EPD-KIE-TP-0027	EPT FM preamp board test procedure	18.11.2015
[RD-27.]	SO-EPD-KIE-TP-0028_iss1_rev0_HET_FM_preamp_board_test_procedure.pdf	SO-EPD-KIE-TP-0028	HET FM preamp board test procedure	18.11.2015
[RD-28.]	SO-EPD-KIE-TP-0029_iss1_rev0_EPT-HET_FM_digital_boards_test_procedure.pdf	SO-EPD-KIE-TP-0029	Test procedure for EPT-HET FM digital boards w/o FPGA	23.11.2015
[RD-29.]	SO-EPD-KIE-TP-0032_iss1_rev0_EPT-HET_FM_LVPS_test_procedure.pdf	SO-EPD-KIE-TP-0032	EPT-HET FM LVPS test procedure	11.12.2015
[RD-30.]	SO-EPD-KIE-TP-0034_iss1_rev0_EPT-HET_FM_analog_boards_test_procedure.pdf	SO-EPD-KIE-TP-0034	Test procedure for EPT-HET FM analog boards with FPGA	05.01.2016
TEST REPORTS				
[RD-31.]	SO-EPD-KIE-TR-0016_iss1_rev0_EPT-HET_FM_crystal_package_test_report.pdf	SO-EPD-KIE-TR-0016	EPT-HET FM crystal package test report	09.11.2015
[RD-32.]	SO-EPD-KIE-TR-0024_iss1_rev2_EPT_FM-detector_functional_test_report.pdf	SO-EPD-KIE-TR-0024	EPT FM detector functional test report	07.02.2016

2. SCOPE

The present Configuration Items Data List / As Built Configuration List identifies the applicable issue/revision of

- applicable requirement documents,
- specifications, drawings,
- engineering lists (materials, mechanical parts, EEE components, processes)

that represent the “As-Designed” and “As Built” configuration of the EPT-HET FM unit of the EPD consortium.

It is the objective of this document to provide all partners within the Solar Orbiter /EPD project with a common and reliable understanding of the design baseline of the project that is reflected in the above set of documents.

The document describes

- in section 4 the general EPT-HET FM configuration management organization,
- in section 6 the document status list,

The CIDL/ABCL on system and sub-unit level contain in accordance with the EPD_DRD-20110226:

The CIDL/ABCL shall contain for each configuration item the following as a minimum:

- The reference of the configuration items including:
 - CI number
 - CI name.
 - CI level.
 - Company's code (supplier and buyer)
- The list of configuration baseline documents defining the configuration in terms of requirements, design and verification, with their evolution status including NCRs and RFWs and their approval status. These shall as a minimum include:
 - Drawings (Including assembly and interface drawings).
 - Circuit functional diagrams.
 - Specifications.
 - Test procedures and plans.
 - Design verification matrix.
 - EEE list.
 - Material, mechanical part and process list.
- The current configuration status (such as "as designed", "as built"),
- The status reports on changes, deviations and waivers,
- The status reports on change implementation and verification.

3. GLOSARY AND DEFINITIONS

3.1. *Acronyms and Abbreviations*

AIT	Assembly, Integration and Test
AIV	Assembly, Integration and Verification
BB	Bread Board
BDD	Block Diagram Drawing
BOL	Beginning Of Life
CC	Configuration Control
CIDL	Configuration Item Data List
CIL	Critical Item List
CVCM	Collected Volatile Condensable Material
DCL	Declared Components List
DDV	Design Development and Verification
DML	Declared Materials List
DMPL	Declared Mechanical Parts List
Doc.	Document
DPL	Declared Processes List
ECP	Engineering Change Proposal
EH	Electrical Harness
EICD	Experiment I/F Control Document
EMC	Electromagnetic compatibility
EOL	End Of Life
EPD	Energetic Particles Detector

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 10 de 19

EPT	Electron, Proton Telescope
FDIR	Failure Detection, Isolation and Recovery
FEE	Front End Electronics
FM	Flight Model
FMECA	Failure Mode, Effects, and Criticality Analysis
FPA	Focal Plane Assembly
GSE	Ground Support Equipment
HET	High Energy Telescope
H/W	Hardware
I/F	Interface
ICD	Interface Control Document
LLI	Long Lead Items
MAIT	Manufacturing, Assembly, Integration and Test.
MOC	Molecular Contamination
NA	Not Applicable / No applicable
NR	Normative Requirement
PA	Product Assurance
PAC	Particulate Contamination
PDF	Portable Document File
PDR	Preliminary Design Review
PIPS	Planar Implanted passivated Silicon
QA	Quality Assurance
RfD	Request for Deviation
RML	Recovered Mass Loss
SE	System Engineering
SRR	System Requirement Review

SSD	Solid State Detector
STEP	SupraThermal Electrons and Protons
STM	Structural and Thermal Model
SW	Software
TAD	Top Assembly Drawing
TBC	To Be Confirmed
TBD	To Be Defined

4. ORGANISATION

4.1. *Responsibility*

Within the EPT-HET project, the configuration management is part of the tasks of the EPT-HET Project Manager.

EPT-HET configuration control is responsible for the systematic evaluation and co-ordination of all changes in the EPT-HET configuration. Configuration control ensures that all requirements and engineering documentation is identified and that all changes to that documentation will be reviewed in a systematic manner to determine the validity and impact of changes. Configuration control will also ensure that all affected organizations and parties will be cognizant of changes and will participate in the change decision making process. Configuration control activities start with the release of the first approval documentation.

4.2. *Configuration accounting*

Documents that shall be considered for the construction and manufacturing of any constituent of EPT-HET FM are those that are available:

- In paper format (located at the University of Kiel - Institut fuer Experimentelle und Angewandte Physik/ Extraterrestrische Physik)
- In electronic format
- As reference

Among others all documents that are listed within the present document are part of the EPT-HET Reference Library in electronic and paper format.

4.3. *Software Version Number Method*

N/A

4.4. *Hardware marking and labeling*

EPT-HET FM housing parts will be marked with special cleanroom pens and labels for the connectors, thermistor lines and external power wires.

5. RFD RFW AND NCR STATUS LIST

5.1. RFDs

No.	Title	Version	Submission Date	Status	Comments
SO-EPD-KIE-RD-0001	EPD EPT-HET & STEP calculated centre of gravity and moments of inertia	2.1	11 Jun 2014	Approved	Version 1.1: Submitted to Astrium for assessment on 26 Jun 2013. Also see e-mail by K. Wirth from 24 Jun 2013. Rejected by Astrium, see e-mail by G. de Paris from 19 Sep 2013. EPD should demonstrate that analysis uncertainty is less than measurement tolerance specified in EID-A. Version 2.0 submitted on 25 Oct 2013: EPD PO signatures are pending. E-mail by K. Wirth from 24 Jun 2013 has not been taken into account. Mol calculation using subassemblies is incorrect. Version 2.0 submitted on 16 Dec 2013: EPD PO signatures were added, otherwise no change. Rejected at ESA CCB on 5 May 2014. See e-mail by P. Olivier from 7 May 2014. Version 2.1: Submitted to Astrium for assessment on 11 Jun 2014. MAIS response to SOL.EPD.MN.00040 AI-01 by Tony Jorden from 27 Nov 2014: "ASU advise that they see no problem with the RFD and expect it to be formally accepted by ASU in due course." 3 Aug 2015: Approved by Airbus and ESA.
SO-EPD-KIE-RD-0002	EPD EPT-HET & STEP low sine vibration qualification level	1.1	27 May 2013	Approved	Submitted to Astrium for information on 26 Jun 2013. Also see e-mail by K. Wirth from 24 Jun 2013.
SO-EPD-KIE-RD-0004	EPD EPT-HET usage of adhesive (Dow Corning 93-500) containing silicone for opto-structural glueing	1.0	16 Dec 2013	Approved	Approved at ESA CCB on 13 Jan 2014. 22 Jun 2015: Approved by Airbus.
SO-EPD-KIE-RD-0005	EPD EPT-HET & STEP usage of material MAPSIL 213 containing silicone for conformal coating of electronics	1.1	9 May 2014	Approved	Version 1.0: See e-mail by P. Olivier from 7 Jan 2014. EPD to update RFD indicating the mass of MAPSIL used and clarifying a bake out will take place at some point in time after application. Version 1.1: Approved at ESA CCB on 23 Jun 2014. See e-mail by P. Olivier from 2 Jul 2014. Submitted to Astrium for information on TBD.
SO-EPD-KIE-RD-0007	EPD EPT-HET usage reflective properties of the material Millipore HAWP29325MF to increase optical performance of BGO-crystal in HET-head	1.1	9 May 2014	Approved	Version 1.0: See e-mail by K. Wirth from 14 Apr 2014. EPD to update RFD to include assessment of criticality of particle generation by millipore material. Version 1.1: Approved at ESA CCB on 23 Jun 2014. See e-mail by P. Olivier from 2 Jul 2014. Submitted to Astrium for information on TBD.
SO-EPD-KIE-RD-0006	EPD EPT-HET & STEP usage of black paint MLS 85 SB C containing silicone for painting of internal instrument surfaces	1.1	21 Feb 2014	Approved by ESA Rejected by Airbus	Approved at ESA CCB on 23 Apr 2014. 22 Jun 2015: Rejected by Airbus. Back to ESA CCB. ESA CCB on 29 Jun 2015: K. Hernan to discuss with Airbus. EPD to provide EPT-HET & STEP bakeout procedure and quantify amount of material. E-mail by Cesar Martin from 17 Sep 2015: Missing information was provided.

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 14 de 19

SO-EPD-KIE-RD-0003	EPD EPT-HET 1 & 2 non-conductive FEP external MLI layer	1.0	7 Jul 2014	To be withdrawn	Impact on electrostatic spacecraft potential is unacceptable, see e-mail by K. Wirth from 5 Sep 2014. E-mail by C. Martin from 26 Sep 2014: Updated annex A of RFD was provided. Non-conductive FEP surface has been reduced to one external surface of EPT-HET 1 only. E-mail by K. Wirth from 6 Oct 2014: EPT-HET 1 will create a perturbation of the order of -1 V blocking low energy electrons extending up to a few meters - not acceptable. E-mail by C. Martin from 23 Oct 2014: 2nd update of annex A of RFD was provided. Germanium coated Kapton HN+VDA is proposed as MLI external layer. E-mail by A. Hilgers from 5 Nov 2014: Impact on electrostatic spacecraft potential is acceptable for optimistic surface resistivity. Verification by test, also taking into account irradiation? Telecon on 13 Jan 2015: Thermal analysis for germanium coated MLI shows that temperatures stay within limits. EPD will update RFD accordingly. Telecon on 24 Mar 2015: MLI has been changed to Germanium coated Kapton 160XC, surface conductivity is < 1 kOhm/sq, i.e. a conductor. E-mail by S. Terol from 25 Mar 2015: Datasheet and request to withdraw RFD were provided. E-mail by K. Wirth from 12 Jun 2015: Surface resistivity < 10⁷ Ohm/sq at low temperatures? Telecon on 16 Sep 2015: Surface resistivity at low temperature is not available. MPCB on 13 Oct 2015: ESA can measure surface resistivity at low temperature.
SO-EPD-KIE-RA-0001	EPD STEP detector PCB from Brockstedt	1.1	27 May 2014	Superseded by SO-EPD-KIE-RD-0013	Telecon on 7 May 2015: Procurement from a qualified manufacturer is recommended, otherwise EPD need to perform a project qualification. ENIG surface finish is foreseen and assembly will be done in the U.S., therefore another RFA is needed for SMT verification. Letter by J. Pacheco and R. Wimmer from 8 Jun 2015: EPD will use Brockstedt PCB without testing. E-mail by K. Wirth from 10 Jun 2015: EPD to expand letter re failure propagation and acceptance of ENIG risk. P. Olivier, 16 Oct 2015: Approval status of corresponding DML items stays open. Ph. Kletzine to decide if risk can be accepted. E-mail by K. Wirth from 2 Nov 2015: EPD to submit RFD.
SO-EPD-KIE-RD-0013	EPD STEP Brockstedt rigid flex boards	1.0	3 Dec 2015	Approved	Approved at ESA CCB on 7 Dec 2015 with the following comment added: "Approved under EPD responsibility. No launch schedule impact will be accepted by ESA as a result of failure or non-conformance affecting this PCB pre-launch." Submitted to Airbus for information on TBD.

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 15 de 19

SO-EPD-KIE-RD-0009	EPD EPT-HET and STEP PCBs follow IPC 6012 Class 3 design rules	2.0	11 Jan 2016	Withdrawn	Version 1: E-mail by K. Wirth from 9 Feb 2015: EPD to change the design to become compliant to ECSS or perform a project qualification by IST testing. Telecon on 7 May 2015: EPD to update RFD to clarify deviations from ECSS-Q-ST-70-12C and add measurement of as manufactured pad sizes. EPD to consider oblong pads. Version 2: Submitted by CAU Kiel to EPD PO on 9 Dec 2015 for approval. RFD to be withdrawn as measured annular rings of finished holes comply with ECSS.
SO-EPD-KIE-RD-0010	No acoustic test for EPD STEP and EPT-HET	1.0	13 Feb 2015	On hold	E-mail by K. Wirth from 23 Feb 2015: The argument that the random vibration test provides some justification for the thin foils w.r.t. the acoustic environment is not correct.
SO-EPD-KIE-RD-0011	EPD STEP PQM random vibration levels (EIDA R-499)	1.1	25 Sep 2015	Approved by ESA	Version 1.0: E-mail by K. Wirth from 23 Jun 2015: Draft random vibration qualification levels from a first analysis of the spacecraft STM tests were provided. These levels have not yet been discussed/agreed with Airbus. E-mail by Cliff Ashcroft from 8 Jul 2015: Finalized random and sine vibration qualification levels were provided. E-mail by Tony Jorden from 15 Jul 2015: Airbus confirm updated loads. Version 1.1: Approved at ESA CCB on 19 Oct 2015. Submitted to Airbus for approval on 19 Oct 2015.
SO-EPD-KIE-RD-0012	EPD EPT-HET and STEP use of silicone based materials as specified in DML	1.0	3 Dec 2015	Submitted	Requested by MPCB.
SO-EPD-KIE-RD-0015	RFD for the length of the grounding strap of EPT-HET and STEP	1.0	25 Jan 2016	Submitted	
SO-EPD-KIE-RD-0016	RFD for vibration notching of EPT-HET	1.0		Submitted	
SO-EPD-KIE-RD-0017	RFD for vibration notching of STEP	1.0		In preparation	

5.2. NCRs

N	Unit / Model	Date	Description	EIDA	Major Minor	Sent to PO	Cause	Action	Verify by	Status
1	EPT-HET STM	2013-06-25	Open circuit photodiode after Y-axis vibration		Minor	04.12.2015 (minor NCR requested by PO)	Stress relief at solder joint	Rework	Retest	Closed
2	EPT-HET STM	2013-06-25	Shift of resonance in Y-axis after QL sine and random	R499	Major	27.06.2013	Movement of Crystal in holder	Redesign crystal mount	Retest	Open

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 16 de 19

N	Unit / Model	Date	Description	EIDA	Major Minor	Sent to PO	Cause	Action	Verify by	Status
3	EPT-HET STM	2013-11-26	Random in-plane vibration carried out at too low level in some frequency ranges	R499	Minor	04.12.2015 (minor NCR requested by PO)	Vibration test procedure written to faulty EIDA issue 3 with wrong levels	Use EIDA issue 4 to correct procedure for PQM; for STM use as is	Test on PQM	Open
4	HET / PQM	2014-11-05	The +6V and -6V supplies on preamp board malfunction		Minor	04.12.2015 (minor NCR requested by PO)	Three diodes soldered with wrong polarity	Diodes removed and resoldered	Test	Closed
5	HET PQM	2014-11-14	Signal rise time in channel 8 of preamp board was incorrect		Minor	04.12.2015 (minor NCR requested by PO)	Wrong resistance at RH8, RL8 wrongly populated	Resistor at RH8 replaced; master schematic revised	Inspection	Closed
6	EPT-HET PQM	2014-12-14	Part IS21009RH-proto could not be soldered on Digital board		Minor	04.12.2015 (minor NCR requested by PO)	Layout for plastic part different to engineering part	Glue part and solder with wires; update drawings for PCB layout	Test	Closed
7	EPT-HET PQM	2014-12-19	Cracks observed in glass seals of MSK5059KRHG		Minor	04.12.2015 (minor NCR requested by PO)	Not known	Assessed to be acceptable by MIL-883 method 2009.11; use as is	None	Open
8	EPT PQM	2015-01-26	Metallization on 10 Ohm 1% 0603 resistors uneven or lifting from body		Minor	04.12.2015 (minor NCR requested by PO)	Not known	Contain with conformal coating	Inspection	Closed
9	EPT-HET PQM	2015-02-17	Could not WRITE to EEPROM		Minor	04.12.2015 (minor NCR requested by PO)	FPGA programmed with wrong byte cycle timing parameter	Change firmware for Digital board FPGA for FM; use as is for PQM as minor effect	New firmware tested in EM1	Closed

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 17 de 19

N	Unit / Model	Date	Description	EIDA	Major Minor	Sent to PO	Cause	Action	Verify by	Status
10	EPT-HET PQM	2015-03-19	Could not mate connectors between HET preamp board and Analog board		Minor	04.12.2015 (minor NCR requested by PO)	Assembly drawings have connector part on HET preamp board rotated 180degrees	Through symmetry can cut away part of connector to enable assembly; correct assembly drawings	Inspection and test	Closed
11	EPT PQM	2015-03-16	Mismatch of mounting holes prevent fastening EPT preamp board to frame		Minor	04.12.2015 (minor NCR requested by PO)	Change on Preamp frame not matched by change to Preamp board	Use spare frame from EM/STM; use EM/STM for FM	Assembly and inspection	Closed
12	EPT PQM	2015-03-13	EPT Sensor Head could not be assembled with Ti fasteners		Minor	04.12.2015 (minor NCR requested by PO)	Helicoil is the problem	Use stainless steel in PQM; FM baseline: Ti screws with nonlocking Bronze Helicoil	Assembly and inspection	Closed
13	HET PQM	2015-01-25	Wiring from sensor to preamp board obstructed		Minor	04.12.2015 (minor NCR requested by PO)	Flange of sensor housing blocking natural path	For PQM remove part of flange; modify manufacture for FM	Assembly and inspection	Closed
14	EPT-HET PQM	2015-04-15	Magnetic moment exceeds requirement during Q-level EMC test	R796	Major	16.04.2015	Not known	Use as is for PQM; for FM no SS fasteners		Open
15	EPT-HET PQM	2015-04-29	Increased noise in some channels during Radiated Susceptibility depending on shielding of connector saver		Minor	04.12.2015 (minor NCR requested by PO)	Use of connector saver during RS test	Shield saver	Test	Closed

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 18 de 19

N	Unit / Model	Date	Description	EIDA	Major Minor	Sent to PO	Cause	Action	Verify by	Status
16	EPT-HET PQM	2015-05-20	Functional test failed after final Z-axis random vibration at Q-level	R499	Major	02.06.2015	Electronics damaged with cracked pins on LVPS and broken FPGA legs on Analog board.	PQM repaired, but used only in TBT and functional tests; for FM strenghtening of boards, mechanical coupling of boards; notching in test	PFM by test	Open
17	STEP PQM	2015-07-07	Trigger rate increased by orders of magnitude during EMC CS-CM-FD test at 1kHz modulation.	R321 R325	Minor	04.12.2015 (minor NCR requested by PO)	EMI enhanced noise on power lines in sensor heads.	Noise reduction capacitors added to power lines in sensor heads and AI shielding of lines between sensors and preamp boards.	EMC tests CS and RS repeated; shielding designed	Closed
18	EPT-HET STEP FM/FS	2015-07-27	Capacitor CNC32PE has Ag coated legs, some are corroded.		Minor	04.12.2015 (minor NCR requested by PO)	Oxidation of Ag.	Pre-tinning of legs	Inspection	Closed
19	EPT-HET PQM	2015-05-07	Background for E-field emissions and for RE center notch is above requirement.	R706	Minor	19.02.2015 (update)	Facility antenna	Facility has acquired another antenna	Test at PFM	Closed
20	STEP PQM	2015-07-10, -09-29	An emission peak at 24MHz observed during RE EMC testing	R324	Minor	04.12.2015 (minor NCR requested by PO)	GSE produces this signal; verified during E-field characterisation by removing GSE while STEP ON, the anomaly is gone	Better shielding of GSE cables	Test at FM	Closed
21	STEP PQM	2015-09-29	Regularly spaced spikes observed in E-field characterisation above about 25MHz.	R706	Minor	04.12.2015 (minor NCR requested by PO)	LVPS primary converter has 8µs pulse form that produces spikes at 125kHz separation	LVPS EMI filter designed to block this emission below 30MHz; further effort to filter to higher freq not considered feasible; use as is	None	Closed

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 19 de 19

N	Unit / Model	Date	Description	EIDA	Major Minor	Sent to PO	Cause	Action	Verify by	Status
22	EPT-HET STEP PQM/FM/FS	2015-10-08	Anomalies of STEP functionality in RS & CS due in part to noise on +6V & -6V LDO supplies to sensors		Minor	05.02.2016 (updated)	2.5V voltage reference IS-1009RH requires 22µF shunt capacitance; 100nF had been populated on LVPS and caused ripple that propagated to LDOs.	Change capacitors	Test	Closed
23	STEP PQM	2015-12-02	Following suite level EMI test at PO one byte of EEPROM content was found to be changed		Minor	na	Not known	None, use as is	None	Open
24	STEP PQM	2015-07-10 & 2015-09-28	Facility ambient or background exceeded requirement in E-field characterisation and RE center notch	R706 R324	Minor	19.2.2015	Facility stated: "Reducing the bandwidth to reduce the noise floor was not possible due to the very slow sweep rate and time Constraints"	Not known, use as is	None	Closed
25	EPT-HET FM	2016-01-22	Anomalies during test of newly populated LVPS board led to inspection of HK Bias circuit		Minor	na	Components R515 and C515 were swapped	Repair to remove and replace	Test	Closed
26	STEP PQM	2016-01-26	During visual inspection cracks were found in glued staking of FPGA and SRAM on the Digital board		Minor	na				Open

N	Unit / Model	Date	Description	EIDA	Major Minor	Sent to PO	Cause	Action	Verify by	Status
27	EPT-HET STEP All	2015- 11-20	Micro-sections of CNC56PE capacitors used in OHB soldering verification testing reveal cracks leading to device failure; Note no failures observed due to Q level testing of STEP PQM.		Major	19.02.2015		At Verification Review this NCR was requested; Further investigation by ESA anticipated; use as is	None	Open
28	EPT-HET STEP PQM	2016- 02-12	Report EMC test results in H-field for EPT-HET and STEP show a gap between 5kHz and 10kHz,	R705	Minor	19.02.2015	In STEP report facility states: "Due to the test being performed in time domain, 5kHz to 10kHz was inadvertently missed.	This will be repeated at flight level using a FFT test receiver."	Test	Open

6. DOCUMENTATION STATUS LIST

6.1. General

The documents listed below provide the general documentation overview/ status of all documents that are valid for the EPT-HET FM project. Those documents quoted in section 6.4 are contained as well.

6.2 Documentation structure

The EPT-HET documentation is structured according to the following table. The entries in the column "document" are the main documents. The overall document configuration is given in section 6.4.

EPT-HET FM Configuration Item Data List /As Built Configuration List

Reference: SO-EPD-KIE-LI-0011
Issue:1 Review: 0
Date: 29/02/2016
Page: 21 de 19

Ident.	Discipline	Document	Bookkeeper	Remark
01.00	External Applicable Documents			
01.01		Experiment Interface Document part A	ESA	
01.02		Experiment Interface Document part B	EPD Project Office	
02.00	External reference Documents			
03.00	Management, General Engineering, Contractual			
03.01		Project schedule	Univ. Kiel	
04.00	Configuration control			
04.01		Configuration item data list	Univ. Kiel	
04.02		RfW/RfA	Univ. Kiel	Copies and status list
04.03		NCRs	Univ. Kiel	Copies and status list
05.00	PA documents			
05.01		Declared Material, Parts and Process Lists	Univ. Kiel	
05.02		EPD Product Assurance Plan	EPD PO	

06.00	Drawings			
06.01		MICDs	Univ. Kiel	
06.02		All (top level and detailed drawings)	Univ. Kiel	
07.00	CAD models			
07.01		Electrical Assembly Procedures EPT-HET & STEP EM	Univ. Kiel	
08.00	Verification and Validation Documents			
8.01		Test Procedures	Univ. Kiel	
8.02		Test Reports	Univ. Kiel	
8.03		Instrument Assembly, Integration and Test Plan	Univ. Kiel	

6.3 Document nomenclature

The formal documents delivered to the EPD Project Office will follow the EPD Documentation Codification given in SO-EPD-PO-TN-0002 (CADs and MICDs of Kiel units will follow the nomenclature given in the EID-A).

Internal Kiel documents are identified by document type, number and author and/ or running numbers.

6.4 All documents

<i>Filename</i>	<i>Code</i>	<i>Description</i>	<i>Date</i>
SO-EPD-KIE-TP-0035_iss1_rev0_EPT-HET-FM-Vibration-Test-Procedure.pdf	SO-EPD-KIE-TP-0035	EPT-HET FM Random-Sine vibration test plan and procedure	29.02.2016
SO-EPD-KIE-TP-0036_iss1_rev0_EPT-HET-FM-Thermal-Cycling-Test-Procedure.pdf	SO-EPD-KIE-TP-0036	EPT-HET FM Thermal Cycling test plan and procedure	29.02.2016
SO-EPD-KIE-TP-0037_iss1_rev0_EPT-HET-FM-EMC-Test-Procedure.pdf	SO-EPD-KIE-TP-0037	EPT-HET FM EMC test plan and procedure	29.02.2016
SO-EPD-KIE-TP-0038_iss1_rev0_EPT-HET-FM-Functional-Test-Procedure.pdf	SO-EPD-KIE-TP-0038	EPT-HET FM Functional test plan and procedure	29.02.2016
SO-EPD-KIE-TP-0030_iss1_rev0_EPT-HET1_FM_physical_properties_test_procedure.pdf	SO-EPD-KIE-TP-0030	EPT-HET1 FM physical properties test procedure	29.02.2016
SO-EPD-KIE-TP-0031_iss1_rev0_EPT-HET2_FM_physical_properties_test_procedure.pdf	SO-EPD-KIE-TP-0031	EPT-HET2 FM physical properties test procedure	29.02.2016

7 PICTURES

7.1 *EPT-HET FM Assembly*

7.1.1 *Sensor*

http://www.ieap.uni-kiel.de/et/people/martin/EPT-HET_FM_sensor_assy/

7.1.2 *Unit*

http://www.ieap.uni-kiel.de/et/people/martin/EPT-HET_FM_Unit/