| Logo SOLO | | | logo-lpp-little | | | | | CP-Reference: RPW-MEB-LFR-QAD-00122-LPP  Issue/Revision:01/00  Date: **13/10/2014** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Enclosed Documents:  All documents updates | | | |
| Engineering Change Proposal | | | | | | | | | | | |
| Title: LFR EQM Design improvements | | | | | | | | | | | |
| **APPLICANT** | **Change description, reason for change** | | | | | | | | | **Original Document** | |
| All changes described here have been reflected inside the LFR schematics, and shall be added inside the LFR routing and placement.  Other documents have changed and are listed here. | | | | | | | | | NCR |  |
| RFD/RFW |  |
| Other |  |
| **Original Document reference** | |
|  | |
| Impacted Sub-System: LFR EQM board | | | | | | | | | **Author**  Name: V. LERAY  Date: **13/10/2014**  Visa: | |
| Sub-System Reference: LFR-172200-FM | | | | | | | | |
| Model | EM | | QM | | | FM | | |
| **RESPONSIBLE** | **Changes to be done**  (List of impacted documents, description of modifications. Impacted documents must be enclosed) | | | | | | | | | | |
| Name: P. LEROY | | | | Date: **13/10/2014** | | | | Stamp: | | |
| Some additional parts are required, due to change on regulator input structure, and findings on performance and EMC testing. In addition to that EMC testing gives some improvements to apply on the routing, regarding location of power lines, signal lines and SpW links.  TCS informations (schematics and DCL) have been improved, also due to EMC findings, and have an impact on the electrical interface and mechanics (connector size change). | | | | | | | | | | |
| **Configuration changes (Drawings references, S/W releases)** | | | | | | | | | | |
| **Beforechange** | | | | | **After change** | | | | | |
| **LFR DCLRPW-MEB-LFR-DCL-00009 03/05**  **SCM TCS DCLSO-LI-RPW-SC-0048-LPC2E 02/00**  **LFR SCHEMATICS LFR-172200-FM 01/06**  **NONE**  **LFR PCB Interface MEB-ICD-17000-0E Folio 2/2**  **LFR Belt interface MEB-DR-17010-0D Folio 1/1**  **NONE** | | | | | **LFR DCLRPW-MEB-LFR-DCL-00009 03/08**  **SCM TCS DCLSO-LI-RPW-SC-0048-LPC2E02/04**  **LFR SCHEMATICS LFR-172200-FM 01/07**  **TCS SCHEMATICSSO-ED-RPW-SC-0102-LPC2E SCM 02/03**  **LFR PCB Interface MEB-ICD-17000-0F Folio 2/2**  **LFR Belt Interface MEB-DR-17010-0E Folio 1/1**  **Routing requirements technical note** | | | | | |
| **Impacted parameters (H/W & S/W)** | | | | | | | | | | |
| |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Performance |  | Size |  | Processes |  | GSE |  |  |  |  |  | | Reliability |  | Thermal |  | EMC |  | TM/TC |  |  |  |  |  | | Weight |  | Electrical |  | Packing |  |  |  |  |  |  |  | | Interface |  | Material |  | Spare |  |  |  |  |  |  |  | | | | | | | | | | | |
| Is there any cost or schedule impacts?  Yes No. | | | | Cost Impacts: | | | | Schedule impacts: | | |
| **VALIDATION** | **Application decision** | | | | | | | | | | |
| Product Assurance Manager | | | | System Engineer | | | | Project Manager | | |
| Name: V. LERAY  Date:  Stamp: | | | | Name: A. JEANDET  Date:  Stamp: | | | | Name: P. LEROY  Date:  Stamp: | | |
| Change done: | | | | By: | | | | QUALITY STAMP: | | |
| **Changes Details** | | | | | | | | | | | |
| **LFR DCL Changes details (last issue applicable joined to this ECP):**  Some additional parts are requested due to:   * Filtering on signal inputs (capacitances on BIAS\_4 and BIAS\_5 inputs) * Level shifter (RHF54ACT541) for usage of 4053 switches. * Regulator change on 3.3V lines * Additional passives parts.   These quantities changes and additional references are reflected inside the LFR DCL and LFR schematics.  **SCM TCS DCL Changes details (last issue applicable joined to this ECP):**  Initial version of the TCS DCL was based on a first design, where a lot of findings have been highlighted during EMC testing. Changes are the following:   * Add of optocoupler * Add of transformers * Add of associated passive parts   **LFR Schematics (last issue applicable joined to this ECP):**  From starting activities no schematics have been provided as an input. During summer 2014, exchanges on the schematics have been performed and issue 01.06 have been edited. Last improvements are reflected inside the 01.07 version and consists in:   * Added reset connection on FPGA(mistake on 05/05/2014). * Grounding strap update. * Replaced \_ by U in components names and mutlisheetgenerator rules. * Added missing decoupling capacitors on ADC sheet * Updated FPGA connections from steel netlist * Added RHFACT541K01V level shifter * Vref/2 buffered by U39B(OPAMP) * Added simple resistive voltage divider to reduce ADC's clkinput to 2.5V   **SCM TCS Schematics (last issue applicable joined to this ECP):**  TCS SCM Schematics haven’t been provided yet as an input to supplier. With this Change proposal the schematics is integrated as a new input document.  Version to consider isattached (SO-ED-RPW-SC-0102-LPC2E SCM Issue 2.3).  **LFR Mechanical/Electrical interface change (last issue applicable joined to this ECP):**  Connector J700-P change from type 15P to type 25P due to additional lines needed for EMC purpose on the SCM TCS. This have an impact on the PCB interface document and Mechanical interface document.  **LFR and TCS routing recommendations (last issue applicable joined to this ECP):**  Additionalrecommendations regarding routing for LFR have been provided inside the TBD document in order to segregate signal lines from power and SpW lines.  TCS area originally defined can be used to lighten the LFR routing constraints however it’s still mandatory to keep the complete insulations of the both functions TCS and LFR. | | | | | | | | | | | |
| **LFR and TCS routing recommendations (last issue applicable joined to this ECP):**  Additional recommendations regarding routing for LFR have been provided inside the TBD document in order to segregate signal lines from power and SpW lines.  TCS area originally defined can be used to lighten the LFR routing constraints however it’s still mandatory to keep the complete insulations of the both functions TCS and LFR.  Minimum surface area for SCM TCS and recommendations regarding the preferred positioning of the components on the SCM TCS have been provided inside SO-ED-RPW-SC-0102-LPC2E document  Ensure that the SCM TCS grounding plane is in the same layer as for LFR’s.  The routing of the circuit must be done in compliance as close as possible to ECSS-Q-ST-70-12C recommendation.  **LFR Socket:**  A socket will be used on the LFR board to allow the mounting of a flash version and the FM version of the FPGA on a same location.  The socket will be designed by the LPP and will use the same interfaces as the one present on the board.  Mechanical details are provided in attachment.  **LFR Mechanical box:**  Additional JTAG connector is required with the use of a flash version of the FPGA. This connector have to be routed on the same SUBD interface as for the TAGCONNECT. | | | | | | | | | | | |