

SPIRE qualification matrix Warm Units

14/11/2008

SPIRE-RAL-DOC-002825 issue 4

| Unit | Model | IID-A requirement | Test performed/ Expected Date | Achieved levels | Test method | Test Report | Qualification status | NCR status | |
|--|--------------------------|---|---|--|------------------------|--|--------------------------------|--|--|
| SPIRE DCU | | | | | | | | | |
| Sine | HS_DCU QM2* | 9.5.3.3 | Oct 05 | qualif. Level of IID-A 3.3 table 9.5.3-5 | shaker | Sap-SPIRE-HT-336-06 | Qualified | no major NCR | |
| Random | HS_DCU QM2* | 9.5.3.4 | Oct 05 | qualif. Level of IID-A 3.3 (table 5.7.3-1) | shaker | Sap-SPIRE-HT-336-06 | Qualified | no major NCR | |
| Shock | HS_DCU QM2* | 9.5.3.6 | Oct-05 | IID-A Issue 3.3 fig. 9.5.3-1 | high shock impact | Sap-SPIRE-HT-337-06 | Qualified | no major NCR | |
| TV | HS_DCU QM2* | 9.5.4 | Nov 05 | qualif. Level of IID-A 3.3 (table 5.7.3-1) | thermal vaccum chamber | Sap-SPIRE-HT-335-06 | Qualified | CEA major NCR n° 396 (no science data at cold start) NCR closed | |
| EMC-CE | -- | 9.5.6.12 5.14.3.1 | not applicable to DCU (no 28V) | -- | -- | No Test | N/A, no spacecraft interface | -- | |
| EMC-CS | -- | 9.5.6.13 5.14.3.3, to 5.14.3.8 | not applicable to DCU | -- | -- | No Test | N/A, no spacecraft interface | -- | |
| EMC-RE | HS_DCU QM2 | 9.5.6.14 5.14.3.9 5.14.3.11 | Postponed on FM | -- | -- | Tested at spacecraft level reprot SPIRE-RAL-REP-003164 | Qualified at spacecraft level. | HR-SP-RAL-RFW-013 | |
| EMC-RS E Field | HS_DCU QM2 | 5.14.3.10 | dec 05 /jan 06 | iid-a 3.3 | as per iid-a | Sap-SPIRE-DS-010-06 | Qualified | Susceptibility found at 185 and 215 MHz (NCR 456) NCR closed, HR-SP-CEA-RFW-015 raised | |
| EMC-RS H Field | HS_DCU QM2 | 5.14.3.12 | dec 05 /jan 06 | iid-a 3.3 | as per iid-a | Sap-SPIRE-DS-010-06 | Qualified | | |
| ESD | HS_DCU QM2 | 9.5.6.15 5.14.3.13 | Nov/Dec 05 | iid-a 3.3 | as per iid-a | Sap-SPIRE-DS-010-06 | Qualified | Susceptibility on bias (NCR453) NCR closed HR-SP-CEA-RFW-016 raised | |
| Isolation | FM | 5.10.3.4 5.10.3.5 5.10.3.9 5.10.4.4 | not applicable to DCU (no 28V) test is isolation to power lines | | | No test | N/A, no spacecraft interface | | |
| Bonding /grounding | FM | 5.10.3.1, to 5.10.3.3, 5.10.3.6 5.10.3.7 5.10.4.9 | 30/05/2006 | iid-a 3.3 | as per iid-a | Sap-SPIRE-CH-408-06 | Qualified | | |
| Radiation | all | 9.5.7 | Analysis, demonstrating compliance of all components. By component selection or test. All components via Herschel CPP scheme. | | | | | Qualified | |
| Functional | AVM | 9.3.2 | several ILT's | n/a | ILT | CQM Functional Test Report - 1, Ref. SPIRE-RAL-REP-002084, Issue 1.0, 12/07/2004 | Qualified | | |
| * : vibration and shock performed with DCU QM2 partly fitted of STM boards | | | | | | | | | |
| SPIRE FCU | | | | | | | | | |
| Sine | FCU QM2* + HS_PSU STM | 9.5.3.3 | Dec 05 | qualif. Level of IID-A 3.3 table 9.5.3-5 | shaker | Sap-SPIRE-HT-372-06 | Qualified | | |
| | HS_PSU_FM | 9.5.3.3 | July 04 | acceptance level of IIDA 3.0 | shaker | HSPiR.PSU.RE.00198.V.ASTR | Qualified | | |
| Random | FCU QM2* + HS_PSU STM | 9.5.3.4 | Dec 05 | qualif. Level of IID-A 3.3 (table 5.7.3-1) | shaker | Sap-SPIRE-HT-372-06 | Qualified | | |
| | HS_PSU_FM | 9.5.3.4 | July 04 | acceptance level of IIDA 3.0 | shaker | HSPiR.PSU.RE.00198.V.ASTR | Qualified | | |
| Shock | FCU QM2* + HS_PSU STM | 9.5.3.6 | Mid Dec 05 | IID-A Issue 3.3 fig. 9.5.3-1 | high shock impact | Sap-SPIRE-HT-379-06 | Qualified | | |
| | FCU_STM + HS_PSU EM | 9.5.3.6 | feb. 2004 | IID-A Issue 3.0 fig. 9.5.3-1 | high shock impact | HSPiR-PSU-REV-DA0018465-V-ASTR | Qualified | | |
| TV | FCU QM2 + HS_PSU STM | 9.5.4 | Nov 05 | qualif. Level of IID-A 3.3 | thermal vaccum chamber | Sap-SPIRE-HT-380-06 | Qualified | | |
| EMC-CE on prim. Pwr lines | HS_PSU_PFM | 9.5.6.12 5.14.3.1 | July / sep. 04 | iid-a 3.3 | as per iid-a | HSPiR-PSU-REE-DA0018814-V-ASTR | Qualified | HR-SP-CEA-RFW-004 (accepted) | |
| EMC-CS on prim. Pwr lines | HS_PSU_PFM | 9.5.6.13 5.14.3.3 5.14.3.4 5.14.3.8 | Nov/Dec 05 | iid-a 3.0 | as per iid-a | HSPiR-PSU-REE-DA0018814-V-ASTR | Qualified | | |
| EMC CS on sig bundles and sig ref | Not applicable / no spec | 5.14.3.5 5.14.3.6 5.14.3.7 | | | | N/A no data interface, no signal bundles | N/A, no spacecraft interface | | |

| | | | | | | | | | |
|---|---------------------|--|--|--|-----------------|--|-------------------------------|-------------------|--|
| EMC-RE | HS_PSU_PFM | 9.5.6.14 | July / sep. 04 | iid-a 3.0 | as per iid-a | HSPiR-PSU-REE-DA0018814-V-ASTR | Qualified | | |
| EMC-RE | HS_FCU FM | 9.5.6.14 | postponed on FM (no test on FCU QM2) | | | Tested at spacecraft level reprot SPIRE-RAL-REP-003164 | Qualified at spacecraft level | RFW-013 applies | |
| EMC-RS | FCU_QM2 + HS_PSU EM | 5.14.3.10 5.14.3.12 | Nov/Dec 05 | iid-a 3.3 | as per iid-a | Sap-SPIRE-DS-011-06 | Qualified | | |
| ESD | FCU_QM2 + HS_PSU EM | 9.5.6.15 5.14.6.15 | Nov/Dec 05 | iid-a 3.3 | as per iida | Sap-SPIRE-DS-011-06 | Qualified | | |
| grounding & isolation misc. | HS_PSU_PFM | 5.10.3.1 to 5.10.3.3, 5.10.3.6 to 5.10.3.8, 5.10.4.9 | 27/07/2006 | IID-A issue 3.0 | as per iid-a | Sap-SPIRE-CH-0412-06 | Qualified | | |
| Isolation prim/chassis & prim/sec, sec/chassis | HS_PSU_PFM | 5.10.3.4 5.10.3.5 5.10.3.9 5.10.4.12 | déc. 2004 | IID-A issue 3.0 | as per iid-a | HSPiR.PSU.RT.00248.V.ASTR | Qualified | | |
| Radiation | | 9.5.7 | Analysis, demonstrating compliance of all components. By component selection or test | | | | | | |
| Functional | QM1/QM2 | 9.3.2 | several ILT's | n/a | ILT | CQM Functional Test Report - 1, Ref. SPIRE-RAL-REP-002084, Issue 1.0, 12/07/2004 | Qualified | | |
| Nota : Vibrations and shocks performed on FCU QM2 partly fitted with STM boards (SCU main boards) | | | | | | | | | |
| SPIRE DPU | | | | | | | | | |
| Sine | PFM | 9.5.3.3 | Apr-06 | 9.5.3.3 | | HERS-SPIRE-RP-CGS-013 | Qualified | | |
| Random | PFM | 9.5.3.4 | Apr-06 | 9.5.3.4 | | HERS-SPIRE-RP-CGS-013 | Qualified | | |
| Shock | CFM1 | 9.5.3.6 | Nov 05 | | ringing plate | | Qualified | | |
| TV | PFM | 9.5.4 | Apr-06 | Max NOP 70 Max OP 55 Min Q | | HERS-SPIRE-RP-CGS-021 Iss1 | Qualified | | |
| EMC-CE | PFM | 9.5.6.12 | Oct 05 | IID-A issue 3.0 | as per iid-a | HERS-SPIRE-RP-CGS-009 issue 1 | Qualified | | |
| EMC-CS | PFM | 9.5.6.13 | Oct 05 | IID-A issue 3.0 | as per iid-a | HERS-SPIRE-RP-CGS-009 issue 1 | Qualified | | |
| EMC-RE | PFM | 9.5.6.14 | Oct-05 | IID-A issue 3.0 | as per iid-a | HERS-SPIRE-RP-CGS-009 issue 1 | Qualified | | |
| EMC-RS | PFM | 5.14.3.10 5.14.3.12 | Nov 05 (EQM) | IID-A issue 3.0 | as per iid-a | HERS-SPIRE-RP-CGS-009 issue 1 | Qualified | | |
| ESD | CFM1 | 9.5.6.15 | Oct 05 | | | Not carried out with ESA approval | | | |
| Bonding, Isolation, Grounding | PFM | | Oct 05 | | | HERS-SPIRE-RP-CGS-009 issue 1 | Qualified | | |
| Radiation | | 9.5.7 | Parts procured via the CPP scheme, therefore approved for the mission | | | | | Qualified | |
| Functional | AVM/CFM1/PFM | 9.3.2 | several ILT's | n/a | ILT | CQM Functional Test Report - 1, Ref. SPIRE-RAL-REP-002084, Issue 1.0, 12/07/2004 | Qualified | | |
| | | | | | Unit level test | HERS-SPIRE-RP-CGS-006 | Qualified | | |
| | | | | | Unit level test | HERS-SPIRE-RP-CGS-007 | Qualified | | |
| | | | | | Unit level test | HERS-SPIRE-RP-CGS-008 | Qualified | | |
| SPIRE FPU | | | | | | | | | |
| Sine | CQM | 9.5.3.3 | 28/03/2004 | IID-A plus notch to limit interface forces | Cryo vbe at CSL | SPIRE-MSS-REP-002049 | Qualified | | |
| Random | CQM | 9.5.3.4. | | | | | Qualified | | |
| Shock | n/a | | | | | | N/A | | |
| TV | n/a | | | | | | N/A | | |
| EMC-CE | PFM | 9.5.6.12 | | | | Tested at spacecraft level reprot SPIRE-RAL-REP-003164 | Qualified | | |
| EMC-CS | PFM | 9.5.6.13 | | | | | Qualified | HR-SP-RAL-RFW-013 | |
| EMC-RE | PFM | 9.5.6.14 | | | | | Qualified | | |
| EMC-RS | PFM | 5.14.3.10 5.14.3.12 | | | | | Qualified | HR-SP-RAL-RFW-013 | |
| ESD | n/a | | | | | | N/A | | |
| Bonding, Isolation, Grounding | n/a | | | | | | N/A | | |
| Radiation | | 9.5.7 | Parts procured via the CPP scheme, therefore approved for the mission | | | | | Qualified | |
| Functional | | 9.3.2 | many functional tests | | ILT | SPIRE-RAL-REP-002834/5/6/7/8/9 | Qualified | | |