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Information Documentaire / Document Information

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AD SPACEBUS Repeater and TCR unit Electrical Design, EMC/ESD and Interfaces Requirements FOR PASSIVE UNITS

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The validations evidence are kept through the documentation management system.

DOCUMENT CHANGE RECORDS

Issue	Date	Change Record Description	Author
01	10/02/09	New Document	C. FROIDEFOND
02	29/04/09	Modification of title	C. FROIDEFOND

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1. INTRODUCTION

This document, called AD, establishes the general electrical/EMC design and interface requirements, for the passive units included in SPACEBUS satellites to be met to ensure their specified performance during assembly, integration, testing, storage, transportation, launch and orbital operations.

2. APPLICABLE AND REFERENCE DOCUMENTS

2.1 Applicable documents

The applicable documents form a part of this specification. Any discrepancy between this specification and applicable documents shall be notified to the attention of Prime Contractor for clarification, resolution and approval.

2.2 Reference documents

Document Reference	Document Title
200411200K-02	**SPACEBUS Repeater and TCR unit Electrical Design and Interfaces Requirements**
200426029E-01	**Repeater & TCR EMC/ESD Requirements**

3. STATEMENT OF APPLICABILITY TO AD01 PART 3

SBX-4CF-AD01-P3-…	Requirement Specification
	4 EMC general requirements
[REQ-013]	All unit and/or subsystem shall be able to operate without any degradation of performance in all specified launch, ground and flight environments.
[REQ-014]	Compliance and applicability matrix are under equipment and/or subsystem contractor responsibility with Prime contractor approval.
[REQ-015]	Qualification process based on analysis or similarity shall be approved by the prime contractor.
[REQ-016]	In case of out of specification results, the problem areas shall be investigated in detail. Appropriate solutions shall be proposed by the equipment and/or subsystem contractor and approved by the prime contractor.
	Proposed test methods may be slightly adapted. These adaptations will be approved through test procedures.
	10 Magnetic requirements
[REQ-108]	<u>for all units excepted battery and TWT</u> - Magnetic moment module (M) of fully operational equipment shall not exceed 0.5 Am^2 in any direction. - Magnetic components projection (Mx, My, Mz) on each axis (X,Y,Z) shall be provided : - $M = \sqrt{(M_X)^2 + (M_Y)^2 + (M_Z)^2}$
[REQ-111]	If he magnetic moment is calculated from DC H field measurement, it's recommended to perform measurements at a minimum distance from the unit corresponding to 2 times of the largest unit dimension.
[REQ-113]	Equipment shall not exhibit failure and unintended responses during and after application of DC H -field = 180dBpT (1E-3 Tesla) in the 3 axis (X,Y,Z).

SBX-4CF-AD01-P3-…	Requirement Specification
	11 Repeater and TTC/RF passive shielding efficiency
[REQ-114]	The shielding efficiency (SE), defined as the ratio of the total interfering power at unit output with respect isotropic radiated power shall not exceed **-75dBi** for the units of the repeater section (before the TWTA) and **-65dBi** for the units of the repeater output section (after the TWTA) and TTC-RF subsystem, at working frequency range.
[REQ-115]	The shielding effectiveness of the unit shall be measured from RE sniff test or RS spray test methods or reverberation chamber method approved by the prime.

4. STATEMENT OF APPLICABILITY TO AD01 PART 4

<table>
<tr><th>SB4-SAT-AD1-P4...</th><th>Requirement Specification</th></tr>
<tr><td></td><td>4.2.2 Bonding characteristics at unit level</td></tr>
<tr><td>[REQ-454]</td><td>
<table>
<tr><th>Bonding connection</th><th>Electrical continuity</th></tr>
<tr><td>between two adjacent parts of a metal case including the resistance between any point of the case and any point of the cover or bonding point (possibly after vibration tests)</td><td>≤ 5 mΩ under 1Adc current</td></tr>
</table>
</td></tr>
<tr><td></td><td>4.3 Paints and coatings characteristics</td></tr>
<tr><td>[REQ-490 a]</td><td>Coatings (including paintings) on non conductive surface (not applicable on coating which is inside the unit)

- Coatings applied on a dielectric or non-conductive surface shall be grounded to the ground reference network on the edges.
- The coating surface resistivity applied on non conductive materials shall be less than 1 E9 Ω / square.</td></tr>
<tr><td>[REQ-491 a]</td><td>Coatings (including paints) on conductive surface (not applicable on coating which is inside the unit)

- The coating resistivity applied on a conductive surface shall be less than 1 E9 Ω.m assuming a depth e ≤ 100 µm.</td></tr>
<tr><td></td><td>4.4.2.2 Specific derating requirements</td></tr>
<tr><td>[REQ-614]</td><td>Mating and demating of each connector shall be less than 25 before unit delivery at Satellite System Integration.</td></tr>
<tr><td></td><td>4.4.2.3 Connector mounting requirements</td></tr>
</table>

SB4-SAT-AD1-P4...	Requirement Specification
[REQ-511]	The connectors shall be placed in such a way that connection and disconnection on one connector shall be made without any specific tool and without disconnecting the other connectors.
[REQ-615]	The connectors shall be placed according to manufacturer connector requirements.
	4.4.2.4 Connector identification
[REQ-518]	Each unit or bracket shall be permanently marked by visible connector identification closely adjacent to the appropriate connector in order to allow a correct mating of corresponding harness connector.
	4.4.3 Connector savers
[REQ-513]	Saver connectors shall be used during integration to lower number of mating and demating cycles.

END OF DOCUMENT