GBA-99010C

Standards for

Electrical, Electronic and Electromechanical (EEE) Parts Program

October 2004

Japan Aerospace Exploration Agency

Revision Log			
Revision.	Date	Description of Major Changes	Approved
Original	9 April 1999	-	K. Ayabe
A	6 March 2000	Incorporated the latest NASDA PPL (NASDA Preferred Parts List).	K. Ayabe
B	3 April 2004	1) Replaced “NASDA” with “JAXA”. 2) Abolished NASDA PPL and changed the categories of standard parts. 3) Simplified the NSPAR (Non-Standard Parts Approval Request).	T. Doura
C	4 October 2004	1) Changed the document title. 2) Revised the EEE parts covered by this document. 3) Clarified the definition of quality levels. 4) Added Quality Level Matrix of Standard and Non-standard Parts.	T. Doura

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1. Purpose

The Standards for EEE (Electrical, Electronic and Electromechanical) Parts Program establishes the selection criteria, standardization procedure and management of EEE parts (hereinafter referred to as “parts”) to properly manage parts costs and to assure reliability in space systems such as rockets and satellites developed by Japan Aerospace Exploration Agency (JAXA).

2. Applicable Documents

The latest issues of the following documents form a part of this document to the extent specified herein.

(1) JAXA QPL/QML
JAXA Qualified Products List/Qualified Manufacturers List
http://eeepitnl.tksc.jaxa.jp/en/parts/index.asp

(2) NPSL
NASA Parts Selection List(1)
http://nepp.nasa.gov/npsl/

(3) ESCC QPL (Former ESA/SCC QPL)
ESCC Qualified Parts List (Former ESA/SCC Qualified Parts List)
https://escies.org/public/escc/qpl/

(4) ECSS-Q-60-01
European Preferred Parts List (EPPL) and its Management
https://escies.org/public/eppl/

(5) GSFC EEE-INST-002
Instructions for EEE Parts Selection, Screening, Qualification, and Derating(1)
http://nepp.nasa.gov/eee-inst-002.cfm

(6) GSFC PPL-21
Goddard Space Flight Center Preferred Parts List
http://nepp.nasa.gov/DocUploads/AA0D50FD-18BE-48EF-ABA2E1C4EFF2395F/ppl21notice1.pdf

(7) MIL QPL/QML
Qualified Products Lists (QPL) and Qualified Manufacturers Lists (QML)
http://www.dscc.dla.mil/Programs/QmlQpl/

Note: Level 1 and Level 2 products specified in the NPSL and GSFC EEE-INST-002 shall be used. Level 3 products shall not be used.

3. Terms and Definitions

The definitions for terms used herein are as follows:

(1) EEE parts:
In general, EEE parts refer to electrical, electronic and electromechanical parts such as transistors, wires and relays. This document covers the following EEE parts.

1. Integrated Circuits
2. Transistors
3. Diodes
4. Capacitors
5. Resistors
6. Connectors
7. Crystals and Crystal Oscillators
8. Filters
9. Relays
10. Switches
11. Transformers and Coils
12. Wires and Cables
13. Solar Cells
14. Printed Wiring Boards
15. Thermistors
16. Heaters
17. Sensors
18. Fuses
19. RF Devices
20. Miscellaneous Parts

(2) Qualification tests:
Qualification tests refer to a series of tests which verify compliance with the functional, performance and reliability requirements under the specified environments.

(3) JAXA certified parts:
JAXA certified parts refer to parts for common and repeated use in multiple space systems such as rockets and satellites which are developed by JAXA. Their functions, performance and reliability have been demonstrated and approved by JAXA through the qualification tests. JAXA certified parts include QPL parts and QML parts.

4. Quality Levels of EEE Parts

EEE parts used in JAXA's space systems shall have sufficient reliability and quality levels required to achieve the mission objectives of the systems. This document defines two quality levels; i.e., Class I and Class II. Proper quality part levels shall be selected based on mission criticality. Class I parts are for low risk applications such as life support systems, those including series configuration, those being a single point of failure, and subsystems or units determined critical to achieve the mission objectives by the JAXA project office. Class I or Class II parts can be used for applications not considered to be low risk. When Class II parts are selected for low risk applications due to Class I parts unavailability, the procedure defined in paragraph 6-3 shall be implemented.

4.1 Class I Parts

Class I parts shall be those listed as Class I parts in Table 1 or equivalent.

4.2 Class II Parts

Class II parts shall be those listed as Class II parts in Table 1 or equivalent.

5. Standard Parts and Non-standard Parts

Standard parts refer to those listed as standard parts in the Table 1. Parts other than standard parts are referred to as non-standard parts. Quality levels of non-standard parts are specified in Table 1. The procedure specified in paragraph 6.1 shall be used to select non-standard parts.

Table 1. Quality Level Matrix of Standard and Non-standard Parts

Quality level	Standard parts	Non-standard parts[1]
Class I	1) Class I parts listed in JAXA QPL/QML	Parts qualified and evaluated per a part specification that requires quality levels equivalent to those with Class I standard parts.
	Level 1 parts listed in NPSL[2]	
	Level B parts listed in ESCC QPL (former ESA/SCC QPL)	
	Parts listed in Part I of EPPL (ECSS-Q-60-01)	
	Level 1 parts listed in GSFC EEE-INST-002[2]	
	Grade 1 parts listed in GSFC PPL-21[2]	
	Parts (a quality level is based on the NPSL level 1) listed in MIL QPL/QML(2)	
Class II	2) Class II parts listed in JAXA QPL/QML	Parts qualified and evaluated per a part specification that requires quality levels equivalent to those with Class II standard parts.
	Level 2 parts listed in NPSL[2]	
	Level C parts listed in ESCC QPL (former ESA/SCC QPL)	
	Parts listed in Part II of EPPL (ECSS-Q-60-01)	
	Level 2 parts listed in GSFC EEE-INST-002[2]	
	Grade 2 parts listed in GSFC PPL-21[2]	
	Parts (a quality level is based on the NPSL level 2) listed in MIL QPL/QML[2]	

Notes:
(1) NSPAR is required.
(2) All application notes in NPSL, GSFC EEE-INST-002 and GSFC PPL-21 shall apply.

6. Parts Selection

Parts shall be selected from the standard parts list when possible. If a required part is not listed in the standard parts list or a required quality level is not available, the following steps shall be taken to select a non-standard part.

6.1 Non-Standard Parts Approval Request

Except for the cases specified in paragraph 6.2, a Non-Standard Parts Approval Request (Form 1) shall be submitted to and approved by the responsible JAXA project office before using non-standard parts. A request will be approved if the following requirements are met.

(1) A specification shall be established.
(2) The specification shall specify operating temperature range, environmental conditions and electrical characteristics in consideration of the actual operating conditions.
(3) The specification shall specify qualification tests and the test results shall be satisfactory. Data from similar tests or similar parts may be used.
(4) The specification shall specify requirements on design, production process and screening and quality conformance inspection. The requirements shall meet the specified quality level. If a corresponding JAXA specification does not exist and a required quality level is not specified, a quality level specified in a similar specification shall be applied. In this case a technical justification shall be provided.
(5) The specification shall define management requirements to ensure that the same design, construction and process conditions apply to the qualification test samples and products for delivery. If a long-term, continuous production is required, the specification shall specify

maintenance requirements. This provision is not applicable if the qualification test samples and products for delivery are from the same lot.

(6) Design, structure or manufacturing conditions shall be free of any reliability concerns.

6.2 Simplified Application for Approval

Past approval granted to a nonstandard part shall be considered effective if the part meets the following requirements.

(1) An approval has been requested and granted for the part by submitting the Non-Standard Parts Approval Request. The part shall have an equivalent quality level as the approved part and shall not pose any reliability concerns with design, construction or manufacturing conditions.

(2) The applicant shall prove by the specification and/or test data used for the past application that the approved application conditions meet or exceed requirements of the target system such as lifetime and environmental conditions.

6.3 Substitution of Class II Parts for Class I Parts

In the event that Class I parts need to be substituted with Class II parts because of Class I parts unavailability, the Class II parts shall be treated as non-standard parts and be subjected to screening equivalent to Class I screening, to upgrade the quality level to a Class I equivalent. When additional screening tests are performed, GSFC EEE-INST-002 shall be used as a guide to determine screening requirements for each part type. Justification of using Class II parts shall be sufficiently proved including a comparison between Class I and Class II parts. Non-Standard Parts Approval Request shall be submitted.

7. Parts Procurement

Standard parts shall be procured per parts specifications and requirements specified in each parts list shown in Table 1. Non-standard parts shall be procured per the approved specifications and additional requirements, if any. In either case, purchasers must assure compliance of quality level. In addition, the purchasers shall verify that the parts meet the requirements specified in the applicable specification by proper means such as source inspection.

8. Parts Applications

All parts shall be properly used within the characteristic range specified in the applicable specification and under proper derating conditions to assure the required system reliability. After selecting and procuring the parts in compliance with this document, the part user shall be responsible for proper use of the parts.

Non-Standard Parts Approval Request (Form 1)

Application No. :
Date of Application :
Organization :

Part Number :_____
Manufacturer :_____
Specification Number :_____
Part Type :_____
Part Description :_____
Generic Part Number :_____
Approval History : Approval No._____ Use application _____
Quality Level : Class I equivalent Class II equivalent Other*( )
Design and Construction : Class I equivalent Class II equivalent Other*( )
DPA Data : Yes No
Production Process Control : Class I equivalent Class II equivalent Other*( )
Screening : Class I equivalent Class II equivalent Other*( )
Qualification Test : Class I equivalent Class II equivalent Other*( )
QCI : Class I equivalent Class II equivalent Other*( )
*) If no criterion for Class I/II of the part type has been defined, the details shall be given here.
Supply Control : Single lot Short-run production Continuous production
Use Application : _____
Reason for Request : _____

--- ESDS / Rad-Hardness ---
ESDS Level :_____
Rad-Hardness Level :_____
Rad-Hardness Test : QT only Each lot Sample lot Other ( )

--- Supplemental Information---

--- Contact Point ---
Organization :_____
Name/Title :_____
Address :_____
Telephone :_____ Fax :_____
Email :_____
--- Attachments ---
Specification C/A data QT data ESD test data Rad-hardness test data

--- Review Result ---
Review Result :_____
Approval Conditions :_____

(Date)
(Name)_____
Director, Electronic and Information Technology Laboratory, JAXA

NSPAR Form Instructions

Item	Instructions
Application No.	Provide a unique number.
Date of Application	Date of application
Organization	Provide the applicant's company/organization name
Part Number	Provide the part number
Manufacturer	Name of manufacturer
Specification Number	Specification number
Part Type	Any part type of EEE parts specified in paragraph 3. (1)
Part Description	Function or characteristics such as high-speed amplifier or power MOSFET
Generic Part Number	Part number of a generic part of equivalent design and construction
Approval History	Approval history in other project
Quality Level	Check the applicable quality level determined by applicant (I or II)
Design and Construction	Classification of design and construction (I or II)
DPA Data	Check "Yes" if DPA data exist
Production Process Control	Classification of production process control level (I or II)
Screening	Classification of screening level (I or II)
Qualification Test	Classification of qualification test level (I or II)
QCI (Quality Conformance Inspection)	Classification of QCI level (I or II)
Supply Control	Single lot: Only one lot production Short-run production: Short term production control Continuous production: Continuous maintenance and control
Applications	Component or equipment for which the part will be used
Reason for Request	Reason why no standard part can be found
---ESDS/Rad-Hardness---	
ESDS Level	ESDS level
Rad-Hardness Level	Radiation hardness level (TID and SEE: SEL, SEGR, SEB, and SEU)
Rad-Hardness Test	Frequency of Radiation Hardness Test
---Supplemental Information---	Supplementary information relevant to this application (Provide a rationale for the selection if paragraph 6.3 is applicable.)
---Contact Point---	
Organization	Provide the organization name
Name/Title	Provide the name and title of the contact person
Address	Provide the address of the organization
Telephone	Provide the telephone number of the contact person
Fax	Provide the facsimile number of the contact person
---Attachments---	Check boxes of the attachments
---Review Result---	
Review Result	Review result of this application (for JAXA use only)
Approval Conditions	Approval conditions of this application (for JAXA use only)