

DIN EN 16602-60:2023-10 (E)

Space product assurance - Electrical, electronic and electromechanical (EEE) components; English version EN 16602-60:2023

Table of contents

European Foreword	7
Introduction	7
1 Scope	9
2 Normative references	10
3 Terms, definitions and abbreviated terms	12
3.1 Terms from other standards.....	12
3.2 Terms specific to the present standard	12
3.3 Abbreviated terms.....	13
3.4 Conventions.....	15
3.5 Nomenclature	16
4 Requirements for Class 1 components	17
4.1 Component programme management	17
4.1.1 General	17
4.1.2 Components control programme	17
4.1.3 Parts control board.....	17
4.1.4 Declared components list.....	18
4.1.5 Electrical and mechanical GSE	19
4.1.6 EQM components	19
4.2 Component selection, evaluation and approval.....	20
4.2.1 General	20
4.2.2 Manufacturer and component selection.....	20
4.2.3 Component evaluation	24
4.2.4 Parts approval.....	26
4.3 Component procurement	27
4.3.1 General	27
4.3.2 Procurement specification	27
4.3.3 Screening requirements	28
4.3.4 Initial customer source inspection (precap)	28
4.3.5 Lot acceptance.....	29

4.3.6	Final customer source inspection (buy-off).....	30
4.3.7	Incoming inspections.....	30
4.3.8	Radiation verification testing	31
4.3.9	Destructive physical analysis	31
4.3.10	Relifing.....	32
4.3.11	Manufacturer's data documentation deliveries	32
4.4	Handling and storage.....	33
4.5	Component quality assurance	33
4.5.1	General	33
4.5.2	Nonconformances or failures	33
4.5.3	Alerts.....	34
4.5.4	Traceability	34
4.5.5	Lot homogeneity for sampling test.....	35
4.6	Specific components.....	35
4.6.1	General	35
4.6.2	ASICs.....	35
4.6.3	Hybrids.....	35
4.6.4	One time programmable devices.....	35
4.6.5	Microwave monolithic integrated circuits	36
4.6.6	Connectors	36
4.7	Documentation	36
5	Requirements for Class 2 components	38
5.1	Component programme management	38
5.1.1	General	38
5.1.2	Components control programme	38
5.1.3	Parts Control Board.....	38
5.1.4	Declared Components List	39
5.1.5	Electrical and mechanical GSE	40
5.1.6	EQM components	40
5.2	Component selection, evaluation and approval.....	40
5.2.1	General	40
5.2.2	Manufacturer and component selection.....	41
5.2.3	Component evaluation	44
5.2.4	Parts approval.....	46
5.3	Component procurement	46
5.3.1	General	46
5.3.2	Procurement specification	47

5.3.3	Screening requirements	47
5.3.4	Initial Customer Source Inspection (precap).....	48
5.3.5	Lot acceptance.....	48
5.3.6	Final customer source inspection (buy-off).....	49
5.3.7	Incoming inspections.....	49
5.3.8	Radiation verification testing	50
5.3.9	Destructive physical analysis	50
5.3.10	Relifing.....	51
5.3.11	Manufacturer's data documentation deliveries	51
5.4	Handling and storage.....	52
5.5	Component quality assurance	52
5.5.1	General	52
5.5.2	Nonconformances or failures	52
5.5.3	Alerts.....	53
5.5.4	Traceability	53
5.5.5	Lot homogeneity for sampling test.....	53
5.6	Specific components.....	53
5.6.1	General	53
5.6.2	ASICs.....	53
5.6.3	Hybrids.....	54
5.6.4	One time programmable devices.....	54
5.6.5	Microwave monolithic integrated circuits	55
5.6.6	Connectors	55
5.7	Documentation	55
6	Requirements for Class 3 components	57
6.1	Component programme management	57
6.1.1	General	57
6.1.2	Components control programme	57
6.1.3	Parts control board.....	57
6.1.4	Declared components list.....	57
6.1.5	Electrical and mechanical GSE	58
6.1.6	EQM components	58
6.2	Component selection, evaluation and approval.....	58
6.2.1	General	58
6.2.2	Manufacturer and component selection.....	59
6.2.3	Component evaluation	62
6.2.4	Parts approval.....	64

6.3	Component procurement	65
6.3.1	General	65
6.3.2	Procurement specification	65
6.3.3	Screening requirements	65
6.3.4	Initial customer source inspection (precap)	66
6.3.5	Lot acceptance.....	66
6.3.6	Final customer source inspection (buy-off).....	66
6.3.7	Incoming inspections.....	67
6.3.8	Radiation verification testing	67
6.3.9	Destructive physical analysis	67
6.3.10	Relifing.....	68
6.3.11	Manufacturer's data documentation deliveries	69
6.4	Handling and storage.....	69
6.5	Component quality assurance	69
6.5.1	General	69
6.5.2	Nonconformances or failures	70
6.5.3	Alerts.....	70
6.5.4	Traceability	70
6.5.5	Lot homogeneity for sampling test.....	71
6.6	Specific components.....	71
6.6.1	Overview	71
6.6.2	ASICs.....	71
6.6.3	Hybrids.....	71
6.6.4	One time programmable devices.....	71
6.6.5	Microwave monolithic integrated circuits	72
6.6.6	Connectors	72
6.7	Documentation	72
7	Quality levels	74
8	Evaluation and lot acceptance for retinned parts.....	88
9	Pure tin lead finish – risk analysis	89
9.1	Overview	89
9.2	Requirements	89
Annex A	(normative) Component control plan (CCP) - DRD	91
A.1.1	Requirement identification and source document.....	91
A.1.2	Purpose and objective.....	91
A.2.1	Scope and content	91

A.2.2	Special remarks	92
Annex B (normative)	Declared component list (DCL) - DRD	93
B.1.1	Requirement identification and source document.....	93
B.1.2	Purpose and objective.....	93
B.2.1	Scope and content	93
B.2.2	Special remarks	94
Annex C (normative)	Procurement specification - DRD.....	95
C.1.1	Requirement identification and source document.....	95
C.1.2	Purpose and objective.....	95
C.2.1	Scope and content	95
C.2.2	Special remarks	96
Annex D (normative)	Part approval document (PAD) - DRD.....	97
D.1.1	Requirement identification and source document.....	97
D.1.2	Purpose and objective.....	97
Annex E (informative)	EEE documents delivery per review	100
Bibliography.....		103
Tables		
Table 4-1:	Document requirements list for Class 1 components	36
Table 5-1:	Document requirements list for Class 2 components	55
Table 6-1:	Document requirements list for Class 3 components	72
Table 7-1:	Quality levels for Class 1 components	74
Table 7-2:	Quality levels for Class 2 components	78
Table 7-3:	Quality levels for Class 3 components	83
Table D-1 :	PAD sheet.....	98
Table E-1 :	EEE delivery documents	101