

european space agency agence spatiale européenne

Pages 1 to 20

CAPACITORS, FIXED, CHIPS, MULTIPLE LAYER, CERAMIC DIELECTRIC, HIGH FREQUENCY,

TYPE I,

BASED ON TYPE CHB

ESA/SCC Detail Specification No. 3009/036



space components coordination group

		Approved by	
Issue/Rev.	Date	SCCG Chairman	ESA Director General or his Deputy
Issue 1	July 1998	Sannot	Hom
Revision 'A'	November 2000	Sannet	Avon



Rev. 'A'

PAGE 2

ISSUE 1

DOCUMENTATION CHANGE NOTICE

	DOCUMENTATION CHANGE NOTICE				
Rev. Letter	Rev. Date	Reference	CHANGE Item		Approved DCR No.
'A'	Nov. '00	P1. Cover page P2. DCN P9. Figure 2(a) Figure 2(b)	: In the Table, 'M' min. amended : In the Table, 'M' min. amended		None None 221578 221578



PAGE 3 ISSUE 1

TABLE OF CONTENTS

1. Scope 5 1.2 Range of Components 5 1.2 Range of Components 5 1.3 Maximum Ratings 5 1.4 Parameter Derating Information 5 1.5 Physical Dimensions 5 1.6 Functional Diagram 5 2. APPLICABLE DOCUMENTS 5 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 5 4. REQUIREMENTS 10 4.1 General 10 4.2 Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2 Deviations from Special In-process Controls 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Burn-in and Electrical Measurements 10 4.2.5 Deviations from Lot Acceptance Tests 11 4.3 Mechanical Requirements 11 4.3 Mechanical Requirements 11 4.3 Adhesion 11 4.4 Materials and Finishes 11 4.4.1 Terminations 12 4.5.2 Marking 12 4.5.3 Electrical Measurements at Room Temperatu			<u>Page</u>
1.2 Range of Components 5 1.3 Maximum Ratings 5 1.4 Parameter Derating Information 5 1.5 Physical Dimensions 5 1.6 Functional Diagram 5 2. APPLICABLE DOCUMENTS 5 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 5 4. REQUIREMENTS 10 4.1 General 10 4.2 Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2 Deviations from Burn-in and Electrical Measurements 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Unuffication Tests 10 4.2.5 Deviations from Lot Acceptance Tests 11 4.3 Mechanical Requirements 11 4.3 Mechanical Requirements 11 4.3 Mechanical Requirements 11	1.	GENERAL	5
1.2 Range of Components 5 1.3 Maximum Ratings 5 1.4 Parameter Derating Information 5 1.5 Physical Dimensions 5 1.6 Functional Diagram 5 2. APPLICABLE DOCUMENTS 5 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 5 4. REQUIREMENTS 10 4.1 General 10 4.2 Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2 Deviations from Burn-in and Electrical Measurements 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Lot Acceptance Tests 11 4.3 Mechanical Requirements 11 4.3 Mechanical Requirements 11 4.3 Mechanical Requirements 11 4.3 Melectric 12 4.3	1.1	Scope	5
1.3 Maximum Ratings 5 1.4 Parameter Derating Information 5 1.5 Physical Dimensions 5 1.6 Functional Diagram 5 2. APPLICABLE DOCUMENTS 5 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 5 4. REQUIREMENTS 10 4.1 General 10 4.2 Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2.1 Deviations from Burn-in and Electrical Measurements 10 4.2.3 Deviations from Purn-in and Electrical Measurements 10 4.2.4 Deviations from Purn-in and Electrical Measurements 10 4.2.5 Deviations from Qualification Tests 10 4.2.1 Deviations from Qualification Tests 10 4.2.2 Deviations from Qualification Tests 11 4.3 Mechanical Requirements 11 4.3.1 Dimension Check 11 4.3 Mechanical Requirements <td< td=""><td></td><td></td><td></td></td<>			
1.4 Parameter Derating Information 5 1.5 Physical Dimensions 5 1.6 Functional Diagram 5 2. APPLICABLE DOCUMENTS 5 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 5 4. REQUIREMENTS 10 4.1 General 10 4.2 Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2 Deviations from Final Production Tests 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Unit Acceptance Tests 11 4.3 Mechanical Requirements 11 4.3 Mechanical Requirements 11 4.3 Dimension Check 11 4.3 Dimension Check 11 4.4 Terminations 12 4.4 Delectrical Measurements 12 4.5 Marking 12 4.5 Marking 12 4.5 The SCC Component Number 12 4.5 The SCC Component Number 12 4.5 Traceability Information 14 4.6 Electrical Measurements 14 4.6.1 Electrical Measurements 14 4.6.2 Electrical Measurements 14 4.7 Durn Tests 14 4.8 Traceability Information 14 4.9 Durn Tests 14 4.1 Parameter Drift Values 14 4.7 Burn-in Tests 14 4.7 Burn-in Tests 14 4.7.1 Parameter Drift Values 14 4.7.2 Conditions for Burn-in 14 4.8 Environmental and Endurance Tests 17 4.8.2 Measurements and Inspections on Completion of Environmental Tests 17 4.8.3 Measurements and Inspections on Completion of Environmental Tests 17 4.8.4 Conditions for Operating Life Tests 17 4.8.5 Measurements and Inspections on Completion of Environmental Tests 17 4.8.8 Measurements and Inspections on Completion of Environmental Tests 17 4.8.8 Measurements and Inspections on Completion of Environmental Tests 17 4.8.8 Measurements and Inspections on Completion of Environmental Tests 17 4.8.8 Measurements and Inspections on Completion of Environmental Tests 17 4.8.8 Measurements and Inspections on Completion of Environmental Tests 17 4.8.8 Measurements and Inspections on Completion of Environmental Tests 17 4.8.8 Measurements and Inspections on Completion of Environmental Tests 17 4.8.9 Measurements and Inspections on Completion of Environmental Tests 17 4.8.9 Measurements and Inspecti			
1.5 Physical Dimensions Functional Diagram 2. APPLICABLE DOCUMENTS 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 4. REQUIREMENTS 10 4.1 General 4.2 Deviations from Generic Specification 4.2.1 Deviations from Special In-process Controls 4.2.1 Deviations from Special In-process Controls 4.2.2 Deviations from Final Production Tests 4.2.3 Deviations from Burn-in and Electrical Measurements 4.2.4 Deviations from Burn-in and Electrical Measurements 4.2.5 Deviations from Qualification Tests 4.2.6 Deviations from Cut Acceptance Tests 4.3 Mechanical Requirements 4.3 Mechanical Requirements 4.3.1 Dimension Check 4.3.2 Weight 4.3.3 Adhesion 4.4 Materials and Finishes 4.4 Materials and Finishes 4.4.1 Terminations 4.4.2 Dielectric 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Measurements 4.6.4 Traceability Information 4.6 Electrical Measurements 4.6.5 Electrical Measurements 4.6.6 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7 Burn-in Tests 4.8 Environmental and Endurance Tests 4.8 Environmental and Endurance Tests 4.8 Environmental and Endurance Tests 4.8 Environments and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.7 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.7 Measurements and Inspections on Completion of Environmental Tests 4.7 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.7 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Ins			
1.6 Functional Diagram 5 2. APPLICABLE DOCUMENTS 5 3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 5 4. REQUIREMENTS 10 4.1 General 10 4.2 Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2 Deviations from Enal Production Tests 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Lot Acceptance Tests 11 4.2.5 Deviations from Lot Acceptance Tests 11 4.3 Mechanical Requirements 11 4.3.1 Dimension Check 11 4.3.1 Dimension Check 11 4.3.2 Weight 11 4.4.1 Terminations 11 4.4.2 Dielectric 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Test Conditions for Measurements at Roo			
3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS 4. REQUIREMENTS 10 4.1 General 4.2 Deviations from Generic Specification 4.2.1 Deviations from Special In-process Controls 4.2.2 Deviations from Special In-process Controls 4.2.3 Deviations from Final Production Tests 4.2.4 Deviations from Burn-in and Electrical Measurements 4.2.5 Deviations from Qualification Tests 4.1 Mechanical Requirements 4.2 Mechanical Requirements 4.3 Mechanical Requirements 4.3 Mechanical Requirements 4.3 Weight 4.3 Materials and Finishes 4.4 Materials and Finishes 4.4 Materials and Finishes 4.5 Dielectric 4.5 Marking 4.5 Marking 4.5 Marking 4.5 Marking 4.5 The SCC Component Number 4.5 The SCC Component Number 4.6 Electrical Measurements 4.6 Electrical Measurements 4.6 Electrical Measurements 4.6 Electrical Measurements 4.6 Electrical Measurements at Room Temperature 4.6 Electrical Measurements at High and Low Temperatures 4.7 Burn-in Tests 4.8 Environmental and Endurance Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 5 Tested Tester Testes 5 Tester Testes 5 Tester Tester Tester Tester Testes 5 Tester Te			
4. REQUIREMENTS 10 4.1 General 10 4.2. Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2 Deviations from Final Production Tests 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Unt Acceptance Tests 10 4.2.5 Deviations from Lot Acceptance Tests 11 4.3 Mechanical Requirements 11 4.3.1 Dimension Check 11 4.3.2 Weight 11 4.3.3 Adhesion 11 4.4 Materials and Finishes 11 4.4.1 Terminations 12 4.4.2 Dielectric 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.2 The SCC Component Number 12 4.5.3 Electrical Measurements at High and Low T	2.	APPLICABLE DOCUMENTS	5
4. REQUIREMENTS 10 4.1 General 10 4.2 Deviations from Generic Specification 10 4.2.1 Deviations from Special In-process Controls 10 4.2.2 Deviations from Final Production Tests 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Qualification Tests 10 4.2.5 Deviations from Lot Acceptance Tests 11 4.3 Mechanical Requirements 11 4.3.1 Dimension Check 11 4.3.2 Weight 11 4.3.3 Adhesion 11 4.4 Materials and Finishes 11 4.4.1 Terminations 12 4.4.2 Dielectric 12 4.5.5 Marking 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.4 Traceability Information 14	3.	TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS	5
4.1 General 4.2 Deviations from Generic Specification 4.2.1 Deviations from Special In-process Controls 4.2.2 Deviations from Special In-process Controls 4.2.3 Deviations from Final Production Tests 10 4.2.4 Deviations from Burn-in and Electrical Measurements 10 4.2.5 Deviations from Qualification Tests 11 4.3 Mechanical Requirements 11 4.3.1 Dimension Check 11 4.3.2 Weight 4.3.1 Dimension Check 11 4.3.3 Adhesion 11 4.4 Materials and Finishes 11 4.4.1 Terminations 11 4.4.2 Dielectric 12 4.5.2 Marking 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.4 Traceability Information 14 4.6 Electrical Measurements 14 4.6.1 Electrical Measurements at High and Low Temperature 14 4.6.2 Electrical Measurements at High and Low Temperatures 14 4.7 Burn-in Tests 14 4.7 Parameter Drift Values 17 4.8.1 Measurements and Inspections on Completion of Environmental Tests 18 48.2 Measurements and Inspections on Completion of Environmental Tests 17 48.8 Measurements and Inspections on Completion of Endurance Tests 17 48.8 Measurements and Inspections on Completion of Endurance Tests 17 48.8 Measurements and Inspections on Completion of Endurance Tests 17 48.8 Measurements and Inspections on Completion of Endurance Tests 17 48.8 Measurements and Inspections on Completion of Endurance Tests 17 48.8 Measurements and Inspections on Completion of Endurance Tests 17	4		_
4.2.1 Deviations from Generic Specification 4.2.1 Deviations from Special In-process Controls 4.2.2 Deviations from Final Production Tests 10 4.2.3 Deviations from Burn-in and Electrical Measurements 10 4.2.4 Deviations from Qualification Tests 11 4.2.5 Deviations from Qualification Tests 11 4.3 Mechanical Requirements 11 4.3.1 Dimension Check 11 4.3.2 Weight 4.3.3 Adhesion 11 4.4 Materials and Finishes 11 4.4 Materials and Finishes 11 4.4.1 Terminations 12 4.4.2 Dielectric 12 4.5 Marking 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.4 Traceability Information 14 4.6 Electrical Measurements 14 4.6.1 Electrical Measurements 14 4.6.2 Electrical Measurements at High and Low Temperatures 14 4.7 Burn-in Tests 17 4.7.1 Parameter Drift Values 17 4.7.2 Conditions from Burn-in 18 4.8.3 Measurements and Inspections on Completion of Environmental Tests 17 4.8.4 Measurements and Inspections on Completion of Endurance Tests 17 4.8.5 Measurements and Inspections on Completion of Endurance Tests 17 4.8.6 Measurements and Inspections on Completion of Endurance Tests 17 4.8.8 Measurements and Inspections on Completion of Endurance Tests 17 4.8.8 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Tests 17 4.8.9 Measurements and Inspections on Completion of Endurance Te	4.	REGUIREMENTS	10
4.2.1 Deviations from Special In-process Controls 4.2.2 Deviations from Final Production Tests 4.2.3 Deviations from Burn-in and Electrical Measurements 4.2.4 Deviations from Burn-in and Electrical Measurements 4.2.5 Deviations from Lot Acceptance Tests 4.3 Mechanical Requirements 4.3.1 Dimension Check 4.3.2 Weight 4.3.3 Adhesion 4.4 Materials and Finishes 4.4.1 Terminations 4.4.1 Terminations 4.5 Dielectric 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.7 Burn-in Tests 4.7 Burn-in Tests 4.8 Burn-in Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests		4.4.4.4.4.	10
4.2.2 Deviations from Final Production Tests 4.2.3 Deviations from Burn-in and Electrical Measurements 4.2.4 Deviations from Burn-in and Electrical Measurements 4.2.5 Deviations from Lot Acceptance Tests 4.3 Mechanical Requirements 4.3.1 Dimension Check 4.3.2 Weight 4.3.3 Adhesion 4.4 Materials and Finishes 4.4.1 Terminations 4.4.2 Dielectric 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.8 Environmental and Endurance Tests 4.8.3 Measurements and Inspections on Completion of Environmental Tests 4.8.4 Measurements and Inspections on Completion of Endurance Tests 4.8.5 Measurements and Inspections on Completion of Endurance Tests 4.8.6 Measurements and Inspections on Completion of Endurance Tests 4.8.7 Measurements and Inspections on Completion of Endurance Tests 4.8.8 Measurements and Inspections on Completion of Endurance Tests 4.8.9 Measurements and Inspections on Completion of Endurance Tests 4.8.9 Measurements and Inspections on Completion of Endurance Tests 4.8.9 Measurements and Inspections on Completion of Endurance Tests 4.8.1 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests			10
4.2.3 Deviations from Burn-in and Electrical Measurements 4.2.4 Deviations from Qualification Tests 4.2.5 Deviations from Qualification Tests 4.3 Mechanical Requirements 4.3 Mechanical Requirements 4.3.1 Dimension Check 4.3.2 Weight 4.3.3 Adhesion 4.4 Materials and Finishes 4.4.1 Terminations 4.4.2 Dielectric 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at High and Low Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.7 Burn-in Tests 4.7 Burn-in Tests 4.8 Environmental and Endurance Tests 4.8 Measurements and Inspections on Completion of Environmental Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Measurements and Inspections on Completion of Endurance Tests 4.8 Conditions for Operating Life Tests			
4.2.4 Deviations from Qualification Tests 4.2.5 Deviations from Lot Acceptance Tests 4.3.1 Mechanical Requirements 4.3.1 Dimension Check 4.3.2 Weight 4.3.3 Adhesion 4.4.4 Materials and Finishes 4.4.1 Terminations 4.4.2 Dielectric 4.5 Marking 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Measurements and Inspections on Completion of Endurance Tests 4.8.5 Measurements and Inspections on Completion of Endurance Tests 4.8.6 Measurements and Inspections on Completion of Endurance Tests 4.8.7 Measurements and Inspections on Completion of Endurance Tests 4.8.8 Measurements and Inspections on Completion of Endurance Tests 4.8.9 Measurements and Inspections on Completion of Endurance Tests 4.8.1 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests			
4.2.5 Deviations from Lot Acceptance Tests 4.3 Mechanical Requirements 11 4.3.1 Dimension Check 11 4.3.2 Weight 4.3.3 Adhesion 11 4.4 Materials and Finishes 11 4.4.1 Terminations 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.4 Traceability Information 14 16 Electrical Measurements 17 18 19 19 10 10 10 10 11 11 11 11 11 11 11 11 11			10
4.3 Mechanical Requirements 4.3.1 Dimension Check 4.3.2 Weight 4.3.3 Adhesion 4.4 Materials and Finishes 4.4.1 Terminations 4.4.2 Dielectric 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements 4.6.2 Electrical Measurements at High and Low Temperature 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7 Parameter Drift Values 4.7 Conditions for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Measurements and Inspections on Completion of Endurance Tests 4.8.5 Measurements and Inspections on Completion of Endurance Tests 4.8.6 Conditions for Operating Life Tests			
4.3.1 Dimension Check 4.3.2 Weight 4.3.3 Adhesion 5.1 Adhesion 7.1 Materials and Finishes 7.2 Dielectric 7.3 Dielectric 7.4 Marking 7.5 Marking 7.5 Marking 7.6 Marking 7.7 Marking 7.7 Marking 7.8 Marking 7.9 Marking 7.9 Marking 7.0 Ma			
4.3.2 Weight 4.3.3 Adhesion 4.4 Materials and Finishes 4.4.1 Terminations 4.4.2 Dielectric 4.5 Marking 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements 4.6.2 Electrical Measurements at Room Temperature 4.6.3 Circuits for Electrical Measurements 4.6.4 Gircuits for Electrical Measurements 4.7 Burn-in Tests 4.7 Parameter Drift Values 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections at Intermediate Points during Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests			
4.3.3 Adhesion 4.4 Materials and Finishes 4.4.1 Terminations 4.4.2 Dielectric 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.6.4 Burn-in Tests 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.7 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests			
4.4 Materials and Finishes 4.4.1 Terminations 12 4.4.2 Dielectric 12 4.5 Marking 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.4 Traceability Information 14 4.6 Electrical Measurements 16 17 18 18 19 19 19 10 10 10 11 11 11 11 12 12 13 14 15 15 16 16 17 18 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19			
4.4.1 Terminations 12 4.4.2 Dielectric 12 4.5 Marking 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.4 Traceability Information 14 4.6 Electrical Measurements 14 4.6.1 Electrical Measurements at Room Temperature 14 4.6.2 Electrical Measurements at High and Low Temperatures 14 4.6.3 Circuits for Electrical Measurements 14 4.7 Burn-in Tests 14 4.7.1 Parameter Drift Values 14 4.7.2 Conditions for Burn-in 14 4.7.3 Electrical Circuits for Burn-in 14 4.8 Environmental and Endurance Tests 17 4.8.1 Measurements and Inspections on Completion of Environmental Tests 17 4.8.2 Measurements and Inspections on Completion of Endurance Tests 17 4.8.3 Measurements and Inspections on Completion of Endurance Tests 17 4.8.4 Conditions for Operating Life Tests 17			
4.4.2 Dielectric 4.5 Marking 4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections at Intermediate Points during Endurance Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.8.5 Intermediate Points during Endurance Tests 4.8.6 Conditions for Operating Life Tests			
4.5 Marking 12 4.5.1 General 12 4.5.2 The SCC Component Number 12 4.5.3 Electrical Characteristics and Ratings 13 4.5.4 Traceability Information 14 4.6 Electrical Measurements 14 4.6.1 Electrical Measurements at Room Temperature 14 4.6.2 Electrical Measurements at High and Low Temperatures 14 4.6.3 Circuits for Electrical Measurements 14 4.7 Burn-in Tests 14 4.7.1 Parameter Drift Values 14 4.7.2 Conditions for Burn-in 14 4.7.3 Electrical Circuits for Burn-in 14 4.8 Environmental and Endurance Tests 17 4.8.1 Measurements and Inspections on Completion of Environmental Tests 17 4.8.2 Measurements and Inspections on Completion of Endurance Tests 17 4.8.3 Measurements and Inspections on Completion of Endurance Tests 17 4.8.4 Conditions for Operating Life Tests 17			
4.5.1 General 4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections at Intermediate Points during Endurance Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.8.5 Conditions for Operating Life Tests			
4.5.2 The SCC Component Number 4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.7		_	
4.5.3 Electrical Characteristics and Ratings 4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7 Parameter Drift Values 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.8.5 Conditions for Operating Life Tests			
4.5.4 Traceability Information 4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.7			
4.6 Electrical Measurements 4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.7			
4.6.1 Electrical Measurements at Room Temperature 4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 4.8.5 Conditions for Operating Life Tests 4.8.6 Temperatures 4.8.7 Temperatures 4.8.8 Temperatures 4.8.9 Temperatures 4.8.0 Temperatures 4.8.0 Temperatures 4.8.1 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Temperatures 4.8.4 Conditions for Operating Life Tests			
4.6.2 Electrical Measurements at High and Low Temperatures 4.6.3 Circuits for Electrical Measurements 4.7 Burn-in Tests 4.7.1 Parameter Drift Values 4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections on Completion of Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 14 15 16 17 18 19 19 19 10 11 12 13 14 15 16 17 17 18 18 19 19 10 10 11 11 12 13 14 15 17 17 18 19 19 10 10 11 11 12 13 14 15 17 17 18 18 18 19 19 19 19 19 19 19			
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4.7.2 Conditions for Burn-in 4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections at Intermediate Points during Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 17			
4.7.3 Electrical Circuits for Burn-in 4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections at Intermediate Points during Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 17			
4.8 Environmental and Endurance Tests 4.8.1 Measurements and Inspections on Completion of Environmental Tests 4.8.2 Measurements and Inspections at Intermediate Points during Endurance Tests 4.8.3 Measurements and Inspections on Completion of Endurance Tests 4.8.4 Conditions for Operating Life Tests 17 18 19 19 10 11 17 17 18 19 10 10 11 11 12 13 14 15 17 17 18 18 19 10 10 10 11 11 12 13 14 15 16 17 17 18 18 18 19 19 10 10 10 10 10 10 10 10			
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		Conditions for Operating Life Tests	



PAGE 4 ISSUE 1

TABL	<u>ES</u>	<u>Page</u>
1(a) 1(b) 2 3 4 5	Range of Components Maximum Ratings Electrical Measurements at Room Temperature Electrical Measurements at High and Low Temperatures Parameter Drift Values Conditions for Burn-in and Operating Life Tests Measurements and Inspections on Completion of Environmental Tests and at Intermediate Points and on Completion of Endurance Testing	6 8 15 15 16 16 18
FIGUI	RES	
1 2 3 4 5	Parameter Derating Information Physical Dimensions Functional Diagram Circuits for Electrical Measurements Electrical Circuit for Burn-in and Operating Life Tests	N/A 9 9 N/A N/A
APPE	NDICES (Applicable to specific Manufacturers only) Agreed Deviations for Tekelec (F)	20



PAGE 5

1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Capacitors, Fixed, Chips, Multiple Layer, Ceramic Dielectric, High Frequency, Type I, based on Type CHB. It shall be read in conjunction with ESA/SCC Generic Specification No. 3009, the requirements of which are supplemented herein.

1.2 RANGE OF COMPONENTS

The range of capacitors covered by this specification is given in Table 1(a).

1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the capacitors specified herein, are scheduled in Table 1(b).

1.4 PARAMETER DERATING INFORMATION (FIGURE 1)

Not applicable.

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the capacitors specified herein are shown in Figure 2.

1.6 <u>FUNCTIONAL DIAGRAM</u>

The functional diagram for the capacitors specified herein is shown in Figure 3.

2. APPLICABLE DOCUMENTS

The following documents for part of this specification and shall be read in conjunction with it:-

- (a) ESA/SCC Generic Specification No. 3009 for Capacitors, Fixed, Chips, Ceramic Dielectric, Types I and Π .
- (b) I.E.C. Publication No. 68.2.21, Basic Environmental Test Procedure for Robustness of Terminations and Integral Mounting Devices.

3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESA/SCC Basic Specification No. 21300 shall apply. In addition, the following symbols are used:-

TC = Temperature Coefficient.

 V_T = Test Voltage.



PAGE 6

ISSUE 1

TABLE 1(a) - RANGE OF COMPONENTS

		I OUNT ON THE TOTAL ON THE TOTA	
(1)	(2)	(3)	(4)
Capacitance	Capacitance Tolerance	Temperature Coefficient	Rated Voltage
(pF)	(±)	(ppm/°C)	(U _R) (V)
0.1	0.1 pF	100 ± 30	
0.2	0.1 pF	100 ± 30	500
0.3	0.1, 0.25 pF		
0.4			i l
0.5	0.1, 0.25, 0.5 pF	i i	
0.5			
0.6			
0.7			
0.8			1
0.9			
1.0			
1.1			
1.2			
1.3		1	l
1.4			
1.5			
1.6			
1.7			
1.8			
1.9			
2.0			
2.1			
2.2		İ	
2.4			
2.7			
3.0			
3.3			
3.6			
3.9			
4.3 4.7			
4.7 5.1			
5.6			
6.2			
	0.1 0.05 5.10.000/		
6.8	0.1, 0.25pF, 5-10-20%		
7.5 8.2		 	
8.2 9.1			
10	1.0.5.10.000/		
10	1-2-5-10-20%		
11 12		i i	
12			
13 15			
15 16			
16			
18 20			
20 22			
22 24			
24 27			- "
30			
			LL

NOTES: See Page 7.



PAGE 7

ISSUE 1

TABLE 1(a) - RANGE OF COMPONENTS (CONTINUED)

(1)	(2)	(3)	(4)
Capacitance	Capacitance Tolerance	Temperature Coefficient	Rated Voltage
(pF)	(±)	(ppm/°C)	(UR) (V)
33	1-2-5-10-20%	100 ± 30	500
36			
39			
43			
47			
51			
56			
62			
68			
75	1111 1 1		
82			
91			
100			
110		ľ	1
120			300
130			
150			
160			
180			
200			
220			000
240			200
270			
300			
330			
360			
390	[
430			
470		İ	jj
510			1 100
560	[100
620			
680			50
750			50 1
820			
910			
1000			

NOTES

1. As specified in Para. 4.4.1 and Figure 2, these ranges are available in 7 Variants.



PAGE

ISSUE 1

TABLE 1(b) - MAXIMUM RATINGS

No.	CHARACTERISTICS	SYMBOL	LIMITS	UNIT	REMARKS
1	Rated Voltage	U _R	See Table 1(a)	٧	
2	Operating Temperature Range	T _{op}	-55 to +125	°C	T _{amb} Without derating
3	Storage Temperature Range	T _{stg}	-55 to +125	°C	
4	Soldering Temperature Variants 01, 02 and 05 Variants 03, 04, 06 and 07	T _{sol}	+ 235 + 260	°C	Note 1 Note 2

NOTES

- Pre-heating at +150°C for 45 seconds, t_{sol} ≤5.0 seconds.
 t_{sol} ≤5.0 seconds, distance from chip body ≥3.0mm.

FIGURE 1 - PARAMETER DERATING INFORMATION

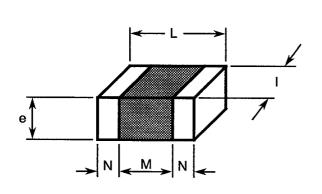


Rev. 'A'

PAGE 9 ISSUE 1

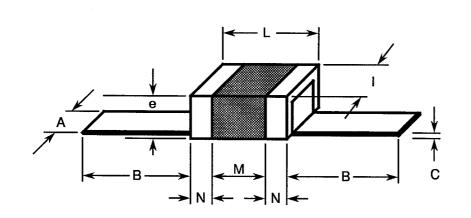
FIGURE 2 - PHYSICAL DIMENSIONS

FIGURE 2(a) - VARIANTS 01, 02, 03, 04 AND 05



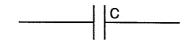
Dimensions (mm)				
	Variants 01-03-04		Variant	s 02-05
	Min.	Max.	Min.	Max.
L	2.4	3.2	2.4	3.7
L	2.4	3.2	2.4	3.7
е	-	2.6	-	3.1
М	1.2	-	1.2	-
N	0.2	0.6	0.2	0.6

FIGURE 2(b) - VARIANTS 06 AND 07



	Dimensions (mm)				
	Variant 06		Varia	nt 07	
	Min.	Max.	Min.	Max.	
Α	2.2	2.6	1.1	1.5	
В	8.0	-	8.0	-	
С	0.08	0.3	0.08	0.3	
е	-	2.6	. -	2.6	
L	2.4	3.8	2.4	3.8	
1	2.4	3.2	2.4	3.2	
М	1.2	-	1.2	-	
N	0.2	0.6	0.2	0.6	

FIGURE 3 - FUNCTIONAL DIAGRAM





PAGE 10

ISSUE 1

4. **REQUIREMENTS**

4.1 GENERAL

The complete requirements for procurement of the capacitors specified herein are stated in this specification and ESA/SCC Generic Specification No. 3009 for Capacitors, Fixed, Chips, Ceramic Dielectric, Types I and II. Deviations from the Generic Specification, applicable to this specification only, are listed in Para. 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESA/SCC requirements are do not affect the components' reliability, are listed in the appendices attached to this specification.

4.2 <u>DEVIATIONS FROM GENERIC SPECIFICATION</u>

4.2.1 <u>Deviations from Special In-process Controls</u>

None.

4.2.2 <u>Deviations from Final Production Tests (Chart II)</u>

None.

4.2.3 <u>Deviations from Burn-in and Electrical Measurements (Chart III)</u>

None.

4.2.4 <u>Deviations from Qualification Tests (Chart IV)</u>

(a) For Variants 06 and 07 only, the following deviations shall apply:-

For Subgroups I to V

(i) Para. 9.15, Mounting: Shall not be performed.

For Subgroup I

(i) Para. 9.5: The following test shall replace "Adhesion":-

Robustness of Terminations

The capacitors shall be subjected to Test 'Ua 1' of I.E.C. Publication No. 68.2.21.

Final Examination

After each of the tests, the capacitors shall be visually examined. There shall be no evidence of damage.

For Subgroup VI

(i) Para. 9.6, Solderability: Shall be replaced by the following:-

Para. 9.6.1 Procedure

The capacitors shall be subjected to Test 'Ta' of I.E.C. Publication No. 68.2.20 using either Method 1 (Solder Bath) or Method 3 (Solder Globule).

Para. 9.6.2 Final Examination

When the test procedures have been carried out, the capacitors shall be visually examined. There shall be no evidence of damage.



PAGE 11

ISSUE 1

4.2.5 <u>Deviations from Lot Acceptance Tests (Chart V)</u>

(a) For Variants 06 and 07 only, the following deviations shall apply:-

For all Levels

(i) Para. 9.15, Mounting: Shall not be performed.

For Level 1

(i) Para. 9.5, Adhesion: Shall be replaced by the following:-

Robustness of Terminations

The capacitors shall be subjected to Test 'Ua 1' of I.E.C. Publication No. 68.2.21.

Final Examination

After each of the tests, the capacitors shall be visually examined. There shall be no evidence of damage.

For Level 3

(i) Para. 9.6, Solderability: Shall be replaced by the following:-

Para. 9.6.1 Procedure

The capacitors shall be subjected to Test 'Ta' of I.E.C. Publication No. 68.2.20 using either Method 1 (Solder Bath) or Method 3 (Solder Globule).

Para. 9.6.2 Final Examination

When the test procedures have been carried out, the capacitors shall be visually examined. There shall be no evidence of damage.

4.3 MECHANICAL REQUIREMENTS

4.3.1 <u>Dimension Check</u>

The dimensions of the capacitors specified herein shall be verified in accordance with the requirements set out in Para. 9.3 of ESA/SCC Generic Specification No. 3009 and they shall conform to those shown in Figure 2 of this specification.

4.3.2 Weight

The maximum weight of the capacitors specified herein shall be 0.1 grammes for Variants 01 to 05, 0.25 grammes for Variant 06 and 0.2 grammes for Variant 07.

4.3.3 Adhesion

The requirements for adhesion are specified in Para. 9.5 of ESA/SCC Generic Specification No. 3009.

4.4 MATERIALS AND FINISHES

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the capacitors specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.



PAGE 12

ISSUE 1

4.4.1 <u>Terminations</u>

Variant 01

The capacitors shall be terminated with AgPd pads.

Variant 02

The capacitors shall be terminated with AgPd with solder coating, 62Sn, 36Pb, 2.0Ag % for bath dipping to a maximum thickness of 120µm.

Variants 03

The capacitors shall be terminated with Au over Ni composition of 95 to 96%,

Ni thickness: min. 3.0μm, max. 7.0μm. Au thickness: min. 0.6μm, max. 4.0μm.

Variant 04

The capacitors shall be terminated with Ni with solder coating, 90Sn, 10Pb %,

Ni thickness: min. 3.0μm, max. 7.0μm. Solder thickness: min. 6.0μm, max. 12μm.

Variant 05

The capacitors shall be terminated with Ni with solder coating, Sn62, 36Pb, 2.0Ag % for bath dipping to a maximum thickness of $120\mu m$.

Variant 06 and 07

The capacitors shall be terminated with Ag ribbon leads with solder coating, Solder thickness: min. 30µm, max. 250µm.

4.4.2 Dielectric

Monolithic, ceramic or porcelain.

4.5 MARKING

4.5.1 General

The marking of all component delivered to this specification shall be in accordance with the requirments of ESA/SCC Basic Specification No. 21700 and the following paragraphs.

These components being too small to accommodate the marking as specified hereafter, the marking information in full shall accompany each component in its primary package. Such marking shall comprise:-

- (a) The SCC Component Number.
- (b) Characteristics and Ratings.
- (c) Traceability Information.

4.5.2 The SCC Component Number

The SCC Component Number shall be constituted and marked as follows:-

	3009030018
Detail Specification Number	
Type Variant (See Para. 4.4.1 and Figure 2)	·
Testing Level (B or C, as applicable)	



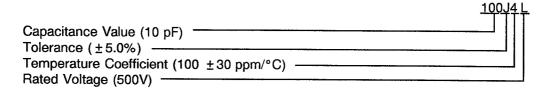
PAGE 13 ISSUE 1

4.5.3 <u>Electrical Characteristics and Ratings</u>

The electrical characteristics and ratings to be marked in the following order of precedence are:-

- (a) Capacitance Value.
- (b) Tolerance.
- (c) Temperature Coefficient.
- (d) Rated Voltage.

The information shall be constituted and marked as follows:-



4.5.3.1 Capacitance Values

The capacitance values shall be expressed by means of the following codes. The unit quantity for marking shall be picofarads.

Capacitance Value	Code
X.X	XCX
XX	XX0
XX10 ¹	XX1
XX10 ²	XX2

4.5.3.2 Tolerances

The tolerances on capacitance values shall be indicated by the code letters specified hereafter.

Tolerance (±pF)	Code Letter
0.1	В
0.25	С
0.5	D

Tolerance (±%)	Code Letter
1.0	F
2.0	G
5.0	J
10	K
20	М

4.5.3.3 Temperature Coefficient

The temperature coefficient shall be indicated by the code numbers specified hereafter.

ppm/°C	Code Number
100 ± 30	4



PAGE 14

ISSUE -

4.5.3.4 Rated Voltage

The rated voltage shall be indicated by the code letters specified hereafter.

Rated Voltage (U _R) (V)	Code Letter
50	С
100	E
200	G
300	J
500	L

4.5.4 Traceability Information

Traceability information shall be marked in accordance with the requirements of ESA/SCC Basic Specification No. 21700.

- (a) Manufacturing Date Code.
- (b) Manufacturer's Name.

4.6 <u>ELECTRICAL MEASUREMENTS</u>

4.6.1 <u>Electrical Measurements at Room Temperature</u>

The parameters to be measured at room temperature are scheduled in Table 2. Unless otherwise specified, measurements shall be performed at $T_{amb} = +22\pm3$ °C.

4.6.2 Electrical Measurements at High and Low Temperatures

The parameters to be measured at high and low temperatures are scheduled in Table 3.

4.6.3 <u>Circuits for Electrical Measurements</u>

A circuit for use in performing the electrical measurements listed in Table 2 of this specification is shown in ESA/SCC Generic Specification No. 3009.

4.7 BURN-IN TESTS

4.7.1 Parameter Drift Values

The parameter drift values applicable to burn-in are specified in Table 4 of this specification. Unless otherwise stated, measurements shall be performed at $T_{amb} = +22\pm3$ °C. The parameter drift values (Δ) applicable to the parameters scheduled shall not be exceeded. In addition to these drift value requirements for a given parameter, the appropriate limit value specified in Table 2 shall not be exceeded.

4.7.2 Conditions for Burn-in

The requirements for burn-in are specified in Section 7 of ESA/SCC Generic Specification No. 3009. The conditions for burn-in shall be as specified in Table 5 of this specification.

On completion of burn-in, a recovery period of 24 \pm 2 hours is necessary before performance of the end-measurements.

4.7.3 <u>Electrical Circuits for Burn-in (Figure 5)</u>



PAGE 15

ISSUE 1

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

No. CHARACTERISTICS		SYMBOL	ESA/SCC 3009	LIM	LINUT		
.,	OT IT IN OTE THE FIGURE	OTNIBOL	TEST CONDITIONS	MIN.	MAX.	UNIT	
1	Capacitance	С	Para. 9.4.1.1	Tolerance shown in Table 1(a)		-	
2	Tangent of Loss Angle	$T_{g\delta}$	Para. 9.4.1.2	• -	15	10-4	
3	Insulation Resistance	Ri	Para. 9.4.1.3 C≤ 470pF C> 470pF	1 000 100	<u>-</u>	GΩ	
4	Voltage Proof	VP	Para. 9.4.1.4	2.5U _R	-	٧	

TABLE 3 - ELECTRICAL MEASUREMENTS AT HIGH AND LOW TEMPERATURES

No.	No. CHARACTERISTICS		ESA/SCC 3009	LIMITS		UNIT	DEMARKS
	0. n.	SYMBOL	TEST CONDITIONS	MIN.	MAX.	UNIT	REMARKS
3	Insulation Resistance at +125 ± 3 °C	Ri	Para. 9.4.1.3 C≤ 470pF C> 470pF	100 10	-	GΩ	Notes 1 and 2
5(i)	Temperature Coefficient	TC	Para. 9.11 Between -55 and +20 ± 2 °C Between +20 ± 2 and +125 °C	-70 -70	+ 130 + 130	10 ⁻⁶ /°C	5 parts for each capacitance value Notes 2, 4 and 5
5(ii)	Temperature Coefficient	TC	Para. 9.11 Between +20 ± 2 and +125 °C	-70	+ 130	10 ⁻⁶ /°C	5 parts for each dielectric lot Notes 3, 4 and 5

NOTES

- 1. Single sample; Inspection Level S3; AQL = 2.5%.
- 2. Applicable to Level 'B' only.
- 3. Applicable to Level 'C' only.
- 4. The "Temperature Coefficient" test is not applicable to capacitance values equal to, or less than 20pF due to equipment limitations.
- 5. If 1 failure out of 5 parts, then test 100%.
 - 1.0% rejects maximum allowed in case of 100% testing.



PAGE 16

TABLE 4 - PARAMETER DRIFT VALUES

No.	CHARACTERISTICS	SYMBOL	SPEC. AND/OR TEST METHOD	TEST CONDITIONS	CHANGE LIMITS (Δ)	UNIT
1	Capacitance Change	<u>ΔC</u> C	ESA/SCC Gen. Spec. 3009	Paras. 9.4.2 and 9.4.1.1	± 0.5 ± 1.0	pF % Notes 1 and 2

NOTES

- 1. For all percentage tolerances, whichever is greater.
- 2. For pF tolerances, $\Delta = 0.1$ pF.

FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS

Not applicable.

TABLE 5 - CONDITIONS FOR BURN-IN AND OPERATING LIFE TESTS

No.	CHARACTERISTIC	CHARACTERISTIC SYMBOL		UNIT
1	Ambient Temperature	T _{amb}	+ 125	°C
2	Test Voltage	V _T	2.0U _R	٧

FIGURE 5 - ELECTRICAL CIRCUIT FOR BURN-IN AND OPERATING LIFE TESTS



PAGE 17

ISSUE 1

4.8 <u>ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESA/SCC GENERIC SPECIFICATION NO. 3009)</u>

4.8.1 Measurements and Inspections on Completion of Environmental Tests

The parameters to be measured and inspections to be performed on completion of environmental tests are scheduled in Table 6. Unless otherwise specified, measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.2 <u>Measurements and Inspections at Intermediate Points during Endurance Tests</u>

The parameters to be measured and inspections to be performed at intermediate points during endurance tests are scheduled in Table 6. Unless otherwise specified, measurements shall be performed at $T_{amb} = +22\pm3$ °C.

4.8.3 <u>Measurements and Inspections on Completion of Endurance Tests</u>

The parameters to be measured and inspections to be performed on completion of endurance tests are scheduled in Table 6. Unless otherwise specified, measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.4 <u>Conditions for Operating Life Tests (Part of Endurance Testing)</u>

The requirements for operating life testing are specified in Section 9 of ESA/SCC Generic Specification No. 3009. The conditions for operating life testing shall be as specified in Table 5 for the Burn-in test.

4.8.5 <u>Electrical Circuit for Operating Life Tests</u> (Figure 5)



PAGE 18

ISSUE 1

TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING

NO.	ESA/SCC GENERIC NO. 30		MEASUREMENTS AN	D INSPECTIONS	0.44501	LIM	ITS	
	ENVIRONMENTAL AND ENDURANCE TESTS (1)		IDENTIFICATION	CONDITIONS	SYMBOL	MIN.	MAX.	UNIT
01	Mounting	Para. 9.15 and Paras. 4.2.4 and 4.2.5 of this spec.	Final Examination Terminals Final Measurements Capacitance Tangent of Loss Angle Insulation Resistance	Good Tinning Table 2 Item 1 Table 2 Item 2 Table 2 Item 3	- C T _{gδ} Ri		Values Item 2 Item 3	pF
02	Adhesion	Para. 9.5 and Paras. 4.2.4 and 4.2.5 of this spec.	Final Examination Visual Examination Capacitance	Damage or loosening Table 2 Item 1	C	- Table 2	-	
03	Solderability	Para. 9.6 and Paras. 4.2.4 and 4.2.5 of this spec.	Final Examination Visual Examination	SCC No. 20400	-	-	-	_
04	Rapid Change of Temperature	Para. 9.7	Initial Measurements Capacitance Final Measurements	Table 2 Item 1 Recovery period 24 ± 2 hours	С	Item 01	Value	pF
			Visual Examination Capacitance Change Tangent of Loss Angle	No damage Table 2 Item 1 Table 2 Item 2	- <u>ΔC</u> C Τ _{αδ}	- -1.0 -1.0	- +1.0 +1.0 (3)	pF or % (2) 10 ⁻⁴
05	Climatic Test Sequence	Para. 9.8	Initial Measurements Capacitance Final Measurements Visual Inspection Capacitance Change	Table 2 Item 1 Recovery Period 1 to 24 hrs SCC No. 20400 Table 2 Item 1	С <u>ΔС</u>	Item 01 - - 1.0		pF pF or
			Tangent of Loss Angle Insulation Resistance	Table 2 Item 2 Table 2 Item 3	C T _{gδ} Ri	- 2.0 - 2.5	+ 2.0 (3) -	% (2) 10 ⁻⁴ GΩ
06	Damp Heat Steady State		Initial Measurements Capacitance Final Measurements	Table 2 Item 1 Recovery Period 6 to 24 ±2hrs	С	Item 01	Value	pF
			Visual Examination Capacitance Change Tangent of Loss Angle Insulation Resistance	No damage Table 2 Item 1 Table 2 Item 2 Table 2 Item 3	- <u>ΔC</u> C T _{gδ} Ri	- 1.0 - 2.0 - 2.5	- + 1.0 + 2.0 (3) -	pF or % (2) 10- ⁴ GΩ

NOTES

- 1. The tests in this table refer to either Chart IV or V and shall be used as applicable.
- 2. Whichever is greater.
- 3. Twice the values specified in Table 2 of this specification.



PAGE 19

ISSUE 1

TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING (CONT'D)

NO.		ESA/SCC GENERIC SPECIFICATION NO. 3009 MEASUREMENTS AND INSPECTIONS				LIMITS		LINUT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)		IDENTIFICATION	CONDITIONS	SYMBOL	MIN.	MAX.	UNIT
07	Operating Life	Para. 9.10	Initial Measurements Capacitance Intermediate Measurements	Table 2 Item 1 To be performed at 1000 hrs (Chart IV) Recovery period 1 hour min		Item 0	1 Value	pF
			Capacitance Change Insulation Resistance Final Measurements	Table 2 Item 1 Table 2 Item 3 Recovery period 24 ± 2 hours	<u>ΔC</u> C Ri	1.0 2.0 2.5	+ 1.0 + 2.0 -	pF or % (2) GΩ
			Capacitance Change Tangent of Loss Angle Insulation Resistance Voltage Proof Visual Examination	Table 2 Item 1 Table 2 Item 2 Table 2 Item 3 Table 2 Item 4 No damage	<u>ΔC</u> C T _{gδ} Ri VP -	1.0 2.0 - 2.5 Table 2	+1.0 +2.0 (3) - Item 4	pF or % (2) 10 ⁻⁴ GΩ
80	Temperature Coefficient	Para. 9.11	Capacitance Changes	Table 3 Item 5(i) or 5(ii)	TC	Tab Item 5(i)		10 ⁻⁶ /°C
09	Permanence of Marking	Para. 9.14	Visual Examination	Gen. 3009 Para. 9.14	-	Para.	9.14	

NOTES

- 1. The tests in this table refer to either Chart IV or V and shall be used as applicable.
- 2. Whichever is greater.
- 3. Twice the values specified in Table 2 of this specification.



PAGE 20

ISSUE 1

APPENDIX 'A'

Page 1 of 1

AGREED DEVIATIONS FOR TEKELEC (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS					
Para. 4.2.4	(a) Para. 9.9, Damp Heat Steady State: May be performed as follows: 15 pieces at 0V, 15 pieces biased at 5.0V and 15 pieces biased at U _R .					
Paras. 4.2.4 and 4.2.5	(a) Para. 9.14, Permanence of Marking: May be omitted as the components are laser marked.					