DOCUMENT CHANGE REQUEST

DCR number 538	Changes required for: General	Originator: S Jeffery - ESCC
Date: 2009/08/18	Date sent: 2009/08/18	Organisation: ESA/ESTEC
Status: IMPLEMENTED		

Title:	Fuses, 0.14 to 3.5 Amps, Based on Type MGA-S		
Number:	4008/001	Issue:	1

Other documents affected:

Page:

Specification 4008/001 Issue 1 is updated to accompany the updated Generic 4008. Changes are summarised herein (see attached Issue 2 - Draft A).

Paragraph:

Specification 4008/001 Issue 1 is updated to accompany the updated Generic 4008. Changes are summarised herein (see attached Issue 2 - Draft A).

Original wording:

Proposed wording:

To introduce a number of editorial changes (see the attached mark-up) which are required to make this detail spec clear, complete and consistent.

Justification:

Improve the appearance, content and clarity of the spec.

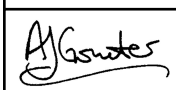
Attachments:

4008001_Issue_2_Draft_B.pdf, null

Modifications:

N/A

Approval signature:



Date signed:

2009-08-18

European Space Components Coordination

FUSES, 0.14 TO 3.5 AMPS

BASED ON TYPE MGA-S

ESCC Detail Specification No. 4008/001

as applicable

Issue 1 2 - Draft B	~~June 2008~~

Document Custodian: European Space Agency - see https://escies.org

as applicable

LEGAL DISCLAIMER AND COPYRIGHT

European Space Agency, Copyright © 2008. All rights reserved.
The European Space Agency disclaims any liability or responsibility, to any person or entity, with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the use and application of this ESCC publication.
This publication, without the prior permission of the European Space Agency and provided that it is not used for a commercial purpose, may be:

- copied in whole, in any medium, without alteration or modification.
- copied in part, in any medium, provided that the ESCC document identification, comprising the ESCC symbol, document number and document issue, is removed.

DOCUMENTATION CHANGE NOTICE

(Refer to https://escies.org for ESCC DCR content)

DCR No.	CHANGE DESCRIPTION
tbd	Specification up-issued to incorporate editorial changes per DCR.

TABLE OF CONTENTS

1.	**GENERAL**	**5**
1.1	Scope	5
1.2	Applicable Documents	5
1.3	Terms, Definitions, Abbreviations, Symbols and Units	5
1.4	The ESCC Component Number and Component Type Variants	5
1.4.1	The ESCC Component Number	5
1.4.2	Component Type Variants and Range of Components	5
1.5	Maximum Ratings	6
1.6	Parameter Derating Information	7
1.7	Physical Dimensions	7
1.8	Materials and Finishes	8
2.	**REQUIREMENTS**	**8**
2.1	General	8
2.1.1	Deviations from the Generic Specification	8
2.1.1.1	Deviations from Chart F4 - Qualification and Periodic Tests	8
2.2	Marking	8
2.3	Current Carrying Capacity Test	9
2.4	Overload Operation Test	9
2.5	Verification of Overload Operation at DC Rated Voltage Test	9
2.5.1	Verification of Overload Operation at DC Rated Voltage, T_{amb} = +22 ±3°C	9
2.5.2	Verification of Overload Operation at DC Rated Voltage, T_{amb} =-50(+5, -0)°C	10
2.6	Insulation Resistance Test	10
2.7	Current Clearing Test	10
2.8	Room Temperature Electrical Measurements	11
2.9	Intermediate and End-Point Electrical Measurements	11
2.10	Burn-in Conditions	13
2.11	Operating Life Conditions	13
APPENDIX 'A'		14

subscript

Symbols	Dimensions mm	
	Min	Max
L	3	3.4
B	1.35	1.75
H	1.35	1.75
D	0.3	0.7

1.8 MATERIALS AND FINISHES

Materials and finishes shall be as follows:

(a) Body : Ceramic
(b) Terminal material : Copper
(c) Terminal plating : Electrolytic Nickel of thickness 1µm minimum and 5µm maximum over electrolytic Copper of thickness 0.3µm minimum and 2µm maximum, with an electrolytic Tin-lead final finish of thickness 5µm minimum and 15µm maximum. The composition of the Tin-lead shall be 65 to 95% tin, remainder lead.

lower case lower case lower case lower case

2. REQUIREMENTS

2.1 GENERAL

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification. Permitted deviations from the Generic Specification, applicable to this specification only, are listed below.

Permitted deviations from the Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirement and do not affect the component's reliability, are listed in the appendices attached to this specification.

2.1.1 Deviations from the Generic Specification

2.1.1.1 Deviations from Chart F4 - Qualification and Periodic Tests

(a) Rapid Change of Temperature: the number of cycles shall be 200.
(b) Vibration: shall not be performed.

2.2 MARKING

The marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and as follows.

The information to be marked on the component shall be:

(a) The ESCC qualified components symbol (for ESCC qualified components only).
(b) The ESCC Component Number.

(c) Traceability information.

2.3 CURRENT CARRYING CAPACITY TEST

Ref. Current Carrying Capacity in the ESCC Generic Specification.

Test Current : Nominal Current, DC, as specified in Component Type Variants and Range of Components.
Duration : 4 hours minimum.
Test temperature : +22 ±3°C.

2.4 OVERLOAD OPERATION TEST

Ref. Overload Operation in the ESCC Generic Specification.

Overload Current	Pre-arcing Time (ms)	
	Min	Max
357% I_R	2	5000
571% I_R	0.5	10
857% I_R	0.05	2

2.5 VERIFICATION OF OVERLOAD OPERATION AT DC RATED VOLTAGE TEST

Ref. Verification of Overload Operation at DC Rated Voltage in the ESCC Generic Specification.

2.5.1 Verification of Overload Operation at DC Rated Voltage, T_{amb} = +22 ±3°C

Overload Current	Pre-arcing Time (ms)	
	Min	Max
357% I_R	2	5000
571% I_R	0.5	10
50A	N/A (Note 2)	
300A (Note 1)	N/A (Note 2)	

NOTES:

1. Not applicable for Variants 11 and 12.
2. The fuse shall open the test circuit. The following criteria shall apply:
   The circuit shall remain energized for 30 seconds minimum without any indication of closing.
   The insulation shall not puncture. The terminals shall not separate from the body.
   The terminals and the body shall not rupture and the terminals shall not be shunted.

2.5.2 Verification of Overload Operation at DC Rated Voltage, T_{amb} =-50(+5, -0)°C

382%

611%

Overload Current	Pre-arcing Time (ms)	
	Min	Max
~~365%~~ I_R	2	5000
~~605%~~ I_R	0.5	10
50A	N/A (Note 2)	
300A (Note 1)	N/A (Note 2)	

NOTES:

1. Not applicable for Variants 11 and 12.
2. The fuse shall open the test circuit. The following criteria shall apply:
   The circuit shall remain energized for 30 seconds minimum without any indication of closing.
   The insulation shall not puncture. The terminals shall not separate from the body.
   The terminals and the body shall not rupture and the terminals shall not be shunted.

2.6 INSULATION RESISTANCE TEST

Ref. Insulation Resistance in the ESCC Generic Specification.

Test Condition : A.
Test Temperature: T_{amb} =+22 ±3°C
Test Limit: 20kΩ minimum.

2.7 CURRENT CLEARING TEST

Ref. Thermal Vacuum in the ESCC Generic Specification.

The maximum current clearing I^2t value for each component type variant is given below.

Variant Number	Maximum Current Clearing I^2t at 571%I_R (DC) (A^2 s)
01	0.0064
02	0.01
03	0.0225
04	0.04
05	0.09
06	0.16
07	0.36
08	0.64
09	1
10	1.44
11	2.56
12	4

Test Reference per ESCC No. 4008	Characteristics	Symbols	Limits		Units
			Min	Max	
	Voltage Drop Drift (from initial measure-ment)	$\frac{\Delta V}{VD}$	-	±20	%
Rapid Change of Temperature Final Measurements	Cold Resistance	R	See Component Type Variants and Range of Components		mΩ
	Voltage Drop Note 1	VD	See Component Type Variants and Range of Components		mV
Vibration Final Measurements	Cold Resistance	R	See Component Type Variants and Range of Components		mΩ
	Voltage Drop Note 1	VD	See Component Type Variants and Range of Components		mV
Shock Final Measurements	Cold Resistance	R	See Component Type Variants and Range of Components		mΩ
	Voltage Drop Note 1	VD	See Component Type Variants and Range of Components		mV
Damp Heat, Steady State Final Measurements	Cold Resistance	R	See Component Type Variants and Range of Components		mΩ
	Voltage Drop Note 1	VD	See Component Type Variants and Range of Components		mV
Resistance to Soldering Heat					
Final Measurements	Cold Resistance	R	See Component Type Variants and Range of Components		mΩ
	Voltage Drop Note 1	VD	See Component Type Variants and Range of Components		mV
Robustness of Terminations					