

Förderverein für Elektrotechnische Normung (FEN) e. V.
Cenelec Electronic Components Committee

CECC



Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

● SPECIFICATION PARTICULIERE:

**CONNECTEURS COAXIAUX
POUR FREQUENCE
RADIOELECTRIQUE
Série SMA**

Harmonized System of Quality Assessment for
Electronic Components

● DETAIL SPECIFICATION:

**RADIO FREQUENCY
COAXIAL CONNECTORS
Series SMA**

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

BAUARTSPEZIFIKATION:

**HOCHFREQUENZ-
KOAXIAL-STECKVERBINDER
Serie SMA**

1

Edition
Issue
Ausgabe

CECC 22111-819

1987

**Copyright – all rights reserved**

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Droits de reproduction réservés

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

Alle Rechte vorbehalten

Insbesondere darf kein Teil dieser Veröffentlichung in irgendeiner Form oder nach irgendeinem Verfahren, elektronisch oder mechanisch, einschließlich Fotokopieren und Mikrofilm, ohne schriftliche Einwilligung des Herausgebers vervielfältigt oder verwertet werden.

PREFACE

This detail specification (DS) was prepared by CECC Working Group 22: 'RF Connectors'.

It relates to Series SMA connectors covered by sectional specification CECC 22 110 and by blank detail specification CECC 22 111. These in turn are related to the generic specification CECC 22 000.

It is based, wherever possible, on the Publications of the International Electrotechnical Commission, and in particular on IEC 169-15 (1979) Part 15: R.F. coaxial connectors with inner diameter of outer conductor 4,13 mm (0,163 in) with screw coupling – Characteristic impedance 50 ohms (Type SMA).

The text of this detail specification was circulated to members of CECC WG 22 and was approved for publication under the accelerated procedure for the acceptance of detail specifications in accordance with Decision 10 of CD Minutes document CECC(Secretariat)1838.

Document

WG22(Bosshard)805

Approval Date

August 1986

CECC 22 111-819 Issue 1



[1]	Page 1 of 6	[2] CECC 22 111 - 819
ELECTRONIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH GENERIC SPECIFICATION 22 000 SECTIONAL SPECIFICATION 22 110	[3]	[4]

[5] DETAIL SPECIFICATION for
RADIO FREQUENCY COAXIAL CONNECTOR OF ASSESSED QUALITY :

SERIES

SMA

Style: Fixed socket for semi-rigid cable

Specials Features + Markings:

Method of cable/wire* attachment:

.....square flange.....

centre conductor - solder/crimp/double contact

.....

outer conductor - solder/clamp or crimp

.....

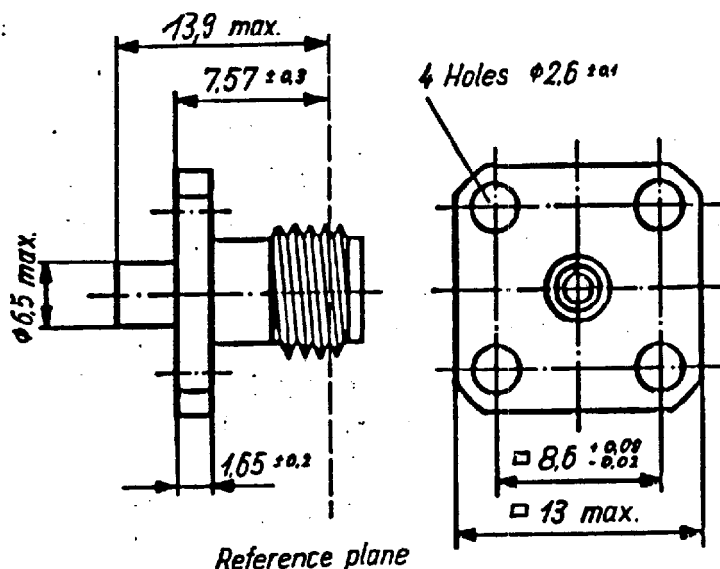
Mass: 5.9..... (Max.)

Solderless connection to
semi-rigid cable

[6] Assessment level .. H .. Characteristic Impedance 50 Ω Climatic category: 55 / 115 / 21

[7] Outline and maximum dimensions

Panel piercing and mounting details



Assembly tools and stripping
dimensions to conform with the
instructions supplied by the
manufacturers

For mating interface and position of reference plane see CECC 22 110

Maximum panel thickness: for front mounting without limit, mm
for rear mounting NA..... mm

The outline dimensions meet the requirements of

[8] Variants

Variant No.	Description of Variant	IEC 96-2	Relevant Cables RG	National Cables
..-01.....	Connector passivated .....	.....	.. RG 402/U.....	.. (FJ) KS. 2.....
.....	stainless steel .....	.....	.....	.....
..-02.....	Connector passivated .....	.....	.. RG 405/U.....	.. KS. 1.....
.....	stainless steel .....	.....	.....	.....
.....				
.....				

Notes: 1. *Delete as appropriate

Information about manufacturers who have components qualified to this details specification
is available in the current CECC 00 200: Qualified Products List.

[9] PERFORMANCE - (including limiting conditions of use)

RATINGS + CHARACTERISTICS		CECC 22110 Clause	VALUE	REMARKS
ELECTRICAL				
	Variant No./ Designation			Measurement freq. range
+Reflection factor	-01	4.4.1	$\leq 0.034 + 0.004f$	...f...2...18.GHz...
	-02			...(VSWR $\leq 1.07 + 0.009f$)
	-03			
	-04			
	-05			
	-06			
				
Centre contact		4.4.2	≤ 3.0 m Ω	Initial
resistance			≤ 8.0 m Ω	After conditioning
Outer conductor		4.4.3	≤ 2.5 m Ω	Initial
continuity			≤ 7.5 m Ω	After conditioning
Insulation resistance		4.4.4	≥ 5.0 G Ω	Initial
			≥ 200 M Ω	After conditioning
+Proof voltage at sea level	-01	4.4.5	1.0.....kV	860 to 1060 mbar (86 to 106 kPa)
	-02		0.75.....kV	
	-03			
	-04			
	-05			
	-06			
				
+Proof voltage at 20 km altitude	-01	4.4.5	200.....V	44 mbar (4.4 kPa)
	-02		150.....V	
	-03			
	-04			
	-05			
	-06			
				
+Working voltage at sea level	-01		335.....V	860 to 1060 mbar (86 to 106 kPa)
	-02		250.....V	
	-03			
	-04			
	-05			
	-06			
				
+Working voltage at 20 km altitude	-01		85.....V	44 mbar (4.4 kPa)
	-02		65.....V	
	-03			
	-04			
	-05			
	-06			
				
Screening effec- tiveness	-01	4.4.8	$Z_c \leq 1.6 \times 10^{-3} \Omega$	Equivalent to .90 dB
	-02			
	-03			
	-04			
	-05			
	-06			
				
ADDITIONAL ELECTRICAL CHARACTERISTICS				

* f = Frequency in GHz

+ Voltage values are r.m.s values of a.c. at 50-60 Hz unless otherwise stated.

RATINGS + CHARACTERISTICS		CECC 22 110 Clause	VALUE	REMARKS
MECHANICAL				
Contact captivation - axial force - torque		4.5.2	22.....N ...0.028.....Nm	CECC 22 000 method (or as specified)
Engagement + separation - torque		4.5.4	na...Nm max.	
Effectiveness of clamping device against cable pulling	Variant No./ Designation .....-01 .....-02 .....-03 .....-04 .....-05 .....-06	4.5.5 (1)	267.....N 134.....N	(to overcome friction of coupling nut)
Effectiveness of clamping device against cable torsion	-01 .....-02 .....-03 .....-04 .....-05 .....-06	4.5.5 (2)	0,30...Nm 0,12...Nm	
Tensile strength of coupling mechanism		4.5.6	na.....N	Relative to reference plane
Coupling torque - normal - proof			na.....Nm na.....Nm	
Bending moment		4.5.9	0,45...Nm	
ADDITIONAL MECHANICAL CHARACTERISTICS				
ENVIRONMENTAL				
Bump		4.6.2	390...m/s ² ...4'000...bumps	(.40.g acceleration)
Vibration		4.6.3	98...m/s ² 10...2'000Hz	(.10.g acceleration)
Shock		4.6.4	490...m/s ² 1/2 Sine 11 ms	(.50.g acceleration)
Climatic category		4.6.5	.50/.115/.21.	
Sealing (panel + barrier sealed connectors)		4.6.8	na....	100 to 110 kPa pressure differential (1000 to 1100 mbar)
Sealing (hermetically sealed connectors)		4.6.9	na....	100 to 110 kPa pressure differential (1000 to 1100 mbar)
ADDITIONAL ENVIRONMENTAL CHARACTERISTICS				
ENDURANCE				
Mechanical		4.7.1	500...operat.	
High temperature		4.7.2	.1'000..h at 115...°C	
ADDITIONAL ENDURANCE CHARACTERISTICS				

[10] Supplementary Information

- marking of the component : in accordance with 2.4 of CECC 22 000, in the following order of precedence :

i) Component identification	Variant No./	Identification
	Designation	
	-01	22.111-819/Q1..
	-02	22.111-819/Q2..
	-03	.....
	-04	.....
	-05	.....
	-06	.....
		
		
ii) Identity of manufacturer	.....	.....
iii) Manufacturing date code, year/week	.....	.....

- marking and contents of package : in accordance with 2.5 and 2.5.1 of CECC 22 000 as follows :

- i) Information prescribed in 2.4 of CECC 22 0000 detailed above
- ii) Nominal characteristic impedance 50 Ω
- iii) Assessment level code letter H.....
- iv) Any additional marking required

- ordering information : in accordance with 2.6 of CECC 22 000 as follows :

- i) Number of the detail specification CECC 22 111-819-xx (No. of Variant)
- ii) Assessment level code letter H.....
- iii) Body finish (if more than one listed) see variant numbers in [8]
- iv) Any additional information or special requirements

- related documents :

CECC 22 000	Generic Specification for radio frequency connectors of assessed quality (and related documents, see 2.1 of CECC 22 000)
CECC 22 110	Sectional Specification for r.f. connectors Series SMA

- certified test records (RCE) : In accordance with 3.7 of CECC 22 000 (when applicable) (requirements to be included later)

- structural similarity : In accordance with 3.2 and 3.4 of CECC 22 000.

[11] TEST SCHEDULE AND INSPECTION REQUIREMENTS - SERIES SMA

Details of tests and quality assessment inspection requirements for levels H and U are given in 5.1 of CECC 22 110.

ACCEPTANCE TESTS**GROUP A1**

Visual examination

CECC
22 110
Clause

4.2

GROUP B1

Outline dimensions

4.3.1

Compatibility mechanical

4.5.7

Engagement + separation

4.5.4

Gauge retention force
(resilient contacts)

4.5.1

Sealing (panel + barrier seal)

4.6.8

Sealing (hermetic)

4.6.9

Voltage proof

4.4.5

LEVEL H			
Test Requir.	I.L.	AQL	Period
a	S 3	1,5 %	Lot by Lot
a	S 3	4 %	
a	S 3	1,5 %	
na	S 3	1,5 %	
a	S 3	4 %	

PERIODIC TESTS**GROUP C1 (d)**

Soldering

4.6.1

Insulation resistance

4.4.4

Test	I.L.	AQL	Period
na			
a	S 3	4 %	1 year

GROUP D1 (d)Mechanical tests on cable
clamping device

4.5.5

Bending moment

4.5.9

Tensile strength of
coupling mechanism

4.5.6

Test Requir.	Specimens (May be from C1)	Permitted Failures † per Group	Period
a	3 mated pairs or sets min.	1	3 yearly
a			
na			

GROUP D2 (d)

Contact resistance

4.4.2

Outer conductor continuity

4.4.3

Bump

4.6.2

Vibration

4.6.3

Shock

4.6.4

Damp heat, steady state

4.6.6

Salt mist

4.6.10

a	3 mated pairs or sets min.	1	3 yearly
a			
a			
a			
a			

GROUP D3Dimensions and materials
(piece parts)

4.3.2

Mass

4.3.1

a	1 set of piece parts each style	1	3 yearly
a			

GROUP D4 (d)

Mechanical endurance

4.7.1

High temperature endurance

4.7.2

a	3 mated pairs or sets min.	1	3 yearly
a			

GROUP D5 (d)

Reflection factor

4.4.1

Screening effectiveness

4.4.8

a	3 mated pairs or sets min.	1	3 yearly
a			

GROUP D6 (d)

Contact captivation

4.5.2

Rapid change of temperature

4.6.7

Climatic sequence

4.6.5

a	3 mated pairs or sets min.	1	3 yearly
a			
a			

PROCEDURES

Quality Conformance Inspection

This shall consist of Test Groups A1 and B1 on a lot-by-lot basis and C1 on a periodic basis.

Qualification Approval and its Maintenance

This shall consist of three consecutive lots passing Test Groups A1 and B1 followed by selection of specimens from lots as appropriate. These specimens shall successfully pass the specified periodic C1 and D tests.

NOTES

I.L.	=	Inspection Level
AQL	=	Acceptabel Quality Level
a	=	applicable
±	=	for Qualification Approval (QA) a total of 2 failures only permitted
(d)	=	destructive test - specimens shall not be returned to stock
na	=	not applicable