BS EN 4652-412:2015

BSI Standards Publication

Aerospace series — Connectors, coaxial, radio frequency

Part 412: Type 4, C interface — Clamp nut assembly version — Square flange receptacle — Product standard

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Série aérospatiale - Connecteurs coaxiaux pour radio fréquences - Partie 412 : Type 4, interface C - Version à presse étoupe - Embase à collerette carrée - Norme de produit

Luft- und Raumfahrt - Koaxiale Hochfrequenz-Steckverbinder - Teil 412: Typ 4, C-Schnittstelle, Klemmmontageversion, fester Steckverbinder mit quadratischem Montageflansch - Produktnorm

This European Standard was approved by CEN on 13 May 2015.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword

This document (EN 4652-412:2015) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this European Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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1 Scope

This European Standard specifies the characteristics of bayonet coupling (C interface) coaxial straight square flange receptacles – 50 ohms. The cable to connector assembly is a clamp technology.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2591 [1)], *Aerospace series — Elements of electrical and optical connection — Test methods*

EN 2812, *Aerospace series — Stripping of electric cables*

EN 4652-001, *Aerospace series — Connectors, coaxial, radio frequency — Part 001: Technical specification*

EN 4652-410, *Aerospace series — Connectors, coaxial, radio frequency — Part 410: Type 4, C interface — Clamp nut assembly version — Straight plug — Product standard*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

TR 6058, *Aerospace series — Cable code identification list* [2)]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4652-001 apply.

4 Required characteristics

— The connection technology shall comply to required tests described in Clause 5.

— Interface shall comply to EN 4652-001.

— Water ingress resistance is required in unmated condition for cable group A.

1) All parts quoted in this standard.

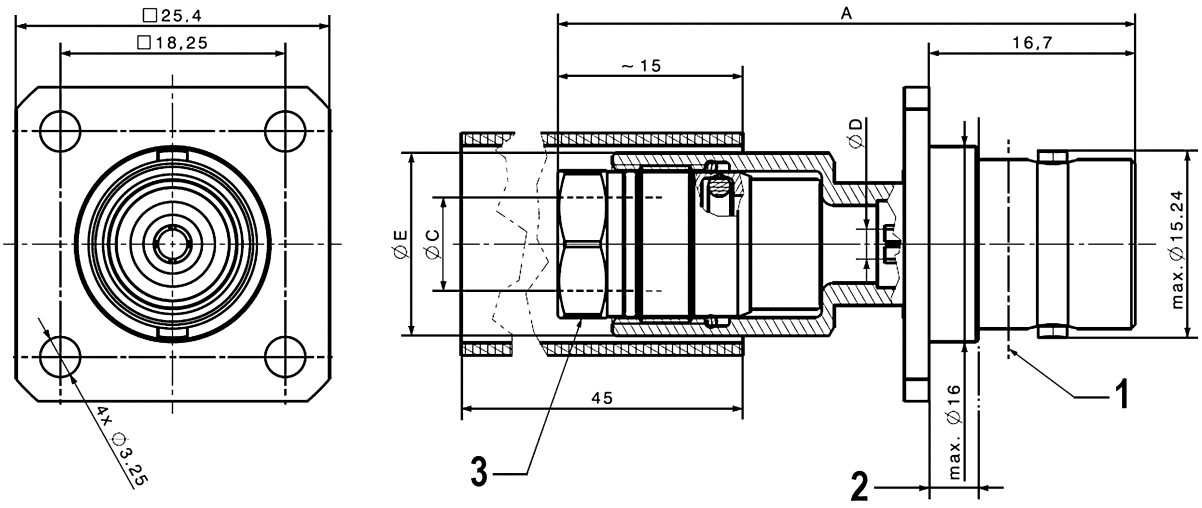
2) Published as ASD-STAN Technical Report at the date of publication of this standard. http://www.asd-stan.org/

4.1 Configuration, dimension and mass

Mass without heat shrink tubing.

See Figure 1 and Table 1.

Dimensions in millimetres



Key

1 Marking
2 Max. panel thickness: 4
3 HEX. *F*

Figure 1 — C square flange receptacle

Marking: see Clause 9.

Table 1 — C square flange receptacle dimensions and mass

Cable group	*A* max.	*ØC* (cable jacket) max.	*ØD* (cable conductor)	*ØE* max.	HEX. *F*	**Mass** g max.
A	48	7,8	2,3	15	12	48,0
B	43	5,55	1,4	13	8	39,5

4.2 Materials and finish

Centre contact ..... : Copper alloy gold plated over nickel undercoat

Insulators ..... : PTFE

Sealings ..... : Silicone rubber or silicone fluoride

Body ..... : Copper alloy, nickel plated

Heat shrink tube ..... : Polyolefin

Rear screw and other parts' materials shall have mechanical and electrical characteristics consistent with the requirements of this product standard.

4.3 Temperature

Operating temperature shall be between – 65 °C and 165 °C.

4.4 Electrical characteristics

Impedance ..... : 50 Ω

Maximum operating frequency ..... : 6 GHz

VSWR ..... : 1,15 up to 6 GHz

Insertion loss ..... : $0{,}05\sqrt{f}$ dB max., f in GHz

Contact resistance (initial centre contact) ..... : 1,0 mΩ max.

Insulation resistance ..... : 5 000 MΩ min.

Withstand voltage ..... : 1 500 Veff (at sea level)

4.5 General characteristics

Force to engage or disengage

— Longitudinal force ..... : 20 N

— Torque ..... : 0,45 Nm max.

Service life ..... : 500 cycles

Retention of centre contact ..... : 27 N

Retention of cable ..... : see Table 2.

Table 2 — Retention of cable

Cable group	**Retention of cable** N min.
A	180
B	180

4.6 Admissible cables, tools and stripping lengths

See Table 3 to Table 5.

Table 3 — Stripping lengths

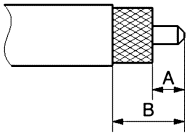
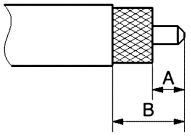
Cable group	**Cable code** (see TR 6058)	**Stripping lengths** mm
A	KW	
B	KX	

Table 4 — Stripping lengths cable group A

A		*B*	
min. mm	max. mm	min. mm	max. mm
3,6	4,4	8,6	9,4

Table 5 — Stripping lengths cable group B

A		*B*	
min. mm	max. mm	min. mm	max. mm
3,6	4,4	7,6	8,4

For stripping, see EN 2812.

5 Test methods

See Table 6.

Table 6 — Test methods

<table>
<tr><th>EN 2591-</th><th>Designation of the test</th><th>Details</th></tr>
<tr><td>101</td><td>Visual examination</td><td>Applicable</td></tr>
<tr><td>102</td><td>Examination of dimensions and mass</td><td>See 4.1.</td></tr>
<tr><td>201</td><td>Contact resistance - low level</td><td>Applicable on centre contact</td></tr>
<tr><td>202</td><td>Contact resistance at rated current</td><td>1,0 mΩ max. = initial centre contact, and
1,5 mΩ max. after test
For nickel plated connectors:
0,4 mΩ max. = initial external contact and
1,5 mΩ max. after test</td></tr>
<tr><td>204</td><td>Discontinuity of contacts in the microsecond range</td><td>Duration of micro discontinuity: ≤ 1 µs
Method B
Test time: throughout duration of tests EN 2591-402 and EN 2591-403.</td></tr>
<tr><td>206</td><td>Measurement of insulation resistance</td><td>5 000 MΩ min.</td></tr>
<tr><td>207</td><td>Voltage proof test</td><td>Method A
<table>
<tr><th>Pressure</th><th>Mated [a]</th><th>Unmated [a]</th></tr>
<tr><td>Sea level</td><td>1 500</td><td>1 500</td></tr>
<tr><td>12,1 kPa</td><td>800</td><td>550</td></tr>
<tr><td>4,7 kPa</td><td>375</td><td>350</td></tr>
<tr><td>2,7 kPa</td><td>250</td><td>200</td></tr>
<tr><td colspan="3">[a] Values in Volts RMS.</td></tr>
</table></td></tr>
<tr><td>212</td><td>Surface transfer impedance</td><td>Applicable (up to 100 MHz)
3 mΩ 1 MHz
1 mΩ 10 MHz
3 mΩ 30 MHz
5 mΩ 100 MHz</td></tr>
<tr><td>214</td><td>Lightning strike, current and voltage pulse</td><td>10 kA wave form 5 A,
10 A RMS</td></tr>
<tr><td>221</td><td>Voltage Standing Wave Ratio (VSWR)</td><td>Method B
VSWR ≤ 1,15 up to 6 GHz</td></tr>
</table>

EN 2591-	Designation of the test	Details
222	Insertion Loss (I.L.)	$0{,}05\sqrt{f}$ dB max., f in GHz Measurement shall be performed with connector mated with EN 4652-410 straight plug from same technology and cable group.
223	Measurement of characteristic impedance of a coaxial connector or contact	50 Ω ± 5 Ω at 200 MHz
224	RF leakage	– 50 dB for cable group A at 2 GHz to 3 GHz – 55 dB for cable group B at 2 GHz to 3 GHz
225	RF high potential withstanding voltage	1 000 V at 5 MHz
226	Corona level	Corona extinction voltage > 315 V rms at 4,4 kPa (70'000 feet altitude)
303	Cold/low pressure and damp heat	Five (5) cycles Minimum temperature – 60 °C
305	Rapid change of temperature	Mated connectors $T_A = \left(165\ ^{+5}_{0}\right)$ °C; $T_B = \left(-65\ ^{0}_{-5}\right)$ °C.
307	Salt mist	The connectors shall be suspended in the test chamber with non-metallic cords, so that no accumulation of condensed saline solution can occur. The connectors shall be: — subjected to 50 cycles of mating and unmating at a rate ≤ 5 cycles/min.; — exposed to the salt mist: — mated for 240 h — Not exposed to the salt mist: — unmated for 48 h.
308	Sand and dust	The mated connectors shall be arranged so that their longitudinal axis is parallel to the wind direction, with the rear of the plug facing the wind. Wind velocity in the duct: (3,5 ± 0,5) m/s Number of cycles: one (1)
311	Low air pressure	Refer to test EN 2591-207.

EN 2591-	Designation of the test	Details
314	Immersion at low air pressure	Specimen without heat shrinkable tube. In unmated condition (applicable only for cable group A connector): After three (3) cycles, remove the specimen from salt water, clean the interface with soft paper. In mated condition: not applicable
315	Fluid resistance	See EN 4652-001.
317	Flammability	Method A
402	Shock	Method A, half sine Severity 30 g, duration 11 ms Number of shocks: one (1) in each way for each of the three (3) axis (six (6) shocks in all)
403	Sinusoidal and random vibration	Method A: sinusoidal vibration with the following individual modalities: Level 2 50 Hz to 70 Hz 1,5 mm double amplitude 70 Hz to 2 000 Hz 15 g Three (3) axis or two (2) axis (straight connectors) Duration 4 h per axis at ambient temperature
404	Transverse load	Not applicable
406	Mechanical endurance	500 cycles
408	Mating and unmating forces	0,45 Nm max.
409	Contact retention in insert	27 N min., applicable on cabled specimen
417	Tensile strength (crimped connection)	See Table 2.
418	Gauge insertion/extraction forces (female contacts)	See EN 4652-001.
507	Plating porosity	Applicable
508	Measurement of thickness of coating on contacts	Applicable
509	Adhesion of coating on contacts	Applicable
513	Magnetic permeability	≤ 2

6 Qualification

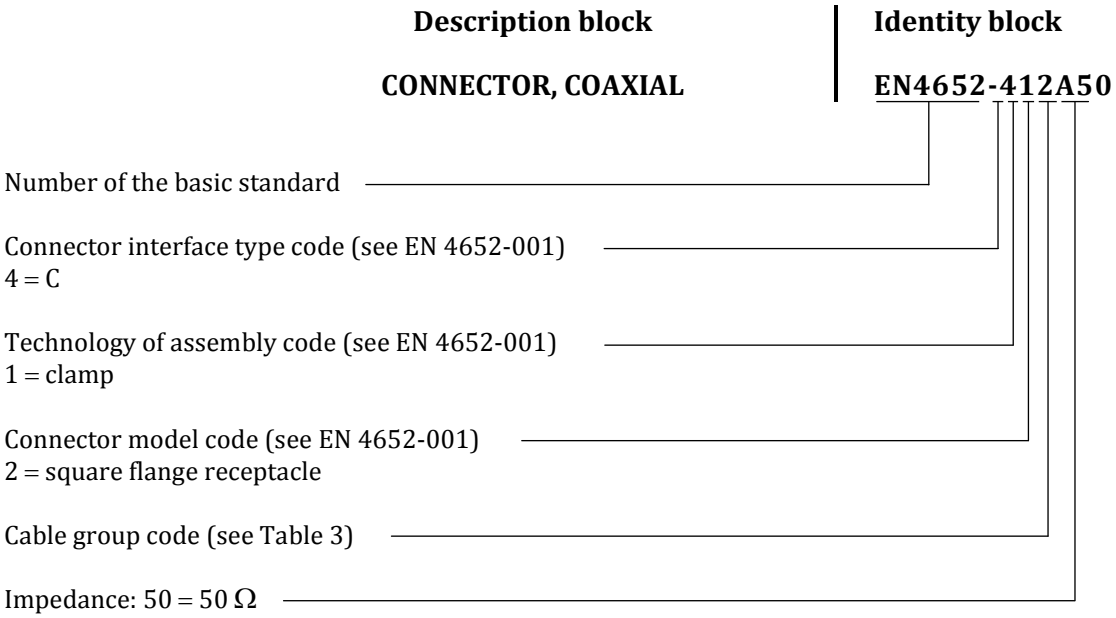
Qualification test programme: see EN 4652-001.

7 Quality assurance

See EN 9133.

8 Designation

EXAMPLE



NOTE If necessary, the code I9005 shall be placed between the description block and the identity block.

9 Marking

See EN 4652-001.

10 Packaging

See EN 4652-001.

11 Storage

See EN 4652-001.

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