

Connectors for electronic equipment –

Part 3-110:

Detail specification for 8 way connectors for
frequencies up to 600 MHz

Withdrawn

PUBLICLY AVAILABLE SPECIFICATION



INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

Reference number
IEC/PAS 61076-3-110

CONTENTS

FOREWORD	6
1 Scope	7
1.1 Normative references	7
2 IEC type designation	9
2.1 Terminology	10
2.2 Marking	10
2.3 Main functions	10
2.4 Interchangeability	10
2.4.1 Intermateability	10
2.4.2 Interoperability	10
2.4.2.1 General	10
2.4.2.2 Requirements	10
3 Common features and isometric view	11
3.1 Isometric view	11
3.2 Mating information	12
3.2.1 Contacts interface	12
3.2.2 Fixed connector contacts	15
3.2.3 Free connector contacts	18
4 Dimensions	20
4.1 General	20
4.2 Type C free connectors	20
4.2.1 Free connector, side protrusions dimensions	20
4.3 Terminations	21
5 Gauges	21
5.1 Fixed connectors	21
5.2 Free connectors	24
5.3 Switch actuator gauges	27
6 Characteristics	27
6.1 General	27
6.2 Classification into climatic categories	27
6.3 Creepage and clearance distance	27
6.4 Electrical characteristics	28
6.4.1 Voltage proof	28
6.4.2 Current-carrying capacity	28
6.4.3 Initial contact resistance	28
6.4.4 Input to output resistance	28
6.4.5 Input to output resistance unbalance	29
6.4.6 Initial insulation resistance	29
6.5 Transmission characteristics, category 7	29
6.5.1 Insertion loss	29
6.5.2 Return loss	29
6.5.3 Propagation delay	29
6.5.4 Delay skew	30
6.5.5 NEXT loss	30
6.5.6 FEXT loss	30
6.5.7 Longitudinal conversion loss	30

6.5.8	Coupling attenuation	30
6.5.9	Transfer impedance	30
6.6	Mechanical characteristics	31
6.6.1	Mechanical operation including switch	31
6.6.2	Effectiveness of connector coupling devices	31
6.6.3	Insertion and withdrawal forces	31
7	Tests and test schedule	31
7.1	General	31
7.2	Test procedures and measuring methods	31
7.3	Preconditioning	32
7.4	Wiring and mounting of specimens	32
7.4.1	Wiring	32
7.4.2	Mounting	32
7.4.3	Arrangement for contact resistance measurement	32
7.4.4	Test procedure	33
7.4.5	Arrangement for dynamic stress tests (test phases AP6, AP7)	33
7.5	Test schedules	33
7.5.1	Basic (minimum) test schedule	33
7.5.2	Full test schedule	34
7.5.2.1	Test group P preliminary	34
7.5.2.2	Test group AP	35
7.5.2.3	Test group BP	36
7.5.2.4	Test group CP	37
7.5.2.5	Test group DP	37
7.5.2.6	Test group EP	38
7.5.2.7	Test group FP	39
Annex A (normative)	Gauging requirements	40
A.1	Fixed connectors	40
A.2	Free connectors	40
Annex B (normative)	Locking device mechanical operation – test procedure and requirements	41
B.1	Object	41
B.2	Preparation of the specimens	41
B.3	Test method	41
B.4	Final measurements	41
Annex C (normative)	High frequency (category 7) transmission interoperability testing	42
C.1	Object	42
C.2	Test equipment	42
C.3	Free connector precision test fixture construction	42
C.4	Fixed connector precision test fixture construction	43
C.5	Alternate fixed or free connector test fixture	43
C.6	Test fixture requirements	43
C.7	Test procedure	43
Annex D (normative)	General requirements for the measurement set-up	44
D.1	Test instrumentation	44
D.2	Coaxial cables and test leads for network analysers	44
D.3	Measurement precautions	44
D.4	Balun requirements	45

D.5	Reference components for calibration	46
D.5.1	Reference loads for calibration	46
D.5.2	Reference cables for calibration	46
D.6	Termination loads for termination of conductor pairs	46
D.7	Termination of screens	47
D.8	Test specimen and reference planes	47
Annex E (normative)	Insertion loss	49
E.1	Object	49
E.2	Test method	49
E.3	Tests set up.	49
E.4	Procedure.	49
E.4.1	Calibration	49
E.4.2	Measurement.....	50
E.5	Test report	50
E.6	Accuracy	50
Annex F (normative)	Return loss	51
F.1	Object	51
F.2	Test method	51
F.3	Test set-up	51
F.4	Procedure	51
F.4.1	Calibration	51
F.4.2	Measurement.....	51
F.5	Test report	51
F.6	Accuracy	51
Annex G (normative)	Near end cross talk	53
G.1	Object	53
G.2	Test method	53
G.3	Test set-up.....	53
G.4	Procedure	54
G.4.1	Calibration	54
G.4.2	Establishment of noise floor	54
G.4.3	Measurement	55
G.5	Test report	55
G.6	Accuracy	55
Annex H (normative)	Far end cross talk.....	56
H.1	Object	56
H.2	Test method	56
H.3	Test set-up	56
H.4	Procedure	57
H.4.1	Calibration	57
H.4.2	Establishment of noise floor	57
H.4.3	Measurement	57
H.5	Test report	58
H.6	Accuracy	58
Annex I (normative)	Longitudinal conversion loss	59
I.1	Object	59
I.2	Test method	59
I.3	Test set-up	59

I.4	Procedure	60
I.4.1	Calibration	60
I.4.2	Noise floor	60
I.4.3	Measurement	60
I.5	Test report	60
I.6	Accuracy	60
Annex J (normative)	Transfer impedance	61
J.1	Object	61
J.2	Test method	61
J.3	Definitions	61
J.3.1	Inner and outer circuit	61
J.3.2	Coupling length	61
J.4	Test set-up	61
J.4.1	Preparation of test specimen	61
J.4.2	Triaxial set-up	62
J.4.3	Impedance of the inner circuit	63
J.4.4	Impedance matching networks	63
J.5	Procedure	65
J.5.1	Calibration	65
J.5.2	Measurement	65
J.5.3	Evaluation of test results	65
J.6	Test report	67
J.7	Accuracy	67
Annex K (normative)	Coupling attenuation	68
K.1	Object	68
K.2	Test method	68
K.3	Test equipment and set-up	68
K.3.1	Equipment	68
K.3.2	Equipment set-up	68
K.3.3	Validation of the equipment set-up	69
K.4	Procedure	69
K.4.1	Calibration	69
K.4.2	Measurement	69
K.5	Test report	69
Annex L (normative)	Termination of balun	71
L.1	Termination of balun with low return loss for common mode	71
L.1.1	Centre tap connected to ground	71
L.1.2	Centre tap open	71
Annex M (normative)	Gauge dimensions supplement for switch actuator for use with standard IEC 61076-3-110 series connectors	72
M.1	Fixed connectors	72
M.2	Free connectors	75

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 3-110: Detail specification for 8 way connectors for frequencies up to 600 MHz

FOREWORD

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC-PAS 61076-3-110 has been processed by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document:

Draft PAS	Report on voting
48B/1115/PAS	48B/1153/RVD

Following publication of this PAS, the technical committee or subcommittee concerned will investigate the possibility of transforming the PAS into an International Standard.

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 3-110: Detail specification for 8 way connectors for frequencies up to 600 MHz

1 Scope

This part of IEC 61076-3 covers 8-way connectors up to 4 pairs to be used up to 600 MHz, when used with an appropriate cable. These cables are specified in the IEC 61156 series and used in cabling systems specified in ISO/IEC 11801.

The connectors are compatible with the already defined IEC 60603-7-7 connectors.¹

The connectors are interoperable with the already defined IEC 60603-7-7 connectors.²

1.1 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61076-3. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61076-3 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-14, *Environmental testing – Part 2: Tests. Test N: Change of temperature*

IEC 60068-2-38, *Environmental testing – Part 2: Tests. Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60169-16, *Radio-frequency connectors – Part 16: R.F. coaxial connectors with inner diameter of outer conductor 7 mm (0.276 in) with screw coupling – Characteristic impedance 50 ohms (75 ohms) (Type N)*

IEC 60352-2:1990, *Solderless connections – Part 2: Solderless crimped connections – General requirements, test methods and practical guidance*

IEC 60352-3:1993, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4:1994, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-6:1994, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

¹ Backward compatibility definition and requirements are given in 2.5.2.

² Interoperability definition and requirements are given in 2.5.3.

IEC 60512-1, *Connectors for electronic equipment – Tests and measurements – Part 1: General*

IEC 60512-2, *Electromechanical components for electronic equipment, basic testing procedures and measuring methods – Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*

IEC 60512-3, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 3: Current-carrying capacity tests*

IEC 60512-4, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 4: Dynamic stress tests*

IEC 60512-5, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 5: Impact tests (free components), static load tests (fixed components), endurance tests and overload tests*

IEC 60512-6, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 6: Climatic tests and soldering tests*

IEC 60512-7, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 7: Mechanical operating tests and sealing tests*

IEC 60512-8, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations*

IEC 60603-7, *Connectors for frequencies below 3 MHz for use with printed boards – Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality*

IEC 60603-7-1, *Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality – Shield mating*

IEC 60603-7-7, *Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality – Shield mating*

IEC 61076-1:1995, *Connectors with assessed quality, for use in d.c., low frequency analogue applications and in digital high speed data applications – Part 1: Generic specification*

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

IEC 61196-1 (all parts), *Radio-frequency cables*

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*

ISO 1302, *Technical drawings – Method of indicating surface texture*

ITU-T G.117, *Transmission aspects of unbalance about earth*

ITU-T K.20, *Resistibility of telecommunication equipment installed in a telecommunications centre to overvoltages and overcurrents*

ITU-T O.9, *Measuring arrangements to assess the degree of unbalance about earth*

CENELEC PREN 50289-1-6, *Communication Cables – Specifications for Test Methods Part 1-6: Electrical Test Methods – Electromagnetic Performance*