OBSAI System Reference
Appendix B

HARD-METRIC 2MM, 6-ROW VERTICAL MALE

REQUIREMENT SPECIFICATION

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## HISTORY

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<td>5.9.2003</td>
<td>0.0.1</td>
<td>Ari Oravainen</td>
<td>First release</td>
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CHANGE HISTORY:
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1. INTRODUCTION

- Specification for Hard metric 2mm, straight male, 144 pin. With or without guide and coding block and with or without endwall.

- Other parts: Guide and coding pin.
2. GENERAL DESCRIPTION

- Type: Data
- Connection method: Pressfit (PCB thickness ≥ 1.4 mm)
- Shape: Straight male.
- Number of poles: 6x24.

Male connector will be loaded with HM 2mm standard pins. Different pin lengths are available.

Male pins acc. to IEC 61076-4-101 must be used.

Figure 1. 2mm straight male connector 144 pin with guide and coding block.
3. **ELECTRICAL SPECIFICATION**

- Operational temperature range: -45…+85 °C.
- Signalling rate: DC… Gbps (defined later on)
- Max. Voltage (U): < 60 VDC.
- Creepage distance: > 0.8 mm.
- Clearance distance: > 0.8 mm.
- Max. Current (I): 0.6 A at max. +35°C temperature rise.
- Contact resistance (Ohm): Row a < 0.015 Ω on mated pair.
  Row f < 0.035 Ω on mated pair.
- Insulation resistance: > 1000 MΩ.
- Voltage proof: 750 V (RMS).
4. MECHANICAL SPECIFICATION

- All mechanical dimensions are described in drawings in chapter 8.
  - Allowed misalignment*: < ±0,1 mm without guide (still t.b.d.)
    ≤ 1,35 mm with guide
  - Contact range / wipe: According to IEC 61076-4-101
  - Basic material of the body: PC, PCT, PBT or similar. No high temp.
    material required.
    Connector plastics shall be UL listed with V0.
  - Contact material: Phosphor Bronze
  - Pressfit pin plating: Tin lead (0.5 ... 3 µm) over nickel (min.
    2.0 µm) and press-in zone acc. to IEC 60352-5 (01/02). ROHS compatible pins
    are required in the future.
  - Weight (g): <30 g 144 pin.
  - Durability: ≥ 250 mating cycles (IEC 61076-4-101, performance level 2).

*) Picture to determine the allowed misalignment will be added to 2nd release.
5. ENVIRONMENTAL REQUIREMENT

Following values are list of conditions where connector will be used. Connector manufacturer does not have to test connector according these conditions. However this information must be taken account in connector design.

These requirements come from system requirements and will be replaced by a connector test specification in a second release of this document.

5.1. Environment specification for operation

Climatic conditions:
- Temperature range -45…+85°C.
- Relative humidity range 5…100% (ETS 300 019-1-4:1992, class 4.1).
- Absolute humidity range 0,26…29g/m³.
- Rate of temperature change 0,5°C/min.
- Air pressure range 70…106 kPa (ETS 300019-1-1:1991).

Mechanical conditions:
- Sinusoidal vibration:
  - Displacement 3,5mm peak between 5…9 Hz
  - Acceleration 2m/s² (~0.2g)
  - Frequency range 62…500 Hz
  - Sweeps 5 sweep cycles for 3 direction increasing frequency (1dB/octave, logarithmic)

- Shocks:
  - Shock spectrum Half Sine
  - Duration 11ms
  - Acceleration 100 m/s² (10 g)
  - Number 3 (may be extended for ~10 shocks)
  - Direction 6 axis (+X, +Y, +Z, -X, -Y,-Z)(total 6 x 3)

- Bump shocks:
  - Acceleration amplitude 400 m/s² (40 g)
  - Pulse duration 6 ms/pulse
  - Number 500 bumps in each of 6 directions.
Random:
- ASD (14)  0,96 m²/s³ or – 3 dB/oct
- Direction  3 (X, Y, Z)
- Frequency  5 – 20 – 800 Hz.
- Duration  3 * 10 min

Earthquake:
Earthquake (zone 4 tests) GR-63-CORE

5.2. Environment specification for transportation

Climatic and mechanical conditions for units, modules and components:

ETS 300 019-1-2: 1994 (testing methods) class 2.3.
ETS 300 019-1-2: 1992 (requirements) class 2.3.
6. CODING

Three types of coding is in use

6.1. Coding 1

Figure 2. Male connector with guidance and coding 1

6.2. Coding 2

Figure 3. Male connector with guidance and coding 2
6.3. Coding 3

Figure 4. Male connector with guidance and coding 3
7. PCB LAYOUT

Figure 5. Lay out drawing for 144 pin male press-fit connector with guidance
Figure 6. Lay out drawing for 144 pin male press-fit connector without guidance
8. SPECIFICATION DRAWINGS

Following figures 7, 8, and 9 will be checked and corrections if any will be made to the second release of this document.

8.1. Male connector

Figure 7. Male connector
1) Press-fit section acc. to IEC 352-5
2) Dimension for alternative connector design 12,4 ± 0,05
5) Dimension for slot distance 15,24 mm : 14,9 ± 0,1

<table>
<thead>
<tr>
<th>A (mm)</th>
<th>C (mm)</th>
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<td>48</td>
<td>23 x 2 = 46</td>
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8.2. Male connector with endwall

1) Press-fit section acc. to IEC 352-5
2) Dimension for alternative connector design 12,4 ± 0,05
5) Dimension for slot distance 15,24 mm : 14,9 ± 0,1

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8.3. Male connector with guidance

Figure 9. Male connector with guidance.

1) Press-fit section acc. to IEC 352-5
2) Dimension for alternative connector design 12,4 ± 0,05
3) Hole for fixing screw
4) Hole for coding pin
5) Dimension for slot distance 15,24 mm : 14,9 ± 0,1
### 8.4. Available Pin Lengths

<table>
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<th>C (mm)</th>
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<td>55</td>
<td>48</td>
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**Figure 10. Available pin lengths**

Pin lengths to be used are defined in a second release of this document, when the whole module mating sequence is defined.
8.5. Coding pin

Figure 11. Coding pin.

Required min. tensile strength to be determined for 2nd release
8.6. Guide pin

Figure 12. Guide pin.

Required min. tensile strength to be determined for 2\textsuperscript{nd} release
9. REFERENCE DOCUMENTS

- ETS 300 019-1-4:1992, class 4.1
- ETS 300019-1-1:1991
- ETS 300 019-1-2
- IEC 512-3, 5b
- ISO 9001
- Earthquake (zone 4 tests) GR-63-CORE
- IEC 1076-4-101
- IEC 60352-5 (01/02)