# DIN Signal male connector straight - THR (CTI>400)

## General information

| | | |
|---|---|---|
| Design | IEC 60603-2 | types: Q, 2Q, 3Q, R, 2R, 3R, R (HE11) male |
| No. of contacts | max. 96 | |
| Contact spacing | 2,54mm | |
| Test voltage | 1000V | |
| Contact resistance | ≤ 15mOhm | |
| Insulation resistance | ≥ $10^{12}$Ohm | |
| Working current | max. 2A at 20°C (see derating diagram) | |
| Temperature range | -55°C ... +125°C<br>max. 15s at 240°C for reflow soldering | |
| Termination technology | THR with solder pins, press-in | |
| Clearance & creepage distance | min. 1,2mm each | |
| Insertion and withdrawal force | 20-pole ≤ 20N<br>30-pole ≤ 30N<br>32-pole ≤ 30N | 48-pole ≤ 45N<br>64-pole ≤ 60N<br>96-pole ≤ 90N |
| Mating cycles | acc. to performance level, see table below | |
| UL file | E102079 | |
| RoHS - compliant | Yes | |
| Leadfree | Yes | |
| Hot plugging | No | |

## Insulator material

| | |
|---|---|
| Material | PCT (thermoplastics, glass fiber reinforcement 30%) |
| Colour | natural coloured, colour deviations and speckles permitted |
| UL classification | UL 94-V0 |
| Material group acc. IEC 60664-1 | II (400 ≤ CTI < 600) |
| NFF classification | I3, F3 |

## Contact material

| | |
|---|---|
| Contact material | Copper alloy |
| Plating termination zone | Sn over Ni for solder, Ni for press-in |
| Plating contact zone | acc. to performance level, see table below |

| performance level | mating cycles: acc. to IEC 60603-2 | mating cycles: complementary acc. to IEC 60603-2 | plating contact zone |
|---|---|---|---|
| *1* | *500* | | *Au over PdNi over Ni* |
| *2* | *400* | | *Au over PdNi over Ni* |
| *3* | *50* | | *Au over PdNi over Ni* |
| NM30 (S4) | | 500 | min. 0,76µm (30µinch) noble metal (alloy) over Ni |
| Au30 | | 500 | min. 0,76µm (30µinch) Au over Ni |
| Au50 | | 500 | min. 1,27µm (50µinch) Au over Ni |

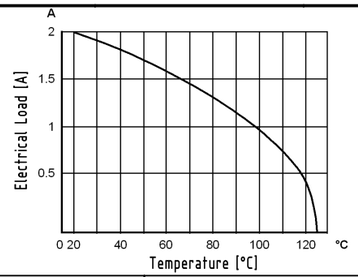
Standard plating options highlighted in *italic*, other plating options are available on request.

## Derating diagram acc. to IEC 60512-5 (current carrying capacity)

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.

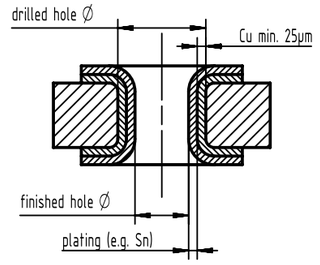
The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512-5




## Recommended configuration of plated through holes for press-in termination

In addition to the hot-air-level (HAL), other PCB surfaces are getting more important. Due to their different properties - such as mechanical strength and coefficient of friction - we recommend the following configuration of PCB through holes.




| | | |
|---|---|---|
| Tin plated PCB (HAL) acc. to EN 60352-5 | Drilled hole Ø | 1,15±0,025mm |
| | Sn | max. 15µm |
| | plated hole Ø | 0,94 - 1,09mm |
| Chemical tin plated PCB | Drilled hole Ø | 1,15±0,025mm |
| | Sn | min. 0,8µm |
| | plated hole Ø | 1,00 - 1,10mm |
| Gold /Nickel plated PCB | Drilled hole Ø | 1,15±0,025mm |
| | Ni | 3 - 7µm |
| | Au | 0,05 - 0,12µm |
| | plated hole Ø | 1,00 - 1,10mm |
| Silver plated PCB | Drilled hole Ø | 1,15±0,025mm |
| | Ag | 0,1 - 0,3µm |
| | plated hole Ø | 1,00 - 1,10mm |
| Copper plated PCB (OSP) | Drilled hole Ø | 1,15±0,025mm |
| | plated hole Ø | 1,00 - 1,10mm |

## Assembly instructions

It is highly recommended to use HARTING press-in tools to ensure a reliable press-in process.
Please refer to the catalogue for tools, machines and further information about the press-in process.

## Soldering instructions

THR (Through Hole Reflow) connectors are designed to be used in a reflow oven together with other SMD (Surface Mount Device) components.
In this process, called as well „Pin in Hole Intrusive Reflow", the connectors are inserted into plated through holes in a comparable way to conventional component mounting.
All other components can be assembled on the pcb surface.

The length of the connector contacts should be such that they protrude by no more than 1.5 millimetres after insertion to the pcb. Each contact collects solder on its tip as it penetrates the solder paste in the hole. So if the contact is too long, this solder would no longer be able to reflow back into the plated through hole by capillary action during the soldering process, therefore the quality of the soldered connection would suffer as a result.

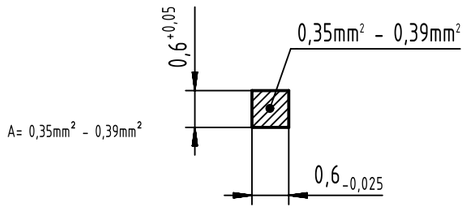
## Quantity of solder paste

Before the components are assembled, solder paste must be applied to all the solder pads (for connecting surface-mount components) and the plated through holes.
To ensure that the plated through holes are completely filled, significantly more solder paste must be applied than traditional solder pads on the pcb surface.
There are numerous calculation methods available which are complicated to apply.
The following rule of thumb has proved valuable in practice:

**VPaste = 2(VH – VP)**
in which:
VPaste = Required volume of solder paste
VH = Volume of the plated through hole
VP = Volume of the connector termination in the hole

Comment: the multiplier "2" compensates for solder paste shrinkage during soldering. For this purpose, it was assumed that 50 % of the paste consists of the actual solder, the other 50 % being soldering aids.

## Cross section of solder termination




All Dimensions in mm
Original Size DIN A3

Scale 1:1 | Free size tol. | Ref. | Sub.



Department EC PD - DE

HARTING Electronics GmbH
D-32339 Espelkamp

| Created by | Inspected by | Standardisation | Date | State |
|---|---|---|---|---|
| STORCK | LEHNERT | HOFFMANN | 2018-05-15 | Final Release |

Title: DIN Signal male connector straight - THR (CTI>400)

Doc-Key / ECM-Nr.: 100571108/UGD/001/C 500000135180

Type: DS | Number: 09731130201 | Rev.: C | Page: 1/1

A3

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

HARTING:

09281486519 09731966519

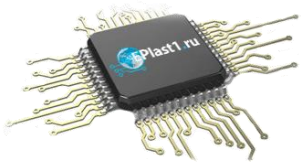
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

**Телефон:** 8 (812) 309 58 32 (многоканальный)
**Факс:** 8 (812) 320-02-42
**Электронная почта:** org@eplast1.ru
**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.