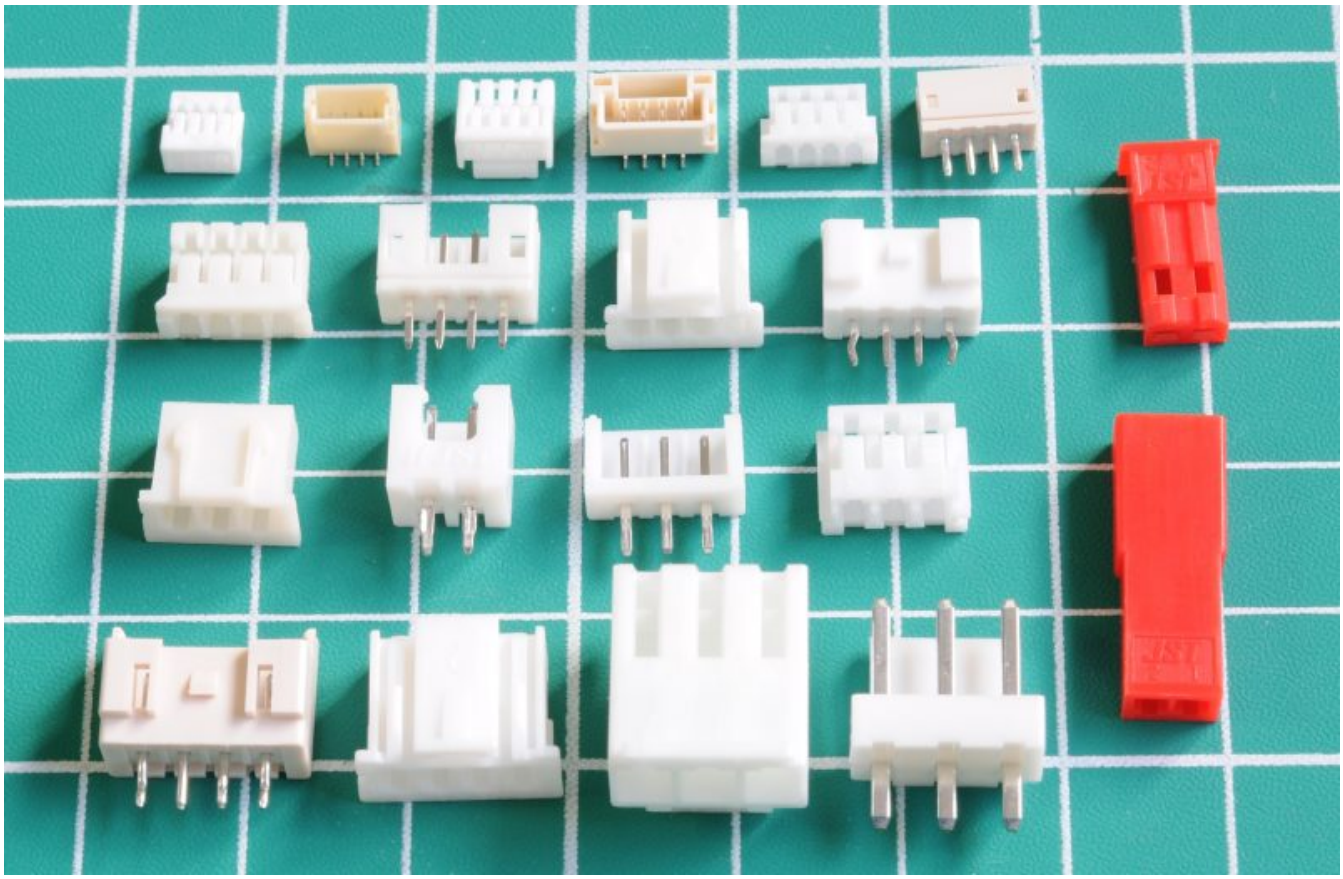


Introduction

"JST Connector" is either shorthand for a connector manufacturer called Japan Solderless Terminal, or a vernacular term for a range of different type of wire to board connectors, which either are, or resemble designs from Japan Solderless Terminal.

In the vernacular sense, precisely which type of connector is being referred to depends on who is using the term and in what context. On this page I'll cover the most popular connectors from Japan Solderless Terminal. Many of which are referred to as "JST Connectors" in various circles.

Note that compatible connectors are made by other manufacturers. Where I specify part numbers, I'm only doing so for genuine parts. Most are stocked by Digi-Key (US) and Farnell (UK). Most will find it more convenient to source from eBay, however note that this is an unlikely source of genuine parts.

Contents

- ZH (1.5mm pitch)
- PH (2.0mm pitch)

- XH (2.5mm pitch)
- PA/XA (2.0mm / 2.5mm pitch)
- EH (2.5mm pitch)
- SM (2.5mm pitch)
- RCY (2.5mm pitch)
- SH/SR (1.0mm pitch)
- SHD (1.0mm pitch)
- GH (1.25mm pitch)
- VH (3.96mm pitch)
- Other types

Crimp tools

Official

JST offer high quality hand crimp tools for their popular connector families. These are mostly made by the German contract crimp tool manufacturer Wezag GmbH, will crimp the associated contacts perfectly and to specification, but are all expensive. I have listed the part numbers for these where available.

Some of these (particularly for PH/XH) are frequently seen on eBay second hand, and may be worth watching out for if you crimp a lot of these connectors, as they are an order of magnitude easier to use than even the best generic tools.

For more obscure types, no hand tool is offered, however JST do sell a hand frame (YRS-XXX) for mounting dies for their MKS-L applicator (used in the AP-K2N crimping machine), a very expensive solution, and the only option for production/mission critical applications.

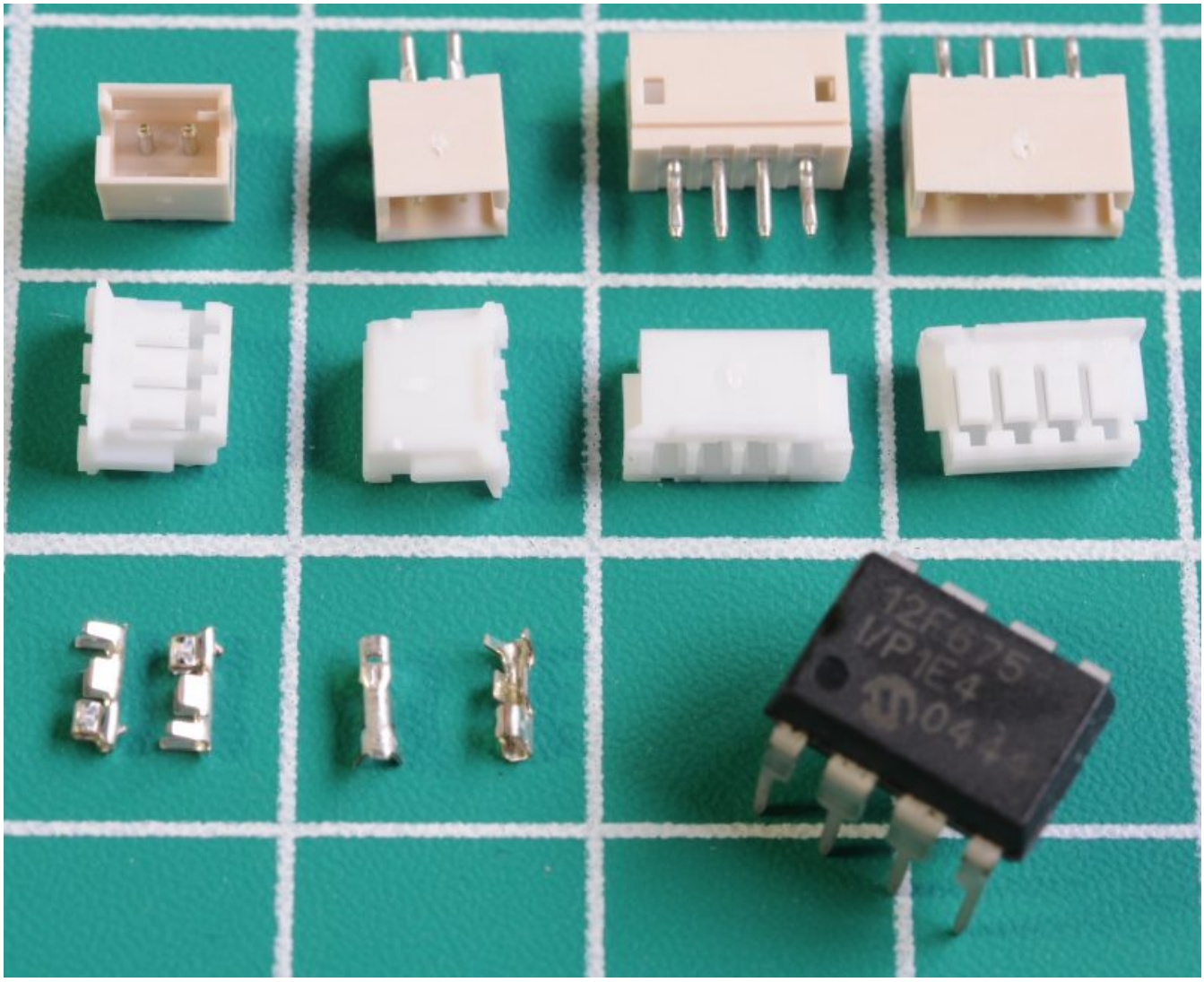
Unofficial / Generic



Unlike many other connector families where there isn't much in the way of good generic/budget crimp tools, there are *many* generic crimp tools specifically designed for JST contacts. Pictured above a two of the best available.

- Engineer PAD-11. Some may be familiar with the PA-09 – an expensive, crappy tool also designed for mainly JST contacts. The PAD-11 costs quite a bit more than the PA-09 but is significantly better made, contacts won't get stuck in it after crimping, and it handles the smallest GH/SH types.
- IWISS IWS-2820M. A copy of the Engineer PAD-11. Not as well made but for the significantly lower price, it could be forgiven.
- Hozan P-707 will crimp larger JST contact types (2.5mm pitch and larger) better than the above two tools due to superior conductor crimping force.

ZH (1.5mm pitch)



JST ZH Connectors

ZH is one of the smallest pitch types of through-hole JST connector. Types smaller than this are all SMD. I am told these are common 3D printer related applications.

Example part numbers

Numbers in bold can be changed to order connectors with a different number of positions.

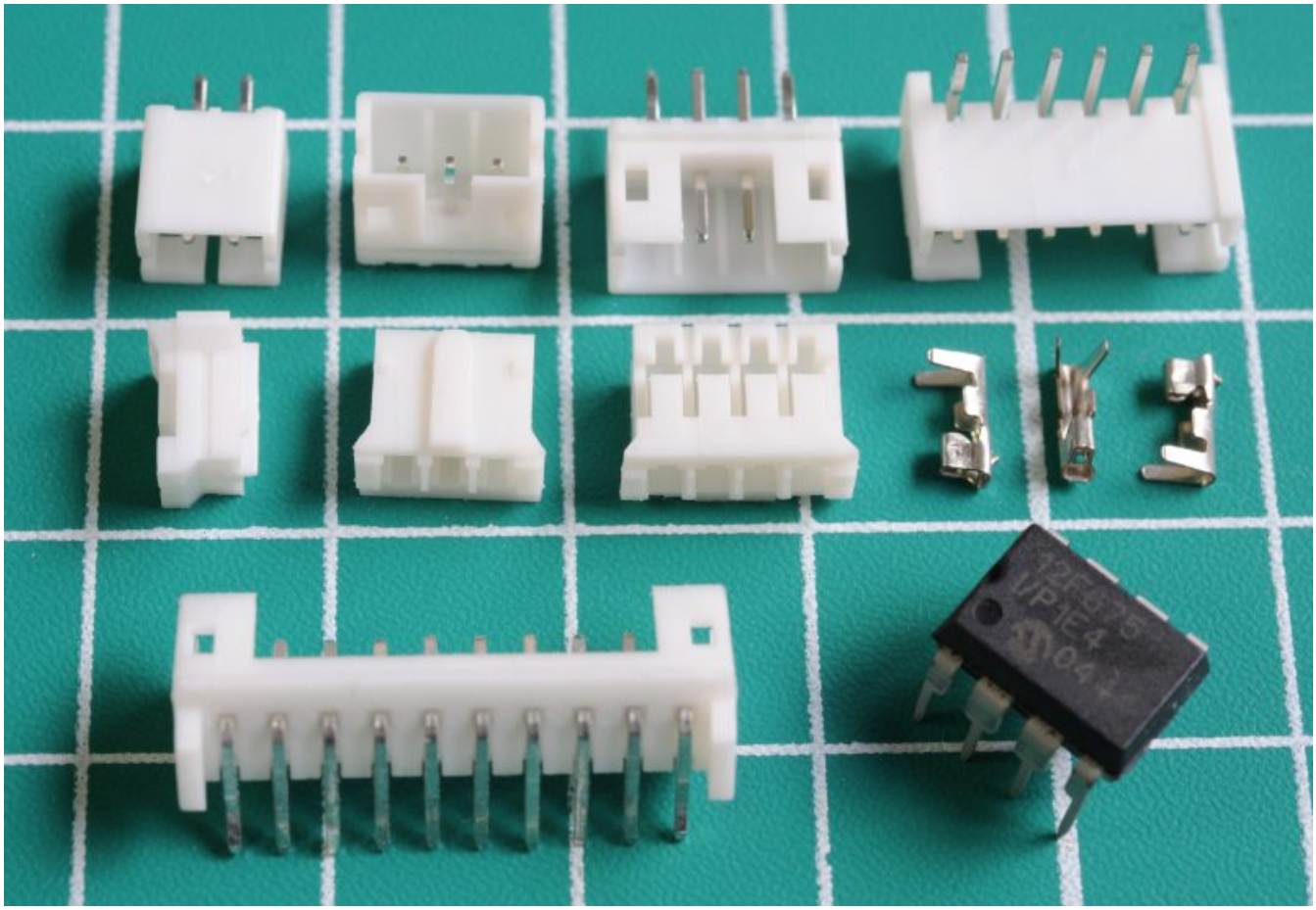
Contact AWG 26-28	SZH-002T-P0.5
Contact AWG 28-32	SZH-003T-P0.5
Housing 2 position	ZHR-**2**
Housing 3 position	ZHR-**3**
Housing 4 position	ZHR-**4**

Header 2 position (PTH)	B**2**B-ZR(LF)(SN)
Header 4 position (PTH)	B**4**B-ZR(LF)(SN)
Hand crimp tool AWG 28-32	WC-490
Hand crimp tool AWG 26-28	WC-491

PH (2.0mm pitch)

This 2.0mm pitch connector is very commonly seen in low cost consumer electronics as well as a plenitude of pre-fabricated hobbyist PCBs and parts. They're dirt cheap, reasonably compact but not particularly robust.

A similar dual row type is also available (PHD) however using different contacts.



PH compatible connectors

Example part numbers

Numbers in bold can be changed to order connectors with a different number of positions.

Contact AWG 24-28 (low insertion force)	SPH-002T-P0.5L
Contact AWG 24-28 (standard insertion force)	SPH-002T-P0.5S
Contact AWG 28-32 (standard insertion force)	SPH-004T-P0.5S
Housing 2 position	PHR-**2**
Housing 4 position	PHR-**4**
Header vertical 2 position	B**2**B-PH-K-S(LF)(SN)
Header vertical 4 position	B**4**B-PH-K-S(LF)(SN)
Header right angle 2 position	S**2**B-PH-K-S(LF)(SN)
Header right angle 4 position	S4B-PH-K-S(LF)(SN)
Hand crimp tool AWG 24-30	WC-240

The official tool is WC-240.

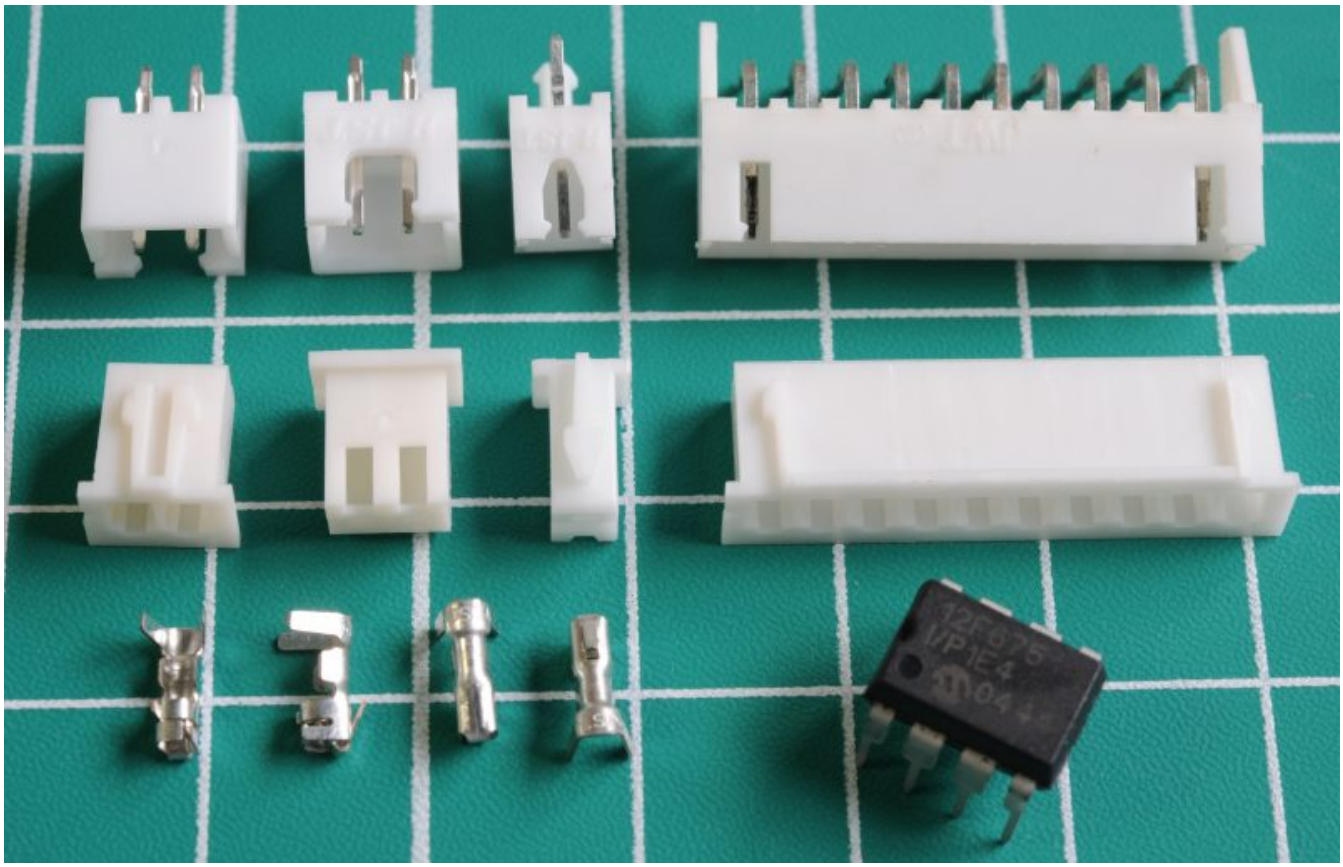


JST WC-240 (mfg'd by Wezag Germany)

The WC-240 is nice to use, but there's not a lot to set it apart from generic tools for occasional use. I personally crimp a large amount of PH, hence the investment in the official tool.

Left: Contacts crimped with PA-09. Right: Contact crimped with Original tool (WC-240).

XH (2.5mm pitch)



Various XH and XH compatible connector parts

This is a slightly larger edition of the PH connector, except with 2.5mm pitch, and slightly larger contacts of a completely different design. Once again, mostly found in low cost consumer electronics. This family features a peculiar single position header and receptacle – a feature I always like to see in a connector family.

I don't use these very much but one advantage of them is height. The mated assembly is considerably slimmer than any other type of connector I use. It's a shame the pitch isn't 2.54mm – I would use them a lot more otherwise. That said, you can usually jam 2 or 3 (maybe even 4) position headers onto strip board if needed.

Example part numbers

Numbers in bold can be changed to order connectors with a different number of positions.

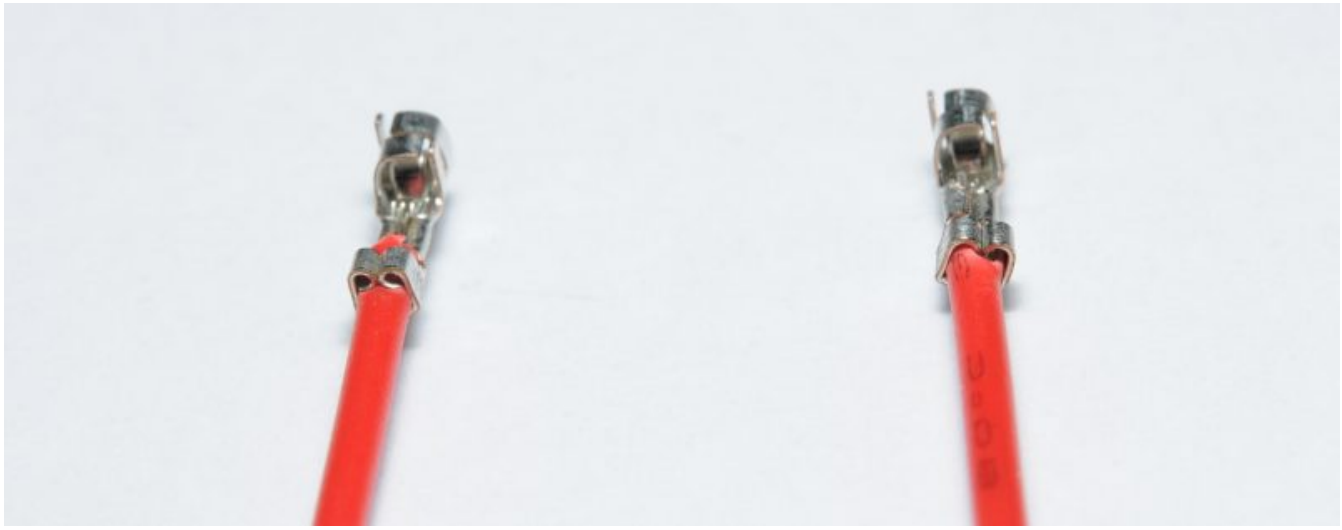
Contact AWG 22-28 (low insertion force)	SXH-001T-P0.6N
Contact AWG 22-28 (standard insertion force)	SXH-001T-P0.6
Housing 2 position	XHP-**2**
Housing 4 position	XHP-**4**
Header vertical 1 position (with boss, not available without)	B1B-XH-AM(LF)(SN)(P)
Header vertical 2 position	B**2**B-XH-A(LF)(SN)
Header vertical 4 position	B**4**B-XH-A(LF)(SN)
Header vertical 4 position (with boss)	B**4**B-XH-AM(LF)(SN)
Header right angle 2 position	S**2**B-XH-A(LF)(SN)
Header right angle 4 position	S**4**B-XH-A(LF)(SN)
Hand crimp tool AWG 22-28	WC-110

The official tool is WC-110



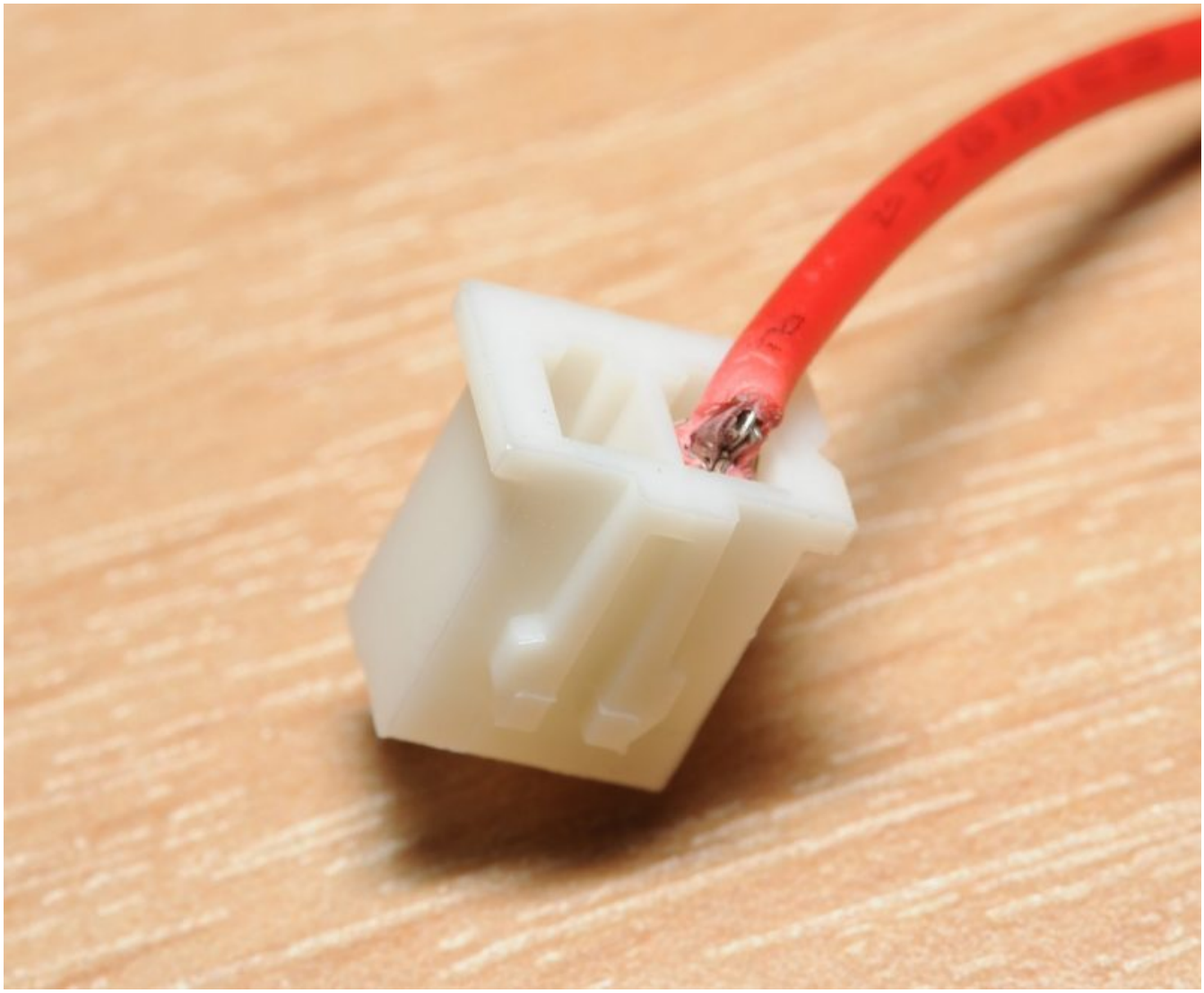
JST WC-110 (mfg'd by Wezag Germany)

I wasn't going to bother covering the differences between this tool and generic tools, because they looked so similar, but lately I've been noticing something –



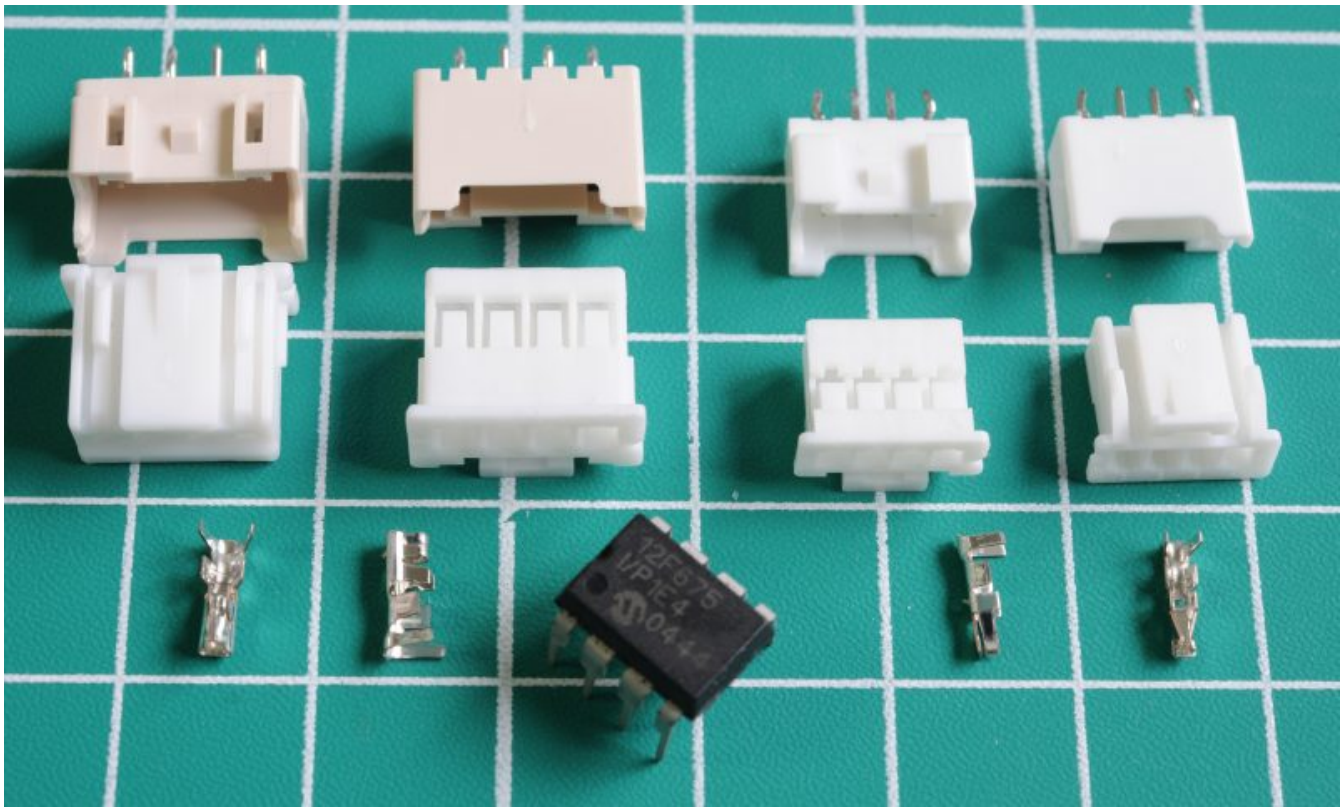
Left: Crimped with WC-110, Right: Crimped with Engineer PA-09

When we look at the crimps top down from the rear, we see that the original tool has beautifully curled the insulation crimp ends around, pressing neatly on the insulation without piercing it. This explains one of my biggest gripes with these connectors, which went away when I started using the original tool: The insulation keeps tearing off.



This problem is particularly acute with this type of connector because the transition from wire to contact is at flush with the top of the housing, so if there's already a tear created by the crimping process – it only takes a few movements back and forward to create the above mess.

PA/XA (2.0mm / 2.5mm pitch)



JST XA and PA connectors

These are very similar to PH/XH however less common. Generally found in consumer products (for example: Japanese brand LCD televisions) which need to perform well in HALT testing.

They feature a positive latch instead of the weaker friction latch used by their PH/XH cousins. One rather unexpected feature is that they *do not* accept the same contacts as PH/XH. PA shares contacts with the PHD family. XA has its own unique type of contact which looks like a scaled-up PH contact.

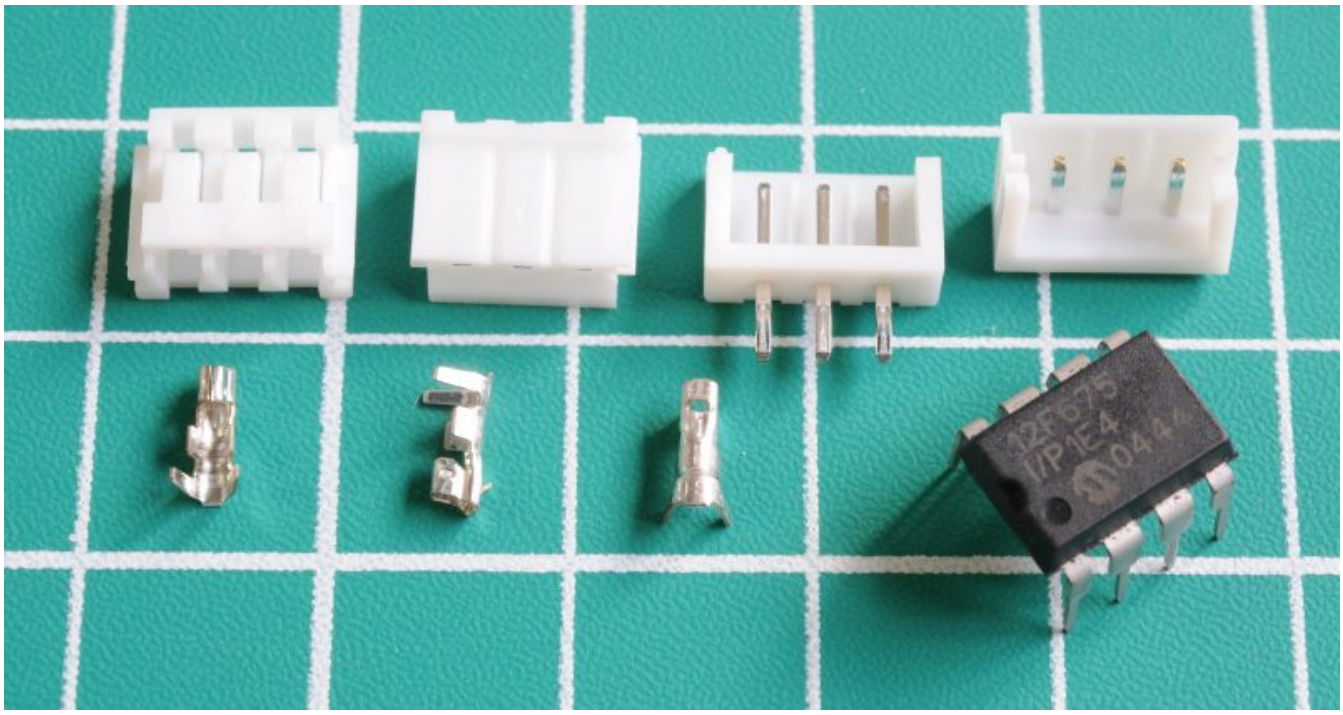
Example part numbers

Numbers in bold can be changed to order connectors with a different number of positions.

PA (PHD) contact AWG 22-26	SPHD-001T-P0.5

PA (PHD) contact AWG 24–28	SPHD-002T-P0.5
XA contact AWG 20-24	SXA-01T-P0.6
XA contact AWG 22-26	SXA-001T-P0.6
PA 2 position housing – 2.0mm pitch	PAP-**04**V-S
XA 2 position housing – 2.5mm pitch	XAP-**04**V-1
PA header vertical 4 position – 2.0mm pitch	B**04**B-PASK(LF)(SN)
XA header vertical 4 position – 2.5mm pitch	B**04**B-XASK-1(LF)(SN)

EH (2.5mm pitch)



EH is a 2.5mm pitch connector deployed in low cost products where a current carrying connector is needed, but PCB real-estate is highly constrained. They are significantly slimmer than XH connectors.

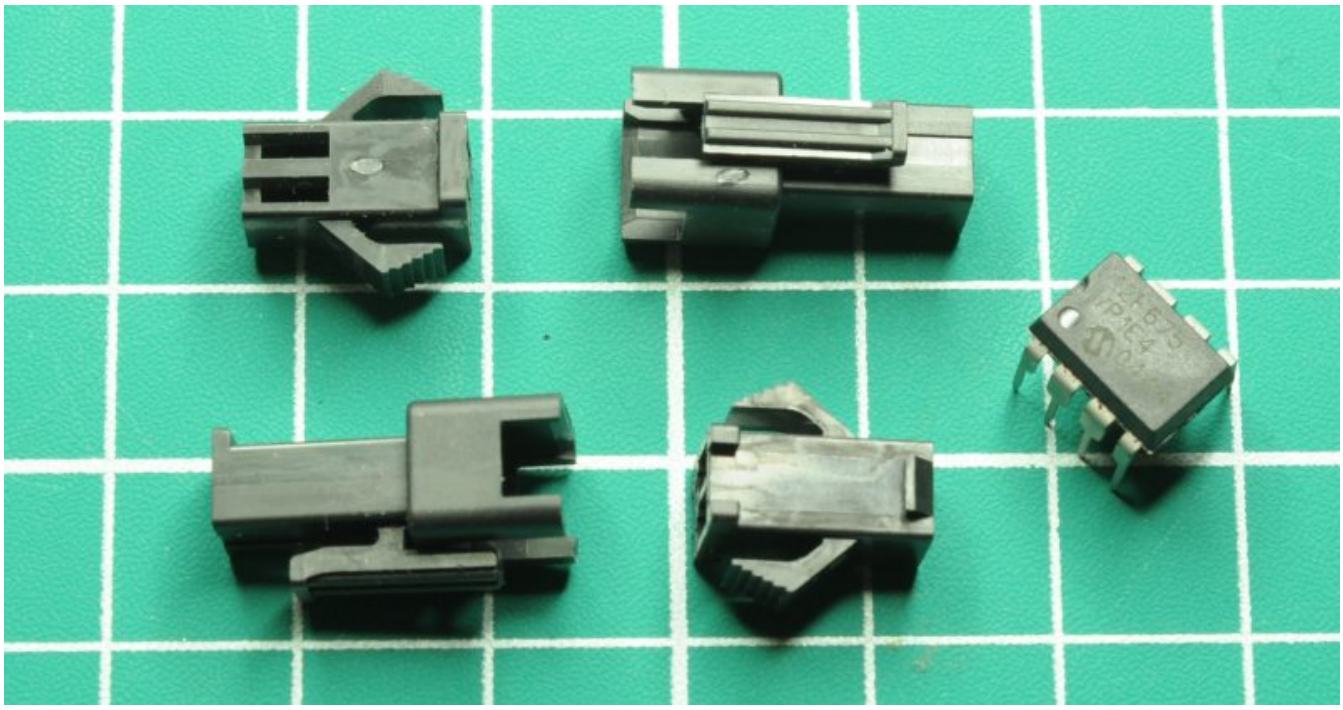
Example part numbers

Numbers in bold can be changed to order connectors with a different number of positions.

Contact AWG 22-30	SEH-001T-P0.6

Housing 3 position	EHR-**3**
Header 3 position vertical	B**3**B-EH-A(LF)(SN)
Header 3 position horizontal	S**3**B-EH(LF)(SN)
Hand crimp tool	WC-260

SM (2.5mm pitch)



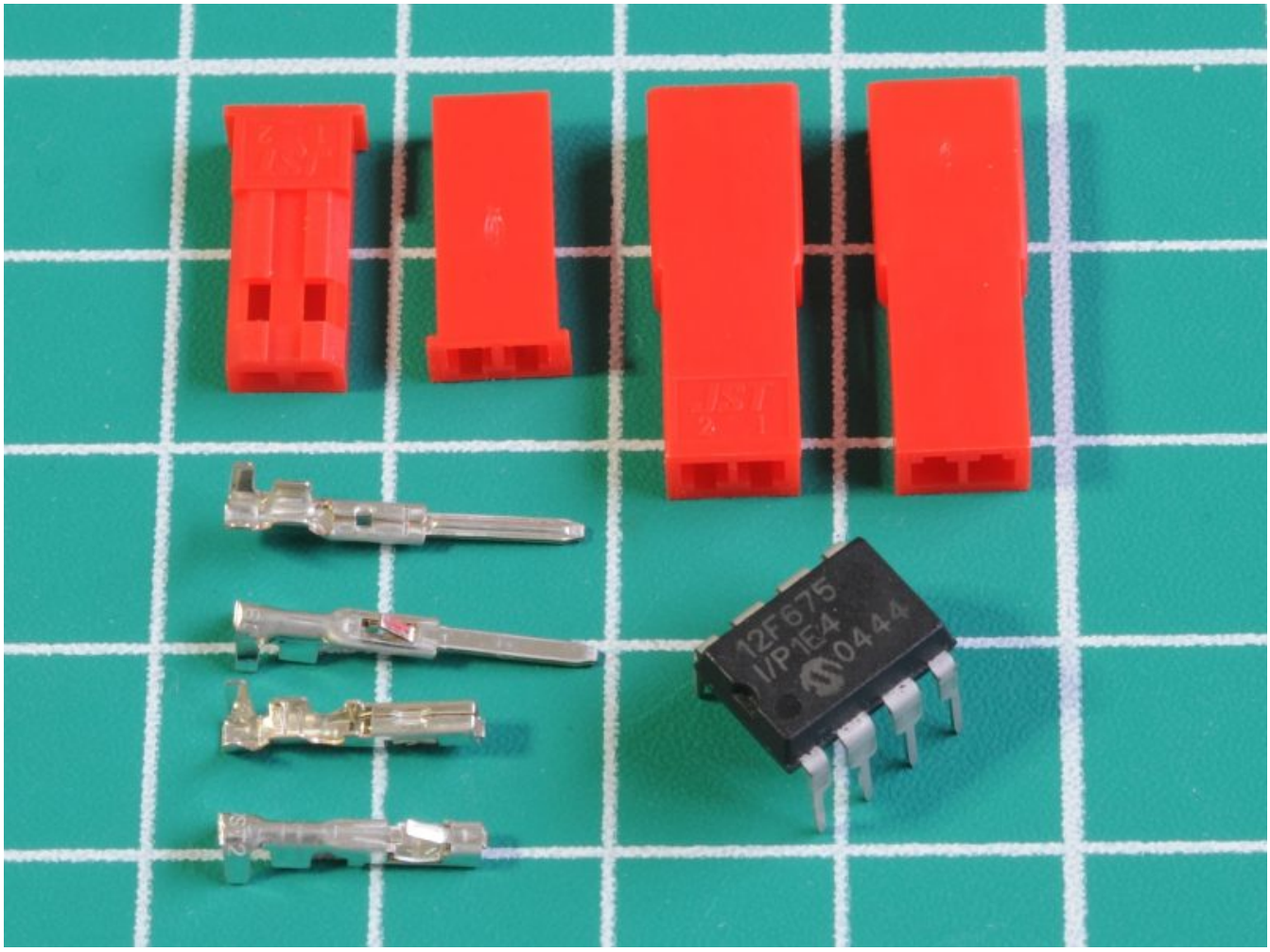
SM is an exclusively wire-to-wire type connector which has become extremely popular in recent times. Given that it has no wire-to-board option, I am unsure as to exactly why.

Example part numbers

Female contact	SHF-001T-0.8BS
Male contact	SYM-001T-P0.6
Female 2 position housing	SMP-02V-BC
Male 2 position housing	SMR-02V-B
Hand crimp tool (Male contacts)	WC-121

Hand crimp tool (Female contacts)	WC-122

RCY (2.5mm pitch)



RCY is a small 2 position only connector, and like SM is exclusively wire-to-wire. I've never seen or used one. It appears they're commonly used for small battery packs.

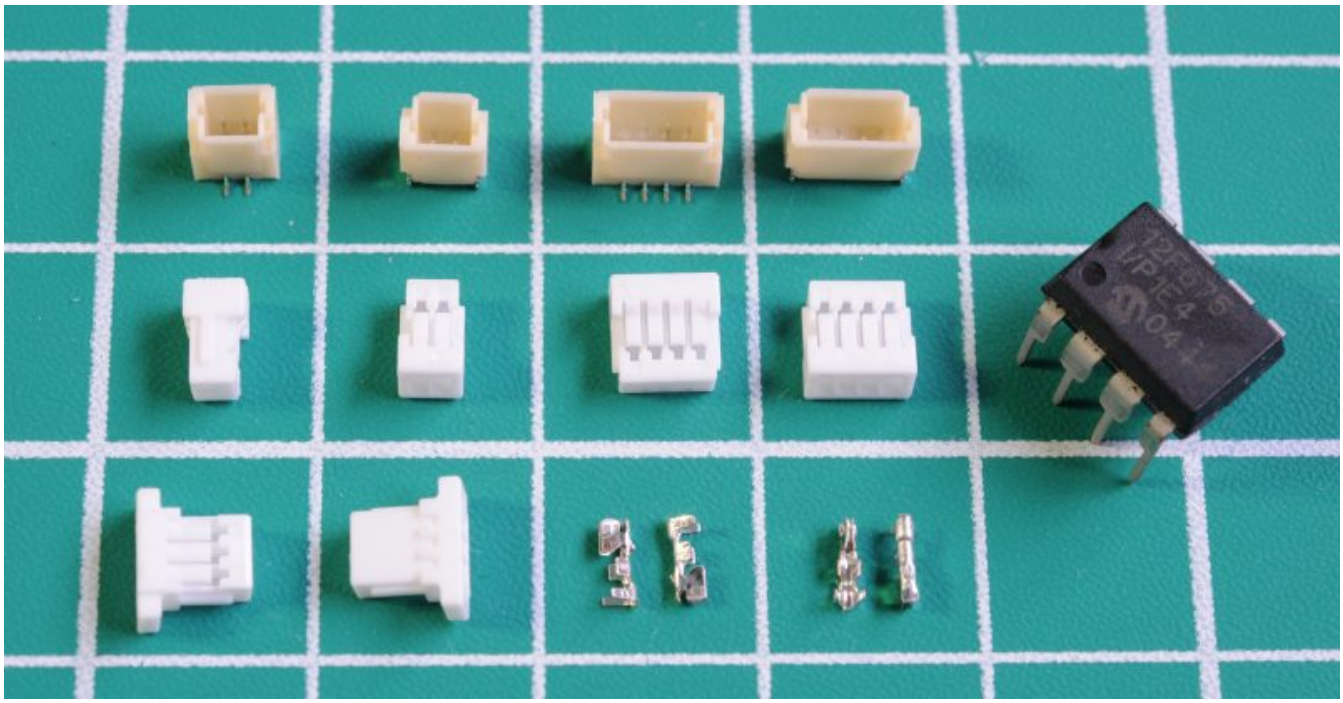
Part numbers

Female contact AWG 22-28	SYF-001T-P0.6
Female contact AWG 22-28 (Bulk packaging)	BYF-001T-P0.6
Male contact AWG 22-28	SYM-001T-P0.6
Female housing	SYP-02T-1
Male housing	SYR-02T

Hand crimp tool (Male contacts)	WC-121
Hand crimp tool (Female contacts)	YRS-125

It appears that a purposed designed hand crimp tool is only offered for male contacts. For female contacts the $1000+ YRS frame, supplied with the appropriate applicator dies is specified. Given that the conductor and insulation crimp is the same for each, the WC-121 would very likely crimp female contacts, but the locator would have to be folded down, and the contact positioned by hand.

SH/SR (1.0mm pitch)



A teeny weeny surface mount only connector family from JST. Commonly found inside laptops for connecting various items to the motherboard. Housings are available with “wings” to aid disconnection. Housings are “SH” and headers are “SR”.

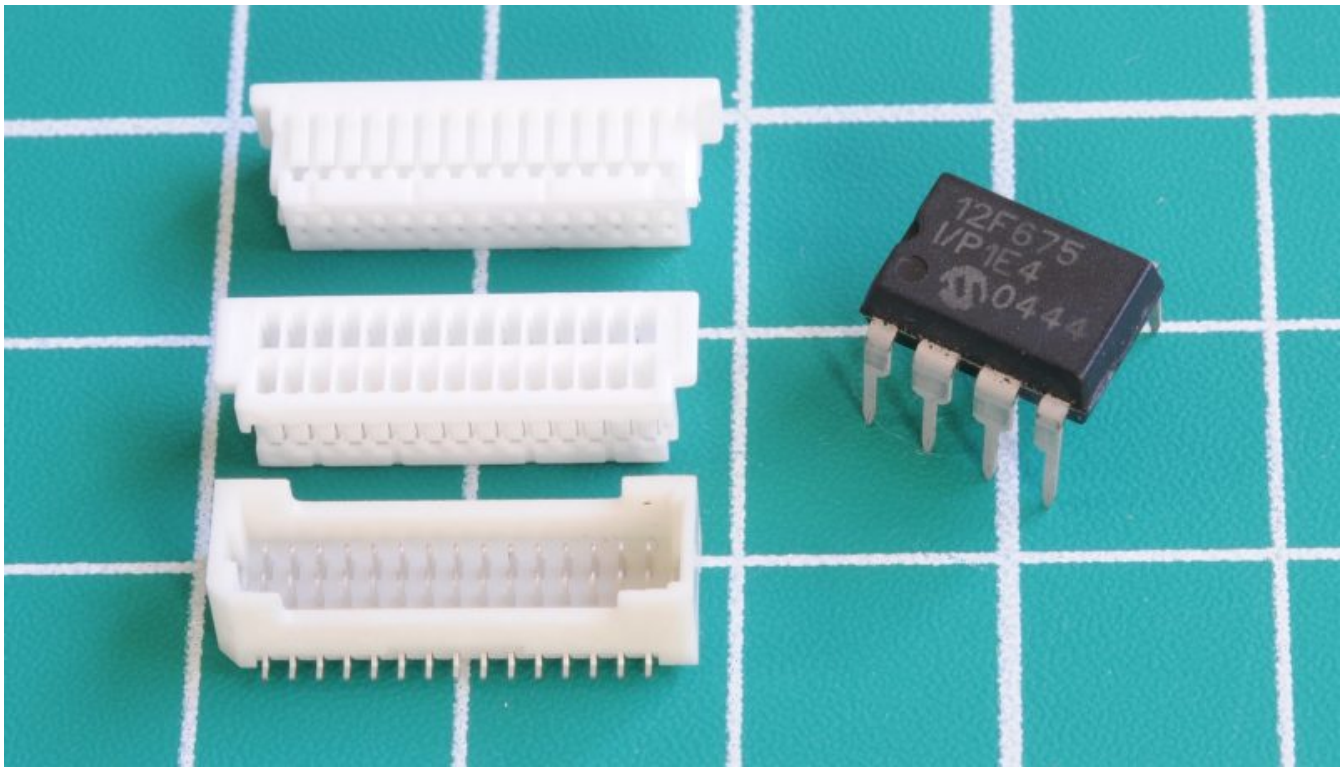
Example part numbers

Numbers in bold can be changed to order connectors with a different number of positions.

Contact AWG 28-32	SSH-003T-P0.2

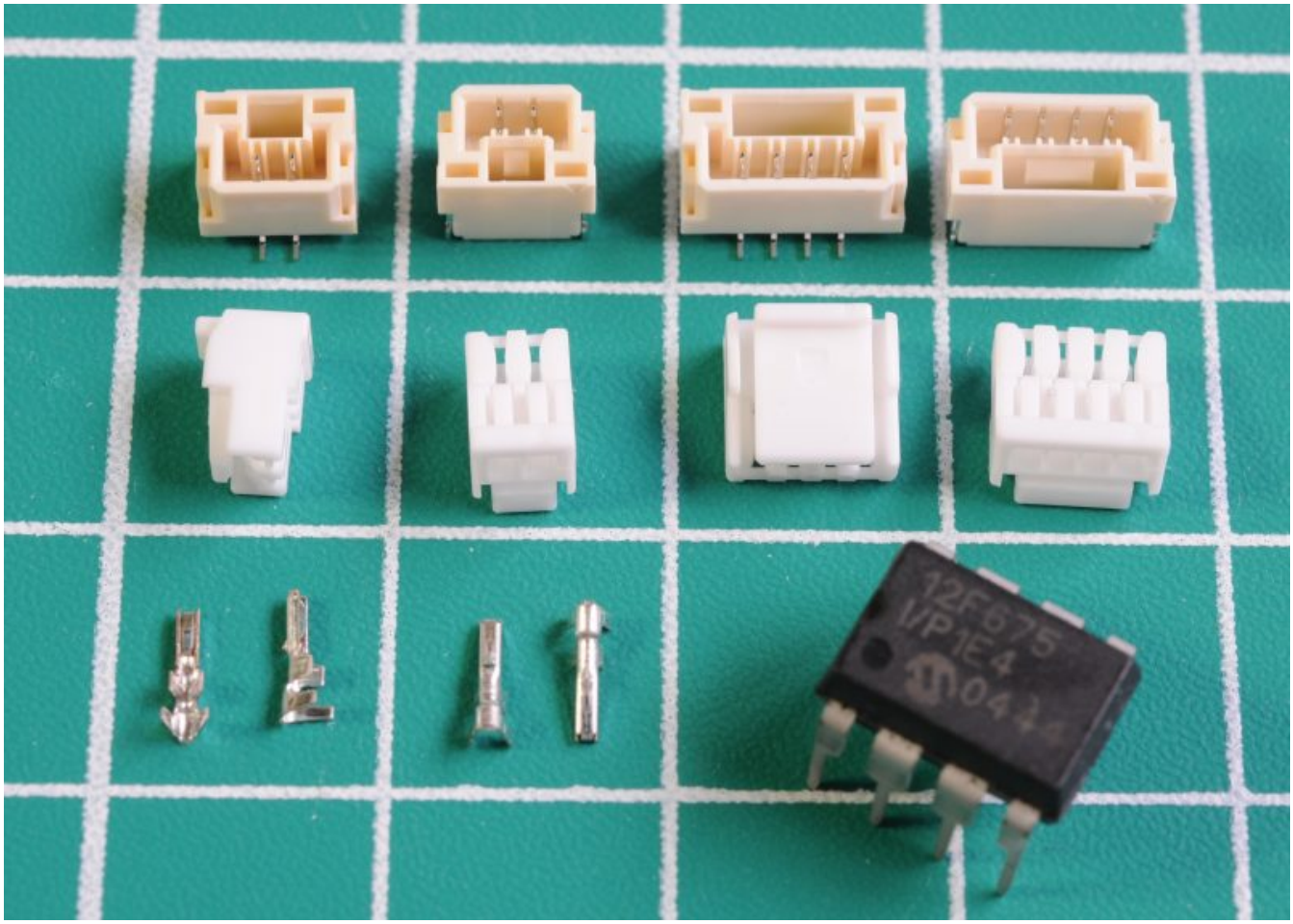
Housing 2 position	SHR-**04**V-S
Housing 2 position (with wings)	SHR-**04**V-S-B
Header 2 position SMD	BM**02**B-SRSS-TB(LF)(SN)
Hand crimp tool (with feeder)	WC-SH2832
Hand crimp tool	YRS-859

SHD (1.0mm pitch)



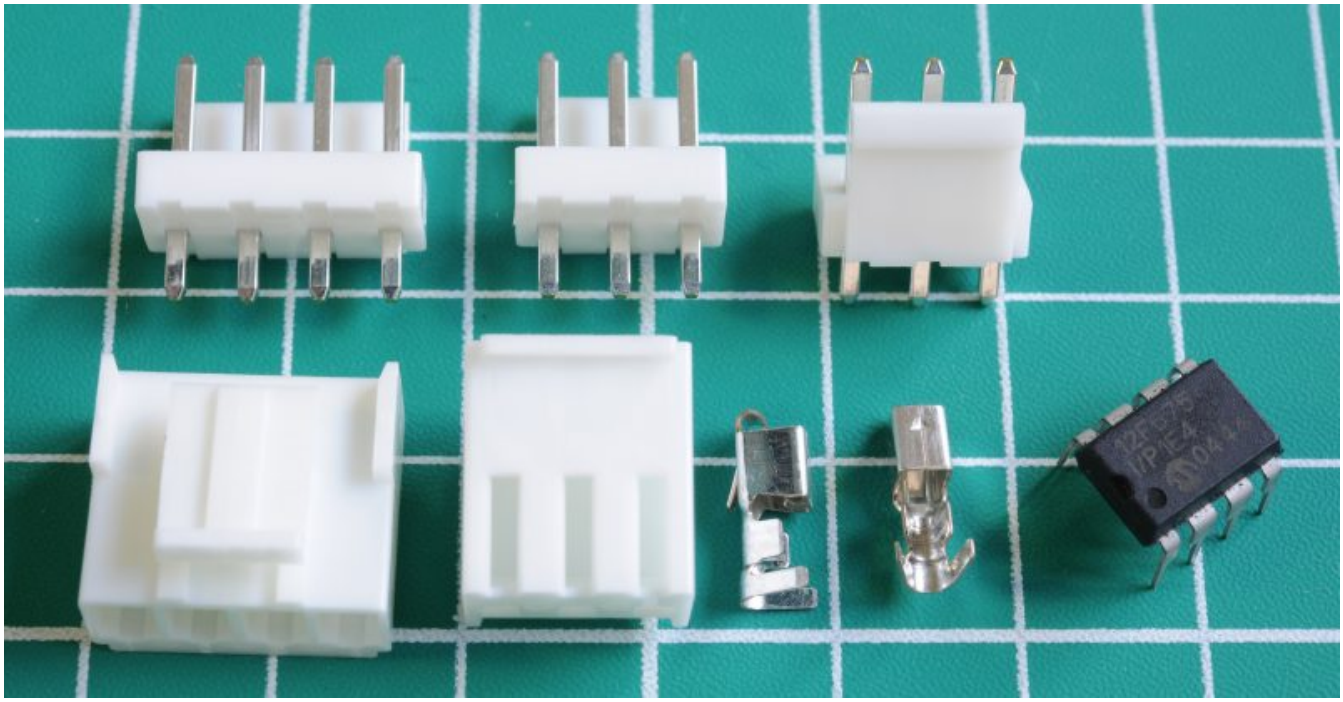
Very similar to the above series, however in a dual row configuration. Commonly used in LCD / LVDS applications.

GH (1.25mm pitch)



Like the above series, also surface mount only however featuring positive latching mechanism and a completely different type of mating surface.

VH (3.96mm pitch)



VH is a larger type of JST connector featuring positive latching and is generally used in high voltage and/or high current connections. Power supply connections in Japanese brand appliances is the most likely place to find them.

Those visiting my site a number of years ago may have seen these pictured, but incorrectly identified as Molex KK .396 connectors. They do look similar, and have the same pitch spacing, but even I didn't know my stuff once upon a time.

Example part numbers

Numbers in bold can be changed to order connectors with a different number of positions.

Contact AWG 18-22 (Bulk packaging)	BVH-21T-P1.1
Contact AWG 18-22 (Strip packaging)	SVH-21T-P1.1
Contact AWG 16-20 (Strip packaging)	SVH-41T-P1.1
Housing 2 position	VHR-**2**N
Housing 4 position	VHR-**4**N
Header 2 position	B**2**P-VH(LF)(SN)
Header 4 position	B**4**P-VH(LF)(SN)
Hand crimp tool AWG 18-22	WC-160
Hand crimp tool AWG 16-20	WC-930

Other types

Just because it isn't listed here, that doesn't mean it's not a JST connector. JST have a huge product range. *Why make just one type of 2.5mm pitch wire-to-board connector when you can make 20?* They're all listed here.

48 thoughts on “Common JST Connector Types”



Stephen Scharfstein says:

January 7, 2021 at 4:43 am

I am looking for a wire to wire quick disconnect connector. 28 AWG wire both male and female. I need connectors only. I think the JST numbers are:
SPAM-002T-P05
SPND-002T-C05

Or similar –

Reply



admin says:

January 7, 2021 at 2:45 pm

PA, while yes, is also wire-to-wire, it’s a fairly obscure connector. It wouldn’t be my first choice for a wire-to-wire system. Molex SL and look-a-likes are better quality and a lot more common.

Reply



Gene says:

January 12, 2021 at 1:22 pm

How about JST SM (wire-to-wire) connectors?
2.5 mm pitch, 3A max current rating.

Reply



admin says:

January 12, 2021 at 1:27 pm

Never seen one of those before, but appears to be popular. Will add it to the list to consider.

Reply



adrian godwin says:

January 8, 2022 at 1:46 am

It's very common on LED strips, especially the addressable (WS2812) type

Reply

Thomas says:

March 1, 2021 at 3:37 am

Oh. My. God.
Im a noob trying to put together an RC model based on HMCS Snowberry by Revel. My task now is to connect Foxeer FPV Cat3 camera to a transmiter but I do not want to solder it. Last 2 days (on/off) I spent looking for wire to wire connectors for 30 AWG….what a nightmare… luckilly I found this site but still it offers a guide but to buy the right thing is another matter.

this JST SM is a great, super idea – thank you so much for it. Seems like my suffering is over.

On that camera there is JST connector with 1mm spread which connects it to a OSD control tool. I was trying to find it …. no luck though. Cramping tool probably does not even exist.

Reply

Jake says:

March 15, 2021 at 2:03 pm

I see you mention that the Hozan P-707 will crimp larger JST contact types (ZH and larger), however is it also a good choice for the smaller types like PH 2.0mm?

Reply

admin says:

March 16, 2021 at 6:07 am

It just works with PH, but I'd say XH and larger is a more appropriate use. What I said there is incorrect. It's too big for ZH.

Reply

Jake says:

March 16, 2021 at 7:31 am

Ahh I see, well I gave it a try and with both the Hozan P-707 and SN-01BM, the insulation crimp is too thick after crimping to fit in the jst ph housing.

So I tried the smaller dies in both tools and it causes an uncomfortable amount of fatigue on the part where the insulation wings are joined to the terminal and the wings tend to wrap around the insulation like a O instead of bite into it like a B.

Any ideas or what do you recommend is the best non official tool for the job?

Reply

Thurston says:

April 29, 2021 at 6:54 pm

I've used a PA-09 with the PH, PHD and GH and been happy enough (but I can relate to the mention of pins getting stuck). Haven't tried the PAD-11 yet. I can also vouch for the superiority of the offical tools. If I needed another tool right now on my own dime I'd buy the IWISS-2820M based on matt's endorsement here..

Reply

Brad Carbaugh says:

May 7, 2021 at 1:14 pm

Hi Matt,
I have a $250 Jabra Evolve headset that is out of warranty. Jabra does not sell replacement batteries. So to them the headset is done. I found a brand new battery and will solderless attach the new male JST type connector. The problem is Jabra will not tell what the connector type is on the small motherboard that resides in the ear piece. If I took a clear picture of the female connector along with measurements might you be able to tell what type it is? Thank you

Reply



S.K. says:

June 22, 2021 at 1:36 pm

I see something very similar to P-707 on sale from IWISS.
IWISS Tool IWS-1442L

Reply



Tim says:

August 6, 2021 at 1:32 am

I've seen ZH for CMOS battery connectors on Thinkpads, and also on an arcade potentiometer (https://www.sensatec.co.jp/e/products/detail.php?product_id=47).

Reply



Adi says:

August 27, 2021 at 6:23 am

Plantower PMS 5003/6003/7003 dust sensors also use them.

Reply



Spence Konde says:

August 20, 2021 at 5:59 am

There is a 1.25mm pitch connector called “micro JST” all over aliexpress. I can find no reference to it on JST’s website – it looks to me like some chinese company took a JST ZH and scaled it down by 1/6th, and decided to market it as “Micro JST” because it *really* looks like something that JST would make, and you’d think they would have something in the tradition of ZH and SH in 1.25, but instead they have the rather strange GH-series which is only used in more niche applications where the higher cost of even knockoff connectors is warranted. They’re **very** common though – wire to board (horizontal and vertical SMD, and straight and right angle through hole) and wire to wire are all readily available. Have you seen these? Would you agree with my assessment that they’re copycat only? Or is there another explanation?

Reply

admin says:

August 20, 2021 at 7:28 am

Hi Spence

I think you are correct. There appears to be just one through-hole JST connector below 1.5mm – “JED”. Not the connector in question here.

(Good work on the cores BTW)

Reply

Spence Konde says:

August 25, 2021 at 8:01 pm

I never understand how they choose which of the holes in the western manufacturers’ product lines they choose to fill

JST-SM wire to board? Not a chance in hell, so everyone has to rig up some way to connect light strings to their PCBs. But a 17% finer pitch smaller basic connector? not only do they have it, they’ve got it in every flavor of the rainbow – wire to wire, wire to board, both angles smt or through hole….

And, thanks 🙂

Reply

admin says:

August 26, 2021 at 8:27 am

Yeah, SM for this application is a curious choice given the limited depth of the family. Interestingly it shares terminals with RCY, a type of connector also frequently seen in this scene. Perhaps the manufacturers don't want to pony up for another set of applicator dies 😉

The answer to your first question is volume. Hobbyists wanting to connect LED strips to PCBs without hassle is unlikely to generate enough volume to be worth designing and tooling up for.

Reply

Markus says:

May 25, 2022 at 12:57 am

What you mean are the HX12501-XAWB (where X is the pincount) connectors. They are handy.

Reply

Spence Konde says:

August 14, 2022 at 4:52 am

Just a little update here. As far as I can tell so called "MicroJST 1.25mm" connectors are actually molex picoblade clones. (obviously not made by JST in any way shape or form)

Reply

admin says:

August 15, 2022 at 11:37 am

Thanks. It really f—'s me off that Chinese manufacturers do this. There is already so much confusion around these connector types.

Reply

Jafet f Espinoza says:

April 7, 2023 at 1:30 am

Is this in fact true I'm looking for some pins for a fpv project the connector is the so say micro jst 1.25

Reply

Tim Robinson says:

August 31, 2021 at 7:15 pm

First, let me offer my profound thanks for all this information! It's pure gold. However, after reviewing all of it, I am unable to identify the male plug I have on some lipo batteries I wish to use in a project. I estimate (with my very old eyes) that the pin spacing is 2.0mm.
At the end that plugs into the female, it is 2.09mm thick, while at the other end it is 2.54mm thick.
Overall width (including the "ears" to key it), it measures 6.52mm. Without the ears, it is 4.55mm wide.
The "ears" are flush with the bottom of the body.
At the wire end, the body measures 4.59 x 2.54mm.

Here's a very crude image of how it looks:

_|==|_
I hope someone can clue me in. Thanks in advance.

Reply

Donald Hamilton says:

October 4, 2021 at 5:44 pm

I am interested in the xhp-2 connectors. how much are they and how many do I have to buy?

Reply

Jim Tompkins says:

November 25, 2021 at 5:11 pm

Hi, can you recommend manufacturers for alternates to JST SR series headers, such as SM02B-SRSS-TB(LF)(SN)? Thanks!

Reply

AL says:

December 1, 2021 at 4:54 am

Thanks for this article, exactly the commentary I needed to get a better grasp of JST's connector zoo.

Reply

Mick Howard says:

February 6, 2022 at 8:53 am

I have a board that utilizes a VH for the higher amp connection, but all other connections on the board (2, 3, and 4 pin) use something identical but smaller. The pitch seems to 2.54 mm. The other difference is the board side is enclosed all the way around the female connector, as apposed to just having the tab for the locking mechanism to interface with protrude from the board.

Reply

SKSSF says:

February 10, 2022 at 5:19 pm

Has anyone found a supplier for a male housing/contact (not header, and inline connector) that will mate with the JST PH female connector? Adafruit sells a cable (https://www.adafruit.com/product/4045) with such a connector on it, but they have not been able to locate the part info or supplier. Thanks!!

Reply

admin says:

February 10, 2022 at 8:14 pm

I had a look through Alibaba. I can't find anyone selling those either. It's quite probable the manufacturer of the cable assembly and connector are one-in-the-same thus the connectors may not yet be available as a separate part. I would be very interested to see if you find it however.

Reply

Edward Horvath says:

March 6, 2022 at 7:18 pm

We are looking for a 6 pin, 1mm, jst looking connector. It is shorter than what I can find online. For a drone application. Any suggestions on how to identify?

Reply

Thomas Varghese says:

May 4, 2022 at 7:46 am

Can you help to identify the JST female connector to be used on a Camera POE Board. I have the photos of the POE board which I could email you if you could advise your email address.

I had ordered few replacement POE boards for CCTV camera, but unfortunately the new POE boards received has different JST male connectors for 2 connectors and the camera manufacturer is not responding to my emails. I need to replace the female pins to matching types to that of POE Board, hence seeking your assistance.

Reply

Bryce Clark says:

May 4, 2022 at 8:56 am

We have a job that needs to use PHR-3, 4 and 5 pin connectors but they seem to be out of stock everywhere I can find to look, all our regular vendors. Do you know any equivalents that will fit these? The harnesses we're building have to mate with other peoples stuff so we

dont have the option to change connector series. Are there any off brands that will mate with PHR Series?

Reply



Thurston says:

September 1, 2022 at 8:55 pm

Thanks to the new era of supply chain issues I've had to research this very question: three Alternate sources I've found and tried for the JST PH series (2mm single row) connectors are as follows- ("p" is the number of positions)
Original JST part numbers PHR-p B8B-PH-K-S(LF)(SN)
AMP makes a clone with part numbers like this: 440129-p (housing) 440054-P (header)
"CVILUX" CI010pS0000 (housing) CI010pP1VK0-NH (header) *letter "i" is second digit*
"Adam Tech" 2CH-C-0p (housing) (can't find the header number right now)

Reply



Allen Pitts says:

May 11, 2022 at 7:40 pm

Hello Matt,
This the best, most well organized info that could be found on JSTs.
Researching just for size, smallest, this what was found.
Part # L W D
502030 32 21 5
601730 32 18 7
103040 41 31 9.6
BLH 4210 42 22 5
653042 44 31 7
502245 47 23 6
ASR00036 48 30 6
423448 50 35 4
603048 50 31 7
883048 50 31 10
603449 51 35 7
963450 52 35 10
103450 52 34 11
103050 52 31 11
553450 52 35 6

103454 56 35 11
553454 56 35 7
654065 66 41 6.6
103395 96 33.5 10
103395 96 34 11

Thanks
Allen

Reply



Atomic Skull says:

June 7, 2022 at 1:33 am

JST SH is teh standard in multirotor flight controller electronics for connecting the FC to things. This is because the CC3D originally used probably because it was the smallest thing they could find. Personally I would have went with Picoblade it's slightly larger at 1.25mm but the PCB side can be soldered into through holes and it has a positive lock, both important in a critical connector that will be used in a high vibration environment . That's why Frsky and most other R/C radio gear manufacturers use Picoblade instead of JST-SH in their mini and micro receivers. It's slightly bigger but also safer to use.

Reply



Russ Taber says:

August 31, 2022 at 4:26 pm

Hey Matt! And others.

Have you ever seen a wear test on connectors? Wondering how many times you can connect and disconnect before failure? Hundreds? Thousands? I have been unable to find any listed data or reports so far.

I'm using JST-RCY connectors for wiring in a puppet to allow for easier disassembly. The puppet maker asked me about the longevity, and never questioned it until she asked. I never heard of them wearing out, but now I am curious.

Thanks.

Reply

will says:

September 21, 2022 at 1:04 am

Hi will here from Australia i have a rc mini Helicopter & i really need a male micro 4 pin to go into a circuit board i have . Do you have this connect have an email i can send you a pic would really appreciate the help i think its a JST Connector & also i want to wire it up to a light have no ideal what wires are positive negative on the board connector
Thanks

Reply

Markus says:

October 30, 2022 at 1:16 pm

Hi, I am looking for a single tool which could crimp…

– “Dupont” style connectors with O shape insulationä
– JST XH/SH/GH/EH/… (B shape)

As both are used in the RC world and also in my DYI electronics (so far I purchased plugs with cables already crimped, but this is quite unflexible).

Is there such tool available? Or would I have to go with two tools? Like the Engineer PAD-11 for the JST stuff and another tool (which one?) for the Dupont O shape insulation style crimps?

Reply

Alexander says:

November 13, 2022 at 10:57 am

What is also fun to know, is that there exists a Chinese HY 2.0 connector, which is very similar to PA, but is not PA, and has nothing to do with JST. Perhaps worth a mention, since I spent a week trying to solve this mystery.

Reply

Maxpower says:

July 26, 2023 at 1:12 am

I wish I'd seen this comment a week ago Alexander! Just solved the same mystery you have.

Trying to work on a Cambridge Audio product, service manual says connectors are JST (PH Type) . . . no they aren't. They are in fact HY 2mm. Shout out to Matt for hosting this awesome blog.

Reply



Cwoods says:

December 18, 2022 at 8:19 pm

Was going to see if I could email you but this seems appropriate to say, holy shit my dude. Answered every question I had and so much that went over my head.

I appreciate how much detail you included, certainly this took a lot of time and effort.

I feel like it's so rare to find things so intricate, formatted well, to the point… Juet wsy too appreciative.

Reply



Atomic skull says:

December 20, 2022 at 3:44 am

SR headers actually do come in a through hole version. The vertical headers up to 14 positions and the right angle headers up to 7 positions. Larger than that an you need to use the SMT version though. In addition to the SH crimped connectors there are also an "SZ" insulation displacement version. SH/SR have become the defacto standard connector on multirotor flight controllers due to being the smallest available connector for a 30x30mm sized (and sometime even smaller) PCB and the need to pack as much as possible into the smallest footprint on said PCB.

Tip: if you are designing a hobby project that uses an SMT SR header where people will be soldering it by hand rather than by machine have the "anchor" pads on either side stick out from under the connector by 2mm otherwise it's very difficult to solder it by hand without melting it.

Reply

Atomic skull says:

December 20, 2022 at 8:35 am

BTW I recently learned that FCI Amphenol and Adam Tech make JST SH 1.0 clones. The FCI version is called Minitek 1.0mm and the Adam Tech version is the CH series. Digikey has both and has them in stock most of the time unlike the JST SH which always seem to be out of stock of whatever number of positions I currently need. Harwin's M40 single row also seems to be a clone but the dimensions of the end are 2.75mm instead of 2.8 so it might be compatible or it might be a "near copy of SH but just different enough to be incompatible" connector like Molex's Picoclasp. I can not tell any difference just from the drawing however.

Reply

Atomic skull says:

December 20, 2022 at 8:40 am

Brain fart, it's the 1CH series which is the Adam Tech version.

Reply

John Bollman says:

January 14, 2023 at 4:32 pm

Quote: "RCY is a small 2 position only connector, and like SM is exclusively wire-to-wire. I've never seen or used one. It appears they're commonly used for small battery packs."

You are correct. These are popular for drones and inexpensive RC cars with 3.7 volt Li-Ion or Li-Poly batteries.

Reply

Morten says:

May 19, 2023 at 7:43 pm

Great overview.
It would be even better, if you would one day add a table with one row per JST connector type, the pitch, other properties (latching etc) and last but not least: current carrying capacity 😉

Reply

W S says:

June 8, 2023 at 6:14 pm

Are there official pin insertion/extraction tools for these connectors? Specifically interested in the JST-GH type connectors.

Reply

Atomic Skull says:

July 31, 2023 at 10:09 pm

Adam Tech CH series connectors are an SH/SR compatible that is available from Digikey. Compared to the genuine JST version they are A. actually in stock (the real SH are constantly out of stock at Digikey) and they cost less too.

Reply

Leave a Reply

Your email address will not be published. Required fields are marked *

Comment

Name *

Email *

Website

Save my name, email, and website in this browser for the next time I comment.

Post Comment