



GDS™ Connector Standard v1.0

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I About This Document

This document describes the connector types and configuration requirements for GDS devices.

- All parts mentioned are RoHS (Restriction of Hazardous Substances Directive 2002/95/EC) compliant.
- This specification defines the minimum requirements for GDS device connectors.

Higher-grade versions could still comply with this GDS standard, for example gold-plated options rather than the tin-plated ones specified.

- All parts have been specified with a Flammability Rating UL 94V-0. There are also compatible UL 94V-2 parts, although there is little extra cost for the highly flame-proof versions.

I.I About GDS

GSA Gaming Device (communications) Standards control the flow of information between a slot machine and the array of peripheral devices operating inside it, including bill validators, card readers and ticket printers using the Universal Serial Bus (USB) standards protocol.

For more details about GSA and the GDS standards, visit: <http://www.gamingstandards.com>.

I.II Acknowledgements

GSA would like to express its appreciation to all members of the GDS committee, past and present, for their significant contribution and dedication to the creation of this standard.

GSA would also like to thank **Molex**® for its support in the efforts of the GDS committee in producing this standard and for its contribution of the drawings and photographs of connectors specified in this standard.

1 Introduction

There are two GDS connector solutions described in the following chapters.

Dual-connector	The first is the dual-connector solution that will be used on all peripherals except the hopper. See Chapter 2 .
Hopper-specific	The second is a hopper-specific single-connector solution that will be used to provide the hopper with blind mating of USB and power within the same connector. See Chapter 3 .

2 GDS Dual-Connector

This connector solution is for peripherals other than the hopper.



Figure 2.1 Molex® Mini-Fit Jr.™ Connectors (<http://www.molex.com/product/power/jr.html>) for GDS Dual-Connector Solution

2.1 Host Power (Plug)

Use a Molex® Series 5557 Mini-Fit Jr.™ Connector

Part Number: 39-01-4041

Basic Specifications of this series:

- Single row 4.2mm (0.165") Pitch
- Positive Housing lock for secure mating retention
- Current rating – 8A
- Flammability Rating – UL 94V-0
- Operating Temperature: -40°C to +105°C
- RoHS Compliant

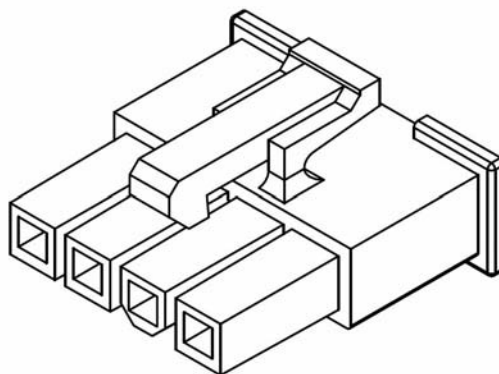


Figure 2.2 Molex® Series 5557 Mini-Fit Jr.™ Connector

NOTE: This part should be loaded with standard Molex® crimp terminals such as part number: 39-00-0077.

2.2 Peripheral Power (Header or Socket)

These connectors are based on the Molex® Mini-Fit Jr.™ product range. See [Figure 2.3](#).

Part numbers 43588-0018 and 43232-0007 each come pre-loaded with longer first mate last break pins in the two center positions.

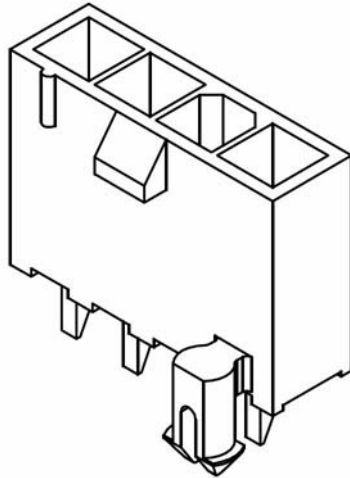
The free hanging version (part number 39-01-4047) uses two different lengths of crimp terminals that must be ordered separately. Long grounding pins MUST be installed in the two center positions of this part to be GDS compliant.

Basic specifications of this series:

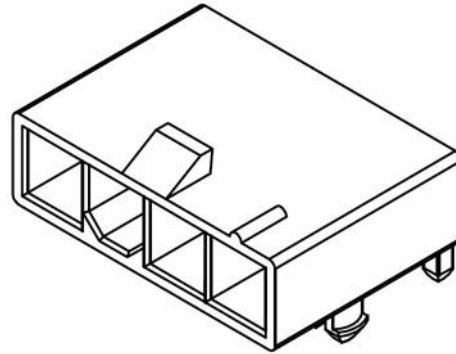
- Single row 4.2mm (0.165") Pitch
- Positive Housing lock for secure mating retention
- Current rating – 8A
- Flammability Rating – UL 94V-0
- RoHS Compliant
- Operating Temperature: -40°C to +105°C
- Compatible with commonly available Molex® 5557 Mini-Fit Jr.™ plugs.

Vertical PCB Mount with Pegs

PN: 43588-0018, Tin Plated

**Right-Angle PCB Mount with Pegs**

PN: 43232-0007, Tin Plated

**Free-Hanging**

PN: 39-01-4047

Crimp Terminal part numbers

(standard length 16AWG)

Bag: 39-00-0131

Reel: 39-00-0130

Ground pin part numbers (long length 18-24AWG)

Bag: 30490-2012

Reel: 30490-2002

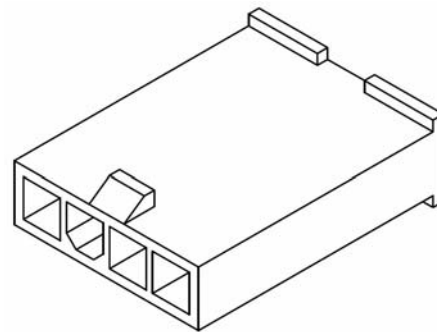


Figure 2.3 Molex® Connector and Pin Details

NOTES:

1. The custom Mini-Fit Jr.™ headers and sockets above will all mate with the host's standard Molex® 5557 Mini-Fit Jr.™ Series connector – [See section 2.1.](#)
2. Ground pins must be long Molex® version.

2.3 Pinouts

For the Molex® power connector in the dual-connector solution the pins have been assigned as follows.

Table 2.1 Pinouts

Pin	Mating Order	Allocation	Molex® Crimp Terminal Part Numbers (for 39-01-4047 ONLY)
1	mate last	12V	Bag: 39-00-0127 Reel: 39-00-0126
2	mate first	Ground	Bag: 30490-2012 Reel: 30490-2002
3	mate first	Ground	Bag: 30490-2012 Reel: 30490-2002
4	mate last	+24V	Bag: 39-00-0127 Reel: 39-00-0126

NOTE: Parts listed are for 18-24AWG pins. Other sizes are available.

2.4 USB Connectors

Two USB connector types are proposed for use with the Molex power connector as part of the dual-connector solution. These are 'Type MINI-B' and 'Type B' connectors

Coin acceptors must use Type MINI-B.

All other GDS peripherals must use Type B to remain GDS compliant.

3 Hopper Connector

Hoppers must use the Positronic Goldfish Connector slightly customized to meet GDS requirements.

Only the allocated pins are to be populated with the correct pin length, as shown in Table 3.1. The Positronic Goldfish Connector has **three pin lengths** to allow for three guaranteed levels of mating order.

For more information regarding the connector family, visit:

http://www.connectpositronic.com/pdf/Goldfish_A001RevA.pdf

3.1 Pinouts/Mating Order

Table 3.1 Pinouts/Mating Order

Pin Number	Mating Order	Allocation
19	mate second	Power GND
16	mate last	+24V
6	mate last	D+
5	mate last	D-
3	mate second	USB GND
4	mate second	Vbus
1	mate first	USB Shield

3.2 Part Numbers

Table 3.2 Male Parts

Quantity	Part Number	Description
1	GFSH109M1H-PA399	Housing
1	MC120N-PA387	Longest pin
3	MC120N-PA388	Mid pin
3	MC120N-PA390	Shortest pin

Table 3.3 Female Parts

Quantity	Part Number	Description
1	GFSH109F183-PA399	Housing
7	FC120N2-PA411	Extended pin

NOTE: These part numbers are for custom parts, and differ slightly from the above data sheet.

3.3 Mating Tolerance

Full mating of all pins is guaranteed for these connectors when they are within 0.8mm of the fully mated position. It is intended that designers would aim to mate the connectors to within 0.4mm of the fully mated position in order to give +/- 0.4mm tolerance.

The float mount bushes supplied with the connector are intended to be used for mounting the connector to a 2.5mm thick surface.

The female housing will be mounted to the hopper. The male housing will be mounted to the EGM.

4 Conclusion

Peripheral manufacturers benefit from the power connector options in the standard Molex® Mini-Fit Jr.™ connector range, including free-hanging versions, and vertical and right-angle PCB mount versions. These options should satisfy all design requirements for device manufacturers.

For host EGM manufacturers, the mating half of the power solution is commonly available from Molex® distributors and is generally a stocked item. The USB connectors used by peripherals will remain the same for all devices of the same type i.e. MINI-B for all coin acceptors and type B for everything else (except the hopper).

The Goldfish hopper connector is custom-made to suit GDS requirements, satisfying the mating tolerances and mating ordering.

Appendix A Power Consumption

Power Consumption figures for all GDS peripherals must fall within the limits as detailed in the table below.

Table A.1 Power Consumption Limits

Device Name	Operating Voltage	Maximum Current (continuous)	Peak Current
Coin Acceptor	12	1A	2A
Note Acceptor	24	1A	3A
Printer	24	3A	5A
Card Reader	24	500mA	1A
Touch Screen	5	300mA	500mA
Hopper	24	2A	4A
Bill to Bill	24	3A	4A

END OF DOCUMENT

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