

SIHD

The monolithic connector for use with thermal clamps

The SIHD connector combines excellent electrical performances with high contact density within a robust housing, which can withstand extreme environmental conditions. In addition, the lateral displacement capability allows the use of thermal clamps for heat management, as well as a more relaxed positional tolerance on the backplane. The optional central ground strip provides cross talk protection and permits the routing of differential pairs. Contacts can be repaired and replaced individually.

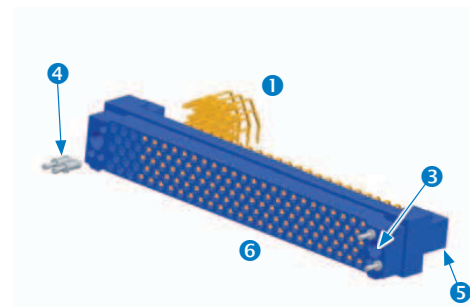
The ability to include ground strips

- Transmission of high-speed signals made easy by reducing self inductance with the inclusion of central ground strips
- Cross talk and self impedance levels reduced impedance 70Ω to 120Ω
- Capacitance distributed along signal contacts

Compatible with the use of thermal clamps

Its standard contact technology, already used in the SIAL connector, permits the lateral displacement (± 0.25 [.010]) of the pin into the socket without generating any stress on the contact termination on the PCB.

This feature allows the use of thermal clamps to keep the daughter board in position after mating, as well as the dissipation of energy generated by the components on the board from the heat sink (thermal drain) to the cold wall (liquid cooled) or to the chassis. The locking of the thermal clamps provides the lateral movement of the plug into the receptacle. The SIHD allows this lateral displacement of ± 0.25 [.010] without creating stress on the solder joints or on the contact area.



QUICK SELECTION GUIDE

Signal contacts ①	Ground Strip ②	Guiding ③	Keying ④	Fittings ⑤	Housings ⑥
<p>FEMALE</p> <p>MALE</p>	<p>Reduced cross talk level</p> <p>Reduced self impedance level</p> <p>Capacitance distributed along signal contacts</p>	<p>A STYLE For M1W3 contacts</p> <p>B STYLE For M1YD contacts</p> <p><i>Fixing of receptacle</i></p>	<p>250 positions available</p> <p>10 holes</p> <p>5 pins on the plug</p> <p>5 pins on the receptacle</p>	<p>For receptacles: style A and B (guiding)</p> <p>For plugs: fixing on thermal drain or on PCB</p>	<p>Without ground strip: 128, 158, 256, 390</p> <p>With ground strip: 102C, 204C, 230C</p>
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The SIHD series serves various markets, including:



Military avionics & airframe



Commercial avionics & airframe

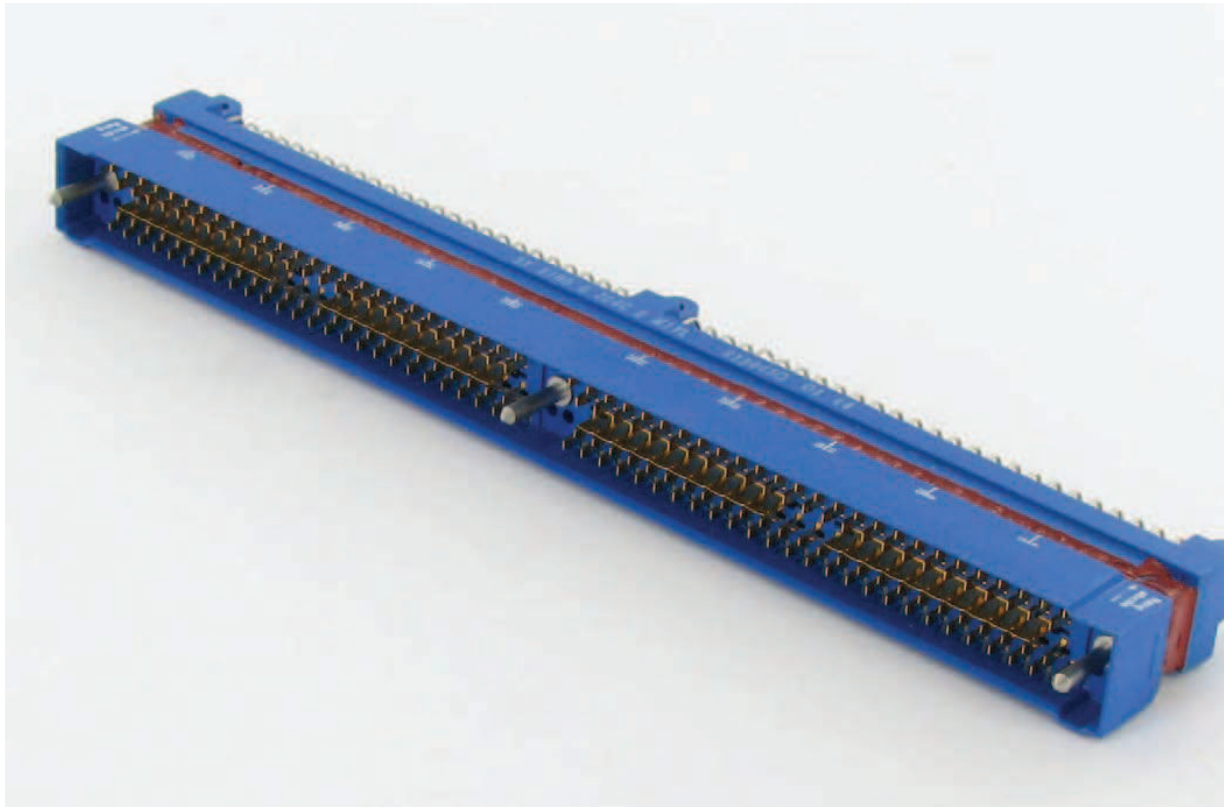


Navy



Space

All dimensions are given for information only and are in mm [inch], except as otherwise specified



SIHD Series

SIHD Series

The monolithic connector for use with thermal clamps

SIHD product range	88
Female signal contacts for plugs	90
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SIHD >>> GENERAL SPECIFICATIONS

MEDIUM
DENSITY

- 2.54 [.100] staggered grid (1.27 [.050] offset), 1.905 [.075] between rows
- Lateral displacement capability allowing the use of thermal clamps: $\pm 0.25 [\pm .010]$
- Possibility to have a central ground strip
- Designed for severe mechanical environments
- Low weight

Terminations



Recommended configurations



Main characteristics

- Medium density: 0.14 cts/mm² [90 cts / inch²]
- 7 variations: 5 rows from 102 to 390 signal contacts
- 3 A per signal contacts / DWV: 750* Vrms
- Lateral rails to protect the male contact from external damage
- Repairable contacts for easy maintenance

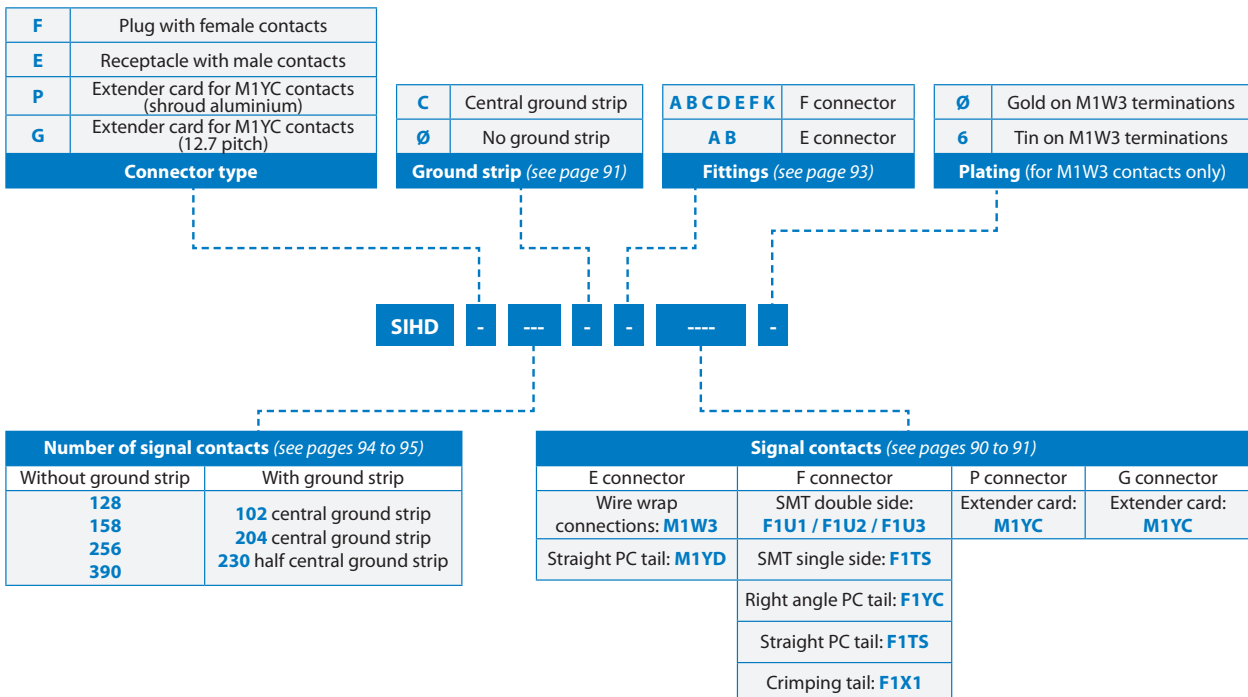
Markets



Main applications



How to order

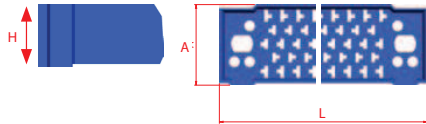


* 375Vrms only for F1U2 cts

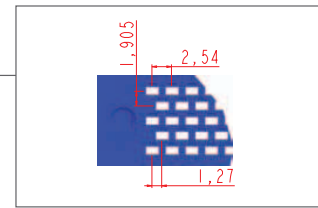
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SIHD >>> TECHNICAL SPECIFICATIONS

DIMENSIONAL CHARACTERISTICS



H = 16.9 to 17.95 [.665 to .707] for plug
 H = 10.22 to 11.15 [.402 to .439] for receptacle
 A = 11.6 to 15 [.457 to .591]
 L = 77.86 to 221 [3.065 to 8.701]



FEMALE CONTACT



Cross cavity by Amphenol: lateral displacement compatible

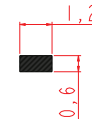
- Cross section of the lateral displacement of the male contact inside the female cavity
- Maintains 2 points of contact
- Allows a ± 0.25 [$\pm .010$] lateral displacement
- No stress on solder joints or on the contact area

Material: beryllium copper (stamped)

Plating:

- Terminations: gold over nickel on crimp contacts (F1X1) tin lead or lead free on other contacts (F1U1, F1U2, F1U3, F1TS, F1YC)
- Active contact area: gold over nickel

MALE CONTACT



Mating end size: 0.6 x 1.2 [.047 x .024]

Contact section (mating side): 0.72 mm² [.001 in²]

Material: phosphorous bronze (stamped)

Plating:

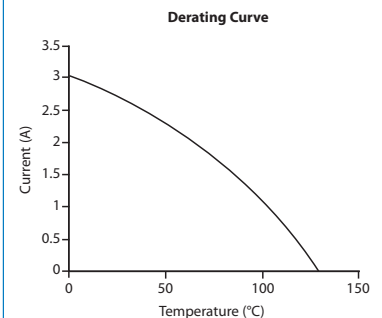
- Terminations: gold over nickel on crimp contacts (M1W3) tin lead or lead free on straight PC tail contact (M1YD)
- Active contact area: gold over nickel

MATERIALS

- **Guiding devices:** passivated stainless steel 303
- **Polarising pins:** passivated stainless steel 303
- **Plastic insert:** thermoset DAP, 40% glass fiber filled

MECHANICAL CHARACTERISTICS	
Backoff ¹ (mm)	1
Mating force per contact (N)	0.58 ^{MAX}
Unmating force per contact (N)	0.16 < F < 0.58
Durability cycles	500
Sinusoidal vibrations (10 to 2000 Hz) micro discontinuity 10 ns	
- unloaded PCB	20 g
- loaded PCB	10 g
Random vibrations (50 to 2000 Hz) micro discontinuity 10 ns	0,1 g ² /Hz
Shocks 6ms 1/2 sinus micro discontinuity 10 ns	100g
Recommended tightening torques	
- nuts for Ø 2 mm screws, brass m.N	0.2
- nuts for Ø 2.5 mm screws, brass m.N	0.25
ENVIRONMENTAL CHARACTERISTICS	
Thermal shocks (°C)	-55 / +125
Salt Spray (hours)	96
Humidity	
Days	56
Temperature (°C)	40
Humidity rate (%)	90-95
ELECTRICAL CHARACTERISTICS	
Current rating per contacts (A)	3 - See derating curve
Insulation resistance (GΩ)	5 ^{MIN}
Contact resistance (mΩ)	12 ^{MAX}
Dielectric Withstanding Voltage (Vrms)	750*
Capacitance between contacts (pF)	2.5 ^{MAX}
Self induction (nH)	25 ^{MAX}
Immunity against noise of groundings for connectors with central ground strips	Noise ≤ 400mV for 0.1 A intensity per contact and signal rise time of 2ns

¹: When both connectors are fully mated, the backoff is the maximum distance the connectors can be unmated while functioning properly

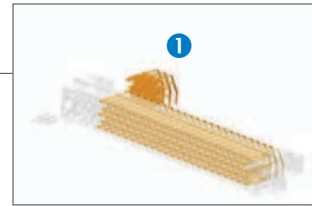


* 375Vrms only for F1U2 cts

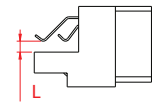
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SIHD >>> SIGNAL CONTACTS (1)

FEMALE CONTACTS FOR PLUGS WITHOUT GROUND STRIP



Double sided SMT



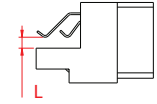
- SMT soldering
- Double sided daughter board
- Surface mount area: 0.7x0.8 [.028x.031]
- PCB thickness: 2.3 to 3.2 [.091 to .126]



Termination style

F1U1

Double sided SMT



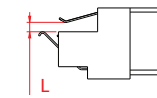
- SMT soldering
- Double sided daughter board
- Surface mount area: 0.7x0.8 [.028x.031]
- PCB thickness: 4.56 to 5.37 [.180 to .211]



Termination style

F1U2

Double sided SMT



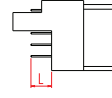
- SMT soldering
- Double sided daughter board, offset
- Surface mount area: 0.7x0.8 [.028x.031]
- PCB thickness: 1.8 to 2.65 [.071 to .104]



Termination style

F1U3

Straight solder PC tail



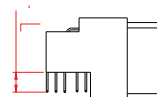
- Straight solder PC tail
- Thru hole soldering
- Daughter board



Termination style

F1TS

Right angle solder PC tail



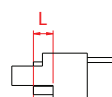
- Thru hole soldering
- Daughter board
- PCB thickness
- With heat sink: 2.9 to 3.41 [.114 to .134]
- Without heat sink: 1.4 to 1.8 [.055 to .071]



Termination style

F1YC

Crimp barrel



- Crimping on wire
- AWG gauge 22 to 28



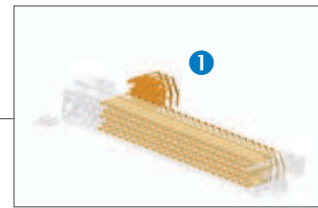
Termination style

F1X1

	F1U1	F1U2	F1U3	F1TS	F1YC	F1X1
L_{MAX}	3.21 [.126]	5.37 [.211]	2.65 [.104]	5.5 [.217]	With heat sink: 4.4 [.173] Without heat sink: 2.8 [.110]	2.9 [.114]
Termination section	0.6 x 0.25 [.024 X .010]				$\varnothing 0.5 \pm 0.03$ [.020 \pm .001]	$\varnothing 1.3$ [.051]
Active contact area plating μm [μin]	2 [.080] Ni + 1 [.039] Au					
Termination plating μm [μin]	2 [.080] Ni + 7 [.276] SnPb or bright pure Sn for RoHS version				2 [.080] Ni + 3 [.118] SnPb or bright pure Sn for RoHS version	2 [.080] Ni + 1 [.039] Au

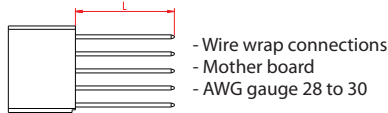
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SIHD >>> SIGNAL CONTACTS & GROUND STRIP TECHNOLOGY (1 & 2)



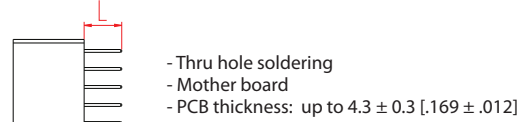
MALE CONTACTS FOR RECEPTACLES WITHOUT GROUND STRIP (1)

Wire-wrap



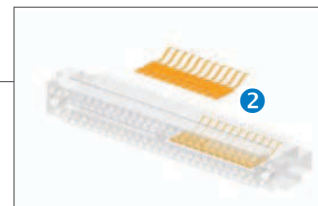
Termination style **M1W3**

Straight solder PC tail



Termination style **M1YD**

	M1W3	M1YD
L	14.75 ± 0.45 [.581 ± .018]	5.3 ± 0.3 [.209 ± .012]
Termination section	Ø 0.82 ± 0.04 [.032 ± .002]	Ø 0.5 ± 0.03 [.020 ± .001]
Mating end size	1.2 x 0.6 [.024 x .047]	
Active contact area plating µm [µin]	2 [.080] Ni + 1 [.039] Au	
Termination plating µm [µin]	2 [.080] Ni + 0.2 [.008] Au for standard version or 2 [.080] Ni + 3 [.118] SnPb for tinned version or 2 [.080] Ni + 3 [.118] bright pure Sn for RoHS version	2 [.080] Ni + 3 [.118] SnPb or bright pure Sn for RoHS version



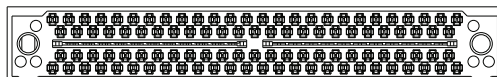
GROUND STRIP TECHNOLOGY (2)

Ground strip benefits



- Reduced cross talk level
- Impedance 70Ω to 120Ω
- Reduced self impedance level
- Capacitance distributed along signal contacts

Central ground strip technology



Arrangements available: 102 & 204 signal contacts
Compatibility: M1YD, M1W3, F1YC, F1U1, F1U2 & F1U3

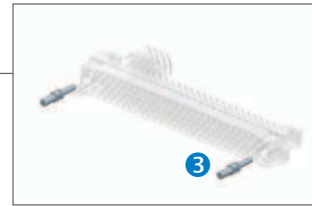
Note: ground strip has the same termination and active contact area platings as the contacts with which its mounted

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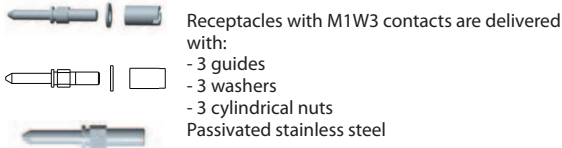
SIHD >>> GUIDING (3) & KEYING (4)

GUIDING (3)

The guides are the fixing accessories for receptacles



A style

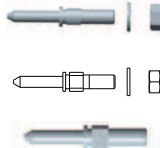


Receptacles with M1W3 contacts are delivered with:
 - 3 guides
 - 3 washers
 - 3 cylindrical nuts
 Passivated stainless steel

SIHD E --- A M1W3

A

B style

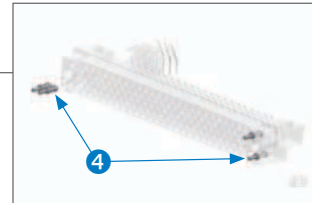


Receptacles with M1YD contacts are delivered with:
 - 3 guides
 - 3 washers
 - 3 hexagonal nuts
 Passivated stainless steel

SIHD E --- B M1YD

B

KEYING (4)

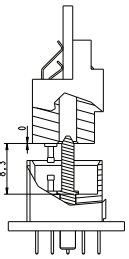
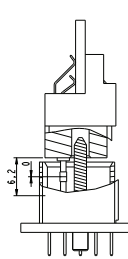
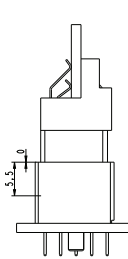
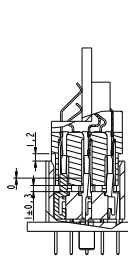
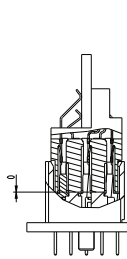


Polarizing pins



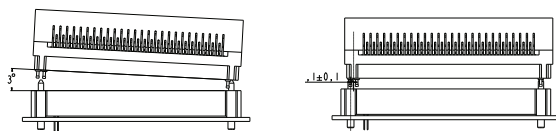
- More than 250 different positions available
- 5 pins delivered with each connector – Plug and receptacle have 10 holes
- Among the 10 holes of the plug, 5 of them have to be equipped with one pin
- Among the 10 holes of the receptacle, 5 of them have also to be equipped with one pin
- If pins are located in opposite holes for both plug and receptacle, mating is not possible

MATING SEQUENCE

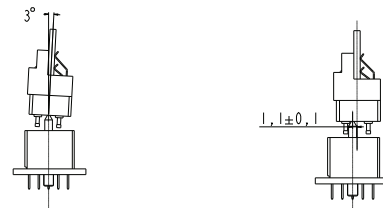
Guiding	Keying	Housing contact	Signal contact	Mated connector
				
8.3 [.327]	6.2 [.244]	5.5 [.217]	1 ± 0.3 [.039 ± .012] 1.2 [.047]	0

REALIGNMENT CAPABILITY

In the longitudinal axis



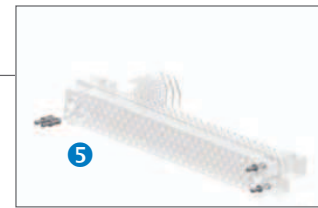
In the lateral axis



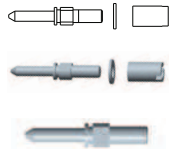
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SIHD >>> FIXING ACCESSORIES (5)

FIXING ACCESSORIES FOR RECEPTACLES = GUIDING



A style

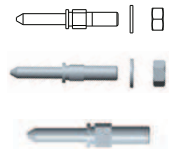


Receptacles with M1W3 contacts are delivered with:
 - 2 or 3 guides
 - 2 or 3 washers
 - 2 or 3 cylindrical nuts
 Passivated stainless steel

SIHD E --- A M1W3

A

B style



Receptacles with M1YD contacts are delivered with:
 - 2 or 3 guides
 - 2 or 3 washers
 - 2 or 3 hexagonal nuts
 Passivated stainless steel

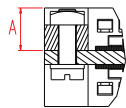
SIHD E --- B M1YD

B

FIXING ACCESSORIES FOR PLUGS

PCB with a thermal drain

A style - For F1U1/F1U2 female contacts



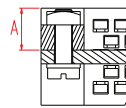
- Mounted to heat sink
 - PCB with a heat sink
 Passivated stainless steel

SIHD F --- A F1U1
 SIHD F --- A F1U2

A

PCB without a thermal drain

D style - For F1YC female contacts

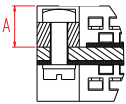


- Mounted to PCB
 - PCB without a heat sink
 Passivated stainless steel

SIHD F --- D F1YC

D

B style - For F1U1 female contacts

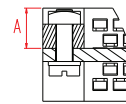


- Mounted to PCB
 - PCB with a heat sink
 Passivated stainless steel

SIHD F --- B F1U1

B

E style - For F1U3 female contacts

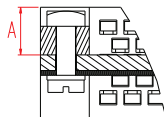


- Mounted to PCB
 - PCB without a heat sink
 Passivated stainless steel

SIHD F --- E F1U3

E

C style - For F1YC/F1T female contacts

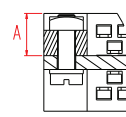


- Mounted to PCB
 - PCB with a heat sink
 Passivated stainless steel

SIHD F --- C F1YC
 SIHD F --- C F1T

C

F style - For F1X1 female contacts



- Mounted to PCB
 - PCB without a heat sink
 Passivated stainless steel

SIHD F --- F F1X1

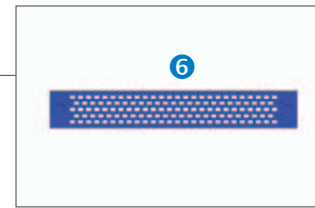
F

Fixing accessories for plugs equipped with female contacts						
	A style	B style	C style	D style	E style	F style
A_{MIN}	F1U1 4.16 [.164] F1U2 3.08 [.121]	F1U1 4.16 [.164]	F1YC 7.72 [.304]	F1YC 7.62 [.300]	F1U3 7.61 [.300]	F1X1 4.93 [.194]

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SIHD >>> WITHOUT GROUND STRIP (6)

ARRANGEMENTS



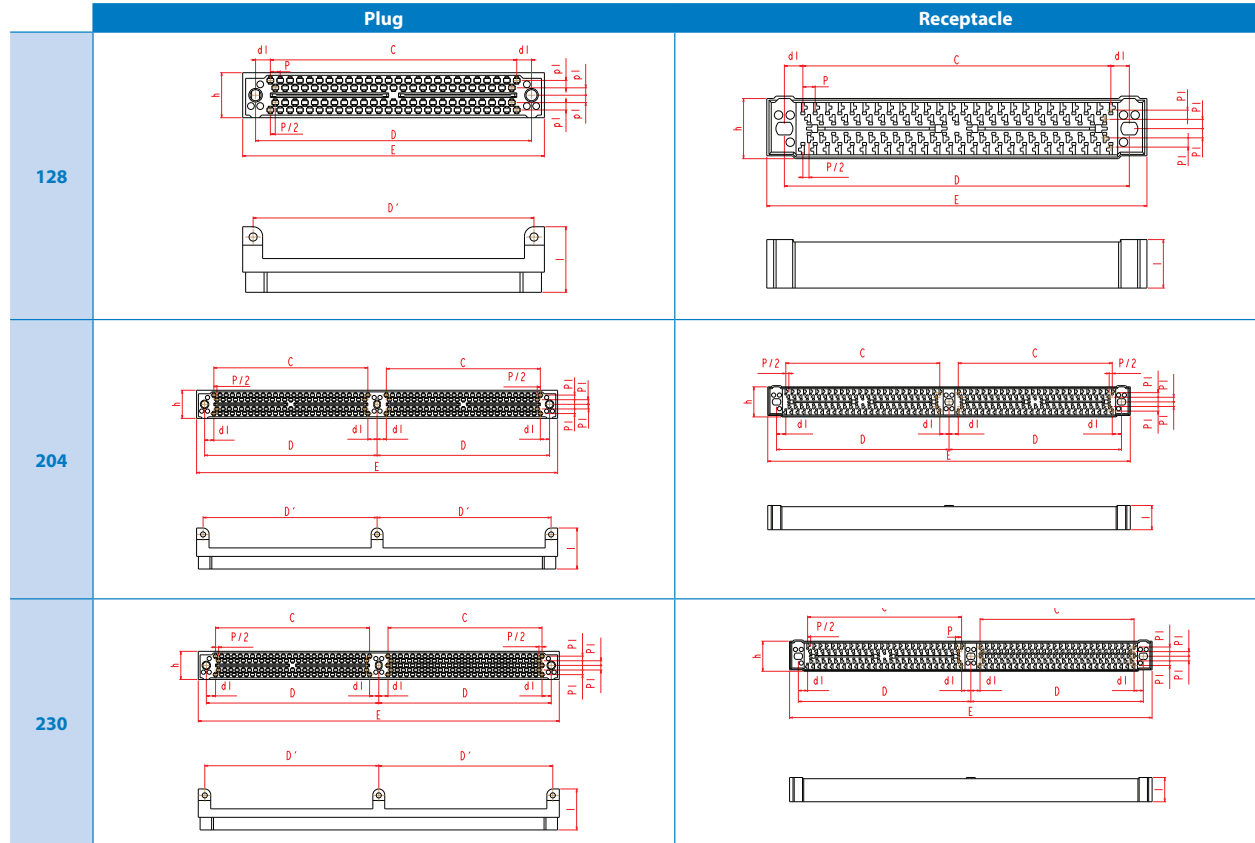
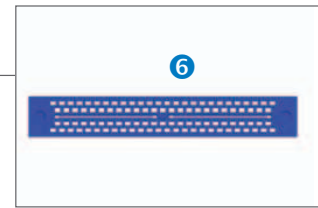
	Plug		Receptacle	
128				
158				
256				
390				

Nb of contacts	128		158		256		390	
	Plug	Receptacle	Plug	Receptacle	Plug	Receptacle	Plug	Receptacle
C	63.5 [2.500]		78.74 [3.100]		63.5 [2.500]		96.52 [3.800]	
D	71.12 [2.800]		86.36 [3.400]		71.12 [2.800]		106.68 [4.200]	
E _{MAX}	77.86 [3.065]	78.38 [3.086]	93.1 [3.665]	93.62 [3.686]	148.98 [5.865]	149.5 [5.886]	220.35 [8.675]	221 [8.701]
h _{MAX}	11.6 [.457]	12.4 [.488]	11.6 [.457]	13.4 [.528]	11.6 [.457]	12.4 [.488]	11.75 [.463]	15 [.591]
D'	72.39 [2.850]	/	87.63 [3.450]	/	71.755 [2.825]	/	106.68 [4.200]	/
l _{MAX}	16.9 [.665]	10.3 [.406]	16.9 [.665]	11.15 [.439]	16.9 [.665]	10.3 [.406]	17.95 [.707]	10.2 [.402]

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SIHD >>> WITH GROUND STRIP (6)

ARRANGEMENTS



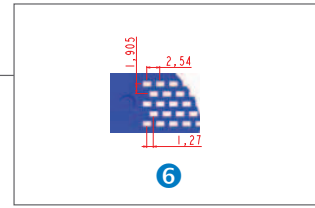
Nb of contacts	Plug			Receptacle		
	102	204	230	102	204	230
C	63.5 [2.500]					
D	71.12 [2.800]					
E _{MAX}	77.86 [3.065]	148.98 [5.865]		78.38 [3.086]	149.5 [5.886]	
h _{MAX}	11.6 [457]			12.4 [488]		
D'	72.39 [2.850]	71.755 [2.825]		/		
I _{MAX}	16.9 [665]			10.3 [406]		

All dimensions are given for information only and are in mm [inch], except as otherwise specified

SIHD >>> WITHOUT GROUND STRIP (6)

LAYOUTS

The boards are shown from the connector side.
All contact locations are equidistant.
n indicates the total number of signal contacts.



F1U1/F1U2 CONTACT (female for plug)*

n = 128, 158, 256 or 390

C ₁	C - p = C - 2.54
C	See pages 94 & 95
D	See pages 94 & 95

F1YC CONTACT (female for plug)*

n = 128, 158, 256 or 390

C	See pages 94 & 95
D	See pages 94 & 95

M1W3/M1YD (male for receptacle)*

n = 128, 158, 256 or 390

C	See pages 94 & 95
D	See pages 94 & 95

R1	R2	R3	h	h1	h2	h3	h2 _{MAX}
Ø 2.3 ^{+0.05} ₊₀ [.091 ^{+0.002} ₊₀]	Ø 0.6 _{MIN} [.024] 0.9 _{MIN} for W3 contacts	Ø 2.75 ^{+0.05} ₊₀ [.108 ^{+0.002} ₊₀]	3.75 [.148]	1.845 [.073]	3.175 [.125]	0.575 [.023]	4.35 _{MAX} [.171]

d1	d2	d3	d4	d5	p1	p	2p	p/2
3.81 [.150]	4.445 [.175]	2.7 ^{+0.1} ₊₀ [.106 ^{+0.004} _{+0.000}]	4.47 [.176]	3 ± 0.1 [.118 ± .004]	1.905 [.075]	2.54 [.100]	5.08 [.200]	1.27 [.050]

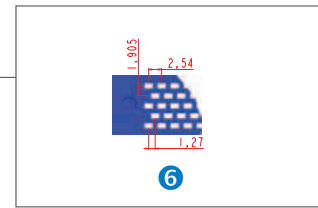
* in mm: 1mm = 0.03937 inch

All dimensions are given for information only and are in mm [inch], except as otherwise specified

SIHD >>> WITH GROUND STRIP (6)

LAYOUTS

The boards are shown from the connector side.
All contact locations are equidistant.
n indicates the total number of signal contacts.



F1U1/F1U2 CONTACT (female for plug)*

C₁	C - p = C - 2.54
C₃	(C - 5p) / 2
C	See pages 94 & 95
D	See pages 94 & 95

F1YC CONTACT (female for plug)*

C₁	C - p = C - 2.54
C₃	(C - 5p) / 2
C	See pages 94 & 95
D	See pages 94 & 95

M1W3/M1YD (male for receptacle)*

P₂	C / 2
C	See pages 94 & 95
D	See pages 94 & 95

R1	R2	R3	R4	p1	p	2p	p/2
Ø 2.3 ^{+0.05} ₊₀ [.091 ⁺⁰]	Ø 0.6 ^{MIN} [.024] 0.9 ^{MIN} for W3 contacts	Ø 2.75 ^{+0.05} ₊₀ [.108 ^{+0.002}]	Ø 2.7 ^{MAX} [.106]	1.905 [.075]	2.54 [.100]	5.08 [.200]	1.27 [.050]

d1	d3	d5	h	h1	h2	h3	h2 ^{MAX}
3.81 [.150]	2.7 ^{+0.1} ₊₀ [.106 ^{+0.004}]	3 ± 0.1 [.118 ± .004]	3.75 [.148]	1.845 [.073]	3.175 [.125]	0.575 [.023]	4.35 ^{MAX} [.171]

* in mm: 1mm = 0.03937 inch

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