

Amphenol SOCAPEX

*SIAL - SIHD*

# Board Level Products

Board to Board Interconnect Solutions



# Table of Contents

About Amphenol .....	4
<b>SIAL - The hybrid connector for use with thermal clamps</b>	
SIAL product range .....	8
Signal contacts .....	12
Special contacts .....	14
Signal modules .....	16
Hybrid modules .....	16
Fittings and guiding .....	17
Keying .....	17
Realignment capability .....	17
Mating sequence .....	17
SIAL signal version typical arrangements .....	18
SIAL signal version layouts .....	20
SIAL coaxial version typical arrangements .....	21
SIAL coaxial version layouts .....	22
Tooling .....	24
<b>SIHD - The monolithic connector for use with thermal clamps</b>	
SIHD product range .....	26
Female signal contacts for plugs .....	30
Male signal contacts for receptacles .....	31
Ground strips .....	31
Guiding / Keying .....	32
Mating sequence .....	32
Realignment capability .....	32
Fixing accessories .....	33
SIHD without ground strip typical arrangements .....	34
SIHD with ground strip typical arrangements .....	35
SIHD without ground strip layouts .....	36
SIHD with ground strip layouts .....	37



## ABOUT AMPHENOL SOCAPEX



### Proven excellence in interconnect solutions

Since **1947**, Amphenol Socapex has prescribed, designed and manufactured reliable and innovative interconnection solutions for **harsh environments**, specializing in standard and customized electrical and fiber optic connectors, contacts, accessories and cabling solutions.

Located in the **Mont Blanc** region of France and Pune in India, Amphenol Socapex has a presence in over 100 countries around the world.

Amphenol Socapex is part of the international **Amphenol Corporation**.



**800+** employees

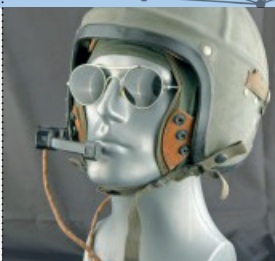


Net Sales 2018: **72,5 M€**  
68% Export - 32% France



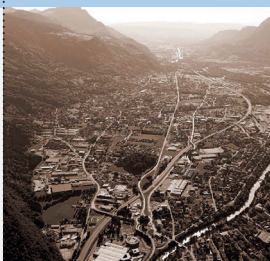
Two facilities :  
**Thyez** (France), **Pune** (India)

**1947**



- Socapex creation in Suresnes, France
- 1<sup>st</sup> radio connector

**1956-57**



- Manufacturing unit in Cluses (74), France
- Thomson-CSF becomes primary shareholder

**Early 1960's**



- 1<sup>st</sup> board level connectors: HE8
- 1<sup>st</sup> "licence Bendix" manufactured connectors
- SL Series launch

**1973**



- New factory 13 000 m<sup>2</sup> in Thyez (74) France with 250 people

**1975**



- Production of 38999 connectors

**OUR HISTORY**

**2014-2017**



Quadrax Contacts

Cable Assembly

**Today and tomorrow | New technologies**



Miniaturization  
High-speed signals

Miniaturization  
ROHS solutions  
Power

Fiber optics  
Rugged Ethernet

Power  
Rugged Ethernet

Fiber optics  
ROHS solutions

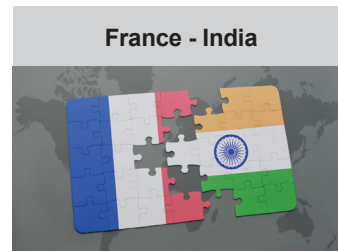


# INTERNATIONAL EXPERTISE



## Our expertise has no boundaries

- Integrated Production in France & India**
- **24 000 m<sup>2</sup>** manufacturing capacity on 2 sites
  - Design centers in **France** and **India**
  - State-of-the-art manufacturing technology



## Our markets





**Military**

Communication Systems - Radios - C4ISR / Ground vehicles - Vetronics / Marine / Missiles



**Aviation**

Commercial & military / Avionics / Engines / Landing gear / Actuators

<p><b>1986</b></p>  <p>- Amphenol becomes primary shareholder</p>	<p><b>1995-96</b></p>  <p>- Expanded Beam connector CTOS launch - Headquarters transferred to Thyez</p>	<p><b>2004</b></p>  <p>- RJ Field launch, "Award Electronica"</p>	<p><b>2005</b></p>  <p>- Opening of manufacturing site in Pune, India</p>	<p><b>2010's</b></p>  <p>- LuxBeam™ and HDAS launch</p>
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## Today and tomorrow | Sustainable development



**Respect for nature and the environment**

Optimization of natural resources    Recycling    Goodwill    Waste Management

Optimization of natural resources

Goodwill    Waste Management    Respect for nature and the environment

## PRODUCING FASTER, SMALLER, STRONGER CONNECTORS...



### Technologies & innovation

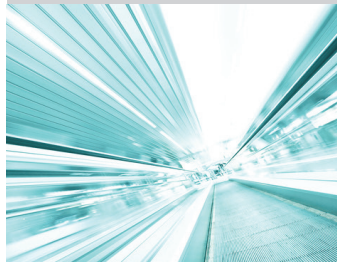
#### Technological Center



**Engineering Laboratory for product testing and qualification, product expertise and metrology**

- Mechanical and electrical skills
- RF and fiber optics expertise

#### High-Speed Expertise



**Strong expertise in high-speed signals**

- 3D EM simulation software & EM models
- Time Domain and frequency domain (VNA 20GHz, TDR and eye diagram)

#### Materials Expertise



**Focus on materials expertise and manufacturing techniques to produce faster, smaller and stronger products**

- 3D CAD mechanical software, simulation & analysis
- Disruptive metal alloys, additive manufacturing

#### Eco-responsibility



**Sustainable environment approach, with pro-active management of regulations (REACH / RoHS / Conflict minerals...)**

- New materials development, plating, and suitable processes
- Recycling and rational resources consumption

### Our workshops

Our workshops located in France & India provide consistent quality adapted to your volume requirements.

**Molding** : Solid expertise in thermoplastic elastomer and thermoset molding

**Machining** : Manufacturing of cylindrical shells from 10 to 90 mm in diameter and rectangular shells

**Screw Machining** : Cylindrical production parts up to 10 mm in diameter

**Plating** : Plating with cadmium, nickel, electroless nickel, silver, black zinc nickel, gold

**Assembly** : Sub-assembly, harnessing, cabling, bonding and marking for small & large volumes

### Our certifications



Product certifications : MIL-DTL38999, EN3645, EN3155, VG

### Our memberships



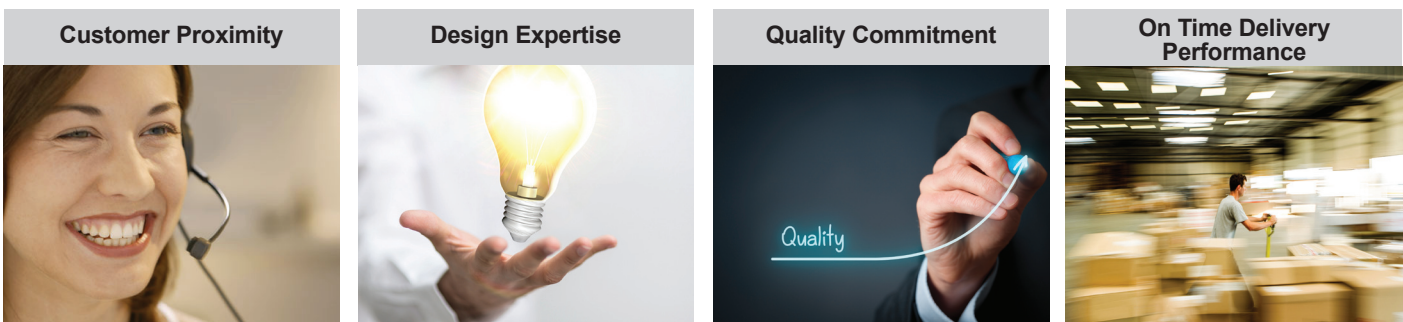
Member of CMG (Connecting Manufacturing Group) Consortium



## DELIVERING GREAT CUSTOMER EXPERIENCE

► We have a strong reputation for helping customers solve their toughest challenges. This approach of serving your needs is ingrained in our company – from our sales team to our product development engineers.





### A partner you can trust



### Buy our solutions

You can access our solutions through our global network of sales offices or through our distributors.

#### Field Sales Team :

-  12 in France
-  15 in Europe
-  100+ in North America and rest of the world.
-  5 Business Development Managers supporting local sales force Europe, North America and the rest of the world

#### Technical Support & Multilingual Customer Service :

-  14 people

#### Worldwide Distribution Network :

Including qualified distributors (QPL approved) for assembling : MIL-DTL-38999, PT/451/VG95328 & Fiber Optics connectors



# SIAL

The hybrid connector for use with thermal clamps

**SIAL is a modular high density interconnection system that has the capability to mix signal and coax contacts. The contact technology developed for this connector allows the use of thermal clamps. With 3 sizes of modules, the SIAL connectors provide the arrangement needed, from 18 to 392 contacts. In a staggered grid pattern (2.54 x 1.905 [.100x.075]), this connector houses 5 rows of contacts in a low profile board to board format. Additionally, SIAL connectors provide shielding on both plug & receptacle, which allows the dissipation of all the electrical charge while mating.**

## The concept

3 standard modules are available with 18, 58 and 98 signal contacts on 5 rows. These allow arrangements up to 392 contacts. The various modules are maintained in a metallic shell, allowing both protection of male contacts on the plug, and a mix of signal and coax modules.

## Compatible with the use of thermal clamps

Its standard contact technology, already used in the monolithic SIHD connector, permits the lateral displacement ( $\pm 0.25$  [.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 SIAL allows this lateral displacement of  $\pm 0.25$  [.010] without creating stress on the solder joints or on the contact area.

## A complete range for test, programming, maintenance

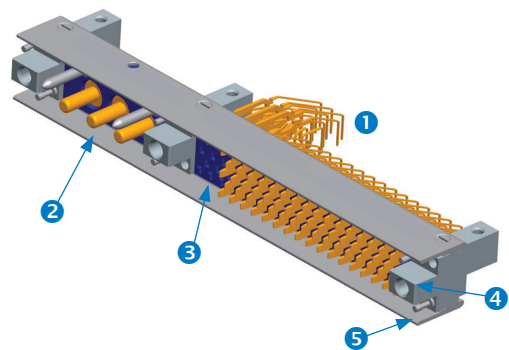
E = Female receptacle for mother board

F = Male plug for daughter board

T = Female test receptacle for daughter board

S = Male test plug

P = Female extender receptacle



## QUICK SELECTION GUIDE

Signal contacts ①	Coax contacts ②	Modules ③	Fittings & Guiding ④	Keying ⑤
<b>FEMALE</b> for receptacles 	<b>COAX SIZE 12</b>  <b>COAX SIZE 16</b>  3 COAX / MODULE  5 COAX / MODULE 	<b>NUMBER OF SIGNAL CONTACTS</b> 018, 036, 058, 076, 098, 116, 156, 196, 214, 254, 312, 370, 392  <b>NUMBER OF COAX CONTACTS</b> Size 12: 03, 06, 09, 12 Size 16: 05, 10	<b>FITTING</b>  <b>FEMALE SOCKET GUIDE</b>  <b>MALE GUIDE PIN</b> 	<b>5 polarizing pins / connector</b> 
PAGE 13   PAGE 12	PAGE 14	PAGE 16	PAGE 17	PAGE 17

The SIAL series serves various markets, including:



Commercial avionics & airframe



Military avionics & airframe



Space

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



# SIAL Series

Lateral displacement compatibility



SIAL Series

## Table of contents

- SIAL product range .....8
- Signal contacts ..... 12
- Special contacts ..... 14
- Signal modules ..... 16
- Hybrid modules ..... 16
- Fittings and guiding ..... 17
- Keying ..... 17
- Realignment capability ..... 17
- Mating sequence ..... 17
- SIAL signal version typical arrangements ..... 18
- SIAL signal version layouts ..... 20
- SIAL coaxial version typical arrangements ..... 21
- SIAL coaxial version layouts ..... 22
- Tooling ..... 24

The SIAL series serves various **markets**, including:



Commercial Avionics & Airframe

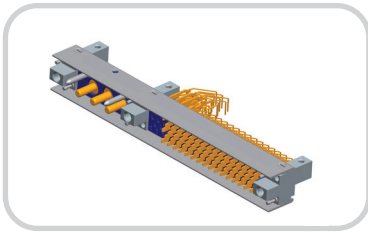


Military Avionics & Airframe



Space

# SIAL>>> GENERAL SPECIFICATIONS



- Modular connector mixing signal and coax contacts in many arrangements
- Lateral displacement capability allowing the use of thermal clamps:  $\pm 0.25 [\pm .010]$
- Complete range for test, programming and maintenance
- Designed for severe mechanical environments
- 2.54 [.100] staggered grid (1.27 [.050] offset), 1.905 [.075] between rows

### Main characteristics

- Medium density: 0.14 cts/mm<sup>2</sup> [90 cts/inch<sup>2</sup>]
- 13 arrangements on 5 rows of contacts, from 18 to 392 signal contacts
- 5 hybrid arrangements mixing coax and signal contacts
- 3 A per signal contacts / DWV: 750 Vrms
- Lateral rails to protect the male contacts from external damage
- Repairable contacts for easy maintenance

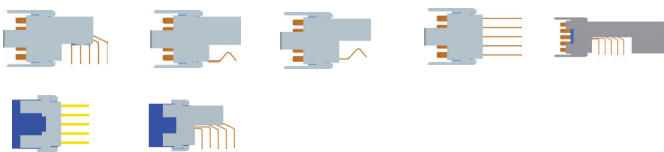
### Markets



### Main applications



### Terminations



### Recommended configurations



### Standard



### How to order

<b>E</b>	Female receptacle
<b>F</b>	Male plug
<b>T</b>	Female test receptacle
<b>S</b>	Male test plug
<b>P</b>	Female extender receptacle
<b>Connector type</b>	

<b>C</b>	Conductive fitting <i>Standard version For E and F types</i>
<b>Blank</b>	Non conductive fitting <i>Test versions and specifics</i>
<b>Conductivity of the fitting</b>	

Size	Male plug	Female receptacle
Size 12	<b>KX</b>	<b>KT</b>
Size 16	<b>NX</b>	<b>NT</b>
No coaxial contact	<b>Blank</b>	
<b>Coax module</b>		

<b>000</b>	Standard
<b>001</b>	ASL F or E with 5 right & left coax
<b>010</b>	ASL E with 2.76 <sub>MAX</sub> mm PCB thickness
<b>011</b>	ASL E with heatshrink sleeve
<b>100</b>	ASL S and E 392 screw locking system
<b>102</b>	ASL F with Y01 contacts without lateral displacement
<b>103</b>	ASL S Y04 straight/flex locking system
<b>200</b>	ASL 39758119 space customer specification
<b>300</b>	ASL MA3401 space customer specification
<b>500</b>	ASL F or E with 5 coax after signal contacts
<b>502</b>	ASL F or E with 5 coax before signal contacts
<b>Deviation</b>	



Number of signal contacts (see page 88)		
Signal contacts only		Signal & coaxial contacts
<b>018</b>	<b>156</b>	<b>018</b> (+3)
<b>036</b>	<b>196</b>	<b>058</b> (+3)
<b>058</b>	<b>214</b>	<b>098</b> (+3)
<b>076</b>	<b>254</b>	<b>058</b> (+5)
<b>098</b>	<b>312</b>	<b>156</b> (+10)
<b>116</b>	<b>370</b>	<b>196</b> (+5)
	<b>392</b>	<b>254</b> (+5)

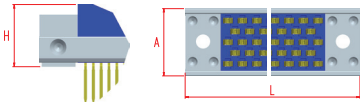
Signal contacts (see pages 84 to 85)		
	Male contact	Female contact
<b>E</b>		<b>Y09, Y19</b>
<b>F</b>	<b>Y01, Y02, Y04, U04, U05, U06, U07, U08</b>	
<b>T</b>		<b>Y01, Y02, Y04, U04, U05, U06, U07, U08</b>
<b>P</b>		<b>Y01, Y02, Y04, U04, U05, U06, U07, U08</b>
<b>S</b>	<b>Y03 Y02 Y04</b>	

Number of coax contacts (see page 93)	
Size	Number of coax
	<b>03</b>
12	<b>06</b>
	<b>09</b>
	<b>12</b>
16	<b>05</b>
	<b>10</b>
No coaxial contact	<b>Blank</b>

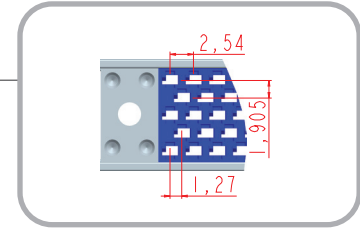
All dimensions are given for information only and are in mm [inch], except as otherwise specified

## SIAL &gt;&gt;&gt; TECHNICAL SPECIFICATIONS

## Dimensional characteristics



L= 22.86[.900] to 231.14[9.100] for signal version  
 L= 53.34[2.100] to 180.34[7.100] for hybrid version  
 A= 12.1<sub>MAX</sub>[.476]  
 H= 6.41<sub>MAX</sub>[.252] for plug  
 H= 10.26<sub>MAX</sub>[.404]



## 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  $\pm 0.25$  [ $\pm .010$ ] lateral displacement
- No stress on solder joints or on the contact area

**Material:** beryllium copper (stamped)

## Plating:

- Termination: tin lead or lead free
- Active contact area: gold over nickel

## Male contact



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

**Contact section** (mating side): 0.72mm<sup>2</sup> [.001 in<sup>2</sup>]

**Material:** beryllium copper (stamped)

## Plating:

- Termination: tin lead or lead free
- Active contact area: gold over nickel

## Materials

- **Fixing devices:** anodized aluminium
- **Guiding devices:** passivated stainless steel
- **Polarizing pins:** passivated stainless steel
- **Metallic rails:** passivated stainless steel
- **Plastic inserts:** thermoset DAP, 30% glass-fiber filled

## MECHANICAL CHARACTERISTICS

<b>Backoff</b> <sup>1</sup> (mm)	< 0.8 [.031]
<b>Mating force</b> per contact (N)	0.58 <sub>MAX</sub>
<b>Unmating force</b> per contact (N)	0.16 < F < 0.58
<b>Durability</b> cycles	500
<b>Sinusoidal vibrations</b> (10 to 2000 Hz) micro discontinuity 2ns	10 g
<b>Random vibrations</b> (10 to 2000 Hz) micro discontinuity 2ns	0.15 g <sup>2</sup> / Hz
<b>Shocks</b> micro discontinuity 1ns	100 g

## ENVIRONMENTAL CHARACTERISTICS

<b>Thermal shocks</b> (°C)	-55 / +125
<b>Salt Spray</b> (hours)	144* or 96

## ELECTRICAL CHARACTERISTICS

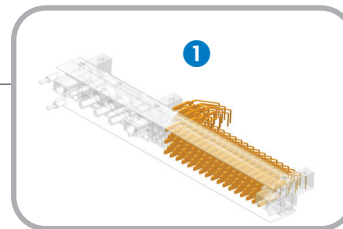
<b>Current rating</b> per contacts (A)	3
<b>Insulation resistance</b> (at 500Vdc) (GΩ)	5 <sub>MIN</sub>
<b>Contact resistance</b> (mΩ)	25 <sub>MAX</sub>
<b>Dielectric Withstanding Voltage</b> (Vrms)	750
<b>Capacitance</b> between contacts (pF)	1.5 <sub>MAX</sub>
<b>Service voltage</b> (at 50 Hz) (Vrms)	250

\* "C" standard version

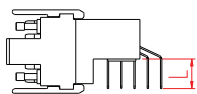
<sup>1</sup>: When both connectors are fully mated, the backoff is the maximum distance the connectors can be unmated while functioning properly

## SIAL >>> SIGNAL CONTACTS (1)

### MALE CONTACTS FOR PLUGS



#### Right angle PC tail



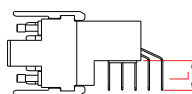
- Thru hole soldering
- Daughter board
- PCB thickness:  $3.1_{\text{MAX}}$  [.122]



Termination style

Y01

#### Right angle PC tail



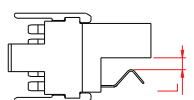
- Thru hole soldering
- Daughter board
- PCB thickness:  $2.6_{\text{MAX}}$  [.102]



Termination style

Y02

#### SMT double side PCB, centered



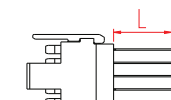
- SMT soldering
- Double-sided daughter board, centered
- PCB thickness:  $2.6 \pm 0.235$  [.102  $\pm$  .009]



Termination style

U04

#### Straight PC tail



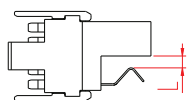
- Thru hole soldering
- Daughter board
- PCB thickness:  $4.5 \pm 0.45$  [.177  $\pm$  .018]



Termination style

Y04

#### SMT double side, centered



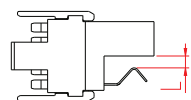
- SMT soldering
- Double-sided daughter board, centered
- PCB thickness:  $1.6 \pm 0.160$  [.063  $\pm$  .006]



Termination style

U06

#### SMT double side, centered



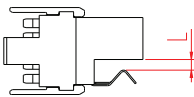
- SMT soldering
- Double-sided daughter board, centered
- PCB thickness:  $2 \pm 0.2$  [.079  $\pm$  .008]



Termination style

U05

#### SMT double side, off centered



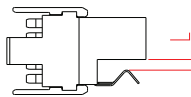
- SMT soldering
- Double-sided daughter board, offset
- PCB thickness:  $2.6 \pm 0.235$  [.102  $\pm$  .009]



Termination style

U08

#### SMT double side, off centered



- SMT soldering
- Double-sided daughter board, offset
- PCB thickness:  $2.44 \pm 0.42$  [.096  $\pm$  .016]



Termination style

U07

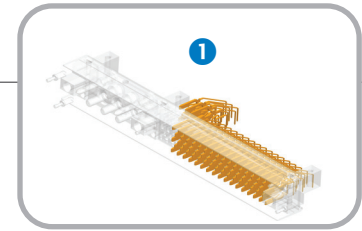
	Y01	Y02	Y04	U04	U05	U06	U07	U08
$L_{\text{MAX}}$	$4.2 \pm 0.2$ [.165 $\pm$ .008]	$3.7 \pm 0.2$ [.146 $\pm$ .008]	6 [.236]	$2.6 \pm 0.235$ [.102 $\pm$ .009]	$2 \pm 0.2$ [.079 $\pm$ .008]	$1.6 \pm 0.160$ [.063 $\pm$ .006]	$2.44 \pm 0.42$ [.096 $\pm$ .016]	$2.6 \pm 0.235$ [.102 $\pm$ .009]
Termination section	$\varnothing 0.4 \pm 0.03$ [.016 $\pm$ .001]			$0.3 \times 0.8$ [.012 $\times$ .031]				
Mating end size	$1.2 \times 0.6$ [.047 $\times$ .024]							
Active contact area plating $\mu\text{m}$ [ $\mu\text{in}$ ]	2 [.079] Ni + <b>1[.039] Au</b>							
Termination plating $\mu\text{m}$ [ $\mu\text{in}$ ]	2 [.079] Ni + 3 [.118] SnPb or bright pure Sn for RoHS version				2 [.079] Ni + 7 [.276] SnPb or bright pure Sn for RoHS version			

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

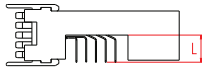


# SIAL >>> SIGNAL CONTACTS (1)

## MALE CONTACT FOR TEST PLUGS



### Right angle PC tail



- Thru hole soldering
- Daughter board
- PCB thickness:  $1.6 \pm 0.16$  [.063 ± .006]

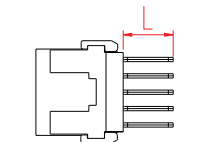


Termination style

**Y03**

## FEMALE CONTACTS FOR RECEPTACLES

### Straight PC tail, standard length



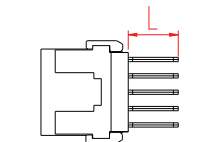
- Thru hole soldering
- Mother board
- PCB thickness:  $3.75 \pm 0.75$  [.148 ± .030]



Termination style

**Y09**

### Straight PC tail, short length



- Thru hole soldering
- Mother board
- PCB thickness: up to  $2 \pm 0.2$  [.079 ± .008]

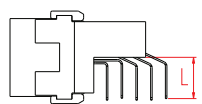


Termination style

**Y19**

## FEMALE CONTACT FOR EXTENDER RECEPTACLES

### Right angle PC tail, short length



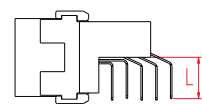
- Thru hole soldering
- Extender card
- PCB thickness:  $2.6_{MAX}$  [.102]



Termination style

**Y02**

### Right angle PC tail



- Thru hole soldering
- Extender card
- PCB thickness  $3.1_{MAX}$  [.122]



Termination style

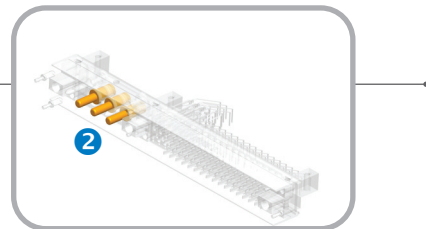
**Y01**

	Y03	Y02	Y01	Y09*	Y09-010	Y19
<b>L<sub>MAX</sub></b>	$2.8 \pm 0.2$ [.165 ± .008]	$3.7 \pm 0.2$ [.146 ± .008]	$4.2 \pm 0.2$ [.165 ± .008]	$5.75 \pm 0.25$ [.226 ± .010]	$4.5 \pm 0.2$ [.177 ± .008]	$3.7 \pm 0.3$ [.146 ± .012]
<b>Mating end size</b>	1.2 x 0.6 [.047 x .024]					
<b>Termination section</b>	Ø 0.4 ± 0.03 [.016 ± .001]			Ø 0.5 ± 0.03 [.020 ± .001]		
<b>Active contact area plating μm[μin]</b>	2 [.079] Ni + 1[.039] Au					
<b>Termination plating μm [μin]</b>	2 [.079] Ni + 3 [.118] SnPb or bright pure Sn for RoHS version					

\* for monobloc version ASLMxx, please consult us

## SIAL >>> SPECIAL CONTACTS (2)

### SIZE 16 COAXIAL CONTACTS



#### Male contacts for plugs – 5-cavity module

##### Straight crimp barrel

- For 5-cavity module
- For 2 [.079] cable
- Size 16: 6 GHz depending on cable – 50 Ω

2 [.079]

320008

##### Straight PC tail - UT47

- For 5-cavity module
- For UT47 semi-rigid cable
- Size 16: 6 GHz depending on cable – 50 Ω

Consult us

320033

##### Right angle PC tail

- For 5-cavity module
- Size 16: 6 GHz depending on cable – 50 Ω

Consult us

320032

#### Female contacts for receptacles – 5-cavity module

##### Straight crimp barrel

- For 5-cavity module
- For 2, 1.2, 2.7 or 2.4 cable [for .079, .047, .106 or .094 cable]
- Size 16: 6 GHz depending on cable – 50 Ω

2 [.079]

1.2 [.047]

2.7 [.106]

2.4 [.094]

320009

320011

320017

320018

##### Straight PC tail - UT47

- For 5-cavity module
- For UT47 semi-rigid cable
- Size 16: 6 GHz depending on cable – 50 Ω

Consult us

320006

##### Straight PC tail - Sucoform

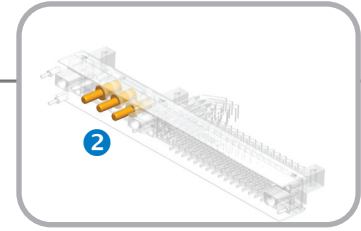
- For 5-cavity module
- For Sucoform cable 0.086 [.003]
- Size 16: 6 GHz depending on cable – 50 Ω
- No lateral displacement

Consult us

320021

## SIAL &gt;&gt; SPECIAL CONTACTS (2)

## SIZE 12 COAXIAL CONTACTS



## Male contacts for plugs – 3-cavity module

## Right angle PC tail

- For 3-cavity module
- Size 12: 0 to 3 GHz – 50 Ω

Consult us

320000

## Straight crimp barrel

- For 3-cavity module
- Size 12: 0 to 3 GHz – 50 Ω
- Standard designation: M39029 / 28 - 211

Consult us

900340

## Female contacts for receptacles – 3-cavity module

## Right angle crimp barrel – KX22A

- For 3-cavity module
- For KX22A cable
- Size 12: 0 to 3 GHz – 50 Ω

Consult us

320001

## Right angle crimp barrel – F 1703/66

- For 3-cavity module
- For F 1703 / 66 cable
- Size 12: 0 to 3 GHz – 50 Ω

Consult us

320004

## Straight PC tail

- For 3-cavity module
- For test only, specific application
- Size 12: 0 to 3 GHz – 50 Ω
- No lateral displacement

Consult us

320002

## Straight crimp barrel

- For 3-cavity module
- Standard designation: M39029 / 27 - 210
- Size 12: 0 to 3 GHz – 50 Ω
- With lateral displacement

Consult us

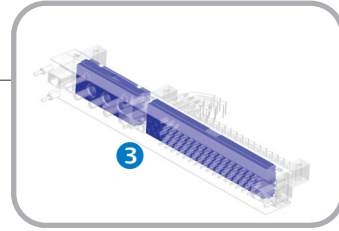
900354

	16-SIZE CONTACT	12-SIZE CONTACT
Impedance Ω	50	50
Voltage rating V	180	180
Current rating mA	500	500
Contact retention N	≥ 50	≥ 50
Frequency range GHz	0 to 1	0 to 1
Contact resistance mΩ	≤ 12	≤ 12
VSWR at 1 GHz	1.3 <sub>MAX</sub>	1.3 <sub>MAX</sub>
Insertion and extraction force per contact N	1 ≤ F ≤ 15	1 ≤ F ≤ 15
Dielectric and extraction force per contact N		at sea level, 1000 V. at 15240 m, 250 V.

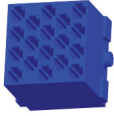
All dimensions are given for information only and are in mm [inch], except as otherwise specified

## SIAL &gt;&gt; MODULES (3)

## SIGNAL MODULES

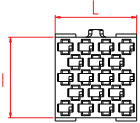


## 18 signal contacts

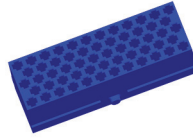


- Arrangement available:

- 18
- 18 x 2
- 18 + 58

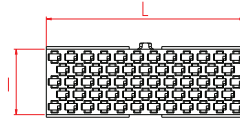


## 58 signal contacts



- Arrangement available:

- 58
- 58 + 18
- 58 x 2
- 58 + 98
- 58 x 2 + 98
- 58 + 98 x 2
- 58 x 2 + 98 x 2
- 58 x 3 + 98 x 2

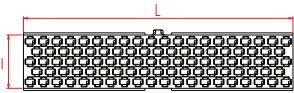


## 98 signal contacts



- Arrangement available:

- 98
- 98 + 58
- 98 x 2
- 98 + 2 x 58
- 98 x 2 + 58
- 98 x 2 + 58 x 2
- 98 x 2 + 58 x 3
- 98 x 4



## HYBRID MODULES

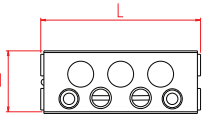
## 3 coax contacts – size 12



- 3-cavity module for 12-size coaxial contact

- Arrangement available:

- 3 + 18
- 3 + 58



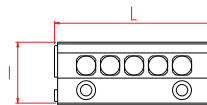
## 5 coax contacts – size 16



- 5-cavity module for 16-size coaxial contact

- Arrangement available:

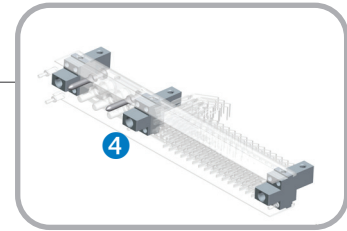
- 5 + 98
- 5 x 2 + 98 + 58



	18 signal contacts	58 signal contacts	98 signal contacts	3 coax contacts	5 coax contacts
L	10.16 [.400]	30.48 [1.200]	50.8 [2.1000]	25.4 <sub>MAX</sub> [1.000]	
I		10.05 [.396]		9.95 [.392]	
Receptacle Plug		10.8 [.425]		10.8 [.425]	

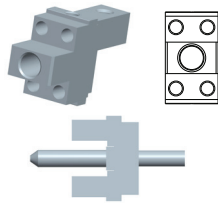


# SIAL >>> FITTINGS/GUIDING & KEYING (4 & 5)



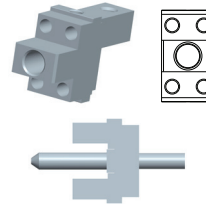
## FITTINGS / GUIDING (4)

### A- centered end fittings



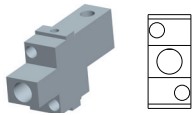
- 1 centered end fitting at one end of the connector
- Max length: 6, 35 [.250]
- Male guide pin on receptacle
- Female centered hole on plug
- 4 holes for polarizing

### B- end fittings



- 1 end fitting at one end of the connector
- Max length: 6, 35 [.250]
- Male guide pin on receptacle
- Offset hole on plug
- 4 holes for polarizing pin

### Central fittings



- Max length: 6, 35 [.250]
- Guiding device: Male guide pin on receptacle
- 2 holes for polarizing pin
- Signal version**
- 1 fitting for 196, 214, 254 and 312 positions
- 2 fittings for 370 positions
- 3 fittings for 392 positions

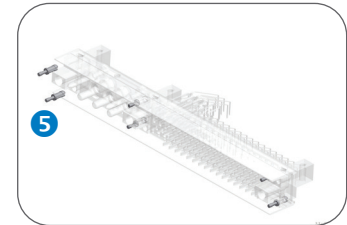
- With coaxial contacts**
- 1 fitting for 18 + 3, 58 + 3 and 98 + 5 positions
- 2 fittings for 98 + 58 + 5 x 2 positions

## KEYING (5)

### Polarizing pins

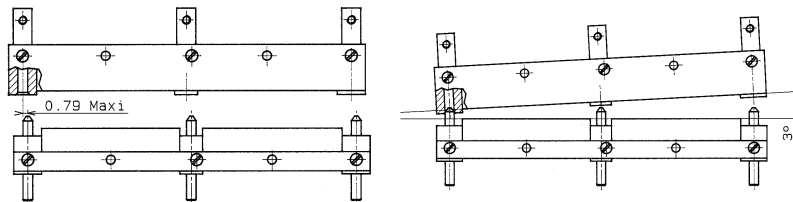


- 2 pins at each end fitting for the plug / 2 pins at each end fitting for the receptacle
- 1 pin at each central fitting for the plug / 1 pin at each central fitting for the receptacle
- Identification of keying cavities: clockwise for the plugs, counterclockwise on the receptacle
- A,B,C,D on A fitting, W,X,Y,Z on B fitting

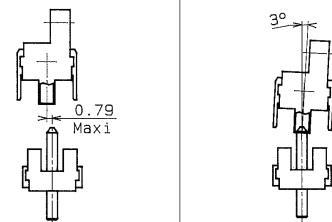


## REALIGNMENT CAPABILITY

### In the longitudinal axis



### In the lateral axis



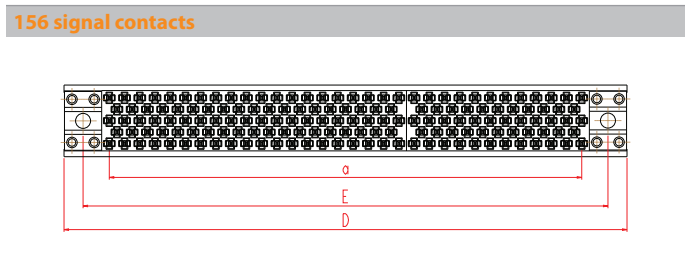
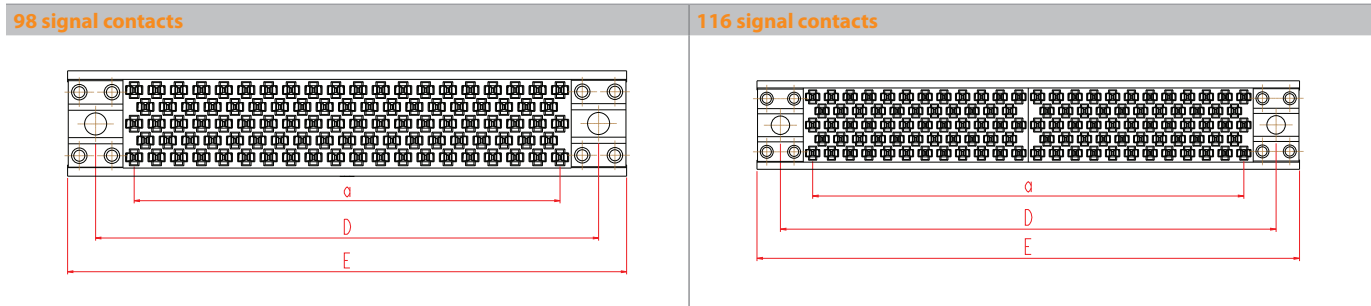
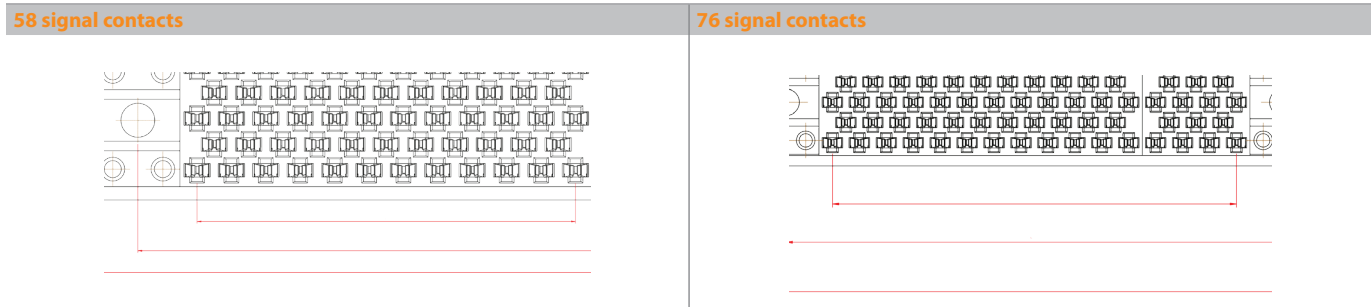
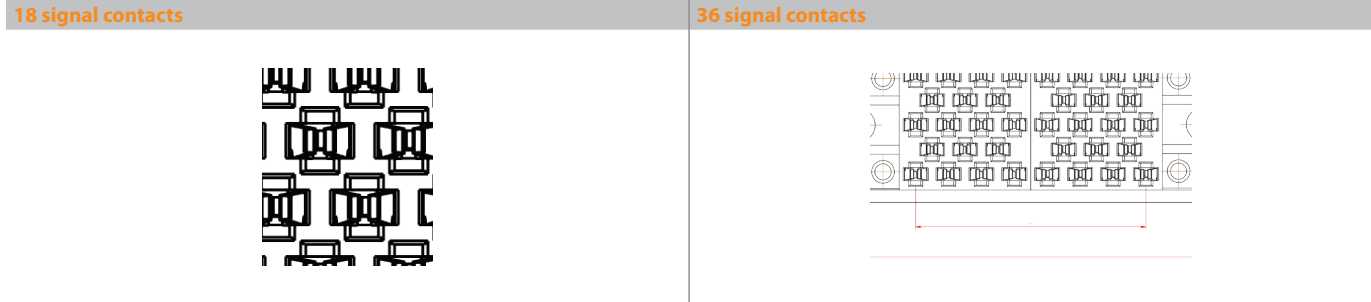
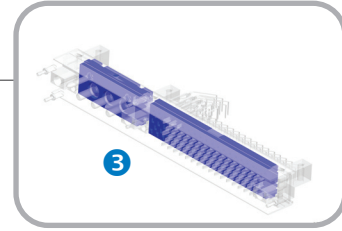
## MATING SEQUENCE

Shell guiding	Coax guiding	Keying	Coax contact	Signal contact	Housing contact
6.8 ± 0.45 [.268 ± .018]	6.56 ± 0.45 [.258 ± .018] 3.3 ± 0.6 [.130 ± .024]	6.27 ± 0.36 [.247 ± .014] 0.24 ± 0.6 [.009 ± .024] 3.7 ± 0.7 [.121 ± .028]	3.26 ± 0.6 [.128 ± .024] 3.3 ± 0.6 [.130 ± .024]	2.14 ± 0.28 [.084 ± .011]	2.14 ± 0.28 [.084 ± .011] 2.9 ± 0.6 [.114 ± .024]

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

**SIAL >> SIGNAL VERSION (3)**

**TYPICAL ARRANGEMENTS**

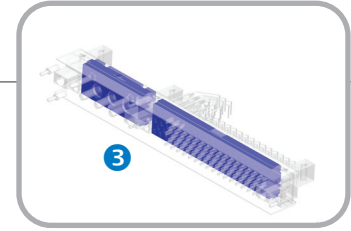


	18	36	58	76	98	116	156
<b>D</b>	16.51 [.650]	26.67 [1.050]	36.83 [1.450]	46.99 [1.850]	57.15 [2.250]	67.31 [2.650]	87.63 [3.450]
<b>E<sub>MAX</sub></b>	22.86 [.900]	33.02 [1.300]	43.18 [1.700]	53.34 [2.100]	63.5 [2.500]	73.66 [2.900]	93.98 [3.700]
<b>a</b>	7.62 [.340]	17.78 [.700]	27.94 [1.100]	38.1 [1.500]	48.26 [1.900]	58.42 [2.300]	81.28 [3.200]

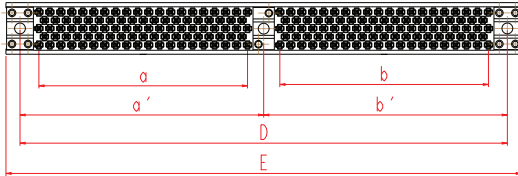
*All dimensions are given for information only and are in mm [inch], except as otherwise specified*

**SIAL >> SIGNAL VERSION (3)**

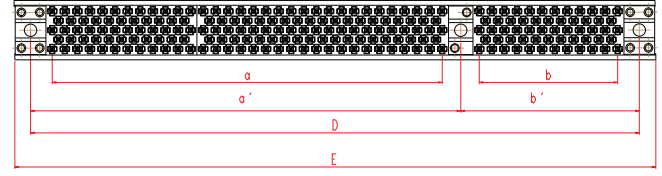
**TYPICAL ARRANGEMENTS**



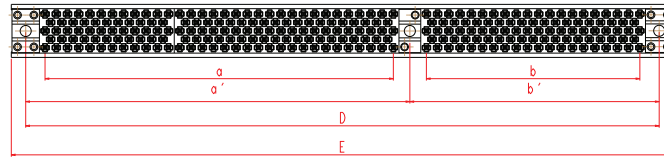
196 signal contacts



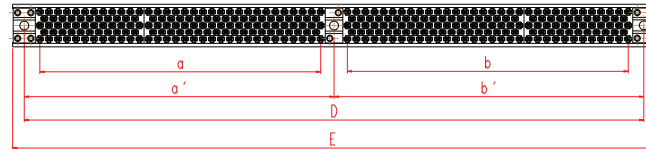
214 signal contacts



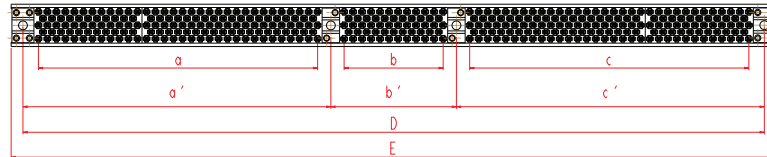
254 signal contacts



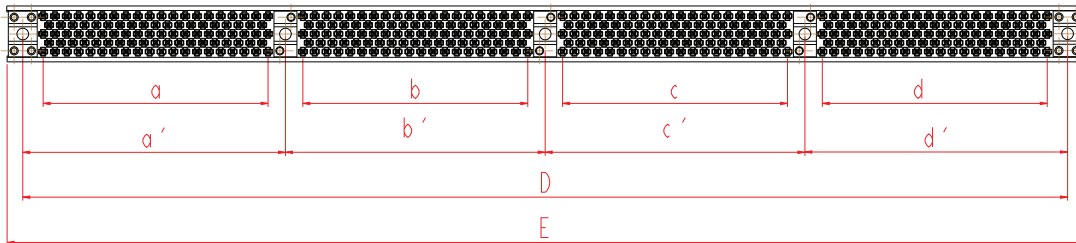
312 signal contacts



370 signal contacts



392 signal contacts

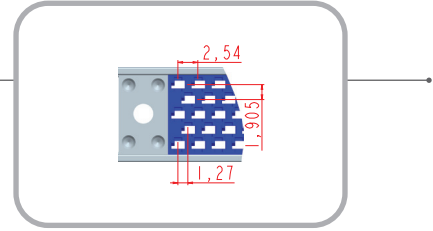


	196	214	254	312	370	392
<b>D</b>	113.03 [4.450]	123.19 [4.850]	143.51 [5.650]	173.99 [6.850]	209.55 [8.250]	224.79 [8.850]
<b>E<sub>MAX</sub></b>	119.38 [4.700]	129.54 [5.100]	149.86 [5.900]	180.34 [7.100]	215.9 [8.500]	231.14 [9.100]
<b>a</b>	48.26 [1.900]	81.28 [3.200]	81.28 [3.200]	81.28 [3.200]	81.28 [3.200]	48.26 [1.900]
<b>a'</b>	56.515 [2.225]	86.995 [3.425]	86.995 [3.425]	86.995 [3.425]	86.995 [3.425]	56.515 [2.225]
<b>b</b>	48.26 [1.900]	27.94 [1.100]	48.26 [1.900]	81.28 [3.200]	27.94 [1.100]	48.26 [1.900]
<b>b'</b>	56.515 [2.225]	36.195 [1.425]	56.515 [2.225]	86.995 [3.425]	35.56 [1.400]	55.88 [2.200]
<b>c</b>					81.28 [3.200]	48.26 [1.900]
<b>c'</b>					86.995 [3.425]	55.88 [2.200]
<b>d</b>						48.26 [1.900]
<b>d'</b>						56.515 [2.225]

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

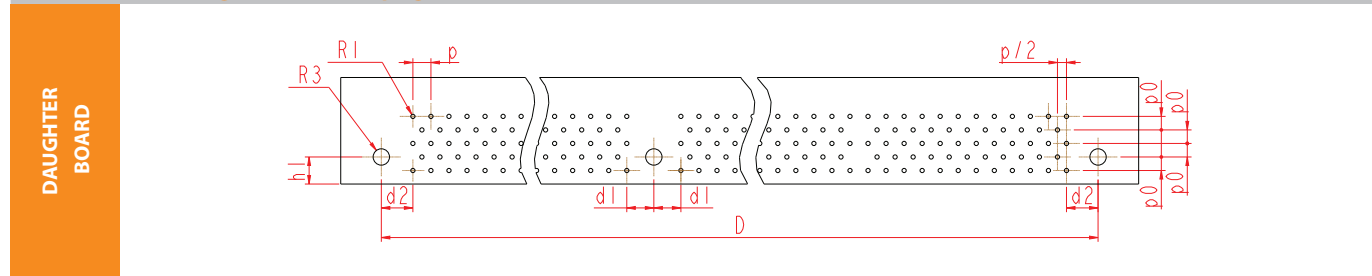
## SIAL &gt;&gt; SIGNAL VERSION (3)

## LAYOUTS

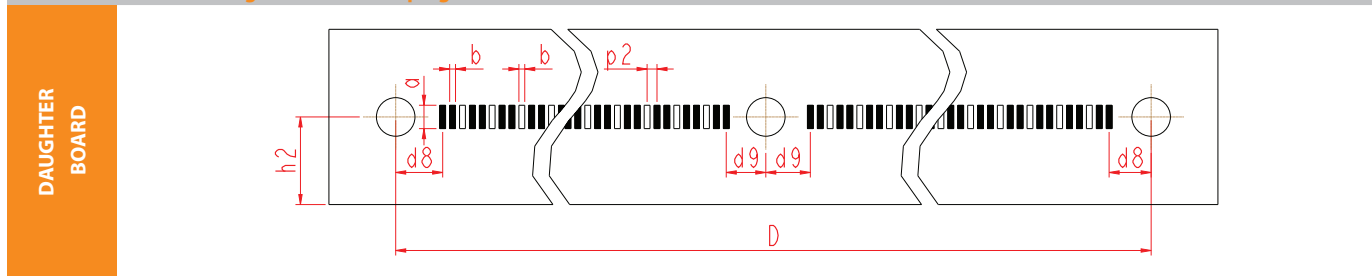


The boards are shown from the connector side  
All contact locations are equidistant.

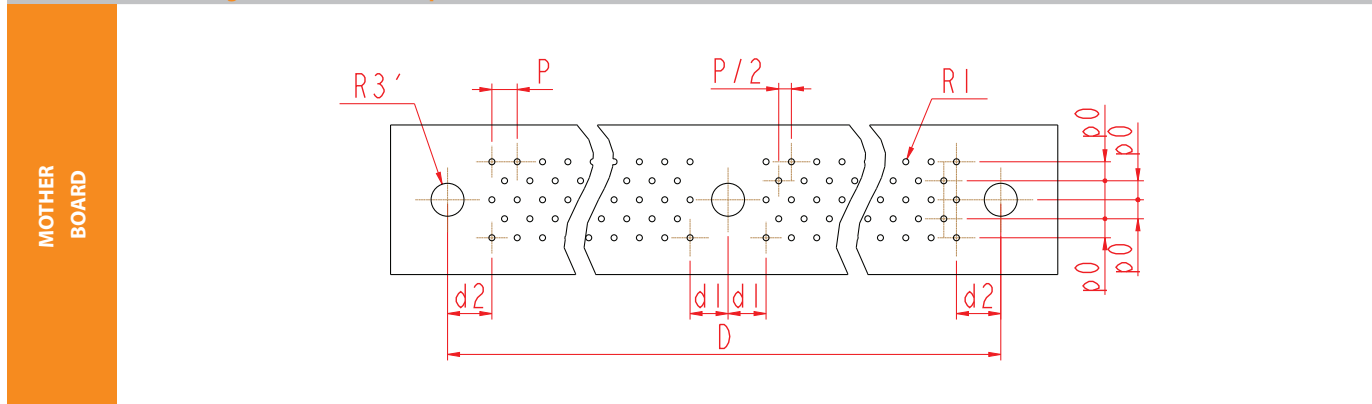
## With YC signal contacts for plug



## With U -- signal contacts for plug



## With Y -- signal contacts for receptacle



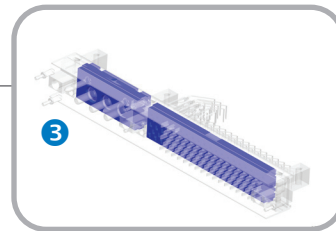
$R_1$	$R_3$	$R_3'$	$p$	$p/2$	$p_0$	$p_2$	$d_1$	$d_2$	$d_8$	$d_9$	$a$	$b$	$h_1$	$h_2$
$\varnothing 0.6_{\text{MIN}}$ [.024]	$\varnothing 2.3^{+0.15}_{-0.1}$ $\varnothing 23^{+0.06}_{-0.04}$	$\varnothing 3.3$ [.130]	2.54 [.100]	1.27 [.050]	1.905 [.075]	0.85 [.033]	3.81 [.150]	4.445 [.175]	4.02 [.158]	3.39 [.133]	$2_{\text{MAX}}$ [.079]	$0.5_{\text{MAX}}$ [.020]	3.81 [.150]	3.81 [.150]

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

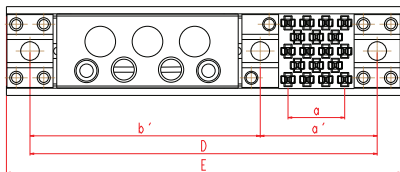


SIAL >> COAXIAL VERSION (3)

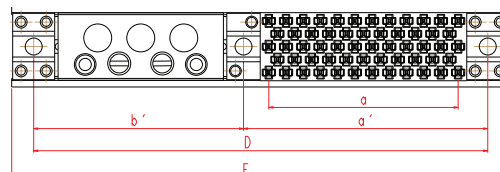
TYPICAL ARRANGEMENTS



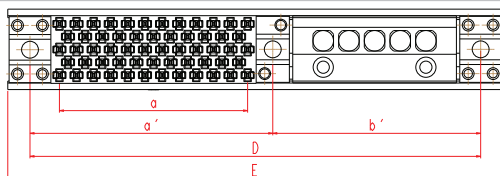
18 signal contacts + 3 coax



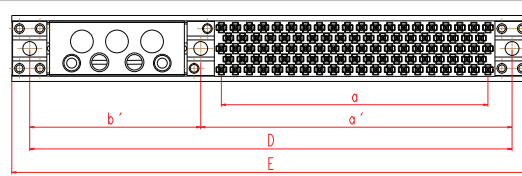
58 signal contacts + 3 coax



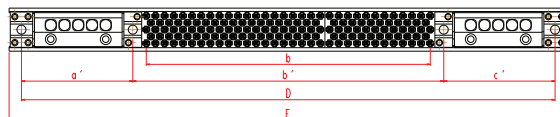
58 signal contacts + 5 coax



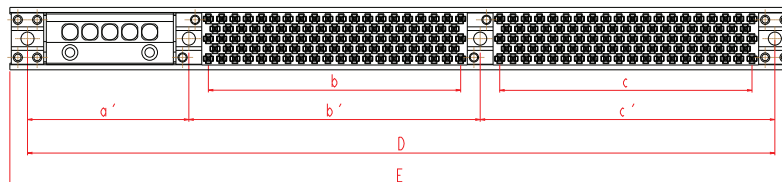
98 signal contacts + 3 coax



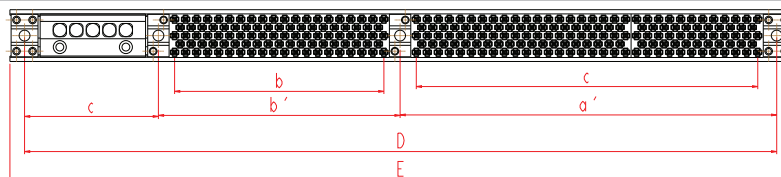
5 coax + 98 + 58 signal contacts + 5 coax



196 signal contacts + 5 coax



254 signal contacts + 5 coax



	18 + 3	58 + 3	58 + 5	98 + 3	5 + 98 + 58 + 5	196 + 5	254 + 5
<b>D</b>	46.99 [1.850]	67.31 [2.650]	67.31 [2.650]	87.63 [3.450]	148.59 [5.850]	143.51 [5.650]	173.99 [6.850]
<b>E<sub>MAX</sub></b>	53.34 [2.100]	73.66 [2.900]	73.66 [2.900]	93.98 [3.700]	154.94 [6.100]	149.86 [5.900]	180.34 [7.100]
<b>a</b>	7.62 [.340]	27.94 [1.100]	27.94 [1.100]	48.26 [1.900]	/	48.26 [1.900]	81.28 [3.200]
<b>a'</b>	15.875 [.625]	36.195 [1.425]	36.195 [1.425]	56.515 [2.225]	31.115 [1.225]	56.515 [2.225]	86.995 [3.425]
<b>b</b>	/	/	/	/	81.28 [3.200]	48.26 [1.900]	48.26 [1.900]
<b>b'</b>	31.115 [1.225]	31.115 [1.225]	31.115 [1.225]	31.115 [1.225]	86.36 [3.400]	55.88 [2.200]	55.88 [2.200]
<b>c</b>					31.115 [1.225]	31.115 [1.225]	31.115 [1.225]

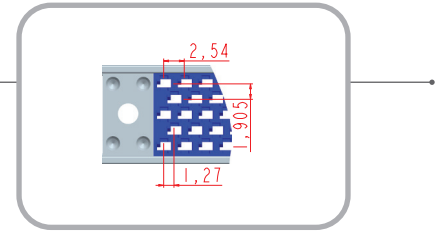
All dimensions are given for information only and are in mm [inch], except as otherwise specified

SIAL Series

## SIAL >> SIZE 16 COAXIAL VERSION (3)

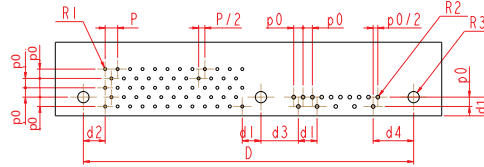
### LAYOUTS

The boards are shown from the connector side  
All contact locations are equidistant.



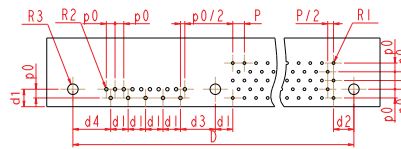
#### With Y0. male signal contacts and 5 coaxial contacts for plug

NX05-002  
DAUGHTER  
BOARD



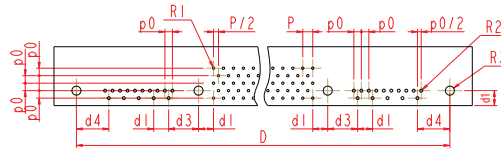
#### With Y0. male signal contacts and 5 coaxial contacts for plug

NX05-000  
DAUGHTER  
BOARD



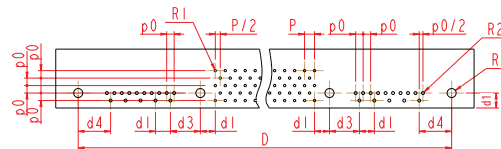
#### With Y0. male signal contacts and 10 coaxial contacts for plug

NX10-001  
DAUGHTER  
BOARD



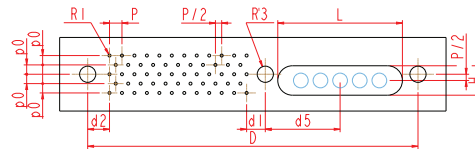
#### With Y0. male signal contacts and 10 coaxial contacts for plug

NX10-000  
DAUGHTER  
BOARD



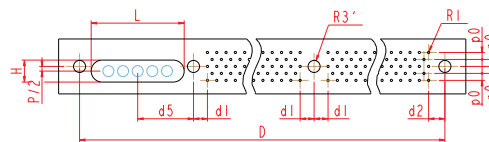
#### With Y09 female signal contacts and 5 coaxial contacts for receptacle

NT05-002  
MOTHER BOARD



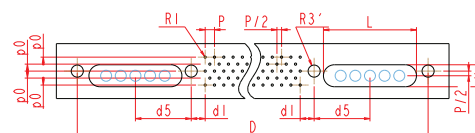
#### With Y09 female signal contacts and 5 coaxial contacts for receptacle

NT05-000  
MOTHER BOARD



#### With Y09 female signal contacts and 10 coaxial contacts for receptacle

NT10-000  
MOTHER BOARD

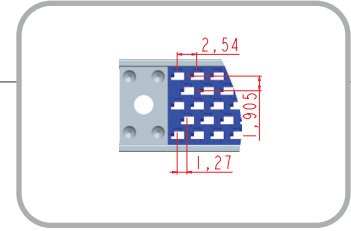


All dimensions are given for information only and are in mm [inch], except as otherwise specified

# SIAL >> SIZE 12 COAXIAL VERSION (3)

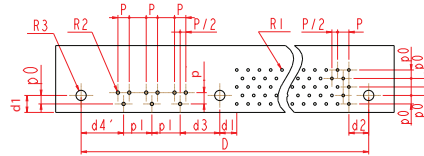
## LAYOUTS

The boards are shown from the connector side  
All contact locations are equidistant.



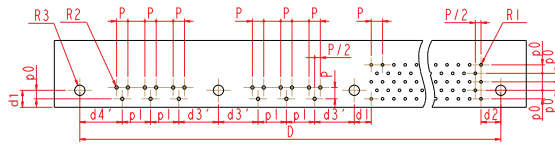
With Y male signal contacts and 3x320000 right angle dip solder coaxial contacts/plug

K(2)03-000  
DAUGHTER  
BOARD



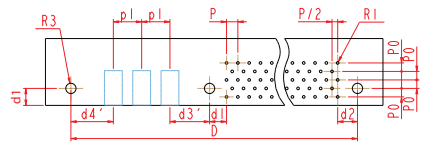
With Y0 male signal contacts and 6x320000 right angle dip solder coaxial contacts/plug

K(2)06-000  
DAUGHTER  
BOARD



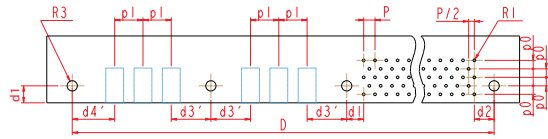
With Y male signal contacts and 3x900340 crimp coaxial contacts/plug

K(1)03-000  
DAUGHTER  
BOARD



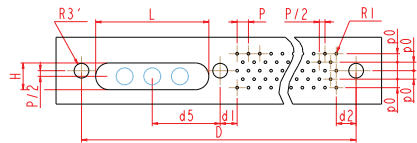
With Y0 male signal contacts and 6x900340 crimp coaxial contacts/plug

K(1)06-000  
DAUGHTER  
BOARD



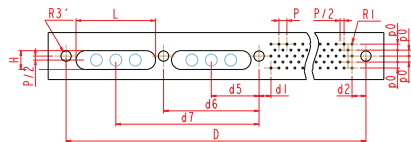
With Y09 female signal contacts and 3 coaxial contacts/receptacle

KT03-000  
MOTHER BOARD



With Y09 female signal contacts and 6 coaxial contacts/receptacle

KT06-000  
MOTHER BOARD



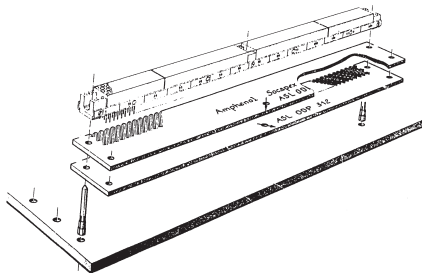
R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>3</sub> '	p	p/2	P <sub>1</sub>	P <sub>0</sub>	P <sub>0</sub> /2	L	H
Ø 0.6 <sub>MIN</sub> [.024]	Ø 0.75 <sub>MIN</sub> [.340]	Ø 23 <sup>+0.15</sup> <sub>-0.1</sub> [.091 <sup>+0.006</sup> <sub>-.004</sub> ]	Ø 3.3 <sup>+0.15</sup> <sub>-0.1</sub> [.130 <sup>+0.006</sup> <sub>-.004</sub> ]	2.54 [.100]	1.27 [.050]	6.35 [.250]	1.905 [.075]	0.9525 [.037]	25.4 <sub>MAX</sub> [1.000] 19 <sub>MIN</sub> [.748]	6 <sub>MIN</sub> [.236]

d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>6</sub>	d <sub>7</sub>	d <sub>3</sub> '	d <sub>4</sub> '
3.81 [.150]	4.445 [.175]	7.62 [.300]	8.255 [.325]	15.24 [.600]	30.48 [1.200]	45.72 [1.800]	8.89 [.350]	9.525 [.375]

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

## SIAL &gt;&gt;&gt; TOOLING

## Receptacle mounting on mother board (Y09)

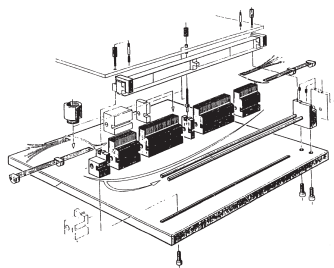


- Insertion of all connector sizes with Y09 dip solder contacts
- Into 0.6 mm [.024] thru plated holes
- Consult us for additional references

ASL ODP 058  
ASL ODP 098  
ASL ODP 116

ASL ODP 156  
ASL ODP 254  
ASL ODP 312

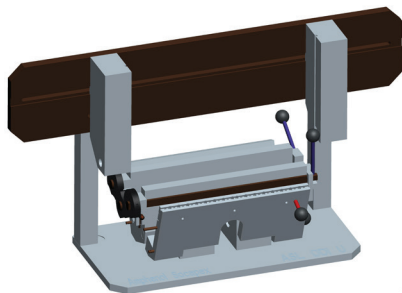
## Plug mounting on daughter board (Y01 or Y02)



- Insertion of all connector sizes with Y01 or Y02 right angle dip solder contacts
- Into 0.6 mm [.024] thru plated holes
- Consult us for additional references

ASL ODI YC 312  
ASL ODI YC 392

## Plug mounting on daughter board (SMT)



- Insertion of all connector sizes with U04, U05, U06, U07 or U08 SMT contacts (Surface Mount Terminations)
- Consult us for additional references

ASL ODI SMT

## Mounting tool for size 16 coax contacts



- On mother board or daughter board
- Consult us for additional references
- For ASLF \*\*\* NX05-002 and ASLF \*\*\* NX05-502 connectors, use the ASL ODP NX10 tool.

ASL ODP NX05

ASL ODP NX10

## Extraction tool for coax contacts

Size 12

Size 16



809839

ASL OD COAX FEMELLE TAILLE 16

## SIAL &gt;&gt;&gt; TOOLING

## CRIMPING TOOL FOR 12-SIZE COAX CONTACTS

## Inner contact crimping tool



- For 12-size coaxial contacts
- Additional turret:  
PN 809932 (M22520/2-34)
- Military reference : M22520/2-01

Part number

809801

## Outer contact crimping tool



- For 12-size coaxial contacts
- Additional turret:  
PN 809927 (M22520/31-02)
- Military reference : M22520/3-1-01

Part number

809926

## INSERTION AND REMOVAL TOOLS FOR 12-SIZE COAX CONTACTS

## Insertion tool



- Size 12
- Metallic

Part number

809838

## Removal tool



- Size 12
- Metallic
- For 900340 and 900354 contacts

Part number

809839

## Insertion/Removal tool



- Size 12
- Plastic

Part number

809859

## Removal tool



- Size 12
- Metallic
- For 320001 contact

Part number

809933

# 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.

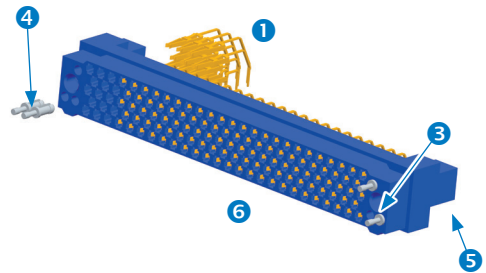
### The ability to include ground strips

- 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 ( $\pm 0.25$  [.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  $\pm 0.25$  [.010] without creating stress on the solder joints or on the contact area.



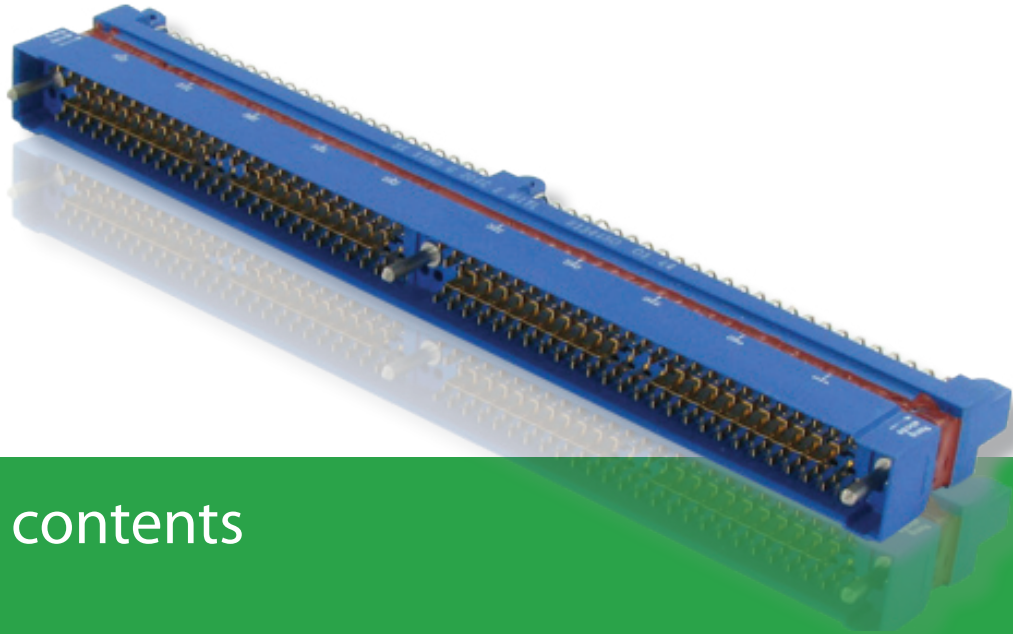
## QUICK SELECTION GUIDE

Signal contacts 1	Ground Strip 2	Guiding 3	Keying 4	Fittings 5	Housings 6
<p><b>FEMALE</b></p> <p><b>MALE</b></p>	<p>Reduced cross talk level</p> <p>Reduced self impedance level</p> <p>Capacitance distributed along signal contacts</p>	<p><b>A STYLE</b> For M1W3 contacts</p> <p><b>B STYLE</b> For M1YD contacts</p> <p><i>Fixing of receptacle</i></p>	<p><b>250 positions available</b></p> <p>10 holes</p> <p>5 pins on the plug</p> <p>5 pins on the receptacle</p>	<p><b>For receptacles:</b> style A and B (guiding)</p> <p><b>For plugs:</b> fixing on thermal drain or on PCB</p>	<p><b>Without ground strip:</b> 128, 158, 256, 390</p> <p><b>With ground strip:</b> 102C, 204C, 230C</p>
PAGE 30   PAGE 31	PAGE 31	PAGE 32	PAGE 32	PAGE 33	PAGE 34



# SIHD Series

Lateral displacement compatibility



SIHD Series

## Table of contents

- SIHD product range ..... 98
- Female signal contacts for plugs ..... 26
- Male signal contacts for receptacles ..... 31
- Ground strips ..... 31
- Guiding / Keying ..... 32
- Mating sequence ..... 32
- Realignment capability ..... 32
- Fixing accessories ..... 33
- SIHD without ground strip: typical arrangements ..... 34
- SIHD with ground strip: typical arrangements ..... 35
- SIHD without ground strip: layouts ..... 35
- SIHD with ground strip: layouts ..... 37

The SIHD series serves various **markets**, including:



Commercial Avionics & Airframe



Military Avionics & Airframe



Navy



Space

## SIHD&gt;&gt;&gt; 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

## Main characteristics

- Medium density: 0.14 cts/mm<sup>2</sup> [90 cts / inch<sup>2</sup>]
- 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



## Terminations



## Recommended configurations



## How to order

<b>F</b>	Plug with female contacts	<b>C</b>	Central ground strip	<b>A B C D E F K</b>	F connector	<b>Ø</b>	Gold on M1W3 terminations
<b>E</b>	Receptacle with male contacts	<b>Ø</b>	No ground strip	<b>A B</b>	E connector	<b>6</b>	Tin on M1W3 terminations
<b>P</b>	Extender card for M1YC contacts (shroud aluminium)	<b>Ground strip</b> (see page 103)		<b>Fittings</b> (see page 105)		<b>Plating</b> (for M1W3 contacts only)	
<b>G</b>	Extender card for M1YC contacts (12.7 pitch)						
<b>Connector type</b>							

SIHD - - - - -

Number of signal contacts (see pages 106 to 107)	
Without ground strip	With ground strip
128	102 central ground strip
158	204 central ground strip
256	230 half central ground strip
390	

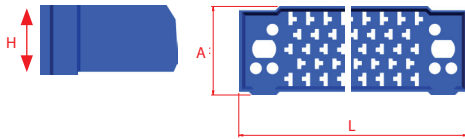
Signal contacts (see pages 102 to 103)			
F connector	E connector	P connector	G connector
SMT double side: <b>F1U1 / F1U2 / F1U3</b>	Wire wrap connections: <b>M1W3</b>	Extender card: <b>M1YC</b>	Extender card: <b>M1YC</b>
SMT single side: <b>F1TS</b>	Straight PC tail: <b>M1YD</b>		
Right angle PC tail: <b>F1YC</b>			
Straight PC tail: <b>F1TS</b>			
Crimping tail: <b>F1X1</b>			

\* 375Vrms only for F1U2 cts

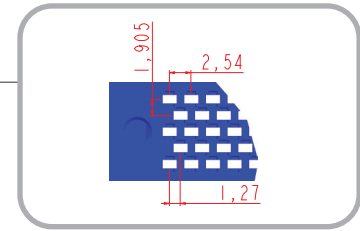
All dimensions are given for information only and are in mm [inch], except as otherwise specified

## SIHD &gt;&gt;&gt; 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

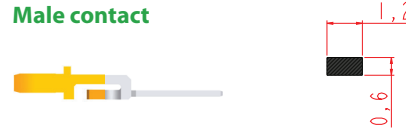
- Cross section of the lateral displacement of the male contact inside the female cavity
- Maintains 2 points of contact
- Allows a  $\pm 0.25$  [ $\pm .010$ ] lateral displacement
- No stress on solder joints or on the contact area

**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 mm<sup>2</sup> [.001 in<sup>2</sup>]

**Material:** phosphorous bronze (stamped)

## Plating:

- Terminations - gold over nickel on wire-wrap contacts (M1W3) - tin lead or lead free on other contacts (M1YD & M1YC)
- Active contact area - gold over nickel

## Materials

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

## MECHANICAL CHARACTERISTICS

<b>Backoff</b> <sup>1</sup> (mm)	1
<b>Mating force</b> per contact (N)	0.58 <sub>MAX</sub>
<b>Unmating force</b> per contact (N)	0.16 < F < 0.58
<b>Durability</b> cycles	500
<b>Sinusoidal vibrations</b> (10 to 2000 Hz) micro discontinuity 10ns	
- unloaded PCB	20 g
- loaded PCB	10 g
<b>Random vibrations</b> (50 to 2000 Hz) micro discontinuity 10ns	0.1 g <sup>2</sup> / Hz
<b>Shocks</b> 6ms 1/2 sinus micro discontinuity 10ns	100 g
<b>Recommended tightening torques</b>	
- 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

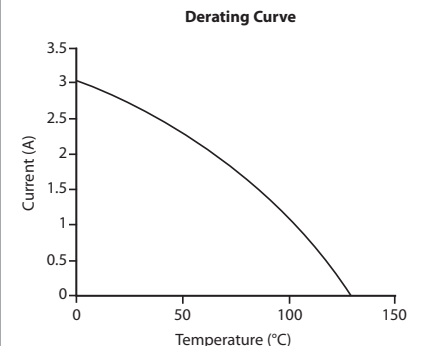
<b>Thermal shocks</b> (°C)	-55 / +125
<b>Salt Spray</b> (hours)	96
<b>Humidity</b>	
<b>Days</b>	56
<b>Temperature</b> (°C)	40
<b>Humidity rate</b> (%)	90-95

## ELECTRICAL CHARACTERISTICS

<b>Current rating</b> per contacts (A)	3 - See derating curve
<b>Insulation resistance</b> (at 500Vdc) (GΩ)	5 <sub>MIN</sub>
<b>Contact resistance</b> (mΩ)	12 <sub>MAX</sub>
<b>Dielectric Withstanding Voltage</b> (Vrms)	750*
<b>Capacitance</b> between contacts (pF)	2.5 <sub>MAX</sub>
<b>Self induction</b> (nH)	25 <sub>MAX</sub>
<b>Immunity against noise</b> of groundings for connectors with central ground strips	Noise ≤ 400mV for 0.1 A intensity per contact and signal rise time of 2ns

\* 375Vrms only for F1U2 cts

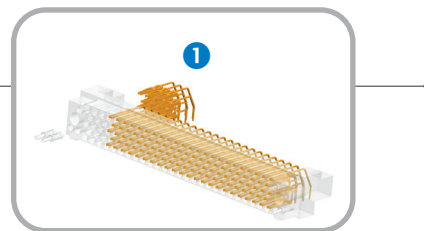
<sup>1</sup>: When both connectors are fully mated, the backoff is the maximum distance the connectors can be unmated while functioning properly



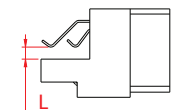
All dimensions are given for information only and are in mm [inch], except as otherwise specified

## SIHD &gt;&gt;&gt; SIGNAL CONTACTS (1)

## FEMALE CONTACTS FOR PLUGS WITHOUT GROUND STRIP



## Double sided SMT



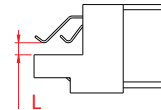
- SMT soldering
- Double sided daughter board
- Surface mount area: 0.7x0.8 [.028x.031]
- PCB thickness: 2.3 to 3.2 [.091 to .126]



Termination style

F1U1

## Double sided SMT



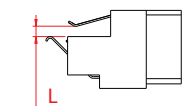
- SMT soldering
- Double sided daughter board
- Surface mount area: 0.7x0.8 [.028x.031]
- PCB thickness: 4.56 to 5.37 [.180 to .211]



Termination style

F1U2

## Double sided SMT



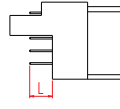
- SMT soldering
- Double sided daughter board, offset
- Surface mount area: 0.7x0.8 [.028x.031]
- PCB thickness: 1.8 to 2.65 [.071 to .104]



Termination style

F1U3

## Straight solder PC tail



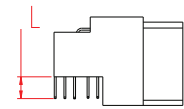
- Straight solder PC tail
- Thru hole soldering
- Daughter board



Termination style

F1TS

## Right angle solder PC tail



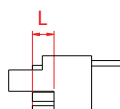
- Thru hole soldering
- Daughter board
- PCB thickness
  - With heat sink: 2.9 to 3.41 [.114 to .134]
  - Without heat sink: 1.4 to 1.8 [.055 to .071]



Termination style

F1YC

## Crimp barrel



- Crimping on wire
- AWG gauge 22 to 28

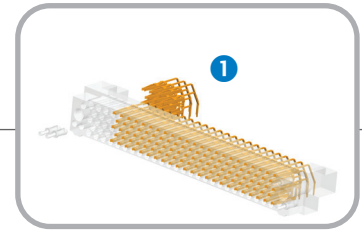


Termination style

F1X1

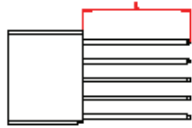
	F1U1	F1U2	F1U3	F1TS	F1YC	F1X1
$L_{MAX}$	3.21 [.126]	5.37 [.211]	2.65 [.104]	5.5 [.217]	With heat sink: 4.4 [.173] Without heat sink: 2.8 [.110]	2.9 [.114]
Termination section	0.6 x 0.25 [.024 X .010]				$\varnothing 0.5 \pm 0.03$ [.020 $\pm$ .001]	$\varnothing 1.3$ [.051]
Active contact area plating $\mu\text{m}$ [ $\mu\text{in}$ ]	2 [.080] Ni + 1 [.039] Au					
Termination plating $\mu\text{m}$ [ $\mu\text{in}$ ]	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	
					1 [.039] Au	

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



## MALE CONTACTS FOR RECEPTACLES WITHOUT GROUND STRIP (1)

### Wire-wrap



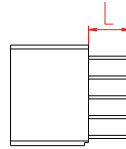
- Wire wrap connections
- Mother board
- AWG gauge 28 to 30



Termination style

**M1W3**

### Straight solder PC tail



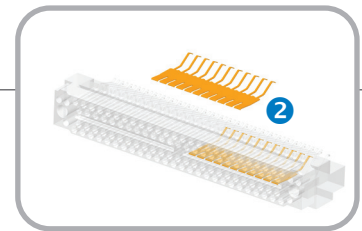
- Thru hole soldering
- Mother board
- PCB thickness: up to 4.3 ± 0.3 [.169 ± .012]



Termination style

**M1YD**

	M1W3	M1YD
<b>L</b>	14.75 ± 0.45 [.581 ± .018]	5.3 ± 0.3 [.209 ± .012]
<b>Termination section</b>	Ø 0.82 ± 0.04 [.032 ± .002]	Ø 0.5 ± 0.03 [.020 ± .001]
<b>Mating end size</b>	1.2 x 0,6 [.024 x .047]	
<b>Active contact area plating μm [μin]</b>	2 [.080] Ni + 1 [.039] Au	
<b>Termination plating μm [μin]</b>	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



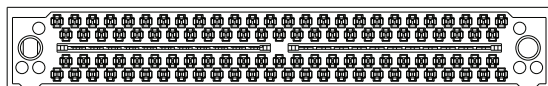
## GROUND STRIP TECHNOLOGY (2)

### 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

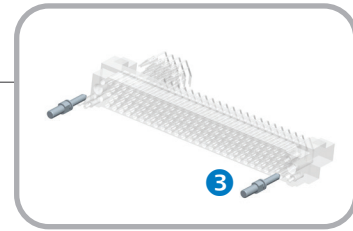
Note: ground strip has the same termination and active contact area platings as the contacts with which its mounted

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

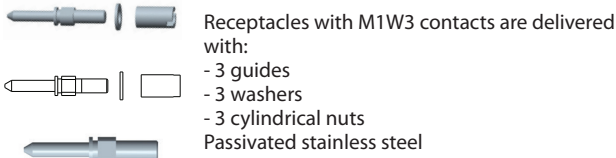
## SIHD &gt;&gt;&gt; GUIDING (3) &amp; KEYING (4)

## GUIDING (3)

The guides are the fixing accessories for receptacles



## A style

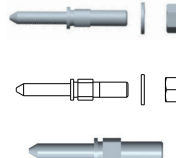


Receptacles with M1W3 contacts are delivered with:  
 - 3 guides  
 - 3 washers  
 - 3 cylindrical nuts  
 Passivated stainless steel

SIHD E --- A M1W3

A

## B style

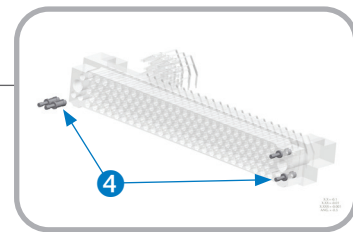


Receptacles with M1YD contacts are delivered with:  
 - 3 guides  
 - 3 washers  
 - 3 hexagonal nuts  
 Passivated stainless steel

SIHD E --- B M1YD

B

## KEYING (4)



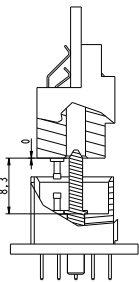
## Polarizing pins



- 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

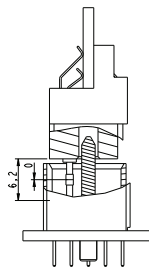
## MATING SEQUENCE

## Guiding



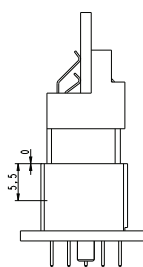
8.3 [.327]

## Keying



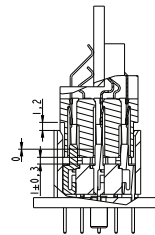
6.2 [.244]

## Housing contact

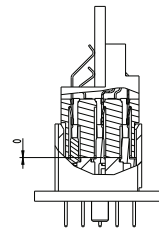


5.5 [.217]

## Signal contact


 $1 \pm 0.3$  [.039 ± .012]  
 1.2 [.047]

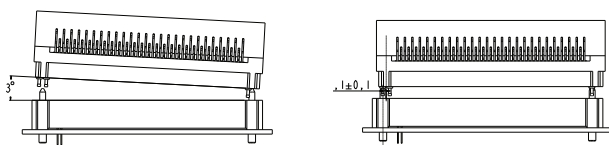
## Mated connector



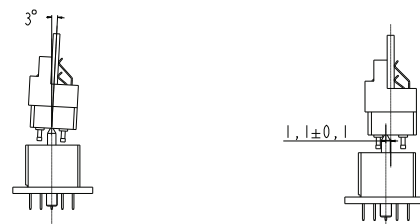
0

## REALIGNMENT CAPABILITY

## In the longitudinal axis



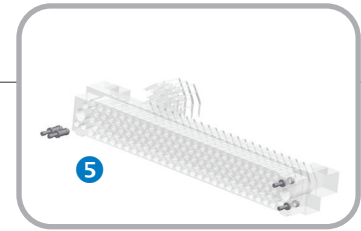
## In the lateral axis



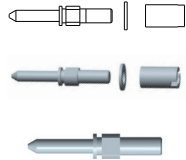


# SIHD >>> FIXING ACCESSORIES (5)

## FIXING ACCESSORIES FOR RECEPTACLES = GUIDING



### A style

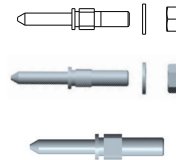


Receptacles with M1W3 contacts are delivered with:  
 - 2 or 3 guides  
 - 2 or 3 washers  
 - 2 or 3 cylindrical nuts  
 Passivated stainless steel

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

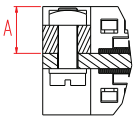
SIHD E --- B M1YD

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

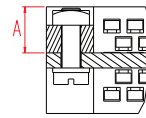
SIHD F --- A F1U1

SIHD F --- A F1U2

A

### PCB without a thermal drain

#### D style - For F1YC female contacts



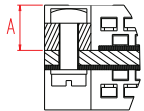
- Mounted to PCB  
 - PCB without a heat sink

Passivated stainless steel

SIHD F --- D F1YC

D

#### B style - For F1U1 female contacts



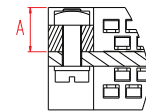
- Mounted to PCB  
 - PCB with a heat sink

Passivated stainless steel

SIHD F --- B F1U1

B

#### E style - For F1U3 female contacts



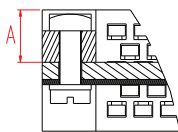
- Mounted to PCB  
 - PCB without a heat sink

Passivated stainless steel

SIHD F --- E F1U3

E

#### C style - For F1YC/F1T female contacts



- Mounted to PCB  
 - PCB with a heat sink

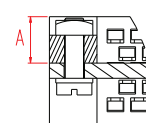
Passivated stainless steel

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

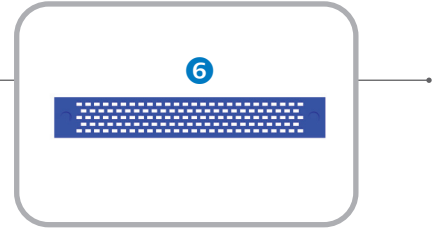
SIHD F --- F F1X1

F

Fixing accessories for plugs equipped with female contacts						
	A style	B style	C style	D style	E style	F style
<b>A<sub>MIN</sub></b>	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]

## SIHD &gt;&gt;&gt; WITHOUT GROUND STRIP (6)

## TYPICAL ARRANGEMENTS



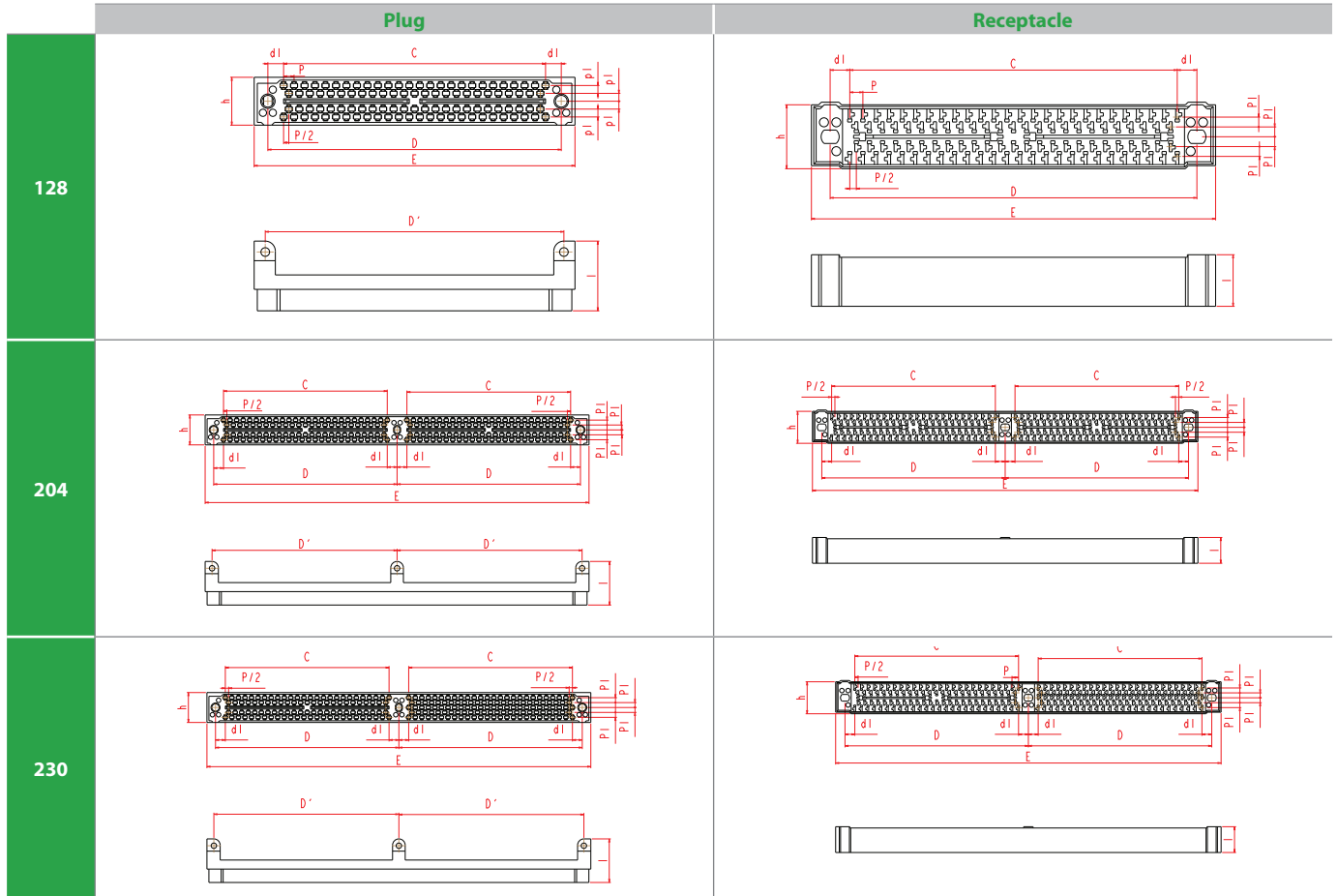
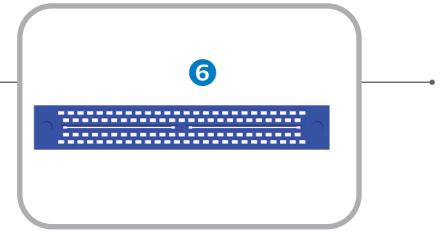
	Plug		Receptacle	
128				
158				
256				
390				

Nb of contacts	128		158		256		390	
	Plug	Receptacle	Plug	Receptacle	Plug	Receptacle	Plug	Receptacle
<b>C</b>	63.5 [2.500]		78.74 [3.100]		63.5 [2.500]		96.52 [3.800]	
<b>D</b>	71.12 [2.800]		86.36 [3.400]		71.12 [2.800]		106.68 [4.200]	
<b>E<sub>MAX</sub></b>	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]
<b>h<sub>MAX</sub></b>	11.6 [.457]	12.4 [.488]	11.6 [.457]	13.4 [.528]	11.6 [.457]	12.4 [.488]	11.75 [.463]	15 [.591]
<b>D'</b>	72.39 [2.850]	/	87.63 [3.450]	/	71.755 [2.825]	/	106.68 [4.200]	/
<b>l<sub>MAX</sub></b>	16.9 [.665]	10.3 [.406]	16.9 [.665]	11.15 [.439]	16.9 [.665]	10.3 [.406]	17.95 [.707]	10.2 [.402]

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

SIHD >>> WITH GROUND STRIP (6)

TYPICAL ARRANGEMENTS



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

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

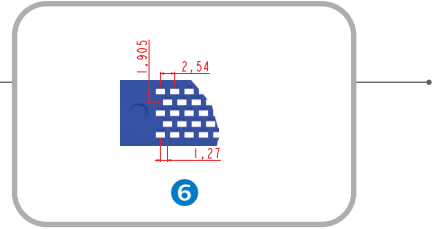
## SIHD &gt;&gt;&gt; WITHOUT GROUND STRIP (6)

## LAYOUTS

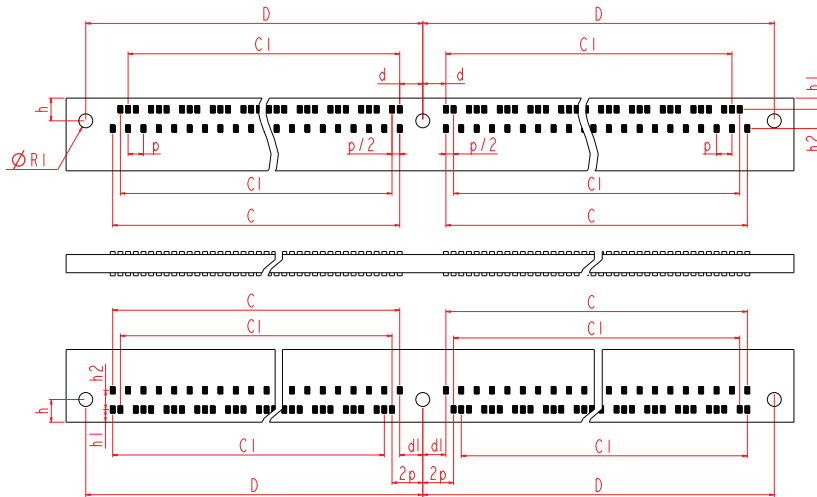
The boards are shown from the connector side.

All contact locations are equidistant.

n indicates the total number of signal contacts.



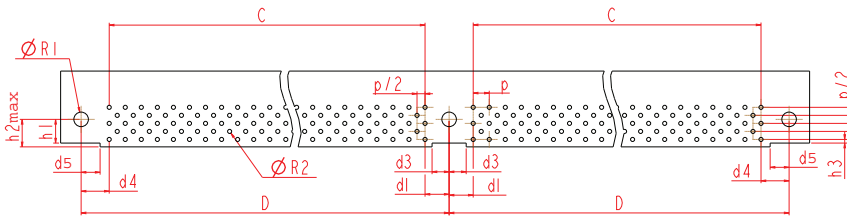
## F1U1/F1U2 CONTACT (female for plug)\*



C <sub>1</sub>	$C - p = C - 2.54$
C	See pages 94 & 95
D	See pages 94 & 95

n = 128, 158, 256 or 390

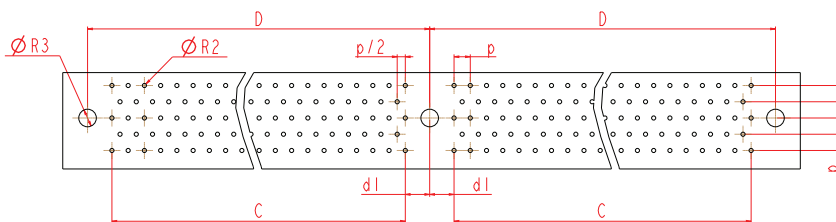
## F1YC CONTACT (female for plug)\*



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

n = 128, 158, 256 or 390

## M1W3/M1YD (male for receptacle)\*



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

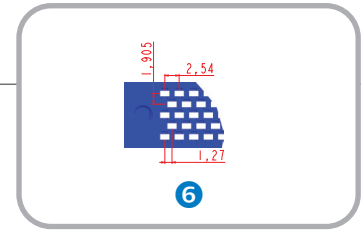
n = 128, 158, 256 or 390

R1	R2	R3	h	h1	h2	h3	h2 <sub>MAX</sub>	
$\varnothing 2.3^{+0.05}_{+0} [ .091^{+0.002}_{+0} ]$	$\varnothing 0.7^{+0.05}_{MIN} [ .028 ]$ $0.9^{+0.05}_{MIN}$ for W3 contacts	$\varnothing 2.75^{+0.05}_{+0} [ .108^{+0.002}_{+0} ]$	3.75 [ .148 ]	1.845 [ .073 ]	3.175 [ .125 ]	0.575 [ .023 ]	4.35 <sub>MAX</sub> [ .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 ]	$3 \pm 0.1 [ .118 \pm .004 ]$	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)

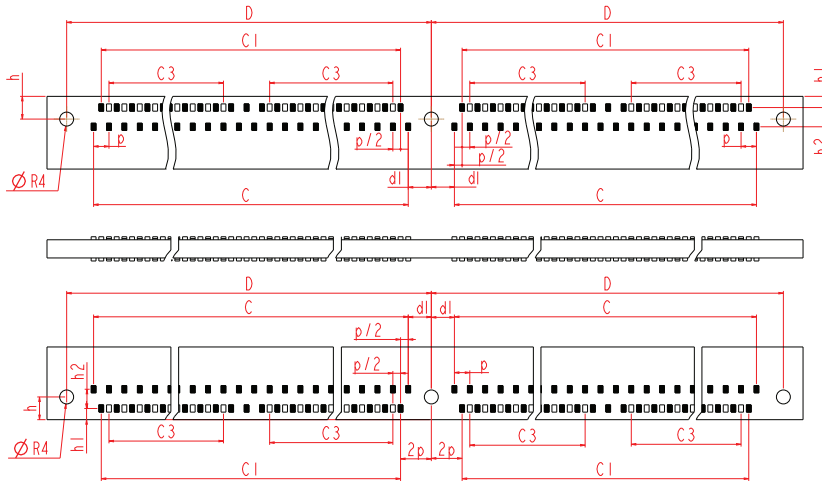


## LAYOUTS

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)\*

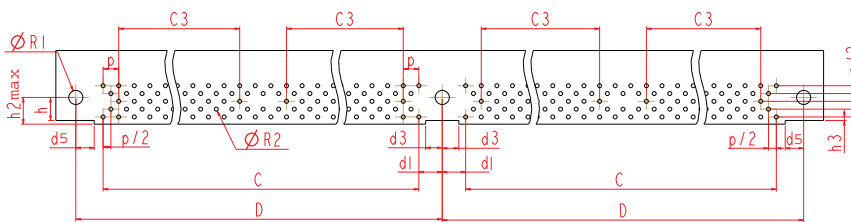
n = 102, 204 or 230



<b>C<sub>1</sub></b>	$C - p = C - 2.54$
<b>C<sub>3</sub></b>	$(C - 5p) / 2$
<b>C</b>	See pages 94 & 95
<b>D</b>	See pages 94 & 95

### F1YC CONTACT (female for plug)\*

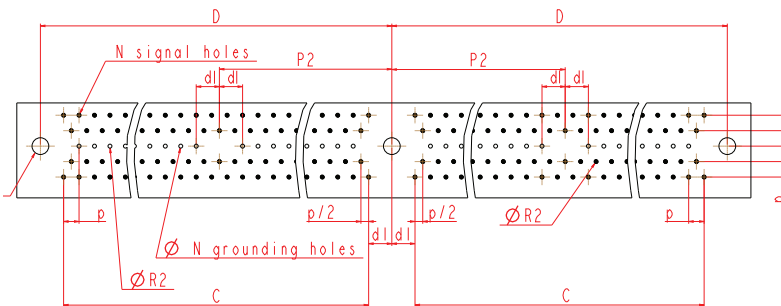
n = 102, 204 or 230



<b>C<sub>1</sub></b>	$C - p = C - 2.54$
<b>C<sub>3</sub></b>	$(C - 5p) / 2$
<b>C</b>	See pages 94 & 95
<b>D</b>	See pages 94 & 95

### M1W3/M1YD (male for receptacle)\*

n = 102, 204 or 230



<b>P<sub>2</sub></b>	$C / 2$
<b>C</b>	See pages 94 & 95
<b>D</b>	See pages 94 & 95

R1	R2	R3	R4	p1	p	2p	p/2
$\varnothing 2.3^{+0.05}_{+0}$ [.091 <sup>+0</sup> ]	$\varnothing 0.7^{+0.028}_{MIN}$ 0.9 <sub>MIN</sub> for W3 contacts	$\varnothing 2.75^{+0.05}_{+0}$ [.108 <sup>+0</sup> ]	$\varnothing 2.7_{MAX}$ [.106]	1.905 [.075]	2.54 [.100]	5.08 [.200]	1.27 [.050]
d1	d3	d5	h	h1	h2	h3	h2 <sub>MAX</sub>
3.81 [.150]	$2.7^{+0.1}_{+0}$ [.106 <sup>+0.004</sup> ]	$3 \pm 0.1$ [.118 ± .004]	3.75 [.148]	1.845 [.073]	3.175 [.125]	0.575 [.023]	$4.35_{MAX}$ [.171]

\* in mm: 1mm = 0.03937 inch

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





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