Beta/Bilingual Interface Proposal 3

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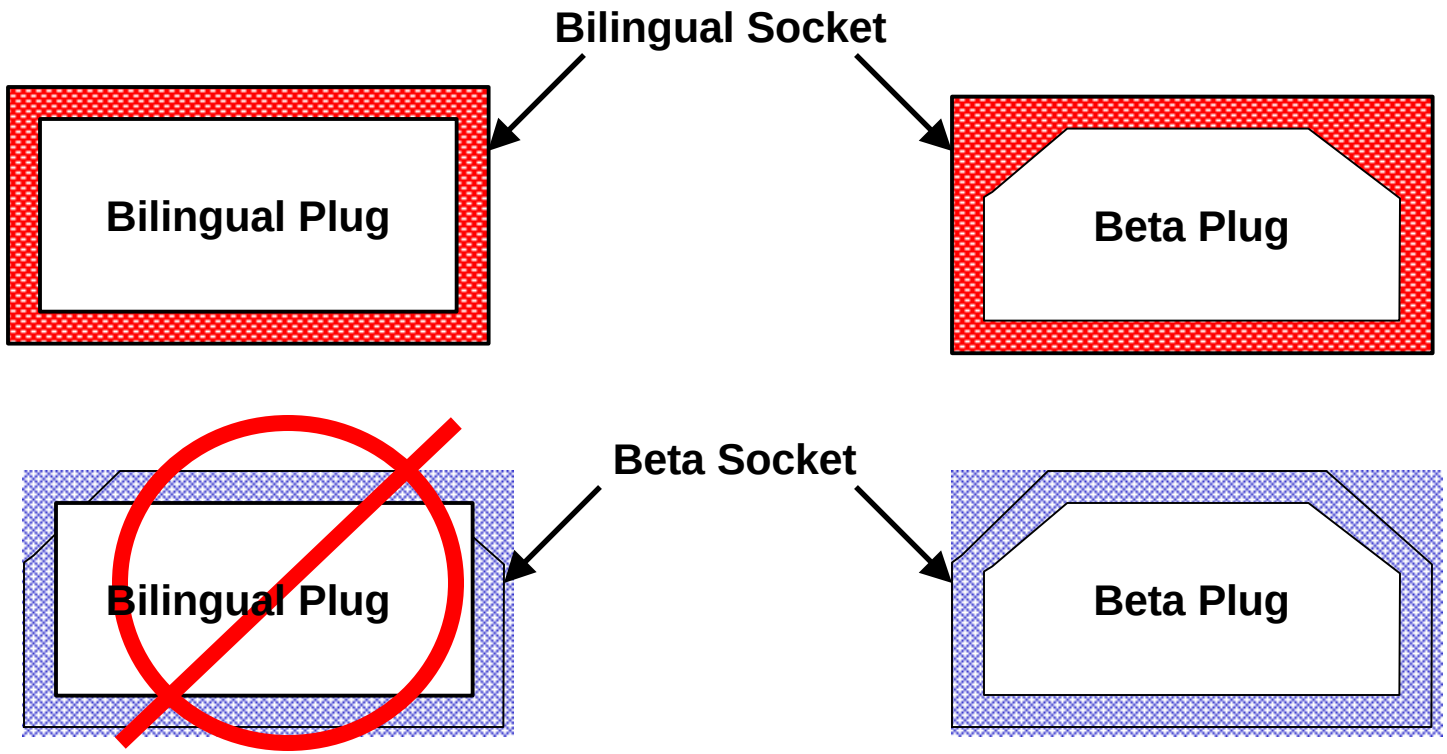
Mechanical Target

- **Mechanical**
  - **Target size to be as close to 4 circuit IEEE 1394a connector as possible.]**
  - **Functions:**
    - **Power, 2 High Speed Data Channels and Status Contact**
  - **Interface geometry**
    - **Blade contact in the socket on the printed circuit board**
    - **Spring contact in the cable plug**
  - **Three stage interface mating**
    - **Cable ground**
    - **Power pairs and signal grounds**
    - **Signal**
  - **Isolated cable ground for safety**
  - **SMT PC board solder tails**
  - **Reference Cable Conductors:**
    - **22 AWG Power and 28 AWG Signal reference for 4.5 m length**
    - **26 AWG Power and 30 AWG Signal reference for 2 meter length**
  - **Cycles: 1000**
  - **Plastic Isolated Plug Shield**

Electrical and Cost Targets

- **Electrical:**
  - **Voltage: 30 VDC maximum**
  - **Current: 1.5 A per contact**
  - **Data Rate: specified to S1600 (Interface capable up to S3200)**
  - **Impedance: 110 +/- 25 Ohms through a 100 ps exception window**
  - **Cross Talk: less than 5%**
  - **Connector Skew:**
    - **Intrapair < 10 ps**
    - **Interpair < 15 ps**
- **Cost:**
  - **PCB socket: Equivalent to current high performance sockets**
  - **Cable Assembly: Equivalent to current high performance cable assemblies at equivalent speeds (S800 and S1600)**

Plug to Socket Matrix

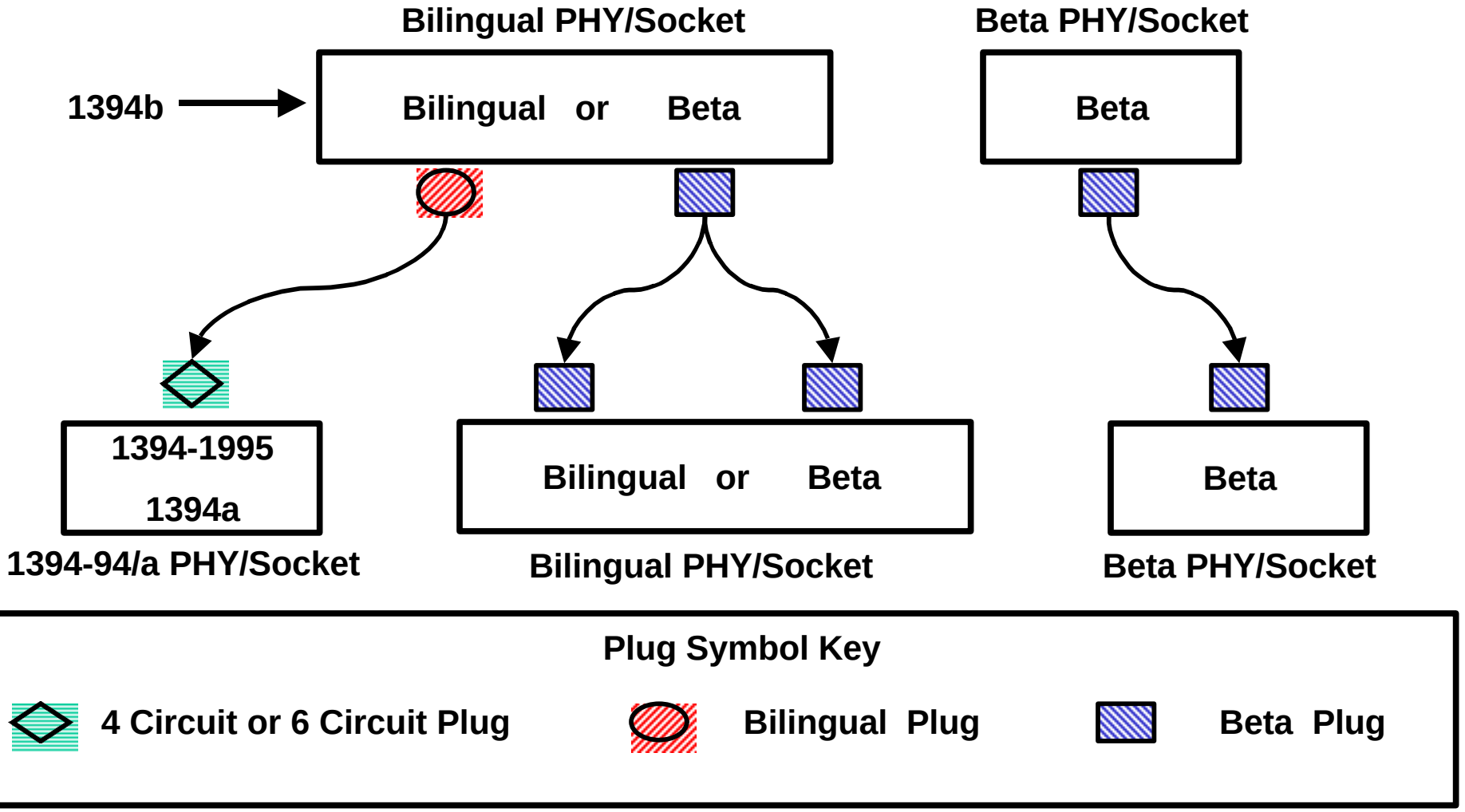


NOTE: **Bilingual plug will not plug into a Beta socket.**

Beta plug will plug into a Bilingual socket.

Revised

Cable Scheme



Copper Connector Sockets and Cable Speed Matrix

Socket	S100-S400 1394-95/A	S100β	S200β	S400β	S800β	S1600β
1394-1995 6 Circuit	X					
1394a 4 Circuit	X					
1394b CAT 5		X				
1394b Bilingual				X	X	X
1394b Beta				X	X	X

NOTE: **Bilingual plug will not plug into a Beta socket.**

Beta plug will plug into a Bilingual socket.

Copper Cable Plug Assembly Matrix

Plug	1394b CAT 5	1394b Bilingual	1394b Beta
1394-1995 6 Circuit		X	
1394a 4 Circuit		X	
1394b CAT 5	X		
1394b Bilingual		1	2
1394b Beta			X

NOTES: **1- Bilingual to Bilingual will use Beta to Beta cables**

2- Beta to Bilingual will use Beta to Beta cables

3- Bilingual plug will not plug into a Beta socket.

4- Beta plug will plug into a Bilingual socket.

Allowable IEEE 1394b Cables

- 6 ckt cable plug (1394-95) to Bilingual cable plug
- 4 ckt cable plug (1394a) to Bilingual cable plug
- Beta cable plug to Beta cable plug

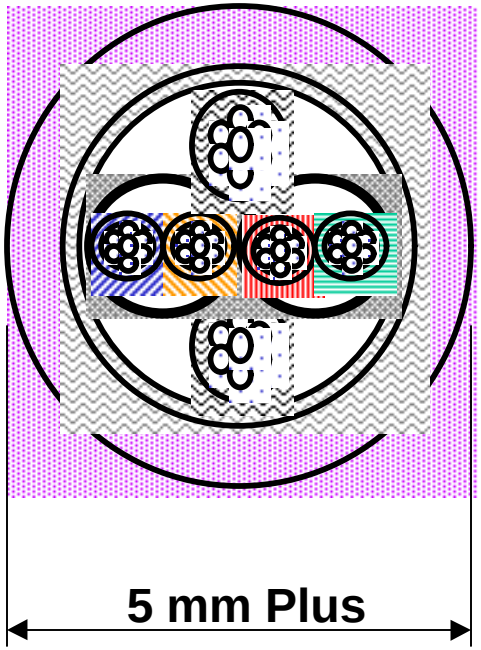
NOTES: **Bilingual to Bilingual will use Beta to Beta cables**

Beta to Bilingual will use Beta to Beta cables

Bilingual plug will not plug into a Beta socket.

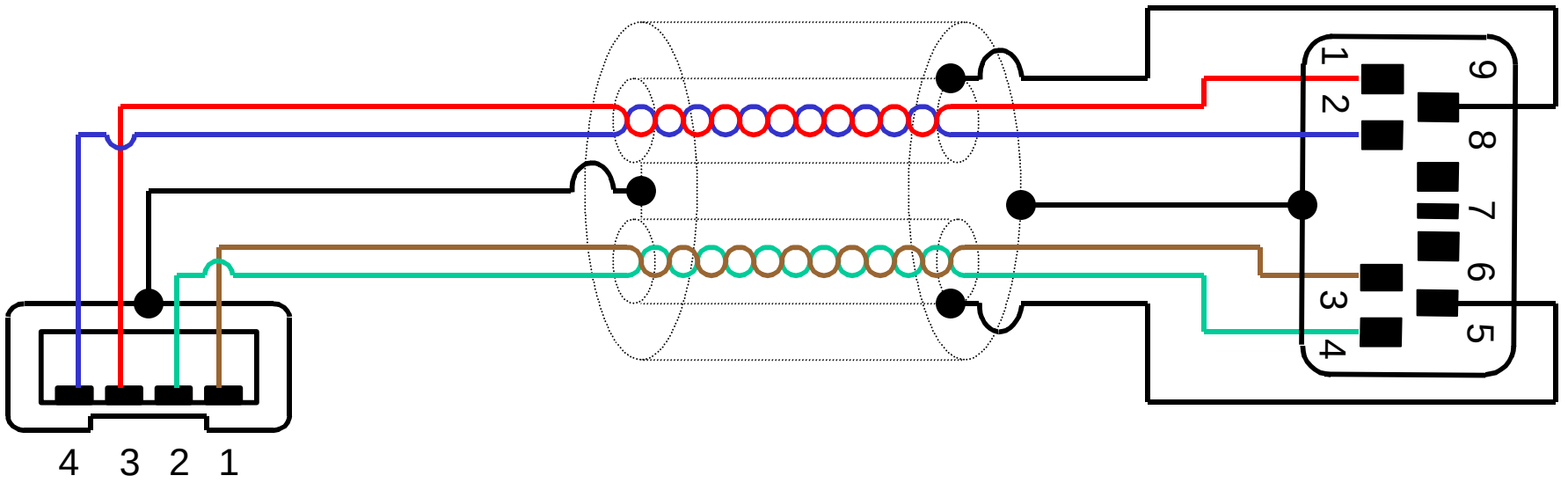
Beta plug will plug into a Bilingual socket.

2 meter Beta Cable Construction (Reference)



- Power Wires
  - Voltage [26 AWG]
  - Ground [26 AWG]
- Two High Speed Data Pairs
  - Twisted Pair [30 AWG]
  - Braided copper shield with polyester tape isolation
- Outer Shield
  - Braided copper shield with polyester tape isolation from the internal conductors

1394a 4 Circuit to Bilingual Cable Assembly



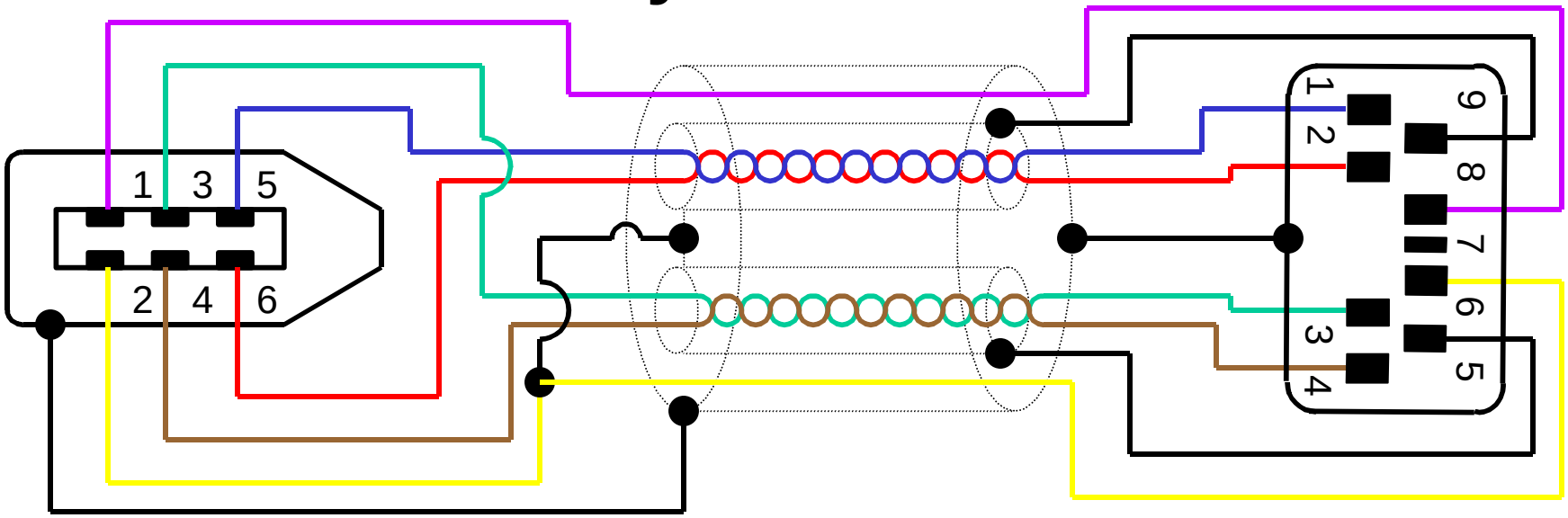
4 Circuit Pin Out (Ref)	
Pin 1	TPB*
Pin 2	TPB
Pin 3	TPA*
Pin 4	TPA

Note:

Connectors are viewed as looking at the front plug face. Bilingual polarization is shown.

Bilingual Circuit Pin Out (Ref)			
Pin 1	TPB *	Pin 6	VG
Pin 2	TPB	Pin 7	SC
Pin 3	TPA *	Pin 8	VP
Pin 4	TPA	Pin 9	TPB (R)
Pin 5	TPA (R)		

1394-1995 6 Circuit to Bilingual Cable Assembly



6 Circuit Pin Out (Ref)	
Pin 1	VP
Pin2	VG
Pin 3	TPB*
Pin 4	TPB
Pin 5	TPA*
Pin 6	TPA

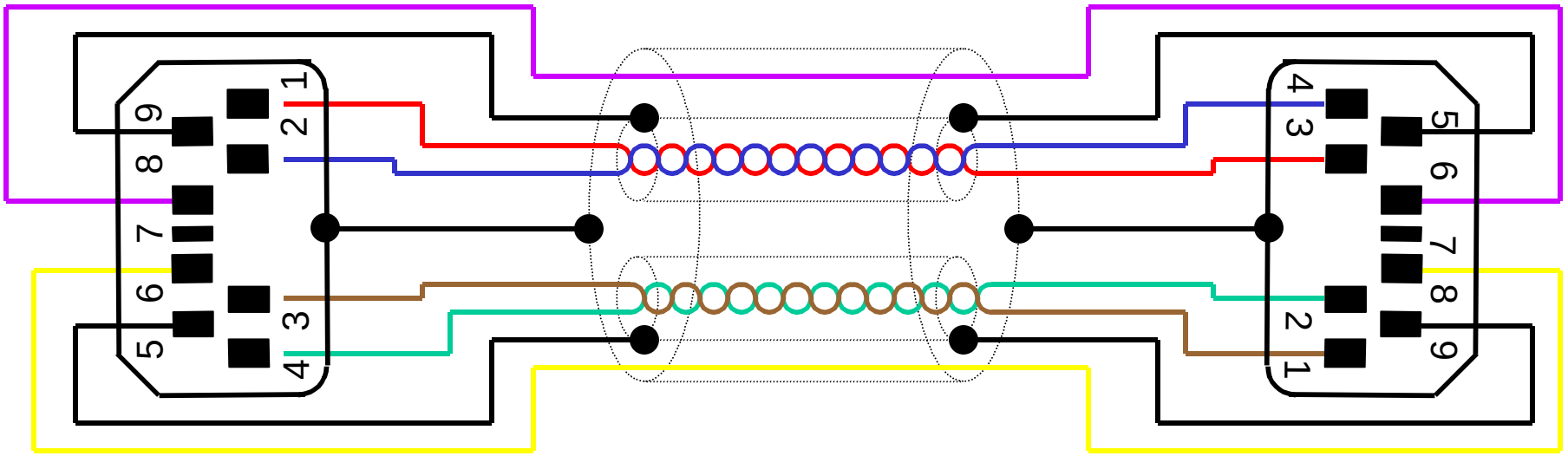
Note:

Connectors are viewed as looking at the front plug face. Bilingual polarization is shown. Power is mandated for this cable.

Bilingual Circuit Pin Out (Ref)			
Pin 1	TPB *	Pin 6	VG
Pin 2	TPB	Pin 7	SC
Pin 3	TPA *	Pin 8	VP
Pin 4	TPA	Pin 9	TPB (R)
Pin 5	TPA (R)		

Beta to Beta Cable Assembly

Revised



Note:

Connectors are viewed as looking at the front plug face. Beta polarization is shown. Power is mandated for this cable.

Beta Circuit	Pin Out (Ref)		
Pin 1	TPB *	Pin 6	VG
Pin 2	TPB	Pin 7	SC
Pin 3	TPA *	Pin 8	VP
Pin 4	TPA	Pin 9	TPB (R)
Pin 5	TPA (R)		

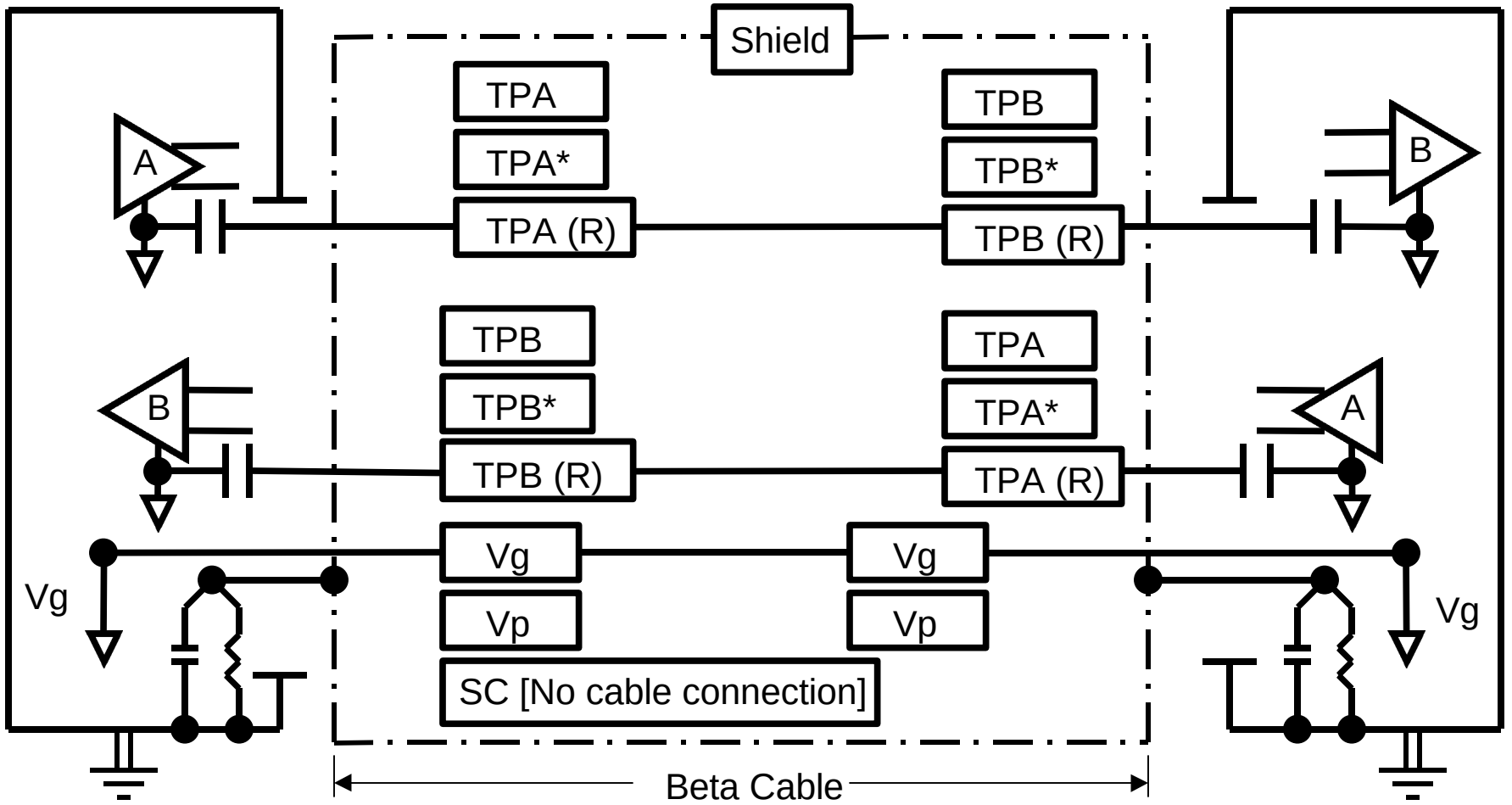
Beta Ground Scheme- **Full System Isolation:**

-Cable Shield is isolated from Chassis Ground

-Signal returns are isolated from power ground and fully dedicated to Rx input

-Signal returns may include galvanic isolation

Revised



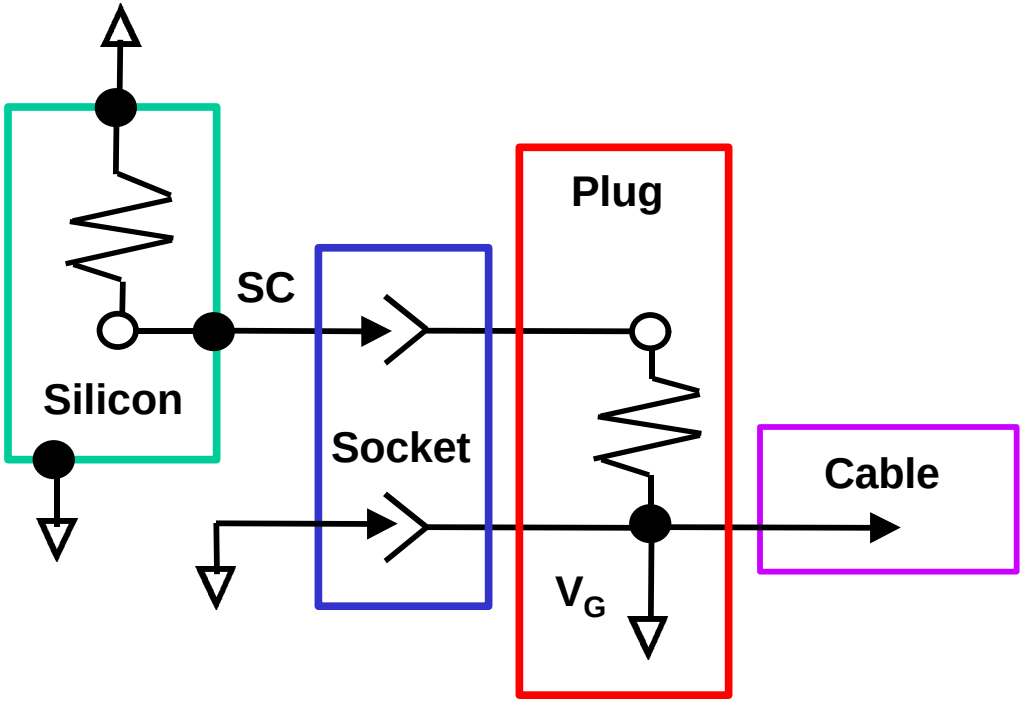
Status Contact State

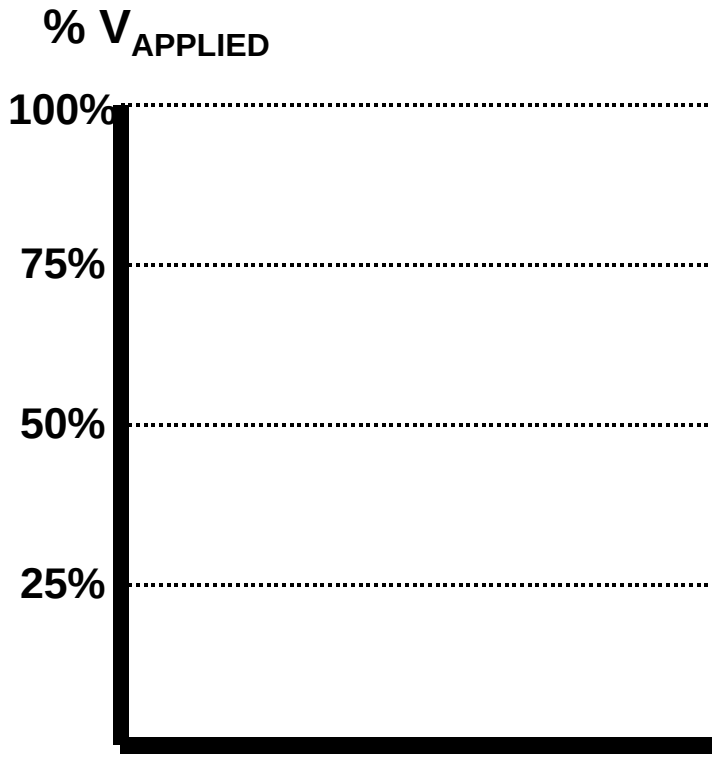
Revised

- **No Connection (Cable presence toning)**
- **Legacy DS Cables (Protocol)**
- **Status (Passive System)**
  - S 800 maximum cable data speed
  - S1600 maximum cable data speed
  - S3200 maximum cable data speed
  - Reserved for future assignments

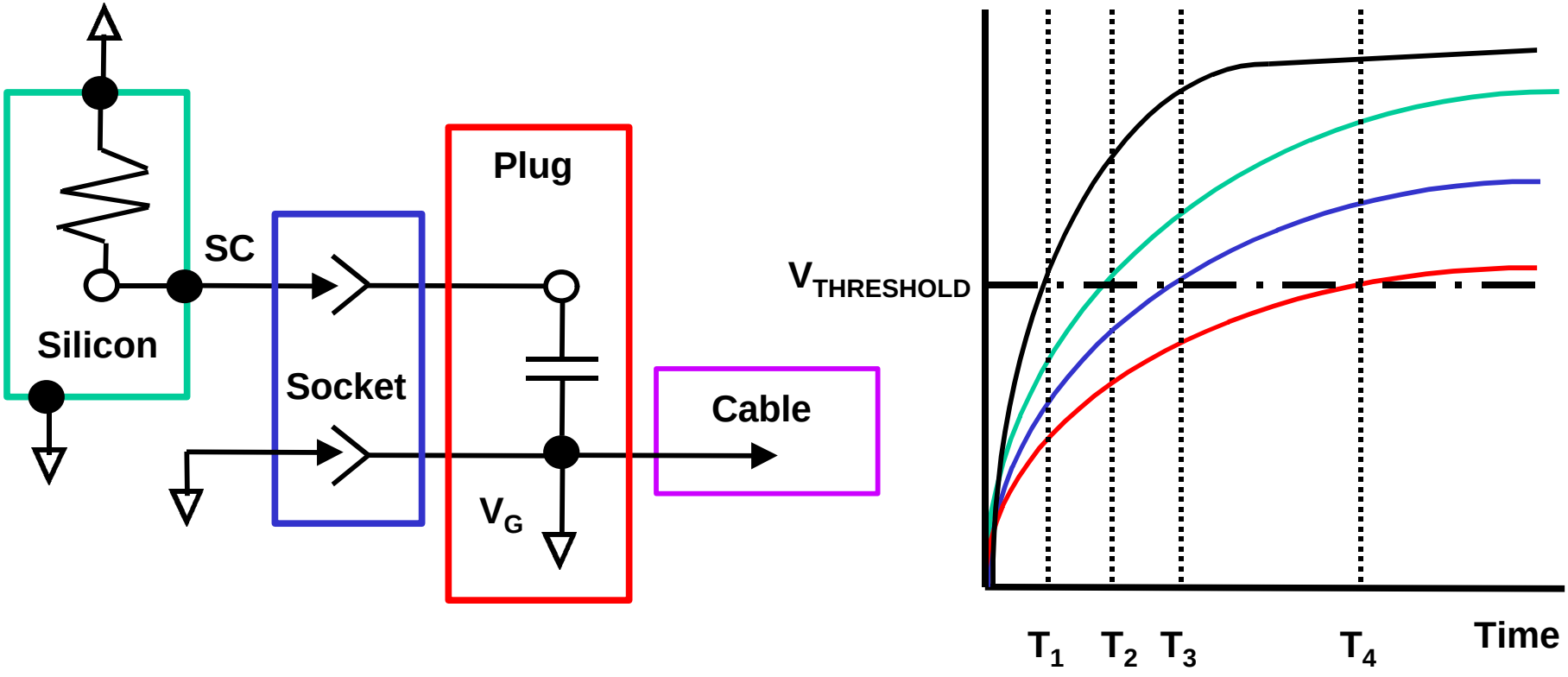
- **Proposed at SCAT and Copperheads Meeting**
  - All cable are S1600 capable
  - SC pin will be used for future cable requirements

Passive Status System Option #1 with Resistor

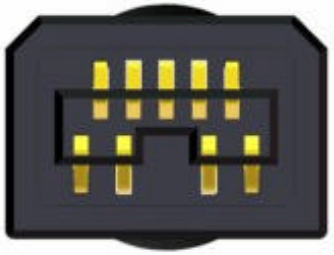




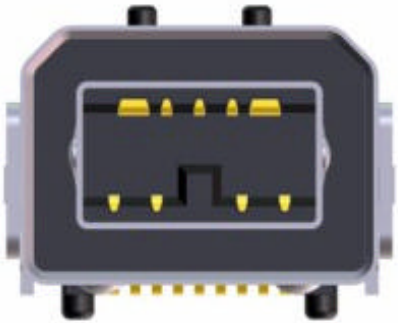
Passive Status System Option #2 with Capacitor



Beta Interface

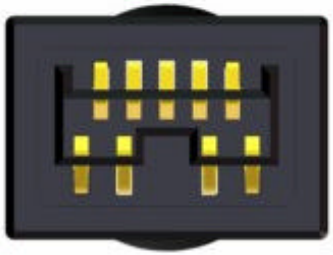


Plug

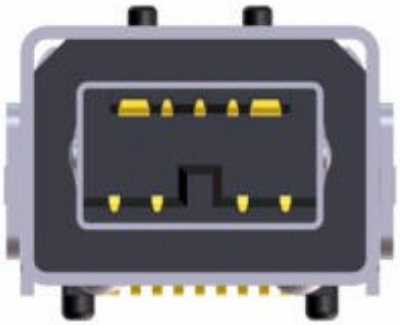


Socket

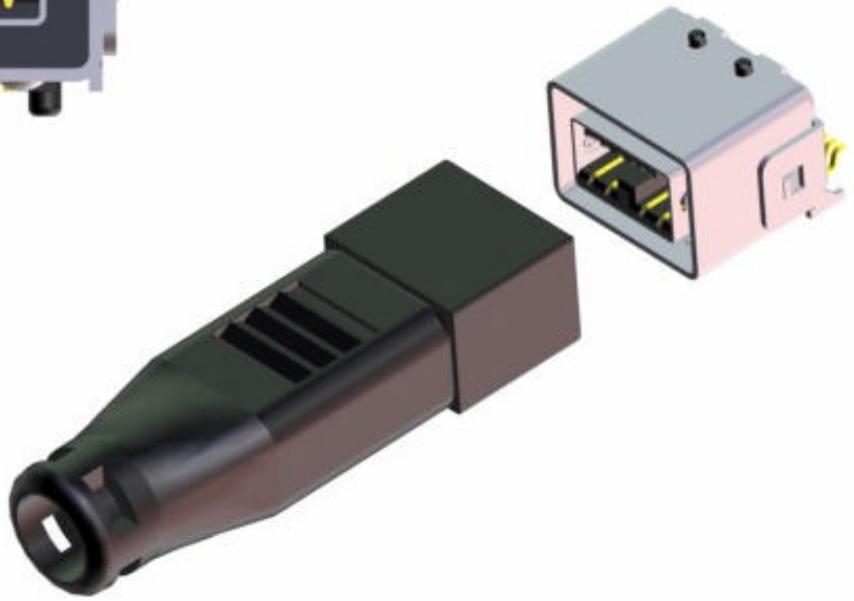
Bilingual Interface



Plug



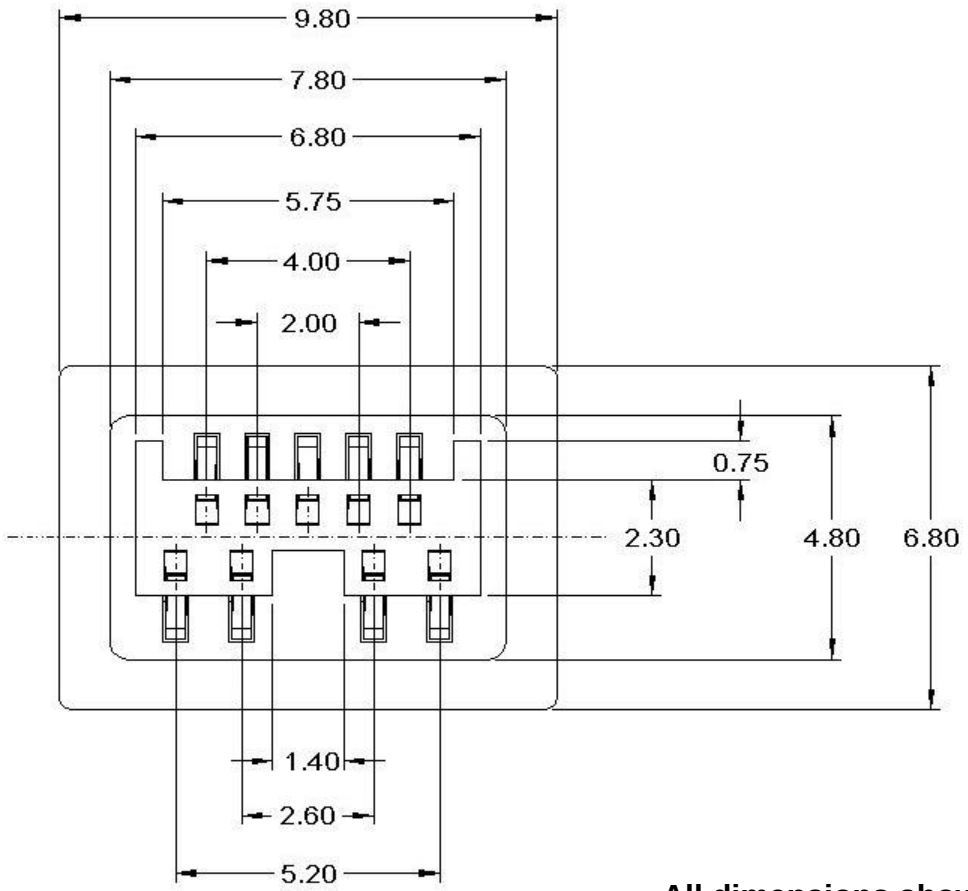
Socket



Beta and Bilingual Interface Pin Out

1	TPB *	Twisted Pair B (Minus)
2	TPB	Twisted Pair B (Plus)
3	TPA *	Twisted Pair A (Minus)
4	TPA	Twisted Pair A (Plus)
5	TPA (R)	Twisted Pair A (Reference)
6	VG	Power (Ground)
7	SC	Status Contact
8	VP	Power (Voltage)
9	TPB (R)	Twisted Pair B (Reference)

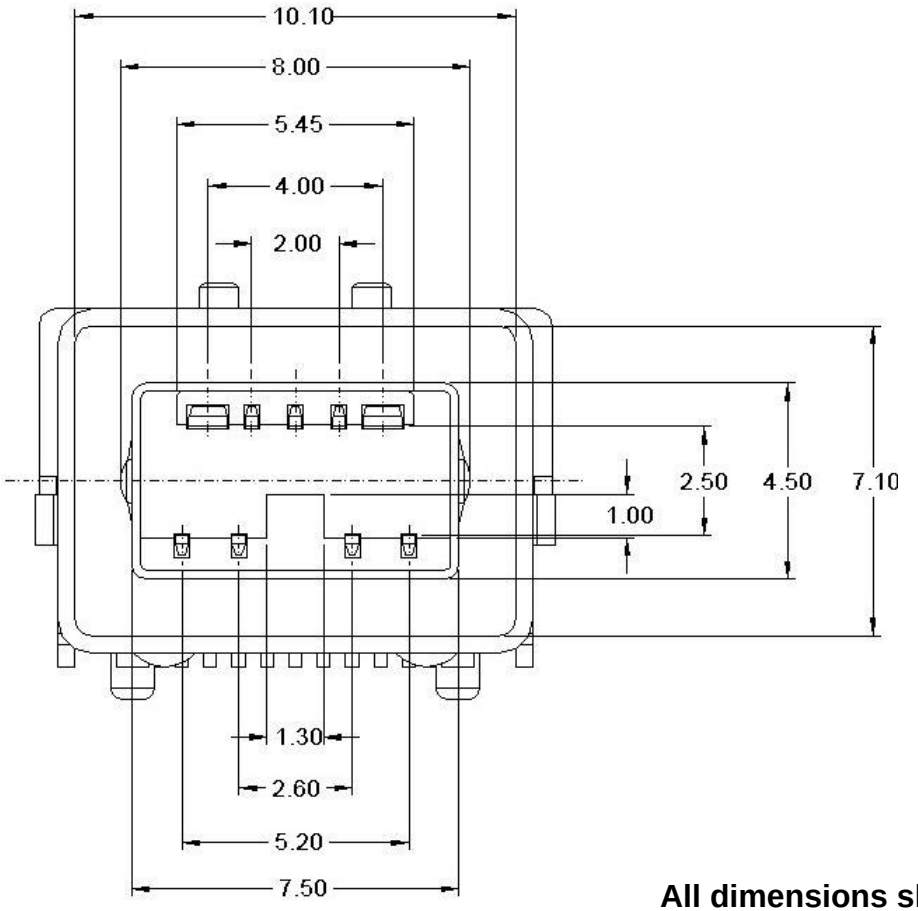
Bilingual Plug Body



PLUG BILINGUAL

All dimensions shown are in millimeters

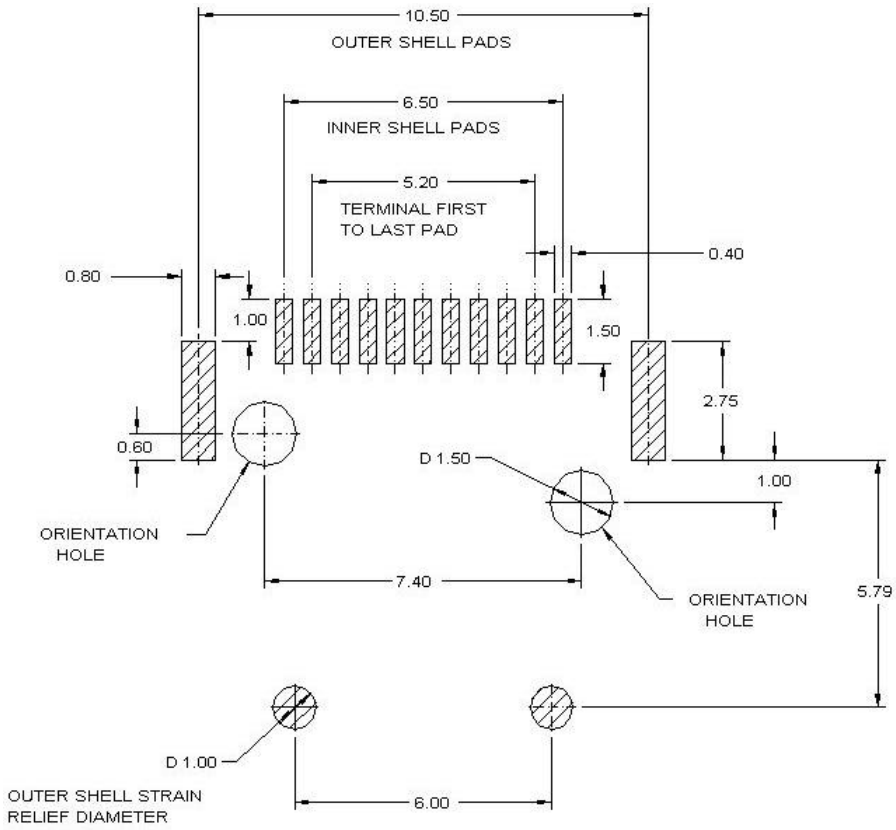
Bilingual Socket Body



SOCKET BILINGUAL

All dimensions shown are in millimeters

Bilingual Socket PC Board Layout



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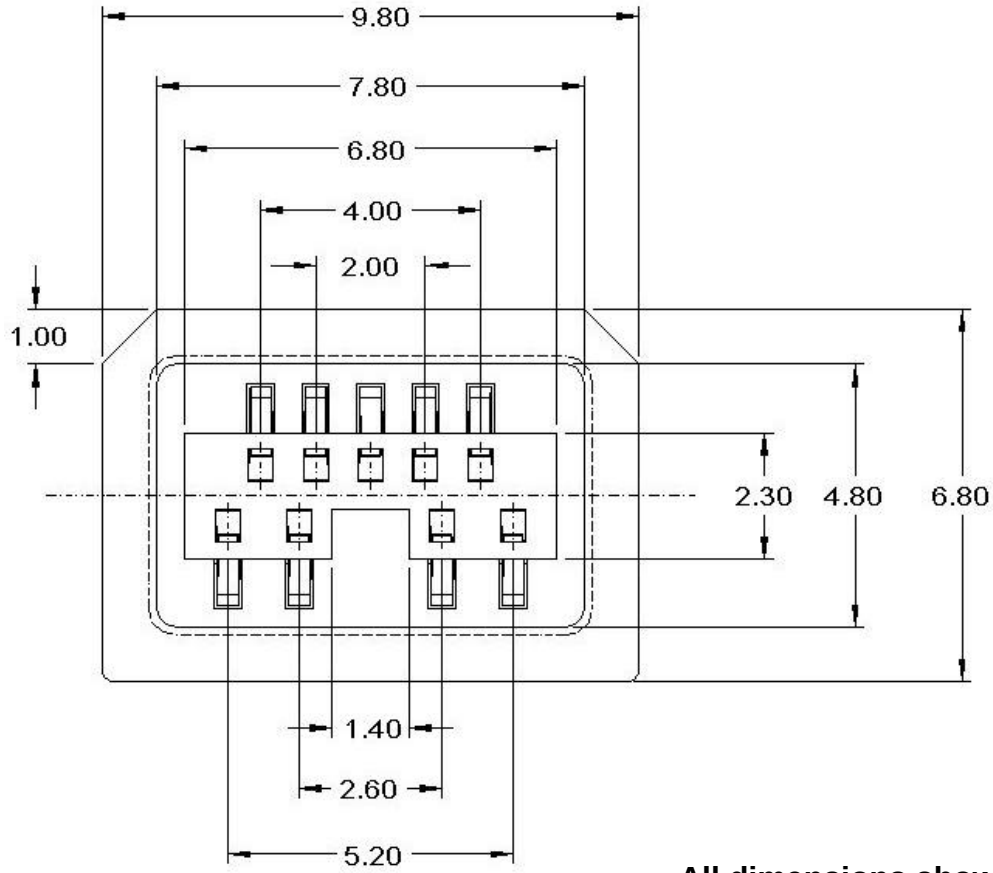
SOCKET BILINGUAL PCB

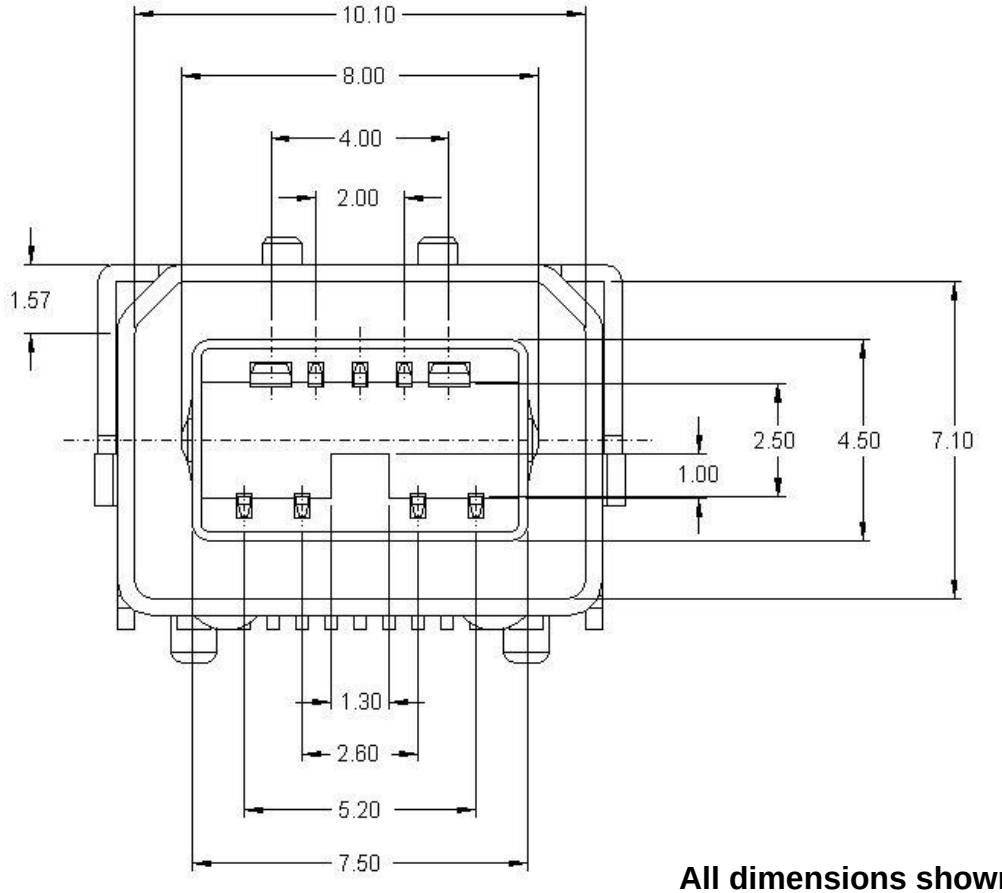
Beta Plug Body



PLUG BETA

All dimensions shown are in millimeters

Beta Socket Body



SOCKET BETA

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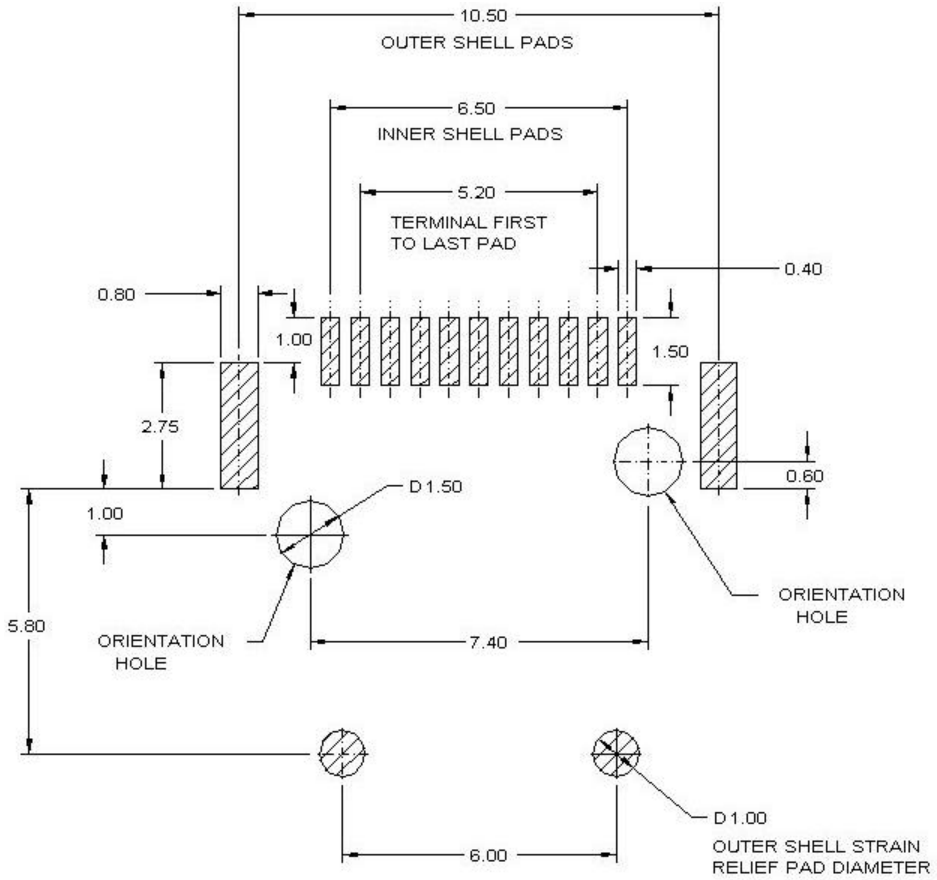
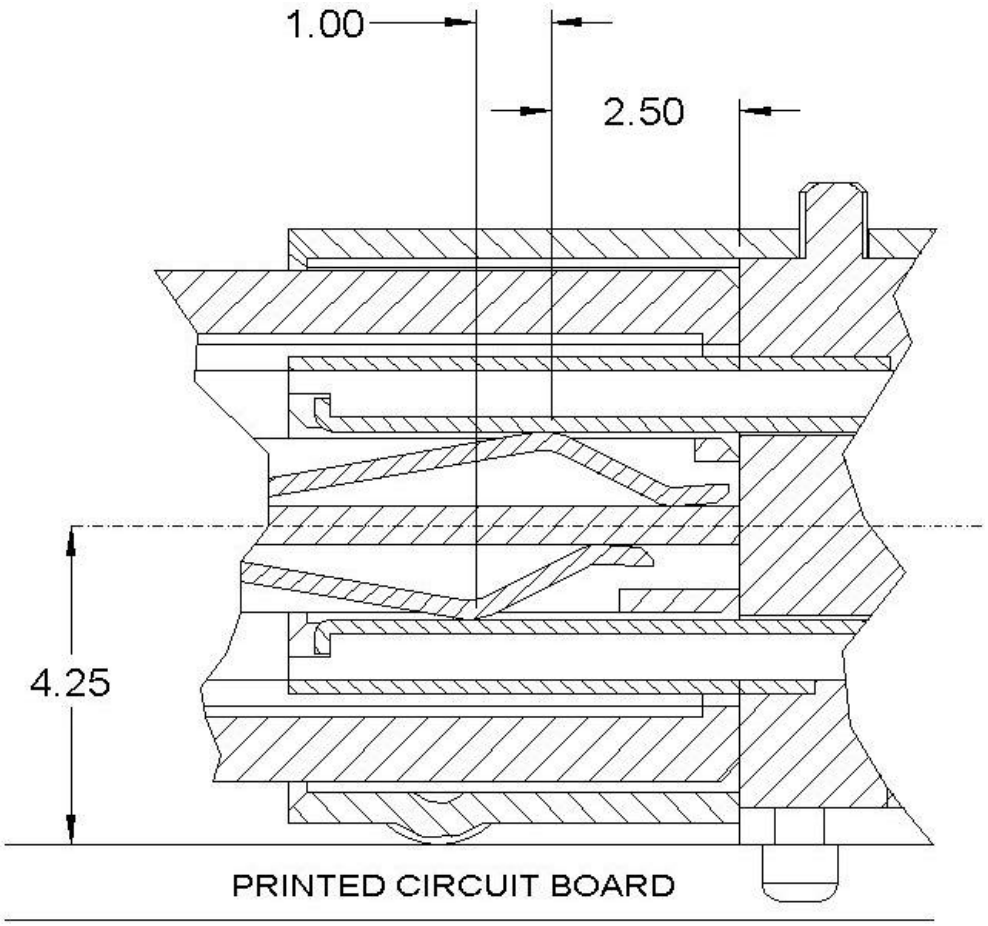
Beta Socket PC Board Layout



SOCKET BETA PCB

All dimensions shown are in millimeters

Mated Cross Section-Bilingual and Beta



Thank you for your time!

- **Please direct all questions and comments to Copperheads at Zayante.com reflector**
- **A copy of this presentation will be posted on the 1394b website within seven working days.**
- **A draft of the Beta/Bilingual interface will be presented as part of the IEEE 1394b document at the August meeting**
- **Copperheads will have off-cycle meetings after the August meeting to meet the draft schedule for closure**