Memo

Date: 31 August, 1997

Subject: Suspend/Resume Signaling Transfer Function

From: Michael A. Brown

To: IEEE 1394a Committee

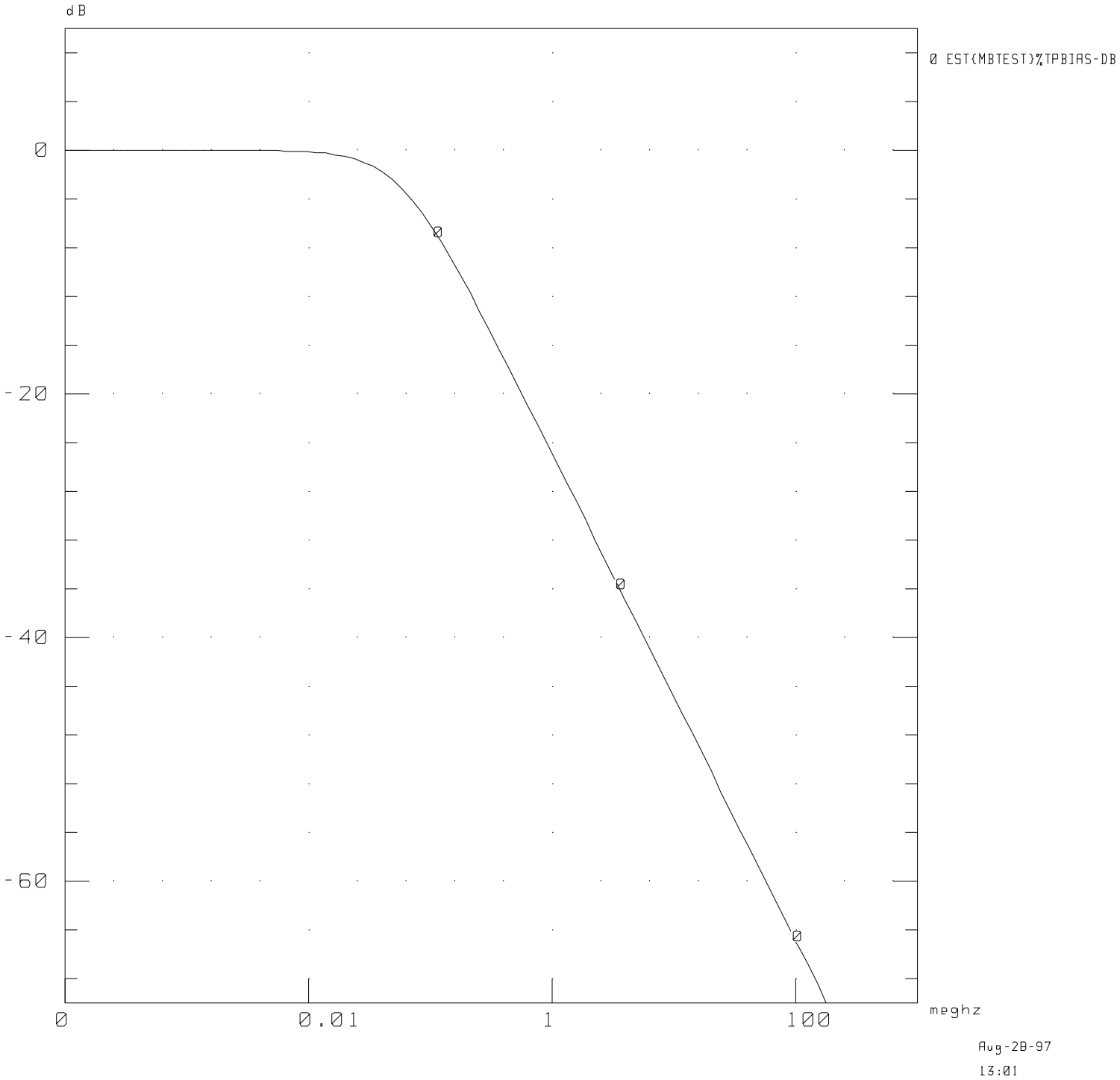
I have included the following files:
graph1.pdf: Bode plot of the transfer function from TPB and TPB* to Tpbias
mbtest.pdf: The simplified schematic used in the simulation
Reversed.pdf: A schematic of the TPA to TPB interconnection with Suspend/Resume (reversed)
Sense.pdf: A schematic of the TPA to TPB interconnection with Suspend/Resume
Graph1.PS: Bode plot of the transfer function from TPB and TPB* to Tpbias (postscript)
MBTEST.PS: The simplified schematic used in the simulation (postscript)
Tpbias Sense.vsd: Visio drawings for the TPA to TPB interconnection
Tpbias Sense Rrversed.vsd: Visio drawings for the TPA to TPB interconnection (reversed)

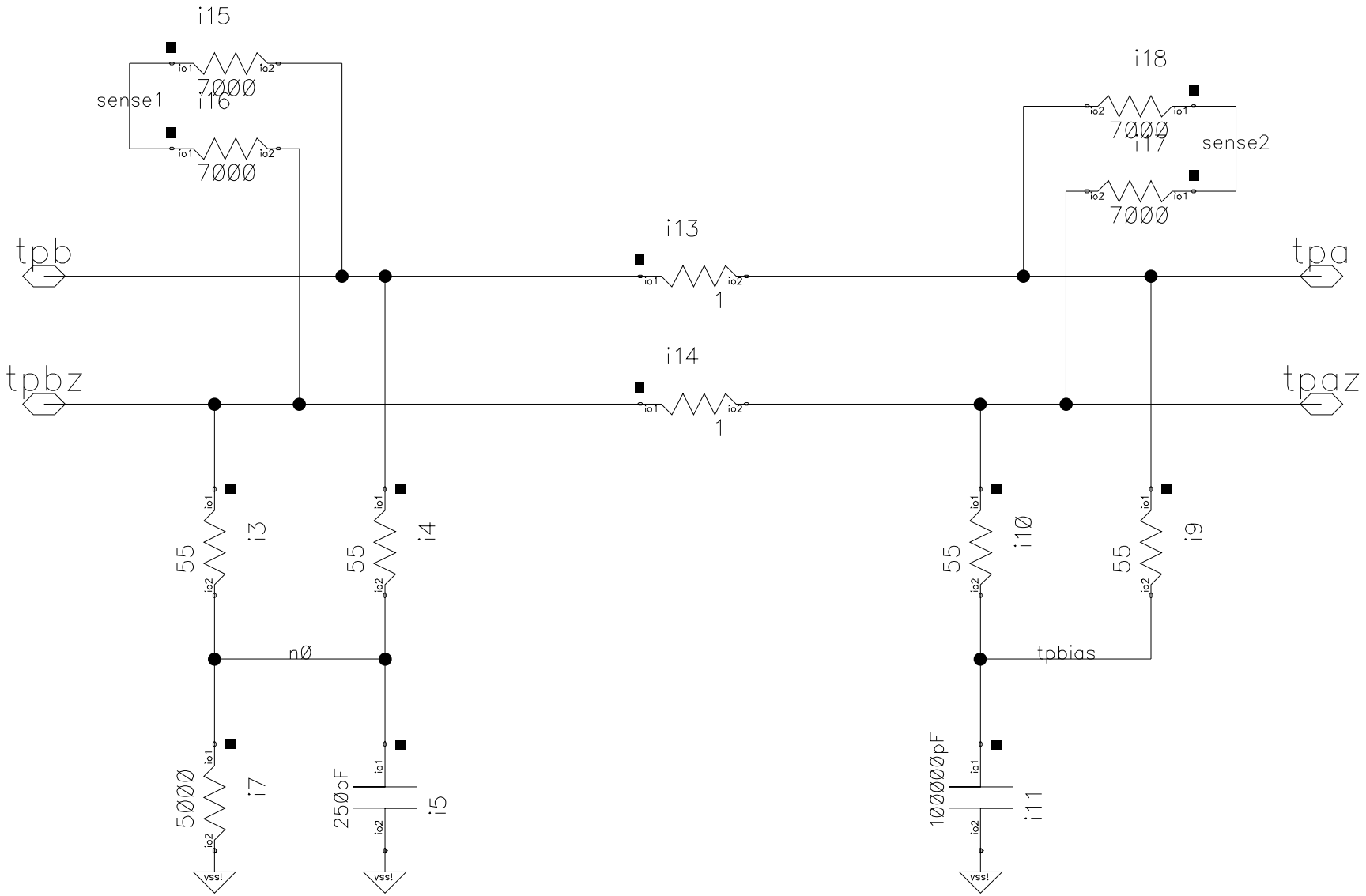
A common mode noise on the signal line evaluation was performed. The input of the transfer function (graph1.pdf) was applied to tpb and tpbz. The output was measured from vss! to tpbias. The 3 dB corner frequency is at approximately 30 KHz. The effective attenuation of signals above 1 MHz exceeds 30 dB. I have assumed a common mode noise source on both signal lines and that the detector is connected to the Tpbias signal pin.

Noise was applied to the cable shield or pin 2 of the 6 wire cable, vss! The assumption is made that this noise would not significantly change the TPA and TPB outputs while in the suspended state, the noise would be attenuated by the ground plane(s) or chassis. Low frequency noise, below 20 KHz, on the cable shield or pin 2, is coupled to the Resume comparator reference and through the 0.1 uf capacitor to tpbias, therefore detection by the Resume comparator is minimized at low frequencies. The transfer function is the same and in the previous test (graph1.pdf). The input was applied to the three vss! pins with tpb, tpbz, tpa, and tpaz tied to ground. The output again was measured from vss! to tpbias. This will provide some immunity to 60 Hz noise and some switching supply sources.

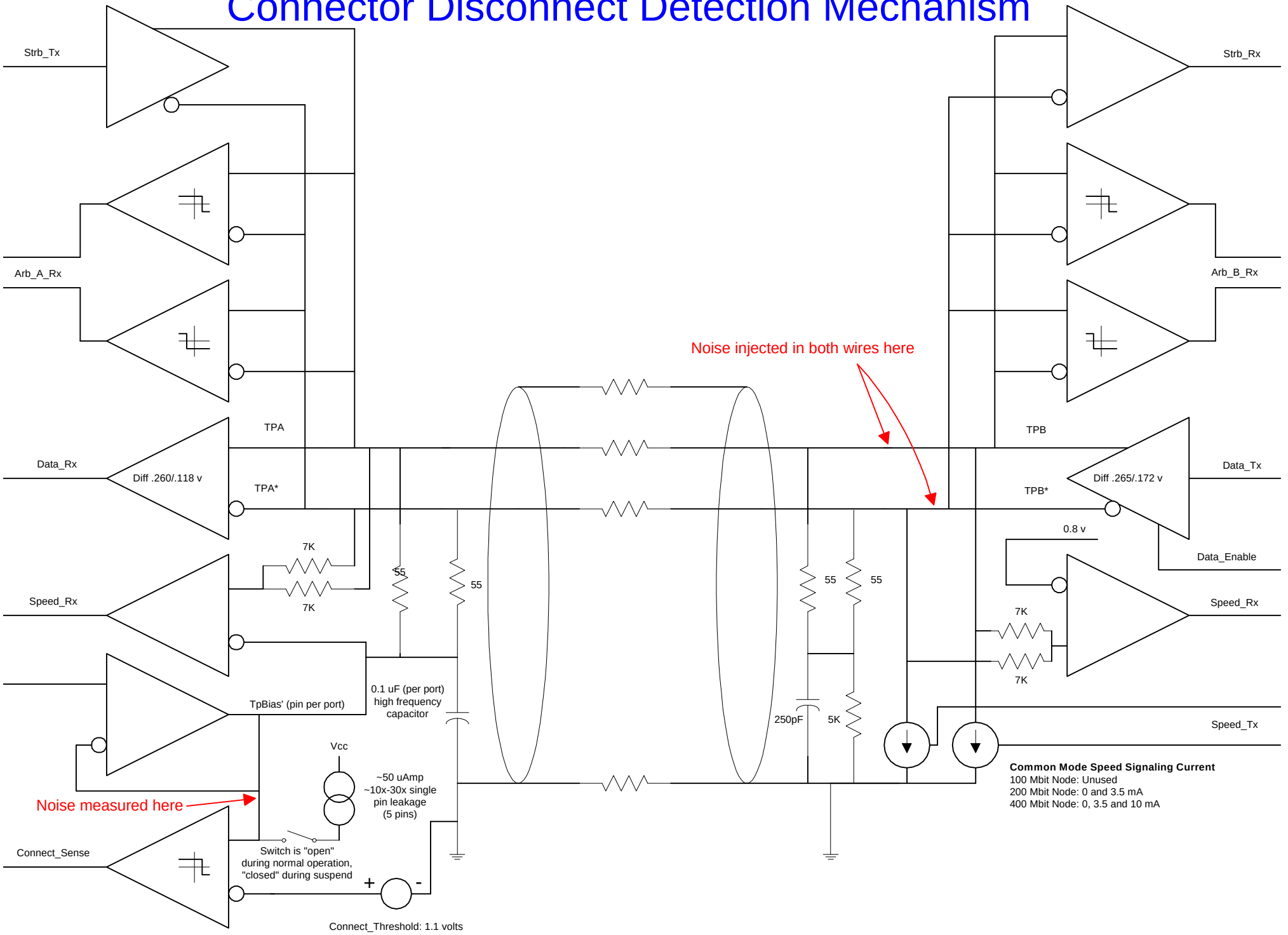
Please review and provide feedback.

GRAPH1


dB
Ø EST(MBTEST)%TPBIAS-DB
Ø
-20
-40
-60
Ø
Ø
Ø
Ø
0
0.01
1
100
meghz
Aug-28-97
13:01


i15
7000
sense1
i16
7000
i18
7000
i17
sense2
7000
tpb
i13
1
tpa
tpbz
i14
1
tpaz
55
i3
55
i4
55
i10
55
i9
n0
tpbias
5000
i7
250pF
i5
100000pF
i11
vss!
vss!
vss!

Connector Disconnect Detection Mechanism



Connector Disconnect Detection Mechanism