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TRU Quick Disconnect Products Mating Durability Test Report

Objective

Test & characterize the mating durability of TRU Quick Disconnect Products (SQS, QRM, and QDS) over an extended number of mating cycles to simulate the lifetime performance of TRU quick disconnect interface(s). The test will measure and monitor the following parameters: VSWR, insertion loss, phase, and insertion / withdrawal force to determine their impact on electrical/ mechanical performance.

Test Samples

One (1) each cable assembly described below was subjected to the test.

Sample 1: SQS Cable Assembly: 32.5" length, TRU-500 cable, Fig(s) 1-3

Connector 1: SQS (m) Plug

Connector 2: SQS (m) Plug, Right Angle

Adapter 1: SQS (f) to QC (m) plus QC (f) to QC (f) block adapter
 plus 7-16 (m) to QC (m)

Adapter 2: SQS (f) to QC (m) plus QC (f) to QC (f) block adapter
 plus 7-16 (f) to QC (m)

Sample 2: QRM Cable Assembly: 33" length, TRU-500 cable, Fig(s) 4-6

Connector 1: QRM (m) Plug

Connector 2: QRM (m) Plug, Right Angle

Adapter 1: QRM (f) to QC (m) plus QC (f) to QC (f) block adapter
 plus 7-16 (m) to QC (m)

Adapter 2: QRM (f) to QC (m) plus QC (f) to QC (f) block adapter
 plus 7-16 (f) to QC (m)

Sample 3: QDS Cable Assembly: 33.5" length, RG-393 cable, Fig(s) 7-9

Connector 1: QDS (m) Plug

Connector 2: QDS (m) Plug, Right Angle

Adapter 1: QDS (f) to QC (m) plus QC (f) to QC (f) block adapter
 plus 7-16 (m) to QC (m)

Adapter 2: QDS (f) to QC (m) plus QC (f) to QC (f) block adapter
 plus 7-16 (f) to QC (m)

TEST SAMPLE 1

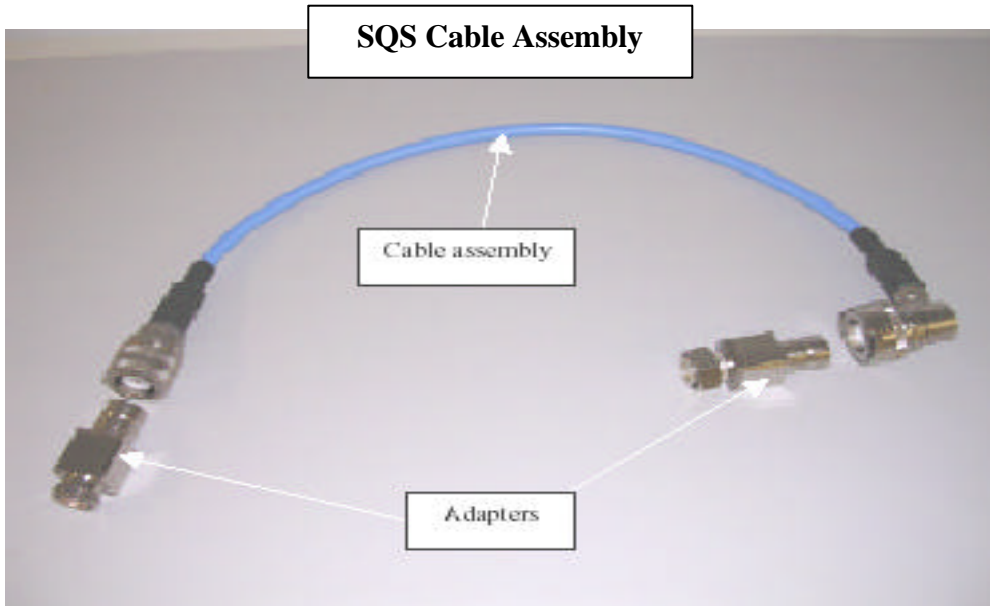


Fig 1

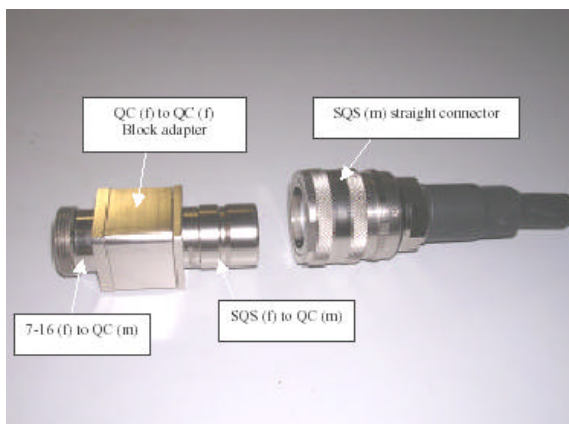


Fig 2

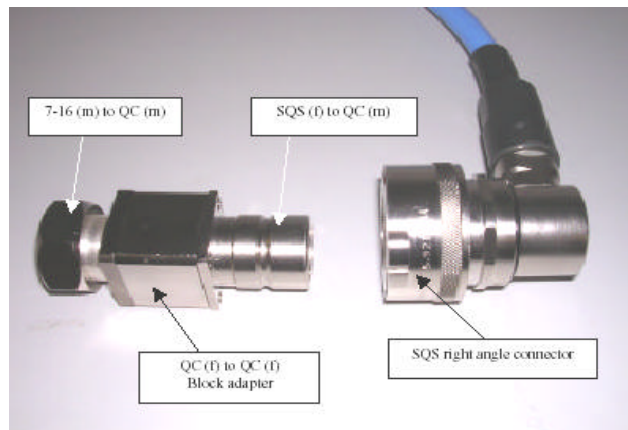


Fig 3

TEST SAMPLE 2

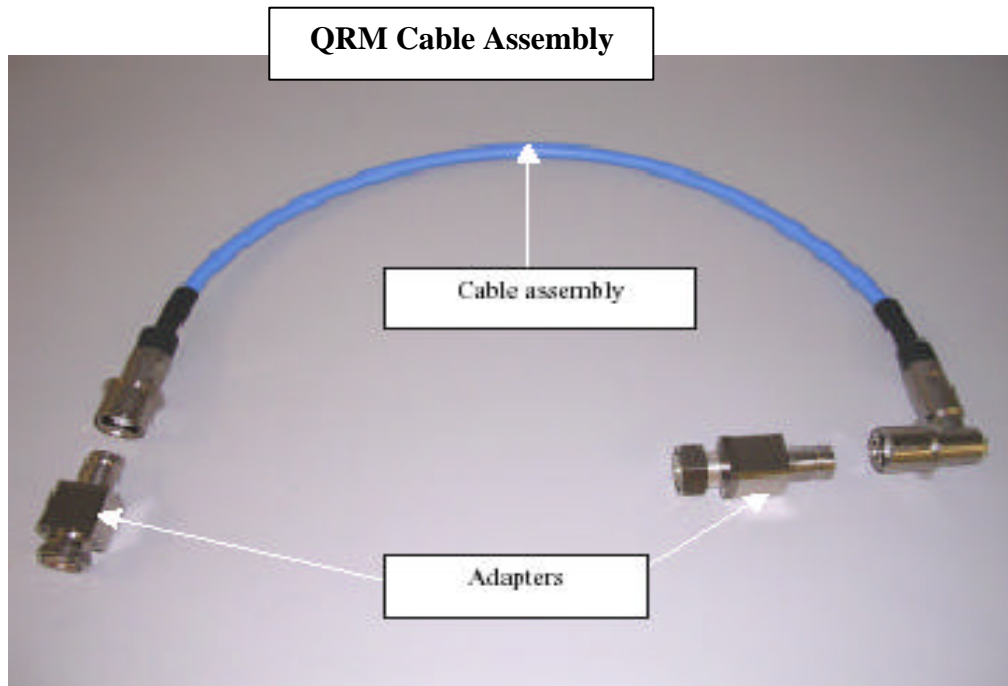


Fig 4

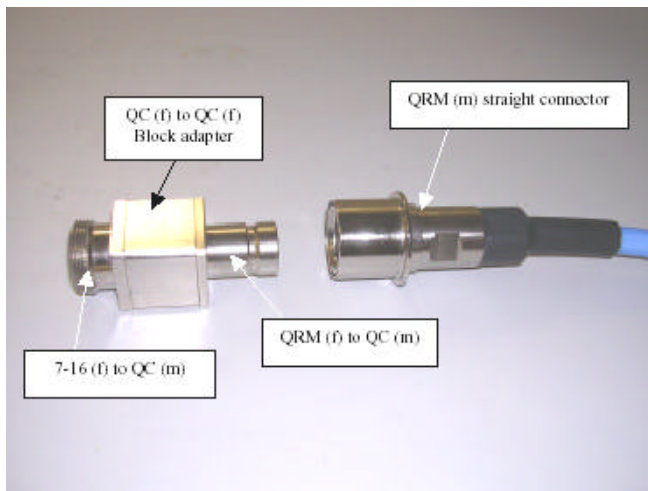


Fig 5

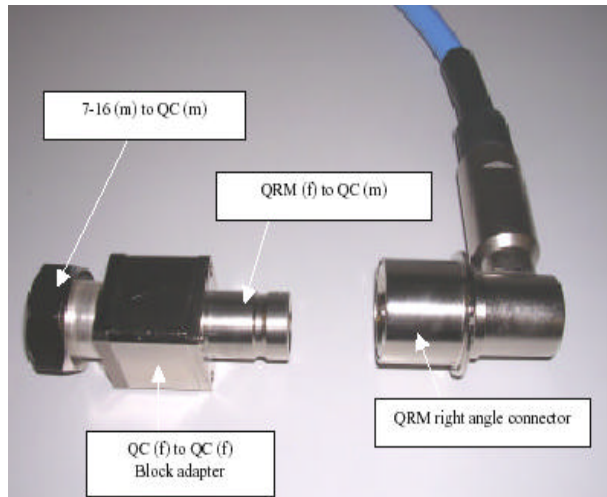


Fig 6

TEST SAMPLE 3

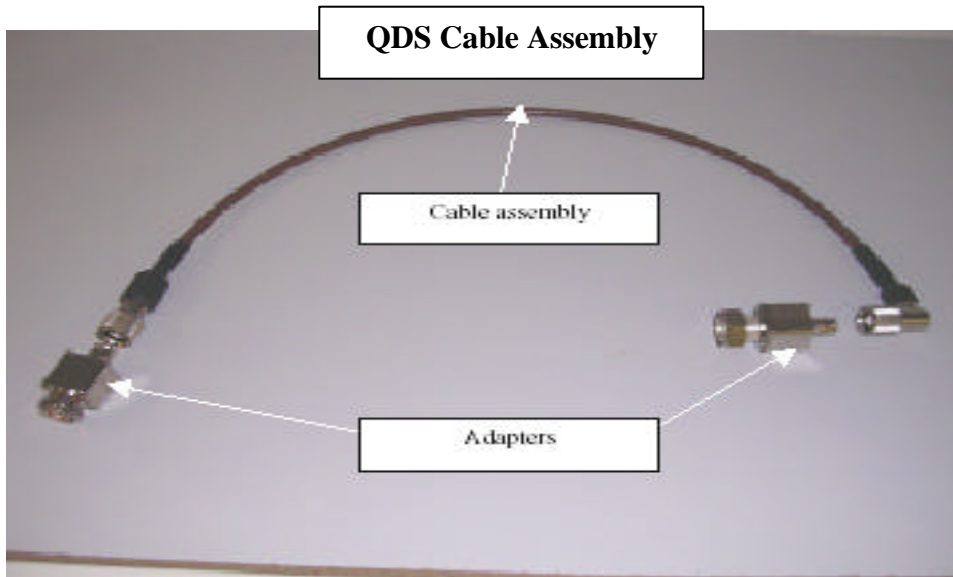


Fig 7

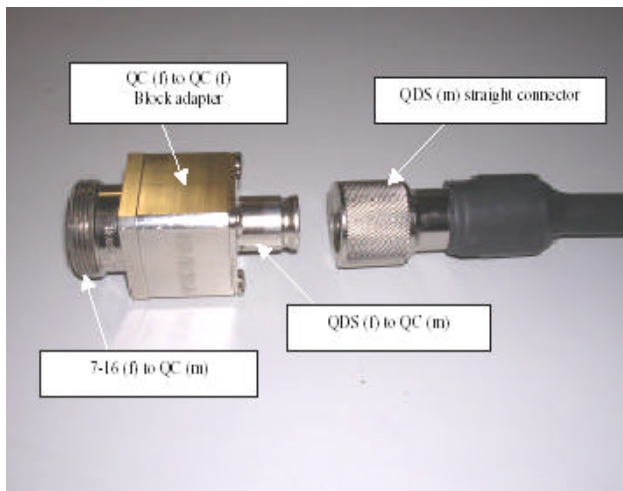


Fig 8

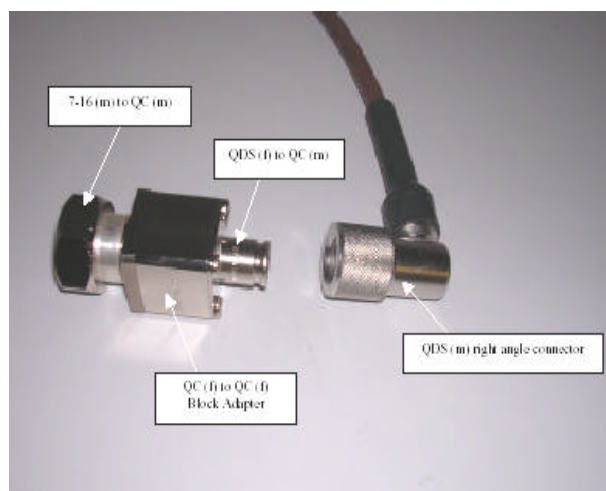


Fig 9

Test & Inspection Conditions:

All individual tests and inspections performed under the following conditions unless otherwise specified in the detail procedure(s):

Environment:

Temperature: Room Ambient, 59 to 86 deg F (15 to 30 deg C)
Relative Humidity: 20% to 80%
Barometric Pressure: Sea Level (650 to 800mm Hg)

Configuration:

Tests and inspections performed on a clean flat surface (bench or equivalent) in a clean well-lighted area, free of debris and foreign objects, unless otherwise specified.

Test & Inspection Equipment:

The following test equipment / tools / fixtures or equivalent were used to perform the tests & inspections.

Electrical: (Fig 10)

Vector Network Analyzer (HP 8753E) used on all electrical measurements

Applicable test port cables / adapters for each assembly, set up as applicable per figures 1-9
7-16 Calibration Kit (p/n: Maury Microwave 2750B)

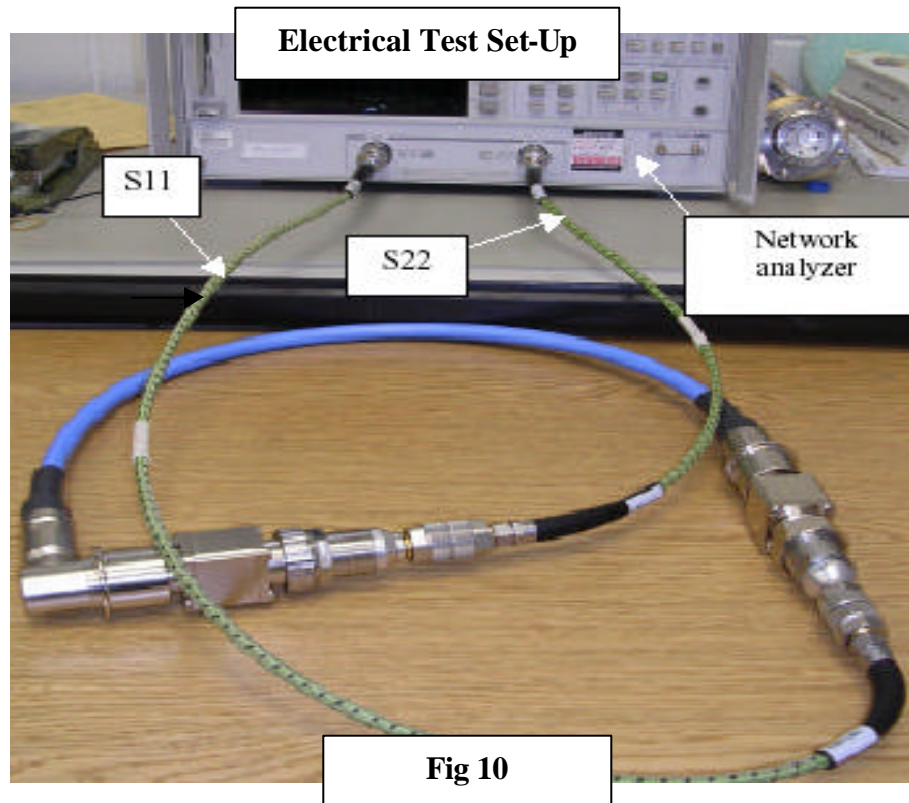
Full 2 Port Calibration:

401 data points

30 Hz BW

S11 measurement = End 1 of cable assembly

S22 measurement = End 2 of cable assembly



Mechanical: Fig(s) 11 & 12

Force Gauge(s):

250 X 2.5 lbs (Chatillon DPP-10) Used on SQS and QDS samples 1 & 3 per figure 11

10 X .10 lbs. (Chatillon DPP-10) Used on QRM sample 2 per figure 12

Stereo Magnifying Scope: Vision Engineering

Digital Height Gauge: Fowler-Trimos V300+

Mechanical Test Set-Up

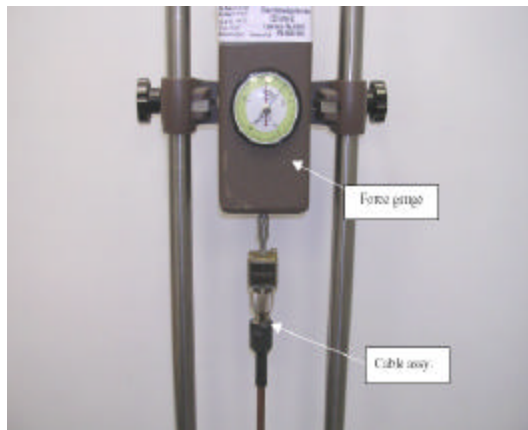


Fig 11

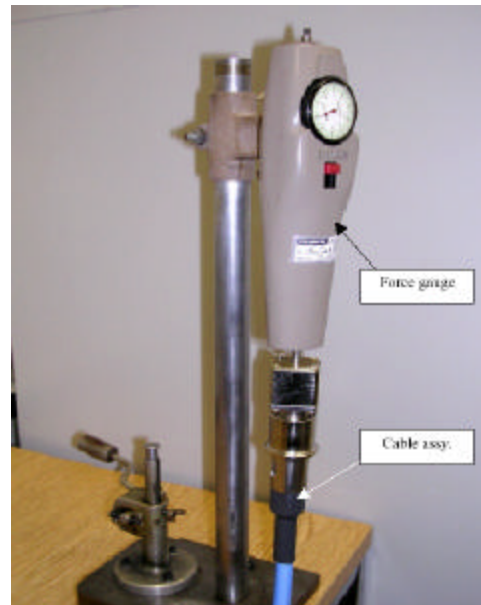
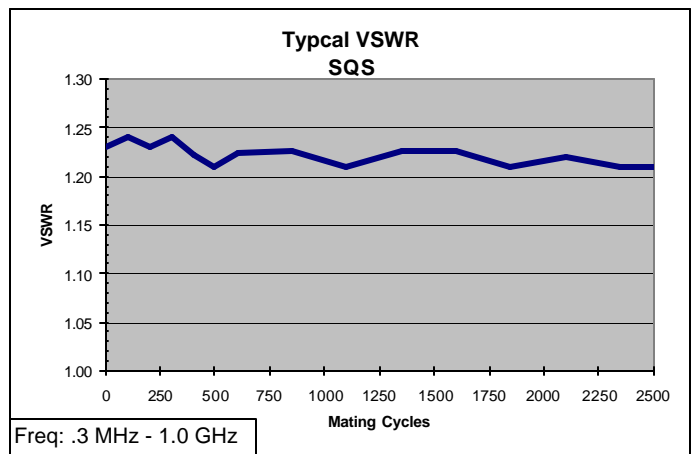
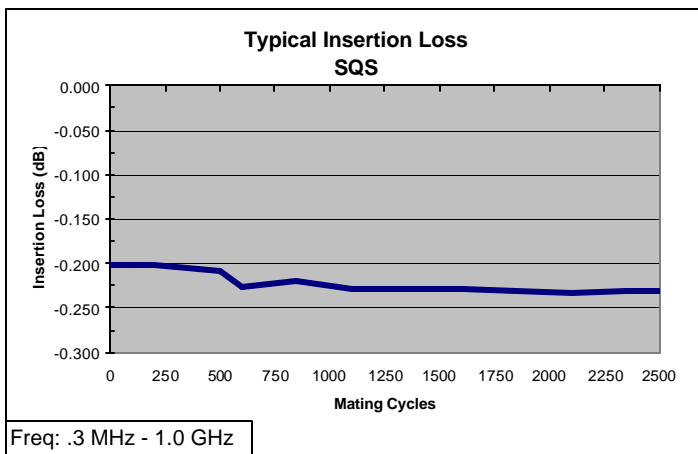
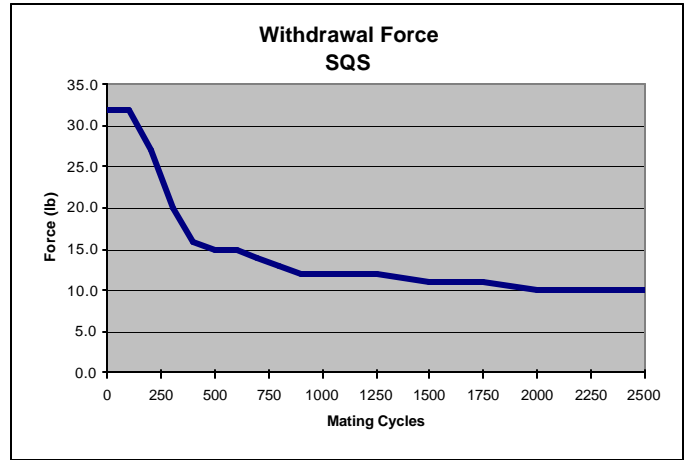
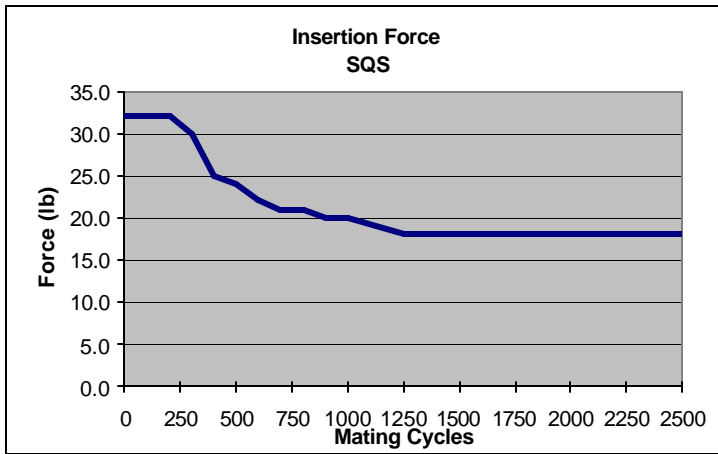


Fig 12

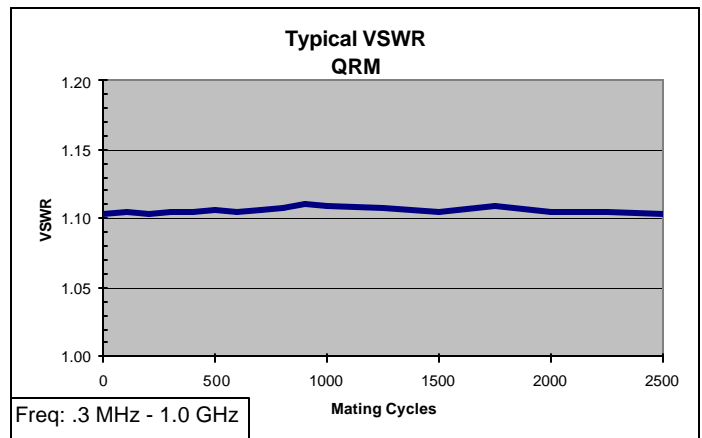
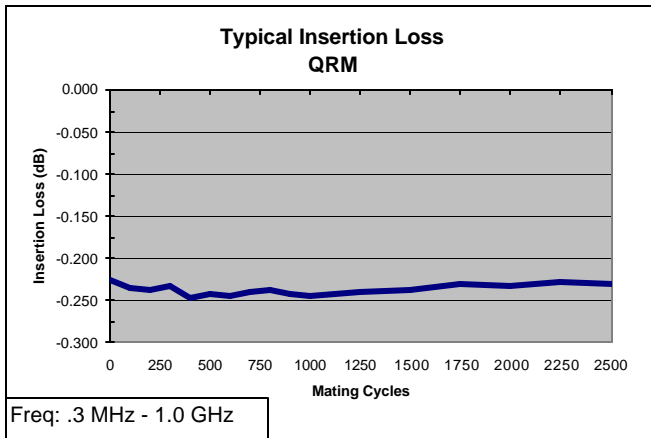
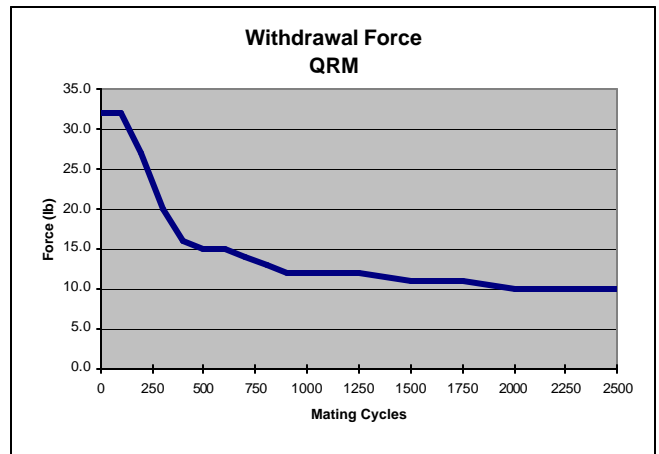
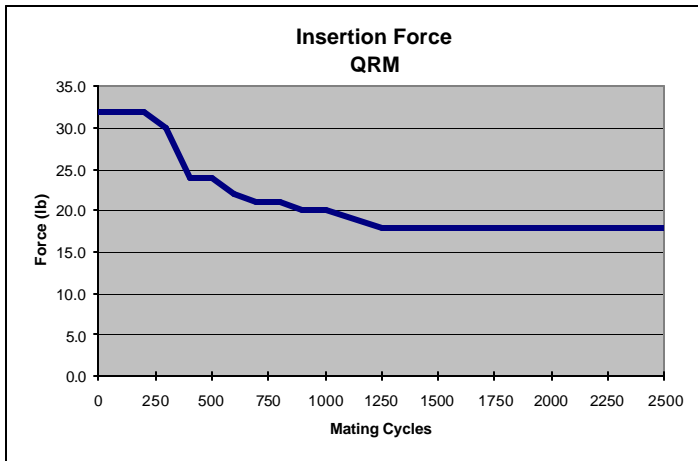
Test Procedure:

- Baseline electrical / mechanical tests were performed on each of the sample assemblies:
 - VSWR, Insertion Loss, Phase
 - Insertion & Withdrawal Force
 - Interface Dimensions, Visual Examination of Product
- Each sample was subjected to 2500 mating cycles.
 - Note: a cycle consists of 1 complete electrical / mechanical mating onto its corresponding mating adapter and 1 complete un-mating from its corresponding adapter.
- After every 250 cycles, all electrical / mechanical tests & inspections performed at baseline were repeated on each sample. The test results were summarized and recorded per the following data:

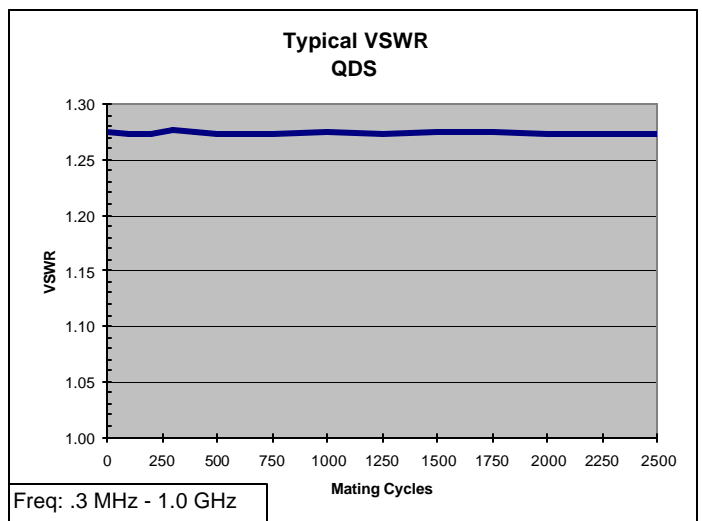
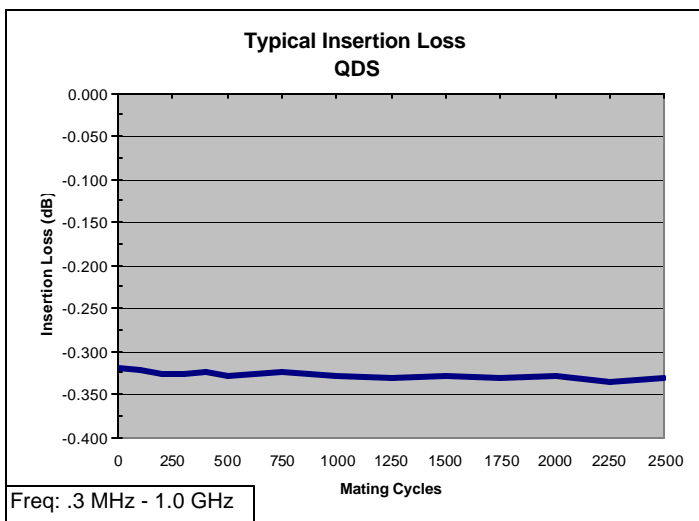
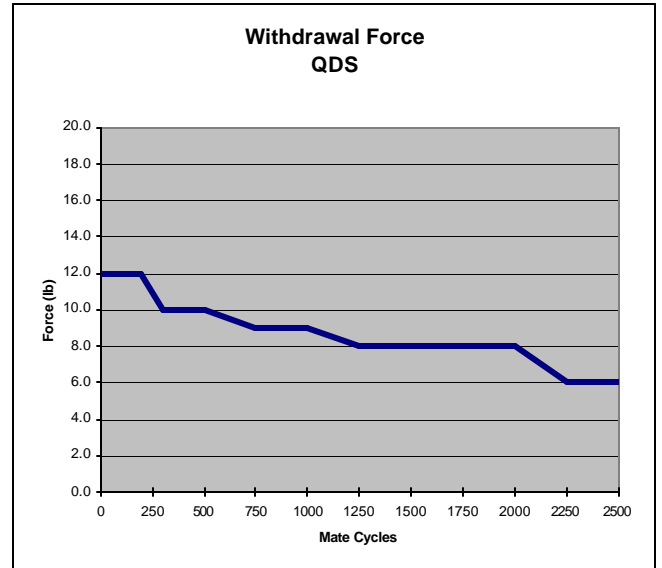
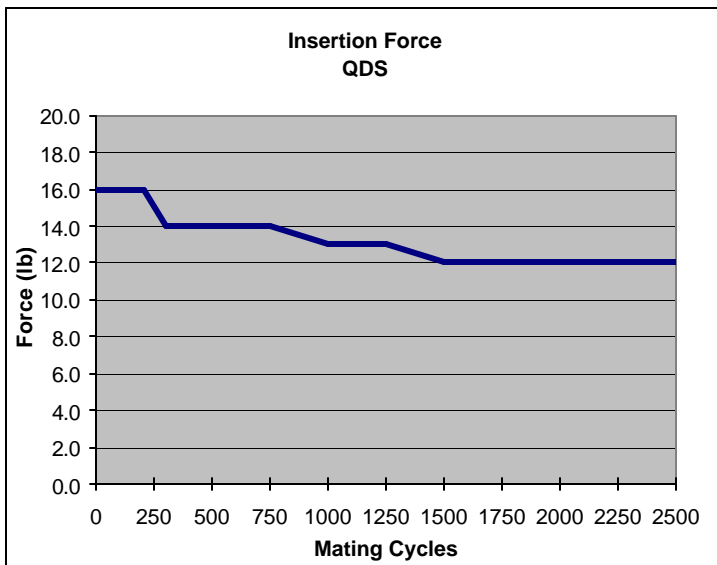
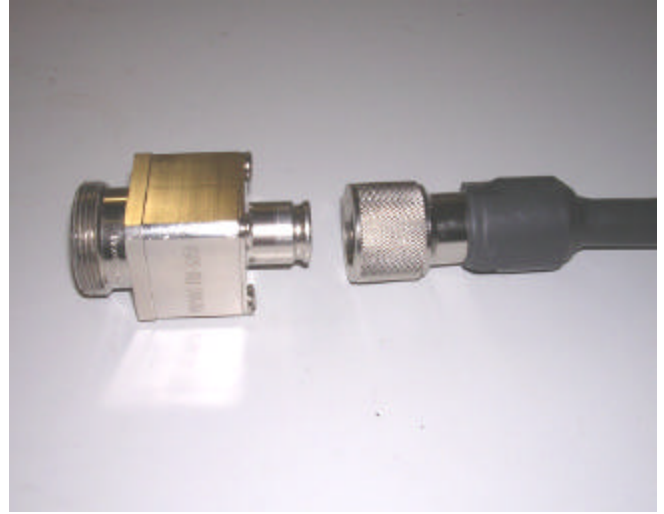
SQS TEST DATA



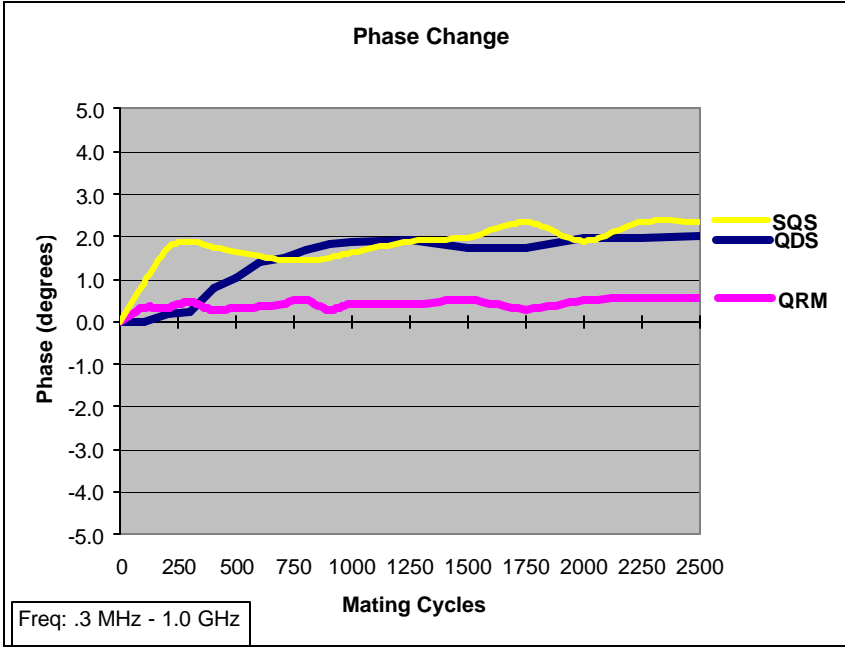
QRM TEST DATA



QDS TEST DATA



**PHASE CHANGE TEST DATA
SQS - QRM - QDS**



Results / Conclusions:

TRU Quick-Disconnect Products meet / exceed 500 mating cycle rating, without any degradation to electrical / mechanical performance parameters.

The Insertion / Withdrawal force of TRU Quick Disconnect Products stabilizes and remains fairly constant after approximately 1000 cycles.

TRU Quick Disconnect Products will operate a minimum of 2500 mating cycles without any significant impact on electrical performance parameters.