

NEW PRODUCT ENGINEERING

MEASUREMENT REPORT

Tested product:

619134-1

Board To Board Connector 10mm Height*

Description: *This Report describes the trend of the contact resistance vs mating cycles.*

* This Report is valid also for Board To Board 6.65mm and 14mm height.

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1 SPECIFICATIONS

The limit values of the contact resistance vs. the mating cycles are listed in the table below.

Table 1: Contact resistance requirements.

Mating Cycles	Center conductor Resistance [mΩ]	Outer conductor Resistance [mΩ]
30	≤20	≤10
5000	≤50	≤20
8000	≤100	≤50

2 MEASUREMENT SETUP

The measure of the contact resistance was performed using the Millivolt Drop Method (See Test Standard EIA-364-23C or alternatively the Tyco Spec 209-10).

The instruments used in this test are listed in the table 2.

The maximum rated current was set to 30mA, in order to avoid any resistance change due to heating in the test samples.

Table 2: Instrument List.

DC POWER SUPPLY	HP6824A
MULTIMETER	HP3478A

3 SAMPLE DESCRIPTION

The samples tested and the magnitudes measured are listed in the table 3.

The target Board and the Board To Board connector were continuously mated and unmated during the test. The Target Board and the Base Board were switched between two different distance: 15mm (BTB unmated) and 9mm (BTB mated). The contact resistance measurement has been performed with the distance of 11mm (maximum stack height).

Table 3: samples and measurements performed.

Sample Group	Ra Center conductor Resistance (pogo + target)	Rc Pogo pin Resistance	Rb Target resistance	Rd Outer conductor	RF Performances
1	✓	✗	✗	✓	✗
2	✓	✗	✗	✓	✗
3	✓	✗	✗	✓	✗
4	✗	✓	✓	✗	✗
5	✗	✓	✓	✗	✗
6	✗	✓	✓	✗	✗
7	✗	✗	✗	✗	✓

✓ : Measure performed

✗ : Measure not performed

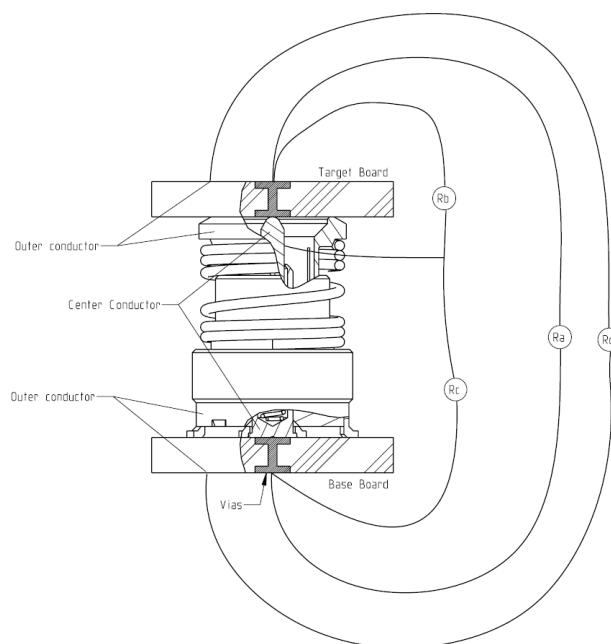


Fig.1 : Board To Board Connector.

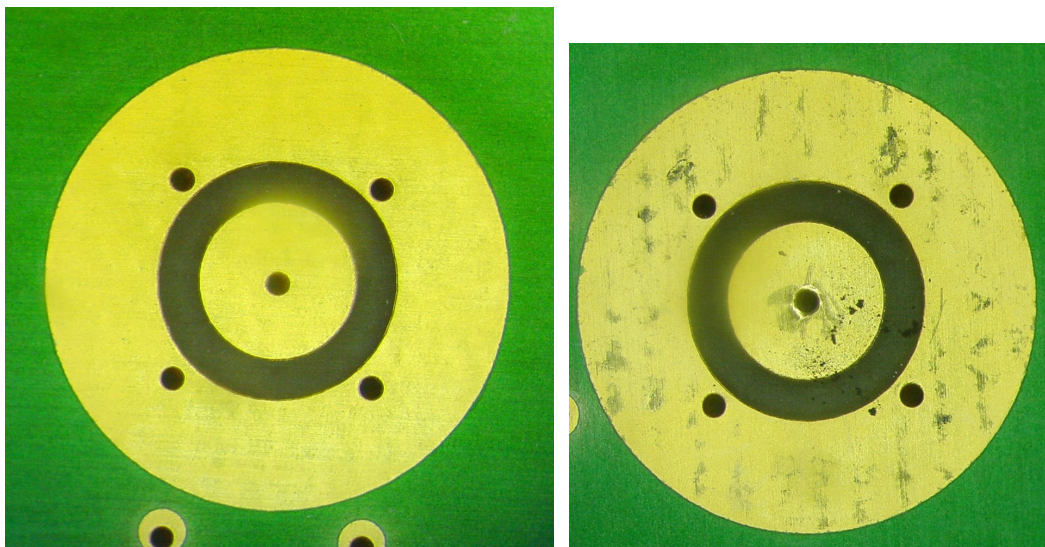


Fig.2: target board gold plated, before and after 8000 mating cycles.

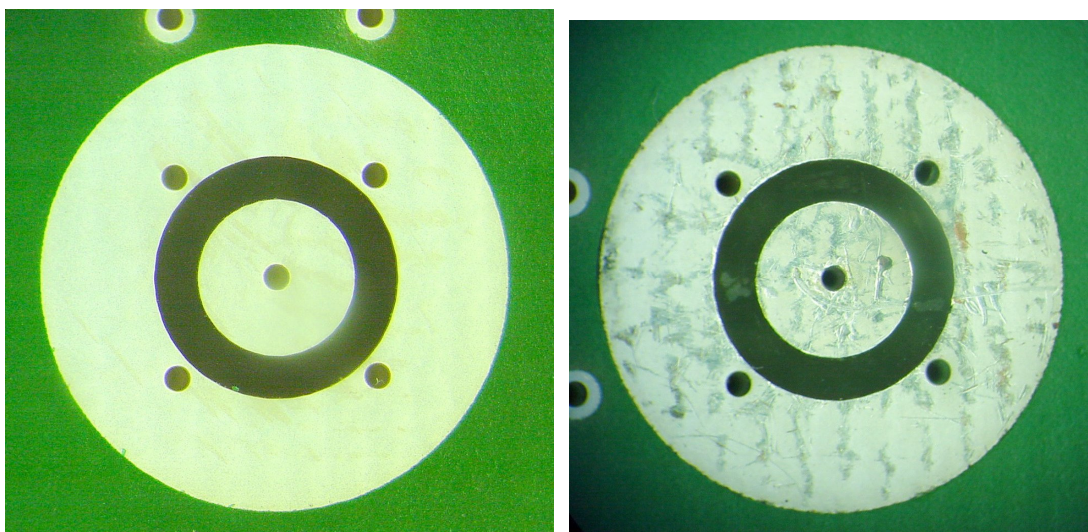


Fig.3: target board silver plated, before and after 8000 mating cycles.

We haven't found any differences between the target Board Au plated and target Board Ag plated. For this reason we decided to use the silver target boards during the test.

4 RESULTS



Fig. 4: outer contact resistance.

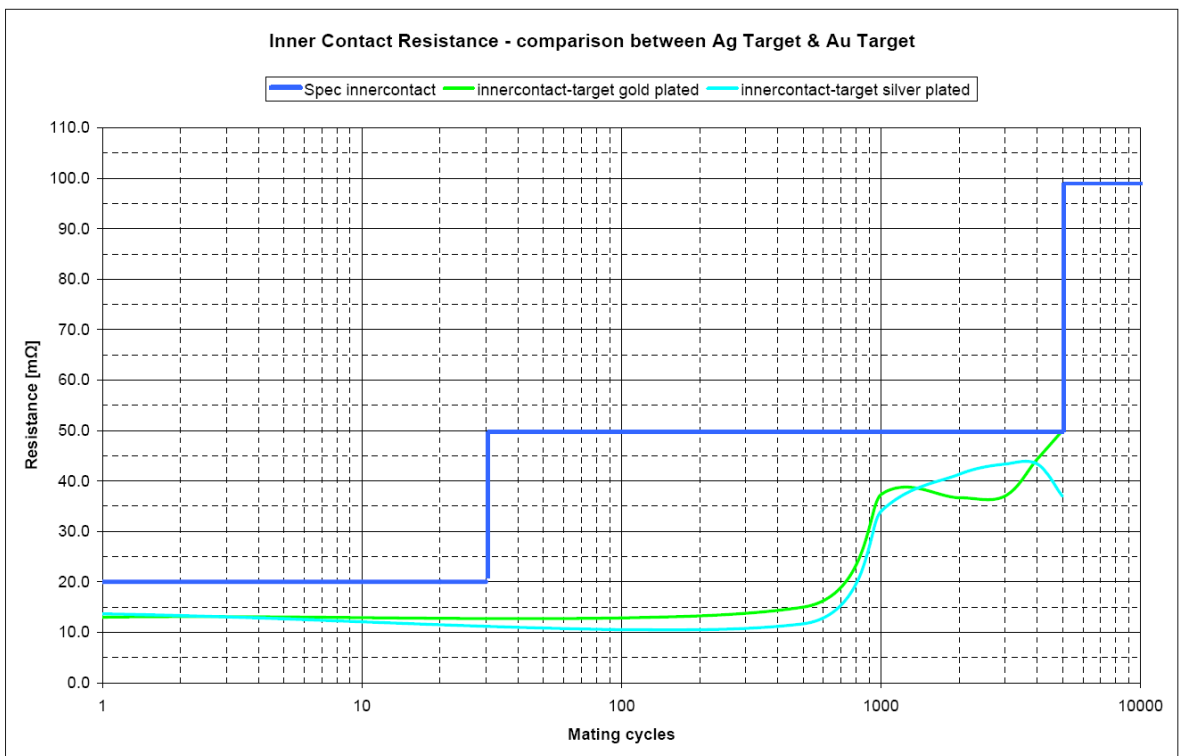


Fig. 5: inner contact resistance

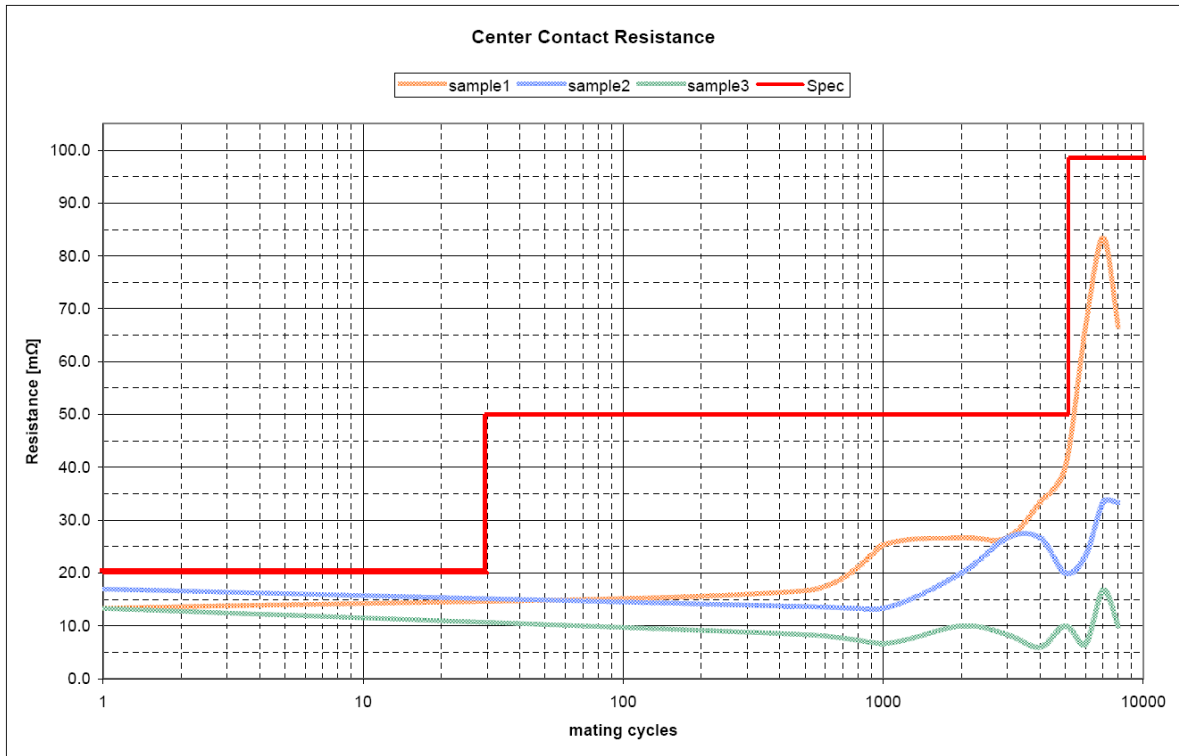


Fig. 5: center contact resistance.

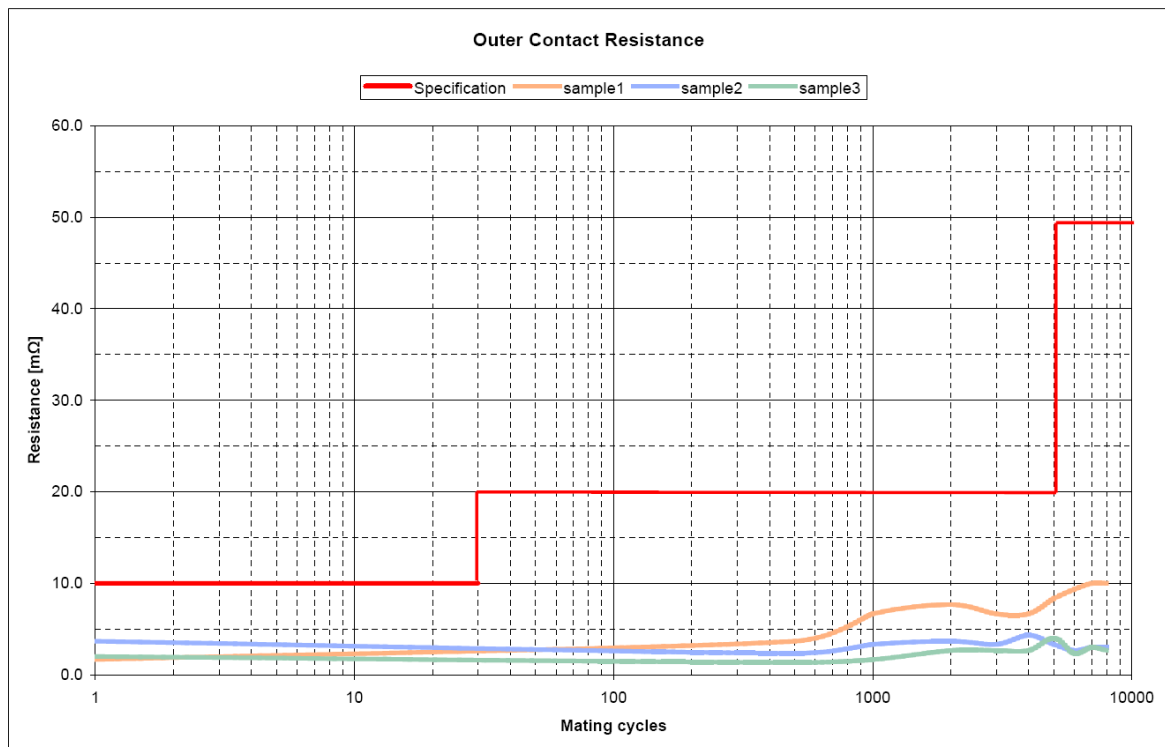


Fig. 6: Outer Contact resistance.

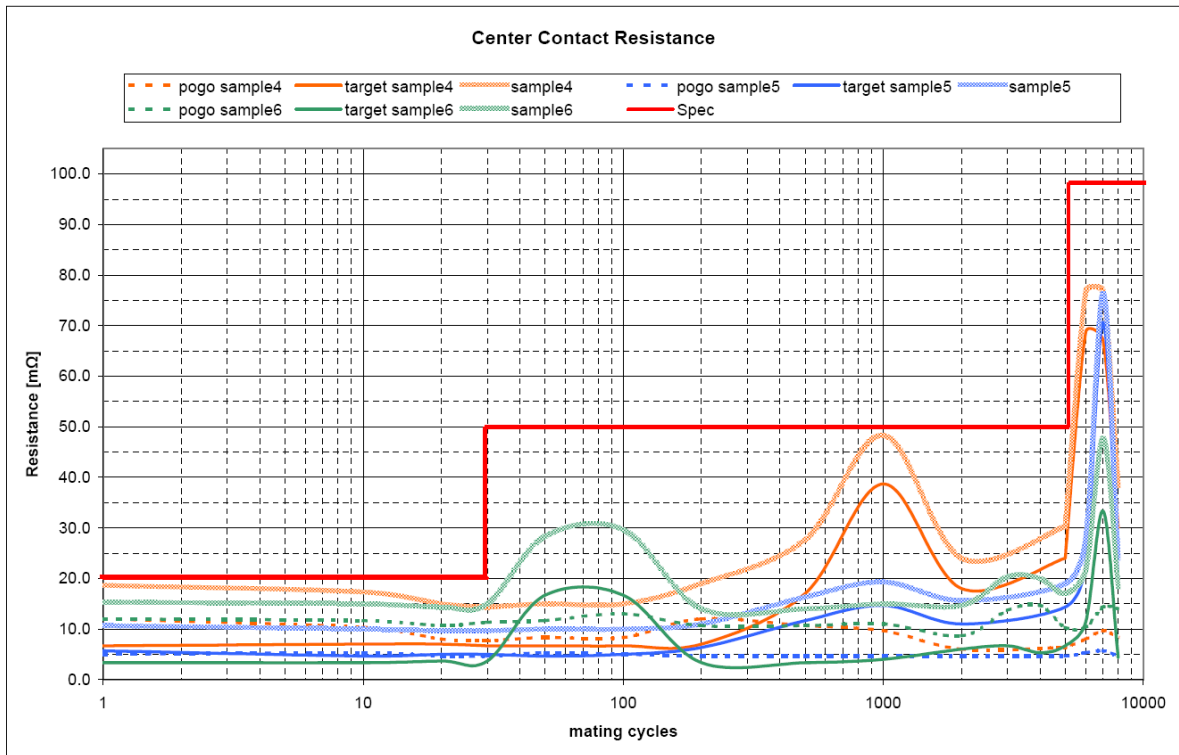


Fig. 7: Center Contact Resistance: pogo pin and target contact contribution.

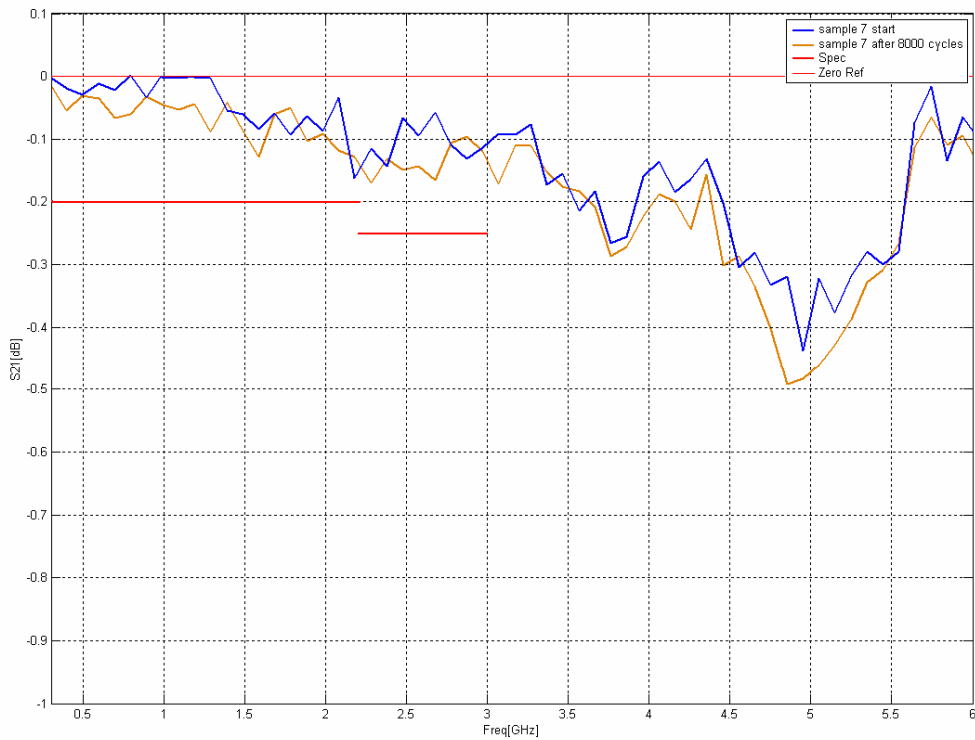


Fig.8: Insertion Loss measurement at the start and after 8000 cycles.

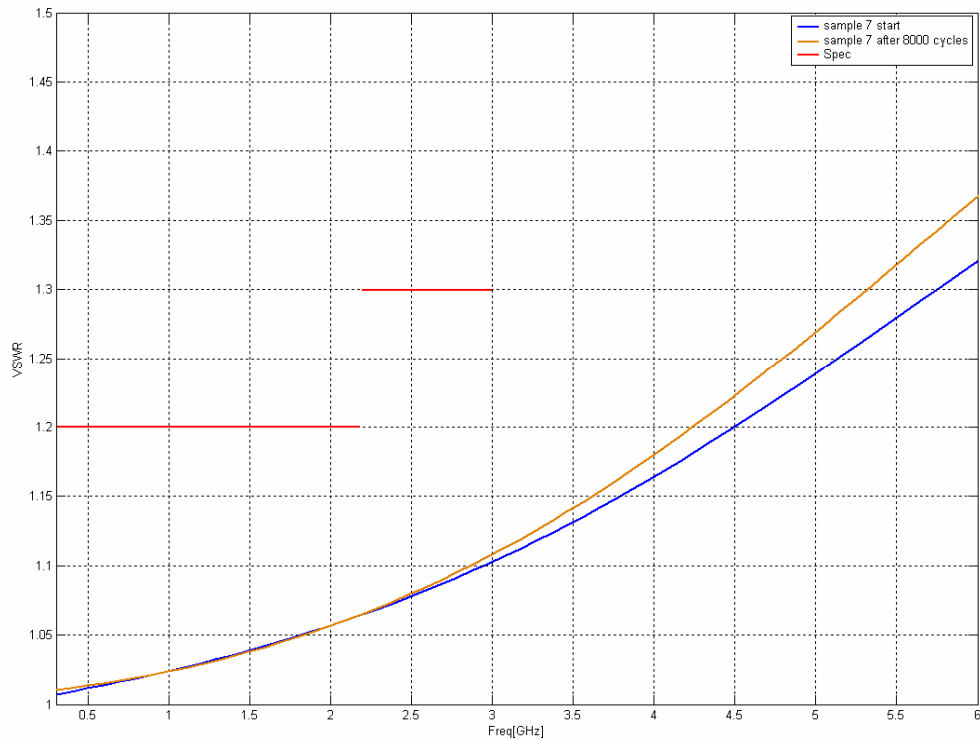


Fig.9: Return Loss measurement at the start and after 8000 cycles.

5 CONCLUSION

The outer contact resistance hasn't shown a great degradation, it remains stable also after 8000 mating cycle.

The center contact resistance increase after 50 cycles. This is caused due to an increased resistance between pogo pin and target board contact, while the resistance of the pogo pin is stable also after 8000 mating cycles.

Anyway the RF performances are also good after 8000 cycles.