

TEST REPORT
MDR Connector 嵌合特性評価
/Mating Performance of MDR Connector

SAMPLES

PLUG : 101XX-6000 EC /SUMITOMO 3M

RECEPTACLE: 102XX-52XX VC /SUMITOMO 3M

<u>Rev.</u>	<u>Explanation</u>	<u>Date</u>
A	Added English version	11/11/99

APRV. M. Shimada 11/11/99
CHKD. S. Senura 11/11/99
PRPD. W. Tokoyama 11/11/99



SUMITOMO 3M LIMITED

TECHNICAL DEPARTMENT
ELECTRONIC & EH&P PRODUCTS DIVISION



1. Title

Mating performance of MDR connector.

2. Samples

MDR WIRE MOUNT PLUG : 1 0 1 X X - 6 0 0 0 E C

MDR BOARD MOUNT RECEPTACLE : 1 0 2 X X - 5 2 X X V C

*See attached data sheets. (DATA-A~F)

3. Test & Results

Test	Method	MIL-STD 202E	DATA
3M SEQUENCE-1	Durability: 50times Moisture cycles: -10°C~65°C, 95%RH, 10cycles Salt spray: NaCl 5% solution, 35°C, 95%RH, 48H	106D 101E	DATA-A
3M SEQUENCE-2	Thermal shock: -55°C→25°C→85°C→25°C, 5cycles Humidity: 40°C, 95%RH, 96H Vibration: sweep freq. 10~55Hz, P-P 1.52mm or 10G sweep/1min, 2H each in X,Y,Z	107D 103B 201A	DATA-B
3M SEQUENCE-3	Thermal aging: 85°C, 1000H		DATA-C
GAS SEQUENCE	Durability: 50times H ₂ S gas: 3ppm, 40°C, 75%RH, 96H		DATA-D
Durability	500times		DATA-E

DATA-A 3 M SEQUENCE-1 / Contact resistance

SAMPLES

MDR WIRE MOUNT PLUG Connector 10150-6000 EC/Sumitomo 3M
 MDR B/M RECEPTACLE Connector 10250-52A2 VC/Sumitomo 3M

TEST

To measure the contact resistance after each test.
 (Resistance value includes contact bulk resistance, cable bulk resistance, interface resistance between contacts and interface resistance between U-beam and cable.)

1. Initial
2. Durability 50 times
3. Moisture cycle MIL STD 202F METHOD 106F
 -10~65°C、95%RH/10cycles
4. Salt spray MIL STD 202F METHOD 101D B
 5% NaCl、35°C/48 hour

◇ See Fig.-1 Measuring method of contact resistance

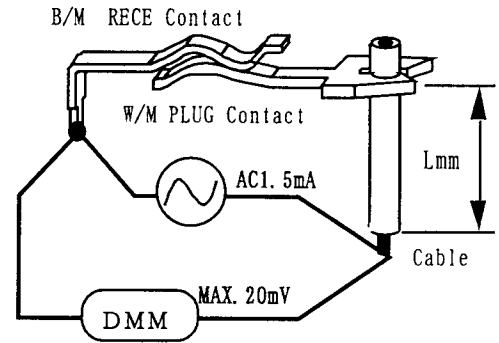


Fig.-1
 Measuring method of contact resistance

RESULTS

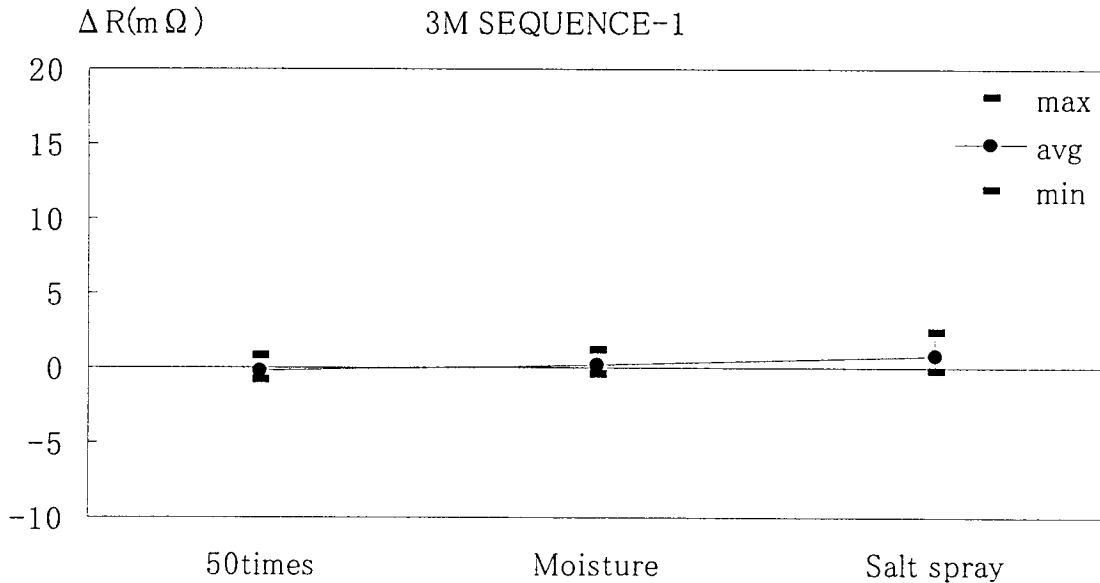
Resistance value in Table-A1 omits bulk resistance of Lmm long cable from measured resistance.

◇ Table-A1 : CONTACT RESISTANCE

◇ Graph-A1 : RESISTANCE CHANGE FROM INITIAL VALUE

Table-A1 CONTACT RESISTANCE

(mΩ)	initial	50times		Moisture		Salt spray	
	R	R	ΔR	R	ΔR	R	ΔR
MAX	13.88	14.09	0.72	14.25	1.11	15.3	2.41
AVG	11.236	10.999	-0.237	11.476	0.24	11.941	0.705
MIN	10.23	9.96	-0.77	10.14	-0.36	10.26	-0.27
STD	0.664	0.627	0.311	0.809	0.381	0.985	0.533



Graph-A1 RESISTANCE CHANGE FROM INITIAL VALUE

DATA-B 3 M SEQUENCE-2 / Contact resistance

SAMPLES

MDR WIRE MOUNT PLUG Connector 10150-6000 EC/Sumitomo 3M
 MDR B/M RECEPTACLE Connector 10250-52A2 VC/Sumitomo 3M

TEST

To measure the contact resistance after each test.
 (Resistance value includes contact bulk resistance, cable bulk resistance, interface resistance between contacts and interface resistance between U-beam and cable.)

1. Initial
2. Thermal shock MIL STD 202F METHOD 107G A
-55°C → 25°C → 85°C → 25°C / 5 cycles
3. Humidity MIL STD 202F METHOD 103B B
40°C, 95%RH/96 hours
4. Vibration MIL STD 202F METHOD 201A
10 → 55Hz, P-P 1.52mm or 10G, sweep/1min, 2H each in X·Y·Z
Continuity 1 μsec. MAX.

◇ See Fig.-1 Measuring method of contact resistance

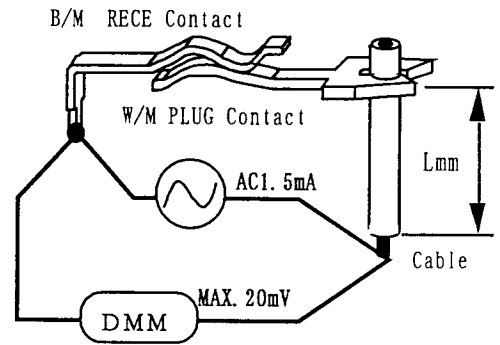


Fig.-1
Measuring method of contact resistance

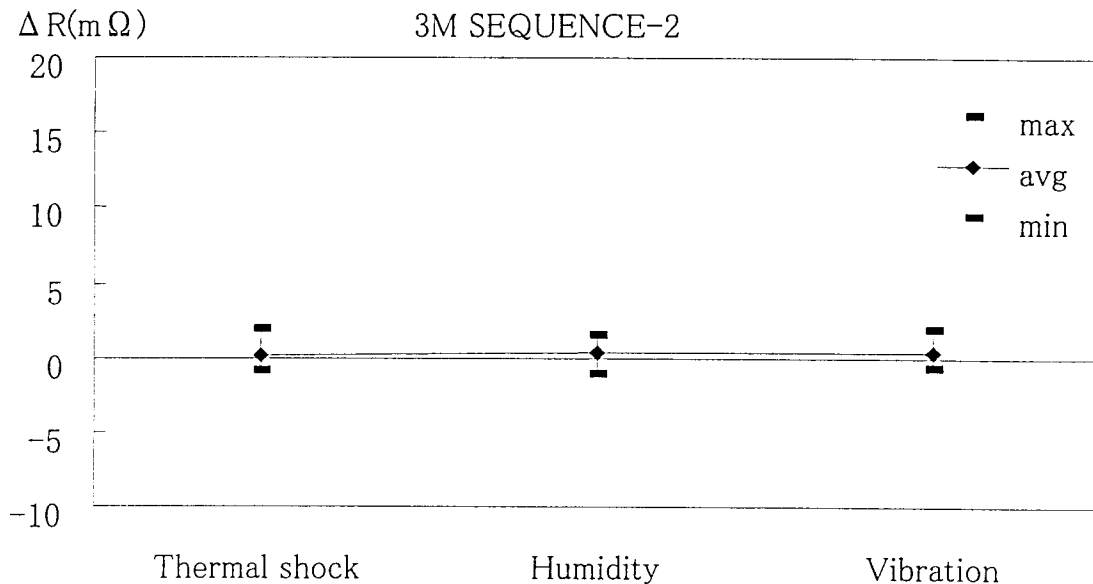
RESULTS

Resistance value in Table-B1 omits bulk resistance of Lmm long cable from measured resistance.

- ◇ Table-B1 : CONTACT RESISTANCE
- ◇ Graph-B1 : RESISTANCE CHANGE FROM INITIAL VALUE
- ◇ Continuity 1 μsec. MAX. : O. K.

Table-B1 CONTACT RESISTANCE

(mΩ)	initial	Thermal shock		Humidity		Vibration	
	R	R	ΔR	R	ΔR	R	ΔR
MAX	14.77	14.87	1.91	15.17	1.62	15.24	1.92
AVG	11.840	12.063	0.223	12.104	0.264	12.162	0.322
MIN	10.31	10.36	-0.84	10.35	-1.09	10.40	-0.76
STD	0.707	0.670	0.300	0.767	0.330	0.849	0.418



Graph-B1 RESISTANCE CHANGE FROM INITIAL VALUE

DATA-C 3 M SEQUENCE-3 / Contact resistance

SAMPLES

MDR WIRE MOUNT PLUG Connector 10150-6000 EC/Sumitomo 3M
 MDR SMC RECEPTACLE Connector 10250-52A2 VC/Sumitomo 3M

TEST

To measure the contact resistance after each test.
 (Resistance value includes contact bulk resistance, cable bulk resistance, interface resistance between contacts and interface resistance between U-beam and cable.)

1. Initial
2. Thermal aging MIL STD 202F METHOD 108A D
85°C/1000 hours

◇ See Fig.-1 Measuring method of contact resistance

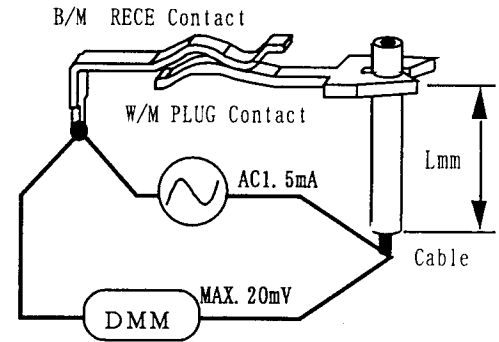


Fig.-1
Measuring method of contact resistance

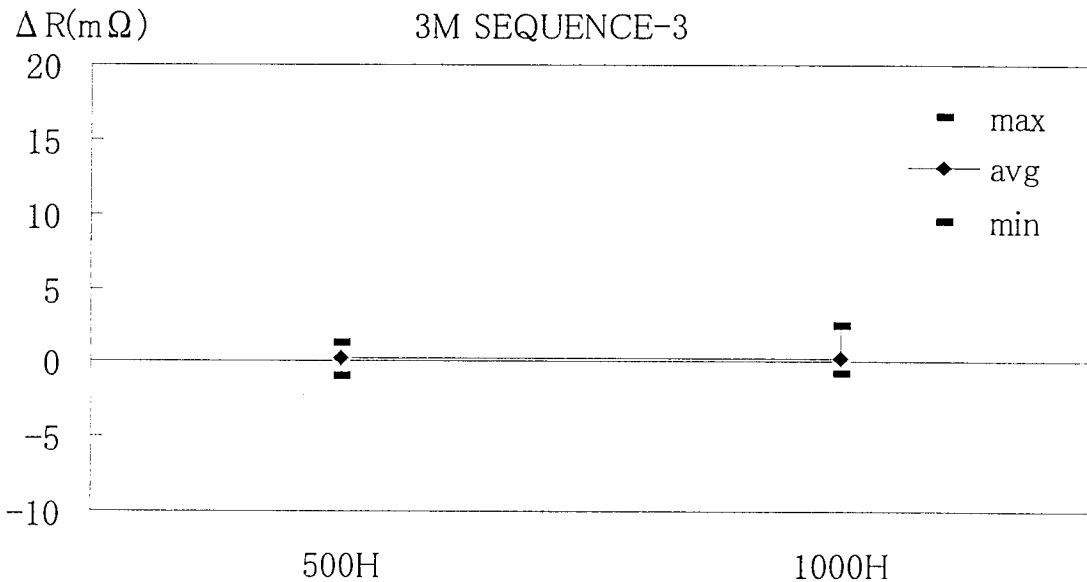
RESULTS

Resistance value in table-C1 omits bulk resistance of Lmm long cable from measured resistance.

- ◇ Table-C1 : CONTACT RESISTANCE
- ◇ Graph-C1 : RESISTANCE CHANGE FROM INITIAL VALUE

Table-C1 CONTACT RESISTANCE

(mΩ)	Initial	500H		1000H	
	R	R	ΔR	R	ΔR
MAX	13.93	14.48	1.24	16.18	2.46
AVG	11.726	11.904	0.178	12.053	0.327
MIN	10.52	10.47	-0.88	10.63	-0.68
STD	0.668	0.734	0.366	0.916	0.552



Graph-C1 RESISTANCE CHANGE FROM INITIAL VALUE

DATA-D H₂S Gas SEQUENCE / Contact resistance

SAMPLES

MDR WIRE MOUNT PLUG Connector 10150-6000 EC/Sumitomo 3M
 MDR SMC RECEPTACLE Connector 10250-52A2 VC/Sumitomo 3M

TEST

To measure the contact resistance after each test.
 (Resistance value includes contact bulk resistance, cable bulk resistance, interface resistance between contacts and interface resistance between U-beam and cable.)

1. Initial
2. Durability 50 times
3. H₂S Gas JEIDA-38-1984
 3ppm±1ppm, 70~80%RH, 40°C, 96 hours

◇ See Fig.-1 Measuring method of contact resistance

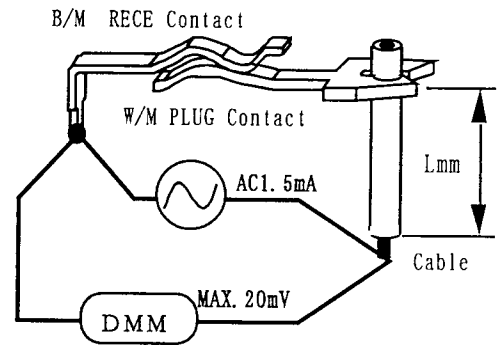


Fig.-1 Measuring method of contact resistance

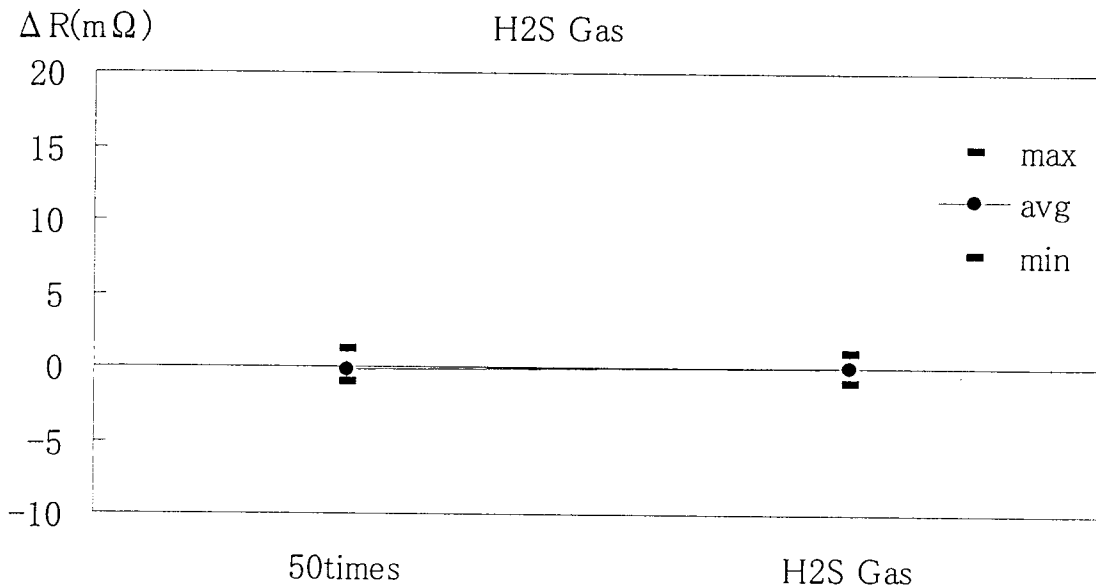
RESULTS

Resistance value in Table-D1 omits bulk resistance of Lmm long cable from measured resistance.

- ◇ Table-D1 : CONTACT RESISTANCE
- ◇ Graph-D1 : RESISTANCE CHANGE FROM INITIAL VALUE

Table-D1 CONTACT RESISTANCE

(mΩ)	Initial	50times		H ₂ S Gas	
	R	R	ΔR	R	ΔR
MAX	13.35	13.52	1.20	13.90	1.12
AVG	11.761	11.634	-0.127	11.772	0.011
MIN	10.48	10.24	-1.07	10.35	-0.96
STD	0.596	0.659	0.33	0.678	0.345



Graph-D1 RESISTANCE CHANGE FROM INITIAL VALUE

DATA-E Durability/Contact resistance

SAMPLES

MDR WIRE MOUNT PLUG Connector 10150-6000 EC/Sumitomo 3M
 MDR SMC RECEPTACLE Connector 10250-52A2 VC/Sumitomo 3M

TEST

To measure the contact resistance after each test.
 (Resistance value includes contact bulk resistance, cable bulk resistance, interface resistance between contacts and interface resistance between U-beam and cable.)

1. Initial
2. Durability Insertion and Withdrawal 500 times
 - ◇ See Fig. -1 Measuring method of contact resistance

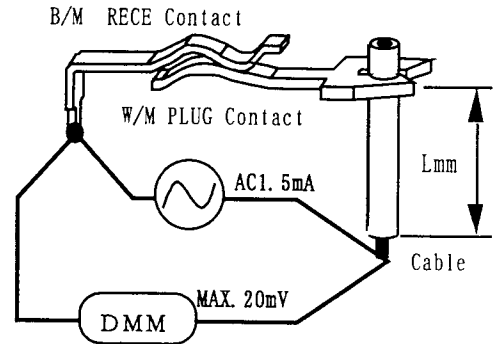


Fig. -1
Measuring method of contact resistance

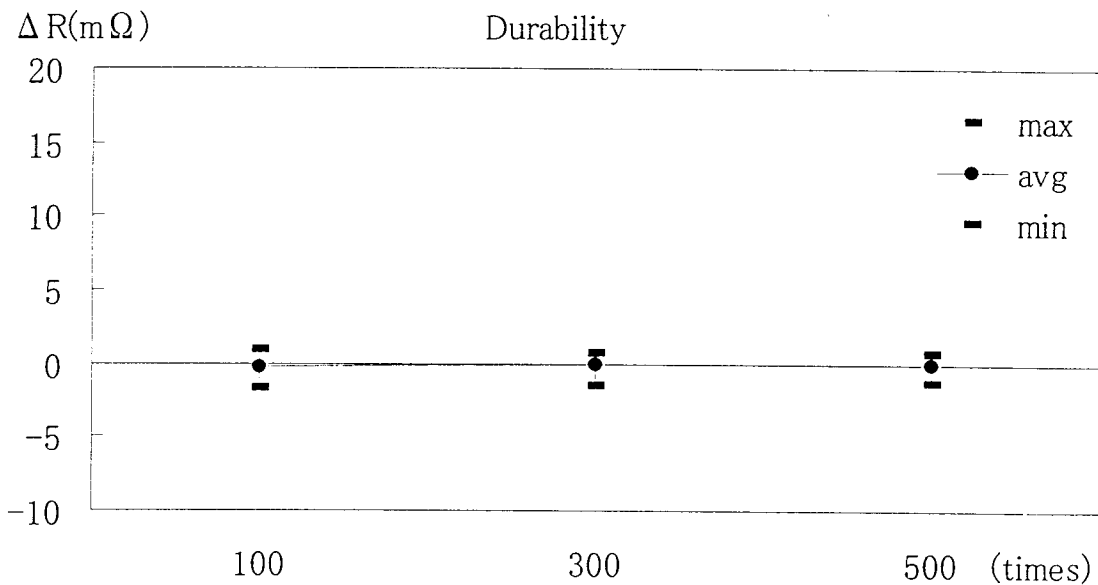
RESULTS

Resistance value in Table-E1 omits bulk resistance of Lmm long cable from measured resistance.

- ◇ Table-E1 : CONTACT RESISTANCE
- ◇ Graph-E1 : RESISTANCE CHANGE FROM INITIAL VALUE

Table-E1 CONTACT RESISTANCE

(mΩ)	Initial	100		300		500	
	R	R	ΔR	R	ΔR	R	ΔR
MAX	13.81	13.63	0.96	13.62	0.83	13.64	0.80
AVG	11.769	11.546	-0.223	11.697	-0.072	11.746	-0.023
MIN	10.31	10.22	-1.75	10.29	-1.43	10.29	-1.29
STD	0.710	0.619	0.430	0.630	0.411	0.649	0.415



Graph-E1 RESISTANCE CHANGE FROM INITIAL VALUE

3M MDR CONNECTOR DURABILITY EVALUATION

DATE OF TEST: MAY 24, 1995

CONNECTORS TESTED: 10150-6000EC (30 μ " AU)
N10250-5212VC (30 μ " AU NON-LUBRICATED)

PURPOSE OF TEST: Check connector durability for up to 20,000 insertion/withdrawal

MEASUREMENTS: Contact Δ resistance
Insertion force
Withdrawal force

ENVIRONMENTAL CONDITIONS: Room Temperature

TEST SUMMARY:

CONTACT Δ RESISTANCE:

0-1,000 cycles	< 1.4 m Ω max.
10,000 cycles	< 2.1 m Ω max.
20,000 cycles	< 1.7 m Ω max.

INSERTION FORCE (TOTAL):

1 cycle	~ 4.6 lbs
10,000 cycles	~ 5.9 lbs
20,000 cycles	~ 5.4 lbs

WITHDRAWAL FORCE (TOTAL):

1 cycle	~ 3.6 lbs
10,000 cycles	~ 4.1 lbs
20,000 cycles	~ 4.1 lbs

CONCLUSION:

The 30 μ " Au connector performed exceptionally well throughout the test with the acceptable Δ resistance when subjecting the product to 20,000 insertions/withdrawals and no special environmental conditions. The insertion and withdrawal forces recorded showed very slight variations, but final force values at 20,000 cycles are not below the initial force levels.