Job Number:	Project Number:	Date of issue:
E99.04.05	600023	July 1999

Description:

Coaxicon Connectors

Part numbers:

619061-1

619028-1

Scope:

To determine the electrical and mechanical performance of the Coaxicon Switching SMD-Jack P/N 619061 (Selective AU-plating) by testing according product specification 108-71010.

For the tests requiring mated conditions, this connector is tested with its counterpart P/N 619028-1.

Conclusions:

In all groups the initial values of the contact resistance, of VSWR, and of the insertion loss are within the specified value.

Test Specification: 108-71010

Test Carried Out:
1 Mechanical Operation, Shock, Bump.
2 Saltmist, Artifical perspiration, Mixed gas.
3 RF tests. (VSWR and Insertion loss)

Distribution:
1 S. Kempter.
2 Doc. center.
3 File Lab.

Test Engineer: Th. van den Bosch	**Requested by:** Product Engineering	
Laboratory Manager: D.M.J. Jooren.	**Classification:** Unrestricted	
Disposal of Samples: Returned to requester.	**Report Number:** 501-19028	**Rev. A**
Appendices:	**Page** 1 **of** 13 **Pages**	

CONTENTS

SAMPLE DESCRIPTION:

Group 1:.
- 16 Coaxicon Switching SMD-Jack P/N 619061-1
  (consisting of selective AU-plated stamped contacts)
- 16 Coaxicon Cable Plug P/N 619028-1

Group 2:
- 16 Coaxicon Switching SMD-Jack P/N 619061-1
  (consisting of selective AU-plated stamped contacts)
- 16 Coaxicon Cable Plug P/N 619028-1

Group 3:
- 16 Coaxicon Switching SMD-Jack P/N 619061-1
  (consisting of selective AU-plated stamped contacts)
- 16 Coaxicon Cable Plug P/N 619028-1

Group 4:
- 4×16 Coaxicon Switching SMD-Jack P/N 619061-1
  (consisting of selective AU-plated stamped contacts)
- 4×16 Coaxicon Switching SMD-Jack P/N 619013-1
  (consisting of full AU-plated stamped contacts) for reference

Group 5:
- 16 Coaxicon Switching SMD-Jack P/N 619061-1
  (consisting of selective AU-plated stamped contacts)
- 16 Coaxicon Switching SMD-Jack P/N 619013-1
  (consisting of full AU-plated stamped contacts) for reference

Group 6:

- 16 Coaxicon Switching SMD-Jack P/N 619061-1
  (consisting of selective AU-plated stamped contacts)
- 16 Coaxicon Switching SMD-Jack P/N 619013-1
  (consisting of full AU-plated stamped contacts) for reference

Group 7:

- 4 Coaxicon Switching SMD-Jack P/N 619061-1 soldered on a test PCB
  (consisting of selective AU-plated stamped contacts)
- 4 Coaxicon Cable Plug P/N 619028

TESTSEQUENCE:

Group 1: Visual Inspection.
Termination resistance center contact of the cable plug and SMD-Jack.
Termination resistance spring contact, and 2nd signal contact.
Mechanical operation.
Visual Inspection.
Termination resistance center contact of the cable plug and SMD-Jack.
Termination resistance spring contact, and 2nd signal contact.

Group 2: Visual Inspection.
Termination resistance center contact of the cable plug and SMD-Jack.
Termination resistance spring contact, and 2nd signal contact.
Shock.
Visual Inspection.
Termination resistance center contact of the cable plug and SMD-Jack.
Termination resistance spring contact, and 2nd signal contact.

Group 3: Visual Inspection.
Termination resistance center contact of the cable plug and SMD-Jack.
Termination resistance spring contact, and 2nd signal contact.
Bump.
Visual Inspection.
Termination resistance center contact of the cable plug and SMD-Jack.
Termination resistance spring contact, and 2nd signal contact.

Group 4: Visual Inspection.
Salt mist (12h/24h/36h/48h)
Visual Inspection.

Group 5: Visual Inspection.
Artifical perspiration.
Visual Inspection.

Group 6: Visual Inspection.
Mixed flowing gas test.
Visual Inspection.

Group 7: Visual Inspection.
Termination resistance center contact of the cable plug and SMD-Jack.
Termination resistance spring contact, and 2nd signal contact.
VSWR for SMD-Jack.
Insertion loss for SMD-Jack.
VSWR for SMD-Jack and cable plug.
Insertion loss for SMD-Jack and cable plug.

TESTPROCEDURES:

IEC 512-2-2a: **TERMINATION RESISTANCE:**
The termination resistance was measured with an open circuit voltage of 20 mVolt and a maximum current of 100 mA DC.

IEC 512-5-9a: **MECHANICAL OPERATION: (Enduration)**
The samples were mated and unmated for 30,000 times at a rate of 700 cycles per hour. After this coupling and retention forces were measured.

IEC 512-4-6c: **SHOCK TEST:**
Acceleration 500g, half sinewave pulses of 1 msec.
3 Shocks in each of six mutually perpendicular directions were executed.
The samples were provided with a circuit to detect interruptions of continuity longer than 1 micro-second.

IEC 512-4-6b: **BUMP TEST:**
Acceleration 25g, half sinewave pulses of 6 msec.
1000 bumps in each direction were executed.
The samples were provided with a circuit to detect interruptions of continuity longer than 1 micro-second.

IEC 512-6-11f: **SALT MIST:**
The samples were placed in a salt spray chamber during 12, 48, 36 and 48 hours with a salt mist produced of a 5% salt solution.

NF S 80-77: **ARTIFICIAL PERSPERATION:**
Cottons moisted with artificial perspiration were placed near/on the contacts and this whole was placed in an oven with a temperature of 55°C.
The the artificial perspiration consists of:
- Destilled water (85%)
- Sodium chloride (10%)
- Lactic acid (5%)
- Duration 24 hours

IEC 68-2-60-Ke/4:

INDUSTRIAL ATMOSPHERE: (mixed gas test)

The test samples were placed in a climatic chamber under the following conditions:

Temperature	: 30°C.
Relative humidity	: 70%.
H_2S concentration	: 10 ppb.
Cl_2 concentration	: 10 ppb.
NO_2 concentration	: 200 ppb.
Condition	: unmated
Duration	: 21 days.

VSWR and INSERTION LOSS

VSWE and insertion loss were measured according to Figure 1 and 2.

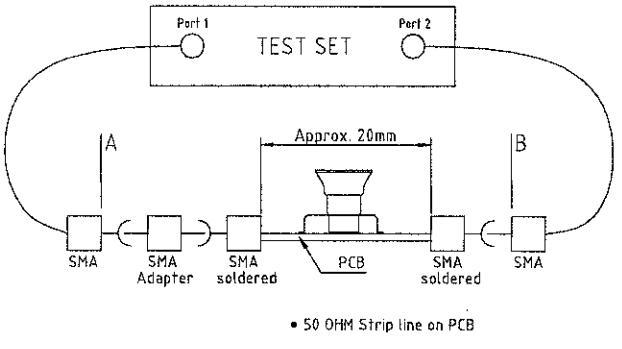

Figure 1 SMD-Jack

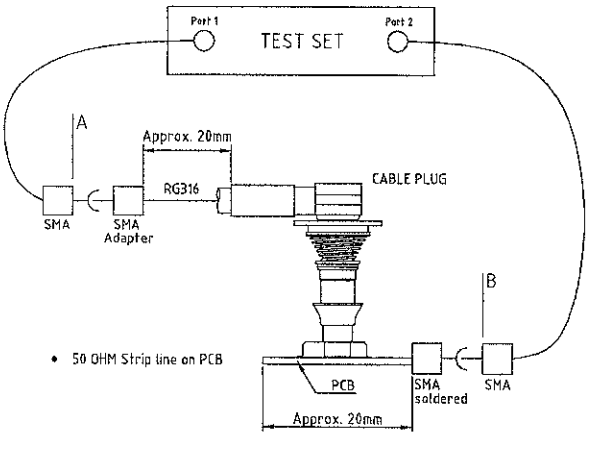

Figure 2 SMD-Jack and Cable Plug

EQUIPMENT USED:

Micro-ohmmeter	Keithley	580	374687	11-99.
Shock tester	MTS-Monterey	IMPAC66	Mark II, 980.28	
Accelero meter	Endevco	AQ 20	F101024	
Bump tester	Env.Equipm.	BT-50	PR 3456	
Saltmist chamber	Weiss	S450SSC	264347	12-99.
Network Analyser	Hewlett Packard	HP 8510B	2643A03501	
S-Parameter Test Set	Hewlett Packard	HP 8515A	2820A01753	
Sweep Oscillator	Hewlett Packard	HP 8350B	2851A11404	

REQUIREMENTS:

All test samples have been soldered before measuring the termination resistance, VSWR, and insertion loss. Therefore the testresults in this report are compared with the "after stress" requirements of AMP specification 108-71000.

TERMINATION RESISTANCE:
Contact resistance center contact of Cable Plug and center contact of SMD-Jack mated

Initial (before soldering)	80 mΩ maximum
After stress	200 mΩ maximum

Contact resistance spring contact and 2nd signal contact of SMD-Jack unmated

Initial (before soldering)	150 mΩ maximum
After stress	250 mΩ maximum

MECHANICAL OPERATION:
No damage, cracking or chipping.

SHOCK TEST:
No damage, cracking or chipping.

BUMP TEST:
No damage, cracking or chipping.
No discontinuity > 1 µs.

SALT MIST:
No base material visible on interface or mating surface.

ARTIFICIAL PERSPERATION
No base material visible on interface or mating surface.

MIXED GAS TEST
No base material visible on interface or mating surface.

VSWR

SMD-Jack		
	Initial (before soldering)	1.10 maximum (DC - 1 GHz)
		1.15 maximum (1 GHz - 2 GHz)
	After stress	1.15 maximum (DC - 1GHZ)
		1.22 maximum (1 GHz - 2 GHz)
SMD-Jack and Cable Plug		
	Initial (before soldering)	1.10 maximum (DC - 1 GHz)
		1.20 maximum (1 GHz - 2 GHz)
	After stress	1.17 maximum (DC - 1GHZ)
		1.25maximum (1 GHz - 2 GHz)

INSERTION LOSS

SMD-Jack

Initial (before soldering)	0.18 dB maximum (DC - 1 GHz)
	0.30 dB maximum (1 GHz - 2 Ghz)
	0.05 dB maximum (see specified bands below)
After stress	0.21 dB maximum (DC - 1 GHz)
	0.35 dB maximum (1 GHz - 2 Ghz)
	0.05 dB maximum (see specified bands below)

SMD-Jack and Cable Plug

Initial (before soldering)	0.25 dB maximum (DC - 1 GHz)
	0.30 dB maximum (1 GHz - 2 Ghz)
	0.05 dB maximum (see specified bands below)
After stress	0.30dB maximum (DC - 1 GHz)
	0.45 dB maximum (1 GHz - 2 Ghz)
	0.05 dB maximum (see specified bands below)

Specified bands:

DCS: TX 1710-1785 MHz
RX 1805-1881 MHz
PCS: TX 1850-1910 MHz
RX 1930-1990 Mhz

SUMMARY OF TESTRESULTS:

Group 1:

Contact resistance center contact of Cable Plug and center contact of SMD-Jack.
Maximum: 82.0 mΩ OK

Contact resistance spring contact and second signal contact
Maximum: 117.0 mΩ OK

Mechanical operation
Visual examination OK

Contact resistance center contact of Cable Plug and center contact of SMD-Jack.
Maximum: 160.0 mΩ OK

Contact resistance spring contact and second signal contact
Maximum: 121.0 mΩ OK

Group 2:
Contact resistance center contact of Cable Plug and center contact of SMD-Jack.
Maximum: 82.0 mΩ OK

Contact resistance spring contact and second signal contact
Maximum: 123.0 mΩ OK

Shock
Visual examination
No abnormalities were detected OK

Contact resistance center contact of Cable Plug and center contact of SMD-Jack.
Maximum: 92.0 mΩ OK

Contact resistance spring contact and second signal contact
Maximum: 175.0 mΩ OK

Group 3:
Contact resistance center contact of Cable Plug and center contact of SMD-Jack.
Maximum: 105.0 mΩ OK

Contact resistance spring contact and second signal contact
Maximum: 122.0 mΩ OK

Bump
Visual examination
No abnormalities were detected, no discontinuity >1 μs OK

Contact resistance center contact of Cable Plug and center contact of SMD-Jack.
Maximum: 922.0 mΩ OK

Contact resistance spring contact and second signal contact
Maximum: 136.0 mΩ OK

Group 4:
Salt mist
Selective plating: no problems on the central contactpin and the corresponding surface on the contact leg. No problem on the non-moving contact. Small corrosion spots near the end of the moving contact leg, but of no influence on the contact area. OK

Group 5:
Artificial persperation
Selective and overall plating: no base material visible on interface or mating surface. OK

Group 6:
Mixed gas
Both testgroups, with full Au-plated and selective Au-plated, don't show corrosion products on the contact surfaces.

Group 7:

Contact resistance center contact of Cable Plug and center contact of SMD-Jack.
Maximum: 82.0 mΩ — OK

Contact resistance spring contact and second signal contact
Maximum: 130.0 mΩ — OK

VSWR

- SMD-Jack
  - Maximum: 1.078 (DC - 1 Ghz) — OK
  - Maximum: 1.086 (1 Ghz - 2 Ghz) — OK
- SMD-Jack and Cable Plug
  - Maximum: 1.110 (DC - 1 Ghz) — OK
  - Maximum: 1.171 (1 Ghz - 2 Ghz) — OK

Insertion loss

- SMD-Jack
  - Maximum: 0.200 dB (DC - 1 Ghz) — OK
  - Maximum: 0.302 dB (1 Ghz - 2 Ghz) — OK
- SMD-Jack and Cable Plug
  - Maximum: 0.181 dB (DC - 1 Ghz) — OK
  - Maximum: 0.311 dB (1 Ghz - 2 Ghz) — OK

TESTRESULTS:

Group 1

All values represented in milli-ohms.

Product name:	COAXICON SERIES MOBILE PHONE
Lot #4	Measurements **30,000 mating cycles** test

Column.	**Measur**	**Description**
-1-:	C1a1	Contact resistance center contact of CABLE PLUG and center contact of SMD-JACK mated
-2-:	C1a2	Contact resistance spring contact and 2nd signal contact of SMD-Jack unmated

	(C1a1)	(C1a2)	(C1a1)	(C1a2)
	Initial	***Initial***	***Final***	***Final***
Part	***-1-***	***-2-***	***-1-***	***-2-***
1	75	108	70	106
2	82	116	92	114
3	72	102	80	104
4	74	105	106	105
5	74	116	77	121
6	74	117	73	119
7	78	116	160	115
8	81	105	125	120
9	79	103	91	102
10	79	110	112	113
11	79	105	77	104
12	75	104	82	106
13	76	107	123	121
14	80	105	74	108
15	77	105	129	109
16	74	102	86	108
Max.	**82.0**	**117.0**	**160.0**	**121.0**
Min.	**72.0**	**102.0**	**70.0**	**102.0**
Mean.	**76.8**	**107.9**	**97.3**	**110.9**

Group 2:

All values represented in milli-ohms.

Product name:	COAXICON SERIES MOBILE PHONE
Lot #1	Measurements **Shock** test

Column.	**Measur.**	**Description**
-1-:	C1a1	Contact resistance center contact of CABLE PLUG and center contact of SMD-JACK mated
-2-:	C1a2	Contact resistance spring contact and 2nd signal contact of SMD-Jack unmated

Part	(C1a1) ***Initial*** ***-1-***	(C1a2) ***Initial*** ***-2-***	(C1a1) ***Final*** ***-1-***	(C1a2) ***Final*** ***-2-***
1	76	103	77	109
2	73	104	78	123
3	76	115	69	175
4	78	102	82	118
5	79	103	92	104
6	75	112	77	158
7	81	106	84	140
8	82	123	89	124
9	78	102	87	127
10	78	116	83	145
11	77	102	72	114
12	80	118	85	130
13	70	104	76	151
14	74	103	73	110
15	72	102	86	105
16	76	107	82	107
Max.	**82.0**	**123.0**	**92**	**175**
Min.	**70.0**	**102.0**	**69**	**104**
Mean.	**76.6**	**107.6**	**80.75**	**127.50**

Group 3:

All values represented in milli-ohms.

Product name: COAXICON SERIES MOBILE PHONE

Lot #2 Measurements **Bump** test

Column.	**Measur.**	**Description**
-1-:	C1a1	Contact resistance center contact of CABLE PLUG and center contact of SMD-JACK mated
-2-:	C1a2	Contact resistance spring contact and 2nd signal contact of SMD-Jack unmated

	(C1a1) ***Initial***	(C1a2) ***Initial***	(C1a1) ***Final***	(C1a2) ***Final***
Part	***-1-***	***-2-***	***-1-***	***-2-***
1	105	117	91	128
2	76	105	79	113
3	79	106	83	112
4	82	117	86	136
5	80	107	89	111
6	78	105	78	110
7	83	114	83	120
8	78	106	84	109
9	87	112	82	115
10	73	113	92	132
11	79	106	87	120
12	87	122	91	127
13	77	104	81	111
14	74	102	82	111
15	81	106	80	116
16	74	116	84	116
Max.	**105.0**	**122.0**	**92**	**136**
Min.	**73.0**	**102.0**	**78**	**109**
Mean.	**80.8**	**109.9**	**84.50**	**117.94**

Group 7:

All values represented in milli-ohms.

Product name:	COAXICON SERIES MOBILE PHONE
Lot #5	Samples for RF Measurements

Column.	**Measur.**	**Description**
-1-:	C1a1	Contact resistance center contact of CABLE PLUG and center contact of SMD-JACK mated
-2-:	C1a2	Contact resistance spring contact and 2nd signal contact of SMD-Jack unmated

Part	(C1a1) ***-1-***	(C1a2) ***-2-***
1	80	114
2	71	130
3	80	121
4	82	109
Max.	**82.0**	**130.0**
Min.	**71.0**	**109.0**
Mean.	**78.3**	**118.5**

RF measurements

Max values

Frequency	Part	Mated VSWR (C1d3)	Mated Ins. Loss dB (C1d4)	Unmated VSWR (C1d1)	Unmated Ins. Loss dB (C1d2)
DC-1 GHz	**Spec.**				
	#1	1.086	0.163	1.043	0.155
	#2	1.086	0.181	1.043	0.199
	#3	1.110	0.178	1.078	0.200
	#4	1.106	0.173	1.067	0.200
1GHz-2GHz	**Spec.**				
	#1	1.171	0.310	1.045	0.246
	#2	1.166	0.311	1.043	0.301
	#3	1.113	0.295	1.086	0.302
	#4	1.134	0.293	1.076	0.298