

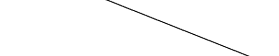
## PRODUCT SPECIFICATION

No. T-2-45531		Date Issued: August 6, 2009
Customer:	Revised:	Date Revised:
Title Subject: SD CONNECTOR (TA TYPE) Lead-Free Product		Issued by: Osaka Engineering Center

This product specification contains the results of performance tests for the SD Connector (TA type) lead-free product

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## 1. PART NAME, PART NUMBER & DRAWING NUMBER

Part Name	Part Number	Drawing Number
SD Connector (TA type)	SD-TA-9BNS-N21-413-TF (LF)	KRD-29022-1
	SD-TA-9BNS-N21-413 (LF)	KRD-29020
		KRD-29021

Note<sub>1</sub>: (LF) as identification part number indicating lead-free product shall be displayed on a label until all products are shifted to the lead-free.

## 2. CONSTRUCTION, DIMENSIONS, MATERIAL & SURFACE FINISH

Construction and dimensions shall be in accordance with the referenced drawings.  
Material and surface finish shall be as specified below.

Part Name	Material	Surface finish, etc.
Housing	LCP	Color: Black
Contact	Copper-alloy	Mating part: Nickel-underplated Gold-plated Solder tail: Nickel-underplated Tin-plated
WP/CD Contact 1	Copper-alloy	Mating part: Nickel-underplated Gold-plated Solder tail: Nickel-underplated Tin-plated
WP/CD Contact 2	Copper-alloy	Mating part: Nickel-underplated Gold-plated Solder tail: Nickel-underplated Tin-plated
Card guide	Copper-alloy	Copper-underplated Tin-plated
Holder	Stainless	-----

## 3. CHARACTERISTICS

Items	Rated value etc.
Current rating	0.5 A (AC, DC)
Voltage rating	3.3 V (AC, DC)
Temperature range	-25 to +90 °C (Note <sub>2</sub> )
Temperature range for storage	-40 to +90 °C

Note<sub>2</sub>: Including temperature rise in applying an electrical current.

## 4. ABOUT WHISKER

Although the lead-free plating on this product is designed to retard whisker growth, it is not possible to completely eliminate the whisker problem.

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## 5. PACKAGING SPECIFICATION (EMBOSSSED-TAPING)

### 5.1 Quantity

Quantity to be wound shall be 430 pieces per reel as the standard quantity.

### 5.2 Packaging Method

- (1) Each connector shall be put into the fixed position\*<sup>1</sup> of the embossed carrier tape individually. The tape shall be sealed with cover tape by heat treatment.
- (2) After sealed, the carrier tape shall be wound\*<sup>2</sup> to reel to be specified quantity and the end of cover tape\*<sup>3</sup> shall be fixed by adhesive tape.
- (3) The wound reel shall be packaged in a corrugated cardboard box for shipment.

Notes \*1: See the attached drawings.

\*2: The direction to be wound; see the attached drawings.

\*3: Corresponding to leader part in taking out the tape.

The treatment of the end of tape; see the attached drawings.

### 5.3 Marking

The label marked the following items shall be attached to the flange part.

- (1) Part Number
- (2) Quantity
- (3) Manufacturing lot number
- (4) Company name or its abbreviation
- (5) Other necessary items

### 5.4 Storage

Store the products in a clean room of the following conditions under the JST original packaging conditions.

Temperature: 5 to 35 °C

Relative humidity: 60% max.

## 6. PERFORMANCES

- (1) When tested in accordance with the test condition and method in each item, each requirement shall be met. Unless otherwise specified, tests shall be conducted under the following ambient conditions specified in JIS C 0010 (IEC 68-1) [Basic Environmental Testing Procedures General and Guidance].

Temperature: 15 to 35 °C

Relative humidity: 25 to 75 %

- (2) For environmental tests, as a rule, specimens assembled for actual use and testing printed circuit board (PCB) manufactured by JST shall be used.

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## 6.1 Taping Part

### 6.1.1 Appearance

Requirement:

- (1) Sprocket hole shall not be covered with cover tape.
- (2) Cover tape shall not run out of carrier tape.
- (3) Cover tape shall not be peeled.
- (4) There shall be no other defects.

Test method: Visual inspection.

### 6.1.2 Tensile Strength of Tape

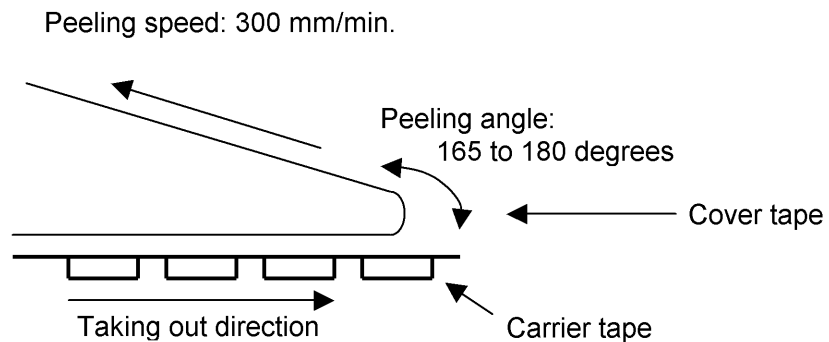
Requirement: There shall be no defects such as breakage.

Test method: Pulling load of 10 N shall be applied to each of carrier tape and cover tape. Pulling direction shall be its pulling-out direction.

### 6.1.3 Peel Strength of Cover Tape

Requirement: 1.0 N max.

Test method: The cover tape shall be pulled as shown in the figure below.



## 6.2 Connector Part

### 6.2.1 Appearance

Requirement: There shall be no crack, no deformation nor discoloration which may affect the performance specified in this specification.

Test method: Visual inspection.

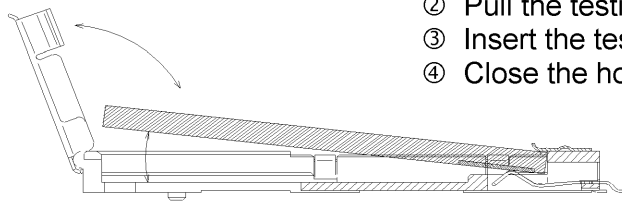
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## 6.2.2 Mechanical Test

### 6.2.2.1 Connector Durability (Office Environment)

Requirement: Variation of contact resistance shall be 40 mΩ max. after the test.

Test method: The specimen assembled for actual use and a testing PCB (dummy card) shall be mated and unmated as shown in the figure below. After repeated 10,000 cycles, contact resistance shall be measured.  
(Testing speed: 400 to 600 cycles/hour)



- ① Open the holder
- ② Pull the testing sub PCB out of the connector
- ③ Insert the testing PCB to the connector
- ④ Close the holder

### 6.2.2.2 Connector Durability (Harsh Environment)

Requirement: [Signal part] 5,000 cycle min.  
[Switch part] 5,000 cycle min.

Test method: See the item 6.2.5.2

### 6.2.2.3 Vibration

Requirement: Variation of contact resistance shall be 40 mΩ max. after the test.  
There shall be no current discontinuity longer than 100 nanoseconds.  
No mechanical damages shall occur on the parts.

Test method: The specimen assembled for actual use shall be subjected to a vibration test of the following conditions. During the test, current continuity shall be checked. After the test, contact resistance shall be measured.

Frequency: 10-2000-10 Hz/ 5 minutes  
Amplitude: 19.6 m/s<sup>2</sup> (2G)  
Direction: Each of X,Y and Z-axis directions  
\*Each axis shall be at right angles to others.  
No. of cycles: 10 cycles for each direction

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#### 6.2.2.4 Shock

Requirement: Variation of contact resistance shall be 40 mΩ max. after the test.  
There shall be no current discontinuity longer than 100 nanoseconds.  
No mechanical damages shall occur on the parts.

Test method: The specimen assembled for actual use shall be subjected to a shock test of the following conditions. During the test, current continuity shall be checked. After the test, contact resistance shall be measured.

Acceleration: 490 m/s<sup>2</sup> (50G)

Duration: 11 msec

Wave form: Half wave, sine wave

Direction: Each of X,Y and Z-axis directions

\*Each axis shall be at right angles to others.

Period: 3 times for each direction

#### 6.2.2.5 Solderability

Requirement: Plating surface of solder-dipping section of a specimen shall be covered with smooth solder.

Test method: Fluxed soldering section of the specimen shall be dipped in solder of the following conditions.

Solder: Sn-3.0Ag-0.5Cu

Flux: Activation flux

(CF-110VH-2A made by Tamura Kaken Corporation)

Solder temperature: 245 ± 3 °C

Immersion period: 3 ± 0.5 seconds

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#### 6.2.2.6 Resistance to Soldering Heat

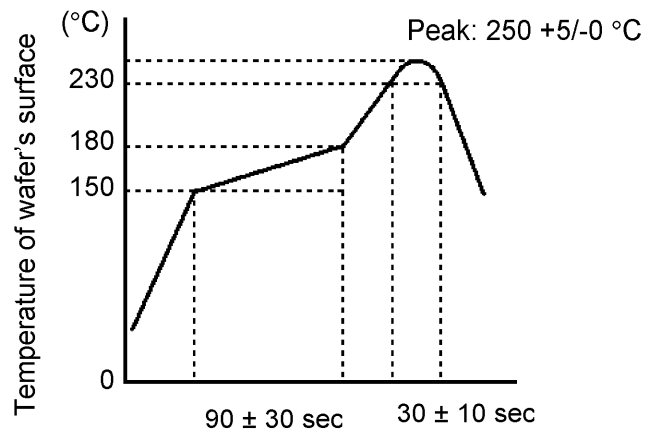
Requirement: There shall be no deformation or damage which may affect the performance.

Test method:

[By reflow soldering]

The specimen shall be subjected to a reflow soldering of the condition shown in the graph below. After the test, the appearance shall be observed.

Material of testing PCB shall be glass based epoxy resin and its thickness shall be 0.8 mm.



**[Temperature profile for reflow soldering]**

[By soldering iron]

The specimen mounted on a PCB shall be soldered by soldering iron of the following conditions. No abnormal load such as lateral load shall be applied to the specimen during the test.

Temperature of the tip: 350 ± 10 °C

Period of soldering: 3 seconds

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### 6.2.3 Electrical Test

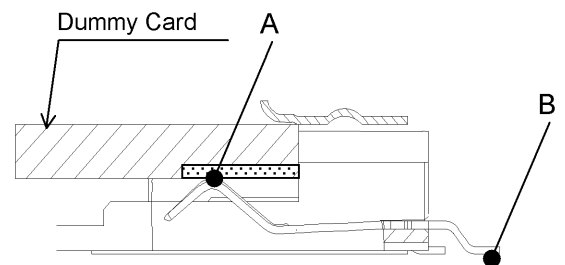
#### 6.2.3.1 Contact Resistance

Requirement:

[Signal part]	Initial;	100 mΩ max.
	After test;	Variation from the initial value 40 mΩ max.
[Switch part]	Initial;	100 mΩ max.
	After test;	Variation from the initial value 40 mΩ max.

Test method: Contact resistance between points A and B of the specimen assembled for actual use shown in the figure below shall be measured under the following condition and method.

Test current: 1 mA (DC)  
Open voltage: 20 mV max.



#### 6.2.3.2 Current Continuity

Requirement: There shall be no current discontinuity longer than 100 nanoseconds during vibration & shock tests.

Test method: Each circuit of the specimen assembled for actual use shall be connected in series and test current of 1 mA DC shall be applied. Current discontinuity longer than 100 nanoseconds during the tests shall be detected by continuity meter.

#### 6.2.3.3 Dielectric Withstanding Voltage

Requirement: There shall be no short-circuit, breakdown nor flashover .  
Leakage current; 1mA max.

Test method: AC 500 Vrms shall be applied between adjacent contacts of the specimen assembled for actual use (not be soldered) for one minute.

#### 6.2.3.4 Insulation Resistance

Requirement: Initial; 1,000 MΩ min.  
After test; 100 MΩ min.  
(Damp heat cycle, thermal shock, humidity tests)

Test method: DC 500 V shall be applied between adjacent contacts of the specimen assembled for actual use (not be soldered) for one minute.



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#### 6.2.3.5 Temperature Rise

Requirement: 30 °C max. (Temperature rise value)

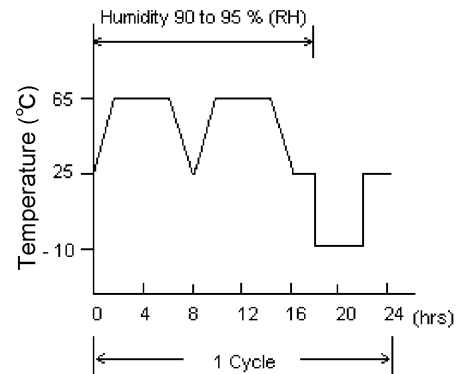
Test method: The specimen assembled for actual use shall be connected in series and 0.5 A (AC) shall be applied to each contact. After temperature becomes constant, temperature rise of the contact shall be measured.

#### 6.2.4 Environmental Test

##### 6.2.4.1 Damp Heat Cycle

Requirement: Variation of contact resistance shall be 40 mΩ max. after the test.  
Insulation resistance shall be 100 MΩ min. after the test.

Test method: The specimen assembled for actual use shall be placed in a humidity chamber of the condition shown in the graph on the right side. After repeated 10 cycles, contact resistance and insulation resistance shall be measured.



##### 6.2.4.2 Thermal Shock

Requirement: Variation of contact resistance shall be 40 mΩ max. after the test.  
Insulation resistance shall be 100 MΩ min. after the test.

Test method: The specimen assembled for actual use shall be subjected to a thermal shock test of the following conditions. After the test, contact resistance, insulation resistance and dielectric withstanding voltage shall be measured.

1 cycle consists of:

- 55 ± 3 °C for 30 minutes

+85 ± 2 °C for 30 minutes

Total cycles: 5 cycles

##### 6.2.4.3 Heat Aging

Requirement: Variation of contact resistance shall be 40 mΩ max. after the test.

Test method: The specimen assembled for actual use shall be placed in a heat oven of the following conditions. After the test, contact resistance shall be measured.

Temperature: 85 ± 2 °C

Period: 96 hours

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#### 6.2.4.4 Cold

Requirement Variation of contact resistance shall be 40 mΩ max. after the test.

Test method: The specimen assembled for actual use shall be placed in a cold chamber of the following conditions. After the test, contact resistance shall be measured.

Temperature:  $-55 \pm 3$  °C  
Period: 96 hours

#### 6.2.4.5 Humidity

Requirement Variation of contact resistance shall be 40 mΩ max. after the test.  
Insulation resistance shall be 100 MΩ min. after the test.

Test method: The specimen assembled for actual use shall be placed in a humidity chamber of the following conditions. After the test, contact resistance, insulation resistance and dielectric withstanding voltage shall be measured.

Temperature:  $40 \pm 2$  °C  
Relative humidity: 90 to 95 %  
Period: 96 hours

#### 6.2.4.6 Hydrogen Sulfide Gas

Requirement Variation of contact resistance shall be 40 mΩ max. after the test.

Test method: The specimen assembled for actual use shall be subjected to hydrogen sulfide gas of the following conditions. After the test, contact resistance shall be measured.

Concentration:  $3 \pm 1$  ppm  
Temperature:  $40 \pm 2$  °C  
Relative humidity:  $80 \pm 5$  %  
Period: 96 hours

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## 6.2.5 Connector Durability

Testing speed: 400 to 600 cycles/hour

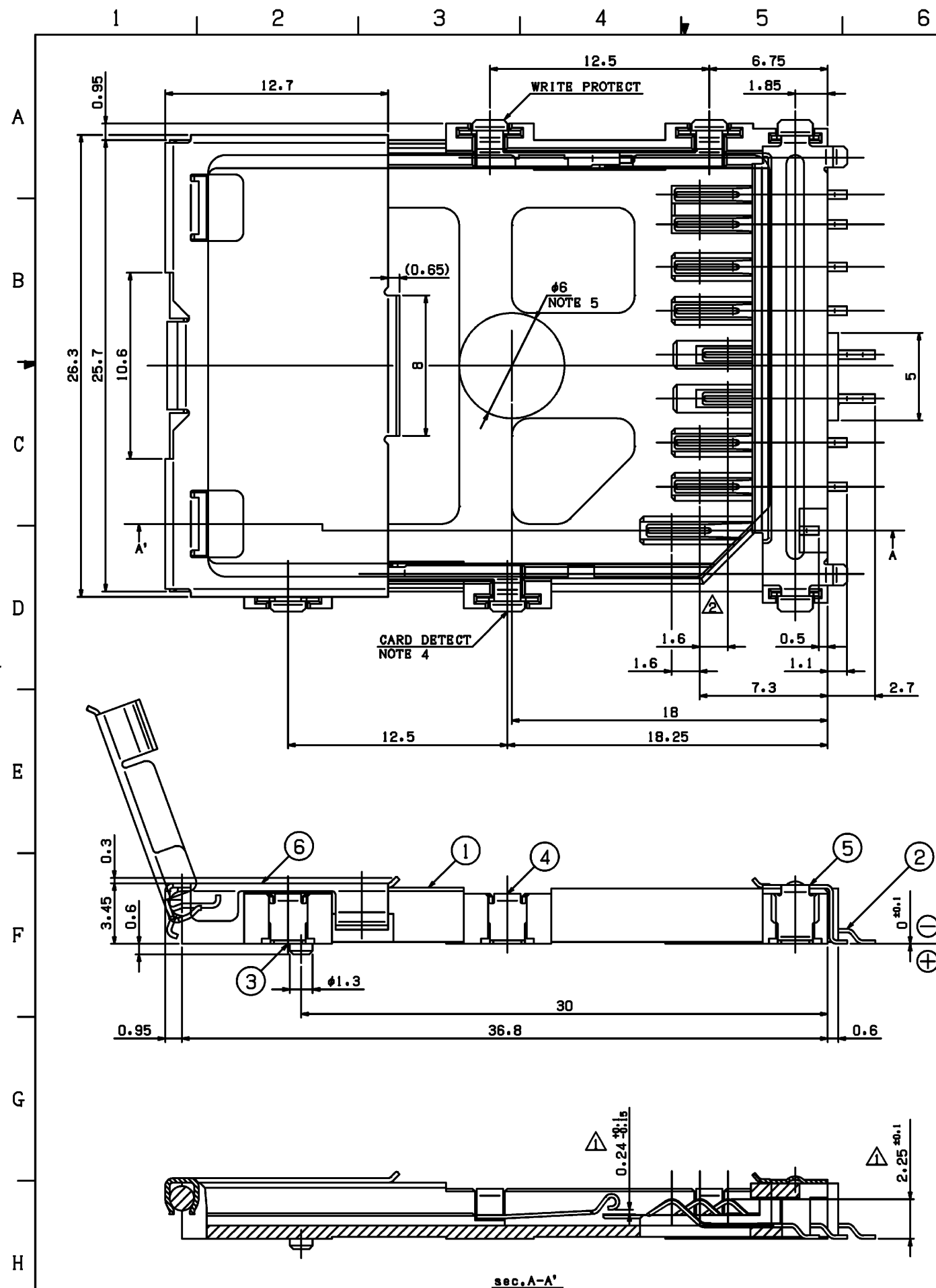
### 6.2.5.1 Office Environment

No.	Test Items	Remarks
1	Contact resistance (Initial)	6.2.3.1
2	Insertion and withdrawal 10,000 cycles	6.2.2.1
3	Contact resistance	6.2.3.1

### 6.2.5.2 Harsh Environment

No.	Test Items	Remarks
1	Contact resistance (Initial)	6.2.3.1
2	Insertion and withdrawal 1,000 cycles	6.2.2.1
3	Contact resistance	6.2.3.1
4	Damp Heat Cycle test 1cycle	6.2.4.1
5	Contact resistance	6.2.3.1
6	Insertion and withdrawal 1,000 cycles (total 2,000 cycles)	6.2.2.1
7	Contact resistance	6.2.3.1
8	Damp Heat Cycle test 1cycle	6.2.4.1
9	Contact resistance	6.2.3.1
10	Insertion and withdrawal 3,000 cycles (total 5,000 cycles)	6.2.2.1
11	Contact resistance	6.2.3.1
12	Damp Heat Cycle test 1cycle	6.2.4.1
13	Contact resistance	6.2.3.1
14	Hydrogen sulfide Gas	6.2.4.6
15	Contact resistance	6.2.3.1





REV.	DESCRIPTION	DATE	DESIGNED
1	Dimensions are changed	DEC.12.2004	K.W
2	Dimensions are changed	Aug.16.2004	K.W
3	Contact surface finish is changed	MAY.25.2005	K.W
4	Change of PART No.	AUG.22.2005	H.O

NOTE 1: Unless otherwise specified tolerance:  $\pm 0.3\text{mm}$   
 2: Contact surface finish  
 Over all : Nickel under plated  
 Contact area: Gold plated  
 Solder tails: Tin plated  
 3: Related drawing number  
 Applicable PCB layout: KRD-29021  
 4: The power must be switched on by CARD DETECT.  
 5: Pick&Place area

6	Holder	Stainless		t0.25
5	Card guide	Copper alloy	Tin plated 3	t0.2
4	WP/CD Contact 2	Copper alloy	Selective Gold plated	t0.2
3	WP/CD Contact 1	Copper alloy	Selective Gold plated	t0.2
2	Contact	Copper alloy	Selective Gold plated	t0.2
1	Housing	LCP (G.F.)		UL94V-0, Black
No.	PART NAME	MATERIAL	SURFACE FINISH	REMARKS
SIZE	UNIT	SCALE	PROJECTION	DATE
A2	METRIC	5:1		MAR. 2.2004
APPROVED	CHECKED	DESIGNED	DRAWN	CUSTOMER
S.K	K.W	H.O		SERIES NAME
				SD CONNECTOR TA type
				PART No.
				SD-TA-9BNS-N21-413 (LF) 4
				DRAWING No.
				KRD-29020
				R4

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