
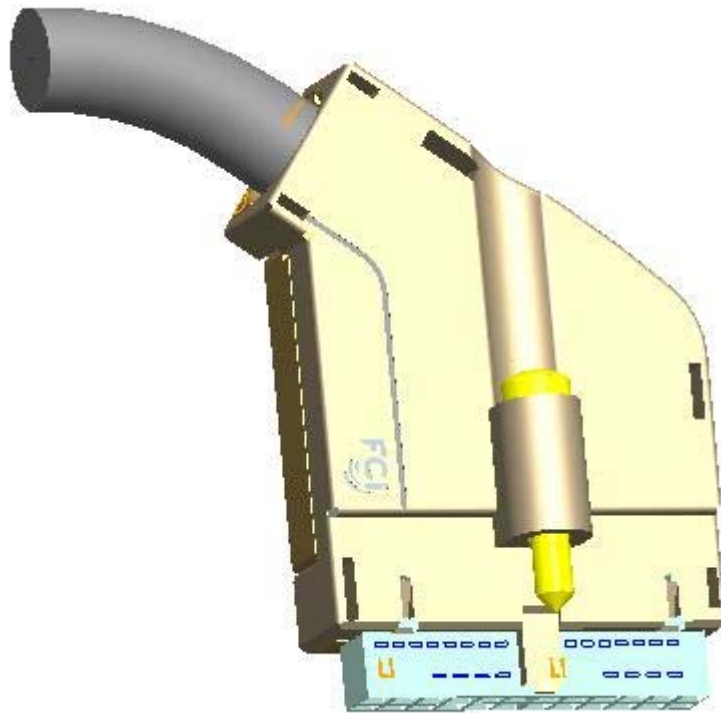



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# SIGNAL CABLE CONNECTOR




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## 1. Scope

This product specification covers the requirements for Low Profile Subscriber Connector.

## 2. Product description

### 2.1 General


Lead-Free product in accordance to RoHS 2002/EC/95  
UL 94 V0.

#### 2.1.1 Ratings and characteristics

This document is describing an insulation displacement connector (IDC) for signal transmission. It is intended for discrete cable wire.

The 2.0mm pitch connector has 2 rows with 12 individual contact springs per row and is intended to mate with PCB mounted male connector.

Rated voltage	105VAC; -48VDC
Current rating at 70°C	0.3A DC average/contact
Insulation resistance	5000MΩ minimum after damp heat steady state IEC 60512-3-1
Recommended cable	Nominal diameter Ø6.8mm; 12 pairs;AWG26 (ø0.4mm solid wire)

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The connector module consists of :  
a contact unit ,  
2 molded plastic covers ,  
a metal cable strain relief.

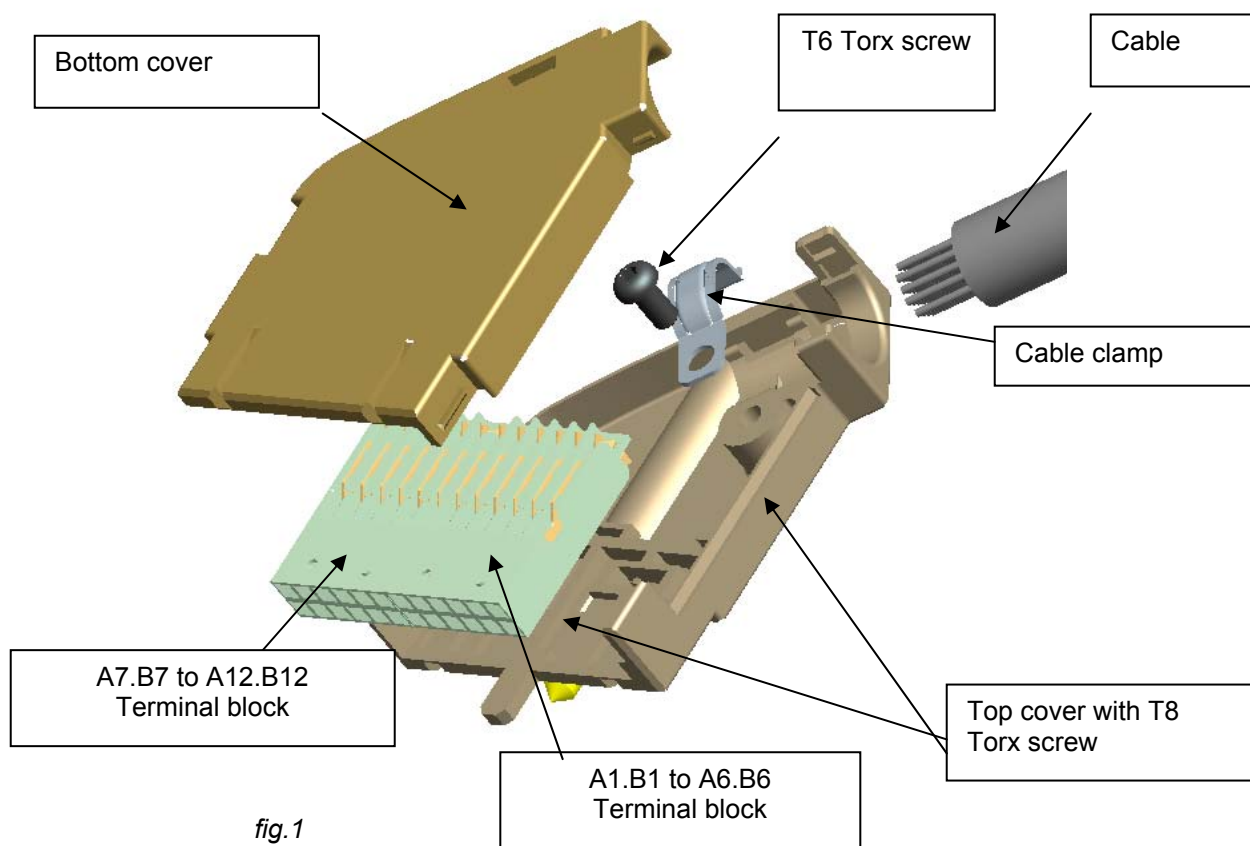



fig. 1

## 2.2 Design and construction

The connector shall be of design, construction and physical dimensions as specified on the applicable product customer drawing: 10073976C.

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## 2.3 Materials and plating

### 2.3.1 Terminal blocks

#### 2.3.1.1 Housing

Material: Polyester (PBTP), 30% glass filled.  
Weight: 0.54g/piece.

#### 2.3.1.2 Contacts terminal

Material: Phosphor bronze.  
Plating:  
- Contact coating on mating area:

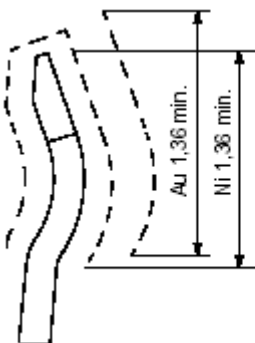


fig.2

Surface coating:

- a) Hard gold
- b) Ni 1,27  $\mu\text{m}$  min.

- Contact on termination area (IDC slot)

2 to 4  $\mu\text{m}$  Sn over 1  $\mu\text{m}$  mini Ni.

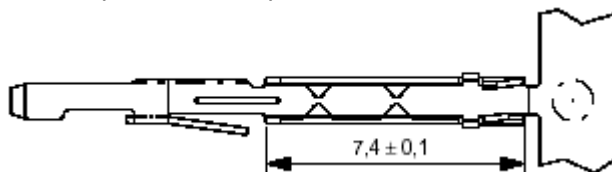



fig.3

Weight: 0.067g/piece.

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### 2.3.2 Covers

Material: Unreinforced polycarbonate.  
Weight bottom cover: 1.43g/piece.  
Weight top cover: 2.02 g/piece.

### 2.3.3 Cable clamp

Material: Stainless steel.  
Weight: 0.18g/piece.

### 2.3.4 Connector fixing screw


Material: Steel.  
Plating: 2 $\mu$  mini Cu, 3 $\mu$  mini Nickel.  
Weight: 0.51g/piece.

Maximum torque: 0.25 Nm

### 2.3.5 Cable clamp screw

Material: Steel.  
Plating: 2 to 4  $\mu$ m Cu + 3 to 5  $\mu$ m Nickel  
Weight: 0.19g/piece.

Maximum torque: 0.25 Nm

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### 3. Characteristics

#### 3.1 General

All characteristics refer to 10073976-001LF and board header connector 10069230-001LF (pair of connectors).

Approved cable is:  
Conductor diameter 0.4mm, 26 AWG, maximum dia 0.65mm

The connector has been designed to hold the following cable configurations:

- one conductor diameter 0.4mm, 26 AWG,
- maximum wire diameter 0.65mm

#### 3.2 Reference environment

According to IEC 60068-1 clause 5.3.1


**Table 2:**

Temperature	15 -35°C
Rel.humidity	25%-75%
Atmospheric pressure	86-106kPa

#### 3.3 Climate category

**Table 3:**

Storage	Max temperature	50°C
	Min. temperature	-40°C
Range of uses	Max temperature	70°C
	Min. temperature	-40°C

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### 3.4 Electrical

#### 3.4.1 Creepage and clearance distances

Minimum creepage and clearance distance between contacts is 0,4 mm

#### 3.4.2 Voltage proof

Voltage proof 1000 V r.m.s min. after damp heat steady state test.  
Conditions: IEC 60512-2, Test 4a.

#### 3.4.3 Current carrying capacity

Current carrying capacity	Ambient temperature
0.3A	70°C

Maximum increase in temperature 10° C at 0.3A, in all contacts.  
Conditions: IEC 60512-3 Test 5b.  
Arrangement according to figure 3 in clause 3.6.2.

#### 3.4.4 Contact resistance

Contact resistance according to table 4.  
Contact resistance max. increase 10mΩ after heat ageing.  
Conditions: Conditions: IEC 60512-2 Test2a.  
Arrangement according to figure 4 in clause 3.6.3.

**Table 4:**

Arrangement	Row	Resistance
contact/contact	a	25 mΩ max
contact/contact	b	35 mΩ max


#### 3.4.5 Insulation resistance

Insulation resistance 5000 MΩ minimum, after damp heat. steady state test.  
Conditions: IEC 60512-2 Test 3a.

#### 3.4.6 Signal transmission

No recommendations.

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### 3.4.7 Termination resistance, IDC-section

Contact resistance max increase 1mΩ after step 6 (heat ageing) in test procedure (compared to initial values). Max increase between step 7 and fully performed test procedure is 1mΩ (compared to values after step 6).

Conditions: IEC 60512-2 Test2a.

Standard atmospheric conditions.

Arrangement according to figure 5 clause 3.6.4.


Connector terminated with cable wires:

- conductor diameter 0.4mm, 26 AWG,
- maximum wire diameter 0.65mm .

1. **Pulling test according to fig. 6. Applied force 20 N for 10 sec, 2 cycles.**
2. **Bending test according to fig. 7, 10 cycles.**  
One cycle is: Applied force 5 N along the cable-axis where it fits into the covers, a 90° bend upwards, a 90° bend downwards and then back to normal position.
3. **Twisting test according to fig. 8, 5 cycles. The first cycle is:**  
Applied force 5 N along the cable-axis where it fits into the covers, a 90° bend downwards (start position), a 180° twist clockwise then back 180° counterclockwise to start position, twist 180° counterclockwise and back to start position. The second cycle starts with a 90° bend of cable in the opposite direction compared to the first cycle, then the same procedure as the first cycle. During the test, a tensile load of 5 N shall be applied to the cable.
4. **Vibration, sinusoidal vibration according to IEC 60068-2-6 test Fc,**  
10-500 Hz, 0,75 mm, 98 m/s<sup>2</sup>, 3x10 sweep cycles.
5. **Rapid change of temperature according to IEC 60068-2-14 test Na**  
-55°C, +85°C, 3h, 100 cycles.
6. **Heat ageing according to IEC 60068-2-2 test Bb.**  
56 days in 85°C
7. **Damp heat: Damp heat steady test according to IEC 60068-2-3,**  
40°C, 90-95% relative humidity, 56 days.
8. **Corrosion 21 days according to IEC 60068-2-60, test Ke, method 2:**  
200 ppb NO<sub>2</sub>, 10 ppb H<sub>2</sub>S, 10 ppb Cl<sub>2</sub>, 30°C, 70% R.H., film on Cu 0,3 -1,0 mg/(dm<sup>2</sup> x day)

### 3.4.8 Transfer impedance –EMC

Not applicable

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### 3.5 Mechanical

#### 3.5.1 Mechanical operations

Number of operations: 200 minimum  
Conditions:  
IEC 60512-5, test 9a.  
Standard atmospheric conditions.  
Frequency of operations: 100 cycles/h.  
Speed of operation: 10mm/s maximum.  
Rest: 30s unmated.

#### 3.5.2 Insertion and withdrawal forces

Global insertion force: 20 N max.  
Conditions:  
IEC 60512-7, test 13b.  
Rate of engagement and separation: 2mm/s maximum.  
Fully equipped connectors.

#### 3.5.3 Contact retention in insert

Force to be applied: 5 N.  
Conditions: IEC 60512-8 test 15a.  
Standard atmospheric conditions.  
The maximum axial displacement after the force has been removed shall not exceed 0,1 mm.  
Min. 10 readings per connector.  
Fully equipped connectors.

#### 3.5.4 Contact force

##### 3.5.4.1 *Contact spring force*


Initial contact spring force 0,50N min.  
Contact spring force 0,50N min., after 200 mechanical operations.  
Contact spring force 0,40N min., after heat ageing, end of life.

##### 3.5.4.2 *Contact force, off centre*

Initial contact force, off centre 0,40N min.  
Contact force, off centre 0,40N min., after 200 mechanical operations.  
Contact force, off centre 0,30N min., after heat ageing.

#### 3.5.6 Cable displacement

Max. displacement of cable: 1 mm after pull of cable measured at the inside of the connector, behind the cable clamp.

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### 3.6 Testing

#### 3.6.1 General

The connector shall undergo the testing schedule described in ETS 300 019 Class 3.2. This testing is a type testing and an approval will be a result of a judging procedure depending of the result of the testing. The manufacturing process and/or the vendors internal specification may not be changed after type testing and approval without permission from design responsible.

#### 3.6.2 Current carrying capacity

For conditions see clause 3.4.3.

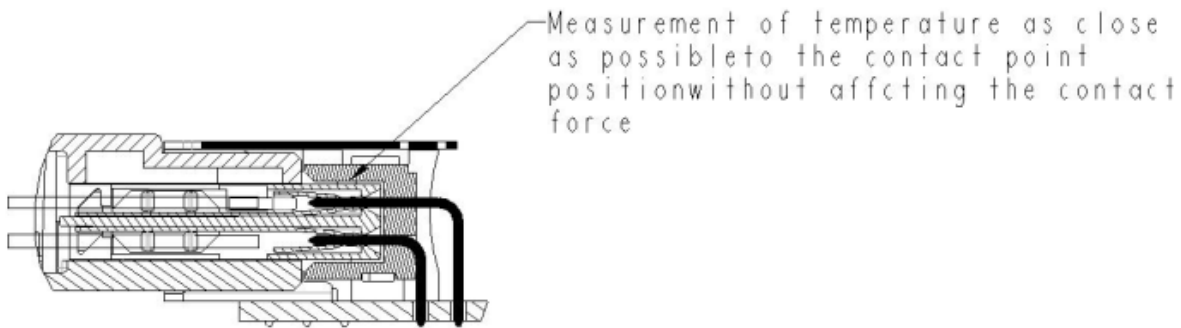


fig.3

#### 3.6.3 Contact resistance

For conditions see clause 3.4.4.

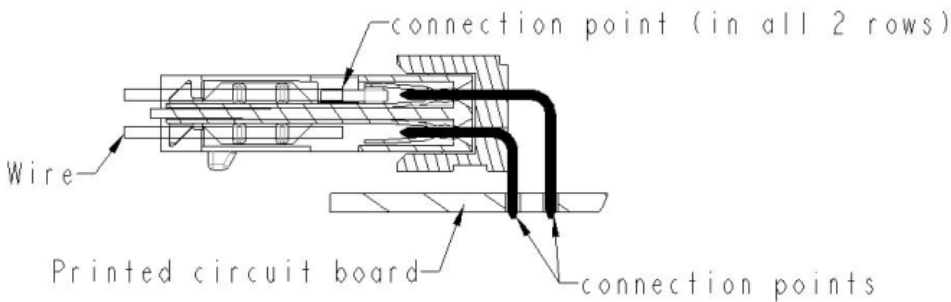



fig.4

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### 3.6.4 Termination resistance

For conditions see clause 3.4.7.

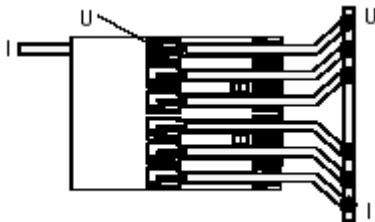


fig.5

### 3.6.5 Pull, bend and twist test of the cable

Conditions: IEC 60068-2-21 test U.

During the pull, bend and twist tests, the IDC-connector shall be mounted in housings (covers) with connected cable as specified for 10067879-00xLF. The cable connector will be mated with the designed board connector and fixed with the front panel screw

#### Pull test:

Conditions: IEC 60068-2-21 test Ua

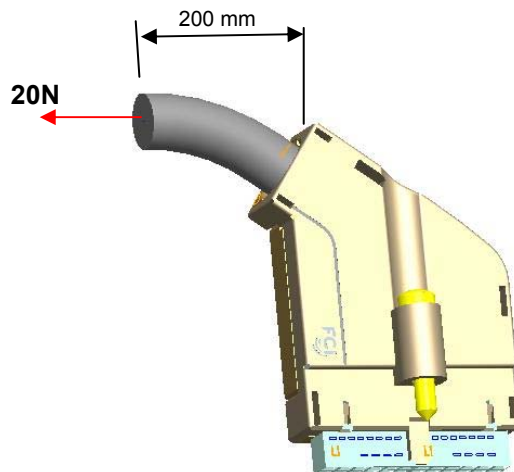



fig.6

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**Bend test:**

Conditions: IEC 60068-2-21 test Ub

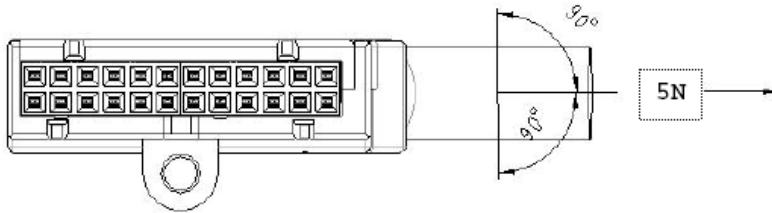


fig.7

**Twist test**

Conditions: IEC 60068-2-21 test Uc

Cable length : 200mm

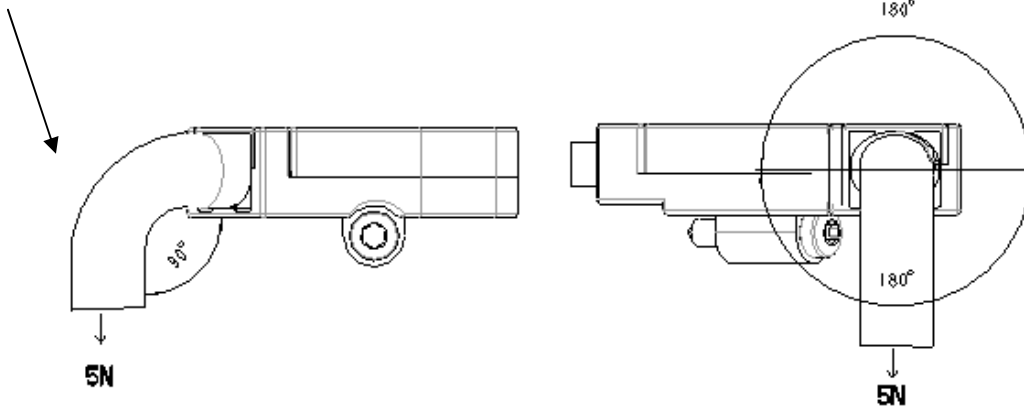



fig.8

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### 3.7. Environmental conditions

#### 3.7.1. Vibration,

**according to EIA364-28, test condition III mated**

10-500 Hz, 0,75 mm, 98 m/s<sup>2</sup>, 3x10 sweep cycles.

During vibration along each axis, the contacts shall evidence no discontinuity greater than 1microsecond

#### 3.7.2. Thermal shock:

**according to EIA364-32 Method A Test condition I Unmated**

-55°C, +85°C,

Duration time at each T° 1h

5 cycles.

#### 3.7.3. high temperature life:

**according to EIA 364-17 Method A Test condition 3**

21 days in 85°C

#### 3.7.4. Humidity:

**Damp heat steady test according to EIA 364-31, Method A Test condition C**


40°C, 90-95% relative humidity, 21 days.

#### 3.7.5. Industrial Mixed Flowing four gaz

**10 days Telcordia CO according to Bellcore GR-1217-CORE**

- 1- Visual examination
- 2- Initial Low Level contact resistance
- 3- 100mating/unmatings
- 4- Low Level contact resistance
- 5- 5day MFG test (5 unmated couples and 5 mated in parallel.)
- 6- Low Level contact resistance
- 7- 5day MFG test (5 unmated couples and 5 mated in parallel.)
- 8- Low Level contact resistance
- 9- Disturbance on mated couples
- 10- Low Level contact resistance
- 11- 100mating/unmatings
- 12- Low Level contact resistance


Test requirement: Delta Rc < 10mΩ

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### 3.8. Test sequence matrix

	Lots						
	1	2	3	4	5	6	7
	Sequence order (1,2,3....)	Sequence order (1,2,3....)	Sequence order (1,2,3....)	Sequence order (1,2,3....)	Sequence order (1,2,3....)	Sequence order (1,2,3....)	Sequence order (1,2,3....)
<b>samples assemblies</b>	4	4	4	4	2	2	2
<b>terminals Tested</b>	48	48	48	48	48	24	48
Visual aspect	1-8	1-8	1-9	1-7	1-7	1-6	1
Dimension control	2						
Low Level Connection Resistance	3-7	2-7	2-4-6-8	2-4-6		2-5	
Insulation resistance					2-5		
Voltage proof					3-6		
Current carrying capacity							2
Pull test		3					
Bent Test		4					
Twist Test		5					
Electrical Discontinuity						4	
Vibration						3	
Rapid change of T°			3				
Damp heat Test			5		4		
Ageing test (high Temperature life)			7				
Corrosion test				3-5			
Mechanical endurance	5						
Insertion and Withdrawal force	4-6						
Cable displacement		6					

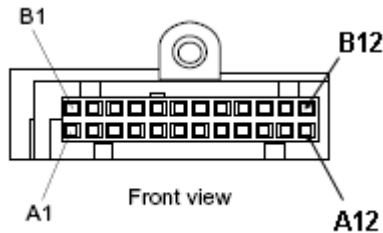
**Note:** the matrix defines the tests applicable to the couple of connectors (cable plug connector + board header connector). The characteristics of the generic Sofix terminal blocks are not included in the matrix

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## 4. Packaging

In Bulk kit in accordance with GS-14-1101 Packaging specification.

## 5. Contact arrangement



## 6. Revision record

Rev.	Page	Description	ECN	YY/MM/DD
A	ALL	CREATED	LS06-0172	07/01/22
B	ALL	The document title was: E053 DIAX CABLE CONNECTOR KIT	LS07-0026	07/01/26
C	All 3 7 8  14 15	New document template Current rating was 0.15Amp Add header P/N Current rating was 0.15Amp Insulation resistance was 1000MΩ Add Clause 3.7 Add Clause 3.8	LS09-0018	07/04/12

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