Test Report issued under the responsibility of:

TEST REPORT

EN 60998-2-1:2004 and IEC 60998-2-1:2002

Connecting devices for low voltage circuits for household and similar purposes Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units

Report Reference No.	:	SZES161100451701
Tested by (name + signature)	:	Rick Lin
Approved by (name + signature)	:	Megan Xue
Date of issue	:	2016-11-29
Number of pages	:	13 Pages
Testing laboratory name	:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address	:	No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China 518057
Applicant's name	:	Zhongshanshi henlanzheng ousaimeijiadengshichang
Address	:	Zhongshanshi henlanzheng sanshaxianganshichang
Test specification:		
Standard	:	IEC 60998-2-1:2002 (see also IEC 60998-1:2002) EN 60998-2-1:2004 (see also EN 60998-1:2004)
Test procedure	:	SGS-CSTC
Non-standard test method	:	N/A
Test Report Form No.	:	IECEN60998_2_1A
TRF originator.	:	KEMA
Master TRF	:	2004-07

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Procedure deviation	:	N/A
Type of test object	:	Terminal block
Trademark	:	
Model/type reference	:	L656
Manufacturer	:	Same as applicant
Rating	:	250 V, 3 x 1,5 mm^2 T80

Test item particulars:		
Number of terminals	:	☐ single ☒ multiway
Function	:	☒ junction ☐ tapping ☐ junction and tapping
Protection against electric shock	:	☒ with ☐ without
Means of fixing	:	☒ with ☐ without
IP number	:	IP 44
Ambient temperature	:	☐ without T marking ☒ with T marking (°C):100
Type of terminals, screw-type	:	☒ pillar ☐ saddle ☐ screw ☐ mantle ☐ stud ☒ unprepared
Rated connecting capacity (mm²)	:	☐ 0,5 mm² ☐ 0,75 mm² ☐ 1 mm² ☒ 1,5 mm² ☐ 2,5 mm² ☐ 4 mm² ☐ 6 mm² ☐ 10 mm² ☐ 16 mm² ☐ 25 mm² ☐ 35 mm²
Type of conductor	:	☒ rigid ☒ flexible
Rated voltage (V a.c. / V d.c.)	:	☒ AC ☐ DC

Copy of marking plate and summary of test results (information/comments):

L656
IP44 3×1,5mm²
T80 250V

Summary of testing:

Terminal block L656 was subjected to the full tests and all clauses were found to be in compliance with the requirements of standards.

Possible test case verdicts:

- test case does not apply to the test object.....: **N(/A)**
- test object does meet the requirement.....: **P(ass)**
- test object does not meet the requirement.....: **F(ail)**

Testing .....:

Date of receipt of test item .....: 2016-11-18

Date (s) of performance of tests .....: 2016-11-10 – 2016-11-29

General remarks:

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The test results presented in this report relate only to the object tested.
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"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma or ☐ point is used as the decimal separator.

The products may be manufactured in the following factory locaion:

Zhongshanshi henlanzheng ousaimeijiadengshichang

Zhongshanshi henlanzheng sanshaxianganshichang

EN 60 998-2-1:2004 and IEC 60 998-2-1:2002			
Cl.	Requirement - Test	Result - Remark	Verdict
8	**MARKING**		
8.1	On main part:		
	a) rated connecting capacity (mm²) .....:	3x1,5 mm^2	P
	b) rated insulation voltage (V) .....:	450 V	P
	c) T marking (°C) (if > 40 °C or < -5 °C).....:	T80	P
	d) type reference.....:	L656	P
	e) manufacturer's or responsible vendor's name, trademark or identification mark.....:		P
	f) IP if > IP20 .....:	IP44	P
	Type of acceptable conductor "r" or "f"		N/A
	Small devices: only d) and e) indicated on device		N/A
	All marks visible on smallest package unit		N/A
8.2	Multiway terminal devices: at least two adjacent		P
8.4	Marking: durable and easily legible; 15 s water; 15 s hexane	Marking moulded	P

9	**PROTECTION AGAINST ELECTRIC SHOCK**		
	Live parts not accessible		P

10	**CONNECTION OF CONDUCTORS**		
10.1	Connecting devices allow correct connection of conductors		P
10.101	Terminals accept two or more conductors and		P
	accept rigid and/or flexible unprepared conductors		P
10.102	Each terminal accepts conductors (table 101) and provides the connection of at least two successive smaller cross-sectional areas:		
	Rated connecting capacity (mm²) .....:	1,5	
	Suitable for connecting cross-sectional areas (mm²).....:	0,75, 1,0, 1,5	P

EN 60 998-2-1:2004 and IEC 60 998-2-1:2002			
Cl.	Requirement - Test	Result - Remark	Verdict
10.103	Terminals accept rigid and flexible conductors (table 101), unless otherwise specified (see 8.1)		P
	Smallest diameter (mm); largest diameter (mm) ....:	1,3 mm, 1,8 mm	
	Tightened and loosened 5 times; torque (Nm); table number .....:	0,4 Nm	
	During the test: terminals show no damage		P
10.104	Terminals clamp the conductor without undue damage:		
	Smallest cross-sectional area (mm²); height H (mm); mass (kg).....:	0,75 mm² and 260 mm with 0,4 kg	
	Largest cross-sectional area (mm²); height H (mm); mass (kg).....:	1,5 mm² and 260 mm with 0,4 kg	
	Torque: as 10.103; during the test: the conductor does not slip out, no break near clamping unit and no damage	0,4 Nm	P
10.105	Pull test:		
	- min. cross-sectional area (mm²); pull (N) .....:	0,75 mm², 30 N	
	- max. cross-sectional area (mm²); pull (N) .....:	1,5 mm², 40 N	
	- torque (Nm) (table 102).....:	0,4 Nm	
	- during the test the conductor does not come out		P
10.106	Rigid conductor: rated cross-sectional area (mm²) :	1,5 mm²	
	Flexible conductor: rated cross-sectional area (mm²).....:	1,5 mm²	
	Torque: as 10.103; after the test no wire of the conductor escaped	0,4 Nm	P

EN 60 998-2-1:2004 and IEC 60 998-2-1:2002			
Cl.	Requirement - Test	Result - Remark	Verdict
11	**CONSTRUCTION**		
11.2	Clamping units clamp conductors reliably and between metal surfaces		P
11.3	Connecting devices: insulation of conductors not in contact with live parts of different polarity		P
11.4	Insulating lining: adequate mechanical strength and secured in a reliable manner		P
11.5	Current-carrying parts: adequate mechanical strength, electrical conductivity and resistance to corrosion; type of metal .....:	Copper：≥58%	P
	Current-carrying parts not made with electroplated coating if subjected to mechanical wear		P
11.6	Terminals: possible to connect number of conductors as specified by the manufacturer:		
	- number of conductors.....:	1	
	- rigid, cross-sectional area (mm^2) .....:	0,75, 1,0, 1,5	
	- flexible, cross-sectional area (mm^2).....:	0,75, 1,0, 1,5	
11.7	Fixing means of bases do not serve any other purpose		P
11.101	Screws and nuts of earthing terminals adequately locked against accidental loosening		P
	Not possible to loosen without a tool		P
11.102	Screws and nuts do not serve to fix any other component, and		P
	are not of metal which is soft, such as zinc or aluminium		P
11.103	Rigid wire or wire of flexible conductor cannot slip out		P
11.104	Terminals permit insertion of largest conductor:		
	- rigid conductors: cross-sectional area (mm^2); max. diameter (mm) .....:	1,7	P
	- flexible conductors: cross-sectional area (mm^2); max. diameter (mm) .....:	1,8	P

EN 60 998-2-1:2004 and IEC 60 998-2-1:2002			
Cl.	Requirement - Test	Result - Remark	Verdict
12	**RESISTANCE TO AGEING, TO HUMIDITY CONDITIONS, TO INGRESS OF SOLID OBJECTS AND TO HARMFUL INGRESS OF WATER**		
12.1	Connecting devices resistant to ageing; after the test (168 h): no cracks visible, not sticky or greasy, no damage; test temperature (°C) ..... :	☐ 70 °C ☒ T + 30 °C = 110	P
12.2	After humidity test (91-95%): no damage; test duration (168 h for connecting devices > IPx2, 48 h for all other)..... :	☒ 168 h ☐ 48 h	P
12.3	IP test (IEC 529) ..... :	IP44	P
	After the test, electric strength test as 13.4, and	IP44	P
	no appreciable entry of water		P

13	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		
13.3	Clamping unit connected with: smallest cross-sectional area (mm²); largest cross-sectional area (mm²) ..... :	0,75 mm², 1,5 mm²	
	Insulation resistance (500 V d.c. for 1 min):		
	1) between all clamping units connected together and the body > 5 MΩ..... :	>200 MΩ	P
	2) between each clamping unit and all others connected to the body > 5 MΩ..... :	>200 MΩ	P
	3) between metal foil and the body > 5 MΩ..... :		N/A
	3a) if necessary, between live parts and metal covers and enclosures > 5 MΩ ..... :		N/A
	3b) if necessary, between live parts and surface on which the base is mounted > 5 MΩ ..... :		N/A
13.4	Electric strength (a.c. for 1 min): no flashover or breakdown:		
	1) test voltage (V) ..... :	3000 V	P
	2) test voltage (V) ..... :	3000 V	P
	3) test voltage (V) ..... :		N/A
	3a) test voltage (V) ..... :		N/A
	3b) test voltage (V) ..... :		N/A

EN 60 998-2-1:2004 and IEC 60 998-2-1:2002			
Cl.	Requirement - Test	Result - Remark	Verdict
14	**MECHANICAL STRENGTH**		
14.2	Tumbling barrel (for < 50 g): 50 falls; after the test no damage	15 g	P
14.3	Impact test (for > 50 g): 10 blows:		
	- height of fall: 7,5 cm		N/A
	- height of fall: 10 cm		N/A
	- height of fall: 20 cm		N/A
	- height of fall: 25 cm		N/A
	After the test, no damage and live parts shall not become accessible		N/A

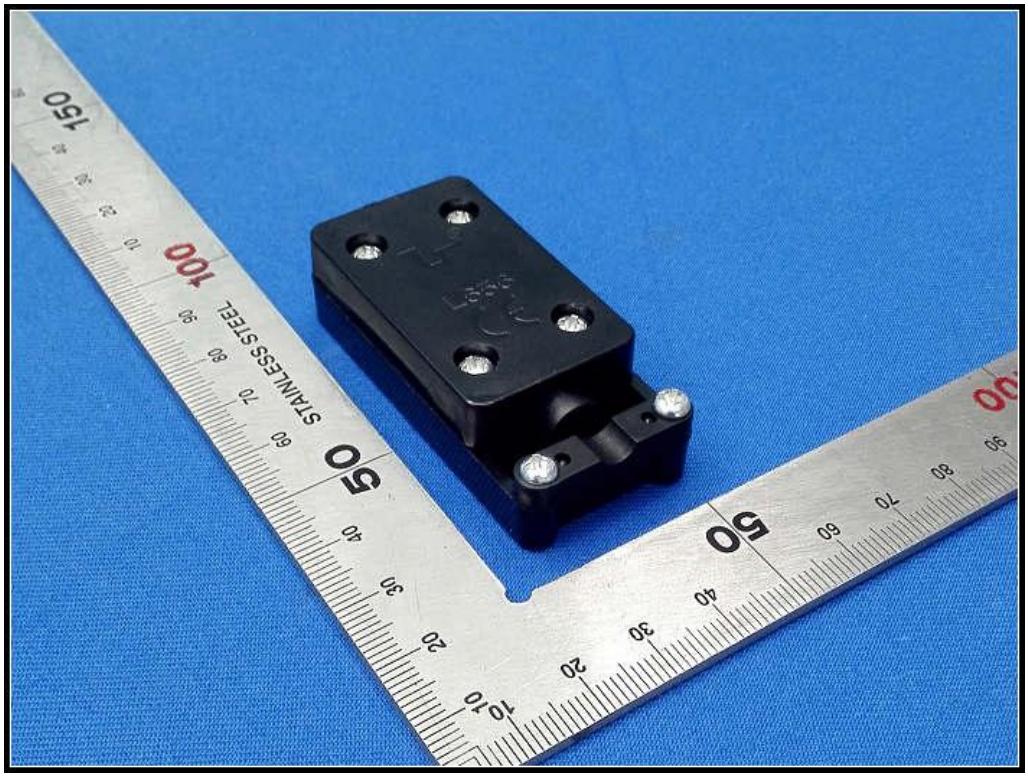
15	**TEMPERATURE RISE**		
	Terminal ..... :	☐ single ☒ multiway	
	T marking (°C)..... :	☒ Yes 80 (°C):	P
	Largest cross-sectional area (mm²) ..... :	1,5	
	Conductors..... :	Flexible	P
	Torque (Nm); table number..... :	0,4 Nm	
	Rated connecting capacity (mm²) ..... :	1,5 mm²	
	Test current (A)..... :	17,5	
	Temperature rise does not exceed 45 K (1)..... :	25,7	P
	Temperature rise does not exceed 45 K (2)..... :	26,5	P
	Temperature rise does not exceed 45 K (3)..... :	23,3	P

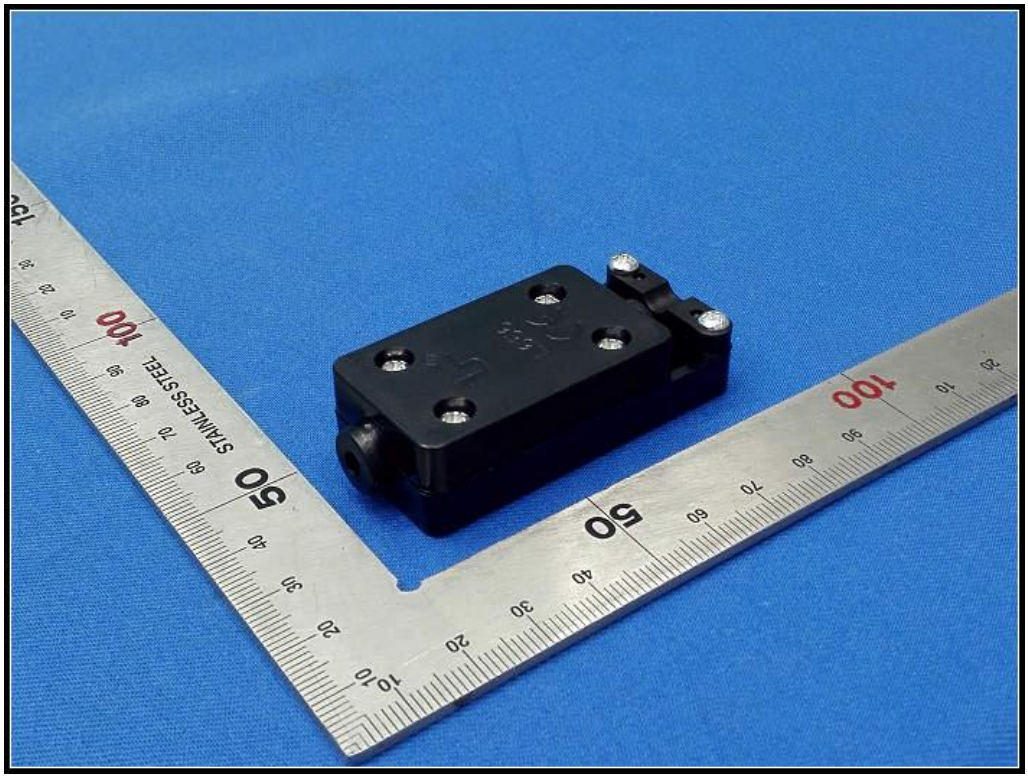
16	**RESISTANCE TO HEAT**		
16.2	Heating cabinet: no damage, after the test, markings still legible; test temperature (°C)	☐ 85 °C ☒ T + 45 °C = 125	P
16.3	Ball-pressure test (125 °C) for parts necessary to retain current-carrying parts in position	☒ T + 45 °C = 125	P
	Ball-pressure test for parts not necessary to retain current-carrying parts in position; test temperature (°C)..... :	☒ 70 °C ☐ 40 + …..	P
	Diameter of impression not exceeding 2 mm ..... :	Internal bracket: 1,65 mm Enclosure: 1,13 mm	P

EN 60 998-2-1:2004 and IEC 60 998-2-1:2002			
Cl.	Requirement - Test	Result - Remark	Verdict
17	**CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND**		
	Creepage distances (mm) and clearances (mm) between live parts of different polarity .....:	cl. and cr. > 5,0 mm	
	idem, requirement (mm) .....:	4,0 mm	P
	Creepage distances (mm) and clearances (mm) between live parts and metal covers and enclosures.....:		
	idem, requirement (mm) .....:		N/A
	Creepage distances (mm) and clearances (mm) between live parts and surface on which the base is mounted .....:	cl. and cr. > 5,0 mm	
	idem, requirement (mm) .....:	4,0 mm	P
	Distances (mm) through sealing compound between live parts and surface on which the base is mounted .....:		
	idem, requirement (mm) .....:		N/A
18	**RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT AND FIRE**		
	Glow-wire test (850 °C) for parts necessary to retain current-carrying parts in position		P
	Glow-wire test (650 °C) for parts not necessary to retain current-carrying parts in position		P
	No visible flames and no sustained glowing, or if flame and glowing, extinguish within 30 s.....:		P
	No ignition of the tissue paper or scorching of the board		P
19	**RESISTANCE OF INSULATING MATERIAL TO TRACKING**		
	50 drops, 175 V, solution A (IEC 112): no flashover		P

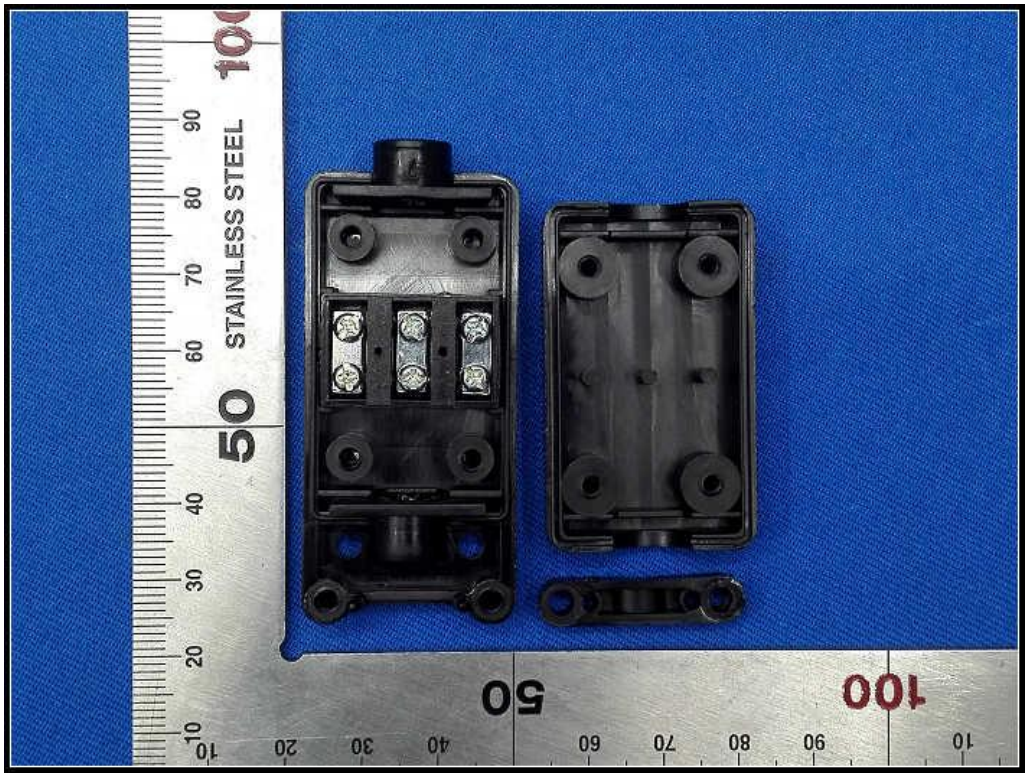
Photo：

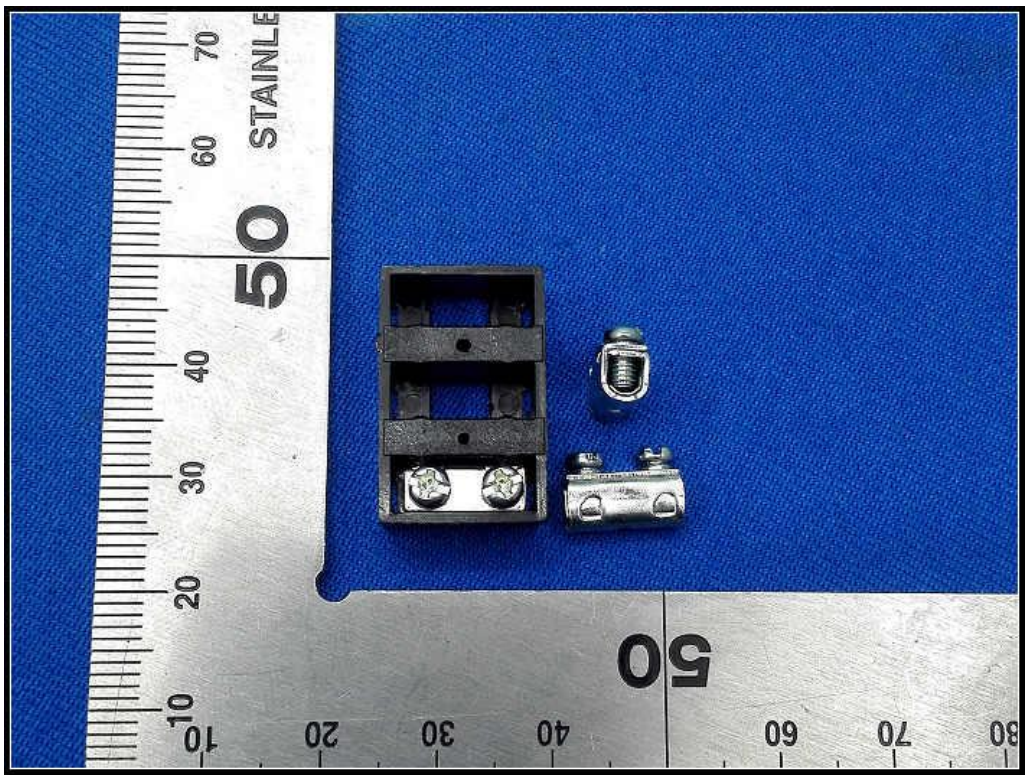
Whole unit of L656



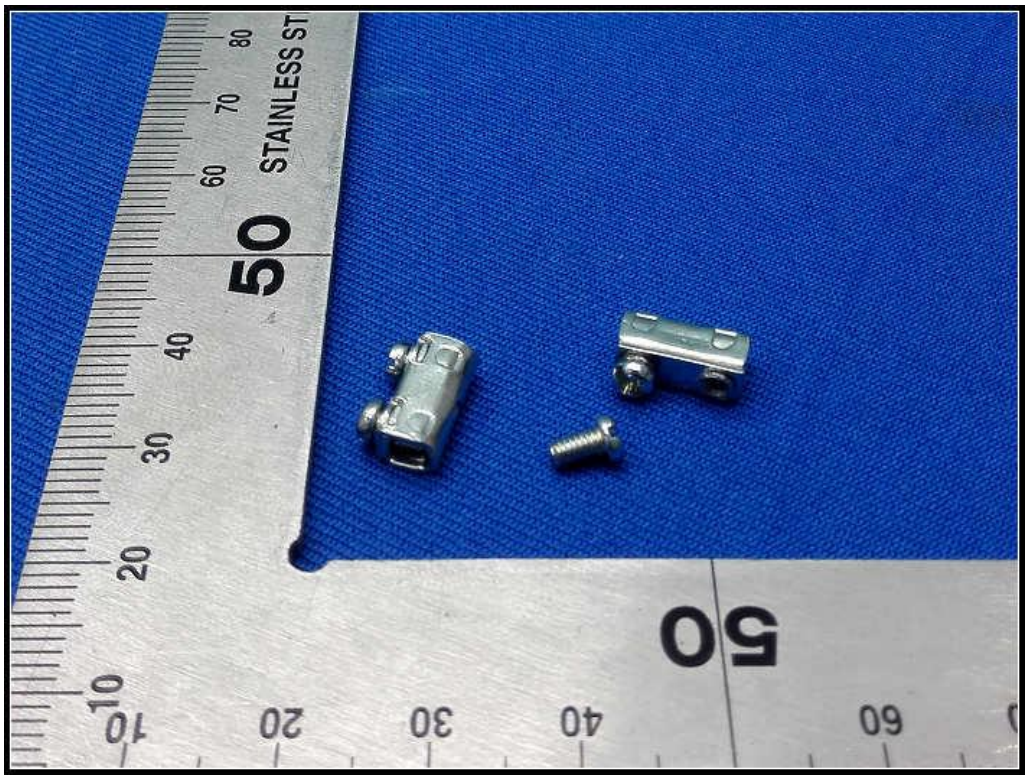


Internal view of L656





Terminal



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