SIM CONNECTOR PUSH-PUSH SUPER LOWPROFILE TYPE

1.Introduction :

1.1 Objective

Testing was performed on the SIM CONNECTOR PUSH-PUSH SUPER LOWPROFILE TYPE to determine if it meets the requirement of product specifications, 108-78899

1.2 Scope

This report covers the electrical, mechanical and environment performance requirements of the SIM CONNECTOR PUSH-PUSH SUPER LOWPROFILE TYPE.
The qualification testing was performed between 19 AUG 2011 and 27 SEP 2011.

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

1.3 Conclusion

SIM CONNECTOR PUSH-PUSH SUPER LOWPROFILE TYPE meets the electorical, mechanical and enviromental performance requirements of product specifications, 108-78899

1.4 Product description

SIM CONNECTOR PUSH-PUSH SUPER LOWPROFILE TYPE is designed to make a connection between a Subscriber Identity Module (SIM) and printed circuit board.

1.5 Test samples

Samples were taken randomly from current production. The follwing samples were used.

| Part number | Description |
|---|---|
| 2174918-1 | SIM CONNECTOR<br>PUSH-PUSH SUPER LOWPROFILE TYPE |
| - | Test card for mechanical<br>Gemplus : GEN31-30 GX3GV3-0-256K |
| - | Test card for contact resistance<br>TB-1524 |

Fig.1

2. Test contents

| Para. | Test items | Requirements | Judgment |
|---|---|---|---|
| 2.1 | Examination of product | ・Visual inspection<br>・No physical damage | Acceptable |
| | | Electrical requirements | |
| 2.2 | Contact resistance (low level) | ・Initial contact resistance: 100 mΩ Max.<br>・Max contact resistance after group testing: 100 mΩ Max.<br>・Contact resistance includes also the bulk resistance due to terminal<br>・After any environmental test for every contact<br>・Detection switch: 300mΩ Max.<br>・Mate connector with dry circuit (20mV, 100mA Max.) at min, deflection position<br>・4-wire measurement required<br>・Measure resistance with minimum thickness memory card (or PWB)<br><br>(IEC 60512-2-1) | Acceptable |
| 2.3 | Insulation resistance | ・1000MΩ Min.<br>・Unmated connector with 500 VDC between adjacent contact for 1 minute<br><br>(IEC 60512-3-1) | Acceptable |
| 2.4 | Dielectric strength | ・No voltage breakdown<br>・Unmated connector with 500 VAC between adjacent contact for 1 minute<br><br>(IEC 60512-3-1) | Acceptable |
| 2.5 | Temperature rise | ・30°C Max. under loaded rating current (0.5A)<br>・Contacts series-,apply test current of loaded rating current of the circuit<br>・Measure the temperature rising by probing on soldered areas of contacts<br>・After the temperature becomes stabilized deduct ambient temperature from the measured | Acceptable |

Fig. 2 (Cont.)

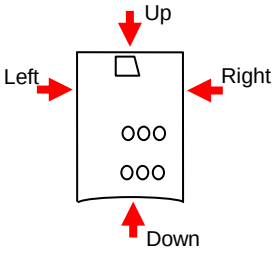
| Para. | Test items | Requirements | Judgment |
|---|---|---|---|
| | | Mechanical requirements | |
| 2.6 | Peeling strength | ・25N Min.<br>・No loosening from PWB<br>・No mechanical damage<br>・Every axis directions<br>・Load is applied to the whole side of the connector on PWB<br>  <br> | Acceptable |
| 2.7 | Card locking force | ・2 N Max.<br>(before and after 3000 mating/unmating cycle with virgin card)<br>・Card should not drop out during normal operation and normal handling<br>・Not to fly out during card removal | Acceptable |
| 2.8 | Durability<br>(3000 cycles) | ・Contact resistance: 100 mΩ Max. at minimum deflection case<br>・No mechanical damage for connector as well as SIM cards<br>・Eject length : 2.8mm Ref.<br>・Mating contacts at 4-10 cycles/minute, including pause between mate/unmate to 3000 cycles<br>・After every 10 (max.) cycles blow with dry air | Acceptable |
| 2.9 | Wrongly Insertion test card upside down | ・25N Min.<br>・No mechanical damage<br>・The card cannot be stuck in the reader | Acceptable |
| 2.10 | Retention force of contact | ・Solderable terminal 0.8N Min.<br>・Per contact<br>・Pulling out a contact on the solder tail, away from the housing | Acceptable |

Fig. 2 (Cont.)

| Para. | Test items | Requirements | Judgment |
|---|---|---|---|
| | | Environmental requirements | |
| 2.11 | Dry cold (steady state) | ・No mechanical damage<br>・No change to performance<br>・Contact resistance: 100mΩ Max.(Data)<br>・- 40°C for 96hours; recovery period 1-2hours under ambient atmospheric conditions<br><br>(IEC60068-2-1Ab) | Acceptable |
| 2.12 | Dry heat (steady state) | ・No mechanical damage<br>・No change to performance<br>・Contact resistance: 100mΩ Max.(Data)<br>・+85°C for 96 hours; recovery period 1-2hours under ambient atmospheric conditions<br><br>(IEC60068-2-2Bb) | Acceptable |
| 2.13 | Thermal shock (change of temperature) | ・No mechanical damage<br>・No change to performance<br>・Contact resistance: 100mΩ Max.(Data)<br>・25 cycle at $T_a$ = - 55 °C for 0.5 hours; then change of temp=25°C Max. 5 minutes; then $T_b$=+85°C for 0.5 hours; then cool to ambient<br>・Recovery: 2 hours at ambient atmosphere<br><br>(IEC60068-2-14 Test Na) | Acceptable |
| 2.14 | Humidity - temperature cycling | ・No change to performance<br>・Contact resistance:100 mΩ Max.<br>・Insulation resistance should be measured<br>・Measure the resistance without opening the mating after test<br>・Temp 25-65°C, RH 50-80% for 10 cycles<br>・Cold shock -10℃ performed<br>・Mated tests: standby mode (power on) 1.8V,10 mA<br><br>(EIA-364-31) | Acceptable |
| | | ・No corrosion on contact area after testing<br>・Unmated tests:<br>-Connector with free contacts<br>-No power on<br>-Testing conditions are same | Acceptable |

Fig. 2 (Cont.)

| Para. | Test items | Requirements | Judgment |
|---|---|---|---|
| 2.15 | $SO_2$ gas | ・No mechanical damage<br>・No change to performance<br>・Contact resistance: 100mΩ Max. (Data)<br>・10±3ppm, Damp 75% at 40±2℃, 48hours | Acceptable |
| 2.16 | Vibration (random) | ・Discontinuity during testing<br>< 1 μs with all contacts in series<br>・No mechanical damage<br>・No change to performance<br>・Contact resistance: 100 mΩ Max.<br>・Contact resistance for grounding: Max. 1Ω<br>・Frequency:10 - 100 Hz;<br>3 $m^2/s^3$ (0.0132 $g^2$/Hz) ;100 - 500 Hz; -3dB/Oct. for: 3 x 60 min (X- Y- and Z-axis)<br><br>(IEC60068-2-64Fh) | Acceptable |
| 2.17 | Shock (specified pulse) | ・Discontinuity during testing<br>< 1 μs with all contacts in series<br>・No mechanical damage<br>・No change to performance<br>・Contact resistance: 100 mΩ Max.<br>・Contact resistance for grounding: Max. 1Ω<br>・Pulse shape=half sine<br>・Peak acceleration =50G<br>・Duration of pulse=11ms<br>・Apply 3 shocks in each direction along the 3 mutually perpendicular axes<br>(18 shocks)<br><br>(IEC60068-2-27Ea) | Acceptable |

Fig. 2 (End)

3. Product qualification test sequence

| Para. | Test examination | Card thickness; minimum / maximum | Test group | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 2.1 | Examination of product | | 1,7 | 1,5 | 1,5 | 1,5 | 1,5 | 1,7 | 1,6 | 1,3 | 1,3 | 1,3 | 1,3 |
| 2.2 | Contact resistance (low level) | Min. | | 2,4 | 2,4 | 2,4 | 2,4 | 3,5 | 2,5 | | | | |
| 2.3 | Insulation resistance | Without card | 2,5 | | | | | | | | | | |
| 2.4 | Dielectric strength | Without card | 3,6 | | | | | | | | | | |
| 2.5 | Temperature rise | Nominal | | | | | | | | 2 | | | |
| 2.6 | Peeling strength | | | | | | | | | | 2 | | |
| 2.7 | Card locking force | Nominal | | | | | | 2,6 | | | | | |
| 2.8 | Durability (3000 cycles) | Maximum | | | | | | 4 | | | | | |
| 2.9 | Wrongly Insertion test card upside down | Nominal | | | | | | | | | | 2 | |
| 2.10 | Retention force of contact | | | | | | | | | | | | 2 |
| 2.11 | Dry cold (steady state) | Min. | | 3 | | | | | | | | | |
| 2.12 | Dry heat (steady state) | Min. | | | 3 | | | | | | | | |
| 2.13 | Thermal shock (change of temperature) | Min. | | | | 3 | | | | | | | |
| 2.14 | Humidity - temperature cycling | Min. | 4 | | | | | | | | | | |
| 2.15 | $SO_2$ gas | Without card/Min | | | | | 3 | | | | | | |
| 2.16 | Vibration (random) | Min. | | | | | | | 3 | | | | |
| 2.17 | Shock (specified pulse) | Min. | | | | | | | 4 | | | | |

(a) Numbers indicate sequence in which the tests are performed.

Fig. 3

4. Test results

| Test item | Unit | N | Result | Requirements | Judge -ment |
|---|---|---|---|---|---|
| Test group 1 | | | | | |
| Examination of product | - | 5 | No abnormalities | No abnormalities | Accept -able |
| Insulation resistance | Ω | 5 | 86300MΩMin. | 1000MΩ Min. | Accept -able |
| Dielectric strength | - | 5 | No abnormalities | No abnormalities | Accept -able |
| Humidity - temperature cycling | - | 5 | No abnormalities | No abnormalities | Accept -able |
| Insulation resistance | Ω | 5 | 42700MΩMin. | 1000MΩ Min. | Accept -able |
| Dielectric strength | - | 5 | No abnormalities | No abnormalities | Accept -able |
| Examination of product | - | 5 | No abnormalities | No abnormalities | Accept -able |

Group 1 (End)

| Test item | | Unit | Result | | | | | Requirements | Judge-ment |
|---|---|---|---|---|---|---|---|---|---|
| | | | N | Max. | Min. | Ave. | Sig. | | |
| Test group 2 | | | | | | | | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |
| Contact resistance (low level) | Contact | mΩ | 30 | 21.71 | 19.79 | 20.65 | 0.60 | Contact : 100mΩ Max.(Initial) Detection switch : 300mΩ Max.(Initial) | Accept-able |
| | Detection switch | | 5 | 42.01 | 34.40 | 36.44 | 3.02 | | |
| Contact resistance (low level) after dry cold (steady state) | Contact | mΩ | 30 | 22.55 | 19.98 | 20.90 | 0.64 | Contact : 100mΩ Max.(Final) Detection switch : 300mΩ Max.(Final) | Accept-able |
| | Detection switch | | 5 | 37.13 | 33.06 | 35.10 | 1.61 | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |

| Test item | | Unit | Result | | | | | Requirements | Judge-ment |
|---|---|---|---|---|---|---|---|---|---|
| | | | N | Max. | Min. | Ave. | Sig. | | |
| Test group 3 | | | | | | | | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |
| Contact resistance (low level) | Contact | mΩ | 30 | 21.26 | 19.12 | 19.88 | 0.91 | Contact : 100mΩ Max.(Initial) Detection switch : 300mΩ Max.(Initial) | Accept-able |
| | Detection switch | | 5 | 47.06 | 34.07 | 39.95 | 4.87 | | |
| Contact resistance (low level) after dry heat (steady state) | Contact | mΩ | 30 | 23.16 | 19.72 | 21.25 | 0.85 | Contact : 100mΩ Max.(Final) Detection switch : 300mΩ Max.(Final) | Accept-able |
| | Detection switch | | 5 | 53.14 | 32.61 | 37.68 | 8.52 | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |

Group 2,3 (End)

| Test item | | Unit | Result | | | | | Requirements | Judge-ment |
|---|---|---|---|---|---|---|---|---|---|
| | | | N | Max. | Min. | Ave. | Sig. | | |
| Test group 4 | | | | | | | | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |
| Contact resistance (low level) | Contact | mΩ | 30 | 22.47 | 19.87 | 20.94 | 0.64 | Contact : 100mΩ Max.(Initial) Detection switch : 300mΩ Max.(Initial) | Accept-able |
| | Detection switch | | 5 | 34.29 | 30.49 | 32.84 | 2.30 | | |
| Contact resistance (low level) after thermal shock (change of temperature) | Contact | mΩ | 30 | 23.93 | 20.51 | 21.55 | 0.69 | Contact : 100mΩ Max.(Final) Detection switch : 300mΩ Max.(Final) | Accept-able |
| | Detection switch | | 5 | 37.74 | 36.23 | 33.31 | 1.73 | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |

| Test item | | Unit | Result | | | | | Requirements | Judge-ment |
|---|---|---|---|---|---|---|---|---|---|
| | | | N | Max. | Min. | Ave. | Sig. | | |
| Test group 5 | | | | | | | | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |
| Contact resistance (low level) | Contact | mΩ | 30 | 22.81 | 20.61 | 21.37 | 0.78 | Contact : 100mΩ Max.(Initial) Detection switch : 300mΩ Max.(Initial) | Accept-able |
| | Detection switch | | 5 | 35.25 | 32.18 | 33.83 | 1.56 | | |
| Contact resistance (low level) after $SO_2$ gas | Contact | mΩ | 30 | 25.22 | 20.19 | 22.35 | 2.42 | Contact : 100mΩ Max.(Final) Detection switch : 300mΩ Max.(Final) | Accept-able |
| | Detection switch | | 5 | 38.17 | 33.35 | 35.09 | 1.69 | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |

Group 4,5 (End)

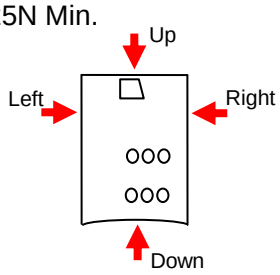
| Test item | | Unit | Result | | | | | Requirements | Judge -ment |
|---|---|---|---|---|---|---|---|---|---|
| | | | N | Max. | Min. | Ave. | Sig. | | |
| Test group 6 | | | | | | | | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept -able |
| Card locking force | | N | 5 | 1.64 | 1.05 | 1.26 | 0.21 | 2 N Max. | Accept -able |
| Contact resistance (low level) | Contact | mΩ | 30 | 21.06 | 19.17 | 20.16 | 0.86 | Contact : 100mΩ Max.(Initial) Detection switch : 300mΩ Max.(Initial) | Accept -able |
| | Detection switch | | 5 | 46.82 | 33.95 | 38.21 | 3.89 | | |
| Durability (3000 cycles) | | - | 5 | No abnormalities | | | | No abnormalities | Accept -able |
| Contact resistance (low level) after durability (3000 cycles) | Contact | mΩ | 30 | 22.29 | 19.62 | 20.62 | 0.81 | Contact : 100mΩ Max.(Final) Detection switch : 300mΩ Max.(Final) | Accept -able |
| | Detection switch | | 5 | 33.40 | 31.01 | 32.41 | 1.25 | | |
| | Eject length | mm | 5 | 3.440 | 2.930 | 3.198 | 0.203 | 2.8mm Ref. | Accept -able |
| Card locking force | | N | 5 | 1.26 | 1.08 | 1.20 | 0.07 | 2 N Max. | Accept -able |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept -able |

Group 6 (End)

| Test item | | Unit | Result | | | | | Requirements | Judge-ment |
|---|---|---|---|---|---|---|---|---|---|
| | | | N | Max. | Min. | Ave. | Sig. | | |
| Test group 7 | | | | | | | | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |
| Contact resistance (low level) | Contact | mΩ | 30 | 21.76 | 19.41 | 20.50 | 1.09 | Contact : 100mΩ Max.(Initial) Detection switch : 300mΩ Max.(Initial) | Accept-able |
| | Detection switch | | 5 | 36.26 | 31.47 | 33.19 | 1.29 | | |
| Vibration (random) | | - | 5 | No abnormalities | | | | 1μs Max. | Accept-able |
| Shock (specified pulse) | | - | 5 | No abnormalities | | | | 1μs Max. | Accept-able |
| Contact resistance (low level) after vibration (random) & shock (specified pulse) | Contact | mΩ | 30 | 36.42 | 20.61 | 23.48 | 2.90 | Contact : 100mΩ Max.(Final) Detection switch : 300mΩ Max. (Final) | Accept-able |
| | Detection switch | | 5 | 42.42 | 39.90 | 38.19 | 3.16 | | |
| Examination of product | | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |

| Test item | Unit | Result | | | | | Requirements | Judge-ment |
|---|---|---|---|---|---|---|---|---|
| | | N | Max. | Min. | Ave. | Sig. | | |
| Test group 8 | | | | | | | | |
| Examination of product | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |
| Temperature rise | °C | 5 | 3.29 | 1.34 | 2.03 | 3.92 | 30°C Max. | Accept-able |
| Examination of product | - | 5 | No abnormalities | | | | No abnormalities | Accept-able |

Group 7,8 (End)

| Test item | | Unit | N | Result | Requirements | Judge -ment |
|---|---|---|---|---|---|---|
| Test group 9 | | | | | | |
| Examination of product | | - | 20 | No abnormalities | No abnormalities | Accept -able |
| Peeling strength | Left | N | 5 | 223.4N | 25N Min.   | Accept -able |
| | Right | | 5 | 156.0N | | |
| | Up | | 5 | 249.8N | | |
| | Down | | 5 | 298.2N | | |
| Examination of product | | - | 20 | No abnormalities | No abnormalities | Accept -able |

| Test item | Unit | N | Result | Requirements | Judge -ment |
|---|---|---|---|---|---|
| Test group 10 | | | | | |
| Examination of product | - | 5 | No abnormalities | No abnormalities | Accept -able |
| Wrongly insertion test card upside down | - | 5 | No abnormalities | No abnormalities | Accept -able |
| Examination of product | - | 5 | No abnormalities | No abnormalities | Accept -able |

| Test item | Unit | N | Result | Requirements | Judge -ment |
|---|---|---|---|---|---|
| Test group 11 | | | | | |
| Examination of product | - | 5 | No abnormalities | No abnormalities | Accept -able |
| Retention force of contact | N | 5 | 13.6N Min. | 1N Min. | Accept -able |
| Examination of product | - | 5 | No abnormalities | No abnormalities | Accept -able |

Group 9,10,11 (End)