



PRODUCT SPECIFICATION

SCALABLE SIM CONNECTOR

1.0 SCOPE

This Product Specification covers the 2.54 mm pitch scalable SIM card connector.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Scalable SIM card connector 47019 series

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and other sections of this specification for the relevant reference documents. In cases where the specification differs from the drawings, the drawings take precedence.

4.0 RATINGS

4.1 VOLTAGE

MAX 15V DC

4.2 CURRENT

MAX 0.5A per contact

4.3 TEMPERATURE

Operating: - 30°C to + 85°C

Storage: - 5°C to + 85°C

5.0 MECHANICAL INTERFACE

5.1 CARD INTERFACE:

SIM card interface: GSM 11.11 specification.

5.2 PWB INTERFACE

Plating on PWB pads: OSP plated copper.

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A3	EC No: S2014-0093 DATE: 2013/07/15	SCALABLE SIM CONNECTOR	1 of 11
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-47019-001	Wang HL 2013/07/15	Zeng Jenny 2013/08/30	Lim Victor 2013/08/30



PRODUCT SPECIFICATION

6.0 PERFORMANCE

6.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Contact Resistance	Mate connectors with dry circuit (20mV, 100mA Max) at minimum deflection (see appendix 3)	50 milliohms MAXIMUM [Initial] Value includes bulk resistance of terminal.
6.1.2	Insulation Resistance	Unmated connectors: apply a voltage of 500 VDC between adjacent contact for 1 minute	1000 Mega ohms MINIMUM
6.1.3	Dielectric Withstanding Voltage	Unmated connectors: apply a voltage of 500 VAC for 1 minute between adjacent contact.	No voltage breakdown;
6.1.4	Temperature Rise	Mated connectors: measure the temperature rise at the rated current 0.5A after: 96 hours	Temperature rise: +30°C MAXIMUM

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A3	EC No: S2014-0093 DATE: 2013/07/15	SCALABLE SIM CONNECTOR	2 of 11
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-47019-001	Wang HL 2013/07/15	Zeng Jenny 2013/08/30	Lim Victor 2013/08/30

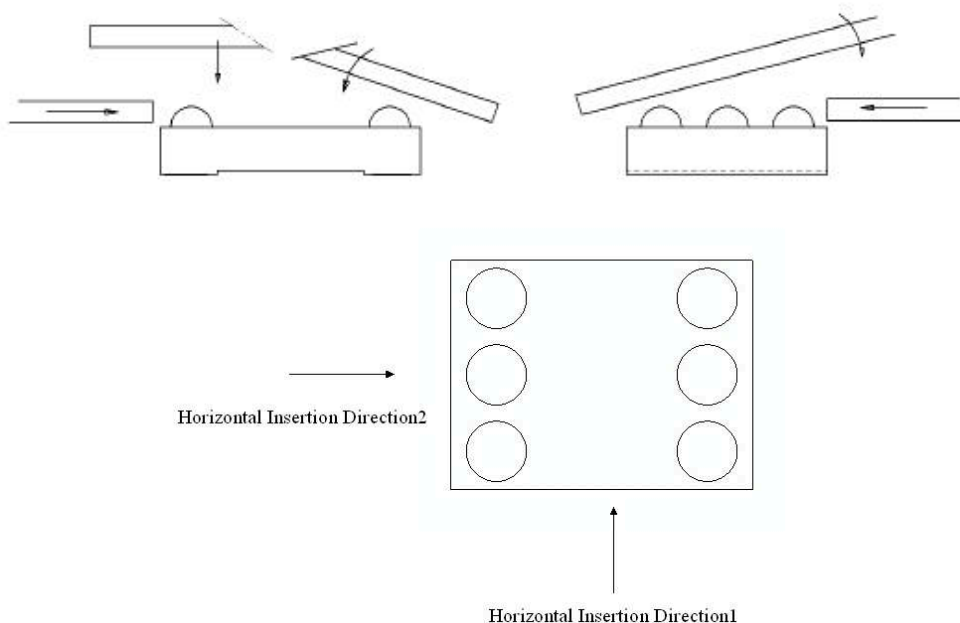


PRODUCT SPECIFICATION

6.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Terminal Normal force	Measure normal force at at minimum deflection of terminal and maximum deflection (see appendix 2) after 3X reflow	0.2N min at min. deflection Force measured from return curve, 0.6N REF at max. deflection
6.2.2	Terminal Retention Force	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	3 N MINIMUM PER contact
6.2.3	Durability (Horizontal Direction 1)	Mate connectors at 400-600 cycles/hour to 3000 cycles. Horizontal insertion for maximum deflection case.	No mechanical damage. Contact resistance 100 milliohms MAX Normal force within spec.
6.2.4	Durability (Horizontal Direction 2)	Mate connectors at 400-600 cycles/hour to 3000 cycles. Horizontal insertion for maximum deflection case.	No mechanical damage. Contact resistance 100 milliohms MAX Normal force within spec.
6.2.5	Durability (Vertical)	Mate connectors at 2.54cm/minute to 10000cycles. Vertical insertion for maximum deflection case	Normal force within spec. No mechanical damage. Contact resistance 100 milliohms MAX
6.2.6	Solder joint peeling strength	Apply a load (see appendix 4) to the connector parallel to the PWB in direction 1 and 2 (see figure below).	See appendix 4

Card insertion directions



REVISION:	ECR/ECN INFORMATION:	TITLE:		SHEET No.
A3	EC No: S2014-0093 DATE: 2013/07/15	SCALABLE SIM CONNECTOR		3 of 11
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:	
PS-47019-001	Wang HL 2013/07/15	Zeng Jenny 2013/08/30	Lim Victor 2013/08/30	



PRODUCT SPECIFICATION

6.3 ENVIRONMENTAL REQUIREMENTS

(Unless stated, all tests shall be performed with mated condition---minimum deflection)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Resistance to Solder Conditions	Unmated samples to be passed through reflow oven according to temp profiles shown in appendix 1 three times (Sequence: above PCB—under PCB—under PCB)	No mechanical damage No connector drop off from PCB
6.3.2	Dry cold (steady state) IEC60068-2-1Ab	At -40°C for 96 hours Recovery: 2hours	No mechanical damage. No change to performance of connector. Contact resistance 100 milliohms MAXIMUM
6.3.3	Dry heat (steady state) IEC60068-2-2Bb	At +85°C for 96 hours Recovery: 2hours	No mechanical damage. No change to performance of connector. Contact resistance 100 milliohms MAXIMUM
6.3.4	Damp Heat (Cyclic) IEC60068-2-30Db	Upper air temp 25-55°C and 90-100%RH for 6 cycles of 24hrs. Cycle is: temp change 25°C->55°C in 3 hours; then maintain at 55°C for 9hours Temp change: 55°C->25°C in 3 hours; then maintain at 25°C for 9hours. Recovery at 25°C and 75%RH for 2 hours.	No mechanical damage. No change to performance Contact resistance 100 milliohms MAXIMUM Insulation resistance in spec.
		Unmated tests: Connector with free contacts, no PCB mated	No corrosion on contact area after testing (check with 80X to 100X microscope)
6.3.5	Thermal Shock IEC60068-2-14 Test Na	50 cycle at Ta=-55°C for 0.5 hours, then change of temp=25°C Maximum 5min, then Tb=+85°C for 0.5 hours, then cool to ambient Recovery: 2hours at ambient atmosphere	No mechanical damage. No change to performance of connector. Contact resistance 100 milliohms MAXIMUM
6.3.6	Salt Spray IEC60068-2-11 Test Ka	48 hours spray, at temp 35+/-2°C, R/H 90-95%, Salt NaCl mist 5% after test wash parts and return to room ambient for 1-2hours	No mechanical damage. No change to performance of connector. Contact resistance 100 milliohms
6.3.7	Vibration (random) IEC60068-2-64Fh	Frequency: 10~100 HZ, 0.0132 g2/Hz; Frequency: 100~500 Hz, -3dB/Oct. Applied for 1 hours in each 3 mutually perpendicular axes	No mechanical damage. No change to performance of connector. Contact resistance 100 milliohms MAXIMUM Discontinuity < 1 microsecond

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A3	EC No: S2014-0093 DATE: 2013/07/15	SCALABLE SIM CONNECTOR	4 of 11
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-47019-001	Wang HL 2013/07/15	Zeng Jenny 2013/08/30	Lim Victor 2013/08/30



PRODUCT SPECIFICATION

6.3.8	Shock (specified pulse) IEC60068-2-27Ea	Pulse shape=half sine Peak acceleration=490m/s ² (50G) Duration of pulse=11ms Apply 3 successive shocks in each direction along the 3 mutually perpendicular axes	No mechanical damage. No change to performance of connector. Contact resistance 100 milliohms MAXIMUM Discontinuity < 1 microsecond
6.3.9	Solderability IEC60068-2-54	Solder paste is deposited on a ceramic plate via stencil. The connectors are steam aged and placed onto the solder paste print. The substrate is processed through a forced hot convection oven. Refer to section 9.0 for temp profile. The connectors are removed from the ceramic and inspected. Steam Aging: 8 hour	Solder coverage = 95% minimum

The meaning of text “mechanical damage” in the table above is:

- no dimension change (over specification)
- no significant corrosion at contact area
- no adhesion problem of plating
- no blistering of plating
- no flaking of plating
- no loosened parts
- no cracks on any parts

Shelf lifetime is to be according to MES00025

REVISION: A3	ECR/ECN INFORMATION: EC No: S2014-0093 DATE: 2013/07/15	TITLE: SCALABLE SIM CONNECTOR		SHEET No. 5 of 11
DOCUMENT NUMBER: PS-47019-001		CREATED / REVISED BY: Wang HL 2013/07/15	CHECKED BY: Zeng Jenny 2013/08/30	APPROVED BY: Lim Victor 2013/08/30



PRODUCT SPECIFICATION

TEST GROUPINGS

Test Item	Group 1	Group 2	Group 3	Group 4	Group 5(2X)	Group 6 (2X)	Group 7
Appearance (corrosion) check	2						
Contact Resistance						2,6,9,11	2,5
Insulation Resistance						3,12	
Dielectric Withstanding Voltage						4,13	
Temperature Rise		1					
Normal Force			3	3	2,4		3,6
Terminal Retention Force	3						
Durability (Horizontal Direction 1&2)					3	8	
Durability (Vertical)							4
Dry Cold			2			5	
Dry Heat				2		7	
Damp Heat (cyclic)	1					10	
Salt Spray							
Vibration							
Shock							
Thermal Shock							
Solder joint peel strength (direction 1)							
Solder joint peel strength (direction 2)							
Resistance to Solder Conditions			1	1	1	1	1
Solderability							

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A3	EC No: S2014-0093 DATE: 2013/07/15	SCALABLE SIM CONNECTOR	6 of 11
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-47019-001	Wang HL 2013/07/15	Zeng Jenny 2013/08/30	Lim Victor 2013/08/30



PRODUCT SPECIFICATION

Test Item	Group 8	Group 9	Group 10	Group 11	Group 12
Appearance (corrosion) check					
Contact Resistance	2,5,7,9	2,4			
Insulation Resistance					
Dielectric Withstanding Voltage					
Temperature Rise					
Normal Force	3,10				
Terminal Retention Force					
Durability (Horizontal Direction 1&2)					
Durability (Vertical)					
Dry Cold					
Dry Heat					
Damp Heat (cyclic)					
Salt Spray		3			
Vibration	8				
Shock	6				
Thermal Shock	4				
Solder joint peel strength (direction 1)			2		
Solder joint peel strength (direction 2)				2	
Resistance to Solder Conditions	1	1	1	1	
Solderability					1

7.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. The parts shall be carried in reels inside boxes. For details refer to packaging spec.

REVISION: A3	ECR/ECN INFORMATION: EC No: S2014-0093 DATE: 2013/07/15	TITLE: SCALABLE SIM CONNECTOR	SHEET No. 7 of 11
DOCUMENT NUMBER: PS-47019-001	CREATED / REVISED BY: Wang HL 2013/07/15	CHECKED BY: Zeng Jenny 2013/08/30	APPROVED BY: Lim Victor 2013/08/30



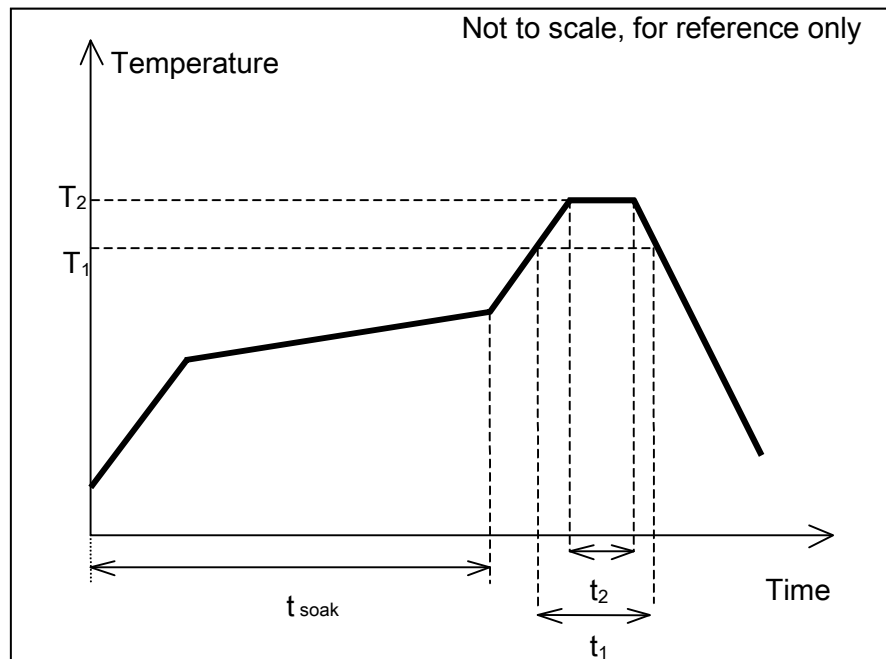
PRODUCT SPECIFICATION

APPENDIX 1: Pb-free reflow profile requirement for solderability testing

The reflow profile defined in this section describes expected minimum reflow profile on product PWBs. Temperature measured on solderable termination or on top of component.

Components have to have adequate wetting and reliable solder joints have to be formed when soldered with this profile.

Pb-free reflow profile requirements for solderability testing		
Parameter	Reference	Specification
Average temperature gradient in preheating		2.5°C/s
Soak time	t_{soak}	2-3 minutes
Time above 217°C	t_1	Max 30 sec
Peak temperature in reflow	T_2	230°C (-0/+5°C)
Time at peak temperature	t_2	10 s
Temperature gradient in cooling		Max -5°C/s



Reflow profile for solderability testing.

REVISION: A3	ECR/ECN INFORMATION: EC No: S2014-0093 DATE: 2013/07/15	TITLE: SCALABLE SIM CONNECTOR	SHEET No. 8 of 11
DOCUMENT NUMBER: PS-47019-001	CREATED / REVISED BY: Wang HL 2013/07/15	CHECKED BY: Zeng Jenny 2013/08/30	APPROVED BY: Lim Victor 2013/08/30

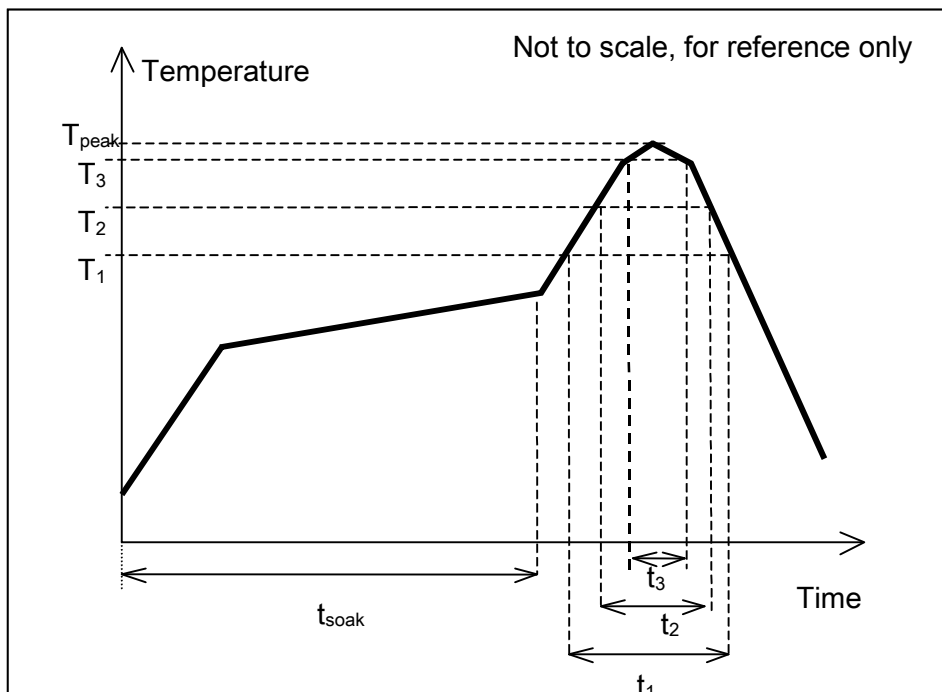


PRODUCT SPECIFICATION

Reflow soldering profile for soldering heat resistance testing

The reflow profile specified in this section describes expected maximum heat exposure of components during the reflow process of NMP product PWBs. Temperature is measured on top of component. All components have to tolerate at least this profile three times (3x) without affecting electrical performance, mechanical performance or reliability.

Pb-free reflow profile requirements for soldering heat resistance		
Parameter	Reference	Specification
Average temperature gradient in preheating		2.5°C/s
Soak time	t_{soak}	2-3 minutes
Time above 217°C	t_1	Max 60 s
Time above 230°C	t_2	Max 50 s
Time above 250°C	t_3	Max 10 s
Peak temperature in reflow	T_{peak}	255°C (-0/+5°C)
Temperature gradient in cooling		Max -5°C/s



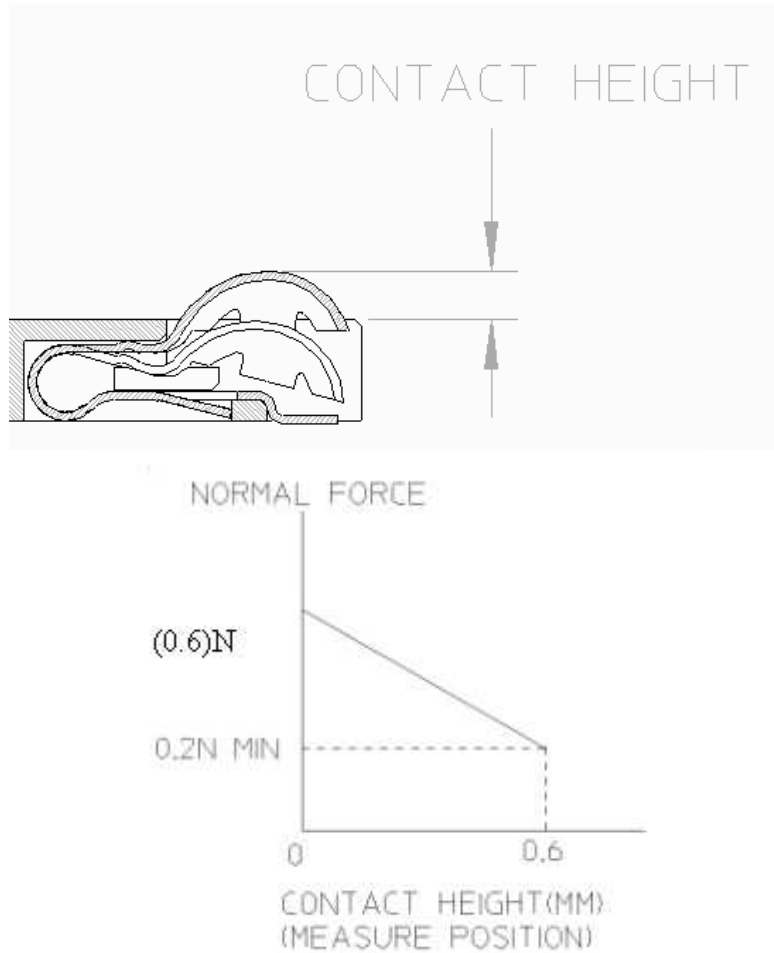
Reflow profile for soldering heat resistance testing.

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A3	EC No: S2014-0093 DATE: 2013/07/15	SCALABLE SIM CONNECTOR	9 of 11
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-47019-001	Wang HL 2013/07/15	Zeng Jenny 2013/08/30	Lim Victor 2013/08/30

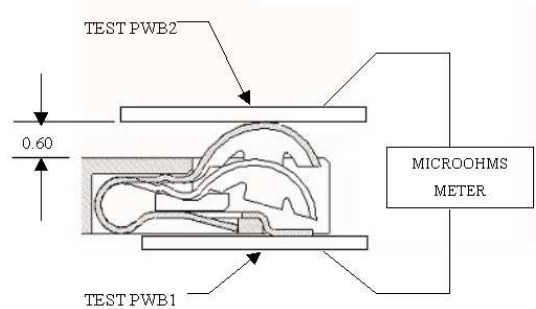


PRODUCT SPECIFICATION

APPENDIX 2: (Normal Force measurement)



APPENDIX 3: (Contact resistance measurement)



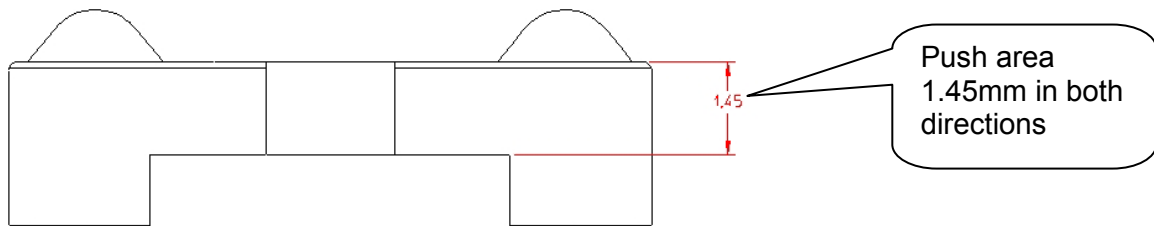
REVISION: A3	ECR/ECN INFORMATION: EC No: S2014-0093 DATE: 2013/07/15	TITLE: SCALABLE SIM CONNECTOR	SHEET No. 10 of 11
DOCUMENT NUMBER: PS-47019-001	CREATED / REVISED BY: Wang HL 2013/07/15	CHECKED BY: Zeng Jenny 2013/08/30	APPROVED BY: Lim Victor 2013/08/30



PRODUCT SPECIFICATION

APPENDIX 4: Connector peeling off force

Connector height	Peeling force (N minimum)		Connector height	Peeling force (N minimum)	
	Direction 1	Direction 2		Direction 1	Direction 2
1.5	50	50	3.3	15	50
1.6	50	50	3.4	15	50
1.7	50	50	3.5	15	50
1.8	50	50	3.6	15	50
1.9	40	50	3.7	15	50
2.0	40	50	3.8	15	50
2.1	30	50	3.9	10	50
2.2	30	50	4.0	10	50
2.3	30	50	4.1	10	50
2.4	30	50	4.2	10	50
2.5	20	50	4.3	10	50
2.6	20	50	4.4	10	50
2.7	20	50	4.5	10	50
2.8	20	50	4.6	10	50
2.9	20	50	4.7	10	50
3.0	20	50	4.8	10	50
3.1	15	50	4.9	10	50
3.2	15	50	5.0	10	50



REVISION: A3	ECR/ECN INFORMATION: EC No: S2014-0093 DATE: 2013/07/15	TITLE: SCALABLE SIM CONNECTOR	SHEET No. 11 of 11
DOCUMENT NUMBER: PS-47019-001	CREATED / REVISED BY: Wang HL 2013/07/15	CHECKED BY: Zeng Jenny 2013/08/30	APPROVED BY: Lim Victor 2013/08/30