





# PRODUCT SPECIFICATION



LANGUAGE

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## 1.0 SCOPE

This specification defines the performance for the of the 2.54 mm pitch SIM PCB connector 91228-0005, and mating card holder 91236-0003 for usage with the Plug-in SIM as specified by the GSM 11.11 Version 5.3.0: July 1996 specification.

## 2.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawing and other sections of this specification for the relevant reference documents and specifications. In cases where the specification differs from the product drawings, the product drawings take precedence. This specification is written as a Motorola specific specification according to 39R88262 Issue 0, 04-27-00.

### Description

### Document

SIM PCB connector  
Card Holder

SDA-91228 SHEET 1 & 3  
SDA-91236 SHEET 1 & 3

## 3.0 RATINGS

Test Ref.	Motorola Ref.	Item	Requirements
3.1	5.2.6	Current	0.5 Amp maximum per contact
3.2	5.2.5	Voltage	50 V DC (maximum)
3.3	-----	Durability	10000 mating cycles
3.4	5.1.2	Operating temperature range	-30°C to +85°C
3.5	5.1.3	Storage temperature range	-40°C to +90°C
3.6	5.2.4	Capacitance	12pF

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## 4.0 ELECTRICAL PERFORMANCE

See section 7.0 for test sequence.

Test Ref.	Motorola Ref.	Item	Test Condition	Requirements
4.1.	5.2.1, 7.2.1	Contact Resistance (IEC 512-2,test2a)	Mated connector with dry circuit of 20mV, 100mA maximum at specified temperatures, per appendix 1	Initial Value <100mΩ standard deviation less than 0.1 times mean.
4.2	5.2.2	Insulation Resistance (IEC 512-2,test 3a)	Unmated connector with 500 V DC between adjacent contacts	1000 MΩ minimum
4.3	5.2.3, 5.2.7	Dielectric Strength (IEC 512-2,test 4a)	Unmated connector with Min 530 VAC for 1 minute between adjacent contacts, as per appendix 2	No breakdown

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## 5.0 MECHANICAL PERFORMANCE

Test Ref.	Motorola Ref.	Item	Test Condition	Requirements
5.1	5.3.3	Durability	Mate connector with SIM card inserted in holder at a rate of 10 cycles per minute 10000 cycles. Use push button for card ejection, as per appendix 3	Appearance - no damage. Maximum change from initial contact resistance = 20mΩ
5.2	5.3.4	Mating Force	Mate connectors at a rate of 25 ± 3 mm/min	Mating force 4.9 N max
5.3	5.3.5	Unmate Force	Unmate connectors at a rate of 25 ± 3 mm/min	Unmating force ( push button force) 11.8 max
5.4	5.3.6	New SIM Card	Test SIM card Function prior. Mate connector with SIM card inserted in holder at a rate of 10 cycles per minute 1000 cycles.	Appearance - no damage. Test SIM card function after test no variability allowed.
5.5	5.3.8.4	Short Circuit Test	Unmate and mate connector which is electrically connected, see appendix 4	No Short Circuit should occur
5.6	5.3.8.3	Normal Force	Measure normal force at contact point of terminal housing, as per appendix 5	Maximum force at max. deflection < 0.5N Min. force at min. deflection > 0.2 N
5.7	5.3.8.4	Reduction in	Measure normal	Mean normal

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		Contact Force	force after durability. Measure normal force at nominal deflection see appendix 5	force should be greater than 0.22 N
5.8	5.3.8.5	Minimum sized SIM card	Mate Min. size cardholder with connector	Maximum change from initial contact resistance = 20mΩ.
			continued next page	
Test Ref.	Motorola Ref.	Item	Test Condition	Requirements
5.9	7.2.4	Vibration	10-150 Hz 0.15mm or 2g, duration 40 minutes, total 5 cycles in X,Y,Z axes	<1μsecond discontinuity Maximum change from initial contact resistance = 20mΩ
5.10	7.2.5	Mechanical Shock	50g/11m sec ½ Sine, 3 shocks each of X,Y,Z axes, total 18 shocks	<1μsecond discontinuity Maximum change from initial contact resistance = 20mΩ
5.11	7.2.7	Housing Shear (Push) Test	Apply Forces in all 4 directions, as per appendix 5. Solder connector to board using a one cycle IR reflow process at 183°C for 60 sec. with a 5 sec. , 215°C max. temp., per appendix 6	F1/F2/F3/F4>20 N
5.12	7.2.8	Terminal Destruction Test	Apply a 4.9 N load for 1 min in all directions, as	No damage to solder joints (

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			per appendix 4. This is to be applied to 5 samples, as per appendix 7	cracks or damage)
5.13	7.2.9	Terminal/Housing Retention Force	Apply an axial load to a terminal assembled in the housing at a speed of 25-50mm/min., as per appendix 8	Retention force 2.9 N min

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6.0 ENVIRONMENTAL PERFORMANCE

Test Ref.	Motorola Ref..	Item	Test Condition	Requirements
6.1	7.2.1	Temperature Characteristics	Measure contact resistance at -40°C, +25°C and +85°C, all measurements must be taken when temperature is stable	Maximum change from initial contact resistance = 20mΩ
6.2	7.2.6	Manual Solder Heat Resistance	Flux terminations and manually immerse the terminations into a 260°C +/- 5°C , for 11 sec., solder to be 63/37.	No change in electrical requirements, see 3.1, 3.2, 3.3, 3.4, 4.1, 4.2 & 4.3 Appearance - no damage.
6.3	7.2.2	Thermal Shock	30 min. at -40°C, 30 min. at +85°C, 20 sec. transition Repeat 32 times.	Appearance - no damage. Maximum change from initial contact resistance = 20mΩ
6.4	7.2.3	Static Humidity	Precondition +25°C for 1 hour. Expose to +85°C with 90-95% relative humidity for 240 Hrs. Allow to dry at room temp. for 4 hrs.	Appearance - no damage. Maximum change from initial contact resistance = 20mΩ

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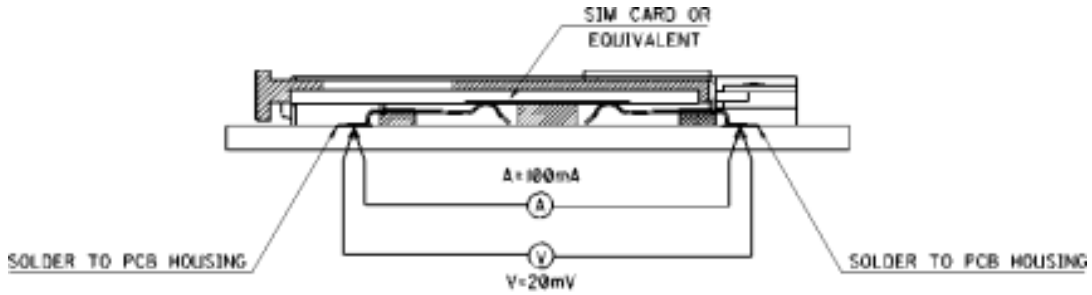


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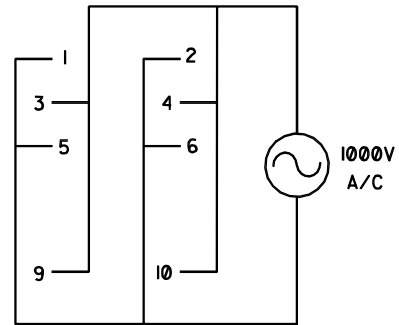
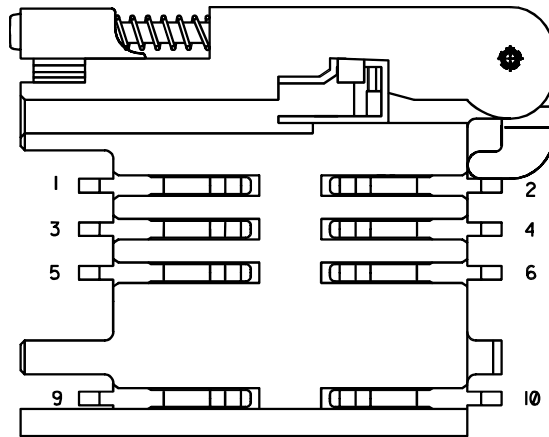
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CONTACT RESISTANCE INITIAL < 50m Ω

CONTACT RESISTANCE TO BE MEASURED AT EACH STAGE AT -40°C, +25°C AND +85°C. ALL MEASUREMENTS MUST BE TAKEN WHEN TEMPERATURE IS STABLE



DIELECTRIC STRENGTH WIRING DIAGRAM

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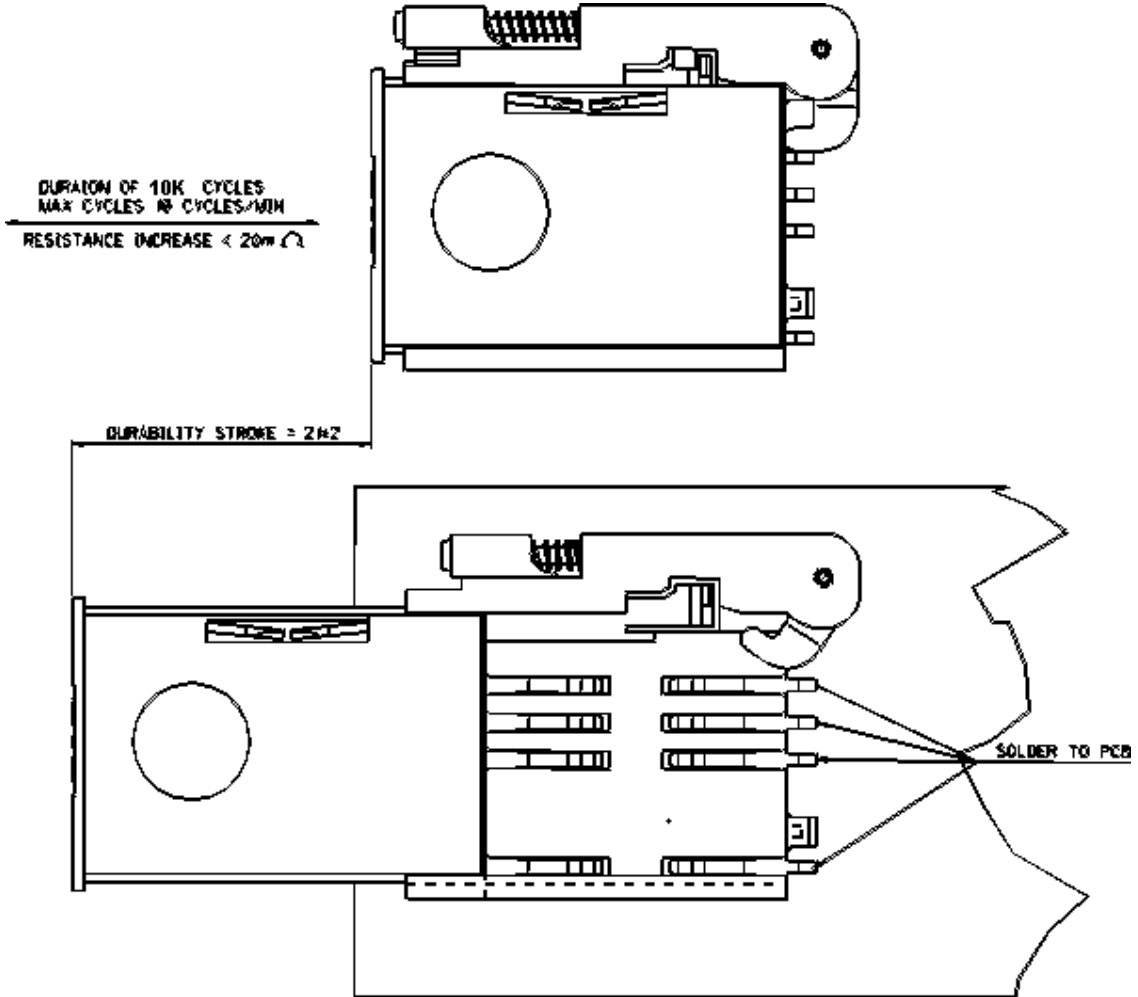
6.5

5.5.3

Solderability  
IR Heat  
Resistance

Sample to be  
passed through  
reflow oven

Appearance - no  
damage.



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## 7.0 TEST GROUPINGS

Test Ref.	Motorola Ref..	Test Item	GP1*	GP2*	GP3*	GP4*	GP5*
3.1	5.2.6	Current				1,	
3.2	5.2.5	Voltage				1,	
3.4	5.1.2	Operating temperature range					
3.5	5.1.3	Storage temperature range					
3.6	5.2.4	Capacitance				1,	
4.1	5.2.1	Contact Resistance	5, 7	2,6	2,7		
4.2	5.2.2	Insulation Resistance				1,	
4.3	5.2.7	Dielectric Strength				1,	
4.4	5.2.3	Voltage Breakdown				1,	
5.1	5.3.3	Durability			6,		
5.2	5.3.4	Mating Force			4,		
5.3	5.3.5	Unmating Force			5,		
5.4	5.3.6	New SIM Card					1,

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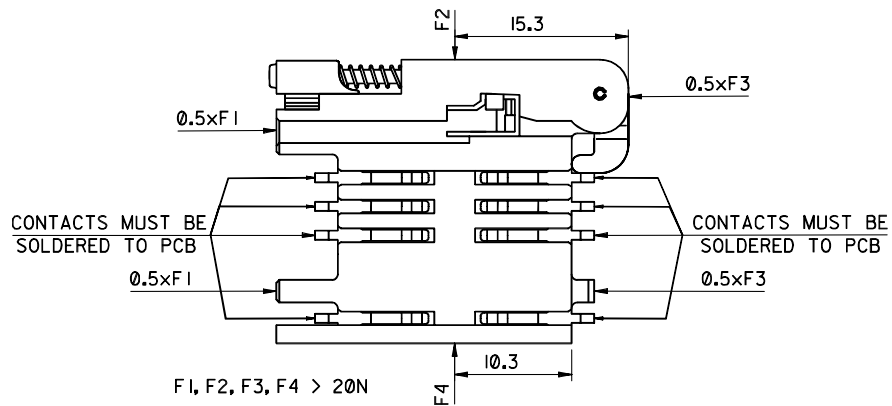
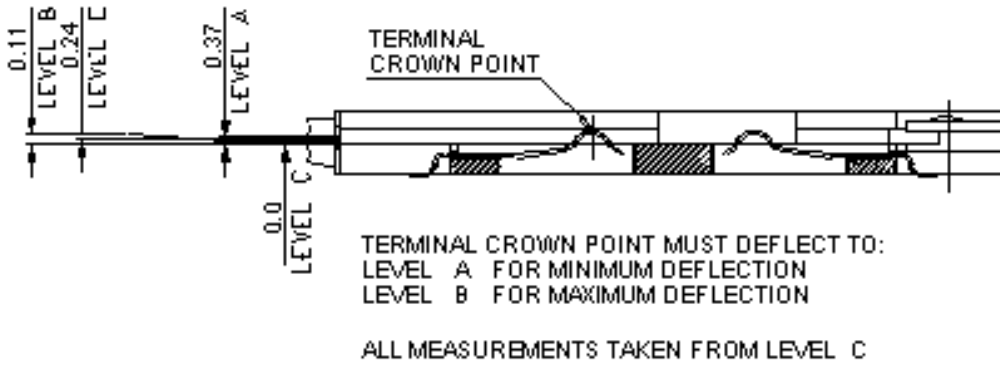
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5.5	5.3.8.3	Normal Force	3, 8	3,7	3,
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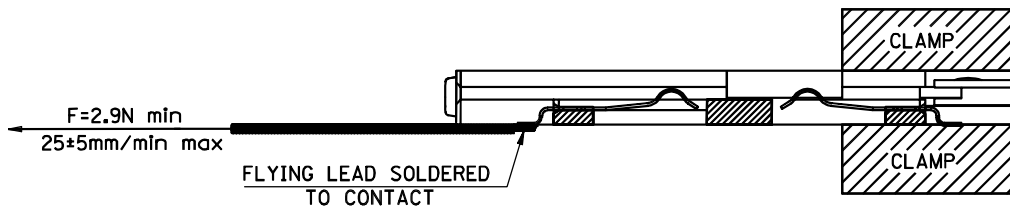
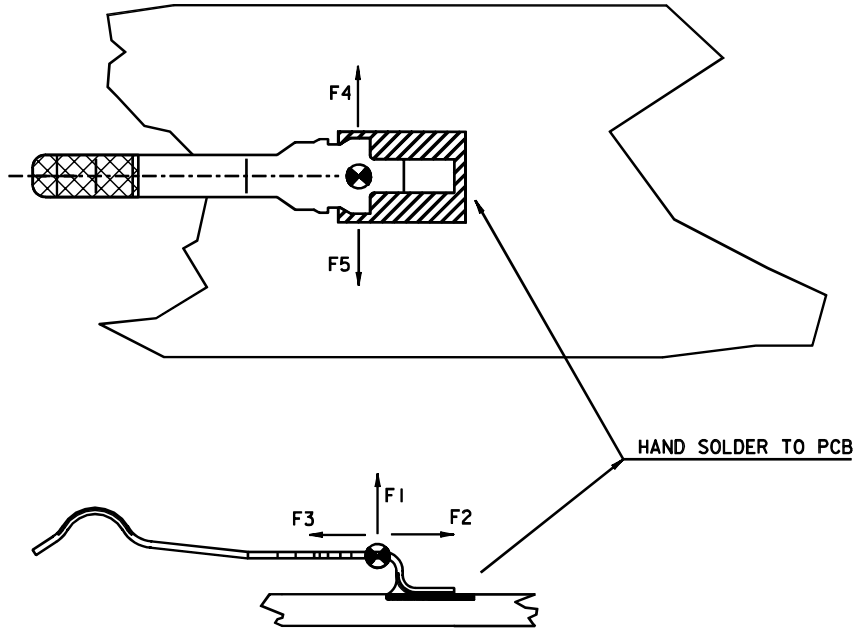
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5.7	5.3.8.5	Minimum sized SIM lead					1,
5.8							



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5.9	7.2.5	Mechanical Shock		5,				
5.10	7.2.7	Housing Shear (Push) Test						1,
5.11	7.2.8	Terminal Destruct Test						1,
5.12	7.2.9	Terminal /Housing Retention Force						1,
6.1	7.2.1	Temperature Characteristics	2,					
6.2	7.2.6	Manual Solder Heat Resistance						1,
6.3	7.2.2	Thermal Shock	4,					
6.4	7.2.3	Static Humidity	6,					
6.5	5.5.3	Solderability IR Heat Resistance	1,	1,	1,			

\* all group sizes must be of 12 units

## Appendix 1:

### Contact Resistance Measurement (4.1)

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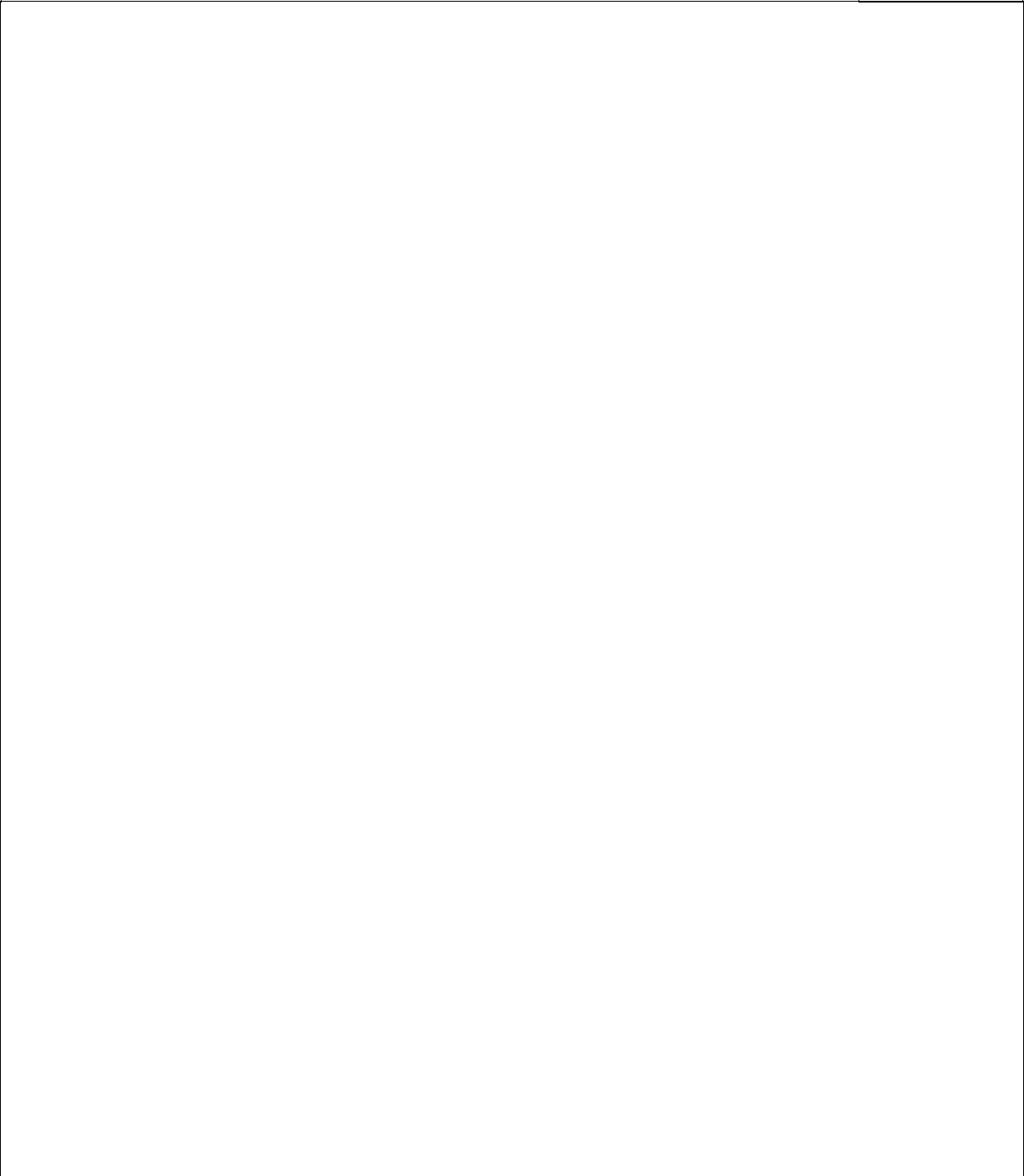


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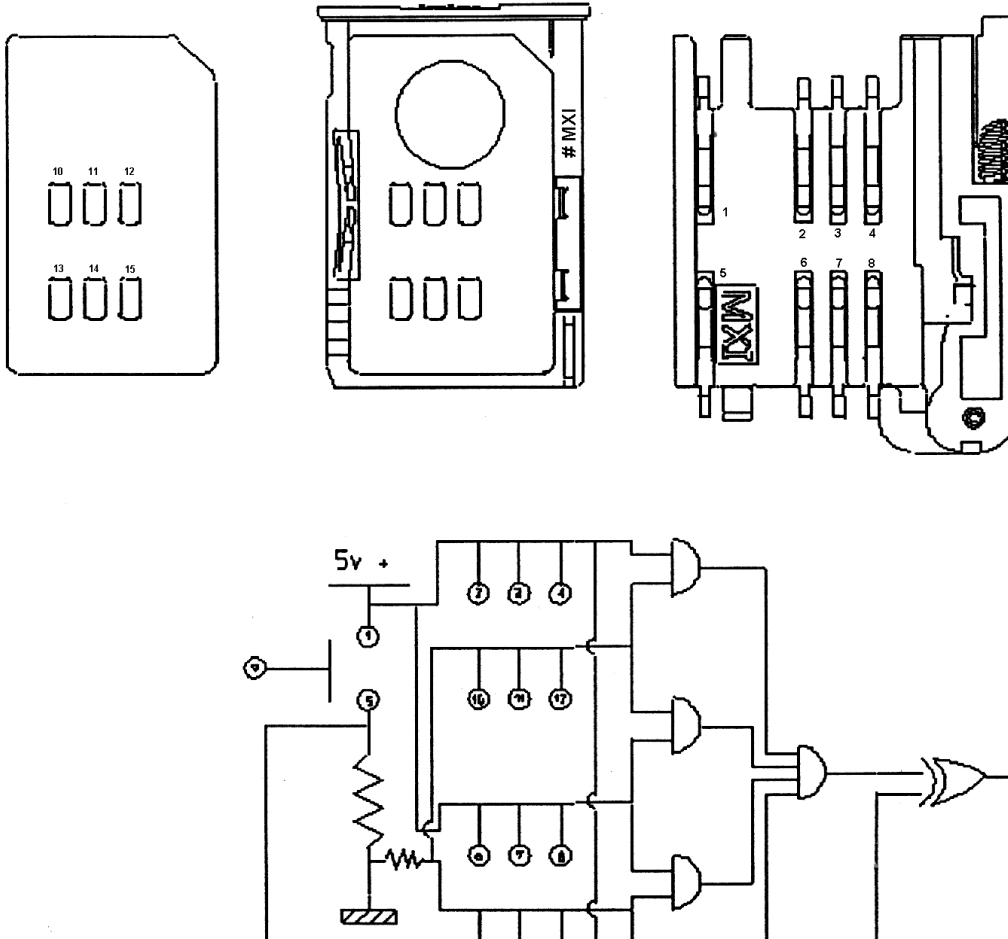
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Suggested Test Circuit Diagram



The single output must remain at a constant state of 0 , during insertion and withdrawal to ensure no shorting.

Short circuit Test (5.5)

**Appendix 5:**

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