

APPENDIX G

TEST SAMPLE TEST PLAN

EMC TEST PLAN

For the

BQT MiP5

SMARTCARD READER

Document No.	Description	By	Date
DC20706A	Initial Release	MKH	24-Jun-04
DC20706B	• Corrected product model details • Added block diagram • Updated product details • Product renamed to MiP5 (previously known as MiProx-5)	PJJ	6-Apr-05
DC20701C	Changed model designators as per request from Tony Lee (2-May-05)	PJJ	2-May-05
DC26501D	Separated block diagrams & operational description from test plan	PJJ	31-May-05

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1 PRODUCT DESCRIPTION

The BQT MiP5 is a contactless smartcard reader designed for keyless entry and other personnel identification and entry purposes. The MiP5 family of products share a common PCB with the models differing only in their data interfaces. See table below:

Model	Interface
MiP5	Weigand
BT815-W	Weigand (Rebadged MiP5)
815-PAC	Serial Tx

The MiP5 uses a pair of open collector drivers to provide a Weigand interface, whilst the 815-PAC uses a single open collector driver to provide a Serial Tx interface. The electrical interfaces for both models are identical, with the mode of operation selectable in software.

A MiP5 is being provided for testing.

The MiP5 is powered from a single 12 Volt DC supply and is connected to a generic controller unit for data transfer. Both power supply and data cabling lengths are between 3m and 1200m for a normal installation.

2 SPECIFICATIONS RELEVANT TO EMC

Clock Frequencies	MIFARE 13.56MHz +/- 30ppm, MIFARE IF 847.5kHz +/- 30ppm, Processor RC Oscillator 7.3728MHz +/-2.5% Processor Watchdog Oscillator 400kHz +20% / -30%
Microprocessor	Philips P89LPC935FDH
Case style & material	Plastic – no metal coating
Power Supply	Internal linear 5V regulated

3 EUT TESTING CONFIGURATION

The MiP5 is to be tested on a table top in the configuration shown in Fig.1. The cable lengths on the table shall comply with the minimum required under the particular test standard. The MiP5 will be connected to a Controller and Power Supply as shown. These units will be remote from the test table in all testing performed. To replicate the normal operation of the MiP5 a suitable smartcard is to be placed upon the reader's antenna where it will automatically be read repeatedly.

4 EUT BUILD DETAILS

Model Number/Name	MiP5
Version	Weigand
Serial Number	
PCB Revision(s)	PC26501A
Software revision(s)	
Manufacturer	BQT Solutions

5 TESTING REQUIRED

Emissions Radiated	Comment
FCC Part 15.209 & 15.225	
EN 300 330 Part 1 & 2	
EN 301 489 Part 1	
EN 55022	
Emissions Conducted	
FCC Part 15.207	
EN 300 330 Part 1 & 2	
EN 301 489 Part 1	
EN 61000_3-2	Current Harmonics
EN 61000-3-3	Voltage Fluctuations & Flicker
Immunity Radiated	
EN 61000-4-3	RF radiated Immunity
Immunity Conducted	
EN 61000-4-2	Electrostatic Discharge
EN 61000-4-4	Fast Transients
EN 61000-4-5	Surges
EN 61000-4-6	Conducted RF
EN 61000-4-11	Voltage dips & interruptions
SELV	
EN 60950	

6 EMISSIONS TESTING

6.1 Radiated

6.1.1 Classifications

Classification	Relevant Clause	Class
Product	ETSI EN 300 330 / 7.1.4	1
Transmitter Power		2
Receiver	ETSI EN 300 330 / 4.1.1	3
Duty Cycle	ETSI EN 300 330 / 7.5	2

6.1.2 Requirements

The following tests are to be performed and reported.

Transmitter

Test	Relevant Clause	
Radiated H-Field	ETSI EN 300 330-1 / 7.2.1	YES
RF Carrier current		N/A
Radiated E-field		N/A
Spurious emissions		YES

Receiver

Test	Relevant Clause	
Adjacent channel selectivity		N/A
Blocking or desensitisation		N/A
Receiver spurious radiation	ETSI EN 300 330-1 / 7.4	YES

6.1.3 Performance Criteria

The EUT must meet the limits of

- ETSI EN 300 330-1
- ETSI EN 300 330-2
- ETSI EN 301 489-1 [EN 55022].

6.2 Conducted

6.2.1 HARMONIC CURRENT EMISSIONS

6.2.1.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-3-2 and ETSI 301 489.

6.2.2 VOLTAGE FLUCTUATIONS AND FLICKER

6.2.2.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-3-3 and ETSI 301 489.

7 IMMUNITY TESTING

7.1 Radiated

7.1.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-4-3 and ETSI 301 489.

7.1.2 Frequency Range

80 to 1000 and 1400 to 2000 MHz with a step increment of 1% of the current test frequency.

7.1.3 Field Strength

3 V/m with 1kHz, 80% amplitude modulation

7.1.4 Performance Criteria

The EUT does not provide a continuous communications link and as such under clause 6.3 of ETSI EN 301 489-1 the following performance criteria shall be applied.

- Degradation of operation permitted during test.
- Erroneous data transmission is permitted.
- No performance degradation permitted after testing complete.

7.2 Conducted

7.2.1 ELECTROSTATIC DISCHARGE TESTING

7.2.1.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-4-2 and ETSI EN 301 489.

7.2.1.2 Types of Discharges

Air and contact discharges are to be applied.

7.2.1.3 Application Points

Discharges are to be applied to all operator accessible areas of the EUT

7.2.1.4 Number of Discharges

At least ten (10) single discharges are to applied at each point.

7.2.1.5 Severity Level

Air discharge:	Level 4 (8kV)
Contact Discharge:	Level 2 (4kV)

All intermediate levels are to be tested as per the requirements of EN 61000-4-2.

7.2.1.6 Performance Criteria

The EUT does not provide a continuous communications link and as such under clause 6.3 of ETSI EN 301 489-1 the following performance criteria shall be applied.

- Degradation of operation permitted during test.
- Erroneous data transmission is permitted.
- No performance degradation permitted after testing complete.

7.2.2 ELECTRICAL FAST TRANSIENT BURST TESTING

7.2.2.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-4-4 and ETSI EN 301 489 levels required.

7.2.2.2 Lines to be Tested

Mains power line and data cable greater than 3m in length are to be tested.

7.2.2.3 Duration of Test

Nominal 5 minutes on all cables.

7.2.2.4 Polarity Of Test Voltage

Both polarities are mandatory.

7.2.2.5 Severity Level

DC Power Line - Level 1 (0.5 kV)

Data Line - Level 1 (0.5 kV).

7.2.2.6 Performance Criteria

The EUT does not provide a continuous communications link and as such under clause 6.3 of ETSI EN 301 489-1 the following performance criteria shall be applied.

- Degradation of operation permitted during test.

- Erroneous data transmission is permitted.

- No performance degradation permitted after testing complete.

7.2.3 ELECTRICAL FAST TRANSIENTS BURST TEST

7.2.3.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-4-5 and ETSI EN 301 489 levels required.

7.2.3.2 Lines to be Tested

Mains power line and Telecommunications cable greater than 3m.

7.2.3.3 Duration of Test

As per the requirements of EN 61000-4-5.

7.2.3.4 Severity Level

Power Line - Level 2 (1kV to ground & 0.5kV line to line)

Telecommunications line - Level 1 (0.5 kV).

7.2.3.5 Performance Criteria

The EUT does not provide a continuous communications link and as such under clause 6.3 of ETSI EN 301 489-1 the following performance criteria shall be applied.

- Degradation of operation permitted during test.

- Erroneous data transmission is permitted.

- No performance degradation permitted after testing complete.

7.2.4 CONDUCTED RF, Common Mode

7.2.4.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-4-6 and ETSI 301 489 levels required.

7.2.4.2 Lines to be Tested

Mains power line and data cable greater than 3m in length are to be tested.

7.2.4.3 Frequency Range

150kHz to 80 MHz. With 1kHz 80 modulation

7.2.4.4 Severity Level

Line - Level 2 – 3Volts rms

7.2.4.5 Performance Criteria

The EUT does not provide a continuous communications link and as such under clause 6.3 of ETSI EN 301 489-1 the following performance criteria shall be applied.

- Degradation of operation permitted during test.
- Erroneous data transmission is permitted.
- No performance degradation permitted after testing complete.

7.2.5 VOLTAGE DIPS and INTERRUPTIONS

7.2.5.1 Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-4-11 and ETSI 301 489 levels required.

7.2.5.2 Voltage Limits

30% dip for 10ms
60% dip for 100ms
95% dip for 5000ms

7.2.5.3 Performance Criteria

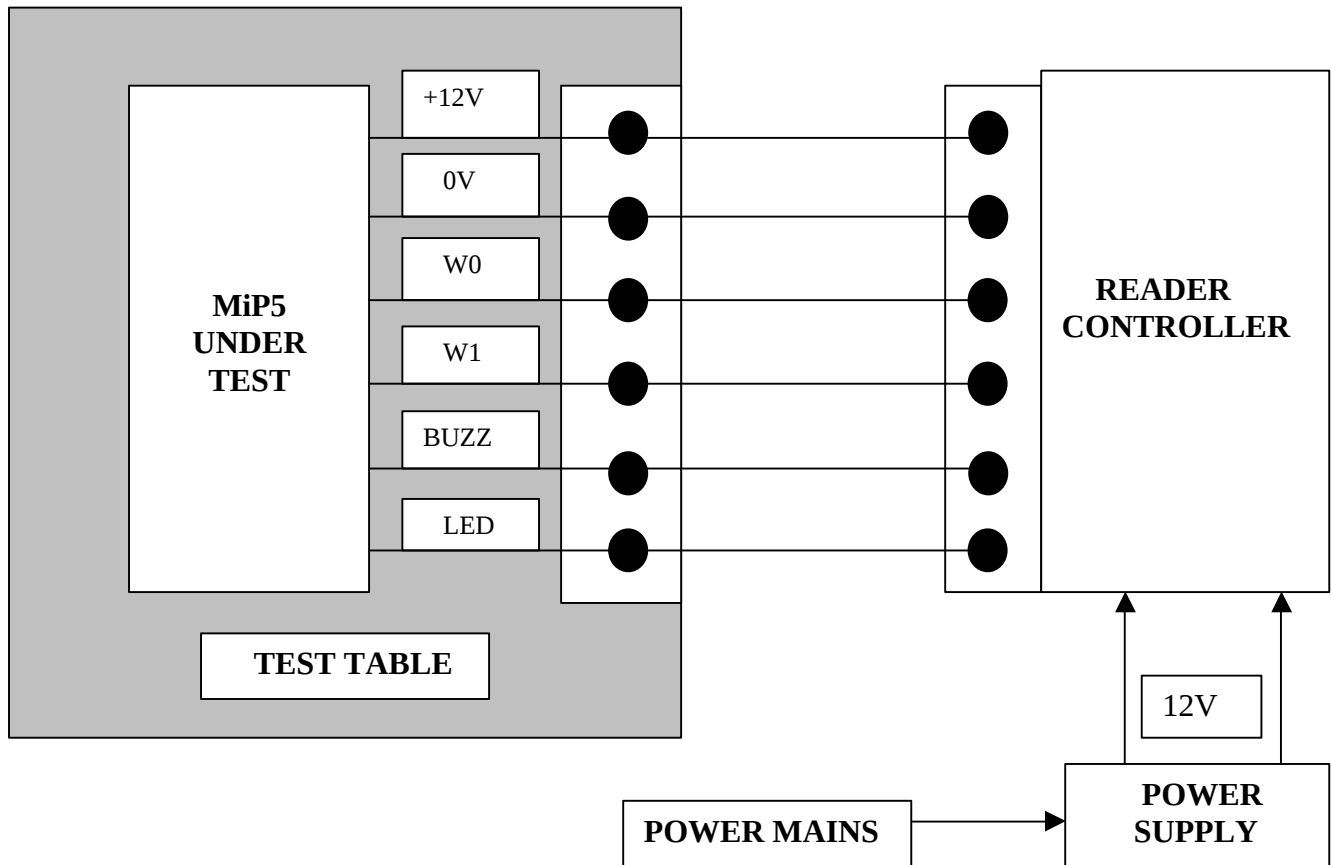
Criteria as specified in ETSI 301 489-1 clause 9.7.3. All operating anomalies are to be reported.

8 SAFETY

9 SELV

EUT TESTING CONFIGURATION

Fig. 1



Note: Cable lengths are defined as per Section “1. Product Description” (page 4)