

SmartQC New Mastercard CQM Quality Control Tool

CQM Compliance Solution

TESTS REQUESTED BY:



TESTS PERFORMED:

Barnes International and Smartware offer a solution for ensuring complete coverage of the required tests related to electromagnetic characteristics and RF functionalities:

- Resonance Frequency
- Quality Factor
- Reading Distance



Assure the quality of contactless payment cards to Mastercard CQM standards

Financial card producers have to prove to Mastercard that for each issued banking card they have successfully completed a series of tests including those related to chip card quality. Mastercard issues their Card Quality Manufacturing (CQM) requirements to ensure the quality of the product during the manufacturing and personalisation phases.

SmartQC software brings a simple step by step process to calculate your sample results set and subsequent monitoring for:
 #3062# Resonance Frequency
 #3063# Q-Factor
 #3064# Reading Distance

Card ID	Timestamp	Resonance Frequency (MHz)	Quality Factor	Reading power (V)
41	2020/04/07 12:11:27	15.200	53	8.3
42	2020/04/07 12:11:31	15.200	53	8.3
43	2020/04/07 12:11:36	15.200	53	8.3
44	2020/04/07 12:11:39	15.200	53	8.3
45	2020/04/07 12:11:42	15.200	53	8.3
46	2020/04/07 12:11:47	15.200	53	8.3
47	2020/04/07 12:11:50	15.200	53	8.3
48	2020/04/07 12:11:53	15.200	53	8.3
49	2020/04/07 12:11:59	15.200	53	8.3
50	2020/04/07 12:12:04	15.200	53	8.3
51	2020/04/07 12:12:08	15.200	53	8.3
52	2020/04/07 12:12:11	15.200	53	8.3
53	2020/04/07 12:13:29	15.200	53	8.3
54	2020/04/07 12:13:32	15.200	53	8.3
55	2020/04/07 12:13:36	15.200	53	8.3
56	2020/04/07 12:13:40	15.200	53	8.3
57	2020/04/07 12:13:44	15.200	53	8.3
58	2020/04/07 12:13:49	15.200	53	8.3
59	2020/04/07 12:13:54	15.200	53	8.3
60	2020/04/07 12:13:58	15.200	53	8.3
61	2020/04/07 12:14:07	14.250	20	4.9
62	2020/04/07 12:14:11	14.250	20	5.0
63	2020/04/07 12:14:14	14.250	20	5.0
64	2020/04/07 12:14:17	14.250	20	5.0
65	2020/04/07 12:14:21	14.250	20	5.0
66	2020/04/07 12:14:24	14.250	20	5.0
67	2020/04/07 12:14:30	14.250	20	5.0
68	2020/04/07 12:14:34	14.250	20	5.0
69	2020/04/07 12:14:37	14.250	20	5.0
70	2020/04/07 12:14:41	14.250	20	5.0

Solution Overview

Barnes and Smartware offer a solution adapted for personalisation bureaus offering complete coverage of Mastercard mandatory tests including contactless electro-magnetic tests.

Step 1) Qualification phase - Create your sample set, edit number of cards to be sampled- default of 70 for CQM.

Step 2) Production phase – test your cards one by one – results automatically calculated and compared with sample set results.

Step 3) View results in the software individually, Powerful pdf reporting available.

Features and Benefits

- The US-CLT hardware allows the measurement of the Resonance Frequency and Quality Factor of a PICC.
- The SmartQC application supports ISO14443 level 3, level 4, type A and type B PICC.
- VNA circuitry is used to measure the Module and Phase of the signal, while the carrier frequency is updated.
- The carrier frequency goes from 10 MHz up to 24 MHz with a minimal 10 kHz step.
- The thresholds are automatically calculated.
- The measured Module and Phase are displayed in function of frequency. Resonance Frequency (f0) and Quality Factor are determined from a computed complex impedance (method Z).
- A reading power test determines the minimum amplitude for a PICC to answer a reset sequence.
- The user defines a profile name to initiate the qualification process.
- The requirement is to qualify a quantity of PICC (70 PICC by default) to determine the minimum and maximum thresholds which validate/fail a PICC test.



THE BARNES ADVANTAGE
 Barnes is the chosen test tool of Banks & Issuers, Card Manufacturers, Personalisation Bureaus and Test Laboratories worldwide.

Here are some reasons why:

BUSINESS AGILITY
 Barnes test tools are easy to use by both technical and non-technical users, and speed up card development and payment scheme certification.

COST ELIMINATION
 The high business costs and wasted resources of producing and issuing invalid cards are eliminated.

RISK REDUCTION
 The reputational risk of issuing invalid EMV cards to end customers is reduced.

FUTURE PROOFED
 Barnes works in partnership with all major payment schemes. As scheme rules evolve, Barnes rapidly makes updated test script packs available to customers via the Barnes website.

SERVICE EXCELLENCE
 Our clients have every confidence that, whatever their test requirement, the Barnes team is always on-hand to deliver expert advice and fast support.

Instant Result Summary showing a PASS, or in the case of FAIL, the Error(s) which caused the failure.

Profile selected
 CQM sample test

Profile thresholds
 Qualification Sample size: 70
 Resonance frequency min: 12.870 MHz
 Resonance frequency max: 17.242 MHz
 Quality factor min: 1
 Quality factor max: 95
 Reading power value: 12.6 V

Test number	Timestamp	Resonance frequency (MHz)	Quality factor	Reading power	Status
1	2020/04/07 12:20:37	14.250	20	OK	✓
2	2020/04/07 12:24:19	15.650	40	OK	✓
3	2020/04/07 12:24:26	14.250	20	OK	✓
4	2020/04/07 12:24:31	15.200	53	OK	✓
5	2020/04/07 12:25:15	17.500	48	NOK	✗

Global result
 Resonance frequency: 15.200 MHz
 Quality factor: 53
 Reading power: OK
 Status: **Pass** (Green checkmark)

Global result
 Resonance frequency: 17.500 MHz
 Quality factor: 48
 Reading power: NOK
 Status: **Fail** (Red X)

Resonance Frequency Options

VNA power: define the power applied by the VNA on the contactless interface to perform the resonance frequency and quality factor measurements.

VNA calibration: Before starting a test, the contactless tester is calibrated. This initialisation records the phase values from 10 to 24 MHz without any tag on the X-Coil 30.

By pressing the Calibrate button, the initialisation data is stored in the non-volatile tester memory. It is not required to perform a calibration sequence each time the tester reboots.

Technical Specification

- Software requirements:**
- OS: Windows 7, 10 (32-bit and 64-bit)
- Hardware requirements:**
- PC with Ethernet Port