EMVCo Electrical Terminal Test Solution

New test solution supporting 3V mPOS payment terminals

The introduction of mPOS (mobile Point of Sales) devices has been driving the need for 3V payment terminals for the acceptance of so-called class B cards (3V supply voltage). The phase out of class A cards (5V supply voltage) as well as the so-called liability shift for merchants in the US create further demand for new 3V payment terminals. As a result, the specification of electrical test cases for Terminal Type Approval Contact Level 1 has been overhauled adding testing at 3V as well as updating the test cases for 5V.

Setup based on all-interface conformance test solution UT³ Platform

This new test solution is based on the proven UT³ Platform connected to the Analog Probe called APR-TT. The payment terminal to be tested is contacted by help of the Analog Flex Probe in ID-1 card size form factor. This test setup serves to prove compliance to all electrical requirements set out by EMVCo. In addition, manual tests using specific paddles directly inserted in the terminal under test prove compliance to short circuit resilience.

Purpose

- Terminal Type Approval
  - According to ISO/IEC 7816 1-4
  - According to EMV Book 1 Version 4.3

Highlights

- Simple setup:
  All-in-one test solution
  - no external multimeter needed
  - no external PC required
  - Integrated digital storage oscilloscope
- Less effort:
  Quick measurements speed up signal analysis
- Secure invest:
  Re-use UT³ Platform for NFC Forum and GCF/PTCRB certification

Specification

TEST BENCH

- UT³ EMVCo Terminal Level 1 Electrical Test Bench

DEVICE TEST CENTER

- Comfortable automated reporting (PDF, xml)
- Info view with each test step
- Comprehensive test cases results including all parameter settings
- Synchronized views on physical and protocol layer for fast analysis
- Remote Desktop support
- Remote Server for automation
- Analog Scope
  - Visualized tracing
  - Detailed analysis of all signals
  - Up to 16 digital and up to 4 analog channels
  - Recording depth up to 128 M sample points
  - 100 M samples/s
  - Memory segmentation for up to 1024 trigger shots

CONFORMANCE TEST SOLUTION

- Supported Smart Card voltages: 1.8 V/3 V/5 V
- Digitizing time base for protocol analysis: 10 ns
- Static current loads on all contacts: -2.0 .. 2.0 mA +/- 1 µA
- VCC contact DC and spike load: 0 .. 2 mA ± 0.1 mA; 2 .. 200 mA ± 0.5 mA
- Voltage measurement: -1.0 .. 6.0 V +/- 10 mV (+/- 20mV, if checked against VCC)
- Input contacts (CLK, RST, I/O, VPP)
  - Impedance: min. 5 MΩ, max. 30 pF
  - IO current measurement: -20 .. 20 mA +/- 0.1 mA
  - Edge time measurement: 2 .. 2000 ns +/- 5 % of measurement or 2 ns, whichever is greater
  - CLK frequency measurement: 0.1 .. 6.0 MHz +/- 1 %
  - CLK duty cycle measurement: 30 .. 70 % +/- 1 %
  - VPP resistance measurement: 0.1 .. 20 MΩ +/- 3 %
- ISO protocol properties
  - Max. speed: 10 MHz using 8 clock cycles per ETU
  - Selectable driver modes: Push/Pull, Open Drain, Open Drain + Slew Rate Control
  - Adjustable output levels: -1.0 .. 6.0 V +/- 10 mV (+/- 20 mV, if derived from VCC)
  - Adjustable edge time: 15 .. 10000 ns; +/- 5 % of setting or 2 ns, whichever is greater
- Temperature range: 5°C to 40°C

SCOPE OF DELIVERY

Hardware

- UT³ Platform with keyboard and mouse
- UT³ Platform APR-TT with Connector Cable
- EMVCo Electrical Accessory Package (Paddles and Analog Flex Probe ID-1)

Software

- Device Test Center
- ISO 7816 Simulation (analog & digital)
- Analog Scope
- UT³ EMVCo Terminal Level 1 Electrical Test Bench

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