ISO/IEC JTC 1/SC 17/WG 8 N 2170
REPLACES: ISO/IEC JTC 1/SC 17/WG 8 N 2161

ISO/IEC JTC 1/SC 17/WG 8
Integrated circuit cards without contacts
Secretariat: DIN

TF2 N811R1 MinutesofTF2Singapore2013

Date of document	2013-10-15
Expected action	Info
Source	Pascal Roux (TF 2 convener)

Background
Attached is a corrected version of the TF 2 minutes, that replaces TF 2 N 811 (WG 8 N 2161).

Minutes of the 41st meeting of WG8 Task Force 2

held at: Grand Copthorne Waterfront Hotel Singapore
392 Havelock Road
Singapore 169663
on: 23rd and 24th September 2013

Participants:

Pascal ROUX	Convener
Reinhard MEINDL	Austria
Erich REISENHOFER	Austria
Michael STARK	Austria
Wenli LIU	China
Franck BRICOUT	France
Stéphane JOBARD	France
Jean-Luc MERIDIANO	France
Klaus FINKENZELLER	Germany
Michael HEGENBARTH	Germany
Florian PETERS	Germany
Peter RAGGAM	Germany
Amos WAMBUA	Kenya
Kihan LEE	Korea
Kwon OJ	Korea
Yoshiaki KANEKO	Japan
Kenichi NAKAMURA	Japan
Hiroo SHIMIZU	Japan
Kelvin LIM	Singapore
Poh Chang NG	Singapore
Maksimiljan STIGLIC	Slovenia
Jose Luis GEIJO-PEREZ	Switzerland
Ryan BOUDREAU	USA

OPENING OF THE MEETING

1. The convener opened the forty-first meeting of WG8 Task Force 2 by welcoming all the participants. He expressed special thanks to Singapore's Information Technology Standards Committee for the organisation of this meeting.

ROLL CALL

2. During the roll call, the convener asked all the participants to introduce themselves and to indicate their affiliations.

REVIEW OF THE MEMBERSHIP LIST

3. An attendance register was circulated during the meeting. The TF2 membership is mentioned in the document WG8 SD2. The regular delegates are requested to register as TF2 members (through their national bodies) to get access to the TF2 documents.

ADOPTION OF THE AGENDA

4. The agenda (document TF2 N796) was agreed with the following additions:

- finalisation of the text for an amendment to ISO/IEC 10373-6 on waveform adjustment,
- clarification on PICC antenna position in the test-PCD-assembly,
- clarification on alternating magnetic field test.

APPROVAL OF THE LAST MEETING MINUTES

5. The minutes of the fortieth TF2 meeting in Tokyo (document TF2 N795) were approved.

REVIEW OF AVAILABLE DOCUMENTS

6. The documents submitted before and during this meeting were as follows:

TF2 N792	WD ISO/IEC 10373-6/COR2 — Identification cards — Test methods — Part 6: Proximity cards — TECHNICAL CORRIGENDUM 2: Correction of annexes G and H (Update of document TF2 N785)	(Project editor)
TF2 N793	WD ISO/IEC 14443-3/COR1 — Identification cards — Contactless integrated circuit(s) cards — Proximity cards — Part 3: Initialization and anticollision — TECHNICAL CORRIGENDUM 1: Type A / Type B influence, frame delay time and frame waiting time (Update of document TF2 N784)	(Project editor)
TF2 N794	PICCs supporting passive and/or active transmission PCD and PICC test methods Test case definition and signal generation feasibility analysis	(NXP)

TF2 N795	Minutes of the 40th meeting of WG8/TF2 Tokyo, Japan – 3rd and 4th June 2013	(TF2 convener)
TF2 N796	Agenda of the 41st meeting of WG8/TF2 Singapore – 23rd and 24th September 2013	(TF2 convener)
TF2 N797	Comments on improvements of PICC and PCD Test Methods	(Infineon)
TF2 N798	ISO/IEC 10373-6 Further improvements	(Infineon)
TF2 N799	WD ISO/IEC 14443-3/Amd.XX — Identification cards — Contactless integrated circuit(s) cards — Proximity cards — Part 3: Initialization and anticollision — AMENDMENT XX: PICCs supporting active and/or passive transmissions	(Project editor)
TF2 N800	Document register TF2 N701 - N800	(TF2 convener)
TF2 N801	Clarifications of ISO/IEC 10373-6	(France)
TF2 N802	R2 values measurements	(FIME)
TF2 N803	ISO/IEC 10373-6 Test Methods for PICCs supporting Active and/or Passive Transmission	(NXP)
TF2 N804	ISO/IEC 10373-6 EMD Precondition Test	(NXP)
TF2 N805	R2 values of PICC under Hmax	(Microprocess)
TF2 N806	Comparison of Infineon and NXP Phase Drift Analysis Tool	(Slovenia)
TF2 N807	Phase Drift Analysis Tool on AMS active device	(NXP)
TF2 N808	Phase evaluation results	(Infineon)
TF2 N809	Contribution on R2 values at Hmax	(Gemalto)
TF2 N810	Active load modulation with signal generator and Active Reference PICC	(Infineon)

RANGE OF R2 VALUES AT HMAX FOR THE 6 REFERENCE PICCS

7. The documents TF2 N781, TF2 N802, TF2 N805 and TF2 N809 were presented. The many different measured R2 values at H_{max} for the 6 Reference PICCs were compared and discussed. TF2 finally agreed to propose a nominal value with a ±10% tolerance for each Reference PICC. The table below summarizes the agreed ranges in which all proposed values are included, except three, which were considered too high.

Reference PICC	**1**	**2**	**3**	**4**	**5**	**6**
TF2 N781 (ACS)	85,3	118	135	105	109	136
TF2 N802 (FIME)	90	126	136	**127**	**130**	**147**
TF2 N805 (Microprocess)		127,5		113	120	119
TF2 N805 (Microprocess)	81	125	122	110	119	
TF2 N805 (Microprocess)				102,3	108,2	119,2
TF2 N805 (Infineon)				108,7	111	123,4
TF2 N805 (Infineon)				108	109,1	123,1
TF2 N809 (Gemalto)	82	120	129			
Defined range (Ω)	75 to 85					
Proposed range (Ω)	**85 +/- 10%**	**125 +/- 10%**	**130 +/- 10%**	**110 +/- 10%**	**115 +/- 10%**	**130 +/- 10%**

These agreed ranges will be included in the next draft amendment to ISO/IEC 10373-6.

IMPROVEMENT OF PICC AND PCD TESTS IN ISO/IEC 10373-6, ANNEXES G AND H

8. The document TF2 N798 was presented by Erich Reisenhofer. The FSDI=0 condition is not consistent with any S(PARAMETERS) test as an S(PARAMETERS) response may exceed 16 bytes and no chaining is possible. It was therefore agreed to suppress this FSDI condition in G.5.6.2 step a). A corrigendum is proposed to include this modification in ISO/IEC 10373-6 as soon as possible. No change is needed for G.5.4.

The use of anticollision commands with NVB = '20' is missing in the many test methods for initialization of the PICC Type A (Scenarios G.2 to G.13). TF2 agreed to add the missing test cases in the current working draft amendment. Besides, the behaviour of the PICC Type A in READY(1), READY(2) and READY(3) states is not extensively defined in ISO/IEC 14443-3, therefore it is not possible to add tests with anticollision commands not corresponding the current PICC cascade level.

9. The document TF2 N797 was presented by Erich Reisenhofer and all comments were discussed. A revised working draft amendment to ISO/IEC 10373-6 will be prepared by the project editor and transmitted to WG8 to be balloted as soon as possible.

PICCS WITH EXTERNAL POWER SUPPLY

10. The document TF2 N803 was presented by Michael Stark. In the proposed new Reference PICC, the active modulation circuit diagram linearly converts the voltage at CON5 into a current in main coil L1. It has been tested up to 65 mA peak (100 mA peak should be possible).

The passive Reference PICC load may influence the active modulation operation by consuming part of the produced current. However, it is important to keep a constant load in addition to the modulation:

- either passive as in the present Reference PICC, using different resonance frequencies,
- or active, setting J1 in position d.

Action 1 Contributions on possible active constant load to replace both the existing passive load and the need of using different resonance frequencies

11. In order to have a single Reference PICC for each class, the replacement of the current passive modulation circuit connected to CON1 by the new active modulation circuit connected to CON5 was discussed and agreed on the principle, provided that this new circuit is calibrated and qualified, preferably by several experts.

Action 2 Calibrate and test the proposed Reference PICC active modulation circuit

Action 3 Michael Stark will provide:

- the new Reference PICC layout and component list (no hardware will be provided),
- the analysis software,
- the signals synthesis Matlab® files.

12. The new PICC transmission analysis software can compute both the phase and the amplitude of the PICC load modulation. It is therefore considered to maximally automate PICC load modulation

measurements (amplitude and phase) by using only this software and no more the DFT. This new method may be particularly interesting to analyse the PICC load modulation on a complete frame for high PICC to PCD bit rates, when the subcarrier does not have enough time to stabilise.

13. Michael Stark confirms again that common PCDs do not show any significant phase drift: less than ±1° is measured, and this may be more noise than real phase variations.

14. The document TF2 N810 was presented by Peter Raggam. It is possible to create the proposed test signals and the Reference PICC with an active modulation circuit does not modify significantly them as far as phase is concerned. This confirms similar results presented during previous TF2 meeting. However, few available signal generators have an external synchronisation input able to exactly follow the PCD carrier. Some of them are only able to synchronise in a narrow band around discrete frequencies obtained with a digital PLL (e.g. 13,50 MHz or 13,60 MHz ±20 kHz).

15. The document TF2 N806 was presented by Maksimiljan Stiglic. The results of the methods proposed by NXP (document TF2 N754) and by Infineon (document TF2 N788), averaged over subcarrier, correlate well: always less than 5° and very often less than 2° difference.

16. The document TF2 N808 was presented by Peter Raggam. As the phase measurement is continuous and the transitions between states are not controlled and create phase variations, it must be decided:

- how much of the transitions between states are ignored, knowing that transitions speed depends on the PICC quality factor,
- if an average is done on the remaining part of each state.

For instance, the NXP phase drift analysis software defines the two modulated states (MS1 and MS2) with the 70% of each state where the amplitude is the most stable and then makes an average on MS1 and on MS2 phases.

17. The document TF2 N807 was presented by Michael Stark. It was confirmed that the relevant PICC parameter is the modulation seen by the PCD, which is the vectorial difference between the two PICC modulated states (see document TF2 N 795, 16 and 17 for more details). As the amplitude and phase continuously change during PICC modulation, it was proposed to calculate the vectorial difference between each PICC signal vectorial value and the vectorial value located exactly 1/2*fs* later, i.e. to calculate the difference between the complex PICC signal and the same signal shifted by exactly 1/2*fs*. The argument of all complex values of any series made by sampling this complex difference at a sample rate of 1/*fs* shall be in a specified range, whatever the starting point of the series, except maybe during fast transitions from one modulated state to the other.

Action 4 Update the PICC test method to compute the vectorial difference between the two PICC states during the PICC modulation, then process this difference signal to show PICC phase drift

Action 5 Measurement of passive and active PICCs to validate this test method and define if transitions must be ignored and how

Action 6 The project editor will update the working draft of the amendment to ISO/IEC 10373-6 on this topic.

18. TF2 agreed that the 2nd CD of amendment 6 to ISO/IEC 14443-2:2010 cannot be balloted as long as corresponding test methods are not stabilised and ready for CD ballot. The load modulation requirements in this amendment will be clarified as soon as test methods are validated.

EMD REQUIREMENTS FOR CLASSES 2, 3, 4, 5 AND 6

19. The document TF2 N804 was presented by Michael Stark. The noise floor precondition test may pass with some oscilloscopes (using 8 bit sampling at 1 GS/s) but not with all, especially at high field strength. The possible causes were discussed and it was proposed to replace the note in ISO/IEC 10373-6:2011/Amd.2:2012, 5.5.3 with the following:

> NOTE This noise floor can be obtained either with a some 14-bit digitizers at a sampling rate of at least 100 million samples per second or with an some 8-bit digital oscilloscopes at a sampling rate of at least 1000 million samples per second. If the noise floor is exceeded at any required field strength, all components of the test setup (signal generator, amplifier, probe, signal amplitude analyzing device…) should be carefully checked in terms of their contribution to the measured noise floor.

Besides, the defined "Class 1" noise floor (three times below the "Class 1" EMD limit $V_{E,PICC}$) may result in some false negative tests due to spikes not originating from the PICC. Michael Stark proposed to contribute on this topic.

It was finally agreed that an evaluation is necessary to improve the EMD test methods, e.g. by specifying the important oscilloscope parameter(s).

Action 7 Contributions on noise floor limit and EMD spikes probability

Action 8 Contributions on the noise main causes and proposals to improve the test methods standard (e.g. with a more precise oscilloscope specification)

Action 9 Contributions to propose EMD limits for each new class 2 to 6 (or confirm the limits proposed in document TF2 N791)

Action 10 A project editor is still needed for an amendment on this topic

DEFINITION OF PCD HMAX TEST IN ISO/IEC 10373-6 WITH ALL 6 REFERENCE PICCS

20. This topic was not discussed for lack of contributions. The working draft amendments are still needed.

Action 11 The working draft amendments to ISO/IEC 14443-2 and to ISO/IEC 10373-6 will be prepared by the project editors and posted before next TF2 meeting for finalisation during next TF2 meeting

TEST PLAN INCLUDING ALL PCD AND PICCS REQUIREMENTS DEFINED IN ISO/IEC 14443

21. This topic was not discussed for lack of contributions and time. Peter Raggam volunteered to be the project editor of this technical report.

Action 12 Contributions to progress on this topic.

FINALISATION OF AMENDMENT ON WAVEFORM ADJUSTMENT

22. The clarification on waveform adjustment previously agreed (see document TF2 N771, 31) will be included in the next draft amendment to ISO/IEC 10373-6.

CLARIFICATION ON PICC ANTENNA POSITION IN THE TEST-PCD-ASSEMBLY

23. The document TF2 N801 was presented by Jean-Luc Meridiano. TF2 agreed that a short cooling period is necessary after the alternating magnetic field test defined in ISO/IEC 10373-6, 6.2.1 and before testing that the PICC operates as intended.

This clarification will be included in the next draft amendment to ISO/IEC 10373-6.

CLARIFICATION ON ALTERNATING MAGNETIC FIELD TEST

24. The document TF2 N801 was presented by Jean-Luc Meridiano. TF2 agreed that, on the Test-PCD assembly, the DUT should be positioned so that its antenna is concentric with the main coil and sense coils. For example, ID-1 "Class 2" PICCs will not be centred on the Test-PCD assembly if their antenna is not centred in their ID-1 body.

This clarification will be included in the next draft amendment to ISO/IEC 10373-6.

PATENTS

25. No patent was declared by any participant on topics which were presented and discussed during this TF2 meeting.

ACTIONS FOR NEXT MEETING

26. See 10, 11, 17, 19, 20 and 21.

NEXT TF2 MEETINGS

27. The forty-second meeting will be held in Germany, in January 2014, on Wednesday 29th and Thursday 30th.

28. The forty-third meeting will be held in Switzerland, in April 2014, on Tuesday 8th and Wednesday 9th.

Distribution: WG8 and TF2 members

Pascal ROUX