

Minutes of the 19th meeting of WG8 Task Force 2

held at: Atmel Corporation
1150 E. Cheyenne Mtn. Blvd
Colorado Springs, CO 80906, USA
on: 16th to 20th June 2003

Participants:

Pascal ROUX	Convener, France
Reinhard MEINDL	Austria
Albert DOROFEEV	Belgium
Michael HEGENBARTH	Germany
Klaus SICKERT	Germany
Mickey COHEN	Israel
Hemy ITAY	Israel
Andrew ROBERTS	Italy
Hiroshi KARIBE	Japan
Susumu KUSAKABE	Japan
Mikio MUKAI	Japan
Kazushige TSURUMI	Japan
Boon Seng LIM	Singapore
Kelvin LIM	Singapore
Kok Leong ONG	Singapore
David THARM	Singapore
Ed BARRETT	USA
Francis CHRISTIAN	USA
David DRESSEN	USA

OPENING OF THE MEETING

1. The convener opened the nineteenth meeting of WG8 Task Force 2 by welcoming all the participants. He expressed special thanks to Atmel 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 participants are requested to register as TF2 members (through their national bodies) to get access to the TF2 documents on the WG8 website.

ADOPTION OF THE AGENDA

4. The agenda (document TF2 N367R1) was agreed with no modification.

APPROVAL OF THE LAST MEETING MINUTES

5. The minutes of the eighteenth meeting in Tokyo (document TF2 N366) were approved.

REVIEW OF AVAILABLE DOCUMENTS

6. Documents submitted before this meeting were as follows:

TF2 N368	Measurement data for 1.6 Mbps	(Sony)
TF2 N369	Discussion on Pros and Cons for bit rates equal to or higher than $f_c/8$	(Japan)
TF2 N370	Proposal for high bit rates specification in ISO/IEC 14443	(Japan)
TF2 N371	Proposal for high bit rates test methods	(Japan)
TF2 N372	French position on the WG8 standing document SD4	(France)
TF2 N373	French proposal of very high bit rate for ISO/IEC 14443 contactless interface	(France)
TF2 N374	Minutes of preliminary meeting to TF2 at G&D Munich 22-May-2003	(TF2 subgroup)
TF2 N375	Working Draft Amendment 2 for ISO/IEC 14443-2	(project editor)
TF2 N376	Working Draft Amendment 1 for ISO/IEC 14443-3	(project editor)
TF2 N377	Contactless Smartcard interface ISO/IEC 14443 Type A Draft additional specification for very high bit rates up to 27,12 Mbit/s	(Philips Austria)

TF2 N378 About a new reference PICC for testing the PCD load modulation reception capabilities (LETI/CEA)

7. Documents submitted during (or just after) this meeting were as follows:

TF2 N379 Comments on WG8 Standing document SD4 (Philips Austria)
TF2 N380 Proposed text for 3rd CD: ISO/IEC 10373-6/P-DAM1.3 - Identification cards - Test methods - Part 6: Proximity Cards - Draft Amendment 1: Additional PICC test methods (project editor)
TF2 N381 Measurement results for data rates up to 848 kbit/s for ISO/IEC 14443 Type A (Philips Austria)
TF2 N382 Simulation results for very high bit rates up to 27,12 Mbit/s for ISO/IEC 14443 Type A (Philips Austria)
TF2 N383 Proposals on Amendments to ISO/IEC 14443-2 and 14443-3 for data rates 212-848 kbit/s (ST and LETI/CEA)
TF2 N384 Draft RFU Policy and Working Plan (project editor)
TF2 N385 Guidelines on how to deal with the indication "Reserved for future use" in standards (project editor)
TF2 N386 Comments from U.S.A. related to: (USA)
WD 10373-1, Identification cards - Test methods - Part 1: General characteristics
TF2 N387 Further comments on RFU on the basis of the outcome of the preliminary meeting to TF2 at G&D Munich 22-May-2003 and the RFU policy as agreed at the TF2 meeting in Colorado Springs (TF2)
TF2 N388 Open Smart Card Infrastructure for Europe (tbc) Contactless Technology - Part 4: Certification (TB6 / SINCE)
TF2 N389 Test methods for ISO/IEC 14443-1, Alternating Magnetic and Electric Field (Philips Germany)

ALTERNATING MAGNETIC AND ELECTRIC FIELD TESTS IN ISO/IEC 14443-1:2000

8. The document TF2 N389 was presented by Klaus Sickert. Different options were discussed for each topic taking the following into consideration:

- it would be very difficult and long to test all possible frequencies,
- the goal of the test is to detect PICC weaknesses,
- there is no wish to amend ISO/IEC 14443-1.

Different options for H field test:

- 1 Delete clauses 4.3.5 except the test at 13,56 MHz (this would need an amendment of 14443-1)
- 2 Find the PICC resonance frequency and test only at this frequency (10,9 seconds at maximum H field); no test is required at other frequencies
- 3 Test at few particular frequencies in addition to the PICC resonance frequency
- 4 Test all frequencies with a sweep

Option 2 was chosen by TF2 as the best compromise.

The peak value of 33 times the average value may be too high for the PICC. TF2 members are requested to check this.

Different options for E field test:

- 5 Delete clauses 4.3.6 (this would need an amendment of 14443-1)
- 6 Keep clause 4.3.6 and add a note in 10373-6 that test is not required
- 7 Test at few particular frequencies in addition to the PICC resonance frequency
- 8 Test all frequencies with a sweep

Option 6 was chosen by TF2 as the best compromise

H field test at 13,56 MHz

TF2 proposed a 5 minute test with 10 cycles of 25 seconds at 12 A/m and 5 seconds at 0 A/m.

These three proposals will be added in the new amendment on RF test methods (10373-6 AMD4).

IMPROVEMENT OF RF TEST METHODS

9. Standing document 4, proposal 4

Hemy Itay mentioned he saw PCDs using resistors to make the type B modulation whose modulation index may change from 13% to 8,5% when a PICC is located at close proximity.

TF2 agreed that the proposed test may be useful and should be added in the new amendment on RF test methods (10373-6 AMD4), taking into consideration the French comment (document TF2 N372).

The coupling should be minimal between the loading coil (including its components) and the pickup coil. The load should be as linear as possible. The capacitor C3 should be small enough to have a negligible influence on rising/falling edges and overshoot.

TF2 members are requested to propose component values for this new Reference PICC and an acceptable maximum for the coupling between the two coils of this tool.

10. Standing document 4, proposal 5

The component layout of the Reference PICC for field and power measurements is not specified in the standard and may influence the results. A simple way of detecting a wrong layout or other problems is to check the R2 value after calibration of the Reference PICC.

TF2 agreed to add a warning in the new amendment on RF test methods (10373-6 AMD4) giving a range of values for R2.

The test voltage at H_{max} was discussed. At 3 V the current is higher but the power is lower than at 6 V. If the PCD passes the test at 3V, it should pass the test at 6 V. Therefore a modification is not needed.

11. Standing document 4, proposal 6

PICCs must be tested independently from PCDs. The problem mentioned in SD4 proposal 6 is the PICC activation field (which is out of our standard).

TF2 agreed to abandon this proposal.

12. Standing document 4, proposal 7

The main problem is not the present measurement method which is more accurate than the alternative one but the driving level of the signal generator which may affect the PICC resonance frequency.

TF2 agreed to add a warning in the new amendment on RF test methods (10373-6 AMD4) about this influence.

13. Standing document 4, proposal 8

The proposed six step procedure will be added in the new amendment on RF test methods (10373-6 AMD4).

14. Standing document 4, proposal 11

The document TF2 N378 was presented by Pascal Roux. The difference between the two side bands amplitude is not adjustable. An adjustment of the resonance frequency could simulate this difference, but is it useful ?

TF2 agreed to continue on this topic in order to add a test in the new amendment on RF test methods (10373-6 AMD4).

TF2 members are requested to contribute on this new Reference PICC and on the associated test method.

15. New amendment on RF test methods (10373-6 AMD4)

TF2 agreed on the following content for this new amendment:

- SD4 proposals 4, 5, 7, 8 and 11.
- Test methods for 14443-1 regarding alternating electric and magnetic field exposure,

TF2 proposed the following title for this amendment: "Additional test methods for PCD RF interface and PICC alternating field exposure".

IMPROVEMENT OF ISO/IEC 14443-3

16. Standing document 4, proposal 2

The Frame Waiting Time definition was discussed and TF2 agreed that TR1 is included in FWT. Consequently the definition of the maximum value of TR0 for frames other than ATQB should be amended according to the formula:

$$TR0_{max} = (256 * 16 / fc) * 2^{FWT} - TR1$$

TF2 members are requested to check this formula.

17. Standing document 4, proposal 3

The PICC "reset" time was discussed and TF2 confirmed that the 5 ms timing given in clause 5 of 14443-3 applies to the four cases mentioned in SD4. Consequently, two additional examples will be added in the next amendment of 14443-3:

EXAMPLE 3 : When a PICC Type A is exposed to field activation it shall be able to accept a REQA within 5 ms of unmodulated operating field.

EXAMPLE 4 : When a PICC Type B is exposed to field activation it shall be able to accept a REQB within 5 ms of unmodulated operating field.

18. Standing document 4, proposal 9

TF2 acknowledged the interest for a PCD to be able to reset PICCs by switching off then switching on the operating field. A minimum delay of 50 ms between these two events was proposed.

TF2 members are requested to check this value.

19. Standing document 4, proposal 10

The PICC type A state after protocol activation (different from the ACTIVE state defined in 14443-3) was given the name PROTOCOL state. This name will be used whenever needed, in particular in protocol test methods.

AMENDMENTS TO 14443-2, 14443-3, 14443-4 AND 10373-6 FOR BIT RATES UP TO $fc/16$

20. The documents TF2 N375, TF2 N376 and TF2 N381 were presented by Reinhard Meindl. The document TF2 N383 was presented by Andrew Roberts.

It was proposed and accepted that bits b9 to b12 of ATQA are no more proprietary but defined in 14443-3 to indicate high bit rate support. Consequently, 14443-3 AMD1 will redefine them and a warning will emphasize this modification so that countries may oppose to it if they already use these bits as proprietary.

TF2 acknowledged that 14443-4 does not need to be amended for bit rates up to $fc/16$.

Test methods will be written after CD ballot results of 14443-2 AMD2 and 14443-3 AMD1 so that they use approved texts as base documents.

The maturity check for CD ballot of these two draft amendments (WD14443-2 AMD2 and WD14443-3 AMD1) will be done by 2003-07-18.

21. Title of the new amendments

TF2 proposed the following title for these amendments: "Bit rates of $fc/64$, $fc/32$ and $fc/16$ ".

22. Patents

After final presentation of the working drafts of 14443-2 AMD2 and 14443-3 AMD1, the participants were asked whether they knew any patent in connection with the proposed solutions. None of the participants knows any patent with regard to these amendments.

FINALIZATION OF 3RD CD ISO/IEC 10373-6/AM1

23. RFU fields and values

The document TF2 N374R1 was presented by Mickey Cohen. The problem is that some companies use the RFU fields/values as if they were proprietary. Besides, some companies claim that the standard is ambiguous: what should a product do when receiving RFU fields not set to their default values ?

It was proposed to amend the standard by clarifying:

- the difference between RFU fields and RFU values,
- the proprietary fields and values,
- that a sender of RFU fields not set to default value is not compliant with the standard,
- what a receiver should do when receiving RFU values and/or RFU fields not set to default values.

Other comments were:

- should this clarification be spread wider than WG8 ?
- there is no RFU in EAL common criteria: each field has a defined value,
- restricted values might be used one day by ISO,
- some PICCs may test the RFU values and reject the transaction if they are not the default values.

The table below summarises the long discussion on the pros and cons of this work and its urgency.

Pros	Cons
<p>This clarification will increase the interoperability.</p> <p>During WG8 ad hoc meeting in London, there was interoperability problems.</p> <p>Programmers need precise guidelines to write PCD or PICC software.</p> <p>The sooner the better to clarify the standard.</p> <p>This clarification will preserve present investment: present PCDs will read future PICCs.</p>	<p>Customers think 14443 is stable; this work will break this image.</p> <p>Do we really need to amend the standard?</p>

TF2 finally decided:

- to remove RFU tests from present amendments on protocol test methods,
- to start the high speed amendments independently from RFU clarification,
- to prepare independent amendments on RFU clarification and the associated test methods.

24. The project editor will prepare a new revision of the third committee draft amendment on PICC protocol test methods (3rd CD10373-6 AMD1) by removing the RFU tests.

25. Title of the new amendments on RFU clarification

TF2 proposed the following title for these amendments: " Clarification of RFU value handling".

FINALIZATION OF WD ISO/IEC 10373-6/AM3

26. The project editor will prepare a new revision of the working draft amendment on PCD protocol test methods (WD10373-6 AMD3) by removing the RFU tests.

The maturity check for CD ballot of this draft amendment will be done by correspondence.

AMENDMENTS TO 14443-2, 14443-3, 14443-4 AND 10373-6 FOR BIT RATES EQUAL TO OR HIGHER THAN $f_c/8$

27. The documents TF2 N368 and TF2 N369 were presented by Kazushige Tsurumi and Susumu Kusakabe. After some technical clarifications and some discussions on the applications which will use bit rates higher than $f_c/8$, TF2 confirmed the consensus to work on these bit rates.

28. The documents TF2 N370 and TF2 N371 were then presented by Kazushige Tsurumi. Some problems at bit rates $f_c/2$ (rising time, falling time, overshoot) and f_c (DC component when a long series of identical bits is sent by the PCD) were discussed. Besides, the convener pointed out that a multiplicity of options is not the goal of a standard, i.e. that only one solution should be chosen for each bit rate.

It was confirmed that Sony have no patents on the proposed solutions. Besides, none of the participants knows any patent with regard to the proposed solutions.

29. The document TF2 N371 (based on a Leti / STMicroelectronics contribution) was presented by Andrew Roberts. The main difference with lower bit rates RF interface is the multilevel modulation which allows a higher bit rate in the same bandwidth.

It was confirmed that Leti and STMicroelectronics have no patents on the proposed solutions. Besides, none of the participants knows any patent with regard to the proposed solutions.

30. The documents TF2 N377 and TF2 N382 were presented by Reinhard Meindl. A multilevel phase modulation is proposed which also allows a higher bit rate in the same bandwidth.

It was confirmed that Philips have no patents on the proposed solutions. Besides, none of the participants knows any patent with regard to the proposed solutions.

31. Title of the new amendments

TF2 proposed the following title for these amendments: "Bit rates of $f_c/8$ and higher".

32. Task list for bit rates of $f_c/8$ and higher

The following task list was agreed so that technical contributions may be compared during next meeting.

- Spectra for the different proposed PCD modulation methods and bit rates using the same parameters:
 - Bit rates: only $fc/8$, $fc/4$, $fc/2$, fc , $2 \times fc$ are considered.
 - Data length: 10 ms of random data whatever the bit rate
 - Delay between messages: 10 ms
 - Measurement method: Quasi-Peak
 - Level of the unmodulated carrier used as reference level
- Influence of bandwidth (PCD Q factor, PICC Q factor) on bit rate
- Expected communication range

DISCUSSION ON X-RAYS TESTS

33. The document TF2 N386 was presented by David Dressen. It was acknowledged that present X-rays tests use a very small dose which does not represent realistic cases. It was proposed either to remove this test or to increase the dose.

NEXT TF2 MEETING

34. The twentieth meeting will be held in Paris, France in November 2003 from Thursday 27th to Friday 28th.

Distribution: WG8 and TF2 members

Pascal ROUX