



**Smart Cards;
Test specification for the
Single Wire Protocol (SWP) interface;
Part 2: UICC features
(Release 10)**

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Contents

Intellectual Property Rights	10
Foreword.....	10
Introduction	10
1 Scope	11
2 References	11
2.1 Normative references	11
2.2 Informative references	12
3 Definitions, symbols and abbreviations	12
3.1 Definitions	12
3.2 Symbols	13
3.3 Abbreviations	13
3.4 Formats	14
3.4.1 Format of the table of optional features	14
3.4.2 Format of the applicability table	14
3.4.3 Status and Notations	14
4 Test environment	15
4.1 Table of optional features	15
4.2 Applicability table	16
4.3 Information to be provided by the DUT supplier	21
4.4 Test equipment	21
4.4.1 Measurement/setting uncertainties	21
4.4.2 Default conditions for DUT operation	22
4.4.2.1 Temperature	22
4.4.2.2 TS 102 221 interface contacts (CLK, RST, I/O) and contact Vcc	22
4.4.2.3 TS 102 600 interface contacts (IC_DP, IC_DM)	23
4.4.2.4 TS 102 613 interface contact (SWIO)	23
4.4.2.5 Status of UICC interfaces	24
4.4.2.6 Characteristics of LLC's	24
4.4.2.6.1 ACT LLC	24
4.4.2.6.2 SHDLC LLC	24
4.4.2.6.3 CLT LLC	24
4.4.3 Minimum/maximum conditions for DUT operation	24
4.4.3.1 Temperature	24
4.4.3.2 Contact Vcc	24
4.5 Test execution	25
4.5.1 Parameter variations	25
4.5.2 Execution requirements	25
4.6 Pass criterion	25
5 Test cases	26
5.1 Principle of the Single Wire Protocol	26
5.2 System architecture	26
5.2.1 General overview	26
5.2.2 TS 102 221 support	26
5.2.2.1 Conformance requirements	26
5.2.3 Configurations	26
5.2.3.1 Conformance requirements	26
5.2.3.2 Test case 1: Global Interface bytes of the ATR	27
5.2.3.2.1 Test execution	27
5.2.3.2.2 Initial conditions	27
5.2.3.2.3 Test procedure	27
5.2.3.3 Test case 2: interaction with TS 102 221 interface - SWP activation while the UICC receives data	27
5.2.3.3.1 Test execution	27

5.2.3.3.2	Initial conditions	27
5.2.3.3.3	Test procedure	27
5.2.3.4	Test case 3: interaction with TS 102 221 interface - SWP activation while the UICC sends data	28
5.2.3.4.1	Test execution	28
5.2.3.4.2	Initial conditions	28
5.2.3.4.3	Test procedure	28
5.2.4	Interaction with other interfaces	28
5.2.4.1	Conformance requirements	28
5.2.4.2	Test case 1: interaction with TS 102 221 interface - TS 102 221 clock stop	28
5.2.4.2.1	Test execution	28
5.2.4.2.2	Initial conditions	29
5.2.4.2.3	Test procedure	29
5.2.4.3	Test case 2: interaction with TS 102 221 interface - TS 102 221 reset	29
5.2.4.3.1	Test execution	29
5.2.4.3.2	Initial conditions	29
5.2.4.3.3	Test procedure	29
5.2.4.4	Test case 3: interaction with TS 102 221 interface - SWP deactivation while the UICC receives data	30
5.2.4.4.1	Test execution	30
5.2.4.4.2	Initial conditions	30
5.2.4.4.3	Test procedure	30
5.2.4.5	Test case 4: interaction with TS 102 221 interface - SWP deactivation while the UICC sends data	30
5.2.4.5.1	Test execution	30
5.2.4.5.2	Initial conditions	30
5.2.4.5.3	Test procedure	31
5.2.4.6	Test case 5: interaction with TS 102 221 interface - reset SWP while the UICC receives data	31
5.2.4.6.1	Test execution	31
5.2.4.6.2	Initial conditions	31
5.2.4.6.3	Test procedure	31
5.2.4.7	Test case 6: interaction with TS 102 221 interface - reset SWP while the UICC sends data	32
5.2.4.7.1	Test execution	32
5.2.4.7.2	Initial conditions	32
5.2.4.7.3	Test procedure	32
5.2.4.8	Test case 7: interaction with TS 102 221 interface - activate SWP in TS 102 221 clock stop	32
5.2.4.8.1	Test execution	32
5.2.4.8.2	Initial conditions	32
5.2.4.8.3	Test procedure	33
5.3	Physical characteristics	33
5.3.1	Temperature range for card operations	33
5.3.1.1	Conformance requirements	33
5.3.2	Contacts	33
5.3.2.1	Provision of contacts	33
5.3.2.1.1	Conformance requirements	33
5.3.2.2	Contact activation and deactivation	33
5.3.2.2.1	Conformance requirements	33
5.3.2.3	Interface activation	34
5.3.2.3.1	Conformance requirements	34
5.3.2.3.2	Test case 1: initial activation in low power mode	35
5.3.2.3.3	Test case 2: initial activation in low power mode with corrupted frames	35
5.3.2.3.4	Test case 3: no activation	36
5.3.2.3.5	Void	36
5.3.2.3.6	Test case 5: full power mode activation	36
5.3.2.3.7	Test case 6: low power mode activation with re-transmission of ACT_SYNC	37
5.3.2.3.8	Test case 7: full power mode activation with re-transmission of ACT_SYNC	37
5.3.2.3.9	Void	38
5.3.2.3.10	Test case 9: low power mode activation with multiple re-transmission of ACT_SYNC	38
5.3.2.3.11	Test case 10: full power mode activation with re-transmission of ACT_READY	38
5.3.2.3.12	Test case 11: full power mode activation with multiple re-transmission of ACT_SYNC	39
5.3.2.3.13	Test case 12: subsequent activation in low power mode	40
5.3.2.3.14	Test case 13: subsequent activation in full power mode	40
5.3.2.3.15	Void	41
5.3.2.4	Behaviour of a UICC in a terminal not supporting SWP	41

5.3.2.4.1	Conformance requirements.....	41
5.3.2.4.2	Test case 1: detect terminal not supporting SWP by TERMINAL CAPABILITIES, classes B and C	41
5.3.2.4.3	Test case 2: detect terminal not supporting SWP by TERMINAL CAPABILITIES, class A.....	41
5.3.2.5	Behaviour of a terminal connected to a UICC not supporting SWP	42
5.3.2.6	Inactive contacts.....	42
5.4	Electrical characteristics.....	42
5.4.1	Operating conditions.....	42
5.4.1.1	Operating conditions	42
5.4.1.2	Supply voltage classes.....	42
5.4.1.2.1	Conformance requirements.....	42
5.4.1.2.2	Test case 1: TS 102 221 voltage classes B and C support	42
5.4.1.3	Vcc (C1) low power mode definition.....	43
5.4.1.3.1	Conformance requirements.....	43
5.4.1.3.2	Test case 1: operation in low power mode	43
5.4.1.4	Signal S1	44
5.4.1.4.1	Conformance requirements.....	44
5.4.1.4.2	Test case 1: S1 communication in voltage class B	44
5.4.1.4.3	Test case 2: S1 communication in voltage class C, full power mode	45
5.4.1.4.4	Test case 3: S1 communication in low power mode.....	46
5.4.1.5	Signal S2	47
5.4.1.5.1	Signal S2.....	47
5.4.1.5.2	Operating current for S2	47
5.5	Physical transmission layer	51
5.5.1	S1 Bit coding and sampling time	51
5.5.1.1	Conformance requirements	51
5.5.1.2	Test case 1: communication with timing variation, default bit duration	51
5.5.1.2.1	Test execution.....	51
5.5.1.2.2	Initial conditions.....	51
5.5.1.2.3	Test procedure	52
5.5.1.3	Test case 2: communication with timing variation, extended bit duration.....	52
5.5.1.3.1	Test execution.....	52
5.5.1.3.2	Initial conditions.....	52
5.5.1.3.3	Test procedure	53
5.5.1.4	Test case 3: S1 rise and fall time.....	53
5.5.1.4.1	Test execution.....	53
5.5.1.4.2	Initial conditions.....	53
5.5.1.4.3	Test procedure	54
5.5.1.5	Test case 4: measurement of C6 input capacitance	54
5.5.1.5.1	Test execution.....	54
5.5.1.5.2	Initial conditions.....	54
5.5.1.5.3	Test procedure	54
5.5.1.5.4	Example for C6 input capacitance test implementation (informative)	54
5.5.1.6	Test case 5: communication with variation in bit duration	55
5.5.1.6.1	Test execution.....	55
5.5.1.6.2	Initial conditions.....	55
5.5.1.6.3	Test procedure	55
5.5.2	S2 switching management	55
5.5.2.1	Conformance requirements	55
5.5.2.2	Test case 1: S2 switching management.....	55
5.5.2.2.1	Test execution.....	55
5.5.2.2.2	Initial conditions.....	55
5.5.2.2.3	Test procedure	55
5.5.3	SWP interface states management	56
5.5.3.1	Conformance requirements	56
5.5.3.2	Test case 1: SWP interface states management by the UICC	56
5.5.3.2.1	Test execution.....	56
5.5.3.2.2	Initial conditions.....	56
5.5.3.2.3	Test procedure	56
5.5.4	Power mode states/transitions and Power saving mode.....	57
5.5.4.1	Conformance requirements	57
5.5.4.2	Test case 1: power states in low power mode (ACT_POWER_MODE)	58

5.5.4.2.1	Test execution.....	58
5.5.4.2.2	Initial conditions.....	58
5.5.4.2.3	Test procedure.....	58
5.5.4.3	Test case 2: power states in low power mode (non-ACT)	58
5.5.4.3.1	Test execution.....	58
5.5.4.3.2	Initial conditions.....	58
5.5.4.3.3	Test procedure.....	58
5.5.4.4	Test case 3: power states in full power mode, without TS 102 221	58
5.5.4.4.1	Test execution.....	58
5.5.4.4.2	Initial conditions.....	59
5.5.4.4.3	Test procedure.....	59
5.5.4.5	Test case 4: power saving mode with TS 102 221 interface - restart TS 102 221 interface first	59
5.5.4.5.1	Test execution.....	59
5.5.4.5.2	Initial conditions.....	59
5.5.4.5.3	Test procedure.....	60
5.5.4.6	Test case 5: power saving mode with TS 102 221 interface - restart TS 102 613 interface first	60
5.5.4.6.1	Test execution.....	60
5.5.4.6.2	Initial conditions.....	60
5.5.4.6.3	Test procedure.....	60
5.5.4.7	Test case 6: power saving mode with TS 102 600 interface - restart TS 102 600 interface first	61
5.5.4.7.1	Test execution.....	61
5.5.4.7.2	Initial conditions.....	61
5.5.4.7.3	Test procedure.....	61
5.5.4.8	Test case 7: power saving mode with TS 102 600 interface - restart TS 102 613 interface first	61
5.5.4.8.1	Test execution.....	61
5.5.4.8.2	Initial conditions.....	61
5.5.4.8.3	Test procedure.....	62
5.5.4.9	Void.....	62
5.5.4.10	Test case 9: power saving mode in SUSPENDED, with TS 102 221 interface restarted first	62
5.5.4.10.1	Test execution.....	62
5.5.4.10.2	Initial conditions.....	62
5.5.4.10.3	Test procedure.....	62
5.5.4.10	Test case 11: power saving mode in SUSPENDED, with TS 102 221 interface restarted after TS 102 613 interface	63
5.5.4.10.1	Test execution.....	63
5.5.4.10.2	Initial conditions.....	63
5.5.4.11.3	Test procedure.....	63
5.6	Data link layer	63
5.6.1	Overview	63
5.6.2	Medium Access Control (MAC) layer.....	64
5.6.2.1	Bit order	64
5.6.2.1.1	Conformance requirements.....	64
5.6.2.1.2	Void.....	64
5.6.2.2	Structure.....	64
5.6.2.2.1	Conformance requirements.....	64
5.6.2.2.2	Test case 1: interpretation of incorrectly formed frames - ACT LLC	64
5.6.2.2.3	Test case 2: interpretation of incorrectly formed frames - SHDLC RSET frames	65
5.6.2.2.4	Test case 3: interpretation of incorrectly formed frames - SHDLC I-frames	65
5.6.2.2.5	Test case 4: communication with frames - idle bits and wakeup sequence	66
5.6.2.3	Bit stuffing	66
5.6.2.3.1	Conformance requirements.....	66
5.6.2.3.2	Test case 1: behaviour of UICC with bit stuffing in frame.....	67
5.6.2.4	Error detection.....	67
5.6.2.4.1	Conformance requirements.....	67
5.6.2.4.2	Test case 1: RSET with CRC error.....	67
5.6.3	Supported LLC layers	68
5.6.3.1	Supported LLC layers	68
5.6.3.1.1	Conformance requirements.....	68
5.6.3.1.2	Test case 1: support of ACT LLC and ACT LPDU structure.....	68
5.6.3.1.3	Test case 2: support of SHDLC LLC and SHDLC LPDU structure	68
5.6.3.2	Interworking of the LLC layers.....	69
5.6.3.2.1	Conformance requirements.....	69

5.6.3.2.2	Test case 1: error handling of ACT LLC on reception of corrupted frame, after SWIO activation	69
5.6.3.2.3	Test case 2: ignore ACT LLC frame reception after the SHDLC link establishment	70
5.6.3.2.4	Test case 3: ignore ACT LLC frame reception in CLT session.....	70
5.6.3.2.5	Test case 4: CLT session during SHDLC communication	71
5.6.3.2.6	Test case 5: closing condition of CLT session whereas SHDLC link has been established before CLT session.....	71
5.6.3.2.7	Test case 6: closing condition of CLT session whereas SHDLC link has not been established before CLT session.....	72
5.6.3.2.8	Test case 7: interpretation of corrupted frames - single SHDLC frame	72
5.6.3.2.9	Void.....	72
5.6.3.2.10	Test case 9: interpretation of corrupted frames - CLT frames.....	72
5.6.3.2.11	Test case 10: first non-ACT frame sent by CLF - initial interface activation.....	73
5.6.3.2.12	Test case 11: first non-ACT frame sent by CLF - subsequent interface activation	73
5.6.4	ACT LLC definition	74
5.6.4.1	ACT LLC definition.....	74
5.6.4.1.1	Conformance requirements.....	74
5.6.4.1.2	Test case 1: structure of ACT LPDU - full power mode	74
5.6.4.1.3	Test case 2: structure of ACT LPDU - low power mode.....	75
5.6.4.1.4	Test case 3: behaviour of UICC on reception of ACT frames - values of INF bit	75
5.6.4.1.5	Test case 4: RFU values in ACT_INFORMATION field	76
5.6.4.1.6	Test case 5: extended bit durations as per ACT_INFORMATION field.....	76
5.6.4.1.7	Test case 6-1: RFU values in ACT_INFORMATION field.....	77
5.6.4.2	SYNC_ID verification process.....	77
5.6.4.2.1	Conformance requirements.....	77
5.7	SHDLC LLC definition.....	77
5.7.1	SHDLC overview	77
5.7.1.1	Conformance requirements	77
5.7.1.2	Test Case 1: data passed up to the next layer	77
5.7.1.2.1	Test execution.....	77
5.7.1.2.2	Initial conditions.....	78
5.7.1.2.3	Test procedure	78
5.7.1.3	Test Case 2: error management, UICC sending I-Frame	78
5.7.1.3.1	Test execution.....	78
5.7.1.3.2	Initial Conditions.....	78
5.7.1.3.3	Test procedure	78
5.7.1.4	Test Case 3: error management.....	78
5.7.1.4.1	Test execution.....	78
5.7.1.4.2	Initial Conditions.....	78
5.7.1.4.3	Test procedure	79
5.7.2	Endpoints	79
5.7.2.1	Conformance requirements	79
5.7.3	SHDLC frames types.....	79
5.7.3.1	Conformance requirements	79
5.7.4	Control Field.....	79
5.7.4.1	Conformance requirements	79
5.7.4.2	I-Frames coding	79
5.7.4.2.1	Conformance requirements.....	79
5.7.4.3	S-Frames coding	79
5.7.4.3.1	Conformance requirements.....	79
5.7.4.4	U-Frames coding.....	80
5.7.4.4.1	Conformance requirements.....	80
5.7.5	Changing sliding window size and endpoint capabilities	80
5.7.5.1	Conformance requirements	80
5.7.5.2	RSET frame payload.....	80
5.7.5.2.1	Conformance requirements.....	80
5.7.5.3	UA frame payload.....	80
5.7.5.3.1	Conformance requirements.....	80
5.7.5.3.2	Void.....	80
5.7.6	SHDLC context	80
5.7.6.1	Conformance requirements	80
5.7.6.2	Constants.....	80

5.7.6.2.1	Conformance requirements.....	80
5.7.6.3	Variables	81
5.7.6.3.1	Conformance requirements.....	81
5.7.6.4	Initial Reset state	81
5.7.6.4.1	Conformance requirements.....	81
5.7.6.4.2	Test case 1: initial state at link reset - reset by the UICC	81
5.7.6.4.3	Test case 2: initial state at link reset - reset by the terminal simulator	81
5.7.7	SHDLC sequence of frames.....	82
5.7.7.1	Conformance requirements	82
5.7.7.2	Nomenclature	83
5.7.7.2.1	Conformance requirements.....	83
5.7.7.3	Link establishment with default sliding window size	83
5.7.7.3.1	Conformance requirements.....	83
5.7.7.3.2	Test Case 1: link establishment by the UICC	83
5.7.7.3.3	Test Case 2: link establishment by the terminal simulator	84
5.7.7.3.4	Test case 3: discard frames before initialization.....	85
5.7.7.3.5	Test case 4: connection time - reset by UICC	85
5.7.7.3.6	Test case 5: connection time - reset by terminal simulator.....	86
5.7.7.3.7	Test case 6: UICC discards I-frames and S-frames during link establishment	86
5.7.7.3.8	Test case 7: requesting unsupported window size - link establishment by terminal simulator.....	87
5.7.7.3.9	Test Case 8: requesting unsupported SREJ support - link establishment by terminal simulator	87
5.7.7.3.10	Test Case 9: requesting unsupported window size and SREJ support - link establishment by terminal simulator.....	87
5.7.7.3.11	Test Case 10: forcing lower window size - link establishment by the UICC	88
5.7.7.3.12	Test Case 11: forcing SREJ not used - link establishment by the UICC	88
5.7.7.3.13	Test Case 12: forcing lower window size and SREJ not used - link establishment by the UICC	89
5.7.7.3.14	Test case 13: discard buffered frames on link re-establishment	89
5.7.7.4	Link establishment with custom sliding window size	90
5.7.7.4.1	Conformance requirements.....	90
5.7.7.5	Data flow	90
5.7.7.5.1	Conformance requirements.....	90
5.7.7.5.2	Test case 1: I-frame transmission	90
5.7.7.5.3	Test case 2: I-frame reception - single I-Frame reception	91
5.7.7.5.4	Test case 3: I-frame reception - multiple I-Frame reception	91
5.7.7.5.5	Test case 4: piggybacking.....	92
5.7.7.6	Reject (go N back)	93
5.7.7.6.1	Conformance requirements.....	93
5.7.7.6.2	Test case 1: REJ transmission	93
5.7.7.6.3	Test case 2: REJ transmission - multiple I-frames received	94
5.7.7.6.4	Test case 3: REJ reception.....	94
5.7.7.7	Last Frame Loss	95
5.7.7.7.1	Conformance requirements.....	95
5.7.7.7.2	Test Case 1: retransmission of a single frame	95
5.7.7.7.3	Test Case 2: retransmission of multiple frames.....	95
5.7.7.8	Receive and not ready	96
5.7.7.8.1	Conformance requirements.....	96
5.7.7.8.2	Test case 1: RNR reception	96
5.7.7.8.3	Test case 2: Empty I-frame transmission.....	97
5.7.7.9	Selective reject	98
5.7.7.9.1	Conformance requirements.....	98
5.7.7.9.2	Test case 1: SREJ transmission	98
5.7.7.9.3	Test case 2: SREJ transmission - multiple I-frames received	98
5.7.7.9.4	Test case 3: SREJ reception.....	98
5.7.7.9.5	Void	99
5.7.8	Implementation	99
5.7.8.1	Conformance requirements	99
5.7.8.2	Information Frame emission	99
5.7.8.2.1	Conformance requirements.....	99
5.7.8.3	Information Frame reception.....	99
5.7.8.3.1	Conformance requirements.....	99
5.7.8.4	Reception Ready Frame reception	99

5.7.8.4.1	Conformance requirements.....	99
5.7.8.5	Reject Frame reception	100
5.7.8.5.1	Conformance requirements.....	100
5.7.8.6	Selective Reject Frame reception.....	100
5.7.8.6.1	Conformance requirements.....	100
5.7.8.7	Acknowledge timeout	100
5.7.8.7.1	Conformance requirements.....	100
5.7.8.8	Guarding/transmit timeout	100
5.7.8.8.1	Conformance requirements.....	100
5.8	CLT LLC definition	100
5.8.1	System Assumptions.....	100
5.8.2	Overview	100
5.8.3	Supported RF protocols	100
5.8.3.1	Conformance requirements	100
5.8.4	CLT Frame Format	101
5.8.4.1	Conformance requirements	101
5.8.4.2	Test case 1: Padding of CLT PAYLOAD in Type A aligned structure	101
5.8.4.2.1	Test execution.....	101
5.8.4.2.2	Initial conditions.....	101
5.8.4.2.3	Test procedure	101
5.8.5	CLT Command Set	102
5.8.5.1	Conformance requirements	102
5.8.5.2	Test case 1: CLT commands, ISO/IEC 14443 Type A	102
5.8.5.2.1	Test execution.....	102
5.8.5.2.2	Initial conditions.....	102
5.8.5.2.3	Test procedure	103
5.8.5.3	Test case 2: CLT commands, ISO/IEC 18092	103
5.8.5.3.1	Test execution.....	103
5.8.5.3.2	Initial conditions.....	103
5.8.5.3.3	Test procedure	104
5.8.6	CLT Frame Interpretation	104
5.8.6.1	CLT frames with Type A aligned DATA_FIELD	104
5.8.6.1.1	Conformance requirements.....	104
5.8.6.2	Handling of DATA_FIELD by the CLF	104
5.8.6.2.1	Conformance requirements.....	104
5.8.6.3	Handling of ADMIN_FIELD	105
5.8.6.3.1	CL_PROTO_INF(A).....	105
5.8.6.3.2	CL_PROTO_INF(F).....	106
5.8.6.3.3	CL_GOTO_INIT and CL_GOTO_HALT.....	106
5.8.7	CLT Protocol Rules	106
5.8.7.1	Rules for the CLF.....	106
5.8.7.2	Rules for the UICC.....	106
5.8.7.2.1	Conformance requirements.....	106
5.9	Timing and performance	106
Annex A (informative):	State diagrams.....	107
A.1	SDL symbols definition.....	107
A.2	Initial SWP interface activation	108
A.3	SHDLC operation.....	110
Annex B (informative):	Bibliography	118
Annex C (informative):	Core specification version information.....	119
Annex D (informative):	Change history	120
History		122

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Smart Card Platform (SCP).

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The present document is part 2 of a multi-part deliverable covering the Test specification for the Single Wire Protocol (SWP) interface, as identified below:

Part 1: "Terminal features";

Part 2: "UICC features".

Introduction

The present document defines test cases for the UICC relating to Single Wire Protocol (SWP). SWP is the communication interface between the UICC and a contactless frontend (CLF) as specified in TS 102 613 [1].

The aim of the present document is to ensure interoperability between the terminal and the UICC independently of the respective manufacturer, card issuer or operator.

1 Scope

The present document covers the minimum characteristics which are considered necessary for the UICC in order to provide compliance to TS 102 613 [1].

The present document specifies the test cases for:

- the physical layer of the interface CLF - UICC;
- the electrical interface of the UICC;
- the initial communication establishment CLF - UICC;
- the data link layer.

Test cases for the terminal relating to TS 102 613 [1] and test cases for the host controller interface (HCI) covering both terminal and UICC are out of scope of the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

- In the case of a reference to a TC SCP document, a non specific reference implicitly refers to the latest version of that document in the same Release as the present document.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- | | |
|-----|--|
| [1] | ETSI TS 102 613: "Smart Cards; UICC - Contactless Front-end (CLF) Interface; Part 1: Physical and data link layer characteristics. |
| [2] | ETSI TS 102 221: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics". |
| [3] | ETSI TS 102 600: "Smart Cards; UICC-Terminal interface; Characteristics of the USB interface". |
| [4] | ETSI TS 102 622: " Smart Cards; UICC - Contactless Front-end (CLF) Interface; Host Controller Interface (HCI)". |
| [5] | ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements". |
| [6] | ISO/IEC 14443-3: "Identification cards - Contactless integrated circuit cards - Proximity cards - Part 3: Initialization and anticollision". |
| [7] | Void. |
| [8] | ISO/IEC 18092: "Information technology - Telecommunications and information exchange between systems - Near Field Communication - Interface and Protocol (NFCIP-1)". |
| [9] | ISO/IEC 13239: "Information technology - Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures". |

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TS 102 613 [1] and the following apply:

corrupted frame: SWP frame which is well-formed with respect to the MAC layer, with the exception that the CRC16 in the frame does not match with the CRC16 result calculated over the payload

NOTE: This frame has at least 1 byte payload. Used by the TE to represent the situation where the DUT receives a corrupted frame (unless otherwise specified).

Non-occurrence RQ: RQ which has been extracted from TS 102 613 [1], but which indicates a situation which should never occur

NOTE: The consequence is that such RQs cannot be explicitly tested.

Nomenclature used for tests involving SHDLC LLC:

For SHDLC link establishment, following definitions apply:

- Terminal simulator transmits RSET:
 - RSET(): RSET frame without payload.
 - RSET(Ws=w): RSET frame with one byte payload.
 - RSET(Ws=w, SREJ=S): RSET frame with two bytes payload. For the endpoint capabilities byte, SREJ=0 represents the value 0x00, SREJ=1 represents the value 0x01.
- UICC transmits RSET:
 - RSET: RSET frame with any valid payload.
 - RSET(): RSET frame without payload.
 - RSET(Ws=w): RSET frame with one byte payload.
 - RSET(Ws=w, SREJ=S): RSET frame with two bytes payload. For the endpoint capabilities byte, SREJ=0 represents the value 0x00, SREJ=1 represents the value 0x01.

For every calculation on NS0_T, NS0_S or NR in the test procedures use modulo 8.

Representative SWP frame exchange procedure: sequence of SWP frames exchanged between TE and DUT

NOTE: Used by the TE to cause SWP communication traffic where needed in test procedures. This sequence shall provide the following characteristics, unless otherwise specified or more precisely stated in test procedures:

- Amount of data exchanged between TE and DUT at least 500 byte (with respect to the MAC layer), valid for both directions.
- Some half-duplex SWP communication.
- Some full-duplex SWP communication.
- Frame transmission started by the TE while the DUT yet sends a frame.
- Exchanged data shall enforce occurrence of some bit stuffing in both directions.
- Some variation of frame length sent from the TE.

The DUT provider shall provide sufficient information to allow this procedure to be defined.

Representative USB frame exchange procedure: sequence of USB frames exchanged between TE and DUT

NOTE: Used by the TE to cause USB communication traffic where needed in test procedures.

User: logical or physical entity which controls the test equipment in a way that it is able to trigger activities of the DUT

3.2 Symbols

For the purposes of the present document, the symbols given in TS 102 613 [1] and the following apply:

The characters x, y, z represent any values for the current test, unless otherwise specified.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TS 102 613 [1] and the following apply:

AC	Alternating Current
CLK	Clock
CLT	ContactLess Tunnelling
CRC	Cyclic Redundancy Code
DUT	Device Under Test
ES	SHDLC endpoint of test equipment (i.e. the terminal simulator)
EUT	SHDLC Endpoint Under Test (i.e. the DUT)
FFS	For Further Study
GND	Ground
ISO	International Organization for Standardization
NR	Number of next information frame to Receive
RF	Radio Frequency
RNR	Receive Not Ready
RQ	Conformance requirement
RR	Receive Ready
RSET	ReSET
RST	ReSeT
SDL	Specification and Description Language
SHDLC	Simplified High Level Data Link Control
SREJ	Selective Reject
SWIO	Single Wire protocol Input/Output
SWP	Single Wire Protocol
T	Terminal, i.e. the terminal simulator (shortcut used only in test procedure tables)
TE	Test Equipment
UA	Unnumbered Acknowledgment
WS	Window Size