Radio Frequency Physical Layer (RFPHY)

***Bluetooth*® Implementation Conformance Statement (ICS) Proforma**

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Contents

1 Identification of the implementation 4
1.1 Implementation Under Test (IUT) identification 4
1.2 Capability Statement 5
1.3 Channel sounding capabilities 6
2 References 7
3 Revision history and acknowledgments 8

1 Identification of the implementation

1.1 Implementation Under Test (IUT) identification

Identification of the Implementation Under Test (IUT) is to be filled in to provide as much detail as possible regarding version numbers and configuration options.

An ICS contact person to respond to queries regarding information supplied in this ICS proforma is named in the Declaration of Compliance: Summary of Selected Specifications in Implementation.

1.2 Capability Statement

Table 1: Bluetooth LE RF Capabilities

Item	Capability	Reference	Status
1	LE Transmitter	[1] 3	C.1
2	LE Receiver	[1] 4	C.1
3	LE Transceiver	[1] 3, 4	C.1
4	LE 2M PHY	[2] 3, 4	C.2
5	Stable Modulation Index - Transmitter	[2] 3.1.1	C.3
6	Stable Modulation Index - Receiver	[2] 3.1.1	C.4
7	LE Coded PHY	[2] 3, 4	C.2
8	Transmitting Constant Tone Extensions	[3] 5	C.10
9	2 µs Antenna Switching During Constant Tone Extension Transmission (AoD)	[3] 5	C.5
10	1 µs Antenna Switching During Constant Tone Extension Transmission (AoD)	[3] 5	C.6
11	2 µs Antenna Sampling During Constant Tone Extension Reception (AoD)	[3] 5	C.11
12	2 µs Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)	[3] 5	C.7
13	1 µs Antenna Sampling During Constant Tone Extension Reception (AoD)	[3] 5	C.7
14	1 µs Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)	[3] 5	C.8
15	Power Class 1	[4] 4.6	C.9
16	Channel Sounding	[5] 1	C.12

C.1: Mandatory to support at least one. Note: Selecting both RFPHY 1/1 “LE Transmitter” and RFPHY 1/2 “LE Receiver” is equivalent to selecting RFPHY 1/3 “LE Transceiver” and vice versa.

C.2: Optional IF CORE 1a/50 “Controller Core v5.0 or later”, otherwise Excluded.

C.3: Optional IF CORE 1a/50 “Controller Core v5.0 or later” AND (RFPHY 1/1 “LE Transmitter” OR RFPHY 1/3 “LE Transceiver”), otherwise Excluded.

C.4: Optional IF CORE 1a/50 “Controller Core v5.0 or later” AND (RFPHY 1/2 “LE Receiver” OR RFPHY 1/3 “LE Transceiver”), otherwise Excluded.

C.5: Optional IF RFPHY 1/8 “Transmitting Constant Tone Extensions”, otherwise Excluded.

C.6: Optional IF RFPHY 1/9 “2 µs Antenna Switching During Constant Tone Extension Transmission (AoD)”, otherwise Excluded.

C.7: Optional IF RFPHY 1/11 “2 µs Antenna Sampling During Constant Tone Extension Reception (AoD)”, otherwise Excluded.

C.8: Mandatory IF RFPHY 1/12 “2 µs Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)” AND RFPHY 1/13 “1 µs Antenna Sampling During Constant Tone Extension Reception (AoD)”, otherwise Excluded.

C.9: Optional IF (CORE 1a/50 “Controller Core v5.0 or later” OR CORE 1c/1 “Core Specification Addendum 5”) AND (RFPHY 1/1 “LE Transmitter” OR RFPHY 1/3 “LE Transceiver”), otherwise Excluded.

C.10: Optional IF CORE 1a/51 “Controller Core v5.1 or later” AND (RFPHY 1/1 “LE Transmitter” OR RFPHY 1/3 “LE Transceiver”), otherwise Excluded.

C.11: Optional IF CORE 1a/51 “Controller Core v5.1 or later” AND (RFPHY 1/2 “LE Receiver” OR RFPHY 1/3 “LE Transceiver”), otherwise Excluded.

C.12: Optional IF CORE 1a/60 “Controller Core v6.0 or later”, otherwise Excluded.

Table 2: No longer used

1.3 Channel sounding capabilities

Table 3: Channel Sounding Capabilities

Prerequisite: ((RFPHY 1/1 “LE Transmitter” AND RFPHY 1/2 “LE Receiver”) OR RFPHY 1/3 “LE Transceiver”) AND RFPHY 1/16 “Channel Sounding”

Item	Capability	Reference	Status
1	CS Initiator	[6] 4.6.41 [7] 4.3	O
2	CS Reflector	[6] 4.6.41 [7] 4.3	O
3	CS Antenna Array	[5] 5.3	O
4	CS Phase-Based Measurements	[5] 6	M
5	CS Mode-1	[5] 3.4	M
6	CS Mode-2	[5] 3.4	M
7	CS Mode-3	[5] 3.4	O
8	TX/SNR	[5] 3.1.3	O
9	LE 2M 2BT	[5] 3, 4	C.1

C.1: Optional IF RFPHY 1/4 “LE 2M PHY”, otherwise Excluded.

2 References

[1] Specification of the Bluetooth System, Physical Layer Specification (PHY) Volume 6, Part A, Version 4.0 or later

[2] Specification of the Bluetooth System, Physical Layer Specification (PHY) Volume 6, Part A, Version 5.0 or later

[3] Specification of the Bluetooth System, Physical Layer Specification (PHY) Volume 6, Part A, Version 5.1 or later

[4] Specification of the Bluetooth System, Link Layer Specification (PHY) Volume 6, Part B, Version 4.2 or later

[5] Specification of the Bluetooth System, Physical Layer Specification (PHY) Volume 6, Part A, Version 6.0 or later

[6] Specification of the Bluetooth System, Link Layer Specification (LL) Volume 6, Part B, Version 6.0 or later

[7] Specification of the Bluetooth System, Channel Sounding Specification (CS) Volume 6, Part H, Version 6.0 or later

3 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
	0.5d1	2007-06-12	Initial ULP RF-PHY ICS Draft
	0.5d2	2007-10-22	First revision including device category mapping
	0.5d3	2007-10-30	Second revision for BTI review, minor editorial changes
	0.7d1	2008-09-23	Updated to be in synch with the RF PHY TS version 0.7d2. Name update from ULP to LE
	0.7d2	2008-09-29	Minor editorial adjustments related to name transition
	0.9d1	2009-01-13	Reference to test interface used for IUT RF PHY test added
	0.9d2	2009-01-14	Edit by Magnus Sommansson: Inclusion of Table 2; Test interface capabilities. Editorial adjustment of references.
	0.9d3	2009-04-02	Updated references, version submitted to BTI
	1.0d1	2009-10-30	Updated references
	1.0d2	2009-11-12	Editorial review
	1.0d3	2009-11-20	Capability statement made independent of profile roles (Controller spec scheduled for December 2009 adoption does not contain profile role definitions) Updated references
	10d4	2009-12-08	Updated references in table 2
0	4.0.0	2009-12-15	Prepare for publication
	4.1.0r01	2013-11-11	Updated revision to 4.1.0 Updated top sheet to include version 4.1
1	4.1.0	2013-12-03	Prepare for Publication
	4.2.0r00	2014-11-17	Revved version to align with Core Specification Version 4.2 Release.
2	4.2.0	2014-12-04	Prepare for TCRL 2014-2 publication
	5.0.0r00	2016-06-01	Integrated changes for Core Specification 5.0 release
	5.0.0r01	2016-09-01	Issue 7534: Updated “TBD” reference in Table 1. Issue 7550: Added new reference and conditionals C.3 and C.4 to Table 1. Added new reference for Bluetooth Core Specification 5.0.
	5.0.0r01	2016-11-14	Updated to current template. Removed unnecessary parentheses and replaced with quotation marks.
3	5.0.0	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
	5.1.0r00-r01	2018-11-13 – 2018-11-27	Updated revision number to 5.1.0 to align with the adoption of Core Specification version 5.1. Updated conditionals in Table 1 for Core 5.1.
4	5.1.0	2018-12-07	Approved by BTI. Prepared for TCRL 2018-2 publication.

Publication Number	Revision Number	Date	Comments
	5.1.1r00–r02	2019-04-24–2019-06-12	TSE 11791 (rating 2): Updated Capability Statement table and notes and References section to address issues with the number and gain of the antennas and the length of the CTE. TSE 11957 (rating 1): Updated references section to more accurately reflect the correct Part of the spec and updated field codes to reflect resulting new numbering.
5	5.1.1	2019-08-01	Approved by BTI. Prepared for TCRL 2019-1 publication.
	p6r00–r02	2019-09-16 – 2019-11-12	TSE 12127 (rating 2): Updated Table 1 (items 1–3) and C.1–C.4 and C.6 conditionals to clarify roles after TCMT updates to take into account the PHYs for the IQ sample tests. Removed deprecated specs from 1:C.2–C.4 per integration review feedback. Revised document numbering convention, setting last release publication of 5.1.1 as p5; added publication number column to Revision History.
6	p6	2020-01-07	Approved by BTI on 2019-12-22. Prepared for TCRL 2019-2 publication.
	p7r00–r01	2021-03-29 – 2021-06-11	TSE 16485 (rating 4): To address E16372 regarding Transmit Power Level for Power Class, added a reference to LL v4.2; updated table 1 with new item 15 and new conditional C.9. TSE 16697 (rating 1): Changed title of document and updated all instances of “RF PHY” and “RF-PHY” to “RFPHY” to align with new TCID structure. Minor editorials to item 14 and conditional C.8. Template-related and consistency checker editorials.
7	p7	2021-07-13	Approved by BTI on 2021-06-27. Prepared for TCRL 2021-1 publication.
	p7ed2r00	2022-02-18	TSE 18365 (rating 1): Updated “is/not supported” language in conditionals globally to align with new conventions. Made template-related editorials, including aligning the copyright page with v2 of the DNMD.
	p7, edition 2	2022-03-07	Approved by BTI on 2022-03-07. Prepared for edition 2 publication.
	p8r00–r03	2022-03-14 – 2022-04-18	TSE 18260 (rating 2): Updated row 8 and C.4 and added C.10 in Table 1. TSE 18347 (rating 2): Updated C.9 of Table 1. Performed template-related formatting fixes. Made consistency checker editorials.
8	p8	2022-06-28	Approved by BTI on 2022-05-31. Prepared for TCRL 2022-1 publication.

Publication Number	Revision Number	Date	Comments
	p9r00–r02	2023-08-28 – 2023-11-03	TSE 23057 (rating 1): Removed Table 2, and related section header of the now-empty section. TSE 24078 (rating 2): Replaced SUM ICS references with CORE ICS references. Updated Table 1 conditionals C.2, C.3, C.4, C.9, C.10, and C.11, affecting items 1/4 – 1/8, 1/11, and 1/15. Updated the document to align with latest standards.
9	p9	2024-07-01	Approved by BTI on 2024-05-22. Prepared for TCRL 2024-1 publication.
	p10r00–r05	2024-07-03 – 2024-08-20	Incorporated CR CS_Test_CR_r16-jorg (which includes Test Issues 23205, 23293, 23331, 23332, 23361, 23362, 23363, 23364, 23365, 23378, 23379, 23381, 23382, 23384, 23404, 23419, 23422, 23424, 23425, 23500, 23501, 23502, 23503, 23504, 23506, 23594, 23693, 23694, 23696, 23701, 23706, 23711, 23732, 23736, 23737, 23738, 23776, 23842, 23923, 23993, 24023, 24033, 24043, 24049, 24133, 24135, 24137, 24138, 24139, 24141, 24142, 24143, 24146, 24147, 24149, 24150, 24151, 24153, 24177, 24181, 24231, 24232, 24330, 24331, 24332, 24410, 24411, 24418, 24419, 24478, 24483, 24515, 24531, 24599, 24601, 24602, 24614, 24618, 24619, 24621, 24623, 24624, 24625, 24627, 24630, 24639, 24645, 24646, 24655, 24656, 24657, 24659, 24660, 24669, 24681, 24717, 24769, 24776, 24789, 24808, 24809, 24838, 24844, 24850, 24867, 24868, 24893, 24894, 24895, 25028, 25029, 25040, 25042, 25053, 25055, 25111, 25112, 25120, 25139, 25140, 25141, 25142, 25143, 25148, 25149, 25150, 25157, 25166, 25209, 25240, 25278, 25282, 25299, 25428, 25443, 25479, 25498, 25511, 25512, 25525, 25585, 25617, 25632). To account for the Channel Sounding feature of Core v6.0, added references to Core Vol. 6 Part B and Vol. 4 Part E, added new items 1/16–1/27 and related conditionals C.12–C.15. Incorporated Test Issue 25785. TSE 26029 (rating 2): Updated the prerequisite for Table 3 to improve test coverage.
10	p10	2024-09-04	Approved by BTI on 2024-08-14. Prepared for TCRL 2024-2 publication.

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