



Project Details

Project Name	HopeRF CMT453X
Product Type	Controller Subsystem
TCRL Version:	TCRL 2023-1
Referenced Qualified Design(s)	146344
Previously Qualified Design Used in this Qualification(s)	139036
Listing Date	2023-10-18
Declaration ID	D065629

Product Listing(s)

Name	Website	Category	Publish Date	Model Number	Description
HopeRF CMT453X	www.hoperf.com	Unique Products	10/18/2023 12:00:00 AM	CMT453X	Ultra power-efficient Bluetooth LE 5.2 chip with 256KB-2048KB Flash, 48KB RAM, and industry leading 2.4GHz RF transceivers. It is built around an ARM Cortex-M0 running up to 64MHz, and a wide selection of peripherals. The chip features an ultra-low transmit and receive power (4.2mA TX at 0dBm, 3.8mA RX) and sleep power consumption is 1.4uA with all RAM retention. CMT453X supports Bluetooth Low Energy 5.2 including 2Mbps PHY, LE Coded PHYs, direction finding using Angle-of-Arrival (AoA) and Angle-of-Departure (AoD), etc. It also supports Bluetooth Mesh, multi-connections, operating as both peripheral and central devices simultaneously. The device is well suited for high performance, low energy consumption IoT connected applications.
HopeRF HM-BT4531	www.hoperf.com	Unique Products	10/18/2023 12:00:00 AM	HM-BT4531	The HM-BT4531 is BLE data transmission module with AT commands support, based on CMT453X BLE 5.2 SoC chip with 256KB-2048KB Flash and 48KB RAM, features a high-performance 2.4GHz transceiver, equipped with an on-board PCB antenna and the external antenna is optional with connector. The modules are a full solution that comes with upgradeable firmware, robust software stacks, worldwide regulatory certifications, and makes it easy for the developer to solve complex wireless communication challenges in their end-products and accelerate time to market.
HopeRF HM-BT4531B	www.hoperf.com	Unique Products	10/18/2023 12:00:00 AM	HM-BT4531B	The HM-BT4531B is BLE data transmission module with AT commands support, based on CMT453X BLE 5.2 SoC chip with 256KB-2048KB Flash and 48KB RAM, features a high-performance 2.4GHz transceiver, equipped with an on-board PCB antenna and the external antenna is optional with connector. The modules are a full solution that comes with upgradeable firmware, robust software stacks, worldwide regulatory certifications, and makes it easy for the developer to solve complex wireless communication challenges in their end-products and accelerate time to market.
HopeRF HM-BT4531C	www.hoperf.com	Unique Products	10/18/2023 12:00:00 AM	HM-BT4531C	The HM-BT4531C is BLE data transmission module with AT commands support, based on CMT453X BLE 5.2 SoC chip with 256KB-2048KB Flash and 48KB RAM, features a high-performance 2.4GHz transceiver, equipped with an on-board PCB antenna and the external antenna is optional with connector. The modules are a full solution that comes with upgradeable firmware, robust software stacks, worldwide regulatory certifications, and makes it easy for the developer to solve complex wireless communication challenges in their end-products and accelerate time to market.
HopeRF HM-BT4531D	www.hoperf.com	Unique Products	10/18/2023 12:00:00 AM	HM-BT4531D	The HM-BT4531D is BLE data transmission module with AT commands support, based on CMT453X BLE 5.2 SoC chip with 256KB-2048KB Flash and 48KB RAM, features a high-performance 2.4GHz transceiver, equipped with an on-board PCB antenna and the external antenna is optional with connector. The modules are a full solution that comes with upgradeable firmware, robust software stacks, worldwide regulatory certifications, and makes it easy for the developer to solve complex wireless communication challenges in their end-products and accelerate time to market.
HopeRF HM-BT4531E	www.hoperf.com	Unique Products	10/18/2023 12:00:00 AM	HM-BT4531E	The HM-BT4531E is BLE data transmission module with AT commands support, based on CMT453X BLE 5.2 SoC chip with 256KB-2048KB Flash and 48KB RAM, features a high-performance 2.4GHz transceiver, equipped with an on-board PCB antenna and the external antenna is optional with connector. The modules are a full solution that comes with upgradeable firmware, robust software stacks, worldwide regulatory certifications, and

makes it easy for the developer to solve complex wireless communication challenges in their end-products and accelerate time to market.

Member Company Shenzhen Hope Microelectronics Co., Ltd

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	Country	China
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Complete the Project and Submit Product(s) for Qualification

By typing my name or other symbol of my signature into the "Signature" field below, I agree on behalf of Shenzhen Hope Microelectronics Co., Ltd ("Company") to [Bluetooth Launch Studio Terms of Use](#), and I make the following representations and warranties personally and on behalf of Company. The following representations and warranties, together with all project information and the [Bluetooth Launch Studio Terms of Use](#), are the Supplier Declaration of Conformity and Declaration of Compliance described in the [Program Reference Document \(PRD\)](#) and [Declaration Process Document \(DPD\)](#).

- ☒ I am authorized by Company to submit all of the information included in this project and all information is complete and accurate.
- ☒ Company does not, by its governing documents or other applicable law, require more than one signatory, a stamp or seal, or a witnessed signature to be legally bound.
- ☒ I agree on behalf of Company to contract in English and electronically, and adopt the characters and symbols input in the signature field below as my signature, with the same effect as an ink signature.
- ☒ The products included in this project are owned and distributed by Company under a Product name that identifies Company as the source of the Product. Company has the right to use and reference all Qualified Designs referenced in the project, and the products and referenced Qualified Designs comply with the version of the Bluetooth Specification identified in the project submission.
- ☒ The product(s) included in this project and the corresponding Qualified Designs comply with the [Bluetooth Launch Studio Terms of Use](#).

If any of the foregoing is not correct or you do not agree, you must exit this form without signing.

Signature:

Cheng Yuan

BLUETOOTH® LAUNCH STUDIO TERMS OF USE

Last Updated: November 15th, 2022.

These Bluetooth Launch Studio Terms of Use (“**Launch Studio Terms**”) are a supplement to the [Bluetooth SIG Website Terms of Use](#) (“**WTOU**”) and together the Launch Studio Terms and WTOU are a legal agreement (collectively the “**Bluetooth Terms**”) between you and Bluetooth SIG, Inc., a Delaware corporation (“**Bluetooth SIG**”) that governs your access to and use of the Bluetooth Launch Studio (the “**Launch Studio Tool**”).

The Launch Studio Tool is a Service (as defined in the WTOU) offered by Bluetooth SIG. Terms used but not defined in these Launch Studio Terms have the meanings ascribed to them in the WTOU. In the event of a conflict between these Launch Studio Terms and the WTOU, these Launch Studio Terms will govern.

PLEASE READ THE BLUETOOTH TERMS CAREFULLY. BY ACCESSING OR USING THE LAUNCH STUDIO TOOL AND/OR CLICKING TO INDICATE THAT YOU AGREE TO THE LAUNCH STUDIO TERMS, YOU REPRESENT THAT YOU ARE AUTHORIZED TO BIND THE ENTITY UNDER WHOSE BLUETOOTH SIG MEMBERSHIP YOU OBTAINED A USER ACCOUNT AND THAT YOU AND THAT MEMBER AGREE TO BE BOUND BY THE BLUETOOTH TERMS. IF YOU ARE NOT AUTHORIZED OR DO NOT AGREE TO THE BLUETOOTH TERMS, DO NOT ACCESS OR USE THE LAUNCH STUDIO TOOL OR CLICK TO INDICATE THAT YOU AGREE TO THESE LAUNCH STUDIO TERMS.

1. MEMBERSHIP ACCOUNT REQUIREMENT.

To access and use the Launch Studio Tool, you must have an Account (as defined in the WTOU) issued under the membership account of a current Bluetooth SIG member and log into the Launch Studio Tool with that Account. You acknowledge and agree that when you access the Launch Studio Tool that you are doing so on behalf of the member your Account is associated with (“**Member**”) and you represent and warrant that you are authorized by Member to access and use the Launch Studio Tool and provide Submissions (defined below) on Member’s behalf.

2. BLUETOOTH QUALIFICATION PROCESS.

The “**Bluetooth Qualification Process**” is the process created by Bluetooth SIG for qualifying Products. The Launch Studio Tool is the Bluetooth SIG tool designed to implement the Bluetooth Qualification Process. A “**Product**” means a product that:

- (a) if sold, is sold as a single item (consisting of software, firmware, drivers, applications, hardware, or a combination of some or all of the foregoing);
- (b) contains one or more Portions; and
- (c) if marketed, is marketed under a name and/or trademark that uniquely identifies Member as the source of the product. A “**Portion**” means hardware, software, or a combination of hardware and software that implements a Bluetooth Specification. If the hardware, software, or combination contains or consists of more than an implementation of the Bluetooth specification, the “Portion” is only the implementation of the Bluetooth Specification. “**Bluetooth Specification**” is defined in the Bylaws of Bluetooth SIG.

3. REPRESENTATIONS AND ACKNOWLEDGEMENTS.

- (a) You represent and warrant that you have permission to submit to Bluetooth SIG all information and materials (including design information, product information, test reports, and test results) that you provide through the Launch Studio Tool (“**Submissions**”) and that all Submissions are true, complete, and accurate.
- (b) You represent and warrant that you and Member will comply with the SIG Member Terms (as defined in the WTOU).
- (c) You represent and warrant that all Submissions that you make through the Launch Studio Tool and all Products listed in your Submissions comply with the SIG Member Terms (as defined in the WTOU) and the Bluetooth Specification(s) referenced in your Submission.

(d) You represent and warrant that the products referenced in your Submissions that you submit to the Bluetooth Qualification Process via the Launch Studio Tool will only be Products that, if marketed or distributed, are done so by Member under a name or trademark that uniquely identifies Member as the source of the Product.

(e) You acknowledge and agree that a product is not a Bluetooth Product under the Bluetooth Trademark License Agreement and you and Member will not market or distribute any product that uses any Bluetooth® trademark on it or in connection with any related marketing, promotion, or advertising unless you or Member have been notified by Bluetooth SIG that it has completed the Bluetooth Qualification Process (e.g., via a confirmation screen or email from Bluetooth SIG expressly stating that the Product has completed the Bluetooth Qualification Process).

4. FEES AND PAYMENT TERMS.

(a) Bluetooth SIG may charge you fees in connection with the Bluetooth Qualification Process including within the Launch Studio Tool and Submissions (e.g., declaration fees, etc.). The type and amount of fees may change at any time. You agree that Member will pay all fees required by Bluetooth SIG in accordance with the instructions provided within the Launch Studio Tool. Bluetooth SIG may accept credit card payments or, if offered within the Launch Studio Tool, may permit you to pay fees offline. If you choose to pay offline, you will pay the invoice issued to you by Bluetooth SIG, according to the terms stated in the invoice. If you provide credit card payment information, you agree that Bluetooth SIG or its third party payment processor may charge your credit card immediately. You acknowledge that, until Bluetooth SIG has processed your payment and received the funds: you and Member will not acquire any of the rights or benefits for those fees. All sales are final and all payments are nonrefundable.

(b) If you receive a discount on any fees based on your Member's level of membership and your Member's membership level changes (e.g., the Member moves from an associate to an adopter level), you will no longer be entitled to receive the discount and any fees owed and any outstanding invoices from Bluetooth SIG as of the date of the membership level change will be increased to reflect the amount owed without the discount. Further, if you prepaid any declaration fees and received a discount and you have not used the declaration fees as of the date of the membership level change, you may not use the declaration fees unless you pay the difference between the then-current standard fee and the discounted fee previously paid.

(c) Declaration Fees. When required by Bluetooth SIG, Member must pay a declaration fee prior to completion of the Bluetooth Qualification Process. To confirm payment of the declaration fee, Bluetooth SIG will issue a unique identification number ("Declaration ID"), which will be associated with your user account. Any declaration fees you pay are paid by you on behalf of Member regardless of the payment method or source of funds and proof of payment is evidenced by the issuance of a Declaration ID. If requested by Member, Bluetooth SIG may reassign, without notice to you, a Declaration ID from your user account to another user account under the Member's membership account. When required by Bluetooth SIG, Member must provide the Declaration ID in the Submission as proof of payment before completing the Bluetooth Qualification Process. All Declaration IDs not used in a Submission as proof of payment expire 12 months from the date of receipt of payment. No declaration fees will be refunded. All Declaration IDs not used in a Submission as proof of payment are nontransferable.

5. CONFIDENTIALITY OF SUBMISSIONS.

You and the Bluetooth SIG agree that Submissions are Confidential Information subject to the Bluetooth SIG Confidentiality Policy even if you do not label the Submission "Confidential." Notwithstanding anything in the Bluetooth SIG Confidentiality Policy and except as described in the following sentence, you agree that Bluetooth SIG will treat your Submissions as confidential, including by not making them available through the searchable database on Bluetooth SIG's web site until the date that you have selected as the "listing date" within the Launch Studio Tool when you click to submit your Submission. Bluetooth SIG further agrees that

(a) if, when you submit a Submission, the "publish date" in your Submission is after the listing date, the following information will be treated as Member Confidential Information and not included in the searchable database on Bluetooth SIG's web site until the "publish date": product name, product number, category, subset ID (if applicable), publish date, and product description and

(b) the test plan and test evidence provided as part of your Submission will continue to be treated as Member Confidential Information for the period of time required under the Bluetooth SIG Confidentiality Policy regardless of any listing date or publish date in the Submission. To the extent that this Section conflicts with the Bluetooth SIG Confidentiality Policy, this Section supersedes the Bluetooth SIG Confidentiality Policy with respect to Bluetooth SIG's obligations of confidentiality of Submissions.

6. RECORD KEEPING AND AUDIT.

You agree to maintain a complete copy of your Submissions as well as all supporting information and documentation related to each Product you submit for qualification through the Launch Studio Tool ("**Records**") in order to document your compliance with the SIG Member Terms and Bluetooth Specifications. You agree that Bluetooth SIG may request copies of Records relating to or pertaining to your Submissions and all Products referenced therein and you will provide copies of Records and permit Bluetooth SIG and its representatives to audit, examine, and make copies of or extracts from all Records (in whatever form they may be kept, whether written, electronic, or other) in order to verify the truth, accuracy, and completeness of your Submissions as well as compliance with the SIG Member Terms and Bluetooth Specifications. Bluetooth SIG will be responsible for the cost of any audit, unless the audit reveals that any Submission is incomplete or inaccurate or that you, Member, any of your Submissions, or any Product fails to comply with the SIG Member Terms or Bluetooth Specifications, in which case Member will reimburse Bluetooth SIG for the costs of the audit within 30 days after receiving Bluetooth SIG's request for reimbursement.

7. ADDITIONAL DISCLAIMERS.

The Launch Studio Tool is not a record-keeping or storage tool. You are responsible for backing up all of Your Content (as defined in the WTOU) submitted to the Launch Studio Tool. In addition to the disclaimers in the WTOU, Bluetooth SIG does not guarantee that Your Content will not be removed, damaged, corrupted, or lost.

Summary ICS

Table 21: Controller Core Specification Version

Item	Capability	Reference	Support	Status	Comment
21/20	Core Specification Version 5.2. Adopted 31 December 2019	Core 5.2	C.1	<input checked="" type="checkbox"/>	C.1: Mandatory to support one and only one of SUM ICS 21/14 "Core v4.2" OR SUM ICS 21/16 "Core v5.0" OR SUM ICS 21/18 "Core v5.1" OR SUM ICS 21/20 "Core v5.2" OR SUM ICS 21/21 "Core v5.3"OR SUM ICS 21/22 "Core v5.4".

Table 22: EDR Features

Item	Capability	Reference	Support	Status	Comment
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Table 31: Host Core Specification Version

Item	Capability	Reference	Support	Status	Comment
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Table 34: LE Host Specification Parts

Item	Capability	Reference	Support	Status	Comment
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Table 41: AMP Controller Core Specification

Prerequisite: SUM ICS 21/14 "Core v4.2" OR SUM ICS 21/16 "Core v5.0" OR SUM ICS 21/18 "Core v5.1" OR SUM ICS 21/20 "Core v5.2"

Item	Capability	Reference	Support	Status	Comment
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Table 42: AMP Controller Specification Parts

Prerequisite: SUM ICS 21/14 "Core v4.2" OR SUM ICS 21/16 "Core v5.0" OR SUM ICS 21/18 "Core v5.1" OR SUM ICS 21/20 "Core v5.2"

Item	Capability	Reference	Support	Status	Comment
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Table 51: Low Energy Controller Configuration

Item	Capability	Reference	Support	Status	Comment
51/1	Low Energy Controller	Core 4.0 or Later	C.1	<input checked="" type="checkbox"/>	C.1: Mandatory IF PROD 2/4 "LE Controller" OR PROD 2/5 "BR/EDR/LE Combined Controller" OR PROD 2/6 "BR/EDR/HS/LE Combined Controller", otherwise Excluded.

Table 52: Low Energy Host Core Specification

Item	Capability	Reference	Support	Status	Comment
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Product Type

Table 1: Product Types

Item	Capability	Reference	Support	Status	Comment
1/5	Controller Subsystem	Vol. 0 Part B	C.1	<input checked="" type="checkbox"/>	C.1: Mandatory to support one and only one Product Type.

Table 2: Controller Core Configuration

Item	Capability	Reference	Support	Status	Comment
2/4	LE Controller	Vol. 0 Part B	C.1	<input checked="" type="checkbox"/>	C.1: Mandatory to support only one Controller Configuration. Optional if 1/2 or 1/3 is Supported.

Table 3: Host Core Configuration

Item	Capability	Reference	Support	Status	Comment
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4.0 Host Controller Interface

Table 1a: IUT Configuration

Item	Capability	Reference	Support	Status	Comment
1a/4	LE Controller	[1] 1.0	M	☑	

Table 1:

Item	Capability	Reference	Support	Status	Comment
1/1	Command Complete event	[1] 7.7.14	M	☑	
1/1d	Support all LE Controller commands	[1] 3.3, 7.7	O	☑	
1/2	Command Status event	[1] 7.7.15	M	☑	
1/3	Hardware Error event	[1] 7.7.16	O	☑	

Table 2:

Item	Capability	Reference	Support	Status	Comment
2/1	Reset command	[1] 7.3.2	M	☑	

Table 3:

Item	Capability	Reference	Support	Status	Comment
3/5	LE Read Buffer Size command [v1]	[1] 7.8.2	C.3	☑	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
3/6	LE Request Peer SCA command	[8] 7.8.108	C.44	☑	Core v5.2 or later C.44: Mandatory IF LL 9/30 "Sleep Clock Accuracy Updates" AND (LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral"), otherwise Optional IF LL 9/30 "Sleep Clock Accuracy Updates", otherwise Excluded.
3/7	LE Request Peer SCA Complete event	[8] 7.7.65.31	C.95	☑	Core v5.2 or later C.95: Mandatory IF 4.0HCI 3/6 "LE Request Peer SCA command", otherwise Excluded.
3/8	LE Read Buffer Size command [v2]	[8] 7.8.2	C.55	☑	Core v5.2 or later C.55: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/33 "Isochronous Broadcaster", otherwise Optional IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
3/9	LE Read ISO TX Sync command	[8] 7.8.96	C.45	☑	Core v5.2 or later C.45: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/33 "Isochronous Broadcaster", otherwise Excluded.

Table 4:

Item	Capability	Reference	Support	Status	Comment
4/1	Read Local Version Information command	[1] 7.4.1	M	☑	
4/2	Read Local Supported Commands command	[1] 7.4.2	M	☑	
4/3	Read Local Supported Features command	[1] 7.4.3	M	☑	
4/5	Read BD_ADDR command	[1] 7.4.6	M	☑	
4/8	LE Read Local Supported Features command	[1] 7.8.3	M	☑	
4/9	LE Read Supported States command	[1] 7.8.27	M	☑	

4/11	LE Read Antenna Information command	[5] 7.8.87	C.31	☑	Core v5.1 or later C.31: Mandatory IF LL 9/14 "Connection CTE Request" OR LL 9/15 "Connection CTE Response" OR LL 9/16 "Connectionless CTE Transmitter" OR LL 9/17 "Connectionless CTE Receiver", otherwise Excluded.
4/13	Read Local Supported Codecs command [v2]	[1] 7.4.8	O	☑	Core v5.2 or later
4/14	Read Local Supported Codec Capabilities command	[1] 7.4.10	C.156	☑	Core v5.2 or later C.156: Mandatory IF 4.0HCI 4/13 "Read Local Supported Codecs command [v2]", otherwise Excluded.
4/15	Read Local Supported Controller Delay command	[1] 7.4.11	C.156	☑	Core v5.2 or later C.156: Mandatory IF 4.0HCI 4/13 "Read Local Supported Codecs command [v2]", otherwise Excluded.

Table 5:

Item	Capability	Reference	Support	Status	Comment
5/13	LE Set Random Address command	[1] 7.8.4	C.1	☑	C.1: Mandatory IF RFPHY 1/1 "LE Transmitter" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
5/14	LE Read Filter Accept List Size command	[1] 7.8.14	M	☑	
5/15	LE Add Device To Filter Accept List command	[1] 7.8.16	M	☑	
5/16	LE Clear Filter Accept List command	[1] 7.8.15	M	☑	
5/17	LE Remove Device From Filter Accept List command	[1] 7.8.17	M	☑	
5/27	LE Add Device To Resolving List command	[4] 7.8.38	C.9	☑	C.9: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.
5/28	LE Remove Device From Resolving List command	[4] 7.8.39	C.9	☑	C.9: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.
5/29	LE Clear Resolving List command	[4] 7.8.40	C.9	☑	C.9: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.
5/30	LE Read Resolving List Size command	[4] 7.8.41	C.9	☑	C.9: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.
5/31	LE Set Address Resolution Enable command	[4] 7.8.44	C.9	☑	C.9: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.
5/32	LE Set Resolvable Private Address Timeout command	[4] 7.8.45	C.9	☑	C.9: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.
5/33	LE Set Advertising Set Random Address command	[5] 7.8.52	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/34	LE Set Extended Advertising Parameters command [v1]	[5] 7.8.53	C.65	☑	Core v5.0 or later C.65: Mandatory IF 4.0HCI 5/34a "LE Set Extended Advertising Parameters command [v2]" OR LL 3/9 "Extended Advertising", otherwise Excluded.
5/35	LE Set Periodic Advertising Parameters command [v1]	[5] 7.8.61	C.18	☑	Core v5.0 or later C.18: Mandatory IF LL 3/10 "Periodic Advertising", otherwise Excluded.
5/36	LE Set Extended Advertising Data command	[5] 7.8.54	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/37	LE Set Periodic Advertising Data command	[5] 7.8.62	C.18	☑	Core v5.0 or later C.18: Mandatory IF LL 3/10 "Periodic Advertising", otherwise Excluded.
5/38	LE Set Extended Scan Response Data command	[5] 7.8.55	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/39	LE Scan Request Received event	[5] 7.7.65.19	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/40	LE Set Extended Advertising Enable command	[5] 7.8.56	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/41	LE Set Periodic Advertising Enable command	[5] 7.8.63	C.18	☑	Core v5.0 or later C.18: Mandatory IF LL 3/10 "Periodic Advertising", otherwise Excluded.
5/42	LE Read Maximum Advertising Data Length command	[5] 7.8.57	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.

5/43	LE Read Number of Supported Advertising Sets command	[5] 7.8.58	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/44	LE Read Transmit Power command	[5] 7.8.74	C.64	☑	Core v5.0 or later C.64: Optional IF RFPHY 1/1 "LE Transmitter" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
5/45	LE Write RF Path Compensation command	[5] 7.8.76	C.22	☑	Core v5.0 or later C.22: Mandatory IF LL 3/12 "Sending Tx Power in Advertisements" OR LL 9/37 "LE Power Control Request", otherwise Optional.
5/46	LE Read RF Path Compensation command	[5] 7.8.75	C.22	☑	Core v5.0 or later C.22: Mandatory IF LL 3/12 "Sending Tx Power in Advertisements" OR LL 9/37 "LE Power Control Request", otherwise Optional.
5/47	LE Remove Advertising Set command	[5] 7.8.59	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/48	LE Clear Advertising Sets command	[5] 7.8.60	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/49	LE Advertising Set Terminated event	[5] 7.7.65.18	C.17	☑	Core v5.0 or later C.17: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
5/50	LE Set Connectionless CTE Transmit Parameters command	[5] 7.8.80	C.27	☑	Core v5.1 or later C.27: Mandatory IF LL 9/16 "Connectionless CTE Transmitter", otherwise Excluded.
5/51	LE Set Connectionless CTE Transmit Enable command	[5] 7.8.81	C.27	☑	Core v5.1 or later C.27: Mandatory IF LL 9/16 "Connectionless CTE Transmitter", otherwise Excluded.
5/52	LE Set Connectionless IQ Sampling Enable command	[5] 7.8.82	C.28	☑	Core v5.1 or later C.28: Mandatory IF LL 9/17 "Connectionless CTE Receiver", otherwise Excluded.
5/54	LE Setup ISO Data Path command	[8] 7.8.109	C.47	☑	Core v5.2 or later C.47: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral", OR LL 9/33 "Isochronous Broadcaster" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.
5/55	LE Remove ISO Data Path command	[5] 7.8.110	C.47	☑	Core v5.2 or later C.47: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral", OR LL 9/33 "Isochronous Broadcaster" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.
5/56	LE Set CIG Parameters command	[5] 7.8.97	C.39	☑	Core v5.2 or later C.39: Mandatory IF LL 9/31 "Connected Isochronous Stream Central", otherwise Excluded.
5/57	LE Remove CIG command	[5] 7.8.100	C.39	☑	Core v5.2 or later C.39: Mandatory IF LL 9/31 "Connected Isochronous Stream Central", otherwise Excluded.
5/58	LE Set CIG Parameters Test command	[5] 7.8.98	C.39	☑	Core v5.2 or later C.39: Mandatory IF LL 9/31 "Connected Isochronous Stream Central", otherwise Excluded.
5/59	LE Enhanced Read Transmit Power Level command	[5] 7.8.117	C.51	☑	Core v5.2 or later C.51: Mandatory IF LL 9/37 "LE Power Control Request", otherwise Excluded.
5/60	LE Set Path Loss Reporting Parameters command	[5] 7.8.119	C.52	☑	Core v5.2 or later C.52: Mandatory IF LL 9/39 "LE Path Loss Monitoring", otherwise Excluded.
5/61	LE Set Path Loss Reporting Enable command	[5] 7.8.120	C.52	☑	Core v5.2 or later C.52: Mandatory IF LL 9/39 "LE Path Loss Monitoring", otherwise Excluded.
5/62	LE Transmit Power Reporting event	[5] 7.7.65.33	C.51	☑	Core v5.2 or later C.51: Mandatory IF LL 9/37 "LE Power Control Request", otherwise Excluded.
5/63	LE Path Loss Threshold event	[5] 7.7.65.32	C.52	☑	Core v5.2 or later C.52: Mandatory IF LL 9/39 "LE Path Loss Monitoring", otherwise Excluded.
5/64	LE Set Transmit Power Reporting Enable command	[5] 7.8.121	C.51	☑	Core v5.2 or later C.51: Mandatory IF LL 9/37 "LE Power Control Request", otherwise Excluded.
5/65	Set Ecosystem Base Interval command	[5] 7.3.100	O	☑	Core v5.2 or later
5/66	Configure Data Path command	[1] 7.3.101	C.156	☑	Core v5.2 or later C.156: Mandatory IF 4.0HCI 4/13 "Read Local Supported Codecs command [v2]", otherwise Excluded.

Table 6:

Item	Capability	Reference	Support	Status	Comment
6/15	LE Set Advertising Enable command	[1] 7.8.9	C.97	☑	C.97: Mandatory IF LL 1/1 "Advertising State", otherwise Excluded.

6/16	LE Set Advertising Parameters command	[1] 7.8.5	C.97	☑	C.97: Mandatory IF LL 1/1 "Advertising State", otherwise Excluded.
6/17	LE Set Scan Response Data command	[1] 7.8.8	C.15	☑	C.15: Mandatory IF LL 3/2 "Connectable and Scannable Undirected Events" OR LL 3/5 "Scannable Undirected Events" OR LL 3/5a "Scannable Directed Events", otherwise Excluded.
6/18	LE Set Advertising Data command	[1] 7.8.7	C.97	☑	C.97: Mandatory IF LL 1/1 "Advertising State", otherwise Excluded.
6/19	LE Advertising Report event	[1] 7.7.65.2	C.98	☑	C.98: Mandatory IF LL 1/2 "Scanning State", otherwise Excluded.
6/20	LE Set Scan Enable command	[1] 7.8.11	C.98	☑	C.98: Mandatory IF LL 1/2 "Scanning State", otherwise Excluded.
6/21	LE Set Scan Parameters command	[1] 7.8.10	C.98	☑	C.98: Mandatory IF LL 1/2 "Scanning State", otherwise Excluded.
6/22	LE Read Advertising Physical Channel Tx Power command	[1] 7.8.6	C.97	☑	C.97: Mandatory IF LL 1/1 "Advertising State", otherwise Excluded.
6/26	LE Directed Advertising Report event	[4] 7.7.65.11	C.63	☑	C.63: Mandatory IF LL 1/2 "Scanning State" AND LL 9/13 "LL Privacy", otherwise Excluded.
6/27	LE Set Extended Scan Parameters command	[5] 7.8.64	C.19	☑	Core v5.0 or later C.19: Mandatory IF LL 4/7 "Extended Scanning", otherwise Excluded.
6/28	LE Set Extended Scan Enable command	[5] 7.8.65	C.19	☑	Core v5.0 or later C.19: Mandatory IF LL 4/7 "Extended Scanning", otherwise Excluded.
6/29	LE Extended Advertising Report event	[5] 7.7.65.13	C.19	☑	Core v5.0 or later C.19: Mandatory IF LL 4/7 "Extended Scanning", otherwise Excluded.
6/30	LE Periodic Advertising Create Sync command	[5] 7.8.67	C.16	☑	Core v5.0 or later C.16: Mandatory IF LL 4/8 "Scanning for Periodic Advertising" AND LL 1/3a "Synchronized State", otherwise Excluded.
6/31	LE Periodic Advertising Create Sync Cancel command	[5] 7.8.68	C.16	☑	Core v5.0 or later C.16: Mandatory IF LL 4/8 "Scanning for Periodic Advertising" AND LL 1/3a "Synchronized State", otherwise Excluded.
6/32	LE Periodic Advertising Terminate Sync command	[5] 7.8.69	C.21	☑	Core v5.0 or later C.21: Mandatory IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.
6/33	LE Periodic Advertising Report event [v1]	[5] 7.7.65.15	C.21	☑	Core v5.0 or later C.21: Mandatory IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.
6/34	LE Periodic Advertising Sync Lost event	[5] 7.7.65.16	C.21	☑	Core v5.0 or later C.21: Mandatory IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.
6/35	LE Periodic Advertising Sync Established event [v1]	[5] 7.7.65.14	C.16	☑	Core v5.0 or later C.16: Mandatory IF LL 4/8 "Scanning for Periodic Advertising" AND LL 1/3a "Synchronized State", otherwise Excluded.
6/36	LE Scan Timeout event	[5] 7.7.65.17	C.19	☑	Core v5.0 or later C.19: Mandatory IF LL 4/7 "Extended Scanning", otherwise Excluded.
6/37	LE Set Periodic Advertising Receive Enable command	[6] 7.8.88	C.32	☑	Core v5.1 or later C.32: Mandatory IF LL 9/27 "Periodic Advertising Sync Transfer: Recipient", otherwise Optional IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.
6/38	LE BIG Create Sync command	[5] 7.8.106	C.42	☑	Core v5.2 or later C.42: Mandatory IF LL 9/34 "Synchronized Receiver", otherwise Excluded.
6/39	LE BIG Sync Established event	[5] 7.7.65.29	C.42	☑	Core v5.2 or later C.42: Mandatory IF LL 9/34 "Synchronized Receiver", otherwise Excluded.
6/40	LE Terminate BIG command	[5] 7.8.105	C.41	☑	Core v5.2 or later C.41: Mandatory IF LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
6/41	LE BIG Sync Lost event	[5] 7.7.65.30	C.42	☑	Core v5.2 or later C.42: Mandatory IF LL 9/34 "Synchronized Receiver", otherwise Excluded.
6/42	LE BIG Terminate Sync command	[5] 7.8.107	C.42	☑	Core v5.2 or later C.42: Mandatory IF LL 9/34 "Synchronized Receiver", otherwise Excluded.
6/43	LE Terminate BIG Complete event	[5] 7.7.65.28	C.41	☑	Core v5.2 or later C.41: Mandatory IF LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
6/44	LE BIGInfo Advertising Report event	[5] 7.7.65.34	C.54	☑	Core v5.2 or later C.54: Mandatory IF LL 9/34 "Synchronized Receiver", otherwise Optional.

Table 7:

Item	Capability	Reference	Support	Status	Comment
7/5	Disconnect command	[1] 7.1.6	C.3b	☑	C.3b: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
7/23	LE Create Connection	[1] 7.8.12	C.59	☑	C.59: Mandatory IF LL 1/5 "Central Role", otherwise Excluded.

command					
7/24	LE Create Connection Cancel command	[1] 7.8.13	C.94	✓	C.94: Mandatory IF 4.0HCI 7/23 "LE Create Connection command" OR 4.0HCI 7/41 "LE Extended Create Connection command [v1]", otherwise Excluded.
7/25	LE Connection Complete event	[1] 7.7.65.1	C.3	✓	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
7/26	Disconnection Complete event	[1] 7.7.5	C.3b	✓	C.3b: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
7/27	LE Connection Update command	[1] 7.8.18	C.62	✓	C.62: Mandatory IF LL 1/5 "Central Role" OR (LL 1/4 "Peripheral Role" AND LL 9/3 "Connection Parameters Request Procedure"), otherwise Excluded.
7/28	LE Connection Update Complete event	[1] 7.7.65.3	C.3	✓	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
7/35	LE Remote Connection Parameter Request Reply command	[1] 7.8.31	C.6	✓	C.6: Mandatory IF LL 9/3 "Connection Parameters Request Procedure", otherwise Excluded.
7/36	LE Remote Connection Parameter Request Negative Reply command	[1] 7.8.32	C.6	✓	C.6: Mandatory IF LL 9/3 "Connection Parameters Request Procedure", otherwise Excluded.
7/37	LE Remote Connection Parameter Request event	[1] 7.7.65.6	C.6	✓	C.6: Mandatory IF LL 9/3 "Connection Parameters Request Procedure", otherwise Excluded.
7/38	LE Enhanced Connection Complete event [v1]	[1] 7.7.65.10	C.24	✓	C.24: Mandatory IF (LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role") AND (LL 9/13 "LL Privacy" OR LL 5/4 "Requesting connections using extended advertising"), otherwise Optional IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
7/39	LE Read Peer Resolvable Address command	[1] 7.8.42	C.10	✓	C.10: Optional IF LL 9/13 "LL Privacy", otherwise Excluded.
7/40	LE Read Local Resolvable Address command	[1] 7.8.43	C.10	✓	C.10: Optional IF LL 9/13 "LL Privacy", otherwise Excluded.
7/41	LE Extended Create Connection command [v1]	[5] 7.8.66	C.20	✓	Core v5.0 or later C.20: Mandatory IF LL 5/4 "Requesting connections using extended advertising", otherwise Excluded.
7/42	LE Channel Selection Algorithm event	[5] 7.7.65.20	C.23	✓	Core v5.0 or later C.23: Mandatory IF LL 9/10 "Channel Selection Algorithm #2", otherwise Excluded.
7/43	LE Set Privacy Mode command	[1] 7.8.77	C.9	✓	Core v5.0 or later C.9: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.

Table 8:

Item	Capability	Reference	Support	Status	Comment
8/5b	Read Remote Version Information command on LE	[1] 7.1.23	C.3	✓	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
8/6	LE Read Remote Features command	[1] 7.8.21	C.3	✓	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
8/7	LE Read Remote Features Complete event	[1] 7.7.65.4	C.3	✓	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
8/8b	Read Remote Version Information Complete event on LE	[1] 7.7.12	C.3	✓	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
8/9	LE Connectionless IQ Report event	[5] 7.7.65.21	C.28	✓	Core v5.1 or later C.28: Mandatory IF LL 9/17 "Connectionless CTE Receiver", otherwise Excluded.
8/10	LE Read Remote Transmit Power Level command	[5] 7.8.118	C.51	✓	Core v5.2 or later C.51: Mandatory IF LL 9/37 "LE Power Control Request", otherwise Excluded.

Table 10:

Item	Capability	Reference	Support	Status	Comment
10/12	LE Set Data Length command	[4] 7.8.33	C.8	✓	C.8: Mandatory IF LL 9/6 "LE Data Packet Length Extension", otherwise Optional.
10/13	LE Data Length Change event	[4] 7.7.65.7	C.8	✓	C.8: Mandatory IF LL 9/6 "LE Data Packet Length Extension", otherwise Optional.
10/14	LE Read Suggested Default Data Length command	[4] 7.8.34	C.8	✓	C.8: Mandatory IF LL 9/6 "LE Data Packet Length Extension", otherwise Optional.
10/15	LE Write Suggested Default Data Length command	[4] 7.8.35	C.8	✓	C.8: Mandatory IF LL 9/6 "LE Data Packet Length Extension", otherwise Optional.

10/16	LE Read Maximum Data Length command	[4] 7.8.46	C.8	☑	C.8: Mandatory IF LL 9/6 "LE Data Packet Length Extension", otherwise Optional.
10/18	LE Set Connection CTE Receive Parameters command	[5] 7.8.83	C.25	☑	Core v5.1 or later C.25: Mandatory IF LL 9/14 "Connection CTE Request", otherwise Excluded.
10/19	LE Set Connection CTE Transmit Parameters command	[5] 7.8.84	C.26	☑	Core v5.1 or later C.26: Mandatory IF LL 9/15 "Connection CTE Response", otherwise Excluded.
10/20	LE Connection CTE Request Enable command	[5] 7.8.85	C.25	☑	Core v5.1 or later C.25: Mandatory IF LL 9/14 "Connection CTE Request", otherwise Excluded.
10/21	LE Connection CTE Response Enable command	[5] 7.8.86	C.26	☑	Core v5.1 or later C.26: Mandatory IF LL 9/15 "Connection CTE Response", otherwise Excluded.
10/22	LE Connection IQ Report event	[5] 7.7.65.22	C.25	☑	Core v5.1 or later C.25: Mandatory IF LL 9/14 "Connection CTE Request", otherwise Excluded.
10/23	LE CTE Request Failed event	[5] 7.7.65.23	C.25	☑	Core v5.1 or later C.25: Mandatory IF LL 9/14 "Connection CTE Request", otherwise Excluded.
10/24	LE Periodic Advertising Sync Transfer command	[6] 7.8.89	C.33	☑	Core v5.1 or later C.33: Mandatory IF LL 9/26 "Periodic Advertising Sync Transfer: Sender" AND LL 1/2 "Scanning State", otherwise Excluded.
10/25	LE Periodic Advertising Set Info Transfer command	[6] 7.8.90	C.34	☑	Core v5.1 or later C.34: Mandatory IF LL 9/26 "Periodic Advertising Sync Transfer: Sender" AND LL 1/1 "Advertising State", otherwise Excluded.
10/26	LE Periodic Advertising Sync Transfer Received event [v1]	[6] 7.7.65.24	C.35	☑	Core v5.1 or later C.35: Mandatory IF LL 9/27 "Periodic Advertising Sync Transfer: Recipient", otherwise Excluded.
10/27	LE Set Periodic Advertising Sync Transfer Parameters command	[6] 7.8.91	C.35	☑	Core v5.1 or later C.35: Mandatory IF LL 9/27 "Periodic Advertising Sync Transfer: Recipient", otherwise Excluded.
10/28	LE Set Default Periodic Advertising Sync Transfer Parameters command	[6] 7.8.92	C.35	☑	Core v5.1 or later C.35: Mandatory IF LL 9/27 "Periodic Advertising Sync Transfer: Recipient", otherwise Excluded.
10/29	LE Modify Sleep Clock Accuracy command	[6] 7.8.94	C.37	☑	Core v5.1 or later C.37: Mandatory IF LL 9/40 "Can Change Sleep Clock Accuracy", otherwise Excluded.
10/30	LE Create CIS command	[8] 7.8.99	C.39	☑	Core v5.2 or later C.39: Mandatory IF LL 9/31 "Connected Isochronous Stream Central", otherwise Excluded.
10/31	LE CIS Established event	[8] 7.7.65.25	C.38	☑	Core v5.2 or later C.38: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral", otherwise Excluded.
10/32	LE CIS Request event	[8] 7.7.65.26	C.40	☑	Core v5.2 or later C.40: Mandatory IF LL 9/32 "Connected Isochronous Stream Peripheral", otherwise Excluded.
10/33	LE Accept CIS Request command	[8] 7.8.101	C.40	☑	Core v5.2 or later C.40: Mandatory IF LL 9/32 "Connected Isochronous Stream Peripheral", otherwise Excluded.
10/34	LE Reject CIS Request command	[8] 7.8.102	C.40	☑	Core v5.2 or later C.40: Mandatory IF LL 9/32 "Connected Isochronous Stream Peripheral", otherwise Excluded.

Table 13:

Item	Capability	Reference	Support	Status	Comment
13/8	LE Set Host Channel Classification command	[1] 7.8.19	C.36	☑	C.36: Mandatory IF LL 9/44 "LE Channel Classification" OR LL 1/5 "Central Role", otherwise Optional IF (LL 9/41 "Extended Advertising" AND LL 1/1 "Advertising State") OR LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
13/9	LE Read PHY command	[5] 7.8.47	C.11	☑	Core v5.0 or later C.11: Mandatory IF LL 9/6a "Multiple PHYs", otherwise Optional.
13/10	LE Set Default PHY command	[5] 7.8.48	C.11	☑	Core v5.0 or later C.11: Mandatory IF LL 9/6a "Multiple PHYs", otherwise Optional.
13/11	LE Set PHY command	[5] 7.8.49	C.11	☑	Core v5.0 or later C.11: Mandatory IF LL 9/6a "Multiple PHYs", otherwise Optional.
13/12	LE PHY Update Complete event	[5] 7.7.65.12	C.11	☑	Core v5.0 or later C.11: Mandatory IF LL 9/6a "Multiple PHYs", otherwise Optional.

Table 14:

Item	Capability	Reference	Support	Status	Comment
14/1	Host Buffer Size command	[1] 7.3.39	C.107	☑	C.107: Mandatory IF 4.0HCI 14/4 "Set Controller to Host Flow Control command", otherwise Excluded.
14/2	Set Event Mask command	[1] 7.3.1	M	☑	
14/4	Set Controller to Host Flow Control command	[1] 7.3.38	C.96a	☑	C.96a: Optional IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.

14/5	Host Number of Completed Packets command	[1] 7.3.40	C.107	☑	C.107: Mandatory IF 4.0HCI 14/4 "Set Controller to Host Flow Control command", otherwise Excluded.
14/8	Set Event Mask Page 2 command	[1] 7.3.69	O	☑	
14/12	Number of Completed Packets event	[1] 7.7.19	C.3a	☑	C.3a: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
14/13	Data Buffer Overflow event	[1] 7.7.26	O	☑	
14/14	LE Set Event Mask command	[1] 7.8.1	M	☑	
14/17	LE Add Device To Periodic Advertiser List command	[5] 7.8.70	C.21	☑	Core v5.0 or later C.21: Mandatory IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.
14/18	LE Remove Device From Periodic Advertiser List command	[5] 7.8.71	C.21	☑	Core v5.0 or later C.21: Mandatory IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.
14/19	LE Clear Periodic Advertiser List command	[5] 7.8.72	C.21	☑	Core v5.0 or later C.21: Mandatory IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.
14/20	LE Read Periodic Advertiser List Size command	[5] 7.8.73	C.21	☑	Core v5.0 or later C.21: Mandatory IF LL 11/1 "Synchronizing to Periodic Advertising", otherwise Excluded.

Table 15:

Item	Capability	Reference	Support	Status	Comment
15/2c	Read Transmit Power Level command on LE	[1] 7.3.35	C.3	☑	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
15/4c	Read RSSI command on LE	[1] 7.5.4	C.3	☑	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
15/8	LE Read Channel Map command	[1] 7.8.20	C.3	☑	C.3: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Excluded.
15/9	LE Read ISO Link Quality command	[8] 7.8.116	C.50	☑	Core v5.2 or later C.50: Optional IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.

Table 16:

Item	Capability	Reference	Support	Status	Comment
16/32	LE Encrypt command	[1] 7.8.22	C.4	☑	C.4: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
16/33	LE Rand command	[1] 7.8.23	C.4	☑	C.4: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
16/34	LE Long Term Key Request Reply command	[1] 7.8.25	C.61	☑	C.61: Mandatory IF LL 1/4 "Peripheral Role" AND LL 9/1 "LE Encryption", otherwise Excluded.
16/35	LE Enable Encryption command	[1] 7.8.24	C.60	☑	C.60: Mandatory IF LL 1/5 "Central Role" AND LL 9/1 "LE Encryption", otherwise Excluded.
16/36	LE Long Term Key Request event	[1] 7.7.65.5	C.61	☑	C.61: Mandatory IF LL 1/4 "Peripheral Role" AND LL 9/1 "LE Encryption", otherwise Excluded.
16/37b	Encryption Change event [v1] on LE	[1] 7.7.8	C.4	☑	C.4: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
16/38b	Encryption Key Refresh Complete event on LE	[1] 7.7.39	C.4	☑	C.4: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
16/39	LE Long Term Key Request Negative Reply command	[1] 7.8.26	C.61	☑	C.61: Mandatory IF LL 1/4 "Peripheral Role" AND LL 9/1 "LE Encryption", otherwise Excluded.
16/46b	Authenticated Payload Timeout Expired event on LE	[4] 7.7.75	C.155b	☑	C.155b: Mandatory IF 4.0HCI 16/48b "Write Authenticated Payload Timeout command on LE", otherwise Optional.
16/47b	Read Authenticated Payload Timeout command on LE	[4] 7.3.93	C.155b	☑	C.155b: Mandatory IF 4.0HCI 16/48b "Write Authenticated Payload Timeout command on LE", otherwise Optional.
16/48b	Write Authenticated Payload Timeout command on LE	[4] 7.3.94	C.7	☑	C.7: Mandatory IF LL 9/1 "LE Encryption" AND LL 9/2 "LE Ping Procedure", otherwise Excluded.
16/50	LE Read Local P-256 Public Key command	[4] 7.8.36	O	☑	
16/51	LE Generate DHKey command [v1]	[4] 7.8.37	C.99	☑	C.99: Mandatory IF 4.0HCI 16/51a "LE Generate DHKey command [v2]", otherwise Optional.
16/51a	LE Generate DHKey command [v2]	[6] 7.8.37	O	☑	Core v5.0 or later
16/52	LE Read Local P-256 Public Key	[4]	O	☑	

Complete event 7.7.65.8

16/53	LE Generate DHKey Complete event	[4] 7.7.65.9	O	☑
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Table 17:

Item	Capability	Reference	Support	Status	Comment
17/7	LE Receiver Test command [v1]	[1] 7.8.28	C.2	☑	C.2: Mandatory IF RFPHY 1/2 "LE Receiver" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
17/8	LE Transmitter Test command [v1]	[1] 7.8.29	C.1	☑	C.1: Mandatory IF RFPHY 1/1 "LE Transmitter" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
17/9	LE Test End command	[1] 7.8.30	M	☑	
17/10	LE Receiver Test command [v2]	[5] 7.8.28	C.13	☑	Core v5.0 or later C.13: Mandatory IF LL 9/6a "Multiple PHYs" OR RFPHY 1/6 "Stable Modulation Index – Receiver", otherwise Optional IF RFPHY 1/2 "LE Receiver" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
17/11	LE Transmitter Test command [v2]	[5] 7.8.29	C.12	☑	Core v5.0 or later C.12: Mandatory IF LL 9/6a "Multiple PHYs" OR RFPHY 1/5 "Stable Modulation Index – Transmitter", otherwise Optional IF RFPHY 1/1 "LE Transmitter" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
17/12	LE Receiver Test command [v3]	[6] 7.8.28	C.30	☑	Core v5.1 or later C.30: Mandatory IF LL 9/14 "Connection CTE Request" OR LL 9/17 "Connectionless CTE Receiver", otherwise Optional IF RFPHY 1/2 "LE Receiver" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
17/13	LE Transmitter Test command [v3]	[6] 7.8.29	C.29	☑	Core v5.1 or later C.29: Mandatory IF LL 9/15 "Connection CTE Response" OR LL 9/16 "Connectionless CTE Transmitter", otherwise Optional IF RFPHY 1/1 "LE Transmitter" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.
17/14	LE ISO Transmit Test command	[8] 7.8.111	C.45	☑	Core v5.2 or later C.45: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
17/15	LE ISO Receive Test command	[8] 7.8.112	C.46	☑	Core v5.2 or later C.46: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.
17/16	LE ISO Read Test Counters command	[8] 7.8.113	C.46	☑	Core v5.2 or later C.46: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.
17/17	LE ISO Test End command	[8] 7.8.114	C.47	☑	Core v5.2 or later C.47: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/33 "Isochronous Broadcaster" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.
17/18	LE Transmitter Test command [v4]	[8] 7.8.29	C.53	☑	Core v5.2 or later C.53: Mandatory IF LL 9/37 "LE Power Control Request", otherwise Optional IF RFPHY 1/1 "LE Transmitter" OR RFPHY 1/3 "LE Transceiver", otherwise Excluded.

Table 20:

Item	Capability	Reference	Support	Status	Comment
20/1	LE Create BIG command	[8] 7.8.103	C.41	☑	Core v5.2 or later C.41: Mandatory IF LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
20/2	LE Create BIG Test command	[8] 7.8.104	C.41	☑	Core v5.2 or later C.41: Mandatory IF LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
20/3	LE Create BIG Complete event	[8] 7.7.65.27	C.41	☑	Core v5.2 or later C.41: Mandatory IF LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
20/4	Isochronous data over HCI	[8] 5.4.5	O	☑	Core v5.2 or later
20/5	LE Set Host Feature command	[8] 7.8.115	C.49	☑	Core v5.2 or later C.49: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/45 "Connection Subrating", otherwise Optional.

Low Energy Link Layer

Table 1: Controller States/Roles

Item	Capability	Reference	Support	Status	Comment
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1/1	Advertising State	[1] 4.4.2	C.1	☑	C.1: Mandatory to support at least one.
1/2	Scanning State	[1] 4.4.3	C.1	☑	C.1: Mandatory to support at least one.
1/3	Initiating State	[1] 4.4.4	C.1	☑	C.1: Mandatory to support at least one.
1/3a	Synchronized State	[6] 4.4.5	C.4	☑	C.4: Excluded IF SUMICS 21/16 "Core v5.0", otherwise Mandatory IF LL 9/27 "Periodic Advertising Sync Transfer: Recipient" OR LL 4/8 "Scanning for Periodic Advertising" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.
1/4	Peripheral Role	[1] 4.5.5	C.3	☑	C.3: Optional IF LL 1/1 "Advertising State", otherwise Excluded.
1/5	Central Role	[1] 4.5.4	C.2	☑	C.2: Mandatory IF LL 1/3 "Initiating State", otherwise Excluded.
1/6	Isochronous Broadcasting State	[7] 4.4.6	C.5	☑	C.5: Mandatory IF LL 9/33 "Isochronous Broadcaster", otherwise Excluded.

Table 2: Device Address Types

Prerequisite: LL 1/1 "Advertising State" OR LL 1/2 "Scanning State" OR LL 1/3 "Initiating State"

Item	Capability	Reference	Support	Status	Comment
2/1	Public Address	[1] 1.3	C.1	☑	C.1: Mandatory to support at least one.
2/2	Random Address	[1] 1.3	C.1	☑	C.1: Mandatory to support at least one.
2/3	Static Address	[3] 1.3.2.1	C.1	☑	C.1: Mandatory to support at least one.
2/4	Generation of private addresses	[3] 1.3.2.2	O	☑	
2/5	Resolution of private addresses	[3] 1.3.2.3	C.2	☑	C.2: Mandatory IF LL 2/4 "Generation of private addresses", otherwise Excluded.
2/6	Network Privacy Mode: Ignore Identity Address when IRK is present in resolving list	[3] 4.7	C.4	☑	C.4: Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.
2/7	Device Privacy Mode	[3] 4.7	C.5	☑	C.5: Optional IF LL 9/13 "LL Privacy" AND SUMICS 21/14 "Core v4.2", otherwise Mandatory IF LL 9/13 "LL Privacy", otherwise Excluded.

Table 3: Protocol Advertising Features

Prerequisite: LL 1/1 "Advertising State"

Item	Capability	Reference	Support	Status	Comment
3/1	Non-Connectable and Non-Scannable Undirected Events	[1] 4.4.2.6	C.1	☑	C.1: Mandatory IF GAP 5/1 "Broadcaster", otherwise Optional IF GAP 5/3 "Peripheral", otherwise Excluded.
3/1a	Non-Connectable and Non-Scannable Directed Events	[6] 4.4.2.9	C.10	☑	C.10: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
3/2	Connectable and Scannable Undirected Events	[1] 4.4.2.3	C.2	☑	C.2: Mandatory IF GAP 5/3 "Peripheral", otherwise Optional.
3/3	Advertising Data	[1] 4.4.2.3, 4.4.2.5, 4.4.2.6	M	☑	
3/4	Connectable Directed Events	[1] 4.4.2.4	O	☑	
3/4a	Low Duty Cycle Direct Advertising	[1] 4.4.2.4	O	☑	
3/4b	Connectable Undirected Events	[6] 4.4.2.7	C.10	☑	C.10: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
3/5	Scannable Undirected Events	[1] 4.4.2.5	O	☑	
3/5a	Scannable Directed Events	[6] 4.4.2.8	C.10	☑	C.10: Mandatory IF LL 3/9 "Extended Advertising", otherwise Excluded.
3/6	Sending Scan Responses	[1] 4.4.2.3, 4.4.2.5	C.2	☑	C.2: Mandatory IF GAP 5/3 "Peripheral", otherwise Optional.
3/7	Accepting Connection Requests	[1] 4.4.2.3, 4.4.2.4	C.3	☑	C.3: Mandatory IF LL 1/4 "Peripheral Role", otherwise Excluded.
3/8	Filtering Policies	[1] 4.3.2	O	☑	
3/9	Extended Advertising	[4] 4.6.12	C.6	☑	C.6: Mandatory IF LL 9/41 "Extended Advertising", otherwise Excluded.
3/10	Periodic Advertising	[4] 4.4.2.12	C.12	☑	C.12: Mandatory IF LL 9/42 "Periodic Advertising", otherwise Excluded.
3/11	Multiple Advertising Sets	[4] 4.4.2.10	C.7	☑	C.7: Optional IF LL 3/9 "Extended Advertising", otherwise Excluded.
3/12	Sending Tx Power in Advertisements	[4] 2.3.4.7	C.7	☑	C.7: Optional IF LL 3/9 "Extended Advertising", otherwise Excluded.
3/12a	Sending Channel Map Update Indication in ACAD	[9] 1.20	C.11	☑	C.11: Optional IF LL 3/10 "Periodic Advertising", otherwise Excluded.
3/13	Connectionless CTE Transmitter	[6] 4.6.18	C.8	☑	C.8: Mandatory IF LL 9/16 "Connectionless CTE Transmitter", otherwise Excluded.

Table 4: Protocol Scanning Features

Prerequisite: LL 1/2 "Scanning State"

Item	Capability	Reference	Support	Status	Comment
4/1	Passive Scanning	[1] 4.4.3.1	C.1	✓	C.1: Mandatory to support at least one IF GAP 5/2 "Observer" OR GAP 5/4 "Central", otherwise Excluded.
4/2	Receiving Advertising Data	[1] 4.4.3.1, 4.4.3.2	M	✓	
4/3	Active Scanning	[1] 4.4.3.2	C.1	✓	C.1: Mandatory to support at least one IF GAP 5/2 "Observer" OR GAP 5/4 "Central", otherwise Excluded.
4/4	Backoff Procedure	[1] 4.4.3.2	C.2	✓	C.2: Mandatory IF LL 4/3 "Active Scanning", otherwise Excluded.
4/5	Filtering Policies	[1] 4.3.3	M	✓	
4/6	Extended Scanner filter policies	[3] 4.4.3	O	✓	
4/6a	Periodic Sync Establishment Filtering Policies	[4] 4.6.13	C.6	✓	C.6: Mandatory IF LL 4/8 "Scanning for Periodic Advertising", otherwise Excluded.
4/7	Extended Scanning	[4] 4.6.12	C.4	✓	C.4: Mandatory IF LL 9/41 "Extended Advertising", otherwise Excluded.
4/8	Scanning for Periodic Advertising	[4] 4.4.3.4	C.5	✓	C.5: Mandatory IF LL 9/42 "Periodic Advertising", otherwise Excluded.

Table 5: Protocol Initiating Features

Prerequisite: LL 1/3 "Initiating State"

Item	Capability	Reference	Support	Status	Comment
5/1	Requesting Connections	[1] 4.4.4	M	✓	
5/2	Requesting to Directed Advertising	[1] 4.4.4	M	✓	
5/3	Initiator Filtering	[1] 4.3.4	M	✓	
5/4	Requesting connections using extended advertising	[4] 4.6.12	C.1	✓	C.1: Mandatory IF LL 9/41 "Extended Advertising", otherwise Excluded.

Table 6: Protocol Peripheral Role Features

Prerequisite: LL 1/4 "Peripheral Role"

Item	Capability	Reference	Support	Status	Comment
6/1	Peripheral Transmissions	[1] 4.5.1, 4.5.5, 4.5.6	M	✓	
6/2	Acknowledgement Scheme	[1] 4.5.9	M	✓	
6/3	Unknown Response	[1] 5.1.4, 2.4.2	M	✓	
6/4	Responding in Feature Setup	[1] 5.1.4.1	M	✓	
6/4a	Requesting Feature Setup	[1] 5.1.4.2	C.18	✓	C.18: Mandatory IF LL 9/5 "Peripheral-initiated Features Exchange", otherwise Excluded.
6/5	Sending Data (Device supports data output from a Host)	[1] 4.5.1, 4.5.6	M	✓	
6/6	Receiving Data (Device supports data input to a Host)	[1] 4.5.1, 4.5.6	M	✓	
6/7	More Data	[1] 4.5.6	O	✓	
6/10	Accepting Parameter Update	[1] 5.1.1	M	✓	
6/10a	Initiating Connection Parameter Request	[1] 5.1	C.2	✓	C.2: Mandatory IF LL 9/3 "Connection Parameters Request Procedure", otherwise Excluded.
6/10b	Accepting Connection Parameter Request	[1] 5.1	C.2	✓	C.2: Mandatory IF LL 9/3 "Connection Parameters Request Procedure", otherwise Excluded.
6/11	Accepting Channel Map Update	[1] 5.1.2	M	✓	
6/12	Encryption Start	[1] 5.1.3	C.17	✓	C.17: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
6/13	Connection Control Timer	[1] 5.2	M	✓	
6/14	Sending Termination	[1] 5.1.6	M	✓	

6/15	Accepting Termination	[1] 5.1.6	M	✓	
6/16	Connection Supervision Timer	[1] 4.5.2	M	✓	
6/18	Peripheral Pause Encryption	[1] 5.1.3	C.17	✓	C.17: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
6/19	Peripheral Version Exchange	[1] 5.1.5	M	✓	
6/20	Peripheral listens to multiple packets per connection event	[1] 4.5.7	O	✓	
6/21	LE Authenticated Payload Timeout	[2] 5.4	C.5	✓	C.5: Mandatory IF LL 9/2 "LE Ping Procedure", otherwise Excluded.
6/22	Data Length Update Procedure	[3] 5.1.9	C.4	✓	C.4: Mandatory IF LL 9/6 "LE Data Packet Length Extension", otherwise Excluded.
6/23	Minimum Number Of Used Channels Procedure	[4] 4.6.15	C.6	✓	C.6: Mandatory IF LL 9/12 "Minimum Number of Used Channels Procedure", otherwise Excluded.
6/23a	PHY Update procedure	[4] 5.1.10	C.9	✓	C.9: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Mandatory IF LL 9/6a "Multiple PHYs", otherwise Optional.
6/24	Constant Tone Extension Request Procedure as Initiator	[6] 5.1.12	C.7	✓	C.7: Mandatory IF LL 9/14 "Connection CTE Request", otherwise Excluded.
6/25	Constant Tone Extension Request Procedure as Responder	[6] 5.1.12	C.8	✓	C.8: Mandatory IF LL 9/15 "Connection CTE Response", otherwise Excluded.
6/26	Initiating Periodic Advertising Sync Transfer Procedure for Local Periodic Advertising	[6] 5.1.13	C.10	✓	C.10: Mandatory IF LL 9/28 "Initiating Periodic Advertising Sync Transfer for Local Periodic Advertising", otherwise Excluded.
6/27	Initiating Periodic Advertising Sync Transfer Procedure for Remote Periodic Advertising	[6] 5.1.13	C.11	✓	C.11: Mandatory IF LL 9/29 "Initiating Periodic Advertising Sync Transfer for Remote Periodic Advertising", otherwise Excluded.
6/28	Accepting Periodic Advertising Sync Transfer Procedure	[6] 5.1.13	C.12	✓	C.12: Mandatory IF LL 9/27 "Periodic Advertising Sync Transfer: Recipient", otherwise Excluded.
6/29	Sending Long Control PDUs	[6] 4.5.11	C.13	✓	C.13: Mandatory IF LL 6/26 "Initiating Periodic Advertising Sync Transfer Procedure for Local Periodic Advertising" OR LL 6/27 "Initiating Periodic Advertising Sync Transfer Procedure for Remote Periodic Advertising", otherwise Excluded.
6/30	Receiving Long Control PDUs	[6] 4.5.11	C.14	✓	C.14: Mandatory IF (LL 6/28 "Accepting Periodic Advertising Sync Transfer Procedure" OR LL 9/32 "Connected Isochronous Stream Peripheral"), otherwise Excluded.
6/31	Can Change Sleep Clock Accuracy	[6] 4.6.25	C.15	✓	C.15: Mandatory IF LL 9/40 "Can Change Sleep Clock Accuracy", otherwise Excluded.
6/32	Bi-Directional Data in Single Connected Isochronous Stream	[7] 4.5.14	C.16	✓	C.16: Mandatory IF LL 9/32 "Connected Isochronous Stream Peripheral", otherwise Excluded.
6/33	Bi-Directional Data in Multiple Connected Isochronous Streams	[7] 4.5.14	C.20	✓	C.20: Optional IF LL 9/32 "Connected Isochronous Stream Peripheral", otherwise Excluded.

Table 7: Protocol Central Role Features

Prerequisite: LL 1/5 "Central Role"

Item	Capability	Reference	Support	Status	Comment
7/1	Central Transmissions	[1] 4.5.1, 4.5.4, 4.5.6	M	✓	
7/2	Acknowledgement Scheme	[1] 4.5.9	M	✓	
7/3	Unknown Responses	[1] 5.1.4, 2.4.2	M	✓	
7/4	Requesting Feature Setup	[1] 5.1.4.1	M	✓	
7/4a	Responding in Feature Setup	[1] 5.1.4.2	C.18	✓	C.18: Mandatory IF LL 9/5 "Peripheral-initiated Features Exchange", otherwise Excluded.
7/5	Sending Data (Device supports data output from a Host)	[1] 4.5.1, 4.5.6	M	✓	
7/6	Receiving Data (Device supports data input to a Host)	[1] 4.5.1, 4.5.6	M	✓	
7/7	More Data	[1] 4.5.6	O	✓	
7/10	Requesting Parameter Update	[1] 5.1.1	M	✓	
7/10a	Initiating Connection Parameter Request	[1] 5.1	C.2	✓	C.2: Mandatory IF LL 9/3 "Connection Parameters Request Procedure", otherwise Excluded.
7/10b	Accepting Connection Parameter Request	[1] 5.1	C.2	✓	C.2: Mandatory IF LL 9/3 "Connection Parameters Request Procedure", otherwise Excluded.

7/11	Requesting Channel Map Update	[1] 5.1.2	M	✓	
7/12	Encryption Start	[1] 5.1.3	C.17	✓	C.17: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
7/13	Connection Control Timer	[1] 5.2	M	✓	
7/14	Sending Termination	[1] 5.1.6	M	✓	
7/15	Accepting Termination	[1] 5.1.6	M	✓	
7/16	Connection Supervision Timer	[1] 4.5.2	M	✓	
7/19	Central Pause Encryption	[1] 5.1.3	C.17	✓	C.17: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
7/20	Central Version Exchange	[1] 5.1.5	M	✓	
7/21	LE Authenticated Payload Timeout	[2] 5.4	C.5	✓	C.5: Mandatory IF LL 9/2 "LE Ping Procedure", otherwise Excluded.
7/22	Data Length Update Procedure	[3] 5.1.9	C.4	✓	C.4: Mandatory IF LL 9/6 "LE Data Packet Length Extension", otherwise Excluded.
7/23	Minimum Number Of Used Channels Procedure	[4] 4.6.15	C.6	✓	C.6: Mandatory IF LL 9/12 "Minimum Number of Used Channels Procedure", otherwise Excluded.
7/23a	PHY Update procedure	[4] 5.1.10	C.9	✓	C.9: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Mandatory IF LL 9/6a "Multiple PHYs", otherwise Optional.
7/24	Constant Tone Extension Request Procedure as Initiator	[6] 5.1.12	C.7	✓	C.7: Mandatory IF LL 9/14 "Connection CTE Request", otherwise Excluded.
7/25	Constant Tone Extension Request Procedure as Responder	[6] 5.1.12	C.8	✓	C.8: Mandatory IF LL 9/15 "Connection CTE Response", otherwise Excluded.
7/26	Initiating Periodic Advertising Sync Transfer Procedure for Local Periodic Advertising	[6] 5.1.13	C.10	✓	C.10: Mandatory IF LL 9/28 "Initiating Periodic Advertising Sync Transfer for Local Periodic Advertising", otherwise Excluded.
7/27	Initiating Periodic Advertising Sync Transfer Procedure for Remote Periodic Advertising	[6] 5.1.13	C.11	✓	C.11: Mandatory IF LL 9/29 "Initiating Periodic Advertising Sync Transfer for Remote Periodic Advertising", otherwise Excluded.
7/28	Accepting Periodic Advertising Sync Transfer Procedure	[6] 5.1.13	C.12	✓	C.12: Mandatory IF LL 9/27 "Periodic Advertising Sync Transfer: Recipient", otherwise Excluded.
7/29	Sending Long Control PDUs	[6] 4.5.11	C.13	✓	C.13: Mandatory IF (LL 7/26 "Initiating Periodic Advertising Sync Transfer Procedure for Local Periodic Advertising" OR LL 7/27 "Initiating Periodic Advertising Sync Transfer Procedure for Remote Periodic Advertising" OR LL 9/31 "Connected Isochronous Stream Central"), otherwise Excluded.
7/30	Receiving Long Control PDUs	[6] 4.5.11	C.14	✓	C.14: Mandatory IF LL 7/28 "Accepting Periodic Advertising Sync Transfer Procedure", otherwise Excluded.
7/31	Can Change Sleep Clock Accuracy	[6] 4.6.25	C.15	✓	C.15: Mandatory IF LL 9/40 "Can Change Sleep Clock Accuracy", otherwise Excluded.
7/32	CIG with multiple CISes: Sequential	[7] 4.5.14	C.16	✓	C.16: Mandatory IF LL 7/32a "More than one CIS in a CIG", otherwise Excluded.
7/33	CIG with multiple CISes: Interleaved	[7] 4.5.14	C.16	✓	C.16: Mandatory IF LL 7/32a "More than one CIS in a CIG", otherwise Excluded.

Table 8: Physical Channels

Item	Capability	Reference	Support	Status	Comment
8/1	General-purpose channels	[1] 1.4.1	C.1	✓	C.1: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role" OR LL 1/6 "Isochronous Broadcasting State" OR LL 3/9 "Extended Advertising", otherwise Excluded.
8/2	Primary Advertising channels	[1] 1.4.1	M	✓	
8/3	Support Data channel selection algorithm	[1] 4.5.8	C.2	✓	C.2: Mandatory IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role" OR LL 9/10 "Channel Selection Algorithm #2", otherwise Excluded.

Table 9: Supported Features

Item	Capability	Reference	Support	Status	Comment
9/1	LE Encryption	[1] 4.6.1	O	✓	
9/2	LE Ping Procedure	[2] 4.6.5	O	✓	

9/3	Connection Parameters Request Procedure	[1] 4.6.2	C.2	☑	C.2: Optional IF LL 9/4 "Extended Reject Indication", otherwise Excluded.
9/4	Extended Reject Indication	[1] 4.6.3	O	☑	
9/5	Peripheral-initiated Features Exchange	[1] 4.6.4	O	☑	
9/6	LE Data Packet Length Extension	[3] 4.6.6	O	☑	
9/6a	Multiple PHYs	[4] 4.6.9	C.6	☑	C.6: Mandatory IF LL 9/7 "LE 2MPHY" OR LL 9/9 "LE Coded PHY", otherwise Excluded.
9/7	LE 2MPHY	[3] 2.1	C.5	☑	C.5: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Optional IF LL 9/4 "Extended Reject Indication", otherwise Excluded.
9/8	Asymmetric Connections	[4] 4.6.9.1	C.7	☑	C.7: Optional IF LL 9/6a "Multiple PHYs", otherwise Excluded.
9/9	LE Coded PHY	[4] 2.2	C.5	☑	C.5: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Optional IF LL 9/4 "Extended Reject Indication", otherwise Excluded.
9/10	Channel Selection Algorithm #2	[4] 4.6.14	C.10	☑	C.10: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Optional.
9/12	Minimum Number of Used Channels Procedure	[4] 4.6.15	C.10	☑	C.10: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Optional.
9/13	LL Privacy	[4] 4.6.7	O	☑	
9/14	Connection CTE Request	[6] 4.6.16	C.11	☑	C.11: Excluded IF SUMICS 21/14 "Core v4.2" OR SUMICS 21/16 "Core v5.0", otherwise Optional IF LL 9/4 "Extended Reject Indication" AND (LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role") AND LL 9/20 "2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)", otherwise Excluded.
9/15	Connection CTE Response	[6] 4.6.17	C.4	☑	C.4: Excluded IF SUMICS 21/14 "Core v4.2" OR SUMICS 21/16 "Core v5.0", otherwise Optional IF LL 9/4 "Extended Reject Indication" AND (LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role") AND RFPHY 1/8 "Transmitting Constant Tone Extensions", otherwise Excluded.
9/16	Connectionless CTE Transmitter	[6] 4.6.18	C.12	☑	C.12: Excluded IF SUMICS 21/16 "Core v5.0", otherwise Optional IF LL 3/10 "Periodic Advertising" AND RFPHY 1/8 "Transmitting Constant Tone Extensions", otherwise Excluded.
9/17	Connectionless CTE Receiver	[6] 4.6.19	C.13	☑	C.13: Optional IF LL 11/1 "Synchronizing to Periodic Advertising" AND RFPHY 1/11 "2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)", otherwise Excluded.
9/18	2 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)	[6] 4.6.20	C.14	☑	C.14: Optional IF LL 9/19 "No Antenna Switching During Constant Tone Extension Transmission (AoA)" AND RFPHY 1/9 "2 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)", otherwise Excluded.
9/19	No Antenna Switching During Constant Tone Extension Transmission (AoA)	[6] 4.6.20	C.15	☑	C.15: Optional IF RFPHY 1/8 "Transmitting Constant Tone Extensions", otherwise Excluded.
9/20	2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)	[6] 4.6.21	C.16	☑	C.16: Optional IF RFPHY 1/11 "2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)", otherwise Excluded.
9/21	2 μ s Antenna Switching And Sampling During Constant Tone Extension Reception (AoA)	[6] 4.6.21	C.27	☑	C.27: Optional IF LL 9/20 "2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)" AND RFPHY 1/12 "2 μ s Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)", otherwise Excluded.
9/22	1 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)	[6] 4.6.20	C.17	☑	C.17: Optional IF LL 9/18 "2 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)" AND RFPHY 1/10 "1 μ s Antenna Switching During Constant Tone Extension Transmission (AoD)", otherwise Excluded.
9/23	1 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)	[6] 4.6.21	C.18	☑	C.18: Optional IF LL 9/20 "2 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)" AND RFPHY 1/13 "1 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)", otherwise Excluded.
9/24	1 μ s Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)	[6] 4.6.21	C.19	☑	C.19: Mandatory IF LL 9/21 "2 μ s Antenna Switching And Sampling During Constant Tone Extension Reception (AoA)" AND LL 9/23 "1 μ s Antenna Sampling During Constant Tone Extension Reception (AoD)" AND RFPHY 1/14 "1 μ s Antenna Switching and Sampling During Constant Tone Extension Reception (AoA)", otherwise Excluded.
9/25	Remote Public Key Validation	[5] 4.6.23, [6] 4.6.26	O	☑	
9/26	Periodic Advertising Sync Transfer: Sender	[6] 4.6.23	C.23	☑	C.23: Excluded IF SUMICS 21/16 "Core v5.0", otherwise Optional IF (LL 3/10 "Periodic Advertising" AND (LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role")), otherwise Excluded.
9/27	Periodic Advertising Sync Transfer: Recipient	[6] 4.6.24	C.22	☑	C.22: Excluded IF SUMICS 21/16 "Core v5.0", otherwise Optional IF (LL 11/1 "Synchronizing to Periodic Advertising" AND (LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role")), otherwise Excluded.

9/28	Initiating Periodic Advertising Sync Transfer for Local Periodic Advertising	[6] 5.1.13	C.21	☑	C.21: Mandatory IF LL 9/26 "Periodic Advertising Sync Transfer: Sender", otherwise Excluded.
9/29	Initiating Periodic Advertising Sync Transfer for Remote Periodic Advertising	[6] 5.1.13	C.21	☑	C.21: Mandatory IF LL 9/26 "Periodic Advertising Sync Transfer: Sender", otherwise Excluded.
9/30	Sleep Clock Accuracy Updates	[6] 4.6.25	C.37	☑	C.37: Excluded IF SUMICS 21/14 "Core v4.2" OR SUMICS 21/16 "Core v5.0", otherwise Optional.
9/31	Connected Isochronous Stream Central	[7] 4.6.27	C.28	☑	C.28: Excluded IF SUMICS 21/18 "Core v5.1", otherwise Optional IF LL 1/5 "Central Role" AND LL 9/4 "Extended Reject Indication" AND LL 9/10 "Channel Selection Algorithm #2" AND LL 9/30 "Sleep Clock Accuracy Updates", otherwise Excluded.
9/32	Connected Isochronous Stream Peripheral	[7] 4.6.27	C.29	☑	C.29: Excluded IF SUMICS 21/18 "Core v5.1", otherwise Optional IF LL 1/4 "Peripheral Role" AND LL 9/4 "Extended Reject Indication" AND LL 9/10 "Channel Selection Algorithm #2" AND LL 9/30 "Sleep Clock Accuracy Updates", otherwise Excluded.
9/33	Isochronous Broadcaster	[7] 4.6.28	C.30	☑	C.30: Excluded IF SUMICS 21/16 "Core v5.0" OR SUMICS 21/18 "Core v5.1", otherwise Optional IF LL 9/42 "Periodic Advertising", otherwise Excluded.
9/34	Synchronized Receiver	[7] 4.6.29	C.30	☑	C.30: Excluded IF SUMICS 21/16 "Core v5.0" OR SUMICS 21/18 "Core v5.1", otherwise Optional IF LL 9/42 "Periodic Advertising", otherwise Excluded.
9/35	ISO Receive Test	[8] 7.8.112, 7.8.113, 7.8.114	C.32	☑	C.32: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/34 "Synchronized Receiver", otherwise Excluded.
9/36	ISO Transmit Test	[8] 7.8.111, 7.8.114	C.33	☑	C.33: Mandatory IF LL 9/31 "Connected Isochronous Stream Central" OR LL 9/32 "Connected Isochronous Stream Peripheral" OR LL 9/33 "Isochronous Broadcaster", otherwise Excluded.
9/37	LE Power Control Request	[7] 4.6.31	C.34	☑	C.34: Excluded IF SUMICS 21/14 "Core v4.2" OR SUMICS 21/16 "Core v5.0" OR SUMICS 21/18 "Core v5.1", otherwise Optional IF LL 9/4 "Extended Reject Indication", otherwise Excluded.
9/39	LE Path Loss Monitoring	[7] 4.6.32	C.34	☑	C.34: Excluded IF SUMICS 21/14 "Core v4.2" OR SUMICS 21/16 "Core v5.0" OR SUMICS 21/18 "Core v5.1", otherwise Optional IF LL 9/4 "Extended Reject Indication", otherwise Excluded.
9/40	Can Change Sleep Clock Accuracy	[6] 4.6.25	C.37	☑	C.37: Excluded IF SUMICS 21/14 "Core v4.2" OR SUMICS 21/16 "Core v5.0", otherwise Optional.
9/41	Extended Advertising	[6] 4.6.12	C.38	☑	C.38: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Optional IF LL 9/10 "Channel Selection Algorithm #2", otherwise Excluded IF LL 1/4 "Peripheral Role" OR LL 1/5 "Central Role", otherwise Optional.
9/42	Periodic Advertising	[6] 4.6.13	C.39	☑	C.39: Optional IF LL 9/41 "Extended Advertising" AND LL 9/10 "Channel Selection Algorithm #2", otherwise Excluded.

Table 10: Scatternet Capabilities

Item	Capability	Reference	Support	Status	Comment
10/1	Act as LE Central and LE Peripheral at the same time	[2] 1.1.1	C.1	☑	C.1: Optional IF LL 1/4 "Peripheral Role" AND LL 1/5 "Central Role", otherwise Excluded.
10/2	Act as LE Peripheral to more than one LE Central at the same time.	[2] 1.1.1	C.2	☑	C.2: Optional IF LL 1/4 "Peripheral Role", otherwise Excluded.

Table 11: Protocol Synchronizing Features

Prerequisite: LL 1/3a "Synchronized State"

Item	Capability	Reference	Support	Status	Comment
11/1	Synchronizing to Periodic Advertising	[6] 4.4.3.4	C.3	☑	C.3: Mandatory IF LL 4/8 "Scanning for Periodic Advertising", otherwise Excluded.
11/2	Connectionless CTE Receiver	[6] 4.6.19	C.1	☑	C.1: Mandatory IF LL 9/17 "Connectionless CTE Receiver", otherwise Excluded.
11/3	Receiving Data on Single Broadcast Isochronous Stream	[7] 4.4.5.2	C.2	☑	C.2: Mandatory IF LL 9/34 "Synchronized Receiver", otherwise Excluded.
11/4	Receiving Data on Multiple Broadcast Isochronous Streams	[7] 4.4.5.2	C.4	☑	C.4: Optional IF LL 9/34 "Synchronized Receiver", otherwise Excluded.

Table 11a: Synchronized Receiver Features

Prerequisite: LL 9/34 "Synchronized Receiver"

Item	Capability	Reference	Support	Status	Comment
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Table 12: Protocol Isochronous Broadcasting Features

Prerequisite: LL 1/6 "Isochronous Broadcasting State"

Item	Capability	Reference	Support	Status	Comment
12/1	Encrypted Broadcast Isochronous Stream	[7] 4.4.6.1, 4.4.6.10	C.1	☑	C.1: Mandatory IF LL 9/1 "LE Encryption", otherwise Excluded.
12/2	Unencrypted Broadcast Isochronous Stream	[7] 4.4.6.1	M	☑	

Low Energy RF PHY

Table 1: Bluetooth LE RF Capabilities

Item	Capability	Reference	Support	Status	Comment
1/1	LE Transmitter	[1] 3	C.1	☑	C.1: Mandatory to support at least one of RFPHY 1/1 "LE Transmitter" OR RFPHY 1/2 "LE Receiver" OR RFPHY 1/3 "LE Transceiver". 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.
1/2	LE Receiver	[1] 4	C.1	☑	C.1: Mandatory to support at least one of RFPHY 1/1 "LE Transmitter" OR RFPHY 1/2 "LE Receiver" OR RFPHY 1/3 "LE Transceiver". 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.
1/3	LE Transceiver	[1] 3, 4	C.1	☑	C.1: Mandatory to support at least one of RFPHY 1/1 "LE Transmitter" OR RFPHY 1/2 "LE Receiver" OR RFPHY 1/3 "LE Transceiver". 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.
1/4	LE 2MPHY	[3] 3, 4	C.2	☑	C.2: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Optional.
1/7	LE Coded PHY	[3] 3, 4	C.2	☑	C.2: Excluded IF SUMICS 21/14 "Core v4.2", otherwise Optional.

Table 2: Bluetooth LE Test Interface Capabilities

Item	Capability	Reference	Support	Status	Comment
2/1	HCI Test Interface	[2] 2	C.1	☑	C.1: Mandatory to support at least one of RFPHY 2/1 "HCI Test Interface" OR RFPHY 2/2 "UART Test Interface".
2/2	UART Test Interface	[2] 3	C.1	☑	C.1: Mandatory to support at least one of RFPHY 2/1 "HCI Test Interface" OR RFPHY 2/2 "UART Test Interface".