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6 **ZigBee IP Platform PICS**

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14 The information on this page should be removed when this document is accepted.

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3　leadership when this document was released:

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1 ## Table of Contents

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1 | ## List of Tables

1   **Change history**

2   Table 1 shows the change history for this specification.

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Table 1 – Document revision change history

Revision	Description
00	Initial outline of document
01	Initial draft of document
02	Updated with changes corresponding to r23 of ZigBee IP specification
03	Updated format to follow ZigBee Pro PICS document, add reference to MAC/PHY test plan and changes from certification event
04	Modify header

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1   Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given standard. Such a statement is called a protocol implementation conformance statement (PICS).

1.1   Scope

This document provides the protocol implementation conformance statement (PICS) proforma for ZigBee IP specification in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7.

1.2   Purpose

The supplier of a protocol implementation claiming to conform to the ZigBee IP specification shall complete the following PICS proforma and accompany it with the information necessary to identify fully both the supplier and the implementation.

The protocol implementation conformance statement (PICS) of a protocol implementation is a statement of which capabilities and options of the protocol have been implemented. The statement is in the form of answers to a set of questions in the PICS proforma. The questions in a proforma consist of a systematic list of protocol capabilities and options as well as their implementation requirements. The implementation requirement indicates whether implementation of a capability is mandatory, optional, or conditional depending on options selected. When a protocol implementer answers questions in a PICS proforma, they would indicate whether an item is implemented or not, and provide explanations if an item is not implemented.

2   References

The following standards and specifications contain provisions, which through reference in this document constitute provisions of this specification. All the standards and specifications listed are normative references. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the standards and specifications indicated below.

2.1   ZigBee Alliance documents

[R1]   ZigBee IP Specification, ZigBee Document Number 095023r29, January 2013

[R2]   ZigBee IEEE 802.15.4 PHY & MAC Layer Test Specification release r01, ZigBee document 04-0319r01

2.2   IEEE documents

[R3]   IEEE Standard for Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) specifications for Low Rate Wireless Personal Area Networks (LR-WPANs), 2006.

2.3   ISO documents

[R4]   ISO/IEC 9646-1:1991, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts.

[R5]   ISO/IEC 9646-7:1995, Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7. Implementation conformance statements.

3   Abbreviations and special symbols

Notations for requirement status:

M	Mandatory
O	Optional
O.n	Optional, but support of at least one of the group of options labeled O.n is required.
N/A	Not applicable
X	Prohibited
Item Number: :Status	Status is conditional on support of item number

"*Item Number*": Conditional, status dependent upon the support marked for the "*Item Number*".

For example, FD1: O.1 indicates that the status is optional but at least one of the features described in FD1 is required to be implemented, if this implementation is to follow the standard of which this PICS Proforma is a part.

4   Instructions for completing the PICS proforma

If a given implementation is claimed to conform to this standard, the actual PICS proforma to be filled in by a supplier shall be technically equivalent to the text of the PICS proforma in this document, and shall preserve the numbering and naming and the ordering of the PICS proforma.

A PICS which conforms to this document shall be a conforming PICS proforma completed in accordance with the instructions for completion given in this section.

The main part of the PICS is a fixed-format questionnaire, divided. Answers to the questionnaire are to be provided in the rightmost column, either by simply marking an answer to indicate a restricted choice (such as Yes or No), or by entering a value, set, or range of values.

5   Identification of the implementation

System under test (SUT) identification

SUT name: _____Silicon Labs Ember Em357_____

Software Version: ____1.0_____

Hardware Version: ____0701-revB_____

Operating system (optional): _____

Specification Version Numbers at time of certification

ZigBee IP Specification Revision: ___**12-0572-09**_____

Approved Errata Text to the ZigBee IP Specification (if any): _____

ZigBee IP Test Plan Revision: ____**12-0227-09**_____

Approved Errata Text to the ZigBee IP Test Plan (if any): _____

Product supplier Contact Information

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6　PICS proforma tables

The following tables are composed of the detailed questions to be answered, which make up the PICS proforma.

6.1　Physical Layer Interface

Table 2 – Physical Layer Interface

Item number	Item description	Reference	Status	Support
PHY1	Does the device employ: A 2450 MHz DSSS PHY employing O-QPSK modulation	[R1]/5.1 [R3]/6.1	O.1	Y
PHY2	Does the device employ: An 868/915 MHz direct sequence spread spectrum (DSSS) PHY employing binary phase-shift keying (BPSK) modulation	[R1]/5.1 [R3]/6.1	O.1	Y
PHY3	Does the device employ: An 868/915 MHz DSSS PHY employing offset quadrature phase-shift keying (O-QPSK) modulation	[R1]/5.1 [R3]/6.1	O.1	Y
PHY4	Does the device employ: An 868/915 MHz parallel sequence spread spectrum (PSSS) PHY employing BPSK and amplitude shift keying (ASK) modulation	[R1]/5.1 [R3]/6.1	O.1	Y

6.2　Network Device Types

Table 3 - Network Device Types

Item number	Item description	Reference	Status	Support
FDT1	Is this device capable of acting as a ZigBee IP Coordinator?	[R1]/6.1	O.2	Y
FDT2	Is this device capable of acting as a ZigBee IP Router?	[R1]/6.1	O.2	Y

Item number	Item description	Reference	Status	Support
FDT3	Is this device capable of acting as a ZigBee IP Host?	[R1]/6.1	O.2	Y

6.3　IEEE 802.15.4-2006 MAC Support

Table 4 – IEEE 802.15.4-2006 MAC Compliance

Item number	Item description	Reference	Status	Support
MAC1	Does the device support the IEEE 802.15.4-2006 MAC specification as a Full Function Device?	[R1]/5.2	FDT1:M FDT2:M FDT3:O	Y
MAC2	Does the device support the IEEE 802.15.4-2006 MAC specification as a Reduced Function Device?	[R1]/5.2	FDT1:N/A FDT2:N/A FDT3:M	Y
MAC3	Does the device have a globally unique EUI-64 address and does the device maintain the address for the lifetime of the device?	[R1]/5.2	M	Y
MAC4	Does the device support assignment and use of network short addresses (16 bit) that are unique within the personal area network the device is a member?	[R1]/5.2	M	Y
MAC5	Does the device support the MAC frame security configuration as defined in ZigBee IP specification?	[R1]/5.10	M	Y

6.4 6LowPAN Adaptation Layer Support

Table 5 – IETF 6LoWPAN Adaptation Layer Compliance

Item number	Item description	Reference	Status	Support
6LO1	Does the device support the 6LoWPAN header compression?	[R1]/5.3	M	Y
6LO2	Does the device support the list of IP addressing modes, MAC addressing modes and header compression modes detailed in RFC 6282?	[R1]/5.3	M	Y
6LO3	Does the device support the default context and upto MIN_6LP_CID_COUNT for the purposes of IP header compression?	[R1]/5.3.2	M	Y
6LO4	Does the device support 6LoWPAN fragmentation ?	[R1]/5.3	M	Y

6.5 Network Layer Support

Table 6 –Network Layer Compliance

Item number	Item description	Reference	Status	Support
NET1	Does the device support the IPv6 protocol?	[R1]/5.4	M	Y
NET3	Does the device support the ICMPv6 protocol including the echo request and echo reply messages?	[R1]/5.4	M	Y
NET4	Does the device support the neighbor discovery protocol described for 6LoWPAN?	[R1]/5.4	M	Y
NET5	Does the device support the RPL protocol with configuration defined in ZigBee IP specification?	[R1]/5.4.2	FDT1:M FDT2:M FDT3:X	Y

Item number	Item description	Reference	Status	Support
NET6	Does the device support the RPL MrHOF Objective Function with configuration defined in ZigBee IP specification?	[R1]/5.4.2.2	FDT1:M FDT2:M FDT3:X	Y
NET7	Does the device support the RPL DAG configuration provided for ZigBee IP?	[R1]/5.4.2	FDT1:M FDT2:M FDT3:X	Y
NET8	Is the device capable of joining atleast MIN_RPL_INSTANCE_COUNT number of RPL instances?	[R1]/5.4.2	FDT2:M FDT3: M	Y
NET9	Is the device capable of starting an RPL Instance and acting as the DoDAG Root?	[R1]/5.4.2	FDT1: M FDT2: O FDT3: X	Y
NET10	Is the device capable of selecting at least RPL_MIN_DAO_PARENT number of DAO parents for configuration of downward routes?	[R1]/5.4.2	FDT1:N/A FDT2:M FDT3:X	Y
NET11	Is the device capable of originating IPv6 subnet-local multicast packets?	[R1]/5.4.4.2	FDT1:M FDT2:M FDT3:M	Y
NET12	Is the device capable of originating IPv6 site-local multicast packets?	[R1]/5.4.4.2	FDT1:M FDT2:M FDT3:M	Y
NET13	Is the device capable of forwarding IPv6 subnet-local multicast packets using MPL protocol with configuration parameters defined in ZigBee IP specification?	[R1]/5.4.4.2	FDT1:M FDT2:M FDT3:X	Y

6.6 Transport Layer

Table 7: Transport Layer Compliance

Item number	Item description	Reference	Status	Support
TRNSPRT1	Does the device support the TCP protocol?	[R1]/5.5	M	Y
TRNSPRT2	Does the device support the UDP protocol?	[R1]/5.5	M	Y

6.7 Network Authentication

Table 8: Network Authentication Compliance

Item number	Item description	Reference	Status	Support
AUTH1	Does the device support the PANA network authentication protocol in the role of Authentication Agent?	[R1]/5.6	FDT1:M FDT2:X FDT3:X	Y
AUTH2	Does the device support the PANA network authentication protocol in the role of client?	[R1]/5.6	FDT1:X FDT2:M FDT3:M	Y
AUTH3	Does the device support the PANA Relay protocol?	[R1]/5.6	FDT1:X FDT2:M FDT3:X	Y
AUTH4	Does the device support the EAP authentication framework and EAP-TLS method in the role of EAP Authenticator?	[R1]/5.7	FDT1:M FDT2:X FDT3:X	Y
AUTH5	Does the device support the EAP authentication framework and EAP-TLS method in the role of EAP Peer?	[R1]/5.7	FDT1:X FDT2:M FDT3:M	Y
AUTH6	Does the device support the EAP-TLS fragmentation?	[R1]/5.8.2	M	Y

Item number	Item description	Reference	Status	Support
AUTH7	Does the device support the TLS-PSK ciphersuite with configuration defined in ZigBee IP specification?	[R1]/5.9	O	Y
AUTH8	Does the device support the TLS-ECC ciphersuite with configuration defined in ZigBee IP specification?	[R1]/5.9	M	Y
AUTH9	Does the device support the PANA ZigBee Alliance vendor-specific Network key AVP defined in ZigBee IP specification?	[R1]/5.6	M	Y
AUTH10	Does the device support the PANA ZigBee Alliance vendor-specific Key request AVP defined in ZigBee IP specification?	[R1]/5.6	O	Y
AUTH11	Does the device support the Enforcement point function?	[R1]/6.9.2	M	Y

6.8　Mesh Link Establishment

Table 9: MLE Compliance

Item number	Item description	Reference	Status	Support
MLE1	Does the device support the transmission and reception of MLE Link configuration messages?	[R1]/5.11	M	Y
MLE2	Does the device support the transmission and reception of MLE Link Advertisement messages	[R1]/5.11	FDT1:M FDT2:M FDT3:X	Y
MLE3	Does the device support the origination of MLE Link Update messages?	[R1]/5.11	FDT1:M FDT2:X FDT3:X	Y
MLE4	Does the device reception of MLE Link Update messages?	[R1]/5.11	FDT1:N/A FDT2:M FDT3:M	Y

6.9   Device Functional Compliance

Table 10 – Device Functional Compliance

Item number	Item description	Reference	Status	Support
FNC1	Does the device support the Network Formation procedure described in ZigBee IP specification?	[R1]/6.2	FDT1:M FDT2, FDT3: X	Y
FNC2	Does the device support the Host bootstrapping procedure defined in ZigBee IP specification?	[R1]/6.5.1	FDT1:X FDT2:X FDT3:M	Y
FNC3	Does the device support the Router bootstrapping procedure defined in ZigBee IP specification?	[R1]/6.5.2	FDT1:X FDT2:M FDT3:X	Y
FNC5	Does the device support the configuration and transmission of the beacon payload described in ZigBee IP specification?	[R1]/6.3	FDT1:M FDT2:M FDT3:X	Y