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**ZigBee<sup>®</sup>  
Alliance**

# **ZIGBEE ALLIANCE CERTIFICATION POLICY**

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## 127 1 INTRODUCTION

128 This document defines policies related to ZigBee Certified, the certification and testing program of the ZigBee®  
129 Alliance. It describes:

- 130 • The ZigBee Certified Program
- 131 • Types of certification
- 132 • Levels of Certification
- 133 • Certification Programs
- 134 • Testing programs and authorized test service providers
- 135 • Golden Units and processes for selection and revision
- 136 • Certification by Similarity and Guidelines for Retesting

### 137 1.1 Scope and Purpose

138 This document defines the certification programs supported by the ZigBee Alliance. This includes the process  
139 and rules for the entire life cycle of a program including specification validation, testing, sunset, etc. It is not the  
140 intent of this document to define the organizational entities responsible for managing any part of this process,  
141 except those required to be visible outside the participation level of the ZigBee Alliance, such as the authority to  
142 certify and resolve conflict.

### 143 1.2 Structure of this Document

144 This document first defines processes and rules that are common to many programs. Even in the common  
145 process there are levels and dependencies. After the common sections, this document then defines each active  
146 program (legacy and current), in terms of requirements and additions to the common process.

### 147 1.3 References

148 This document refers to several other documents related to details of the certification policy.

- 149 13-0625 Technical Structure, Process and Procedures
- 150 08-0123 Test Event Rules of Engagement
- 151 05-3739 ZigBee Certified Logo and Trademark Policy
- 152 08-5185 Qualification and Validation of Test Service Providers
- 153 11-5456 Master Cluster List

### 154 1.4 Abbreviations and Terminology

155 *Table 1 – Abbreviations and Terminology*

<b>Certification Program</b>	A well defined process, that approves interpretation, validates conformance and interoperability to a set of specifications, and when successfully completed, allows the certification authority to issue a certificate
<b>Certified Product</b>	A Product that has been certified under the Product Certification Program
<b>Compliant Platform</b>	A Platform that has been certified under the Compliant Platform Certification Program
<b>Compliant Platform Certification Program</b>	A Certification Program that validates a Platform for purposes of certification
<b>DUT</b>	Device Under Test

<b>Golden Unit</b>	A Compliant Platform or Certified Product chosen to be used as part of a Program to test interoperability.
<b>GU</b>	Golden Unit
<b>MAC</b>	Media Access Control
<b>ODM</b>	Original Design Manufacturer
<b>OEM</b>	Original Equipment Manufacturer
<b>PHY</b>	Physical Layer
<b>PICS</b>	Protocol Implementation Conformity Statement (list of supported functions)
<b>Platform</b>	An implementation of a Stack
<b>Product</b>	An implementation of a Standard
<b>Product Certification Program</b>	A Certification Program validating a Product for purposes of certification
<b>Program</b>	see Certification Program
<b>RF</b>	Radio Frequency
<b>SKU</b>	Stock Keeping Unit (unique model identifier)
<b>Stack</b>	An approved set of base specifications upon which a Standard is built (e.g. ZigBee PRO, RF4CE, etc).
<b>Standard</b>	A approved set (or vertical stack) of specifications, built upon a Stack, defining interoperable behavior, on which interoperable applications can be built (e.g. ZSE, ZigBee 3.0, ZRC, etc).
<b>Test Event</b>	organized event to test and validate specification implementations
<b>Test Harness</b>	test harness that is developed by an authorized test service provider for use in executing testing and approved by the ZigBee Alliance
<b>ZigBee product</b>	Product
<b>ZigBee standard</b>	Standard

156

## 157 2 ZIGBEE CERTIFIED PROGRAM

158 This section describes the general process and rules that are common for all certification programs.

### 159 2.1 Description

160 ZigBee Certified is the overall program which enables certification of Products and Compliant Platforms that  
 161 conform to ZigBee Alliance standards. The program defines various types of certifications and related policies  
 162 including requirements for certification and testing programs and leverages the expertise of hundreds of  
 163 engineers and business people to ensure only quality Products earn ZigBee Certified Product status.

164 ZigBee Certified generally follows international standards for the definition and operation of a certification  
 165 program. In particular, ZigBee Certified is designed as a Type 1b certification program as defined in ISO/IEC  
 166 Guide 67: 2004. Type 1b systems consist of several types of activities:

- 167 • Determination of Product characteristics: This is achieved through testing of submitted  
168 samples performed by independent authorized test service providers.
- 169 • Evaluation: This is achieved by formally evaluating the results of testing.
- 170 • Decision: This is the stage that controls granting, maintaining and extending suspending or  
171 withdrawing certification.
- 172 • Licensing: Licensing refers to granting, suspending, or withdrawing the rights to use  
173 certificates or marks such as logos.

## 174 2.2 Testing Versus Certification

175 The ZigBee Certified program maintains a strict distinction between testing and certification. Testing is the  
176 process verifying conformance to ZigBee standards. Certification is granting official recognition that a Product  
177 conforms to a ZigBee standards and that a Product manufacturer conforms to all the relevant policies of the  
178 ZigBee Certified program.

179 Only the ZigBee Alliance may grant certification.

## 180 2.3 ZigBee Responsibilities

181 The Test and Certification Oversight Committee (TCOC) of the ZigBee Board of Directors shall be responsible  
182 for development of policies related to certification (including this document) and working with the ZigBee  
183 Certification Advisory working group and other technical working groups on certification related issues. The  
184 TCOC is made up of volunteers from members of the ZigBee Board of Directors.

## 185 2.4 Director of ZigBee Certified

186 The Director of ZigBee Certified shall be named by Alliance management and will be responsible for a variety  
187 of functions related to administering the ZigBee certified program including processing of certification  
188 applications, issuing of certificates, consulting with the TCOC on certification and testing policy matters, and  
189 interpreting certification policies on a day-to-day basis.

190 In accordance with ISO/IEC Guide 65, the Director of ZigBee Certified has decision making authority in  
191 regards to granting certifications and other related tasks.

## 192 2.5 Expert Review Panel

193 The Expert Review Panel is a team of volunteers from member companies nominated by the Certification  
194 Advisory working group and approved by the TCOC. The Panel provides expert technical advice to the ZigBee  
195 Certified program. The function of the Panel is defined in document 08-5185 “Qualification and Validation of  
196 Test Service Providers”. An up-to-date list of the current Panel members is maintained at the front of the  
197 Certification Advisory working group meeting minutes document.

198 Aside from their role in validation of test service providers, the Expert Review Panel may be called on from  
199 time to time to provide other expert advice in regards to other matters such as review of test plans, review of  
200 interoperability concerns discovered in the field or to assist the Director of ZigBee Certified in resolution of  
201 disputes.

## 202 2.6 Appeals

203 The ZigBee Alliance has a procedure for the resolution of issues regarding the granting of certification.

204 Certification applicants may appeal a decision regarding certification if they believe this certification policy was  
205 applied in error. The basis of the appeal shall be (1) a specific concern about the misapplication of the policy or  
206 (2) an error on the part of an authorized test service provider or the Director of ZigBee Certified.

### 207 2.6.1 Appeals Process

208 The process for appeals shall be:



- 209 • Applicant shall send an appeal request to certification@zigbee.org. The request shall  
210 document the issue, the specific basis of the appeal and the corrective action requested.  
211
- 212 • Acknowledgement of receipt of the appeal by either the Director of ZigBee Certified or the  
213 Chief Executive Officer of the ZigBee Alliance shall be provided.  
214
- 215 • The Director of ZigBee Certified and the Chief Executive Officer of the ZigBee Alliance shall  
216 consider the appeal.  
217
- 218 • A preliminary decision shall be made either to take corrective action or to reject the appeal.  
219
- 220 • If corrective action is to be taken, the Director of ZigBee Certified or the Chief Executive  
221 Officer of the ZigBee Alliance shall implement the corrective action.  
222
- 223 • If the appeal is proposed for rejection, the appeal shall be forwarded to the Appeals  
224 Committee for consideration.  
225
- 226 • A report on the status of the appeal shall be given to the applicant.  
227
- 228 • The Appeals Committee shall consider the appeal.  
229
- 230 • A decision shall be made either to take corrective action or to reject the appeal.  
231
- 232 • If corrective action is to be taken, the Director of ZigBee Certified or the Chief Executive  
233 Officer of the ZigBee Alliance shall implement the corrective action.  
234
- 235 • If the appeal is rejected, the specific basis for rejection shall be documented.  
236
- 237 • A report on the final disposition of the appeal shall be given to the applicant by either the  
238 Director of ZigBee Certified or the Chief Executive Officer of the ZigBee Alliance.

239 All parties shall treat any information related to an appeal as confidential information during the process.

## 240 2.6.2 Appeals Committee

241 The ZigBee Alliance shall have a committee to address appeals. The Appeals Committee shall consist of the  
242 Chief Executive Officer of the Alliance, the chairperson of the TCOC and a representative of each authorized  
243 test service provider. The Chief Executive Officer of the Alliance shall act as chairperson of the Appeals  
244 Committee.

245 In order to insure the impartiality of the appeals process, any member of the Committee who may have any  
246 conflict of interest with the party making the appeal shall disclose the conflict. The member will not be allowed  
247 to vote or participate in Committee activities regarding the appeal. Conflicts of interest are defined as, at a  
248 minimum, a financial or competitive relationship with the appealing party. The Committee members themselves  
249 shall decide if other issues are conflicts of interest.

## 250 2.7 Levels of Certification

251 The ZigBee Alliance offers two levels of standards compliance –Compliant Platform and Certified Product.

### 252 2.7.1 Compliant Platform

253 The ZigBee Compliant Platform program defines a rigorous evaluation and certification process for a Platform  
254 before it can be certified as a Compliant Platform and engineered into a Product. Each Platform is comprised of  
255 a radio and a microprocessor with storage running ZigBee firmware. The Platform is tested for compliance to a  
256 set of ZigBee specifications (see section 6 Certification Programs).

257 This program ensures the supply chain has a solid foundation for Products destined for personal or commercial  
258 use. Successfully completing this testing allows the member to have its Platform recognized by the Alliance as a  
259 Compliant Platform.

## 260 2.7.2 Certified Product

261 A Certified Product program defines the testing requirements and a process to validate a Product's conformance  
262 to a Standard (see section 6 Certification Programs). The Product must be fully compliant to the Standard(s) and  
263 successfully execute all mandatory and implemented optional commands. Successful certification allows the  
264 Product to be recognized by the Alliance as a Certified Product and use a Certified Product logo. A Compliant  
265 Platform is a fundamental building block of a Certified Product. With few exceptions (defined in this  
266 document), the use of a certified Compliant Platform is a mandatory prerequisite to assessment as a Certified  
267 Product.

## 268 2.8 Requirements for Certification

269 Certification may be awarded based on a Product's successful completion of the process defined in a Certified  
270 program (see section 6 Certification Programs).

### 271 2.8.1 Membership

272 To submit a Product for certification or compliance testing and to be granted certification, a company must be a  
273 member in good standing of the ZigBee Alliance. The Alliance has several different types of membership which  
274 are documented on its web site: <http://www.zigbee.org>.

### 275 2.8.2 Conformance to Standard

276 Conformance is verified by testing performed by an authorized test service provider and demonstrated by a test  
277 report documenting successful completion of the entire test plan including all test cases for mandatory features  
278 and test cases for any implemented optional features as identified by the PICS. The test service providers shall  
279 report any information relevant regarding the Product's conformance to a standard in the test report.

### 280 2.8.3 Documentation of Product

281 The ZigBee Alliance shall require information sufficient to identify a Product before granting certification  
282 including.

- 283 1) Declaration of Conformity (DoC or DOC):  
284 a) Version numbers of Product hardware, software, and firmware  
285 b) For a Product, a Stock Keeping Unit (SKU) and/or Universal Product Code  
286 c) For a Product, the Compliant Platform upon which the Product is based  
287 d) Signature of a representative of the Product manufacturer  
288 e) Signature of a representative of the authorized test service provider performing Product testing  
289
- 290 2) Protocol Implementation Conformance Statements (PICS):  
291 a) including mandatory and optional features supported by the Product  
292
- 293 3) Non-declaratory information that is also requested:  
294 a) Product description  
295 b) Product photo

## 296 2.9 Process for Certification

297 The certification process begins after the manufacturer completes development of the Product to be certified.

298 **Testing:** Testing for conformance to a Standard is performed by Alliance authorized test service  
299 providers using test plans developed by the Alliance. The Alliance maintains a list of authorized test

300 service providers on its web site at <http://www.zigbee.org>. Each test service provider has a process for  
301 Product submission and will provide details on how to submit Products. All test service providers will  
302 require submission of a Declaration of Conformity and a Protocol Implementation Conformance  
303 Statement for the submitted Product. In order to successfully pass test plans, a Product must pass all  
304 mandatory test cases and any optional test cases that are applicable to the Product based on the  
305 functionality it supports. In addition to the explicit functionality being checked by the test cases, the  
306 submitted Product must not exhibit any behavior which is contrary to the behavior detailed in the  
307 underlying specifications, in order to be considered to have passed a test plan.  
308

309 **Reporting:** Test service providers will submit test results directly to the Alliance.  
310

311 **Application:** The Alliance grants certifications based on an application. The application is web based  
312 and is available in the Member's Area of <http://www.zigbee.org> and consists of the information  
313 described in section 2.8.3 above.  
314

315 **Processing:** The Alliance staff processes applications under the direction of the Director of ZigBee  
316 Certified. Applications are processed for completeness to all requirements as described in Alliance  
317 policies including

- 318 • Submission of all required documentation
- 319 • Membership in the Alliance
- 320 • Completion of testing
- 321 • Payment of applicable fees  
322

323 **Certification:** Only the ZigBee Alliance may grant certification and a Product is only certified  
324 when the Alliance issues certification. The Alliance will issue certificates as evidence of successful  
325 certification.

326 A test service provider may occasionally submit non-compliant results to the Director of ZigBee Certified for  
327 him/her to make a decision on the issue of certification.

## 328 2.10 Certificates

329 The ZigBee Alliance shall provide a certificate which will serve as evidence that a particular Product is ZigBee  
330 Certified.

## 331 2.11 Logo Usage

332 The ZigBee Alliance has created logos, interoperability icons, and text to be used to identify various Products  
333 that are ZigBee Certified.

334 The "ZigBee Designations and Logo Policy" defines these and describes ZigBee trademarks that can be used by  
335 member companies. This document is available as 05-3739.

## 336 2.12 Length of Certification

337 Once a Product is certified, it remains certified for the lifetime of the Product unless the ZigBee Alliance  
338 revokes the certification or the Product is modified.

339 Modifications include any changes to the Product. However, not all modifications will require retesting of a  
340 Product in order to be certified. The Alliance maintains guidelines about modifications that require retesting and  
341 will determine whether retesting is required for any particular modification.

342 For complete information, refer to section 3.6 Certification by Similarity

343 .

## 344 2.13 Revocation of Certification

345 The ZigBee Alliance may also revoke certification or participation in the certification process if any of the  
346 following occurs:

- 347 • A Product is found to be hazardous as defined in ISO Guide 27-1983.  
348
- 349 • The manufacturer has made any material misstatement of fact, or omission of fact, to the  
350 Alliance or its authorized test service providers.  
351
- 352 • The manufacturer fails to follow all Alliance certification requirements.  
353
- 354 • The manufacturer is misusing ZigBee Alliance trademarks. Examples of misuse include (but  
355 are not limited to) misapplying logos/icons, using logos with Products that have not been  
356 certified or otherwise not following the ZigBee Certified Logo and Trademark Policy.  
357
- 358 • The manufacturer has engaged in any form of misconduct which compromises the integrity of  
359 the ZigBee Alliance or the ZigBee Certified program.  
360
- 361 • The manufacturer leaves the ZigBee Alliance and continues using logos, trademarks or any  
362 other branding.  
363
- 364 • The member is in violation of the member agreement, license, trademark, or bylaws.

365 Prior to revoking any certification, the Alliance shall notify the manufacturer with details and steps needed to  
366 resolve issues and take corrective action. After revocation, and the manufacturer made corrective action and  
367 successfully resolve all issues, the Alliance may, at its discretion, restore the certification or issue a new  
368 certification.

369 Corrective action shall follow ISO Guide 27-1983 “Guidelines for corrective action to be taken by a certification  
370 body in the event of misuse of its mark of conformity”.

## 371 2.14 Testing and Certification Fees

372 There are two fees associated with the ZigBee Certified program: testing and certification.

373 Testing fees are set by the individual authorized test service providers.

374 Certification fees are set by the ZigBee Alliance and vary based on the type of membership in the Alliance. The  
375 current fee schedule is available at <http://www.zigbee.org> or by contacting the Alliance.

# 376 3 TESTING

377 This section defines the process for testing that is common to certification programs and the final development  
378 of certification programs. Testing for conformance to ZigBee Standard or Stack is performed by Alliance  
379 authorized test service providers using test plans developed by the Alliance.

## 380 3.1 Test Plans

381 The test plan must, at a minimum, cover all PICS related items. This must be confirmed by means of a PICS-to-  
382 Test-Case mapping. The test plan will undergo standard approval as part of the process detailed in Policies &  
383 Procedures (document 13-0625) before formal release. In order to be finalized, and approved, a test plan must  
384 undergo validation at a Specification Validation Event (SVE). More details regarding the SVE can be found in  
385 document 08-123 Test Event Rules of Engagement. Features that are certifiable are listed in document 11-5456  
386 Master Cluster List.

387 The ZigBee Alliance will maintain the list of current test plans, associated PICS, any errata on the ZigBee  
388 Alliance website.

## 389 3.2 Authorized Test Service Providers

390 The ZigBee Alliance authorizes independent test service providers to administer the testing associated with the  
391 ZigBee Certified program. The process for selecting and qualifying test service providers is maintained in  
392 document 08-5185.

393 The current list of authorized test service providers is maintained at the Alliance web site:  
394 <http://www.zigbee.org>

## 395 3.3 Test Harness

396 A test harness is an automated test tool that is design to execute a defined test procedure and deliver Pass/Fail  
397 decision based on the observed behavior of a Device Under Test based on well-defined criteria. Test harnesses  
398 could be in use in the various ZigBee Certified test programs.

### 399 3.3.1 ZigBee Alliance Test Harness

400 The ZigBee Alliance may have a test harness developed for use in one or more of its certification programs  
401 defined in this document. Where the Alliance has its own test harness, this harness shall be the one official test  
402 harness used by all authorized test service providers in the execution of testing activities for the given  
403 certification program.

404 Maintenance of a ZigBee Alliance test harness and associated test scripts is managed, updated and validated  
405 through existing ZigBee Alliance processes (supported by member efforts).

### 406 3.3.2 Test House Test Harness

407 Where there is no applicable ZigBee Alliance test harness available for a given certification program,  
408 Authorized Test Service Providers may (at their own discretion) create test harnesses (or other test tools) for the  
409 execution of the testing procedures associated with the given program. The ZigBee Alliance shall have access  
410 to these Authorized Test Service Provider developed testing tool(s) for the sole purpose of auditing the service  
411 provider's conformance to the test validation procedures (see document 08-5185).

## 412 3.4 Requirements for Testing

### 413 3.4.1 Compliant Platform Testing

414 The guidelines for Compliant Platform testing are as follows:

- 415 • Platforms submitted for testing must be built on compliant IEEE 802.15.4 PHY/MAC layers.  
416 Compliance to IEEE 802.15.4 shall be determined by successful completion of the testing requirements  
417 described on document 14-0332 (ZigBee IEEE 802.15.4 Level Test Specification) at one of the ZigBee  
418 authorized test service providers.
- 419 • Manufacturers must provide any technical support structure required to assist in the implementation of  
420 their Product into the test environment
- 421 • The test is non-destructive and will be applied using the functionalities given by the specific Platform  
422 tested.
- 423 • Test service providers can provide more information.

424

## 425 3.4.2 Certified Product Testing

426 The guidelines for Certified Product testing are:

- 427 • A Product submitted for testing must be built on a certified Compliant Platform
- 428 • Manufacturers must provide any technical support structure required to assist in the implementation of  
429 their Product into the test environment
- 430 • The test is non-destructive and will be applied using the functionalities given by the Product tested.
- 431 • Test service providers can provide more information
- 432 • For the purposes of testing test (security) certificates are to be used

## 433 3.4.3 Testing Samples

434 Vendor applying for certification must leave at least one sample of the Device Under Test (DUT), if required by  
435 the test service provider to satisfy ISO17025. These samples will be used for traceability and reference in case  
436 of future contention of results or when deemed necessary. A sample consists of:

- 437 • Exact hardware that the device will be certified on
- 438 • Same firmware as the one the DUT passed the certification testing on
- 439 • Any software/tools pertaining to the device and its certification necessary to reproduce the test plan  
440 testing

441 In the case where the test service provider in question already has the hardware configuration (from previous  
442 certification or otherwise), and if the test service provider has the tools (both hardware and software) needed to  
443 flash new firmware onto the devices, a vendor may simply send the test service provider a copy of the new  
444 firmware as the sample for the DUT.

## 445 3.5 Reporting of Test Results

446 Authorized test service provider shall report results of successful tests directly to the ZigBee Alliance.  
447 Unsuccessful test results are not reported to the Alliance unless an application for certification has been made  
448 and the Alliance requests reporting of test results.

449 The test reports shall conform to reporting as defined by ISO/IEC 17025:2005 Section 5.10 and at a minimum  
450 shall include:

- 451 • Test Information: Location and dates of testing, any tracking or other information necessary to  
452 trace results such as test project numbers, responsible testing engineer  
453
- 454 • Tested Device: Company, address, contact information, Product name, hardware and software  
455 Product versions, serial number, ZigBee device type, and other information necessary to  
456 identify the device  
457
- 458 • Type of Test: Compliant Platform, or Certified Product  
459
- 460 • Standards: Name and version information  
461
- 462 • Test Plan: documentation of Test Plan and version numbers used or a list of test cases if a  
463 complete test plan is not used  
464
- 465 • Test Equipment: Documentation of any equipment used in the test including test harness,  
466 script, sniffers, GUs, and other information necessary to identify the testing equipment  
467 including version information  
468
- 469 • Test Results: List of individual tests conducted with individual test results  
470
- 471 • Test Results Summary: Overall Pass / Fail

472  
473  
474  
475

- Test Results Observations: Observations outside the scope of the test cases
- Signatures: Test engineer, any reviewer or quality engineers

### 476 3.6 Certification by Similarity

477 The ZigBee Alliance offers a Certification by Similarity program. The program allows a Product that is derived  
478 from a previously tested and certified Product to be considered for certification based on its similarity to the  
479 tested certified Product depending on the differences between the two. The purpose of the program is to speed  
480 time-to-market and to minimize costs.

481 For complete information on this process see section 7 Certification by Similarity.

### 482 3.7 Testing Events

483 A ZigBee Alliance Test Event is defined in document 08-0123 Test Event Rules of Engagement.

### 484 3.8 Features Not Previously Certified

485 A feature that has not been previously tested during an official specification Test Event cannot be certified. A  
486 feature is defined as an attribute of an implementation such as support for a particular cluster in a ZigBee  
487 Alliance standard. A feature becomes validated (and therefore testable and certifiable) only when the following  
488 condition(s) are satisfied:

489 Three separate implementations of the feature must be tested against three separate implementations of the  
490 complementary side of that feature (e.g. server against client) through the ZigBee Alliance:

491 One of the implementations, but no more than one, may be a Test Harness from an authorized test service  
492 provider.

493 A “separate implementation” is defined as an implementation developed independently from other  
494 implementations by a different member of the ZigBee Alliance.

495 When a test case is testing the handling of illegal or non-standard behaviour the requirement to test against three  
496 implementations is relaxed and testing against a single implementation (test harness or golden unit) that exhibits  
497 the non-standard behaviour is acceptable. Otherwise the requirement is to test against three implementations.

498 The testing described above will be subject to the same rules and requirements as Specification Validation  
499 Events, defined in document 08-0123 Test Event Rules of Engagement.

500 Once all testing is complete, the specifications for which the testing has been done shall be updated to reflect the  
501 change.

502 In order for a device using a previously non-certifiable feature to become certified, all requirements for  
503 certification must be met including successful completion of the entire test plan as described in this policy.

504 If three separate implementations are not available for testing, the feature cannot be validated. A device  
505 implementing that feature may not be certified and the manufacturer has a choice to either:

- Wait for the other implementations to become available
- Certify the rest of the Product and identify the non-certifiable feature(s) as Manufacturer Specific (i.e., cluster ID, profile ID, command ID, or other ZigBee Alliance approved method)

511

## 512 4 GOLDEN UNIT

513 A Golden Unit (GU) is a Compliant Platform or a Certified Product - that is designated as reference instantiation  
514 of the specifications it implements. A GU is a specific combination of hardware, software, firmware and errata  
515 including revision numbers for each. GUs represent an important infrastructure for ZigBee testing programs.

516 One or more GUs are used to test against Platforms and Products during the testing leading towards  
517 certification. Specifically they are used for:

- 518 • Evaluating the expected behavior of the device under test
- 519 • Testing for interoperability and conformance to the test specification

520 When the specification is silent or ambiguous, the behavior of the GUs will be used as the reference for  
521 evaluating the expected behavior of the device under test.

### 522 4.1 Golden Unit Selection

523 For each release of a specification, the following procedure shall be used to establish GUs for that release.

524 The ZigBee Alliance will announce a specification release interoperability testing series. This interoperability  
525 testing series will constitute the GU selection round. During the initial certification process of new  
526 specifications for platforms there are three phases:

527 Phase 1. Proof of Concept Test Events are held during which the test plan is fully developed and  
528 implemented to validate the specification or modify as required.

529

530 Phase 2. Gating Test Events mark the cutoff of Interop Test Events. Participation at all prior  
531 Gating Test Events is required to participate in subsequent test events.

532

533 Phase 3. The Specification Validation Event is the final Gating Test Event where participants  
534 must test all mandatory features. Attendance at each Gating Test Event is required to  
535 participate in the Specification Validation Event. Participation in a SVE implies a  
536 commitment to become a Golden Unit

537 Upon completion of the interoperability testing series, platforms which have successfully completed the series  
538 will be eligible for certification.

539 Participation solely in the Specification Validation Event does not guarantee being selected as a GU. Platforms  
540 may become GUs subject to completing certification and conformance to Section 4.2 Vendor Commitments as a  
541 Golden Unit Provider.

542 The Director of ZigBee Certified shall select the GUs. The selection will be made from devices that participated  
543 in the Specification Validation Event with preference given to the devices that tested against the most  
544 implementations.

545 An additional requirement in becoming a GU provider is that the test service provider provides the GU test logs  
546 to the ZigBee Alliance which will post them to the document server. The Director of ZigBee Certified shall  
547 work with the vendor in making the test log files anonymous

548 GUs shall be established and provided to the test service providers before certification can commence. The  
549 approved test service providers will then be in a position to commence testing of additional platforms as part of  
550 the certification process. A test program may not begin until GUs have been selected.

551 GU vendors are likely to have been actively involved in creation of the relevant specification, and have been  
552 actively participating in the interoperability testing series in vendor-neutral environments. This represents a  
553 significant commitment by the GU vendors.



## 554 4.2 Vendor Commitments as a Golden Unit Provider

### 555 4.2.1 Requirements for Compliant Platforms Golden Units

556 Vendors of GUs used for compliant platform testing shall:

- 557 • Implement all mandatory and optional functions
- 558
- 559 • Act as a ZigBee Coordinator, Router and End Device
- 560
- 561 • Support all device operations (e.g., ZigBee Trust Centers, Network Managers, etc.)
- 562
- 563 • Allow for negative testing (i.e., be able to produce stimulus that is incorrect, or in error, with
- 564 respect to the platform specification) as required by the test specification
- 565
- 566 • Provide a clearly documented interface, including descriptive operational documentation,
- 567 which enables the running of all test cases and the test specification
- 568
- 569 • Maintain compliant platform status for that device, so long as the specification to which that
- 570 device applies to is in effect, see section 4.3
- 571
- 572 • Provide technical support to the ZigBee authorized test service providers for its ongoing use as
- 573 a GU
- 574
- 575 • Provide ten units per ZigBee authorized test service provider (enough to support one site per
- 576 ZigBee authorized test service provider), free of charge
- 577
- 578 • Make available additional GUs (to ZigBee authorized test service providers) during the 1st
- 579 6mo's for the purposes of breakage replacement and additional purchase

## 580 4.3 Updating Golden Units

### 581 4.3.1 Conditions for Updating Platform Golden Units

582 Updating of the GUs shall be determined by the Director of ZigBee Certified. Circumstances warranting  
583 updating a GU include:

- 584 • Approval of Change Control Board comments (CCB) that affect the behavior of the GUs
- 585 • Revision to the specification, test specifications or PICS document that affect the behavior of
- 586 the GUs
- 587 • Errors or bugs are found in the GU
- 588 • A GUs is not available anymore (discontinued, etc.)

### 589 4.3.2 Process of Updating Platform Golden Units

590 If an update is deemed necessary, the ZigBee Alliance shall send an official note to the GU vendor as well as  
591 test service providers detailing the following:

- 592 • Reasons for the need to update
- 593 • Timeline to update
- 594 • All supporting information/documentation to update (example: new specification revision,
- 595 CCB references, specific bugs to fix, etc.)

596 Once the vendor implements the needed changes, the new revision(s) of the GUs need to be revalidated.  
597 Revalidation of a Golden Unit requires successful testing completion according to the retest requirements for  
598 Compliant Platform as described in section 7 Certification by Similarity. To the end of revalidating Golden  
599 Units, there are two possibilities:

- 600                   • Set a test event for the manufacturers and test service providers to attend and verify the  
601                   changes. This test event shall be only open to those GU vendors and the test service providers.  
602                   At least one test service provider shall attend that event.  
603
- 604                   • Send the new revision(s) of the GUs to all test service providers who will then test them  
605                   internally and submit the results to the ZigBee Alliance.
- 606    If the result of the testing is considered a pass the new revisions will then be officially accepted as the new GUs  
607    and the official list of GUs pertaining to that specification must be modified to reflect the changes.
- 608    The vendors shall then send the new GUs to all test service providers (in case of a firmware upgrade, sending  
609    the revised firmware would be sufficient as long as test service providers have the tools to upgrade the firmware  
610    on their units). At that point, the new GUs shall replace the old ones in official testing at the test service  
611    providers.
- 612    Note that in case that new hardware is needed, the number of GUs to be sent to test service providers shall be  
613    determined by the Director of ZigBee Certified.
- 614    If a GU vendor cannot update their units within the timeline specified by the Director of ZigBee Certified, the  
615    Director of ZigBee Certified can then decide to make a new call for a GU to replace that specific  
616    platform/device.
- 617    Any Golden Unit going through the revalidation process, shall be removed from the active rosters of Golden  
618    Units until the revalidation process is successfully completed and all necessary updates (HW and/or SW) have  
619    been completed at all test service providers and shall not be used in the testing of units for the applicable  
620    standard.

## 621 5 MODIFICATIONS AND REVISIONS

622 This section described the process and requirements for certification when a product has already been certified.

### 623 5.1 Modification of Products

624 Certification is awarded to particular version of a Product. Any modification to that Product will result in a new  
625 version and that version may not claim certification without going through the ZigBee Certified program.

626 The new version of the Product may not require testing in order to be certified. Changes that affect conformance  
627 to the Standard (hardware, firmware or software changes) will usually require testing. The Alliance maintains  
628 requirements for testing of changes to Products. For complete information, see section 7 Certification by  
629 Similarity.

630 The original version of the Product retains certification for the life of the Product, unless revoked by action of  
631 the Alliance.

### 632 5.2 Revisions to Specifications

633 In the interests of continuous improvement in the quality of the compliance program, the ZigBee Alliance may,  
634 from time to time, change the compliance testing procedures through a change to a test plan. Because a  
635 Product's certification is good for the life of the Product, there will be no requirements for vendors to go  
636 through certification again. However, the ZigBee Alliance encourages vendors to resubmit their devices to test  
637 service providers for verification of compliance to those changes.

638 The ZigBee Alliance will maintain records sufficient to identify the version of a test plan under which certified  
639 Products were tested.

#### 640 5.2.1 Grace Period for Testing

641 When a test plan or specification is revised, the ZigBee Alliance will declare a grace period during which  
642 manufacturers in their development cycles can still certify to an old test plan and specification. However, after  
643 the grace period is over, all devices going through certification must be tested against latest test plan and  
644 specification.

645 The work group creating the standard will recommend a grace period for revisions affecting Products to be  
646 approved by the appropriate Technical Sub-Committee and the Marketing work group. This grace period will be  
647 based on the amount of changes introduced by the new specification and the current state of deployment of  
648 devices based on the previous version of the specification or similar considerations.

#### 649 5.2.2 Major Revisions Affecting Interoperability

650 In exceptional circumstances, the ZigBee Alliance reserves the right to mandate resubmission of Compliant  
651 Platforms for testing against a revised Compliant Platform test plan. This may occur, for instance, where a  
652 serious deficiency in the test plan or process is uncovered, leading to platform interoperability issues. In the  
653 event that the Alliance mandates such resubmission and the vendor fails to successfully complete such testing  
654 within the time specified by the Director of ZigBee Certified, the Alliance may move to revoke certification of  
655 the Compliant Platform

656

657

658

## 659 6 CERTIFICATION PROGRAMS

660 This section describes existing certification programs, in terms of requirements and additions to the common  
661 process. Except where noted, each product or compliant platform certification program uses the common rules  
662 and process described in the previous sections. When there is a choice of options (i.e. Golden Units or no  
663 Golden Units), or dependencies (e.g. Platform vs. Product) then this is described here.

### 664 6.1 ZigBee PRO Stack

665 The ZigBee PRO Stack may be used under a number of Standards. Each Standard specifies the Stack revisions  
666 that it requires, or at least the minimum required.

#### 667 6.1.1 ZigBee PRO Compliant Platform Certification Program

668 The Platform implementation SHALL conform to these Stack specifications as appropriate to the declared  
669 PICS:

- 670 • 802.15.4 2011 or later as required by the ZigBee PRO specification
- 671 • ZigBee PRO specification

672 The program SHALL be defined by the following sections, and specific sections that pertain to a Compliant  
673 Platform (not a Product):

- 674 1) Section 2 ZigBee Certified Program
- 675 2) Section 3 Testing
  - 676 a. Including section 3.3.2 Test House Test Harness, but not 3.3.1 ZigBee Alliance Test Harness
- 677 3) Section 4 Golden Unit
- 678 4) Section 5.2 Revisions to Specifications
  - 679 a. The grace period SHALL be fixed at 6 months

#### 680 6.1.2 Legacy Profile Product Certification Program

681 A legacy Profile Standard is built upon the ZigBee PRO Stack. A Product implementation SHALL be built upon  
682 a ZigBee PRO Compliant Platform and conform to the ZigBee PRO Stack specification revision as required by  
683 the Profile Standard:

684 The Product implementation SHALL conform to these Standard specifications as appropriate to the declared  
685 PICS:

- 686 • ZigBee Cluster Library
- 687 • A legacy Profile Standard, such as ZHA, ZSE, ZLL, ZBA, etc.

688 The program SHALL be defined by the following sections that pertain to a Certified Product (not a Platform):

- 689 1) Section 2 ZigBee Certified Program
- 690 2) Section 3 Testing
  - 691 a. Including section 3.3.2 Test House Test Harness, but not 3.3.1 ZigBee Alliance Test Harness
- 692 3) Section 4 Golden Unit
- 693 4) Section 5.2 Revisions to Specifications
  - 694 a. The grace period SHALL be determined by the Work Group that has developed and balloted  
695 the profile standard, with TSC approval

696 *Note: After the sunset period following the release of ZigBee 3.0 Standard, there will only be a Legacy Profile*  
697 *Product Certification Program for ZigBee Smart Energy (ZSE).*

### 698 6.1.3 ZigBee 3.0 Product Certification Program

699 The ZigBee 3.0 Standard is built upon the ZigBee PRO Stack. A Product implementation SHALL be built upon  
700 a ZigBee PRO Compliant Platform and conform to the ZigBee PRO Stack revision as required by the ZigBee  
701 3.0 Standard:

702 The Product implementation SHALL conform to these Standard specifications as appropriate to the declared  
703 PICS:

- 704 • Application Architecture
- 705 • Base Device Behavior specification
- 706 • Green Power specification requirements for a ZigBee Router (Green Power Basic Proxy)
- 707 • ZigBee Cluster Library
- 708 • One or more application device specifications

709 The program SHALL be defined by the following sections that pertain to a Certified Product (not a Platform):

- 710 1) Section 2 ZigBee Certified Program
- 711 2) Section 3 Testing
  - 712 a. Including section 3.3.1 ZigBee Alliance Test Harness, but not 3.3.2 Test House Test Harness
- 713 3) Section 5.2 Revisions to Specifications
  - 714 a. The grace period SHALL be determined by the Work Group that has developed and balloted  
715 device specifications, with TSC approval

## 716 6.2 Green Power Device Stack

717 The Green Power Device Stack supports a single Green Power Device Standard. There is no Complaint  
718 Platform Program.

### 719 6.2.1 Green Power Device Product Certification Program

720 The Product implementation SHALL conform to these Standard specifications as appropriate to the declared  
721 PICS:

- 722 • 802.15.4 2011 or later as required by the Green Power specification
- 723 • Green Power specification requirements for a Green Power Device

724 The program SHALL be defined by the following sections that pertain to a Certified Product (not a Platform):

- 725 1) Section 2 ZigBee Certified Program
- 726 2) Section 3 Testing
  - 727 a. Including section 3.3.1 ZigBee Alliance Test Harness, but not 3.3.2 Test House Test Harness
- 728 3) Section 5.2 Revisions to Specifications
  - 729 a. The grace period SHALL be determined by the Work Group that has developed and balloted  
730 device specifications, with TSC approval

## 731 6.3 RF4CE Stack

732 The RF4CE Stack supports a single Remote Control Standard.

### 733 6.3.1 RF4CE Compliant Platform Program

734 The Platform implementation SHALL conform to these Stack specifications as appropriate to the declared  
735 PICS:

- 736 • 802.15.4 2006 or later as specified by RF4CE specification
- 737 • RF4CE specification

### 738 6.3.2 Remote Control Product Certification Program

739 The Remote Control Standard is built upon the RF4CE Stack. A Product implementation SHALL be built upon  
740 a ZigBee RF4CE Compliant Platform and conform to the RF4CE Standard revision as required by the Remote  
741 Control Standard.

742 The Product implementation SHALL conform to the Standard specifications as appropriate to the declared  
743 PICS:

- 744 • ZRC specification

745 The program SHALL be defined by the following sections that pertain to a Certified Product (not a Platform):

- 746 4) Section 2 ZigBee Certified Program
- 747 5) Section 3 Testing
  - 748 a. Including section 3.3.2 Test House Test Harness, but not 3.3.1 ZigBee Alliance Test Harness
- 749 6) Section 4 Golden Unit
- 750 7) Section 5.2 Revisions to Specifications
  - 751 a. The grace period SHALL be determined by the Work Group that has developed and balloted
  - 752 the profile standard, with TSC approval
  - 753

## 754 7 CERTIFICATION BY SIMILARITY

755 The ZigBee Alliance offers a Certification by Similarity program to member companies. The Certification by  
756 Similarity (CbS) program allows a ZigBee Product that is derived from a previously tested and certified ZigBee  
757 Product to be granted certification based on its similarity to a previously tested certified Product. The purpose  
758 of the CbS program is to speed time-to-market and to minimize certification costs. It is not intended to  
759 eliminate the requirement that a Product actually passes ZigBee compliance tests.

### 760 7.1 Policy

761 The only authority to grant Certification by Similarity to a Product is the ZigBee Alliance. No test service  
762 provider or any other entity is authorized to grant or pursue Certification by Similarity requests on behalf of the  
763 ZigBee Alliance.

764 The new Product must be derived from and be substantially similar to a ZigBee certified Product that has  
765 successfully undergone full and complete compliance testing. CbS addresses changes such as color, enclosures,  
766 language, etc. that do not affect the conformance of the Product to ZigBee standards. The new Product cannot be  
767 compared to another Product that itself has been granted Certification by Similarity without additional testing  
768 having been performed. More details on the guidelines that govern the CbS, and thus the need (or lack of) for  
769 testing, can be found in [section 8.6](#) of this document.

770 If the original certified Product on which the Certification by Similarity is based is older than three years, then  
771 complete testing is required of the new Product.

772 CbS does not waive the requirement for certifiers of Products to be members of the Alliance, follow logo usage  
773 guidelines, or comply with any policies of the ZigBee Alliance.

### 774 7.2 Certification by Similarity Guidelines

775 When Products are very similar, testing of one Product may allow the other similar Products to be added to the  
776 Integrators List (Approved List) without re-testing. Furthermore, some changes to certain Products may be  
777 deemed harmless to the existing certification for that specific Product, in which case the newer revision will  
778 automatically be certified by similarity.

779 The decision on whether or not a Product will qualify for Certification by Similarity (CbS) will be the  
780 responsibility of ZigBee's Certification body according to the procedure highlighted above. The ultimate  
781 responsibility for making sure that all Product variations and models are certified (whether through actual  
782 certification and/or via CbS), ultimately lies with each vendor.

783 Audits by the ZigBee Alliance that reveal discrepancies between shipping Product and samples tested may be  
784 cause for required re-test, revocation of certification, and/or legal action. Companies' rights to use the ZigBee  
785 Logo are covered in the standard logo license agreement.

### 786 7.3 Certification by Similarity Guidelines Procedure

- 787 1) An applicant (Product developer) submits a Testing Exemption Request Form (found below) at  
788 certification@zigbee.org in lieu of testing.
- 789 2) When applicable, the ZigBee Alliance will obtain specification sheets/drawings of both the originally  
790 certified and new Products.
- 791 3) A review of the Testing Exemption Request Form and specification sheets/drawings will be performed  
792 by the Director of ZigBee Certified. One or more of the authorized test service providers and/or other  
793 experts (e.g. ZigBee Alliance Expert Review Panel) may be consulted by the ZigBee Alliance, keeping  
794 in mind the confidential sensitivities that come with an unreleased Product.
- 795 4) The ZigBee Alliance will issue its assessment to the vendor within one (1) calendar week. One of two  
796 outcomes is possible:

- 797 5) Certification by Similarity is granted. The applicant must complete a standard application for  
798 certification in the [www.zigbee.org](http://www.zigbee.org) Member's Area and the Alliance will process the application as  
799 any other certification.  
800 6) Certification by Similarity is denied. The Product is required to go through testing at one of the  
801 authorized test service providers.

802 When testing is required the Product developer will follow standard procedures for testing and certification.

## 803 7.4 Guidelines for "Retest"

804 The guidelines for retests can be found in [section 8.6](#) of this document.

805 If you think retest is not required, your company can submit a Testing Exemption Request Form (provided  
806 below) for consideration by the ZigBee Alliance.

## 807 7.5 Testing Exemption Request Form

808 Companies must submit a Testing Exemption Request Form to [certification@zigbee.org](mailto:certification@zigbee.org) for their  
809 Product/platform/HW to be considered to be exempt from a spot check or full testing.

810 The form can be found in section 8 Testing Exemption Request Form.

## 811 7.6 Retest Requirements for Compliant Platform Certification

### 812 7.6.1 Retest not required

813 I/O additions on the dev board

### 814 7.6.2 Full retest required

815 Bug fixes that substantively affect the platform functionality require a full retest.

### 816 7.6.3 Spot check required

817 A spot check tests specific areas affected plus random spot check of other areas against golden units.

- 818 • Porting of the stack (with no changes) to a new hardware
- 819 • Bug fixes that do not substantively affect the functionality
- 820 • Update to the stack (including non-ZigBee related code update)
- 821 • Microcontroller change (with the PHY/MAC staying the same)
- 822 • Addition of a new feature/module to the ZigBee firmware

### 823 7.6.4 IEEE 802.15.4 retesting required

824 See Retest requirements for 802.15.4 compliant radios

## 825 7.7 Retest Requirements for Certified Products

### 826 7.7.1 Retest not required

- 827 • Product packaging changes (color, shape, etc.)
- 828 • Changes in interface that do not affect ZigBee or Radio functionality (color display v/s B&W, push  
829 button light switch v/s paddle switch, etc.)



- 830       • HW configuration changes that do not affect ZB (changing location of a read switch, change of  
831 metrology, change of button location, etc)

### 832 7.7.2 Full retest required

- 833       • Addition/exposure of a new feature and/or cluster to the ZigBee firmware  
834       • HW, SW or FW changes for the device(s) that the stack and app are running on (with the exception of  
835 those items called out above in Retest not required)  
836       • Layout change of the module used

### 837 7.7.3 Spot check required

838 Note: Considering that the level of effort and price to certify Products are relatively small, it would be cheaper  
839 and faster to retest fully if needed than deal with the procedures and maintenance of spot check requests and  
840 upkeep.

### 841 7.7.4 IEEE 802.15.4 retesting required

842 See 7.8 Retest Requirements for 802.15.4 Compliant Radios

843 Note: The exact nature of the IEEE 802.15.4 retesting needs to be defined. As part of regulatory Radio testing,  
844 Products have to be supplied with a number of test modes. It is intended that the IEEE 802.15.4 retesting would  
845 only use these existing test modes (to reduce the development burden on the Product manufacturer)

## 846 7.8 Retest Requirements for 802.15.4 Compliant Radios

### 847 7.8.1 Full retest required

- 848       • Change in Radio IC  
849       • Changes in SW, FW affecting Radio functionality  
850       • Changes requiring retest by regulatory authorities

### 851 7.8.2 Spot check required

- 852       • Change/Addition of a PA (All Tx tests shall be run, Rx tests shall be spot checked)  
853       • Change/Addition of LNA (All Rx tests shall be run, Tx tests shall be spot checked)  
854       • Change of all other components connected externally to the Radio IC  
855       • Change in RF/EMI/EMR enclosures  
856       • Change in packaging affecting RF/EMI/EMR characteristics  
857       • Change in board layout

### 858 7.8.3 Retest not required

859 Change in I/O interface to the board

### 860 7.8.4 Spot check rules (Firmware/Platform)

- 861       • Full retest of functionality that has been changed or where bugs were fixed  
862       • Full coverage of the all the other areas through spot check (one test case per function)  
863       • In case of any failure on the spot check areas, the Product is considered as a fail and a full retest is  
864 needed

### 865 7.8.5 Spot check rules (PHY)

- 866 • Full test (all test cases) of the first and last channel in the band
- 867 (Channel 11 and 26 for 2.4GHz)
- 868 • Spot check for the rest of the channels (2 channels per test case)
- 869 • In case of any failure during the spot check, the Product is considered as a fail and a full retest is
- 870 needed

871

## 8 TESTING EXEMPTION REQUEST FORM

Product Developer Information	
Company Name:	
Contact Name: (First, Last)	
Contact Email:	
Work Phone:	
Original Certified Product Information	
Product Name	
Software Revision:	
Hardware Revision:	
ZigBee Certificate ID	
Product Submitted for Testing Exemption	
Product Name	
ZigBee Specification(s) Rev.#(s) and any Errata at Time of Request	
Software Revision:	
Hardware Revision:	
<p>Note: Revision number is the number used to distinguish this specific build of the Product from a subsequent or prior one.</p>	

<p>Detailed Differences:</p> <p>Note: Please explain in detail the differences between the Product currently on the Integrators List / Approved List and the item you are submitting for certification by similarity. (Please do not use terms that only your company or your specific industry understands.)</p>	
<p>Has the schematic changed?</p>	<p>Yes: <input type="radio"/> No: <input type="radio"/></p>
<p>If YES, Please Explain:</p>	
<p>Have any components changed (including RF hardware):</p>	<p>Yes: <input type="radio"/> No: <input type="radio"/></p>
<p>If YES, Please Explain:</p>	

<p>Has the ZigBee Component Enclosure Changed? (Structural, Material or Density)</p>	<p>Yes: <input type="radio"/> No: <input type="radio"/></p>
<p>If YES, Please Explain:</p>	
<p>Does the change expose new functionality?</p>	<p>Yes: <input type="radio"/> No: <input type="radio"/></p>
<p>If YES, Please Explain:</p>	
<p>Has the firmware changed?</p>	<p>Yes: <input type="radio"/> No: <input type="radio"/></p>
<p>If YES, Please Explain:</p>	

Has the Product driver changed (if applicable)?	Yes: <input type="radio"/> No: <input type="radio"/>
If YES, Please Explain:	

872

873

874 Signature: \_\_\_\_\_

875

876 Name (Print): \_\_\_\_\_

877

878 Date: \_\_\_\_\_

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880