

**GTI**

# **Guideline for Device Certification**

**GTI**



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<b>Working Group</b>	<b>Terminal WG</b>
<b>Task</b>	<b>PM3-PJ5: IoT Program / Device Certification Project</b>
<b>Source members</b>	China Mobile, Keysight, Rohde &Schwarz
<b>Support members</b>	
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## Document History

Date	Meeting #	Version #	Revision Contents
2018.01.24	GTI 21 <sup>st</sup>	V1.0.0	

# 1 General

This document is the guideline for GTI Device Certification, which contains GTI certification architecture, definition of certification objects, certification procedure and criteria as well as procedure of test platform validation and test lab accreditation. The annexes of this document provide templates for device certification application and declaration, etc. Detailed templates are in separate files.

## 2 Organization Architecture

GTI certification for IoT products will be carried out based on “Device Certification Project” in “IoT Program”(PM3-PJ5) by all project members. Figure 2-1 gives an overview of the GTI Certification Organization Architecture for IoT products.

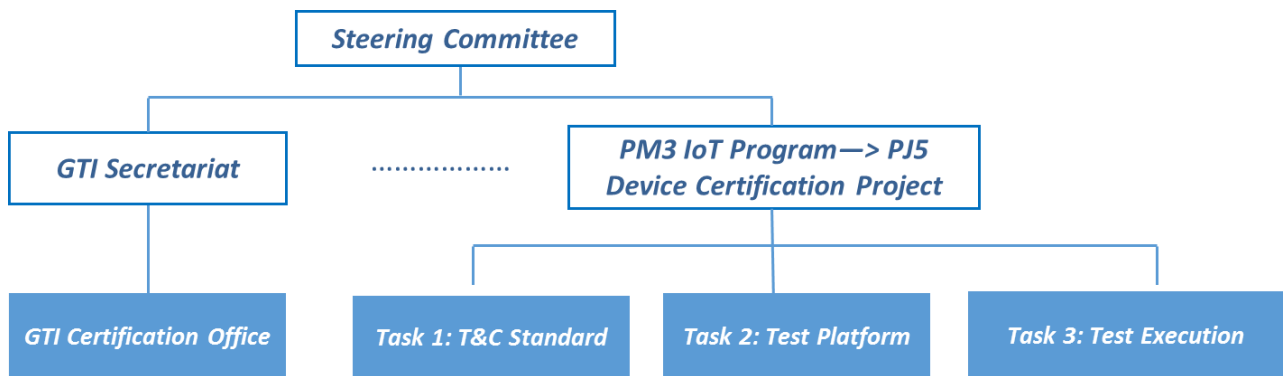


Figure 2-1 GTI Certification Organization Architecture for IoT Product

The certification architecture for other types of products need further discussion

### 2.1 GTI Certification Office

GTI Certification Office is subordinates of GTI Secretariat. The main responsibility of GTI Certification Office is:

- Membership Management. GTI Certification Office shall review the member qualification when a company applies to join GTI Certification Project (PM3-PJ5).
- Test Lab Management. GTI Certification Office shall review the test lab qualification and submit the application to Steering Committee when a test lab applies for the GTI accreditation.
- Certification Report Release. GTI Certification Office shall release the certification report which was reviewed by Device Certification Project and approved by Steering Committee.
- Document Management. GTI Certification Office shall maintain the status of GTI Certification Documents drafted by Device Certification Project and approved by Steering Committee.

## 2.2 Task 1: Test and Certification(T&C) Standard Task

The main responsibility of T&C Standard Task is to define test specification and develop certification criteria.

- T&C Standard Task could develop test specification if needed. The test specification should be approved by Steering Committee before official release.
- T&C Standard Task could quote test specification officially released by other group in GTI or other Standard Organizations.
- T&C Standard Task shall develop Certification Criteria and submit the Certification Criteria to Steering Committee for approval.

## 2.3 Task 2: Test Platform Task

The main responsibility of Test Platform Task is to validate test cases in test platform defined in test specification. Refer to Section 8 for test platform validation requirement.

## 2.4 Task 3: Test Execution Task

Test Execution Task shall define the qualifications and accreditation rules for GTI test lab.

Test Execution Task shall define and maintain the template of Certification Application submitted by manufactures to test labs and the template of Test Report submitted by test labs to GTI Certification Office.

The accredited test lab in Test Execution Task shall be responsible for the test execution and submit test report to GTI Certification Office.

Test Execution Task shall define the query procedure to test results.

## 3 Application

Becoming GTI member is the precondition in participating in GTI Certification activities.

To join into GTI Device Certification Project, GTI member shall submit the Application Table in Annex A to GTI Certification Office. Members in GTI Device Certification Project shall appoint a contact person for certification matters.

## 4 Certification Objects

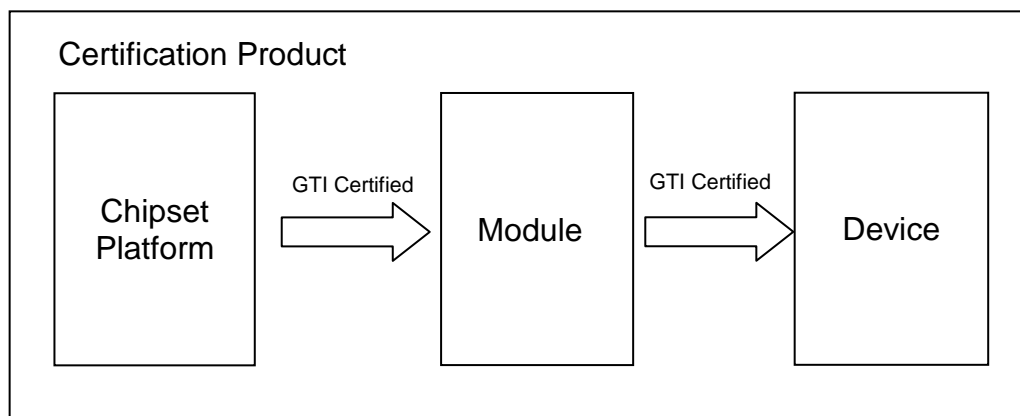


Figure 4-1 GTI Certification Product

A Product for Certification may be:

- A **Chipset Platform** implementing the communication functionality intended to be integrated into a device or module.
- A **Module** intended to be embedded in a device to provide that device with communication functionality, noting that the Module should reference a GTI Certified Platform.
- A **Device** intended to be placed on the vertical industry, noting that the communication functionality of the Device should be provided by an embedded and GTI certified module or chipset platform.

## 5 Certification Procedure

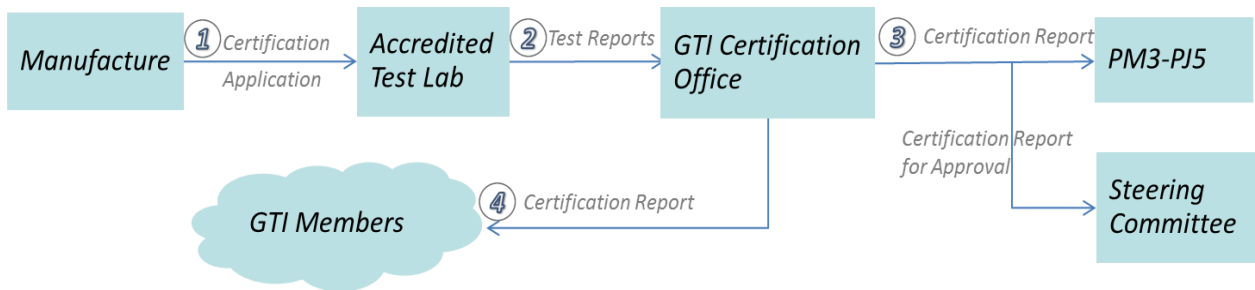


Figure 5-1: GTI Certification Procedure

### 5.1 Certification Application

To apply for the test and certification, manufacturer shall submit a product-declaration table (Annex B) to state the product information and supported 3GPP functionality to Test Lab.

For optional tests, manufacturer shall clearly state in Self-Assessment Table (Annex C) which tests is chosen to run, and submit the completed self-assessment table to test lab.

### 5.2 Test Execution

Test lab shall test and demonstrate the compliance of the Product to the certification criteria. The test cases applicable to a product are decided by the corresponding certification criteria and self-assessment table, including:

- Test cases labelled “M” in Certification Criteria
- Test cases labelled “C” in Certification Criteria
- Test cases labelled “O” in Certification Criteria but chosen by manufacture in Self-Assessment Table

M: Mandatory, C: Confidential but Mandatory, O: Optional.

Refer to Section 6.1 for the certification criteria to chipset platform.

Test lab shall prepare Product-Declaration (Annex B), Self –Assessment Table (Annex C) and Test Reports (Annex D) in one folder and submit them to GTI Certification Office. It is the responsibility of test lab to guarantee the reliability and accuracy of test reports.

### **5.3 Certification Declaration**

GTI Certification Office shall formalize Certification Report based on test reports submitted by Test Lab. The following information should be included in Certification Report :

- A brief production introduction quoting from Product-Declaration.
- Test results in terms of “PASS ” or “Fail” of Category “M” test cases
- Test results of Category “C” test cases. It is up to manufacture to decide whether to release the test results of Category “C” test cases.
- Test results in terms of “PASS ” or “Fail” of Category “O” test cases which are chosen by manufacture in Self-Assessment Table

The Certification Reports shall be reviewed by GTI Device Certification Project (PM3-PJ5). Members in Device Certification Project are allowed to raise questions about the Certification Reports. It is the responsibility of Test Lab to explain the queries and provide evidence to approve the results. The Query Period is 7 calendar days. The Certification Reports shall be submitted to Steering Committee for approval if no query is received during Query Period.

Once Certification Reports are approved by Steering Committee, GTI Certification Office shall officially release the certification Reports in GTI website. The Product recognised by GTI as Certified will be listed on the GTI website with Certification Report.

## **6 Certification Criteria**

There are three categories of Test Case in Certification Criteria. It is the responsibility of T&C Standard Task to specify the category attribute of test case in certification criteria

- Category “M”: The test cases are mandatory. The test results will be released in Certification Report. The Product cannot be declared Certified if any of the Category “M” test cases fails.
- Category “O”: The test cases are optional. Manufacture member can select optional test cases to test.
- Category “C”: The test cases are confidential and mandatory. Manufacture member can decide whether to release the test results or provide these test cases.

The Product could be declared Certified once successfully pass the Category “M” Test Cases in Certification Criteria

### **6.1 Certification Requirement for Chipset Platform**

The Chipset to be certified should keep consistent with its reference design provided to customers.

A Chipset Certification remains valid for [FFS] years. The certified test results may be referenced to avoid duplication of testing when the Chipset is referenced by a Device or Module.

Refer to Annex F.1 for the Certification Criteria for NB-IoT chipset.

## **6.2 Certification Requirement for Module**

In order to avoid duplication of testing, the Module integrating with GTI Certified Chipset is permitted to have test case exemptions.

NB-IoT module integrating with GTI certified chipset could reference the following test results from the integrated GTI Certified Chipset as part of the Module certification:

- NB-IoT Protocol Conformance Test
- The functionality part of Interoperability Test

NB-IoT module is required to execute following tests to get certified:

- NB-IoT RF Conformance Test
- RF Sensitivity and Measurement Accuracy Test
- Power Consumption Test
- The performance part of Interoperability Test

Refer to Annex F.2 for the Certification Criteria for NB-IoT Module.

## **6.3 Certification Requirement for Device**

FFS

# **7 Test Platform Validation**

## **7.1 New Test Platform Introduction**

Test Platform vendor shall submit new test platform declaration to GTI Certification Office When introducing new test platform. With the template found in Annex H, the declaration shall contain the following information:

- Test Platform Name.
- Software Information
- Hardware Information
- Description

## **7.2 Validation of Test Platform**

For conformance tests, GTI can accept the conformance test platforms which have been validated by other standard organizations.

For test cases defined in T&C Standard Task, test platform will be in either Validated or Invalidated status. For each test case, only the Test Platform in Validated Status can be used for GTI Certification.

For each test case defined in T&C Standard Task, a Test Platform shall be set to be Validated, when all the following criteria have been met:



- Test platform vendors have successfully run the test case with two DUTs in accredited test labs. The validation reports including procedure logs, data traces and test results have been submitted to Test Platform Task for approval
- The validation reports are approved by Test Platform Task

Members in Test Platform Task are allowed to raise queries about the validation reports. Validation reports should be discussed by Test Platform Task prior to approval. The Query Period is 7 calendar days. The validation reports shall be automatically approved if no query is raised during Query Period.

### 7.3 Test Platform Maintenance

Test platform manufacture is responsible to align with GTI test specification quarterly. Re-validation is required if new hardware or software release is introduced in test platform.

## 8 Test Lab Accreditation

The test labs that apply for GTI accreditation should satisfy the following requirements.

- Test lab should be active GTI Member
- Test lab should have valid ISO 17025 accreditation
- Test lab should only be recognised for those areas specifically identified within the scope of their ISO 17025 accreditation. A transition period is allowed. During transition period, the test lab could perform testing without the related ISO 17025 accreditation. This transition period will be for 24 months.
- Test lab should be capable of performing GTI validated tests and be equipped with validated test platforms in accordance with the GTI requirements

To apply for GTI accreditation, test lab shall submit Test Lab Application Form to GTI certification office. GTI Certification Office reviews the application and submits the application to Steering Committee for approval. Annual audit process is conducted by GTI Certification Office

### Annex A Application Table

Please fill out the Application Form carefully and send it back to GTI Certification Office

<b>Application Form</b>	
<b>For Participation into GTI Certification Project</b>	
Company Name	

Company Category	
Contact Person	
Job Title	
E-mail	
Telephone	
Task that applied to join	<input type="checkbox"/> Test and Certification(T&C) Standard Task <input type="checkbox"/> Test Platform Task <input type="checkbox"/> Test Execution Task

**Note:** “Company Category” includes Infrastructure, Terminal & Chips, Module & Antenna, Instrument, Test, Solution, IPX Providers, Organization, 5G Vertical Industry, Others, and etc.

Please return completed Application Form to: [admin@gtigroup.org](mailto:admin@gtigroup.org)

## Annex B Product-Declaration Table

The following table shall provide a summary of information provided in the Certification Declaration.

Table B-1: PRODUCT INFORMATION

GENERAL INFORMATION		
1	Product Manufacturer	
2	Product TYPE(CHIPSET/MODULE/DEVICE)	
3	Product identifier (Model Name or Number)	
4	Hardware Version	
5	Software Version	
6	Primary Function Description (NB-IoT/eMTC/...)	
Product is a Module embeded a GTI Certified Chipset		(YES/NO) If yes, go to line 7-10
7	Chipset Manufacturer	
8	Chipset Model Name or Number	
9	Chipset Software Version	
10	Chipset Hardware Version	
Product is a Device embeded a GTI Certified Module		(YES/NO) If yes, go to line 11-14
11	Module Manufacturer	
12	Module Model Name or Number	
13	Module Software Version	
14	Module Hardware Version	

Note1: The GENERAL INFORMATION in Table B-1 will be listed in Certification Declaration

Note2: The Product identifier means the Chipset/Model Name or Number

Table B-2: PRODUCT FEATURES for NB-IoT Products

Supports only NB-S1 mode (i.e. NB-IoT)	(YES/NO)
Supports NB-IOT 'Stand-alone operation'	(YES/NO)
Supports NB-IOT 'Guard band operation'	(YES/NO)
Supports NB-IOT 'In-band operation'	(YES/NO)
Supports Power Save Mode (PSM)	(YES/NO)
Supports Extended Discontinuous Reception (eDRX)	(YES/NO)
Support of data via Control plane (PDN)	(YES/NO)
Support of data via Control plane (SMS)	(YES/NO)
Support of data via User plane CloT	(YES/NO)
Support of EMM-REGISTERED without PDN	(YES/NO)
Support of EMM-REGISTERED with PDN	(YES/NO)
Supports Control Plane CloT optimisation	(YES/NO)
Supports User Plane CloT optimisation	(YES/NO)
Support for Header Compression for Control Plane in CloT	(YES/NO)
Supports UL multi-tone transmission on NPUSCH in NB-IoT	(YES/NO)
Supports UL 3.75k sub-carrier on NPUSCH in NB-IoT	(YES/NO)
Supports APN rate control	(YES/NO)
Band 01	(YES/NO)
Band 02	(YES/NO)
Band 03	(YES/NO)
Band 05	(YES/NO)
Band 08	(YES/NO)
Band 20	(YES/NO)

Table B-3: AT Command

NO.	Function	AT Command
1	Switch On	
2	Switch Off	
3	Uplink UDP Data Transfer	
4	Downlink UDP Data Transfer	
5	Output the measurement results of NRSRP, NRSRQ and SINR	
6	Enable PSM	
7	Disable PSM	
8	Enable eDRX	
9	Disable eDRX	

## **Annex C Self-Assessment Table**

The template of self-assessment table can be found in separate files as part of the “GTI Certification Guidance” package.

Annex C.1 contains the template of “Self-Assessment Table for NB-IoT Chipset”

## **Annex D Test Report**

The template of Test Reports can be found in separate files as part of the “GTI Certification Guidance” package.

Annex D.1 contains the template of Test Report for NB-IoT Chipset / NB-IoT Module

## **Annex E Certification Report**

The template of Certification Report can be found in separate files as part of the “GTI Certification Guidance” package.

Annex E.1 contains the template of Certification Report for NB-IoT Chipset

## **Annex F Certification Criteria**

The Certification Criteria can be found in separate files as part of the “GTI Certification Guidance” package.

Annex F.1 contains the Certification Criteria of NB-IoT Chipset

## Annex G Test Lab Application Table

Company Name	
Test Lab Name (if different to above)	
GTI Member	<input type="checkbox"/> YES <input type="checkbox"/> NO
ISO 17025 certificate number	
ISO 17025 certificate and accreditation scope	
Contact Person	
Job Title	
E-mail	
Telephone	

Please return completed Application Form to: [admin@gtigroup.org](mailto:admin@gtigroup.org)

## Annex H Test Platform Declaration

Company Name	
Test Platform Name	
Software Information	
Hardware Information	
Contact Person	
E-mail	
Telephone	

## 9 Document Change History

Version	Approved Date	Clause	Comment
1.0.0	12 <sup>th</sup> , Mar. 2018		Initial Version
2.0.0		6.2, Annex D, Annex F.2	Amendments to include certificaion requirement for NB-IoT Module and Annex F.2
2.0.0		Annex C.1, Annex D.1, Annex F.1, Annex F.2	Delete PCT TC 22.3.2.5 and TC 22.3.3.5 from certification criteria due to spec issue