



DVD-RAM Disc (2.6 Gbytes)

TEST SPECIFICATION

Version 1.01

June 2005

Amendment for DVD-RAM Disc (2.6 Gbytes) TS Version 1.0₁ (June 2005)

The following pages were amended without changing the version number of the TS.

- **Minor amendment (March 26, 2009)**

Page	Location	Amendment
Page 8	Annex A	<ul style="list-style-type: none">• Class-A Lab information of "Hitachi Ltd.", "Industrial Technology Research Institute" and "Matsushita Electric Industrial Co., Ltd. (company name)" was updated.

- **Minor amendment (January 2010)**

Page	Location	Amendment
Page 8	Annex A	<ul style="list-style-type: none">• Class-A Lab information of "Hitachi Ltd. (company name)" and "Panasonic Corporation" were updated.

- **Amendment 1 (January 2012)**

Page	Location	Amendment
Page 8	Annex A	<ul style="list-style-type: none">• "Toshiba Corporation" was deleted from the Class-A Lab list.

- **Amendment 2 (June 2012)**

Page	Location	Amendment
Page 8	Annex A	<ul style="list-style-type: none">• "Industrial Technology Research Institute" was deleted from the Class-A Lab list.

Conditions for Publication

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Revision History

- April 28, 1999
DVD-RAM Disc Test Specification Version 0.9 was drafted.
- May 20, 1999
Version 1.0 was revised with agreement at Verification Task Force meeting.
- July 8, 1999
Version 1.0 was revised with correction and deletion of some parts of test item.
- June 2005
Version 1.0₁ updated Class-A Lab List, and was edited as electronic files.

Table of Contents

1. General	1
1.1 Scope	1
1.2 Normative References	1
1.3 Scope of Products Covered	1
2. DVD Logo	2
2.1 Definition of Terms Used	2
2.2 DVD Logo Mechanism	4
3. Test Specification	6
3.1 Test Specification of DVD-RAM Disc	6
3.1.1 Mechanical parameters	6
3.1.2 Optical parameters	6
3.1.3 Recorded parameters	6
3.1.4 Signals from grooves	6
3.1.5 Signals from header field in rewritable data zone	6
3.1.6 Signals from embossed data zone	6
3.1.7 Characteristics of the recording layer	6
3.1.8 Cross power over-write	7
3.1.9 Cyclability test	7
3.1.10 Information area format	7
3.1.11 Dimensions of the DVD-RAM Disc Case	7
Annex A	
List of Class-A Verification Labs	8
Annex B	
Glossary of Terms used	9
Annex C	
Procedure for Class-A Verification Lab Product Submission	10
Annex D	
Guide of Peak power (PPo) and Bias power (PBo) determination	11

Forms for DVD Format verification

Form 1C

Preliminary Information for DVD Format Verification F1

Form 2C

Test Information of DVD Format Verification F2

Form 3C

Test result of the Mechanical Parameter characteristics F3

Form 4C

Test result of the Optical Parameter characteristics F4

Form 5C

Test result of the Recorded Parameter characteristics F5

Form 6C

Test result of the Signal from grooves characteristics (1) F6

Form 7C

Test result of the Signal from grooves characteristics (2) F7

Form 8C

Test result of the Signal from Header field in Rewritable data zone characteristics (1) F8

Form 9C

Test result of the Signal from Header field in Rewritable data zone characteristics (2) F9

Form 10C

Test result of the Signal from Header field in Rewritable data zone characteristics (3) F10

Form 11C

Test result of the Signal from Header field in Rewritable data zone characteristics (4) F11

Form 12C

Test result of the Signals from Embossed data zone characteristics F12

Form 13C

Test result of the Recording layer characteristics (1) F13

Form 14C

Test result of the Recording layer characteristics (2) F14

Form 15C

Test result of the Cross Power Over-Write characteristics F15

Form 16C

Test result of the Cyclability characteristics F17

Form 17C

List of the test result F18

Form 18C

Confirmation of DVD Format Verification F19

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1. General

1.1 Scope

The scope of this Test Specification is for the purpose of testing DVD-RAM Disc (2.6 Gbytes) for compliance with **DVD Specifications for Rewritable Disc Part 1 and Part 2**. The test procedure described herein could be used by Class-A Verification Labs, Class-B Verification Labs and Quality Assurance Departments of DVD-RAM Disc manufacturers.

The scope of this Test Specification is limited to product compliance to DVD Specifications and not to evaluate performance of DVD-RAM Disc.

1.2 Normative References

DVD Specifications for Rewritable Disc

Part 1: Physical Specifications Version 1.0

Part 2: File System Specification Version 1.1

1.3 Scope of Products Covered

DVD-RAM Disc (2.6 Gbytes Type)

2. DVD Logo

DVD Format/Logo Licensing Corporation owns the rights to license the DVD Logo. To be able to use the DVD Logo, DVD manufacturer must have:

- a. License to use the Logo and
- b. DVD Specification compliance of the product for logo consideration must be validated by the test specifications as defined in this book.

Licensing terms for the DVD Logo are available from the DVD Format/Logo Licensing Corporation.

This section will describe the mechanism to be used for product compliance testing.

2.1 Definition of Terms Used

First Production Model- The **First Production Model** must be tested and approved by any of the appropriate Class-A Verification Labs (see definition of Class-A Labs below) for compliance with DVD Specifications. Class-A labs will use the test specifications described in this document for compliance verification.

The following parameters must be used to determine a **First Production Model**:

1. Initial or the latest production model at the start of Logo Program for each licensee
2. DVD Specifications Version n.x changing to n+1.x

Next Production Model - A **Next Production Model** does not require compliance verification from a Class-A Verification Lab but must be tested by licensee in its QA department for compliance with DVD Specifications. Licensee's QA department must have the test tools required to perform the tests specified in this document and must, at minimum, use the test procedure referred to in this document (licensee is free to have its own QA procedure, equipment and tools as long as it is a superset of the specification described in this document). A Licensee without own QA department can get the product tested by a certified Third Party Class-B Verification Lab (see definition of Class-B Labs below).

The following parameters must be used to determine a **Next Production Model**:

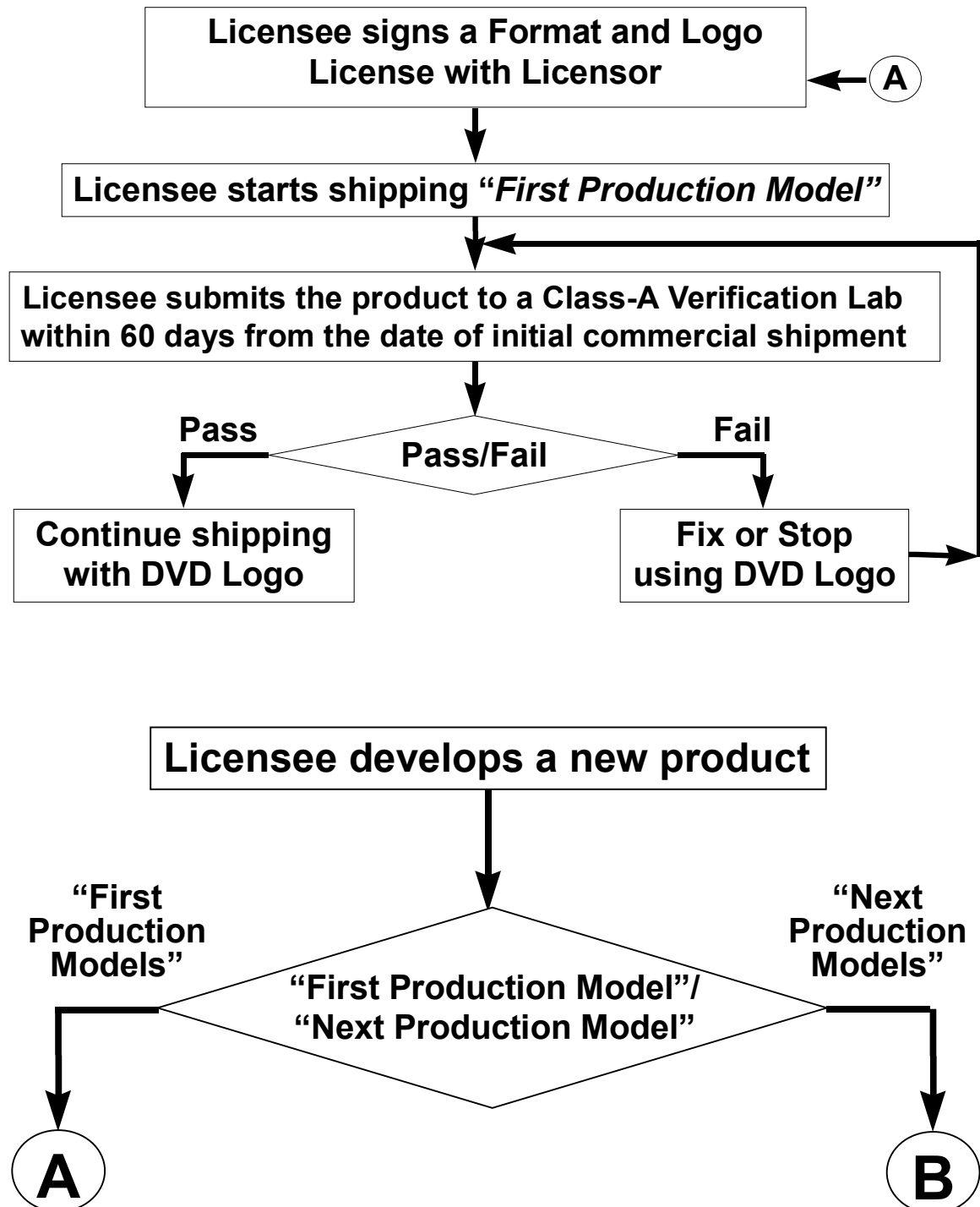
1. DVD Specifications Version n.x changing to n.x+1
2. Significant DVD format related changes to the Material and/or Manufacturing process.
This will be at the discretion of the Licenser and Licensee.
3. Single Sided
4. Double Sided

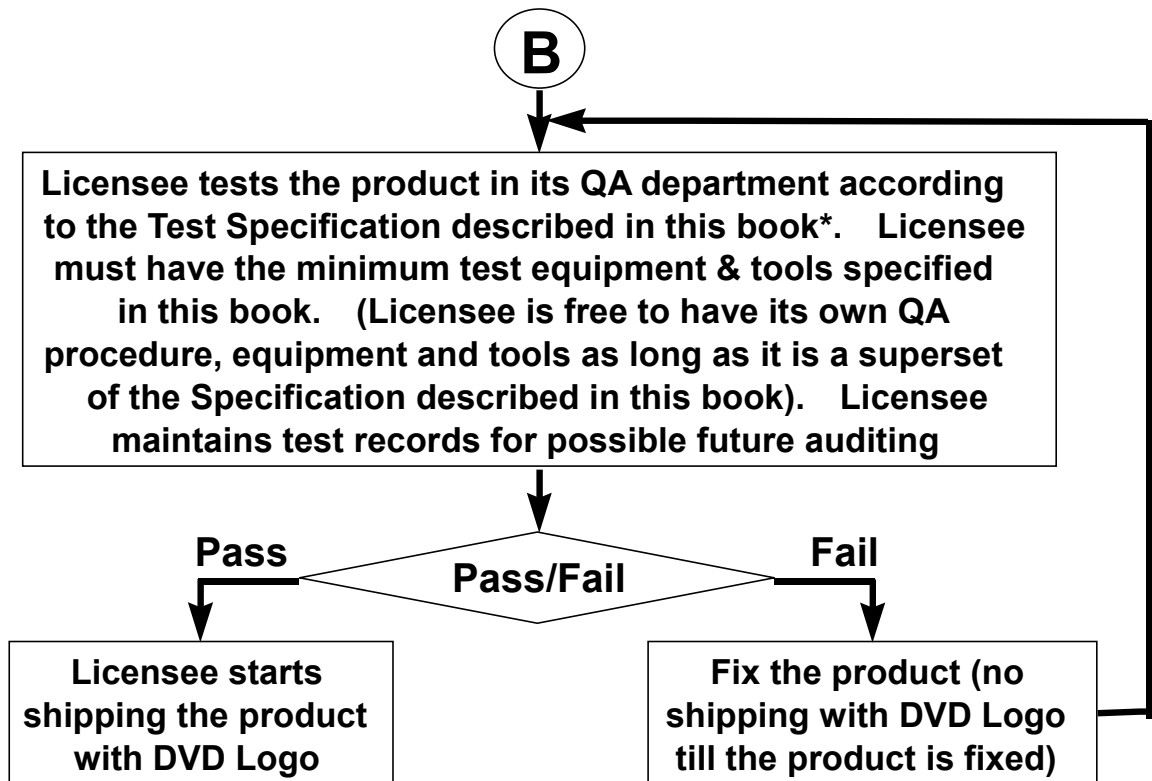
Class-A Verification Labs - Class-A Verification Labs are experts in DVD technology and provide independent expert assessment of Licensee's product compliance with DVD Specifications. Class-A labs also provide additional services such as interpretation of DVD Specifications, development of Test Tools and Auditing of Class-B Labs and Licensees.

Class-B Verification Labs - DVD-RAM Disc Class-B Verification Labs provide DVD-RAM Disc testing strictly according to the **DVD-RAM Disc Test Specification** (They can not interpret specifications).

2.2 DVD Logo Mechanism

The DVD Logo mechanism is described in the following flow chart:





*: Licensee without own QA department can get the product tested from a **DVD-RAM Disc Class-B Verification Lab**.

3. Test Specification

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing.

3.1 Test Specification of DVD-RAM Disc

The following sections describe the test procedures required for the DVD-RAM Disc, the tests are identical for both, the First Production Models and the Next Production Models.

3.1.1 Mechanical parameters

- Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 3C**. Finally judge the result with **Form 17C**.

3.1.2 Optical parameters

- Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 4C**. Finally judge the result with **Form 17C**.

3.1.3 Recorded parameters

- Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 5C**. Finally judge the result with **Form 17C**.

3.1.4 Signals from grooves

- Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 6C and 7C**. Finally judge the result with **Form 17C**.

3.1.5 Signals from header field in rewritable data zone

- Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 8C to 11C**. Finally judge the result with **Form 17C**.

3.1.6 Signals from embossed data zone

- Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 12C**. Finally judge the result with **Form 17C**.

3.1.7 Characteristics of the recording layer

- Refer to **Annex D**. It is written the way of determining write power. Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 13C and 14C**. Finally judge the result with **Form 17C**.

3.1.8 Cross power over-write

- Refer to **Annex D**. It is written the way of determining write power. Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 15C**. Over-write power condition is as follows.

Condition A is Operational Peak Power (PPo) and Operational Bias Power (PBo). Condition B is plus 5% of PPo and PBo.

Condition C is minus 10% of PPo and PBo.

Write same place by these condition's power and measure with jitter.

Finally confirm the result with **Form 17C**.

Note: It is recommended to test under the power condition A (11.0 mW, 5.0 mW), condition B (11.6 mW, 5.3 mW) and condition C (9.9 mW, 4.5 mW) in addition to above test.

Remarks: This data shall be treated as non-specified data in DVD Specification for Rewritable Disc Version 1.0.

3.1.9 Cyclability test

- Refer to **Annex D**. It is written the way of determining write power. Measure the item by using DVD-RAM Disc Evaluation System or equivalent system in accordance with **Form 16C**. Random signal shall be written repeatedly and measure with jitter at 10, 10,000, 50,000, 100,000. Finally confirm the result with **Form 17C**.

Remarks: This data shall be treated as non-specified data in DVD Specification for Rewritable Disc Version 1.0.

3.1.10 Information area format

- Ensure that information area format is written properly by using DVD-RAM Disc Evaluation System or equivalent system. Finally judge the result with **Form 17C**.

3.1.11 Dimensions of the DVD-RAM Disc Case

- Enter the measuring test results of DVD-RAM Disc case which is specified in paragraph 3.3, 3.4 and/or 3.5 of DVD Specification for Rewritable Disc / Part 1. Physical Specifications. Finally judge the result with **Form 17C**.

Annex A

List of Class-A Verification Labs

This List is correct at the time of publication. However, when the Class-A Lab information contained here differs from such information cited in our website www.dvdfllc.co.jp, the List with more current date prevails. Also, please refer to the website for the latest Verification Service of each Class-A Lab.

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Annex B

Glossary of Terms used

DVD-RAM : DVD Rewritable Disc
DVD-ROM : DVD Read-Only Disc
DVD-R : DVD Recordable Disc

Annex C

Procedure for Class-A Verification Lab Product Submission

The procedure for submitting a product to a Class-A Verification Lab is as follows:

Preliminary Application

Applicant must complete **Form 1C** to provide preliminary information.

Self Test

Applicant must test the product in accordance with this Test Specification prior to submitting to a Class-A Verification lab. Applicant must complete **Form 2C to 17C** to provide test results.

Mutual Non-Disclosure Agreement (NDA)

Applicant, in order to maintain the confidentiality of the applicant's product and Verification Lab's information, must sign a Mutual Non-Disclosure Agreement.

Application

Applicant must submit 10 product samples along with **Form 2C to 17C** and the NDA.

Test Result

Upon completion of testing, Verification Lab will complete **Form 18C** to inform the applicant and DVD Format/Logo Licensing Corporation of the test results.

Annex D

Guide of Peak power (PPo) and Bias power (PBo) determination

The operational Bias power (PBo) is determined as follows.

1. Set the Bias power1 to PBt (5.2mW).
2. Over-write the random data by changing the Peak power, and measure the jitter.
3. Get the lower Peak power PPbtm when the jitter becomes 13%.
4. Get the higher Peak power PPtop when the jitter becomes 13%.
5. Calculate $P11=1.2 \times PPbtm$, and $P21=(PPbtm+PPtop)/2$.
6. The lower power is the temporary Peak power PPt, comparing P11 and P21.
7. Set the Peak power PPt.
8. Over-write the random data by changing the Bias power1, and measure the jitter.
9. Get the lower Bias power1 PBbtm when the jitter becomes 13%.
10. Get the higher Bias power1 PBtop when the jitter becomes 13%.
11. The operational Bias power1 PBo is given as $(PBbtm + PBtop)/2$.

The operational Peak power (PPo) is determined as follows.

1. Set the Bias power to PBo.
2. Over-write the random data by changing the Peak power, and measure the jitter.
3. Get the lower Peak power PPbtm when the jitter becomes 13%.
4. Get the higher Peak power PPtop when the jitter becomes 13%.
5. Calculate $P1=1.2 \times PPbtm$, and $P2=(PPbtm+PPtop)/2$.
6. The lower power is the operational Peak power PPo, comparing P1 and P2.

Remarks:

This way of determining Peak power and Bias power isn't defined at DVD Specifications for Rewritable Disc / Part 1 exactly. But it is recommended meaning to unify the way of verification.

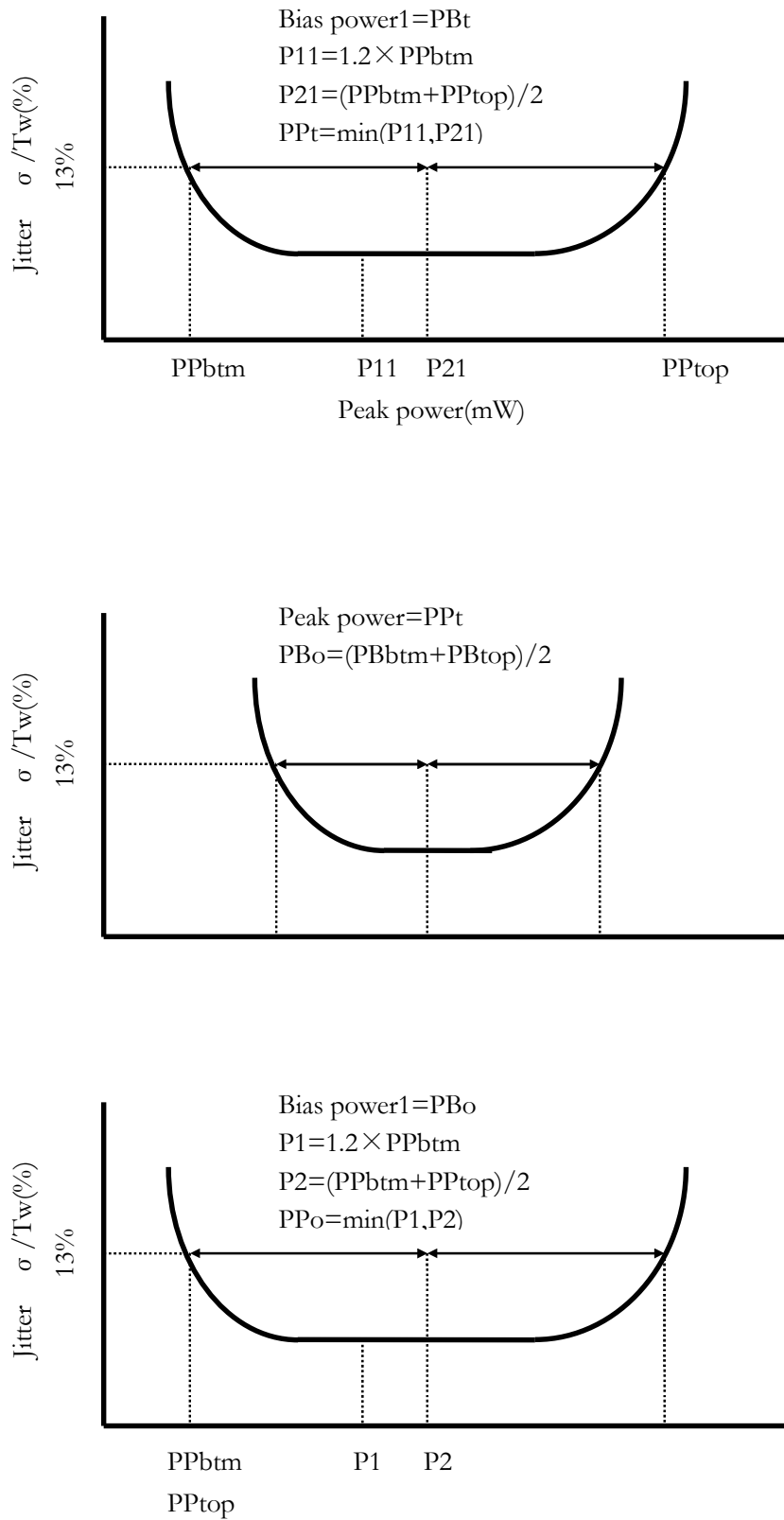


Figure : Guide of Peak power and Bias power definition