



## PT. DIMULTI PILAR NARMADI

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DECREE OF THE MINISTER OF COMMUNICATIONS AND INFORMATICS OF THE  
REPUBLIC OF INDONESIA  
NUMBER 04 OF 2024  
ABOUT  
TECHNICAL STANDARDS FOR DIGITAL BROADCAST RADIO TRANSMITTER  
TELECOMMUNICATION DEVICES BASED ON DIGITAL RADIO MONDIALE AND  
DIGITAL AUDIO BROADCASTING PLUS

MINISTER OF COMMUNICATIONS AND INFORMATICS OF THE REPUBLIC OF  
INDONESIA

Considering:

- a. that in accordance with the provisions of Communication and Information Technology Number 5 of 2023 concerning the Master Plan and Technical Provisions for Operational Technical Provisions for the Use of the Radio Frequency Spectrum for Terrestrial Broadcasting Services, radio broadcasting operations can use digital technology standards based on digital radio Mondiale and digital technology standards based on digital audio broadcasting plus;
- b. that based on the provisions of Article 34 paragraph (1) and Article 37 paragraph (1) of Government Regulation Number 46 of 2021 concerning Post, Telecommunications and Broadcasting, every telecommunications tools and/or telecommunications equipment that is made, assembled, or entered for trading and/or used in the territory of the Unitary State of the Republic of Indonesia must meet the technical standards set by the Minister of Communication and Information;
- c. that based on the considerations as intended in letters a and b, it is necessary to stipulate a Decree of the Minister of Communication and Information regarding Technical Standards for Digital Radio Broadcasting Telecommunication Equipment based on Digital Radio Mondiale and Digital Audio Broadcasting Plus;

Bearing in mind:

1. Law Number 36 of 1999 concerning Telecommunications (State Gazette of the Republic of Indonesia of 1999 Number 154, Supplement to State Gazette of the Republic of Indonesia Number 3881) as amended by Law Number 6 of 2023 concerning Stipulation of Government Regulations in Lieu of Laws Number 2 of 2022 concerning Job Creation into Law (State Gazette of the Republic of Indonesia of 2023 Number 41, Supplement to the State Gazette of the Republic of Indonesia Number 6856);
2. Law Number 39 of 2008 concerning State Ministries (State Gazette of the Republic of Indonesia of 2008 Number 166, Supplement to State Gazette of the Republic of Indonesia Number 4916);
3. Government Regulation Number 46 of 2021 concerning Post, Telecommunications and Broadcasting (State Gazette of the Republic of Indonesia of 2021 Number 56, Supplement to State Gazette of the Republic of Indonesia Number 6658);
4. Presidential Regulation Number 22 of 2023 concerning the Ministry of Communication and Information (State Gazette of the Republic of Indonesia of 2023 Number S1);
5. Regulation of the Minister of Communication and Information Technology Number 16 of 2018 concerning Operational Provisions for Certification of Telecommunications



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- Equipment and/or Equipment (State Gazette of the Republic of Indonesia of 2018 Number 1801);
6. Regulation of the Minister of Communication and Information Technology Number 12 of 2021 concerning the Organization and Work Procedures of the Ministry of Communication and Information Technology (State Gazette of the Republic of Indonesia of 2021 Number 1120);
  7. Regulation of the Minister of Communication and Information Technology Number 5 of 2023 concerning the Master Plan and Operational Technical Provisions for the Use of the Radio Frequency Spectrum for Radio Broadcasting Services via Terrestrial Media (State Gazette of the Republic of Indonesia of 2023 Number 654);

### DECIDE:

To stipulate : DECREE OF THE MINISTER OF COMMUNICATIONS AND INFORMATICS CONCERNING TECHNICAL STANDARDS FOR DIGITAL BROADCASTING TELECOMMUNICATIONS EQUIPMENT BASED ON DIGITAL RADIO MONDIALE AND DIGITAL AUDIO BROADCASTING PLUS.

FIRST : Determine:

- a. technical standards for digital broadcast radio transmitter telecommunications equipment based on digital radio Mondiale as listed in Appendix I which is an inseparable part of this Ministerial Decree, and
- b. technical standards for digital broadcast radio transmitter telecommunications equipment based on digital audio broadcasting plus as listed in Appendix II which is an inseparable part of this Ministerial Decree.

SECOND : Fulfilment of technical standards for digital broadcast radio transmitting telecommunications equipment based on digital radio Mondiale and digital audio broadcasting plus as intended in the FIRST Dictum is proven through certification of telecommunications tools and/or telecommunications equipment in accordance with the provisions of statutory regulations.

THIRD : In the context of certification of telecommunications equipment and/or telecommunications equipment as referred to in SECOND Dictum:

- a. to prove compliance with technical standards, electrical safety requirements, electromagnetic compatibility, and radio frequency requirements in addition to signal input parameters, must attach a test report or test report, and
- b. To prove compliance with the input signal parameters for radio frequency requirements, you must attach a statement of conformity to technical standards.

FOURTH : Fulfilment of technical standards for digital broadcast radio transmitter telecommunications equipment based on digital radio Mondiale and digital audio broadcasting plus as intended in the FIRST Dictum regarding immunity in electromagnetic compatibility requirements is determined by a separate Ministerial Decree.

FIFTH : Test results reports or test reports for digital broadcast radio transmitter



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telecommunications equipment based on digital audio broadcasting plus which have been issued before this Ministerial Decree comes into force, can still be submitted for certification of telecommunications tools and/or telecommunications equipment as long as they do not conflict with this Ministerial Decree and the provisions of regulations legislation.

SIXTH : This Ministerial Decree comes into effect 3 (three) months from the date of stipulation.

Set in Jakarta  
On January 3, 2024  
MINISTER OF COMMUNICATIONS AND  
INFORMATICS  
REPUBLIC OF INDONESIA

BUDI ARIE SETIADI



**DIMULTI**



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APPENDIX I  
DECISION OF THE MINISTER OF  
COMMUNICATIONS AND INFORMATICS  
OF THE REPUBLIC OF INDONESIA  
NUMBER 04 OF 2024  
ABOUT  
TECHNICAL STANDARDS FOR RADIO  
TRANSMITTING TELECOMMUNICATION  
DEVICES  
DIGITAL BROADCASTS BASED ON  
DIGITAL RADIO MONDIALE  
AND BROADCASTING PLUS DIGITAL  
AUDIO

TECHNICAL STANDARDS FOR DIGITAL BROADCAST RADIO TRANSMITTER  
TELECOMMUNICATION DEVICES BASED ON DIGITAL RADIO MONDIALE

CHAPTER I  
GENERAL REQUIREMENTS

A. Definition

1. Digital Broadcast Radio Transmitting Telecommunication Device. Digital Radio Mondiale, hereinafter referred to as DRM Transmitter, is a digital broadcast radio transmitter device based on digital radio Mondiale technology (ETSI ES 201 980) which consists of a DRM exciter/modulator, RF amplifier and/or RF system filter, which works in the radio frequency band:
  - a. medium frequency (MF) with a radio frequency range of 526.5 kHz to 1606.5 kHz;
  - b. very high frequency (VHF) Band II with radio frequency range. 87.0 MHz to 108.0 MHz; and/or
  - c. very high frequency (VHF) Band III with radio frequency range. 174 MHz to 230 MHz.
2. Rated Output Power is the average power transmitted by the transmitter at the antenna port under conditions specified by the manufacturer.
3. Frequency Stability is the variation of frequency over a time scale. which has been specified.
4. Spurious Emissions are emissions on radio frequencies that are outside the required bandwidth and whose power can be reduced without affecting information transmission.
5. Out-of-Band Emissions are emissions at radio frequencies, instantaneously outside the required bandwidth, resulting from the modulation process but not including Spurious Emissions.
6. Modulation Error Ratio is a single parameter to measure the quality of the transmitted signal. Modulation Error Ratio is the sum of the squares of the ideal symbol vector magnitudes divided by the sum of the squares of the error symbol vector magnitudes. The Modulation Error Ratio results are expressed as a power ratio in dB.

**B. List of Abbreviations**

1. A : Ampere
2. AC : Alternating Current
3. CISPR : Comité Internationale Spécial des Perturbations Radioelectrotechnique  
(International Special Committee on Radio Interference, IEC)
4. dB : decibel
5. dBc : decibel relative to carrier
6. dBm : decibel milli watt
7. dBW : decibel Watt
8. DC : Direct Current
9. DCP : Distribution and Communication Protocol
10. DRM : Digital Radio Mondiale
11. EIRP : Equivalent Isotopically Radiated Power
12. EMC : Electromagnetic Compatibility
13. ETSI : European Telecommunications Standards Institute
14. Hz : Hertz
15. ICNIRP : International Commission on Non-Ionizing Radiation Protection
16. IEC : International Electrotechnical Commission
17. ISO : International Organization for Standardization
18. kHz : Kilo Hertz
19. m : meter
20. MF : Medium Frequency
21. mW : milli Watt
22. MER : Modulation Error Ratio
23. MDI : Multiplex Distribution Interface
24. MHz : Mega Hertz
25. SNI : Standard
26.  $\mu$ T : micro-Tesla
27.  $\mu$ W : micro watt
28. V : Volt
29. VHF : Very High Frequency
30. W : Watt

**CHAPTER II  
TECHNICAL STANDARDS**

**1. Configuration**

An example of a DRM Transmitter device configuration is in accordance with Figure 1

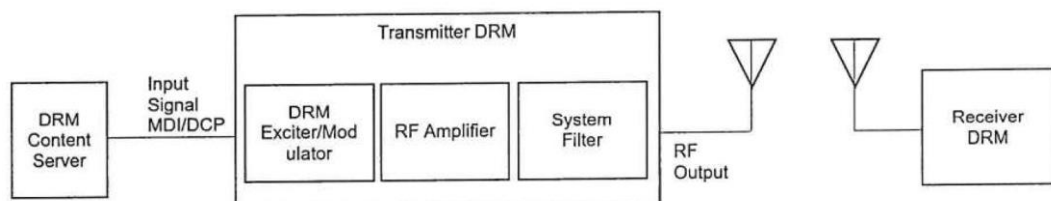


Figure 1. Example of a DRM Transmitter configuration



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## 2. Power Supply Requirements

The DRM transmitter is powered by AC or DC.

For DRM Transmitter devices powered by AC power, all parameter benchmarks must be met when using:

- a. single-phase power supply with AC voltage  $220\text{ V} \pm 10\%$ ; or
  - b. three-phase power supply with AC voltage  $380\text{ V} \pm 10\%$ ;
- with a frequency of  $50\text{ Hz} \pm 2\%$ . When using an external power supply (e.g. AC/DC power converter), the external power supply must not affect the device's ability to meet all technical parameter benchmarks.

## 3. Electrical Safety Requirements

The electrical safety assessment of the device must meet the requirements specified in SNI IEC 60950-1:2016, SNI IEC 62368-1:2014, IEC 62368-1, or IEC 60215 with the parameters that must be met are:

- a. excessive voltage or strong electricity or strong dielectric; And
- b. leakage current or touch current.

## 4. EMC requirements

### a. Immunity

The value limits and mechanisms for implementing obligations for immunity requirements are in accordance with the provisions in the FOURTH Dictum of this Ministerial Decree.

### b. Emission

- 1) DRM transmitters must comply with SNI CISPR 32:2015, IEC CISPR 32, ETSI EN 301 489-11, or ETSI EN 301 489-53.
- 2) In the case of using SNI ISO/IEC CISPR 32:2015, the following emission measurements must be carried out on the DRM Transmitter if possible:
  - a) radiation emissions in the cabinet (enclosure port) must meet the limits in Table 1, Table 2 and/or Table 3.

Table 1. Cabinet Radiation Emission Limits below 1 GHz

Radio Frequency Range	Quasi-peak Limit (dB $\mu$ V/m) at 10 m distance
30-230 MHz	$40\text{ dB}\mu\text{V/m} \leq 60 + 10 \log_{10} (P/2000) \leq 70\text{ dB}\mu\text{V/m}$
> 230 MHz up to 1 GHz	$47\text{ dB}\mu\text{V/m} \leq 67 + 10 \log_{10} (P/2000) \leq 77\text{ dB}\mu\text{V/m}$
Catatan: P = Rated Output Power dalam Watt	

Table 2. Cabinet Radiation Emission Limit Above 1 GHz

Radio Frequency Range	Average Limit (dB $\mu$ V/m) At 3 m distance	Quasi-peak Limit (dB $\mu$ V/m) at 3 m distance
1 GHz – 3 Ghz	$56\text{ dB}\mu\text{V/m} \leq 86 + 10 \log_{10} (P/2000) \leq 96\text{ dB}\mu\text{V/m}$	$76\text{ dB}\mu\text{V/m} \leq 106 + 10 \log_{10} (P/2000) \leq 116\text{ dB}\mu\text{V/m}$



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3 GHz - 6 GHz	$60 \text{ dB}\mu\text{V/m} \leq 90 + 10 \log_{10} (P/2000) \leq 100 \text{ dB}\mu\text{V/m}$	$80 \text{ dB}\mu\text{V/m} \leq 110 + 10 \log_{10} (P/2000) \leq 120 \text{ dB}\mu\text{V/m}$
Note: P = Rated Output Power dalam Watt		

As an alternative, the limits in table 3 can be used

Table 3. Alternative cabinet radiation emission limits above 1 GHz

Radio Frequency Range	RMS-Average Limit (dB $\mu$ V/m) At 3 m distance (see note 1 and 2)
1 GHz – 3 GHz	$60 \text{ dB}\mu\text{V/m} \leq 90 + 10 \log_{10} (P/2000) \leq 100 \text{ dB}\mu\text{V/m}$
3 GHz - 6 GHz	$64 \text{ dB}\mu\text{V/m} \leq 94 + 10 \log_{10} (P/2000) \leq 104 \text{ dB}\mu\text{V/m}$
Note 1: P = Rated Output Power in Watt Note 2: p = For detector RMS-Average detector, see CENELEC EN 55016-1-1 [3], clause 7.	

b) Conduction emissions at AC or DC power ports in table 4.

Table 4. AC or DC Power Port conduction emission limits

AC Power (kVA) DC Power (kW)	Limit (dB $\mu$ V)		Radio Frequency Range (MHz)
	Quasi-peak	Average	
>0 up to 2	79	66	0,15 up to 0,5
	73	60	>0,5 up to 30
>2 up to 10	89	76	0,15 up to 0,5
	83	70	>0,5 up to 30
>10 up to 75	100 <sup>2)</sup>	90 <sup>2)</sup>	0,15 up to 0,5
	86 <sup>2)</sup>	76 <sup>2)</sup>	>0,5 up to 5
	96 up to 70 <sup>1) 2)</sup>	80 up to 60 <sup>1) 2)</sup>	5 up to 30
>75	130 <sup>2)</sup>	120 <sup>2)</sup>	0,15 up to 0,5
	125 <sup>2)</sup>	115 <sup>2)</sup>	>0,5 up to 5
	115 <sup>2)</sup>	105 <sup>2)</sup>	5 up to 30
Catatan: Limits decreasing linearly with the logarithm of frequency Diukur dengan CISPR Voltage probe, lihat gambar 4 EN 55011			

5. Radio frequency requirements

Each DRM transmitter must at least meet the following requirements:

Table 5. DRM transmitter radio frequency requirements

Parameter	MF	VHF band II	VHF band III
Operating Frequency	526,5 kHz – 1606,5 kHz	87,0 MHz – 108,0 MHz	174,0 MHz – 230,0 MHz



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Bandwidth	9 kHz	96 kHz	96 kHz 6 x 96 kHz 4 x 96 kHz
Rated Output Power	According to table 6	According to table 7	According to table 7
Frequency Stability	$\leq 10$ Hz	$\leq 100$ Hz	$\leq 100$ Hz
Spurious Emission	According to Table 8 dan Figure 2	According to table 9 dan Figure 3	According to table 9 dan Figure 3
Out-of-Band Emissions	According to table 10	According to table 11	According to table 11
MER	$\geq 30$ dB	$\geq 21$ dB	$\geq 21$ dB

Table 6. Rated Output Power Limit for DRM transceiver operating within 526,5 kHz – 1606,5 kHz frequency range.

No	Class Classification	Rated Output Power
1	Class I for non-Low Power channels DRM transceiver	>100 Watt
2	Class II for Low Power channels DRM transceiver (1485 kHz, 1584 kHz, and 1602 kHz)	$\leq 100$ Watt

Table 7. Rated Output Power Limit for DRM transceiver operating within 87,0 MHz – 108,0 MHz and 174,0 MHz – 230,0 MHz frequency range.

No	Class Classification	Rated Output Power
1	Class I	>40 Watt
2	Class II	$\leq 40$ Watt

Table 8. Spurious emission limit for DRM transceiver operating within 526,5 kHz – 1606,5 kHz frequency range.

Average Power	Average Power Level Limit absolute (dBm) or relative level (dBc) for the Average Power entering the antenna port at the reference bandwidth
All Power Range	-50 dBc, without exceeding the absolute Average Power of 50 Mw (17 dBm)





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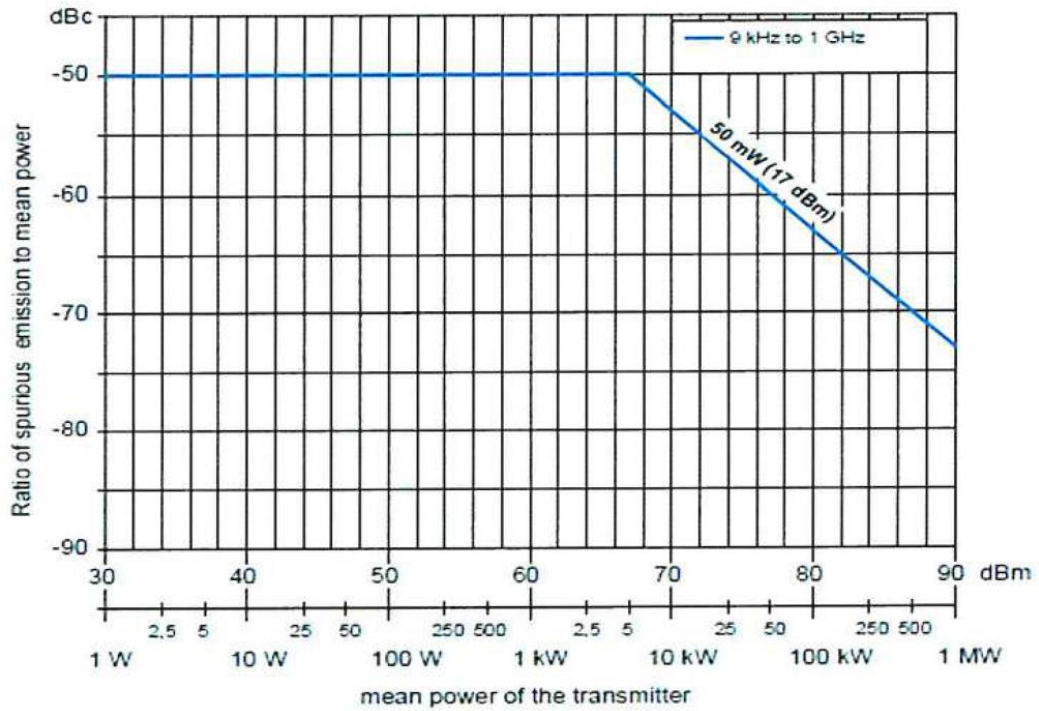


Figure 2. Spurious emissions limit for DRM transceiver operating within 526,5 kHz – 1606,5 kHz frequency range.

Table 9. Spurious emission limit for DRM transceiver operating within 87,0 MHz – 108,0 MHz and 174 MHz – 230 MHz frequency range.

Average Power (P)	Absolute Average Power Level Limit (dBm) or relative level (dBc) below average level that enters to the antenna port in the reference bandwidth
$P < 9 \text{ dBW}$	-36 dBm
$9 \text{ dBW} \leq P < 29 \text{ Dbw}$	75 dBc
$29 \text{ dBW} \leq P < 39 \text{ dBW}$	-16 dBm
$39 \text{ dBW} \leq P < 50 \text{ dBW}$	85 dBc
$50 \text{ dBW} \leq P$	-5 dBm



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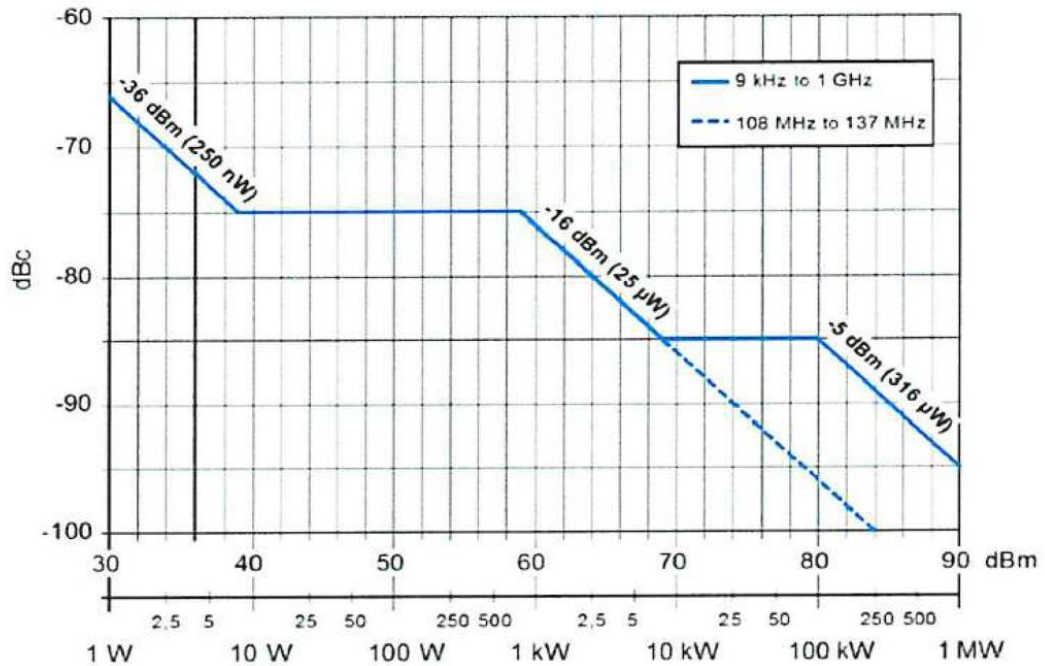


Figure 3. Spurious emission limit for DRM transceiver operating within 87,0 MHz – 108,0 MHz and 174 MHz – 230 MHz frequency range.

Table 10. Out-of-Band emissions limit for DRM transceiver operating within 526,5 kHz – 1606,5 kHz frequency range.

Relative Frequency (f/F)	Difference of Frequency (f) from the centre frequency of the channel bandwidth (f) (kHz)	Relative Level (dB)
	F=9	
± 0,1	0,9	0
± 0,5	4,5	0
± 0,7	6,3	-35
± 1,4	12,6	-47
± 2,8	25,2	-59
≥ ± 2,952	26,57	-60

Table 11. Out-of-Band emission limit for DRM transceiver operating within 87,0 MHz – 108,0 MHz and 174 MHz – 230 MHz frequency range.

Relative Frequency from the channel centre (kHz)	Relative Level (dB)
-500	-65
-300	-65
-200	-60
-100	-50
-70	-30
-50	0
50	0
70	-30
100	-50
200	-60
300	-65



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500

-65

### 6. Signal Input Requirements

The DRM device Signal Input must be MDI/DCP compliant on ETSI TS 102 820 and ETSI TS 102 821 and support all DCP configuration options (DCP Profile A).

## CHAPTER III TESTING METHODS

Test methods for DRM Transmitter devices refer to:

### 1. Electrical Safety Testing Methods

Test methods comply with SNI IEC 60950-1:2016, SNI IEC 62368-1:2014, IEC 60215, and/or IEC 62368-1.

Parameter testing is carried out based on the following assumptions:

- a. the device is supplied continuously with a dedicated external power supply (AC/DC converter or adapter/charger) or with an AC power supply; And
- b. The device operates with SELV in environments where it is redundant. voltage from the telecommunications network may occur. SELV refers to a voltage that does not exceed 42.4 V peak or 60 V DC.

### 2. EMC (Emission) Testing Method

Test methods comply with ETSI EN 301 489-1, ETSI EN 301 489-11, ETSI EN 301 489-53, SNI CISPR 32:2015, and/or IEC CISPR 32.

### 3. Radio Frequency Test Method:

- a. Rated Output Power in accordance with clause 5.3.1 of ETSI EN 302 245;
- b. Frequency Stability in accordance with clause 5.3.2 of ETSI EN 302 245;
- c. Spurious Emissions in accordance with clause 5.3.3 of ETSI EN 302 245;
- d. Out-of-Band Emissions in accordance with clause 5.3.5 of ETSI EN 302 245;
- e. MER in accordance with clause 5.3.6 of ETSI EN 302 245; and/or
- f. testing methods determined by the Director General of Post and Informatics Resources and Equipment.

MINISTER OF COMMUNICATIONS AND  
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REPUBLIC OF INDONESIA

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TELECOMMUNICATION DEVICES BASED ON DIGITAL AUDIO BROADCASTING  
PLUS

CHAPTER I  
GENERAL REQUIREMENTS

1. Definition

Digital Broadcast Radio Transmitter Telecommunication Device Based on Digital Audio Broadcasting Plus, hereinafter referred to as DAB+ Transmitter, is a digital broadcast radio transmitter device based on digital audio broadcasting technology consisting of DAB+ exciter/modulator, RF amplifier and/or RF system filter, which works in the radio frequency band. 174 MHz to 230 MHz.

2. List of Abbreviations

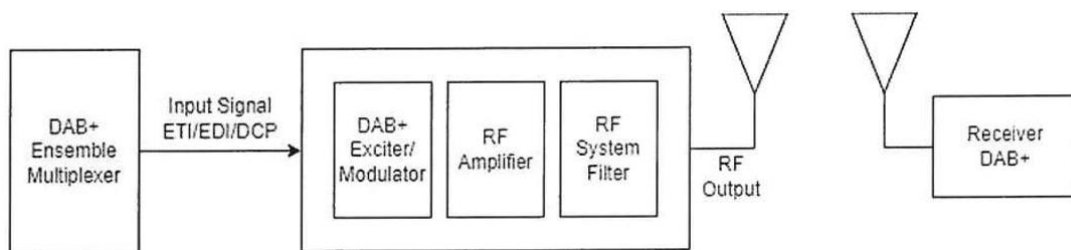
1. A : Ampere
2. AC : Alternating Current
3. CISPR : Comité Internationale des Spécial Perturbations Radioelectrotechnique (International Special Committee on Radio Interference, IEC)
4. dB : decibel
5. dBc : decibel relative to carrier
6. dBm : decibel milli watt
7. Dbw : decibel Watt
8. DC : Direct Current
9. DCP : Distribution and Communication Protocol
10. DAB+ : Digital Audio Broadcasting Plus
11. EDI : Encapsulation of DAB Interfaces
12. EIRP : Equivalent Isotropically Radiated Power
13. EMC : Electromagnetic Compatibility
14. ETSI : European Telecommunications Standards Institute
15. Hz : Hertz
16. ICNIRP : International Commission on Non-Ionizing Radiation Protection
17. IEC : International Electrotechnical Commission
18. ISO : International Organization for Standardization
19. kHz : kilo Hertz

- 20. m : meter
- 21. mW : milli Watt
- 22. MER : Modulation Error Ratio
- 23. MHz : Mega Hertz
- 24. SNI : Standard
- 25.  $\mu$ T : micro-Tesla
- 26.  $\mu$ W : micro watt
- 27. V : Volt.
- 28. W : Watt

## CHAPTER II TECHNICAL STANDARDS

### 1. Configuration

An example of a DAB+ transmitter device configuration is in accordance with Figure 1.



### 2. Power Supply Requirements

DAB+ transmitters are AC or DC powered.

For AC powered DAB+ Transmitter devices, all parameter benchmarks must be met when using:

- a. single-phase power supply with AC voltage  $220\text{ V} \pm 10\%$ ; or
- b. three-phase power supply with AC voltage  $380\text{ V} \pm 10\%$ , with a frequency of  $50\text{ Hz} \pm 2\%$ . When using an external power supply (e.g. AC/DC power converter), the external power supply must not affect the device's ability to meet all technical parameter benchmarks.

### 3. Electrical Safety Requirements

The electrical safety assessment of the device must meet the requirements specified in SNI IEC 60950-1:2016, SNI IEC 62368-1:2014, IEC 62368-1, or IEC 60215 with the parameters that must be met are:

- a. excessive voltage or strong electricity or strong dielectric; And
- b. leakage current or touch current.

### 4. EMC requirements

#### a. Immunity

The value limits and mechanisms for implementing obligations for immunity requirements are in accordance with the provisions in the FOURTH Dictum of this Ministerial Decree.



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## b. Emission

- 1) DAB+ transmitters must comply with SNI CISPR 32:2015, IEC CISPR 32, ETSI EN 301 489-11, or ETSI EN 301 489-53.
- 2) In the case of using SNI ISO/IEC CISPR 32:2015, the following emission measurements must be carried out on the DAB+ Transmitter if possible:
  - a) radiation emissions in the cabinet (enclosure port) must meet the limits in Table 1, Table 2 or Table 3.

Table 1. Cabinet Radiation Emission Limits below 1 GHz

Radio Frequency Range	Quasi-peak Limit (dB $\mu$ V/m) at 10 m distance
30-230 MHz	$40 \text{ dB}\mu\text{V/m} \leq 60 + 10 \log_{10} (P/2000) < 70 \text{ dB}\mu\text{V/m}$
230 MHz up to 1 GHz	$47 \text{ dB}\mu\text{V/m} \leq 67 + 10 \log_{10} (P/2000) \leq 77 \text{ dB}\mu\text{V/m}$

Note: P= Rated Output Power in Watt

Table 2. Cabinet Radiation Emission Limit Above 1 GHz

Radio Frequency Range	Average Limit (dB $\mu$ V/m) at 3 m distance	Quasi-peak Limit (dB $\mu$ V/m) at 3 m distance
1 GHz - 3 GHz	$56 \text{ dB}\mu\text{V/m} \leq 86 + 10 \log_{10} (P/2000) \leq 96 \text{ dB}\mu\text{V/m}$	$76 \text{ dB}\mu\text{V/m} \leq 106 + 10 \log_{10} (P/2000) < 116 \text{ dB}\mu\text{V/m}$
3 GHz - 6 GHz	$60 \text{ dB}\mu\text{V/m} \leq 90 + 10 \log_{10} (P/2000) \leq 100 \text{ dB}\mu\text{V/m}$	$80 \text{ dB}\mu\text{V/m} \leq 110 + 10 \log_{10} (P/2000) \leq 120 \text{ dB}\mu\text{V/m}$

Note: P = Rated Output Power dalam Watt

As an alternative, the limits in Table 3 can be used.

Table 3. Alternative Cabinet Radiation Emission Limits above 1 GHz

Radio Frequency Range	RMS-Average Limit (dB $\mu$ V/m) at 3 m distance (See note 1 and 2)
1 GHz - 3 GHz	$60 \text{ dB}\mu\text{V/m} \leq 90 + 10 \log_{10} (P/2000) \leq 100 \text{ dB}\mu\text{V/m}$
3 GHz - 6 GHz	$64 \text{ dB}\mu\text{V/m} \leq 94 + 10 \log_{10} (P/2000) \leq 104 \text{ dB}\mu\text{V/m}$

Note 1: P = Rated Output Power in Watt

Note 2: P = For RMS-Average detector, see CENELEC EN 55016-1-1 [3], clause 7.

- b) conduction emissions at the AC or DC power port must meet the Class A requirements specified in Table A.9 and Table A.11 in accordance with clause 4 of SNI ISO/IEC CISPR 32:2015 or Table 4.

Table 4. AC or DC power port conduction emission limits)

AC Power (kVA) DC Power (kW)	Limit (dB $\mu$ V)		Radio Frequency Range (MHz)
	Quasi-peak	Average	



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>0 up to 2	79	66	0,15 up to 0,5
	73	60	>0,5 up to 30
>2 up to 10	89	76	0,15 up to 0,5
	83	70	>0,5 up to 30
>10 up to 75	100 <sup>2)</sup>	90 <sup>2)</sup>	0,15 up to 0,5
	86 <sup>2)</sup>	76 <sup>2)</sup>	>0,5 up to 5
	96 up to 70 <sup>1) 2)</sup>	80 up to 60 <sup>1) 2)</sup>	5 up to 30
>75	130 <sup>2)</sup>	120 <sup>2)</sup>	0,15 up to 0,5
	125 <sup>2)</sup>	115 <sup>2)</sup>	>0,5 up to 5
	115 <sup>2)</sup>	105 <sup>2)</sup>	5 up to 30
Note: Limits decreasing linearly with the logarithm of frequency Measured with CISPR Voltage probe, see figure 4 of EN 55011			

## 5. Radio Frequency Requirements

Each DAB+ Transmitter must at least meet the requirements in accordance with Table 5.

Table 5. DAB+ Transmitter Radio Frequency Requirements

Operating Frequency	174 MHz – 230 MHz
Bandwidth	1536 kHz
Rated Output Power	Conforms to manufacturer's declaration with a tolerance of $\pm 0.5$ dB
Frequency Stability	$\leq 100$ Hz
Spurious Emission	In accordance with table 6 and Figure 2
Out-of-Band Emissions	a. Out-of-band emissions must not exceed the limits specified in Table 7. b. The out-of-band emission limit is given as the average power level measured in a 4 kHz bandwidth, where 0 dB corresponds to the average output power.
MER	$\geq 20$ dB

Table 6. Spurious emissions Limit

Mean power of the transmitter	Limit
	Mean power absolute levels (dBm) or relative levels (dBc) below the power supplied to the antenna port in the reference bandwidth
$P < 9$ dBW	-36 dBm
$9$ dBW $< P < 29$ Dbw	75 dBc
$29$ dBW $< P < 39$ dBW	-16 dBm
$39$ dBW $< P < 50$ dBW	85 dBc
$50$ dBW $< P$	-5 dBm

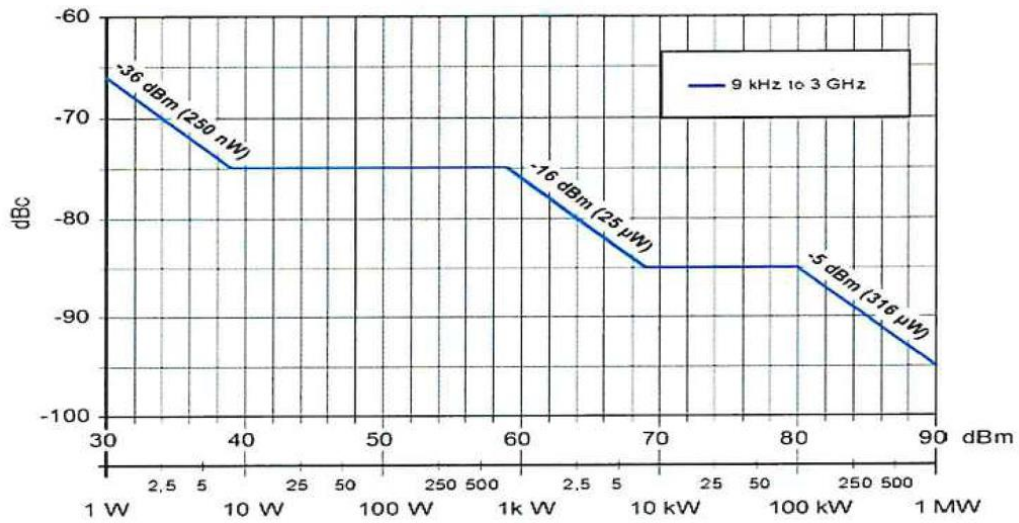


Figure 2. Spurious emissions limits for DAB+ transmitters

Table 7. Out-of-Band emissions limit

1,54 MHz block, frequency difference from the centre frequency (MHz)	Low power level Absolute level (dBm)	Medium power Relative level (dBc)	High Power Absolute level (dBm)
±0,77	18	-26	34
±0,97	-27	-71	-11
±1,75	-62	-106	-46
±3,0	-62	-106	-46

#### 6. Signal Input Requirements

The DAB+ device's Input Signal must be ETI/EDI/DCP compliant with ETSI ETS 300 799, ETSI TS 102 693, and ETSI TS 102 821 and support all DCP configuration options (DCP Profile A).

### CHAPTER III TESTING METHODS

The test method for the DAB+ Transmitter Device is carried out in accordance with:

#### 1. Electrical Safety Testing Methods

Test methods comply with SNI IEC 60950-1:2016, SNI IEC 62368-1:2014, IEC 60215, and/or IEC 62368-1.

Parameter testing is carried out based on the following assumptions:

- The device is supplied continuously with an external power supply (AC/DC converter or adapter/charger) or with an AC power supply; And
- The device operates with SELV in environments where overvoltage of the telecommunications network may occur. SELV refers to a voltage that does not exceed 42.4 V peak or 60 V DC.

#### 2. EMC (emission) Testing Method





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Test methods comply with ETSI EN 301 489-1, ETSI EN 301 489-11, ETSI EN 301 489-53, SNI CISPR 32:2015, and/or IEC CISPR 32.

3. Radio Frequency Test Method:
  - a. Rated Output Power in accordance with clause 5.3.1 of the ETSI EN 302 077 reference;
  - b. Frequency stability in accordance with clause 5.3.2 of the ETSI reference EN 302 077;
  - c. Spurious emissions in accordance with clause 5.3.4 in the ETSI EN 302 077 reference;
  - d. Out-of-band emissions in accordance with clause 5.3.5 of the ETSI reference EN 302 077;
  - e. MER in accordance with clause 5.3.7 in the ETSI reference EN 302 077; and/or
  - f. Test methods determined by the Director General of Post and Informatics Resources and Equipment

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