

R&S[®]SMCVB-KS15

EMC Streams

User Manual



1179269002
Version 04

ROHDE & SCHWARZ
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This document describes the following software options:

- R&S®SMCVB-KS15 EMC Streams (1434.5092.xx)

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1179.2690.02 | Version 04 | R&S®SMCVB-KS15

Throughout this document, R&S® is indicated as R&S.

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1 Welcome to the R&S SMCVB-KS15 option

The R&S SMCVB-KS15 is a stream library that provides stream files for EMC certification.

This user manual contains a reference description of the functionality that the stream library provides. All functions not discussed in this manual are described in the R&S SMCV100B user manual. The latest version is available at:

www.rohde-schwarz.com/manual/SMCV100B

1.1 Key features

The R&S SMCVB-KS15 features:

- Numerous stream files for EMC certification
- Streaming of high-quality video contents
- Streaming of high-quality audio contents
- Efficient use with dedicated streams

1.2 Installation

Required options

The equipment layout for processing files of waveform libraries includes:

- R&S SMCV100B base unit (64 MSample ARB memory, 60 MHz RF bandwidth)
- Broadcast standard option for the "TS Player" application (R&S SMCVB-Kxxx)
- Enable Broadcast Standards option (R&S SMCVB-K519)
- Stream library option (R&S SMCVB-KSxx)

For more information on stream options, see chapter "TS Player section "Required options" in the broadcast standard option user manual of the R&S SMCV100B.

To register for access to the libraries

R&S SMCV100B stream and waveform libraries are available for download for registered users on the "Vector Signal Generator Customer Web" at the global Rohde & Schwarz information system (GLORIS).

1. For access, register at <https://gloris.rohde-schwarz.com>:
In the section "How to register", follow the instructions provided in the introduction video "How to register for GLORIS".
2. Register to GLORIS with the creation of a personal account.

Mr.
 Mrs.
 Ms.
 No information

First Name Last Name

Email

Country City

Company

Reason for registration
 Please tell us the reason for your registration (i.e. which product you have or what kind of information you want to get). If you already have a contact person at Rohde & Schwarz, please add the email address of your contact as well.

Password Retype Password

I accept the [Terms of Use](#) for a global Rohde & Schwarz Extranet account
 I accept the following [Marketing Permission](#)
 I want to register for e-commerce

Register Now

3. For access to the "Vector Signal Generator Customer Web", provide the following information:
- Specify that you want access to the "Vector Signal Generator Customer Web".
 - Include the material number and serial number of your device.
The label is located on the rear panel of the R&S SMCV100B.
- a) When using a new GLORIS account, fill the information in the "Reason for registration" field.

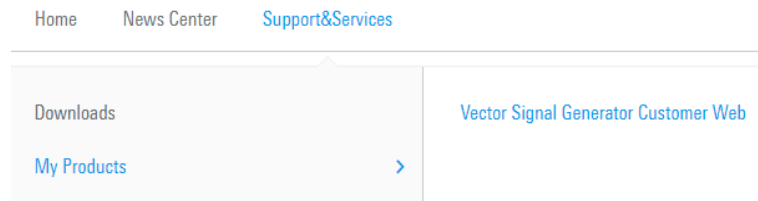
- b) When using an existing GLORIS account, click "Customer support" and fill in the information into an email.

Contact

E-Mail [Customer Support](#)

To access "Product Related Documents"

1. Log in to GLORIS.
2. In the menu bar, select "Support&Services > My Products > Vector Signal Generator Customer Web".



The "R&S SMCV100B Customer Web" page opens.

3. In the selection field "Product Selection for VSG", select "R&S®SMCV100B".

A webpage opens and displays search results for products related to the R&S SMCV100B.

Product Related Documents



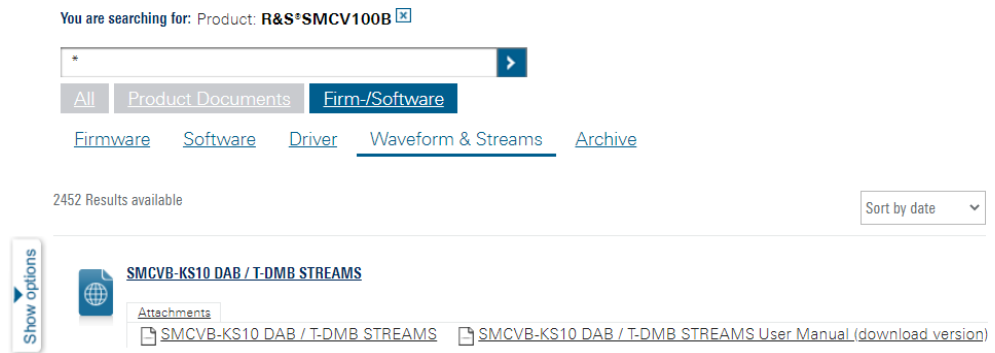
To download a library file

This procedure describes how to download library files. It provides a step-by-step description for download of a stream library file. The download of waveform library files is analogous.

1. Access the "Product Related Documents" webpage as described in "[To access "Product Related Documents"](#)" on page 6.
2. In the search navigation bar, select "Firm-/Software" > "Waveform & Streams".

The search lists all information related to stream and waveform libraries of the R&S SMCV100B:

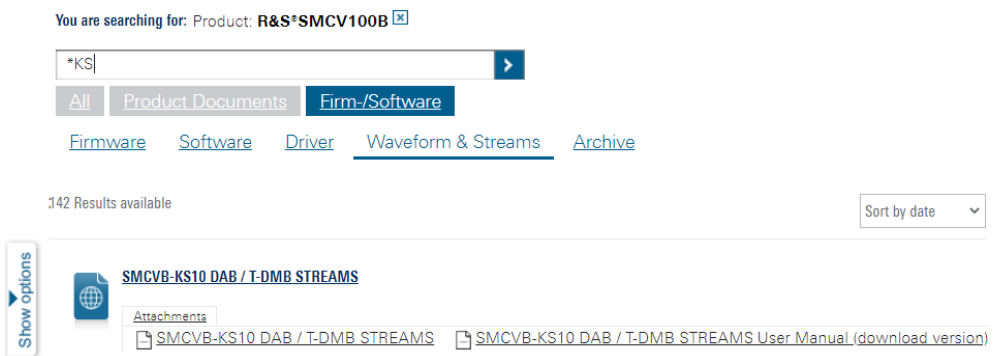
- R&S SMCVB-KSxx results relate to stream libraries.
- R&S SMCVB-KVxx results relate to waveform libraries.



3. Optionally, deactivate the filtering to display all waveform and stream library content.
 - a) On the left menu, select "Show options".
 - b) Click "Filtering on. Reset all filters."

Filtering on. Reset all filters.

4. Optionally, to filter for stream library content enter *KS in the search input field.



5. In the search result list, navigate to the required library.
6. To download required library files, click the download link in the "Attachments" section of the library product page.
For example, for DAB/T-DMB streams, click the download link "R&S SMCVB-KS10 DAB / T-DMB STREAMS".

A download dialog opens to select and save files of the stream library.

To save a library file

- ▶ Save the library file to one of the following storage locations:
 - External storage device (HDD, memory stick): Use an external USB storage device to save large files or complete libraries. Connect the storage device to one of the USB 3.0 connectors on the rear panel of the R&S SMCV100B. If detected correctly, you can access the files on the R&S SMCV100B in the /usb/ directory in the file-select dialogs.

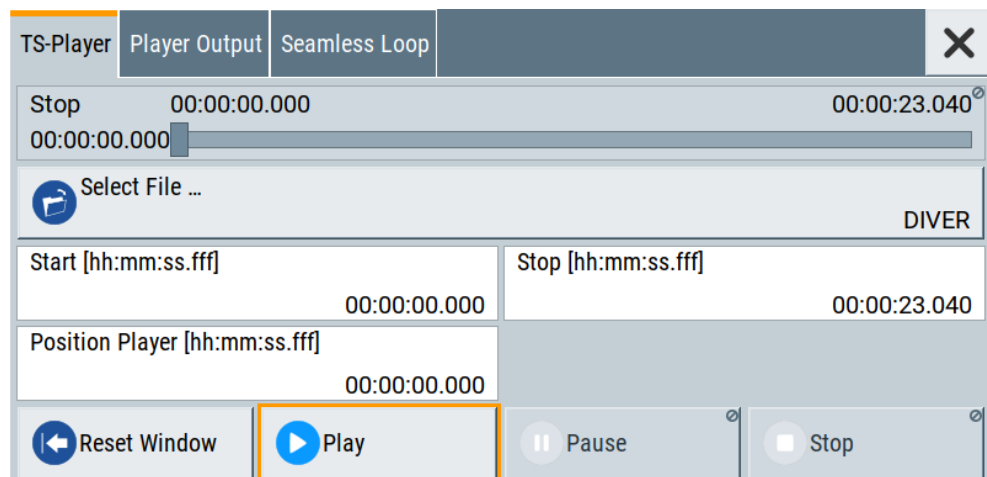
The R&S SMCV100B supports the following storage formats: ext2/ext3/ext4, FAT16/FAT32, NTFS (read-only), ISO9660, UDF

- Internal memory (SSD): Use the internal memory to save single files to the user directory `/var/user/` of the R&S SMCV100B, for example, using FTP via a LAN connection.

To load and play a stream library file

1. Load the file from its storage location:
 - External storage device (HDD, memory stick): Load the file from the `/usb/` directory.
 - Internal memory (SSD): Load the file from the user directory `/var/user/`

Note: Library files are encrypted files. Loading the library file at the R&S SMCV100B requires installation of the corresponding library option. See "[Required options](#)" on page 5.
2. To load the file at the R&S SMCV100B, open the "TS Player" application in digital broadcast standard ("`<Broadcast_Standard>`") dialogs:
 - a) Select "Baseband" > "`<Broadcast_Standard>`" > "Input Signal".
 - b) Select "Source" > "TS Player".
 - c) Select "TS Player" button.
 - d) Select "Select File".
3. To select the file, navigate to the storage location (1).
4. Select "TS-Player" > "Play".



The R&S SMCV100B processes the stream file.

5. Select "`<Broadcast_Standard>`" > "State" > "On", to activate the baseband signal.
6. In the block diagram, select "RF" > "On".

The stream file is modulated onto the RF carrier and output at the "RF 50 Ω " connector.

For more information on loading stream files, see chapter "How to generate an internal TS signal" in the broadcast standard option user manual of the R&S SMCV100B.

1.3 What's new

Compared to the previous version the documentation provides updated installation instructions to access, download and play waveform library files, see [Chapter 1.2, "Installation"](#), on page 5.

1.4 Documentation overview

This section provides an overview of the R&S SMCV100B user documentation. Unless specified otherwise, you find the documents at:

www.rohde-schwarz.com/manual/smcv100b

1.4.1 Getting started manual

Introduces the R&S SMCV100B and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the instrument.

1.4.2 User manuals and help

Separate manuals for the base unit and the software options are provided for download:

- **Base unit manual**
Contains the description of all instrument modes and functions. It also provides an introduction to remote control, a complete description of the remote control commands with programming examples, and information on maintenance, instrument interfaces and error messages. Includes the contents of the getting started manual.
- **Software option manual**
Contains the description of the specific functions of an option. Basic information on operating the R&S SMCV100B is not included.

The contents of the user manuals are available as help in the R&S SMCV100B. The help offers quick, context-sensitive access to the complete information for the base unit and the software options.

All user manuals are also available for download or for immediate display on the internet.

1.4.3 Service manual

Describes the performance test for checking compliance with rated specifications, firmware update, troubleshooting, adjustments, installing options and maintenance.

The service manual is available for registered users on the global Rohde & Schwarz information system (GLORIS):

<https://gloris.rohde-schwarz.com>

1.4.4 Instrument security procedures

Deals with security issues when working with the R&S SMCV100B in secure areas. It is available for download on the internet.

1.4.5 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

1.4.6 Specifications and product brochures

The specifications document, also known as the data sheet, contains the technical specifications of the R&S SMCV100B. It also lists the firmware applications and their order numbers, and optional accessories.

The brochure provides an overview of the instrument and deals with the specific characteristics.

See www.rohde-schwarz.com/brochure-datasheet/smcv100b

1.4.7 Calibration certificate

The document is available on <https://gloris.rohde-schwarz.com/calcert>. You need the device ID of your instrument, which you can find on a label on the rear panel.

1.4.8 Release notes and open source acknowledgment

The release notes list new features, improvements and known issues of the current software version, and describe the software installation.

The software uses several valuable open source software packages. An open source acknowledgment document provides verbatim license texts of the used open source software.

www.rohde-schwarz.com/firmware/smcv100b

1.4.9 Application notes, application cards, white papers, etc.

These documents deal with special applications or background information on particular topics.

For some application sheets, see also:

www.rohde-schwarz.com/application/smcv100b

1.4.10 Videos

Find various videos on Rohde & Schwarz products and test and measurement topics on YouTube: <https://www.youtube.com/@RohdeundSchwarz>

2 DTV stream files

The EMC streams option contains data streams that can specifically be used for EMC certification testing in accordance with CISPR 13 (EN 55013) and CISPR 20 (EN 55020). The test signals are available in common HDTV and SDTV formats for DVB systems (DVB T and DVB T2 delivery system) or ATSC systems. Also, the test signals feature MPEG 2/H.262 or AVC/H.264 video compression. All transport streams comprise the moving color bar test pattern and supply two services with the same video but different audio: service 1 transmits a 1 kHz sinusoidal tone with a level of 6 dBFS, service 2 transmits an audio with no tone (silence). Since EMC tests always require a screen-filling video representation, the library contains test patterns with an aspect ratio of 4:3 and 16:9.

2.1 Available test patterns

2.1.1 Color bar with moving element 4:3 standard (definition) television SDTV

- 480i / 29.97 frames per second
- 576i / 25 frames per second)



Figure 2-1: Figure 2-1: Moving color bar 4:3 SDTV

This test pattern is compliant to the ITU R BT.471 1 defined 100/0/75/0 color bars signal with levels given from ITU R BT.801. It is enhanced with the moving edge (element) in the lower center for EMC purposes.

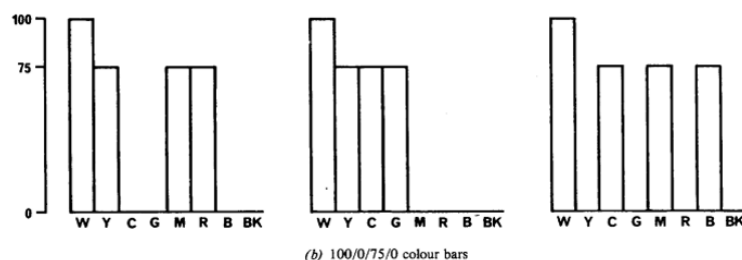


Figure 2-2: Figure 2-2: Definition of ITU R BT.471 1 color bars (75 %)

2.1.2 Color bar with moving element 16:9 standard (definition) television SDTV

- 480i / 29.97 frames per second
- 576i / 25 frames per second)



Figure 2-3: Figure 2-3: Moving color bar 16:9 SDTV

This test pattern is compliant to the ITU R BT.471 1 defined 100/0/75/0 color bars signal with levels given from ITU R BT.801. It is enhanced with the moving edge (element) in the lower center for EMC purposes.

2.1.3 Moving color bars 16:9 high definition television HDTV

- 1080i / 29.97 frames per second
- 1080i / 25 frames per second



Figure 2-4: Figure 2-4: Moving color bar 16:9 SDTV

This test pattern uses the signal levels given by ITU R BT.801. Although these levels do not match the conversion matrix of ITU R BT.709 5, it is suitable for EMC measurements.

2.1.4 Moving color bars 16:9 standard (definition) television SDTV according to CISPR 32

- 480i / 29.97 frames per second
- 576i / 25 frames per second)



Figure 2-5: Figure 2-5: CISPR 32 moving color bar 16:9 SDTV

This test pattern is given in the CISPR 32 standard to be used for complexity level 4. The standard points to color bars of the ITU R BT.1729 test pattern, which is an SDTV 100 % (100/0/100/0) color bars signal with additional grey bars on each side. It is enhanced with the moving edge (element) in the lower center for EMC purposes.

Complexity Level	Display image	Description	Examples of equipment
4 (Most)	Colour bars with moving picture element	Standard television colour bar signal according to ITU-R BT 1729 with an additional small moving element. See ^a .	Digital television set, set-top box, personal computer, DVD equipment, video game console, stand alone monitor.

Figure 2-6: Reference to ITU R BT.1729 color bars in CISPR 32

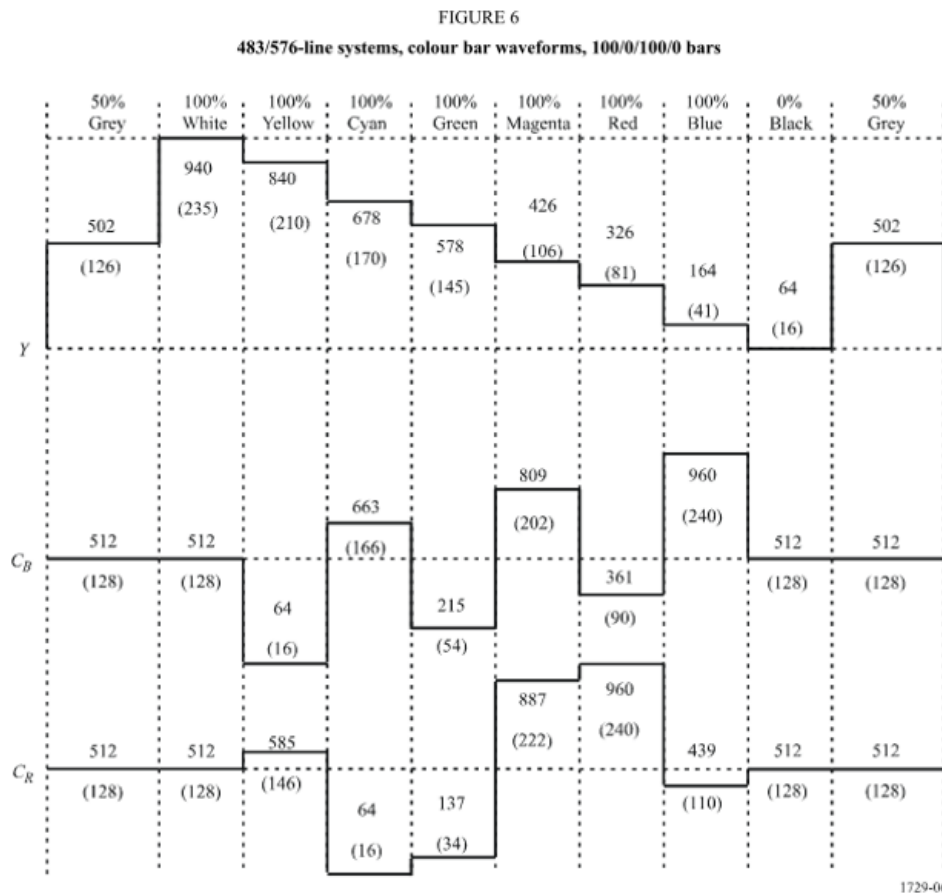


Figure 2-7: Definition of SDTV color bar levels in ITU R BT.1729

2.1.5 Moving color bars 16:9 high definition television HDTV according to CISPR 32

- 1080i / 29.97 frames per second
- 1080i / 25 frames per second)

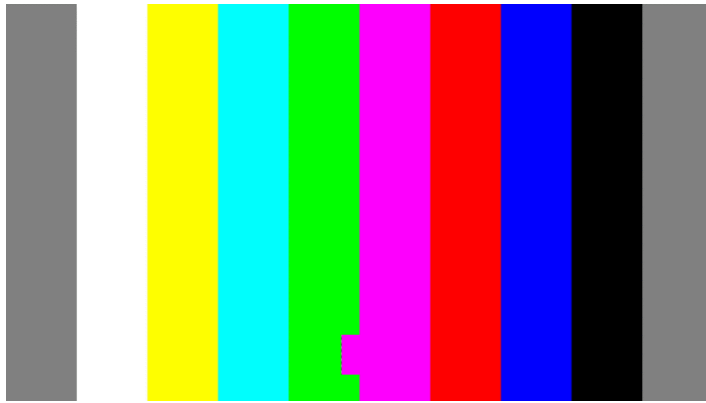


Figure 2-8: Figure 2-8: CISPR 32 moving color bar 16:9 HDTV

This test pattern is given in the CISPR 32 standard to be used for complexity level 4. The standard points to color bars of the ITU R BT.1729 test pattern, which is an HDTV 100 % (100/0/100/0) color bars signal with additional grey bars on each side. It is enhanced with the moving edge (element) in the lower center for EMC purposes.

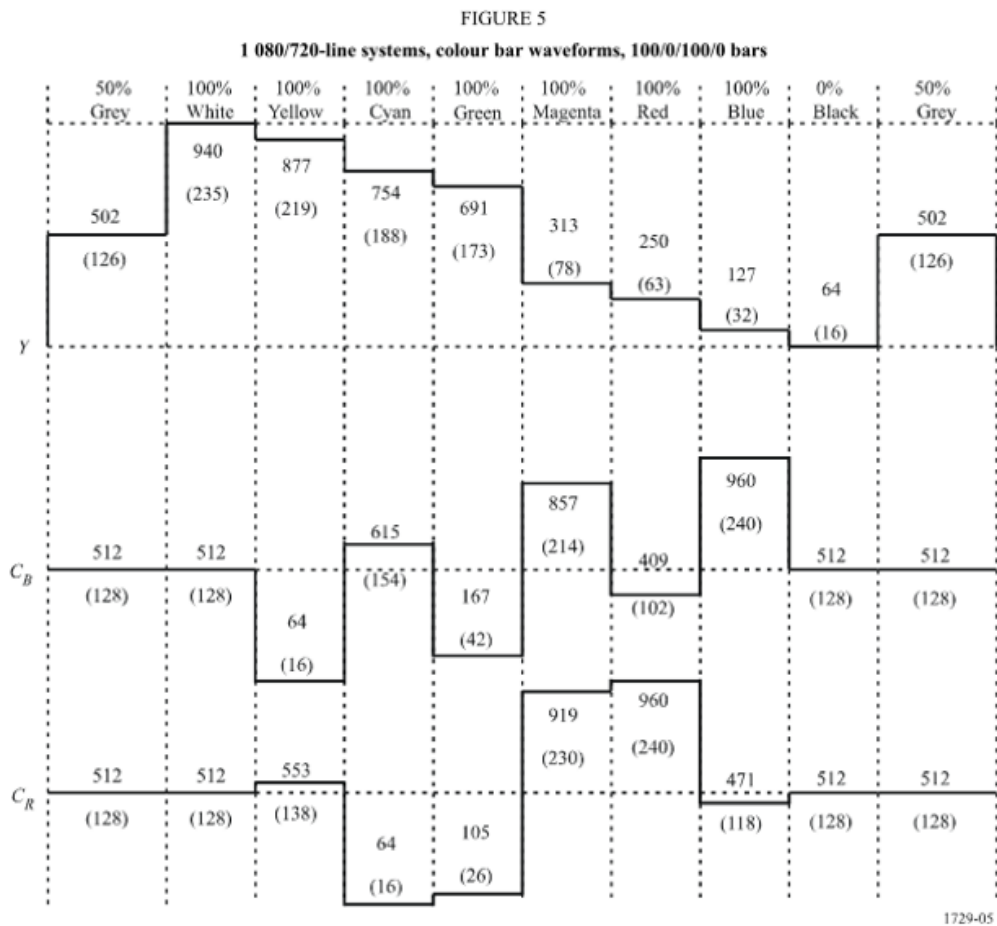


Figure 2-9: Figure 2-9: Definition of HDTV color bars levels in ITU R BT.1729

2.1.6 ITU-R BT.1729 multizone test pattern 16:9 high definition television HDTV

- 1080i / 25 frames per second

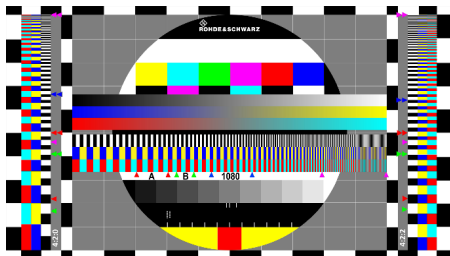


Figure 2-10: Figure 2-10: ITU R BT.1729 test pattern HDTV interlaced

- 1080p / 50 frames per second

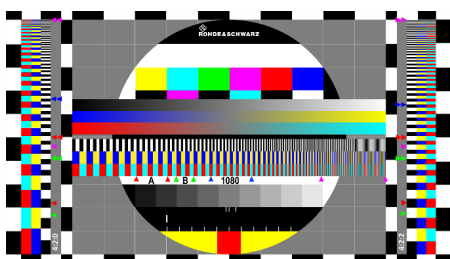


Figure 2-11: Figure 2-11: ITU R BT.1729 test pattern HDTV progressive

Although CISPR 32 requires an SDTV color bars signal only, modern TV receiver equipment is able to display high definition signals. Therefore, also perform the EMC tests with HDTV signals. For that reason, the ITU-R BT.1729 multizone test pattern itself is provided in addition in this signal library. The test pattern includes a moving element (white horizontal moving line) already.

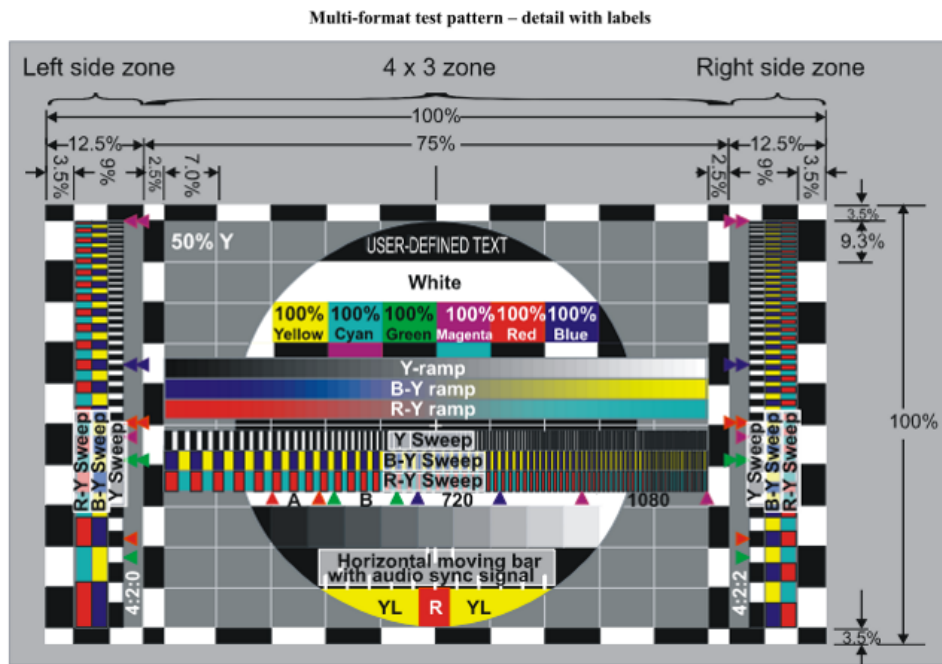


Figure 2-12: Figure 2-12: Definition of HDTV test pattern in ITU R BT.1729

2.2 DVB-MPEG-2 / H.262 streams with terrestrial delivery system descriptor

The network information section of these streams contains the terrestrial delivery system descriptor.

Table 2-1: DVB T_MPEG2_MCBBar25Hz_576i_43_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	4:3	1 kHz, -6 dB ^{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	4:3	Silence MPEG-2 audio 192 kbps

DVB-MPEG-2 / H.262 streams with terrestrial delivery system descriptor

Table 2-2: DVB T_MPEG2_MCBar25Hz_576i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-3: DVB T_MPEG2_MCBar25Hz_1080i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	1080i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-4: DVB-T_MPEG2_MCBar_CISPR32_25Hz_576i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-5: DVB-T_MPEG2_MCBar_CISPR32_25Hz_1080i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

DVB-AVC / H.264 streams with terrestrial delivery system descriptor

Table 2-6: DVB T_MPEG2_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.3 DVB-AVC / H.264 streams with terrestrial delivery system descriptor

The network information section of these streams contains the terrestrial delivery system descriptor.

Table 2-7: DVB T_H264_MCBAR25Hz_576i_43_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars AVC video 6 Mbps	4:3	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars AVC video 6 Mbps	4:3	Silence MPEG-2 audio 192 kbps

Table 2-8: DVB T_H264_MCBAR25Hz_576i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

DVB-MPEG-2 / H.262 with DVB-T2 delivery system descriptor

Table 2-9: DVB T_H264_MCBBar25Hz_1080i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	1080i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-10: DVB T_H264_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	Silence MPEG-2 audio 384 kbps

Table 2-11: DVB T_H264_ITU-R_BT1729_50Hz_1080p.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080p	50 Hz	ITU-R BT1729 AVC video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080p	50 Hz	ITU-R BT1729 AVC video 6 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.4 DVB-MPEG-2 / H.262 with DVB-T2 delivery system descriptor

The network information section of these streams contains the DVB T2 delivery system descriptor with PLP ID = 0x00 and T2 System ID = 0x0000.

DVB-MPEG-2 / H.262 with DVB-T2 delivery system descriptor

Table 2-12: DVB T2_MPEG2_MCBBar25Hz_576i_43_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	4:3	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	4:3	Silence MPEG-2 audio 192 kbps

Table 2-13: DVB T2_MPEG2_MCBBar25Hz_576i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-14: DVB T2_MPEG2_MCBBar25Hz_1080i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	1080i	25 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-15: DVB-T2_MPEG2_MCBBar_CISPR32_25Hz_576i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-16: DVB-T2_MPEG2_MCBBar_CISPR32_25Hz_1080i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-17: DVB T2_MPEG2_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.5 DVB-AVC / H.264 with DVB-T2 delivery system descriptor

The network information section of these streams contains the DVB T2 delivery system descriptor with PLP ID = 0x00 and T2 System ID = 0x0000.

Table 2-18: DVB T2_H264_MCBBar25Hz_576i_43_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars AVC video 6 Mbps	4:3	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars AVC video 6 Mbps	4:3	Silence MPEG-2 audio 192 kbps

DVB-AVC / H.264 with DVB-T2 delivery system descriptor

Table 2-19: DVB T2_H264_MCBBar25Hz_576i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	576i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-20: DVB T2_H264_MCBBar25Hz_1080i_169_19200ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	1080i	25 Hz	Moving color bars AVC video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-21: DVB T2_H264_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	Silence MPEG-2 audio 384 kbps

Table 2-22: DVB T2_H264_ITU-R_BT1729_50Hz_1080p.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.6 DVB-MPEG-2 / H.262 with DVB-C delivery system descriptor

The network information section of these streams contains the cable delivery system descriptor.

Table 2-23: DVB-C_MPEG2_MCBBar_CISPR32_25Hz_576i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-24: DVB-C_MPEG2_MCBBar_CISPR32_25Hz_1080i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-25: DVB C_MPEG2_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.7 DVB-AVC / H.264 with DVB-C delivery system descriptor

The network information section of these streams contains the cable delivery system descriptor.

DVB-MPEG-2 / H.262 with DVB-S delivery system descriptor

Table 2-26: DVB C_H264_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	Silence MPEG-2 audio 384 kbps

Table 2-27: DVB C_H264_ITU-R_BT1729_50Hz_1080p.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.8 DVB-MPEG-2 / H.262 with DVB-S delivery system descriptor

The network information section of these streams contains the satellite delivery system descriptor.

Table 2-28: DVB S_MPEG2_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 384 kbps

DVB-AVC / H.264 with DVB-S delivery system descriptor

Table 2-29: DVB-S_MPEG2_MCBBar_CISPR32_25Hz_576i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	576i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-30: DVB-S_MPEG2_MCBBar_CISPR32_25Hz_1080i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	1080i	25 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

2.9 DVB-AVC / H.264 with DVB-S delivery system descriptor

The network information section of these streams contains the satellite delivery system descriptor.

Table 2-31: DVB S_H264_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 AVC video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 AVC video 6 Mbps	16:9	Silence MPEG-2 audio 384 kbps

DVB-MPEG-2 / H.262 with DVB-S2 delivery system descriptor

Table 2-32: DVB S_H264_ITU-R_BT1729_50Hz_1080p.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.10 DVB-MPEG-2 / H.262 with DVB-S2 delivery system descriptor

The network information section of these streams contains the satellite delivery system descriptor with settings for DVB-S2.

Table 2-33: DVB-S2_MPEG2_MCBBar_CISPR32_25Hz_576i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	576i	25 Hz	CISPR32 mov- ing color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	576i	25 Hz	CISPR32 mov- ing color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-34: DVB-S2_MPEG2_MCBBar_CISPR32_25Hz_1080i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	CISPR32 mov- ing color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	1080i	25 Hz	CISPR32 mov- ing color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-35: DVB S2_MPEG2_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.11 DVB-AVC / H.264 with DVB-S2 delivery system descriptor

The network information section of these streams contains the satellite delivery system descriptor with settings for DVB-S2.

Table 2-36: DVB S2_H264_ITU-R_BT1729_25Hz_1080i.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080i	25 Hz	ITU-R BT1729 AVC video 3 Mbps	16:9	Silence MPEG-2 audio 384 kbps

Table 2-37: DVB S2_H264_ITU-R_BT1729_50Hz_1080p.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 384 kbps
2	1080p	50 Hz	ITU-R BT1729 AVC video 5.5 Mbps	16:9	Silence MPEG-2 audio 384 kbps

2.12 ATSC-MPEG-2 / H.262 streams

Table 2-38: ATSC_MCBBar2997Hz_480i_43_32032ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	480i	29.97 Hz	Moving color bars MPEG-2 video 6 Mbps	4:3	1 kHz, -6 dB _{FS} AC-3 audio 384 kbps
2	480i	29.97 Hz	Moving color bars MPEG-2 video 6 Mbps	4:3	Silence AC-3 audio 384 kbps

Table 2-39: ATSC_MCBBar2997Hz_480i_169_32032ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	480i	29.97 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 384 kbps
2	480i	29.97 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 384 kbps

Table 2-40: ATSC_MCBBar2997Hz_1080i_169_32032ms.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	29.97 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 384 kbps
2	1080i	29.97 Hz	Moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 384 kbps

Table 2-41: ATSC_MPEG2_MCBBar_CISPR32_2997Hz_480i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	480i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	480i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

Table 2-42: ATSC_MPEG2_MCBBar_CISPR32_2997Hz_1080i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} AC-3 audio 192 kbps
2	1080i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence AC-3 audio 192 kbps

2.13 ISDB-T-MPEG-2 / H.262 streams

Table 2-43: ISDB-T_MPEG2_MCBBar_CISPR32_2997Hz_480i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	480i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	480i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

Table 2-44: ISDB-T_MPEG2_MCBBar_CISPR32_2997Hz_1080i_169.EMC_C

Service	Format	Frame rate	Video	Aspect ratio	Audio
1	1080i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	1 kHz, -6 dB _{FS} MPEG-2 audio 192 kbps
2	1080i	29.97 Hz	CISPR32 moving color bars MPEG-2 video 6 Mbps	16:9	Silence MPEG-2 audio 192 kbps

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