



National Information & Communications Technology Authority

**TYPE APPROVAL SPECIFICATION FOR  
DVB-T2 DIGITAL SET-TOP BOX.**

# Minimum Technical Specifications for DVB-T2 Digital Set-Top Box (STB).

The International Telecommunication Union (ITU) has developed a digital terrestrial television broadcasting frequency (DTTB) plan for the migration from Analogue to Digital television broadcasting. The proposed date to accomplish migration from Analogue to Digital television broadcasting is June 17, 2020. In compliance with the migration, the National Information and Communications Authority (NICTA), in line with the ITU *Guidelines for the transition from Analogue to Digital Broadcasting* adopted and approved **December, 2017 as the analogue switch-over date**. The implementation of the DTTB was planned based on DVB-T2 standard.

DVB-T2 is the world's most advanced digital terrestrial television (DTT) standard, offering more robustness, flexibility and efficiency than other DTT standard. It supports Standard Definition (SD), High Definition (HD), Ultra High Definition (UHD), mobile TV (MTV) or combination thereof and, therefore, targets innovative receivers such as computers, smart phones, and dongles.

The **DVB-T2's** enhanced features offer better sound and picture quality for viewing and for viewers to enjoy these features existing broadcast TV operators are hereby advised to upgrade their Analogue TV systems to the **DVB-T2** standard. The upgrade will mean that any subsequent rollout of digital broadcasting infrastructure in PNG shall be on the DVB-T2 platform. In order to access programmes on the DVB-T2 platform, consumers will have to acquire DVB-T2 compliant set- top boxes (STBs).

Vendors and consumers are advised that only DVB-T2 compliant set-top boxes capable of receiving and correctly displaying digital DVB-T2 signals will be permitted to be imported and used in PNG. All equipment vendors shall comply with the NICTA approved DVB-T2 set-top box specifications and, in compliance with NICT Act, all the set top boxes shall obtain type approval from the National Information and Communications Technology Authority (NICTA).

Authorized vendors/dealers of the DVB-T2 set top boxes may be required to display, at the point of sale, a valid vendor authorization or type approval certificate issued by NICTA.

In accordance with section 30 of the Radio Spectrum Regulation, NICTA has set the following minimum technical specifications for DVB-T2 set top boxes for the purpose of Type Approval.

**MINIMUM TECHNICAL SPECIFICATIONS**

1	DVB-T2 Set Top Box complied Standard is <b>ETSI EN 302 755 V1.3.1 (2012-04)</b>		
2	T2 Channel	Input impedance	75 ohms
		Modulation	COFDM: QPSK, 16QAM, 64QAM, 256QAM
		Frequency	UHF (470 – 806 MHz), VHF (174 – 230MHz)
		Input signal level	36~85dBμV
		FEC coding	LDPC Code + BCH Code, Code rates: 1 /2, 3/5, 2/3, 3 /4, 4/5, 5/6
		FFT Size	1K, 2K, 4K, 8K, 16K, <b>32K</b>
		C/N range (Rice channel)	3dB (QPSK 1 /2) to 24dB (256QAM 5/6)
		Pilot Pattern	PP1 to PP8
		Guard intervals	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
		Channel raster	7 MHz (VHF), 8 MHz (UHF),
		Signal Bandwidth	7.61 MHz (Normal mode), 6.80, 7.77 MHz (Extended mode) 1.54 (optional), 6.66, 1.57,(optional),
		Service specific robustness	Physical Layer Pipes (PLP)
		Interleaving	Bit + Cell +Time + Frequency
		Diversity	SISI, MISO, (SIMO, MIMI if diversity receiver)
		Rotated constellations	Significant robustness gain in channels with severe degradations (multipath, SFN operation, narrow band interference...)
		Mode of Extensions	Future Extension Frame (FEF)
		Max Bit Rates (8MHz)	50.3 Mbit/s, (32Ke, 256QAM, CR=5/6, GI=1/28, PP7)
Used Bit Rates (8MHz)	Portable SFN: 25.0 Mbit/s, Fixed SFN: 37.0 Mbit/s, Fixed MFN: 40.2 Mbit/s		

3	MPEG Transmission stream and video and Audio Decoding	Transmission stream	MPEG-4 ISO/IEC 14496-10
		Video decoding	MPEG-4 AVC (H.264)
		Aspect Ratio(image rate)	4:3, 16:9
		Frame frequency	25Hz (PAL)
		Video Resolution	720X576 (PAL)-standard definition, 1920X1080 (High definition-optional)
		Video Output SD (Picture Format)	PAL
		Video Output HD (Picture Format)	576i, 576p, <b>720p, 1080i, 1080p, 4k</b>
		Audio decoding	MPEG 2 (MusiCam ) Layer I & II / HE AAC
		Audio mode	Single track/dual track/stereo
		Audio sampling rate	32KHz, 44.1KHz <b>48KHz. , 96 KHz</b> (optional)
4	Scanning function	<ul style="list-style-type: none"> <li>• The STB should include a frequency scanning function to detect the availability of DVB-T signals.</li> <li>• It should also automatically list the content of the terrestrial bouquet by reading the PSI/SI streams and</li> <li>• Be capable of programme memory in case of cut off</li> </ul>	
5	Quality reception thresholds	All STBs should have an on-screen visual signal level indicator which would aid in directing the antenna and troubleshooting reception problems	
6	Software	<p><b>EPG:</b> current and next programme information. 24x7 days schedule.</p> <ul style="list-style-type: none"> <li>• Capable of the Identity control, watch rating and parental lock</li> <li>• Auto/manual tuning</li> <li>• 24-hour clock</li> <li>• <b>OTA:</b> STB software's, EPG, CA features must be upgradable over the air. (USB Upgrade-optional)</li> <li>• Support Receive mail</li> <li>• Provides the instant and personalised message prompt</li> <li>• Display and withdrawal of subtitles</li> <li>• Support multi-language info</li> </ul>	
7	Additional Hardware	PVR (optional)	
8	Teletext & Teletext subtitle	<ul style="list-style-type: none"> <li>• It is able to display Teletext using the OSD and/or by the insertion of the Teletext data in the VBI of the analogue CVBS video output.</li> <li>. it is able to display Teletext subtitling, meeting the requirements for level 1.5 in ref ETS 300 706</li> </ul>	

9	Interfaces	RF input connector: <b>IEC 169-2 female</b> , input impedance 75 ohms <ul style="list-style-type: none"> <li>• One RCA (CINCH) female connector for video output and Two RCA (CINCH) female connectors for stereo sound output</li> <li>• RF by pass (loop) IEC 169-2 male</li> <li>• RF output via a PAL-G modulator</li> <li>• SCART interface (optional)</li> <li>• <b>HDMI interface</b> for HD Output</li> <li>• Should include at least one RF cable to connect the unit with its associated analogue television receiver</li> <li>• RS232 for Serial Data</li> <li>• USB for modem</li> </ul>	
10	Interfaces for Conditional Access	STB must include at least one embedded smart card reader or a DVB-CI (Common Interface) slot to allow any type of conditional access module to be plugged into the set top box.	
11	Physical attributes	Power supply	AC 240±5%, 50 ±1Hz with an option of 12V DC input
12	Environmental attributes	Operating Temperature	0~45°C
		Operating humidity	Up to 90%
13	Reliability	Mean Time between failure (MTBF)	>80,000Hrs

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