DTS:X

This mode faithfully reproduces the sound design recorded in the DTS:X audio format.
The DTS:X audio format is a combination of the mixing method based on traditional channel based formats (5.1 ch and 7.1 ch) and object based dynamic audio mixing, and it is characterized by the precise positioning of sounds and the ability to express sound movement.

- To enable transfer of this audio format, connect via an HDMI cable and set the audio output on the player to Bitstream output.

ES Discrete (DTS-ES Discrete)

This mode faithfully reproduces the sound design recorded in the DTS-ES Discrete audio format.
DTS-ES Discrete is an optional audio format based on 5.1 ch for DVD-Video and Blu-ray Discs. It is possible to record a maximum of 6.1 channels with a monaural surround back channel added.

- To enable transfer of this audio format, connect via a digital cable and set the audio output on the player to Bitstream output.

ES Matrix (DTS-ES Matrix)

This mode faithfully reproduces the sound design recorded in the DTS-ES Matrix audio format.
DTS-ES Matrix is an optional audio format based on 5.1 ch for DVD-Video and Blu-ray Discs. A monaural surround back channel is inserted to this format by matrix encoding. During playback, 6.1 channel-playback is achieved by the matrix decoder on this unit.

- To enable transfer of this audio format, connect via a digital cable and set the audio output on the player to Bitstream output.

Ent.Show (Entertainment Show)

Suitable for rock or pop music. Listening to music in this mode creates a lively sound field with a powerful acoustic image, like being at a club or rock concert.

Ext.Stereo (Extended Stereo)

This mode is ideal for background music. Stereo sound is played through the surround speakers as well as the front speakers, creating a stereo image.

F.S.Surround (Front Stage Surround)

In this mode, you can enjoy a virtual playback of multichannel surround sound even with only two or three speakers. This works by controlling how sounds reach the listener's left and right ears.

- This mode cannot be selected when "Speaker Virtualizer" (→p118) is set to "Off" (Default: On).

Mono

In this mode, monaural audio is played from the center speaker at the time of inputting an analog signal or PCM signal. If there is no center speaker connected, monaural audio is played from the front speakers.

Mono Music

In this mode, all speakers output the same sound in mono, so the sound you hear is the same regardless of where you are within the listening room.

PCM

Mode suitable for playing sources recorded in multichannel PCM.

Rock/Pop

Mode suitable for rock content.

Sports

Mode suitable for sport content.

Stereo

In this mode, sound is output from the right and left front speakers and subwoofer.

Unplugged

Suitable for acoustic instruments, vocals and jazz. This mode emphasizes the front sound field image, giving the impression of being in front of the stage.

Speaker combinations

- Up to two powered subwoofers can be connected in either combination.

(North American models)

Speaker Channels	FRONT	CENTER	SURROUND	SURROUND BACK	HEIGHT	Bi-AMP	ZONE 2 (ZONE SPEAKER)
2.1 ch	✔					✔ (*1)	✔ (*1)
3.1 ch	✔	✔				✔ (*1)	✔ (*1)
4.1 ch	✔		✔			✔ (*1)	✔ (*1)
5.1 ch	✔	✔	✔			✔ (*1)	✔ (*1)
6.1 ch	✔		✔	✔ (*2)			✔
7.1 ch	✔	✔	✔	✔ (*2)			✔
2.1.2 ch	✔				✔ (*3)	✔ (*1) (*3)	✔ (*1)
3.1.2 ch	✔	✔			✔ (*3)	✔ (*1) (*3)	✔ (*1)
4.1.2 ch	✔		✔		✔ (*4)		✔
5.1.2 ch	✔	✔	✔		✔ (*4)		✔

(*1) You can select either Bi-AMP or ZONE SPEAKER.
(*2) When audio is being output from the ZONE SPEAKER, surround back speakers cannot play audio.
(*3) When using Bi-Amp speakers, it is necessary to connect the Bi-Amp speakers to the HEIGHT terminals, and height speakers to the SURROUND terminals.
(*4) When audio is being output from the ZONE SPEAKER, height speakers cannot play audio.

(European, Australian and Asian models)

Speaker Channels	FRONT	CENTER	SURROUND	SURROUND BACK	HEIGHT	Bi-AMP	ZONE 2 (ZONE SPEAKER)
2.1 ch	✔					✔ (*1)	✔ (*1)
3.1 ch	✔	✔				✔ (*1)	✔ (*1)
4.1 ch	✔		✔			✔ (*1)	✔ (*1)
5.1 ch	✔	✔	✔			✔ (*1)	✔ (*1)
6.1 ch	✔		✔	✔			
7.1 ch	✔	✔	✔	✔			
2.1.2 ch	✔				✔ (*2)	✔ (*1) (*2)	✔ (*1)
3.1.2 ch	✔	✔			✔ (*2)	✔ (*1) (*2)	✔ (*1)
4.1.2 ch	✔		✔		✔		
5.1.2 ch	✔	✔	✔		✔		

(*1) You can select either Bi-AMP or ZONE SPEAKER.
(*2) When using Bi-Amp speakers, it is necessary to connect the Bi-Amp speakers to the HEIGHT terminals, and height speakers to the SURROUND terminals.

General Specifications

Amplifier Section	North American models	European models	Australian and Asian models
Rated Output Power	With 8 ohm loads, both channels driven, from 20-20,000 Hz; rated 80 watts per channel minimum RMS power, with no more than 0.08% total harmonic distortion from 250 milliwatts to rated output. (FTC)	7 ch × 135 W at 6 ohms, 1 kHz, 1 ch driven of 1% THD (IEC)	
Maximum Effective Output Power	170 W at 6 ohms, 1 kHz, 1 ch driven of 10% THD	160 W at 6 ohms, 1 kHz, 1 ch driven of 10% THD (JEITA)	7 ch × 160 W at 6 ohms, 1 kHz, 1 ch driven of 10% THD (JEITA)
Dynamic Power (IEC60268-Short-term maximum output power)	160 W (3 Ω, Front), 125 W (4 Ω, Front), 85 W (8 Ω, Front)		
THD+N (Total Harmonic Distortion + Noise)	0.08% (20 Hz - 20,000 Hz, Rated output power)		
Input Sensitivity and Impedance	200 mV/47 kΩ (LINE(RCA)), 3.5 mV/47 kΩ (PHONO MM)		
Rated RCA Output Level and Impedance	PRE OUT (SUBWOOFER) : 1 V/470 Ω		
	LINE OUT (ZONE 2/ZONE B) : 200 mV/2.2 kΩ		
Phono Maximum Input Signal Voltage	70 mV (MM 1 kHz 0.5%)		
Frequency Response	10 Hz - 100 kHz/+1 dB, –3 dB (Direct/Pure Direct)		
Tone Control Characteristics	±10 dB, 20 Hz (BASS), ±10 dB, 20 kHz (TREBLE)		
Signal to Noise Ratio	106 dB (IHF-A, LINE IN, SP OUT), 80 dB (IHF-A, PHONO IN, SP OUT)		
Speaker Impedance	4 Ω - 16 Ω		
Headphone Rated Output	80 mW + 80 mW (32 Ω, 1 kHz, 10% THD)		
Supported impedance of Headphones	8 Ω - 600 Ω		
Headphones Frequency Response	10 Hz - 100 kHz		

Tuner Section	North American models	European models	Australian and Asian models
FM Tuning Frequency Range	87.5 MHz - 107.9 MHz	87.5 MHz - 108.0 MHz, RDS	
50 dB quieting sensitivity (FM MONO)	1.0 µV, 11.2 dBf (IHF, 1 kHz, 100% MOD)		
AM Tuning Frequency Range	530 kHz - 1710 kHz	-	522/530 kHz - 1611/1710 kHz
DAB Tuning Frequency Range	-	174.928 MHz - 239.200 MHz (Band III)	-
DAB Sensitivity	-	-100 dBm (Min.) (Band III)	-
Preset Channel	40		

BLUETOOTH Section	North American models	European models	Australian and Asian models
Communication system	BLUETOOTH Specification version 4.2		
Frequency band	2.4 GHz band		
Modulation method	FHSS (Frequency Hopping Spread Spectrum)		
Compatible BLUETOOTH profiles	A2DP 1.2, AVRCP 1.3		
Supported Codecs	Receiving: SBC, AAC Transmitting: SBC, aptX, aptX HD		
Transmission range (A2DP)	20 Hz - 20 kHz (Sampling frequency 44.1 kHz)		
Maximum communication range	Line of sight approx. 15 m(*) (*)The actual range will vary depending on factors such as obstacles between devices, magnetic fields around a microwave oven,static electricity, cordless phone, reception sensitivity, antenna's performance, operating system, software application, etc.		

HDMI	North American models	European models	Australian and Asian models
Input	6		
Output	2 (MAIN, SUB/ZONE2)		

	Input *1						Output		
	HDMI 1	HDMI 2	HDMI 3	HDMI 4	HDMI 5	HDMI 6	MAIN	SUB/Zone2	
								SUB	Zone2
HDMI Ver	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0
bandwidth	40Gbps	40Gbps	40Gbps	18Gbps	18Gbps	18Gbps	40Gbps	40Gbps	18Gbps
ALLM	✔	✔	✔	✔	✔	✔	✔	✔	✔
VRR (for Game)	✔	✔	✔	-	-	-	✔	✔	✔
QMS (for Movie)	✔	✔	✔	-	-	-	✔	✔	✔
FVA (for Game)	✔	✔	✔	-	-	-	✔	✔	✔
QFT (for Movie)	✔	✔	✔	-	-	-	✔	✔	✔
DSC	✔	✔	✔	-	-	-	✔	✔	-
Uncompressed	8K/60p 4:2:0	8K/60p 4:2:0	8K/60p 4:2:0	4K/60p 4:4:4	4K/60p 4:4:4	4K/60p 4:4:4	8K/60p 4:2:0	8K/60p 4:2:0	4K/60p 4:4:4
Compressed (TV needs DSC)	8K/120p 4:4:4	8K/120p 4:4:4	8K/120p 4:4:4	-	-	-	8K/120p 4:4:4	8K/120p 4:4:4	-
ARC / eARC *2	-	-	-	-	-	-	✔	-	-
HDR10 (HDR10, BT.2020, HLG)	✔	✔	✔	✔	✔	✔	✔	✔	✔
HDR10+	✔	✔	✔	✔	✔	✔	✔	✔	✔

*1 Audio Format: 2 ch linear PCM (32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz, 16/20/24 bit)
Multi-channel linear PCM (Maximum 7.1 channels, 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz, 16/20/24 bit)
Bitstream (Dolby Digital, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS, DTS-ES, DTS 96/24, DTS-HD Master Audio, DTS-HD High Resolution Audio, DTS Express, DTS:X, DSD(2.8 MHz), PCM)

*2 ARC compatible audio formats: PCM, Dolby Digital, Dolby Digital Plus, DTS (DTS 96/24, DTS-ES, etc.), DTS-HD High Resolution Audio

eARC compatible audio formats: PCM, Dolby Digital, Dolby Digital Plus, DTS (DTS 96/24, DTS-ES, etc.), Dolby TrueHD, Dolby Atmos, DTS- HD Master Audio, DTS:X, Multichannel PCM, DTS-HD High Resolution Audio

Corresponding input resolutions	Frame rate	Color space	Color depth	HDMI IN 1 - 3	HDMI IN 4 - 6
4K (3840x2160p) 4K SMPTE (4096x2160p)	24/25/30 Hz	YCbCr4:2:2	12 bit	✔	✔
		YCbCr4:4:4/RGB	8 bit	✔	✔
			10/12 bit	✔	✔
	48/50/60 Hz	YCbCr4:2:0	8 bit	✔	✔
			10/12 bit	✔	✔
		YCbCr4:2:2	12 bit	✔	✔
		YCbCr4:4:4/RGB	8 bit	✔	✔
			10/12 bit	✔	
	100/120 Hz	YCbCr4:2:0	8/10/12 bit	✔	
		YCbCr4:2:2	12 bit	✔	
		YCbCr4:4:4/RGB	8/10 bit	✔	
			12 bit	✔(*1)	
5K (5120x2160p)	24/25/30 Hz	YCbCr4:2:2	12 bit	✔	
		YCbCr4:4:4/RGB	8 bit	✔	
			10/12 bit	✔	
	48/50/60 Hz	YCbCr4:2:0	8/10/12 bit	✔(*2)	
		YCbCr4:2:2	12 bit	✔	
		YCbCr4:4:4/RGB	8 bit	✔	
			10/12 bit	✔	
8K (7680x4320p)	24/25/30 Hz	YCbCr4:2:0	8/10/12 bit	✔	
		YCbCr4:2:2	12 bit	✔	
		YCbCr4:4:4/RGB	8/10 bit	✔	
			12 bit	✔(*1)	
	48/50/60 Hz	YCbCr4:2:0	8/10 bit	✔	
			12 bit	✔(*1)	
		YCbCr4:2:2	12 bit	✔(*1)	
		YCbCr4:4:4/RGB	8/10/12 bit	✔(*1)	

(*1)Video compressed with DSC (Display Stream Compression) can be input and output. DSC is a video compression technique that enables the transmission of high-resolution video, which requires high bandwidth, via HDMI. While playing this video format, there is no on-screen display when you perform such operations as using the Quick Menu or adjusting the volume.
(*2)5K, 48 Hz, YCbCr4:2:0, 8/10/12 bit is not supported.

- Signals are output from the HDMI OUT jack of this unit to the TV with the same resolution as the input resolution. When a TV supporting 4K is used, HDMI video signals with 1080p can be output with 4K.

For linked functions to work properly, do not connect CEC-compliant devices exceeding the connectable number to the HDMI jack as shown below.

- Blu-ray Disc/DVD players: up to 3 units, Blu-ray Disc/DVD recorders: up to 3 units, Cable TV tuner, terrestrial digital tuner, and satellite broadcasting tuner: up to 4 units

Operation has been confirmed on the following devices: (As of April 2020)
Toshiba brand televisions; Sharp brand televisions; Onkyo and Integra brand RIHD-compatible players; Toshiba brand players and recorders; Sharp brand players and recorders (when used with a Sharp brand television)

Network Section	North American models	European models	Australian and Asian models
Ethernet LAN	1 (10BASE-T/100BASE-TX)		
Wireless LAN	IEEE 802.11 a/b/g/n/ac standard (Wi-Fi® standard) 5 GHz/2.4 GHz band		
■Music Server (→p100) Supported Audio Formats	**MP3 (.mp3)** • MPEG-1/MPEG-2 Audio Layer-3/44.1 kHz, 48 kHz/Between 8 kbps and 320 kbps, and VBR **WMA (.wma)** • 44.1 kHz, 48 kHz/Between 5 kbps and 320 kbps, and VBR • WMA Pro/Voice/WMA Lossless formats are not supported. **WAV (.wav)** WAV files contain uncompressed PCM digital audio. • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz/8 bit, 16 bit, 24 bit **AIFF (.aiff/.aif)** AIFF files contain uncompressed PCM digital audio. • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz/8 bit, 16 bit, 24 bit **AAC (.aac/.m4a/.mp4/.3gp/.3g2)** • MPEG-2/MPEG-4 Audio/44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz/Between 8 kbps and 320 kbps, and VBR **FLAC (.flac)** • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz/8 bit, 16 bit, 24 bit **LPCM (Linear PCM)** • 44.1 kHz, 48 kHz/16 bit **Apple Lossless (.m4a/.mp4)** • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz/16 bit, 24 bit **DSD (.dsf/.dff)** • DSF/DSDIFF/2.8 MHz, 5.6 MHz, 11.2 MHz		

USB Section	North American models	European models	Australian and Asian models
USB	2 (Front : Ver.2.0, 5 V/0.5 A, Rear : Ver.2.0, 5V/1 A)		
■USB Storage Device (→p97) Supported Audio Formats	**MP3 (.mp3)** • MPEG-1/MPEG-2 Audio Layer-3/44.1 kHz, 48 kHz/Between 8 kbps and 320 kbps, and VBR **WMA (.wma)** • 44.1 kHz, 48 kHz/Between 5 kbps and 320 kbps, and VBR • WMA Pro/Voice/WMA Lossless formats are not supported. **WAV (.wav)** WAV files contain uncompressed PCM digital audio. • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz/8 bit, 16 bit, 24 bit **AIFF (.aiff/.aif)** AIFF files contain uncompressed PCM digital audio. • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz/8 bit, 16 bit, 24 bit **AAC (.aac/.m4a/.mp4/.3gp/.3g2)** • MPEG-2/MPEG-4 Audio/44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz/Between 8 kbps and 320 kbps, and VBR **FLAC (.flac)** • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz/8 bit, 16 bit, 24 bit **LPCM (Linear PCM)** • 44.1 kHz, 48 kHz/16 bit **Apple Lossless (.m4a/.mp4)** • 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz/16 bit, 24 bit **DSD (.dsf/.dff)** • DSF/DSDIFF/2.8 MHz, 5.6 MHz, 11.2 MHz		

General	North American models	European models	Australian and Asian models
Power Supply	AC 120 V, 60 Hz	AC 220 - 240 V, 50/60 Hz	
Power Consumption	460 W	450 W	
Full Standby mode	0.10 W	0.15 W	
Network Standby (wired)	1.6 W	1.8 W	
Network Standby (wireless)	1.7 W	1.8 W	
Bluetooth Wakeup	1.6 W	1.7 W	
HDMI CEC	0.10 W	0.15 W	
Standby mode (ALL ON)	1.7 W	1.8 W	
Equipment with HiNA functionality Standby mode, Network disconnect and Network Standby ON	2.7 W	2.9 W	
	This equipment complies with European Commission Regulation (EC) No 1275/2008 as equipment with HiNA functionality. If you do not to use the Network function, please set Network Standby setting to Off. You can reduce power consumption under standby mode.		
Dimensions (W × H × D)	435 mm × 173 mm × 370.5 mm 17-1/8" × 6-13/16" × 14-9/16"		
Weight	9.6 kg (21.2 lbs.)		
Maximum radio-frequency power transmitted in the frequency band(s)	-	2400 MHz - 2483.5 MHz (20 dBm (e.i.r.p)) 5150 MHz - 5350 MHz (23 dBm (e.i.r.p)) 5470 MHz - 5725 MHz (23 dBm (e.i.r.p))	-

Video Inputs	North American models	European models	Australian and Asian models
Composite	Not equipped		
Component	Not equipped		

Audio Inputs	North American models	European models	Australian and Asian models
Analog	6 (Including 1 × PHONO, 1 × AUX (Front))		
Digital	2 (COAXIAL×1, OPTICAL×1) • Supported sampling rates for PCM signals (stereo, mono) from a digital input are 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz/16 bit, 20 bit, and 24 bit.		

Audio Outputs	North American models	European models	Australian and Asian models
Analog	LINE OUT (ZONE 2)(*) × 1 PRE OUT (SUBWOOFER) × 2 *Can be changed to LINE OUT (ZONE B).		
Speaker Outputs	9 (FRONT L/R, CENTER, SURROUND L/R, HEIGHT L/R or SURROUND BACK L/R, ZONE 2 L/R) • North American models are banana plug ready.	7 (FRONT L/R, CENTER, SURROUND L/R, HEIGHT L/R or SURROUND BACK L/R or ZONE 2 L/R)	
Phones	1 (ø 6.3 mm, 1/4")		

Others	North American models	European models	Australian and Asian models
Setup Mic	1 (Front)		
RS-232	Not equipped		
12V TRIGGER OUT	Not equipped		
IR	Not equipped		

Specifications and features are subject to change without notice.

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