

News Release

May 8, 2012

For Immediate Release

Pioneer Introduces the New CYBER NAVI Car Navigation system in Japan With the world's first*¹ Head-Up Display to project augmented reality information in front of the windscreen*²



Augmented reality information projected past the windscreen (artist's impression)

*1 The world's first Head-Up Display to project augmented reality information in front of the windscreen, and the world's first in-vehicle Head-Up Display to use lasers (according to an investigation by Pioneer as of May 8, 2012)



【AVIC-VH99HUD】



【AVIC-ZH99HUD】

Product	Model	Recommended retail price	Release period
■ 1D+1D main unit type			
7" wide screen VGA terrestrial digital TV/DVD-V/CD/Bluetooth®/USB/SD/tuner with 5.1 channel support, DSP AV all-in-one HDD navigation cruise scouter unit, AR HUD unit set	AVIC-VH99HUD	Open price	Late July
7" wide screen VGA terrestrial digital TV/DVD-V/CD/Bluetooth®/USB/SD/tuner with 5.1 channel support, DSP AV all-in-one HDD navigation cruise scouter unit set	AVIC-VH99CS	Open price	Late May
7" wide screen VGA terrestrial digital TV/DVD-V/CD/Bluetooth®/USB/SD/tuner with 5.1 channel support, DSP AV all-in-one HDD navigation	AVIC-VH99	Open price	Late May
■ 2D main unit type			
7" wide screen VGA terrestrial digital TV/DVD-V/CD/Bluetooth®/USB/SD/tuner with 5.1 channel support, DSP AV all-in-one HDD navigation cruise scouter unit, AR HUD unit set	AVIC-ZH99HUD	Open price	Late July
7" wide screen VGA terrestrial digital TV/DVD-V/CD/Bluetooth®/USB/SD/tuner with 5.1 channel support, DSP AV all-in-one HDD navigation cruise scouter unit set	AVIC-ZH99CS	Open price	Late May
7" wide screen VGA terrestrial digital TV/DVD-V/CD/Bluetooth®/USB/SD/tuner with 5.1 channel support, DSP AV all-in-one HDD navigation	AVIC-ZH99	Open price	Late May
7" wide screen VGA terrestrial digital TV/DVD-V/CD/Bluetooth®/USB/SD/tuner, DSP AV all-in-one HDD navigation	AVIC-ZH77	Open price	Late May

Product Concept

Pioneer Corporation announces the release of its latest Cyber Navi car navigation system for the Japanese market, which come with an AR HUD unit*² - the world's first*¹ Head-Up Display to project augmented reality information in front of the windscreen.

This device uses the AR HUD unit to project various augmented reality information useful for driving in front of the windscreen, using vivid full color image. The display overlays augmented reality information on top of the real scenery, so that the driver can track information instantaneously while significantly reducing eye movement and refocusing.

The latest Cyber Navi has a variety of advanced functions to support comfortable driving. The *AR HUD View* function displays information in the AR HUD unit, such as information about the route and the distance to the vehicle ahead, in a way that is easy to understand. The *Parking Watcher* function downloads information in real-time to show the latest information about car park congestion in the navigation screen. There is also a function that detects and displays speed limit signs, notifying the driver with a sound effect when a sign is detected. This device also meets the needs of users who want to always have the latest map data, with map data updates with no additional fee for the first three years, and a *Road Creator* function that automatically generates road data when you drive on a road that is not listed on the map, and then uses this road data for route navigation.

Pioneer will continue to focus on improving the value of car navigation and coming up with cutting-edge new products that enable a comfortable driving experience by thinking about the way information should be presented in vehicles or while driving, and by making further advances in video analysis technology.

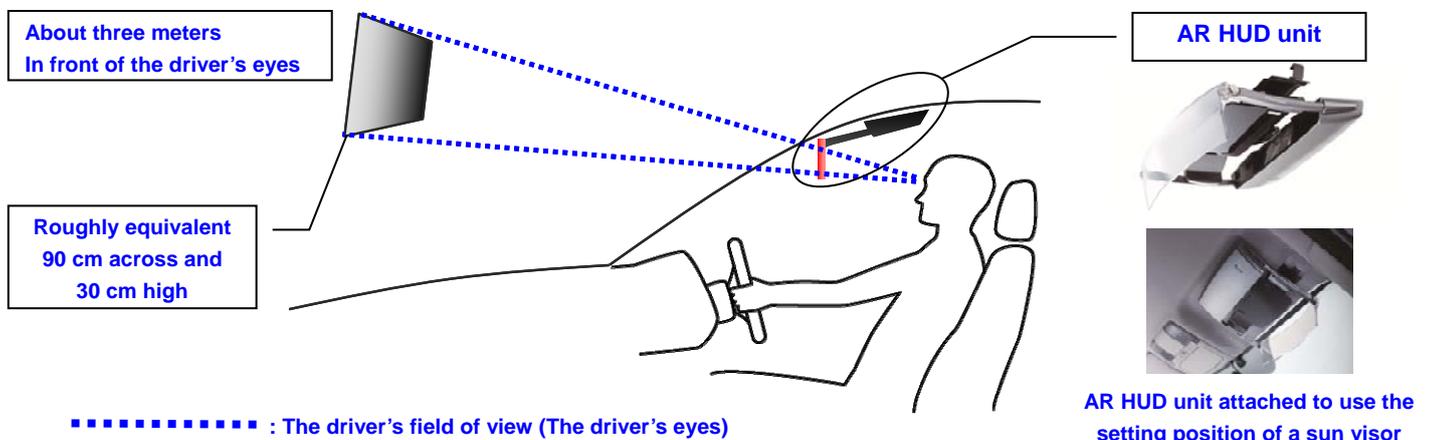
YouTube clip explaining the product:

<http://www.youtube.com/user/PioneerCorporationPR>

Key features:

1) The latest Cyber Navi systems come with an AR HUD unit*², the world's first*¹ Head-Up Display to project augmented reality information in front of the windscreen

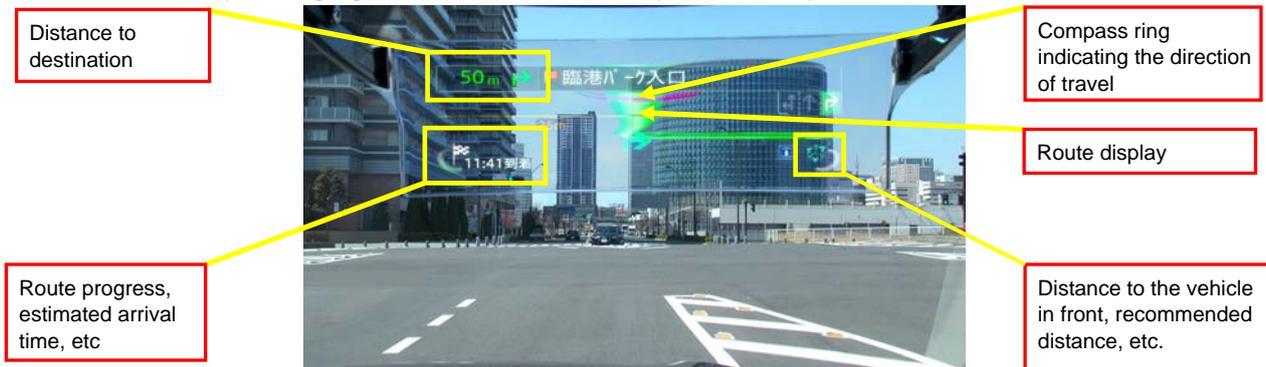
The AR HUD unit uses an RGB laser light source to display full color augmented reality information with high contrast and a high brightness level*³. The display, which is projected about three meters in front of the driver's eyes, is 90 cm across and 30 cm high, roughly equivalent to a 37 inch display. The information is overlaid over the real scenery behind, enabling the driver to track the necessary information for driving instantaneously while significantly reducing eye movement and refocusing.



2) An AR HUD View function, displaying augmented reality information that is useful for driving and relevant to the situation

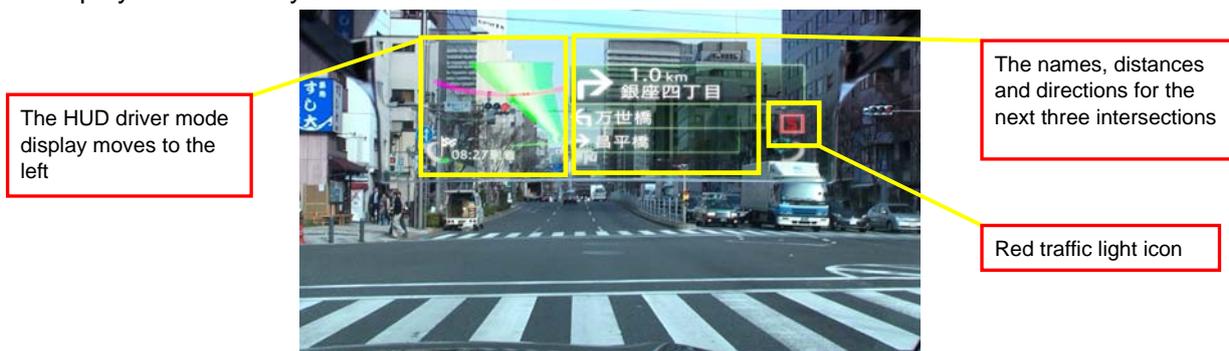
-HUD driver mode

1) This mode displays information about the distance to the vehicle in front and the route to the destination by arranging the information in a way that is easy to understand.



2) This mode displays essential information at intersections (the HUD intersection list display).

When the vehicle stops (such as at a traffic light), the display automatically switches to show information such as the guidance direction and the names of the next three intersections. The unit also detects red traffic light signals and displays an appropriate icon. Once the unit detects that the traffic light has turned green, or that the vehicle (or the vehicle in front) has started moving, the display automatically switches back to HUD driver mode.



Content shown in HUD Driver Mode (including the HUD intersection list display)		
•Route information (distance to destination, guidance direction, intersection names)	•Lane information	•Guidance arrows
•Route	•Percent complete of route/Lapsed time/Arrival anticipation time	•Speed camera icon
•Compass ring	•Indication of distance between two cars	•Logo icon
•Target scope		•Distance to destination progress circle

-HUD highway mode

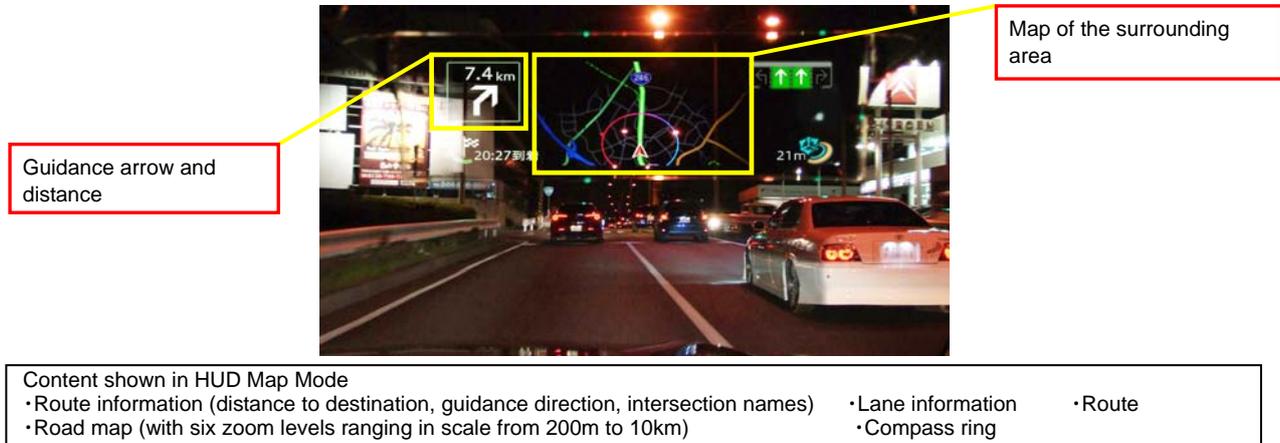
When the vehicle enters a highway, the device automatically switches to HUD Highway Mode. This mode shows information such as the distances and estimated transit times to exits, and information about Service Area and Parking Area facilities, while also displaying the road status, using different colors to indicate congested sections, for example.



Content shown in HUD Highway Mode		
•Information of Service Area/Parking Area facilities	•Target scope	•Indication of the traffic congestion status of each section
•Lane information	•Route	•Indication of distance between two cars
•Compass ring		•Percent complete of route/Lapsed time/Arrival anticipation time

•HUD Map Mode

HUD Map Mode displays a map of the area around the vehicle, with toll roads, national roads and ordinary roads indicated using different colors. The map can be displayed at six different zoom levels, ranging in scale from 200m to 10km, allowing users to check information about the area around the vehicle. This mode also displays lane information, a guidance arrow, and an icon indicating when a red traffic signal has been detected.



3) AR Scouter Mode, with additional new functions such as speed sign detection*4

This product comes with AR Scouter Mode, which displays clear, easy-to-understand guidance information to facilitate comfortable driving by using unique video technology to analyze video images that are recorded through the windscreen by a Cruise Scouter unit*4. As well as improving on existing functions, new functions have also been added.

•Speed sign detection

When a speed sign is detected ahead, an image of the speed sign is displayed on the screen in the main unit, and the driver is notified via a sound effect.

•A longer lock-on range for the target indicating the distance to the vehicle ahead, and a clearer inter-vehicular distance indicator

The lock-on range for the target that indicates the distance between the driver's vehicle and the vehicle in front has been extended. The size and color of the inter-vehicular distance indicator have also be changed to make it easier to check the distance to the vehicle ahead, thereby making it easier to maintain an appropriate inter-vehicular distance.

•Lane change detection prompting the driver to take care not to meander (only when driving on the highway)

If the driver crosses the lane dividing lines unintentionally, this function prompts the driver to take care not to meander by changing the display color for the lane. A new addition is that this function now prompts the driver with sound effect to take care if the vehicle continues to straddle the dividing line for a certain period of time.

•Clearer guidance arrows

Borders are now displayed around the guidance arrows that are shown when the route turns a corner at an intersection, making the arrows easier to see.

•Red traffic signal detection

This function works out when there is a red light up ahead, and uses an icon to notify the driver when the light turns green, prompting the driver to check the road ahead.

•Detecting when the car ahead starts moving

This function recognizes when the car ahead has started moving, and prompts the driver to check the road ahead with a clear display and a sound effect.

4) Comes with a Data Communication Module with a communication function that can be used free of charge for three years*⁵

The AVIC-VH99HUD, AVIC-ZH99HUD, AVIC-VH99CS and AVIC-ZH99CS models come with a Data Communication Module with a communication function that uses NTT Docomo's FOMA service and which can be used for three years from the time of purchase. Various communication services can be used from the day of purchase just by performing a simple registration, without the need for a separate data contract.*⁶

5) A *Parking Watcher* function that displays the changing congestion status of car parks

If a car park for which congestion information can be obtained is set as the destination, the *Parking Watcher* function downloads the latest congestion data and updates it in real time, reducing the worry of not knowing the congestion status until you arrive.

6) Can be updated to the latest map data for up to three years for no additional fee*⁷

By using the dedicated *Navi Studio* (for Cyber Navi) computer software, users can easily obtain the latest map data via an SD card*⁸. Map data can also be updated via the communications module*⁹, so that users can enjoy comfortable driving by always using the latest maps.

7) A *Road Creator* function that automatically generates new roads on the map as you drive

This product comes with a *Road Creator* function that automatically generates new roads when the user actually drives over a road that is not listed on the map already. Roads can be created on the map thanks to Cyber Navi's precise vehicle positioning technology. The roads that are created in this way are included in subsequent route searches and navigation.

8) High quality route searches via the Smart Loop traffic congestion information[®] system targeting all of the roughly 700,000 km of roads in Japan*¹⁰

Route searches are based on the Smart Loop traffic congestion information[®] system, which targets all of the roughly 700,000 km of roads in Japan (except for very narrow laneways), enabling users to perform high quality route searches.

*1: The world's first Head-Up Display to project augmented reality information in front of the windscreen, and the world's first onboard Head-Up Display to use lasers (according to an investigation by Pioneer as of May 8, 2012)

*2: Not included with the AVIC-VH99CS, AVIC-ZH99CS, AVIC-VH99 and AVIC-ZH99 models. The *ND-HUD1* AR HUD unit (sold separately) is required for these models. Not compatible with the AVIC-ZH77.

*3: The AR HUD unit uses PicoP technology developed by MicroVision, Inc

*4: A Cruise Scouter unit (sold separately) is required in order to use this mode with the AVIC-VH99 and AVIC-ZH99 models. Not compatible with the AVIC-ZH77.

*5: Free of charge for up to three years from the month when use of the data services starts (from the day the user starts using the services until the end of that month, plus another 35 months). There are plans to enable users to continue using these services by concluding an annual data contract (priced at around ¥10,000 per year) after the initial free period expires.

*6: Customer registration and registration to use Smart Loop are required.

*7: The period for which free update are available is scheduled to run from May 2012 until April 2015. Thereafter a fee will be charged for the use of this service.

*8: This requires either two 8GB SDHC cards (class 4 or higher) or one 16GB SDHC card (class 4 or higher), sold separately.

*9: Only 'road data' and 'map data'. Maps cannot be updated via mobile phones.

*10: This system applies to all roads except for narrow laneways that are less than 5.5 m wide (all of the roads displayed at the 500m zoom level).

* 'Bluetooth' and the Bluetooth logo are registered trademarks of Bluetooth SIG, Inc. in the United States.

* 'FOMA' is a registered trademark of NTT Docomo, Inc.

* Smart Loop traffic congestion information[®] is a registered trademark of Pioneer Corporation.

* The images in the presentation materials are artist's impressions, and may not be the same as the actual items.

Options

Product	Model	Suggested retail price (including tax)	Release period
AR HUD unit	ND-HUD1	¥105,000	Late July
Cruise Scouter unit	ND-CS2	¥52,500	Late May

1) ND-HUD1 AR HUD unit, which enables the AR HUD View

This product is for use with the AVIC-VH99CS, AVIC-ZH99CS, AVIC-VH99, and AVIC-ZH99 models, which do not come with an AR HUD unit^{*11}.

2) ND-CS2 Cruise Scouter unit, which enables AR Scouter Mode

This product is only for use with the AVIC-VH99 and AVIC-ZH99 models, which do not come with a Cruise Scouter unit.

*11: This unit can also be used with AVIC-VH09CS, AVIC-ZH09CS, AVIC-VH09, AVIC-ZH09 and AVIC-ZH09-MEV models for which the 'Spring 2012 Full Data Update' has been performed.

Upgrade information

Product	Model	Suggested retail price (including tax)	Release period
HDD Navigation Map Type VI Vol.2, SD update edition	CNSD-6200	¥19,950	June
HDD Navigation Map Type V Vol.5 (First Edition for 2012), installation pack	CNVU-5500	¥21,000	June
HDD Navigation Map Type V Vol.5 (June 2012 to May 2013), download edition	CNVU-5500DL	¥16,800	June
HDD Navigation Map Type IV Vol.7, installation pack for the 2D main unit type	CNVU-4700Z	¥21,000	July
HDD Navigation Map Type IV Vol.7, installation pack	CNVU-4700	¥21,000	July
HDD Navigation Map Type IV Vol.7, download edition	CNVU-4700DL	¥16,800	July

1) Updating to the latest data with an SD card (not free)

•Models compatible with the CNSD-6200 update: AVIC-VH09CS, ZH09CS, VH09, ZH09, ZH07, ZH09-MEV

2) Updating to the latest data by sending the internal hard disk or Brain Unit to Pioneer^{*12} (not free)

•Models compatible with the CNVU-5500 update: AVIC-VH9990, ZH9990, H9990, VH9900, ZH9900, H9900, VH9000, ZH9000, H9000

•Models compatible with the CNVU-4700Z update: AVIC- ZH099G, ZH099, ZH009G, ZH009

•Models compatible with the CNVU-4700 update: AVIC-VH099MDG, VH099G, VH099MD, VH099, XH099, H099, VH009MDG, VH009G, VH009MD, VH009, XH009, H009

3) Updating to the latest data from home by connecting the Living Kit to a broadband connection (not free)

•Models compatible with the CNVU-5500DL update: AVIC-VH9900, ZH9900, H9900, VH9000, ZH9000, H9000

•Models compatible with the CNVU-4700DL update: AVIC-VH099MDG, VH099G, VH099MD, VH099, XH099, H099, VH009MDG, VH009G, VH009MD, VH009, XH009, H009

*12: The work of rewriting the data is expected to take around seven days from the time when the HDD is received, but may take longer during busy periods.

AVIC-VH99HUD/VH99CS/ZH99HUD/ZH99CS/VH99/ZH99: Main specifications

	AVIC-VH99 HUD /VH99CS	AVIC-ZH99HUD /ZH99CS	AVIC-VH99	AVIC-ZH99
■Main navigation unit (common components)				
Maximum electric power consumption	10 A			
Voltage	DC 14.4 V (voltages between 10.8 V and 15.1 V can be used)			
■GPS component – reception protocol	12 channel multichannel reception protocol			
■Audio component – maximum output	50 W × 4 channels			
■DVD player component				
Region Number	2			
Supported disks	DVD (VIDEO MODE, VR MODE), DVD-R (DL), DVD-RW, CD-ROM, CD-DA, CD-R/RW			
MP3 decoding formats	MPEG-1, 2, 2.5 AUDIO LAYER-3			
WMA decoding formats	Ver.7, 8, 9 (2 channel audio)			
AAC decoding formats	MPEG-4 AAC (only files encoded using iTunes version 10.01.22 or earlier versions)			
AVI decoding formats	MPEG-4 Video+MP3, MPEG-4 Video+AC3			
■AM /FM tuner component				
Reception frequency bands	FM: 76.0 to 90.0 MHz; AM: 522 to 1,629 kHz			
■Terrestrial digital TV tuner component				
Broadcast protocol	(Japanese) terrestrial digital broadcast protocol			
Channels received	470 MHz to 770 MHz (UHF channel 13 to channel 62)			
■TV monitor component				
Screen size	7" widescreen VGA			
Number of effective pixels	1,152,000 pixels (800 wide x 480 high x 3 colors (RGB))			
LCD type	TFT active matrix			
■AR HUD unit				
Inclusions	Included (sold separately for the VH99CS)	Included (sold separately for the ZH99CS)	Not included (sold separately)	Not included (sold separately)
Maximum electric power consumption	1A		-	
Voltage	DC 14.4 V (voltages between 10.8 V and 15.1 V can be used)		-	
Light source	RGB laser light source		-	
Number of effective pixels	202,800 pixels (780 W × 260 H)		-	
Upgrade media	microSD memory cards and microSDHC memory cards (Version 2.0) supported		-	
Connection protocols	Bluetooth 2.1+EDR		-	
■Cruise scouter unit				
Inclusions	Included	Included	Not included (sold separately)	Not included (sold separately)
Maximum electric power consumption	1 A		-	
Voltage	DC 14.4 V (voltages between 10.8 V and 15.1 V can be used)		-	
Video output by the camera	Orthoscopic		-	
Image sensor	Color 1/4 inch CMOS sensor		-	
Number of effective pixels	About 31 megapixels		-	
Lens	Wide angle; Focal length: f=3.3 mm; F value: 2.6		-	
Angle of view	Horizontal: about 59°; Vertical: about 45°		-	
■Data communication module				
Inclusions	Included	Included	Not included (sold separately)	Not included (sold separately)
■Dimensions				
Dimensions of the monitor component (W × H × D)	178 mm × 50 mm × 165 mm	-	178 mm × 50 mm × 165 mm	-
Dimensions of the navigation component (W × H × D)	178 mm × 50 mm × 151 mm	178 mm × 100 mm × 167 mm	178 mm × 50 mm × 151 mm	178 mm × 100 mm × 167 mm
Dimensions of the AR HUD unit (W × H × D)	Main unit: 260 mm × 123 mm × 257 mm; Combiner component: 260 mm × 75 mm × 5 mm		-	
Dimensions of the Cruise Scouter unit (W × H × D)	Camera component (including the cover): 42 mm × 42 mm × 43 mm; Main unit: 121 mm × 100 mm × 22 mm		-	

Dimensions of the data communication module (W×H×D)	27 mm × 87 mm × 11 mm		-	
■Weight				
Monitor component	2.1 kg	-	2.1 kg	—
Navigation component	1.1 kg	2.6 kg	1.1 kg	2.6 kg
AR HUD unit	950 g (including the stay)			
Cruise Scouter unit	Camera component (including the cover): 260 g; Main unit: 450 g		-	
Data communication module	25 g		-	

AVIC-ZH77: Main specifications

	AVIC-ZH77			
■Main navigation unit (common components)				
Maximum electric power consumption	10 A			
Voltage	DC 14.4 V (voltages between 10.8 V and 15.1 V can be used)			
■GPS component – reception protocol	12 channel multichannel reception protocol			
■Audio component – maximum output	50 W × 4 channels			
■DVD player component				
Region Number	2			
Supported disks	DVD(VIDEO MODE, VR MODE), DVD-R(DL), DVD-RW, CD-ROM, CD-DA, CD-R/RW			
MP3 decoding formats	MPEG-1, 2, 2.5 AUDIO LAYER-3			
WMA decoding formats	Ver.7, 8, 9(2 channel audio)			
AAC decoding formats	MPEG-4 AAC (only files encoded using iTunes version 10.01.22 or earlier versions)			
AVI decoding formats	MPEG-4 Video+MP3, MPEG-4 Video+AC3			
■AM /FM tuner component				
Reception frequency bands	FM: 76.0 to 90.0 MHz; AM: 522 to 1,629 kHz			
■Terrestrial digital TV tuner component				
Broadcast protocol	(Japanese) terrestrial digital broadcast protocol			
Channels received	470 MHz to 770 MHz (UHF channel 13 to channel 62)			
■TV monitor component				
Screen size	7" widescreen VGA			
Number of effective pixels	1,152,000 pixels (800 wide x 480 high x 3 colors (RGB))			
LCD type	TFT active matrix			
■Data communication module				
Inclusions	Not included (sold separately)			
■Dimensions				
Dimensions of the main unit (W×H×D)	178 mm × 100 mm × 167 mm			
■Weight				
Main unit	2.6 kg			