

THD data table of digital sources (chronological order): explanations

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Column n°1 (Issue): Sources

Month (arabic numerals) or quarter (roman numerals) and year of publication of the magazine where the measurement was published. The magazines belong to the German publisher WEKA MEDIA PUBLISHING GmbH which publishes measurements coming from its own laboratory ([TestLAB](#), formerly Testfactory). The magazines are mainly *Stereoplay* and secondarily *Audio* and *Audiophile*, the former being identified by the use of bold type and the latter by italics.

Column n° 2 (Brand) et 3 (Model name): Identification of the device under test.

Column n° 4 (Note): Informs about a remarkable feature of the device.

Column n° 5 (D/A Converter(s)): Identification of the digital/analog converter(s) of the device for reading the test signal (rare devices have different converters used depending on the nature of the digital signal).

Column n° 6 to 11: Analysis of measurements

This is the result of FFT (Fast Fourier Transform) analysis of the analog signal on the outputs of each device using an Audio Precision System Two SYS2722 (except for devices tested up to 1995 inclusive, which are measured using an older version of the Audio Precision). The test signal is a pure tone at maximum level (0 dBFS or 0 dB SA-CD) either digitally generated by the analyzer (to test devices with digital inputs) or burned on different type of discs (to test CD-, SA-CD-, DVD-players, etc...). Rated output voltage is 0.3 V RMS (-10 dBV) at 300 Ω or less for mobile audio devices (DAP) and 2 V RMS (6 dBV) for all others. The fundamental frequency of the test signal is removed before analysis by means of a notch filter in order to increase the dynamic range of the analyzer, which makes it possible to improve the resolution of measurement of very weak signals. The informations resulting from these measurements is, from left to right:

* **H2, H3, H4, H5:** Level of the 2nd to 5th harmonics of the test signal that emerge from the noise floor on the worst channel. Boxes left empty in the absence of visible harmonics. All levels mentioned in the table are in dBr, that is to say in level relative to the level of the test signal on the analog outputs of the device (0 dBr is the maximum output level), or in dBV, that is to say in absolute value (0 dBV=1 V). The lower the level of each harmonic, the better the result. **BEWARE !** If the levels in dBV are directly comparable with each other, the levels in dBr are not directly comparable, neither with each other nor with the levels in dBV, since they indicate a proportion with respect to the output levels of each device, levels which can slightly deviate from rated output voltage. For this reason, percentages of total harmonic distortion rate are only calculated for the devices whose levels are given in dBr, unless the exact output voltage is known.

* **Hn:** Box filled in with a “yes” when the distortion spectrum includes one or more harmonics greater than rank 5, otherwise left empty.

* **THD:** Total Harmonic Distortion (THD). Percentage rates are calculated on H2 to H5 after converting their respective levels in dBr to percentage using the formula: $\sqrt{(H2^2+H3^2+H4^2+H5^2)}$. Calculations are performed to seven decimal places and results rounded to the nearest fifth decimal place. The levels in dBV are calculated by adding the level of the H2 to H5 harmonics and the results rounded to the nearest first decimal place.

Device classification rules:

The devices are grouped according to the nature and frequency of the test signal used to carry out the measurements: DSD (1-bit delta-sigma modulation, sampling frequency 2.8224 MHz), high resolution PCM (24 bits) and PCM in standard resolution (16 bits). The devices are arranged in each subgroup in chronological order. A color code makes it easy to identify each device according to the performance category in which its THD places it. Shades of green corresponding to 5 dB intervals distinguish the best performing devices of the highest category.

THD level:

Extremely low: THD \leq -110 dBr or THD \leq -104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr \leq THD \leq -80 dBr or -94 dBV \leq THD \leq -74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr \geq THD \geq -40 dBr or -54 dBV \geq THD \geq -34 dBV

Fatally high: THD \geq -40 dBr or THD \geq -34 dBV

SA-CD players: test at 1 kHz in DSD from an SA-CD test-disc, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
2/2001	Sony	SCD-1 ¹		Sony CXD8594	-110 dB	-127 dB	-130 dB	-129 dB		0.00032 %
2/2001	Sony	SCD-XB940QS		Sony CXD9556	-106 dB	-121 dB				0.00051 %
2/2001	Sony	DVP-S9000ES	DVD-V	Sony CXD9556	-100 dB	-113 dB	-129 dB	-124 dB	yes	0.00103 %
2/2001 ²	Sony	SCD-555ES		Sony CXD9521	-117 dB	-120 dB				0.00017 %
2/2001	Sharp	DX-SX1		Burr Brown DSD1700 ³	-102 dB	-80 dB		-97 dB	yes	0.01013 %
2/2001	Marantz	SA-1		Philips TDA1547	-103 dB	-121 dB		-127 dB	yes	0.00072 %
2/2001	Philips	SACD-1000	5.1	Cirrus Logic CS4397	-102 dB	-114 dB	-128 dB	-110 dB	yes	0.00088 %
2/2001	Accuphase	Transport DP100 Converter DC101		Analog Devices AD1853 ⁴	-111 dB	-121 dB		-122 dB	yes	0.00031 %
6/2003	Musical Fidelity	Tri-Vista SACD	Digital in	Burr Brown PCM1738	-95 dB	-127 dB	-124 dB	-130 dB	yes	0.00178 %
6/2003	Philips	DVD 963 SA	DVD-V	Analog Dev. AD1955 ⁵	-102 dB	-95 dB	-125 dB	-120 dB	yes	0.00195 %
8/2003	Sony	DVP NS 999ES	DVD-V	Sony CXD9674 ⁶	-106 dB	-106 dB	-129 dB	-118 dB	yes	0.00072 %
10/2003	Pioneer	DV 565A	DVD-A	Burr Brown DSD1791	-106 dB	-110 dB	-122 dB	-128 dB	yes	0.00060 %
10/2003 ⁷	Sony	DVP NS 930V	DVD-V	Sony CXD9674 ⁸	-94 dB	-111 dB	-116 dB	-115 dB	yes	0.00203 %
IV/2003	Shanling	SCD-T 200 (tube out)		Burr Brown PCM1738	-52 dB	-71 dB	-85 dB	-92 dB	yes	0.25284 %
IV/2003	Shanling	SCD-T 200 (solid state out)		Burr Brown PCM1738	-101 dB	-110 dB	-121 dB	-117 dB	yes	0.00096 %
2/2004	Sony	SCD-XA9000ES	5.1	Sony CXD9657 ⁹	-118 dB	-109 dB	-132 dB	-120 dB	yes	0.00039 %
6/2004	Marantz	SA 8400		Cirrus Logic CS4397	-96 dB	-96 dB	-127 dB	-107 dB	yes	0.00229 %
11/2004	Denon	DVD 2910	DVD-A	Burr Brown DSD1791	-109 dB	-112 dB	-130 dB	-125 dB		0.00044 %

1 Save for the lack of balanced outputs, the model SCD-777ES is electronically strictly identical to the SCD-1.

2 See below a test in CD mode in the first quarter 2001 issue of *Audiophile*.

3 In CD mode, the DAC chip and the output stages are different. See below a test in CD mode in the August 2000 issue of *Stereoplay*.

4 This DAC chip has no DSD input. DSD signals are converted into 24 bits/176.4 kHz PCM prior to the D/A conversion in the DP100 by a Texas Instruments TSM57070 processor.

5 In 5.1 mode, another DAC chip (Cirrus Logic CS4362) is used for the center, surround and LFE channels of the 5.1 output.

6 In 2.0 mode. In 5.1 mode, the DAC chip (Sony CXD9675) and the output stages are different.

7 The same measurement was also published in the November 2003 issue of *Stereoplay*.

8 In 2.0 mode. In 5.1 mode, the DAC chip (Sony CXD9675) and the output stages are different.

9 Equivalent to the Burr Brown PCM1738.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

SA-CD players: test at 1 kHz in DSD from an SA-CD test-disc, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
12/2004	Marantz	SA 11 S1		NPC SM5866	-106 dB	-112 dB	-126 dB	-123 dB	yes	0.00057 %
12/2004	Denon	DVD 3910	DVD-A	Burr Br. PCM1796 ¹⁰	-109 dB	-121 dB	-118 dB	-119 dB	yes	0.00057 %
12/2004	Onkyo	DV SP 502 E	DVD-A	Burr Br. PCM1742 ¹¹	-99 dB	-107 dB	-114 dB	-120 dB	yes	0.00123 %
3/2005	T+A	Pulsar SACD 1245 R		Burr Brown ?	-97 dB	-126 dB	-110 dB	-127 dB	yes	0.00145 %
4/2005	Denon	DVD A1 XV	DVD-A	Burr Brown PCM1792	-104 dB	-110 dB	-116 dB	-113 dB	yes	0.00076 %
4/2005	Onkyo	DV SP 1000E	DVD-A	Wolfson WM8719	-97 dB	-102 dB	-118 dB	-110 dB	yes	0.00166 %
5/2005	MacIntosh	MVP861 AC	DVD-A	Burr Brown DSD1792	-115 dB	-112 dB	-128 dB	-135 dB	yes	0.00031 %
6/2005	T+A	SADV 1245 R	DVD-V	Burr Brown PCM1792	-105 dB	-115 dB	-119 dB	-121 dB	yes	0.00061 %
7/2005	Philips	DVP 9000S	DVD-V	Cirrus Logic CS4362 ¹²	-112 dB	-81 dB		-119 dB	yes	0.00892 %
7/2005	Samsung	DVD HD 945	DVD-A	Burr Brown DSD1608	-93 dB	-94 dB	-110 dB	-117 dB	yes	0.00302 %
8/2005	Cayin	SCD 50T (tube out)		Burr Brown PCM1738	-31 dB	-44 dB	-59 dB	-71 dB	yes	2.89046 %
8/2005	Cayin	SCD 50T (solid state out)		Burr Brown PCM1738	-69 dB	-66 dB	-99 dB	-99 dB	yes	0.06143 %
8/2005	Denon	DCD-SA1	Digital in	Burr Brown PCM1792	-116 dB	-113 dB	-131 dB	-134 dB	yes	0.00028 %
8/2005	Lindemann	820		Burr Brown PCM1792	-100 dB	-119 dB	-114 dB	-117 dB	yes	0.00104 %
8/2005	T+A	D10	Tube out	Burr Brown PCM1796	-76 dB	-82 dB	-109 dB	-121 dB	yes	0.01773 %
9/2005	Marantz	SA 15 S1		Cirrus Logic CS4397	-109 dB	-97 dB		-108 dB	yes	0.00151 %
11/2005	Denon	DVD 1920	DVD-A	Burr Brown DSD1608	-103 dB	-95 dB	-110 dB	-116 dB	yes	0.00194 %
11/2005	Marantz	DV 7600	DVD-A	Cirrus Logic CS4398	-111 dB	-118 dB	-130 dB	-127 dB	yes	0.00031 %
11/2005	Yamaha	DVD S 2500 ¹³	DVD-A	Cirrus Logic CS4382 ¹⁴	-117 dB	-99 dB		-118 dB	yes	0.00114 %
5/2006	Pioneer	DV 696 AV	DVD-A	Burr Br. PCM1742 ¹⁵	-106 dB	-108 dB	-110 dB	-116 dB	yes	0.00073 %

10 In 2.0 mode. In 5.1 mode, three other PCM1796 are used, but with different output stages.

11 This DAC chip has no DSD input. DSD signals are converted into 24 bits/88.2 kHz PCM prior to the D/A conversion by a MediaTek MT1389EE processor.

12 8 channels DAC chip of which only 6 are used for the 5.1 output and the Mixed 2.0 output, which are in parallel with the front outputs. In 2.0 mode, another better DAC chip (Cirrus Logic CS4398) is used only for the front channels of the 5.1 output. Assumed to have been tested on the Mixed 2.0 output.

13 Same base technical platform as the Philips DVP9000S (see above).

14 8 channels DAC chip of which only 6 are used, 2 for the Mixed 2.0 output and 4 for the center, surround and LFE channels of the 5.1 output. Another better DAC chip (Cirrus Logic CS4398) is used for the front channels of the 5.1 output. Assumed to have been tested on the Mixed 2.0 output.

15 This DAC chip has no DSD input. DSD signals are converted into 24 bits/88.2 kHz PCM prior to the D/A conversion by a MediaTek MT1389EXE processor.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

SA-CD players: test at 1 kHz in DSD from an SA-CD test-disc, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
5/2006	MacIntosh	MCD201		Cirrus Logic CS4398	-111 dB	-110 dB	-122 dB	-107 dB	yes	0.00062 %
6/2006	Marantz	SA 7001		Cirrus Logic CS4397	-83 dB	-88 dB	-124 dB	-99 dB	yes	0.00820 %
7/2006	Harman Kardon	DVD 47	DVD-A	Cirrus Logic CS4392	-95 dB	-97 dB	-123 dB	-117 dB	yes	0.00228 %
9/2006	emmLabs	Disc transport CDS SE Converter DCC 2 SE	Analog. in + preamp.	Manufacturer's own	-111 dB	-103 dB	-132 dB	-136 dB	yes	0.00076 %
10/2006	Denon	DCD 1500 AE		Burr Brown PCM1791	-113 dB	-124 dB				0.00023 %
11/2006	Denon	DVD 3930	DVD-A	Burr Br. PCM1796 ¹⁶	-105 dB	-105 dB	-119 dB	-124 dB	yes	0.00081 %
3/2007	Sony	SCD-XA1200ES	5.1	Burr Brown DSD1751	-100 dB	-112 dB	-118 dB		yes	0.00104 %
4/2007	T+A	SACD 1250 R		Burr Brown PCM1792	-109 dB	-123 dB	-119 dB		yes	0.00038 %
5/2007	Marantz	SA 7001 KI		Cirrus Logic CS4397	-84 dB	-88 dB	-123 dB	-103 dB	yes	0.00749 %
5/2007	Pioneer	PD D6		Burr Brown PCM1738	-106 dB	-114 dB	-125 dB	-119 dB	yes	0.00055 %
7/2007	Arcam	DV 139	DVD-A	Wolfson WM8740	-103 dB	-87 dB		-90 dB	yes	0.00552 %
10/2007	Pioneer	DV 600 AV	DVD-A	Burr Br. PCM1742 ¹⁷	-92 dB	-108 dB	-110 dB	-113 dB	yes	0.00257 %
2/2008	Pioneer	DV LX 50	DVD-A	Burr Br. PCM1796 ¹⁸	-112 dB	-125 dB	-128 dB	-133 dB	yes	0.00026 %
7/2008	Esoteric	X 05		Cirrus Logic CS4398	-115 dB	-103 dB		-114 dB	yes	0.00076 %
2/2009	MacIntosh	MCD500	Digital in	ESS ES9008S	-112 dB	-110 dB	-126 dB	-128 dB	yes	0.00041 %
11/2009	Marantz	UD9004	Universal	AKM AK4399	-114 dB	-108 dB	-135 dB	-116 dB	yes	0.00047 %
12/2009	T+A	SACD 1260 R		Burr Brown PCM1795	-107 dB	-112 dB	-131 dB	-125 dB	yes	0.00052 %
8/2011	NAD (Swoboda)	M5 (tweaked)	5.1	Burr Br. DSD1794 ¹⁹	-100 dB	-117 dB	-118 dB	-124 dB	yes	0.00102 %
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16 In 2.0 mode. In 5.1 mode, three other PCM1796 are used, but with different output stages.

17 This DAC chip has no DSD input. DSD signals are converted into 24 bits/88.2 kHz PCM prior to the D/A conversion by a MediaTek MT1389EXE processor.

18 In 5.1 mode, two other PCM1796 are used for the center, surround and LFE channels, but with slightly different output stages.

19 In 2.0 mode. In 5.1 mode, the DAC chip (AKM AK4358) and the output stages are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/192 kHz) at 315 Hz, 330 Hz or 333 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
6/2003	Lexicon	RT 10 ²⁰	SA-CD	Cirrus Logic CS4392	-110 dB	-113 dB	-127 dB	-114 dB	yes	0.00044 %
6/2003	Yamaha	DVD S 2300	SA-CD	Burr Br. PCM1608 ²¹	-90 dB	-91 dB	-101 dB	-116 dB	yes	0.00433 %
6/2003	Harman Kardon	DVD 30	DVD-A	Wolfson WM8740	-106 dB	-103 dB	-119 dB	-109 dB	yes	0.00094 %
7/2003	Linn	Unidisk 1.1	SA-CD	Cirrus Logic CS4397	-99 dB	-101 dB	-129 dB	-117 dB	yes	0.00144 %
8/2003	Denon	DVD 2900	SA-CD	Burr Brown DSD1790	-107 dB	-108 dB	-117 dB	-118 dB	yes	0.00063 %
10/2003	Panasonic	DVD S 31	DVD-A	Burr Brown PCM1752	-91 dB	-98 dB	-121 dB	-120 dB	yes	0.00309 %
10/2003	Panasonic	DVD S 35	DVD-A	Burr Brown PCM1752	-92 dB	-95 dB	-114 dB	-116 dB	yes	0.00308 %
10/2003	Panasonic	DVD S 75	DVD-A	Burr Brown PCM1607	-93 dB	-101 dB	-104 dB		yes	0.00249 %
10/2003	Linn	Unidisk 2.1	SA-CD	Cirrus Logic CS4392	-102 dB	-104 dB	-120 dB	-119 dB	yes	0.00103 %
11/2003	Denon	DVD 1400	SA-CD	Burr Br. DSD1702 ²²	-92 dB	-96 dB	-118 dB	-111 dB	yes	0.00299 %
12/2003	Marantz	DV 12 S 2	SA-CD	Cirrus Logic CS4392	-101 dB	-120 dB	-110 dB	-109 dB	yes	0.00102 %
12/2003	Primare	DVD 30	SA-CD	Cirrus Logic CS4392	-102 dB	-99 dB	-105 dB			0.00149 %
12/2003	TEAC	DV 50	SA-CD	Burr Brown PCM1738	-93 dB	-96 dB	-109 dB	-108 dB	yes	0.00279 %
2/2004	Denon	DVD A11	SA-CD	Burr Br. PCM1790 ²³	-106 dB	-122 dB				0.00051 %
3/2004	Marantz	DV 6400	SA-CD	Burr Brown PCM1751	-100 dB	-97 dB	-114 dB	-113 dB	yes	0.00176 %
3/2004	Pioneer	DV 868 AVi	SA-CD	Burr Brown PCM1738	-97 dB	-115 dB	-135 dB	-131 dB	yes	0.00142 %
11/2004	Panasonic	DMR E 500 H	DVD-R	?	-100 dB	-103 dB	-123 dB	-116 dB	yes	0.00124 %
8/2010	NuForce	Icon HDP	USB in	AKM AK4390	-113 dB	-102 dB	-120 dB	-123 dB	yes	0.00083 %
2/2016	AVM	Ovation MP 6.2	DSD	ESS ES9018K2M	-108 dB	-115 dB	-131 dB	-125 dB	yes	0.00044 %
5/2016	T+A	DAC8 DSD	USB in	Burr Br. PCM1795 ²⁴	-103 dB	-110 dB	-116 dB	-135 dB	yes	0.00079 %
7/2016	Cambridge	Azur 851N	Network	Analog Dev. AD1955	-125 dB	-116 dB	-126 dB	-136 dB	yes	0.00018 %

20 Marantz DV8400 clone.

21 8 channels DAC chip : 2 channels are used for the 2.0 output and the 6 other for the 5.1 output. When playing SA-CDs, 4 much better 2 channels DAC chips (Analog Devices AD1955) are used with their own output stages.

22 Another DAC chip (Burr Brown PCM1751) and different output stages are used for the 2.0 output, usable only for CDs and DVD-Vs.

23 In 2.0 mode. In 5.1 mode, two different DAC chips (Burr Brown DSD1790) and different output stages are used for the center, surround and LFE channels.

24 When playing DSD files, the D/A converters (a manufacturer's own design) are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/192 kHz) at 315 Hz, 330 Hz or 333 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
11/2016	Linn	Klimax DS/3	Network	AKM AK4497	-135 dB	-127 dB				0.00005 %
11/2016	Pioneer	N-P01	Network	AKM AK4480EF	-116 dB	-99 dB	-127 dB	-103 dB	yes	0.00134 %
11/2016 ²⁵	Naim	ND5 XS	Network	Burr Brown PCM1791	-103 dB	-105 dB	-116 dB	-118 dB	yes	0.00093 %
1/2017	T+A	MP1000 E	CD	Burr Brown 32 bits	-110 dB	-107 dB	-117 dB	-123 dB	yes	0.00057 %
5/2017	Marantz	SA 10	DSD256	Manufacturer's own	-103 dB	-110 dB			yes	0.00078 %
6/2017 ²⁶	T+A	MP 3100 HV	SA-CD	Burr Br. PCM1795 ²⁷	-96 dB	-106 dB	-120 dB	-127 dB	yes	0.00167 %
8/2017	Pioneer	N-70AE	Network	ESS ES9016	-117 dB	-107 dB	-134 dB	-115 dB	yes	0.00050 %
11/2017	Musical Fidelity	M6scd	USB in	Burr Brown PCM1795	-90 dB	-102 dB	-107 dB	-129 dB	yes	0.00329 %
12/2017	Pioneer	PD-70AE	SA-CD	ESS ES9026PRO	-111 dB	-107 dB		-115 dB	yes	0.00056 %
1/2018	Oppo	Sonica DAC	Network	ESS ES9038PRO	-133 dB	-127 dB	-143 dB	-135 dB	yes	0.00005 %
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25 Also tested in 24 bits/96 kHz PCM in dBV in the January 2012 issue of *Stereoplay* (see below).

26 The same measurement was also published in the November 2017 issue of *Audio*.

27 When playing SA-CDs or DSD files, the D/A converters (a manufacturer's own design) and the output stages are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 970 Hz, 1 kHz or 1,020 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
8/2002	Rotel	RSP 1066	Pre-Proc.	AKM AK4364	-71 dB	-85 dB	-100 dB	-111 dB	yes	0.02875 %
11/2004	Linn	Kinos	Pre-Proc.	?	-92 dB	-99 dB	-105 dB	-111 dB		0.00282 %
6/2006	Panasonic	DVD S 42	DVD-V	?	-105 dB	-96 dB		-121 dB	yes	0.00168 %
10/2010	Pro-Ject	DAC Box FL		Philips TDA1543	-52 dB	-63 dB	-81 dB	-92 dB	yes	0.26114 %
8/2011	Cambridge	Azur 751 BD	Universal	Wolfson WM8740	-103 dB	-108 dB	-117 dB	-122 dB	yes	0.00083 %
5/2012	Audio Research	DSPre	USB in	Burr Brown PCM1792	-82 dB	-86 dB				0.00939 %
9/2013	Rega	DAC	USB in	Wolfson WM8742	-87 dB	-90 dB	-131 dB	-96 dB	yes	0.00580 %
9/2013	Cyrus	Pre Qx DAC	USB in	Burr Brown PCM1798	-96 dB	-110 dB	-102 dB	-119 dB	yes	0.00180 %
10/2013	Meridian	Director	USB in	Cirrus Logic CS4353	-94 dB	-101 dB			yes	0.00219 %
10/2014	Rotel	RC1570	USB in	Wolfson WM8740	-84 dB	-116 dB	-115 dB	-114 dB		0.00632 %
10/2014	Bryston	BP 17 / DAC	Preamp.	Cirrus Logic CS43122	-113 dB	-104 dB				0.00067 %
10/2014	MacIntosh	C 50 AC	Preamp.	Burr Brown PCM1795	-117 dB	-128 dB				0.00015 %
12/2014	Trinnov	Amethyst	Pre-Proc.	Burr Brown PCM4104	-106 dB	-109 dB	-118 dB		yes	0.00063 %
2/2015	LH Labs	Geek Out 1000	USB in	ESS ES9018M	-91 dB	-103 dB	-92 dB	-103 dB	yes	0.00391 %
2/2015	AVM	Evolution SD 3.2	HDD play	?	-117 dB	-104 dB				0.00065 %
10/2015 ²⁸	Nubert	nuControl	Preamp.	Burr Brown PCM1794	-111 dB	-95 dB	-116 dB	-103 dB	yes	0.00194 %
12/2015	Panasonic	DMP BDT 570	BR-D	?	-89 dB	-103 dB	-111 dB	-120 dB	yes	0.00363 %
12/2015	Cambridge	CXU	BR-D	Wolfson WM8740	-101 dB	-105 dB		-116 dB	yes	0.00107 %
2/2016	Marantz	SA 14 S1 SE	SA-CD	Burr Brown DSD1792	-96 dB	-107 dB	-116 dB	-115 dB	yes	0.00166 %
7/2016	AVM	Ovation SD 6.2	Network	ESS ES9018K2M	-113 dB	-114 dB	-118 dB	-120 dB	yes	0.00034 %
7/2016	North Star Design	Blue Diamond	USB in	ESS ES9016	-119 dB	-119 dB	-119 dB		yes	0.00019 %
10/2017	AVM	Ovation SD 8.2	Network	ESS ES9018K2M	-76 dB	-82 dB	-104 dB	-105 dB	yes	0.01775 %
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28 The same measurement was also published in the December 2015 issue of *Audio*.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 970 Hz, 1 kHz or 1,020 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
12/2018	Meitner	MA-1 V2	USB in	Manufacturer's own			-109 dB			0.00035 %
3/2019	Auralic	Network player Aries G1 Converter Vega G1		ESS ES9038PRO	-118 dB	-124 dB				0.00014 %
5/2019	Linn	Selekt DSM	Network	AKM AK4493	-121 dB	-123 dB	-146 dB			0.00011 %
5/2019	Atoll	ST 200 Signature	Network	Burr Brown PCM1792	-62 dB	-85 dB	-112 dB			0.07963 %
5/2019	Mark Levinson	N° 519	Digital ins	ESS 32 bits	-119 dB	-122 dB	-128 dB	-131 dB		0.00015 %
5/2019	Lumin	T2	Network	ESS ES9028PRO	Harmonics burried in noise ²⁹				≤ 0.00011 %	
7/2019	Luxman	D-N150	USB in	Burr Br. PCM5102A	-90 dB	-89 dB	-111 dB	-109 dB	yes	0.00477 %
10/2019	T+A	SDV 3100 HV	Network	Burr Br. PCM1795 ³⁰		-126 dB	-137 dB	-136 dB	yes	0.00005 %
11/2019	Aurender	A100	Network	AKM AK4490	-119 dB	-124 dB	-128 dB	-119 dB	yes	0.00018 %
10/2019	Arcam	CDS50	Network	ESS ES9038K2M	-133 dB	-111 dB	-131 dB	-116 dB	yes	0.00033 %
10/2019	Pro-Ject	CD Box DS2	USB in	AKM AK4490	-112 dB	-114 dB		-128 dB		0.00032 %
10/2019	NAD	C658	Network	ESS ES9028	-94 dB	-90 dB	-110 dB	-106 dB	yes	0.00379 %
3/2020	iFi Audio	Pro iDSD	Digital ins	Burr Brown PCM1793	-76 dB	-72 dB	-91 dB	-85 dB	yes	0.03036 %
3/2020	Ayon	CD-10 II Signature	USB in	AKM AK4490EQ	-44 dB	-79 dB	-111 dB			0.63106 %
3/2020	Eternal Arts	DP DAC Mk II	USB in	Burr Brown PCM1796	-41 dB	-52 dB	-66 dB	-74 dB	yes	0.92754 %
6/2020	Ayre	QX-5 Twenty	Digital ins	ESS ES9038PRO	-64 dB	-67 dB	-100 dB	-102 dB	yes	0.07732 %
8/2020	RME	ADI-2 DAC FS	USB in	AKM AK4493	-132 dB	-120 dB	-131 dB	-139 dB	yes	0.00011 %
10/2020	Auralic	Vega G2.1	Network	ESS SABRE (?)	-140 dB	-137 dB	-142 dB	-139 dB	yes	0.00002 %
10/2020	Aqua	La Voce S3		Mfr's own R2R	-76 dB	-83 dB	-91 dB	-78 dB	yes	0.02116 %
1/2021	Audia Flight	FL CD Three S	Dig. ins ³¹	AKM AK4493EQ	-104 dB	-86 dB	-124 dB	-95 dB	yes	0.00536 %
1/2021	dCS	Bartok	Network	dCS Ring DAC	-138 dB	-129 dB				0.00004 %
1/2021	Atoll	MS 120	Network	Burr Brown PCM1796	-48 dB	-60 dB	-73 dB	-85 dB	yes	0.41112 %

29 The noise floor between -119 and -126 dBr on the FFT spectrum is rather high for a 24 bits signal and masks all harmonics of the test tone.

30 When playing DSD files, the D/A converters (a manufacturer's own design) and the output stages are different.

31 Digital inputs optional.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 970 Hz, 1 kHz or 1,020 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
1/2021	Marantz	SACD 30n	Digital ins	Manufacturer's own	-113 dB	-117 dB				0.00026 %
1/2021	T+A	MP 2500 R	Network	Burr Br. PCM1795 ³²	-93 dB	-102 dB	-114 dB	-127 dB	yes	0.00238 %
3/2021	Cocktail Audio	N25	Network	ESS ES9018K2M	-113 dB	-102 dB	-118 dB	-114 dB	yes	0.00086 %
4/2021	NuPrime	Omnia WR-1	Network	ESS ES9023	-67 dB	-81 dB	-91 dB	-91 dB	yes	0.04572 %
4/2021	Cambridge	DacMagic 200M	USB in	ESS ES9028Q2M	-131 dB	-119 dB	-142 dB	-125 dB	yes	0.00013 %
5/2021	Nubert	nuConnect TrX	Wireless	?	-87 dB	-91 dB	-101 dB	-107 dB	yes	0.00537 %
6/2021	Mark Levinson	N° 5101	Digital ins	ESS 32 bits	-118 dB	-124 dB	-123 dB	-125 dB	yes	0.00017 %
6/2021	AVM	MP 8.3	Digital ins	ESS ES9038Q2M	-91 dB	-77 dB	-118 dB	-119 dB	yes	0.01440 %
8/2021	Bluesound	Node 130	Network	Burr Brown PCM5142	-87 dB	-94 dB	-108 dB	-106 dB	yes	0.00493 %
8/2021	Lotoo	PAW-S1	USB	AKM AK4377	-123 dB	-119 dB		-117 dB	yes	0.00019 %
12/2021	T+A	DAC 200	HDMI ins	Burr Br. PCM1795 ³³	-97 dB	-101 dB	-116 dB			0.00168 %
1/2022	iFi Audio	Network pl. ZEN Stream Converter ZEN DAC V2	MQA	Burr Brown DSD1793	-90 dB	-71 dB	-79 dB	-81 dB	yes	0.03178 %
2/2022	TEAC	UD-505-X	Analog. in	AKM AK4497	-105 dB	-102 dB	-121 dB	-118 dB	yes	0.00099 %
7/2022	Chord	MoJo 2	USB	Manufacturer's own		-77 dB		-81 dB	yes	0.01670 %
9/2022	NuPrime	DAC-9x	HDMI ins	ESS ES9028Q2M	-114 dB	-111 dB	-129 dB	-116 dB	yes	0.00038 %
2/2023	Rotel	DT-6000	USB in	ESS ES9028PRO	-120 dB	-117 dB	-125 dB	-124 dB	yes	0.00019 %
6/2023	MacIntosh	MCD85 AC	Digital in	ESS ES9016S	-97 dB	-78 dB	-105 dB	-100 dB	yes	0.01272 %
6/2023	Musical Fidelity	M6x-DAC	USB in	ESS ES9038Q2M	-125 dB	-113 dB	-145 dB	-125 dB	yes	0.00024 %
9/2023	Rega	Saturn MK3	USB in	Wolfson WM8742	-88 dB	-97 dB	-125 dB	-95 dB	yes	0.00458 %
9/2023	TEAC	VRDS-701	USB in	Manufacturer's own	-84 dB	-87 dB	-98 dB	-102 dB	yes	0.00787 %
2/2024	SPL	Diamond	USB in	AKM AK4490	-114 dB	-107 dB	-137 dB	-120 dB	yes	0.00050 %
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32 When playing SA-CDs or DSD files, the D/A converters (a manufacturer's own design) are different.

33 When playing DSD files, the D/A converters (a manufacturer's own design) are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
II/1999	Denon	DVD-5000	HDCCD	Burr Brown PCM1704	-108 dB	-111 dB	-117 dB	-110 dB	yes	0.00060 %
4/2002	Philips	DVD 962 SA	SA-CD	Cirrus Logic CS4397	-96 dB	-98 dB	-125 dB	-117 dB	yes	0.00203 %
8/2002	Denon	DVD A1	DVD-A	Burr Brown PCM1704	-111 dB	-131 dB	-119 dB	-110 dB	yes	0.00044 %
8/2003	Mark Levinson	N° 40	Pre-Proc.	Analog Dev. AD1853	-96 dB	-110 dB	-118 dB	-113 dB	yes	0.00164 %
8/2003	TAG McLaren	AV 192 R	Pre-Proc.	?	-94 dB	-106 dB	-123 dB	-107 dB	yes	0.00211 %
8/2003	Accuphase	VX 700	Pre-Proc.	Analog Dev. AD1853	-97 dB	-99 dB	-113 dB	-108 dB	yes	0.00186 %
10/2003	Panasonic	DVD RV 62	DVD-V	?	-101 dB	-98 dB	-106 dB	-116 dB	yes	0.00163 %
10/2003	Pioneer	DV 360	DVD-V	Burr Brown PCM1742	-101 dB	-104 dB	-118 dB	-127 dB	yes	0.00110 %
10/2003	Pioneer	DV 464	DVD-V	Burr Brown PCM1742	-110 dB	-104 dB	-119 dB	-126 dB	yes	0.00072 %
10/2003	Pioneer	DV 550	DVD-V	?	-87 dB	-97 dB	-104 dB	-115 dB	yes	0.00473 %
10/2003	Sony	DVP NS 330	DVD-V	AKM AK4381	-103 dB	-112 dB		-114 dB	yes	0.00078 %
10/2003	Sony	DVP NS 430	DVD-V	AKM AK4381	-97 dB	-103 dB	-115 dB	-105 dB	yes	0.00169 %
10/2003	Sony	DVP NS 730P	DVD-V	AKM AK4381	-97 dB	-103 dB	-111 dB	-108 dB	yes	0.00165 %
2/2004	Lexicon	MC 12	Pre-Proc.	Analog Dev. AD1853	-95 dB	-106 dB		-122 dB	yes	0.00185 %
12/2004	Denon	DVD 1910	DVD-V	Burr Brown PCM1755	-100 dB	-85 dB	-102 dB	-110 dB	yes	0.00578 %
12/2004	Panasonic	DVD S 24	DVD-V	?	-97 dB	-103 dB	-120 dB	-111 dB	yes	0.00161 %
12/2004	Panasonic	DVD S 97	DVD-A	?	-97 dB	-110 dB	-111 dB	-111 dB	yes	0.00150 %
2/2005	Sony	DVP LS 785 V	SA-CD	AKM AK4358	-107 dB	-109 dB	-128 dB	-116 dB		0.00059 %
2/2005	Denon	DVD 1710	DVD-V	Burr Brown PCM1756	-100 dB	-84 dB	-100 dB	-110 dB	yes	0.00647 %
2/2005	Harman Kardon	DVD 22	DVD-V	Wolfson WM8728	-103 dB	-96 dB	-111 dB	-117 dB	yes	0.00176 %
2/2005	Kenwood	DVF 3080	DVD-V	Cirrus Logic CS4391		-88 dB		-97 dB	yes	0.00422 %
2/2005	Onkyo	DV SP 402	DVD-V	?	-105 dB	-102 dB	-107 dB	-118 dB	yes	0.00108 %
2/2005	Yamaha	DVD S 550	DVD-V	AKM AK4382		-96 dB	-116 dB	-119 dB	yes	0.00160 %
9/2005	Panasonic	DMR EH 60	DVD-R	?	-104 dB	-97 dB	-120 dB	-119 dB	yes	0.00155 %
9/2005	Pioneer	DVR 433 H	DVD-R	Burr Brown PCM1742	-102 dB	-97 dB	-111 dB	-115 dB	yes	0.00165 %

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
9/2005	Toshiba	RD XS 34	DVD-R	Burr Brown PCM1755	-97 dB	-96 dB	-105 dB	-95 dB	yes	0.00283 %
12/2005	Lexicon	RT 20 ³⁴	SA-CD	Cirrus Logic CS4398 ³⁵	-111 dB	-106 dB	-120 dB	-125 dB	yes	0.00057 %
12/2005	JVC	XV N 422	DVD-V	AKM AK4385	-82 dB	-93 dB	-110 dB	-106 dB	yes	0.00827 %
12/2005	Samsung	DVD P 355	DVD-A	Burr Brown PCM1753		-90 dB	-104 dB	-110 dB	yes	0.00324 %
12/2005	Pioneer	DV 380	DVD-V	Burr Brown PCM1742	-100 dB	-100 dB	-104 dB	-114 dB	yes	0.00156 %
12/2005	CyberHome	CH DVD 635 S	SA-CD	?	-107 dB	-106 dB	-118 dB	-113 dB	yes	0.00072 %
1/2006	Marantz	DV 9600	SA-CD	Cirrus Logic CS4398 ³⁶	-107 dB	-105 dB	-120 dB	-121 dB	yes	0.00073 %
1/2006	Pioneer	DV 989 AVi	SA-CD	Burr Br. PCM1738 ³⁷	-96 dB	-115 dB	-111 dB	-115 dB	yes	0.00163 %
2/2006	LG	DV 9900 H	DVD-V	Cirrus Logic CS4344 ³⁸	-95 dB	-94 dB	-101 dB	-94 dB	yes	0.00345 %
2/2006	Philips	DVP 5900	DVD-V	AKM AK4580	-89 dB	-102 dB	-101 dB	-108 dB	yes	0.00376 %
2/2006	Samsung	DVD HD 850	DVD-A	Burr Brown PCM1753	-94 dB	-82 dB	-95 dB	-104 dB	yes	0.00840 %
2/2006	Sony	DVP NS 92 V	SA-CD	AKM AK4358	-102 dB	-106 dB	-119 dB	-120 dB		0.00095 %
4/2006	Profitec	TC 7500		Burr Brown PCM1716	-54 dB	-55 dB	-55 dB	-56 dB	yes	0.35802 %
4/2006	Lake People	DAC C 460		?	-123 dB	-107 dB		-103 dB	yes	0.00084 %
4/2006	RME	ADI 2		AKM AK4395	-102 dB	-101 dB	-126 dB	-126 dB	yes	0.00120 %
4/2006	Benchmark	DAC 1		Analog Dev. AD1853	-107 dB	-119 dB	-114 dB	-122 dB	yes	0.00051 %
4/2006	Musical Fidelity	X-DAC V3		Burr Brown DSD1792	-94 dB	-106 dB	-108 dB	-114 dB	yes	0.00211 %
4/2006 ³⁹	Electrocompaniet	ECD 1		Cirrus Logic CS4397	-86 dB	-89 dB	-117 dB	-99 dB	yes	0.00624 %
6/2006	Philips	DVP 5140	DVD-V	AKM AK4385	-91 dB		-105 dB	-103 dB	yes	0.00296 %
6/2006	Pioneer	DV 393	DVD-V	MediaTek MT1389E	-92 dB	-110 dB				0.00253 %
6/2006	Sony	DVP NS 36	DVD-V	AKM AK4385	-95 dB	-105 dB	-124 dB	-106 dB	yes	0.00193 %

34 Marantz DV9500 clone but without the headphone output of the base player.

35 The DSD inputs of those DAC chips are grounded. DSD signals are converted into PCM prior to D/A conversion by an NPC SM5819 processor.

36 *Ibidem*.

37 In 5.1 mode, two other PCM1738 are used for the center, surround and LFE channels, but with different output stages.

38 In 2.0 mode. In 5.1 mode, the DAC chip (Cirrus Logic CS4360) and the output stages are different.

39 Another measurement in 16 bits/44.1 kHz was previously published in the August 2002 issue of *Stereoplay* (see below).

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
6/2006	Toshiba	SD 260	DVD-V	?	-68 dB	-91 dB			yes	0.03991 %
6/2006	Yamaha	DVD S 559	DVD-V	Burr Brown PCM1742	-94 dB	-100 dB	-110 dB	-117 dB	yes	0.00226 %
8/2006	Arcam	DV 137	SA-CD	Wolfson WM8740	-100 dB	-98 dB	-117 dB	-108 dB	yes	0.00166 %
8/2006	Rotel	RDV 1092	DVD-A	Cirrus Logic CS4396	-108 dB	-101 dB	-138 dB	-102 dB	yes	0.00126 %
2/2007	Harman Kardon	DVD 37	SA-CD	Cirrus Logic CS4382	-97 dB	-98 dB	-128 dB	-117 dB	yes	0.00190 %
2/2007	Denon	DVD 1730		Burr Brown PCM1782	-106 dB	-98 dB	-121 dB		yes	0.00136 %
2/2007	Onkyo	DV SP 404		MediaTek MT1389FE	-92 dB	-107 dB			yes	0.00255 %
2/2007	Pioneer	DV 490V		MediaTek MT1389FE	-94 dB	-103 dB			yes	0.00212 %
2/2007	Yamada	DVD Mi 220 X	DVD-A	?	-99 dB	-103 dB	-105 dB	-117 dB	yes	0.00145 %
5/2008	T+A	MP 1250 R	Network	Burr Brown PCM1738	-109 dB	-109 dB	-111 dB	-110 dB	yes	0.00066 %
10/2008	Pioneer	BDP LX 71	BR-D	Wolfson WM8740	-111 dB	-105 dB	-121 dB	-115 dB	yes	0.00066 %
1/2009	Denon	DVD 1800 BD	BR-D	Burr Brown PCM1782	-105 dB	-98 dB	-118 dB	-118 dB	yes	0.00139 %
1/2009	Philips	BDP 7200	BR-D	Burr Brown PCM1782	-96 dB	-100 dB	-101 dB	-103 dB	yes	0.00219 %
1/2009	Samsung	BD P 2500	BR-D	AKM AK4396 ⁴⁰	-105 dB	-104 dB	-121 dB	-98 dB	yes	0.00152 %
2/2009	Denon	DVD 3800 BD	BR-D	Burr Brown PCM1796	-91 dB	-111 dB	-111 dB	-117 dB	yes	0.00285 %
2/2009	Pioneer	BDP LX91	BR-D	Wolfson WM8740	-113 dB	-103 dB	-123 dB	-110 dB	yes	0.00081 %
2/2009	Sony	BDP S5000ES	BR-D	Burr Brown PCM1796	-96 dB	-109 dB	-112 dB	-115 dB	yes	0.00165 %
3/2009	Onkyo	DV BD 606	BR-D	Burr Brown PCM1782	-109 dB	-100 dB	-120 dB	-121 dB	yes	0.00107 %
3/2009	Pioneer	BDP 51 FD	BR-D	Wolfson WM8740	-110 dB	-106 dB		-107 dB	yes	0.00068 %
3/2009	Marantz	BD 8002	BR-D	Burr Brown PCM1796	-91 dB	-122 dB	-119 dB	-116 dB	yes	0.00826 %
5/2009	Pioneer	BDP LX08	BR-D	Wolfson WM8740	-111 dB	-100 dB		-115 dB	yes	0.00105 %
5/2009	Phonosophie	BDP LX08 ⁴¹	BR-D	Wolfson WM8740	-106 dB	-103 dB		-114 dB	yes	0.00089 %
6/2009	Samsung	BDP 1600	BR-D	Cirrus Logic CS4353	-95 dB	-95 dB	-120 dB	-103 dB	yes	0.00261 %

⁴⁰ In 2.0 mode. In 7.1 mode, the DAC chip (ESS ES9006) and the output stages are different.

⁴¹ Pioneer BDP LX 08 clone (see above a test of this Pioneer in the May 2009 issue of *Stereoplay*).

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
8/2009	Harman Kardon	BDP 10	BR-D	AKM AK4359	-89 dB	-116 dB				0.00355 %
8/2009	Panasonic	DMP BD 80	BR-D	Burr Brown PCM1681	-98 dB	-99 dB	-125 dB	-123 dB	yes	0.00169 %
8/2009	Samsung	BDP 4610	BR-D	?	-96 dB	-101 dB	-122 dB	-127 dB	yes	0.00182 %
9/2009	Philips	BDP 7300	BR-D	Cirrus Logic CS4351 ⁴²	-93 dB	-99 dB	-123 dB	-132 dB	yes	0.00251 %
10/2009	Denon	DBP 2010	BR-D	Burr Brown PCM1782	-97 dB	-90 dB	-114 dB	-123 dB	yes	0.00347 %
10/2009	JVC	XV BP 1	BR-D	Burr Brown PCM1780	-101 dB	-101 dB		-118 dB	yes	0.00127 %
10/2009	Pioneer	BDP 320	BR-D	Burr Brown PCM1742	-85 dB	-84 dB	-113 dB	-112 dB	yes	0.00846 %
10/2009	Sony	BDP S 360	BR-D	AKM AK4382	-110 dB	-101 dB	-116 dB	-124 dB	yes	0.00096 %
10/2009	Sherwood	BDP 6003	BR-D	Cirrus Logic CS4344	-86 dB	-85 dB	-108 dB	-85 dB	yes	0.00941 %
12/2009	Pioneer	BDP LX52	BR-D	Burr Brown PCM1742	-87 dB	-97 dB	-106 dB	-114 dB	yes	0.00472 %
12/2009	Sony	BDP S 760	BR-D	AKM AK4382 ⁴³	-104 dB	-95 dB	-123 dB	-110 dB	yes	0.00191 %
1/2010	T+A	BD 1260 R	BR-D	Burr Brown PCM1795	-99 dB	-134 dB	-115 dB		yes	0.00114 %
2/2010	Marantz	UD8004	Universal	Burr Brown PCM1796	-96 dB	-106 dB	-116 dB	-122 dB	yes	0.00167 %
5/2010	Naim	DAC		Burr Brown PCM1704	-105 dB	-115 dB	-114 dB	-108 dB	yes	0.00074 %
5/2010	Cambridge	Azur 650 BD	BR-D	Cirrus Logic CS4345	-97 dB	-85 dB	-112 dB	-109 dB	yes	0.00581 %
6/2010	MacIntosh	MVP881BR	Universal	AKM AK4399	-95 dB	-99 dB		-112 dB	yes	0.00212 %
9/2010	Anthem	BLX 200	BR-D	?	-96 dB	-98 dB	-114 dB	-108 dB	yes	0.00207 %
9/2010	emmLabs	DAC 2	USB in	Manufacturer's own	-103 dB	-94 dB				0.00212 %
10/2010	Ayre	DX-5	Universal	Burr Br. PCM1792A	-75 dB	-78 dB	-97 dB	-100 dB	yes	0.02186 %
11/2010	Arcam	rDAC	USB in	Wolfson WM8741	-86 dB	-94 dB	-122 dB	-100 dB	yes	0.00549 %
11/2010	Styleaudio	Carat-Ruby 2	USB in	Burr Brown PCM1796	-90 dB	-97 dB	-103 dB	-104 dB	yes	0.00359 %
11/2010	Violectric	DAC V 800	USB in	Burr Brown PCM1792	-111 dB	-100 dB	-117 dB	-107 dB	yes	0.00114 %
12/2010	NAD	T577	BR-D	?	-107 dB	-107 dB	-115 dB	-120 dB	yes	0.00066 %

42 In 2.0 mode. In 5.1 mode, the DAC chip (Cirrus Logic CS4365) and the output stages are different.

43 In 2.0 mode. In 7.1 mode, the DAC chip (AKM AK4358) and the output stages are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
2/2011	Arcam	FMJ BDP 100	BR-D	Wolfson WM8741	-82 dB	-71 dB	-72 dB	-77 dB	yes	0.04108 %
2/2011	Marantz	UD5005	Universal	Burr Brown PCM1781	-95 dB	-98 dB		-120 dB	yes	0.00218 %
3/2011	Philips	BDP 9600	BR-D	Burr Br. PCM1789 ⁴⁴	-112 dB	-101 dB		-122 dB		0.00093 %
3/2011	Pioneer	BDP LX 54	BR-D	Wolfson WM8524	-85 dB	-85 dB	-105 dB	-92 dB	yes	0.00836 %
1/2011	Linn	Akurate DS	Network	Wolfson WM8741	-113 dB	-99 dB	-122 dB	-109 dB	yes	0.00120 %
4/2011 ⁴⁵	M2Tech	Young	USB in	Burr Brown PCM1795	-107 dB	-118 dB	-121 dB	-124 dB	yes	0.00048 %
6/2011	Denon	DBP 2012 UD	Universal	Burr Brown PCM1795	-99 dB	-118 dB	-115 dB	-122 dB	yes	0.00115 %
7/2011	Marantz	UD7006	Universal	Burr Brown PCM1795	-109 dB	-116 dB	-120 dB	-127 dB	yes	0.00040 %
9/2011	Weiss	DAC202	Firewire	ESS ES9018	-123 dB	-125dB	-136 dB	-133 dB	yes	0.00009 %
10/2011	Calyx	DAC 24/192	USB in	ESS ES9018	-112 dB	-106 dB	-136 dB	-128 dB	yes	0.00056 %
10/2011	Hegel	HD2		Burr Brown PCM1754	-97 dB	-88 dB	-104 dB	-104 dB	yes	0.00432 %
10/2011	North Star Design	Essencio Plus	USB in	Burr Brown PCM1795	-88 dB	-86 dB	-99 dB		yes	0.00650 %
10/2011	NuForce	DAC-9	USB in	Burr Brown PCM1798	-78 dB	-85 dB	-87 dB	-93 dB	yes	0.01467 %
11/2011	Onkyo	BD-SP809	BR-D	Burr Brown PCM5102	-88 dB	-102 dB	-113 dB	-106 dB	yes	0.00410 %
11/2011	Yamaha	BD-A 1010	Universal	?	-113 dB	-92 dB	-118 dB	-110 dB	yes	0.00254 %
12/2011	Cambridge	Azur 651 BD	Universal	Cirrus Logic CS4382	-106 dB	-110 dB	-128 dB	-119 dB	yes	0.00060 %
1/2012	Chord	QBD 76 HD	USB in	Manufacturer's own	-115 dB	-111 dB	-116 dB	-116 dB	yes	0.00040 %
1/2012	Electrocompaniet	EMP 2	Universal	Cirrus Logic CS4398	-108 dB	-91 dB	-134 dB	-108 dB	yes	0.00287 %
1/2012 ⁴⁶	Asus	Xonar Essence One	USB in	Burr Brown PCM1795	-94 dB	-116 dB	-111 dB	-117 dB	yes	0.00203 %
1/2012	Fostex	HP-A3	USB in	AKM AK4390	-98 dB	-103 dB	-118 dB	-102 dB	yes	0.00165 %
1/2012 ⁴⁷	King Rex	UD 384	USB in	?	-83 dB	-105 dB	-104 dB		yes	0.00713 %
2/2012	AMR	DP-777	USB in	Wolfson 32 bits ⁴⁸	-53 dB	-94 dB		-109 dB	yes	0.22389 %

44 In 2.0 mode. In 7.1 mode, the DAC chip (Burr Brown PCM1754) and the output stages are different.

45 The same measurement was also published in the October 2011 issue of *Stereoplay*.

46 The same measurement was also published in the April 2012 issue of *Stereoplay*.

47 The same measurement was also published in the January 2012 issue of *Stereoplay*.

48 When playing CDs, the DAC chip is different: a Philips UDA1305.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
2/2012	Antelope	Converter Zodiac Gold Power supply Voltikus	USB in	Burr Brown PCM1792	-97 dB	-108 dB	-109 dB	-115 dB	yes	0.00152 %
2/2012	Peachtree	Grand Pre	USB in	ESS ES9018	-74 dB	-90 dB	-92 dB	-98 dB	yes	0.02040 %
2/2012	Ayre	QB 9 24/192	USB in	?	-74 dB	-87 dB	-102 dB	-105 dB	yes	0.02047 %
2/2012	B.M.C.	DAC 1 HiRes	USB in	?	-77 dB	-79 dB	-96 dB	-97 dB	yes	0.01816 %
2/2012	Resolution Audio	Cantata Music Server	USB in	?	-100 dB	-108 dB	-111 dB	-102 dB	yes	0.00137 %
2/2012	Pioneer	BDP LX 55	Universal	AKM AK4480	-96 dB	-106 dB	-121 dB	-110 dB		0.00169 %
3/2012	Cambridge	DacMagic Plus	USB in	Wolfson WM8740	-106 dB	-102 dB	-126 dB	-114 dB	yes	0.00096 %
3/2012	Primare	BD32	Universal	Cirrus Logic CS4398 ⁴⁹	-123 dB	-126 dB	-143 dB	-108 dB	yes	0.00041 %
3/2012	Pro-Ject	Stream Box DS	USB in	Cirrus Logic CS4344	-90 dB	-94 dB	-95 dB	-104 dB	yes	0.00419 %
4/2012	Block	DAC 100	USB in	Burr Brown PCM1794	-79 dB	-77 dB	-89 dB	-94 dB	yes	0.01849 %
4/2012	Musical Fidelity	V-DAC II	USB in	Burr Brown DSD1796	-109 dB	-114 dB	-117 dB	-122 dB	yes	0.00044 %
4/2012	Musical Fidelity	M1 DAC II	USB in	Burr Brown DSD1796	-96 dB	-106 dB	-101 dB	-109 dB	yes	0.00192 %
5/2012	Phonosophie	DAC 1	USB in	Burr Brown PCM1792	-131 dB	-113 dB	-117 dB	-122 dB	yes	0.00028 %
5/2012	MacIntosh	MVP 891	Universal	ESS ES9018	-119 dB	-117 dB	-138 dB	-133 dB	yes	0.00018 %
5/2012	Trigon	Chronolog	HDD play	?	-61 dB	-44 dB	-81 dB	-64 dB	yes	0.64040 %
5/2012	Auralic	ARK MX+	USB in	AKM AK4399	-118 dB	-120 dB	-125 dB	-113 dB	yes	0.00028 %
5/2012 ⁵⁰	Hegel	HD11	USB in	AKM AK4399	-120 dB	-106 dB	-125 dB	-113 dB	yes	0.00056 %
5/2012 ⁵¹	TEAC	UD-H01	USB in	Burr Brown PCM1795	-101 dB	-109 dB	-119 dB	-115 dB	yes	0.00098 %
5/2012	Vincent	DAC-1	USB in	Burr Brown PCM1796	-93 dB	-94 dB	-101 dB		yes	0.00313 %
5/2012	Onkyo	T-4070	Network	Wolfson WM8742	-100 dB	-111 dB	-126 dB	-97 dB	yes	0.00175 %
5/2012	Pioneer	N-30	Network	AKM AK4480	-103 dB	-105 dB	-128 dB	-111 dB	yes	0.00095 %
6/2012	Burmester	113	USB in	Wolfson WM8742	-104 dB	-100 dB	-112 dB	-130 dB	yes	0.00121 %

49 In 2.0 mode. In 7.1 mode, the DAC chip (Cirrus Logic CS4382A) and the output stages are different.

50 The same measurement was also published in the May 2012 issue of *Stereoplay*.

51 The same measurement was also published in the July 2012 issue of *Stereoplay*.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
6/2012	Loewe	BlueTechVision 3D	BR-D	?	-94 dB	-95 dB	-120 dB	-103 dB	yes	0.00277 %
7/2012	Panasonic	DMP BDT 500	BR-D	?	-105 dB	-111 dB	-108 dB	-110 dB	yes	0.00081 %
8/2012	Meitner	MA 1	USB in	Manufacturer's own	-124 dB	-112 dB		-128 dB		0.00026 %
8/2012	Denon	DBT 1713 UD	Universal	Burr Brown PCM1781	-97 dB	-98 dB		-119 dB	yes	0.00190 %
8/2012	T+A	Music Player balanced	USB in	Burr Brown PCM1795	-104 dB	-105 dB	-106 dB	-140 dB	yes	0.00098 %
9/2012	Restek	MDAC+	Pre-Proc.	Wolfson WM8741	-101 dB	-90 dB	-124 dB	-98 dB	yes	0.00352 %
9/2012 ⁵²	T+A	DAC8	Pre-Proc.	Burr Brown PCM1795	-99 dB	-103 dB	-122 dB	-134 dB	yes	0.00133 %
9/2012	Wadia	121	Pre-Proc.	ESS ES9018	-104 dB	-110 dB	-122 dB		yes	0.00071 %
9/2012	Marantz	UD5007	Universal	Burr Brown PCM1781	-98 dB	-97 dB		-119 dB	yes	0.00190 %
10/2012	Weiss	MAN301	HDD play	ESS ES9018	-128 dB	-120 dB		-139 dB	yes	0.00011 %
11/2012	Arcam	FMJ D33	USB in.	Burr Brown PCM1792	-102 dB	-110 dB	-115 dB	-125 dB	yes	0.00088 %
11/2012	Denon	DBT 3313 UD	Universal	Burr Brown PCM1795	-98 dB	-113 dB	-119 dB	-127 dB	yes	0.00128 %
11/2012	Musical Fidelity	M6 DAC	USB in	Burr Brown DSD1796	-101 dB	-104 dB	-113 dB	-117 dB	yes	0.00112 %
12/2012	Arcam	FMJ BDP 300	BR-D	Wolfson WM8741	-102 dB	-95 dB		-100 dB	yes	0.00219 %
12/2012	Marantz	UD7007	Universal	Burr Brown PCM1795	-104 dB	-107 dB	-115 dB	-102 dB	yes	0.00080 %
1/2013	Linnenberg	u:c:a	USB in	Burr Br. PCM1794A	-87 dB	-67 dB	-104 dB	-98 dB	yes	0.04491 %
2/2013	Meitner	MA 2	Digital in	Manufacturer's own	-124 dB	-110 dB			yes	0.00032 %
3/2013	NAD	M51		Zetex ZXCZM800	-107 dB	-125 dB	-111 dB	-121 dB	yes	0.00054 %
3/2013	Meridian	Explorer	USB	?	-108 dB	-110 dB	-115 dB	-126 dB	yes	0.00054 %
4/2013	Oppo	BDP-105	Universal	ESS ES9018 ⁵³	-123 dB	-122 dB	-143 dB	-139 dB	yes	0.00011 %
6/2013	North Star Design	Fluxio		Burr Brown PCM1795	-80 dB	-90 dB	-90 dB	-103 dB	yes	0.01098 %
6/2013	Musical Fidelity	M1SDAC	USB in	Burr Brown DSD1796	-110 dB	-103 dB	-109 dB	-123 dB	yes	0.00086 %
6/2013	T+A	MP 3000 HV	CD	Burr Brown PCM1795	-94 dB	-108 dB	-122 dB		yes	0.00445 %

52 The same measurement was published three other times: in the April 2014 issue, as well as in the February 2016 and March 2018 issues (review of the DAC8 DSD) of *Stereoplay*.

53 In 7.1 mode, another ESS9018 is used but with different output stages.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
6/2013	MacIntosh	D100	USB in	ESS ES9016	-112 dB	-136 dB	-122 dB	-128 dB	yes	0.00027 %
7/2013	Auralic	Vega	DSD	ESS ES9018	-114 dB	-119 dB	-136 dB	-124 dB	yes	0.00024 %
7/2013	Cayin	DAC11	USB in	Burr Brown PCM1792	-45 dB	-65 dB	-72 dB	-76 dB	yes	0.56593 %
8/2013	Electrocompaniet	EMP 3	Universal	?	-108 dB	-89 dB	-127 dB	-106 dB	yes	0.00361 %
9/2013	B.M.C.	PureDAC	USB in	ESS ES9018	-102 dB	-72 dB	-114 dB	-91 dB	yes	0.02529 %
12/2013	TEAC	UD-501	DSD	Burr Brown PCM1795	-116 dB	-126 dB	-131 dB	-138 dB		0.00017 %
1/2014	AMI	DDH-1	USB in	Burr Brown PCM1795	-92 dB	-99 dB	-126 dB	-129 dB	yes	0.00275 %
2/2014	Playback Designs	MPD-3 DAC	DSD	Manufacturer's own	-84 dB	-96 dB	-101 dB		yes	0.00657 %
4/2014	Cambridge	Azur 752 BD	Universal	Wolfson WM8740	-105 dB	-115 dB	-116 dB	-111 dB	yes	0.00067 %
4/2014	Oppo	BDP-103D	Universal	Cirrus Log. CS4382A	-89 dB	-111 dB		-115 dB	yes	0.00356 %
4/2014	Ayon	S-5	Network	Burr Brown PCM1704	-46 dB	-77 dB	-107 dB	-101 dB	yes	0.50139 %
4/2014	North Star Design	Incanto	USB in	ESS ES9016	-112 dB	-115 dB	-129 dB	-135 dB	yes	0.00031 %
4/2014	Wadia	di122	USB in	ESS ES9016	-97 dB	-101 dB	-107 dB	-115 dB	yes	0.00174 %
4/2014	Audio Analogue	Vivace	USB in	Burr Brown PCM1795	-80 dB	-79 dB	-86 dB	-99 dB	yes	0.01589 %
5/2014	Pro-Ject	DAC BOX RS ⁵⁴	USB in	Burr Brown PCM1792	-90 dB	-107 dB	-109 dB	-120 dB	yes	0.00322 %
5/2015	Aesthetix	Romulus	USB in	Burr Br. PCM1792A	-70 dB	-85 dB	-92 dB	-96 dB	yes	0.03226 %
5/2015	Restek	Epos+	Digital in	Burr Brown PCM1704	-101 dB	-100 dB	-112 dB	-105 dB	yes	0.00147 %
6/2014	Audio Research	CD6	Digital in	Burr Br. PCM1792A	-87 dB	-69 dB	-111 dB	-93 dB	yes	0.03583 %
7/2014 ⁵⁵	Rotel	RDD 1580	USB in	Wolfson WM8740	-100 dB	-103 dB	-114 dB	-117 dB	yes	0.00125 %
7/2014	SOTM	Network player SMS100 Converter SHP100 Power supply MBPS100	USB in	Cirrus Logic CS4398	-103 dB	-106 dB	-130 dB	-108 dB	yes	0.00095 %
8/2014	Wadia	321	USB in	ESS ES9018	-113 dB	-110 dB	-124 dB	-116 dB	yes	0.00042 %
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⁵⁴ The converter was also tested in the same issue with its CD transport. See below a test in 16 bits/44.1 kHz PCM in dBr.

⁵⁵ The same measurement was also published in the June 2015 issue of *Stereoplay*.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
9/2014 ⁵⁶	Marantz	NA 8005	Network	Cirrus Logic CS4398	-101 dB	-112 dB		-108 dB	yes	0.00101 %
10/2014	AMC	US24192i	USB in	?	-89 dB	-102 dB	-105 dB	-116 dB	yes	0.00368 %
10/2014	Naim	NAC-N 172 XS	Network	?	-80 dB	-88 dB	-102 dB	-107 dB	yes	0.01080 %
11/2014	Nagra	Converter HD DAC Power supply MPS	USB in	Andreas Koch's design	-60 dB	-98 dB	-101 dB	-116 dB	yes	0.10001 %
11/2014	Pioneer	U-05S	USB in	ESS ES9016	-110 dB	-110 dB	-115 dB	-121 dB	yes	0.00049 %
11/2014	North Star Design	Excelsio	USB in	ESS ES9018	-121 dB	-129 dB	-139 dB	-128 dB	yes	0.00010 %
11/2014	Shanling	CD 3.2	USB in	ESS ES9018	-131 dB	-125 dB	-143 dB	-129 dB	yes	0.00007 %
11/2014	TAD	DA-1000	USB in	Burr Brown PCM1794	-102 dB	-110 dB	-113 dB	-123 dB	yes	0.00089 %
2/2015 ⁵⁷	iFi Audio	iDSD Micro	USB in	Burr Brown DSD1793	-95 dB	-104 dB	-106 dB	-107 dB	yes	0.00200 %
2/2015	Chord	Hugo	USB in	Manufacturer's own	-115 dB	-127 dB	-131 dB	-126 dB	yes	0.00019 %
2/2015	Ayre	QB-9	DSD	ESS ES9016	-99 dB	-85 dB	-129 dB	-122 dB	yes	0.00574 %
2/2015	Pioneer	N-50A	HDD play	ESS ES9011	-120 dB	-104 dB	-134 dB	-129 dB	yes	0.00064 %
2/2015 ⁵⁸	CocktailAudio	X-40	HDD play	ESS ES9018 K2M	-101 dB	-116 dB	-125 dB	-121 dB	yes	0.00091 %
2/2015	T+A	PDP 3000 HV	SA-CD	Burr Br. PCM1795 ⁵⁹	-102 dB	-106 dB	-124 dB	-128 dB	yes	0.00094 %
2/2015	Technics	ST-C700	Network	Burr Brown PCM1795	-100 dB	-109 dB	-112 dB	-119 dB	yes	0.00110 %
2/2015	Pioneer	BDP-LX88	SA-CD	ESS ES9018	-110 dB	-114 dB	-133 dB	-131 dB	yes	0.00038 %
2/2015	Oppo	BDP-105D	Universal	ESS ES9018 ⁶⁰	-121 dB	-121 dB				0.00013 %
3/2015	Musical Fidelity	M3SCD	USB in	?	-89 dB	-98 dB	-110 dB	-113 dB	yes	0.00378 %
3/2015	Rega	Saturn-R	USB in	Wolfson WM8742	-87 dB	-91 dB	-126 dB	-95 dB	yes	0.00557 %
3/2015	Yamaha	CD-S2100	USB in	ESS ES9016	-126 dB	-119 dB		-128 dB	yes	0.00013 %

⁵⁶ The same measurement was also published in the November 2014 issue of *Stereoplay*.

⁵⁷ The same measurement was also published in the February 2016 issue of *Stereoplay* (review of the iDSD Nano).

⁵⁸ The same measurement was also published in the May 2015 issue of *Audio*.

⁵⁹ When playing SA-CDs, DSD signals are converted into 24 bits/88.2 kHz PCM prior to the D/A conversion. Under some restrictions, when playing DSD files, the D/A converters (a manufacturer's own design) and the output stages are different.

⁶⁰ In 7.1 mode, another ESS9018 is used but with different output stages.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
3/2015	Bluesound	Node	Network	?	-104 dB	-96 dB	-109 dB	-104 dB	yes	0.00185 %
3/2015	Marantz	NA 6005	Network	Cirrus Logic CS4398	-104 dB	-114 dB	-129 dB	-110 dB	yes	0.00073 %
3/2015	Cambridge	StreamMagic V2	Network	Wolfson WM8740	-107 dB	-105 dB	-127 dB	-113 dB	yes	0.00075 %
3/2015	Pioneer	N-70A	Network	ESS ES9016	-120 dB	-99 dB		-127 dB	yes	0.00113 %
5/2015	Linn	Majik DS V2		?	-102 dB	-107 dB	-132 dB	-125 dB	yes	0.00091 %
6/2015	MacIntosh	Disc transport MCT450 Converter D150	SA-CD USB in	ESS ES9016	-114 dB	-121 dB	-126 dB	-128 dB	yes	0.00023 %
6/2015	Matrix	Mini i-Pro	USB in	ESS ES9016	-116 dB	-101 dB	-118 dB	-129 dB	yes	0.00091 %
6/2015	Musical Fidelity	MX-DAC	USB in	Burr Brown PCM1795	-92 dB	-106 dB	-105 dB	-124 dB	yes	0.00262 %
6/2015	Atoll	DAC 200	USB in	Burr Brown PCM1792	-83 dB	-93 dB	-96 dB	-105 dB	yes	0.00761 %
6/2015	AVM	Evolution MP 5.2	Network	?	-81 dB	-82 dB	-118 dB	-101 dB	yes	0.01197 %
6/2015 ⁶¹	Burmester	150	Network	?	-121 dB	-112 dB	-128 dB	-113 dB	yes	0.00035 %
7/2015	Naim	NAC-N 272	Network	?	-60 dB	-76 dB	-66 dB	-82 dB	yes	0.11330 %
7/2015	Linn	Akurate DSM/1	Network	Wolfson WM8741	-107 dB	-109 dB	-121 dB	-107 dB	yes	0.00073 %
7/2015	Arcam	UDP 411	Universal	Burr Brown PCM1794	-95 dB	-100 dB	-125 dB	-119 dB		0.00204 %
7/2015	T+A	MP 2000 R	Network	Burr Brown PCM1795	-89 dB	-103 dB	-110 dB	-133 dB	yes	0.00363 %
8/2015	Cambridge	CXN	Network	Wolfson WM8740	-104 dB	-101 dB	-124 dB	-114 dB	yes	0.00111 %
9/2015	ReQuest	The Beast	HDD play	OEM MSB Techno.	-91 dB	-93 dB	-97 dB	-101 dB	yes	0.00397 %
9/2015	Digibit	Aria DAC	HDD play	Burr Brown PCM1795	-108 dB	-101 dB	-118 dB	-114 dB	yes	0.00100 %
9/2015	AVM	Music Server ML 6.2	HDD play	?	-87 dB	-80 dB	-100 dB	-98 dB	yes	0.01101 %
9/2015	QUAT	MS5	HDD play	Analog Dev. AD1955	-90 dB	-89 dB	-103 dB	-108 dB	yes	0.00482 %
9/2015	Astell&Kern	AK500	HDD play	Cirrus Logic CS4398	-107 dB	-105 dB	-132 dB	-110 dB	yes	0.00079 %
10/2015	Arcam	AirDAC	Network	Burr Brown PCM5102	-86 dB	-95 dB	-123 dB	-101 dB	yes	0.00539 %
2/2016	TEAC	NT-503	Network	AKM AK4490	-108 dB	-104 dB		-128 dB		0.00075 %

61 The measurement was also published in the September 2015 issue of *Stereoplay* (review of the 151 Musiccenter). A new measurement was published in the July 2016 issue of *Stereoplay* (see below).

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
2/2016	Shanling	H 1.2	USB in	ESS ES9016	-113 dB	-105 dB	-121 dB	-118 dB	yes	0.00061 %
2/2016	Consonance	Reference DSD1.1	USB in	AKM AK4490	-62 dB	-93 dB	-102 dB	-112 dB	yes	0.07947 %
2/2016	Technics	SU-R1	Network	Burr Brown PCM1792	-120 dB	-121 dB				0.00013 %
3/2016	Wadia	di322	USB in	ESS ES9018S	-106 dB	-127 dB	-126 dB	-139 dB	yes	0.00051 %
5/2016	Nagra	Classic DAC	DXD	Andreas Koch's design	-67 dB	-91 dB		-116 dB	yes	0.04476 %
6/2016	Chord	Dave	DSD256	Manufacturer's own	-128 dB	-124 dB	-130 dB	-136 dB	yes	0.00008 %
7/2016 ⁶²	Burmester	150	Network	?	-107 dB	-105 dB	-121 dB	-127 dB	yes	0.00073 %
7/2016	Shanling	M 3.2	Network	ESS ES9018	-109 dB	-135 dB	-120 dB	-128 dB	yes	0.00037 %
7/2016	Consonance	Reference DSD1.3	USB in	?	-119 dB	-128 dB	-127 dB	-110 dB	yes	0.00034 %
8/2016	Entotem	Plato	HDD play	?	-97 dB	-106 dB	-122 dB	-104 dB	yes	0.00163 %
8/2016	Sony	HAP-Z1ES	HDD play	Burr Brown PCM1795	-125 dB	-130 dB	-131 dB	-131 dB	yes	0.00008 %
8/2016	Playback Designs	Network player Syrah Converter Merlot		Manufacturer's own	-110 dB	-100 dB	-111 dB	-117 dB	yes	0.00110 %
8/2016	Purist	Micro 2TB	HDD play	?	-71 dB	-71 dB	-71 dB	-74 dB	yes	0.05273 %
8/2016	CAAS Audio	DAS	HDD play	?	-64 dB	-72 dB	-69 dB	-86 dB	yes	0.07679 %
8/2016 ⁶³	ELAC	Discovery DS-S101G	HDD play	?	-103 dB	-98 dB	-125 dB	-110 dB	yes	0.00148 %
8/2016	Bluesound	Vault 2	HDD play	Burr Brown PCM5122	-87 dB	-100 dB	-108 dB	-118 dB	yes	0.00460 %
8/2016	Cocktail Audio	X-12	HDD play	Cirrus Logic CS4351	-81 dB	-98 dB	-118 dB			0.00900 %
8/2016	Astell&Kern	AK300 (with its dock)	HDD play	AKM AK4490	-107 dB	-105 dB		-135 dB	yes	0.00072 %
9/2016	SOTM	sDP-1000EX		?	-117 dB	-105 dB	-111 dB	-108 dB	yes	0.00076 %
10/2016	Cayin	iDAC-6	USB in	AKM AK4490	-116 dB	-94 dB	-114 dB	-103 dB	yes	0.00213 %
10/2016	Primare	NP30	Network	Burr Brown PCM1792	-93 dB	-85 dB	-105 dB	-103 dB	yes	0.00612 %
10/2016	T+A	MP 2000R Mk II	Network	Burr Brown PCM1795	-92 dB	-118 dB	-110 dB	-134 dB	yes	0.00253 %
11/2016	Bluesound	Node 2	Network	Burr Brown PCM5122	-89 dB	-101 dB	-116 dB	-113 dB	yes	0.00367 %

62 Another measurement was previously published twice, first in the June 2015 issue of *Audio* (see above) and next in the September 2015 issue of *Stereoplay*.

63 The same measurement was also published in the September 2016 issue of *Audio*.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
11/2016	Cabasse	Stream Source	Network	Wolfson WM8524	-67 dB	-73 dB	-86 dB	-89 dB	yes	0.05034 %
12/2016	Naim	NDX ⁶⁴	Network	Burr Brown PCM1791	-106 dB	-104 dB	-111 dB	-113 dB	yes	0.00088 %
12/2016	YBA	MP100SE	Network	AKM AK4490	-119 dB	-107 dB	-130 dB	-133 dB	yes	0.00046 %
2/2017	Musical Fidelity	Encore Connect	HDD play	?	-92 dB	-115 dB	-116 dB	-111 dB	yes	0.00254 %
2/2017	Digibit	Aria 2	HDD play	?	-104 dB	-124 dB	-129 dB	-118 dB	yes	0.00065 %
2/2017	Auralic	Altaïr	HDD play	ESS ES9018KSM	-126 dB	-115 dB	-133 dB	-132 dB	yes	0.00019 %
3/2017	Lindemann	musicbook:25DSD	Network	AKM AK4490	-101 dB	-109 dB		-135 dB		0.00096 %
4/2017	Luxman	DA-250	USB in	Burr Brown PCM1795	-104 dB	-108 dB	-111 dB	-124 dB	yes	0.00080 %
6/2017	Ayon	CD-35	Digital ins	AKM AK4490EQ	-69 dB	-91 dB	-105 dB	-118 dB	yes	0.03560 %
7/2017	Sugden	Masterclass DAC-4	USB in	?	-98 dB	-100 dB	-109 dB	-96 dB	yes	0.00229 %
8/2017	Accustic Arts	Tube DAC II MK3	USB in	Burr Brown PCM1792	-81 dB	-100 dB	-114 dB	-126 dB	yes	0.00897 %
10/2017	AVM	Ovation CD 8.2	Digital in	?	-66 dB	-69 dB	-82 dB	-80 dB	yes	0.06272 %
2/2018	Cocktail Audio	N15	Network	ESS ES9018K2M	-118 dB	-115 dB	-123 dB	-125 dB	yes	0.00026 %
4/2018	Marantz	ND8006	Network	ESS ES9016	-105 dB	-124 dB	-136 dB	-130 dB	yes	0.00057 %
6/2018	Brinkmann	Nyquist	Network	ESS ES9018S ⁶⁵	-69 dB	-65 dB	-105 dB	-80 dB	yes	0.06724 %
9/2018	Digitale Audio Systeme	HD-Player Model 2	HDD play	Manufacturer's own R2R	-90 dB	-71 dB	-86 dB	-83 dB	yes	0.02966 %
11/2018	Naim	NDX 2	Network	Burr Br. PCM1792A	-117 dB	-119 dB	-121 dB	-127 dB		0.00021 %
5/2022	Advance Paris	WTX-Stream Tube	Network	Burr Brown PCM1796	-84 dB	-98 dB	-80 dB	-104 dB	yes	0.01191 %
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64 With software update. The same device with the first version of the software was tested in 24 bits/96 kHz PCM in dBV in the May 2011 issue of *Stereoplay* (see below).

65 In DSD mode, the D/A converters (a manufacturer's own design) and the output stages are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/48 kHz) at 315 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
11/2003	Harman Kardon	DVD 25		Wolfson WM8740	-108 dB	-104 dB	-112 dB	-125 dB	yes	0.00079 %
11/2003	JVC	XV NP 1		AKM AK4381	-93 dB	-102 dB	-104 dB	-107 dB	yes	0.00250 %
11/2003	Onkyo	DV SP 501		Burr Brown PCM1742	-90 dB	-91 dB	-110 dB	-110 dB	yes	0.00426 %
11/2003	Yamaha	DVD S 540		AKM AK4382	-102 dB	-97 dB	-126 dB	-112 dB	yes	0.00164 %
6/2004	JVC	XV N 316		AKM AK4385	-88 dB	-87 dB	-108 dB	-91 dB	yes	0.00663 %
6/2004	Kiss	DP 1000		Wolfson WM8728	-58 dB	-79 dB	-92 dB	-100 dB	yes	0.12642 %
6/2004	Panasonic	DVD S 47	DVD-A	Burr Brown PCM1752	-95 dB	-98 dB	-123 dB	-119 dB	yes	0.00218 %
6/2004	Pioneer	DV 2750		Burr Brown PCM1742	-104 dB	-108 dB	-118 dB	-122 dB	yes	0.00076 %
6/2004	TEAC	DV 7 D		Burr Brown PCM1606	-92 dB	-107 dB	-101 dB	-105 dB	yes	0.00276 %
7/2004	Philips	DVP 720 SA	SA-CD	AKM AK4382A ⁶⁶	-108 dB	-90 dB		-98 dB	yes	0.00343 %
7/2004	Pioneer	DV 575A	SA-CD	Burr Brown PCM1742	-101 dB	-111 dB	-121 dB	-121 dB	yes	0.00094 %
3/2007	Samsung	BD P 1000	BR-D	AKM AK4358	-102 dB	-82 dB	-120 dB	-95 dB	yes	0.00818 %
3/2007	Toshiba	HD E 1	HD-DVD	Burr Brown PCM1755	-97 dB	-90 dB	-109 dB	-114 dB	yes	0.00349 %
8/2007	Pioneer	BDP LX 70	BR-D	Burr Brown PCM1738	-99 dB	-111 dB	-114 dB	-122 dB	yes	0.00118 %
8/2007	Sony	BDP S1E	BR-D	Burr Brown PCM1738	-97 dB	-104 dB	-109 dB	-112 dB	yes	0.00161 %
11/2007	Pioneer	BDP LX 70 A	BR-D	Burr Brown PCM1738	-89 dB	-111 dB	-114 dB	-123 dB	yes	0.00357 %
11/2007	Samsung	BDP 1400	BR-D	AKM AK4358	-101 dB	-85 dB	-111 dB	-93 dB	yes	0.00612 %
4/2008	Panasonic	DMP BD 30	BR-D	Burr Brown PCM1680	-100 dB	-97 dB		-118 dB	yes	0.00174 %
4/2008	Philips	BDP 7100	BR-D	AKM AK4358	-105 dB	-85 dB	-110 dB	-96 dB	yes	0.00588 %
7/2008	Sony	BDP S 300	BR-D	Burr Brown PCM1791	-107 dB	-108 dB	-124 dB	-125 dB		0.00060 %
7/2008	Sony	BDP S 500	BR-D	Burr Brown PCM1791	-93 dB	-111 dB	-109 dB	-115 dB	yes	0.00229 %
8/2008	Panasonic	DMP BD 50	BR-D	?	-104 dB	-99 dB		-114 dB	yes	0.00130 %
8/2008	Samsung	BDP 1500	BR-D	AKM AK4396		-102 dB	-100 dB	-113 dB	yes	0.00130 %
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⁶⁶ In 2.0 mode. In 7.1 mode, another DAC chip (Cirrus Logic CS4360) is used to produce the centre, surround et LFE channels.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/192 kHz) at 1 kHz, levels in dBV										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
11/2011	Ayon	S 3	Network	Burr Brown PCM1792	-72 dB	-90 dB	-115 dB	-116 dB	yes	-71,9 dB
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Test in high resolution PCM (24 bits/96 kHz) at 1 kHz, levels in dBV										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
9/2008	Apogee	Rosetta 200		Analog Dev. AD1852	-106 dB	-121 dB	-119 dB	-129 dB	yes	-105,6 dB
9/2008	Aqvox	USB 2 D/A		Burr Brown PCM1796	-77 dB	-76 dB	-104 dB	-93 dB	yes	-73,4 dB
9/2008	Benchmark	DAC 1 Pre	Pre-Proc.	Analog Dev. AD1853	-109 dB	-123 dB	-114 dB	-131 dB	yes	-107,6 dB
9/2008	M-Audio	Fast Track Ultra		?	-101 dB	-105 dB	-116 dB	-107 dB	yes	-98,7 dB
9/2008	Terratec	DMX 6Fire USB	Sound c.	Cirrus Logic CS42426	-106 dB	-99 dB	-121 dB	-113 dB	yes	-98,0 dB
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Test in high resolution PCM (24 bits/96 kHz) at 315 Hz, levels in dBV										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
5/2009	Musical Fidelity	V-DAC		Burr Brown DSD1792	-96 dB	-92 dB	-105 dB	-101 dB	yes	-90.0 dB
5/2009	Cambridge	DacMagic		Wolfson WM8740	-106 dB	-109 dB	-115 dB	-113 dB	yes	-103,3 dB
5/2009	Advance Acoustic	MDA 503		Analog Dev. AD1955	-77 dB	-92 dB	-102 dB	-117 dB	yes	-76,8 dB
5/2009	Lavry	DA 11		Analog Dev. AD1955	-98 dB	-117 dB	-128 dB	-124 dB	yes	-97,9 dB
2/2010	Audio Research	DAC 7	USB in	Burr Brown PCM1792	-88 dB	-71 dB	-110 dB	-102 dB	yes	-70.9 dB
2/2010	Ayre	QB 9	USB in	Burr Brown DSD1796	-77 dB	-84 dB	-103 dB	-112 dB	yes	-76,2 dB
2/2010	PS Audio	PerfectWave	USB in	Wolfson WM8742	-81 dB	-96 dB	-119 dB	-107 dB	yes	-80.8 dB
2/2010	T+A	MP 1260R	USB in	Burr Brown PCM1795	-123 dB	-117 dB	-128 dB	-129 dB	yes	-115,5 dB
4/2011	Musical Fidelity	M1 Clic	Network	Burr Brown DSD1796	-110 dB	-97 dB	-120 dB	-124 dB	yes	-96,7 dB

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/96 kHz) at 315 Hz, levels in dBV										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
4/2011	Marantz	NA 7004	Network	Cirrus Logic CS4398	-107 dB	-115 dB		-108 dB	yes	-104,0 dB
4/2011	Rotel	RT-09	Network	Wolfson WM8740	-98 dB	-95 dB	-93 dB	-95 dB	yes	-88,8 dB
4/2011	Meridian	Sooloos MediaCore 200	Network	?	-88 dB	-87 dB	-118 dB	-98 dB	yes	-84,2 dB
4/2011	Olive	06 HD	Network	Burr Brown PCM1792	-101 dB	-113 dB	-111 dB	-129 dB	yes	-100.3 dB
5/2011	Naim	NDX ⁶⁷	+ Wifi	Burr Brown PCM1791	-103 dB	-107 dB	-116 dB	-119 dB		-101,3 dB
6/2011	Audio Research	DAC 8	USB in	Burr Brown PCM1792	-79 dB	-73 dB	-106 dB	-88 dB	yes	-71,9 dB
1/2012	Linn	Klimax DS/1	Network	Wolfson WM8741	-122 dB	-102 dB	-130 dB	-107 dB	yes	-100.7 dB
1/2012	Linn	Klimax DSM	Network	Wolfson WM8741	-117 dB	-95 dB	-126 dB	-105 dB	yes	-94,5 dB
1/2012 ⁶⁸	Naim	ND5 XS	+ Wifi	Burr Brown PCM1791	-108 dB	-105 dB	-116 dB	-117 dB	yes	-102,8 dB
10/2012	Naim	Converter NDS Power supply XPS	+ Wifi	Burr Brown PCM1704	-103 dB	-118 dB	-107 dB	-111 dB	yes	-100.9 dB
1/2013	Denon	DNP-F109	Network	AKM AK4424	-91 dB	-99 dB	-116 dB	-110 dB	yes	-90.3 dB
1/2013	Pioneer	N-50	Network	AKM AK4480	-106 dB	-103 dB	-123 dB	-115 dB	yes	-101,0 dB
1/2013	Rotel	RT-12	Network	Wolfson WM8740	-94 dB	-88 dB	-113 dB	-104 dB	yes	-86,9 dB
1/2013	Yamaha	CD-N500	Network	Burr Brown PCM5121	-91 dB	-96 dB	-92 dB	-114 dB	yes	-87,7 dB
2/2013	Atoll	ST 100	Network	Burr Brown PCM1796	-40 dB	-54 dB	-68 dB	-81 dB	yes	-39,8 dB
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67 The same device with software update was tested in 24 bits/96 kHz PCM in dBr in the December 2016 issue of *Stereoplay* (see above).

68 Also tested in 24 bits/192 kHz PCM in dBr in the November 2016 issue of *Audio* (see above).

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in high resolution PCM (24 bits/48 kHz) at 1 kHz, levels in dBV										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
12/2008	Accustic Arts	Tube DAC II SE ⁶⁹	Tube out	?	-109 dB	-110 dB	-99 dB	-112 dB	yes	-98,1 dB
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Test in high resolution PCM (24 bits/48 kHz) at 330 Hz, levels in dBV										
Édition	Marque	Désignation	Note	Convertisseur(s) N/A	H2	H3	H4	H5	Hn	THD
12/2007	PS Audio	DL III		Burr Brown PCM1798	-76 dB	-86 dB	-106 dB	-104 dB	yes	-75,6 dB
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Test in WAV (192 kHz sampling frequency) at 315 Hz, levels in dBV										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
11/2009	Linn	Majik DS Dynamik	Network	Wolfson WM8740	-114 dB	-94 dB	-123 dB	-106 dB	yes	-93,6 dB
11/2009	Linn	Akurate DS Dynamik	Network	Wolfson WM8740	-112 dB	-94 dB	-122 dB	-106 dB	yes	-93,6 dB
11/2009	Linn	Klimax DS Dynamik	Network	Wolfson WM8740	-90 dB	-92 dB	-109 dB	-97 dB	yes	-87,3 dB
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69 The converter was also tested in the same issue with its transport Drive II. See below a test in 16 bits/44.1 kHz PCM in dBr.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

DAP tested in high resolution PCM (24 bits/96 kHz) at 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
8/2020	Shanling	M6		AKM AK4493SEQ		-120 dB				0.00010 %
3/2021	Cayin	N3Pro		AKM AK4493EQ	-115 dB	-114 dB	-113 dB			0.00035 %
8/2021	iBasso	DX300		Cirrus Logic CS43198	-104 dB	-106 dB	-118 dB	-113 dB	yes	0.00082 %
8/2021	Shanling	M3X		ESS ES9219	-94 dB	-97 dB	-107 dB	-118 dB	yes	0.00249 %
8/2021	Sony	NW-A105		Sony CXD3778	-73 dB	-81 dB	-88 dB	-97 dB	yes	0.02446 %
8/2021	HiBy	R6 2020		ESS ES9038Q2M	-124 dB	-123 dB			yes	0.00009 %
8/2022	Astell&Kern	Kann Max		ESS ES9038Q2M	-108 dB	-112 dB	-117 dB		yes	0.00049 %
8/2022	Cayin	N8ii		Rohm BD34301EKV	-64 dB	-49 dB	-89 dB	-66 dB	yes	0.36387 %
8/2022	Fiio	M17		ESS ES9038PRO	-116 dB	-111 dB	-128 dB	-109 dB	yes	0.00048 %
8/2022	HiBy	R5 Gen2		ESS ES9219C	-121 dB	-108 dB	-123 dB	-116 dB	yes	0.00044 %
8/2022	iBasso	DX240		ESS ES9038PRO	-99 dB	-100 dB	-128 dB	-125 dB	yes	0.00150 %
8/2022	Shanling	M6 Pro		ESS ES9068AS	-112 dB	-101 dB	-119 dB	-89 dB	yes	0.00367 %
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THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 1 kHz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
4/1992 ⁷⁰	Philips	LHH500		Philips SAA7321	-91 dB	-94 dB	-94 dB	-98 dB	yes	0.00418 %
7/1995 ⁷¹	Denon	DCD-S10	Digital in	Burr Brown PCM1702	-112 dB	-117 dB	-113 dB	-114 dB	yes	0.00042 %
7/1995 ⁷²	Sony	CDP-XA7ES		Sony CXD2562	-115 dB	-115 dB				0.00025 %
7/1996	Wadia	25		Burr Brown PCM1702	-87 dB	-73 dB	-103 dB	-94 dB	yes	0.02292 %
7/1996	Marantz	CD63 Mk II KI Signature		NPC SM5872	-100 dB	-106 dB	-112 dB			0.00115 %
7/1996	Sony	CDP-XA3ES		Sony CXD2562	-104 dB	-113 dB	-114 dB	-115 dB		0.00072 %
7/1996	TEAC	VRDS 10 Special Edition		Philips TDA1547	-103 dB	-106 dB		-103 dB		0.00112 %
7/1996	Rotel	RCD 930 AX		Sony CXD2518	-88 dB	-84 dB	-96 dB	-98 dB	yes	0.00773 %
2/1997	Onix	CD 33/3	HDCD	Burr Brown PCM67	-101 B	-96 dB	-97 dB	-94 dB	yes	0.00305 %
2/1997	Phonosophie	CD-Player 2	HDCD	Burr Brown PCM67	-109 dB	-107 dB	-118 dB	-123 dB	yes	0.00059 %
2/1997	Arcam	Alpha 8		NPC SM5864	-106 dB	-116 dB		-127 dB	yes	0.00053 %
2/1997	Cyrus	DAD 3		Philips TDA1305	-96 dB	-110 dB	-106 dB	-109 dB	yes	0.00173 %
2/1997	Rega	Planet		Burr Brown PCM1710	-104 dB	-100 dB	-117 dB	-113 dB	yes	0.00121 %
2/1997	Denon	DCD 425		Burr Brown PCM1712	-94 dB	-85 dB	-114 dB	-88 dB	yes	0.00718 %
2/1997	Denon	DCD 625 II		?	-114 dB	-93 dB	-117 dB	-101 dB	yes	0.00242 %
2/1997	Grundig	M 100 CD		Philips TDA1549	-117 dB	-108 dB	-123 dB	-104 dB	yes	0.00076 %
2/1997	Marantz	CD 57		NPC SM5872	-108 dB	-110 dB	-120 dB		yes	0.00052 %
2/1997	Onkyo	DX 7210		NPC SM5872	-98 dB	-109 dB	-118 dB	-125 dB	yes	0.00132 %
2/1997	Pioneer	PD S 705		Pioneer PD2029A	-107 dB	-113 dB	-117 dB	-116 dB	yes	0.00054 %
2/1997	Technics	SL PG 580 A		Panasonic MN662713	-97 dB	-108 dB	-114 dB	-108 dB	yes	0.00153 %
4/1997	Grundig	CD 437		Philips TDA1313	-94 dB	-101 dB	-110 dB	-114 dB	yes	0.00222 %
4/1997	JVC	XL V 120		Panasonic MN35510	-93 dB	-100 dB		-116 dB		0.00246 %

70 Measured without notch filter.

71 The level of each harmonic is converted in dBr from the absolute levels published in the magazine (see below the original levels in dBV) and the level of the test signal measured at the output of the device, that is 7.4 dBV, which set 0 dBr.

72 The level of each harmonic is converted in dBr from the absolute levels published in the magazine (see below the original levels in dBV) and the level of the test signal measured at the output of the device, that is 8.3 dBV, which set 0 dBr.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 1 kHz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
4/1997	Marantz	CD 46		Philips TDA1545	-92 dB	-116 dB	-105 dB	-116 dB	yes	0.00258 %
4/1997	Onkyo	DX 7110		NPC SM5872	-95 dB	-109 dB	-115 dB	-125 dB	yes	0.00182 %
4/1997	Philips	CD 721		Philips TDA1545	-94 dB	-108 dB	-106 dB	-106 dB	yes	0.00215 %
4/1997	Pioneer	PD 204		Pioneer PD2026	-94 dB	-104 dB	-118 dB	-105 dB	yes	0.00213 %
4/1997	Sony	CDP-XA50ES		Sony CXD2562	-106 dB	-127 dB	-125 dB			0.00051 %
4/1997	Panasonic	DVD A 100	DVD-V	Burr Brown PCM1710	-109 dB	-98 dB	-120 dB	-118 dB	yes	0.00132 %
4/1997	Thomson	DTH 1000	DVD-V	Burr Brown PCM1710	-109 dB	-98 dB	-120 dB	-118 dB	yes	0.00132 %
7/1997	Mark Levinson	N° 36 S	HDCCD	Burr Brown PCM1702	-117 dB	-110 dB	-114 dB	-111 dB	yes	0.00049 %
7/1997	AMC	CD 9		Panasonic MN6474	-117 dB	-103 dB	-114 dB	-118 dB	yes	0.00076 %
7/1997	Onkyo	DX 7511		NPC SM5872CN	-96 dB	-108 dB	-123 dB	-120 dB	yes	0.00164 %
8/1997	Cambridge	DAC 3		Philips TDA1305	-100 dB	-106 dB	-117 dB	-114 dB	yes	0.00115 %
8/1997	Musical Fidelity	X-DAC	HDCCD	Burr Brown PCM69	-96 dB	-91 dB	-87 dB	-121 dB	yes	0.00552 %
8/1997	Orelle	DA 188		Analog Dev. AD1864	-103 dB	-105 dB	-114 dB	-108 dB	yes	0.00101 %
8/1997	Sony	CDP-XA30ES		Sony CXD2562	-114 dB	-127 dB	-117 dB	-123 dB		0.00026 %
9/1997	Wadia	850		Burr Brown PCM1702	-84 dB	-71 dB	-107 dB	-85 dB	yes	0.02943 %
9/1997	Advantage	CD 1		Burr Brown PCM1702	-98 dB	-115 dB	-118 dB	-117 dB	yes	0.00129 %
9/1997	Copland	CDA 288	HDCCD	Burr Brown PCM63P	-94 dB	-103 dB	-111 dB	-106 dB	yes	0.00219 %
9/1997	Meridian	508.20		Cirrus Logic CS4329	-113 dB	-119 dB	-129 dB	-129 dB		0.00026 %
9/1997	Kenwood	DP 5090		Kenwood KAN05	-109 dB	-110 dB	-123 dB	-114 dB	yes	0.00052 %
9/1997	Pioneer	PD S 605		Pioneer PD2029	-98 dB	-94 dB	-116 dB	-121 dB	yes	0.00237 %
9/1997	Sony	CDP-XE700		Sony CXD8567	-111 dB	-104 dB	-124 dB	-111 dB	yes	0.00075 %
9/1997	Technics	SL PS 670 D		Panasonic MN6474	-98 dB	-106 dB	-111 dB	-109 dB	yes	0.00143 %
9/1997	Cello	Reference		Burr Brown PCM63K	-109 dB	-116 dB	-108 dB	-125 dB	yes	0.00056 %
10/1997	Dynaco	CDV2	Tube out	NPC SM5871	-66 dB	-95 dB	-113 dB	-117 dB	yes	0.05015 %
10/1997	Helios	Model 3 S		Cirrus Logic CS4328	-101 dB	-107 dB	-104 dB	-114 dB	yes	0.00120 %

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 1 kHz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
10/1997	Mission (Cyrus)	DAD 3 Q		Analog Dev. AD1861	-96 dB	-115 dB	-103 dB	-108 dB	yes	0.00179 %
10/1997	TEAC	VRDS 9		Burr Brown PCM1702	-126 dB	-110 dB	-119 dB	-122 dB	yes	0.00035 %
10/1997	Thule	Spirit Player		Burr Brown PCM1715	-105 dB	-98 dB		-120 dB	yes	0.00138 %
11/1997	AMC	CD 6		Philips SAA7323	-92 dB	-110 dB	-98 dB	-114 dB	yes	0.00283 %
11/1997	Micromega	Stage 4		Philips TDA1305	-89 dB	-109 dB	-106 dB	-111 dB	yes	0.00361 %
11/1997	Pioneer	PD S 06		Burr Brown PCM1702	-112 dB	-114 dB	-100 dB	-118 dB	yes	0.00106 %
11/1997	Sony	CDP-XA20ES		Sony CXD8505	-100 dB	-107 dB	-128 dB	-124 dB	yes	0.00110 %
11/1997	Marantz	CD 14		Philips TDA1547	-116 dB	-118 dB		-125 dB		0.00021 %
11/1997	Philips	CDR 870		Philips TDA1305	-107 dB	-115 dB	-115 dB	-111 dB	yes	0.00058 %
4/1998	Meridian	565	Pre-Proc.	?	-99 dB			-119 dB		0.00113 %
II/2000	Sony	DTC-ZA5ES	DAT	Sony CXD8505	-100 dB	-106 dB	-115 dB	-117 dB	yes	0,00114 %
II/2001	Micromega	Minium	DVD-V	Burr Brown PCM1742	-88 dB	-84 dB	-102 dB	-108 dB	yes	0.00751 %
IV/2001	Jadis	JS 1 MkIII	AES/EBU	Analog Dev. AD1853	-43 dB	-65 dB	-87 dB	-110 dB	yes	0.71015 %
IV/2001	Kondo	M100 DAC		Burr Brown PCM56	-68 dB	-91 dB	-108 dB	-101 dB	yes	0.03992 %
8/2014	AMC	XCDi-vt	Tube out	Burr Brown PCM1798	-105 dB	-104 dB	-115 dB	-121 dB	yes	0.00087 %
8/2014	Audreal	Muse Deluxe	Tube out	Analog Dev. AD1852	-67 dB	-102 dB	-119 dB	-105 dB	yes	0.04468 %
8/2014	Magnat	MCD1050	USB in	?	-79 dB	-108 dB				0.01123 %
1/2016	Musical Fidelity	Nu-Vista CD	Digital in	Burr Brown PCM1795	-113 dB	-96 dB	-114 dB	-110 dB	yes	0.00164 %
2/2016	Onkyo	C-N7050	Network	Burr Brown PCM1795	-112 dB	-97 dB		-107 dB	yes	0.00150 %
5/2016	Creek	Evolution 100CD	USB in	Wolfson WM8742	-104 dB	-102 dB	-113 dB	-113 dB	yes	0.00106 %
5/2016	Quad	Artera Play	USB in	ESS ES9018	-103 dB	-107 dB				0.00084 %
9/2016	Sony	UHP-H1	BR-D	AKM AK4452		-108 dB		-124 dB	yes	0.00040 %
2/2017	Accuphase	DP-720	USB in	ESS ES9018	-119 dB					0.00011 %
7/2017	Rotel	CD14		Wolfson WM8740	-107 dB	-120 dB	-114 dB	-111 dB	yes	0.00057 %
7/2017	McGee	CD-M1		Burr Brown PCM1732	-99 dB	-88 dB	-106 dB	-107 dB	yes	0.00419 %

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 1 kHz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
8/2017	Oppo	UDP-203	UHD-BR	AKM AK4458VN	-119 dB	-108 dB				0.00041 %
8/2017	Denon	DCD 1600 NE	SA-CD	Burr Brown PCM1795	-96 dB	-110 dB	-112 dB	-109 dB	yes	0.00167 %
11/2017	NAD	C568	USB in	Wolfson WM8741	-109 dB	-91 dB	-111 dB	-112 dB	yes	0.00287 %
11/2017	Rotel	RCD 1572		Wolfson WM8740	-113 dB	-111 dB	-110 dB	-109 dB	yes	0.00060 %
8/2018	Primare	CD35 Prisma	Digital ins	ESS ES9028PRO	-100 dB	-106 dB	-118 dB	-123 dB	yes	0.00118 %
6/2019	Musical Fidelity	M2scd		Burr Brown PCM1792	-112 dB	-103 dB	-119 dB	-113 dB		0.00079 %
9/2019	Cambridge	AXC35		Wolfson WM8524	-87 dB	-96 dB	-106 dB	-95 dB	yes	0.00507 %
10/2019	Vincent	CD-200	Tube out	Burr Brown PCM1796	-52 dB	-78 dB	-67 dB	-75 dB	yes	0.25606 %
12/2019	Pioneer	PD-50AE	SA-CD	ESS ES9026PRO	-103 dB	-113 dB	-119 dB		yes	0.00075 %
6/2020	Atoll	CD100 Signature	Digital ins	Burr Brown PCM1796	-76 dB	-92 dB		-102 dB	yes	0.01607 %
7/2020	Accustic Arts	Player II	Digital ins	Burr Brown PCM1792	-107 dB	-75 dB		-106 dB	yes	0.01780 %
12/2020	Denon	DCD-A110	SA-CD	Burr Brown PCM1795	-125 dB	-124 dB	-125 dB			0.00010 %
1/2021	Rotel	CD11 Tribute		Burr Brown PCM5102	-114 dB	-81 dB	-102 dB	-98 dB	yes	0.00904 %
1/2022	Yamaha	CD-S303	USB in	Burr Brown PCM1780	-98 dB	-96 dB	-122 dB	-104 dB	yes	0.00212 %
6/2022	Pro-Ject	CD Box S3		Burr Brown PCM5102	-96 dB	-106 dB	-109 dB	-119 dB	yes	0.00170 %
9/2022	Denon	DCD-900NE	USB in	ESS ES9018K2M	-127 dB	-121 dB				0.00010 %
12/2022	BC Acoustique	EX-614	USB in	AKM AK4432	-102 dB	-94 dB		-104 dB	yes	0.00224 %
3/2023	Cayin	MINI-CD MK2	Dig. outs	ESS ES9018K2M	-97 dB	-83 dB	-107 dB	-107 dB	yes	0.00725 %
6/2023	Reavon	UBR-X200	Universal	Burr Br. PCM1795 ⁷³	-85 dB	-69 dB	-81 dB	-79 dB	yes	0.03868 %
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73 In 2.0 mode. In 7.1 mode, the DAC chip (Burr Brown PCM1690) and the output stages are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
4/1998	Wadia	27i		Burr Brown PCM1702	-119 dB	-78 dB	-111 dB	-103 dB	yes	0.01261 %
4/1998 ⁷⁴	Arcam	Alpha 8 SE	HDCCD	NPC SM5864	-98 dB	-103 dB		-113 dB	yes	0.00146 %
4/1998	Marantz	CD17 M		Philips TDA1547	-106 dB	-109 dB	-129 dB	-130 dB	yes	0.00062 %
4/1998	Acurus	ACD 11		Panas. MN66271RA	-91 dB	-97 dB	-111 dB	-115 dB	yes	0.00317 %
7/1998	Mark Levinson	N° 39	HDCCD	Burr Brown PCM1702	-104 dB	-111 dB	-115 dB	-114 dB	yes	0.00074 %
7/1998	Wadia	830		Burr Brown PCM1702	-84 dB	-73 dB	-101 dB	-89 dB	yes	0.02340 %
12/1998	Marantz	DR 700	Recorder	Philips TDA1305	-90 dB	-107 dB	-111 dB	-104 dB	yes	0.00327 %
12/1998	Philips	CDR 760	Recorder	Philips TDA1305T	-98 dB	-103 dB	-110 dB	-109 dB	yes	0.00152 %
12/1998	Philips	CDR 560	Recorder	Philips TDA1315	-94 dB	-111 dB	-107 dB	-109 dB	yes	0.00209 %
1/1999	TEAC	VRDS 25X	Digital in	Analog Dev. AD1862	-109 dB	-102 dB	-117 dB	-106 dB	yes	0.00101 %
5/1999	Philips	DVD 930 ⁷⁵	DVD-V	?	-101 dB	-107 dB	-112 dB	-105 dB	yes	0.00117 %
5/1999	Kenwood	DVF 9010	DVD-V	Burr Brown PCM1716	-105 dB	-109 dB	-124 dB	-115 dB	yes	0.00069 %
5/1999	Panasonic	DVD A 160	DVD-V	Burr Brown PCM1734	-104 dB	-101 dB	-107 dB	-129 dB	yes	0.00118 %
5/1999	Pioneer	DV 717	DVD-V	Burr Brown PCM1716	-101 dB	-102 dB	-111 dB	-124 dB	yes	0.00123 %
5/1999	Sony	DVP-S7700	DVD-V	Sony CXD8799	-98 dB		-114 dB	-129 dB	yes	0.00128 %
5/1999	Onkyo	DV S 501	DVD-V	AKM AK4321	-105 dB	-94 dB	-113 dB			0.00209 %
5/1999	Marantz	CDR 630	Recorder	Philips TDA1305	-89 dB	-109 dB	-111 dB	-109 dB	yes	0.00359 %
II/1999	Marantz	CD 7	Digital ins	Philips TDA1541A S2	-113 dB	-129 dB		-109 dB	yes	0.00042 %
II/1999	Wadia	850i	Digital ins	Burr Brown PCM1702	-103 dB	-72 dB	-112 dB	-98 dB	yes	0.02516 %
II/1999	Musical Fidelity	X-Ray		Burr Brown ?	-99 dB	-118 dB	-109 dB	-126 dB	yes	0.00118 %
II/1999 ⁷⁶	Arcam	Alpha 8 SE	HDCCD	NPC SM5864	-87 dB	-99 dB	-108 dB	-107 dB	yes	0.00464 %
7/1999	Mark Levinson	CD transport N° 37 Converter N° 360		Burr Brown PCM1704	-117 dB	-99 dB	-107 dB	-99 dB	yes	0.00165 %

74 Also tested in the second quarter 1999 issue of *Audiophile* (see below).

75 Electronically identical to the Grundig GTV 1000.

76 Also tested in the April 1998 issue of *Stereoplay* (see above).

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
8/1999	Electrocompaniet	EMC 1		?	-63 dB	-89 dB	-102 dB	-92 dB	yes	0.07009 %
8/1999	Sphinx	Project 32		Burr Brown PCM1704	-96 dB	-99 dB	-111 dB	-101 dB	yes	0.00216 %
8/1999	Marantz	CD 17 Mk II		Philips TDA1547	-113 dB	-116 dB	-125 dB	-124 dB	yes	0.00029 %
8/1999	Rotel	RCD 991 AE		Burr Brown PCM63P	-95 dB	-108 dB	-114 dB	-111 dB	yes	0.00185 %
11/1999	Pioneer	PDR 509	Recorder	Burr Brown PCM1716	-106 dB	-105 dB	-106 dB	-125 dB	yes	0.00091 %
11/1999	Sony	CDP-XA555ES		Sony CXD9521	-100 dB	-121 dB	-112 dB		yes	0.00104 %
12/1999	Mark Levinson	N° 30.6	HDCCD	Burr Brown PCM1704	-97 dB	-104 dB	-122 dB	-100 dB	yes	0.00184 %
12/1999	Mission (Cyrus)	DAD 3 Q 24		Burr Brown PCM1728	-109 dB	-119 dB	-115 dB	-124 dB	yes	0.00042 %
12/1999	Philips	CDR 950	Recorder	Analog Dev. AD1855	-106 dB	-113 dB	-120 dB	-111 dB	yes	0.00063 %
5/2000	Sony	CDP-XB630		Sony CXD8567	-107 dB	-107 dB	-120 dB	-114 dB	yes	0.00067 %
5/2000	Sony	CDP-XB720		Sony CXD8735	-114 dB	-109 dB	-123 dB	-113 dB	yes	0.00047 %
5/2000	Sony	CDP-XB930		Sony CXD8735	-105 dB	-104 dB	-112 dB	-110 dB	yes	0.00094 %
5/2000	Yamaha	CDX 396		Panasonic MN35511	-103 dB	-101 dB	-107 dB	-115 dB	yes	0.00124 %
5/2000	Yamaha	CDX 496		Panasonic MN35511	-102 dB	-95 dB	-108 dB	-112 dB	yes	0.00200 %
5/2000	Yamaha	CDX 596		Analog Dev. AD1854	-99 dB	-120 dB	-116 dB	-117 dB	yes	0.00115 %
5/2000	Pioneer	PDR W 739	Recorder	Burr Brown PCM1716	-96 dB	-102 dB	-108 dB	-123 dB	yes	0.00182 %
5/2000	TEAC	RW 800	Recorder	Cirrus Logic CS4223	-100 dB	-98 dB	-111 dB	-117 dB	yes	0.00164 %
5/2000	TEAC	RW H 300	Recorder	Burr Brown PCM3003	-99 dB	-85 dB	-103 dB	-102 dB	yes	0.00583 %
6/2000	Denon	CDR 1000	Recorder	Analog Dev. AD1855	-92 dB	-118 dB	-119 dB	-118 dB	yes	0.00252 %
6/2000	Hitachi	DV W 1	5.1	Burr Br. PCM1716 ⁷⁷	-77 dB	-82 dB	-109 dB	-92 dB	yes	0.01640 %
6/2000	LG	ADR 620	Recorder	AKM AK4394	-102 dB	-96 dB	-115 dB	-104 dB	yes	0.00189 %
6/2000	Kenwood	DPF 3030		Analog Dev. AD1855	-95 dB	-109 dB	-116 dB	-117 dB	yes	0.00183 %
II/2000	Accuphase	DP-75V	Digital in	Analog Dev. AD1853	-114 dB	-114 dB	-129 dB	-121 dB	yes	0.00030 %
II/2000	Accuphase	DC-330	Preamplifier	Analog Dev. AD1853	-113 dB	-116 dB		-124 dB	yes	0.00032 %

⁷⁷ In 2.0 mode. In 5.1 mode, the DAC chip (Burr Brown PCM1600) and the output stages are different.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
8/2000	Arcam	FMJ CD23		dCS Ring DAC	-98 dB	-106 dB	-111 dB	-122 dB	yes	0.00139 %
8/2000	Sharp	DX-SX1	SA-CD	Burr Br. PCM1716 ⁷⁸	-95 dB	-100 dB	-107 dB	-113 dB	yes	0.00210 %
8/2000	Denon	DVD 3300	DVD-A	?	-120 dB	-82 dB		-96 dB	yes	0.00810 %
I/2001 ⁷⁹	Sony	SCD-555ES	SA-CD	Sony CXD9521	-110 dB	-113 dB	-123 dB			0.00039 %
II/2001	Ayre	D-1	DVD-A	Burr Brown PCM1704	-91 dB	-86 dB	-114 dB	-124 dB	yes	0.00575 %
II/2001	Audiomeca	Keops		Philips TDA1305	-96 dB	-99 dB	-104 dB	-108 dB	yes	0.00208 %
9/2001	JVC	XV-D9000	DVD-A	Panasonic MN35505	-121 dB	-101 dB	-129 dB	-109 dB	yes	0.00096 %
9/2001 ⁸⁰	Marantz	SA 12 S1	SA-CD	Cirrus Logic CS4397	-107 dB	-99 dB	-126 dB	-105 dB	yes	0.00136 %
III/2001	Audionet	ART V2	Digital ins	AKM AK4393	-124 dB	-97 dB	-117 dB	-112 dB	yes	0.00144 %
11/2001 ⁸¹	Mark Levinson	N° 390S	HDCCD	Analog Dev. AD1853	-123 dB	-122 dB				0.00011 %
11/2001	T+A	CD 1240 R		Burr Brown PCM63	-110 dB	-101 dB	-120 dB	-119 dB	yes	0.00096 %
11/2001	Creek	CD 53		Cirrus Logic CS4396	-94 dB	-110 dB	-121 dB	-113 dB	yes	0.00203 %
11/2001	Myryad	MCD 600		Cirrus Logic CS4396	-126 dB	-117 dB	-129 dB	-104 dB	yes	0.00065 %
11/2001	Classé	CD/DVD 1	HDCCD	Burr Brown PCM1704	-103 dB	-107 dB			yes	0.00084 %
3/2002	Pioneer	DV 747A	SA-CD	Cirrus Logic CS4392	-113 dB	-111 dB	-124 dB	-120 dB		0.00038 %
3/2002	Denon	DCD 485		Burr Brown PCM1735	-100 dB	-103 dB	-112 dB	-126 dB	yes	0.00125 %
3/2002	Onkyo	DX 7333		Toshiba TC9268	-88 dB	-108 dB	-113 dB	-110 dB	yes	0.00402 %
3/2002	Technics	SL PG 4		Panasonic MN662790	-100 dB	-94 dB	-116 dB	-110 dB	yes	0.00226 %
3/2002	Imerge	S 1000 40/80	HDD play	?		-93 dB		-109 dB	yes	0.00227 %
I/2002 ⁸²	Linn	Sondek CD12		Burr Brown PCM1702	-114 dB	-104 dB	-119 dB	-105 dB	yes	0.00088 %
4/2002	Creative	Extigy	Sound c.	Philips UDA1328T	-95 dB	-101 dB	-112 dB	-91 dB	yes	0.00349 %
4/2002	Terratec	DMX 6Fire	Sound c.	AKM AK4524	-99 dB	-93 dB	-114 dB	-115 dB	yes	0.00252 %

78 In SA-CD mode, the DAC chip and the output stages are different. See above a test in SA-CD mode in the February 2001 issue of *Stereoplay*.

79 See above a test in SA-CD mode in the February 2001 issue of *Stereoplay*.

80 The same measurement was also published in the fourth quarter 2001 issue of *Audiophile*.

81 The same measurement was also published in the second quarter 2002 issue of *Audiophile*.

82 The same measurement was also published in the November 2002 issue of *Stereoplay*.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
4/2002	Arcam	CD 72 T		Burr Brown PCM1716	-100 dB	-95 dB	-104 dB	-125 dB	yes	0.00214 %
4/2002	Arcam	CD 92 T	HD CD	dCS Ring DAC	-107 dB	-105 dB	-113 dB	-122 dB	yes	0.00077 %
4/2002	Arcam	FMJ CD23 T	HD CD	dCS Ring DAC	-102 dB	-104 dB	-115 dB	-121 dB	yes	0.00103 %
4/2002	Panasonic	SL PR 300	Recorder	?	-109 dB	-97 dB	-118 dB	-119 dB	yes	0.00147 %
8/2002	Esoteric	CD transport P70 Converter D70		Burr Brown PCM1704	-106 dB	-107 dB	-108 dB	-98 dB	yes	0.00148 %
8/2002	Wadia	301		Burr Brown PCM1704	-78 dB	-83 dB	-91 dB	-94 dB	yes	0.01485 %
8/2002	Lyric	CD T 8	HD CD	?	-37 dB	-94 dB	-101 dB	-110 dB		1.41254 %
8/2002	T+A	CD 1230 R		Analog Dev. AD1853	-128 dB	-100 dB		-130 dB	yes	0.00100 %
8/2002 ⁸³	Electrocompaniet	ECD 1		Cirrus Logic CS4397	-88 dB	-88 dB	-114 dB	-101 dB	yes	0.00570 %
8/2002	Musical Fidelity	A 3 ²⁴		Burr Brown PCM1738	-90 dB	-98 dB	-102 dB	-113 dB	yes	0.00350 %
8/2002	Burmester	Rondo CD 992		Burr Brown PCM1702	-110 dB	-110 dB	-118 dB	-120 dB	yes	0.00048 %
9/2002	JVC	XV E 111	DVD-V	?	-109 dB	-114 dB	-123 dB			0.00041 %
9/2002	Panasonic	DVD XV 10	DVD-V	Burr Brown PCM1742	-106 dB	-103 dB	-116 dB	-118 dB	yes	0.00089 %
9/2002	Pioneer	DV 454	DVD-V	Burr Brown PCM1742	-91 dB	-112 dB	-107 dB	-114 dB	yes	0.00287 %
9/2002	Marantz	DV 8300	SA-CD	Cirrus Logic CS4392	-98 dB	-116 dB	-117 dB	-115 dB	yes	0.00129 %
III/2002	Meridian	DVD player 800 Preamp-Processor 861	DVD-A 5.1	Cirrus Logic CS4390	-107 dB	-105 dB	-123 dB			0.00072 %
11/2002	Vincent	CD S6	Tube out	Burr Brown PCM1732	-94 dB	-122 dB	-104 dB		yes	0.00209 %
11/2002	Rega	Planet Mk II		Wolfson WM8716	-108 dB	-95 dB	-120 dB	-101 dB	yes	0.00203 %
11/2002	Panasonic	DVD RA 82	DVD-A	?	-104 dB	-100 dB	-114 dB	-119 dB	yes	0.00120 %
11/2002	Philips	DVD 763 SA	SA-CD	Cirrus Logic CS4362	-105 dB	-100 dB	-129 dB	-118 dB	yes	0.00115 %
11/2002	Pioneer	DV 656 A	SA-CD	Burr Br. PCM1738 ⁸⁴	-103 dB	-108 dB	-109 dB	-112 dB	yes	0.00092 %
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83 Another measurement in 24 bits/96 kHz was published in the April 2006 issue of *Stereoplay* (see above).

84 In 2.0 mode. In 5.1 mode, two different DAC chips (Burr Brown DSD1702) and different output stages are used for the center, surround and LFE channels.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
1/2003	Sony	SCD-XA777ES	5.1	Sony CXD9657 ⁸⁵	-113 dB	-110 dB		-121 dB		0.00040 %
1/2003	emmLabs	DAC 8 Mk II	8 chann.	Burr Br. DSD1700 ⁸⁶	-117 dB	-87 dB				0.00447 %
1/2003	Micromega	Reference SACD	5.1	Cirrus Logic CS4397 ⁸⁷	-100 dB	-107 dB	-116 dB	-121 dB	yes	0.00111 %
1/2003	Onkyo	DV SP 800	DVD-A	Cirrus Logic CS4392	-107 dB	-89 dB	-113 dB	-117 dB	yes	0.00359 %
1/2003	Sony	SCD-XE670	5.1	Burr Brown DSD1702	-110 dB	-108 dB	-118 dB	-127 dB	yes	0.00053 %
1/2003	Sony	DVP NS 705	SA-CD	Sony CXD9674	-96 dB	-109 dB	-112 dB	-120 dB	yes	0.00165 %
1/2003	Sony	DVP NS 905	SA-CD	Sony CXD9674	-95 dB	-119 dB	-116 dB	-128 dB	yes	0.00179 %
1/2003	Yamaha	CDR HD 1300	Recorder	AKM AK4528	-110 dB	-97 dB	-119 dB	-109 dB	yes	0.00150 %
5/2003	Marantz	SA 17 S1	5.1	Cirrus Logic CS4397	-100 dB	-99 dB	-124 dB	-104 dB	yes	0.00163 %
6/2003	Kiss	DP 500	DVD-V	Wolfson WM8728	-58 dB	-78 dB	-91 dB	-93 dB	yes	0.12657 %
10/2003	Terratec	Phase 28	Sound c.	?	-98 dB	-91 dB		-105 dB	yes	0.00314 %
11/2003	Naim	CDS 3		Burr Brown PCM1704	-107 dB	-106 dB	-111 dB	-110 dB	yes	0.00079 %
12/2003	Lua	Cantilena SEL	Tube out	Cirrus Logic CS4396	-80 dB	-100 dB	-124 dB		yes	0,01005 %
12/2003	Quad	CDP		Cirrus Logic CS4396	-124 dB	-117 dB	-127 dB	-107 dB	yes	0.00047 %
12/2003	Vincent	CD S6 Mk II	Tube out	?	-97 dB	-125 dB	-105 dB	-125 dB	yes	0.00152 %
1/2004	Sony (Swoboda)	SCD-XA333ES (tweaked)	5.1	Sony CXD9657 ⁸⁸	-99 dB	-112 dB	-111 dB	-119 dB	yes	0.00119 %
1/2004	Panasonic	DMR E 100 H	DVD-R	?	-103 dB	-99 dB		-111 dB	yes	0.00136 %
1/2004	Creek	CD 50 Mk II		Cirrus Logic CS4396	-110 dB	-108 dB	-125 dB	-116 dB	yes	0.00054 %
1/2004	NAD	C542		Burr Brown PCM1732	-100 dB		-108 dB	-121 dB	yes	0.00108 %
2/2004	Denon	DVD 700	DVD-V	Burr Brown PCM1751	-105 dB	-94 dB	-118 dB	-116 dB	yes	0.00208 %
2/2004	JVC	XV NA77	DVD-A	Panasonic MN35505	-108 dB		-127 dB			0.00040 %
2/2004	Marantz	DV 4300	DVD-V	Cirrus Logic CS4391	-116 dB	-111 dB	-117 dB		yes	0.00035 %

85 Equivalent to the Burr Brown PCM1738.

86 This DAC chip has no PCM input. PCM signals are converted into DSD prior to the D/A conversion by an undocumented means.

87 For the 5.1 output. For the stereo 2.0 output, another DAC chip is used (Analog Devices AD1852) with low end output stages.

88 Equivalent to the Burr Brown PCM1738.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
2/2004	Sony	DVP LS 500	DVD-V	AKM AK4381	-97 dB	-107 dB	-118 dB	-123 dB	yes	0.00149 %
I/2004	Accuphase	DP-77	SA-CD	Analog Dev. AD1853 ⁸⁹	-108 dB	-117 dB	-127 dB	-125 dB	yes	0.00043 %
I/2004	Krell	SACD Standard	5.1	Burr Brown PCM1738	-94 dB	-114 dB	-108 dB	-110 dB	yes	0.00207 %
6/2004	Esoteric	UX-1	SA-CD	Burr Brown PCM1704	-103 dB	-117 dB	-118 dB	-110 dB	yes	0.00079 %
6/2004	Meridian	G 07		Analog Dev. AD1852	-104 dB	-104 dB	-121 dB	-127 dB		0.00090 %
II/2004	dCS	Disc transport Verdi Converter Elgar plus	SA-CD Firewire	dCS Ring DAC	-115 dB	-112 dB	-126 dB	-127 dB		0.00032 %
12/2004	Unison	Unico CD	Tube out	Cirrus Logic CS4392	-76 dB	-93 dB	-108 dB	-117 dB	yes	0.01600 %
3/2005	Atoll	CD 100		Panasonic MN662713	-101 dB	-75 dB	-97 dB	-99 dB	yes	0.01800 %
3/2005	Naim	CD 5x		Burr Brown PCM1704	-94 dB	-102 dB	-104 dB	-99 dB	yes	0.00250 %
5/2005	Primare	CD21		Burr Brown PCM1738	-102 dB	-111 dB	-117 dB	-118 dB	yes	0.00086 %
6/2005	MacIntosh	MS 300	HDD play	?	-72 dB	-64 dB	-73 dB	-69 dB	yes	0.07983 %
6/2005	Yamaha	CDR HD 1300 DSC	HDD play	AKM AK4528	-111 dB	-97 dB	-124 dB	-113 dB		0.00146 %
6/2005	Revox	M37	HDD play	?	-95 dB	-101 dB		-106 dB	yes	0.00205 %
9/2005	Vincent	CD S2		Burr Brown PCM1716	-98 dB	-110 dB	-107 dB		yes	0.00137 %
9/2005	Harman Kardon	HD 970		Analog Dev. AD1955	-120 dB	-125 dB	-120 dB	-129 dB	yes	0.00016 %
9/2005	Sony	CDP-XE270		Sony CXD2587	-96 dB	-97 dB	-115 dB	-110 dB	yes	0.00215 %
9/2005	TEAC	CD P 1850		Burr Brown PCM1710	-94 dB	-97 dB	-114 dB	-116 dB	yes	0.00248 %
10/2005	Onkyo	C 733		Cirrus Logic CS4396	-104 dB	-111 dB	-111 dB	-101 dB	yes	0.00116 %
10/2005	Vincent	CD S1.1	HDCCD	Burr Brown PCM1732	-99 dB		-106 dB		yes	0.00123 %
10/2005	Exposure	2010 S		Burr Brown PCM1716	-99 dB		-106 dB	-125 dB	yes	0.00123 %
10/2005	Ballad	CD 200 S	HDCCD	Burr Brown PCM1732	-82 dB	-94 dB	-104 dB		yes	0.00821 %
10/2005	Denon	DCD 2000 AE	SA-CD	Burr Brown DSD1790	-106 dB	-96 dB	-126dB	-113 dB	yes	0.00168 %
11/2005	Meridian	808i	CD+Pre	?	-106 dB	-105 dB	-123 dB	-129 dB		0.00076 %

89 This DAC chip has no DSD input. When playing SA-CDs or DSD signals through optional HS-Link digital input board, DSD signals are converted into 24 bits/192 kHz PCM prior to the D/A conversion through a custom digital signal process implemented on an FPGA.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
 Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
 Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
 Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
 High: -60 dBr≥THD≥-40 dBr or -54 dBV≥THD≥-34 dBV
 Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
2/2006	Creek	Destiny CD-Player		Cirrus Logic CS4396	-110 dB	-110 dB	-122 dB	-114 dB	yes	0.00050 %
3/2006	Cambridge	Azur C 640 V2		Wolfson WM8740	-108 dB	-101 dB	-115 dB	-123 dB	yes	0.00100 %
5/2006	Fujitsu Siemens	Activy	HDTV	?	-97 dB	-95 dB	-95 dB	-96 dB	yes	0.00329 %
5/2006	MacroSystem	Enterprise	HDTV	Wolfson WM8770	-85 dB	-88 dB	-116 dB	-97 dB	yes	0.00704 %
5/2006	Meridian	G 06		Analog Dev. AD1852	-101 dB	-102 dB	-120 dB	-125 dB		0.00120 %
5/2006	Hifidelio	Pro	HDD play	Analog Dev. AD1981	-97 dB	-99 dB	-102 dB	-105 dB	yes	0.00205 %
5/2006	Yamaha	CDR HD 1500	HDD play	AKM AK4528		-94 dB	-125 dB	-111 dB	yes	0.00202 %
5/2006	Yamaha	CDR HD 1500 DSC	HDD play	AKM AK4528	-113 dB	-96 dB	-127 dB	-111 dB	yes	0.00163 %
6/2006	Rotel	RCD 06		Burr Brown PCM1716	-101 dB	-98 dB	-107 dB	-119 dB	yes	0.00161 %
6/2006	Naim	CD player CD555 Power supply PS		Burr Brown PCM1704	-98 dB	-111 dB	-106 dB	-119 dB	yes	0.00139 %
6/2006	Linn	Majik CD		Wolfson WM8740	-105 dB	-102 dB				0.00097 %
7/2006	Burmester	061	Digital in	Burr Brown PCM1794	-100 dB	-106 dB	-109 dB	-114 dB	yes	0.00119 %
7/2006	ESI	Juli@	Sound c.	AKM AK4358	-116 dB	-93 dB	-120 dB	-111 dB	yes	0.00226 %
8/2006	Creek	Evo CDP		Burr Brown PCM1738	-109 dB	-110 dB	-116 dB	-118 dB	yes	0.00052 %
8/2006	Escient	SE 160i	HDD play	?	-74 dB	-64 dB	-75 dB	-69 dB	yes	0.07716 %
8/2006	Roland	CD2	HDD play	?	-98 dB	-95 dB			yes	0.00218 %
8/2006	Reson	RH1	HDD play	?		-102 dB	-112 dB	-111 dB		0.00088 %
10/2006	Advance Acoustic	MCD203		Analog Dev. AD1853	-98 dB	-90 dB	-110 dB	-114 dB	yes	0.00342 %
10/2006	Arcus	Finest class CD 200 S		?	-83 dB	-85 dB	-99 dB	-102 dB	yes	0.00915 %
10/2006	Music Hall	CD 25.2		Burr Brown PCM1738	-100 dB	-110 dB	-112 dB	-117 dB	yes	0.00109 %
10/2006	Onkyo	DX 7555		Wolfson WM8740	-101 dB	-98 dB	-104 dB	-113 dB	yes	0.00168 %
1/2007	Denon	DCD 500AE		Burr Brown PCM1791	-100 dB	-119 dB	-114 dB	-124 dB	yes	0.00103 %
1/2007	TEAC	CD P 1260		Samsung S5L8310W	-81 dB	-82 dB	-111 dB	-99 dB	yes	0.01199 %
1/2007	Yamaha	CDX 497		Cirrus Logic CS4392	-105 dB	-103 dB	-122 dB	-124 dB	yes	0.00091 %

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
2/2007	Marantz	SA 7 S1	SA-CD	NPC SM5866	-102 dB	-114 dB		-120 dB		0.00083 %
3/2007	Arcus	DAR300	Recorder	?	-96 dB	-90 dB	-98 dB	-99 dB	yes	0.00392 %
3/2007	Cambridge	Azur 640H	Recorder	Wolfson WM8740	-103 dB	-96 dB	-120 dB	-116 dB	yes	0.00175 %
3/2007	Denon	CHR F 300	Recorder	?	-85 dB	-99 dB	-101 dB	-118 dB	yes	0.00580 %
4/2007	Harman Kardon	HD 950		Wolfson WM8740	-95 dB	-104 dB	-117 dB	-114 dB	yes	0.00190 %
5/2007	Advance Acoustic	MCD203 II		Analog Dev. AD1955	-82 dB	-89 dB		-117 dB		0.00870 %
6/2007	PrimaLuna	ProLogue Eight	Tube out	Burr Brown PCM1792	-33 dB	-41 dB	-51 dB	-61 dB	yes	2.42767 %
8/2007	Linn	Akurate CD	Universal	Cirrus Logic CS4397	-125 dB	-95 dB	-122 dB	-112 dB	yes	0.00180 %
8/2007	Musical Fidelity	X-Ray V8		Burr Brown PCM1738	-86 dB	-93 dB	-97 dB	-103 dB	yes	0.00571 %
8/2007	Musical Fidelity	X-DAC V8 (tube out)		Burr Brown DSD1792	-99 dB	-85 dB	-101 dB	-116 dB	yes	0.00581 %
8/2007	Musical Fidelity	X-DAC V8 (solid state out)		Burr Brown DSD1792	-100 dB	-101 dB	-135 dB	-119 dB	yes	0.00134 %
9/2007	Cambridge	Azur 340C		Cirrus Logic CS4338	-97 dB	-97 dB	-90 dB	-105 dB	yes	0.00378 %
9/2007	Onkyo	DX 7355		Wolfson WM8716	-106 dB	-104 dB	-117 dB	-105 dB	yes	0.00099 %
9/2007	Yamaha	CDX 397 mk II		Cirrus Logic CS4392	-105 dB	-102 dB	-128 dB	-128 dB	yes	0.00097 %
10/2007	Lyngdorf	CD 1		Wolfson WM8740	-111 dB	-101 dB	-122 dB	-111 dB	yes	0.00098 %
10/2007	Ayon	CD 1	Tube out	Cirrus Logic CS4398	-33 dB	-64 dB	-59 dB	-82 dB	yes	2.24243 %
10/2007	Densen	B 420		?	-70 dB	-73 dB	-93 dB	-90 dB	yes	0.03894 %
10/2007	Electrocompaniet	ECC 1		Cirrus Logic CS4398	-100 dB	-85 dB	-119 dB	-108 dB	yes	0.00573 %
10/2007	Raysonic	CD 128	HDCD	Burr Brown PCM1732	-54 dB	-70 dB	-77 dB	-101 dB	yes	0.20244 %
10/2007	Vincent	CD S5		Burr Brown PCM1793	-43 dB	-68 dB	-88 dB	-85 dB	yes	0.70910 %
12/2007	Naim	CD 5i		Philips UDA1330	-96 dB	-103 dB		-114 dB	yes	0.00175 %
12/2007	Burmester	CD player 069 Power supply Reference		Wolfson WM8741	-102 dB	-85 dB	-109 dB	-111 dB	yes	0.00570 %
12/2007	NAD	T 585	SA-CD	Burr Brown DSD1608	-101 dB		-109 dB	-118 dB	yes	0.00097 %
1/2008	T+A	Music Player	HDD play	Burr Brown PCM1796	-103 dB	-111 dB	-123 dB	-126 dB	yes	0.00077 %

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
1/2008	Arcam	FMJ MS 250	HDD play	Cirrus Logic CS4398	-99 dB	-108 dB		-109 dB	yes	0.00124 %
2/2008	Marantz	CD 6002		Cirrus Logic CS4398	-110 dB	-109 dB	-125 dB	-108 dB	yes	0.00062 %
2/2008	Yamaha	CD-S2000	SA-CD	Burr Brown PCM1792	-106 dB	-120 dB	-116 dB	-129 dB	yes	0.00054 %
2/2008	T+A	CD Player		?	-108 dB	-110 dB		-124 dB	yes	0.00051 %
2/2008	Ayre	CX 7e		Burr Brown PCM1738	-67 dB	-85 dB	-107 dB	-73 dB	yes	0.05028 %
3/2008	Eera	DL 1		?	-121 dB	-107 dB		-106 dB	yes	0.00068 %
3/2008	Bryston	BCD 1		Cirrus Logic CS4398	-119 dB	-111 dB		-107 dB	yes	0.00054 %
3/2008	Marantz	SA 11 S2	SA-CD	NPC SM5866	-105 dB	-116 dB		-120 dB		0.00059 %
5/2008	Cayin	SP CD 300		Burr Brown PCM1792	-73 dB	-91 dB	-105 dB	-112 dB	yes	0.02257 %
5/2008	Pathos	Digit		Cirrus Logic CS4396	-82 dB	-86 dB	-85 dB	-94 dB	yes	0.01112 %
5/2008	Meridian	808.2		?	-96 dB	-102 dB			yes	0.00177 %
6/2008	NAD	C515 BEE		Cirrus Logic CS4392	-98 dB	-96 dB	-111 dB	-115 dB	yes	0.00205 %
6/2008	Cambridge	Azur 740C	Digital in	Wolfson WM8740	-109 dB	-110 dB	-125 dB	-121 dB	yes	0.00049 %
6/2008	Rega	Saturn		Wolfson WM8740	-84 dB	-118 dB	-112 dB	-119 dB		0.00632 %
8/2008	Arcam	FMJ CD37	SA-CD	Wolfson WM8741	-111 dB	-94 dB	-113 dB	-119 dB	yes	0.00203 %
10/2008	Naim	HDX	HDD play	Burr Brown PCM1791	-95 dB	-104 dB	-111 dB	-112 dB		0.00192 %
11/2008	Magnat	MCD 850	SA-CD	Burr Brown PCM1796	-81 dB	-102 dB	-115 dB	-103 dB	yes	0.00898 %
11/2008	Marantz	SA 7003	SA-CD	Cirrus Logic CS4398	-104 dB	-115 dB		-109 dB	yes	0.00075 %
11/2008	Yamaha	CD-S1000	SA-CD	Burr Brown PCM1796	-109 dB	-107 dB	-128 dB	-119 dB		0.00058 %
12/2008	Accustic Arts	Transport Drive II Convert. Tube DAC II SE ⁹⁰	Tube out	?	-115 dB	-114 dB	-99 dB	-112 dB	yes	0.00118 %
1/2009	Marantz	SA 8003	SA-CD	Cirrus Logic CS4398	-107 dB	-115 dB	-128 dB	-110 dB		0.00058 %
1/2009	Roksan	Kandy K2		Burr Brown PCM1738	-103 dB	-101 dB	-118 dB	-114 dB		0.00116 %
1/2009	Vincent	CD S4	HD CD	Burr Brown PCM1716	-97 dB	-114 dB	-105 dB		yes	0.00154 %

90 The D/A converter was also tested alone in the same issue. See above a test in 24 bits/48 kHz PCM in dBV.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
4/2009	Creek	Evo II CDP		Burr Brown PCM1796	-102 dB	-105 dB	-118 dB	-125 dB	yes	0.00098 %
4/2009	T.A.C.	CD C60	HD CD	Burr Brown PCM1792	-102 dB	-106 dB	-118 dB	-125 dB	yes	0.00095 %
6/2009	Ayre	CX 7e MP		Burr Brown PCM1738	-66 dB	-78 dB	-77 dB	-73 dB	yes	0.05806 %
7/2009	Harman Kardon	HD 990	Digital in	Analog Dev. AD1955	-111 dB	-117 dB		-128 dB	yes	0.00032 %
7/2009	NAD	C545 BEE		Wolfson WM8740	-96 dB	-93 dB	-109 dB	-105 dB	yes	0.00282 %
9/2009	Ayre	C-5xe MP	SA-CD	Burr Brown DSD1792	-58 dB	-70 dB	-89 dB	-106 dB	yes	0.12985 %
9/2009	Esoteric	SA-50	SA-CD	AKM AK4392	-116 dB	-101 dB	-119 dB	-103 dB	yes	0.00116 %
9/2009	Yamaha	CD-S700	USB in	Burr Brown DSD1791	-113 dB	-115 dB	-115 dB	-117 dB	yes	0.00037 %
9/2009	Rotel	RCD1520		Wolfson WM8740	-98 dB	-98 dB	-112 dB	-117 dB	yes	0.00180 %
10/2009	Naim	CD player CD 5 XS Power supply Flatcap XS		Burr Brown PCM1793	-102 dB	-99 dB	-106 dB	-100 dB	yes	0.00177 %
8/2010	Atoll	DAC 100	USB in	Burr Brown PCM1796	-65 dB	-84 dB	-108 dB	-96 dB	yes	0.05661 %
9/2010	Marantz	CD 5004		Cirrus Logic CS4392	-119 dB	-110 dB	-128 dB	-125 dB	yes	0.00034 %
10/2010	Pro-Ject	CD Box SE		Burr Brown PCM1796	-97 dB	-94 dB	-120 dB	-101 dB	yes	0.00260 %
11/2010	Simaudio	Moon CD .5		Burr Brown PCM1793	-109 dB	-106 dB	-117 dB	-117 dB	yes	0.00065 %
11/2010	Creek	Destiny 2 CD-Player		Cirrus Logic CS4396	-113 dB	-111 dB	-126 dB	-113 dB	yes	0.00043 %
11/2010	Ayon	CD 1s	Tube out	Burr Brown PCM1792	-73 dB	-98 dB	-112 dB	-105 dB	yes	0.02243 %
3/2011	Simaudio	Moon CD1		Burr Brown PCM1793	-106 dB	-109 dB	-111 dB	-114 dB	yes	0.00070 %
3/2011	Primare	CD 32		Burr Brown PCM1704	-99 dB	-109 dB	-104 dB	-107 dB	yes	0.00141 %
3/2011	Trigon	Recall II		Burr Brown PCM1794	-100 dB	-94 dB	-123 dB	-117 dB	yes	0.00224 %
4/2011	Burmester	089	Digital in	Burr Brown PCM1794	-99 dB	-101 dB	-111 dB	-115 dB	yes	0.00147 %
4/2011	MacIntosh	MCD 1100 AC	SA-CD	ESS ES9018	-117 dB	-112 dB		-126 dB		0.00029 %
4/2011	Wadia	S7i	Digital in	?	-65 dB	-72 B	-87 dB	-108 dB	yes	0.06175 %
8/2011	B.M.C.	BD CD 1	Digit. out	Burr Brown PCM1792	-79 dB	-85 dB	-104 dB	-102 dB	yes	0.01259 %
12/2011	Marantz	CD 6004		Cirrus Logic CS4398	-116 dB	-118 dB	-125 dB	-107 dB	yes	0.00049 %

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV
Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV
Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV
Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV
High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV
Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 315 Hz or 330 Hz, levels in dBr										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
12/2011	NAD	C565 BEE	Digital in	Wolfson WM8741	-111 dB	-99 dB		-98 dB	yes	0.00171 %
1/2012	T.A.C.	C 35	HDCCD	Burr Brown PCM1732	-68 dB	-93 dB	-104 dB		yes	0.03988 %
3/2012	Sugden	PDT 4F	HDCCD	?	-99 dB	-95 dB	-107 dB	-87 dB	yes	0.00496 %
8/2012	Cyrus	CD 8 SE 2		Burr Brown PCM1738	-110 dB	-108 dB	-118 dB	-121 dB	yes	0.00053 %
8/2012	NAD	C546 BEE		Wolfson WM8740	-91 dB	-91 dB	-94 dB	-97 dB	yes	0.00468 %
10/2012	AVM	Evolution CD5.2	Digital in	Wolfson WM8741	-85 dB	-85 dB	-123 dB	-98 dB	yes	0.00805 %
10/2012	Ayon	CD 07s	Digital in	Burr Brown PCM1796	-65 dB	-104 dB	-119 dB	-127 dB		0.05624 %
10/2012	Vincent	CD S7 DAC	Tube out	Burr Brown PCM1796	-84 dB	-89 dB	-99 dB	-100 dB	yes	0.00739 %
3/2013	Esoteric	K-05	Digital in	AKM AK4399	-85 dB	-85 B	-123 dB	-98 dB	yes	0.00805 %
7/2013	Progressive Audio	CD 2		Burr Brown PCM1792	-87 dB	-83 dB	-100 dB	-100 dB	yes	0.00849 %
11/2013	Rotel	RCD1570		Wolfson WM8740	-100 dB	-89 dB	-105 dB	-114 dB	yes	0.00377 %
12/2013	TEAC	PD-501 HR		Cirrus Logic CS4398	-123 dB	-117 dB	-130 dB	-110 dB	yes	0.00036 %
5/2014	Pro-Ject	CD transport CD Converter DAC Box RS ⁹¹		Burr Brown PCM1792	-90 dB	-107 dB	-105 dB	-117 dB	yes	0.00325 %
6/2015	Denon	DCD-50		Burr Brown PCM5102	-86 dB	-95 dB	-108 dB	-115 dB	yes	0.00534 %
9/2015	Purist	Statement 7	HDD play	Burr Brown PCM1795	-99 dB	-100 dB	-116 dB	-112 dB	yes	0.00153 %
1/2016	Auralic	Aries Mini	Network	ESS ES9018K2M	-111 dB	-101 dB	-129 dB			0.00094 %
1/2017	Sugden	Fusion 21	Digital in	?	-94 dB	-91 dB	-97 dB	-88 dB	yes	0.00546 %
6/2017	Unison	CD Uno	USB in	ESS ES9018K2M	-48 dB	-90 dB	-111 dB	-120 dB	yes	0.39812 %
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91 The D/A converter was also tested alone in the same issue. See above a test in 24 bits/96 kHz PCM in dBr.

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV

Test in 16 bits/44.1 kHz PCM at 1 kHz, levels in dBV										
Issue	Brand	Model name	Note	D/A converter(s)	H2	H3	H4	H5	Hn	THD
7/1995 ⁹²	Denon	DCD-S10	Digital in	Burr Brown PCM1702	-105 dB	-110 dB	-106 dB	-107 dB	yes	-100,6 dB
7/1995	Rotel	RHDC 10		Burr Brown PCM63	-113 dB	-115 dB	-109 dB		yes	-106,8 dB
7/1995 ⁹³	Sony	CDP-XA7ES		Sony CXD2562	-107 dB	-107 dB				-104,0 dB
7/1995	TEAC	VRDS 20		Philips TDA1547	-119 dB	-118 dB	-110 dB	-117 dB	yes	-108,3 dB
9/1995	CEC	TL 3		?	-100 dB	-103 dB		-107 dB	yes	-97,6 dB
12/1995	Linear Acoustic	CD 1		Philips TDA1547	-113 dB	-105 dB				-104,3 dB
12/1995	Marantz	CD 17		Philips TDA1547	-107 dB	-107 dB				-104,0 dB

92 The absolute levels published in this issue have been converted in levels relative to the full scale output voltage to calculate the THD in percentage (See above).

93 *Ibid.*

THD level:

Extremely low: THD≤-110 dBr or THD≤-104 dBV

Very low: -110 dBr<THD<-100 dBr or -104 dBV<THD<-94 dBV

Low: -100 dBr≤THD≤-80 dBr or -94 dBV≤THD≤-74 dBV

Relatively high: -80 dBr>THD>-60 dBr or -74 dBV>THD>-54 dBV

High: -60 dBr≥THD>-40 dBr or -54 dBV≥THD>-34 dBV

Fatally high: THD≥-40 dBr or THD≥-34 dBV