AVR-X4700H and AVR-X3600H Bench Test Analysis

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SOUND UNITED

Summary

Denon Engineering performed the same measurements on the 2019 Model (AVR-X3600H) and 2020 Model (AVR-X4700H) to ensure equal or better measured performance.

For all tests, the measurement data is almost identical between the AVR-X3600H (2019 model) and the AVR-X4700H (2020 model) or the AVR-X4700 (2020 model) measurements are better.

The measurement conditions are explained for each measurement.

Bench Test Index and Summary

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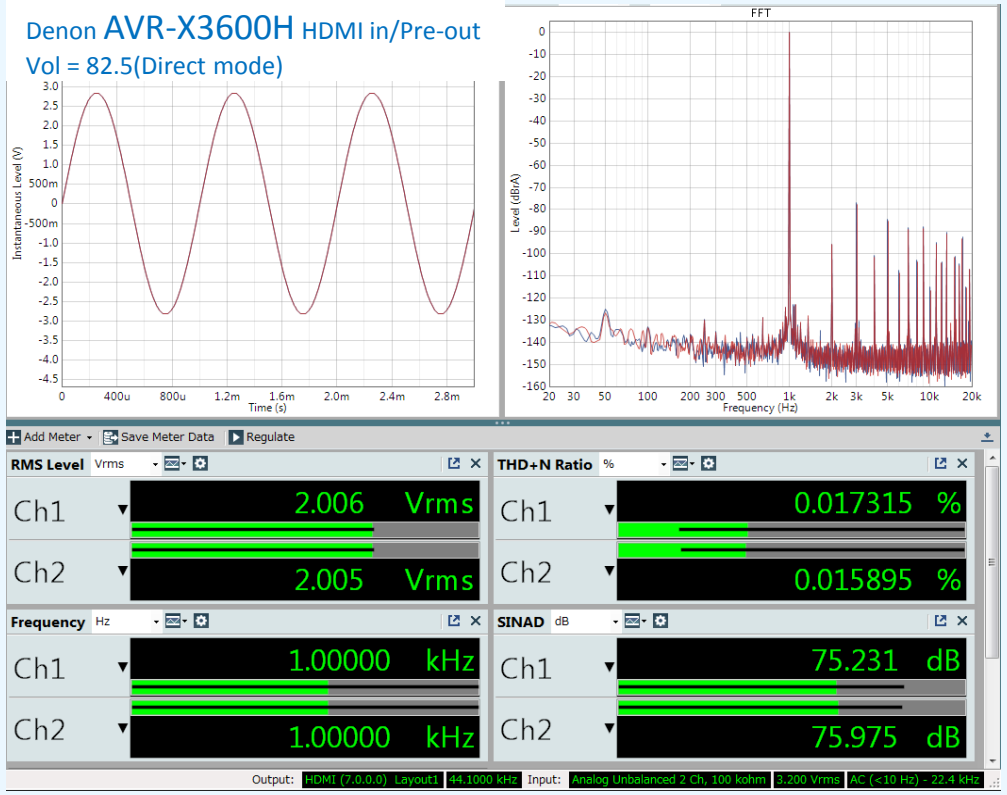
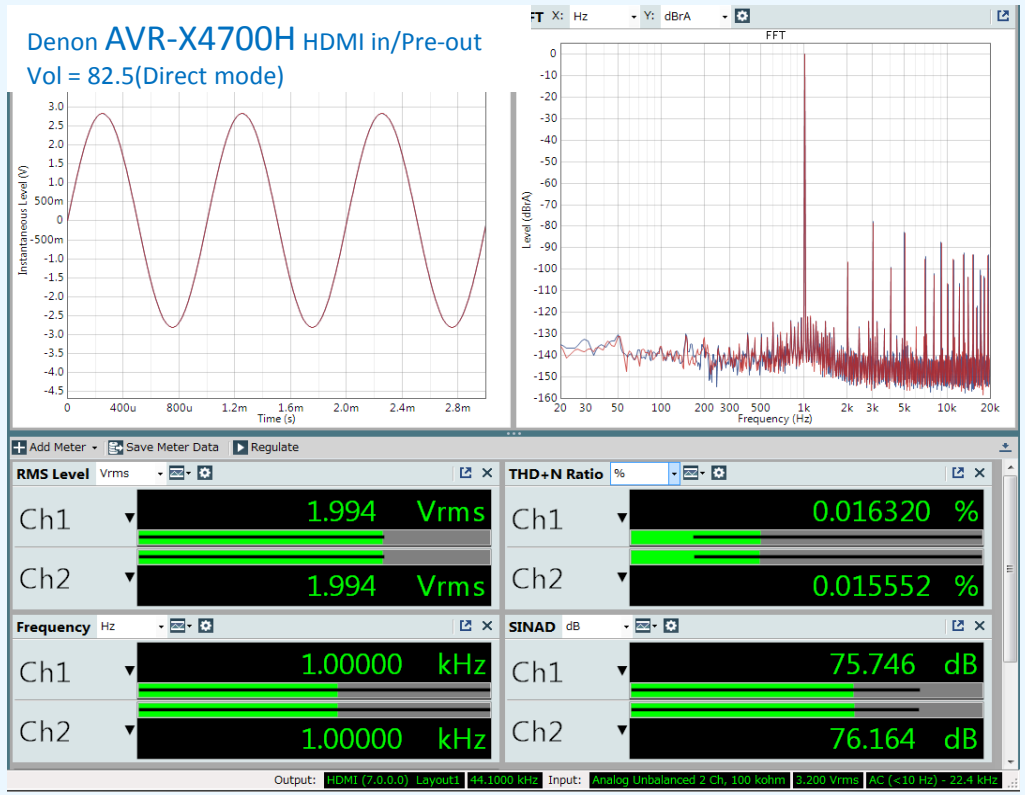
1. FFT & THD+N HDMI In w/ Power Amp

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering

Denon AVR-X3600H HDMI in/Pre-out
Vol = 82.5(Direct mode)



Denon AVR-X4700H HDMI in/Pre-out
Vol = 82.5(Direct mode)



We confirmed the AVR-X4700H performance is as good as the AVR-X3600H.

1. FFT & THD+N HDMI In w/ Power Amp

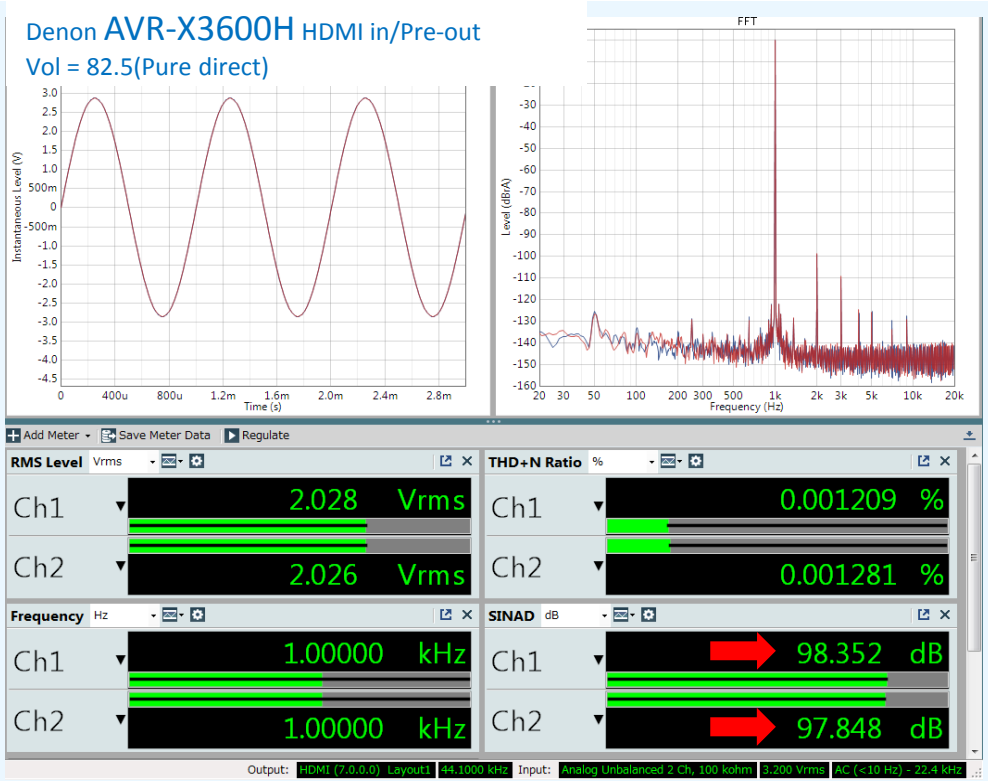
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	1k Hz Sin Wave
		Output Level	0.0 dBFS
		Sampling Frequency	44.1k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	~ 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	22.4k Hz
AV Receiver Setting		Mode	Direct mode
		Amp Assign	7.1ch + Zone2
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

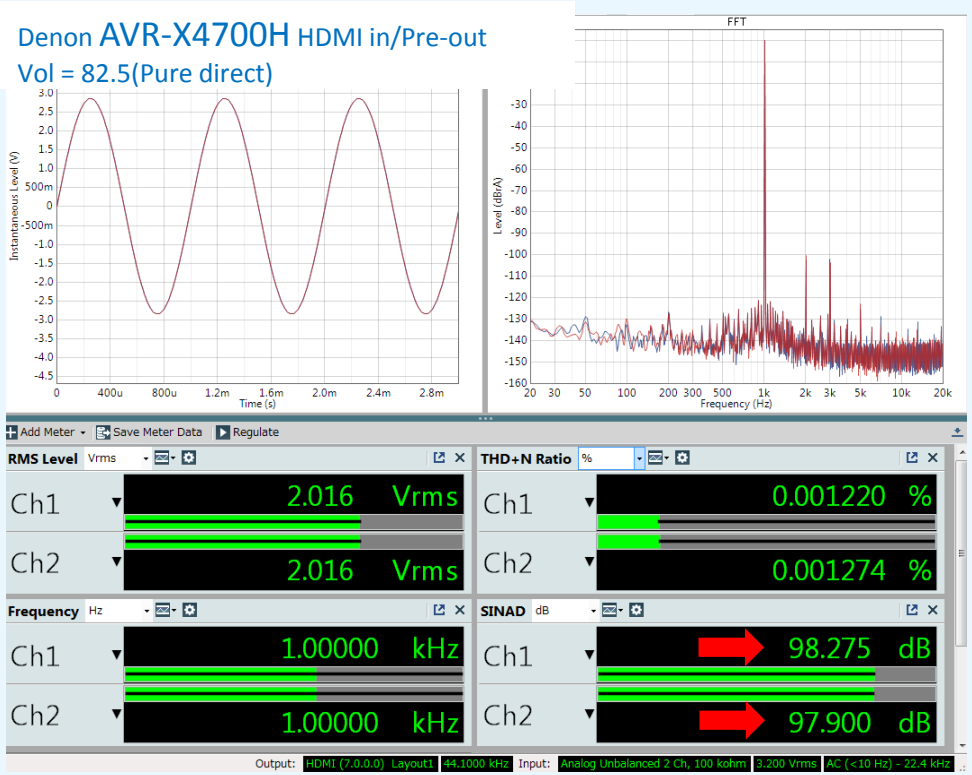
2. FFT & THD+N HDMI In

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering

Denon AVR-X3600H HDMI in/Pre-out
Vol = 82.5(Pure direct)



Denon AVR-X4700H HDMI in/Pre-out
Vol = 82.5(Pure direct)



We confirmed the AVR-X4700H performance is as good as the AVR-X3600H.

2. FFT & THD+N HDMI In

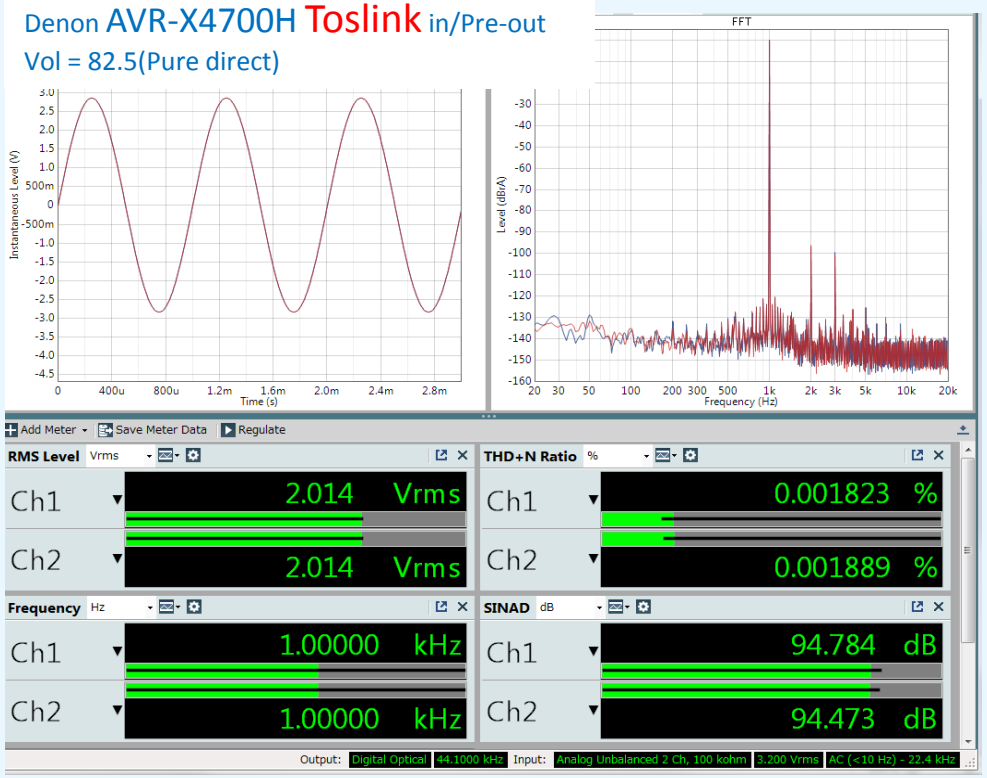
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	1k Hz Sin Wave
		Output Level	0.0 dBFS
		Sampling Frequency	44.1k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	~ 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	22.4k Hz
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

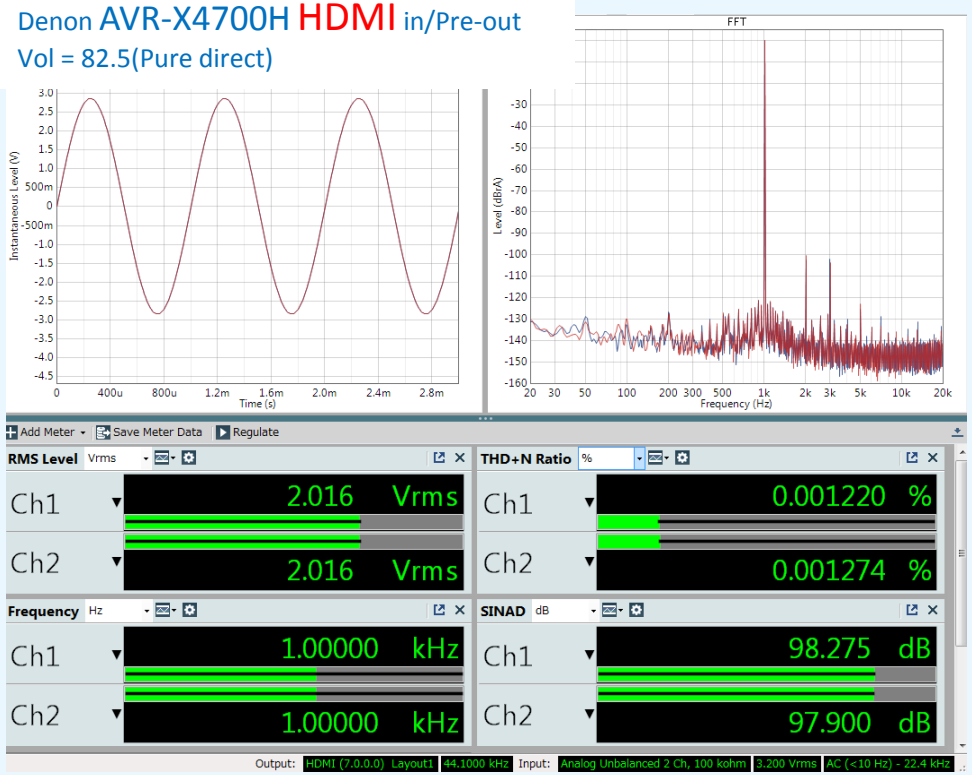
3. FFT & THD+N Toslink In (AVR-X4700H only)

AVR-X4700H Toslink vs HDMI measurement results comparison performed by Denon Engineering

Denon AVR-X4700H Toslink in/Pre-out
Vol = 82.5(Pure direct)



Denon AVR-X4700H HDMI in/Pre-out
Vol = 82.5(Pure direct)



We compared the results for both Toslink and HDMI. The result of HDMI is **better** than the Toslink result.

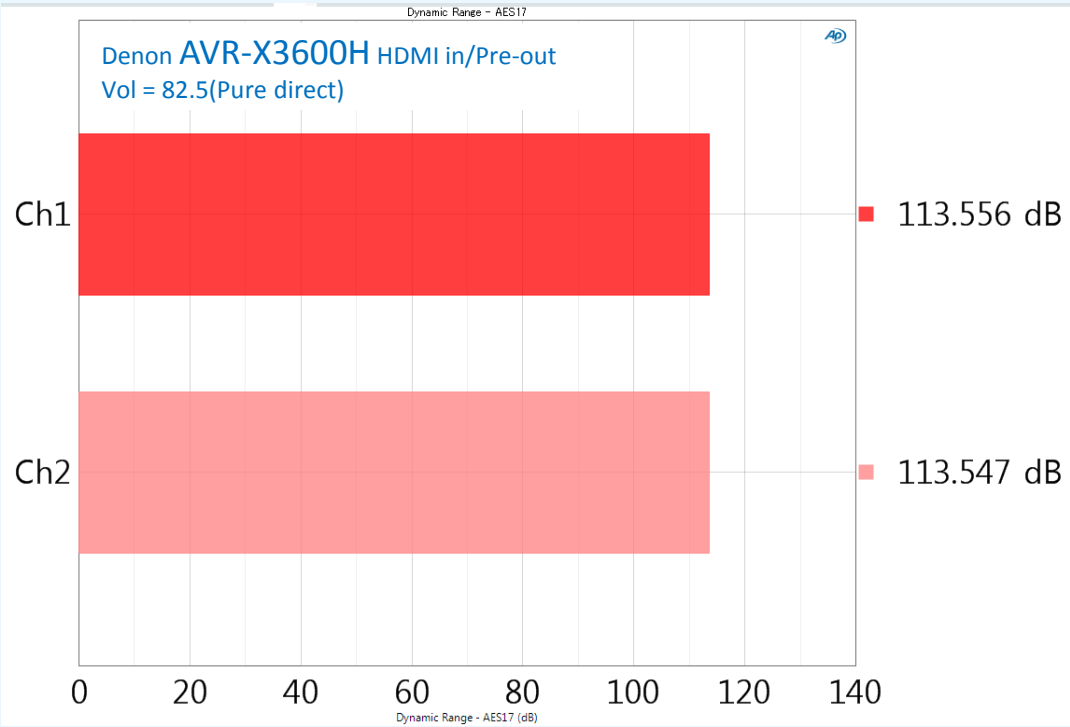
3. FFT & THD+N Toslink In (AVR-X4700H only)

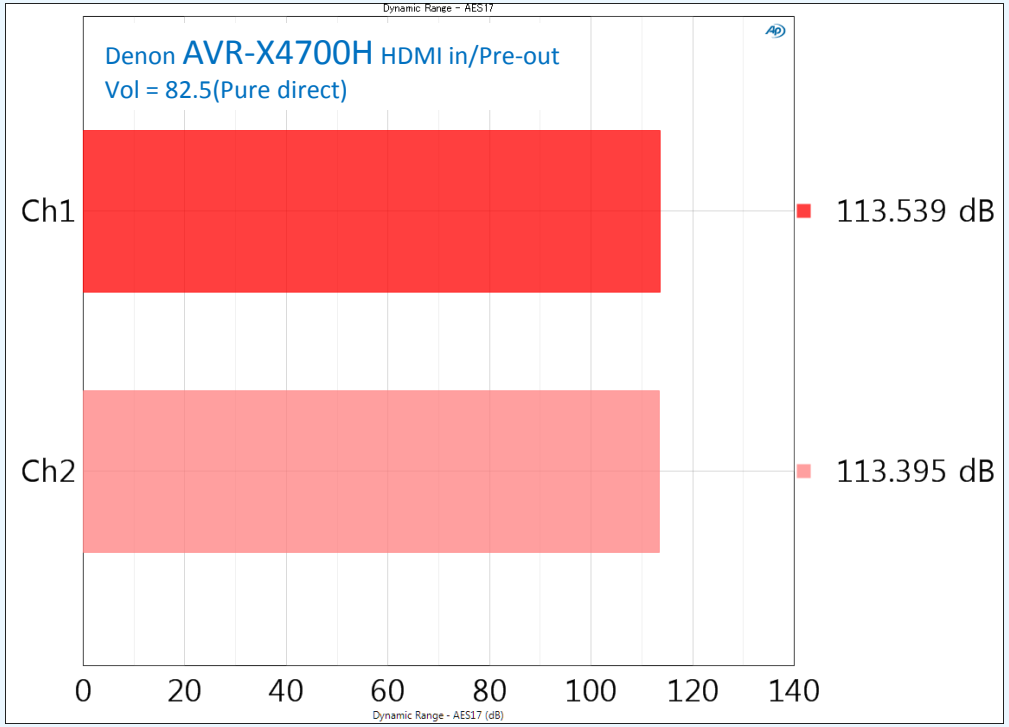
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode
AP Output		Terminal	Digital Optical (Toslink)
		Signal	1k Hz Sin Wave
		Output Level	0.0 dBFS
		Sampling Frequency	44.1k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	~ 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	22.4k Hz
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	Digital Optical (Toslink)
		Output	Pre-Out
		Volume	82.5

4. Dynamic Range

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering





We confirmed the AVR-X4700H performance is as good as the AVR-X3600H.

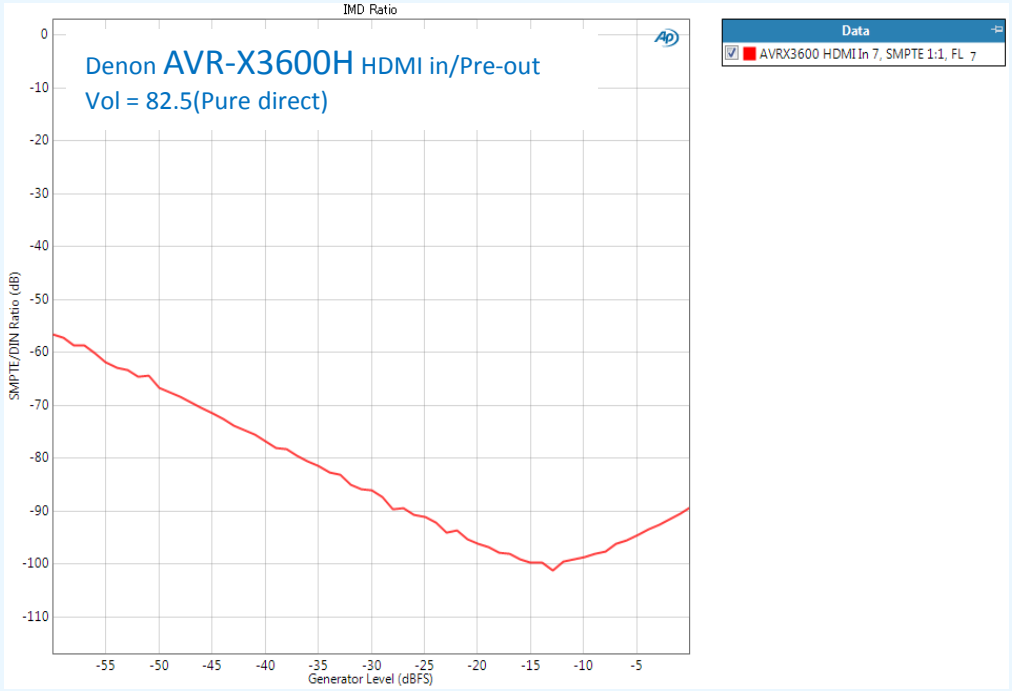
4. Dynamic Range

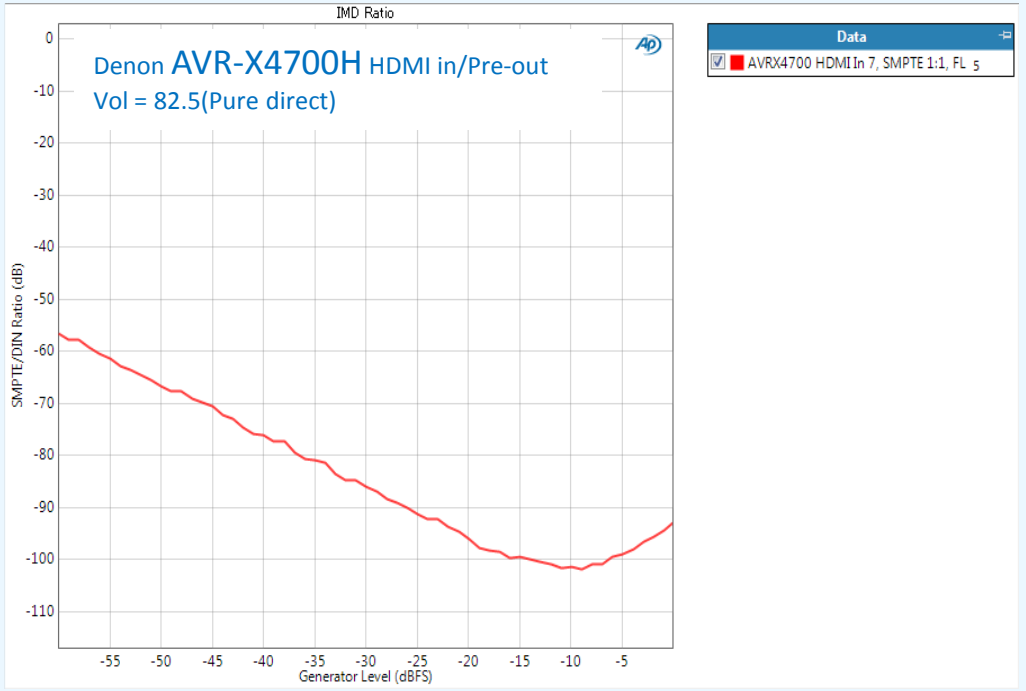
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Sequence Mode Dynamic Range AES17
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	997 Hz Sin Wave
		Output Level	-60.0 dBFS
		Sampling Frequency	44.1k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	0 dBFS Ref. = 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	AES17 (20k Hz LPF + A-wt)
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

5. IMD

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering





We confirmed that the AVR-X4700H performance is better than the AVR-X3600H.

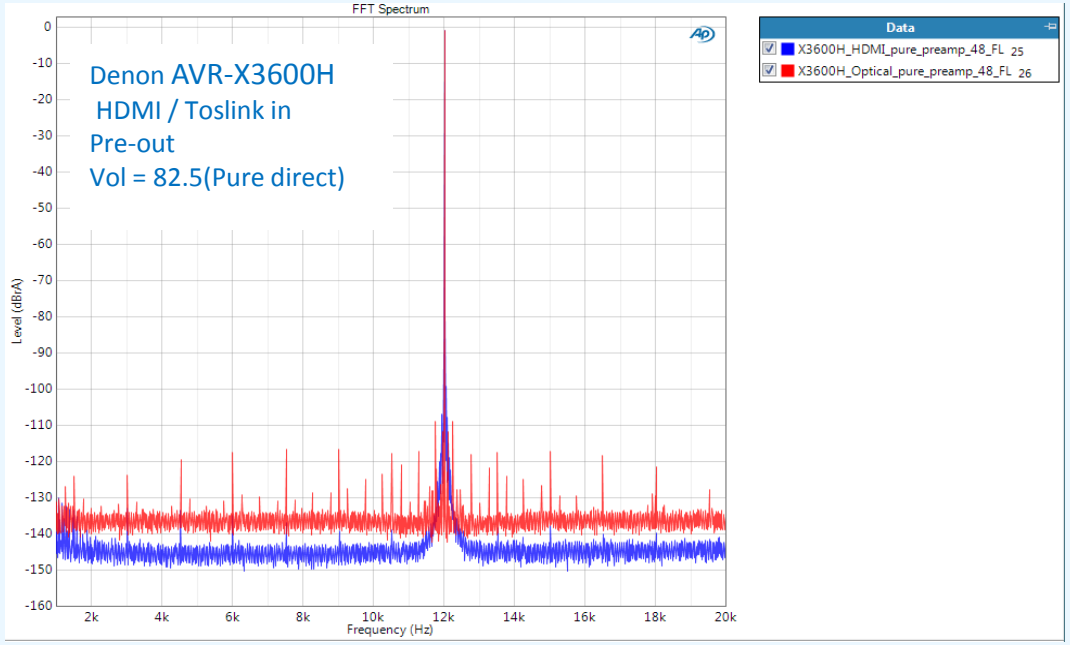
5. IMD

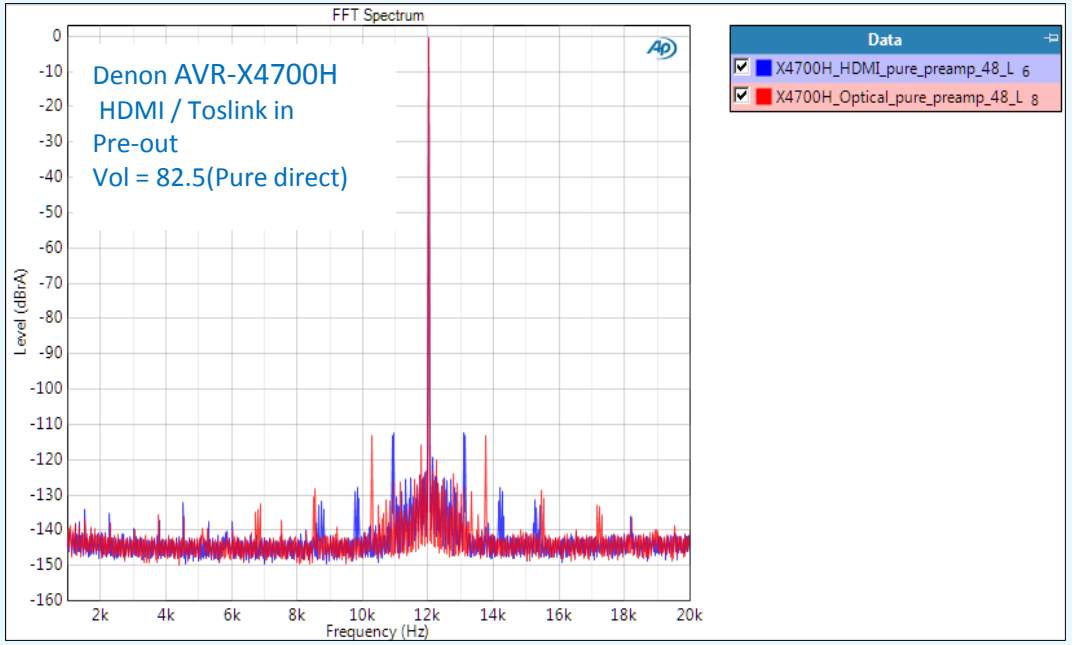
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode, SMPTE/DIN Ratio
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	250 Hz + 8k Hz Sin Wave (SMPTE 1:1)
		Output Level	0.0 dBFS to -60.0 dBFS
		Sampling Frequency	44.1k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	0dBFS Ref. = 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	22.4k Hz
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

6. Jitter

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering





We confirmed the AVR-X4700H performance is as good as the AVR-X3600H for HDMI.

The AVR-X4700H performance is better than the AVR-X3600H for Toslink.

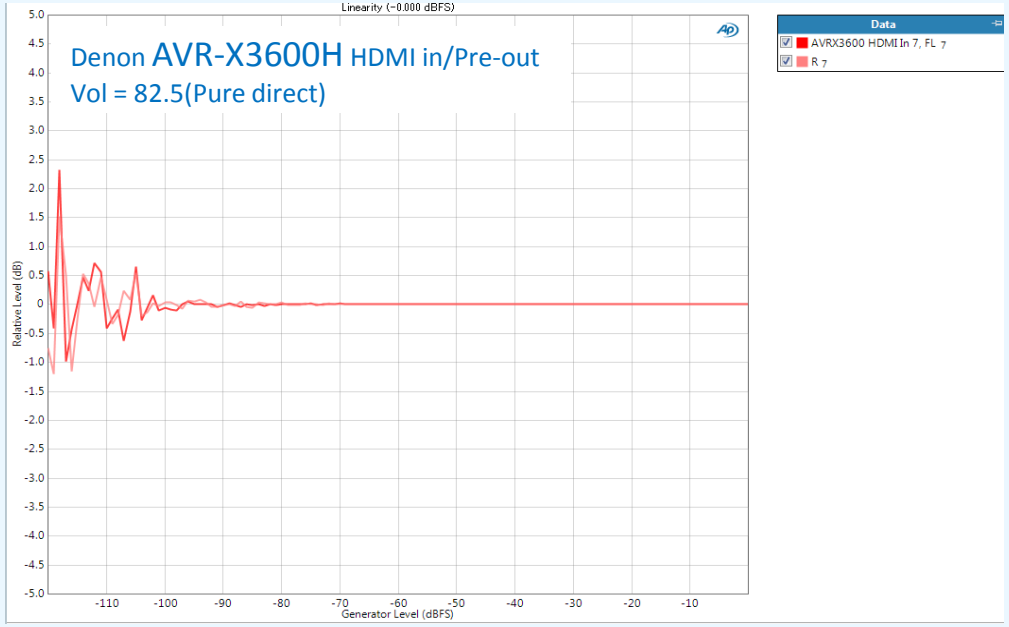
6. Jitter

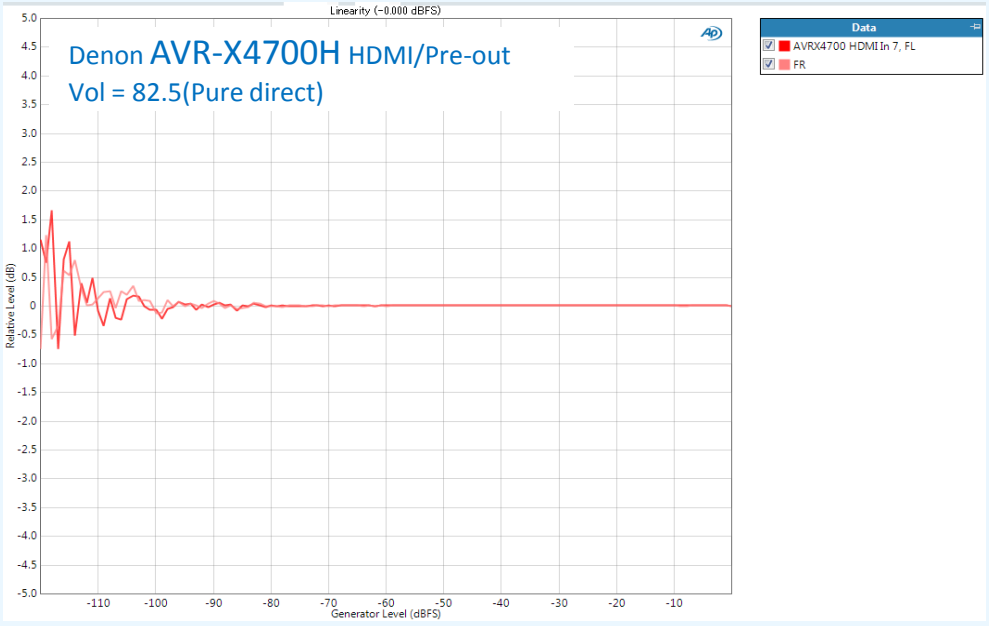
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode
AP Output		Terminal	1. Built-in HDMI terminal on AP
			2. Digital Optical (Toslink)
		Signal	J-test Signal
		Output Level	0.0 dBFS
		Sampling Frequency	48.0k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	~ 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	22.4k Hz
		FFT	256k Point, 16 Averages
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	1. HDMI
			2. Digital Optical (Toslink)
		Output	Pre-Out
		Volume	82.5

7. Linearity

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering





We confirmed the AVR-X4700H performance is as good as the AVR-X3600H.

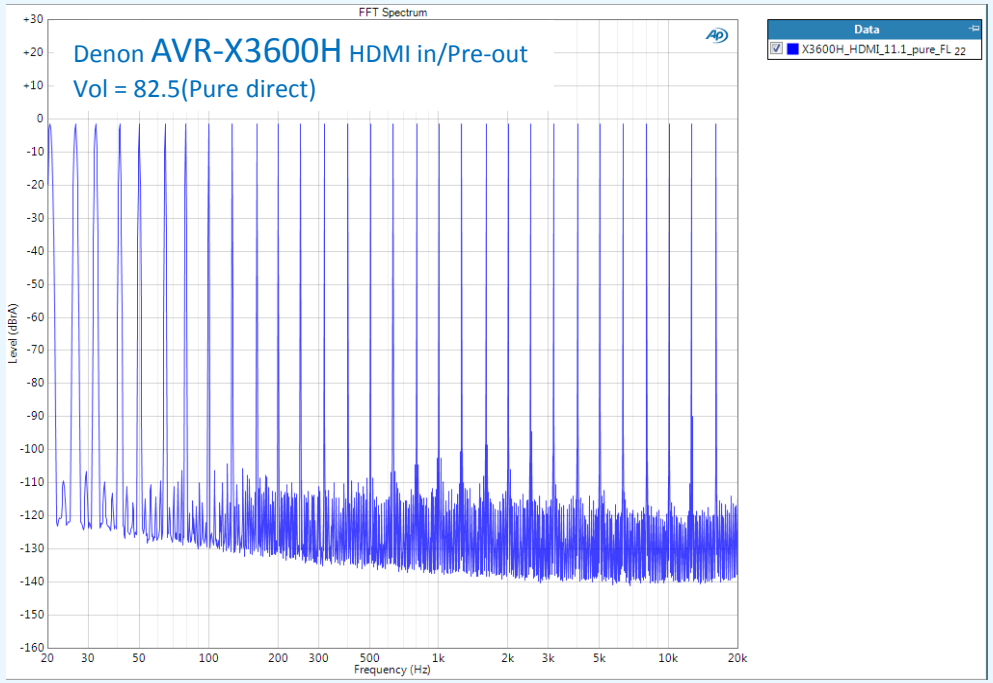
7. Linearity

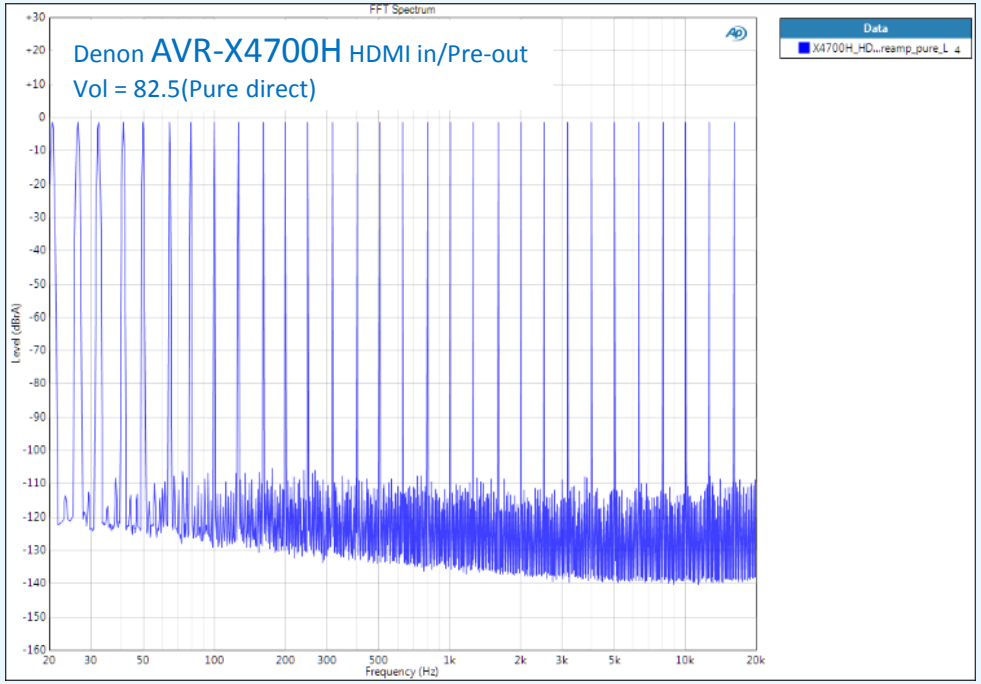
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Sequence Mode Bandpass Level Sweep Linearity (-0.000 dBFS)
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	1k Hz Sin Wave
		Output Level	0.0 dBFS to -120.0 dBFS
		Sampling Frequency	44.1k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	0dBFS Ref. = 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	22.4k Hz
		Bandpass Filter	Bandpass Filter (1k Hz)
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

8. Thirty-two (32) Tone

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering





We confirmed the AVR-X4700H performance is as good as the AVR-X3600H.

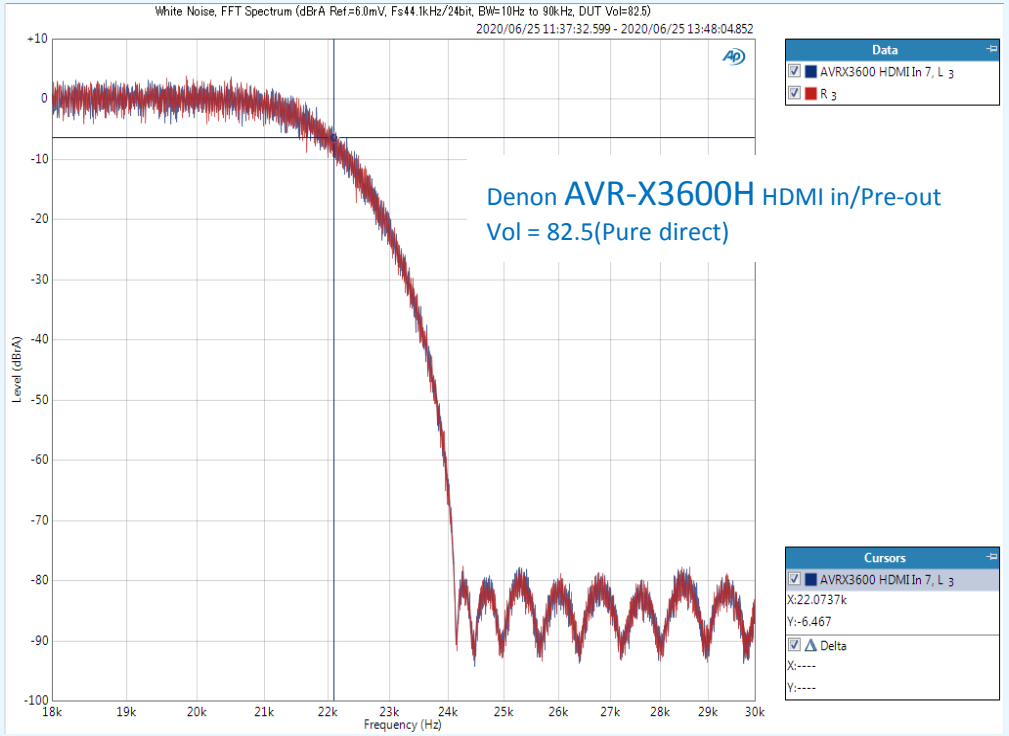
8. Thirty-two (32) Tone

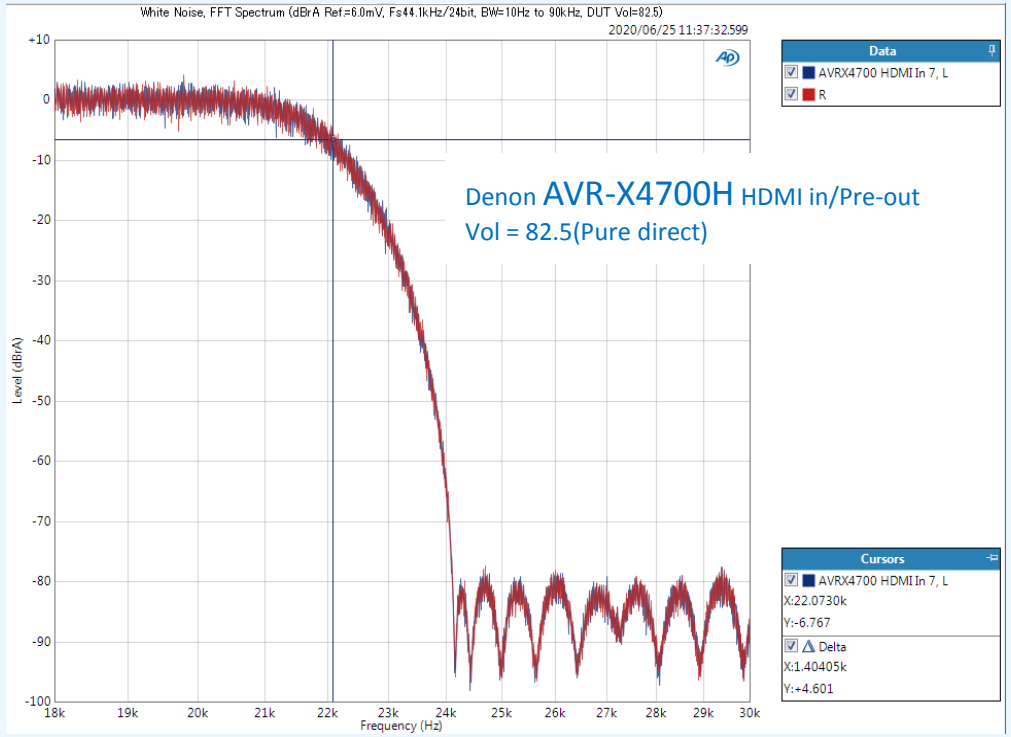
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode FFT Spectrum
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	APx 32-tone
		Output Level	0.0 dBFS
		Sampling Frequency	192.0k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	0dBFS Ref. = 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	22.4k Hz
		FFT	256k Point, 16 Averages
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

9. DAC Filter Response

AVR-X3600H (2019) vs AVR-X4700H (2020) model comparison measurements performed by Denon Engineering





We confirmed the AVR-X4700H performance is as good as the AVR-X3600H.

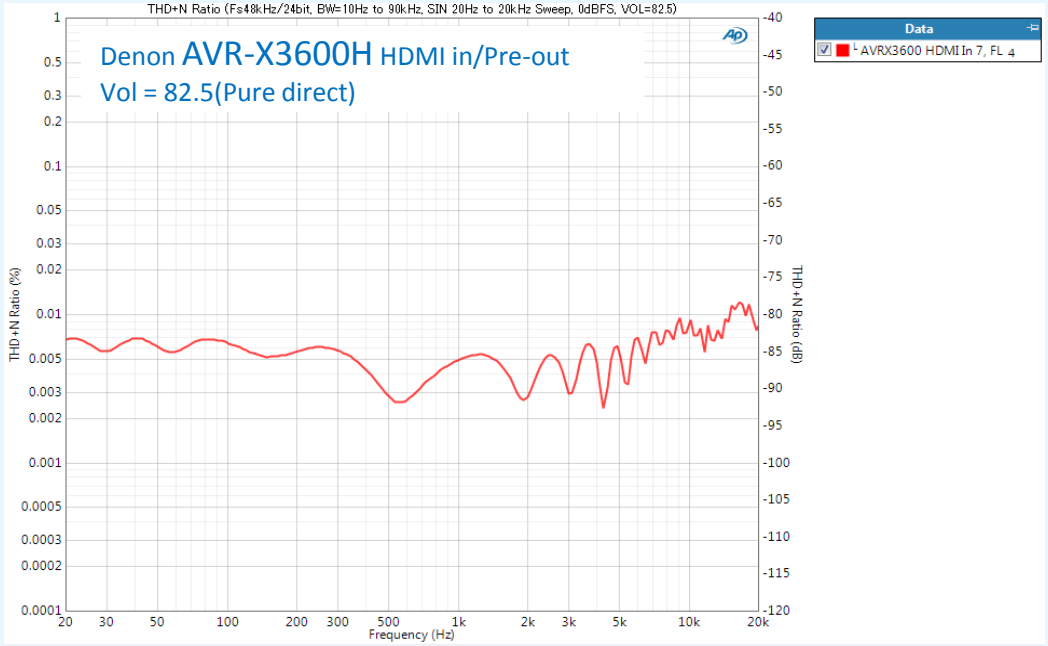
9. DAC Filter Response

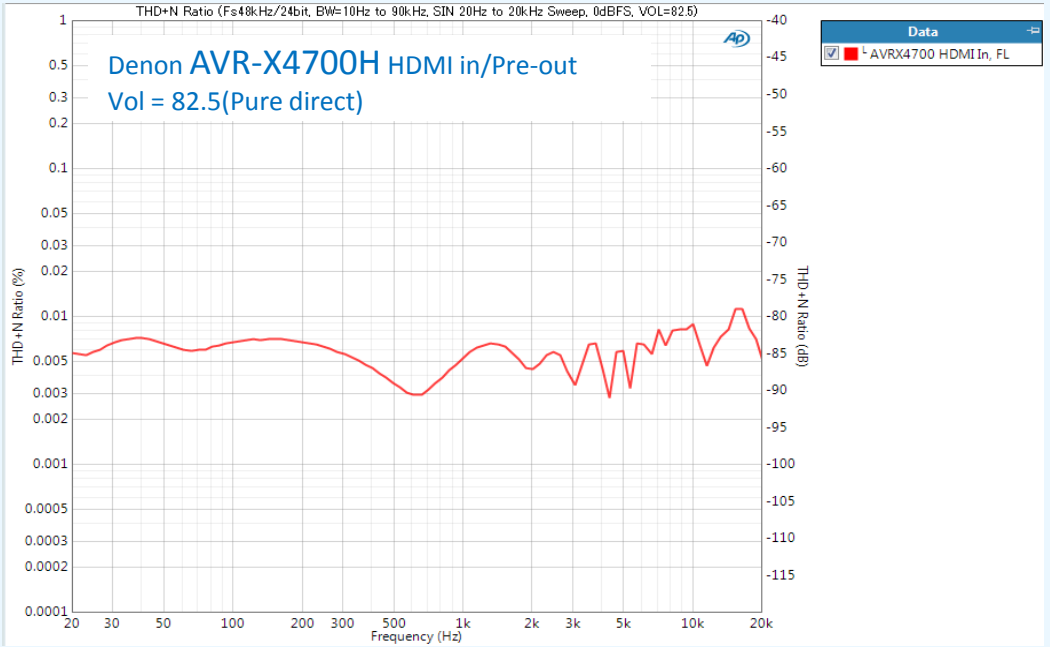
Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode FFT Spectrum
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	White Noise
		Output Level	0.0 dBFS
		Sampling Frequency	44.1k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	0dBFS Ref. = 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	90.0k Hz
		FFT	256k Point, 16 Averages
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

10. THD + N vs Frequency

2019 vs 2020 model comparison measurements performed by Denon Engineering





We confirmed the AVR-X4700H performance is as good as the AVR-X3600H.

10. THD + N vs Frequency

Measurement Conditions

Condition			Setting
Audio Precision		Type No.	APx582
		AP Test Mode	Bench Mode Frequency Sweep
AP Output		Terminal	Built-in HDMI terminal on AP (Linear 8ch Layout1)
		Signal	20 Hz to 20k Hz Sin Wave
		Output Level	0.0 dBFS
		Sampling Frequency	48k Hz
		Bit Width	24 bit
AP Input		Terminal	Analog Unbalanced 2ch
		Input impedance	100k ohm
		Input Level	0dBFS Ref. = 2 Vrms
	Analyzer Setting	High Pass Filter	AC(<10 Hz)
		Low Pass Filter	90k Hz
AV Receiver Setting		Mode	Pure Direct
		Amp Assign	11.1 ch mode (Pre-out : Front)
		Input	HDMI
		Output	Pre-Out
		Volume	82.5

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