

A-9355 Integrated Digital Amplifier

GOLD

VL DIGITAL RI

Reproducing Audio with a Sense of Speed and Energy

The key difference between analog and digital amplification is the manner in which the input signal is amplified. Put simply, with analog amplification, the analog input signal is amplified without modification. On the other hand, with digital amplification, the analog signal is converted into a pulse (digital) signal and then amplified, before being converted back into an analog signal. Generally speaking, a digital amplifier offers greater power efficiency (up to 90%) and a smaller chassis size, as there is no need for a large heat sink. Besides these advantages, Onkyo also believes it is possible to improve sound quality, as digital amplifiers have a greater ability to reproduce sound with speed and energy. This is the focus with the A-9355 digital amplifier. By countering spike noise with Onkyo's Vector Linear (VL) Digital modulation circuit and negating voltage fluctuations through the power supply, the A-9355 is aimed at the music lover who wants to get the best out of their collection. The concept also draws on build quality that strives to take audio reproduction to its limits.

- 85 W/Ch Minimum into 4 Ω , 1 kHz, 2 Channels Driven, JEITA
- 70 W/Ch Minimum into 4 Ω , 1 kHz, 2 Channels Driven, IEC
- Exclusive Vector Linear (VL) Digital Technology for Accurate Conversion
- All Discrete Output Stage Circuitry to Inhibit Audio Signal Interference
- Optimum Gain Volume Circuitry to Preserve Signal Purity
- Massive Power Transformer
- Audiophile-Grade Capacitors
- Low-Impedance, Thick Bus Plate for Perfect Grounding
- Precision Motor-Driven Volume Control
- Tone Control (Bass, Treble, Loudness On/Off)
- Pure Direct Mode for Bypassing Tone Control
- Discrete Phono Equalizer Circuitry for Superior Sound Quality
- 5 Audio Inputs and 2 Outputs
- Phono Input
- Speaker A/B Drive
- High-Rigidity, Anti-Resonant Chassis to Reduce Vibrations
- Aluminum Front Panel and Volume Knob
- Banana Plug-Compatible Speaker Posts
- Gold-Plated Headphone Jack
- Heavy-Duty Power Cord
- Compatible with RI Dock for the iPod
- RI (Remote Interactive) Remote Control

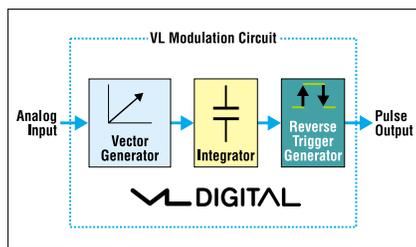


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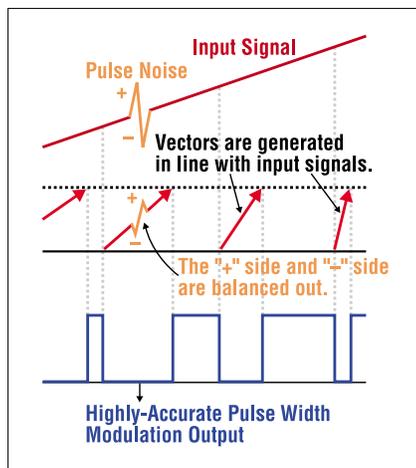
Pulse Width Modulation (PWM) and Onkyo's Vector Linear (VL) Digital Technology

PWM is the most common method of amplifying audio signals, and it involves analog-to-digital conversion. Unfortunately, a digital amplifier generates a lot of "noise spikes" from sources external to the modulator circuitry. This spike noise introduces errors into the inversion timing, making accurate conversion into pulse widths impossible. So, to further improve the precision of our digital amplifiers, we've had to push even further.

Onkyo's response is a highly accurate analog-to-digital conversion circuit—VL Digital—that is unaffected by noise in the analog signal. VL Digital technology comprises a vector generator, an integrator (like a charger) and an inversion trigger generator. When the analog input signal is received, the vector generator outputs a current proportional to the size of the analog input. This current is sent to the integrator, where it is "charged." When the charge quantity reaches a specified value, the trigger operates and inverts the output pulse. Circuits charge and invert alternately, performing pulse width modulation proportional to the analog signal.



The upper and lower portions of the spike noise waveform are symmetrical, so they have the same area. Therefore, if the analog signal contains spike noise, these charge quantities will cancel each other out. This ensures accurate pulse width modulation at all times. Onkyo's third-generation VL Digital technology includes an inverted Darlington circuit that goes beyond earlier versions to accurately produce a current flow based on the input voltage.



Relying on a Heavy-Duty Power Supply with Minimal Voltage Fluctuations

As voltage fluctuations cause the digital pulse height to fluctuate, Onkyo places a high priority on the power supply in its digital amplifier design. This heavy-duty power supply—consisting of a massive power transformer—is quite unlike other digital amplifiers that use powerful servos and small power supplies. Onkyo has also opted for two audiophile-grade capacitors (each with a capacitance of 10,000 μF)—a step up from the A-9355's predecessor. The A-9355's power supply promotes a smooth sound and a wide dynamic range.

Low-Impedance Thick, Copper Bus Plate for Perfect Grounding

Electricity stored in an amplifier's capacitor is outputted via an electric power line. To provide continuous output at full power, a digital amplifier requires a large, stable flow of current. Any loss of power at the output stage becomes a hindrance to the instantaneous flow of that current. The A-9355 uses a thick bus plate to achieve an extremely low level of impedance from the power supply to the speakers and to ground.

Optimum Gain Volume Circuitry to Preserve Signal Purity

Conventional volume attenuation methods must initially drop a signal close to the noise floor at low volumes. Even though the signal is only tainted with a little noise, the amount increases when the signal is amplified. Onkyo's Optimum Gain Volume Circuitry adjusts the gain so that less than half the amount of attenuation is necessary. This signal never comes close to the noise floor, thus averting the possibility of noise found in conventional volume-attenuation designs.

Discrete Phono Equalizer for Superior Sound Quality

The NF-type (negative feedback) phono equalizer is the most widely used circuitry for vinyl playback. With this method, as more negative feedback is applied at higher frequencies, transient response deteriorates and the sound quality suffers as a

result. However, the NF-type enables a higher signal-to-noise ratio and a wider dynamic range. With a less commonly used phono equalizer, the CR-type, it is possible to get an excellent transient response. With the A-9355's onboard phono equalizer, it is possible to keep negative feedback uniform over the whole frequency range. The A-9355's phono equalizer combines the benefits of both the NF-type and CR-type phono equalizers—a high signal-to-noise ratio, a wider dynamic range and excellent transient response—to produce exceptional sound quality from vinyl music sources.

SPECIFICATIONS

AMPLIFIER SECTION	
Power Output	85 W/Ch (4 Ω , 1 kHz, 2 channels driven, JEITA) 70 W/Ch (4 Ω , 1 kHz, 2 channels driven, IEC)
Dynamic Power	75 W + 75 W (4 Ω) 38 W + 38 W (8 Ω)
Total Harmonic Distortion	0.08 % (1 kHz, 1 W)
Damping Factor	60 (Front, 1 kHz, 8 Ω)
Input Sensitivity and Impedance	Phono MM 2.5 mV/50 k Ω LINE 200 mV/50 k Ω
Output Level and Impedance	200 mV/2.2 k Ω (Rec out)
Phono Overload	70 mV (MM, 1 kHz, 0.5%)
Frequency Response	10 Hz–60 kHz (+1, -3 dB, CD)
Tone Control	+10 dB, -10 dB, 100 Hz (Bass) +10 dB, -10 dB, 10 kHz (Treble) +8 dB, 100 Hz (Loudness) +4 dB, 10 kHz (Loudness)
Signal-to-Noise Ratio	100 dB (CD, IHF-A), 70 dB (Phono, IHF-A)
Speaker Impedance	4 Ω –16 Ω
GENERAL	
Power Supply	AC 120 V, 60 Hz AC 220–230 V, 50/60 Hz
Power Consumption	45 W 51 W
Standby Power Consumption	0.2 W
Dimensions (W x H x D)	435 x 124 x 344 mm
Weight	7.3 kg



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