



Spectral DMA-250 Series 3 Reference Amplifier

Eighteen years ago Spectral introduced the original DMA-250 reference power amplifier. The high-speed, high-current DMA-250 was inspired by the revolutionary technology innovations and instrumentation design of the Spectral DMA-180, our first high-current, wide band amplifier. The DMA-250 replicated the extreme signal response of the high power DMA-180 and was an immediate worldwide success, changing the way serious designers defined amplifier performance. Today, the new DMA-250 builds on the achievement of the original DMA-250 and illustrates Spectral's commitment to state-of-the-art signal transparency and musical realism combined with exceptional value.

As the foundation of the Spectral amplifier family, the DMA-250 S3 represents striking progress in the development of an ideal power amplifier for high performance music systems. Drawing on the many design advances developed for Spectral's ambitious DMA-300 and DMA-280 reference amplifiers, the performance and technology of the DMA-250 are fundamentally superior to that of conventional SS and tube power amplifiers, achieving significantly lower distortion levels and radically faster signal response.

The uncompromising high-speed amplifier topology of our DMA-280 Reference Amplifier forms the basis for the remarkable DMA-250. This new generation topology features innovative input, gain and output driver stages based on a new family of premium discrete silicon devices. The pure class A driver and gain sections now operate up to ten times faster than previous Spectral designs and offer dramatic improvement in transient resolution and an ultra-low noise floor. Amplifier settling and recovery are perfect. The result is immersive sonics of extraordinary purity and detail which emerge from an absolutely uncompressed soundfield, free of artifact or fatigue. From much listening and design

experimentation, Spectral has consistently pioneered component systems having fast settling, high-speed circuit architecture. These have invariably outperformed more traditional often cumbersome high-end design methods to achieve superlative detail, soundstaging and listener involvement. Indeed, test methodology simulating music waveforms and hearing acuity confirm that quickness of response and rapid signal extinction when reproducing complex dynamics are mandatory for accurate music reproduction. Only then can one preserve instantaneous waveform accuracy to prevent cover-up of delicate musical signals by previous events. Construction and performance of the Spectral DMA-250 S3 Reference Amplifier for this demanding criterion and resulting sonic resolution are unmatched among contemporary high-end amplifier designs.

Unparalleled Resolution, Unprecedented Control

The very high-speed launch and high current reserves of the new DMA-250 are achieved with the use of Spectral's proprietary "Focused Array" construction. Our breakthrough topology time aligns high-current vertical fet output devices for rapid, piston-like signal launch. The output section is comprised of eight individual V-fet amplifier modules paralleled to achieve a minimum 200 watt RMS / per channel with 60 amp capability. With this "Focused Array" arrangement of parallel fet amplifiers, full rated power is delivered with total load stability at an unprecedented 1 MHz.

Like the renowned DMA-280 Reference Amplifier, the DMA-250 utilizes Spectral's unique "Focused Array" output section design with powerful ultra-fast Mega Fet devices. Each device, having vacuum tube like operating character, is energized from its own dedicated high energy storage capacitor, rectifier, and individually powered from an isolated ultra-low coupled transformer winding. Individual teflon bias trimmers are used to calibrate each output device separately. Groups of these individual output device / power supply circuits utilize field folding construction and electronic shielding to further impede propagation of stray interference. The resulting "Focused Array" of individual isolated output sections performs as one with virtually no cross-coupling and energy storage artifacts reflecting between output devices. During extreme program dynamics, this arrangement can launch an instantaneous high current drive of over 60 amps per channel to the most sophisticated loudspeakers with assured precision waveform tracing. Gone are performance damaging magnetic and electrical field propagation problems of conventional multiple device power amplifiers. Without stray radiation, critical signal paths within the DMA-250 and other sound system components can perform with lowest possible distortion and settle to signal extinction in microseconds. Hence, the DMA-250 works with power and speed yet behaves inert to other electronic parts of the system. Reproduction is highly articulate and resolving yet has all the powerful unlimited character of the finest very high power amplifier designs due to its superb overload and ultra-fast recovery characteristics.

Ultra Premium Discrete High Speed Circuitry

Small signal circuitry is based on Spectral's proven discrete circuit multiple cascode, double push-pull fet technology. Premium silicon array construction, similar to circuitry in the DMA-280 Reference Amplifier, is applied to the DMA-250 to achieve enormous internal dynamic range capability. This reserve is linear class A with many times greater dynamic capability than program demands. It allows high current drive for quick controlled response from the very large output FETs as well as isolation from their internal electronic activity. Unhindered by interferences and slow cumbersome response of conventional practice, these parts operate with unyielding control and exacting precision. Reproduction is absolutely pure, effortless, highly focused and holographic.

Audio amplification paths through the DMA-250 are direct, inherently linear and simple. These minimalist configurations have always sounded and measured the best but normally become ponderous and overburdened when protection and support functions are added. The DMA-250 takes a different route to solve the sonic problems of amplifier protection circuitry. To maintain the pristine signal path, a sophisticated analog computing ancillary system is thermal and opto-coupled within the amplifier. This "hands off" operational management system observes device loading and power dissipation as well as speaker damaging out of range signals. It takes control without circuitous cross interfering connections to electronics in the signal path, leaving the musical signal absolutely pure and totally untouched.



New Solutions to Old Interface Problems

All connections to the DMA-250 have internal interfaces to assure ideal conditioning as well as optimum transmission of audio signals and power. The crossing points or matching networks also remove interferences that would otherwise enter sensitive circuitry and create unwanted signal propagation and noise. Traditional solid state amplifiers have always employed output terminating networks to provide an impedance or compliance to accommodate the load of the speaker cable and crossover in order to protect the amplifier. Unfortunately, the problems associated with using conventional output networks are severe, ranging from non-linear and unpredictable loading behavior to magnetic field propagation and noise. All these problems will degrade amplifier performance and sonics. In Spectral amplifiers the sources of these distortions are eliminated. Stabilizing networks, resistors, chokes and inductors are replaced with tailored precision woven cables which eliminate non-linearities, noise propagation and magnetic fields. Now the signal from the output devices to the cable load is pristine, isolated and uncompromised by passive component problems.

Unique Advantages of the High Speed Topology

Spectral amplifiers beginning with the first of its kind DMA-180 have unique timed or focused power architectures. Their circuitry, including choice of fast CMOS output semiconductors and construction layout assure responses from all power parts arrive equally to the speakers and the internal feedback components. To do this, each output device has its own isolated power supply source and field cancelling layout. Groups of these are placed for coincident timing so that responses can be precise and simultaneous. Their field cancelling design assures their actions do not propagate noise to the sensitive input circuitry and feedback components. Heavy shielding is unnecessary. Since these configurations operate so quick, our internal interface cables provide precise impedance and compliance to eliminate unpredictable loading behaviors. Old solid state designs use coils for this purpose but their magnetic field propagation degrades performance. Heroic massive machined chassis construction might improve the problem but is simply not necessary except for cosmetic decoration. The focused power architecture, woven and terminated interface cables along with sophisticated signal and routing of Spectral designs and construction provide safety and extreme internal noise isolation. Crossover transitions between positive and negative FETS are smooth and small signal feedback circuits operate in a ultra-quiet environment to eliminate overcorrection responses typical in other high-end amplifier designs.

High Resolution and the Listening Experience

Quick response and instantaneous accuracy to the original music waveforms of live signals are the hallmark of well crafted high resolution recordings. The same requirements are necessary for their reproduction. A large inherent bandwidth that is not forced by excessive correction or feedback is an essential performance foundation as it can avoid having to confront many technical complications with negative sonic consequences. Transient intermodulation, cross modulation, group delay distortion, dispersion, reactive loading are a few of these difficult to describe and understand errors that will not be found from the DMA-250. Advanced testing and state-of-the-art semiconductors, exceptional layouts with much dedicated engineering has been necessary to address and eliminate these distortion issues. In a waveform or time sense, the output signal from the DMA-250 traverses from point "A" to "B" of a musical event with exactly the same waveform shape as its input signal. It does this with parts-per-million accuracy that is free of memorialized unnatural artifacts either before or after the input event. This requires extreme precision. Because Spectral circuits have intrinsic speed and accuracy, the amplification from the DMA-250 is stress free and precise. This important performance aspect preserves clarity, transparency and resolution.

The Reference Amplifier for the Rest of Us

For the serious music enthusiast, the DMA-250 S3 Reference Amplifier is a 'game changer' just as its revolutionary predecessors have been. With its extreme ultra-low distortion and extraordinary signal response courtesy of the benchmark DMA-280, the DMA-250 sets a very high standard indeed. Today's DMA-250 distills the essence of what Spectral engineers have discovered over decades of painstaking engineering research in the pursuit of ultimate amplifier design. The DMA-250 is also eloquent proof that state-of-the-art performance and ultimate refinement need not cost a kings ransom. Although of reasonable cost, the DMA-250 offers uncompromising sonic sophistication and drive precision for the most critical of music system applications. The DMA-250 S3 is the reference amplifier for the rest of us.

Specifications

- Power Output (continuous), 200 Watts 80hm, 360 Watts 40hm, 545 Watts 2 Ohm
- Output Current: 60 Amps peak per channel
- Frequency Response: - ± 0.1 dB, DC-150 KHz, - ± 1 dB, DC-1 MHz, - ± 3 dB, DC-1.8 MHz

Distortion

- Static: Less than 0.015% from DC to 100 KHz, typically 0.005% @ 200 WRMS/8 ohms
- Dynamic: 8 Tone Cluster Test 20 KHz @ 500 Hz separation; 0.01% 8 ohms; 0.015% 4 ohms

- Speed Rise Time: Less than 400 nanoseconds
- Settling: 1.5 microseconds to -40dB
- Slew Rate: 600 volts/microsecond

Noise

- Signal to Noise: 97dB
- Crosstalk: -102dB @ full power 8 ohms

Input

- Impedence: 10K ohms
- Sensitivity: 1.5 volts / nominal output

Power Supply

- Line Voltage: 100 volts, 120 volts, 240 volts (factory set)
- AC Voltage Range: $\pm 10\%$
- Maximum Consumption: 1600 Watts
- Quiescent Consumption: 250 Watts
- Operating Temp: 0° to 50° Celsius range; 32° to 122° Fahrenheit

Protection Features

- DC Protection Servo: 0.5 volt range
- Current Limit Onset: 40 Amps
- Thermal Threshold: Protects at 85° Celsius, 185° Fahrenheit
- AC Main Fuses: 2 @ 2.5A 3AG Slo-Blo for 100 - 120 VAC

- Dimensions W x H x D: 48.22 x 18.4 x 45.8cm
- Weight: 29.0 kg



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