

MODEL 266 HIGH POWER AMPLIFIER

Specifications typical at 25 °C. HV = +400 V. Test Load = 0.47mH + 0.15Ω + 47nF each side to ground.

266	OUTPUT CURRENT						
	Current Mode Output (+/-A Peak, A rms) Pulse Duration / Off time (ms)						
HV 400 V	(DC)	500/500	100/100	20/40	5/15	170/1000	+ or -Burst
+/- A Peak	250	312	350	430	475	430	475
A rms	250	221	247	248	237	177	237

UNIDIRECTIONAL CURRENT BURST

Peak Current Output	±475 A
Burst Waveform	All positive or all negative pulses
Burst Frequency	50 Hz
Duty Factor During Burst	0.5
Burst Duration	100 ms
Interval	100 ms

LOAD

Current Mode	0.47 mH + 0.15Ω
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OUTPUT VOLTAGE

±350 V pk across output terminals with 430 A pulses

PARALLEL OPERATION

operation

Amplifier may be connected for Master/Slave

BANDWIDTH, SMALL SIGNAL

-3 dB @ 5 kHz

SETTLING RESPONSE

After 450 A output ramp	
Current Error < 1%, 4.5 A	150 μs
Current Error < 0.2%, 0.9 A	260 μs

INPUT LIMITER

Current Mode	Adjustable ±30 to ±520 A
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GAIN

Current Mode Adjustment Span	45 to 65A/V
Factory Preset to	50 A/V
Accuracy	±0.5%
Input 2	2.5 A/V ±1%

OUTPUT OFFSET

Adjustable, factory set to zero	
Current Mode Adjustment Span	1.0 A
Stability	
Long Term (> 1 year)	< 80 mA
HV Supply Sensitivity	< 0.5 mA/V

PROPAGATION DELAY

35 μs, independent of amplitude
load dependent, adjustable range ± 5μs typical

EXTERNAL OFFSET

User added to Input 2 (2.5 A/V)

DC DRIFT

Due to Self-Heating @ 250 A DC

Offset < 10 mA/15 min
Gain < 25 mA/ 15 min

Due to Ambient Temperature

Offset 1.2 mA/°C
Gain 30 ppm/°C

LINEARITY

DC Endpoint, ±400 A < 0.01%
Total Harmonic Distortion < 0.2% @ 200 Hz, 250 A rms

NOISE OUTPUT

Current Mode

Discrete Frequency

10 Hz to 40 Hz < 200 µA rms
50 Hz to 60 Hz < 10µA rms
40 Hz to 10 kHz < 5 x f µA rms, where f = frequency in Hz

Ripple

50 - 200 kHz
Load Current, 0 V Output < 0.8 mA
Load Current, 200 V Output < 4 mA
Amplifier Current, 0 V Output < 200 mA rms x C (where C= 0.047µF I = 10 mA)
where C = wall filter capacitance in µF each side to ground

Random Total

0.1 Hz to 10 Hz < 1.6 mA p-p
10 Hz to 150 Hz < 500 µA rms
10 Hz to 5 kHz < 1.6 mA rms

Step (popcorn)

0.1 Hz to 10 Hz < 0.8 mA p-p

Voltage Mode, Open Load

Random Total

10 Hz to 500 Hz 1.2 mV RMS
10 Hz to 10 kHz 5 mV RMS

Ripple

50 - 200 kHz
Each Output to Ground < 0.2 V rms @ 0V output
200 V Output, Differential < 0.6 V rms

Discrete Frequency, 0 V output

Each Output to Ground < 60 mV rms, 1 MHz to 5 MHz
< 10 mV rms, 5 MHz to 100 MHz

SIGNAL INPUTS

Input 1 Differential
Input 2 Differential
Impedance > 20 kΩ
Max Input Voltage ±20 V either input or differential
Common Mode Rejection Ratio 80 dB minimum, DC to 360 Hz

OUTPUT IMPEDANCE

DC > 800Ω
4 kHz to 6 kHz 10 Ω

SWITCHING FREQUENCY

50 kHz
Synchronization 1 MHz ±1% input or output, TTL
Effect of Clock Loss Amplifier inhibits; low voltage power converters and PWM reference operate

MODEL 266 HIGH POWER AMPLIFIER

CURRENT MONITOR	Front BNC and rear D connector
Sensitivity	$\pm 1 \text{ V}/50 \text{ A} \pm 0.5\%$
Range	$\pm 12 \text{ V}$
Stability	0.1%
Source Impedance	100 Ω
VOLTAGE MONITOR	Front BNC and rear D connector
Sensitivity	$\pm 1 \text{ V}/40 \text{ V} \pm 1\%$
Range	$\pm 12 \text{ V}$
Stability	0.1%
Source Impedance	100 Ω
CONFIGURATION MODULE	3 per axis-switchable, set gain and response for specific load
Accessibility	Front
Optional Modules Available	TEST mode for short circuit burn-in. VOLTAGE CONTROL mode SLAVE mode. (Same for either current or voltage control, for parallel operation of amplifiers)
REMOTE ENABLE	TTL ground or 5 V opto-isolated input enables output Front panel INHIBIT switch must be off
FRONT PANEL SWITCHES	INHIBIT RESET
LOAD PROTECTION	
Voltage or Current	Adjustable input limiter Soft start
Shutdown	Current vs. time (Note 1) All four bridge arms open To +HV and ground
Diode Clamps	
FAULT PROTECTION (latched unless otherwise stated)	Shutdown Power device failure Short Circuit Load Disconnected Overcurrent vs. time Temp. Fault High frequency overload (Note 2) Overtemperature at any of 11 measurement points Clock loss HV (not latched) Power supplies or internal voltages out of tolerance (not latched) Open Connector, internal (not latched, fan, current sensor, thermistor, display)
LEDS	
ENABLED	Green. Operating, no faults and INHIBIT switch is off
STATUS OK	Yellow. No faults and INHIBIT switch is off
DC OK	Green. All DC voltages within tolerance
DC FAULT	Red. One or more DC voltages out of tolerance
INHIBIT	Red. INHIBIT switch has been pushed.
OVERCURR	Red. Too much current for too long or too much HF output (Note 1.)
OVERTEMP	Red. Heat sink, inductor, or diode too hot; 13 sensors

Note 1. Protection for current vs. time to spec. table.

2. Protection of high frequency due to internal oscillation or due to excessive high frequency demand ($\geq 6 \text{ kHz}$ at full output voltage swing).

TTL OUTPUTS

STATUS OK
ENABLE BUS

Active Low

Enabled and operating, no faults and INHIBIT switch is off
Amplifier is enabled and operating (Controls slaves)

RESET

Front panel push switch or rear input for TTL
lower switch

TEST CONNECTORS

Two rear 25-pin D connectors provide analog
and TTL digital test
points for factory tests and servicing

POWER REQUIREMENTS

Fan Supply
High Voltage
Amplifier Shutdown
Dissipation at 250 A DC
Dissipation during 475 A peak
Internal Capacitance, Each Amplifier

+28 VDC @ 6 A (for fans and internal voltages)
+400 V
< 55 V or > 425 V
3.6 kW
11.3 kW
38,000 μ F

MECHANICAL

Size

10.5" H x 19" W x 28.5" D, rack mount
26.7 cm H x 48.3 cm W x 72.4 cm D

Weight

114 lb., 51.7 kg