7815 Series

High-Power, High-Precision AC/DC Linear Power Amplifiers

Features

- Stable when driving a wide range of resistive, inductive or capacitive loads
- Four-quadrant operation (source and sink)
- Field-selectable controlled-voltage or controlled-current modes of operation
- Protection circuitry protects the amplifier from input overloads, improper output connection (including shorted and improper loads), over-temperature, over-current, and supply voltages that are too high or low

AE Techron's 7815 Series AC power amplifiers are durable, four-quadrant, DC-enabled, low-noise, wide-bandwidth amplifiers. This combination of features and capabilities makes them a great choice for a large number of research and industrial applications. 7815 series amplifiers are a great solution if bandwidth and/or system noise is a problem. They are able to drive low-impedance loads at frequencies of up to 60kHz. Because they utilize a linear circuit topology, AE Techron 7815 series amplifiers have no switching noise in their output and very low radiated EMI. This results in THD and noise floors that are much lower than what is possible with traditional switch mode amplifiers, making them ideal for applications that require either high precision or, because of sensitive measurements, cannot tolerate the radiated noise associated with switch mode amplifiers.

7815 series amplifiers are tough, both physically and electrically. 7815 series models have been used for conducting experiments on a Navy warship, controlling a magnetic field in a fusion experiment, and driving DUTs while absorbing back EMF when there is a failure.

The 7815 series is designed and built for applications where large surge currents or long duration power is needed. This makes them ideal for applications where power or duty cycle requirements are greater than is possible with consumer- or pro-audio-grade amplifiers. Because power ratings are continuous, AE Techron amplifiers often produce between 4 and 8 times more power than a similarly rated consumer amplifier.

Key Performance Capabilities:

Output Power:	**Up to 15 kVA continuous, 30 kVA short-term**
Current:	**Up to 300A continuous, 600A short-term**
Voltage:	**Up to ±500 Vp**
Bandwidth:	**DC to 60 kHz, ±3 dB**
Slew Rate:	**40 V/µs**
THD:	**Less than 0.25% (DC to 20 kHz)**
DC Drift:	**Less than ±400 µV (from room temperature to thermal shutdown)**

The 7815 Series consists of three amplifier models: 7815-50-300, 7815-100-150 and 7815-300-50. Each model has been optimized for specific load impedances, from 0.1 ohm to 8 ohms. Customized versions can be ordered with special amplifier configurations and/or with extra rack space to install additional equipment. Contact us today; let us see if we can create a custom configuration specifically to meet your needs.

7815-50-300 AC Output

	PEAK OUTPUT						RMS OUTPUT				
	40 mSec Pulse, 20% Duty Cycle		5 Minutes, 100% Duty Cycle		1 Hour, 100% Duty Cycle		5 Minutes, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
Ohms	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Watts
2.67	98	52	98	52	97	52	69	36	69	36	2484
1.33	95	69	95	69	95	69	66	48	66	48	3168
0.67	88	132	88	132	88	132	60	90	60	90	5400
0.33	81	243	81	243	81	243	56	168	56	168	9408
0.167	72	432	72	432	72	432	50	300	50	300	15000
0.083	50	630	32	402	32	402	23	273	23	273	6279
0.0417	23	591	23	582	23	573	16	399	16	390	6240

Note: Testing performed into resistive loads as specified. Performance reported is typical into the specified load up to 20 kHz frequency levels. Performance may be affected when operating into highly reactive loads or above 20 kHz, reducing maximum voltage, current and power output.

7815-100-150 AC Output

	PEAK OUTPUT						RMS OUTPUT				
	40 mSec Pulse, 20% Duty Cycle		5 Minutes, 100% Duty Cycle		1 Hour, 100% Duty Cycle		5 Minutes, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
Ohms	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Watts
open	181	0	181	0	181	0	128	0	128	0	0
5.33	159	36	159	30	159	30	112	21	112	21	2352
2.67	159	57	154	57	154	57	109	39	109	39	4251
1.33	158	117	152	114	152	114	107	81	107	81	8667
0.67	157	237	*	*	141	213	*	*	100	150	15000
0.50	148	297	*	*	71	213	*	*	50	150	7500
0.33	140	420	*	*	71	213	*	*	50	150	7500
0.167	106	627	*	*	63	381	*	*	45	270	12150

* Testing not performed.

Note: Testing performed into resistive loads as specified. Performance reported is typical into the specified load up to 20 kHz frequency levels. Performance may be affected when operating into highly reactive loads or above 20 kHz, reducing maximum voltage, current and power output.

7815-300-50 AC Output

	PEAK OUTPUT						RMS OUTPUT				
	40 mSec Pulse, 20% Duty Cycle		5 Minutes, 100% Duty Cycle		1 Hour, 100% Duty Cycle		5 Minutes, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
Ohms	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Watts
open	543	0	543	0	543	0	384	0	384	0	0
48	477	12	477	10	477	10	336	7	336	7	2352
24	477	19	462	19	462	19	327	13	327	13	4251
12	474	39	456	38	456	38	321	27	321	27	8667
6	471	79	*	*	423	71	*	*	300	50	15000
4.5	444	99	*	*	*	*	*	*	*	*	*
3	420	140	*	*	213	71	*	*	150	50	7500
1.5	318	209	*	*	189	127	*	*	135	90	12150

* Testing not performed.

Note: Testing performed into resistive loads as specified. Performance reported is typical into the specified load up to 20 kHz frequency levels. Performance may be affected when operating into highly reactive loads or above 20 kHz, reducing maximum voltage, current and power output.

7815-50-300
Output Range: -95Vp to +95Vp
Output Current: 0A to 300A RMS continuous
Maximum Continuous Output Power: 15 kW RMS
Peak Current: 630A for 40 ms
Slew Rate: 40 V/µs
Supply Voltage: 3-phase 208V ±10%, 90A, 50/60 Hz; 400V, 45A version available
Dimensions (HxWxD): 52.3 x 22.6 x 31.6 in. (132.8 x 57.4 x 80.3 cm)
Weight: Approximately 600 lbs. (272 kg)

7815-100-150
Output Range: -180Vp to +180Vp
Output Current: 0A to 150A RMS continuous
Maximum Continuous Output Power: 15 kW RMS
Peak Current: 630A for 40 ms
Slew Rate: 40 V/µs
Supply Voltage: 3-phase 208V ±10%, 90A, 50/60 Hz; 400V, 45A version available
Dimensions (HxWxD): 52.3 x 22.6 x 31.6 in. (132.8 x 57.4 x 80.3 cm)
Weight: Approximately 600 lbs. (272 kg)

7815-300-50
Output Range: -477Vp to +477Vp
Output Current: 0A to 50A RMS continuous
Maximum Continuous Output Power: 15 kW RMS
Peak Current: 200A for 40 ms
Slew Rate: 40 V/µs
Supply Voltage: 3-phase 208V ±10%, 90A, 50/60 Hz; 400V, 45A version available
Dimensions (HxWxD): 52.3 x 22.6 x 31.6 in. (132.8 x 57.4 x 80.3 cm)
Weight: Approximately 600 lbs. (272 kg)

Common Data (all models)

Performance
Testing performed at 208V/415V AC. 7800 series amplifiers can operate from 400V AC ±10%. Since these amplifiers have an unregulated power supply, low line conditions may slightly affect the maximum voltage potential.

All testing was performed in Controlled-Voltage (CV) mode. Accuracy was measured when driven into a 10-ohm load with between 0.1V DC and 6V DC or between 0.2V AC and 5V AC presented at its inputs.

Bandwidth (-3dB): DC to 60 kHz
Phase Response (10 Hz - 10 kHz): ±8.3 degrees
Unit to Unit Phase Error: ±0.1 degrees at 60 Hz
Output Offset: <±200 µV
Output Offset Current: <10 mA, DC
Residual Noise, 10 Hz to 20 kHz: <250 µV (<0.25 mV)
THD (DC - 20 kHz): <0.25%
DC Drift,
- **From Cold to Maximum Operating Temperature:** <±400 µV
- **After 20 Minutes of Operation:** ±200 µV

Output Impedance: 3.2 mΩ in Series with 2.2 µH
Input Characteristics: Unbalanced BNC connector, 10 kΩ single-ended
Gain,
- **Voltage Mode:** 60 volts/volt
- **Current Mode:** 60 amperes/volt

Gain Linearity (over input signal, from 0.2V to 5V),
- **DC:** 0.0125%
- **AC:** 0.030%

Max Input Voltage: ±10V, balanced or unbalanced
Input Impedance: 20 kΩ differential
Input Sensitivity: 3.0V input for 3800W output into 1 ohm, adjustable
Common Mode Rejection Range: ±11V DC maximum
Common Mode Rejection Ratio: Better than 70 dB

Status Display, Control, I/O
Front Panel LED Displays indicate: Ready, Standby, Fault
Soft Touch Switches for: Run, Stop, Reset
LCD Display: Can be configured for up to four simultaneous displays reporting one, two, or all four of the following: V_P, V_{RMS}, A_P, A_{RMS}. Also reports any fault conditions that occur and suggests corrective action.
Back Panel Power Connection: Barrier strip
Signal Output: Back-panel high-current connectors
Signal Input: Back-panel unbalanced BNC

Communication Capabilities
Reporting: System Fault, Over Temp, Over Voltage, Over Load

Protection
Over/Under Voltage: ±10% from specified supply voltage amplifier is forced to Standby
Over Current: Breaker protection on both main power and low-voltage supplies
Over Temperature: Separate output transistor, heat sink, and transformer temperature monitoring and protection

Physical Characteristics
Chassis: Black powder-coated heavy-duty steel frame and panels
Operating Temperature: 10°C to 50°C (50°F to 122°F), maximum output power de-rated above 30°C (86°F).)
Humidity: 70% or less, non-condensing
Cooling: Forced air cooling from front to back through filters via six 100ft3/min. fans.

CE 400V versions of this product bear the CE mark