The *AE Techron* ***7224*** is a DC plus audio bandwidth AC signal source that can be used to simulate ripple, noise, drop outs, surges and ground as required by a variety of standards for DC powered electronics in the military, aviation and automotive industries.

7224 AC/DC Power Amplifier/ Battery + Ripple Simulator

For testing to these Specifications:

MILITARY
MIL STD 461
RTCA / DO 160
AVIATION
AIRBUS ABD0100
Boeing D6-16050-5
ISO 1540:2006
MIL STD 704
PRODUCT STANDARDS
EN 300329
EN 300340
EN 300342-1
EN 301489-1, -7, -17, -24
AUTOMOTIVE STANDARDS
ISO 7637
ISO 11452-8 and -10
ISO 16750-2
JASO D001-94
SAE J1113-2, -11, -12
SAE J1455
AUTOMOTIVE OEM
BMW 600 13.0 (Part 2)
BMW GS 95004
BMW GS 95003-2
BMW GS 95024-2-1
Chrysler CS-11809 (2009)
Chrysler CS-11979
Chrysler DC-11224 Rev.A
DaimlerChrysler DC-10614
DaimlerChrysler DC-10615
DaimlerChrysler DC-11224
DaimlerChrysler PF-10540
EMC-CS-2010JLR V1.1 (2011-01)
Fiat 9.90110
Ford EMC-CS-2009.1, RI 140 and 150
Ford EMC-CS-2009.1, CI 210, 230, 250 and 260
(more…)

Features

- Stable when driving highly capacitive loads.
- Up to 16A continuous at 13.8 VDC.
- 300+ kHz small signal bandwidth (–3 dB).
- ±150 VDC capable.
- 75 V/µS slew rate.
- Four quadrant operation.
- Output impedance of 5.3 mOhm in Series with 0.95 µH.
- Multiple amplifiers can be combined for greater output current.

7224 DC Specifications - *High Current Mode*

	OUTPUT (Amperes)		
VDC	100 mS Surge	10 Minute, 100% Duty Cycle	1 Hour, 100% Duty Cycle
48	40	12	12
24	45	26	20
13.8	50	20	16

7224 AC Specifications - *High Voltage Mode*

	OUTPUT (RMS)				
	5 Minute, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
Ohms	Volts	Amps	Volts	Amps	Watts
16	112	6.9	112	6.9	773
8	96	11.5	96	11.5	1104
4	76	18.2	43	10.3	443

7224 AC Specifications - *Mid-Level Mode*

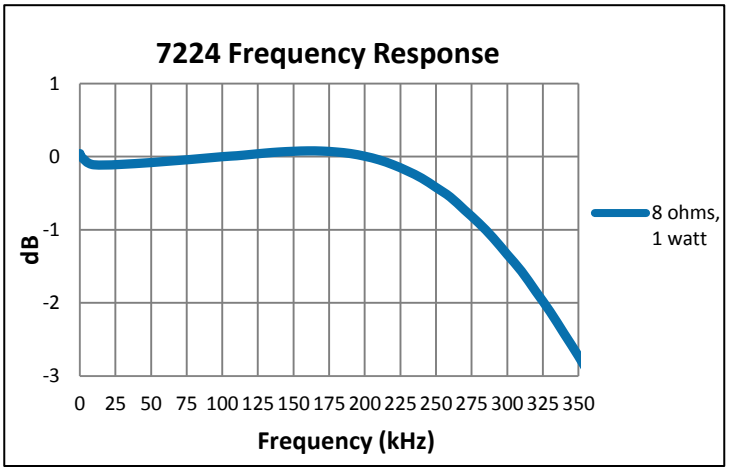
	OUTPUT (RMS)				
	5 Minute, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
Ohms	Volts	Amps	Volts	Amps	Watts
4	49	12	49	11.6	568
2	40	19	40	18.5	740
1	30	28	15	14.8	222

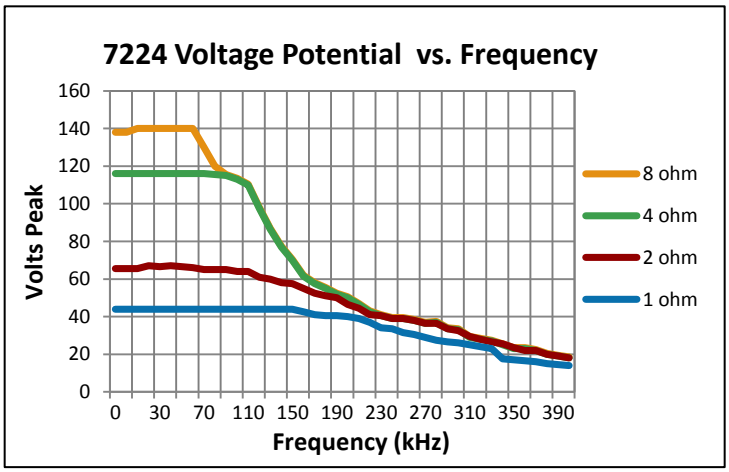
AUTOMOTIVE OEM (continued):

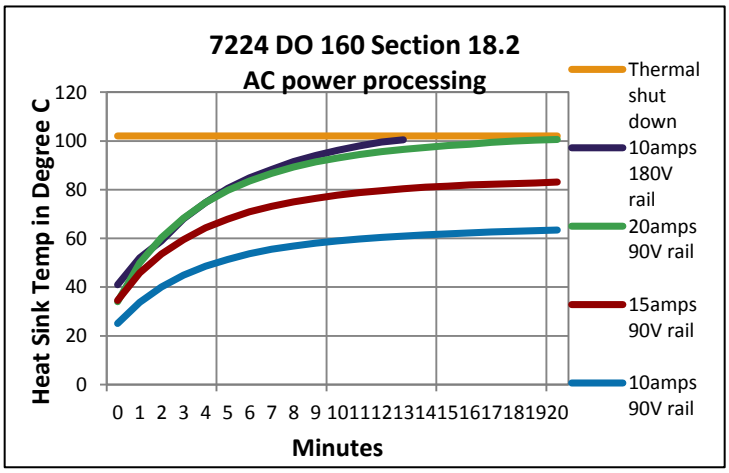
Ford ES-XW7T-1A278-AC
Ford WDR 00.00EA
Freightliner 49-00085
GLloyd VI-7-2
GM 9105P
GMW 3097
GMW 3100
GMW 3172
Honda 3982z-SDA-0030
Hyundai ES 39110-00
Hyundai ES 96100-02
IVECO 16-2103
Kia/Hyundai ES 95400-10
Mack Trucks 606GS15
MAN 3285
Mazda MES PW 67600
MBN 10284-2
Mercedes MBN 10284-2
Mercedes AV EMV
Mercedes-Benz A 211 000 42 99
Mercedes MBN 22100-2
Mitsubishi ES-X82010
MW 3097
Nissan 28400 NDS 02, 03, 05, 07
Nissan 28401 NDS 02
Piaggio 7431
Porsche
PSA B21 7090 & 7110
PSA B21 7110
Renault 36.00.400/B & C
Renault 36.00.808/--D, E.F, G, H, J, K, and L
SA B21 7110
Scania TB1400
Scania TB1700
Smart DE1005B
Tata TST/TS/WI/257
Toyota TSC3500G
Toyota TSC3590G
Toyota TSC6203G
Toyota TSC7001G
Toyota TSC7034G
UN ECE R10 (Automotive)
Volvo STD 515-0003
Volvo EMC Requirements
VW TL 801 01
VW TL 820 66
VW TL 821 66
VW TL 823 66
VW TL 824 66
VW TL 825 66

7224 AC Specifications - *High Current Mode*

	RMS OUTPUT				
	5 Minute, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
Ohms	Volts	Amps	Volts	Amps	Watts
1	21	21	20.5	20.5	420
0.75	18	24	18	24	432
0.5	16	32	16	32	512







Performance

AC testing was done at 100 Hz. See DC Specifications chart for test conditions.

7224P accuracy was measured when driven into a 10-ohm load with between 0.1VDC and 6VDC or between 0.2VAC and 5VAC presented at its inputs.

Small Signal Frequency Response:
DC - 300 kHz +0.0 to -1.0 dB

8-Ohm Power Response:
± 140 Vpk DC to 60 kHz
± 50 Vpk DC to 180 kHz
± 30 Vpk DC to 300 kHz

Slew Rate:
75 V/µSec

Residual Noise:
10 Hz to 300 kHz: 950 µV (0.95 mV)
10 Hz to 80 kHz: 300 µV (0.3 mV)

Signal-to-Noise Ratio:
10 Hz - 30 kHz: –113 dB
10 Hz - 80 kHz: –106.6 dB
10 Hz - 300 kHz: –99.9 dB

Unit to Unit Phase Error:
± 0.1 degrees at 60 Hz

THD:
DC - 30 kHz less than 0.1%

Output Offset:
7724: Less than ±5 mV
7224P: Less than ±400 µV

DC Drift:
7224: <±1.5 mV
7224P: <±200 µV
(after 20 minutes of operation)

Output Impedance:
5.3 mOhm in Series with 0.95 µH

Phase Response:
± 5 degrees (10 Hz - 10 kHz) plus 560 nsec propagation delay

Input Characteristics

Balanced with ground:
Three terminal barrier block connector
20 k ohm differential

Typical Multi Amplifier Configurations

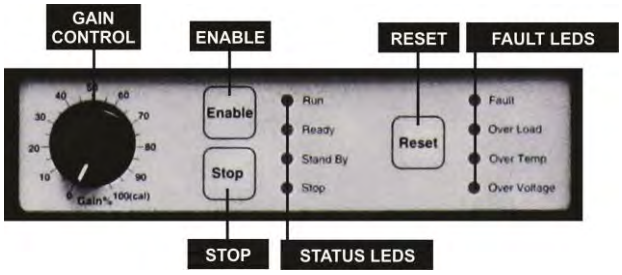
Two 7224s in Series

High Voltage, Low Current	5 Min, 30% duty Cycle		1 Hr, 100% duty Cycle	
Ohms	Volts Peak	Amps Peak	Volts Peak	Amps Peak
32	316	9.8	316	9.8
16	272	16.3	272	16.3
8	216	25.7	122	14.5

Two 7224s in Parallel

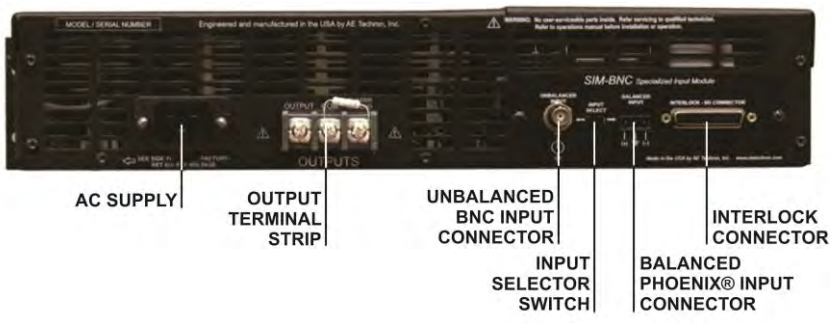
Medium Voltage, Medium Current	5 Min, 100% duty Cycle		1 Hr, 100% duty Cycle	
Ohms	Volts Peak	Amps Peak	Volts Peak	Amps Peak
2	69	32.8	69	32.8
1	57	54.2	57	52.4
0.5	43	79.2	21	42

Low Voltage, High Current	5 Min, 100% duty Cycle		1 Hr, 100% duty Cycle	
Ohms	Volts Peak	Amps Peak	Volts Peak	Amps Peak
0.5	29	58	29	58
0.375	26	68	26	68
0.25	22.7	90	22.7	90



7224 Front Panel Indicators and Controls

7224 Front Panel On / Off / Breaker Switch



7224 Back Panel

Unbalanced:
BNC connector, 10k ohm single ended. Fixed or variable gain

Gain:
Voltage Mode: 20 volts/volt
Current Mode: 5 amperes/volt

Gain Linearity (over input signal, from 0.2V to 5V):
7224: 0.15%
7224P: 0.02% (DC); 0.05% (AC)

Max Input Voltage:
± 10 V balanced or unbalanced

Input Impedance:
20 kOhm differential

Common Mode Rejection:
-58 dB with 5 V input

Display, Control, Status, I/O

Front Panel LED Displays indicate:
Ready, Standby, Fault, Over Temp, Over Voltage, Overload

Soft Touch Switches for:
Run, Stop, Reset

Gain Control, when enabled:
Voltage gain adjustable from 20 to 0

On/Off Breaker

Back Panel Power Connection:
25 Amp IEC (with retention latch)

Signal Output:
Three-position terminal strip (OUTPUT/COM/CHASSIS GROUND); resistor between COM and CHASSIS GROUND terminals is a 2.7-ohm, 2W, 5%, metal-oxide resistor

Signal Input:
User Selectable BNC or Barrier Strip Balanced

Communication Capabilities

Current Monitor:
± 1 V / 5 A ± 1%

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

Control: Force to Standby, Reset after a fault

Multiple Unit Configuration

Series Operation:
Total Voltage (1, 2, or 3 -7224's): 150 V_{pk}, 300 V_{pk}, or 450 V_{pk} or 600 V_{pk}; Increased slew rate up to 200 V/µSec

Parallel Operation:
Total Current (1, 2, 3, or 4-7224's):
50 A_{pk}, 100 A_{pk}, 150 A_{pk} or 200 A_{pk}

Physical Characteristics

Chassis:
The Amplifier is designed for stand- alone or rack-mounted operation. The Chassis is black aluminum with a powder coat finish. The unit occupies two EIA 19-inch-wide units.

Weight:
41 lbs (18.6 kg), Shipping 51 lbs (23.2 kg)

AC Power:
Single phase, 120 VAC, 60 Hz, 20 Amp service; (220-240 VAC, 50-60 Hz, 10 Amp service model available)

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 removable filters.

Airflow: 180CFM

Dimensions:
19" x 22.75" x 3.5" (48.3 cm x 57.8 cm x 8.9 cm)

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

AE Techron Sales Representative