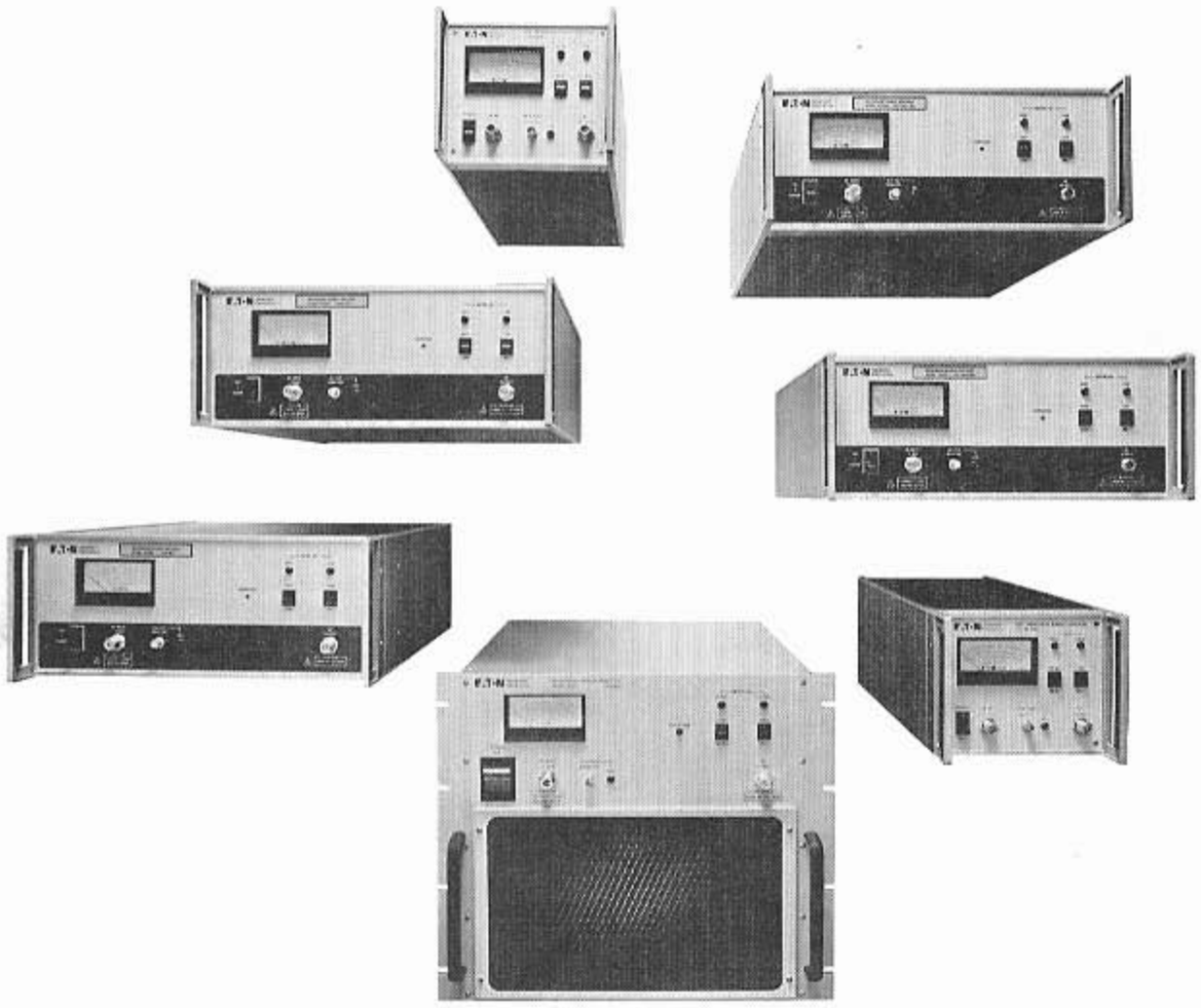
Eaton

High Power Broadband Linear Amplifiers

from 10 to 200 Watts • 10 kHz to 1000 MHz



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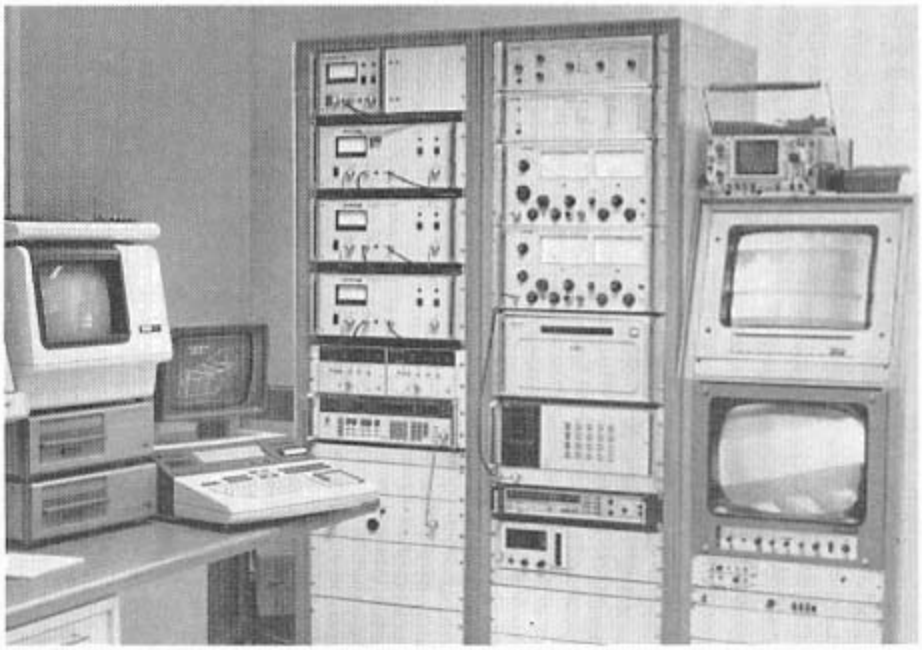
Eaton
Solid State Broadband Linear Power Amplifiers

Extremely versatile line of power amplifiers developed expressly for...

- **EMS**
- **Research & Development**
- **High Power Component/System Testing**
- **Wattmeter Calibration**
- **Communications**
- **NMR Spectroscopy**
- **Laser Modulation**
- **ATE Systems**
- **OEM Applications**



Eaton Broadband Amplifiers in use as a source for susceptibility testing systems.

Electromagnetic Susceptibility Testing
Susceptibility is a term given to a particular type of testing that will define a level of immunity of a particular device to a high intensity RF field.

Eaton Broadband Amplifiers are universally used as a source for EMC susceptibility testing. Sufficient power is available to satisfy virtually all of the currently specified field intensities. The amplifiers can be used to provide a high level of CW, AM, FM and pulse modulation signals.

It is difficult to find a modern industry that has not come to "the age of electronics." Microelectronics has found its way into a majority of our labor saving control and safety systems. It is becoming increasingly important to design new electronic devices that will not be affected by the high RF energy fields that are present in our everyday lives like high power radar and communications equipment. The broadband amplifiers serve several markets relative to their needs to qualify electronic systems and components to be immune to the effects of an RF field.

Laboratory R & D
The high technology frontier has been a proving ground for Eaton Broadband Power Amplifiers. They have played an active role in many R & D type applications, in both universities and private research. Lasers, plasma, ultrasonics, NMR and radiological health effects are only a few areas in which these amplifiers have been specified and successfully employed.

Power level stability and spectral purity are essential for laboratory applications. Our performance and reliability have been the keys to success.

High Power Component Testing
Under high power conditions components can break down and have their characteristics badly degraded or totally fail. Broadband amplifiers are useful to component groups who must evaluate their designs and products.

A multitude of devices exist that require high power RF signals for testing. Switches, filters, ferrite devices, couplers, multipliers, transistors, antennas and even amplifiers require RF power testing. Eaton Broadband Amplifiers are suited by design for all of these applications.

Eaton
Broadband Linear Power Amplifiers

Models	Features	Frequency Range	Rated Power Output into 50 ohms	1 dB Compression IMD – 25 dBc	Total Harmonic Distortion	Input Required (50 ohms)
5001	• Up to 80 Watts Available Power • Directional True Power Wattmeter • Instantaneous Bandwidth over 10 kHz to 10 MHz Range • Covers Low Frequency Limit for MIL-STD-461 • ALC Loop Capability • Low Noise Figure • Completely Solid State	10 kHz to 10 MHz	50 watts	40 watts	25 dB down @ 1 dB comp.	10 mW maximum input for rated output power
1020, 2020B, 5020B, 2C20	• Active VSWR, Power Protection • Directional True Power Wattmeter • ALC Leveling Capability • Instantaneous Bandwidth over 1 to 200 MHz Range • Low Noise Figure • Completely Solid State	1 to 200 MHz	**1020** 10 watts **2020B** 25 watts **5020B** 50 watts **2C20** 200 watts	10 watts 20 watts 40 watts 140 watts	25 db down @ 1 dB comp.	1 mW maximum input for rated output power
1052, 2052B, 3552B, 2C52	• Active VSWR Power Protection • Directional True Power Wattmeter • ALC Leveling Capability • Instantaneous Bandwidth over 100 to 512 MHz Range • Covers Mobile and MIL Communications Bands • Low Noise Figure • Completely Solid State	100 to 512 MHz	**1052** 10 watts **2052B** 25 watts **3552B** 50 watts **2C52** 200 watts	10 watts 15 watts 30 watts 100 watts		
15100B, 1C100	• Active VSWR Power Protection • Directional True Power Wattmeter • ALC Leveling Capability • Instantaneous Bandwidth over 500-1000 MHz Range • Low Noise Figure • Completely Solid State	500 to 1000 MHz	**15100B** 25 watts **1C100** 100 watts	15 watts 50 watts		

Note: All units 0-50°C Operating Temperature. Models 5001, 1020 and 1052 do not have protection circuits.
Rack Mount Kits: 1940 = 1/2 rack mount for models 5001, 1020, 1052
1941 = wide body rack mount
1942 = slides for wide body units (includes 1941 rack mount)

EATON 5001

EATON 1C100

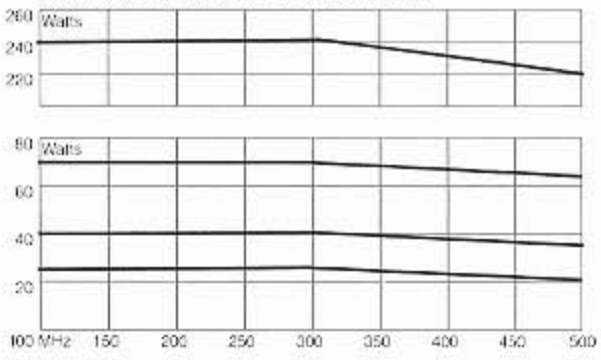
EATON 5020B

EATON 2C52

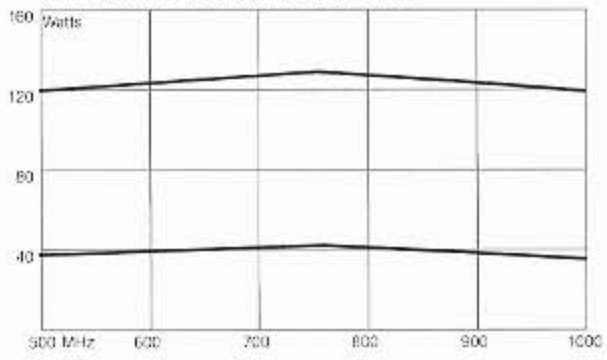
EATON 2020B

Input VSWR	Gain Variation	Noise Figure (Typical)	Protection	Power Requirements	Size (H W D)	Weight
2:1	±1.5 dB	10 dB	withstand 10 dB overdrive with 50 watts output, load VSWR of 1.5:1 No damage @ 50 watt output into any load	115/230 VAC. ±10% 50/60 Hz. 500 watts	7 x 8.5 x 17.25 inches (17.78 x 21.59 x 43.81 cm)	43 lbs (19.5 kg)
1.5:1	±1.5 dB (2C20: ±2.5 dB)	11 dB	• automatic thermal shutdown with reset. • active power circuit protects against excessive VSWR, even during infinite output VSWR & simultaneous input overdrive	115/230 VAC. ±10% 50/60 Hz. **1020** 125 watts **2020B** 350 watts **5020B** 500 watts **2C20** 2000 watts. 220 VAC only	**1020** 7 x 8.5 x 17.25 inches (17.78 x 21.59 x 43.81 cm) **2020B** **5020B** 7 x 17 x 17.25 inches (17.78 x 43.18 x 43.81 cm) **2C20** 15.75 x 19 x 19 inches (40.1 x 48.3 x 48.3 cm)	22 lbs (10 kg) 43 lbs (19.5 kg) 97 lbs (44 kg)
2:1	±2 dB (2C52: ±3 dB	14 dB		115/230 VAC. ±10% 50/60 Hz. **1052** 200 watts **2052B** 400 watts **3552B** 500 watts **2C52** 2000 watts. 220 VAC only	**1052** 7 x 8.5 x 17.25 inches (17.78 x 21.59 x 43.81 cm) **2052B** **3552B** 7 x 17 x 17.25 inches 17.78 x 43.18 x 43.81 cm) **2C52** 15.75 x 19 x 19 inches (40.1 x 48.3 x 48.3 cm)	22 lbs (10 kg) 43 lbs (19.5 kg) 97 lbs. (44 kg)
3:1	±2 dB (1C100: ±3 dB	15 dB		115/230 VAC. ±10% 50/60 Hz. **15100B** 200 watts **1C100** 2000 watts 220 VAC only	**15100B** 7 x 17 x 17.25 inches (17.78 x 43.18 x 43.81 cm) **1C100** 15.75 x 19 x 19 inches (40.1 x 48.3 x 48.3 cm)	43 lbs. (19.5 kg) 97 lbs. (44 kg)

Models 1052, 2052B, 3552B, 2C52
Typical maximum output power into 50 ohm load



Models 15100B, 1C100
Typical maximum output power into a 50 ohm load



An amplifier must be conservatively rated and well protected to provide a reliable source for testing devices with a probability of opens or shorts or, in the case of transistors, a virtually unknown load that must be tuned. Eaton Broadband Amplifiers with the ALC output and power protection circuit can provide a nearly constant output power safely into any load.

The Eaton 363/800 Wattmeter Calibrator and 8C100 RF Power Center are ideal for ATE applications. Covering from 2 MHz to 1000 MHz, the 363/800 and 8C100 supply up to 800 watts of filtered CW power and are IEEE-488 programmable.

High Power Wattmeter Calibration
Eaton Corporation has been providing RF power signal sources for wattmeter calibration for over 20 years. Traditional sources were cavity oscillators and required manual tuning to change frequency and output power.

Broadband amplifiers offer many distinct advantages as applied to wattmeter calibration. Being broadband and requiring no tuning, broadband amplifiers can provide the clean and stable high power levels necessary to test and calibrate in-line and terminated high power wattmeters. Broadband power amplifiers are currently being used in both commercial and military applications for manufacturing and recalibration purposes.

The 363/800 and 8C100 high power RF systems cover from 2 MHz to 1000 MHz and supply up to 800 watts of filtered CW power.

Eaton is currently supplying the 363/800 to the United States Air Force as a programmable high power wattmeter calibrator.

Multi-Channel Communications
Eaton Solid State Broadband Amplifiers are exceptionally linear and will allow a number of signals to be amplified simultaneously with a minimum of intermodulation distortion.

Broadband linear amplifiers can be "cascaded" and even multiplexed to act as repeaters. Using a multiple antenna or radiating coaxial system, communications coverage can approach 100% in areas where point-to-point communication is unreliable due to steel reinforcement in concrete structures. Multi-channel communications such as "operations", "securities" and even "emergency" can be handled through linear amplifiers.

Amplifiers can be included as initial design considerations or after-market updates to existing single-channel systems.

NMR Spectroscopy
Eaton Broadband Amplifiers were designed primarily for linear CW operation but will also operate in a pulse power mode.

Nuclear Magnetic Resonance, or NMR, is the science of studying the composition of various substances. By exposing a material sample to a high power pulse of RF energy the molecules of the sample are rotated about an axis. Upon the termination of the pulse the molecules return to their original position and emit an RF signal which is received by the spectrometer and used to determine the chemical composition of the sample.

Broadband linear amplifiers are ideal for this application because of their pulse handling characteristics and low Q. The pulse is accurately reproduced and has no tendency to ring.

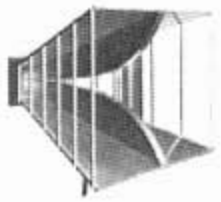
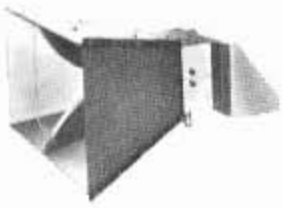
Eaton 363/800 and 8C100 are stable and reliable high-power RF sources.

OEM and ATE Systems
Eaton Broadband Amplifiers have been made available to the OEM market. We have found many situations where the performance of our laboratory instruments has opened the door to OEM agreements for broadband amplifiers modules.

For special applications, Eaton Corporation's Electronic Instrumentation Division can provide custom modules to specially suit individual requirements. We can provide special combinations of frequency power and other electrical characteristics as well as cooling and mechanical packaging.

Eaton Broadband Power Amplifiers, when driven by a programmable low level signal source, become the ultimate high power signal source. Output frequency from 10 kHz to 1000 MHz and power levels up to 1 kW can be controlled by software in automated testing systems.

Antennas for Susceptibility Testing

	Model:	Specifications:
	**Double Ridged Guide Antenna 200 MHz to 2000 MHz** Model 96000	Frequency Range: 200-2000 MHz Average Power Gain: 7.8 dBi Average Beamwidth: E Plane 50°, H Plane 45° Average VSWR: 1.5:1 (50 ohms ref.) Maximum Input Power: 800 watts Connector: Type N Dimensions: (H.W.L.) 72.9 x 97.8 x 93.3 cm (28.70" x 38.50" x 36.75") Weight: 11.8 kg (26 lbs.)
	**Double Ridged Guide Antenna 1 GHz to 18 GHz** Model 96001	Frequency Range: 1-18 GHz Average Power Gain: 10.7 dBi Average VSWR: 1.5:1 (50 ohms ref.) Average Beamwidth: E Plane 53°, H Plane 48° Maximum Input Power: 500 watts Connector: Type N Dimensions: (H.W.L.) 15.8 x 24.4 x 27.9 cm (6.25" x 9.62" x 11.0") Weight: 1.8 kg (4 lbs.)
	**High Field Biconical Antenna 20 MHz to 300 MHz** Model 96002	Frequency Range: 20-300 MHz Impedance: Matched to 50 ohms Average Balun VSWR: 2:1 Maximum Input Power: 2 kW (Peak) 1 kW Average Connector: Type N Dimensions: Diameter: 52.0 cm (20.5") Length: 133.3 cm (52.5") Weight: 3.2 kg (7 lbs.)
	**Parallel Element Antenna 10 kHz to 30 MHz** Model 96003	Frequency Range: 10 kHz-30 MHz Input Impedance: 100 ohms or greater Field Strength Capability: 20 V/M at 1 meter on centerline with 87 V Ein (low band), 45 V Ein (high band). Connector: Type N Dimensions: Width: 5.0 cm (2.0") Length: 184.1 cm (72.5") Weight: 5.5 kg (12 lbs.)
	**Log-Periodic Antenna 200 MHz to 1000 MHz** Model 96005	Frequency Range: 200-1000 MHz Average Power Gain: 5 dB min. Average VSWR: 2:1 max. (50 ohms ref.) Maximum Input Power: 1000 watts Connector: Type N Dimensions: (H.W.L.) 6.30 x 74.9 x 74.9 cm (2.5" x 29.5" x 29.5") Weight: 1.8 kg (4 lbs.)

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In the interest of product improvement, all specifications are subject to change without notice.

For additional information contact Eaton Sales & Service Centers in **So. California** (213) 822-3061, **Virginia** (703) 471-9672, **No. California** (408) 733-6574, **Illinois** (312) 279-8220, **Munich, Germany** (089) 5233023-24, **Wokingham, United Kingdom** (0734) 794717.

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