

Logarithmic Amplifiers LOGARITHMIC AMP IC 120MHz 50dB

Manufacturers	Analog Devices, Inc
Package/Case	CDIP-20
Product Type	RF Power Detectors ; Log Detectors
RoHS	
Lifecycle	



Images are for reference only

Please submit RFQ for AD640TD/883B or [Email to us: sales@ovaga.com](mailto:sales@ovaga.com) We will contact you in 12 hours.

[RFQ](#)

General Description

The AD640 is a complete monolithic logarithmic amplifier. A single AD640 provides up to 50 dB of dynamic range for frequencies from dc to 120 MHz. Two AD640s in cascade can provide up to 95 dB of dynamic range at reduced bandwidth. The AD640 uses a successive detection scheme to provide an output current proportional to the logarithm of the input voltage. It is laser calibrated to close tolerances and maintains high accuracy over the full military temperature range using supply voltages from ± 4.5 V to ± 7.5 V.

The AD640 comprises five cascaded dc-coupled amplifier/limiter stages, each having a small signal voltage gain of 10 dB and a -3 dB bandwidth of 350 MHz. Each stage has an associated full-wave detector, whose output current depends on the absolute value of its input voltage. The five outputs are summed to provide the video output (when low-pass filtered) scaled at 1 mA per decade (50 μ A per dB). On chip resistors can be used to convert this output current to a voltage with several convenient slope options. A balanced signal output at +50 dB (referred to input) is provided to operate AD640s in cascade.

The logarithmic response is absolutely calibrated to within ± 1 dB for dc or square wave inputs from ± 0.75 mV to ± 200 mV, with an intercept (logarithmic offset) at 1 mV dc. An integral X10 attenuator provides an alternative input range of ± 7.5 mV to ± 2 V dc. Scaling is also guaranteed for sinusoidal inputs.

The AD640B is specified for the industrial temperature range of -40°C to $+85^{\circ}\text{C}$ and the AD640T, available processed to MIL-STD-883B, for the military range of -55°C to $+125^{\circ}\text{C}$. Both are available in 20-lead side-braced ceramic DIPs or leadless chip carriers (LCC). The AD640J is specified for the commercial temperature range of 0°C to $+70^{\circ}\text{C}$, and is available in both 20-lead plastic DIP (N) and PLCC (P) packages. This device is now available to Standard Military Drawing (DESC) number 5962-9095501MRA and 5962-9095501M2A.

Product Highlights

Absolute calibration of a wideband logarithmic amplifier is unique. The AD640 is a high accuracy measurement device, not simply a logarithmic building block.

Advanced design results in unprecedented stability over the full military temperature range.

The fully differential signal path greatly reduces the risk of instability due to inadequate power supply decoupling and shared ground connections, a serious problem with commonly used unbalanced designs.

Differential interfaces also ensure that the appropriate ground connection can be chosen for each signal port. They further increase versatility and simplify applications. The signal input impedance is $\sim 500\text{ k}\Omega$ in shunt with $\sim 2\text{ pF}$.

The dc-coupled signal path eliminates the need for numerous interstage coupling capacitors and simplifies logarithmic conversion of subsonic signals.

The low input offset voltage of $50\text{ }\mu\text{V}$ ($200\text{ }\mu\text{V}$ max) ensures good accuracy for low level dc inputs.

Thermal recovery “tails,” which can obscure the response when a small signal immediately follows a high level input, have been minimized by special attention to design details.

The noise spectral density of $2\text{ nV}/\sqrt{\text{Hz}}$ results in a noise floor of $\sim 23\text{ }\mu\text{V rms}$ (-80 dBm) at a bandwidth of 100 MHz . The dynamic range using cascaded AD640s can be extended to 95 dB by the inclusion of a simple filter between the two devices.

Features

Complete, fully calibrated monolithic system

Five stages, each having 10 dB gain, 350 MHz BW

Direct coupled fully differential signal path

Logarithmic slope, intercept and AC response are stable over full military temperature range

Dual polarity current outputs scaled 1 mA/decade

Voltage Slope Options (1 V/Decade , 100 mV/dB , etc.)

Low power operation (typically 220 mW at 65 V)

Low cost plastic packages also available

Application

Radar, sonar, ultrasonic and audio systems

Precision instrumentation from DC to 120 MHz

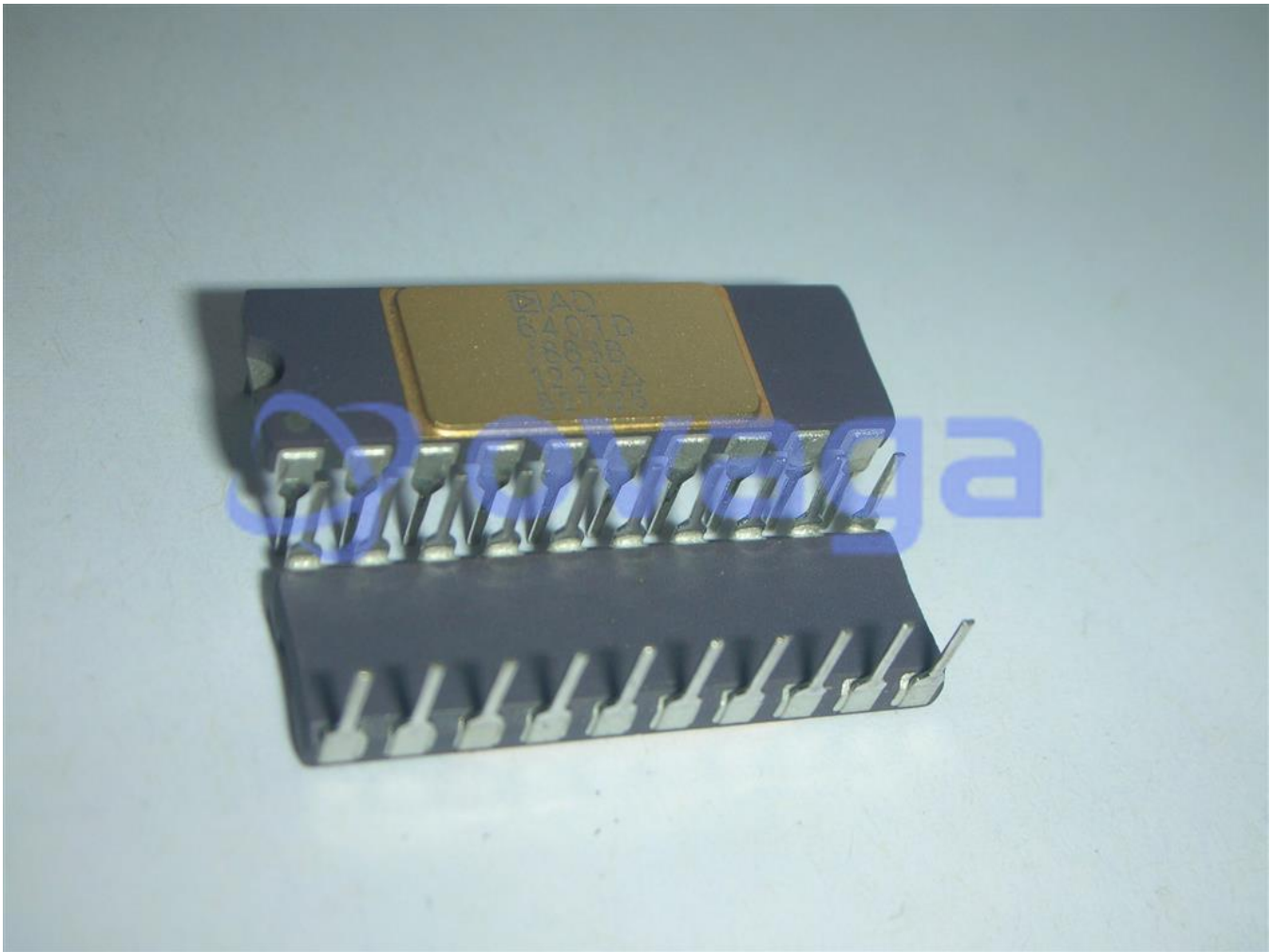
Power measurement with absolute calibration

Wide range high accuracy signal compression

Alternative to discrete and hybrid IF strips

Replaces several discrete log amp ICs



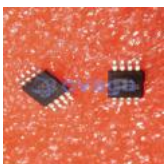


Related Products



[AD8418BRMZ-RL](#)

Analog Devices, Inc
MSOP-8



[ADA4084-2ARMZ](#)

Analog Devices, Inc
MSOP-8



[AD8567ARUZ](#)

Analog Devices, Inc
TSSOP-14



[AD8022ARMZ](#)

Analog Devices, Inc
MSOP-8



[ADA4528-2ARMZ-R7](#)

Analog Devices, Inc
MSOP-8



[AD8062ARMZ](#)

Analog Devices, Inc
MSOP8



[AD8628AUJZ](#)

Analog Devices, Inc
SOP23



[AD8041AR](#)

Analog Devices, Inc
SOP-8