AD640JPZ

Data Sheet

Logarithmic Amplifiers LOGARITHMIC AMP IC 120MHz 50dB

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

Images are for reference only

Please submit RFQ for AD640JPZ or Email to us: sales@ovaga.com We will contact you in 12 hours. RFQ

General Description

The AD640 is a complete monolithic logarithmic amplifier. A singleAD640 provides up to 50 dB of dynamic range for frequenciesfrom dc to 120 MHz. Two AD640s in cascade can provide up to95 dB of dynamic range at reduced bandwidth. The AD640 uses asuccessive detection scheme to provide an output current proportionalto the logarithm of the input voltage. It is laser calibrated toclose tolerances and maintains high accuracy over the full militarytemperature range using supply voltages from ±4.5 V to ±7.5 V.

The AD640 comprises five cascaded dc-coupled amplifier/limiterstages, each having a small signal voltage gain of 10 dB and a –3 dBbandwidth of 350 MHz. Each stage has an associated full-wavedetector, whose output current depends on the absolute value of itsinput voltage. The five outputs are summed to provide the videooutput (when low-pass filtered) scaled at 1 mA per decade (50 µAper dB). On chip resistors can be used to convert this output currentto a voltage with several convenient slope options. A balancedsignal output at +50 dB (referred to input) is provided to operateAD640s in cascade.

The logarithmic response is absolutely calibrated to within ±1 dBfor dc or square wave inputs from ±0.75 mV to ±200 mV, withan intercept (logarithmic offset) at 1 mV dc. An integral X10attenuator 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°C and the AD640T, available processed to MILSTD-883B,for the military range of –55°C to +125°C. Both areavailable in 20-lead side-brazed ceramic DIPs or leadless chipcarriers (LCC). The AD640J is specified for the commercialtemperature range of 0°C to +70°C, and is available in both20-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 isunique. The AD640 is a high accuracy measurement device,not simply a logarithmic building block.

Advanced design results in unprecedented stability over thefull military temperature range.

The fully differential signal path greatly reduces the risk ofinstability due to inadequate power supply decoupling andshared ground connections, a serious problem with commonlyused unbalanced designs.

Differential interfaces also ensure that the appropriate groundconnection can be chosen for each signal port. They furtherincrease versatility and simplify applications. The signal inputimpedance is ~500 kΩ in shunt with ~2 pF.

The dc-coupled signal path eliminates the need for numerousinterstage coupling capacitors and simplifies logarithmicconversion of subsonic signals.

The low input offset voltage of 50 µV (200 µV max) ensuresgood accuracy for low level dc inputs.

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

The noise spectral density of 2 nV/√Hz results in a noise floor of~23 µV rms (–80 dBm) at a bandwidth of 100 MHz. The dynamicrange using cascaded AD640s can be extended to 95 dBby 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](#)

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MSOP-8

[ADA4528-2ARMZ-R7](#)

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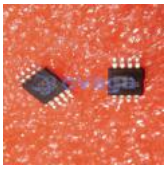

[ADA4084-2ARMZ](#)

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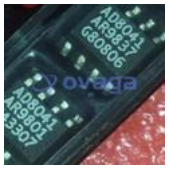

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