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Voltage-to-Frequency Converters Offer Useful Options in A/D Conversion (AB-066)	409
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It describes the design and construction technique of this three port isolation amplifier, including industrial and medical applications.	
Isolation Amps Hike Accuracy and Reliability (AB-093)	157
Two practical examples of how designers can employ isolation amplifiers. In this case, those with internal power supplies to improve their systems' performance and reliability. One is a process control application, while the other discusses an ECG amplifier.	
Improved Noise Performance of the ACF2101 Switched Integrator (AB-053).....	163
Depending on the application, the signal-to-noise performance of the ACF2101 needs to be improved. How to achieve this with only one additional component is shown in this application bulletin.	

OPERATIONAL AMPLIFIERS

Noise Analysis of FET Transimpedance Amplifiers (AB-076)	167
Provides a detailed noise analysis of the transimpedance amplifier configuration commonly used with photodiodes. Shows the contribution of voltage and current noise and the effect of frequency-dependent noise.	
Photodiode Monitoring with Operational Amplifiers (AB-075)	172
Examines various current-to-voltage converter circuits. Describes circuit performance as a function of noise, DC errors, signal bandwidth, and feedback resistance.	
Designing Photodiode Amplifier Circuits with OPA128 (AB-077)	182
Discusses common photodiode amplifier configurations with emphasis on selection of an appropriate op amp. Provides tips on achieving optimum sensitivity and low noise.	
Tame Photodiodes with Op Amp Bootstrap (AB-094)	185
Applying basic op amps in a transimpedance configuration to amplify photodiode signals creates severe problems. This describes a way to solve them.	



Diode-Connected FET Protects Operational Amplifiers (AB-064)	186
Shows how to use a FET to protect an op amp from overload in a circuit that measures dielectric properties.	
Single-Supply Operation of Operational Amplifiers (AB-067)	187
Explains the attributes of a "single-supply" op amp. Shows circuit techniques which allow operation of standard or high performance op amps in single power supply applications.	
Compensate Transimpedance Amplifiers Intuitively (AB-050)	192
Rather than utilize a lot of equations this is a short guide to obtain quick results when dealing with a V/I converter.	
Feedback Plots Define Op Amp AC Performance (AB-028)	194
A comprehensive discussion of feedback effects and the construction of feedback plots for operational amplifiers. Beginning with single-stage amplifiers, it will conclude with an examination of multi-stage and composite amplifiers.	
Feedback Circuit Clamps Precisely (AB-090)	207
This note describes an application for a limiter circuit with variable clamp control.	
Op Amp Performance Analysis (AB-045)	209
A simple guideline through performance, feedback and stability concepts common to all op amp configurations. This analysis helps in finding the optimal feedback factor to decrease errors and improve total circuit performance.	
Double the Output Current to a Load with the Dual OPA2604 Audio Op Amp (AB-051)	217
Shows an application for a simple circuit to create an audio current driver with $\pm 70\text{mA}$ output current drive.	
A Low Noise, Low Distortion Design for Antialiasing and Anti-Imaging Filters (AB-026)	218
Describes the theory and design of GIC filters (Generalized Immittance Converter) often used in DSP, PCM, or audio applications.	
Fast Settling, Low Pass Filter (AB-022)	225
Discusses the relationship between settling time and bandwidth on a low-pass filter and gives an example for a nonlinear filter suitable for fast high-resolution systems.	
Classical Op Amp or Current-Feedback Op Amp? (AB-007)	228
Shows an example for a composite op amp that can give you the best of both worlds.	
Voltage-Feedback Amplifiers vs Current-Feedback Amplifiers (AB-091)	230
Introduces the principles of a current-feedback amplifier and highlights some differences to voltage-feedback amplifiers.	

The Current-Feedback Op Amp a High-Speed Building Block (AB-193)	232
<i>This note discusses in depth the design and behavioral differences between current-feedback amplifiers (CFA) and voltage-feedback amplifiers (VFA). Includes specification, simulation and application examples.</i>	
Ultra High Speed ICs (AB-180)	244
<i>Illustrates the evolution of active electronic components starting with the vacuum tube up to state-of-the-art diamond current sources.</i>	
New Ultra High-Speed Circuit Techniques with Analog ICs (AB-183)	249
<i>Expanding the understanding of the diamond structure used in current-feedback amplifiers, this bulletin focuses on a variety of high-speed applications.</i>	
Building a 400MHz Wide-Band Differential Amplifier: It's a Breeze with the Diamond Transistor OPA660 (AB-188)	266
<i>Illustrates the concept and realization of a high-speed differential amplifier using the OPA660. Impressive performance results are shown.</i>	
Designing Active Filters with the Diamond Transistor, OPA660, Part 1 (AB-190)	270
<i>Active filtering is a common requirement and relatively straightforward for low frequency applications. Now, new op amp design allows active filtering above 5MHz. Showing 2nd, 3rd, and 5th order filtering, this bulletin offers a guide through theory and design based on examples.</i>	
Fiber Optic Transmission (AB-192)	282
<i>Describes the design of a 110MHz fiber optic transmission system utilizing high-speed components like the OPA660, OPA621 and OPA623.</i>	
Driving Video Output Stages with Monolithic Integrated Amplifiers (AB-184)	290
<i>High-resolution video demands high frequencies and high-speed. Only a few integrated products can address this problem such as the current-feedback op amp, OPA623, and the operational transconductance amplifier, OPA2662. The performance of both amplifiers is compared in this bulletin.</i>	
SWOP Amps Simplify RF Signal Processing (AB-092)	297
<i>When designing high performance systems for RF and video applications that require amplifiers, multiplexers or programmable gain amplifiers, finding the right components can be difficult. Using a high speed SWOP amp, such as the OPA678, can greatly simplify the design process. High speed MUXes, built with OPA678, with variable gains are detailed.</i>	
Operational Amplifier Macromodels: A Comparison (AB-046)	299
<i>Discusses two different types of macromodels: the Boyle-model versus the multiple pole/zero model and highlights some points for their correct interpretation.</i>	

POWER OPERATIONAL AMPLIFIERS

Power Amplifier Stress and Power Handling Limitations (AB-039)303

Power op amps can be damaged by excessive signal or load conditions. This bulletin explains "safe operating area specifications" and shows how to evaluate various types of signal and load conditions.

Mounting Considerations for TO-3 Packages (AB-037)309

TO-3 power amplifiers can be damaged or suffer degraded performance by improper mounting. This bulletin shows numerous mounting and heat sinking techniques.

Heat Sinking — TO-3 Thermal Model (AB-038)317

Power handling ability of a power amplifier depends on the heat sink used. A thermal model is used to help determine heat sink requirements.

MULTIPLEXERS

The MPC100 Analog Multiplexer Improves RF Signal Distribution (AB-049)318

Illustrates some applications for use with the wide-band video multiplexer, MPC100.

REFERENCES

Make a Precision Current Source or Current Sink (AB-002)320

Based on the 10V voltage reference, REF102, this bulletin shows how to build a precision current source or sink.

Voltage-Reference Filters (AB-003)322

Noise can be a serious problem even with precision references. Here is how to improve this parameter on the REF102. An example showing stability over time is also included.

SPECIAL FUNCTIONS

Careful Layout Tames Sample/Hold Pedestal Errors (AB-060)324

Subtle problems with PC board layouts can often direct the blame for poor system performance toward a component. A real life example for reducing a pedestal error by reducing stray capacitance is detailed.

"DC to DC" Converter Noise Reduction (AB-162)326

High frequency switching noise can become a serious problem in analog applications. This note provides tips on eliminating noise problems, component selection, and measurement techniques.

10MHz Analog Multiplexer Carries Output Amplifier, Breaks Bandwidth Barrier (AB-083)329

Explains the operation of a wide-bandwidth analog multiplier and discusses its application as a modulator/demodulator. Compares performance with double-balanced diode mixers.

Digitally Programmable Time-continuous Active Filter with Lowpass, Highpass, Bandpass and Notch Outputs (AB-062)	334
The UAF42 Universal Active Filter can be programmed over a wide frequency range by varying two resistors. MDACs can be used to digitally program cutoff frequency.	
Thermal and Electrical Properties of Selected Packaging Materials (AB-030)	337
A convenient table provides a plethora of data on materials used in electronics. It includes resistivity, TCR, thermal resistance and thermal expansion of over 70 materials.	
MFB Low-Pass Filter Design Program (AB-034)	339
Sallen-Key and Multiple Feedback low-pass active filters are among the most commonly used filter topologies. This bulletin explains how to select the best filter type and describes operation of free software to simplify the design process.	
Simple Filter Turns Square Waves into Sine Waves (AB-058)	347
While it's easy to digitally generate a square wave at a given frequency, it can get tricky if you need sine waves. Using the UAF42 universal active filter IC as a tuned circuit, a square wave can easily be filtered to provide a low distortion sine wave output.	
Filter Design Program for the UAF42 Universal Active Filter (AB-035)	349
The UAF42 filter IC contains op amps, resistors and capacitors needed to make state-variable filters. A design program speeds filter type selection and design.	
Design a 60Hz Notch Filter with the UAF42 (AB-071)	363
The UAF42 Universal Active Filter's high-pass and low-pass outputs are summed to create a notch response. The uncommitted op amp on the UAF42 is used for the summing amp.	
The ACF2101 Used as a Bipolar Switched Integrator (AB-048)	365
Some applications require the integration of bipolar input currents. The ACF2101 is designed primarily for unipolar operation, but with some additional components its input range can be extended.	
Comparison of Noise Performance Between a FET Transimpedance Amplifier and a Switched Integrator (AB-057)	367
Takes a look at a few variables that optimize the performance of circuits that amplify photodiode signals. In addition, it discusses the use of an alternative—the new switched integrator, ACF2101.	
MTTF, Failure, Reliability and Life Testing (AB-059)	374
Reliability information becomes more and more important in the industry. To utilize the terms appropriately, it is necessary to understand their definitions and derivations correctly.	
OPT201 Photodiode-Amplifier Rejects Ambient Light (AB-061)	379
Many applications for the OPT201 must provide high sensitivity for varying light levels while rejecting a constant background light. An active feedback loop provides ac-coupled response, but can reject much larger ambient light levels without overloading.	

Implementation and Applications of Current Sources and Current Receivers (AB-165)	380
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Current sources are pervasive in analog circuit design. This assortment of circuit ideas includes current sources, sinks, voltage-to-current converters and current receivers.

VOLTAGE-TO-FREQUENCY CONVERTERS

Voltage-to-Frequency Converters Offer Useful Options in A/D Conversion (AB-066)	409
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While sampling A/D converters look at the input voltage at an instant in time, integrating converters truly average the input over time. The V/F converter combined with a counter forms an integrating A/D converter with unique advantages.

Frequency-to-Voltage Converters (AB-040)	413
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Voltage-to-Frequency converter ICs can be connected in frequency-to-voltage mode, but they suffer from a severe trade-off between output ripple and settling time. A novel circuit dramatically reduces output ripple, yet responds quickly to changing input frequency.

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The Model Index lists Burr-Brown models that are used or discussed in the bulletin.