

# innovation

## Apex Precision Power Presents A Technical Seminar

Linear and PWM Power Amplifiers, Voltage References

### Real World Issues

#### Power Operational Amplifiers

#### Electrical Limitations

- Slow Rate • Saturation
- Current Limit • Common Mode

#### Amplifier Protection

- Input • Output
- Power Supply

#### Safe Operating Area

- Thermal
- Second Breakdown
- Output/Voltage Limits

#### Stability and Compensation

- Gnd-Loop: supply lines, output stage, grounding

#### Loop Stability

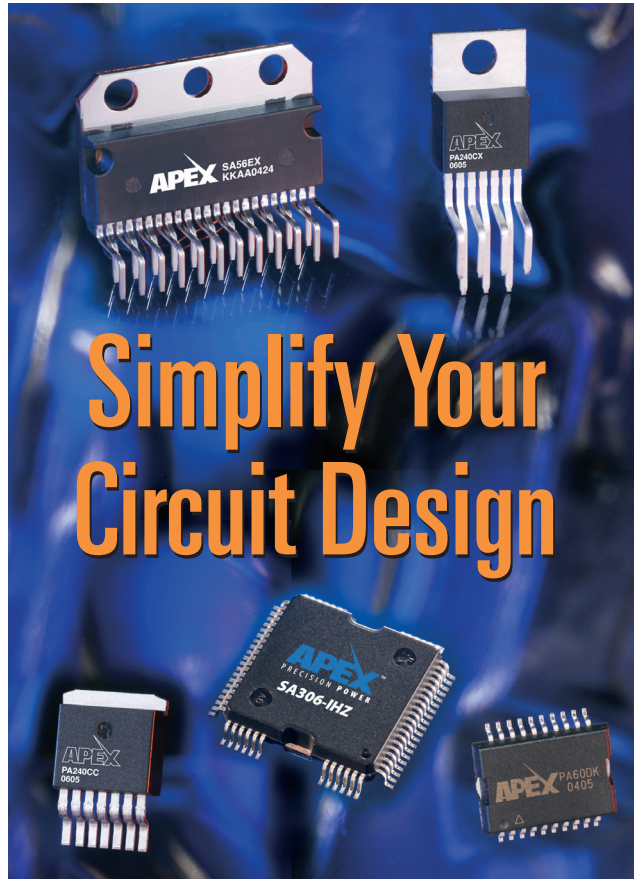
- Open Loop Phase Margin
- Rate-of-closure • 1/β Techniques

#### Real World Stability Tests

- Where Theory Meets Reality

#### High Speed Techniques

- Speed Versus Bandwidth



### Real World Applications

#### (Single Supply, Bipolar Supply, Asymmetrical Supply)

- Motion Control
- ATE: programmable power supplies
- Sources: AC/DC
- Deflection: electromagnetic, electrostatic
- Piezo Drives

#### Pulse Width Modulation Amplifiers

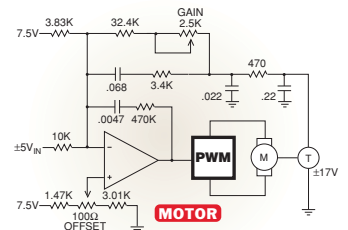
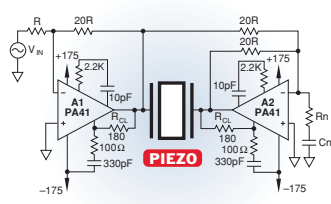
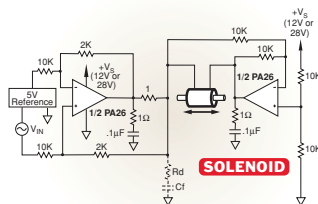
- Theory
- Applications

#### Precision Voltage References

- Understanding the Subtleties
- How to Select

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[www.cirrus.com/ts](http://www.cirrus.com/ts)



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Time: \_\_\_\_\_

Location: \_\_\_\_\_

RSVP: \_\_\_\_\_

RSVP Deadline: \_\_\_\_\_

