

# POWER ANALOG SOLUTIONS

Radiation Tolerant Product Guide



**APEX**<sup>®</sup>  
MICROTECHNOLOGY  
PRECISION • POWER • ANALOG



## RADIATION TOLERANT GUIDE

# Precision Power Analog

### Our Value

- Family of rad-tolerant “R” grade devices
- Broad product portfolio of fully-certified “M/883” and M/883-equivalent amplifier solutions (“M” grade)
- Commercial/Industrial grade suited for COTS level circuits
- All devices are standard catalog products to deliver high-reliability and trim design time
- Dedicated power analog applications engineering technical support to guide product selection, review schematics, and de-bug circuits
- DLA MIL-PRF-38534 certified and ISO 9001:2015 registration
- Certified and qualified MIL-PRF-38534 manufacturing facility since 1990



Radiation  
Tolerant  
Inquiry  
Form

## Driving a complex load? Let Apex be your analog expert!

### INDUSTRY LEADER IN ANALOG COMPONENTS

Apex Microtechnology offers industry-leading innovation in the design and development of precision power analog components used to control current, voltage, and speed for applications in the hi-rel industrial, aerospace & defense, medical, and semi-cap markets. The Apex product family includes power operational (linear amplifiers), pulse width modulation (PWM, class D amplifiers, switching amplifiers), integrated power modules, precision ICs, and precision voltage references. Apex Microtechnology is a recognized leader for analog components that lead the industry in terms of performance, quality, and reliability.

### U.S. OWNED AND OPERATED

Apex Microtechnology has in-house engineering and manufacturing expertise operated in a vertically integrated headquarters based in Tucson, Arizona (USA).

### QUALITY AND PERFORMANCE

Apex Microtechnology's quality policy is based on four core directives: Satisfy the Customer First; Provide Competitive Solutions to Customers; Comply with all Customer, Statutory, and Regulatory Requirements; Measure and Improve Continually. Apex maintains both ISO9001 and MIL-PRF-38534 Hybrid Microcircuit DLA facility certifications.

### TECHNICAL SUPPORT

For more information about Apex Rad-Tolerant “R” grade devices or for additional radiation testing options & capabilities offered by Apex please submit our Radiation-Tolerant inquiry form by scanning the QR code.

For product selection assistance and technical support, call the Apex Microtechnology applications engineering team.

**800-546-2739** (toll free in the USA and Canada)



# APEX FLIGHT HERITAGE

With a stellar flight heritage that spans across renowned space missions, Apex devices have proven their reliability and resilience in the most demanding space environments. Our devices have been an integral part of various space missions, including the Mars Rover, James Webb Telescope, the International Space Station, and OSIRIS-REx. Beyond our past achievements, we remain committed to developing innovative solutions while maintaining the size, weight, and power (SWaP) requirements from the industry. Apex continues to expand its radiation tolerant portfolio to include additional solutions for the evolving demands of space exploration.



MARS ROVER



JAMES WEBB  
TELESCOPE





INTERNATIONAL  
SPACE STATION



OSIRIS-REx



# RADIATION TOLERANT PRODUCTS

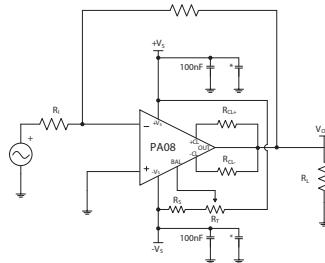
Model	Supply Voltage max (V)	Output Current continuous (peak) (A)	Slew Rate typical (V/ $\mu$ s)	Quiescent Current max (mA)	Power Dissipation max (W)	Package
PA08R	300	0.15 (0.2)	30	8.5	17.5	8-pin TO-3 (CE)
PA07R 	100	5	5	30	67	8-pin TO-3 (CE)
PA12R 	100	10 (15)	4	50	125	8-pin TO-3 (CE)
PA74R	40	3 (x2 channels)	1.4	40	36 per channel/60	8-pin TO-3 (CE)
PA02R	38	5	20	40	48	8-pin TO-3 (CE)

 Indicates the device has flight heritage

## High Voltage Power Amplifier with Programmable Current Limit

### PA08R

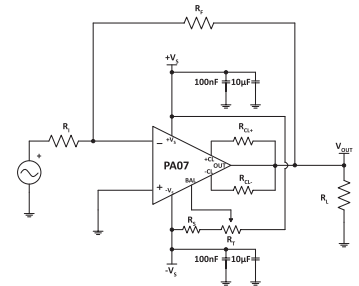
$\pm 15V$  to  $\pm 150V$  Voltage Supply Operation  
150 mA High Output Current  
Low Bias Current - FET Input



## High Voltage, High Current, Class A/B Power Operational Amplifier

### PA07R

$\pm 12V$  to  $\pm 50V$  Voltage Supply Operation  
 $\pm 5$  A Peak Output Current  
Excellent Linearity - Class A/B Output



# APEX RADIATION TOLERANT TESTING

Apex Microtechnology's radiation tolerant "R" product portfolio consists of devices built and tested to maintain operability after exposure to certain levels of radiation. Apex standard Rad-Tolerant devices include:

- HDR testing 50krad TID
- ELDRS testing 50krad TID
- TID lot traceability
- SEE Testing 37 MeV (minimum)
- Military Grade, class H baseline
- Radiation test report
- Rad-Tolerant datasheet

Apex Microtechnology, in partnership with testing facilities, can perform additional radiation tests including but not limited to:

- Low Dose Rate (LDR)
- Displacement Damage (DD)

Apex devices are not limited to the standard rad-tolerant levels. Devices can be tested based on a specific mission profile resulting in a custom rad-tolerant device.



For more information about Apex Radiation Tolerant "R" grade devices or for additional radiation testing options & capabilities offered by Apex please submit our Radiation-Tolerant Inquiry Form by scanning the QR code.

## DLA AND ISO CERTIFICATIONS

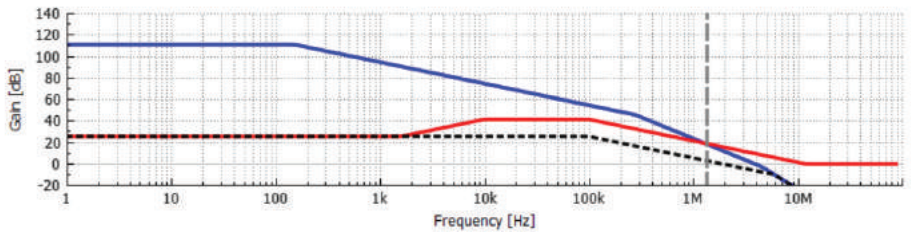
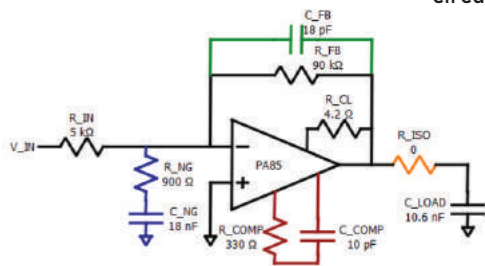
Apex Microtechnology products deliver high quality and reliability by using the same DLA MIL-PRF-38534 certification, ISO 9001:2015 registration and qualified manufacturing systems and processes across all product grades. Apex operates a DLA certified and qualified QML-38534 manufacturing facility with our certification maintained since November 8, 1989, and a QML listing as of May 31, 1990. All products are screened to MIL-PRF-38534 and Class H.

The only point at which variables occur is during electrical testing. The M/883 equivalent ("M" grade) products are tested over a wider temperature range, in addition to certain environmental screenings and internal visual inspection criteria. Commercial and industrial grade products are 100% static and dynamic tested at +25°C. Military level products are 100% tested over their respective full temperature ranges. For complete product and quality information, including complete technical datasheets and supporting design documentation, or to request product samples, visit [www.apexanalog.com](http://www.apexanalog.com).

## POWER DESIGN SOFTWARE TOOL

# POWER DESIGN

Need help with selecting the best product that suits your application needs? How about resolving key design challenges and calculations associated with your power analog circuit? Apex's Power Design software tool helps automate many of the calculations required when working with high power linear and PWM amplifiers. It has multiple modules that provide the ability to plot load-lines and current limits directly onto the Safe Operating Area to ensure circuit stability; calculate internal power dissipation and heatsink requirements; dynamically select a part and assist with other key tasks involved with designing high power analog circuits.



## APEX VALUE ADDED



### Applications Engineering Staff

Dedicated team of analog experts to assist in design optimization



### Design Engineering Team

Powering next-gen innovation in high voltage, high current analog components



### Dedicated Account Management and Customer Support Staff

Overall quality and customer satisfaction are our top priorities



### Manufacturing Capabilities

Equipped to produce integrated COTS solutions at large volumes



### Reduced Lead Times

Best-In-Class lead times to ensure your design stays on schedule



### In-House Obsolescence Management

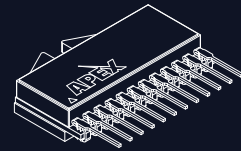
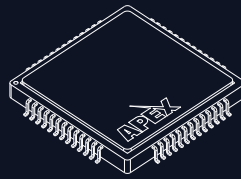
Ensuring long-term product availability and manufacturing support

# APEX<sup>®</sup>

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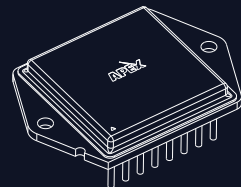
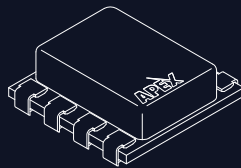
## Apex Headquarters

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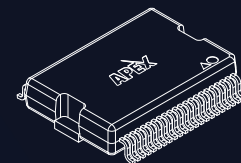
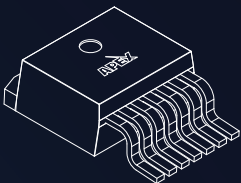
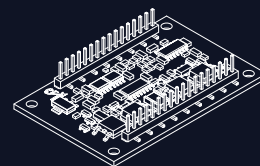
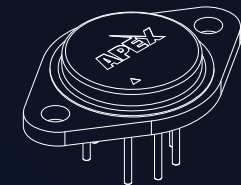
## For Technical Support:

Call Toll Free +1 (800) 546-2739  
in the U.S. and Canada  
Fax: +1 (520) 888-7003  
email: [apex.support@apexanalog.com](mailto:apex.support@apexanalog.com)



## For Customer Service:

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Fax: +1 (520) 888-3329  
email: [custserv@apexanalog.com](mailto:custserv@apexanalog.com)



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