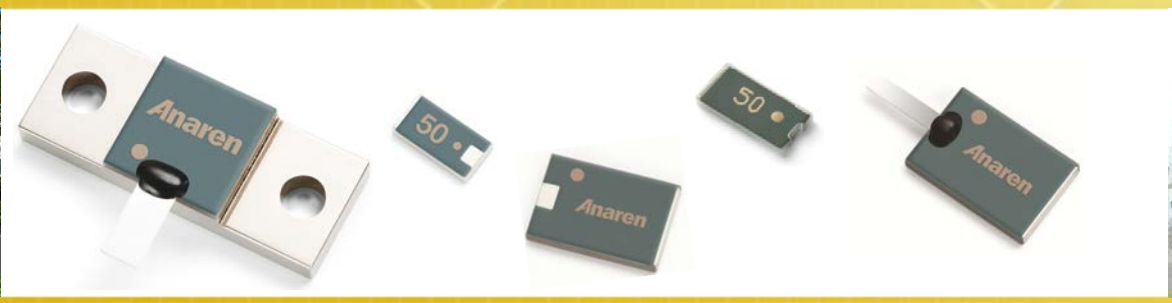

Wireless Resistive Products

Bo Jensen, Product Line Manager
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What'll we think of next?®

Technology Differentiators

- All the resistive products in the presentation are:
  - Targeted for high volume low cost applications
  - 100% manufactured in China

- Lowest cost solution
  - Low cost manufacturing
  - Low cost innovative designs

- Environmentally friendly
  - BeO free – using AlN and Alumina
  - Lead free – using RoHS compliant tin finish

- Highest performance
  - Designed for superior RF performance in commercial bands
  - True characterization & accurate testing (RF, Power & Temperature)
  - Higher power handling in smaller packages
  - New designs enabling customers to use SMD for high power applications

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Surface Mount Terminations

060120A15Z50

- 0.060” x 0.120” (1.5x3.0mm)
- Alumina Ceramic
- 8W/50Ω
- DC to 6.0GHz
- Return Loss:
  >19dB to 6GHz

C10A50Z4

- 0.100” x 0.200” (2.5x5.1mm)
- Alumina Ceramic
- 10W/50Ω
- DC to 3.0GHz
- Return Loss:
  >19dB to 3.0GHz

C16A50Z4

- 0.100” x 0.200” (2.5x5.1mm)
- Alumina Ceramic
- 16W/50Ω
- DC to 4.0GHz
- Return Loss:
  >26dB to 2.7GHz
  >24dB to 4.0GHz

C20N50Z4

NEW

- 0.100” x 0.200” (2.5x5.1mm)
- AIN Ceramic
- 20W/50Ω
- DC to 2.3GHz
- Return Loss:
  >20dB to 2.3GHz

C50A50Z4

- 0.250” x 0.250” (6.4x6.4mm)
- Alumina Ceramic
- 50W/50Ω
- DC to 2.7GHz
- Return Loss:
  >26dB to 2.2GHz
  >24dB to 2.7GHz

C75A50Z4

NEW

- 0.250” x 0.250” (6.4x6.4mm)
- Alumina Ceramic
- 75W/50Ω
- DC to 2.7GHz
- Return Loss:
  >20dB to 2.7GHz

* Samples
January 1st 2010

C100N50Z4

- 0.250” x 0.250” (6.4x6.4mm)
- AIN Ceramic
- 100W/50Ω
- DC to 3.8GHz
- Return Loss:
  >24dB to 2.7GHz
  >20dB to 3.8GHz

C150N50Z4

NEW

- 0.250” x 0.250” (6.4x6.4mm)
- AIN Ceramic
- 150W/50Ω
- DC to 3.6GHz
- Return Loss:
  >20dB to 3.6GHz

C200N50Z4

NEW

- 0.250” x 0.375” (6.4x9.5mm)
- AIN Ceramic
- 200W/50Ω
- DC to 2.2GHz
- Return Loss:
  >20dB to 2.2GHz

Chip Terminations

060120A25X50

- 0.060” x 0.120” (1.5x3.0mm)
- Alumina Ceramic
- 10W/50Ω
- DC to 6.0GHz
- Return Loss:
  >19dB to 6.0GHz

A15N50X4 NEW

- 0.050” x 0.100” (1.3x2.5mm)
- AlN Ceramic
- 15W/50Ω
- DC to 4.5GHz
- Return Loss:
  >20dB to 4.0GHz

A16A50X4

- 0.100” x 0.200” (2.5x5.1mm)
- Alumina Ceramic
- 16W/50Ω
- DC to 4.0GHz
- Return Loss:
  >20dB to 4.0GHz

A100N50X4A

- 0.250” x 0.225” (6.4x5.7mm)
- AlN Ceramic
- 100W/50Ω
- DC to 3.5GHz
- Return Loss:
  >20dB to 3.5GHz

1616-50

- 0.550” x 0.135” (14.0x3.4mm)
- AlN Ceramic
- 100W/50Ω
- DC to 3.5GHz
- Return Loss:
  >21dB to 3.5GHz

A125N50X4

- 0.250” x 0.250” (6.4x6.4mm)
- AlN Ceramic
- 125W/50Ω
- DC to 4.0GHz
- Return Loss:
  >20dB to 4.0GHz

A150N50X4B

- 0.250” x 0.375 (6.4x9.5mm)
- AlN Ceramic
- 150W/50Ω
- DC to 2.7GHz
- Return Loss:
  >20dB to 2.7GHz

A150N50X4C

- 0.225” x 0.350” (5.7x8.5mm)
- AlN Ceramic
- 150W/50Ω
- DC to 3.5GHz
- Return Loss:
  >26dB to 3.0GHz

A150N50X4E NEW

- 0.250” x 0.250 (6.4x6.4mm)
- AlN Ceramic
- 150W/50Ω
- DC to 3.6GHz
- Return Loss:
  >20dB to 3.6GHz

A200N50X4 NEW

- 0.250” x 0.375 (6.4x9.5mm)
- AlN Ceramic
- 200W/50Ω
- DC to 2.2GHz
- Return Loss:
  >20dB to 2.2GHz

A200N50X4A NEW

- 0.225” x 0.350” (5.7x8.5mm)
- AlN Ceramic
- 200W/50Ω
- DC to 3.0GHz
- Return Loss:
  >20dB to 3.0GHz

A250N50X4 NEW

- 0.375” x 0.375” (9.5x9.5mm)
- AlN Ceramic
- 250W/50Ω
- DC to 2.2GHz
- Return Loss:
  >20dB to 2.2GHz

Flanged Terminations

x100N50X4

- 0.250” x 0.515” (6.4x13.1mm)
- AIN Ceramic
- 100W/50Ω
- DC to 3.0GHz
- Return Loss:
  >20dB to 3.0GHz
- I/J/K (L/C/R versions)

G100N50W4

- 0.230” x 0.800” (5.8x20.3mm)
- AIN Ceramic
- 100W/50Ω
- DC to 3.0GHz
- Return Loss:
  >25dB to 2.0GHz
  >20dB to 3.0GHz

G150N50W4B

- 0.375” x 0.870” (9.5x22.1mm)
- AlN Ceramic
- 150W/50Ω
- DC to 2.7GHz
- Return Loss:
  >25dB to 2.0GHz
  >20dB to 2.7GHz

G150N50W4E

NEW

- 0.375” x 0.870” (9.5x22.1mm)
- AlN Ceramic
- 150W/50Ω
- DC to 3.6GHz
- Return Loss:
  >20dB to 3.6GHz

G200N50W4

NEW

- 0.375” x 0.870” (9.5x22.1mm)
- AlN Ceramic
- 200W/50Ω
- DC to 2.2GHz
- Return Loss:
  >20dB to 2.2GHz

G250N50W4

NEW

- 0.375” x 0.975” (9.5x24.8mm)
- AlN Ceramic
- 250W/50Ω
- DC to 2.2GHz
- Return Loss:
  >20dB to 2.2GHz

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Flangeless Terminations

E125N50X4

- 0.250” x 0.250” (6.4x6.4mm)
- AlN Ceramic
- 125W/50Ω
- DC to 3.8GHz
- Return Loss:
- >24dB to 2.0GHz
- >20dB to 3.8GHz

E150N50X4

- 0.250” x 0.375” (6.4x9.5mm)
- AlN Ceramic
- 150W/50Ω
- DC to 2.7GHz
- Return Loss:
- >20dB to 2.7GHz

E150N50X4E

NEW

- 0.250” x 0.250” (6.4x6.4mm)
- AlN Ceramic
- 150W/50Ω
- DC to 3.6GHz
- Return Loss:
  >20dB to 3.6GHz

E200N50X4

NEW

- 0.250” x 0.375” (6.4x9.5mm)
- AlN Ceramic
- 200W/50Ω
- DC to 2.2GHz
- Return Loss:
  >20dB to 2.2GHz

E200N50X4A

NEW

- 0.220” x 0.350” (5.7x8.5mm)
- AlN Ceramic
- 200W/50Ω
- DC to 3.0GHz
- Return Loss:
  >20dB to 3.0GHz

E250N50X4

NEW

- 0.375” x 0.375” (9.5x9.5mm)
- AlN Ceramic
- 250W/50Ω
- DC to 2.2GHz
- Return Loss:
  >20dB to 2.2GHz

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Attenuator Families

D10AxxZ4

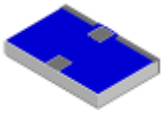
- SMD
- 0.100” x 0.200” (2.5x5.1mm)
- Alumina Ceramic
- 10W/50Ω
- 1, 2, 3, 4, 5, 6, 9, 10, 20 & 30dB
- DC to 3GHz
- Return Loss:
  >20dB to 3.0GHz

D50AxxZ4

NEW

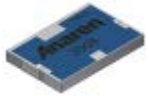
- SMD
- 0.250” x 0.250” (6.4x6.4mm)
- Alumina Ceramic
- 50W/50Ω
- 10, 20, 30dB
- DC to 2.3GHz
- Return Loss:
- >20dB to 2.3GHz

* Samples
January 1st 2010



1615-xx

- Chip
- 0.250” x 0.375” (6.4x9.5mm)
- AlN Ceramic
- 100W/50Ω
- 20&30dB
- DC to 2.3GHz
- Return Loss:
- >20dB to 2.3GHz



B150NAxxX4

NEW

- Chip
- 0.250” x 0.375” (6.4x9.5mm)
- AlN Ceramic
- 150W/50Ω
- 20&30dB
- DC to 2.3GHz
- Return Loss:
- >20dB to 2.3GHz

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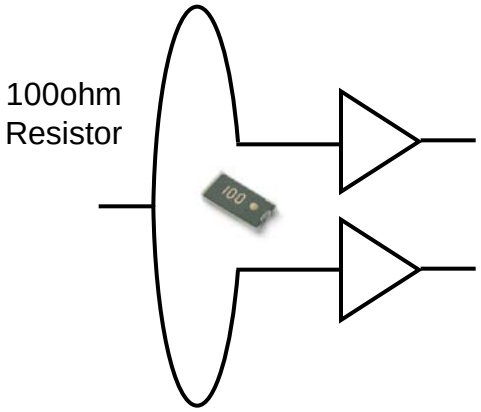
Upcoming Products - SMD Resistors

R16AxxZ4

- SMD
- 0.100” x 0.200” (2.5x5.1mm)
- Alumina Ceramic
- 16W
- 100Ω
- Optimized for Wilkinson Dividers

* Samples
February 1st 2011



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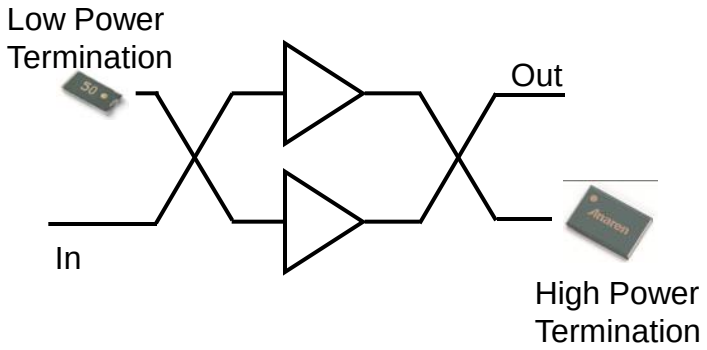
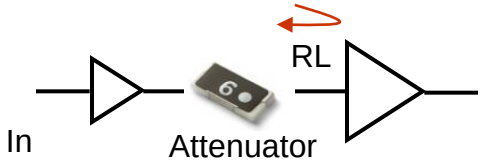
Resistive Product Applications

Balanced amplifier configuration



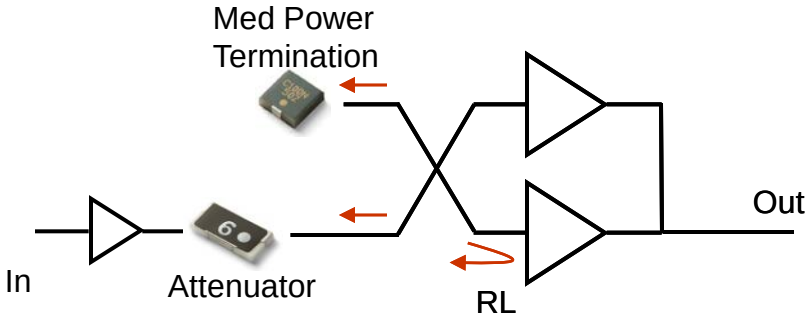
- Classic configuration

Ripple reduction due to mismatch



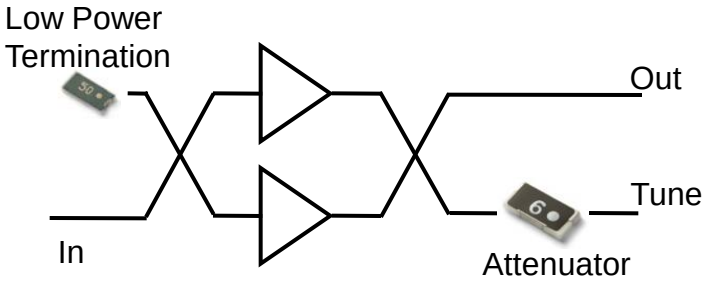
- Typically, a few dBs can make big impact
- Lower cost than isolator
- Low power applications only
- Attenuator available 1 - 30dB

Doherty amplifier configuration



- Significant reflection when peak amplifier is off

Amplifier tuning



- As part of production / test
- Tune PA until isolated port signal is reduced

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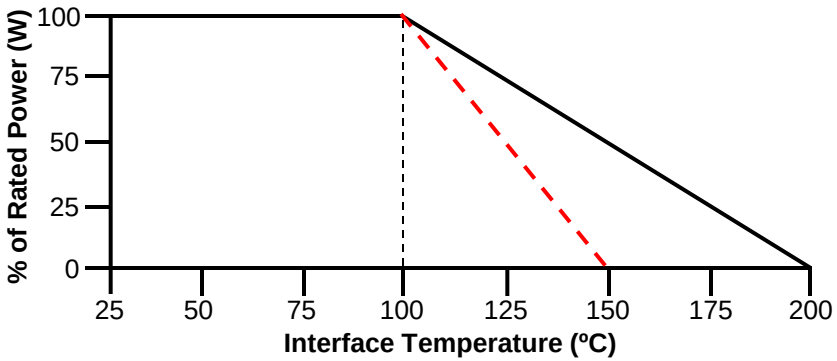
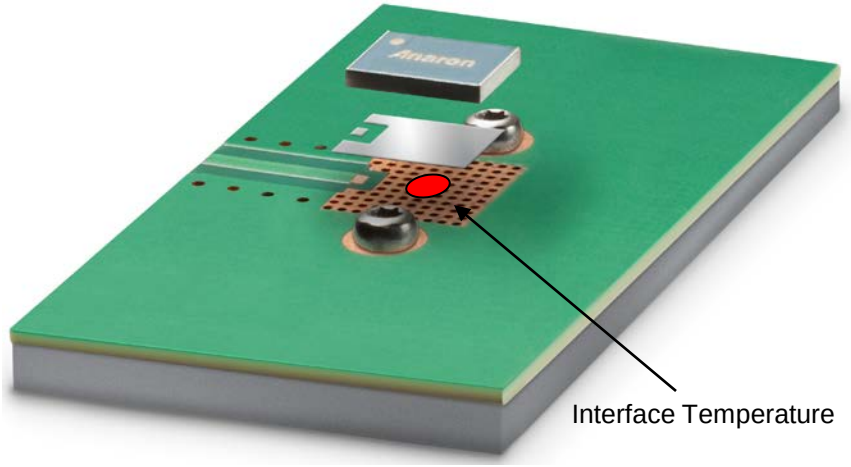
Resistive Product Applications

Power vs Temperature Derating

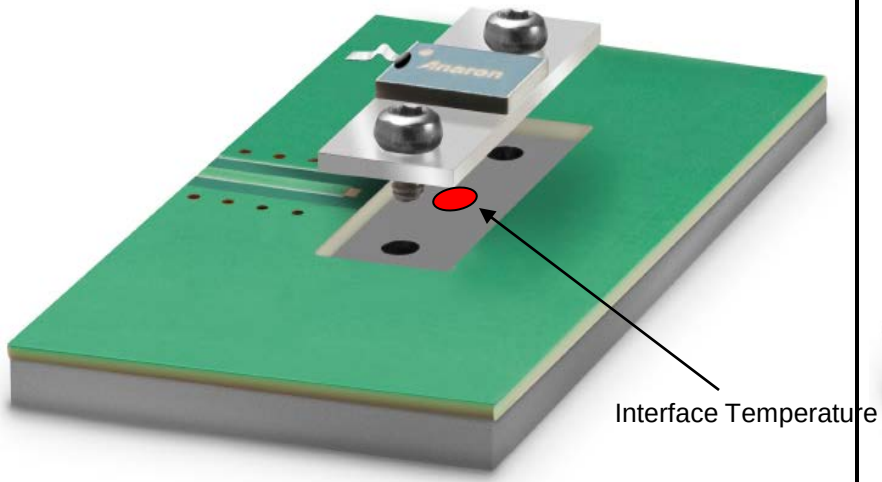


Example C200N50Z4 SMD Chip
Note actual performance can be dependent on solder selection (- - -)

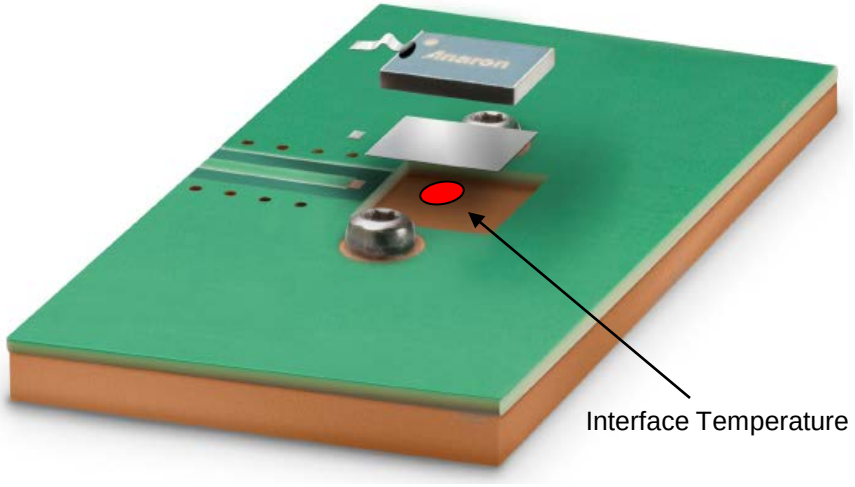
High Power Surface Mount



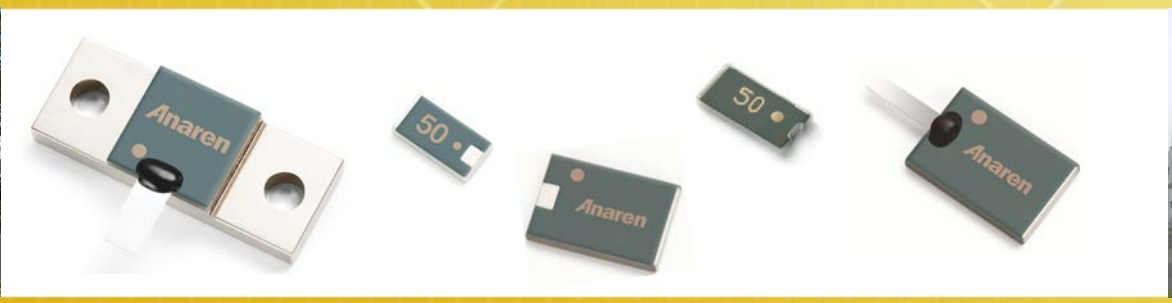
High Power Flanged Mount



High Power Flangeless Mount



Thank You.



Wireless Resistive Products

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