Filters
Filters – Part A
Filters

• Overview
• Performance Parameters
• Filter Technologies and Considerations
• Discrete Element Filter Design and Simulation Techniques
• Other Filter Technologies (BAW, MEMS)
• Impact on System Design
Overview

Filters = Critical Parts of Analog Signal Processing Puzzle

RF IN

Courtesy of Brit Kane, ITT Technologies
Performance Parameters

For now, let’s limit our discussion to the following types of filters:

LOW-PASS  HIGH-PASS  BAND-PASS

• Insertion Loss
• In-Band Ripple
• Return Loss
• Cut-off Frequency
Performance Parameters (contd.)

• Bandwidth
• Out-of-Band Rejection
• Group Delay
• Power Handling
Filter Technologies / Considerations

- Main Technologies in Use Today
  - Surface Acoustic Wave
  - Discrete (Lumped) Element
  - Coaxial
Filter Technologies / Considerations (contd.)

• Main Technologies in Use Today
  – Ceramic
  – Planar
Filter Technologies / Considerations (contd.)

• Main Technologies in Use Today
  – Waveguide
Filter Technologies / Considerations (contd.)

- SAW
- Lumped Element
- Planar
- Ceramic
- Coaxial
- Waveguide

- Loss
- Size

- Loss
- Coaxial
- Ceramic
- Waveguide
- Cost