



*Dept. of Electronics & Communication
Engineering*

Harbin Institute of Technology

Harbin 150001, P.R. China

E-mail: qw@hit.edu.cn

Tel. +86 451 6413502

移动通信终端天线设计 (3)

吴群

教授，工学博士



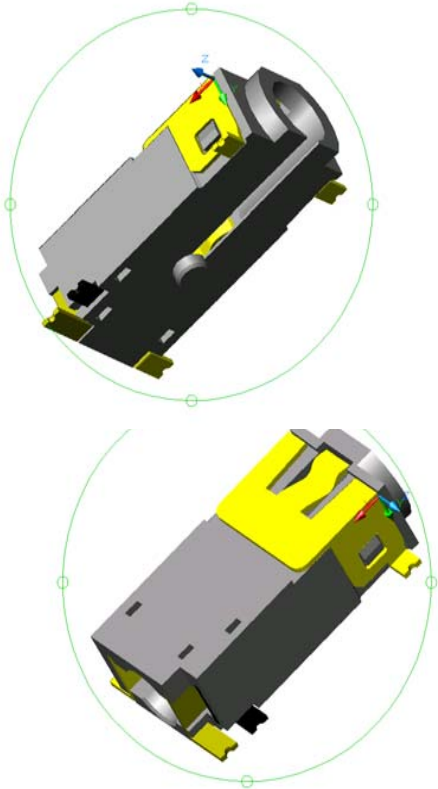
哈爾濱工業大學

Antenna related parts and connectors



Connector R&D

Features



- From 4 up to 7 contacts
- Float Mounting
- Switch by plug
- Simplifies alignment into the system
- Contact force on PCB : 0,35 N mini
- Allow to connect headset and/or charger in one connector
- Customized and polarized charger side

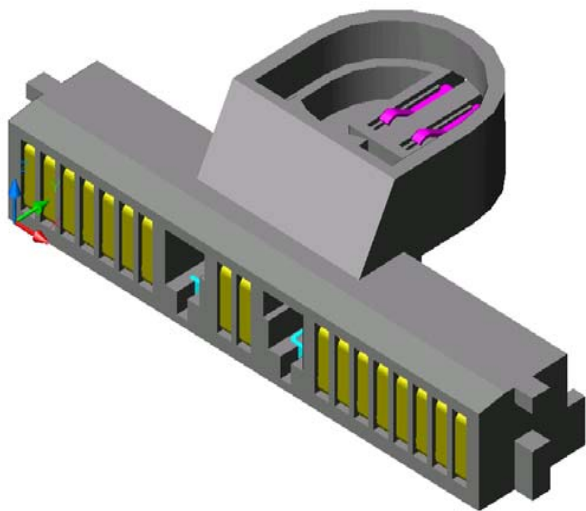
Allowed design range: from 6 to 12 contacts with 1,4 mm pitch

Flat plug Technology



Connector R&D

Features



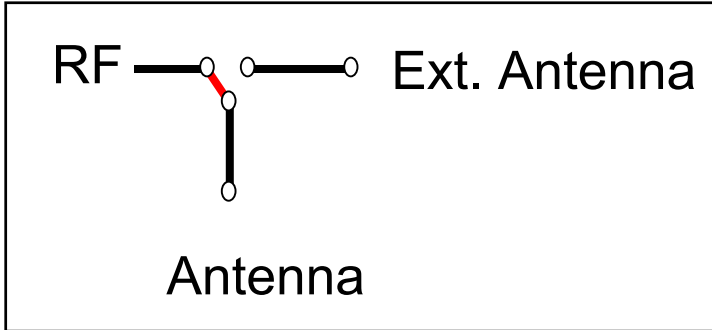
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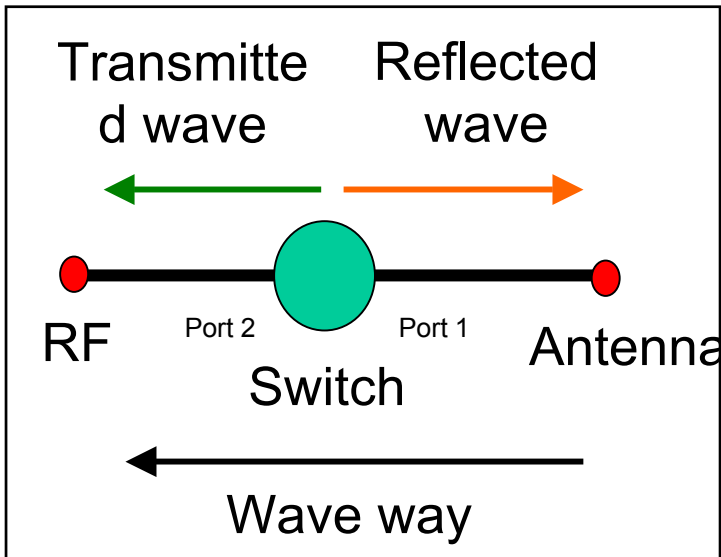


RF Switch



Functions

- Switching : mechanical side
- Wave transmission : RF behaviour



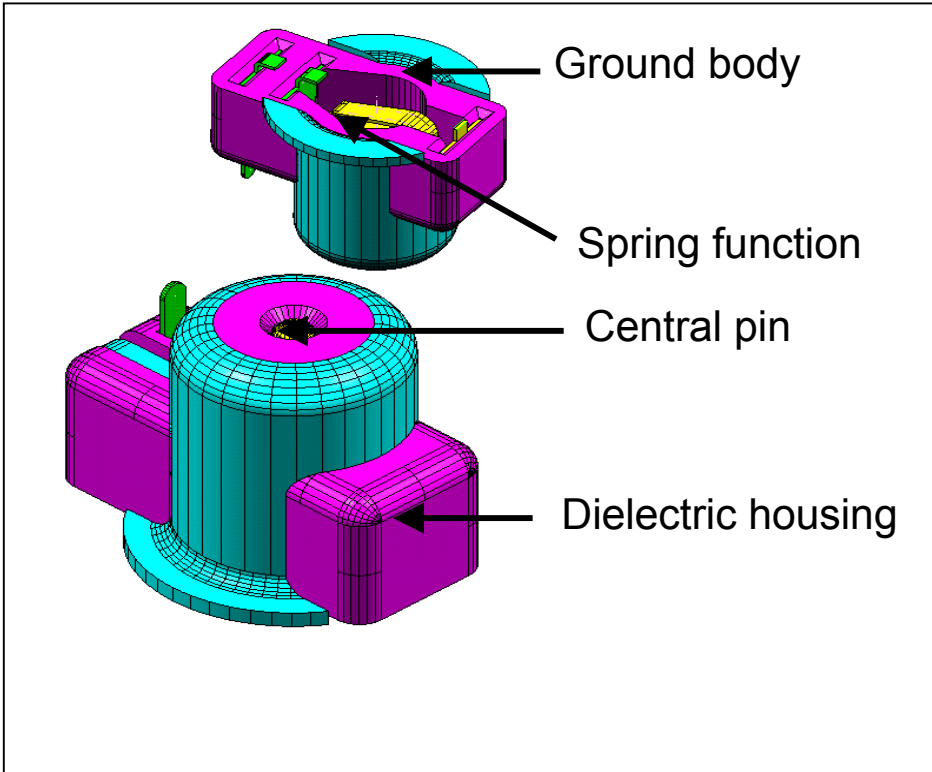
Requirements

- RF switch is a discontinuity on the wave line = signal disturbances
- Target: decrease to minimum this disturbances
- Adapted working at different wavelenths



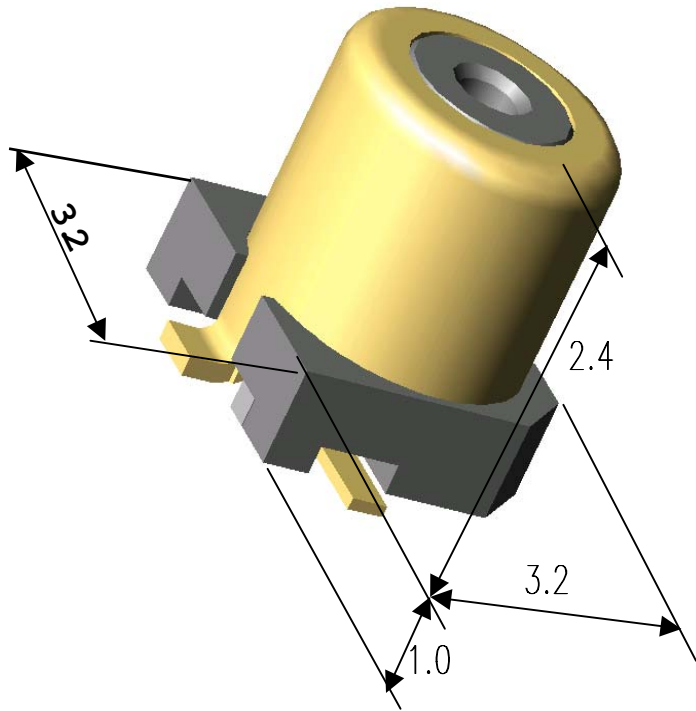
RF Switch

architecture

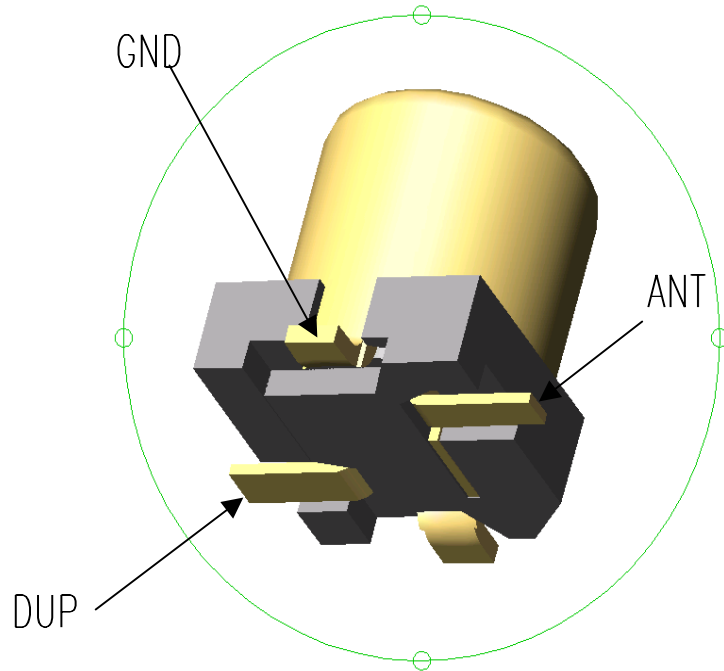




RF Switch



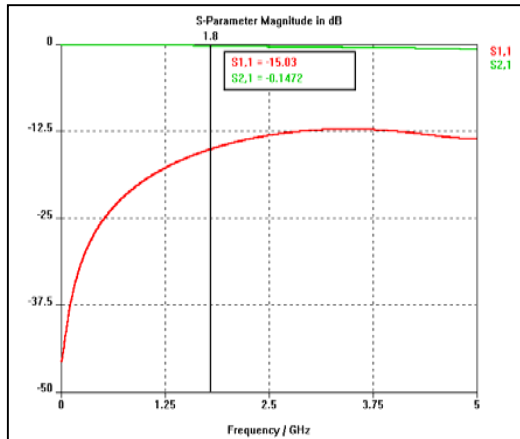
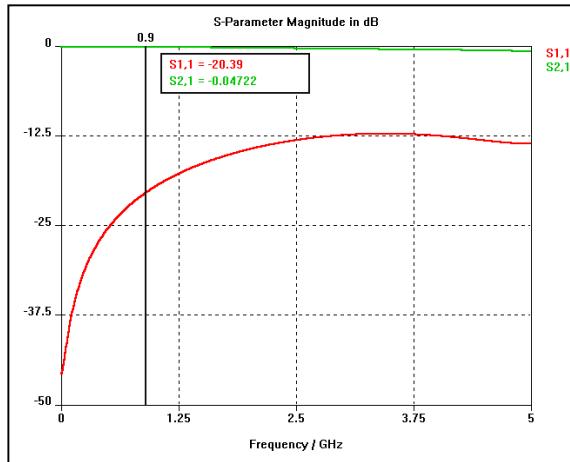
architecture





RF Switch

Characterization parameters



Click to enhance

- S parameters : S_{11} for reflection, S_{21} for transmission (dB)

$$S_{i1} = f(\lambda)$$

- Reflection parameter : VSWR

$$VSWR = (1 + |S_{11}|) / (1 - |S_{11}|)$$

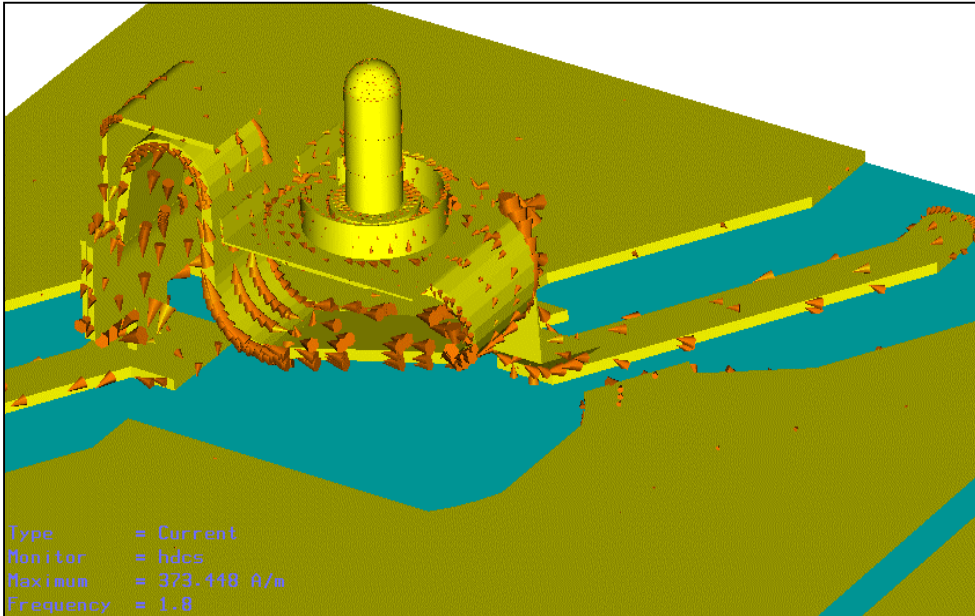
- Transmission parameter: Insertion loss

$$IL = 10 \cdot \text{Log}(1 / |S_{21}|^2)$$

- Insulation between signal and ground strips : high frequencies
- Switch impedance (Z) must reach the board one
→ less misadaptation



RF Switch



Reaching RF features

- Design and prototyping: measurement by a network analyzer
- RF simulation in design step: recommended for complex products

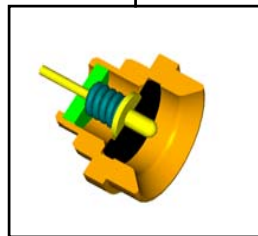


RF Switch



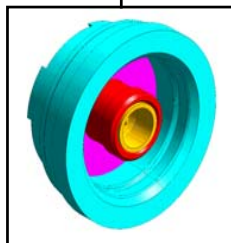
Float switch

- Switch function on antenna contact
- Inserted directly in the phone frame
- Machined technology
- 4 versions available
- High assembly rate, fully automated





RF Switch



Waterproof switch

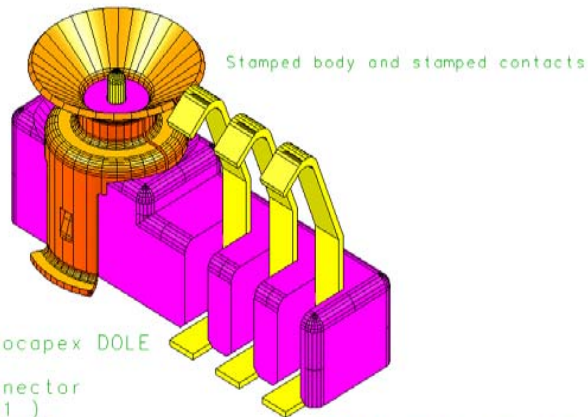
- **Waterproof under 2 meters**
- **All machined parts**
- **Radial displacement**
- **SMT technology**
- **Adapted for low quantities, few investments**
- **Ability for specific outer design**



RF Switch

Stamped + DAC

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Switch Connector
(ET757301)
BP 1e 02/05/00

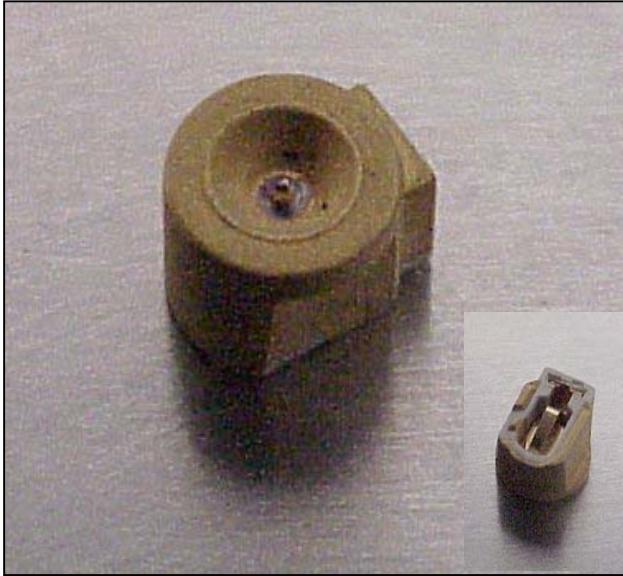
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- Stamped body
- High temperature plastic frame
- Direct Antenna Contacts, inserted
- SMT technology

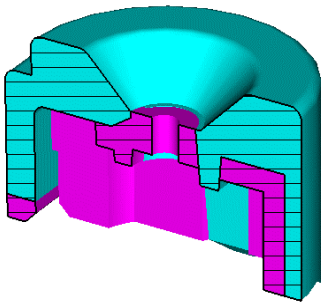


RF Switch

MID switch



- New technology to reduce the number of spare parts to 2 or 3
- Two shots molding and metallized body
- Overall dimensions: 5,5 x 5 x 3,5 mm
- Adaptable to any external design, by changing the interface cavity



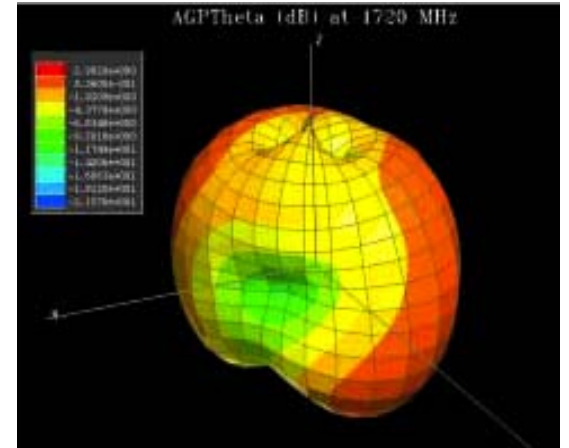
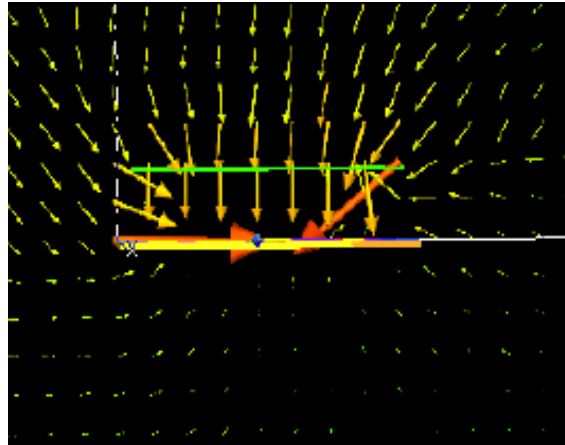
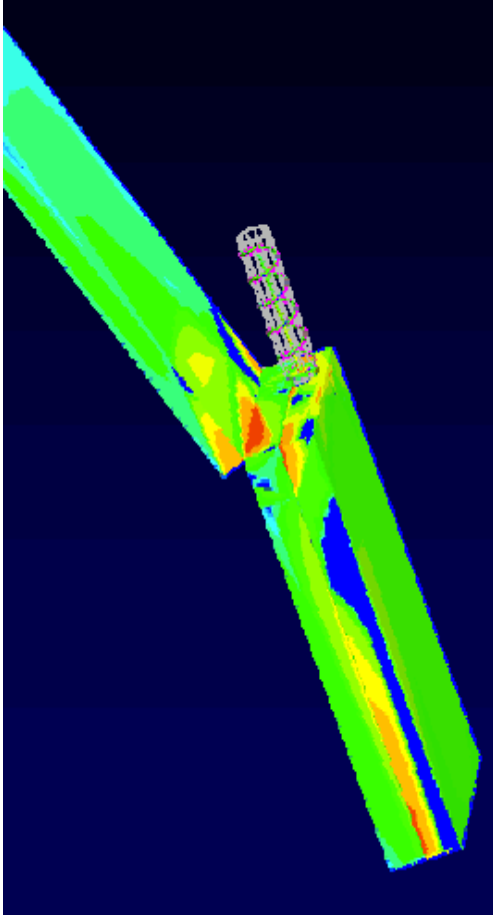
Body structure



Antennas design EDA

Electromagnetic modeling

- IE3D Zealand (Planar structures)
- NEC2 LLNL (Wires only)
- HFSS Ansoft (Full 3D)
- FD-TD Internally developed SAR Calculations



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