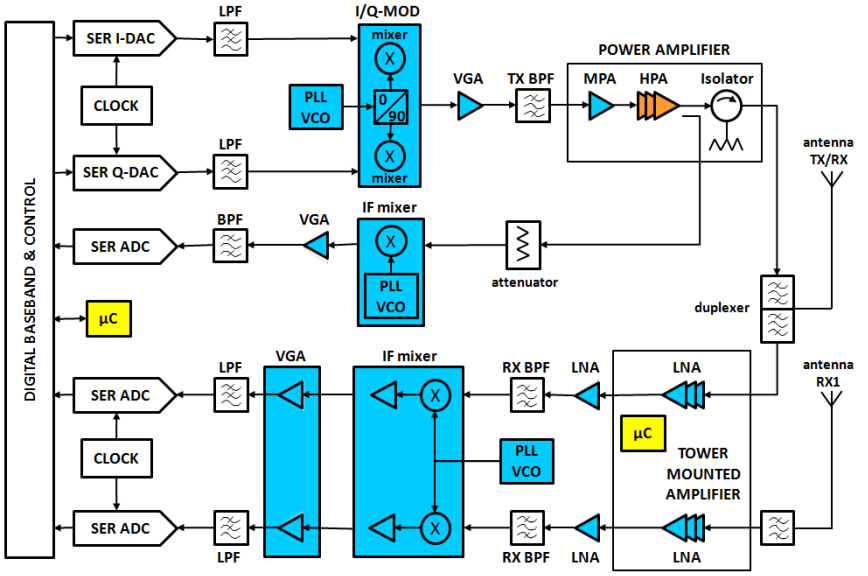
# RF Semiconductor Technology Roadmap

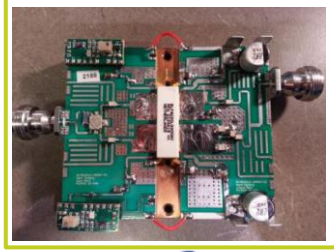
- **NXP's strategy is driven by four global market trends**
  - Energy efficiency, connected devices, security and health
- **We have a long history and broad RF product portfolio**
  - RFID, car access & immobilizer, wireless infrastructure, TV and STB
  - NXP has wafer fabs in Manchester, Nijmegen, Hamburg and Singapore
- **NXP focus on all major markets for RF power transistors**
  - Wireless infrastructure (base stations) is the biggest market by value and has been the main driver for **LDMOS** technology
  - 50V LDMOS developed for high power broadcasting, avionics and ISM
  - Aerospace & Defence is the main market driving **GaN**
- **Roadmaps are driven by technical innovation and our customers**
  - NXP research activities and key customer relationships
- **Commercial success is fundamental for long term innovation**

# NXP High Performance RF for Base Stations

**Key features and benefits**

- Complete portfolio covering the RF signal chain
- Leading position in RF power transistors for base station power amplifiers from 700MHz~2700MHz
- More than 450W per device @ 2.1GHz
- Best in class power efficiency
- Extensive Doherty application expertise
- High volume production on 8 inch wafers
- 8th generation LDMOS in mass production
- Packages optimized for cost and video bandwidth



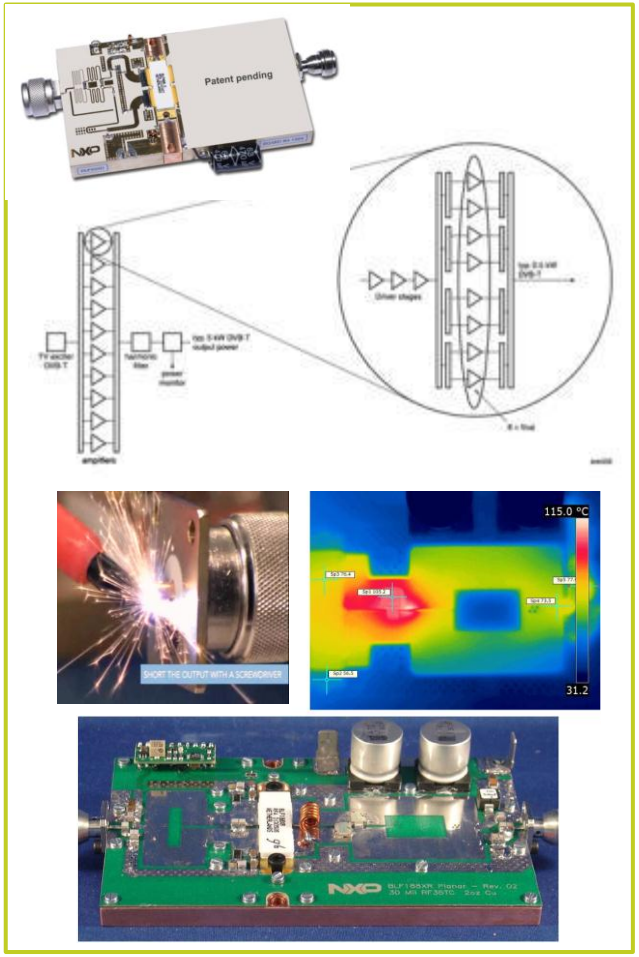
| Device | Freq (MHz) | Pout for IS95 (dBm) | Gain (dB) | Eff. (%) | CCDF of IS95 (dB) | Peak Power Pulse (dBm) | AM/PM (degree) |
|---|---|---|---|---|---|---|---|
| BLF8G20LS-400AV | 1805 | 49.3 | 15.6 | 45.8 | 56.7 | 56.6 | -11 |
| | 1842.5 | 49.3 | 16.2 | 46.1 | 56.8 | 56.6 | -6 |
| | 1880 | 49.3 | 16.4 | 45.8 | 56.7 | 56.6 | -3 |

Alcatel·Lucent HUAWEI ERICSSON Nokia Siemens Networks ZTE中兴

# NXP High Power RF for Broadcast & ISM

**Key features and benefits**

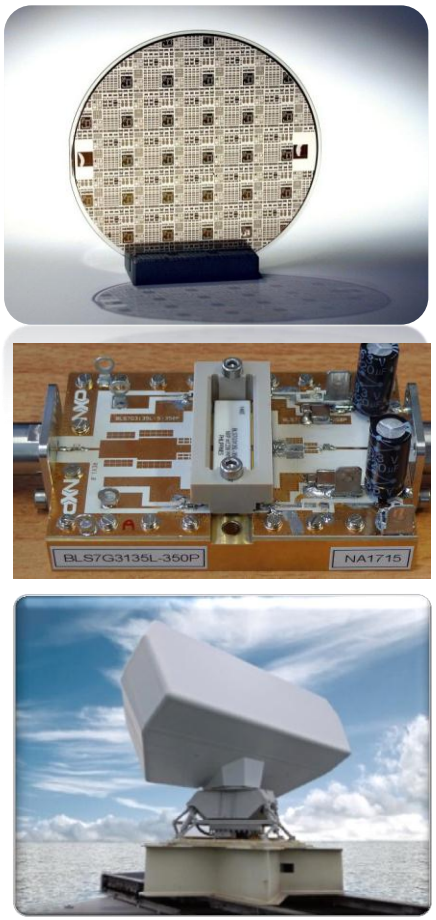
- Highest power levels enabled by 50V LDMOS process
- Enhanced for ruggedness up to 65:1 VSWR
- Best performance for FM, VHF, UHF & ISM
- Power density up to 2 W/mm, doubled compared to VDMOS
- Ultra wideband Doherty PA designs for high efficiency digital TV
- 1.2kW from a single device reducing PA size and weight
- Packaging optimized for thermal performance
- Low cost, high gain unmatched plastic packaged drivers
- Reducing $/W cost enabling ISM heating and lighting markets
- GaN efficiency benefits less significant at lower frequencies



# NXP RF Power for Aerospace & Defence

**Key features and benefits**

- NXP provides both LDMOS and GaN technologies, allowing customers to select the best technology for their specific needs
- European supplier with long term commitment to A&D market
- Complete product portfolio covering UHF, avionics, L-band and S-band radar applications
- 400W LDMOS (Gen8) device for S-band pulsed radar applications (2700MHz to 3100MHz)
- 50V LDMOS for 1kW avionics and 500W L-band devices with high gain and efficiency in thermally enhanced packages
- 50V GaN on SiC optimized for linearity and broadband operation (RF jamming and secure communications)
- Broadband radio communication (30MHz to 512MHz) with 32V and 50V LDMOS evaluation boards available
- Roadmaps for next generations of GaN and LDMOS



# New Markets Driving NXP RF Power Roadmap

**Key features and benefits**


- Plasma lighting with high efficiency and reliability
- RF heating with accurate control for power and frequency
- Replacement of magnetrons with solid state power amplifiers
- High volume LDMOS production capability and packaging technology driving component cost reduction
- Energy saving payback periods are reducing