



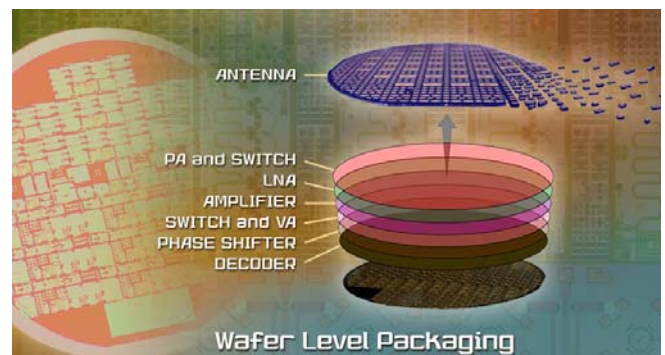
The Northrop Grumman Space Technology foundry, located in Redondo Beach, California, processes commercial volumes of hetero-junction bipolar transistor (HBT) and high electron mobility transistor (HEMT) monolithic microwave and millimeter wave integrated circuits (MMICs). Our high-performance circuits are used in established and emerging commercial markets, including cellular and broadband wireless systems, and cutting-edge aerospace & defense and scientific applications.

We offer:

- Advanced process technologies that enable differentiating MMIC and system performance
- In-house multi-wafer Molecular Beam Epitaxy (MBE) for precision control of device doping profiles
- Process Design Kits with synchronized layout and model sets optimized to millimeter wave, low noise and power applications
- Mature and reliable processes
- Stability of defense critical DoD "Trusted" foundry
- 100mm volume wafer fabrication facilities
- Multi-customer shared mask foundry runs
- On-wafer RF testing beyond 110 GHz



Emerging Technologies



Today's Technologies

Parameter/ Technology	1 μm digital GaAs HBT	0.8 μm digital InP HBT	1 μm power InP HBT	0.15 μm GaAs PHEMT	0.1 μm GaAs PHEMT	0.1 μm InP PHEMT
Ft (peak)	40 GHz	140 GHz	80 GHz	80 GHz	120 GHz	180 GHz
Fmax (peak)	70 GHz	150 GHz	150 GHz	200 GHz	250 GHz	350 GHz
Beta/Gm	400	50	25	550 mS/mm	650 mS/mm	900 mS/mm
Breakdown	>13V BV CEO	>4V BV CEO	>13V BV CEO	13V BV gdr	7.5V BV gdr	2.5V BV gdr
Wafer Thickness	100 μm	75 μm	75 μm	50 & 100 μm	50 & 100 μm	75 μm
Airbridged Metal Available	Yes	Yes	Yes	Yes	Yes	Yes
Backside Vias	Yes	Yes	Yes	Yes	Yes	Yes
Diode Type	ESD & Schottky	Schottky	Schottky	Gate Source	Gate Source	Gate Source

300 GHz
HBT and
HEMT

Indium
Phosphide

Fully Integrated
GaN MMIC
Technology