

## RF/Wireless Test

### RF/Wireless Test Services

Amkor offers complete, cost-effective RF/Wireless semiconductor device test development services to customers seeking a direct path from first silicon to production. Our dedicated test development group has the experience, skills and equipment to accommodate customers' sophisticated wireless test requirements for current and emerging communications standards, as well as traditional RF component level tests.

Examples of our successful ATE development projects:

- GPS
- Bluetooth
- WLAN
- DVB
- Cellular (CDMA/GSM/WCDMA) products

Wireless stimulus and measurement capabilities:

- Frequency: DC – 6 GHz (multi-port)
- Modulation: CW and IQ programmable modulation standards (IEEE/ITU)

RF component tests (PAs, LNAs, mixers, switches, etc.) include:

- Power
- S-parameters
- Gain
- Noise figure
- Harmonics & THD
- Signal-to-Noise (SNR, SINAD)
- Second & Third order Intercept
- EVM

Additional proven supporting test capabilities:

- High-Speed Serial (SATA, PCIe, DDR2/3, USB2, HDMI)
- Embedded DAC/ADC testing
- Embedded RAM
- Test pattern translation (VCD/EVCD, WGL, STIL file inputs with tester binary pattern outputs)
- Digital pin electronics and relay controls for high pin-count devices
  - Continuity & leakage
  - DC measurements
  - Functional patterns
  - Serial bus control



### Chandler Arizona Test Development Laboratory

We have in-house wafer prober (300mm TEL) and package handler equipment (Seiko-Epson), and state-of-the-art Verigy v93000 SOC PortScale™ ATE equipped for digital, mixed-signal and multi-port RF testing. In addition, we offer local PCB load board, contactor socket and handler interface design capabilities supporting customers seeking a direct path from first silicon to high volume manufacturing qualification and production. Precision laboratory bench equipment and PCB rework facilities complement the ATE development environment.

- In addition to Verigy v93000 SOC, our factories offer Teradyne UltraFLEX UltraWave™ ATE.
- Pre-production services include in-house “quick-turn” product screening and engineering sampling.
- For protocol-aware “system” products, we offer customizable multi-site automated test solutions integrated with a cost-effective PC-based station controller.

Amkor has an experienced, dedicated staff of semiconductor test professionals for product test development, integration, debug, correlation and factory release.



Visit Amkor Technology online for locations and to view the most current product information.



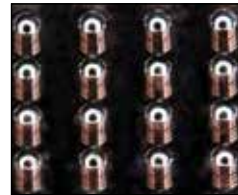
### RF Test Solution Benefits

- Competitive cost of test
- Increase standardization
- Increase yield
- Faster test development
- Better ATE utilization
- Lower test overhead
- Lower capitalization cost
- Qualification and characterization services
- Complete test integration engineering
- Extensive RF test production experience
- Strong test equipment roadmap
- Broad geographical footprint with proximity to foundries, assembly and end customers

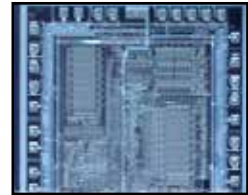


### RF Services

- Test and correlation development
- Socket design and characterization
- RF SiP module test strategies
- Wafer probe services including WLCSP, bump and RF can be leveraged for Known Good Die (KGD) for modules
- Product evaluation
  - Initial product characterization
  - Reference samples correlation
  - Product performance monitoring
- Reliability and manufacturability
  - Data collection and yield analysis
  - Production support, including failure analysis and line-rejects verification
- DUT board development
  - Layout
  - Simulation
  - Tuning
  - Correlation



Cu Pillars



In-line Peripheral Pads



Full Array Bumps



Interstitial Pads



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