DEI is a fabless Semiconductor Company specializing in the design and manufacture of Analog, RF, Mixed-Signal, and Digital ASICs & ICs.

**Quality Certifications & Processing:**
- MIL-STD-883 Processing
- Department of State Registered for ITAR

**Design Processes:**
DEI’s Integrated Circuit designs use a variety of processes including:
- Bipolar (20V, 37V, 60V) (Multiple processes)
- High Performance Bipolar ($f_T = 12GHz$ to 28 GHz)
- BiCMOS/CMOS (0.18 um, 0.35 um, 0.6 um, 0.8 um, 1.5 um)
- SiGe BiCMOS (0.35 um) ($f_T = 35Ghz$ to 62GHz)
- DIMOS (320V, 650V)

Selection of a process depends upon operating voltage, output drive specifications, power; and other parameters. DEI specializes in using semiconductor processes that provide ten-year product availability.

**Design Expertise:**
Device Engineering has completed over 75 full custom, semi-custom and standard products over the last 8 years. All new, 2nd source, and replacement ICs make use of:
- System level needs analysis
- Design to either Concept or Specification
- Detailed product definition
- Definition of special needs or enhancements
- Use of Reverse Engineering for form/fit/function replacement devices
- Rigorous process requirements definition (utilizing the same or similar process for legacy type devices)
- Engineering staff with 100+ years of Electronics Design Experience
- On staff PhD EEs

**Design Examples:**
- Reverse Engineered Obsolete Microlinear Bipolar Array
- Retarget obsolete PMOS ASICs to HV CMOS
- 12 Bit Multiplying Quad DAC
- Pierce Oscillator
- PLL/Clock
- Thermal Controller
- High Voltage Drive ICs
- ARINC 429 Databus Products
- Backplane Transceiver Buffer/ Logic
- RF AGC Amplifier
- Frequency Synthesizer (4 GHz, Low Noise)
- Commercial Lighting Controller
- LED Dimmer/Driver
- Discrete Interface Circuits
- Voltage Monitor
- Relay Driver
Unique Design Technologies:
Device Engineering has developed unique capabilities that can be applied to a variety of applications. These capabilities include:

- On Chip Lightning Protected Inputs (Transients up to 600V) DO160 Level 3
- RMS Conversion
- Very Low Phase Noise Frequency Synthesizer Design -160dBc/Hz > 5KHz
- Low Power (nA, sub 1V)
- High Voltages (300 to 1650V)
- Relay Driver/ Control
- Transient Voltage Protection
  - 100V/ 100us Transient Suppression
- Intelligent Switch

Design & Layout Tools:
Device Engineering uses industry standard design tools based on Personal Computer platforms. Our expertise and tools include, but are not limited to:

- Cadence RF Design Suite
- Viewdraw/ModelSim
- Leonardo-Spectrum
- PSpice
- SIMetrix (SPICE/Schematic)
- Tanner Design Suite (Layout/DRC/LVS/SPR)
- SILVACO Design Suite (Schematic/Circuit Sim/Layout/DRC/LVS/LPE)
- IC Editors ICED (Layout Editor)

Production Capabilities:
Device Engineering has the capabilities to perform wafer screening and production testing. These capabilities include, but are not limited to:

- Wafer Testing
  - Wafer Probe Stations
  - Hot Chuck Probing +125C
- Production Screening/QCI Testing
  - 2 – ASL3000 Analog/RF Testers
  - 2 – ASL1000 Analog Testers
  - 3 – Thermonics TFUs
  - Hot / Cold Electrical Testing
  - Burn-In Ovens
  - MIL-STD-883 Method 5004
  - HAST Testing
- Device Marking Capability
- Dry Pack Capability
- IC Handlers for Volume Production
  - SOIC & TSSOP
  - PLCC
  - DIP
  - MLPQ / QFN
  - PQFP & MQFP

Sample Mixed Signal Design Flow