

Device Engineering Incorporated

Device
Engineering
Incorporated

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Integrated Circuit Design and Production Capabilities

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

Quality Certifications & Processing:

- AS9100:2009 Rev C & ISO9001:2008
- 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, 40V, 60V) (Multiple processes)
- High Performance Bipolar ($f_T = 12\text{GHz}$ to 28GHz)
- BiCMOS/CMOS (0.18 μm , 0.35 μm , 0.6 μm , 0.8 μm , 1.5 μm)
- SiGe BiCMOS (0.35 μm) ($f_T = 35\text{GHz}$ 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 50 full custom, semi-custom and standard products over the last 10 years. New, 2nd source, and replacement ICs make use of some or all of the following:

- System level needs analysis
- Design to either Concept or Specification
- Detailed product definition
- Definition of special needs or enhancements
- 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 150+ 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



AS9100 Rev C / ISO9001:2008
Certificate

Device Engineering Incorporated

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
 - 1 – ASL1000 Analog Tester
 - 3 – Thermonics TFUs
 - Hot / Cold Electrical Testing
 - Burn-In Ovens
 - MIL-STD-883 Method 5004
 - HAST Testing
- **IC Handlers for Volume Production**
 - SOIC & TSSOP
 - PLCC
 - DIP
 - MLPQ / QFN
 - PQFP & MQFP
- **Device Marking Capability**
- **Dry Pack Capability**

Sample Mixed Signal Design Flow

