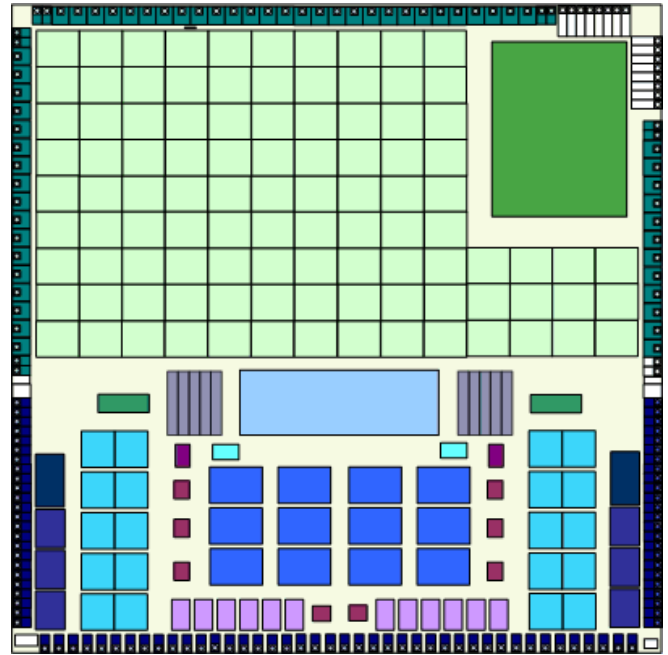


VCA-5 – Wideband Mixed Signal

The VCA-5 combines digital, EEPROM, analog, and analog resources on a single ASIC array to address a wide range of high speed mixed signal applications. The VCA-5 contains 76,500 ASIC gates, 32Kbyte of non-volatile EEPROM memory, 102Kbits of embedded SRAM and 80+ analog resources. Additionally, the A-5 array contains a 25MSPS, 10-bit pipelined ADC and 10 50MSPS, 6-bit Current Steering DACs. The VCA-5 is well suited for wideband data acquisition and DSP processing applications.

The VCA-5 utilizes a single mask layer to change analog, digital, and memory circuits resulting in:

- Reduced NRE Charges
- Rapid Time to Prototypes
- Fabrication Time in Weeks not Months
- Reduced Risk



Resources

Digital

- **76,500 Logic Gates**
- 102 Kbits of 1-Port SRAM
- 32Kx8 EEPROM, 20-Year Retention
- 60 Configurable Digital I/O
- 3.3V Digital Power

Analog

- **88 Op-Amps & Resources**
- 3.3V Analog
- 16 Fully Differential Analog Tiles
- 20 Single Ended Analog Tiles
- 12 Wideband/Low Noise Op-amp Tiles
- 2 Bias Generators
- 8 10-bit, 1MSPS DACs
- 2 8-bit, 1MSPS ADCs
- 10-bit, 25MSPS Pipelined ADC
- 10 6-bit, 50MSPS Current Steering DACs

Resources (cont.)

- 2 Programmable Delay Lines
 - 33ns Span, 100ps Steps
- 73 Analog I/O
- 3.3V Isolated Analog Power

Applications

- High Speed Data Acquisition
- Multi-Channel PID Controller
- Mixed Signal 8051 with USB
- Radiation Detection
- Multi-Channel Actuator
- FPGA + Analog to ASIC Conversion
- Filtering

Table 1 - VCA-5 Resources

Digital Resources

- **76,500 Logic Gates**
 - 102 Logic Tiles – LT1K-1P-750
 - 102 Distributed SRAM
 - 64 x16 1-Port RAM (1024-bits)
 - 104,448 bits total distributed RAM
 - **Non-Volatile Memory**
 - 32K x 8 EEPROM
 - 20 Year Data Retention
 - 100K Cycle Write Endurance
 - Byte & Page Mode Write Operations
 - Integrated Charge Pump & Control
- **60 Digital I/O**
 - Via Configurable Options
 - Input, Output, Bidirectional
 - Slew Rate Control
 - Pull-Up, Pull Down
 - Drive Strength
 - 4 Digital VDD Pads
 - 2 Digital VSS Pads

Analog Resources

- **88 Op-Amps plus Resources**
- **18 Digital to Analog Converters**
- **3 Analog to Digital Converters**
- **Op-Amp Gain Bandwidths up to 170MHz**
- **20 Single-Ended Analog Tiles**

SE-A-TILE Resources

- 2 Single-Ended OTA/Op-Amps
- 18MHz Gain Bandwidth
- Capacitor Array
- Resistor Array
- Transistor Array
- Switch Array
- Logic Array
- Configurable Bias Generator

▪ 16 Fully Differential Analog Tiles

FD-A-TILE Resources

- 2 Fully Differential OTA/Op-Amps
- 170MHz Gain Bandwidth
- Differential Capacitor Array
- Differential Resistor Array
- Differential Transistor Array
- Differential Switch Array
- Logic Array
- Configurable Bias Generator

▪ 12 Wideband Op-Amps (OA02)

▪ 12 Low Noise Op-Amps (OA03)

▪ Digital to Analog Converters

- 8 D2A1001 – 10-bit, 1MSPS R2R Ladder DAC
- 10 D2A0601 – 6-bit, 50MSPS Current Steering, Thermometer Encoded DACs

▪ Analog to Digital Converters

- 2 A2D0801 – 8-bit, 1MSPS SAR ADC
- 1 A2D1003 – 10-bit, 25MSPS Pipelined ADC

Analog to Digital Converters can be created as soft-IP using the OTA/Op-Amps, switches, and capacitors within the array. Sigma-Delta and Successive Approximation converters with resolutions up to 14-bits and sample rates up to 1MSPS are realizable.

▪ Miscellaneous Analog

- 2 Band Gaps
- Voltage Reference Network

▪ 73 Analog I/O

- Via Configurable Options
 - 1500 50, 0 Ohm pad resistance
 - 7 Analog VDD Pads
 - 9 Analog VSS Pads