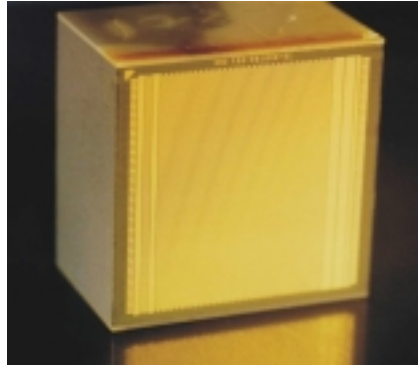


3DANN-R Vector Image Processing System



Features:

- Stacked IC module and interface electronics
- Ultra-High Speed - 10^{12} Ops for accelerating convolution computations
- Module contains 64 identical layers of custom analog processing ASICs that compute the inner product of an image vector and a weight (kernel) vector
- Digital signals are converted to analog within the module
- 5-10 Watts power dissipation
- Module size: $(\frac{1}{2})^3$ inch³

General Description:

The 3DANN-R system is comprised of a stacked IC module and interface electronics designed for the purpose of accelerating inner product calculations. The intended throughput of the 3DANN-R system is 1×10^{12} operations per second, where an operation is an 8 bit multiply and sum.

The 3DANN-R module receives digital input signals for the image and kernels. Within the module the digital signals are converted to analog. The inner product math is performed in analog and sent out from the module on 64 lines as an analog current. The signals are received by 64 transimpedance buffer amplifiers that convert the signals to voltages. The voltages are then converted back to digital by 64 analog to digital converters. The signals are formatted to be 10 bit bipolar output. Mid scale ADC output represents zero signal from the 3DANN-R. A least significant bit of the ADC represents about 2 millivolts of noise.

For more information contact ATD Marketing:

Phone 1-714-549-8211 Fax 1-714-444-8840 E-mail ProductInfo@irvine-sensors.com

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ADVANCE INFORMATION

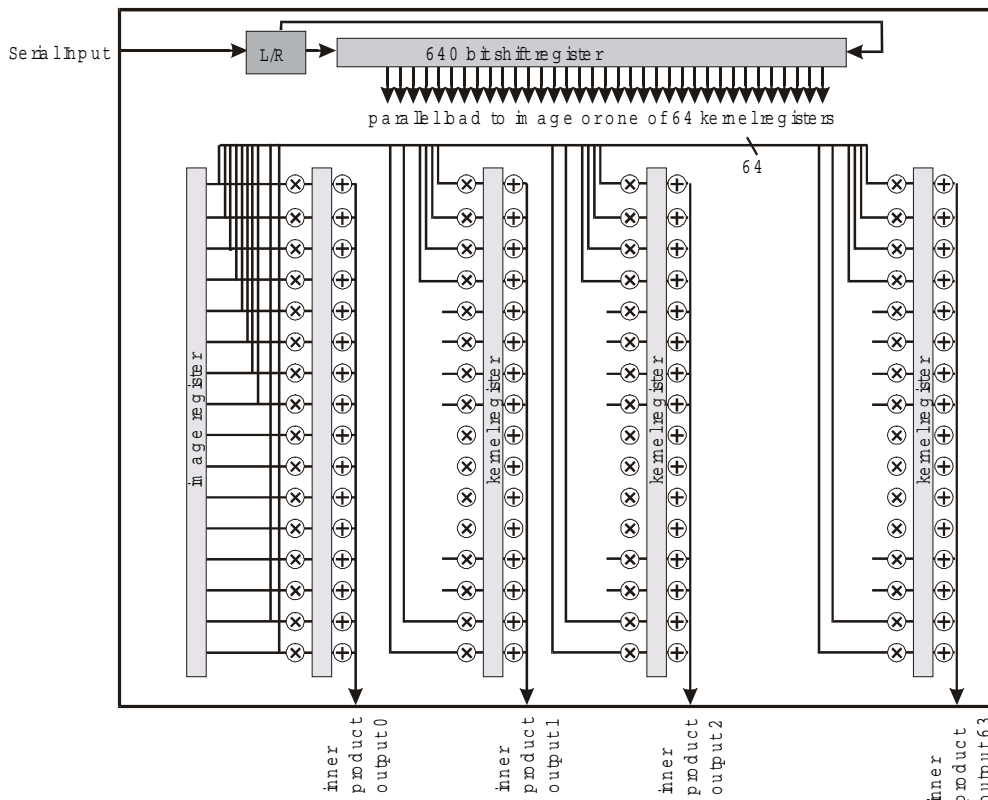
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ADVANCED TECHNOLOGY DIVISION – 3DANN PRODUCTS™

Technical Specifications:

Transfer Function	Inner product of vector with kernel, Multiply and Sum
Input Dynamic Range	8-bits plus sign
Output Dynamic Range	9-bits plus sign
Kernel Dynamic Range	7-bits plus sign
Operations Per Second	1×10^{12}
Computation Frequency	4 MHz
Input Signal Serial Clock	40 MHz
Kernel Size	Adjustable in steps of 64 without padded zeros, i.e. 64, 128, 256, ... 4096
Linearity	~1%
Power Dissipation	5-10 Watts
Processor Volume	$(1/2)^3$ inch ³
Weight Update Time	1 msecond

Functional Block Diagram:



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