Module Based Arrays - 0.25 Micron

Product Brief

OVERVIEW

LightSpeed's 4E advanced Module Based Array product family provides production alternatives to high end FPGAs and conventional standard cell ASICs. Utilizing a patented Top Metal single mask technology, they provide high complexity and high performance utilizing standard EDA tools with short leadtimes and no user test vectors.

Utilizing the capabilities of advanced 0.25 micron CMOS process technology provides up to 892K usable logic gates in addition to 1 Mbit of embedded dual port RAM. Specialized I/O interfaces for LVDS, HSTL and GTL+ signalling enable use in very high performance systems.

FEATURES	BENEFITS
Advanced 0.25 micron, 5 layer metal, high performance process	Enables high density and high performance system-on-chip designs - Over 200 MHz system clock rates
Integrated AutoTest	Provides 100% stuck-at fault coverage without user test vectors
Proven high density Module Based Array architecture - up to 892 K usable gates	Complete placement, routing and SDF delay extraction in 1 to 5 days
Up to 1024K bits of Embedded dual port RAM - 8K, 16K or 64K bit blocks	System level integration and performance improvement - Flexible configurations allow optimum system architecture
Rapid turn-around single Top Metal customization	Rapid deployment from first silicon to full production - Minimization of inventory and WIP exposure
Advanced HSTL, LVDS and GTL+ I/O signalling	Easy integration into very high performance systems
Standard ASIC design methodology and tools	Minimizes learning curve and reduces design cost - well proven and understood
Rich Selection of InstantCORE high level functions	Easy integration of standard functions - reduces design time and risk
On-chip, high speed analog PLLs	Achieve higher I/O rates / lower clock insertion delay
Industry standard IEEE 1149.1 boundary scan logic (JTAG) built into I/O	Support for standard board level test systems and software tools - requires no user gates
	System compatibility with other leading edge devices

Products

To facilitate flexibility in use, the 4E family has nine pre-defined base devices. These provide a variety of gate complexity, I/O count and choice of embedded memory capability.

4E Product Family Members

Device	Usable Gates	Maximum Signal I/O	Defined Vdd / Vss Pads	Embedded Memory			Modules
				Number of RAM Blocks	Ram Block Size	RAM bits Total	
4E144K145	145K	320	129	18	8K	144K-2P	20,780
4E224K212	212K	328	132	14	16K	224K-2P	30,277
4E256K323	323K	432	174	16	16K	256K-2P	46,150
4E224K432	432K	502	202	28	8K	224K-2P	61,718
4E320K482	482K	466	186	20	16K	320K-2P	68,795
4E256K538	538K	554	222	32	8K	256K-2P	76,802
4E768K536	536K	529	212	12	64K	768K-2P	76,543
4E896K624	624K	564	226	14	64K	896K-2P	89,974
4E001M892	892K	648	260	16	64K	1024K-2P	127,411

Packaging

Module based Arrays are provided in high pin count packages to accomodate the requirements of next generation communications and computer infrastructure equipment. Preferred packages for most products are Enhanced Ball Grid Array (EBGA) style because of their superior thermal and electrical characteristics.

The 4E family is specifically designed to support high performance systems design with high I/O count requirements. To accomodate high performance I/O, the 4E family provides configurable I/O cells that can drive the following special signalling specifications:

- HSTL
- SSTL
- LVDS
- GTL+

Additional power and ground connections are provided to supply the I/O separately from the core logic

4E Family Package Options

	Package Pins	Maximum User I/O
Plastic Quad Flat Packages	160	109
	208	145
	240	172
Enhanced Ball Grid Arrays	352	268
	432	330
	480	366
	560	427
	672	524
	792	618

4E Family Performance

CIRCUIT	PERFORMANCE	
Toggle Frequency	600	MHz Max.
Ring Oscillator	39	psec.
Inverter	61	psec.
Nand2	170	psec.
FF Clk to Q	450	psec.

LightSpeed Offices

Company

LightSpeed was funded in 1996 to develop innovative logic integration solutions that dramatically reduce the design and production cycle times inherent in traditional ASICs. Targeting customers, primarily in communications markets, that build complex, high performance systems, LightSpeed's Module Based Arrays provide unique "Time to Production" value.

The company is headquartered in Sunnyvale, California and includes experts in FPGA and ASIC architectures, libraries, synthesis, Placement and Routing, test and technical support.

LightSpeed is partnered with TSMC, the premier semiconductor foundry in the world to ensure a high-quality, uninterrupted supply of semiconductor devices to our customers.

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