Military FPGA Combining High Performance *and* High Density

DEVICE HIGHLIGHTS

Military FPGA

- Mil Std 883 and Mil Temp Ceramic
- Mil Temp Plastic Guaranteed -55 to +125oC

High Performance and High Density

- Densities up to 90,000 usable PLD gates with 316 I/Os
- Multiple dual-port RAM modules, organized in user-configurable 1,152-bit blocks

Security:

The ViaLink technology is inherently secure and virtually impossible to reverse engineer. The interconnect is more secure than an ASIC and can be programmed in a secure location.

JTAG:

Full JTAG IEEE 1149.1 compliant

Mixed Voltage Systems:

pASIC 3 and QuickRAM families drive standard TTL levels. The I/Os are compatible with 5.0 and 3.3V devices.

Speed:

Able to perform in systems operating at greater than 200 MHz over the entire military temperature range.

Low Power Consumption:

90mA at 50 MHz, 300 mA at 200 MHz

Routability:

100% guaranteed routability with 100% utilization and 100% pin-out stability through design revisions and retro-fitting.

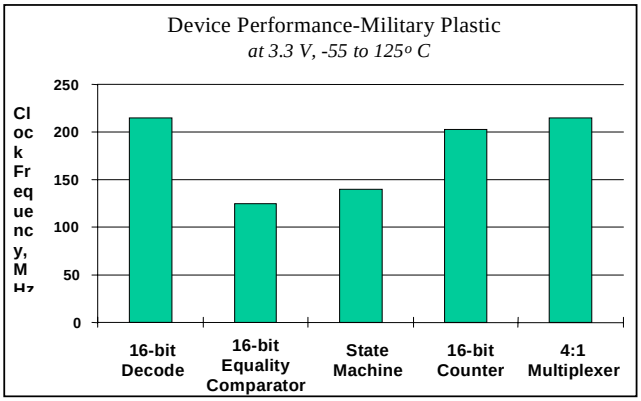


FIGURE 1: Speed

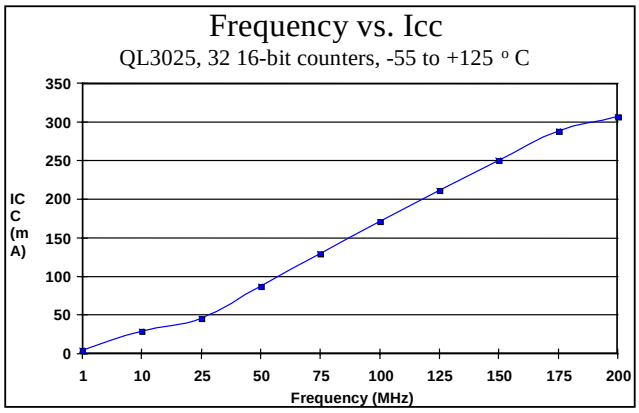


FIGURE 2: Power vs. Frequency

QUICKLOGIC

pASIC 1 Military Plastic Mil Std 883

		QL8x12B	QL12x16B	QL16x24B	QL24x32B
Usable Gates		1-2k	2-4k	4-7k	8-14k
Max I/O		64	76	122	180
Logic Cells		96	192	384	768
Qualification		M	M, /883	M, /883	M, /883
SMD (5962-)			96836	95599	96837
Package	CPGA	68	84	144	
	CQFP			160	208
	PQFP				208

pASIC 3 Military Plastic

		QL3012	QL3025	QL3040	QL3060
Usable Gates		8-12k	16-25k	24-40k	36-60k
Max I/O		70	174	174	174
Logic Cells		320	672	1,008	1,584
Qualification		M	M	M	M
Package	PLCC	84			
	PQFP		208	208	208

QuickRAM Military Plastic Mil Std 883

		QL4016	QL4036	QL4090
Usable Gates		8-12k	16-25k	36-60k
RAM Bits		11,520	16,128	25,344
Max I/O		82	174	316
Logic Cells		320	672	1,584
Qualification		M, /883	M, /883	M, /883
SMD (5962-)		planned	planned	planned
Package	PLCC	84		
	PQFP		208	208, 240
	CPGA	84*	144*	256*
	CQFP	100	208	208
	PBGA			456

M = Military Temperature (-55 to +125ºC)
/883 = MIL-STD-883 qualified
* Check QuickLogic for Availability

Issues Facing the Defense Contractor

The defense contractor is faced today with shrinking defense budgets and diminishing manufacturing supply of traditional military semiconductors. New designs require access to the latest technology and packages that traditionally lag in the military market. Recognizing this, the DOD have paved the way for the defense contractor to use plastic in military systems. Improvements in reliability and design have made viable the use of plastic for military applications. QuickLogic'sÆ ViaLinkÆ metal to metal FPGAs are perfectly suited for military applications using plastic packages. The pASIC 3Æ and QuickRAMÆ families offer high speed, low power and security of design guaranteed over the military temperature range.

The military designer needs access to the latest technology . Traditionally, military qualifications lag their commercial counter part. In more and more cases, the model of value added testing does not work since the product was not designed up front for the robustness required by the military. The military designer is also looking for the latest in package technology to take advantage of a smaller footprint and weight savings.

In 1994, the DOD opened the door for defense contractors to use the best commercial practices. DSCC support this with the development of QML. The defense contractor can use commercial product but end system must still meet the original requirements. The liability now falls directly on the defense contractor if they deviate from military standard semiconductors.

Military Plastic

The debate over using plastic in military systems continues. There are advantages and disadvantages to both. Is not the intent of QuickLogic to debate this issue but to provide a viable low cost military plastic solution. The design engineer needs to know the limitations of the product as it pertains to his application. Not all applications can or should use plastic. Applications that have extreme temperature variations, long storage life, hermeticity issues, or are considered mission critical should continue to look at the military /883 product. Applications that are ground based, man-portable, or in controlled environments can take advantage of what plastic can offer.

Obtaining full military temperature operation from a PEM can be difficult. Solid design rules need to be followed to allow the die to perform at the extreme temperatures. Even some military designs are not able to dissipate the heat at 125o C when in a plastic package. QuickLogic's pASIC 3 metal to metal FPGA using the ViaLink technology is perfectly suited for military plastic applications. This technology offers the OEM a military plastic solution at half the cost of traditional military IC's without sacrificing performance. The metal to metal technology is non-volatile, low power, high speed, and guaranteed over the entire military temperature range.

Military Plastic Program

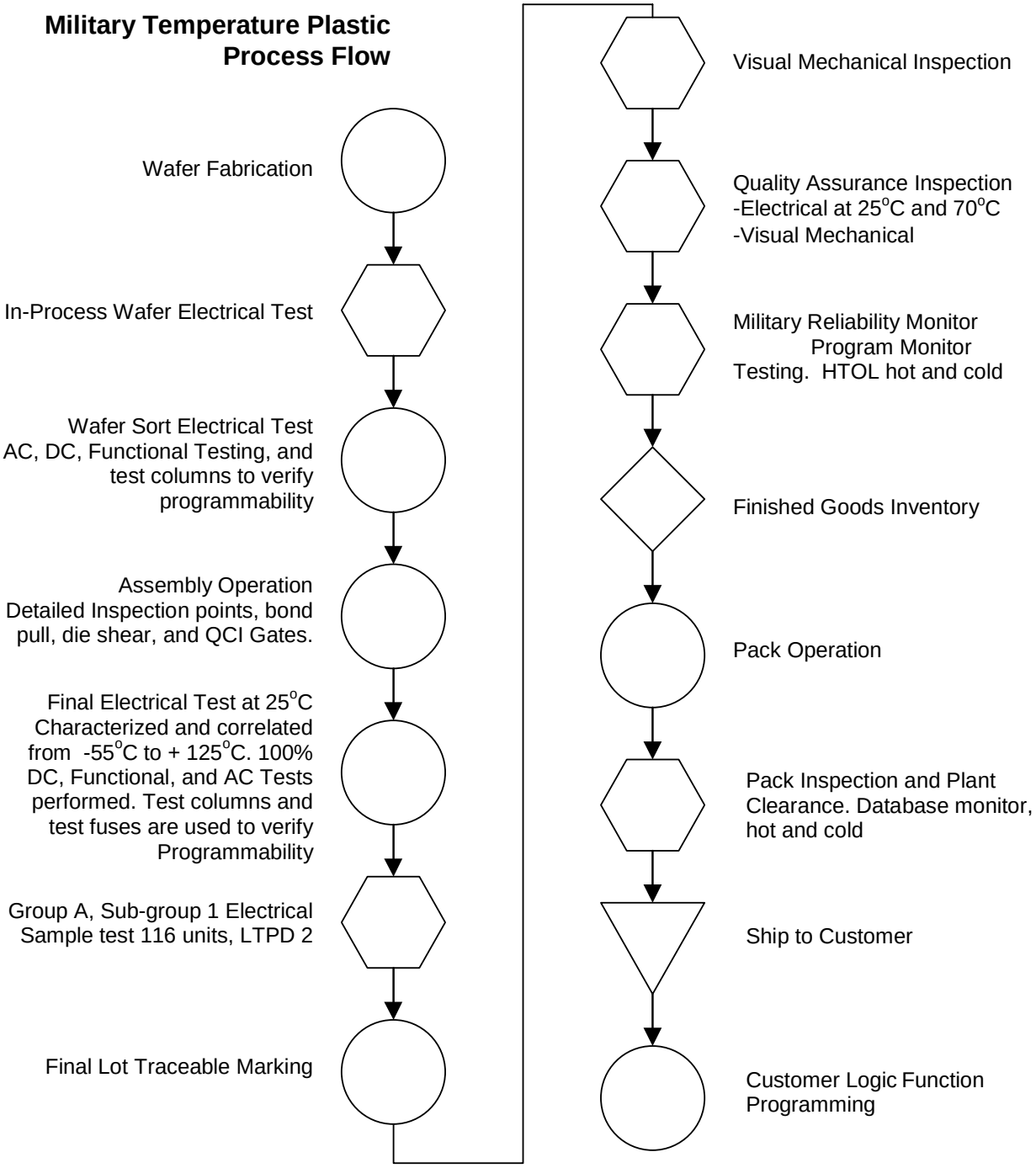
QuickLogic's military plastic device families of FPGAs provide designers of military products with technology and package options not available with traditional ceramic devices. QuickLogic's plastic program addresses the issues of DMS (Diminishing Manufacturing Supply), reliability and performance.

Ideal for military applications, the devices' ViaLink technology employs a non-volatile metal-to-metal interconnect with a typical resistance of 30 ohms. This low resistance coupled with low capacitance (<1fF) provides high speed with low power consumption guaranteed over the military temperature range of -55 to +125oC.

Miltary Progam Guarantees

Guarantee	Military Plastic
Lot Traceability	Yes
Burn-in	No
Product Change Notification	Yes
Military Temperature Guarantee	Yes
Qualification and Reliability Data	Yes
Failure Analysis	Yes
Extended Life Availability	Yes
C of C	Available
SMD	Pending QML

Military Temperature Plastic Process Flow



QuickLogic Mil Std 883 Process Flow