Fact Sheet

Military Semiconductor Products

SMJ320F240

SGYV069A - April 2001

SMJ320F240 DSP Controller

HIGHLIGHTS

The SMJ320F240 is the first single-chip military DSP controller specifically optimized for motor control applications. This highly integrated device represents a significant breakthrough over traditional microcontroller and general-purpose DSP processor solutions by enabling direct-drive, variable-speed control of simple-to-build brushless motors. The device also provides better motor performance, lower energy usage, quieter operation, and greater reliability when compared to other solutions. Most importantly, the 'F240's combination of math processing capabilities and integrated motor control peripherals can allow designers to achieve reduced system cost by requiring less hardware components.

KEY FEATURES/BENEFITS

- 20 MIPS DSP core for real-time processing of advanced algorithms
- Optimized event manager
- Integrated dual 10-bit A/D converters
- SPI and SCI for serial communications
- 16K words of Flash Memory
- 28 bidirectional I/O pins
- Watchdog timer

DIE SIZE

Size of die - 338 X 335 Mils

PACKAGING

132 pin HFP Ceramic Quad Flatpack

Weight – 8.5gm

POWER DISSIPATION

Theta Jc = 2.57 C/W
Theta Ja = 55.71 C/W

ARCHITECTURE

The SMJ320F240 is composed of three main functional units: a ‘C2xx DSP core, internal memory and peripherals. In addition to these three functional units, there are several system-level features that are distributed. These include the memory map, device reset, interrupts, digital input/output (I/O), clock generation and low-power operation.

CORE - The ‘F240 uses an advanced Harvard-type architecture that maximizes the processing power by maintaining two separate memory bus structures, program and data, for full-speed execution. This multiple bus allows reading both data and instructions simultaneously. The four-deep pipeline allows most instructions to be executed in a single cycle.

MEMORY - 544 Words x 16 Bit Data/Program On-Chip Dual-Access RAM
16K Words x 16 Bit On-Chip Flash EEPROM
224 Words x 16 Bits of total memory address reach (64K Data, Program, and I/O,
32K Global)

PERIPHERALS - Motor Control Event Manager w/ 12 Compare/PWM channels, 3 general purpose timers, 3 full compare units with deadband, 3 simple compare units and 4 capture units. Other peripherals include Serial-Communication Interface (SCI), Serial-Peripheral Interface (SPI), watchdog timer, dual 10-bit A/D converters, PLL, 28-bit addressable I/O pins and scan based emulation.

TOOLS

ASSEMBLER..... Converts assembly language to machine language.
LINKER..... Combines object modules into a single executable object file, performs relocation and resolves external references.
C COMPILER..... Translates C source code into 320C2xx assembly source code.
SIMULATOR..... Software debugger tool that simulates the operation of the 320F240.
XDS-510…..... Hardware controller card for in-system emulation.
F240 EVM Board….. The C24x™ EVM comes complete with a C24x evaluation board, emulator, fixed-point assembly language tools, an EVM debugger, power supply, sample applications code and complete documentation.

DESIGN-IN SUPPORT

TI has the most extensive DSP application support

Product Information Center:	(972) 644-5580 (For general information, availability, etc.)
DSP Developer’s Village:	http://dspvillage.ti.com/docs/dspvillagehome.jhtml
DSP Hotline (Technical questions):	http://www-k.ext.ti.com/cgi-bin/webcgi.exe?New,KB=dsp
F24x Information:	http://dspvillage.ti.com/docs/catalog/dspplatform/dspplatform.jhtml?familyID=110
Military DSP Info:	http://www.ti.com/sc/docs/products/military/processr/index.htm

Product Information Center

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