DSP Based Data Acquisition System with ADC’s, DAC’s, Digital I/O in a 40-pin Metal DIP Package for Extreme Environments/Applications

**FEATURES**
- Powerful 16-bit TI® TMS320F240 DSP core
- 16K words of FLASH and 32K words of SRAM
- Internal PGA supports custom applications
- 8 10-Bit ADC Channels
- 3 10-Bit DAC Channels
- Internal 2.500 volt reference
- 16 programmable digital I/O’s
- High speed asynchronous serial port
- Internal temperature sensor
- Low power, single supply operation
- Operation to 200°C

**DESCRIPTION**

The TX5350 is a complete, low-power data acquisition system in a single package. Major internal components are a powerful 16-bit DSP with two 10-bit analog-to-digital converters each with an 8-channel single-ended multiplexer (only 8 channels are available in the 40 pin package), a stable, internal 2.500 volt reference, three 10-bit digital-to-analog converters, an internal temperature sensor and sixteen independent digital pins that can be user programmed to any I/O pin of the DSP.

The TX5350 also contains an antifuse PGA that is programmed at the die level to implement the personality of the device. All DSP I/O is routed through this PGA to provide maximum flexibility for any application. For custom configurations,

**APPLICATIONS**
- High temperature SCADA systems
- Petroleum reservoir monitoring
- Petroleum logging tools
- Petroleum LWD and MWD tools
- Aircraft flight control systems
- Smart sensor applications

**DEVELOPMENT TOOLS**
- SX5350 board level TX5350 equivalent
- JTAG emulator

PGA source code would be provided to Texas Components after debug on the SX5350 development system and devices using a new part number device would be manufactured.

Additionally, the TS5350 contains a full duplex, high-speed asynchronous serial interface which can be used for host-to-device communication. The resident DSP/PGA combination can be used to implement almost any communication protocol and provide local control independent of the host.

Resident software includes a serial boot loader and debugger to facilitate loading of new executables into flash memory, allowing the entire personality of the TX5350 to be reconfigured without removing it from the circuit.
## TX5350 Specifications @ 5V and 25°C

### Operating Temperature Range
-50°C to +200°C

### Analog Inputs
- 8 Available user inputs
- 2 For used Internal State of Health
   - (VCC, Substrate Temperature)
- Resolution: 10 Bit
- Accuracy: ±1 Lsb
- Conversion Time: 10 us
- Conversion Voltage Range: 2.500 Volts
  - Lsb = 2.44 mV (2.500 / 1024)

### Reference
- Voltage: 2.500 V ± 0.05%
- Drift (-50°C to +150°C): 5 ppm
- Drift (+150°C to +200°C): 10 ppm
- Buffer Output Current: ±5 mA

### Analog Outputs (3)
- 10 Bit PWM filtered outputs
- Output Range: 0.0 V to 2.500 V
- Output Ripple: 1.5 mV
- Output Impedence: 40 K ohms
- Settling Time: 0.1%: 13 ms

### Power Supply Input
- 4.75 to 5.25 Volts

### Power Consumption
- 40 ma typ --- (Clock and Load dependent)

### Internal RC Oscillator
- Frequency: 2.304 MHz ± 1%
- Stability: 100 ppm

### TMS320F240 CPU Clock
- PLL scaleable (X4) 2.304 MHz to 9.216 MHz

### External Clock Input
- 1 CMOS load
- Frequency Range: 1 to 20 MHz
  - (Internal clock is disabled upon detect)

### Digital I/O
- 16 user configurable I/O ports
- 7 JTAG I/O

### Voltage Input - Any Input
- Max input range: -0.3 V to +5.3 V
- Input capacitance: 10 pf

### Digital Outputs
- Output voltage: 0.2 to 4.8 V @ 10 mA load

### Floating point capacity
- >30,000 operations/sec @ 9.216 MHz DSP Clock

### Serial Communication
- Up to 115200 baud

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**TX5350 Pin out – Top View**

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