Fact Sheet

Military Semiconductor Products

TLV2548MJB/FKB, 5962-9957001QRA/2A

SGYV088, May 2000

ADC, 12-BIT, 200 KSPS, 8-CHAN., SERIAL, 2.7 V TO 5.5 V, LOW POWER, W/AUTO PD

HIGHLIGHTS / DESCRIPTION

The TLV2548 is a high performance, 12-bit low power, 3.6-µs CMOS analog-to-digital converter (ADC) which operates from a single 2.7-V to 5.5-V power supply. This device has three digital inputs and a 3-state output [chip select (CS\), serial input-output clock (SCLK), serial data input (SDI) and serial data output (SDO)] that provides a direct 4-wire interface to the serial port of most popular host microprocessors (SPI interface). When interfaced with a DSP, a frame sync (FS) signal is used to indicate the start of a serial data frame.

In addition to a high-speed A/D converter and versatile control capability, this device has an on-chip analog multiplexer that can select any analog inputs or one of three internal self-test voltages. The sample-and-hold function is automatically started after the fourth SCLK edge (normal sampling) or can be controlled by a special pin, CSTART\, to extend the sampling period (extended sampling). The normal sampling period can also be programmed as short (12 SCLKs) or as long (24 SCLKs) to accommodate the faster SCLK operation popular among high-performance signal processors. The TLV2548 is designed to operate with very low power consumption. The power-saving feature is further enhanced with software/hardware/auto power down modes and programmable conversion speeds. The conversion clock (OSC) and reference are built-into the silicon. The converter can use the external SCLK as the source of the conversion clock to achieve higher conversion speed (up to 3.6 µs when a 20 MHz SCLK is used). Two different internal reference voltages are available. An optional external reference can also be used to achieve maximum flexibility.

KEY FEATURES/BENEFITS

- Maximum Throughput 200 KSPS
- Built-In Reference, Conversion Clock and 8× FIFO
- Differential/Integral Nonlinearity Error: ±1 LSB
- Signal-to-Noise and Distortion Ratio: 68 dB, fi=12kHz
- Spurious Free Dynamic Range: 75 dB, fi = 12 kHz
- SPI/DSP-Compatible Serial Interfaces With SCLK up to 20 MHz
- Single Wide Range Supply 2.7 Vdc to 5.5 Vdc
- Analog Input Range 0 V to Supply Voltage with 500 kHz BW
- Hardware Controlled and Programmable Sampling Period
- Low Operating Current (0.95 mA at 2.7 V, 1.3 mA at 5.5 V, External Ref,
  1.6 mA at 2.7 V, 2.1 mA at 5.5 V, Internal Ref)
- Power Down: Software/Hardware Power-Down Mode (1.5 µA Max, Ext Ref),
- Auto Power-Down Mode (2.5 µA, Ext Ref)
- Programmable Auto-Channel Sweep

Parameter Name	TLV2548M
Resolution	12 Bits
Sample Rate	200 KSPS
Supply	2.7 V to 5.5 V
Data-Bus Interface	Serial
Analog Inputs	8 Channels
Power (typ)	4.5 mW
Vref (Int/Ext)	Internal or External
DNL (max)	+/- 1 LSB
INL (max)	+/- 1 LSB

TECHNOLOGY

CMOS, ESD level: 4 KV

DIE SIZE

The current die has a size of: 79 mils x 134 mils, subject to change.

PACKAGING

Package Option: 20-pin Ceramic Dual in Line Package (J)
20-pin Leadless Ceramic Chip Carrier (FK)

POWER DISSIPATION

The table below shows modeled data. This data can be used for approximating system thermal characteristics. Note: Better thermal impedances can be achieved by using air flow, or by increasing metal backplane thickness or trace area in the Printed Circuit Board (PCB).

Package Thermal Data

Package	$R_{\theta}JA$	$R_{\theta}JC$
20 Pin DIP	66 ºC/W	7.0 ºC/W
20 Pin LCC	91 ºC/W	5.4 ºC/W*

*modeled data

PROCESS/PERFORMANCE OPTIONS

The TLV2548M is processed to the military temperature range. B suffix devices are for programs requiring devices processed to MIL-PRF-38535. The DSCC Standard Microcircuit Drawings (SMD) for these devices are given below.

DSCC SMD

TI Parent	DSCC SMD #
TLV2548MJB	5962-9957001QRA
TLV2548MFKB	5962-9957001Q2A
TLV2548MJ	N/A

SUPPORT

An Evaluation Module (EVM) is available: http://www-s.ti.com/sc/psheets/slau029/slau029.pdf

You can access data sheets via TI's home page on the internet (http://www.ti.com) or reference the literature number SLAS198 when contacting the PIC.

For additional information on this and other Mixed Signal/Analog Products visit our Mixed Signal home page at: http://www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

Additional information regarding this product is available by calling the Texas Instruments U.S. Product Information Center (PIC) at (972) 644-5580 during normal business hours (CST/CDT). Online information is available at: http://www.ti.com/sc/docs/pic/americas.htm
For European PIC information, visit http://www.ti.com/sc/docs/pic/home.htm