7809 LPRP

Analog-to-Digital Converter

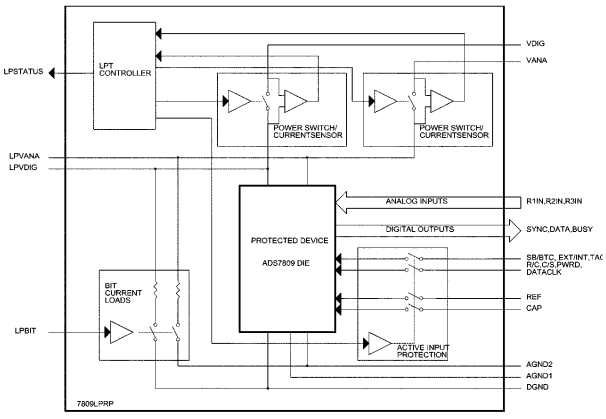
- 16-bit organization
- 24 pin RAD-PAK® flat package
- 100 kHz min sampling rate
- ±10 V and 0 V to 5 V input range
- Advanced CMOS technology
- DNL: 16-bits "No Missing Codes"
- 86dB min SINAD with 20 kHz input
- Single +5 V supply operation
- Utilizes internal or external reference
- Serial output
- Power dissipation: 132 mW max

Space Electronics Analog-to-Digital Converter

Space Electronics' 7809LPRP is a radiation-hardened, high speed 16-bit analog-to-digital converter features up to 100 kilorad (Si) total dose tolerance dependent upon orbit. The device is radiation-hardened at the microcircuit level using SEi's RAD-PAK® packaging technology and is latchup protected by Space Electronics' Latchup Protection Technology (LPT™). The device is a 24 pin, 16-bit sampling analog-to-digital converter that uses state-of-the-art CMOS structures. The 7809LPRP contains a 16-bit capacitor based SAR A/D with S/H, reference, clock, interface for microprocessor use, and serial output drivers. It is specified at a 100 kHz sampling rate, and guaranteed over the full temperature range. Laser-trimmed scaling resistors provide various input ranges including ±10V and 0 to 5 V, while the innovative design allows operation from a single +5 V supply, with power dissipation of under 132 mW. In addition, the 7809LPRP is available with packaging and screening up to Class S.

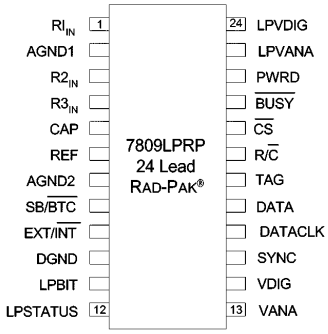
LPT™ Operation

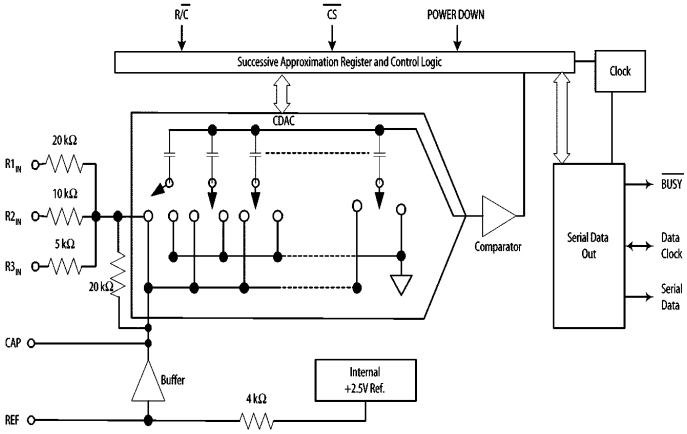
Latchup Protection Technology (LPT™) automatically detects an increase in the supply current of the 7809LPRP converter due to a single event effect and internally cycles the power to the converter off, then on, which restores the steady state operation of the device. The LPTTM circuitry consists of two power switch and current sensor blocks, an LPTTM controller block, a BIT cur- rent load block, and an active input protection block.



ELECTRONIC COMPONENTS GROUP
MAXWELL TECHNOLOGIES

Analog-to-Digital Converter





Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNIT
Analog Inputs	$R1_{IN}$	-25	+25	V
	$R2_{IN}$	-25	+25	V
	$R3_{IN}$	-25	+25	V
	CAP	V_{ANA} +0.3	AGND2 -0.3	V
	REF[1]			
Ground Voltage Differences	DGND, AGND2	-0.3	+0.3	V
V_{ANA}		--	7	V
V_{DIG}		--	7	V
V_{DIG} to V_{ANA}		--	+0.3	V
Specified Performance		-40	85	°C
Digital Inputs		-0.3	V_{DIG} +0.3	V
Derated Performance Temperature	T_A	-55	+125	°C
Storage Temperature	T_{STG}	-65	+150	°C

1. Indefinate short to AGND2, momentarily short to V_{ANA}

Accuracy Specifications

PARAMETER	PARAMETER	MIN	TYP	MAX	UNIT
Integral Linearity Error		--	--	±3	LSB[1]
Differential Linearity Error		--	--	+3, -2	LSB
No Missing Codes[2]		15	--	--	Bits
Transition Noise[3]		--	1.3	--	LSB
Full Scale Error[4,5]		--	--	±0.5	%
Full Scale Error Drift		--	±7	--	ppm/°C
Bipolar Zero Error[4]		--	--	±10	mV
Bipolar Zero Error Drift		--	±2	--	ppm/°C
Unipolar Zero Error[4]		--	--	±3	mV
Unipolar Zero Error Drift		--	±2	--	ppm/°C
Power Supply Sensitivity	4.8 V<Vs<5.25V	--	--	±8	LSB

1. LSB stands for Least Significant Bit. One LSB is equal to 305 uV. 2. Not tested. 3. Typical rms noise at worst case transitions and temperatures. 4. Measured with various fixed transistors.

Space Electronics
A Maxwell Technologies Company
9244 Balboa Avenue, San Diego, CA 92103
tel: 858-503-3300
fax: 858-503-3301
e-mail: sales@spaceelectronics.com