

Nonvolatile SRAMs

These Dallas Semiconductor Nonvolatile Static RAMs integrate a lithium power source and intelligent control circuitry to retain data even in the absence of system power. Nonvolatile SRAMs feature unlimited write endurance and read/write access times as fast as 70 ns. DIP package devices have a 0.600" row spacing, 0.100" pin spacing and JEDEC pinouts. PowerCap Modules (PCM) are surface-mount devices that feature a two-piece construction with the DS9034PC

PowerCap, which protects the lithium power source from high-temperature reflow soldering. The DS9034PC PowerCap is sold separately, see previous page for details. **Standard Operating Temperature Range:** 0° to 70°C. **Industrial Operating Temperature Range:** –40° to 85°C also available.

Mfr.'s Type		Memory Size	Voltage	Access Time (ns)	No. of Pins
DIP	PowerCap*				
DS1220V-100	—	2 K × 8	5.0 V	100	24
DS1230V-70	DS1230VP-70	32 K × 8	5.0 V	70	28/34
DS1245V-70	DS1245VP-70	128 K × 8	5.0 V	70	32/34
DS1250V-70	DS1250VP-70	512 K × 8	5.0 V	70	32/34
DS1258V-70	—	128 K × 16	5.0 V	70	40
DS1270V-70	—	2048 K × 8	5.0 V	70	40
DS1245W-150	DS1245WP-150	128 K × 8	3.3 V	150	32/34
DS1250W-150	DS1250WP-150	512 K × 8	3.3 V	150	32/34
—	DS1330WP-150†	32 K × 8	3.3 V	150	34
—	DS1345WP-150†	128 K × 8	3.3 V	150	34
—	DS1350WP-150†	512 K × 8	3.3 V	150	34

*Orders for PowerCap products must be accompanied by orders for equal amounts of Mfr.'s Type DS9034PC. † **Additional features:** Battery monitor and reset.

CPU Supervisors

DS1233 EconoResets provide complete power monitoring and power-on reset functions to improve system operation and protect nonvolatile memories. The DS1233D is compatible with processors that are capable of initiating a "soft" reset output at the RST input. The DS1232LP and DS1832 extend the DS1233 functionality with a fully integrated watchdog to monitor processor operation and will restart a system when the µP is no longer executing instructions. DS1834 is a complete 3 V and 5 V monitoring and power-on reset solution for mixed voltage systems.

Mfr.'s Type	Description	Operating Voltage	Voltage Tolerance	Package Type
DS1232LP*	Reset and Watchdog	5 V	Selectable	8-pin DIP
DS1232LPN*	Ind. Reset and Watchdog	5 V	Selectable	8-pin DIP
DS1232LPS*	Reset and Watchdog	5 V	Selectable	16-pin SOIC
DS1232LPSN*	Ind. Reset and Watchdog	5 V	Selectable	16-pin SOIC
DS1233-5	EconoReset with PBRST	5 V	5%	TO-92
DS1233Z-5	EconoReset with PBRST	5 V	5%	SOT-223
DS1233-10	EconoReset with PBRST	5 V	10%	TO-92
DS1233Z-10	EconoReset with PBRST	5 V	10%	SOT-223
DS1233D-5	EconoReset	5 V	5%	TO-92
DS1233DZ-5	EconoReset	5 V	5%	SOT-223
DS1233D-10	EconoReset	5 V	10%	TO-92
DS1832	Reset and Watchdog	3 V	Selectable	8-pin DIP
DS1834AS	Dual EconoReset	5 V and 3 V	Selectable	8-pin SOIC

* The DS1232LP is a low power pin- and function-compatible replacement for the DS1232.

High-Speed Microcontrollers

Dallas Semiconductor high-speed microcontrollers are revolutionary products in the 8051 microcontroller family which deliver up to 3 times the performance of industry standard 8051s just by dropping into an existing socket. This is accomplished by using 4 clocks per instruction instead of the usual 12, without changing crystal frequency. All parts are instruction set-compatible with the 80C51/87C51. Type DS80C320 is pin-for-pin compatible with 80C32, including the 3-volt version, type DS80C323. Type DS80C310 is a cost-reduced version of type DS80C320. Type DS87C520 is pin-for-pin compatible with the 80C51/87C51, and includes 16 kB of EPROM, 1.2 kB of SRAM. Type DS87C530 contains the same features as type DS87C520, plus a real-time clock and 1 kB non-volatile SRAM. All of the high-speed controllers, except type DS80C310, include dual serial port, power-on reset, and watchdog timer.

Mfr.'s Type	No. of Pins	Package	Clock Speed Max.
DS80C310-MCG	40	PDIP	25 MHz
DS80C320-ECG	44	TOFP	25 MHz*
DS80C320-MCG	40	PDIP	25 MHz*
DS80C320-MCL	40	PDIP	33 MHz*
DS80C320-QCG	44	PLCC	25 MHz*
DS80C320-QCL	44	PLCC	33 MHz
DS80C323-MCG	40	PDIP	18 MHz
DS80C390-FCL	64	LOFP	40 MHz
DS87C520-MCL	40	PDIP	33 MHz*
DS87C520-QCL	44	PLCC	33 MHz*
DS87C520-WCL	40	Windowed	33 MHz
DS87C530-ECL	52	TOFP	33 MHz*
DS87C530-KCL	52	Windowed	33 MHz
DS87C530-QCL	52	PLCC	33 MHz
DS87C550-QCL	68	PLCC	33 MHz
DS87C550-FCL	80	POFP	33 MHz
DS87C550-KCL	68	Windowed CLCC	33 MHz

*Industrial temperature range also available — substitute "N" for "C" in Mfr.'s Type.

DS5000T Soft Microcontrollers

Soft microcontrollers with embedded clock/calendar permit logging of events with time and date stamp. 8-bit µC provides nonvolatile RAM for program and/or data memory storage via lithium power source. 128 internal nonvolatile registers for variable retention. Capable of modifying program/memory in end-use. Maintains all nonvolatile resources for 10 years in absence of Vcc. On-chip full duplex serial I/O port and 32 parallel I/O lines. Compatible with 8051 instruction set and pinout. **Temperature Range:** 0-70°C. 0.100" (2.54) pin spacing. 0.600" (15.24) row spacing. Type DS5000P-16 is an 80-pin quad flat pack containing a stand alone DS5000 soft microcontroller die. Supports up to 32 Kbytes of data memory, 32 Kbytes of program memory. This gives user the flexibility of using their own lithium cells and memory to implement a nonvolatile microcontroller solution with the soft features of the DS5000. DS5000T/Kit evaluation kit has type DS5000T-32-12 microcontroller, software diskette, user's guide, in-system loader software. Supports downloading from IBM PC host and downloads/verifies Intel Hex absolute object file.

Mfr.'s Type	Program/Data RAM	Clock Speed
DS5000T-8-16	8 Kbytes	16 MHz
DS5000T-32-16	32 Kbytes	16 MHz
DS5000FP-16	CPU only	16 MHz
DS5000T/Kit	Evaluation Kit	—

Direct-to-Digital Temperature Sensors and Battery Management Devices

The core feature set of this family of temperature sensors is a direct-to-digital readout of the temperature (≥9 bits), over- and under-temperature nonvolatile thermostat set points, factory-calibration, and dedicated thermostat logic outputs. Variations in the product family include 3 types of serial interfaces (1-Wire®, 2-wire, and 3-wire), on-chip E2PROM memory (up to 256 bytes), multi-sense capability (up to ⇔), and accuracy/price trade-offs. No external components are required to sense temperature and convert it to a digital word that can be read by a µP. Because of the factory calibration, there is no need for the designer to perform any compensation or linearization over the operating range (–55°C to +125°C). The nonvolatile thermostat trip points and dedicated thermostat outputs allow for standalone (no µP required) thermostat operation. Applications include thermal management of personal computers and servers, office electronics, equipment racks, HVAC environmental control, and process monitoring/control.

Mfr.'s Type	Power Supply	Interface	Accuracy	Multi-Sense	NV Memory	Package	Distinguishing Feature
DS56S	3 V/5 V	Analog voltage	±2.0°C	—	—	8-Pin SOIC, USOP, Bump	Dual independent thermostat settings
DS75S	3 V/5 V	2-Wire digital	±2.0°C	Up to 8	—	8-Pin SOIC, USOP, Bump	LM75 compatible with higher resolution
DS1620 DS1620S	3 V/5 V	3-Wire digital	±0.5°C	—	4 bytes	8-Pin DIP 8-Pin SOIC	Stand-alone thermostat mode
DS1621 DS1621S	3 V/5 V	2-Wire digital	±0.5°C	Up to 8	4 bytes	8-Pin DIP 8-Pin SOIC	Addressable interface
DS1624 DS1624S	3 V/5 V	2-Wire digital	±0.5°C	Up to 8	256 bytes	8-Pin DIP 8-Pin SOIC	256 B on-chip EEPROM
DS1629S	3 V/5 V	2-Wire digital	±2.0°C	—	—	8-Pin SOIC	On-chip real time clock (XTAL)
DS1721S	3 V/5 V	2-Wire digital	±1.0°C	Up to 8	—	8-Pin SOIC	Relaxed spec, lower cost DS1621
DS1722S	3 V/5 V	3-Wire/SPI digital	±2.0°C	—	—	8-Pin SOIC, USOP, Bump	SPI interface
DS1780E	3 V/5 V	2-Wire digital	±2.0°C	Up to 4	—	24-Pin TSSOP	Monitors 6 voltages, and 2 fan speeds, 8-bit DAC controls fan speed
DS18B20	3 V/5 V	1-Wire digital	±0.5°C	Up to ∞	2 bytes	8-Pin SOIC, TO92, Bump	Single wire digital interface with 9-12 bit resolution
DS18S20	3 V/5 V	1-Wire digital	±0.5°C	Up to ∞	2 bytes	8-Pin SOIC, TO92	Single wire digital interface with multipoint sensing
DS1821	3 V/5 V	1-Wire digital	±1.0°C	—	2 bytes	PR-35 8-Pin SOIC TO220	Single wire digital interface with stand-alone thermostat mode
DS1821T							
DS1822	3 V/5 V	1-Wire digital	±2.0°C	Up to ∞	—	8-Pin SOIC, TO92, Bump	Relaxed spec DS18B20
DS2401	2.8 V-6 V	1-Wire digital	—	Up to ∞	—	TO92 SOT223	Silicon serial number
DS2434 DS2434S	3 V/5 V	1-Wire digital	±1.0°C	—	32 bytes	PR-35 16-Pin SSOP	Battery ID, EEPROM and temperature
DS2436B DS2436Z	3 V/5 V/10 V 2.4 V-10 V	1-Wire digital	±1.0°C	Up to ∞	32 bytes	TO92 8-Pin SOIC	DS2434 features plus voltage A/D converter
DS2438	2.4 V-10 V	1-Wire digital	±20.0°C	Up to ∞	40 bytes	8-Pin SOIC	Fuel gauge temperature ID, Voltage A/D
DS2441S	2.4 V-5.5 V	1-Wire digital	±3.0°C	Up to ∞	32 bytes	8-Pin SOIC	Li-ION safety circuit, fuel gauge, temperature
DS2442	2.4 V-10 V	1-Wire digital	±3.0°C	Up to ∞	32 bytes	8-Pin SOIC	DS2441 with dual cell Li-ION safety circuit