DETAILED DESCRIPTION

Each DS1688/DS1691 is individually manufactured with a unique 64-bit serial number as well as an additional 64-bit customer-specific ROM or serial number. The serial number is programmed and tested at Dallas to ensure that no two devices are alike. The serial number can be used to electronically identify a system for purposes such as establishment of a network node address or for maintenance tracking. Customers can reserve blocks of available numbers from Dallas Semiconductor.

The serialized RTCs also incorporate power-control circuitry, which allows the system to be powered on via an external stimulus, such as a keyboard or by a time and date (wake up) alarm. The $\overline{PWR}$ output pin can be triggered by one or either of these events, and can be used to turn on an external power supply. The $\overline{PWR}$ pin is under software control, so that when a task is complete, the system power can then be shut down.

The DS1688/DS1691 incorporate a power-on elapsed time counter, a power-on cycle counter, and a battery powered continuous counter. These three counters provide valuable information for maintenance and warranty requirements.

Automatic backup and write protection for an external SRAM is provided through the V_{CCO} and $\overline{CEO}$ pins. The lithium energy source used to permanently power the RTC is also used to retain RAM data in the absence of V_{CC} power through the V_{CCO} pin. The chip enable output to RAM ($\overline{CEO}$) is controlled during power transients to prevent data corruption.

The DS1688 is a clock/calendar chip with the features described above. An external crystal and battery are the only components required to maintain time-of-day and memory status in the absence of power. The DS1691 incorporates the DS1688 chip, a 32.768kHz crystal, and a lithium battery in a complete, self-contained timekeeping module. The entire unit is fully tested at Dallas Semiconductor such that a minimum of 10 years of timekeeping and data retention in the absence of V_{CC} is guaranteed.

For a complete description of operating conditions, electrical characteristics, bus timing, and pin descriptions other than the SQW output, refer to the DS1689/DS1693 data sheet, available online at www.maxim-ic.com/DS1689.

PIN DESCRIPTION

PIN		NAME	FUNCTION
SO	EDIP		
1	1	V_{BAUX}	Auxiliary Battery Supply
2, 3	—	X1, X2	Crystal Input, Crystal Output
4	4	$\overline{RCLR}$	Active-Low RAM Clear Input
5–12	5–12	AD0–AD7	Muxed Address/Data Bus
13	13	$\overline{PWR}$	Active-Low Power-On Interrupt Output
14, 19	14	GND	Ground
15	15	$\overline{KS}$	Active-Low Kickstart Input
16	16	$\overline{CS}$	Active-Low Chip Select Input
17	17	ALE	Address Strobe
18	18	$\overline{WR}$	Active-Low Write Data Strobe
20	20	$\overline{RD}$	Active-Low Read Data Strobe
21	21	PSEL	+3V or +5V Power Select
22	22	$\overline{IRQ}$	Active-Low Interrupt Request Output
23	—	V_{BAT}	Battery + Supply
24	24	SQW	Square-Wave Output. This signal functions identical to the DS1689/DS1693 with an exception occurring at power-up. A 32kHz square wave is output on this pin, t_{REC}, after a power-up condition has been detected. This condition sets the following bits, enabling the 32kHz output: DV1 = 1, SQWE = 1, and E32K = 1. The square wave is output on this pin if either SQWE = 1 or E32K = 1.
25	25	V_{CCO}	RAM Power-Supply Output
26	26	V_{CCI}	+3V or +5V Main Supply
27	27	$\overline{CEO}$	Active-Low RAM Chip Enable Out
28	28	$\overline{CEI}$	Active-Low RAM Chip Enable In
—	2, 3, 19, 23	N.C.	No Connection

PACKAGE INFORMATION

For the latest package outline information and land patterns, go to www.maxim-ic.com/packages.

PACKAGE TYPE	PACKAGE CODE	DOCUMENT NO.
28 SO	F28+3	**21-0251**
28 PDIP	P28-6	**21-0044**
28 EDIP	MDP28-2	**21-0241**

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