

# DALLAS

## SEMICONDUCTOR

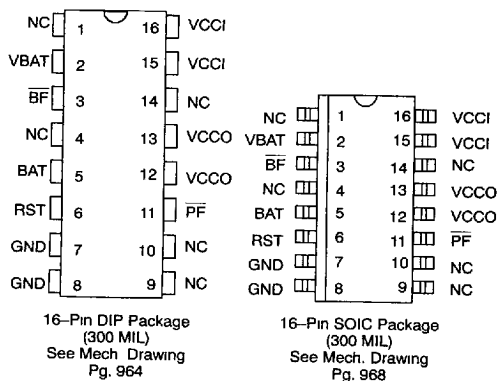
# DS1259

## Battery Manager Chip

### FEATURES

- Facilitates uninterruptible power
- Uses battery only when primary  $V_{CC}$  is not available
- Low forward voltage drop
- Power fail signal interrupts processor or write protects memory
- Consumes less than 100 nA of battery current
- Low battery warning signal
- Battery can be electrically disconnected upon command
- Battery will automatically reconnect when  $V_{CC}$  is applied
- Mates directly with DS1212 Nonvolatile Controller x 16 Chip to back up 16 RAMs
- Optional 16-pin SOIC surface mount package

### PIN ASSIGNMENT



### PIN DESCRIPTION

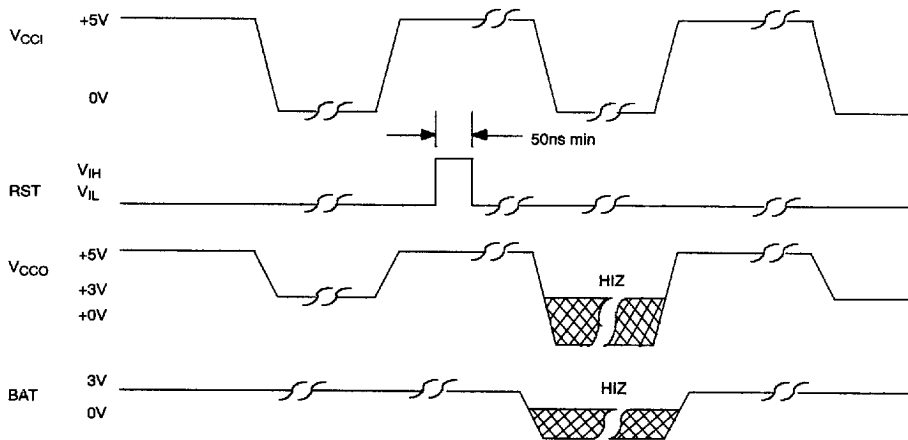
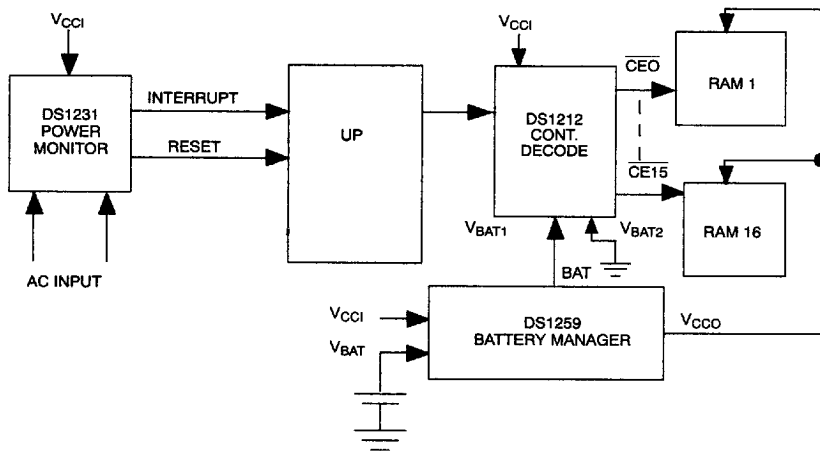
NC	– No Connection
$V_{BAT}$	– Battery Input Connection
BF	– Battery Fail Output Signal
BAT	– Battery Output
RST	– Reset Input
GND	– Ground
PF	– Power Fail Output Signal
$V_{CCO}$	– RAM Supply
$V_{CCI}$	– +5V Supply

### DESCRIPTION

The DS1259 Battery Manager Chip is a low-cost battery management system for portable and nonvolatile electronic equipment. A battery connected to the battery input pin supplies power to CMOS electronic circuits when primary power is lost through an efficient switch via the  $V_{CCO}$  pins. When power is supplied from the bat-

tery, the power fail signal is active to warn electronic reset circuits of the power status. Energy loss during shipping and handling is avoided by pulsing reset, thereby causing the battery to be isolated from other elements in the circuits.



**RESET TIMING Figure 2****TYPICAL APPLICATION Figure 3**

**ABSOLUTE MAXIMUM RATINGS\***

Voltage on any Pin Relative to Ground

-0.3V to +7.0V

Operating Temperature

0°C to 70°C

Storage Temperature

-55°C to +125°C

Soldering Temperature

260°C for 10 seconds

\* This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

**RECOMMENDED DC OPERATING CONDITIONS**

(0°C to 70°C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Primary Power Supply	$V_{CCI}$		5	5.5	V	1
Input High Voltage	$V_{IH}$	2.0		$V_{CC}+0.3$	V	1
Input Low Voltage	$V_{IL}$	-0.3		+0.8	V	1
Battery Voltage Pin 2	$V_{BAT}$	2.5	3	3.7	V	6
Battery Output Pin 5	BAT	$V_{BAT}-0.1$			V	1

**DC ELECTRICAL CHARACTERISTICS**(0°C to 70°C;  $V_{CC} = 4.5$  to 5.5V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Leakage Current	$I_{LO}$	-1.0		+250	$\mu A$	
Output Current @ 2.4V	$I_{OH}$	-1.0			mA	1, 2
Output Current @ 0.4V	$I_{OL}$			+4.0	mA	1, 2
Input Supply Current	$I_{CCI}$			10	mA	3
Pins 12, 13 $V_{CCO}=V_{CCI}-0.2$	$I_{CCO}$			250	mA	
Pin 11 $\overline{PF}$ Detect	$V_{TP}$	(1.26x $V_{BAT}$ ) -250mV	(1.26x $V_{BAT}$ ) +250mV		V	4, 6
Pin 3 $\overline{BF}$ Detect	$V_{BATF}$	1.5	2.0	2.6	V	7

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Pins 12, 13 $V_{CCO}=V_{BAT}-0.2V$	$I_{CCO2}$			15	mA	5
Battery Leakage	$I_{BAT}$			100	nA	8
Pin 5 Battery Output Current	$I_{BATOUT}$			100	$\mu A$	

**CAPACITANCE**(T<sub>A</sub> = 25°C)

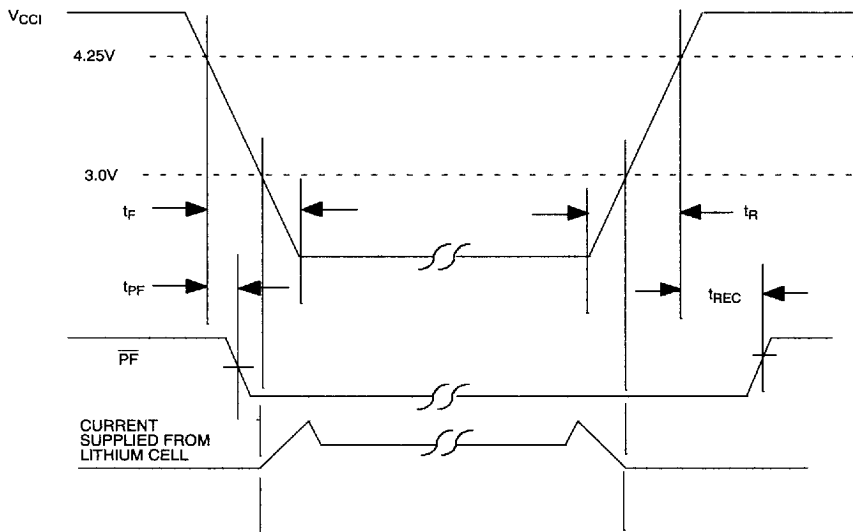
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Input Capacitance	$C_{IN}$		5	10	pF	
Output Capacitance	$C_{OUT}$		5	10	pF	

## AC ELECTRICAL CHARACTERISTICS

(0°C to 70°C;  $V_{CC} = 4.0$  to 5.5V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
$V_{CCI}$ Slew Rate	$t_F$	300			$\mu\text{s}$	
$V_{CCI}$ Slew Rate	$t_R$	1			$\mu\text{s}$	
Power-Down to $\overline{\text{PF}}$ Low	$t_{PF}$	0			$\mu\text{s}$	
$\overline{\text{PF}}$ High after Power-Up	$t_{REC}$			100	$\mu\text{s}$	9

## POWER-DOWN/POWER-UP CONDITION



## NOTES:

1. All voltages are referenced to ground.
2. Load capacity is 50 pF.
3. Measured with Pins 11, 12, 13, and 3 open.
4.  $V_{TP}$  is the point that  $\overline{\text{PF}}$  is driven low.
5.  $I_{CCO2}$  may be limited by the capability of the battery.
6. Trip Point Voltage for Power Fail Detect:  
 $V_{TP} = 1.26 \times V_{BAT} \pm 250 \text{ mV}$   
For 5% operation:  $V_{BAT} = 3.7\text{V max.}$   
For 10% operation:  $V_{BAT} = 3.5 \text{ V max.}$
7.  $V_{BATF}$  is the point that  $\overline{\text{BF}}$  is driven low. These limits are for 0°C to 70°C operation.
8. Battery leakage is the internal energy consumed by the DS1259.
9.  $V_{CC} = +5 \text{ volts, } t_A = 25^\circ\text{C.}$