
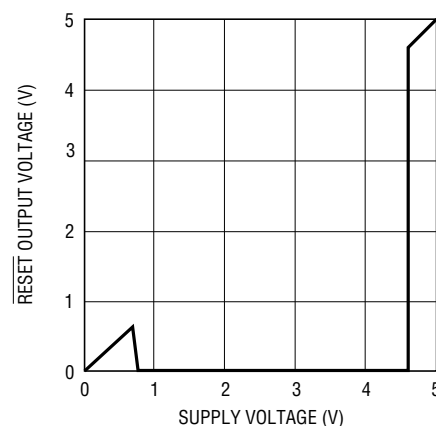


Features:

- **Guaranteed** Reset at $V_{CC} = 1V$
- Low Power
- UL Recognized  for Lithium Battery Backup
- Tight Reset Threshold and Timeout Specs
- Fully Specified Over Temperature
- Fast RAM Chip Enable Delay, 20ns typ, 35ns max*
- SOIC Packages
- 3V Versions (LTC[®]694-3.3, LTC695-3.3)

*Greatly enhanced performance compared to alternate sources which only provide 200ns maximum chip enable delay



LTC Family of Supervisory Circuit Products

| FUNCTION | 1235 | 690 | 691 | 692 | 693 | 694/694-3.3 | 695/695-3.3 | 699 | 1232 |
|--|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-------------------|
| Pushbutton Reset | X | | | | | | | | X |
| Battery Backup Switching UL Recognized | X | X | X | X | X | X | X | | |
| Conditional Battery Backup | X | | | | | | | | |
| RAM Write Protect | X | | X | | X | | X | | |
| Watchdog Timer | X | X | X | X | X | X | X | X | X |
| Power Fail Warning | X | X | X | X | X | X | X | | |
| Power Up/Down Reset | X | X | X | X | X | X | X | X | X |
| Reset Threshold (V) | 4.65 | 4.65 | 4.65 | 4.40 | 4.40 | 4.65/2.90 | 4.65/2.90 | 4.65 | 4.62 ¹ |
| Reset Pulse Width (ms) | 200 | 50 | 50 | 200 | 200 | 200 | 200 | 200 | 610 |
| Guaranteed V_{CC} Reset Level (V) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Power Supply Current (μA) | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 500 |
| Packages: Plastic | 16 | 8 | 16 | 8 | 16 | 8 | 16 | 8 | 8 |
| Ceramic DIP | | 8 | 16 | | | 8 | 16 | | |
| SOIC | 16 ² | 8 ³ | 16 ² | 8 ³ | 16 ² | 8 ³ | 16 ² | 8 ³ | 8 ³ |
| Temperature Ranges | C | C, I | C, I | C, I | C, I | C, I | C, I | C | C |

Notes: 1. 4.62V or 4.37V threshold selectable

2. 0.3" wide SOL package

3. 0.15" wide SO package

4. Temperature ranges: C = 0°C to 70°C, I = -40°C to 85°C, M = -55°C to 125°C

Definitions of Functions

Pushbutton Reset: Provides a manual reset input, usually triggered by a pushbutton switch, which is debounced and will initiate the usual reset sequence.

Battery Backup Switching: When V_{CC} drops below the battery voltage, V_{OUT} is connected to V_{BATT} and the device is placed in standby mode to conserve power. This provides backup power to the CMOS RAM while consuming less than $1\mu A$ of supply current. LTC devices are UL recognized for lithium battery backup.

Conditional Battery Backup: Electrically disconnects the battery during shipment and storage to prevent unnecessary discharge. Disconnection is done by detecting the power down sequencing of the supply and battery inputs.

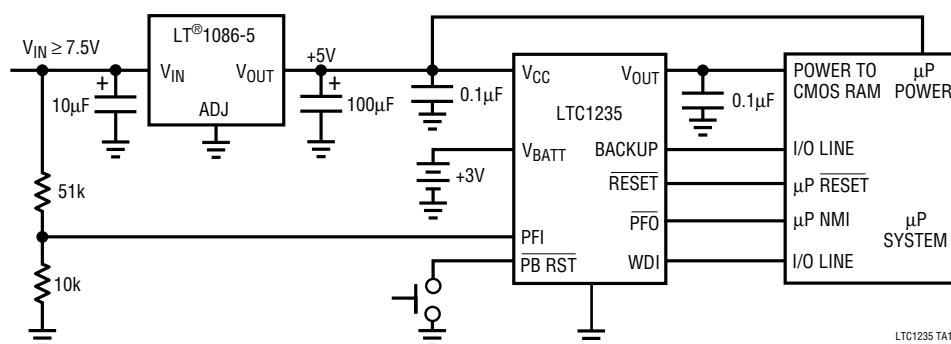
RAM Write Protect: The system RAM enable line is gated by the supervisory circuit. When the supply voltage drops below the reset voltage threshold, the enable line is inhibited, preventing erroneous data from being written into the RAM when V_{CC} is at an invalid level. The maximum enable delay for LTC's supervisors is 45ns.

Watchdog Timer: Monitors the activity of the μ P. The processor must toggle this input line before the given timeout period expires, or a reset will be initiated. This function is intended to prevent μ P's from becoming accidentally stalled in microcode loops indefinitely.

Power Fail Warning: Provides early warning to the μ P of an impending power failure by monitoring the unregulated power supply. This gives the processor time to perform shutdown activities before all regulated power is lost.

Power Up/Down Reset: Resets the μP when the power supply line drops below the preset threshold. LTC's supervisors will hold the reset line low down to supply voltages of 1.0V, providing a reliable reset through V_{CC} voltages which may allow the processor to begin operation.

Typical Applications



THE LTC1235 EXTENDS BATTERY LIFE BY PROVIDING BATTERY POWER ONLY WHEN REQUIRED TO BACK UP RAM DATA. IT SAVES THE BATTERY WHEN NO DATA BACKUP IS NEEDED. THE μ P REQUESTS BACKUP WITH THE BACKUP PIN.

Pin Functions:

PFI = Power Fail Detector Input
PFO = Power Fail Detector Output
WDI = Watchdog Detector Input
WDO = Watchdog Detector Output

LOWLINE = Low V_{CC} Detector Output
BKUP = Battery Backup Switch Input
CE IN = RAM Chip Enable Input
CE OUT = RAM Chip Enable Output