



Microcircuits

C690
C691
C692
C693

Single-Chip Microprocessor Supervisory Circuits

Features

- Precision voltage monitoring (C690/C691, 4.65 V; C692/C693, 4.40 V)
- Reduced component count
- Power OK/reset time delay
- Watchdog timer with 100 ms, 1.6 sec or adjustable settings
- Standby current of 1 μ A
- Battery backup power switching function
- Onboard gating of chip enable signals
- Voltage monitor for power failure or low battery warning

General Description

CMD's C690 microprocessor supervisory circuits are designed to reduce the component count and complexity necessary for power supply monitoring and battery control functions in microprocessor systems. When compared to separate ICs or other discrete components, the C690 family offers substantially improved system reliability and accuracy. Typical applications include computers, con-

trollers, automotives, intelligent instruments and critical microprocessor power monitoring.

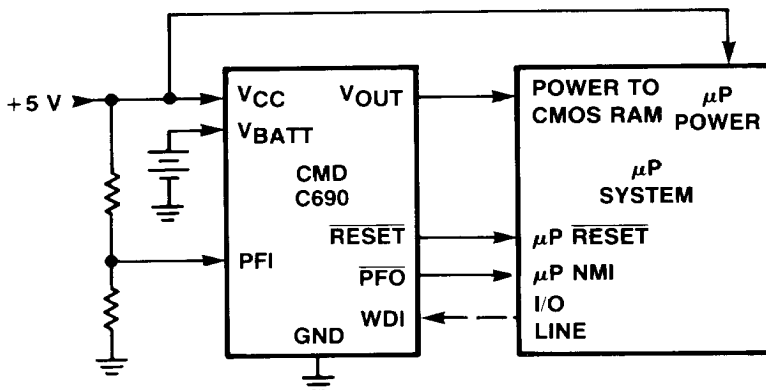
C690 and C692. Both are supplied in 8-pin packages and provide the following functions.

- Microprocessor reset during power-up, power-down and brown-out conditions
- Backup battery switchover for CMOS, RAM, CMOS microprocessor or other low power logic
- 1.25 V threshold detector for power fail warning, low battery detection or to monitor non +5 V power supplies
- Reset pulse in the event the optional watchdog timer has not been toggled within a specified time.

C691 and C693. Both come in 16-pin packages and perform all C690 and C692 functions plus the following.

- CMOS RAM or EEPROM write protection
- Adjustable reset and watchdog timeout periods
- Separate outputs for indicating a watchdog timeout, backup battery switchover and low V_{CC}

Block Diagram



C690 TYPICAL APPLICATION

Absolute Maximum Ratings

Terminal Voltage (with respect to GND)		Power Dissipation	
V _{CC}	− 0.3 V to 6.0 V	8 Pin Plastic DIP	
V _{BATT}	− 0.3 V to 6.0 V	(Derate 5 mW/°C above + 70°C)	400 mW
All Other Inputs (Note 1)	− 0.3 V to (V _{OUT} + 0.5 V)	8 Pin CERDIP	
Input Current		(Derate 8 mW/°C above + 85°C)	500 mW
V _{CC}	200 mA	16 Pin Plastic DIP	
V _{BATT}	50 mA	(Derate 7 mW/°C above + 70°C)	600 mW
GND	20 mA	16 Pin Small Outline	
Output Current		(Derate 7 mW/°C above + 70°C)	600 mW
V _{OUT}	short circuit protected	16 Pin CERDIP	
All Other Outputs	20 mA	(Derate 10 mW/°C above + 85°C)	600 mW
Rate-of-Rise, V _{BATT} , V _{CC}	100 V/μs	Storage Temperature Range	− 65°C to + 160°C
Operating Temperature Range		Lead Temperature (Soldering, 10 seconds)	300°C
C suffix	0°C to + 70°C		
E suffix	− 40°C to + 85°C		
M Suffix	− 55°C to + 125°C		

Electrical Characteristics: (V_{CC} = full operating range, V_{BATT} = 2.8 V, T_A = 25°C, unless otherwise noted.)

Parameter	Conditions	Min	Typ	Max	Units
Battery Backup Switching					
Operating Voltage Range		4.75	—	5.5	V
C690, C691 V _{CC}		2.0	—	4.25	
C690, C691 V _{BATT}		4.5	—	5.5	
C692, C693 V _{CC}		2.0	—	4.0	
C692, C693 V _{BATT}					
V _{OUT} Output Voltage	I _{OUT} = 1 mA I _{OUT} = 50 mA	—	V _{CC} − 0.1 V _{CC} − 0.25	—	V
V _{OUT} in Battery Backup Mode	I _{OUT} = 100 μA, V _{CC} < V _{BATT} − 0.2 V	—	V _{BATT} − 0.1 V _{BATT} − 0.02	—	V
Supply Current (excludes I _{OUT})		—	1.5	—	mA
Supply Current in Battery Backup Mode	V _{CC} = 0 V, V _{BATT} = 2.8 V	—	0.6	1.0	μA
Battery Standby Charging Current	5.5 V > V _{CC} > V _{BATT} + 0.2 V	—	—	5.0	μA
Battery Switchover Threshold	Power Up Power Down	—	70 50	—	mV
V _{CC} − V _{BATT}		—	20	—	mV
Battery Switchover Hysteresis		—	—	0.4	V
BATT ON Output Voltage	I _{SINK} = 3.2 mA	—	—	—	V
BATT ON Output Short	BATT ON = V _{OUT}	—	7.0	—	mA
Circuit Current	BATT ON = 0 V	0.5	1.0	25	μA
Reset and Watchdog Timer					
Reset Voltage Threshold	C690, C691 C692, C693	4.5 4.25	4.65 4.4	4.75 4.5	V V

Note 1. The input voltage limits on PFI and WDI may be exceeded provided the input current is limited to less than 10 mA.