

## POWER MANAGEMENT

### 3.0V/3.3V Microprocessor Supervisors with Battery Backup Switch

The IMP690T/S/R, IMP802LT/S/R, IMP804T/S/R and IMP805T/S/R simplify power supply monitoring and control in 3V/3.3V microprocessor and battery powered systems. The circuits monitor and control the power supplied to memory, microcontrollers and microprocessors. Each circuit implements four functions: reset control, watchdog monitoring, battery-backup switching and power-failure monitoring. In addition to microprocessor reset under brownout, power-up and power-down conditions, these devices provide battery-backup switching to maintain control in power-loss situations.

The important features of these four functions are:

- 200msec reset time
- 1.6 second watchdog timer with disable function
- Three threshold options: 3.075V (T devices), 2.925V (S devices) and 2.625V (R devices)
- SPDT (single-pole, double-throw) 40Ω PMOS switch connects back-up power to RAM if V<sub>CC</sub> fails
- 1.25V threshold power-loss comparator for general purpose voltage monitoring

The auxiliary power-fail comparator with precision 1.25V reference acts as an undervoltage detector. All IMP802/804 devices have power-fail accuracy of ±2%. The IMP690/805 power fail threshold accuracy is ±4%.

The IMP690 reset is active LOW and the IMP80x reset is active HIGH. All parts are available in 8-pin DIP and SO packages. The IMP690T/S/R, IMP805T/S/R, IMP802T/S/R, and IMP804T/S/R (-1) devices have pinouts that match the Maxim MAX690T/S/R, MAX805T/S/R, MAX802T/S/R, and MAX804T/S/R supervisors. Backup battery switching and watchdog operation match IMP's 5V IMP690A/692A/805L/802L/M supervisors.

### Selection Guide

IMP Part	Reset Threshold	Reset Polarity		Reset Accuracy	PFI Accuracy	Watchdog Timer	Backup-Battery Switch
		Low	High				
IMP690T	3.075V	●		±75mV	±4% (±50mV)	●	●
IMP805T			●				
IMP802T	3.075V	●		±60mV	±2% (±25mV)	●	●
IMP804T			●				
IMP690S	2.925V	●		±75mV	±4% (±50mV)	●	●
IMP805S			●				
IMP802S	2.925V	●		±60mV	±2% (±25mV)	●	●
IMP804S			●				
IMP690R	2.625V	●		±75mV	±4% (±50mV)	●	●
IMP805R			●				
IMP802R	2.625V	●		±60mV	±2% (±25mV)	●	●
IMP804R			●				

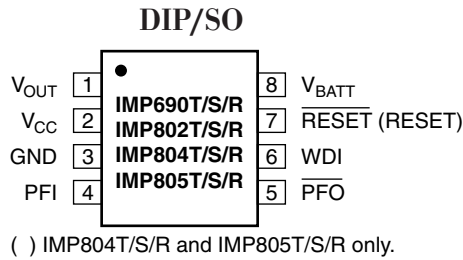
### Key Features

- ◆ Design Improvement over Maxim MAX690/802/804/805
- ◆ 60μA Maximum supply current (3.6V)
- ◆ Three precision supply-voltage monitor options
  - 3.075V (T devices)
  - 2.925V (S devices)
  - 2.625V (R devices)
- ◆ RESET and  $\overline{\text{RESET}}$  outputs
  - 200msec reset time
- ◆ Battery-backup power switch on-chip
  - Power CMOS RAM, CMOS μP or logic
- ◆ Watchdog timer: 1.6sec timeout
- ◆ Independent 1.25V Power Fail threshold detector
  - Power-fail warning, low battery detection
  - Monitor supplies other than 3.0V/3.3V
  - IMP690 and IMP805: ±4 % PFI accuracy
  - IMP802 and IMP804: ±2 % PFI accuracy
- ◆ Small 8-pin SO and DIP packages

### Applications

- ◆ Embedded control systems
- ◆ Battery-operated systems
- ◆ Intelligent instruments
- ◆ Wireless communication systems
- ◆ PDAs and handheld equipment
- ◆ μP/μC power supply monitoring
- ◆ CMOS memory backup

## Pin Configuration



## Ordering Information

Part Number	Reset Threshold (V)	Temperature Range	Pins-Package
IMP690RCPA-1	2.625	0°C to 70°C	8-pin, DIP
IMP690RCSA-1	2.625	0°C to 70°C	8-pin, SO
IMP690REPA-1	2.625	-40°C to 85°C	8-pin, DIP
IMP690RESA-1	2.625	-40°C to 85°C	8-pin, SO
IMP690SCPA-1	2.925	0°C to 70°C	8-pin, DIP
IMP690SCSA-1	2.925	0°C to 70°C	8-pin, SO
IMP690SEPA-1	2.925	-40°C to 85°C	8-pin, DIP
IMP690SESA-1	2.925	-40°C to 85°C	8-pin, SO
IMP690TCPA-1	3.075	0°C to 70°C	8-pin, DIP
IMP690TCSA-1	3.075	0°C to 70°C	8-pin, SO
IMP690TEPA-1	3.075	-40°C to 85°C	8-pin, DIP
IMP690TESA-1	3.075	-40°C to 85°C	8-pin, SO
IMP802RCPA-1	2.625	0°C to 70°C	8-pin, DIP
IMP802RCSA-1	2.625	0°C to 70°C	8-pin, SO
IMP802REPA-1	2.625	-40°C to 85°C	8-pin, DIP
IMP802RESA-1	2.625	-40°C to 85°C	8-pin, SO
IMP802SCPA-1	2.925	0°C to 70°C	8-pin, DIP
IMP802SCSA-1	2.925	0°C to 70°C	8-pin, SO
IMP802SEPA-1	2.925	-40°C to 85°C	8-pin, DIP
IMP802SESA-1	2.925	-40°C to 85°C	8-pin, SO
IMP802TCPA-1	3.075	0°C to 70°C	8-pin, DIP
IMP802TCSA-1	3.075	0°C to 70°C	8-pin, SO
IMP802TEPA-1	3.075	-40°C to 85°C	8-pin, DIP
IMP802TESA-1	3.075	-40°C to 85°C	8-pin, SO
IMP804RCPA-1	2.625	0°C to 70°C	8-pin, DIP
IMP804RCSA-1	2.625	0°C to 70°C	8-pin, SO
IMP804REPA-1	2.625	-40°C to 85°C	8-pin, DIP
IMP804RESA-1	2.625	-40°C to 85°C	8-pin, SO
IMP804SCPA-1	2.925	0°C to 70°C	8-pin, DIP
IMP804SCSA-1	2.925	0°C to 70°C	8-pin, SO
IMP804SEPA-1	2.925	-40°C to 85°C	8-pin, DIP
IMP804SESA-1	2.925	-40°C to 85°C	8-pin, SO
IMP804TCPA-1	3.075	0°C to 70°C	8-pin, DIP
IMP804TCSA-1	3.075	0°C to 70°C	8-pin, SO
IMP804TEPA-1	3.075	-40°C to 85°C	8-pin, DIP
IMP804TESA-1	3.075	-40°C to 85°C	8-pin, SO
IMP805RCPA-1	2.625	0°C to 70°C	8-pin, DIP
IMP805RCSA-1	2.625	0°C to 70°C	8-pin, SO
IMP805REPA-1	2.625	-40°C to 85°C	8-pin, DIP
IMP805RESA-1	2.625	-40°C to 85°C	8-pin, SO
IMP805SCPA-1	2.925	0°C to 70°C	8-pin, DIP
IMP805SCSA-1	2.925	0°C to 70°C	8-pin, SO
IMP805SEPA-1	2.925	-40°C to 85°C	8-pin, DIP
IMP805SESA-1	2.925	-40°C to 85°C	8-pin, SO
IMP805TCPA-1	3.075	0°C to 70°C	8-pin, DIP
IMP805TCSA-1	3.075	0°C to 70°C	8-pin, SO
IMP805TEPA-1	3.075	-40°C to 85°C	8-pin, DIP
IMP805TESA-1	3.075	-40°C to 85°C	8-pin, SO

## Pin Description

Pin Number		Name	Function
IMP690 IMP802	IMP804 IMP805		
1	1	V <sub>OUT</sub>	Voltage supply for RAM or other circuitry. When V <sub>CC</sub> is above the reset threshold, V <sub>OUT</sub> connects to V <sub>CC</sub> through a P-channel MOS device. If V <sub>CC</sub> falls below the reset threshold, V <sub>OUT</sub> is connected to the higher of V <sub>BATT</sub> or V <sub>CC</sub> . Connect to V <sub>CC</sub> if no battery is used.
2	2	V <sub>CC</sub>	Main power supply input.
3	3	GND	Ground.
4	4	PFI	Power failure monitor input. PFI is connected to the internal power fail comparator that is referenced to 1.25V. When PFI is less than the power-fail-input threshold, V <sub>PFT</sub> , PFO goes LOW; otherwise, PFO remains HIGH. If this feature is unused, the PFI pin should be connected to GND or V <sub>OUT</sub> .
5	5	PFO	Power-fail output. PFO is active LOW whenever the PFI pin is less than 1.25V. Leave open if unused.
6	6	WDI	Watchdog input. If WDI remains HIGH or LOW for 1.6 seconds, the internal watchdog timer triggers a reset. The watchdog timer clears when reset is asserted or WDI sees a rising or falling edge. If WDI is held HIGH or LOW for longer than the watchdog timeout period, typically 1.6 seconds, reset becomes active for the reset pulse width time, t <sub>RS</sub> , of 140ms minimum. If WDI is left floating or connected to a high impedance three-state buffer the watchdog function is disabled.
7	—	RESET	Active-LOW RESET output. Pulses LOW for 200ms when the watchdog timer runs out. It remains LOW whenever V <sub>CC</sub> is below the reset threshold. It remains LOW for 200msec after either V <sub>CC</sub> rises above the reset threshold or the watchdog triggers a reset.
—	7	RESET	Active-HIGH RESET output. The inverse of RESET.
8	8	V <sub>BATT</sub>	Auxiliary power or backup-battery input. This input has hysteresis to prevent rapid toggling between V <sub>CC</sub> and V <sub>BATT</sub> . When V <sub>CC</sub> rises above the reset threshold, V <sub>OUT</sub> reconnects to V <sub>CC</sub> . V <sub>BATT</sub> should be connected to V <sub>CC</sub> if the function is not used. V <sub>BATT</sub> may not exceed V <sub>CC</sub> by more than 0.6V.

## Absolute Maximum Ratings

### Pin Terminal Voltage with Respect to Ground

V<sub>CC</sub> ..... -0.3V to 6.0V  
V<sub>BATT</sub> ..... -0.3V to 6.0V  
All Other Inputs\* ..... -0.3V to (V<sub>CC</sub> + 0.3V)

Input Current at V<sub>CC</sub> ..... 200mA

Input Current at V<sub>BATT</sub> ..... 50mA

Input Current at GND ..... 20mA

### Output Current:

V<sub>OUT</sub> ..... Short circuit protected for up to 10 sec

All Other Inputs ..... 20mA

Rate of Rise: V<sub>BATT</sub> and V<sub>CC</sub> ..... 100V/μs

### Continuous Power Dissipation

Plastic DIP (derate 9mW/°C above 70°C) ... 800mW

SO (derate 5.9mW/°C above 70°C) ..... 500mW

Storage Temperature Range ..... -65°C to 160°C

Lead Temperature Soldering, (10 sec) ..... 300°C

\* The input voltage limits on PFI and WDI may be exceeded if the current is limited to less than 10mA

These are stress ratings only and functional operation is not implied. Exposure to absolute maximum ratings for prolonged time periods may affect device reliability.

## Electrical Characteristics

Unless otherwise noted,  $V_{CC} = 3.17V$  to  $5.5V$  for the IMP690T/802T/804T/805T,  $V_{CC} = 3.02V$  to  $5.5V$  for the IMP690S/802S/804S/805S,  $V_{CC} = 2.72V$  to  $5.5V$  for the IMP690R/802R/804R/805R,  $V_{BATT} = 3.6V$ ; and  $T_A = T_{MIN}$  to  $T_{MAX}$ . Typical values at  $T_A = 25^\circ C$ .

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Operating Temperature Range		IMP690_C __ IMP802_C __, IMP804_C __, IMP805_C __	0		+70	$^\circ C$
		IMP690_E __ IMP802_E __, IMP804_E __, IMP805_E __	-40		+85	
Operating Voltage Range, $V_{CC}$ , $V_{BATT}$		Note 1	1.1		5.5	V
$V_{OUT}$		$I_{OUT} = 5mA$	$V_{CC} - 0.025$	$V_{CC} - 0.015$		V
		$I_{OUT} = 50mA$	$V_{CC} - 0.25$	$V_{CC} - 0.15$		
		$I_{OUT} = 250\mu A$ , $V_{CC} > 2.5V$ , $V_{BATT} < V_{CC} - 0.2V$		$V_{CC} - 0.002$		
$V_{OUT}$ in Battery- Backup Mode		$I_{OUT} = 250\mu A$ , $V_{BATT} > 2.3V$ , $V_{CC} < V_{BATT} - 0.2V$	$V_{BATT} - 0.1$	$V_{BATT} - 0.01$		V
		$I_{OUT} = 1mA$ , $V_{BATT} > 2.3V$ , $V_{CC} < V_{BATT} - 0.2V$		$V_{BATT} - 0.02$		
Supply Current Excluding $I_{OUT}$	$I_S$	$V_{CC} < 3.6V$		25	60	$\mu A$
		$V_{CC} < 5.5V$		35	80	
Supply Current in Battery Backup Mode	$I_S$	Note 2			10	$\mu A$
Battery Leakage Current		$5.5V > V_{CC} > V_{BATT} + 0.2V$ . Note 3 & 4, $T_A = 25^\circ C$	-20		20	nA
Reset Threshold Note 5	$V_{RST}$	IMP690T, IMP805T, $V_{CC}$ falling	3.00	3.075	3.15	V
		IMP690T, IMP805T, $V_{CC}$ rising	3.00	3.085	3.17	
		IMP690S, IMP805S, $V_{CC}$ falling	2.85	2.925	3.00	
		IMP690S, IMP805S, $V_{CC}$ rising	2.85	2.935	3.02	
		IMP690R, IMP805R, $V_{CC}$ falling	2.55	2.625	2.70	
		IMP690R, IMP805R, $V_{CC}$ rising	2.55	2.635	2.72	
		IMP802T, IMP804T, $V_{CC}$ falling	3.00	3.075	3.12	
		IMP802T, IMP804T, $V_{CC}$ rising	3.00	3.085	3.14	
		IMP802S, IMP804S, $V_{CC}$ falling	2.88	2.925	3.00	
		IMP802S, IMP804S, $V_{CC}$ rising	2.88	2.935	3.02	
		IMP802R, IMP804R, $V_{CC}$ falling	2.59	2.625	2.70	
		IMP802R, IMP804R, $V_{CC}$ rising	2.59	2.635	2.72	
Reset Pulse Width	$t_{RS}$		140	200	280	ms
RESET Output Voltage	$V_{OH}$	$I_{SOURCE} = 800\mu A$ , $4.5V < V_{CC} < 5.5V$	$V_{CC} - 1.5V$			V
	$V_{OL}$	$I_{SINK} = 3.2mA$ , $4.5V < V_{CC} < 5.5V$			0.4	
	$V_{OH}$	$I_{SOURCE} = 500\mu A$ , $V_{RST (MAX)} < V_{CC} < 3.6V$	$0.8V_{CC}$			
	$V_{OL}$	$I_{SINK} = 1.2mA$ , $V_{RST (MAX)} < V_{CC} < 3.6V$			0.3	
	$V_{OL}$	$I_{SINK} = 50\mu A$ , $V_{CC} = 1.1V$			0.3	
	$V_{OL}$	$I_{SINK} = 100\mu A$ , $V_{CC} = 1.2V$			0.3	

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## Electrical Characteristics

Unless otherwise noted,  $V_{CC} = 3.17V$  to  $5.5V$  for the IMP690T/802T/804T/805T,  $V_{CC} = 3.02V$  to  $5.5V$  for the IMP690S/802S/804S/805S,  $V_{CC} = 2.72V$  to  $5.5V$  for the IMP690R/802R/804R/805R,  $V_{BATT} = 3.6V$ ; and  $T_A = T_{MIN}$  to  $T_{MAX}$ . Typical values at  $T_A = 25^\circ C$ .

Parameter	Symbol	Conditions	Min	Typ	Max	Units
RESET Output Voltage	$V_{OH}$	$I_{SOURCE} = 800\mu A$ , $4.5V < V_{CC} < 5.5V$	$V_{CC} - 1.5V$			V
	$V_{OL}$	$I_{SINK} = 3.2mA$ , $4.5V < V_{CC} < 5.5V$			0.4	
	$V_{OH}$	$I_{SOURCE} = 500\mu A$ , $V_{RST (MAX)} < V_{CC} < 3.6V$	$0.8V_{CC}$			
	$V_{OL}$	$I_{SINK} = 1.2mA$ , $V_{RST (MAX)} < V_{CC} < 3.6V$			0.3	
Watchdog Timeout	$t_{WD}$	$V_{CC} < 3.6V$	1.12	1.60	2.24	s
WDI Pulse Width	$t_{WP}$		100	20		ns
WDI Input Current		$WDI = V_{CC}$			150	$\mu A$
		$WDI = 0V$	-150			
WDI Input Threshold	$V_{IH}$	Logic HIGH	$0.7V_{CC}$			V
	$V_{IL}$	Logic LOW			$0.3V_{CC}$	
PFI Input Threshold	$V_{PFT}$	$V_{CC} = 3.6V$ , IMP690, IMP805	1.187	1.25	1.287	V
		$V_{CC} = 3.6V$ , IMP802, IMP804	1.212	1.25	1.262	
PFI Input Current			-25	0.01	25	nA
PFO Output Current	$V_{OH}$	$I_{SOURCE} = 800\mu A$ , $4.5V < V_{CC} < 5.5V$	$V_{CC} - 1.5V$			V
	$V_{OL}$	$I_{SINK} = 3.2mA$ , $4.5V < V_{CC} < 5.5V$			0.4	
	$V_{OH}$	$I_{SOURCE} = 500\mu A$ , $V_{RST (MAX)} < V_{CC} < 4.5V$	$0.8V_{CC}$			
	$V_{OL}$	$I_{SINK} = 1.2mA$ , $V_{RST (MAX)} < V_{CC} < 4.5V$			0.3	

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Notes: 1. The following are tested at  $V_{BATT} = 3.6V$  and  $V_{CC} = 5.5V$ :  $V_{CC}$  supply current, watchdog functionality, logic input leakage, PFI functionality, and the RESET and RESET states. The state of RESET or RESET and PFO is tested at  $V_{CC} = V_{CC (MIN)}$ .

2. Tested at  $V_{BATT} = 2.8V$ ,  $V_{CC} = 2.3V$  and  $0V$

3. Leakage current into the battery is tested under the following worst-case conditions:  $V_{CC} = 5.5V$ ,  $V_{BATT} = 1.8V$ , and at  $V_{CC} = 1.5V$ ,  $V_{BATT} = 1.0V$ .

4. "-" equals the battery-charging current and "+" equals the battery-discharging current.

5. The reset threshold tolerance is wider for  $V_{CC}$  rising than for  $V_{CC}$  falling to accommodate the 30mV typical hysteresis, which prevents internal oscillation.

## Application Information

The IMP690T/S/R, IMP802T/S/R, IMP804T/S/R and IMP805T/S/R monitor system power supplies, generate power failure signals and issue reset signals to the system controller. Four key functions are provided:

1. A battery backup switch for CMOS processors, logic or memory.
2. A reset signal if the watchdog timer is not reset by the system processor.
3. A Reset signal during power-up, power-down and brownout conditions.
4. An independent 1.25V threshold comparator for power-fail warning, low battery detection, or for monitoring voltages other than 3.0/3.3V.

### Reset Output

It is important to initialize a microprocessor to a known state. The IMP690T/S/R, IMP802T/S/R, IMP804T/S/R and IMP805T/S/R devices assert a reset during power-up, power-down and brownout conditions. The reset output of these supervisory circuits send a reset pulse to the microprocessor in response to power-up, power-down/power-loss or a watchdog time-out. The reset pulse width,  $t_{RS}$ , is typically around 200msec. The reset signal is active LOW for the IMP690/IMP802 and active HIGH for the IMP804/IMP805. The watchdog timer can also generate a reset signal.

$\overline{RESET}$  guaranteed to be a logic LOW for  $0V < V_{CC} < V_{RST}$  if  $V_{BATT}$  is greater than 1.1V.  $\overline{RESET}$  is valid for  $V_{CC} > 1.1V$  if no backup battery is used.

Once  $V_{CC}$  is above the reset threshold,  $\overline{RESET}$  remains LOW for the reset timeout period, typically 200msec, and then returns HIGH. Timing is shown in Figure 2.

Power-up reset occurs when a rising  $V_{CC}$  reaches the reset threshold, forcing a reset condition in which the reset output is asserted for the duration of  $t_{RS}$ .

Power-loss or "brown-out" reset occurs when  $V_{CC}$  dips below the reset threshold resulting in a reset assertion for the duration of  $t_{RS}$ . The reset signal remains asserted as long as  $V_{CC}$  is between  $V_{RT}$  and 1.1V, the lowest  $V_{CC}$  for which these devices can provide a guaranteed logic-low output.

A watchdog timeout reset occurs when a logic "1" or logic "0" is continuously applied to the WDI pin for a period that exceeds the watchdog timeout period (typically 1.6 seconds). After the duration of the reset interval, the watchdog timer starts a new 1.6-second timing interval.

The system microprocessor must reset the internal watchdog timer by changing states at the WDI input. If the WDI pin is held either HIGH or LOW, a reset pulse will be triggered every 1.8 seconds (the 1.6-second timing interval plus the 200msec reset pulse width,  $t_{RS}$ ).

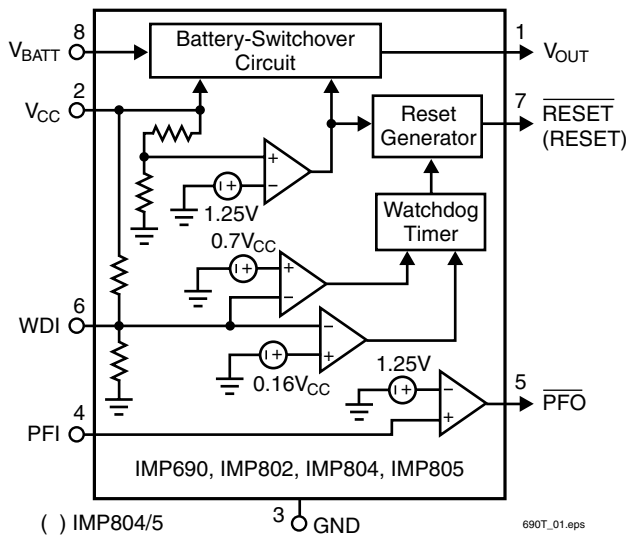


Figure 1. Block Diagram

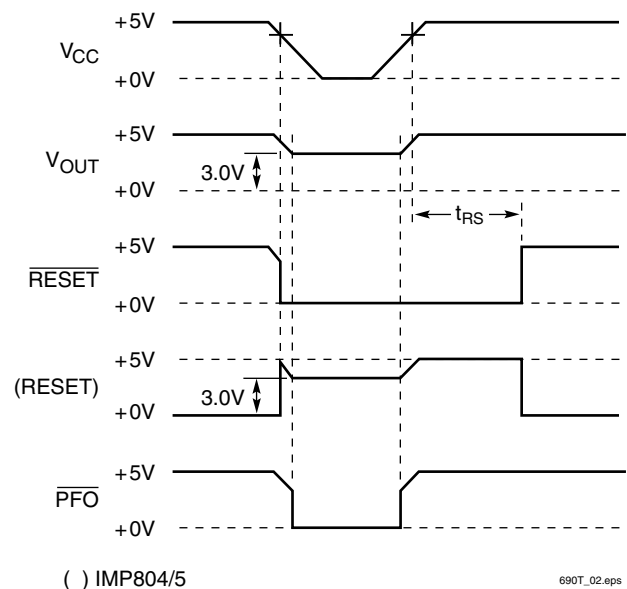


Figure 2. Timing Diagram

## Application Information

### Watchdog Input

The watchdog circuit monitors microprocessor activity. It can be used to insure that the microprocessor is in a continually responsive state by requiring that the WDI pin be toggled every 1.6 seconds typically. If the WDI pin is not toggled within the 1.6 second, a reset pulse will be asserted.

If WDI is tied HIGH or LOW, a reset pulse is triggered every 1.8 seconds ( $t_{WD} + t_{RS}$ ).

The IMP690/802/804/805 watchdog function can be disabled by open circuiting the WDI pin and allowing it to float.

### Backup-Battery Switchover

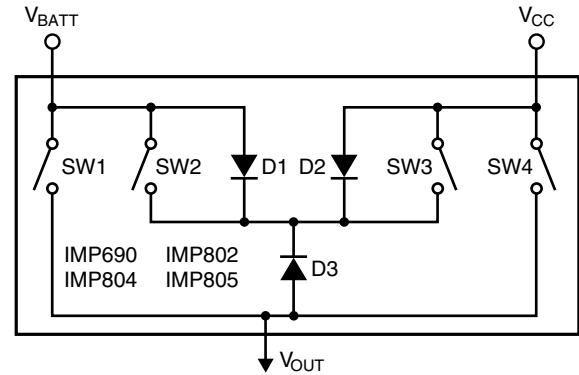
A power loss can be made less severe if the system RAM contents are preserved or other critical low power logic is powered. This is achieved in the IMP690/802/804/805 by switching from the failed  $V_{CC}$  to an alternate power source connected at  $V_{BATT}$  when  $V_{CC}$  is less than the reset threshold voltage ( $V_{CC} < V_{RST}$ ), and  $V_{CC}$  is less than  $V_{BATT}$ .

Switchover Reference	Conditions for $V_{OUT} = V_{BATT}$
RESET Threshold	$V_{BATT} > V_{CC}$ AND $V_{CC} < V_{RST}$

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For IMP devices, whenever  $V_{CC} > V_{RST}$ ,  $V_{OUT}$  is switched back to  $V_{CC}$ . There is hysteresis in the switchover circuit.

The  $V_{OUT}$  pin is normally connected to  $V_{CC}$  through a  $3\Omega$  PMOS switch but a brownout or loss of  $V_{CC}$  will cause a switchover to  $V_{BATT}$  by means of a  $40\Omega$  PMOS switch. Although both conditions ( $V_{CC} < V_{RST}$  and  $V_{CC} < V_{BATT}$ ) must occur for the switchover to  $V_{BATT}$  to occur,  $V_{OUT}$  will be switched back to  $V_{CC}$  when  $V_{CC}$  exceeds  $V_{RST}$  irrespective of the voltage at  $V_{BATT}$ . It should be noted that an internal device diode (D1 in Figure 3) would be forward biased if  $V_{BATT}$  exceeds  $V_{CC}$  by more than a diode drop when  $V_{CC}$  is switched to  $V_{OUT}$ . Because of this, it is recommended that  $V_{BATT}$  be no greater than  $V_{RST} + 0.6V$  (see Table 2).



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Figure 3. Internal device configuration of battery switch-over function

### Backup Power Sources

Battery voltage selection is important to insure that the battery does not discharge through the parasitic device diode D1 (see Figure 3) when  $V_{CC}$  is less than  $V_{BATT}$  and  $V_{CC} > V_{RST}$ .

Table 2: Maximum Battery Voltages

Part No.	Maximum Battery Voltage
IMP690/802/804/805T	$V_{RST} (MAX) + 0.6V$ (3.75V)
IMP690/802/804/805S	$V_{RST} (MAX) + 0.6V$ (3.525V)
IMP690/802/804/805R	$V_{RST} (MAX) + 0.6V$ (3.225V)

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### Power-Fail Comparator

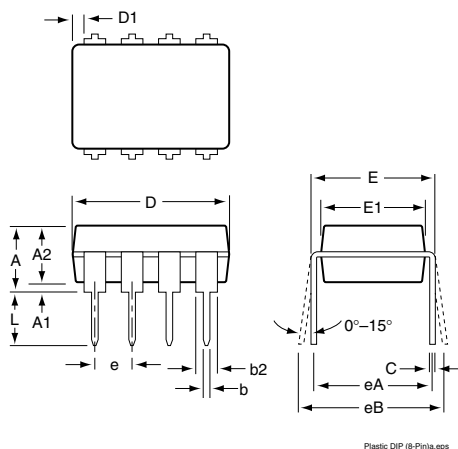
The Power Fail feature is an independent voltage monitoring function that can be used for any number of monitoring activities. For example, the PFI function can provide an early sensing of power supply failure by sensing the unregulated DC voltage ahead of the regulated supply sensing seen by the backup-battery switchover circuitry.

The PFI pin is compared to a 1.25V internal reference. If the voltage at the PFI pin is less the power fail threshold,  $V_{PFT}$ , the PFO goes LOW. The PFI input voltage is often set by a voltage divider from the monitored supply.

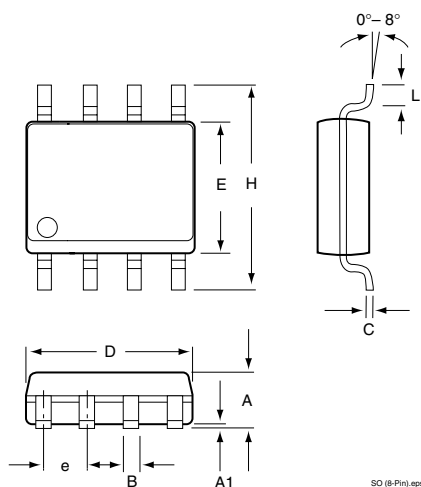
The PFI comparator operates without hysteresis.

## Package Dimensions

### Plastic DIP (8-Pin)



### SO (8-Pin)



	Inches		Millimeters	
	Min	Max	Min	Max
<b>Plastic DIP (8-Pin)*</b>				
A	—	0.210	—	5.33
A1	0.015	—	0.38	—
A2	0.115	0.195	2.92	4.95
b	0.014	0.022	0.36	0.56
b2	0.045	0.070	1.14	1.78
b3	0.030	0.045	0.80	1.14
D	0.355	0.400	9.02	10.16
D1	0.005	—	0.13	—
E	0.300	0.325	7.62	8.26
E1	0.240	0.280	6.10	7.11
e	0.100	—	2.54	
eA	0.300	—	7.62	
eB	—	0.430	—	10.92
eC	—	0.060	—	—
L	0.115	0.150	2.92	3.81
<b>SO (8-Pin)**</b>				
A	0.053	0.069	1.35	1.75
A1	0.004	0.010	0.10	0.25
B	0.013	0.020	0.33	0.51
C	0.007	0.010	0.19	0.25
e	0.050		1.27	
E	0.150	0.157	3.80	4.00
H	0.228	0.244	5.80	6.20
L	0.016	0.050	0.40	1.27
D	0.189	0.197	4.80	5.00

\* JEDEC Drawing MS-001BA

\*\* JEDEC Drawing MS-012AA

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