

Microprocessor Voltage Monitors with Manual Reset

Description

The FP6811 and FP6812 are cost-effective system supervisory circuits designed to monitor the power supply status in microprocessor (μ P) and digital systems. In addition, they provide a de-bounced manual reset input pin to initiate a reset.

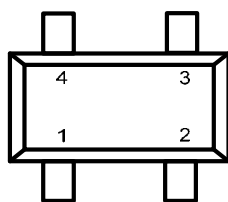
These circuits assert a reset signal whenever the V_{CC} supply voltage declines below a preset threshold, keeping it asserted for at least 140ms after V_{CC} has risen above the reset threshold.

The FP6811-N has an open-drain output stage, while FP6811-C and FP6812-C have push-pull outputs. The FP6811-N's open-drain output requires a pull-up resistor. The FP6811 has an active-low $\overline{\text{RESET}}$ output while the FP6812 has an active-high RESET output.

The FP6811 and FP6812 are optimized to reject fast transient glitches on the V_{CC} line. A low supply current makes these devices suitable for portable equipment. Each device is available in a 4-pin SC-70-4 package format.

Pin Assignments

C4 Package (SC-70-4)



TOP VIEW
 1. GND
 2. $\overline{\text{RESET}}$ / RESET
 3. $\overline{\text{MR}}$
 4. V_{CC}

Figure 1. Pin Assignments of FP6811 / FP6812

Features

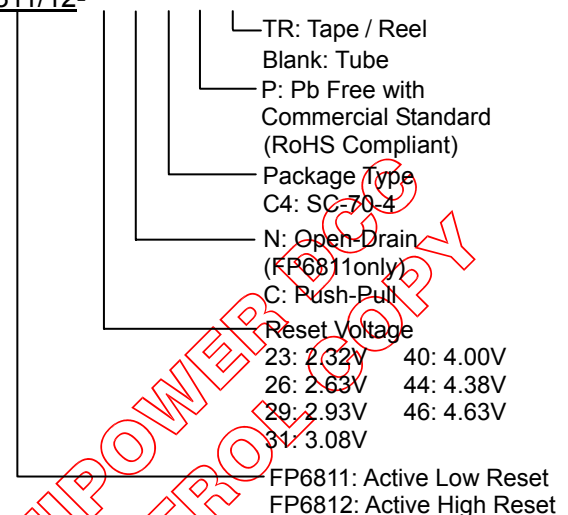
- Precision Monitoring of 2.5V, 3.0V, 3.3V, and 5.0V Power-Supply Voltages
- 140ms Guaranteed Minimum Reset Output Duration
- Low Supply Current
- V_{CC} Transient Immunity
- Small SC-70-4 Package
- No External Components
- Guaranteed Reset Valid to $V_{CC}=1V$
- Available in Three Output Configurations
 - Open-Drain $\overline{\text{RESET}}$ Output (FP6811-N)
 - Push-Pull $\overline{\text{RESET}}$ Output (FP6811-C)
 - Push-Pull RESET Output (FP6812-C)
- RoHS Compliant

Applications

- Computers
- Battery Powered Equipments
- Microprocessor Power Supply Monitoring
- Embedded Systems
- Automotive

Ordering Information

FP6811/12-



Note: Please consult Fitipower sales office or authorized distributors for availability of special reset voltages.

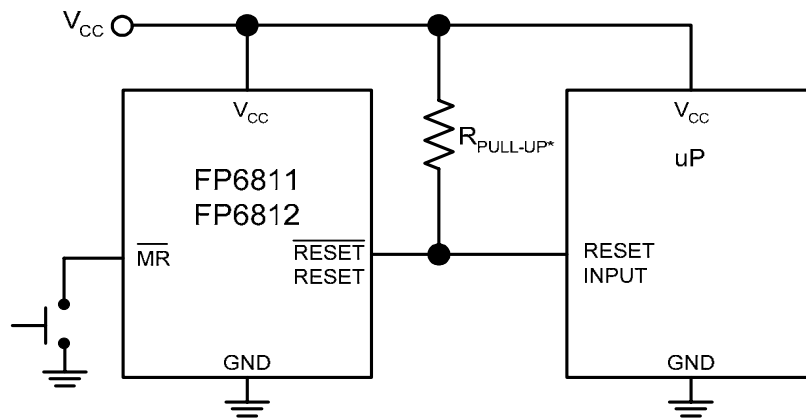
SC-70-4 Marking (FP6811)

Part Number	Product Code	Part Number	Product Code
FP6811-23NC4P	Ka	FP6811-23CC4P	Km
FP6811-26NC4P	Kb	FP6811-26CC4P	Kn
FP6811-29NC4P	Kd	FP6811-29CC4P	Kr
FP6811-31NC4P	Ke	FP6811-31CC4P	Ks
FP6811-40NC4P	Kf	FP6811-40CC4P	Kt
FP6811-44NC4P	Kh	FP6811-44CC4P	Ku
FP6811-46NC4P	Ki	FP6811-46CC4P	Kv

SC-70-4 Marking (FP6812)

Part Number	Product Code	Part Number	Product Code
FP6812-23CC4P	CL	FP6812-40CC4P	CR
FP6812-26CC4P	CM	FP6812-44CC4P	CS
FP6812-29CC4P	CN	FP6812-46CC4P	CT
FP6812-31CC4P	CP		

Typical Application Circuit



*FP6811-N ONLY

Figure 2. Typical Application Circuit of FP6811/FP6812

Functional Pin Description

Pin Name	Pin Function
GND	Ground
$\overline{\text{RESET}}$ (FP6811)	$\overline{\text{RESET}}$ Output remains low while V_{CC} is below the reset threshold or while $\overline{\text{MR}}$ is held low, and for at least 140ms after V_{CC} rises above the reset threshold.
RESET (FP6812)	RESET Output remains high while V_{CC} is below the reset threshold or while $\overline{\text{MR}}$ is held low, and for at least 140ms after V_{CC} rises above the reset threshold.
$\overline{\text{MR}}$	Manual Reset Input. Driving low to force a reset. Reset remains active as long as $\overline{\text{MR}}$ is low and for the reset timeout period after $\overline{\text{MR}}$ is released. $\overline{\text{MR}}$ has an internal 63 k pull up resistor to VCC.
V_{CC}	Supply Voltage

Block Diagram

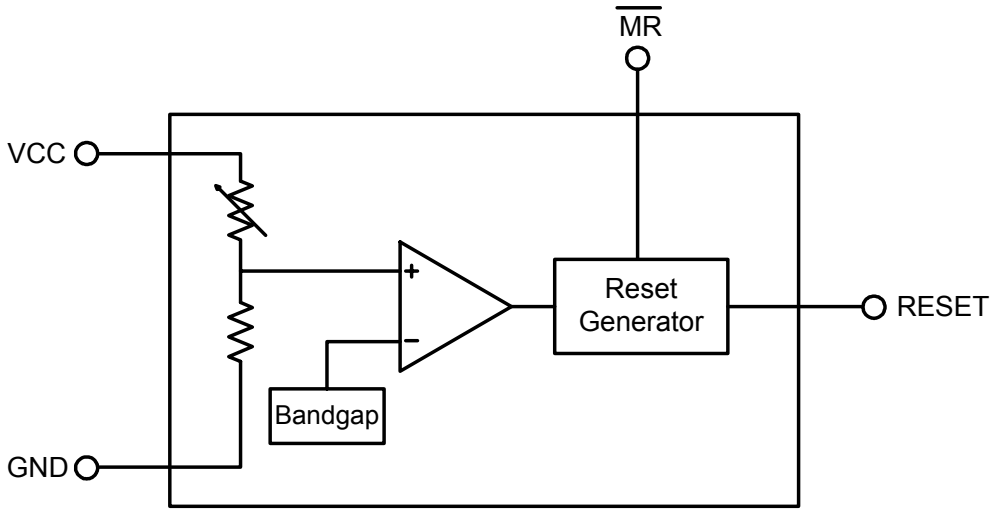


Figure 3. Block Diagram of FP6811/FP6812

Absolute Maximum Ratings

- Supply Voltage (V_{CC} to GND) ----- -0.3V to +6V
- RESET, \overline{RESET} Voltage (Push-Pull) ----- -0.3 to ($V_{CC}+0.3V$)
- \overline{RESET} Voltage (Open Drain) ----- -0.3V to ($V_{CC}+0.3V$)
- Input Current (V_{CC}) ----- 20mA
- Output Current, RESET, \overline{RESET} ----- 20mA
- Rate of Rise (V_{CC}) ----- 100V/us
- Power Dissipation @ $T_A=70^\circ C$, SC-70-4 (P_D) ----- 110mW
- Package Thermal Resistance, SC-70-4 (θ_{JA}) ----- 500°C/W
- Junction Temperature (T_J) ----- 150°C
- Storage Temperature (T_S) ----- -65°C to +150°C
- Lead Temperature (Soldering, 10sec) ----- 260°C

Note : Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device.

Recommended Operating Conditions

- Supply Voltage (V_{CC} to GND) ----- +1.0V to +5.5V
- Operation Temperature Range ----- -40°C to +85°C



Electrical Characteristics

(V_{CC}=full range, T_A=25°C, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
V _{CC} Range	V _{CC}		1.0		5.5	V
Supply Current	I _{CC}	V _{CC} <5.5V, FP68__-46/44/40		3		μA
		V _{CC} <3.6V, FP68__-23/26/29/31		3		
Reset Threshold	V _{TH}	FP6811-46/ FP6812-46	4.54	4.63	4.72	V
		FP6811-44/ FP6812-44	4.29	4.38	4.47	
		FP6811-40/ FP6812-40	3.92	4.00	4.08	
		FP6811-31/ FP6812-31	3.02	3.08	3.14	
		FP6811-29/ FP6812-29	2.87	2.93	2.99	
		FP6811-26/ FP6812-26	2.58	2.63	2.68	
Reset Threshold Tempco				30		ppm/°C
$\overline{\text{MR}}$ Input Threshold	V _{IH}	V _{CC} > V _{TH(MAX)} , V _{CC} = 3V	2.3			V
	V _{IL}				0.8	
	V _{IH}	V _{CC} > V _{TH(MAX)} , V _{CC} < 3V	0.7V _{CC}			
	V _{IL}				0.25V _{CC}	
$\overline{\text{MR}}$ Glitch Immunity				100		ns
V _{CC} to Reset Delay		V _{CC} =V _{TH} to (V _{th} -100mV)		20		us
Reset Active Timeout Period			140	240	560	ms
$\overline{\text{RESET}}$ Output Voltage Low (Push-Pull active low and Open-Drain active low, FP6811)	V _{OL}	V _{CC} =V _{TH} min, I _{SINK} =1.2mA, FP6811-23/26/29/31			0.3	V
		V _{CC} =V _{TH} min, I _{SINK} =3.2mA, FP6811-44/46			0.4	
		V _{CC} >1.0V, I _{SINK} =50uA			0.3	
RESET Output Voltage Low (push-pull active high, FP6812)	V _{OL}	V _{CC} =V _{TH} max, I _{SINK} =1.2mA, FP6811-23/26/29/31			0.3	V
		V _{CC} =V _{TH} max, I _{SINK} =3.2mA, FP6811-44/46			0.4	V
$\overline{\text{RESET}}$ Output Voltage High (push-pull active low, FP6811)	V _{OH}	V _{CC} >V _{TH} max, I _{SOURCE} =500uA, FP6811-23/26/29/31	0.8V _{CC}			V
		V _{CC} >V _{TH} max, I _{SOURCE} =800uA, FP6811-44/46	V _{CC} -1.5			V
RESET Output Voltage High (push-pull active high, FP6812)	V _{OH}	1.8V<V _{CC} <V _{TH} min, I _{SOURCE} =150uA	0.8V _{CC}			V
$\overline{\text{RESET}}$ Open-Drain Output Leakage Current (FP6811-N)		V _{CC} >V _{TH} , RESET de-asserted			1	μA

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Typical Performance Curves

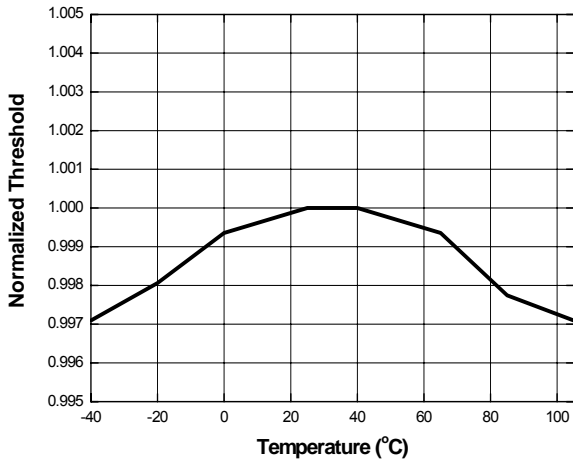


Figure 4. Normalized Reset Threshold vs. Temperature

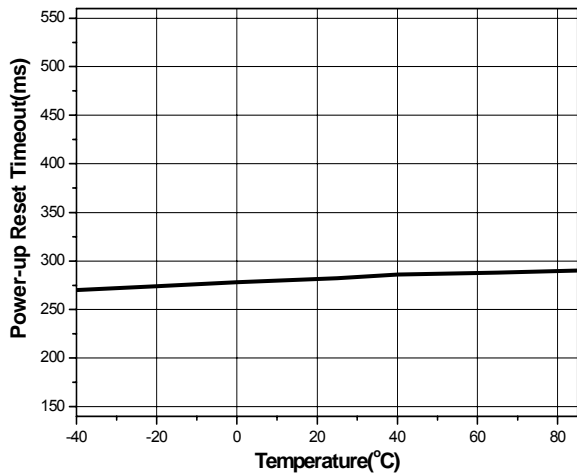


Figure 5. Power-up Timeout vs. Temperature

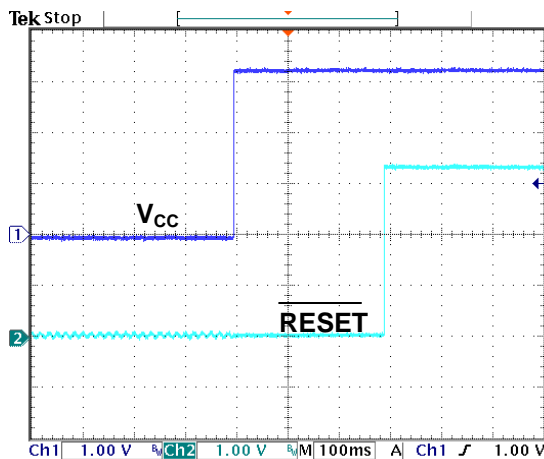


Figure 6. Power-Up $\overline{\text{RESET}}$ Timeout Waveforms;

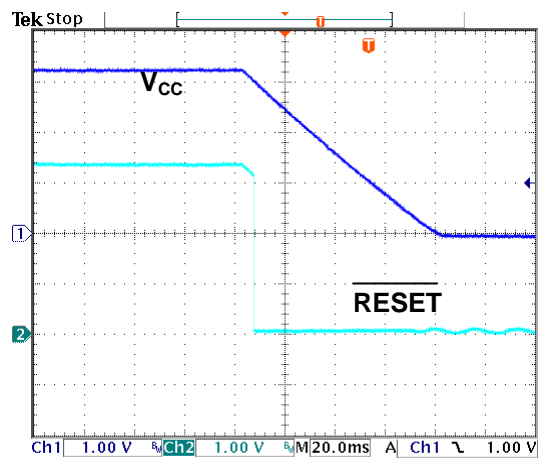


Figure 7. Power-Down $\overline{\text{RESET}}$ Delay Waveforms;

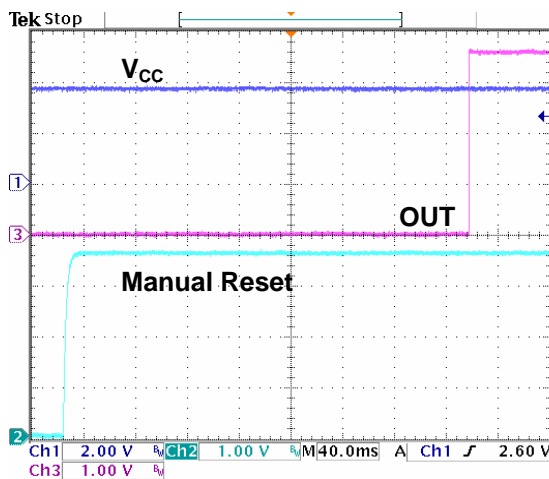


Figure 8. Manual Reset Voltage On Waveform for $-V_{TH}=3.1V$

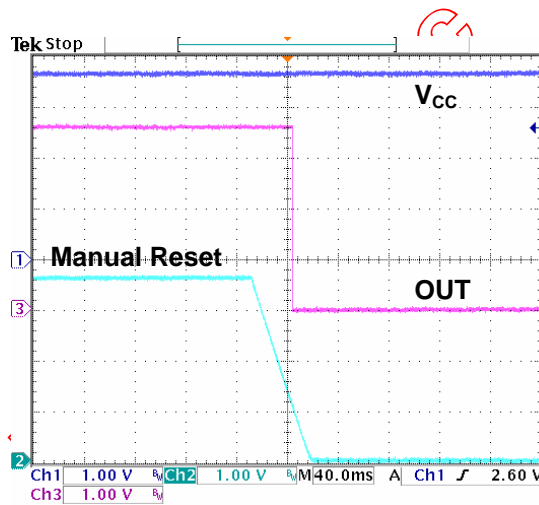


Figure 9. Manual Reset Voltage Off Waveform for $-V_{TH}=3.1V$

Typical Performance Curves (Continued)

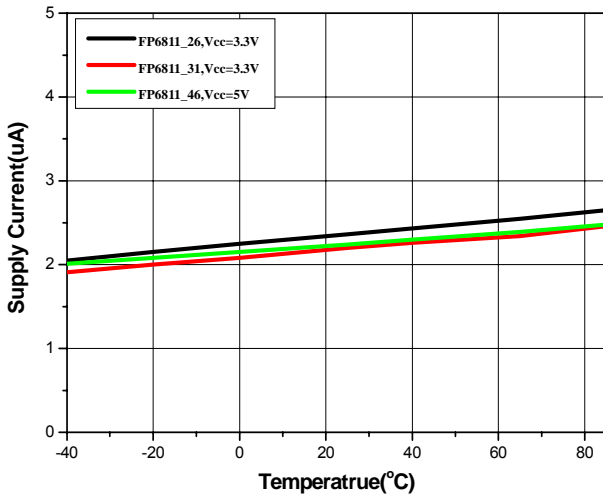


Figure 10. Supply Current vs. Temperature

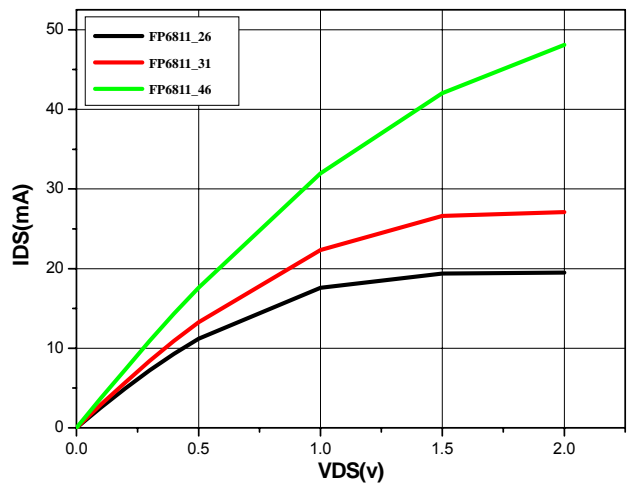


Figure 11. Output Sinking Capability

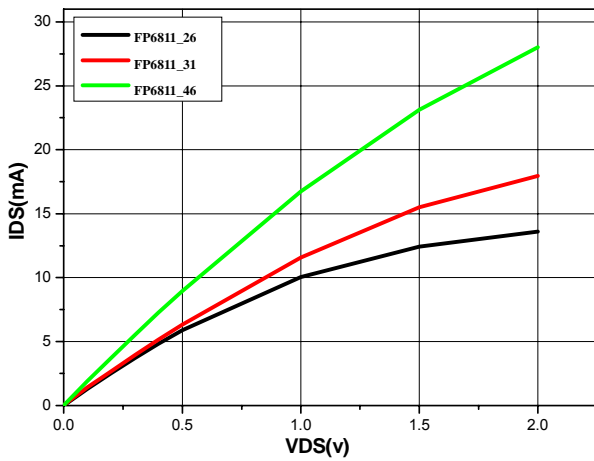
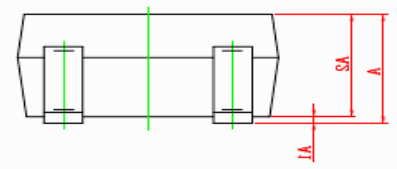
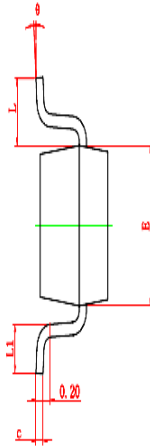
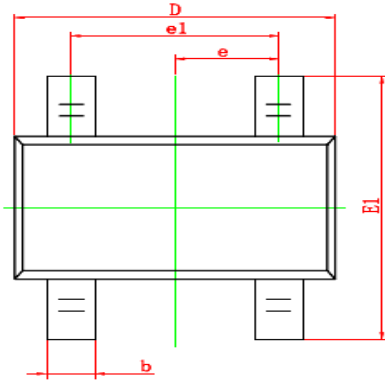


Figure 12. Output Sourcing Capability

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Outline Information

SC-70-4 Package (Unit: mm)



SYMBOLS UNIT	DIMENSION IN MILLIMETER		
	MIN	NOM	MAX
A	0.90	---	1.10
A1	0.00	---	0.10
A2	0.90	---	1.00
b	0.15	---	0.35
c	0.08	---	0.15
D	2.00	---	2.20
E	1.15	1.25	1.15
E1	2.15	---	2.45
e	---	0.65TYP	---
e1	1.20	---	1.40
L	---	0.525REF	---
L1	0.26	---	0.46
θ	- 15°		

Note 1 : Package Body Sizes Exclude Mold Flash and Gate Burrs.

Note 2 : Tolerance ± 0.10 mm(4 mil) Unless Otherwise Specified.

Note 3 : Controlling Dimension Is Millimeter. Converted Inch Dimension Are Not Necessarily Exact.

Note 4 : Followed from EIAJ ED-7500-2.

Note 5 : Dimension L Is measured Form 0.1 mm above Seated Plane.

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Life Support Policy

Fitipower's products are not authorized for use as critical components in life support devices or other medical systems.