ILC811/812

Preliminary

Microprocessor Reset Circuits

POWER ON THE GO — POWERED BY IMPALA

General Description

The ILC811/ILC812 is a low cost microprocessor supervisory circuit that asserts a reset if the power supply drops below a designated threshold or the manual reset pin is forced low. Several different reset thresholds are available to accommodate systems operating at 3V, 3.3V or 5V.

The ILC811 has an active low $\overline{\text{RESET}}$ output, while the ILC812 offers an active high RESET output. The reset output is guaranteed to remain asserted for a minimum of 140ms after V_{CC} has risen above the designated reset threshold. The ILC811/ILC812 is available in a 4-pin SOT-143

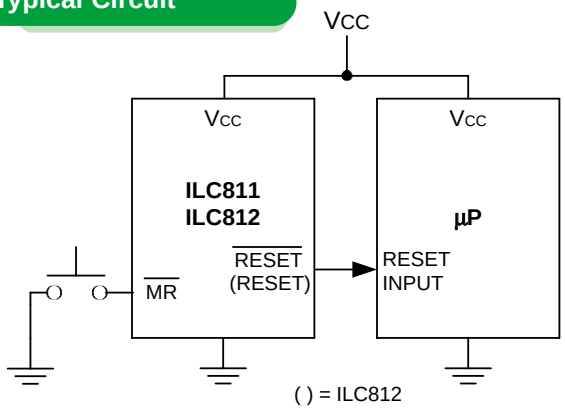
Features

- Precision Voltage Monitor for 3V, 3.3V or 5V Power Supplies
- 6mA Supply Current
- 140ms Minimum Reset Pulse Width
- $\overline{\text{RESET}}$ Remains Valid with V_{CC} as Low as 1.4V
- Active Low Manual Reset Input
- No External Components
- 4-Pin SOT-143 Package

Applications

- Critical Microprocessor Power Monitoring
- Portable Equipment
- Intelligent Instruments
- Computers & Printers
- Controllers

Typical Circuit



Ordering Information

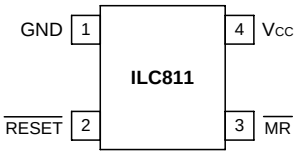
Part	Package	Temp. Range
ILC811_U	4-Lead SOT-143	-40°C to +85°C
ILC812_U	4-Lead SOT-143	-40°C to +85°C

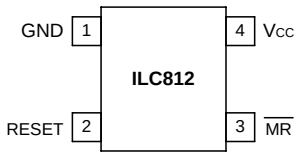
Place the device suffix of desired reset threshold voltage from the table [below] in the blank to complete the part number.

Reset Threshold Voltage (V)	Device Suffix
4.63	L
4.38	M
4.00	J
3.08	T
2.93	S
2.63	R

Pin Package Configuration

Top View





Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units
Terminal Voltage	V_{CC}	-0.3 to 6.0	V
	$\overline{MR}$	-0.3 to (V_{CC} + 0.3)	V
Input Current	V_{CC}, $\overline{MR}$	20	mA
Output Current	RESET, $\overline{RESET}$	20	mA
Rate of Rise	V_{CC}	100	V/µs
Operating Temperature Range	T_A	-40 to +85	°C
Storage Temperature Range		-65 to +150	°C
Lead Temperature (Soldering - 10 sec.)		300	°C
Power Dissipation (T_A = +70°C)		320	mW

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability. Operating ranges define those limits between which the functionality of the device is guaranteed.

Electrical Characteristics

V_{CC} = 5V for ILC81_L/M/J, V_{CC} = 3.3V for ILC81_S/T, V_{CC} = 3V for ILC81_R, T_A = Operating Temperature Range, unless otherwise noted.

Parameter	Conditions	Min	Typ	Max	Units
Operating Voltage Range, V_{CC}	T_A = 0°C to 70°C T_A = -40°C to 85°C	1.4 1.6		5.5 5.5	V
Supply Current, I_{CC}	ILC811L/M/J, ILC812L/M/J V_{CC} < 3.6V, ILC811R/S/T, ILC812R/S/T		9 6	15 10	µA
Reset Voltage Threshold, V_{TH}	ILC811L, ILC812L ILC811M, ILC812M ILC811J, ILC812J ILC811T, ILC812T ILC811S, ILC812S ILC811R, ILC812R	4.50 4.25 3.89 3.00 2.85 2.55	4.63 4.38 4.00 3.08 2.93 2.63	4.75 4.50 4.10 3.15 3.00 2.70	V
Reset Timeout Period, t_R		140	240	560	ms
$\overline{RESET}$ Output Voltage, V_{OH}	I_{SOURCE} = 800µA, ILC811L/M/J I_{SOURCE} = 500µA, ILC811R/S/T	V_{CC} – 1.5 0.8 x V_{CC}			V
$\overline{RESET}$ Output Voltage, V_{OL}	V_{CC} = V_{TH} Min., I_{SINK} = 3.2mA, ILC811L/M/J V_{CC} = V_{TH} Min., I_{SINK} = 1.2mA, ILC811R/S/T V_{CC} > 1.4V, I_{SINK} = 50µA, T_A = 0°C to 70°C V_{CC} > 1.6V, I_{SINK} = 50µA, T_A = -40°C to 85°C			0.4 0.3 0.3 0.3	V
RESET Output Voltage, V_{OH}	1.8V < V_{CC} < V_{TH} Min., I_{SOURCE}= 150µA	0.8 x V_{CC}			V
RESET Output Voltage, V_{OL}	I_{SINK} = 3.2mA, ILC812L/M/J I_{SINK} = 1.2mA, ILC812R/S/T			0.4 0.3	V
$\overline{MR}$ Minimum Pulse Width		10			µs
$\overline{MR}$ to Reset Delay			0.5		µs
$\overline{MR}$ Input Threshold, V_{IH}	V_{CC} > V_{TH} Max., ILC81_L/M/J ILC81_R/S/T	2.3 0.7 x V_{CC}			V
$\overline{MR}$ Input Threshold, V_{IL}	V_{CC} > V_{TH} Max., ILC81_L/M/J ILC81_R/S/T			0.8 0.25 x V_{CC}	V
$\overline{MR}$ Pull-Up Resistance		10	20	30	kΩ
$\overline{MR}$ Glitch Immunity			100		ns

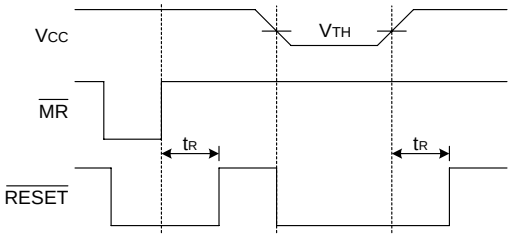
Pin Functions

	Pin Number		
Pin Name	ILC811	ILC812	Description
GND	1	1	Ground Pin.
$\overline{\text{RESET}}$	2	N/A	$\overline{\text{RESET}}$ goes low if V_{CC} falls below the reset threshold and remains asserted for one reset timeout period (140ms min.) after V_{CC} exceeds the reset threshold.
RESET	N/A	2	RESET goes high if V_{CC} falls below the reset threshold and remains asserted for one reset timeout period (140ms min.) after V_{CC} exceeds the reset threshold.
$\overline{\text{MR}}$	3	3	Manual reset input. A logic low on $\overline{\text{MR}}$ forces a reset. The reset will remain asserted as long as MR is held low and for one reset timeout period (140ms min.) after $\overline{\text{MR}}$ goes high. This input can be shorted to ground via a switch or driven from CMOS or TTL logic. Float if unused.
V_{CC}	4	4	Power supply input, 3V, 3.3V or 5V.

Circuit Description

Microprocessor Reset

The $\overline{\text{RESET}}$ pin is asserted whenever V_{CC} falls below the reset threshold voltage or if $\overline{\text{MR}}$ (manual reset) is forced low. The reset pin remains asserted for a period of 240ms after V_{CC} has risen above the reset threshold voltage or $\overline{\text{MR}}$ has returned high. The reset function ensures the microprocessor is properly reset and powers up into a known condition after a power failure. $\overline{\text{RESET}}$ will remain valid with V_{CC} as low as 1.4V.

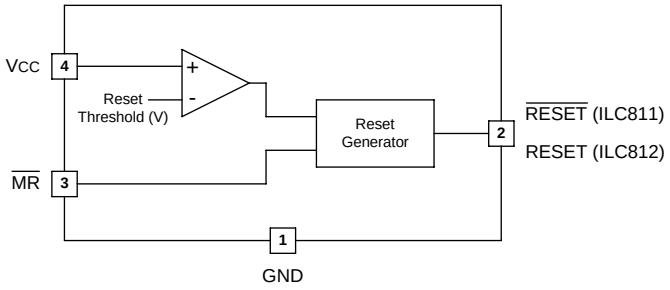


VCC Transients

The ILC811/ILC812 are relatively immune to negative-going V_{CC} glitches below the reset threshold. Typically, a negative-going transient 125µV below the reset threshold with a duration of 50ms (25µs for ILC81_R/S/T) or less will not cause an unwanted reset.

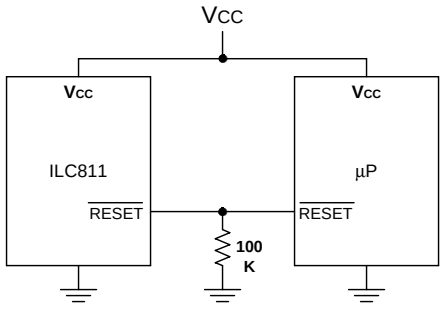
Interfacing to Bidirectional Reset Pins

The ILC811/ILC812 can interface with µPs with bidirectional reset pins by connecting a 4.7kΩ resistor in series with the ILC811/ILC812 output and the µP reset pin.



RESET Valid to 0V

A resistor can be added from the $\overline{\text{RESET}}$ pin to ground to ensure the $\overline{\text{RESET}}$ output remains low with VCC down to 0V. A 100kW resistor connected from $\overline{\text{RESET}}$ to ground is recommended. The size of the resistor should be large enough to not load the RESET output and small enough to pull-down any stray leakage currents.



Reset Valid to V_{CC} =0V

Alternate Source Cross Reference Guide

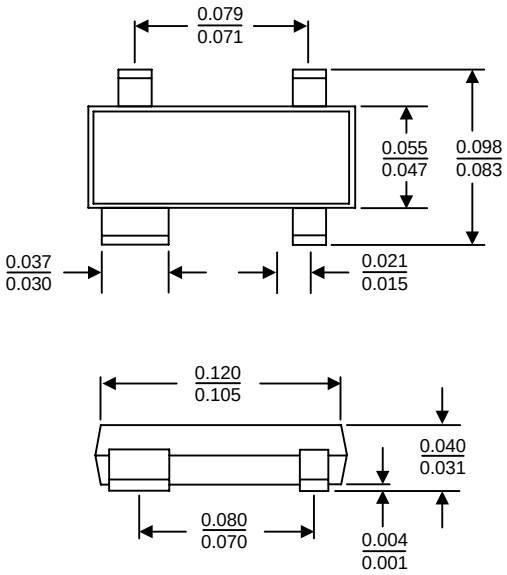
Industry P/N	ILC Direct Replacement
MAX811JEUS-T	ILC811JU
MAX811LEUS-T	ILC811LU
MAX811MEUS-T	ILC811MU
MAX811REUS-T	ILC811RU
MAX811SEUS-T	ILC811SU
MAX811TEUS-T	ILC811TU
MAX812JEUS-T	ILC812JU
MAX812LEUS-T	ILC812LU
MAX812MEUS-T	ILC812MU
MAX812REUS-T	ILC812RU
MAX812SEUS-T	ILC812SU
MAX812TEUS-T	ILC812TU

Device Marking Information

	SOT-143
ILC811J	KJYY
ILC811L	KLYY
ILC811M	KMYY
ILC811R	KRYY
ILC811S	KSYY
ILC811T	KTYY
ILC812J	LJYY
ILC812L	LLYY
ILC812M	LMYY
ILC812R	LRYY
ILC812S	LSYY
ILC812T	LTYY
	YY = Lot Code

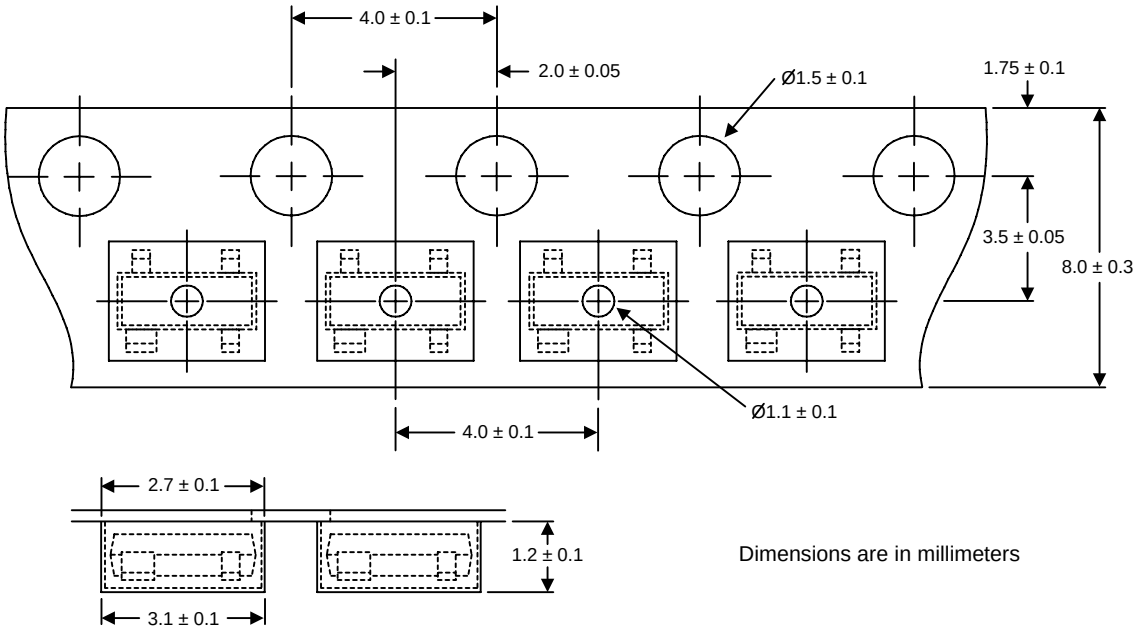
Packaging Information

4-Pin SOT-143



Dimensions are in inches

Tape and Reel Information



Dimensions are in millimeters