



USS809

LINEAR INTEGRATED CIRCUIT

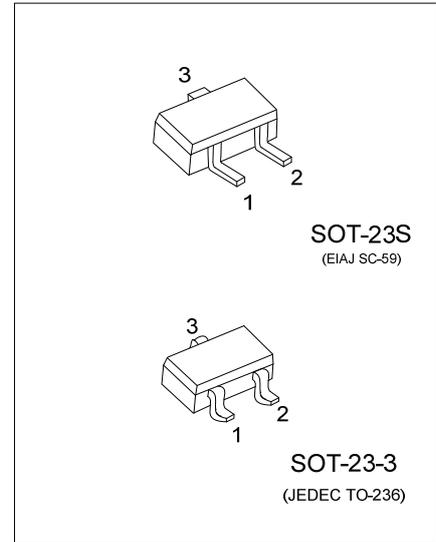
MICROPROCESSOR RESET CIRCUITS

DESCRIPTION

The UTC **USS809** series are resetting circuits which can monitor power supplies especially in microprocessor based systems.

In normal operation, the UTC **USS809** series can assert a reset under any of the following situation: the power supply drops below a designated reset threshold level (which is available for 3V or 3.3V or 5V system).

Active low **RESET** output which has already been guaranteed to remain asserted for at 140ms least while V_{CC} rises above the designed threshold level.



FEATURES

- * Voltage monitor for 3V or 3.3V or 5V power supplies
- * Valid $\overline{\text{RESET}}$ remains with V_{CC} as low as 1V
- * Typical supply current: 5 μ A
- * Fixed 140ms minimum reset pulse width
- * Push-Pull $\overline{\text{RESET}}$ Active Low Output

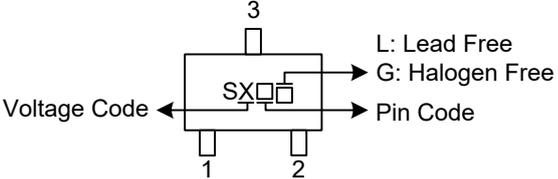
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
USS809L-x-AE2-2-R	USS809G-x-AE2-2-R	SOT-23-3	$\overline{\text{RESET}}$	V_{CC}	GND	Tape Reel
USS809L-x-AE2-3-R	USS809G-x-AE2-3-R	SOT-23-3	GND	$\overline{\text{RESET}}$	V_{CC}	Tape Reel
USS809L-x-AE2-5-R	USS809G-x-AE2-5-R	SOT-23-3	$\overline{\text{RESET}}$	GND	V_{CC}	Tape Reel
USS809L-x-AE3S-2-R	USS809G-x-AE3S-2-R	SOT-23S	$\overline{\text{RESET}}$	V_{CC}	GND	Tape Reel
USS809L-x-AE3S-3-R	USS809G-x-AE3S-3-R	SOT-23S	GND	$\overline{\text{RESET}}$	V_{CC}	Tape Reel
USS809L-x-AE3S-5-R	USS809G-x-AE3S-5-R	SOT-23S	$\overline{\text{RESET}}$	GND	V_{CC}	Tape Reel

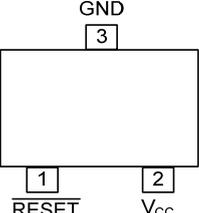
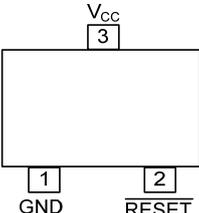
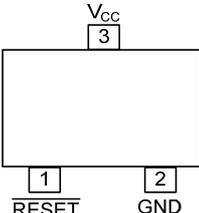
Note: Pin Assignment: x: Output Voltage, refer to Marking Information.

<p>USS809G-x-AE2-2-R</p>	<ul style="list-style-type: none"> (1) R: Tape Reel (2) refer to Pin Assignment (3) AE2: SOT-23-3, AE3S: SOT-23 (4) x: Refer to Marking Information (5) G: Halogen Free and Lead Free, L: Lead Free
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-23-3 SOT-23S	N: 2.25V A: 2.63V B: 2.93V C: 3.08V D: 4.00V E: 4.38V F: 4.63V J: 5.00V	

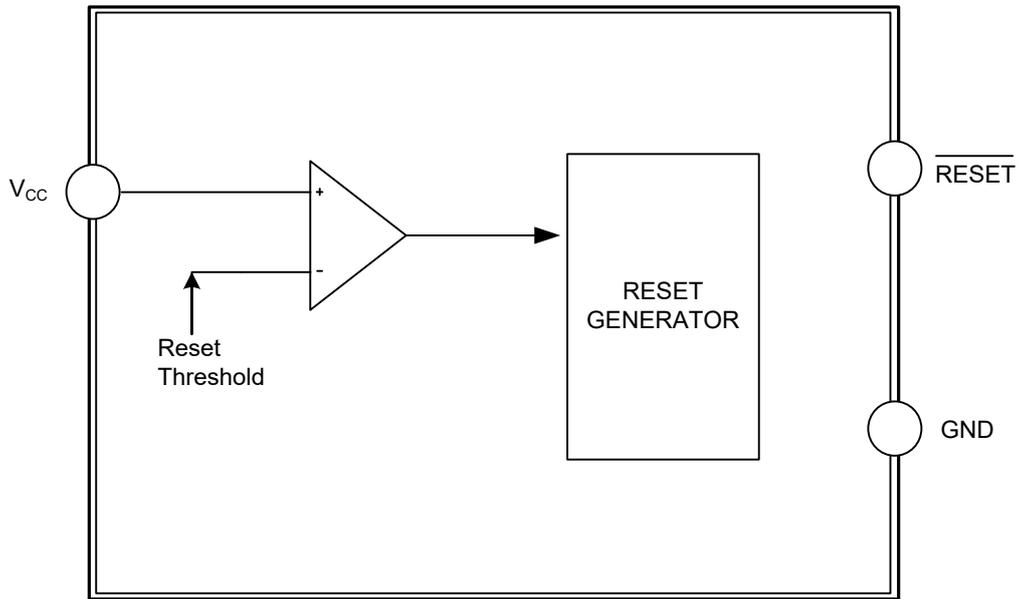
PIN CONFIGURATION

SOT-23-3 / SOT-23S		
AE2-2 / AE3S-2	AE2-3 / AE3S-3 / AL3	AE2-5 / AE3S-5
		

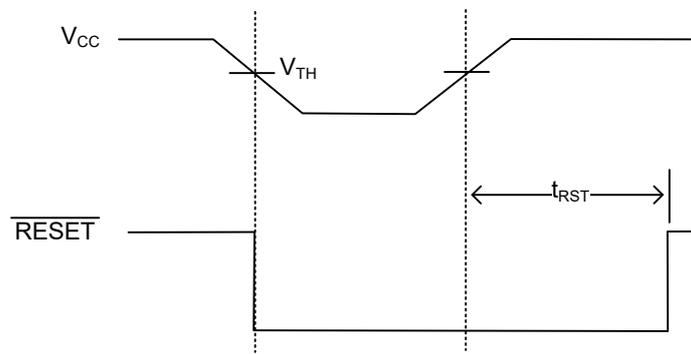
PIN DESCRIPTION

PIN NAME	DESCRIPTION
GND	Ground
$\overline{\text{RESET}}$	This pin will fall low after the V_{cc} 's falling below the reset threshold voltage and it also can remain asserted for at least 140ms min after V_{cc} 's rising upon the reset threshold.
V_{cc}	Input of power supply.

■ BLOCK DIAGRAM



■ FUNCTIONAL DIAGRAM



Reset Timing Diagram

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{CC}	-0.3 ~ +6.0	V
RESET	V_{RESET}	-0.3 ~ +6.0	V
Input Current	I_{IN}	20	mA
Output Current (RESET)	I_{OUT}	20	mA
Rate of Rise	$V_{CC(RR)}$	100	V/ μ s
Power Dissipation ($T_A=70^\circ\text{C}$)	P_D	300	mW
Junction Temperature	T_J	+150	$^\circ\text{C}$
Operating Temperature	T_{OPR}	-40 ~ +105	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

- Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
 2. The device is not guaranteed to function outside its operating rating.
 4. It is guarantee by design, not 100% be tested.

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

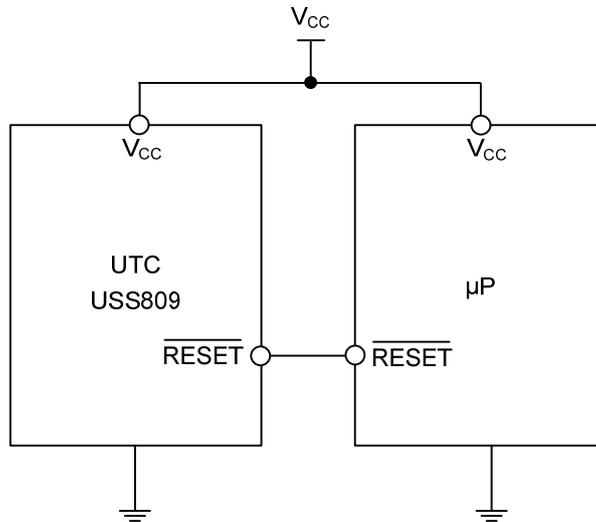
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Operating Voltage Range	V_{CC}		1		6	V	
Supply Current	I_{CC}	$V_{CC}=3\text{V}$, No Load	USS809-N		10	μA	
			USS809-A		10	μA	
		$V_{CC}=3.3\text{V}$, No Load	USS809-B		10	μA	
			USS809-C		10	μA	
		$V_{CC}=5\text{V}$, No Load	USS809-D		15	μA	
			USS809-E		15	μA	
		$V_{CC}=5.5\text{V}$, No Load	USS809-F		15	μA	
Reset Voltage Threshold	V_{TH}	$V_{CC}=3\text{V}$	USS809-N	2.19	2.25	2.31	V
			USS809-A	2.56	2.63	2.70	V
		$V_{CC}=3.3\text{V}$	USS809-B	2.85	2.93	3.01	V
			USS809-C	3.00	3.08	3.16	V
		$V_{CC}=5\text{V}$	USS809-D	3.90	4.00	4.10	V
			USS809-E	4.26	4.38	4.50	V
		$V_{CC}=5.5\text{V}$	USS809-F	4.50	4.63	4.76	V
$V_{CC}=5.5\text{V}$	USS809-J	USS809-F	4.85	5.00	5.15	V	
		USS809-J	4.85	5.00	5.15	V	
Reset Timeout Period	t_{RST}		140	240	560	ms	

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Reset Output Voltage	V _{OH}	I _{SOURCE} =500μA	USS809-N	2.0			V
			USS809-A	2.4			V
			USS809-B	2.64			V
			USS809-C	2.64			V
		I _{SOURCE} =800μA	USS809-D	3.5			V
			USS809-E	3.5			V
			USS809-F	3.5			V
			USS809-J	4.55			V
	V _{OL}	V _{CC} =V _{TH_MIN} , I _{SINK} =1.2mA	USS809-N			0.3	V
			USS809-A			0.3	V
			USS809-B			0.3	V
			USS809-C			0.3	V
		V _{CC} =V _{TH_MIN} , I _{SINK} =3.2mA	USS809-D			0.4	V
			USS809-E			0.4	V
			USS809-F			0.4	V
			USS809-J			0.4	V
V _{CC} >1V, I _{SINK} =50μA					0.3	V	

Note: Production testing done at T_A = +25°C, overtemperature limits ensured by QC screen.

■ TYPICAL APPLICATION CIRCUIT



■ APPLICATION INFORMATION

Microprocessor Reset

As soon as V_{CC} falls below the reset threshold voltage, the $\overline{\text{RESET}}$ pin is asserted. But the $\overline{\text{RESET}}$ pin can keep asserted for a period of 140ms after V_{CC} rose above the reset threshold voltage. After a power failure the reset operation can keep the processor being reset and powers up properly.

V_{CC} Transients

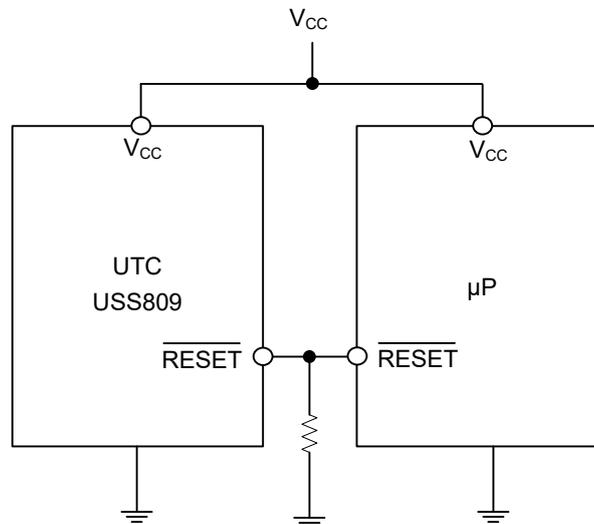
The UTC **USS809** series won't cause a reset typically as this situation: a negative-going transient 125mV below the reset threshold with a duration of 20μs or less.

Interfacing to Bidirectional Reset Pins

Connecting a 4.7kΩ resistor in series with the UTC **USS809** series output and the μP reset pin can make the UTC **USS809** series interface with μPs with bidirectional reset pins.

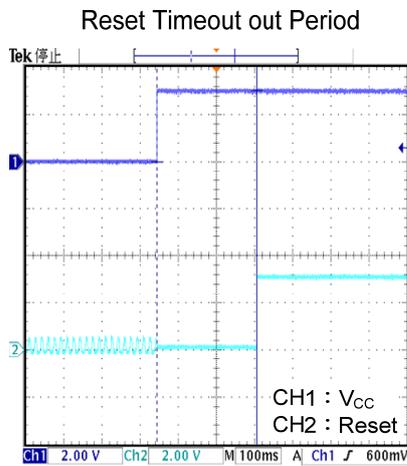
$\overline{\text{RESET}}$ Valid at Low Voltage

As the figure below, adding a resistor which is recommended 100kΩ can ensure the $\overline{\text{RESET}}$ output remains low with V_{CC} down to 0V. The size of the resistor should be not too large which will load the output excessively and not too small which can pull-down any stray leakage currents.



Reset Valid to $V_{CC} = 0V$

■ TYPICAL CHARACTERISTICS



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