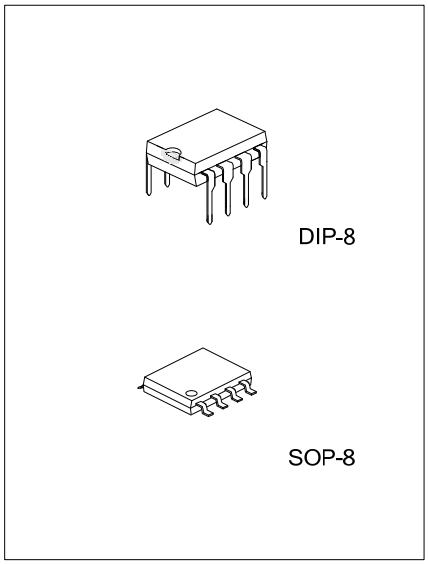
UTL7712

LINEAR INTEGRATED CIRCUIT

SUPPLY-VOLTAGE SUPERVISORS



■ DESCRIPTION

The UTC **UTL7712** family of integrated-circuit supply-voltage supervisors is designed specifically for use as reset controllers in microcomputer and microprocessor systems. The supply-voltage supervisor monitors the supply for undervoltage conditions at the SENSE input. During power up, the $\overline{\text{RESET}}$ output becomes active (low) when V_{CC} attains a value approaching 3.6V. At this point (assuming that SENSE is above V_{IT+}), the delay timer function activates a time delay, after which outputs $\overline{\text{RESET}}$ and RESET go inactive (high and low, respectively). When an undervoltage condition occurs during normal operation, $\overline{\text{RESET}}$ and RESET go active.

■ FEATURES

* Power-On Reset Generator
* Automatic Reset Generation After Voltage Drop
* Wide Supply-Voltage Range
* Precision Voltage Sensor
* Temperature-Compensated Voltage Reference
* Externally Adjustable Pulse Duration

■ ORDERING INFORMATION

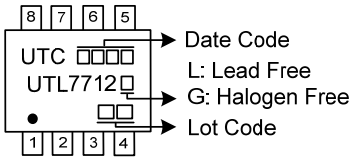
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UTL7712L-D08-T	UTL7712G-D08-T	DIP-8	Tube
UTL7712L-S08-R	UTL7712G-S08-R	SOP-8	Tape Reel

UTL7712G-D08-T

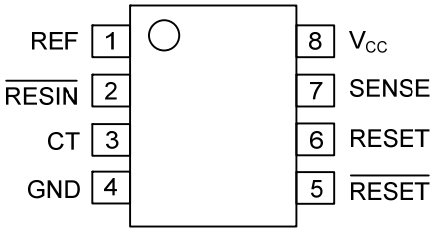
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) D08: DIP-8, S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



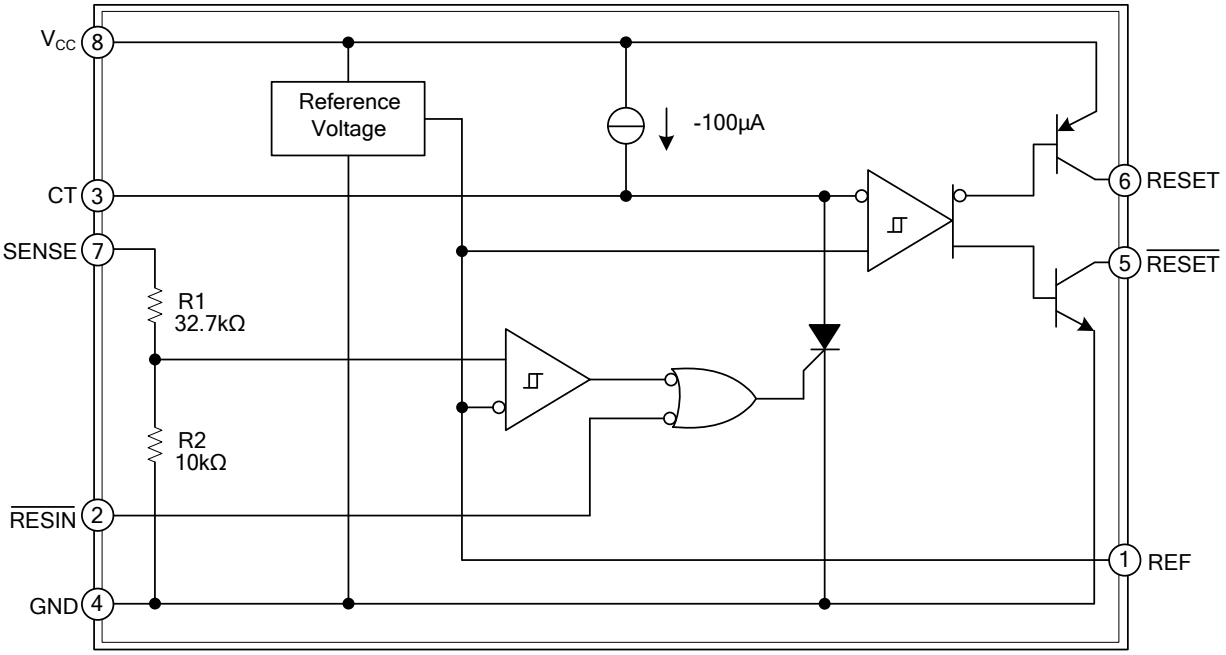
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	REF	Voltage reference output
2	$\overline{\text{RESIN}}$	Reset input
3	CT	External timing-capacitor pin
4	GND	Device ground
5	$\overline{\text{RESET}}$	Supervisor reset signal output (inverted)
6	RESET	Supervisor reset signal output
7	SENSE	Sense input
8	V_{CC}	Power supply

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING over operating free-air temperature range (unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	20	V
Input Voltage, $\overline{\text{RESIN}}$	V_I	-0.3 ~ 20	V
Input Voltage Range SENSE	V_I	-0.3 ~ 20	V
High-Level Output Current, I_{OH}, RESET	I_{OH}	-30	mA
Low-Level Output Current, I_{OL}, $\overline{\text{RESET}}$	I_{OL}	30	mA
Operating Virtual Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: 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.

■ RECOMMENDED OPERATING CONDITIONS (Unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	3.5		18	V
High-Level Input Voltage at $\overline{\text{RESIN}}$	V_{IH}	2			V
Low-Level Input Voltage at $\overline{\text{RESIN}}$	V_{IL}			0.6	V
Input Voltage, SENSE	V_I	0		20	V
High-Level Output Current, RESET	I_{OH}			-16	mA
Low-Level Output Current, $\overline{\text{RESET}}$	I_{OL}			16	mA
Operating Free-Air Temperature	T_A	-40		+85	°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-8	θ_{JA}	85	°C/W
	SOP-8		97	°C/W

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS (Note 1)	MIN	TYP	MAX	UNIT
High-Level Output Voltage, RESET	V_{OH}	I_{OH} = -16mA	V_{CC} -1.5			V
Low-Level Output Voltage, $\overline{\text{RESET}}$	V_{OL}	I_{OL} = 16mA			0.6	V
Reference Voltage	V_{REF}	T_A = 25°C	2.48	2.53	2.58	V
Negative-going Input Threshold Voltage, SENSE	V_{IT-}	T_A =25°C	10.6	10.8	11	V
Hysteresis, SENS (V_{IT+} - V_{IT-})	V_{hys}	T_A =25°C		35		mV
Input Current $\overline{\text{RESIN}}$	I_I	V_I = 2.4V to V_{CC}			20	μA
		V_I = 0.4V			-100	μA
High-Level Output Current, $\overline{\text{RESET}}$	I_{OH}	V_O = 18V			50	μA
Low-Level Output Current, RESET	I_{OL}	V_O = 0			-50	μA
Supply Current	I_{CC}	All inputs and outputs open		1.8	3	mA

Note: All electrical characteristics are measured with 0.1-μF capacitors connected at REF, CT, and V_{CC} to GND

■ SWITCHING CHARACTERISTICS over operating free-air temperature range (unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS (Note 1)	MIN	TYP	MAX	UNIT
Output Pulse Duration			CT = 0.1μF	0.65	1.4	2.8	msec
Input Pulse Duration at $\overline{\text{RESIN}}$				0.4			μs
Pulse Duration at Sense Input to Switch Outputs		$t_{w(S)}$	$V_{IH} = V_{IT-} + 200mV$, $V_{IL} = V_{IT-} - 200mV$	2			μs
Propagation Delay Time, $\overline{\text{RESIN}}$ to $\overline{\text{RESET}}$		t_{pd}	V_{CC} = 5V			1	μs
Rise Time	RESET	t_r	V_{CC} = 5V (Note 2)			0.2	μs
	$\overline{\text{RESET}}$					3.5	μs
Fall Time	RESET	t_f	V_{CC} = 5V (Note 2)			3.5	μs
	$\overline{\text{RESET}}$					0.2	μs

Notes: 1. All switching characteristics are measured with 0.1-μF capacitors connected at REF and V_{CC} to GND.

2. The rise and fall times are measured with a 10kΩ load resistor at RESET and $\overline{\text{RESET}}$.

■ TIMING DIAGRAM

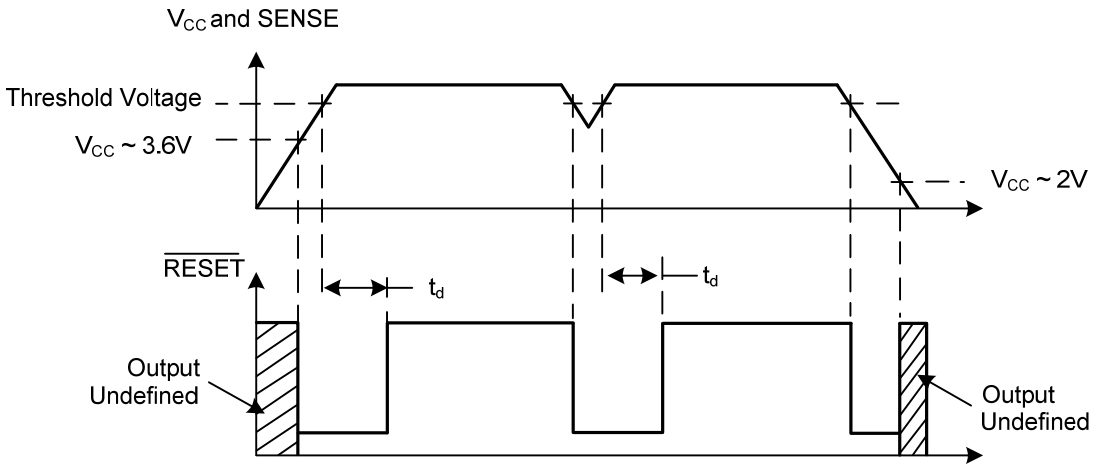


Figure 1. Timing Diagram

■ PARAMETER MEASUREMENT INFORMATION

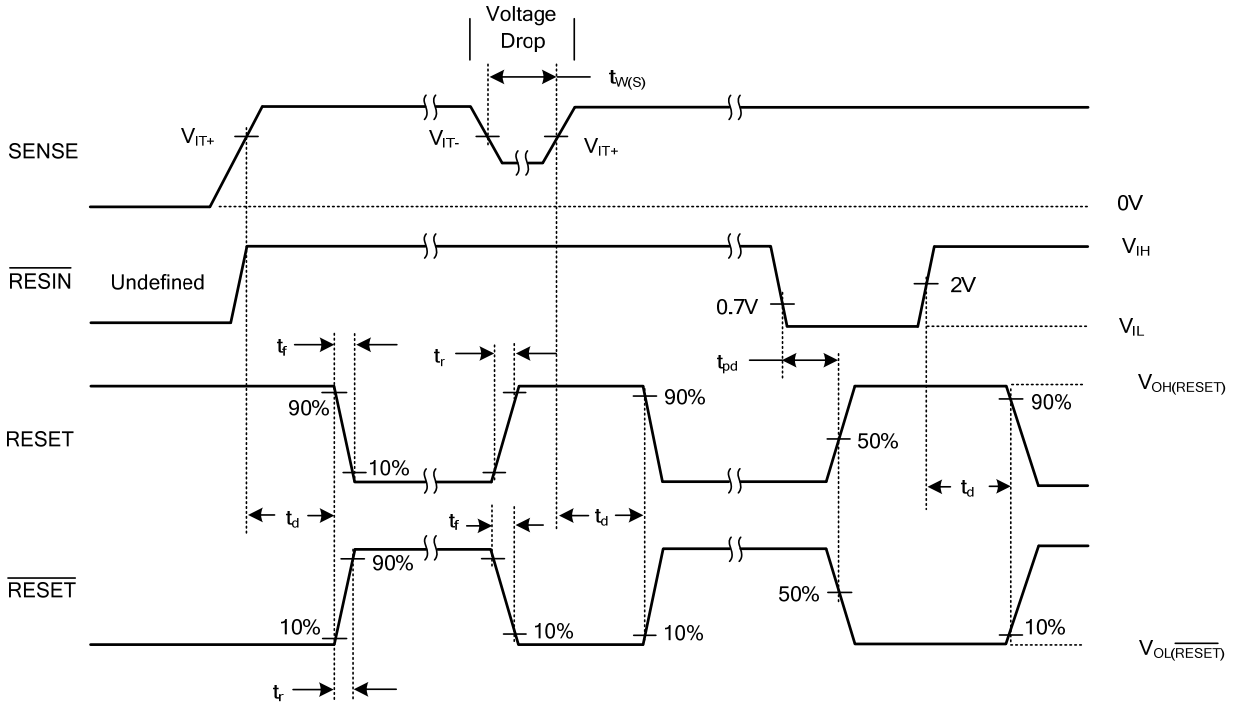


Figure 2. Voltage Waveform

■ TYPICAL APPLICATION CIRCUIT

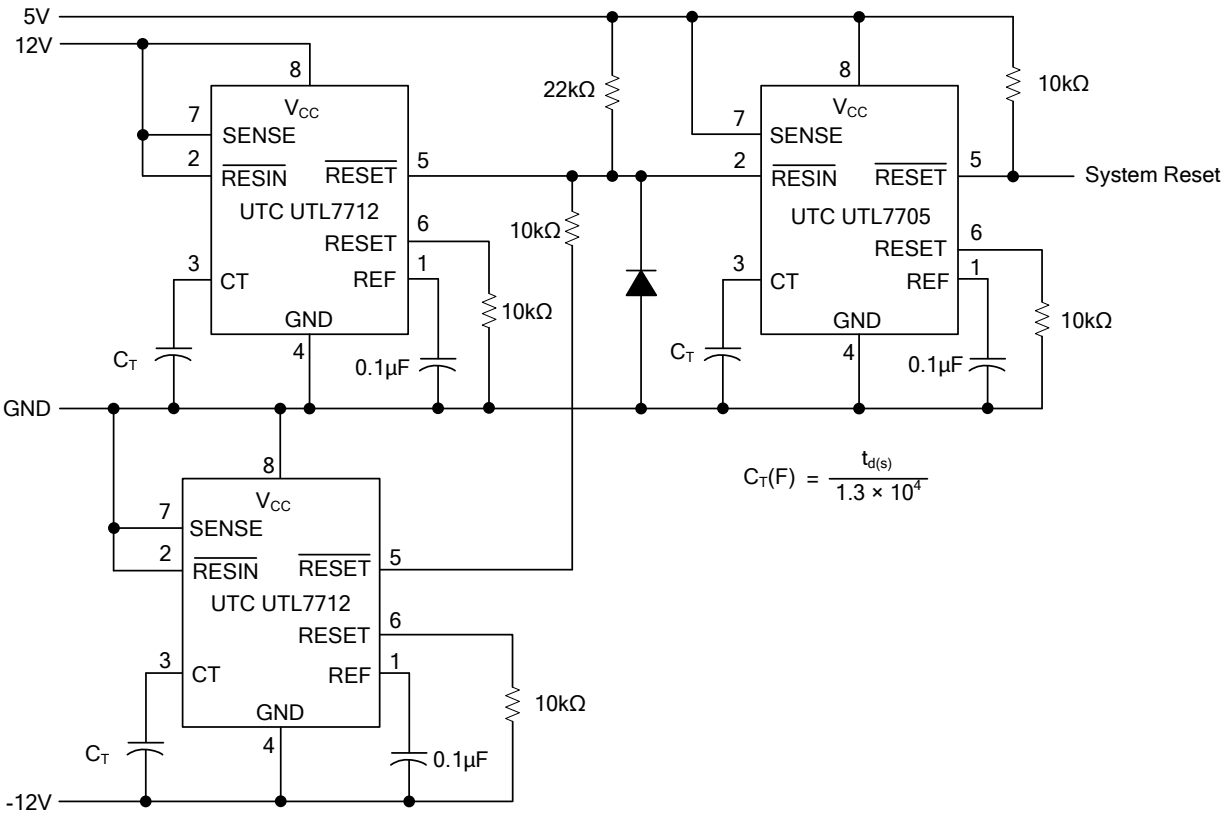


Figure 3. Multiple Power-Supply System Reset Generation

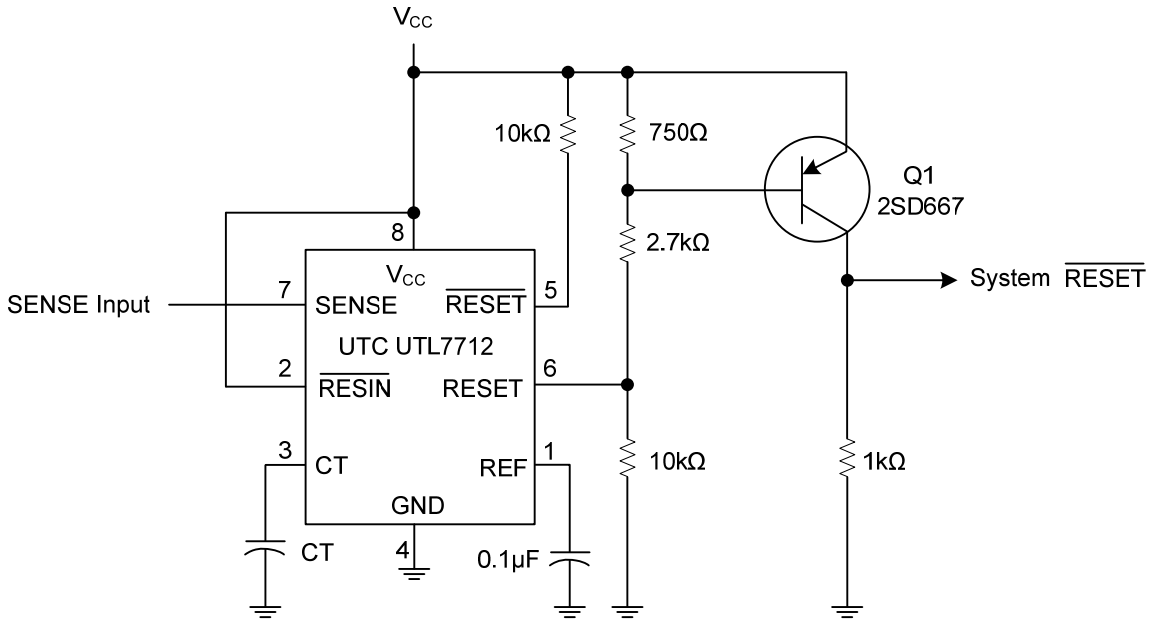
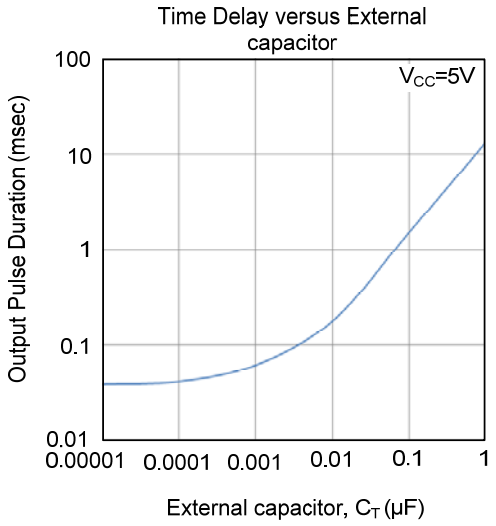


Figure 4. Eliminating Undefined States Using a PNP Transistor

■ EXTERNALLY ADJUSTABLE PULSE DURATION

The time delay is determined by the value of the external capacitor.



C_T : Td (sec) = 1.4 × 10^4 × Ct (F) + 38.5 μSec (TYP.)