

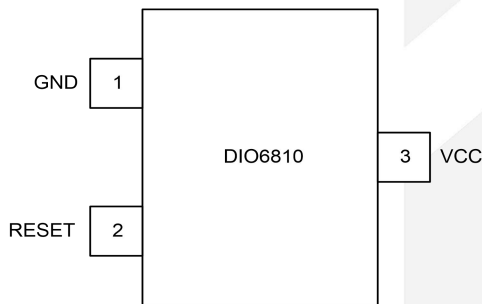
## DIO6810

# Ultra-Low Power Microprocessor Reset Circuit

### Features

- 140 ms min reset pulse width
- 10  $\mu\text{A}$  supply current at  $V_{\text{CC}} = 3\text{ V}$
- Guaranteed reset valid to  $V_{\text{CC}} = +1.0\text{ V}$
- Power supply transient immunity
- Operating temperature range  
-40°C to +125°C
- Available in SOT-23 and SOT-23-3L

### Block Diagram



### Descriptions

The DIO6810 series are micro-processor ( $\mu\text{P}$ ) supervisory circuits used to monitor the power supplies in  $\mu\text{P}$  and digital systems. They provide excellent circuit reliability and low cost by eliminating external components.

These circuits perform a single function: they assert a reset signal whenever the  $V_{\text{CC}}$  supply voltage rises above a preset threshold, keeping it asserted for at least 140 ms after  $V_{\text{CC}}$  has risen above the reset threshold.

The DIO6810 has CMOS outputs. The DIO6810 has an active-high RESET output. The reset comparator is designed to ignore fast transients on  $V_{\text{CC}}$ , and the outputs are guaranteed to be in the correct logic state for  $V_{\text{CC}}$  down to 1.0 V over the temperature range.

The device is available in 3 pin SOT-23 and SOT-23-3L package.

### Applications

- Computers
- Controllers
- Intelligent instruments
- Portable/Battery-powered equipment

### Ordering Information

Part Number	RoHS	$T_{\text{A}}$	Package	
DIO6810XST3	Green	-40 to +125°C	SOT-23	Tape & Reel, 3000
DIO6810XSU3	Green	-40 to +125°C	SOT-23-3L	Tape & Reel, 3000



# DIO6810

## Ordering Information Complimentary Note

Ordering Code = Part No. + Package Code

ST3: stands for SOT-23

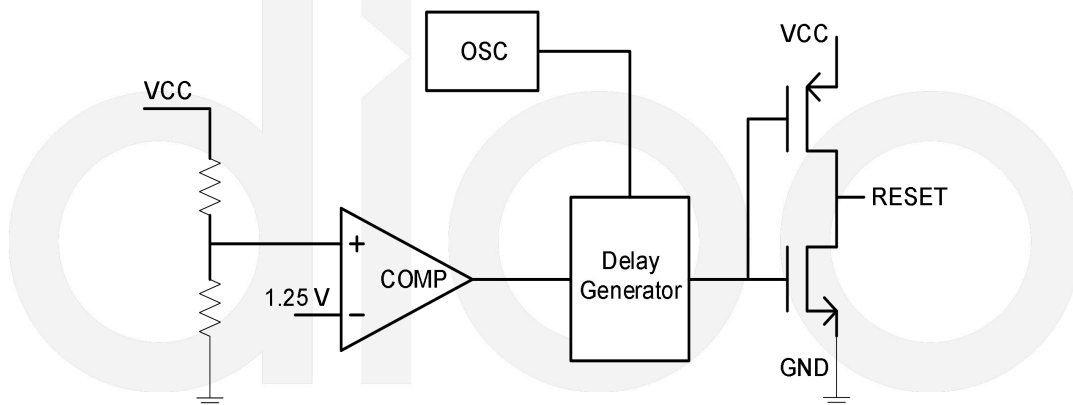
SU3: stands for SOT-23-3L

X: Refer to Device Function Reference Table on Page 2

## Device Function Reference Table

Part No.	Reset threshold	Reset active Low or High	Output Type	Marking
DIO6810L	4.63V	High	CMOS	AGAA
DIO6810M	4.38V	High	CMOS	AHAA
DIO6810J	4.00V	High	CMOS	CXAA
DIO6810T	3.08V	High	CMOS	AJAA
DIO6810S	2.93V	High	CMOS	AKAA
DIO6810R	2.63V	High	CMOS	ALAA
DIO6810Z	2.32V	High	CMOS	AMAA

## Block Diagram





# DIO6810

## Pin Descriptions

Pin No.	Symbol	Description
1	GND	Ground terminal
2	RESET	CMOS output. This output remains high if $V_{CC}$ drops below $V_{RES}$ , and for at least 140 ms after $V_{CC}$ rises above $V_{RES}+V_{HYST}$
3	$V_{CC}$	Analog input. This pin is both the power supply to internal circuit and the voltage to be monitored

## Absolute Maximum Ratings

Stresses beyond those listed under Absolute Maximum Rating may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Symbol	Parameter	Rating	Units
$V_{CC}$	Terminal voltage (with respect to GND)	-0.3 to 6.0	V
RESET		-0.3 to 6.0	
$V_{CC}$	Input current	20	mA
RESET		20	
$R_{\theta JA}$	Thermal resistance	300	°C/W
$T_A$	Operating temperature	-40 to 125	°C
$T_L$	Lead temperature range (soldering 10 s)	300	°C
$T_{STG}$	Storage temperature	-65 to 150	°C
ESD	HBM, JEDEC: JESD22-A114	4500	V



# DIO6810

## DC Electrical Characteristics

Typical value:  $V_{CC} = 3\text{ V}$ ,  $T_A = 25^\circ\text{C}$ , unless otherwise noted

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Maximum input voltage	$V_{CCMAX}$				5.5	V
Minimum input voltage	$V_{CCMIN}$		1.0			V
Supply current	$I_{VCC}$	$V_{CC} = 2.0\text{ V}$		8		$\mu\text{A}$
		$V_{CC} = 3.0\text{ V}$		10		
		$V_{CC} = 5.0\text{ V}$		14		
Reset threshold	$V_{RES}$	DIO6810L	4.51	4.63	4.75	V
		DIO6810M	4.25	4.38	4.5	
		DIO6810J	3.9	4.00	4.1	
		DIO6810T	3.0	3.08	3.15	
		DIO6810S	2.86	2.93	3.00	
		DIO6810R	2.56	2.63	2.7	
		DIO6810Z	2.26	2.32	2.38	
Temperature coefficient of reset threshold	$T_C$			21		ppm
Reset threshold hysteresis	$V_{HYST}$			$0.03V_{RES}$		V
$V_{CC}$ to RESET delay		$V_{CC}$ transitions from $(V_{RES} + 0.1)\text{ V}$ to $(V_{RES} - 0.1)\text{ V}$		23		$\mu\text{s}$
RESET output voltage low	$V_{OL}$	$V_{CC} = 3\text{ V}$ , $V_{RES} < 3\text{ V}$ , $I_{SINK} = 3.2\text{ mA}$			0.3	V
		$V_{CC} = 4\text{ V}$ , $V_{RES} < 4\text{ V}$ , $I_{SINK} = 5\text{ mA}$			0.3	
		$V_{CC} = 5\text{ V}$ , $V_{RES} < 5\text{ V}$ , $I_{SINK} = 6\text{ mA}$			0.3	
RESET output voltage high	$V_{OH}$	$V_{CC} = 2\text{ V}$ , $V_{RES} > 2\text{ V}$ , $I_{SOURCE} = 600\text{ }\mu\text{A}$	$V_{CC}-0.4$			V
		$V_{CC} = 3\text{ V}$ , $V_{RES} > 3\text{ V}$ , $I_{SOURCE} = 1.2\text{ mA}$	$V_{CC}-0.4$			
		$V_{CC} = 4\text{ V}$ , $V_{RES} > 4\text{ V}$ , $I_{SOURCE} = 2\text{ mA}$	$V_{CC}-0.4$			
Reset pulse width	$T_{RES}$		140	240	500	ms

Specifications subject to change without notice.

## Applications Information

A microprocessor's ( $\mu\text{P}$ 's) reset input starts the  $\mu\text{P}$  in a known state. The DIO6810 series assert reset to prevent code-execution errors during power-up, power-down, or brownout conditions. The device consists of a comparator, a low current high precision voltage reference, voltage divider, output delay circuit and output driver. They assert a reset signal whenever the  $V_{\text{CC}}$  supply voltage rises above a preset threshold, keeping it asserted for at least 140 ms after  $V_{\text{CC}}$  has risen above the reset threshold.

The DIO6810 have a CMOS output stage. The DIO6810 have an active-high RESET output. The reset comparator is designed to ignore fast transients on  $V_{\text{CC}}$ , and the outputs are guaranteed to be in the correct logic state for  $V_{\text{CC}}$  down to 1.0 V over the temperature range.

The operation of the device can be best understood by referring to figure 1.

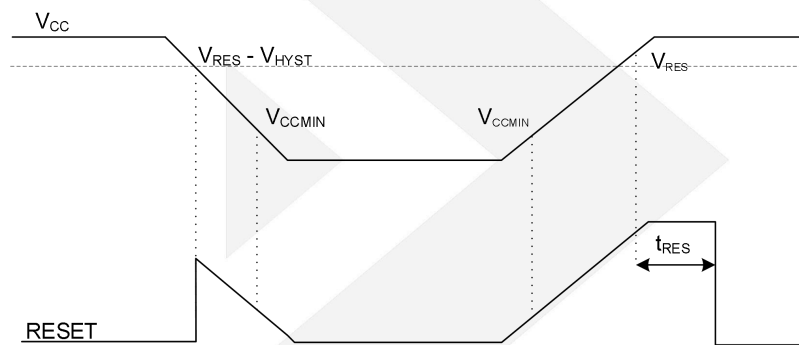


Figure 1

### Negative-Going $V_{\text{CC}}$ Transients

In addition to issuing a reset to the  $\mu\text{P}$  during power-up, power-down, and brownout conditions, the DIO6810 series are relatively immune to short-duration negative-going  $V_{\text{CC}}$  transients (glitches). As the magnitude of the transient increases (goes farther below the reset threshold), the maximum allowable pulse width decreases. Typically, a  $V_{\text{CC}}$  transient that goes 100 mV below the reset threshold and lasts 10  $\mu\text{s}$  or less will not cause a reset pulse. A 0.1  $\mu\text{F}$  bypass capacitor mounted as close as possible to the  $V_{\text{CC}}$  pin provides additional transient immunity.

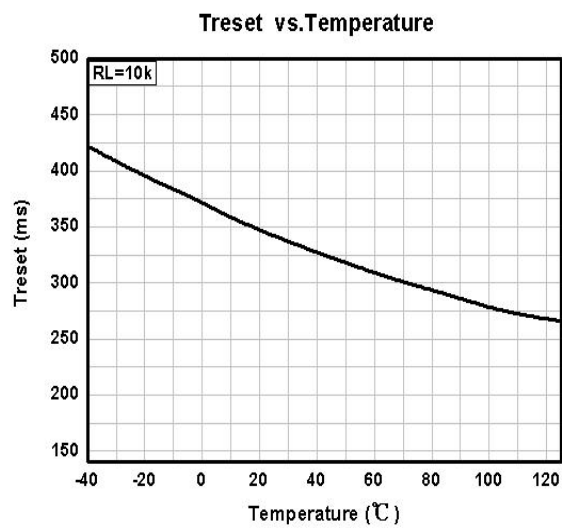
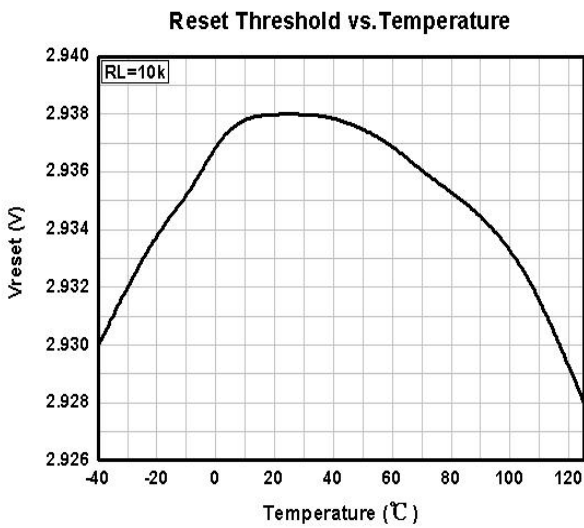
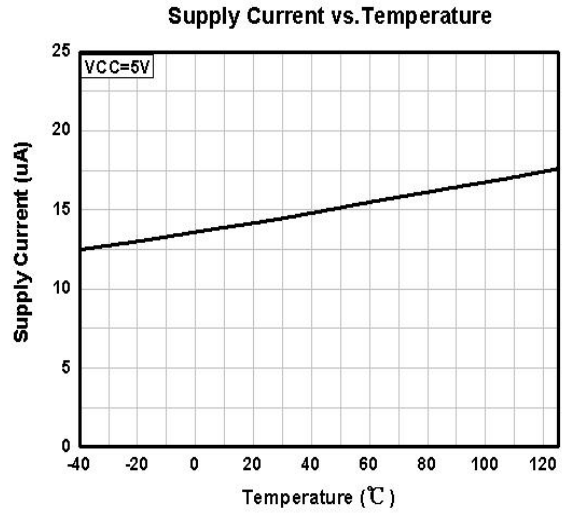
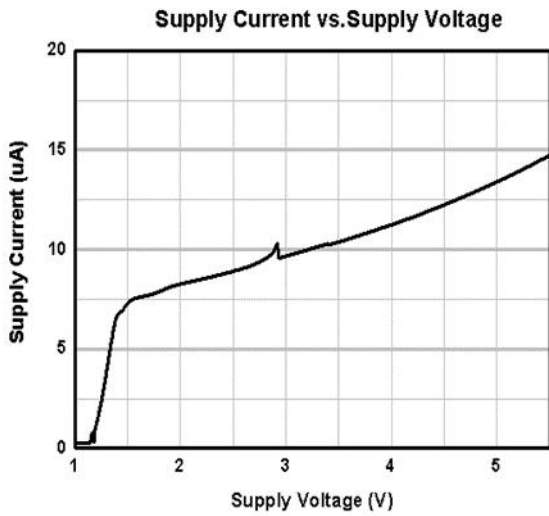




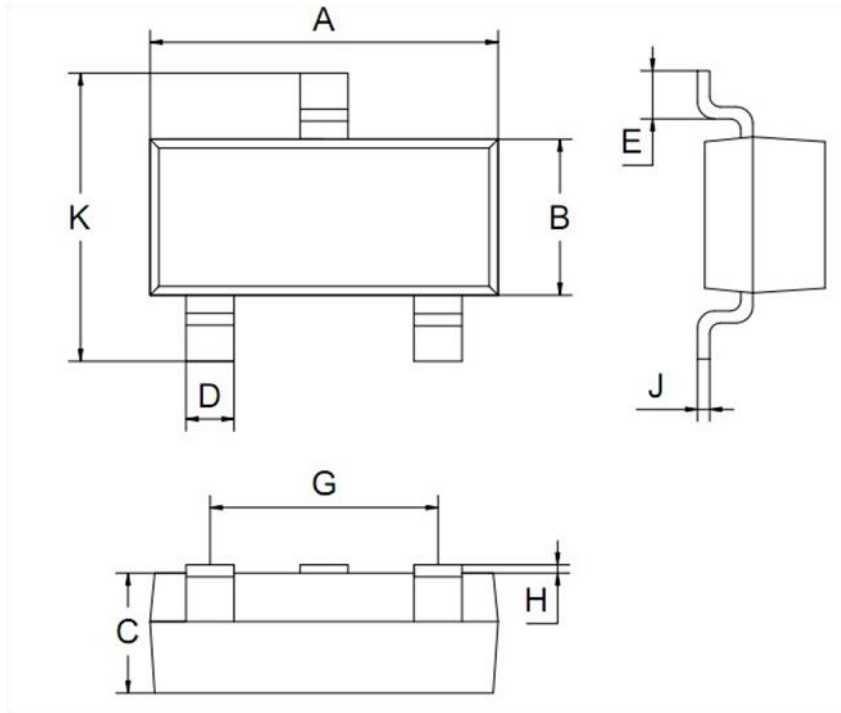
# DIO6810

## Typical Performance Characteristics

All typical value:  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$ , unless otherwise specified.

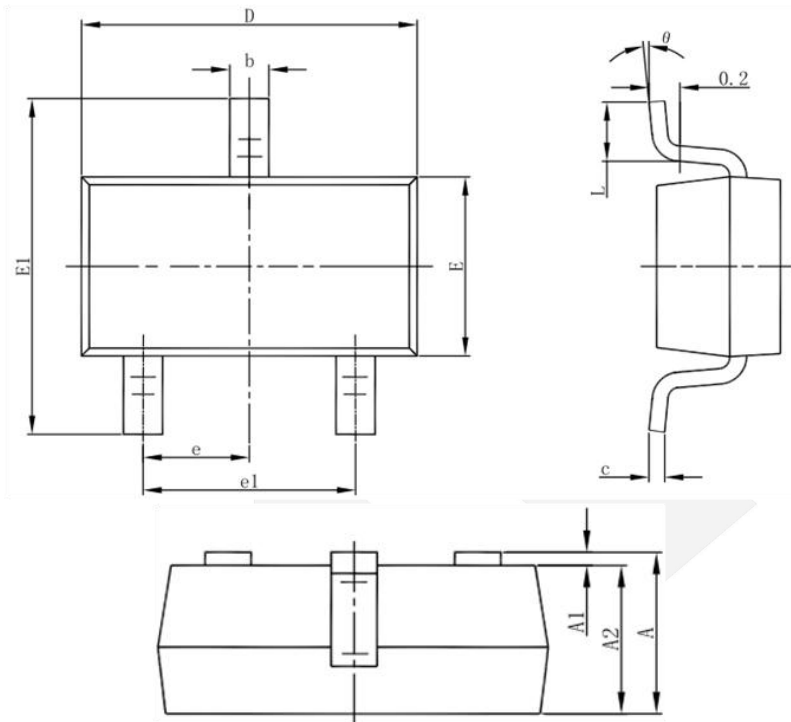


## Physical Dimensions: SOT-23



Symbol	Dimensions In Millimeters	
	Min	Max
A	2.70	3.10
B	1.10	1.50
C	1.0 Typical	
D	0.4 Typical	
E	0.35	0.48
G	1.80	2.00
H	0.02	0.1
J	0.1 Typical	
K	2.20	2.60

## Physical Dimensions: SOT-23-3L



Symbol	Dimensions In Millimeters	
	Min	Max
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 TYP.	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

## CONTACT US



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