

Low I_q Supply Voltage Supervisory in SOT23-3

FEATURES

- Operating Supply Voltage: 1.0V to 5.5V
- $\pm 2\%$ Reset Threshold Accuracy
- Low Quiescent Current: 5 μ A (typically)
- Push-Pull Active Low $\overline{\text{RESET}}$ output
- 240ms Power-On Reset Delay
- 3-Pin SOT23-3 Package

APPLICATIONS

- Digital Set Top Boxes
- TV
- Portable Device
- Microprocessor Systems

GENERAL DESCRIPTION

The TMI6809 series device are low I_q supply voltage supervisory that monitors a single voltage used in microprocessor and digital control system. The TMI6809 provide and active low reset signal while the V_{CC} supply voltage drops below the reset threshold voltage. When the V_{CC} supply voltage rises above the threshold voltage plus hysteresis the reset output goes high after 240ms (typical) reset delay time.

TMI6809 series are available suitable for monitoring 3V, 3.3V and 5V supply voltages. The low supply current of typical 5 μ A makes TMI6809 series devices ideal for using in portable, battery powered system applications, and they are available in 3-pin SOT23-3 package.

TYPICAL APPILCATION

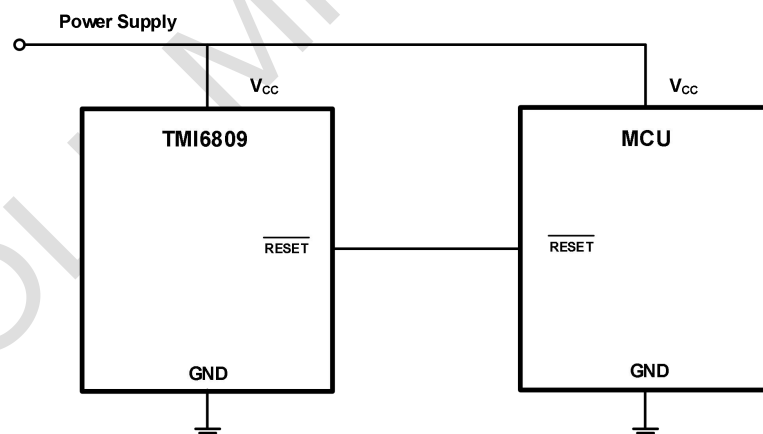
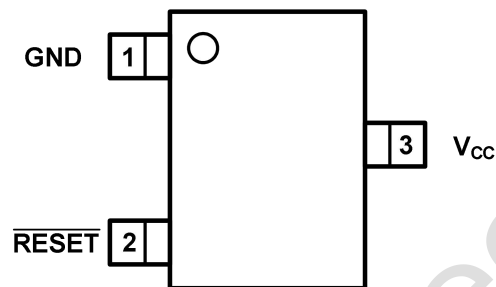


Figure 1. Typical Application Circuits

ABSOLUTE MAXIMUM RATINGS (Note 1)

Parameter	Value	Unit
Input Supply Voltage	-0.3~6	V
RESET Voltage	-0.3~6	V
Storage Temperature Range	-50~150	°C
Junction Temperature (Note2)	-40~150	°C
Power Dissipation	390	mW

PACKAGE/ORDER INFORMATION



SOT23-3

Top Mark: TxxXXX (Txx: Device Code, XXX: Inside Code)

Part Number	Reset Threshold	Package	Top mark	Quantity/ Reel
TMI6809-232	2.32V	SOT23-3	T3QXXX	3000
TMI6809-263	2.63V	SOT23-3	T6RXXX	3000
TMI6809-293	2.93V	SOT23-3	T9SXXX	3000
TMI6809-308	3.08V	SOT23-3	T0TXXX	3000
TMI6809-400	4.00V	SOT23-3	T0JXXX	3000
TMI6809-438	4.38V	SOT23-3	T3MXXX	3000
TMI6809-463	4.63V	SOT23-3	T6LXXX	3000

TMI6809 series devices are Pb-free and RoHS compliant.

PIN FUNCTIONS

Pin	Name	Function
1	GND	Ground Pin.
2	RESET	Active low reset output pin.
3	V _{CC}	Power supply voltage that is monitored.

ESD RATING

Items	Description	Value	Unit
V _{ESD_HBM}	Human Body Model for all pins	±4000	V
V _{ESD_CDM}	Charge Device Model for all pins	±1000	V

JEDEC specification JS-001

RECOMMENDED OPERATING CONDITIONS

Items	Description	Min	Max	Unit
Voltage Range	V _{CC}	1.0	5.5	V
T _J	Operating Junction Temperature Range	-40	125	°C

THERMAL RESISTANCE (Note 3)

Items	Description	Value	Unit
θ _{JA}	Junction-to-ambient thermal resistance	255	°C/W
θ _{JB}	Junction-to-board thermal resistance	140	°C/W
θ _{JC}	Junction-to-case (top) thermal resistance	150	°C/W
ψ _{JT}	Junction-to-top characterization parameter	48	°C/W
ψ _{JB}	Junction-to-board characterization parameter	139	°C/W

ELECTRICAL CHARACTERISTICS

(1.0V < V_{CC} < 5.5V, T_A = 25°C, unless otherwise noted.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Voltage Range	V _{CC}		1.0		5.5	V
Input Supply Quiescent Current	I _q		1	5	16	μA
RESET Voltage Threshold	V _{TH}	TMI6809-232	2.28	2.32	2.36	V
		TMI6809-263	2.58	2.63	2.68	V
		TMI6809-293	2.87	2.93	2.98	V
		TMI6809-308	3.02	3.08	3.14	V
		TMI6809-400	3.92	4.00	4.08	V
		TMI6809-438	4.29	4.38	4.46	V
		TMI6809-463	4.54	4.63	4.72	V
RESET Voltage Threshold Temperature Coefficient				30		ppm/°C
V _{CC} to RESET Delay Time	T _{PD_VCC}	V _{CC} =V _{TH} to V _{TH} - 100mV		200		μs
RESET Active Timeout Delay	T _D	T _A =25°C	210	240	270	ms
		T _A =-40°C to 125°C _(Note3)	160	240	320	ms
RESET Low-level Output Voltage	V _{OL}	V _{CC} = V _{TH} - 0.5V, I _{O_sink} = 1mA			0.3	V
RESET High-level Output Voltage	V _{OH}	V _{CC} = V _{TH} + 0.5V, I _{O_source} = 1mA	V _{CC} - 0.3			V
RESET Output Voltage Sink Current	I _{OL}	V _{CC} = 2V, V _{RESET} = 3V TMI6809-263		15		mA
RESET Output Voltage Source Current	I _{OH}	V _{CC} = 3V, V _{RESET} = 0V TMI6809-263		30		mA

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Note 2: T_J is calculated from the ambient temperature T_A and power dissipation P_D according to the following formula: T_J = T_A + (P_D) × θ_{JA}.

Note 3: Measured on JESD51-7, 4-layer PCB.

FUNCTIONAL BLOCK DIAGRAM

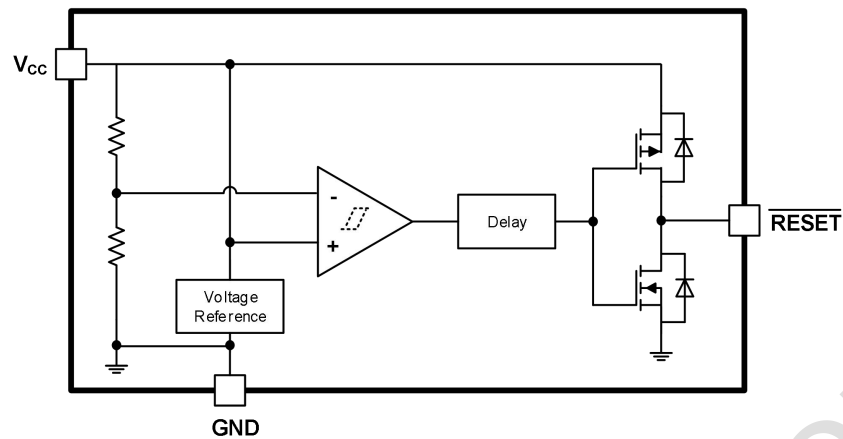


Figure 2. TMI6809 Block Diagram

V_{CC} $\overline{\text{RESET}}$ TIMING

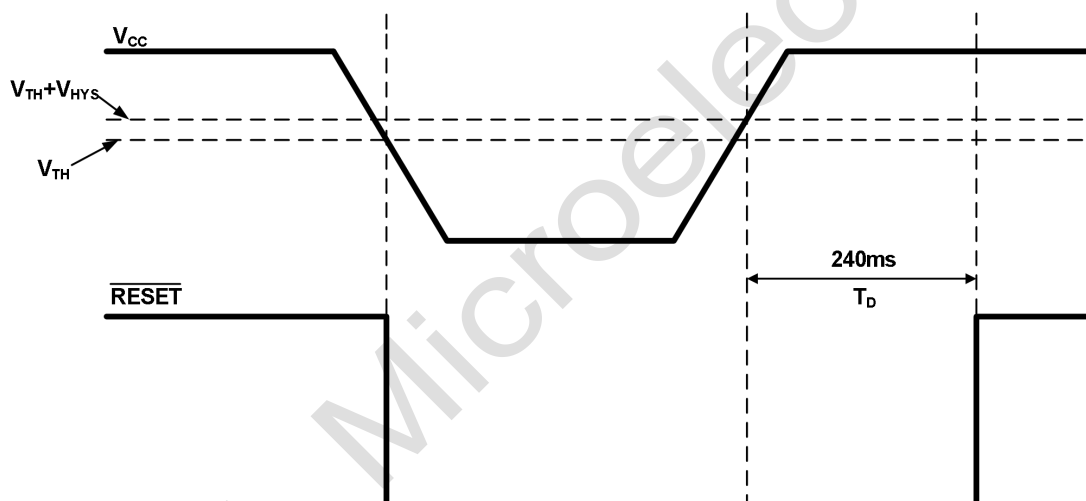


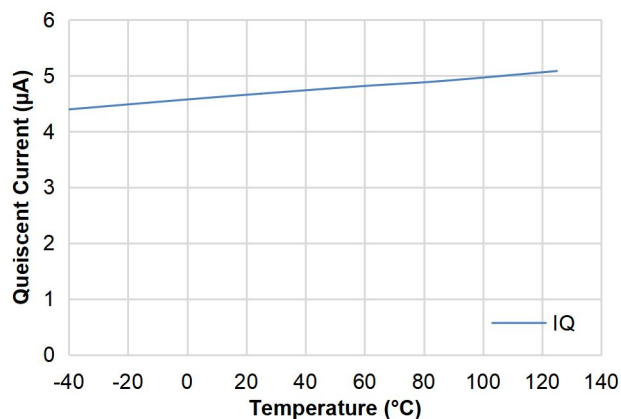
Figure 3. TMI6809 V_{CC} Reset Timing

TYPICAL PERFORMANCE CHARACTERISTICS

Test condition: $V_{CC}=5V$, $T_A=25^{\circ}C$, unless other noted.

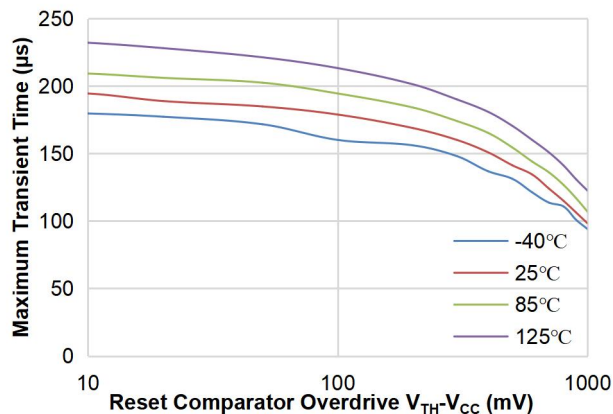
Input Quiescent Current at $V_{CC} = 5V$

$V_{CC}=5V$, $-40^{\circ}C \leq T_A \leq 125^{\circ}C$



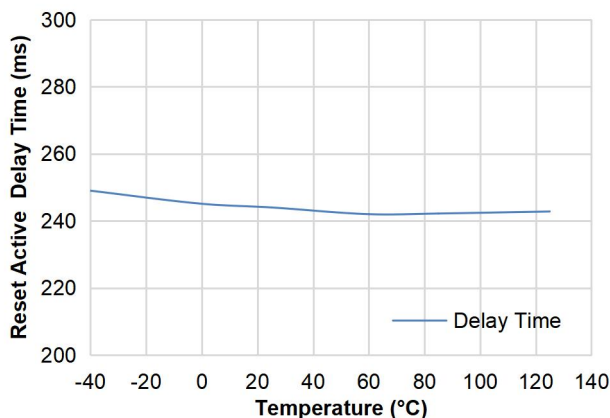
Maximum Transient Duration

$V_{CC}=5V$, $-40^{\circ}C \leq T_A \leq 125^{\circ}C$



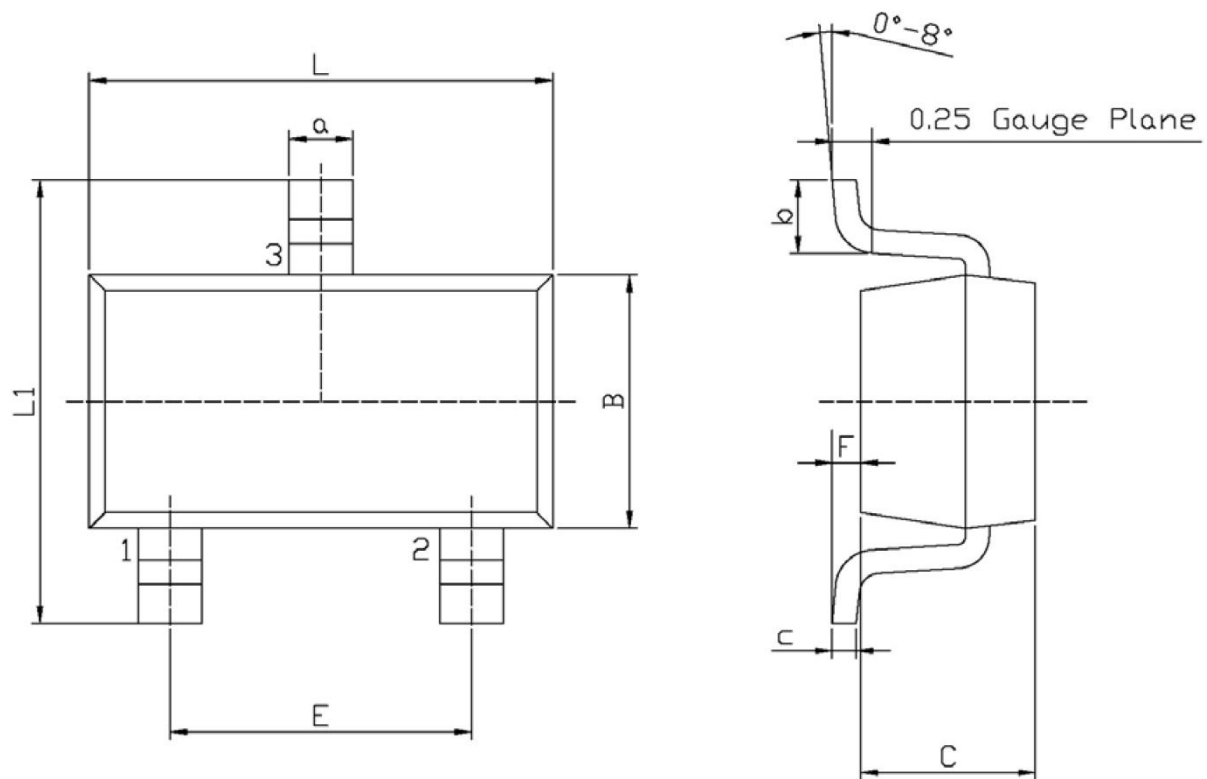
RESET Active Timeout Delay at $V_{CC} = 5V$

$V_{CC}=5V$, $-40^{\circ}C \leq T_A \leq 125^{\circ}C$



PACKAGE INFORMATION

SOT23-3



Unit: mm

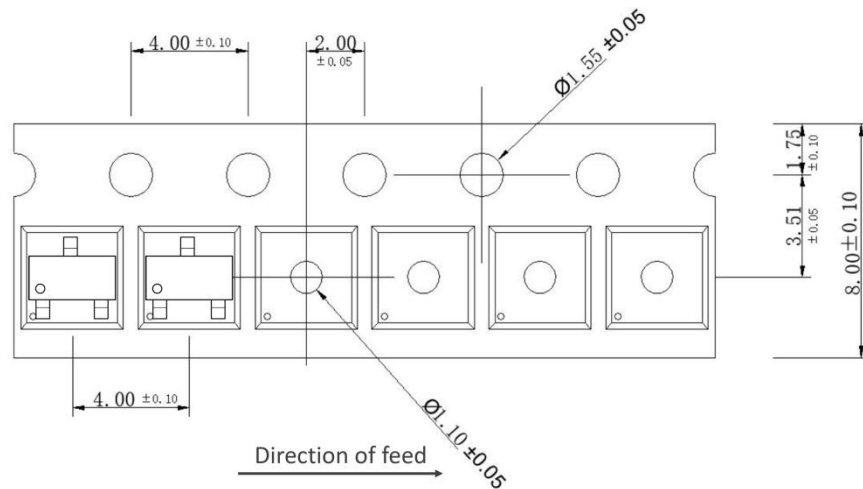
Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	a	0.35	0.50
B	1.50	1.70	c	0.10	0.20
C	0.90	1.30	b	0.30	0.55
L1	2.60	3.00	F	0	0.15
E	1.80	2.00			

Note:

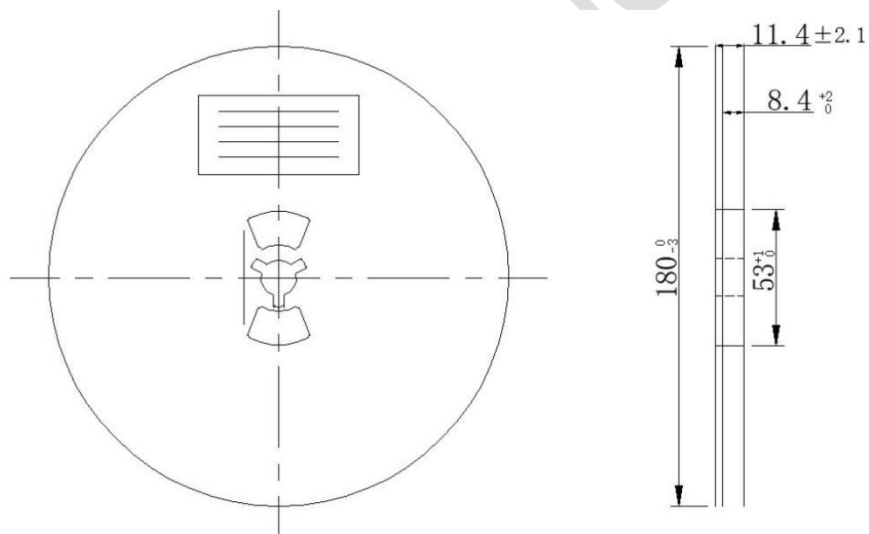
- 1) All dimensions are in millimeters.
- 2) Package length does not include mold flash, protrusion or gate burr.
- 3) Package width does not include inter lead flash or protrusion.
- 4) Lead popularity (bottom of leads after forming) shall be 0.10 millimeters max.

TAPE AND REEL INFORMATION

TAPE DIMENSIONS:



REEL DIMENSIONS:



Note:

- 1) All Dimensions are in Millimeter
- 2) Quantity of Units per Reel is 3000
- 3) MSL level is level 3.

Important Notification

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