FAIRCHILD SEMICONDUCTOR™

August 2000

FM810
Precision Reset Generator Circuit

General Description

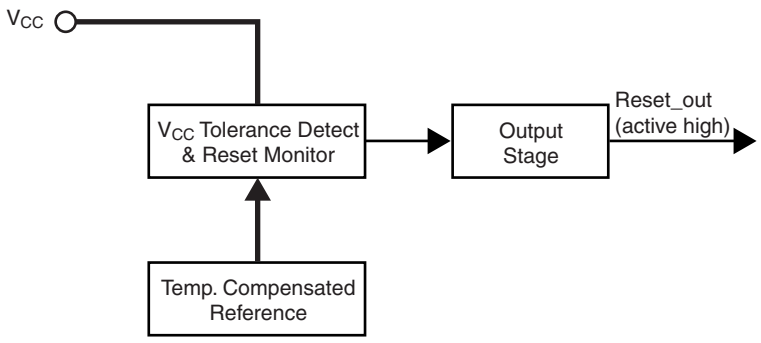
The FM810 features comprehensive reset generation for microcontroller/microprocessor based systems. If the system V_{CC} voltage level is determined to be in an out-of-tolerance state, the device automatically generates a high reset signal. The reset signal is held in the active state (high) for a specified duration (minimum 140 ms) after the V_{CC} returns to a in-tolerance state.

The FM810 is fabricated using CMOS technology. The FM810 is available in the SOT-23 package.

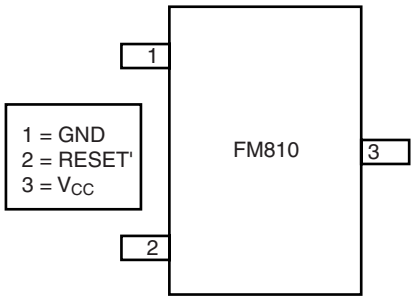
Features

- Automatic reset generation on power-up
- Minimum 140 ms reset pulse — compatible with other similar 810 class devices
- Other reset pulse choices available – 32 - 256 ms
- Choice of commercial and extended temperature ranges
- Choice of Reset Thresholds — 4.63V, 4.38V, 4.00V, 3.08V, 2.93V, 2.63V
- Package available: SOT-23

Block Diagram



Connection Diagram



Each FM810 device has the following Identifier (FM810yz) (Top Mark on devices will be 10yz)

Reset Characteristics

RESET THRESHOLD (V)	Identifier(y)	Fairchild Part Number
4.63	L	FM810Lz
4.38	M	FM810Mz
4.00	J	FM810Jz
3.08	T	FM810Tz
2.93	S	FM810Sz
2.63	R	FM810Rz

RESET PULSE DURATION (mS)	Identifier(z)	Fairchild Part Number
32	E	FM810yE*
64	F	FM810yF*
128	H	FM810yH*
256	Blank	FM810y

Note*: These choices are available upon special request only. Please work with Fairchild Marketing to determine availability.

Product Specifications

Absolute Maximum Ratings

Ambient Storage Temperature	–65°C to +150°C
All Input or Output Voltages with Respect to Ground	-0.3V to 6.5V
Lead Temperature (Soldering, 10 seconds)	+300°C
ESD Rating	2000V min.

Operating Conditions

Ambient Operating Temperature	
Commercial	0°C to +70°C
Industrial	-40°C to +85°C

Electrical Characteristics

Parameter	Symbol	Temp	Conditions	Min	Typ	Max	Units
V_{CC} Range		Com		1.0		5.5V	V
	I_{ND}			1.2		5.5	V
Supply Current	I_{CC}	Com				50	µA
						100	µA
Reset Threshold	V_{TH}	Com	'L' Identifier	4.50	4.63	4.75	V
		Ind		4.40	4.63	4.85	V
		Com	'M' Identifier	4.25	4.38	4.50	V
		Ind		4.16	4.38	4.56	V
		Com	'J' Identifier	3.89	4.00	4.10	V
		Ind		3.80	4.00	4.20	V
		Com	'T' Identifier	3.00	3.08	3.15	V
		Ind		2.92	3.08	3.23	V
		Com	'S' Identifier	2.85	2.93	3.00	V
		Ind		2.78	2.93	3.08	V
		Com	'R' Identifier	2.55	2.63	2.70	V
		Ind		2.50	2.63	2.75	V
nRESET Output Voltage High	V_{OH}	All	Isource = 150 mA	$0.8V_{CC}$			V
nRESET Output Voltage Low	V_{OL}	All	Isink = 1.2mA	0.4			V
Reset Timeout Period	T_{RST}	All		175	240	375	ms

Note : Production testing done at TA = +25°C, over temperature limits guaranteed by design only.

General Description

The FM810 features a highly accurate voltage reference against which the V_{CC} is compared. Once the V_{CC} is below the specified threshold, it will drive the RESET line and continue to hold it high till the V_{CC} returns above the threshold and the time for the RESET pulse duration has expired. The FM810 is immune to short negative going transients on the V_{CC} line. The placement of a 0.1µF bypass capacitor as close as possible to the V_{CC} pin provides additional transient immunity.

For a V_{CC} value below 1.0V-1.3V, the FM810 does not sink current on the RESET pin.

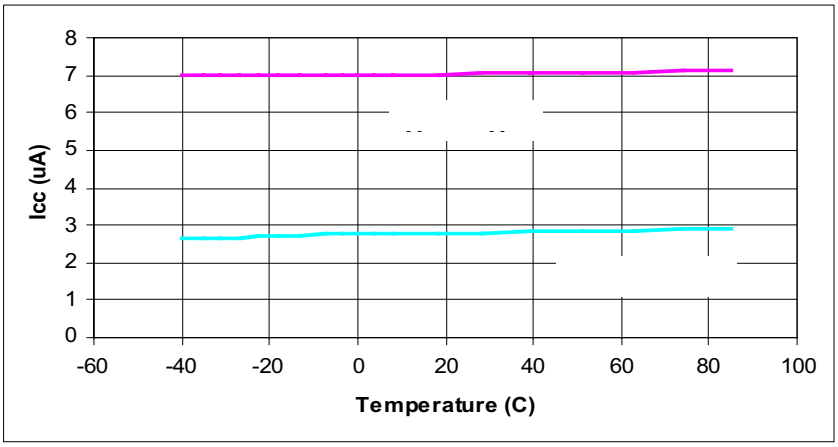
This is not a problem in most systems since most common devices are not functional in this range. If it is desired for the FM810 reset to be functional below the range above, it is suggested to use a 100KΩ pull-down resistor between RESET and V_{SS}.

Interfacing to Bidirectional reset pins

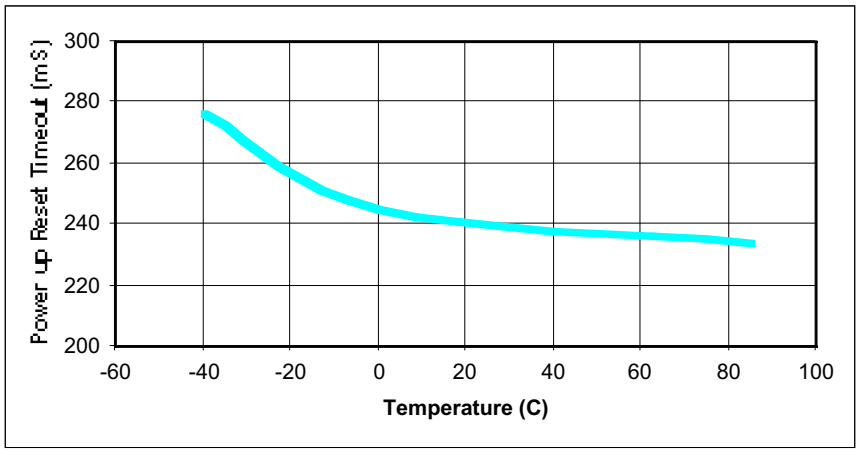
FM810 can be used with microprocessors with bidirectional reset pins. In order to allow the microprocessor to drive the reset line, the output of the FM810 must be connected to the microprocessor through a 4.7kΩ resistor. This will ensure that the RESET line has correct level at both the FM810 as well as the device end.

Typical Operating Characteristics

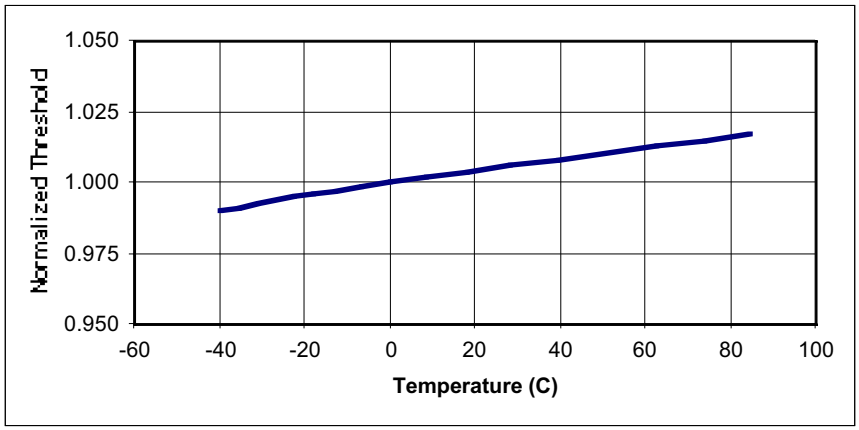
Supply Current Vs. Temperature (FM810R/S/T)



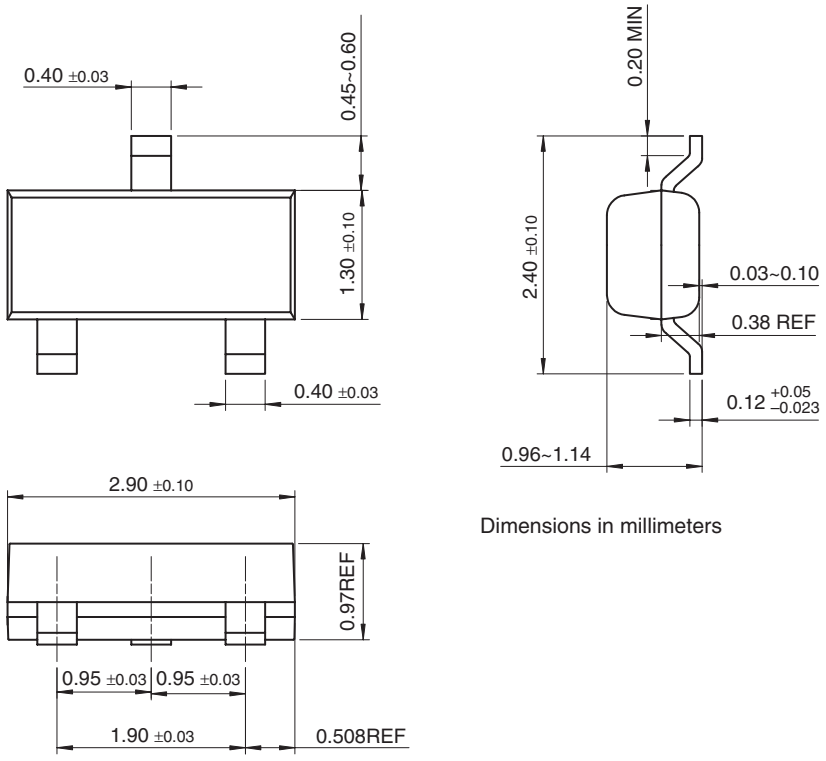
Power up Reset Timeout Vs. Temperature FM810(R/S/T)



Normalized Reset Threshold Vs. Temperature FM810(R/S/T)



Physical Dimensions inches (millimeters) unless otherwise noted



Dimensions in millimeters

SOT-23 Package Dimensions
FS Pkg Code AU

Life Support Policy

Fairchild's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of Fairchild Semiconductor Corporation. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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