

FM1233

Precision Reset Generator Circuit

General Description

The FM1233 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 low-going reset signal. The reset signal is held in the active state (low) for a specified duration (minimum 140 ms) after the V_{CC} returns to an in-tolerance state.

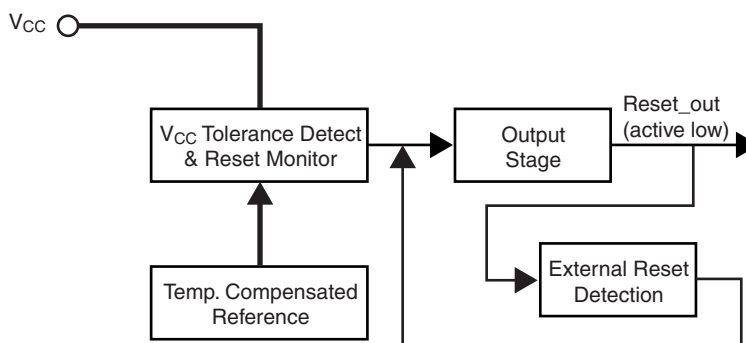
The FM1233 also allows an external reset to be connected to the reset pin without adding additional debounce logic or extra pins.

This device is fabricated using CMOS technology. This device is available in the SOT-23 package.

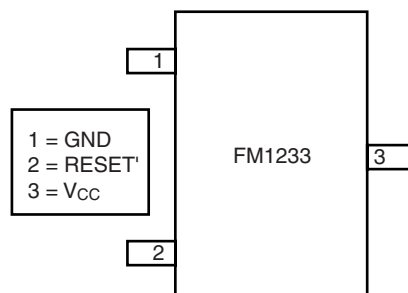
Features

- Automatic reset generation on power-up
- Minimum 140 ms reset pulse — compatible with other similar 1233 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 FM1233 device has the following Identifier (FM1233yz) (Top Mark on devices will be 10yz)

Reset Characteristics

RESET THRESHOLD (V)	Identifier(y)	Fairchild Part Number
4.63	L	FM1233Lz
4.38	M	FM1233Mz
4.00	J	FM1233Jz
3.08	T	FM1233Tz
2.93	S	FM1233Sz
2.63	R	FM1233Rz

RESET PULSE DURATION (mS)	Identifier(z)	Fairchild Part Number
32	E	FM1233yE*
64	F	FM1233yF*
128	H	FM1233yH*
256	Blank	FM1233y

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
		Ind		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	I _{source} = 150 mA	0.8V _{CC}			V
nRESET Output Voltage Low	V _{OL}	All	I _{sink} = 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

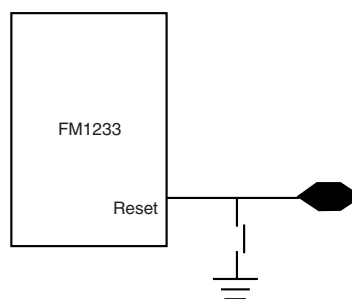
The FM1233 features a highly accurate voltage reference against which the V_{CC} is compared. Once the V_{CC} is below the specified threshold, it will drive the RESET line and continue to hold it low until the V_{CC} returns above the threshold and the time for the RESET pulse duration has expired. The FM1233 is immune to short negative going transients on the V_{CC} line. The placement of a $0.1\mu F$ 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 FM1233 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 FM1233 reset to be functional below the range above, it is suggested to use a $100K\Omega$ pull-down resistor between RESET and V_{SS} .

Bi-Directional Reset

The FM1233 allows for the connection of an external reset switch to be wired to the reset pin. The FM1233 has the feature of allowing an external reset pin to be connected without having to add debounce logic or an extra pin to the package. The FM1233 detects when an external source is pulling the reset line low. Once this occurs the FM1233 will pull the reset line low as well. When the external source stops driving the reset line the FM1233 will continue to hold the reset line low so as to prevent debounce. After a certain length of time the FM1233 will stop driving the reset line and it will return to its non-active (high) state.

Connecting an External Reset to the FM1233

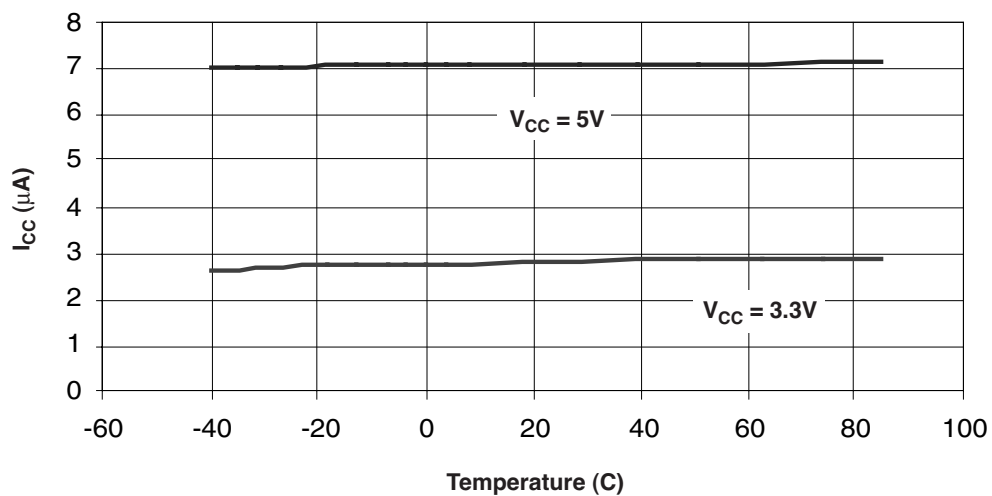


Interfacing to Bidirectional reset pins

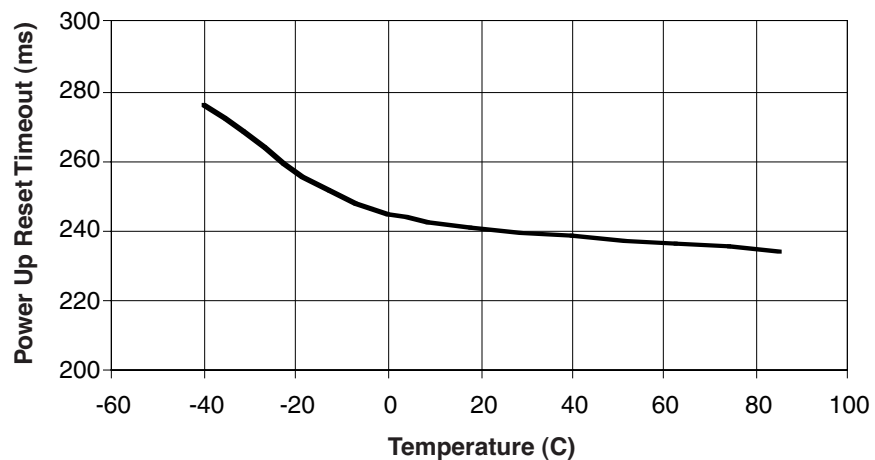
FM1233 can be used with microprocessors with bidirectional reset pins. The microprocessors can still drive the reset line but when the microprocessor has released the reset line the FM1233 will continue to hold it for a duration no longer than 300 ms.

Typical Operating Characteristics

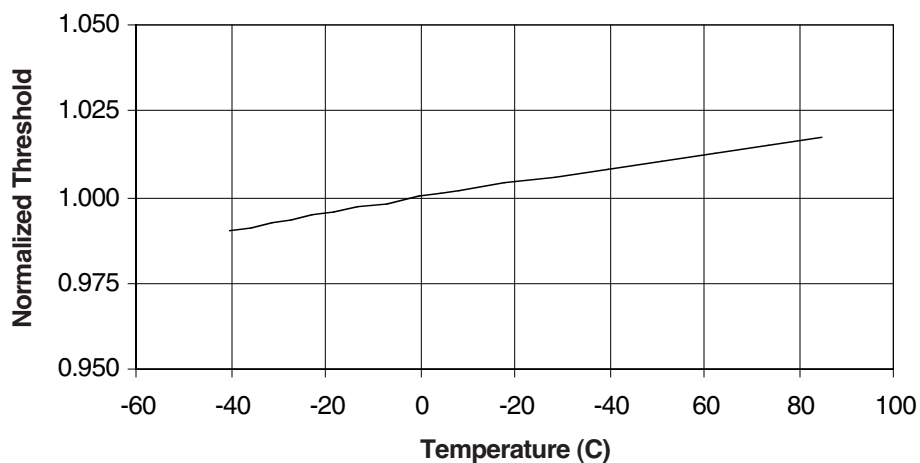
Supply Current Vs. Temperature (FM1233R/S/T)

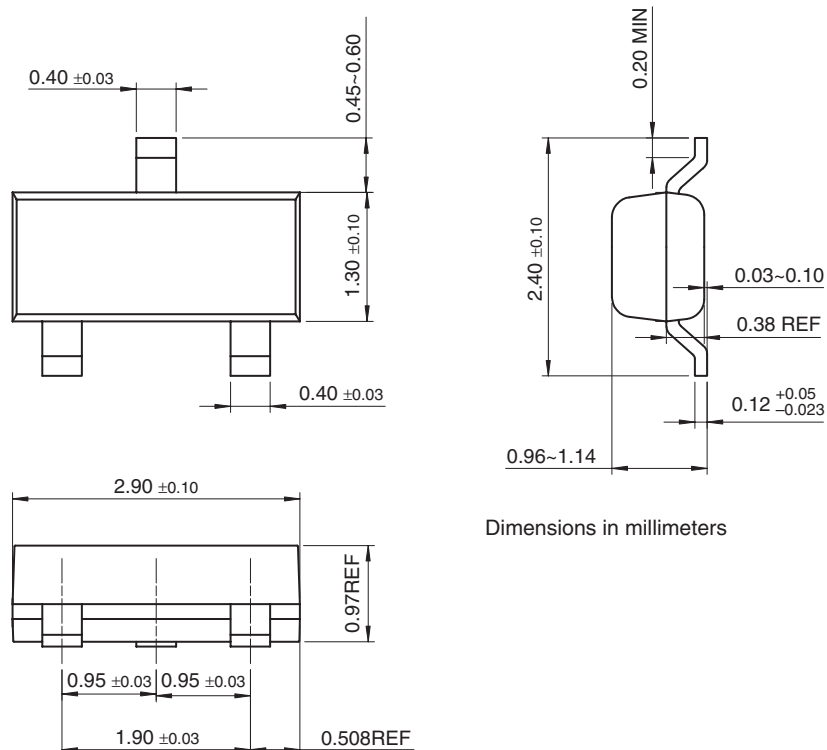


Power up Reset Timeout Vs. Temperature FM1233(R/S/T)



Normalized Reset Threshold Vs. Temperature FM1233(R/S/T)



Physical Dimensions inches (millimeters) unless otherwise noted

SOT-23 Package Dimensions
FS Pkg Code AU

Life Support Policy

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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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