



Maxim > Products > [Supervisors, Voltage Monitors, Sequencers]

## DS1833

5V EconoReset

### Description

The DS1833 is pin-compatible with the DS1233 and similar in function to the DS1233D but with an active high reset. It is intended for 5V systems that require a 350ms hold on active high reset for system stabilization.

The DS1833 monitors power supplies and automatically restarts the processor when operational safety thresholds are breached. It is designed with CMOS outputs and is capable of maintaining a valid output on the active high reset to 1.2V with an internal 5k $\Omega$  pull-up resistor. On power-up, the DS1833 holds reset for 350ms to allow the system to stabilize.

With a variety of features that can target a specific application, EconoResets provide simple and cost-effective CPU monitoring solutions.

### Key Features

- Power-fail monitor with automatic reset
- Precision temperature-compensated voltage reference and sensor
- Maintains active high reset for 350ms after power return
- Internal 5k $\Omega$  pull-up resistor
- Operating ranges: 5V with 5%, 10%, or 15% tolerance
- -40°C to +85°C

### Key Specifications: Supervisors (1 Monitored Voltage)

Part Number	Reset Threshold Range (V)	Active-High Reset Output	Min. Reset Timeout Range	Watchdog Feature	Supervisor Features	Reset Thresh. Acc. (% @+25°C)	Max. I <sub>CC</sub> ( $\mu$ A)	
DS1833	3.3 to 5.5	Open Drain with Internal Pull-Up	250ms to 450ms	No Watchdog	Power Fail Comparator	2.5	2000	

[See All Supervisors \(1 Monitored Voltage\) \(268\)](#)

**Notes:**

\*\*This pricing is BUDGETARY, for comparing similar parts. Prices are in U.S. dollars and subject to change. Quantity pricing may vary substantially and international prices may differ due to local duties, taxes, fees, and exchange rates. For volume-specific prices and delivery, please see the [price and availability page](#) or contact an authorized distributor.

**Application Notes**

[Application Note 3316: Dallas Semiconductor Microprocessor Supervisor Selection Guide - DS1833](#)

**Evaluation Kits**

none

**Design Guides**

[Microprocessor Supervisory \(PDF\)](#)

**Reliability Reports**

[Reliability Report: DS1833.](#)

[pdf](#)

**Software/Models**

none

**Ordering Information**

Notes:

1. Other options and links for purchasing parts are listed at:
2. [Didn't Find What You Need?](#) Ask our applications engineers. Expert assistance in finding parts, usually within one business day.
3. Part number suffixes: T or T&R = tape and reel; + = RoHS/lead-free; # = RoHS/lead-exempt. More: See [Full Data Sheet](#) or [Part Naming Conventions](#).
4. \* Some packages have variations, listed on the drawing. "PkgCode/Variation" tells which variation the product uses. Note that "+", "#", "-" in the part number suffix describes RoHS status. Package drawings may show a different suffix character.

**Devices: 1-24 of 24**

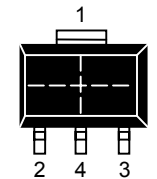
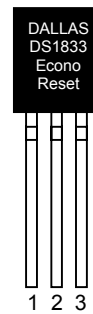
DS1833	Notes	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
DS1833Z-15+				ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833Z-5+				ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833Z-10+				ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833Z-5+T&R	5%			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833Z-15+T&R	15%			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833Z-10+T&R	10%			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833Z-15	15% Monitor			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>
DS1833Z-10	10% Monitor			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>
DS1833Z-5	5% Monitor			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>
DS1833Z-15/T&R	15%			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>
DS1833Z-10/T&R	10%			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>
DS1833Z-5/T&R	5%			ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>

DS1833-15+				TO92; 3 pin; Dwg: <a href="#">21-0248</a> (PDF) Use pkgcode/variation: Q3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833-10/T&R	10%			TO92; 3 pin; Dwg: <a href="#">21-0250</a> (PDF) Use pkgcode/variation: Q3-4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1833-5	5% Monitor			TO92; 3 pin; Dwg: <a href="#">21-0248</a> (PDF) Use pkgcode/variation: Q3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1833-10	10% Monitor			TO92; 3 pin; Dwg: <a href="#">21-0248</a> (PDF) Use pkgcode/variation: Q3-1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1833-10+				TO92; 3 pin; Dwg: <a href="#">21-0248</a> (PDF) Use pkgcode/variation: Q3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833-5+				TO92; 3 pin; Dwg: <a href="#">21-0248</a> (PDF) Use pkgcode/variation: Q3+1*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833-5+T&R	5%			TO92; 3 pin; Dwg: <a href="#">21-0250</a> (PDF) Use pkgcode/variation: Q3+4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1833-15/T&R	15%			TO92; 3 pin; Dwg: <a href="#">21-0250</a> (PDF) Use pkgcode/variation: Q3-4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
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DS1833-15+T&R	15%			TO92; 3 pin; Dwg: <a href="#">21-0250</a> (PDF) Use pkgcode/variation: Q3+4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>

## FEATURES

- Automatically restarts microprocessor after power failure
- Maintains active-high reset for 350 ms after  $V_{CC}$  returns to an in-tolerance condition
- Accurate 5%, 10% or 15% microprocessor 5V power supply monitoring
- Reduces need for discrete components
- Precision temperature-compensated voltage reference and voltage sensor
- Low-cost TO-92 package or surface mount SOT-223 package
- Internal 5k pull-up resistor
- Operating temperature of  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

## PIN ASSIGNMENT



TOP VIEW  
SOT-23 PACKAGE  
See Mech.  
Drawings Section  
On Website



BOTTOM VIEW  
TO-92 PACKAGE  
See Mech.  
Drawings Section  
On Website

## PIN DESCRIPTION

PIN 1	Ground
PIN 2	Reset
PIN 3	$V_{CC}$
PIN 4	Ground (SOT-223 only)

## DESCRIPTION

The DS1833 EconoReset uses a precision temperature compensated reference and comparator circuit to monitor the status of the power supply ( $V_{CC}$ ). When an out-of-tolerance condition is detected, an internal power fail signal is generated which forces reset to the active (high) state. When  $V_{CC}$  returns to an in-tolerance condition, the reset signal is kept in the active state for approximately 350 ms to allow the power supply and processor to stabilize.

## OPERATION - POWER MONITOR

The DS1833 provides the functions of detecting out-of-tolerance power supply conditions and warning a processor-based system of impending power failure. When  $V_{CC}$  is detected as out-of-tolerance, as defined by the tolerance of the part selected, the RST signal is asserted. On power-up, RST is kept active for approximately 350 ms after the power supply has reached the selected tolerance. This allows the power supply and microprocessor to stabilize before RST is released.

**ABSOLUTE MAXIMUM RATINGS\***

Voltage on V <sub>CC</sub> Pin Relative to Ground	-0.5V to +7.0V
Voltage on I/O Relative to Ground	-0.5V to V <sub>CC</sub> +0.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +125°C
Soldering Temperature	260°C for 10 seconds

\* This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

**RECOMMENDED DC OPERATING CONDITIONS** (-40°C to +85°C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	V <sub>CC</sub>	1.2	5.0	5.5	V	1

**DC ELECTRICAL CHARACTERISTICS** (-40°C to +85°C; V<sub>DD</sub>=5V ± 10%)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Low Level @ RST	V <sub>OL</sub>			0.4	V	1
Output Current @ 0.4V	I <sub>OL</sub>	+8			mA	
Operating Current	I <sub>CC</sub>		1.5	2	mA	
V <sub>CC</sub> Trip Point 5%	V <sub>CCTP1</sub>	4.5	4.625	4.74	V	1
V <sub>CC</sub> Trip Point 10%	V <sub>CCTP2</sub>	4.25	4.375	4.49	V	1
V <sub>CC</sub> Trip Point 15%	V <sub>CCTP3</sub>	4.0	4.125	4.24	V	1
Output Capacitance	C <sub>OUT</sub>			10	pF	
Internal Pull-Up Resistor	R <sub>P</sub>	3.75	5	6.25	kΩ	

**AC ELECTRICAL CHARACTERISTICS** (-40°C to +85°C; V<sub>CC</sub>=5V ± 10%)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Reset Active Time	t <sub>RST</sub>	250	350	450	ms	
V <sub>CC</sub> Detect to RST	t <sub>RPD</sub>			100	ns	
V <sub>CC</sub> Slew Rate (4.75V - 4.00V)	t <sub>F</sub>	300			μs	
V <sub>CC</sub> Slew Rate (4.00V - 4.75V)	t <sub>R</sub>	0			ns	
V <sub>CC</sub> Detect to RST	t <sub>RPU</sub>	250	350	450	ms	

**NOTES:**

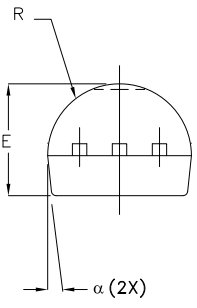
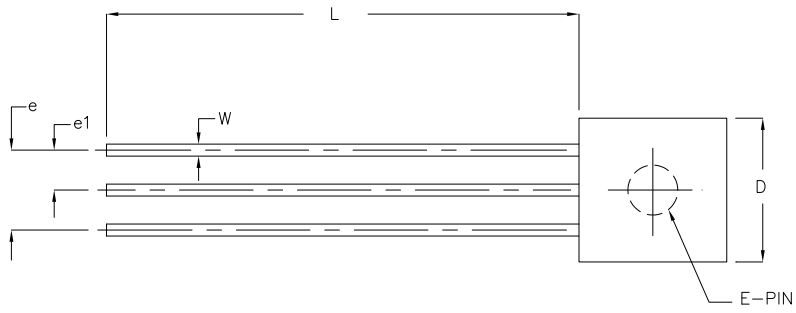
1. All voltages are referenced to ground.

**ECONORESET SELECTION GUIDE**

		VCC TRIP POINT			PUSHBUTTON DETECT		
		MIN	TYP	MAX	MIN	TYP	MAX
<b>5V</b>	DS1233-15	4.0	4.125	4.24	2.4	-	3.3
	DS1233-10	4.25	4.375	4.49	2.4	-	3.3
	DS1233-5	4.5	4.625	4.75	2.4	-	3.3
	DS1233D-15	4.0	4.125	4.24	N/A		N/A
	DS1233D-10	4.25	4.375	4.49	N/A		N/A
	DS1233D-5	4.5	4.625	4.75	N/A		N/A
	DS1833-15	4.0	4.125	4.24	N/A		N/A
	DS1833-10	4.25	4.375	4.49	N/A		N/A
	DS1833-5	4.5	4.625	4.75	N/A		N/A
<b>3.3V</b>	DS1233A-15	2.64	2.72	2.80	1.8	-	3.0
	DS1233A-10	2.8	2.88	2.97	1.8	-	3.0

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A			

SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.195	4.32	4.95
b	.014	.020	0.36	0.51
E	.130	.155	3.30	3.94
e	.095	.105	2.41	2.67
e1	.045	.055	1.14	1.40
L	.500	.610	12.70	15.49
R	.085	.095	2.16	2.41
S1	.045	.060	1.14	1.52
W	.016	.022	0.41	0.56
D	.175	.195	4.45	4.95
$\alpha$	4°	6°	4°	6°



- NOTE:
1. PACKAGE OUTLINE EXCLUSIVE OF ANY MOLD FLASHES DIMENSION.
  2. PACKAGE OUTLINE EXCLUSIVE OF BURR DIMENSION.
  3. CONTROLLED DIMENSION IS INCH.
  4. MEETS JEDEC T0-226 AA.

SIGNATURE	DATE	<b>MAXIM</b> MARKETING OUTLINE, T0-92, 3-PIN			
ASSY ENGR:					
PROD. ENGR:					
DES. ENGR:		SIZE	FSCM NO	DWG NO	REV
CHECK BY: TW	12/01	D		21-0248	A
DRAWN BY: JFD	12/01	SCALE	N/A		