

DS1813

5V EconoReset with Pushbutton

Description

The DS1813 (5V) and DS1818 (3.3V) EconoResets are simple three-pin voltage monitors and power-on resets that hold reset for 150ms for stabilization after power returns to tolerance. The voltage monitor uses precision temperature reference and comparator circuits that detect out-of-tolerance conditions and generate an active low reset.

The DS1813 (like the DS1811) has an open-drain output with an internal 5.5k Ω pull-up resistor for use in a wired-AND circuit. The DS1813 also monitors a pushbutton on the reset output, generating a reset when the pushbutton is released.

EconoResets replace discrete components and save space, particularly in the new SOT-23 package. They can benefit any system that requires reliable processor operation, especially consumer products like printers, HVAC, energy management, cellular telephones, PDAs, and set-top boxes.

Key Features

- Voltage monitor for power-fail detection
- Monitors pushbutton for external over-ride
- Active low reset output
- 150ms pause for stabilization
- Efficient open-drain output with internal 5.5k Ω pull-up resistor
- Maximum quiescent current of 40 μ A
- Operating ranges:
 - 5V with 5%, 10% or 15% tolerance
 - -40 $^{\circ}$ C to +85 $^{\circ}$ C

Key Specifications: Supervisors (1 Monitored Voltage)

Part Number	Reset Threshold Range (V)	Active-Low Reset Output	Min. Reset Timeout Range	Watchdog Feature	Supervisor Features	Reset Thresh. Acc. (% @+25°C)	Max. I _{CC} (µA)	
DS1813	3.3 to 5.5	Open Drain	85ms to 300ms	No Watchdog	Manual Reset	2.5	40	
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 - DS1813](#)

Evaluation Kits

none

Design Guides

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

Reliability Reports

[Reliability Report: DS1813.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

DS1813	Notes	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
DS1813R-15+T&R	5V-15% 3000/Reel			SOT-23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3+4*	-40°C to +85° C	See data sheet Materials Analysis
DS1813R-5-U+				SOT-23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3+4*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813R-15-U+				SOT-23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3+4*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813R-10-U+				SOT-23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3+4*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813R-10+T&R	5V-10% 3000/Reel			SOT-23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3+4*	-40°C to +85° C	See data sheet Materials Analysis
DS1813R-5+T&R	5V-5% 3000/Reel			SOT-23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3+4*	-40°C to +85° C	See data sheet Materials Analysis
DS1813R-15-U	5V-15% Partial Reel			SOT23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3-4*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813R-10-U	5V-10% Partial Reel			SOT23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3-4*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813R-5-U	5V-5% Partial Reel			SOT23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3-4*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813R-15/T&R	5V-15% 3000/Reel			SOT23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3-4*	-40°C to +85° C	See data sheet Materials Analysis
DS1813R-10/T&R	5V-10% 3000/Reel			SOT23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3-4*	-40°C to +85° C	See data sheet Materials Analysis

DS1813R-5/T&R	5V-5% 3000/Reel		SOT23; 3 pin; Dwg: 21-0051 (PDF) Use pkgcode/variation: U3-4*	-40°C to +85° C	See data sheet Materials Analysis
DS1813-15+T&R	5V-15% 2000/Reel		TO92; 3 pin; Dwg: 21-0250 (PDF) Use pkgcode/variation: Q3+4*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813-10+T&R	5V-10% 2000/Reel		TO92; 3 pin; Dwg: 21-0250 (PDF) Use pkgcode/variation: Q3+4*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813-5+T&R	5V-5% 2000/Reel		TO92; 3 pin; Dwg: 21-0250 (PDF) Use pkgcode/variation: Q3+4*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813-15+			TO92; 3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813-15/T&R	5V-15% 2000/Reel		TO92; 3 pin; Dwg: 21-0250 (PDF) Use pkgcode/variation: Q3-4*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813-10/T&R	5V-10% 2000/Reel		TO92; 3 pin; Dwg: 21-0250 (PDF) Use pkgcode/variation: Q3-4*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813-5/T&R	5V-5% 2000/Reel		TO92; 3 pin; Dwg: 21-0250 (PDF) Use pkgcode/variation: Q3-4*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813-15	5V-15% Monitor		TO92; 3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813-10	5V-10% Monitor		TO92; 3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813-5	5V-5% Monitor		TO92; 3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1813-10+			TO92; 3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1813-5+			TO92; 3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis

GENERAL DESCRIPTION

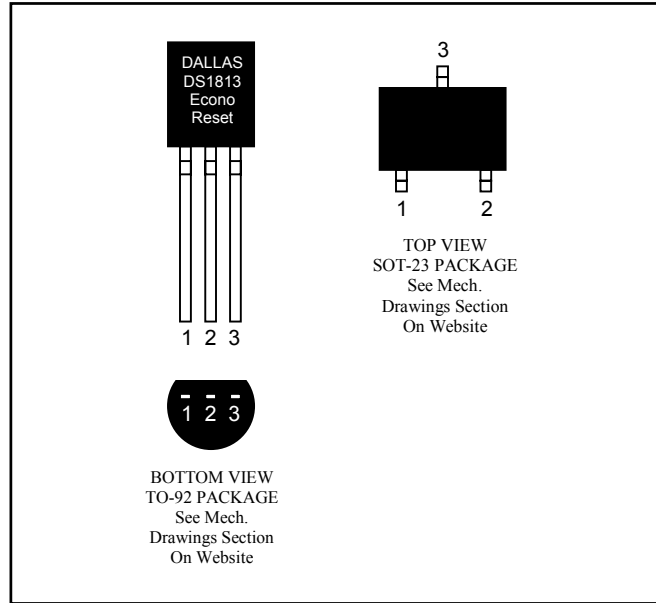
The DS1813 EconoReset uses a precision temperature reference and comparator circuit to monitor the status of the power supply (V_{CC}). When an out-of-tolerance condition is detected, an internal power-fail signal is generated which forces reset to the active state. When V_{CC} returns to an in-tolerance condition, the reset signal is kept in the active state for approximately 150ms to allow the power supply and processor to stabilize.

The DS1813 also monitors a pushbutton on the reset output. If the reset line is pulled low, a reset is generated upon release and will be held in reset output low for typically 150ms.

FEATURES

- Automatically Restarts a Microprocessor After Power Failure
- Monitors Pushbutton for External Override
- Maintains Reset for Typically 150ms After V_{CC} Returns to an In-Tolerance Condition
- Reduces Need for Discrete Components
- Precision Temperature-Compensated Voltage Reference and Voltage Sensor
- Low-Cost TO-92 or Space-Saving Surface-Mount SOT-23 Packages Available
- Efficient Open-Drain Output with Internal 5.5k Ω Pullup Resistor
- -40°C to +85°C Operating Temperature

PIN CONFIGURATIONS



PIN DESCRIPTION

PIN		NAME	FUNCTION
TO-92	SOT-23		
1	1	\overline{RST}	Active-Low Reset Output
2	2	V_{CC}	Power Supply
3	3	GND	Ground

ABSOLUTE MAXIMUM RATINGS

Voltage Range on V_{CC} Pin Relative to Ground.....	-0.5V to +7.0V
Voltage Range on \overline{RST} Relative to Ground.....	-0.5V to ($V_{CC} + 0.5V$)
Operating Temperature Range.....	-40°C to +85°C
Storage Temperature Range.....	-55°C to +125°C
Soldering Temperature.....	See IPC/JEDEC J-STD-020 Specification

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

($T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	V_{CC}	0		5.5	V	1

DC ELECTRICAL CHARACTERISTICS

($V_{CC} = 1.2V$ to $5.5V$, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$.)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES	
Output Current at 0.4V	I_{OL}	10			mA	2, 3	
Voltage Input Low	V_{IL}			0.4	V	1	
Voltage Input High	V_{IH}	0.7 x V_{CC}			V	1	
Operating Current $V_{CC} < 5.5$	I_{CC}		30	40	μA	4	
V_{CC} Trip Point	DS1813-5	V_{CCTP}	4.50	4.62	4.75	V	1
	DS1813-10		4.25	4.35	4.49		
	DS1813-15		4.00	4.13	4.24		
Internal Pullup Resistor	R_P	3.50	5.5	7.5	k Ω	6	
Output Capacitance	C_{OUT}			10	pF		

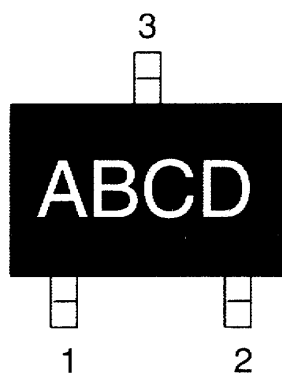
AC ELECTRICAL CHARACTERISTICS

($V_{CC} = 1.2V$ to $5.5V$, $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$.)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Reset Active Time	t_{RST}	100	150	300	ms	
V_{CC} Detect to \overline{RST}	t_{RPD}		2	5	μs	
V_{CC} Slew Rate ($V_{CCTP(MAX)} - V_{CCTP(MIN)}$)	t_F	300			μs	7
V_{CC} Slew Rate ($V_{CCTP(MIN)} - V_{CCTP(MAX)}$)	t_R	0			ns	
V_{CC} Detect to \overline{RST}	t_{RPU}	100	150	300	ms	5
Pushbutton Detect to \overline{RST}	t_{PB}	1			μs	
Pushbutton Reset	t_{PBRST}	100	150	300	ms	

NOTES:

- 1) All voltages are referenced to ground.
- 2) Measured with $V_{CC} \geq 2.7V$.
- 3) A $1k\Omega$ external resistor may be required in some applications for proper operation of the microprocessor reset control circuit.
- 4) Measured with \overline{RST} output open.
- 5) $t_R = 5\mu s$.
- 6) V_{OH} and I_{OH} are a function of the value of R_P and the associated output load conditions.
- 7) This value is for reference in defining values for t_{RPD} and should not be considered a requirement for proper operation or use of the device.

PART MARKING CODES

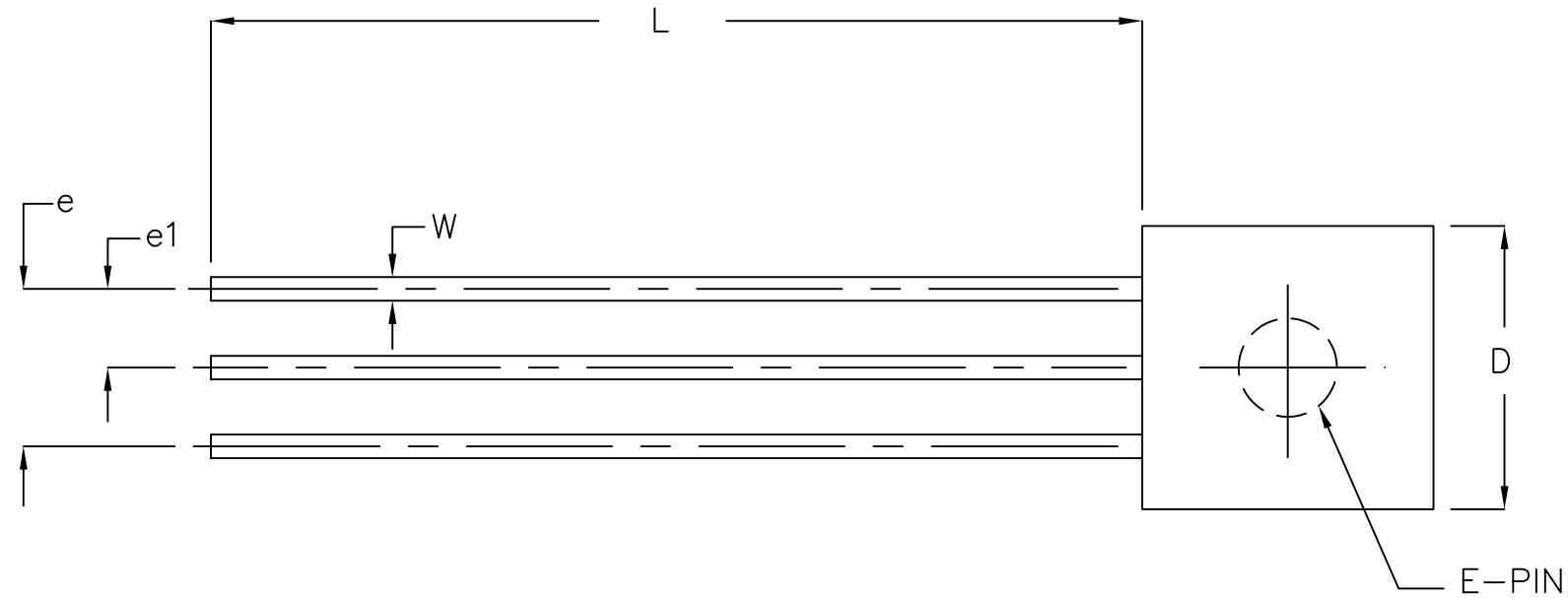
“A,” “B,” and “C” represent the device type.

810 DS1810
 811 DS1811
 812 DS1812
 813 DS1813
 815 DS1815
 816 DS1816
 817 DS1817
 818 DS1818

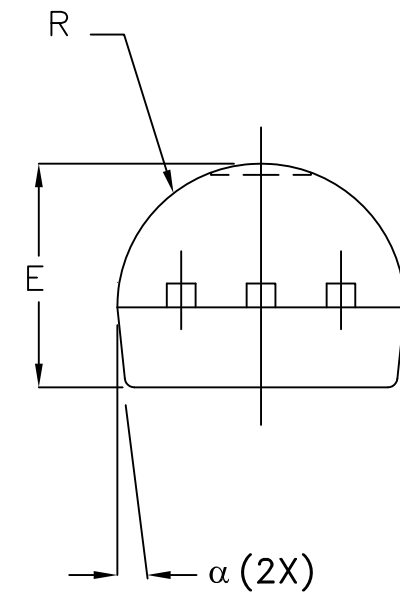
“D” represents the device tolerance.

A 5%
 B 10%
 C 15%
 D 20%

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
α	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 TO-226 AA.

SIGNATURE	DATE	MAXIM			
ASSY ENGR:					
PROD. ENGR:		MARKETING OUTLINE, TO-92, 3-PIN			
DES. ENGR:					
CHECK BY: TWM	12/01	SIZE D	FSCM NO	DWG NO 21-0248	REV A
DRAWN BY: JFD	12/01	SCALE N/A			SHEET 1 OF 1