

## DS1812

5V EconoReset with Active High Push-Pull Output

### Description

The DS1812 (5V) and DS1817 (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 high reset.

The output has a push-structure capable of maintaining a valid output to 0 volts with a 100k $\Omega$  pull-down resistor. The low-power circuit has a quiescent current consumption of only 40 micro-amps.

The DS1812 replaces discrete components and saves space, particularly in the new SOT-23 package. EconoResets 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

- Power-fail detection
- Resets system during power transients
- Push-pull active high reset
- 150ms stabilization pause
- Maximum quiescent current of 40 $\mu$ A
- 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	Reset Thresh. Acc. (% @ +25°C)	Max. I <sub>CC</sub> ( $\mu$ A)

DS1812	3.3 to 5.5	Push-Pull	85ms to 300ms	No Watchdog	2.5	40	
<a href="#">See All Supervisors (1 Monitored Voltage) (268)</a>							

#### 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 - DS1812](#)

#### Evaluation Kits

none

#### Design Guides

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

#### Reliability Reports

[Reliability Report: DS1812.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.

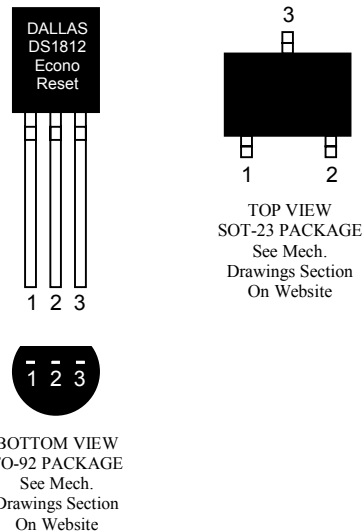
DS1812	Notes	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
DS1812R-5+T&R	5V-5%			SOT-23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3+4 *	-40°C to +85° C	See data sheet <a href="#">Materials Analysis</a>
DS1812R-15+T&R	5V-15%			SOT-23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3+4 *	-40°C to +85° C	See data sheet <a href="#">Materials Analysis</a>
DS1812R-5-U+				SOT-23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3+4 *	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1812R-15-U+				SOT-23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3+4 *	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1812R-10-U+				SOT-23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3+4 *	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1812R-10+T&R	5V-10%			SOT-23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3+4 *	-40°C to +85° C	See data sheet <a href="#">Materials Analysis</a>
DS1812R-5/T&R/CO1				SOT23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3-4 *	-40°C to +85° C	See data sheet <a href="#">Materials Analysis</a>
DS1812R-15/T&R	5V-15%			SOT23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3-4 *	-40°C to +85° C	See data sheet <a href="#">Materials Analysis</a>
DS1812R-5/T&R	5V-5%			SOT23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3-4 *	-40°C to +85° C	See data sheet <a href="#">Materials Analysis</a>
DS1812R-5-U	5V-5%			SOT23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3-4 *	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>
DS1812R-15-U	5V-15%			SOT23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3-4 *	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>
DS1812R-10-U	5V-10%			SOT23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3-4 *	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No</a> <a href="#">Materials Analysis</a>

DS1812R-10/T&R	5V-10%			SOT23; 3 pin; Dwg: <a href="#">21-0051</a> (PDF) Use pkgcode/variation: U3-4*	-40°C to +85° C	See data sheet <a href="#">Materials Analysis</a>
DS1812-5+T&R	5V-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>
DS1812-10+T&R	5V-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="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1812-15+				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>
DS1812-15+T&R	5V-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>
DS1812-15/T&R	5V-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>
DS1812-10/T&R	5V-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>
DS1812-5/T&R	5V-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="#">No Materials Analysis</a>
DS1812-15	5V-15% 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>
DS1812-10	5V-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>
DS1812-5	5V-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>
DS1812-10+				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>
DS1812-5+				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>

### FEATURES

- Automatically restarts a microprocessor after power failure
- Maintains reset for 150 ms 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
- Push-pull active high output
- Operating temperature  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

### PIN ASSIGNMENT



### PIN DESCRIPTION

#### TO-92

1	RST	Active High Reset Output
2	$V_{CC}$	Power Supply
3	GND	Ground

#### SOT-23

1	RST	Active High Reset Output
2	$V_{CC}$	Power Supply
3	GND	Ground

### DESCRIPTION

The DS1812 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 150 ms to allow the power supply and processor to stabilize.

**ABSOLUTE MAXIMUM RATINGS\***

Voltage on V <sub>CC</sub> Pin Relative to Ground	-0.5V to +7.0V
Voltage on RST 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>	0.0		5.5	V	1

**DC ELECTRICAL CHARACTERISTICS** (-40°C to +85°C; V<sub>CC</sub>=1.2V to 5.5V)

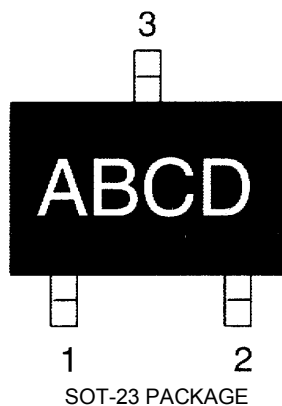
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Output Voltage @ 0-500 μA	V <sub>OH</sub>	V <sub>CC</sub> -0.5V	V <sub>CC</sub> -0.1V		V	1
Output Current @ 2.4 volts	I <sub>OH</sub>		350		μA	2
Output Current @ 0.4 volts	I <sub>OL</sub>	+10			mA	2
Operating Current V <sub>CC</sub> < 5.5	I <sub>CC</sub>		30	40	μA	3
V <sub>CC</sub> Trip Point (DS1812-5)	V <sub>CCCTP</sub>	4.50	4.62	4.75	V	1
V <sub>CC</sub> Trip Point (DS1812-10)	V <sub>CCCTP</sub>	4.25	4.35	4.49	V	1
V <sub>CC</sub> Trip Point (DS1812-15)	V <sub>CCCTP</sub>	4.00	4.13	4.24	V	1
Output Capacitance	C <sub>OUT</sub>			10	pF	

**AC ELECTRICAL CHARACTERISTICS** (-40°C to +85°C; V<sub>CC</sub>=1.2V to 5.5V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
RESET Active Time	t <sub>RST</sub>	100	150	300	ms	
V <sub>CC</sub> Detect to RST	t <sub>RPD</sub>		2	5	μs	
V <sub>CC</sub> Slew Rate (V <sub>CCCTP</sub> (MAX) to V <sub>CCCTP</sub> (MIN))	t <sub>F</sub>	300			μs	
V <sub>CC</sub> Slew Rate (V <sub>CCCTP</sub> (MIN) to V <sub>CCCTP</sub> (MAX))	t <sub>R</sub>	0			ns	
V <sub>CC</sub> Detect to RST	t <sub>RPU</sub>	100	150	300	ms	4

**NOTES:**

1. All voltages are referenced to ground.
2. Measured with  $V_{CC} \geq 2.7$  volts.
3. Measured with RST output open.
4.  $t_R = 5 \mu s$ .

**PART MARKING CODES**

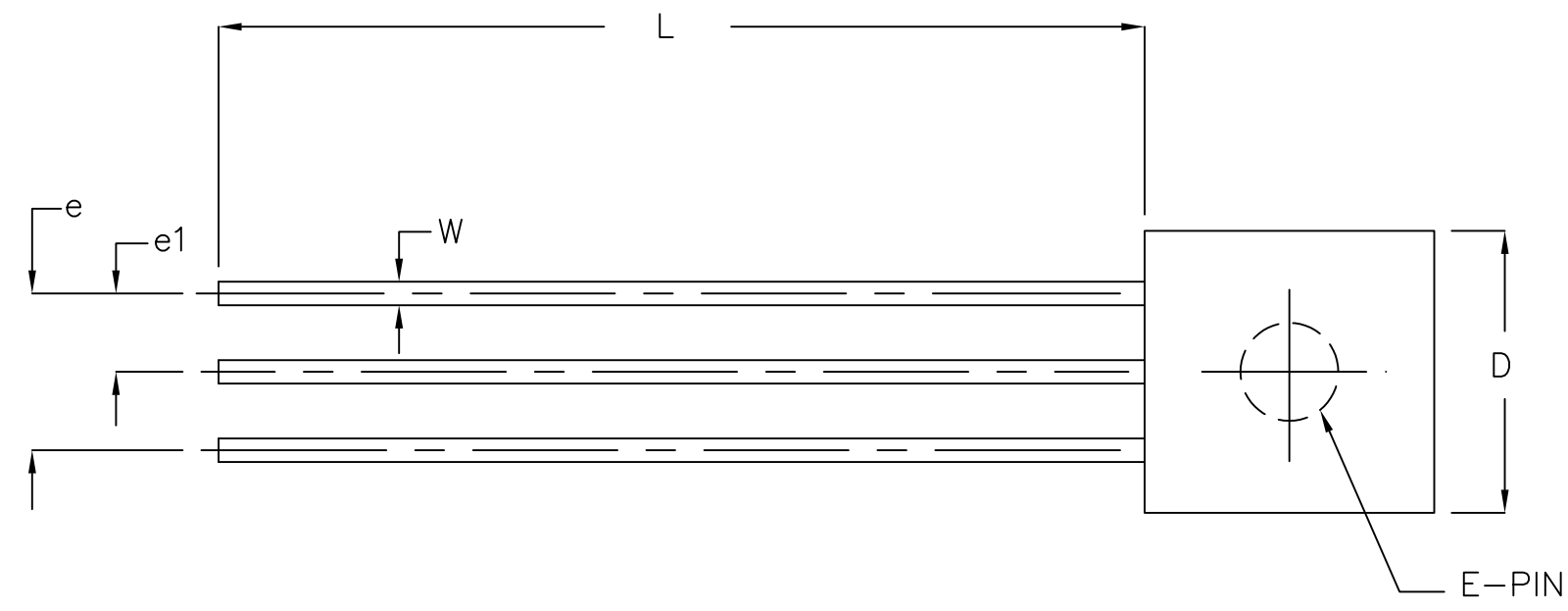
“A”, “B”, & “C” represent the device type.

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

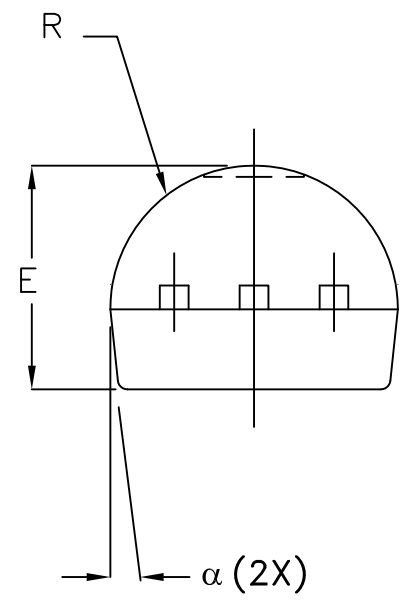
“D” represents the device tolerance.

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
$\alpha$	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 TO-226 AA.

SIGNATURE	DATE	<b>MAXIM</b>			
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