

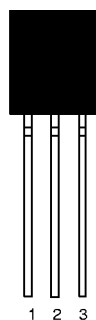
DALLAS
SEMICONDUCTOR

DS1813 5V EconoReset with Pushbutton

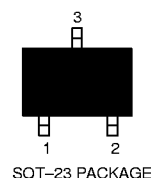
FEATURES

- Automatically restarts a microprocessor after power failure
- Monitors pushbutton for external override
- Maintains reset for typically 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
- Efficient open-drain output with internal 5.5K Ω pull-up resistor
- Operating temperature -40°C to $+85^{\circ}\text{C}$

PIN ASSIGNMENT



TO-92 PACKAGE
See Mech. Drawings
Section



SOT-23 PACKAGE

PIN DESCRIPTIONS

TO-92

1	$\overline{\text{RST}}$	Active Low Reset Output
2	V_{CC}	Power Supply
3	GND	Ground

SOT-23

1	$\overline{\text{RST}}$	Active Low Reset Output
2	V_{CC}	Power Supply
3	GND	Ground

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 sig-

nal is kept in the active state for approximately 150 ms to allow the power supply and processor to stabilize.

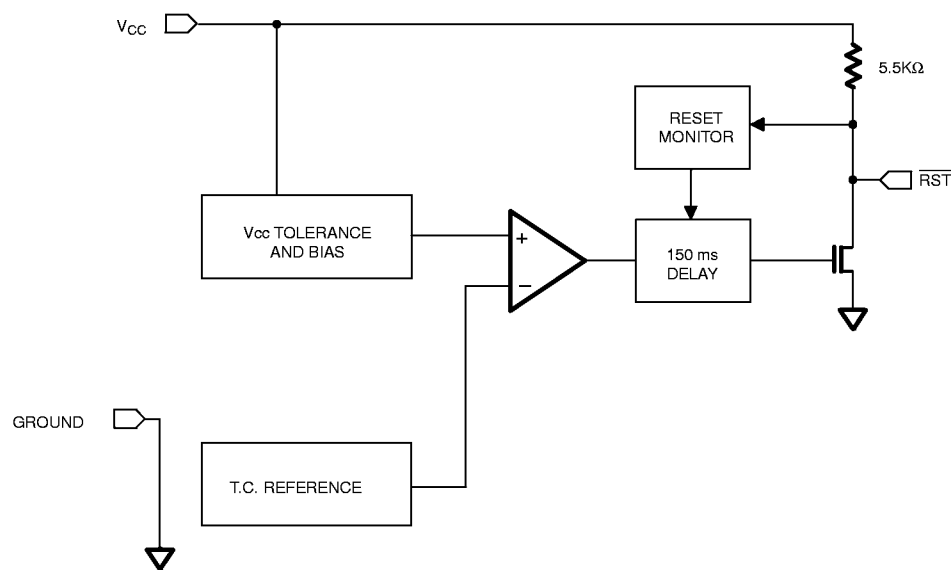
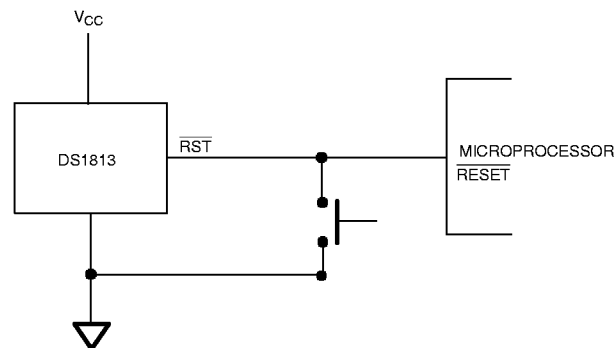
The DS1813 also monitors a pushbutton on the reset output. If the reset line is pulled low, a reset is generated upon release and will be held in reset output low for typically 150 ms.

OPERATION – POWER MONITOR

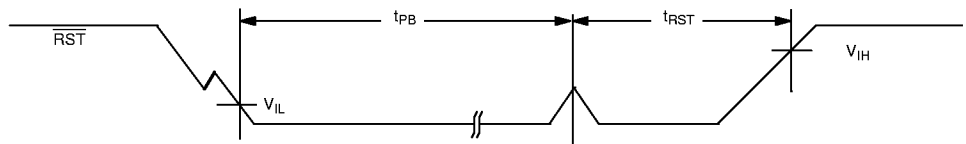
The DS1813 provides the functions of detecting out-of-tolerance power supply conditions and warning a processor-based system of impending power failure. When V_{CC} is detected as out-of-tolerance, the $\overline{RST}$ signal is asserted. On power-up, $\overline{RST}$ is kept active for approximately 150 ms after the power supply has reached the selected tolerance. This allows the power supply and microprocessor to stabilize before $\overline{RST}$ is released.

OPERATION – PUSHBUTTON RESET

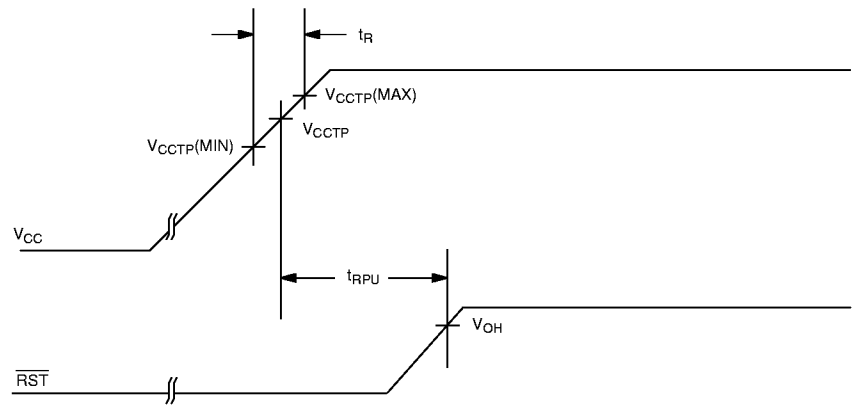
The DS1813 provides for a pushbutton switch for manual reset control. When the DS1813 is not in a reset cycle, a pushbutton reset can be generated by pulling the $\overline{RST}$ pin low for at least 1 μs . When the pushbutton is held low, the $\overline{RESET}$ is forced active low and will remain active low for about 150 ms after the pushbutton is released. See Figure 2 for an application example and Figure 3 for the timing diagram.

BLOCK DIAGRAM (OPEN-DRAIN OUTPUT) Figure 1**APPLICATION EXAMPLE** Figure 2

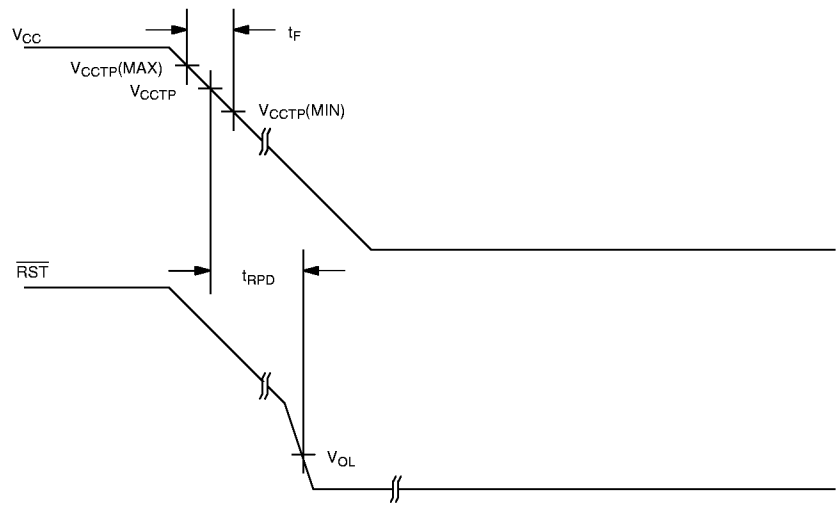
TIMING DIAGRAM: PUSHBUTTON RESET Figure 3



TIMING DIAGRAM: POWER UP Figure 4



TIMING DIAGRAM: POWER DOWN Figure 5



ABSOLUTE MAXIMUM RATINGS*

Voltage on V_{CC} Pin Relative to Ground	–0.5V to +7.0V
Voltage on $\overline{RST}$ Relative to Ground	–0.5V to +5 V_{CC} + 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_{CC}	0.0		5.5	V	1

DC ELECTRICAL CHARACTERISTICS(–40°C to +85°C; V_{CC} = 1.2V to 5.5V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Output Current @ 0.4 volts	I_{OL}	+10			mA	2, 3
Voltage Input Low	V_{IL}			0.4	V	1
Voltage Input High	V_{IH}	0.7 V_{CC}			V	1
Operating Current $V_{CC} < 5.5$	I_{CC}		30	40	μ A	4
V_{CC} Trip Point (DS1813–5)	V_{CCTP}	4.50	4.62	4.75	V	1
V_{CC} Trip Point (DS1813–10)	V_{CCTP}	4.25	4.35	4.49	V	1
V_{CC} Trip Point (DS1813–15)	V_{CCTP}	4.00	4.13	4.24	V	1
Internal Pull-Up Resistor	R_P	3.50	5.5	7.5	K	6
Output Capacitance	C_{OUT}			10	pF	

AC ELECTRICAL CHARACTERISTICS(–40°C to +85°C; V_{CC} = 1.2V to 5.5V)

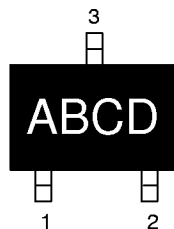
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
RESET Active Time	t_{RST}	100	150	300	ms	
V_{CC} Detect to $\overline{RST}$	t_{RPD}		2	5	μ s	
V_{CC} Slew Rate (V_{CCTP} (MAX) – V_{CCTP} (MIN))	t_F	300			μ s	7
V_{CC} Slew Rate (V_{CCTP} (MIN) – V_{CCTP} (MAX))	t_R	0			ns	
V_{CC} Detect to $\overline{RST}$	t_{RPU}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

NOTES:

1. All voltages are referenced to ground.
2. Measured with $V_{CC} \geq 2.7$ volts.
3. A 1K Ω external resistor may be required in some applications for proper operation of the microprocessor reset control circuit.

4. Measured with $\overline{\text{RST}}$ output open.
5. $t_R = 5\ \mu\text{s}$.
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", & "C" represent the device type.

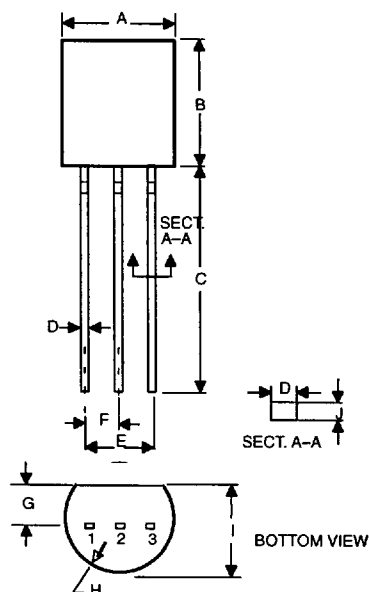
810	...	DS1810
811	...	DS1811
812	...	DS1812
813	...	DS1813
815	...	DS1815
816	...	DS1816
817	...	DS1817
818	...	DS1818

"D" represents the device tolerance.

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

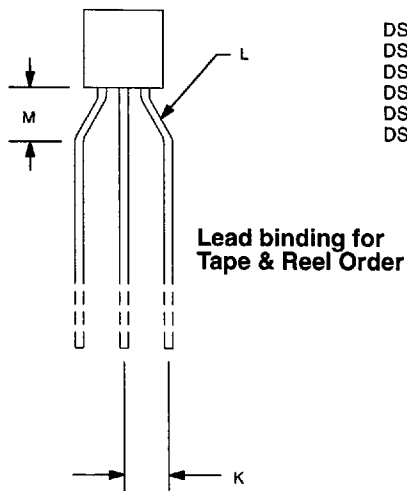
MECHANICAL DRAWINGS

TO-92 PACKAGE



Includes:

DS1233 DS2401
DS1233A DS2405
DS1233D DS2430
DS1833 DS2502
DS2223 DS2505
DS2224

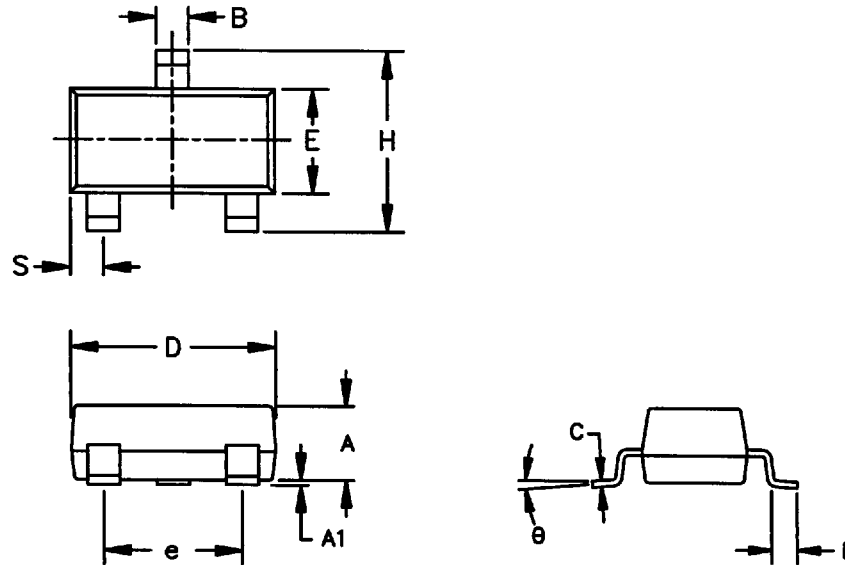


Lead binding for
Tape & Reel Order

PKG	TO-92	
DIM	MIN	MAX
A IN.	0.175	0.195
MM	4.45	4.96
B IN.	0.170	0.195
MM	4.32	4.96
C IN.	0.500	0.610
MM	12.70	15.49
D IN.	0.016	0.022
MM	0.406	0.559
E IN.	0.095	0.105
MM	2.41	2.67
F IN.	0.045	0.060
MM	1.14	1.52
G IN.	0.45	0.060
MM	1.14	1.52
H IN.	0.085	0.095
MM	2.16	2.41
I IN.	0.130	0.155
MM	3.30	3.94
J IN.	0.014	0.020
MM	0.35	0.51
K IN.	0.093	0.115
MM	2.36	2.92
L IN.	45°	60°
MM		
M IN.	0.118 TYPICAL	
MM	3.00	

MECHANICAL DRAWINGS

SOT 23



LTR	INCHES	
	MIN	MAX
A	0.030	0.040
A1	0.001	0.006
B	0.015	0.022
C	0.003	0.008
D	0.100	0.120
E	0.040	0.060
e	0.070	0.085
H	0.080	0.100
I	0.005	0.015
S	0.015	0.025
θ	0°	8°

NOTES:

1. PACKAGE OUTLINE EXCLUSIVE OF ANY MOLD FLASHES DIMENSION.
2. PACKAGE OUTLINE EXCLUSIVE OF BURR DIMENSION.

56-G2017-001