



DS1233A	2.5 to 3.3	Open Drain with Internal Pull-Up	85ms to 300ms	No Watchdog	Manual Reset	2.5	50	
<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 - DS1233A](#)

#### Evaluation Kits

none

#### Design Guides

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

#### Reliability Reports

Request Reliability Report for:

#### 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: 1-17 of 17

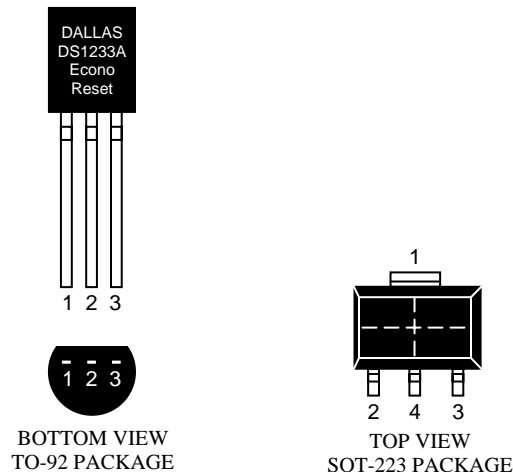
DS1233A	Notes	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
DS1233AZ-10/TR+C19				ST223; 3 pin; Dwg: <a href="#">21-0264</a> (PDF) Use pkgcode/variation: K3+1*	-40°C to +85°C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1233AZ-10+T&R	3.3V-10% 2500/Reel			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>
DS1233AZ-15	3.3V-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>
DS1233AZ-10	3.3V-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>
DS1233AZ-15/T&R	3.3V-15% 2500/Reel			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>
DS1233AZ-10/T&R	3.3V-10%, 2500/Reel			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>
DS1233AZ-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>
DS1233AZ-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>
DS1233AZ-15+T&R	3.3V-15% 2500/Reel			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>
DS1233A-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>
DS1233A-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>

DS1233A-15+T&R	3.3V-15% 2000/Reel			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>
DS1233A-10+T&R	3.3V-10% 2000/Reel			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>
DS1233A-15/T&R	3.3V-15% 2000/Reel			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</a> <a href="#">Materials Analysis</a>
DS1233A-10/T&R	3.3V-10% 2000/Reel			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</a> <a href="#">Materials Analysis</a>
DS1233A-15	3.3V-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</a> <a href="#">Materials Analysis</a>
DS1233A-10	3.3V-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</a> <a href="#">Materials Analysis</a>

## FEATURES

- Automatically restarts microprocessor after power failure
- Monitors pushbutton for external override
- Internal circuitry debounces pushbutton switch
- Maintains reset for 350ms after  $V_{CC}$  returns to an in-tolerance condition or pushbutton released
- Accurate 10% or 15% microprocessor 3.3V 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 $\Omega$  pull-up resistor
- Operating temperature of -40°C to +85°C

## PIN ASSIGNMENT



## PIN DESCRIPTION

PIN 1	$\overline{\text{GROUND}}$
PIN 2	$\overline{\text{RESET}}$
PIN 3	$V_{CC}$
PIN 4	$\overline{\text{GROUND}}$ (SOT-223 ONLY)

## DESCRIPTION

The DS1233A EconoReset monitors two vital conditions for a microprocessor: power supply and external override. A precision temperature-compensated reference and comparator circuit are used 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 350ms to allow the power supply and processor to stabilize. The second function of the DS1233A is pushbutton reset control. The DS1233A debounces a pushbutton closure and will generate a 350ms reset pulse upon release.

## OPERATION — POWER MONITOR

The DS1233A 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  $\overline{\text{RST}}$  signal is asserted. On power-up,  $\overline{\text{RST}}$  is kept active for approximately 350ms after the power supply has reached the selected tolerance. This allows the power supply and microprocessor to stabilize before  $\overline{\text{RST}}$  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 Range	-40°C to +85°C
Storage Temperature Range	-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	3.3	5.5	V	1

**DC ELECTRICAL CHARACTERISTICS** (-40°C to +85°C; V<sub>DD</sub> = 3.3V ± 10%)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Low Level @ $\overline{\text{RST}}$	V <sub>OL</sub>			0.4	V	1
Output Current @ 0.4V	I <sub>OL</sub>	+8			mA	
Operating Current	I <sub>CC</sub>			50	μA	
V <sub>CC</sub> Trip Point 10%	V <sub>CC</sub> TP1	2.80	2.88	2.97	V	1
V <sub>CC</sub> Trip Point 15%	V <sub>CC</sub> TP2	2.64	2.72	2.80	V	1
Output Capacitance	C <sub>OUT</sub>			10	pF	
Pushbutton Detect	PB <sub>DV</sub>	0.8		2.0	V	1
Pushbutton Release	PB <sub>RD</sub>		0.3	0.8	V	1, 2
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> = 3.3V ± 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 $\overline{\text{RST}}$	t <sub>RPD</sub>			100	ns	
V <sub>CC</sub> Slew Rate (2.85V - 2.3V)	t <sub>F</sub>	300			μs	
V <sub>CC</sub> Slew Rate (2.3V - 2.85V)	t <sub>R</sub>	0			ns	
Pushbutton Debounce	PB <sub>DB</sub>	250	350	450	ms	
V <sub>CC</sub> Detect to RST	t <sub>RPU</sub>	250	350	450	ms	

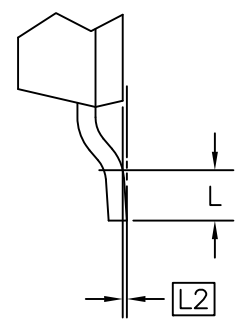
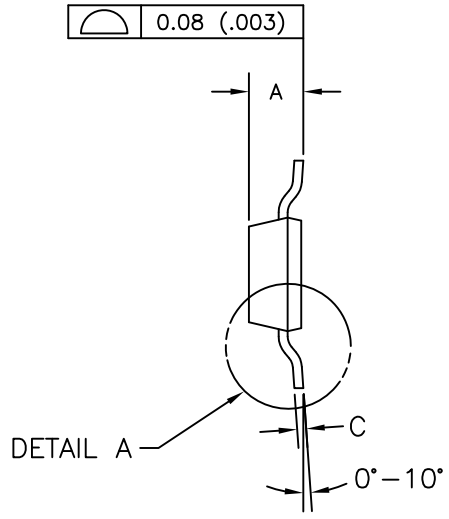
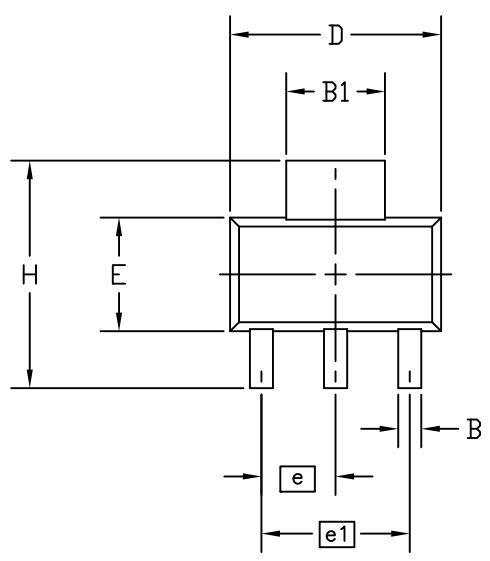
**NOTES:**

- 1) All voltages are referenced to ground.
- 2) With a 100pF to 0.01μF capacitor connected from  $\overline{\text{RST}}$  to ground.

**ECONORESET SELECTION GUIDE**

		<b>V<sub>CC</sub> TRIP POINT</b>			<b>PUSHBUTTON DETECT</b>		
		<b>MIN</b>	<b>TYP</b>	<b>MAX</b>	<b>MIN</b>	<b>TYP</b>	<b>MAX</b>
<b>5V</b>	DS1233-15	4.0	4.125	4.24	1.8	-	3.3
	DS1233-10	4.25	4.375	4.49	1.8	-	3.3
	DS1233-5	4.5	4.625	4.75	1.8	-	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	0.8	-	2.0
	DS1233A-10	2.8	2.88	2.97	0.8	-	2.0

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A			



DIM	MIN	NOM	MAX
A IN. MM	- -	- -	.071 1.80
B IN. MM	.024 0.60	.029 0.74	.035 0.88
B1 IN. MM	.114 2.90	.120 3.04	.125 3.18
C IN. MM	.009 0.24	.012 0.30	.016 0.40
D IN. MM	.248 6.30	.256 6.50	.264 6.70
E IN. MM	.130 3.30	.138 3.50	.146 3.70
e IN. MM	.091 BSC 2.30 BSC		
e1 IN. MM	.181 BSC 4.60 BSC		
H IN. MM	.264 6.70	.276 7.00	.287 7.30
L IN. MM	.036 0.91	- -	- -
L2 IN. MM	.0024 BSC 0.06 BSC		

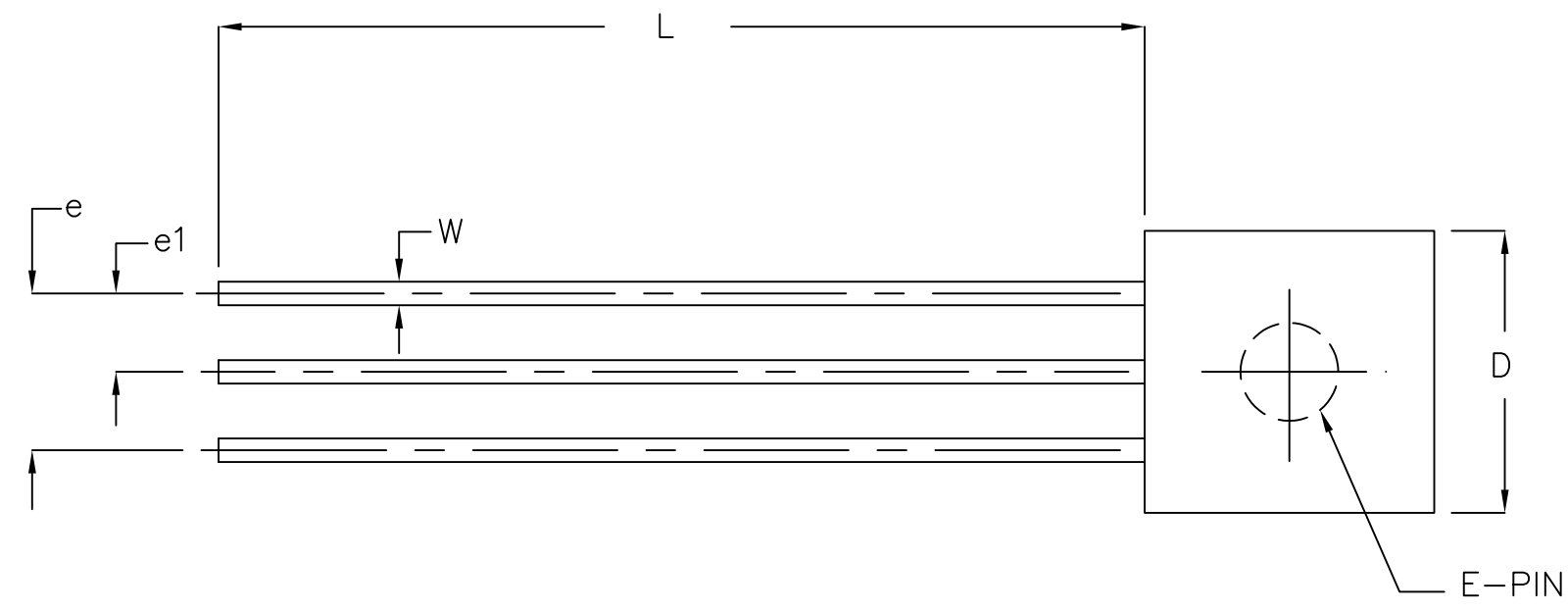
SIGNATURE	DATE
DOC. CONTROL:	
ENGR. MGR:	
MFG. ENGR:	
CHECKED BY:	
DRAWN BY: R. ERBACHER	1-30-96



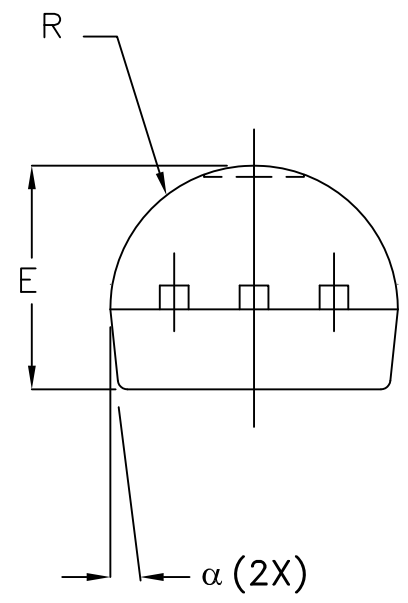
TITLE		MARKETING OUTLINE SOT-223 (TO-261)	
SIZE	FSCM NO	PART NO.	REV
A		21-0264	A



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