DS1233

5V EconoReset

Description

The DS1233 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 DS1233 is pushbutton reset control. The DS1233 debounces a pushbutton closure and will generate a 350ms reset pulse upon release.

Key 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 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 5kΩpull-up resistor
- Operating temperature of -40°C to +85°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)	

DS1233	3.3 to 5.5	Open Drain with Internal Pull-Up	250ms to 450ms	No Watchdog	Manual Reset	2.5	50	
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 51: How to Save Data During a Power Fail without Corrupting It - DS1233
Application Note 3316: Dallas Semiconductor Microprocessor Supervisor Selection Guide - DS1233

Evaluation Kits

none

Design Guides

Microprocessor Supervisory (PDF)

Reliability Reports

Reliability Report: DS1233.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: SeeFull 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: 1-26 of 26

DS1233	Notes	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
DS1233Y-10/T&R+C05				ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1233Z-10+T&R	5V-10% 2500/Reel			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1233Z-15	5V-15% Monitor			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1233Z-10	5V-10% Monitor			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1233Z-5	5V-5% Monitor			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1233Z-15/T&R	5V-15% 2500/Reel			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1233Z-10/T&R	5V-10% 2500/Reel			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1233Z-15+T&R	5V-15% 2500/Reel			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1233Z-5/T&R	5V-5%, 2500/Reel			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3-1*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1233Z-10+				ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1233Z-5+				ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3+1*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis

DS1233Z-15+				ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3+1*	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1233Z-5+T&R	5V-5% 2500/Reel			ST223;3 pin; Dwg: 21-0264 (PDF) Use pkgcode/variation: K3+1*	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1233-15/T&R/STR				TO92;3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3-1*	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis
DS1233-10+				TO92;3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3+1*	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1233-10+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
DS1233-5+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
DS1233-5+	5V-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
DS1233-15+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
DS1233-15/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
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DS1233-15	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
DS1233-10	5V-10%			TO92;3 pin; Dwg: 21-0248 (PDF) Use pkgcode/variation: Q3-1*	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis

DS1233
5V EconoReset

FEATURES

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- Reduces need for discrete components
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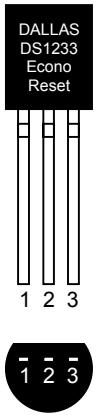
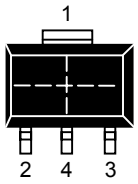
- Internal 5kΩ pull-up resistor
- Operating temperature of -40°C to +85°C

PIN ASSIGNMENT



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



TOP VIEW
SOT-223 PACKAGE
See Mech.
Drawings Section
on Website

PIN DESCRIPTION

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

DESCRIPTION

The DS1233 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 DS1233 is pushbutton reset control. The DS1233 debounces a pushbutton closure and will generate a 350ms reset pulse upon release.

OPERATION — POWER MONITOR

The DS1233 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_{CC} Pin Relative to Ground	-0.5V to +7.0V
Voltage on I/O 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	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}	1.2	5.0	5.5	V	1

DC ELECTRICAL CHARACTERISTICS (-40°C to +85°C; V_{DD} = 5V ± 10%)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Low Level @ $\overline{RST}$	V_{OL}			0.4	V	1
Output Current @ 0.4V	I_{OL}	+8			mA	
Operating Current	I_{CC}			50	µA	
V_{CC} Trip Point 5%	V_{CCTP0}	4.50	4.625	4.75	V	1
V_{CC} Trip Point 10%	V_{CCTP1}	4.25	4.375	4.49	V	1
V_{CC} Trip Point 15%	V_{CCTP2}	4.0	4.125	4.24	V	1
Output Capacitance	C_{OUT}			10	pF	
Pushbutton Detect	PB_{DV}	1.8		3.3	V	1
Pushbutton Release	PB_{RD}		0.3	0.8	V	1, 2
Internal Pull-Up Resistor	R_P	3.75	5	6.25	kΩ	

AC ELECTRICAL CHARACTERISTICS (-40°C to +85°C; V_{CC} = 5V ± 10%)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
RESET Active Time	t_{RST}	250	350	450	ms	
V_{CC} Detect to $\overline{RST}$	t_{RPD}			100	ns	
V_{CC} Slew Rate (4.75V - 4.00V)	t_F	300			µs	
V_{CC} Slew Rate (4.00V - 4.75V)	t_R	0			ns	
Pushbutton Debounce	PB_{DB}	250	350	450	ms	
V_{CC} Detect to RST	t_{RPU}	250	350	450	ms	

NOTES:

1) All voltages are referenced to ground.

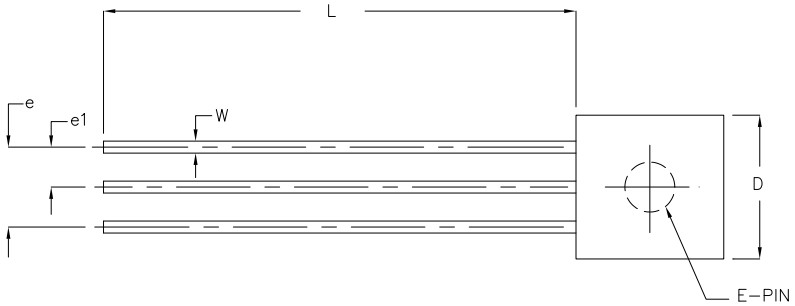
2) With a 100pF to 0.01µF capacitor connected from $\overline{RST}$ to ground.

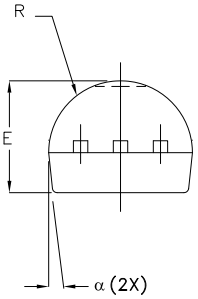
ECONORESET SELECTION GUIDE

		V_{CC} TRIP POINT			PUSHBUTTON DETECT		
		MIN	TYP	MAX	MIN	TYP	MAX
5V	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
3.3V	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			

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
ASSY ENGR:	
PROD. ENGR:	
DES. ENGR:	
CHECK BY: TWM	12/01
DRAWN BY: JFD	12/01

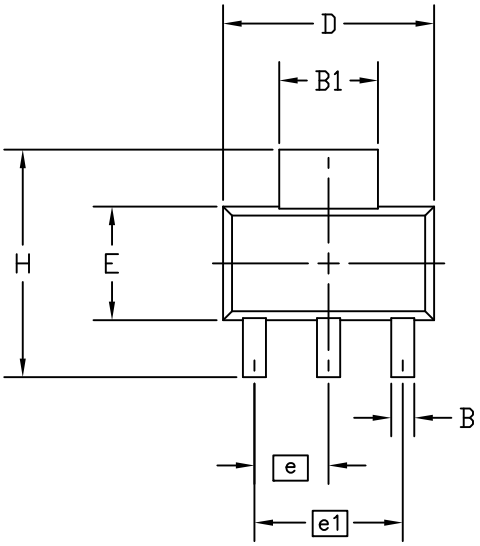
MAXIM

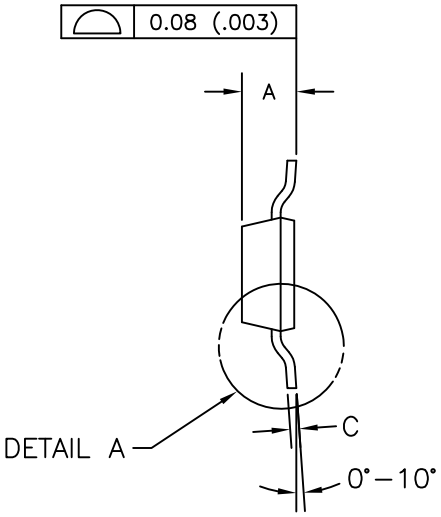
MARKETING OUTLINE, TO-92, 3-PIN

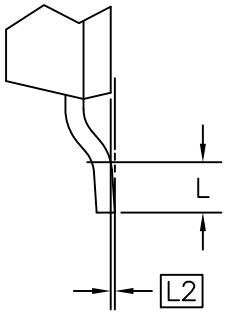
SIZE	FSCM NO	DWG NO	REV
D		21-0248	A

SCALE N/A SHEET 1 OF 1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A			







DETAIL 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

MAXIM

TITLE

MARKETING OUTLINE
SOT–223 (TO–261)

SIZE	FSCM NO	PART NO.	REV
A		21–0264	A

DO NOT SCALE DWG. | SCALE N/A | SHEET 1 OF 1