

DS1231	3.3 to 5.5	Open Drain	85ms to 300ms	No Watchdog	Power Fail Comparator	2.5	2000	
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 245: Adding Hysteresis to CPU Supervisor Voltage Sense Inputs Monitoring Upstream Voltage Supplies for Power-Fail Warnings - DS1231](#)

[Application Note 3316: Dallas Semiconductor Microprocessor Supervisor Selection Guide - DS1231](#)

Evaluation Kits

none

Reliability Reports

Reliability Report: [DS1231.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.

DS1231	Notes	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
DS1231-50+				PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8+7*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231-20N+				PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8+7*	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231-35N+				PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8+7*	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231-50N+				PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8+7*	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231-35+				PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8+7*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231-20+	200mV Hysteresis			PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8+7*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231-50	500mV Hysteresis			PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8-7*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231-20	200mV Hysteresis			PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8-7*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231-35	350mV Hysteresis			PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8-7*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231-50/G				PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8-7*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231-35N	350mV Hysteresis			PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8-7*	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis
DS1231-20N	200mV Hysteresis			PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8-7*	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis

DS1231-50N	500mV Hysteresis			PDIP; 8 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P8-7*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1231S-20+T&R				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+11*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231S-35+				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+11*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231S-35N/T&R				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	-40°C to +85° C	See data sheet Materials Analysis
DS1231S-50N/T&R				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1231S-50N+				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+11*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231S-20N+				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+11*	-40°C to +85° C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231S-50+				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+11*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231S-500+T&R				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+11*	0°C to +70°C	See data sheet Materials Analysis
DS1231S-20+				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+11*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
DS1231S-20	200mV Hysteresis			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231S-20/T&R	200mV Hysteresis			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis

DS1231S-35	350mV Hysteresis			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231S-35/T&R	350mV Hysteresis			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231S-50	500mV Hysteresis			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
DS1231S-500/T&R				SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	0°C to +70°C	See data sheet Materials Analysis
DS1231S-20N	200mV Hysteresis			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis
DS1231S-50N	500mV Hysteresis			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-11*	-40°C to +85° C	RoHS/Lead-Free: No Materials Analysis

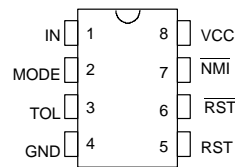
FEATURES

- Warns processor of an impending power failure
- Provides time for an orderly shutdown
- Prevents processor from destroying nonvolatile memory during power transients
- Automatically restarts processor after power is restored
- Suitable for linear or switching power supplies
- Adjusts to hold time of the power supply
- Supplies necessary signals for processor interface
- Accurate 5% or 10% V_{CC} monitoring
- Replaces power-up reset circuitry
- No external capacitors required
- Optional 16-pin SOIC surface mount package

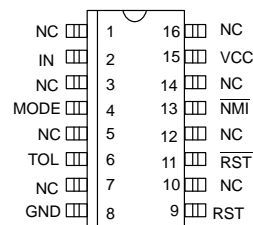
DESCRIPTION

The DS1231 Power Monitor Chip uses a precise temperature-compensated reference circuit which provides an orderly shutdown and an automatic restart of a processor-based system. A signal warning of an impending power failure is generated well before regulated DC voltages go out of specification by monitoring high voltage inputs to the power supply regulators. If line isolation is required a UL-approved opto-isolator can be directly interfaced to the DS1231. The time for processor

PIN ASSIGNMENT



DS1231 8-Pin DIP
(300 MIL)
See Mech. Drawings
Section



DS1231S 16-Pin SOIC
(300 MIL)
See Mech. Drawings
Section

PIN DESCRIPTION

IN	– Input
MODE	– Selects input pin characteristics
TOL	– Selects 5% or 10% V_{CC} detect
GND	– Ground
RST	– Reset (Active High)
$\overline{\text{RST}}$	– Reset (Active Low, open drain)
$\overline{\text{NMI}}$	– Non-Maskable Interrupt
V_{CC}	– +5V Supply
NC	– No Connections

shutdown is directly proportional to the available hold-up time of the power supply. Just before the hold-up time is exhausted, the Power Monitor unconditionally halts the processor to prevent spurious cycles by enabling Reset as V_{CC} falls below a selectable 5 or 10 percent threshold. When power returns, the processor is held inactive until well after power conditions have stabilized, safeguarding any nonvolatile memory in the system from inadvertent data changes.

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	0°C to 70°C
Operating Temperature (Industrial Version)	-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

(0°C to 70°C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	V_{CC}	4.5	5.0	5.5	V	1
Input Pin 1	V_{IN}			V_{CC}	V	1

DC ELECTRICAL CHARACTERISTICS(0°C to 70°C; $V_{CC} = 4.5$ to 5.5V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Low Level @ RST	V_{OL}			0.4	V	1
Output Voltage @ -500 μA	V_{OH}	$V_{CC}-0.5V$	$V_{CC}-0.1V$		V	1, 6
Input Leakage	I_{IL}	-10		+10	μA	2
Output Current @2.4V	I_{OH}	1.0	2.0		mA	5
Output Current @0.4V	I_{OL}	2.0	3.0		mA	
Operating Current	I_{CC}		0.5	2.0	mA	3
Input Pin 1 (Mode=GND)	I_C	15	25	50	μA	
Input Pin 1 (Mode= V_{CC})	I_C			0.1	μA	
IN Trip Point (Mode=GND)	V_{TP}	See Figure 3				1
IN Trip Point (Mode= V_{CC})	V_{TP}					1
V_{CC} Trip Point (TOL=GND)	V_{CCTP}	4.50	4.62	4.74	V	1
V_{CC} Trip Point (TOL= V_{CC})	V_{CCTP}	4.25	4.37	4.49	V	1

CAPACITANCE(T_A = 25°C)

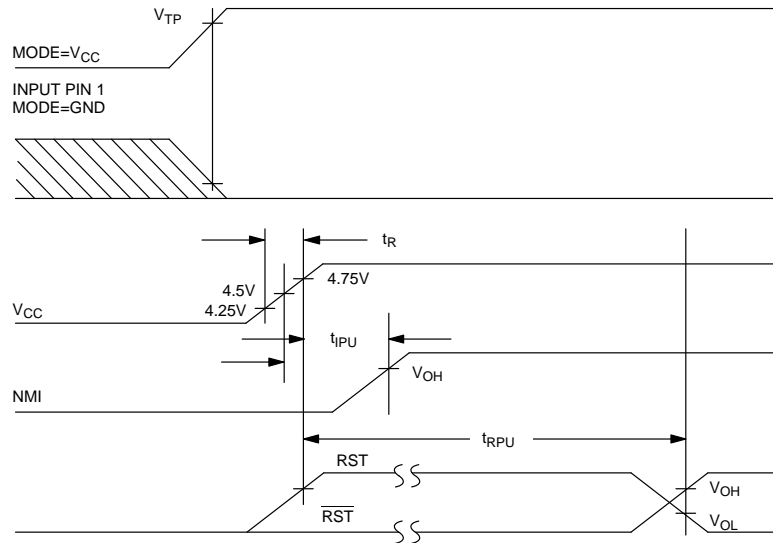
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Input Capacitance	C_{IN}			5	pF	
Output Capacitance	C_{OUT}			7	pF	

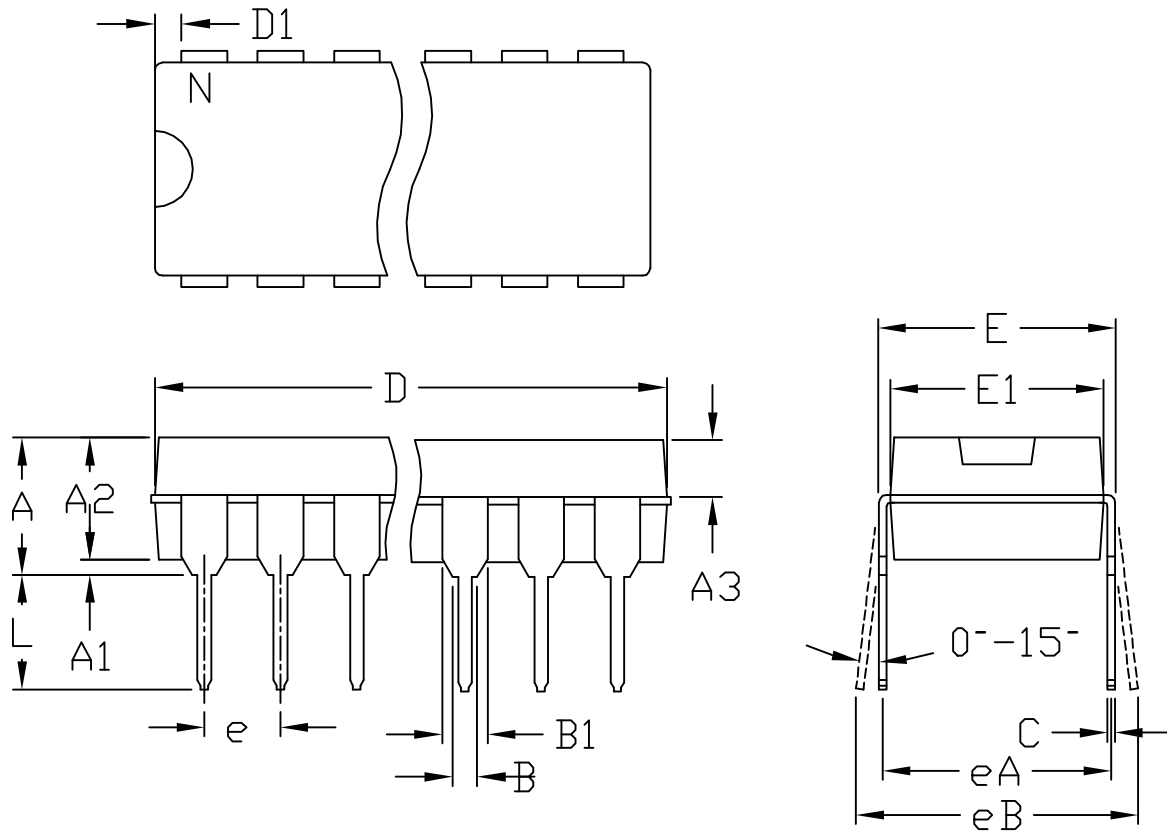
AC ELECTRICAL CHARACTERISTICS(0°C to 70°C; $V_{CC} = 5V \pm 10\%$)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
V_{TP} to \overline{NMI} Delay	t_{IPD}			1.1	μs	
V_{CC} Slew Rate 4.75-4.25V	t_F	300			μs	
V_{CC} Detect to RST and \overline{RST}	t_{RPD}			100	ns	
V_{CC} Detect to \overline{NMI}	t_{IPU}			200	μs	4
V_{CC} Detect to RST and \overline{RST}	t_{RPU}	150	500	1000	ms	4
V_{CC} Slew Rate 4.25-4.75V	t_R	0			ns	

NOTES:

- All voltages referenced to ground.
- $V_{CC} = +5.0$ volts with outputs open.
- Measured with outputs open.
- $t_R = 5 \mu s$.
- \overline{RST} is an open drain output and requires a pull-up resistor.
- RST remains within 0.5V of V_{CC} on power-down until V_{CC} drops below 2.0V. \overline{RST} remains within 0.5V of GND on power-down until V_{CC} drops below 2.0V.

TIMING DIAGRAM: POWER-UP



	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	---	0.180	---	4.572
A1	0.015	---	0.38	---
A2	0.125	0.175	3.18	4.45
A3	0.055	0.080	1.40	2.03
B	0.015	0.022	0.381	0.56
B1	0.045	0.065	1.14	1.65
C	0.008	0.014	0.2	0.355
D1	0.005	0.080	0.13	2.03
E	0.300	0.325	7.62	8.26
E1	0.240	0.310	6.10	7.87
e	0.100	BSC.	2.54	BSC.
eA	0.300	BSC.	7.62	BSC.
eB	0.400	BSC.	10.16	BSC.
L	0.115	0.150	2.921	3.81

	INCHES		MILLIMETERS		N	MS001
	MIN	MAX	MIN	MAX		
D	0.348	0.390	8.84	9.91	8	AB
D	0.735	0.765	18.67	19.43	14	AC
D	0.745	0.765	18.92	19.43	16	AA
D	0.885	0.915	22.48	23.24	18	AD
D	1.015	1.045	25.78	26.54	20	AE
D	1.14	1.265	28.96	32.13	24	AF
D	1.360	1.380	34.54	35.05	28	*5

- NOTES:
1. D&E DO NOT INCLUDE MOLD FLASH
 2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED .15mm (.006")
 3. CONTROLLING DIMENSION: MILLIMETER
 4. MEETS JEDEC MS001-XX AS SHOWN IN ABOVE TABLE
 5. SIMILIAR TO JEDEC MO-058AB
 6. N = NUMBER OF PINS