

MAX691A, MAX693A, MAX800, MAX800L, MAX800M

Microprocessor Supervisory Circuits

Industry-Standard, Full-Function μ P Supervisor

Description

The MAX691A/MAX693A/MAX800L/MAX800M microprocessor (μ P) supervisory circuits are pin-compatible upgrades to the MAX691, MAX693, and MAX695. They improve performance with 30 μ A supply current, 200ms typ reset active delay on power-up, and 6ns chip-enable propagation delay. Features include write protection of CMOS RAM or EEPROM, separate watchdog outputs, backup-battery switchover, and a RESET-bar output that is valid with V_{CC} down to 1V. The MAX691A/MAX800L have a 4.65V typical reset-threshold voltage, and the MAX693A/MAX800M's reset threshold is 4.4V typical. The MAX800L/MAX800M guarantee power-fail accuracies to $\pm 2\%$.

Key Features

- 200ms Power-OK/Reset Timeout Period
- 1 μ A Standby Current, 30 μ A Operating Current
- On-Board Gating of Chip-Enable Signals, 10ns max Delay
- MaxCap® or SuperCap Compatible
- Guaranteed Active-Low RESET Assertion to $V_{CC} = +1V$
- Voltage Monitor for Power-Fail or Low-Battery Warning
- Power-Fail Accuracy Guaranteed to $\pm 2\%$ (MAX800L/M)
- Available in 16-Pin Narrow SO, Plastic DIP, and TSSOP Packages
- Underwriters Laboratories (UL®) Recognized

Applications/Uses

Automotive Electronics
Computers: Desktop, Workstation, Server
Controllers
Critical μ P Monitoring
Intelligent Instruments

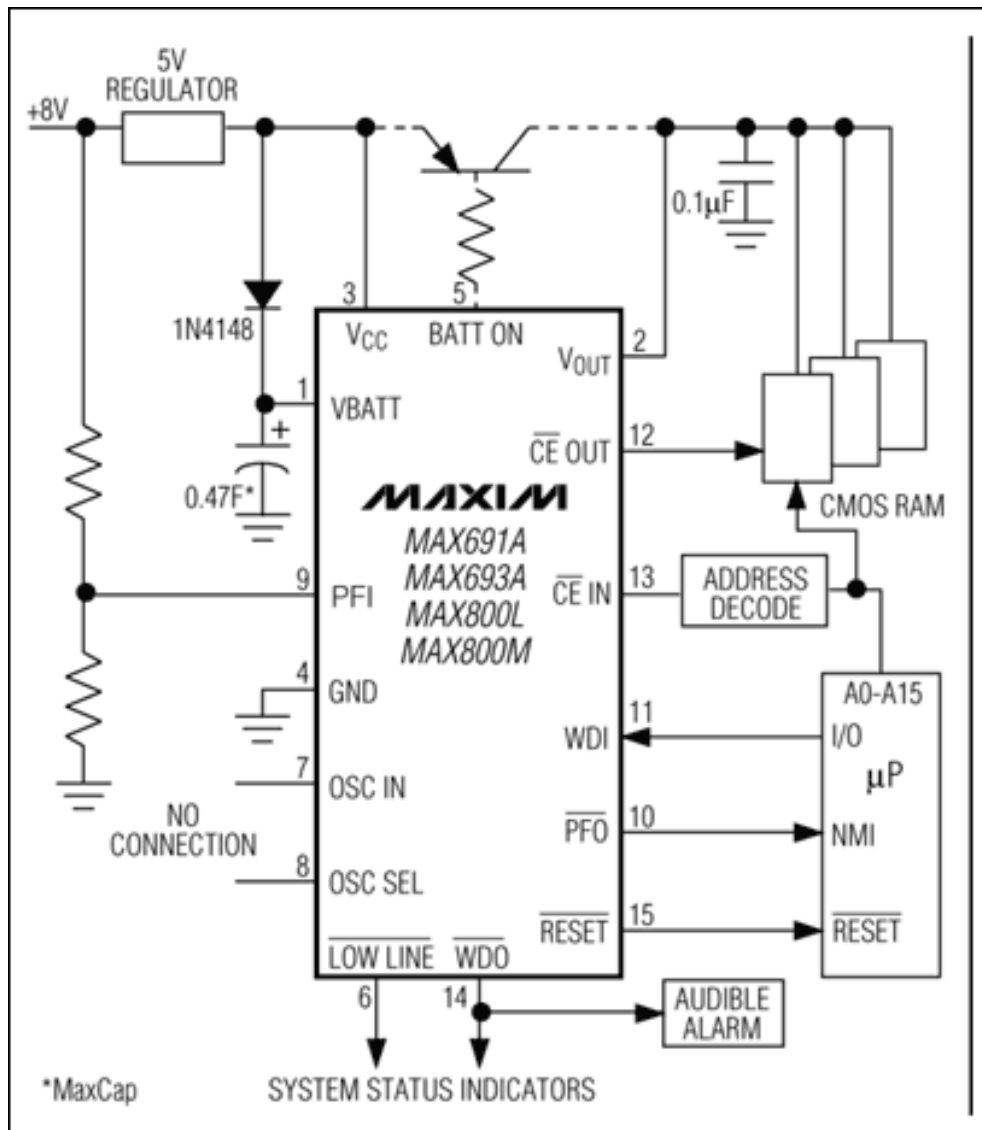
Part Number	Reset Threshold Range (V)	Active-Low Reset Output	Active-High Reset Output	Max. I _{CC} (µA)	Features	RoHS Available	Industry Qualified	Package	Operating Temp. Range (°C)
MAX691A	3.3 to 5.5	Push-Pull	Push-Pull	100	<ul style="list-style-type: none"> Adjustable Reset Input <ul style="list-style-type: none"> Battery On Chip Enable Gate <ul style="list-style-type: none"> Low Line Power Fail Comparator <ul style="list-style-type: none"> Watchdog 	Yes	MIL-STD-883B	Ceramic DIP/16 PDIP/16 SOIC/16 TSSOP/16	-55 to +125 -40 to +85 0 to +70
MAX693A							MIL-STD-883B	Ceramic DIP/16 PDIP/16 SOIC/16 TSSOP/16	
MAX800							-	PDIP/16 SOIC/16 TSSOP/16	

[See All Battery Backup Circuits \(86\)](#)

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.

Diagram



Typical Operating Circuit

Application Notes

Application Note 518: Boost Converter Yields Orderly Shutdown - MAX800M

Evaluation Kits

none

Design Guides

Reliability Reports

Show FIT data for:
 Reliability Report: [MAX693AxxE.pdf](#)

Request Reliability Report for:

Underwriters Laboratories (UL®) Recognized

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.

Filter:

Devices: 1-100 of 103

1 2 --->

MAX691A	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
MAX691AEJE			Ceramic DIP; 16 pin; Dwg: 21-0045 (PDF) Use pkgcode/variation: J16-3*	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis

MAX691AMJE/883B			Ceramic DIP; 16 pin; Dwg: 21-0045 (PDF) Use pkgcode/variation: J16-3*	-55°C to +125°C	RoHS/Lead-Free: No Materials Analysis
MAX691AMJE			Ceramic DIP; 16 pin; Dwg: 21-0045 (PDF) Use pkgcode/variation: J16-3*	-55°C to +125°C	RoHS/Lead-Free: No Materials Analysis
MAX691AC/D					See data sheet
MAX691AEPE+			PDIP; 16 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P16+1*	-40°C to +85°C	RoHS/Lead-Free: Lead Free Materials Analysis
MAX691ACPE			PDIP; 16 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P16-1*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
MAX691ACPE+			PDIP; 16 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P16+1*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
MAX691AEPE			PDIP; 16 pin; Dwg: 21-0043 (PDF) Use pkgcode/variation: P16-1*	-40°C to +85°C	RoHS/Lead-Free: No Materials Analysis
MAX691ACSE+			SOIC; 16 pin; Dwg: 21-0041 (PDF) Use pkgcode/variation: S16+3*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
MAX691ACSE			SOIC; 16 pin; Dwg: 21-0041 (PDF) Use pkgcode/variation: S16-3*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
MAX691ACSE+T			SOIC; 16 pin; Dwg: 21-0041 (PDF) Use pkgcode/variation: S16+3*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
MAX691ACWE+			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+1*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
MAX691ACWE+T			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16+1*	0°C to +70°C	RoHS/Lead-Free: Lead Free Materials Analysis
MAX691ACSE-T			SOIC; 16 pin; Dwg: 21-0041 (PDF) Use pkgcode/variation: S16-3*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis
MAX691ACWE-T			SOIC; 16 pin; Dwg: 21-0042 (PDF) Use pkgcode/variation: W16-1*	0°C to +70°C	RoHS/Lead-Free: No Materials Analysis



Microprocessor Supervisory Circuits

MAX691A/MAX693A/MAX800L/MAX800M

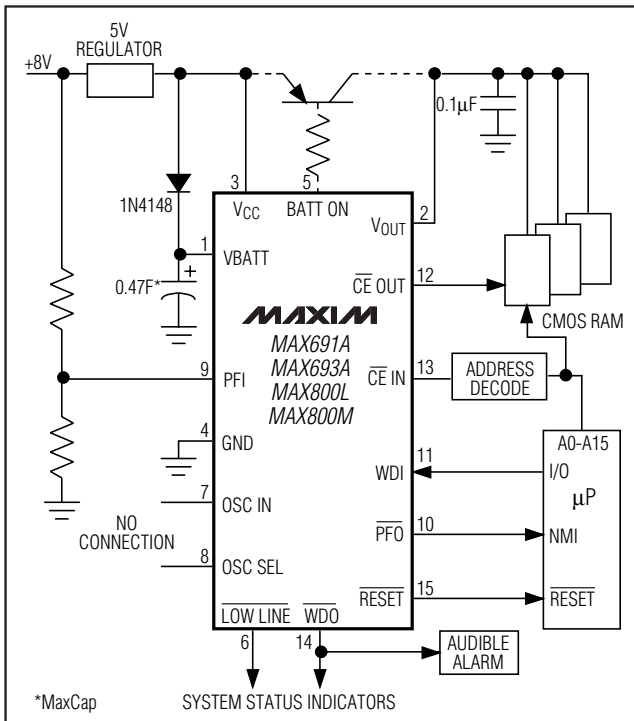
General Description

The MAX691A/MAX693A/MAX800L/MAX800M microprocessor (μ P) supervisory circuits are pin-compatible upgrades to the MAX691, MAX693, and MAX695. They improve performance with 30 μ A supply current, 200ms typ reset active delay on power-up, and 6ns chip-enable propagation delay. Features include write protection of CMOS RAM or EEPROM, separate watchdog outputs, backup-battery switchover, and a RESET output that is valid with V_{CC} down to 1V. The MAX691A/MAX800L have a 4.65V typical reset-threshold voltage, and the MAX693A/MAX800Ms' reset threshold is 4.4V typical. The MAX800L/MAX800M guarantee power-fail accuracies to $\pm 2\%$.

Applications

- Computers
- Controllers
- Intelligent Instruments
- Automotive Systems
- Critical μ P Power Monitoring

Typical Operating Circuit



MaxCap is a registered trademark of Kanthal Globar, Inc.

Features

- ◆ 200ms Power-OK/Reset Timeout Period
- ◆ 1 μ A Standby Current, 30 μ A Operating Current
- ◆ On-Board Gating of Chip-Enable Signals, 10ns max Delay
- ◆ MaxCap® or SuperCap Compatible
- ◆ Guaranteed $\overline{\text{RESET}}$ Assertion to $V_{CC} = +1V$
- ◆ Voltage Monitor for Power-Fail or Low-Battery Warning
- ◆ Power-Fail Accuracy Guaranteed to $\pm 2\%$ (MAX800L/M)
- ◆ Available in 16-Pin Narrow SO, Plastic DIP, and TSSOP Packages

Ordering Information

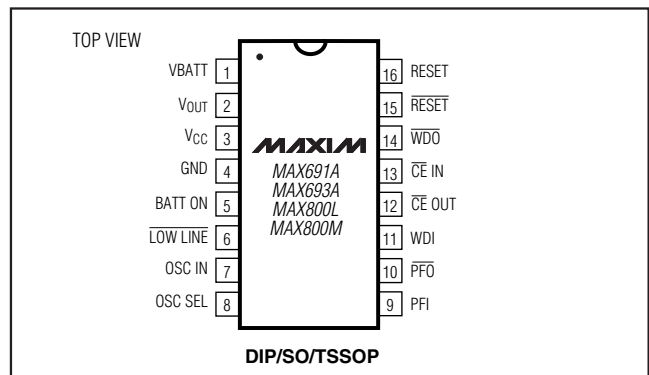
PART	TEMP RANGE	PIN-PACKAGE
MAX691ACUE	-0°C to +70°C	16 TSSOP
MAX691ACSE	-0°C to +70°C	16 Narrow SO
MAX691ACWE	-0°C to +70°C	16 Wide SO
MAX691ACPE	-0°C to +70°C	16 Plastic DIP
MAX691AC/D	-0°C to +70°C	Dice*
MAX691AEUE	-0°C to +70°C	16 TSSOP
MAX691AESE	-40°C to +85°C	16 Narrow SO
MAX691AEWE	-40°C to +85°C	16 Wide SO
MAX691AEPE	-40°C to +85°C	16 Plastic DIP

Ordering Information continued on last page.

*Dice are specified at $T_A = +25^\circ\text{C}$, DC parameters only.

Devices in PDIP, SO, and TSSOP packages are available in both leaded and lead-free packaging. Specify lead free by adding the + symbol at the end of the part number when ordering. Lead free not available for CERDIP package.

Pin Configuration



Microprocessor Supervisory Circuits

ABSOLUTE MAXIMUM RATINGS

Terminal Voltage (with respect to GND)

V _{CC}	-0.3V to +6V
VBATT	-0.3V to +6V
All Other Inputs	-0.3V to (V _{OUT} + 0.3V)

Input Current

V _{CC} Peak	1.0A
V _{CC} Continuous	250mA
VBATT Peak	250mA
VBATT Continuous	25mA
GND, BATT ON	100mA
All Other Outputs	25mA

Continuous Power Dissipation (T_A = +70°C)

TSSOP (derate 6.70mW/°C above +70°C)	533mW
Narrow SO (derate 8.70mW/°C above +70°C)	696mW
Wide SO (derate 9.52mW/°C above +70°C)	762mW
Plastic DIP (derate 10.53mW/°C above +70°C)	842mW
CERDIP (derate 10.00mW/°C above +70°C)	800mW

Operating Temperature Ranges

MAX69_AC_/MAX800_C_	0°C to +70°C
MAX69_AE_/MAX800_E_	-40°C to +85°C
MAX69_AMJE	-55°C to +125°C

Storage Temperature Range

Lead Temperature (soldering, 10s)

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

(MAX691A, MAX800L: V_{CC} = +4.75V to +5.5V; MAX693A, MAX800M: V_{CC} = +4.5V to +5.5V; VBATT = 2.8V, T_A = T_{MIN} to T_{MAX}, unless otherwise noted.)

PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
Operating Voltage Range, V _{CC} , VBATT (Note 1)			0		5.5	V
V _{OUT} Output	V _{CC} = 4.5V	I _{OUT} = 25mA		V _{CC} - 0.02	V _{CC} - 0.05	V
		I _{OUT} = 250mA	MAX69_AC	V _{CC} - 0.2	V _{CC} - 0.3	
			MAX69_AE, MAX800_C/E	V _{CC} - 0.2	V _{CC} - 0.35	
			MAX69_A/M		V _{CC} - 0.40	
I _{OUT} = 210mA	MAX69_AC/AE, MAX800_C/E	V _{CC} - 0.17	V _{CC} - 0.3V			
V _{CC} -to-V _{OUT} On-Resistance	V _{CC} = 4.5V	MAX69_AC, MAX800_C		0.8	1.2	Ω
		MAX69_AE, MAX800_E		0.8	1.4	
		MAX69_A/M		0.8	1.6	
V _{OUT} in Battery-Backup Mode	VBATT = 4.5V, I _{OUT} = 20mA		VBATT - 0.3		V	
	VBATT = 2.8V, I _{OUT} = 10mA		VBATT - 0.25			
	VBATT = 2.0V, I _{OUT} = 5mA		VBATT - 0.15			
VBATT-to-V _{OUT} On-Resistance	VBATT = 4.5V				15	Ω
	VBATT = 2.8V				25	
	VBATT = 2.0V				30	
Supply Current in Normal Operating Mode (excludes I _{OUT})	V _{CC} > VBATT - 1V			30	100	μA
Supply Current in Battery-Backup Mode (excludes I _{OUT}) (Note 2)	V _{CC} < VBATT - 1.2V, VBATT = 2.8V	T _A = +25°C		0.04	1	μA
		T _A = T _{MIN} + T _{MIN}			5	
VBATT Standby Current (Note 3)	VBATT + 0.2V ≤ V _{CC}	T _A = +25°C	-0.1		0.02	μA
		T _A = T _{MIN} + T _{MIN}	-1.0		0.02	
Battery Switchover Threshold	Power-up			VBATT + 0.3		V
	Power-down			VBATT - 0.3		

Microprocessor Supervisory Circuits

ELECTRICAL CHARACTERISTICS (continued)

(MAX691A, MAX800L: $V_{CC} = +4.75V$ to $+5.5V$; MAX693A, MAX800M: $V_{CC} = +4.5V$ to $+5.5V$; $V_{BATT} = 2.8V$, $T_A = T_{MIN}$ to T_{MAX} , unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Battery Switchover Hysteresis			60		mV
BATT ON Output Low Voltage	$I_{SINK} = 3.2mA$		0.1	0.4	V
	$I_{SINK} = 25mA$		0.7	1.5	
BATT ON Output Short-Circuit Current	Sink current		60		mA
	Source current	1	15	100	μA
RESET AND WATCHDOG TIMER					
Reset Threshold Voltage	MAX691A, MAX800L	4.50	4.65	4.75	V
	MAX693A, MAX800M	4.25	4.40	4.50	
	MAX800L, $T_A = +25^\circ C$, V_{CC} falling	4.55		4.70	
	MAX800M, $T_A = +25^\circ C$, V_{CC} falling	4.30		4.45	
Reset Threshold Hysteresis			15		mV
V_{CC} to RESET Delay	Power-down		80		μs
LOW LINE-to-RESET Delay			800		ns
Reset Active Timeout Period, Internal Oscillator	Power-up	140	200	280	ms
Reset Active Timeout Period, External Clock (Note 4)	Power-up		2048		Clock Cycles
Watchdog Timeout Period, Internal Oscillator	Long period	1.0	1.6	2.25	sec
	Short period	70	100	140	ms
Watchdog Timeout Period, External Clock (Note 4)	Long period		4096		Clock Cycles
	Short period		1024		
Minimum Watchdog Input Pulse Width	$V_{IL} = 0.8V$, $V_{IH} = 0.75 \times V_{CC}$	100			ns
RESET Output Voltage	$I_{SINK} = 50\mu A$, $V_{CC} = 1V$, $V_{BATT} = 0V$, V_{CC} falling		0.004	0.3	V
	$I_{SINK} = 3.2mA$, $V_{CC} = 4.25V$		0.1	0.4	
	$I_{SOURCE} = 1.6mA$, $V_{CC} = 5V$	3.5			
RESET Output Short-Circuit Current	Output source current		7	20	mA
RESET Output Voltage Low (Note 5)	$I_{SINK} = 3.2mA$	0.1	0.4		V
LOW LINE Output Voltage	$I_{SINK} = 3.2mA$, $V_{CC} = 4.25V$			0.4	V
	$I_{SOURCE} = 1\mu A$, $V_{CC} = 5V$	3.5			
LOW LINE Output Short-Circuit Current	Output source current	1	15	100	μA
WDO Output Voltage	$I_{SINK} = 3.2mA$			0.4	V
	$I_{SOURCE} = 500\mu A$, $V_{CC} = 5V$	3.5			
WDO Output Short-Circuit Current	Output source current		3	10	mA
WDI Threshold Voltage (Note 6)	V_{IH}	$0.75 \times V_{CC}$			V
	V_{IL}			0.8	
WDI Input Current	WDI = 0V	-50	-10		μA
	WDI = V_{OUT}		20	50	

MAX691A/MAX693A/MAX800L/MAX800M

Microprocessor Supervisory Circuits

ELECTRICAL CHARACTERISTICS (continued)

(MAX691A, MAX800L: $V_{CC} = +4.75V$ to $+5.5V$; MAX693A, MAX800M: $V_{CC} = +4.5V$ to $+5.5V$; $V_{BATT} = 2.8V$, $T_A = T_{MIN}$ to T_{MAX} , unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
POWER-FAIL COMPARATOR					
PFI Input Threshold	MAX69_AC/AE/AM, $V_{CC} = 5V$	1.2	1.25	1.3	V
	MAX800_C/E, $V_{CC} = 5V$	1.225	1.25	1.275	
PFI Leakage Current			± 0.01	± 25	nA
\overline{PFO} Output Voltage	$I_{SINK} = 3.2mA$			0.4	V
	$I_{SOURCE} = 1\mu A$, $V_{CC} = 5V$	3.5			
\overline{PFO} Output Short-Circuit Current	Output source current	1	15	100	μA
PFI-to-PFO Delay	$V_{IN} = -20mV$, $V_{OD} = 15mV$		25		μs
	$V_{IN} = 20mV$, $V_{OD} = 15mV$		60		
CHIP-ENABLE GATING					
\overline{CE} IN Leakage Current	Disable mode		± 0.005	± 1	μA
\overline{CE} IN-to- \overline{CE} OUT Resistance (Note 7)	Enable mode		75	150	Ω
\overline{CE} OUT Short-Circuit Current (Reset Active)	Disable mode, \overline{CE} OUT = 0V	0.1	0.75	2.0	mA
\overline{CE} IN-to- \overline{CE} OUT Propagation Delay (Note 8)	50Ω source impedance driver, $C_{LOAD} = 50pF$		6	10	ns
\overline{CE} OUT Output-Voltage High (Reset Active)	$V_{CC} = 5V$, $I_{OUT} = -100\mu A$	3.5			V
	$V_{CC} = 0V$, $V_{BATT} = 2.8V$, $I_{OUT} = 1\mu A$	2.7			
RESET-to- \overline{CE} OUT Delay	Power-down		12		μs
INTERNAL OSCILLATOR					
OSC IN Leakage Current	OSC SEL = 0V		0.10	± 5	μA
OSC IN Input Pullup Current	OSC SEL = V_{OUT} or floating, OSC IN = 0V		10	100	μA
OSC SEL Input Pullup Current	OSC SEL = 0V		10	100	μA
OSC IN Frequency Range	OSC SEL = 0V		50		kHz
OSC IN External Oscillator Threshold Voltage	V_{IH}	$V_{OUT} - 0.3$	$V_{OUT} - 0.6$		V
	V_{IL}		3.65	2.00	
OSC IN Frequency with External Capacitor	OSC SEL = 0V, $C_{OSC} = 47pF$		100		kHz

Note 1: Either V_{CC} or V_{BATT} can go to 0V, if the other is greater than 2.0V.

Note 2: The supply current drawn by the MAX691A/MAX800L/MAX800M from the battery excluding I_{OUT} typically goes to $10\mu A$ when $(V_{BATT} - 1V) < V_{CC} < V_{BATT}$. In most applications, this is a brief period as V_{CC} falls through this region.

Note 3: "+" = battery-discharging current, "-" = battery-charging current.

Note 4: Although presented as typical values, the number of clock cycles for the reset and watchdog timeout periods are fixed and do not vary with process or temperature.

Note 5: RESET is an open-drain output and sinks current only.

Note 6: WDI is internally connected to a voltage divider between V_{OUT} and GND. If unconnected, WDI is driven to 1.6V (typ), disabling the watchdog function.

Note 7: The chip-enable resistance is tested with $V_{CC} = +4.75V$ for the MAX691A/MAX800L and $V_{CC} = +4.5V$ for the MAX693A/MAX800M. \overline{CE} IN = \overline{CE} OUT = $V_{CC}/2$.

Note 8: The chip-enable propagation delay is measured from the 50% point at \overline{CE} IN to the 50% point at \overline{CE} OUT.

Microprocessor Supervisory Circuits

Ordering Information (continued)

PART	TEMP RANGE	PIN-PACKAGE
MAX691AEJE	-40°C to +85°C	16 CERDIP
MAX691AMJE	-55°C to +125°C	16 CERDIP**
MAX691AMSE/PR	-55°C to +125°C	16 Wide SO**
MAX691AMSE/PR-T	-55°C to +125°C	16 Wide SO**
MAX693ACUE	-0°C to +70°C	16 TSSOP
MAX693ACSE	-0°C to +70°C	16 Narrow SO
MAX693ACWE	-0°C to +70°C	16 Wide SO
MAX693ACPE	-0°C to +70°C	16 Plastic DIP
MAX693AC/D	-0°C to +70°C	Dice*
MAX693AEUE	-40°C to +85°C	16 TSSOP
MAX693AESE	-40°C to +85°C	16 Narrow SO
MAX693AEWE	-40°C to +85°C	16 Wide SO
MAX693AEPE	-40°C to +85°C	16 Plastic DIP
MAX693AEJE	-40°C to +85°C	16 CERDIP
MAX693AMJE	-55°C to +125°C	16 CERDIP
MAX800LCUE	-0°C to +70°C	16 TSSOP
MAX800LCSE	-0°C to +70°C	16 Narrow SO
MAX800LCPE	-0°C to +70°C	16 Plastic DIP
MAX800LEUE	-40°C to +85°C	16 TSSOP
MAX800LESE	-40°C to +85°C	16 Narrow SO
MAX800LEPE	-40°C to +85°C	16 Plastic DIP
MAX800MCUE	-0°C to +70°C	16 TSSOP
MAX800MCSE	-0°C to +70°C	16 Narrow SO
MAX800MCPE	-0°C to +70°C	16 Plastic DIP
MAX800MEUE	-40°C to +85°C	16 TSSOP
MAX800MESE	-40°C to +85°C	16 Narrow SO
MAX800MEPE	-40°C to +85°C	16 Plastic DIP

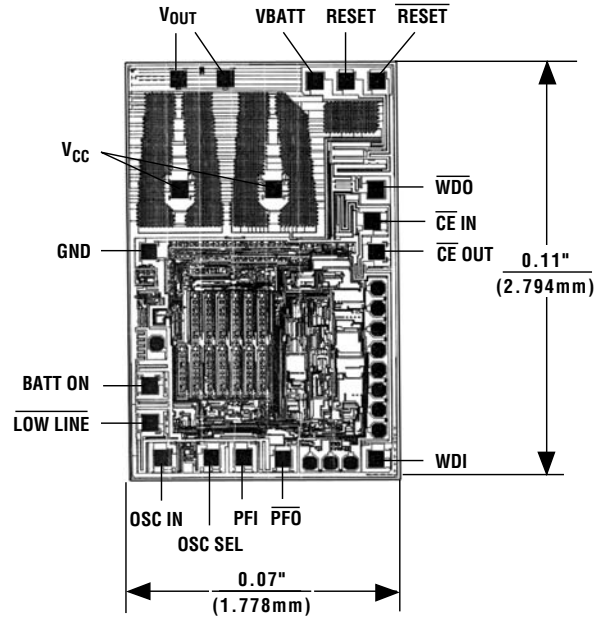
*Dice are specified at $T_A = +25^\circ\text{C}$, DC parameters only.

**Contact factory for availability and processing to MIL-STD-883B.

Devices in PDIP, SO and TSSOP packages are available in both leaded and lead-free packaging. Specify lead free by adding the + symbol at the end of the part number when ordering.

Lead free not available for CERDIP package.

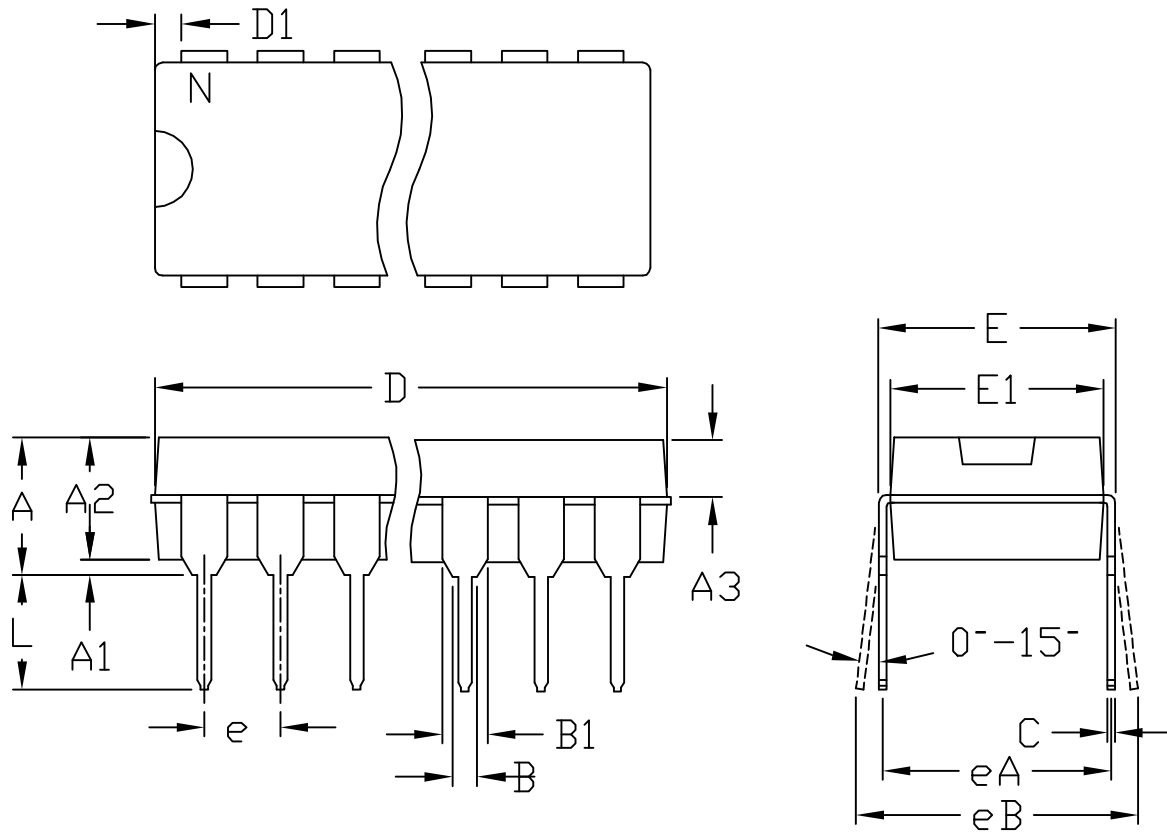
Chip Topography



SUBSTRATE CONNECTED TO V_{OUT}

Package Information

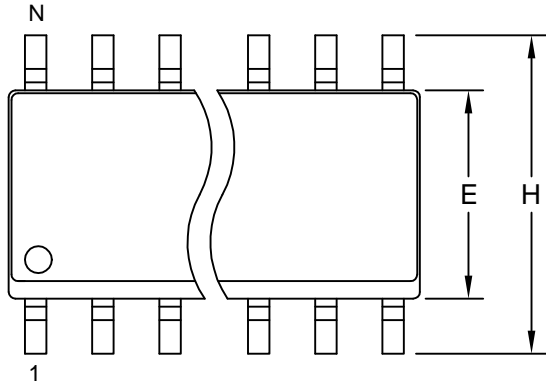
PACKAGE TYPE	PACKAGE CODE	DOCUMENT NO.
16 TSSOP	U16-1	21-0066
16 CERDIP	J16-3	21-0045
16 Narrow SO	S16-3	21-0041
16 Plastic DIP	P16-1	21-0043
16 Wide SO	W16-1	21-0042



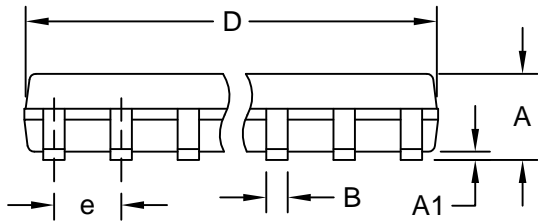
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	---	0.180	---	4.572
A1	0.015	---	0.38	---
A2	0.125	0.175	3.18	4.45
A3	0.055	0.080	1.40	2.03
B	0.015	0.022	0.381	0.56
B1	0.045	0.065	1.14	1.65
C	0.008	0.014	0.2	0.355
D1	0.005	0.080	0.13	2.03
E	0.300	0.325	7.62	8.26
E1	0.240	0.310	6.10	7.87
e	0.100	BSC.	2.54	BSC.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

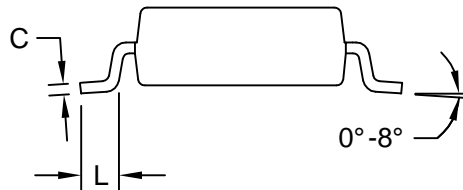
- NOTES:
1. D&E DO NOT INCLUDE MOLD FLASH
 2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED .15mm (.006")
 3. CONTROLLING DIMENSION: MILLIMETER
 4. MEETS JEDEC MS001-XX AS SHOWN IN ABOVE TABLE
 5. SIMILIAR TO JEDEC MO-058AB
 6. N = NUMBER OF PINS



TOP VIEW



FRONT VIEW



SIDE VIEW

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.053	0.069	1.35	1.75
A1	0.004	0.010	0.10	0.25
B	0.014	0.019	0.35	0.49
C	0.007	0.010	0.19	0.25
e	0.050 BSC		1.27 BSC	
E	0.150	0.157	3.80	4.00
H	0.228	0.244	5.80	6.20
L	0.016	0.050	0.40	1.27

VARIATIONS:

DIM	INCHES		MILLIMETERS		N	MS012
	MIN	MAX	MIN	MAX		
D	0.189	0.197	4.80	5.00	8	AA
D	0.337	0.344	8.55	8.75	14	AB
D	0.386	0.394	9.80	10.00	16	AC

NOTES:

1. D&E DO NOT INCLUDE MOLD FLASH.
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED 0.15mm (.006").
3. LEADS TO BE COPLANAR WITHIN 0.10mm (.004").
4. CONTROLLING DIMENSION: MILLIMETERS.
5. MEETS JEDEC MS012.
6. N = NUMBER OF PINS.

PROPRIETARY INFORMATION			
TITLE: PACKAGE OUTLINE, .150" SOIC			
APPROVAL	DOCUMENT CONTROL NO. 21-0041	REV. B	1/1