

## DS1233M

EconoReset

### Description

The DS1233M EconoReset uses a precision temperature-compensated 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 (low) 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.

### Key Features

- Automatically restarts microprocessor after power failure
- Maintains reset for 350ms 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 package or surface mount 8-pin SO packages available package
- Internal 5k ohm pullup resistor
- Compatible with Motorola 68XXX series and HC16 Microprocessors
- Pin function compatible with the Motorola MC33064, MC34064, MC33164, and MC34164
- Operating temperature of  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

### Key Specifications: Supervisors (1 Monitored Voltage)

Part Number	Reset Threshold Range (V)	Active-Low Reset Output	Min. Reset Timeout Range	Watchdog Feature	Reset Thresh. Acc. (% @ $+25^{\circ}\text{C}$ )	Max. $I_{CC}$ ( $\mu\text{A}$ )
DS1233M	2.5 to 3.3 3.3 to 5.5	Open Drain with Internal Pull-Up	85ms to 300ms 300ms to 1s	No Watchdog	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 3316: Dallas Semiconductor Microprocessor Supervisor Selection Guide - DS1233M

**Evaluation Kits**

none

**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: 1-24 of 24**

DS1233M	Notes	Free Sample	Buy	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
---------	-------	-------------	-----	--	------	---------------------------------------

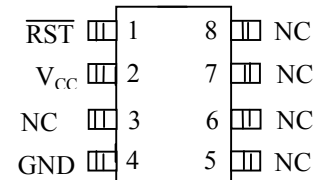
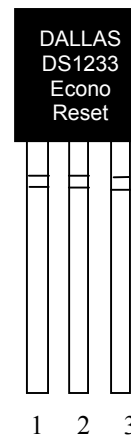
DS1233MS-55+T&R			SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8+4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1233MS-3+T&R			SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8+4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1233MS-5+T&R			SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8+4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1233MS-3+			SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8+4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1233MS-5+			SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8+2*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1233MS-55+			SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8+2*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">Lead Free</a> <a href="#">Materials Analysis</a>
DS1233MS-3/T&R	3.3V-15%, 2500/Reel		SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8-4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1233MS-5/T&R	5V-10% 2500/Reel		SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8-2*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1233MS-55/T&R	5V-5% 2500/Reel		SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8-4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1233MS-3	3.3V-15% Monitor		SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8-4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1233MS-5	5V-10% Monitor		SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8-2*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1233MS-55	5V-5% Monitor		SOIC; 8 pin; Dwg: <a href="#">21-0041</a> (PDF) Use pkgcode/variation: S8-4*	-40°C to +85° C	RoHS/Lead-Free: <a href="#">No Materials Analysis</a>
DS1233M-3+T&R			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>

DS1233M-55+T&R			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>
DS1233M-3+			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>
DS1233M-5+T&R			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>
DS1233M-5+			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>
DS1233M-55	5V-5% 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 Materials Analysis</a>
DS1233M-5	5V-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 Materials Analysis</a>
DS1233M-3	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 Materials Analysis</a>
DS1233M-55+			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>
DS1233M-55/T&R	5V-5% 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 Materials Analysis</a>
DS1233M-3/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 Materials Analysis</a>
DS1233M-5/T&R	5V-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 Materials Analysis</a>

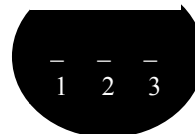
## FEATURES

- Automatically restarts microprocessor after power failure
- Maintains reset for 350 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 package or surface mount 8-pin SOIC packages available
- Internal 5 k $\Omega$  pullup resistor
- Compatible with Motorola 68XXX series and HC16 Microprocessors
- Pin function compatible with the Motorola MC33064, MC34064, MC33164, and MC34164
- Operating temperature of -40°C to +85°C

## PIN ASSIGNMENT



DS1233M 8-Pin SOIC  
(150mil)  
See Mech. Drawings  
Section on Website



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

## PIN DESCRIPTIONS

### TO-92

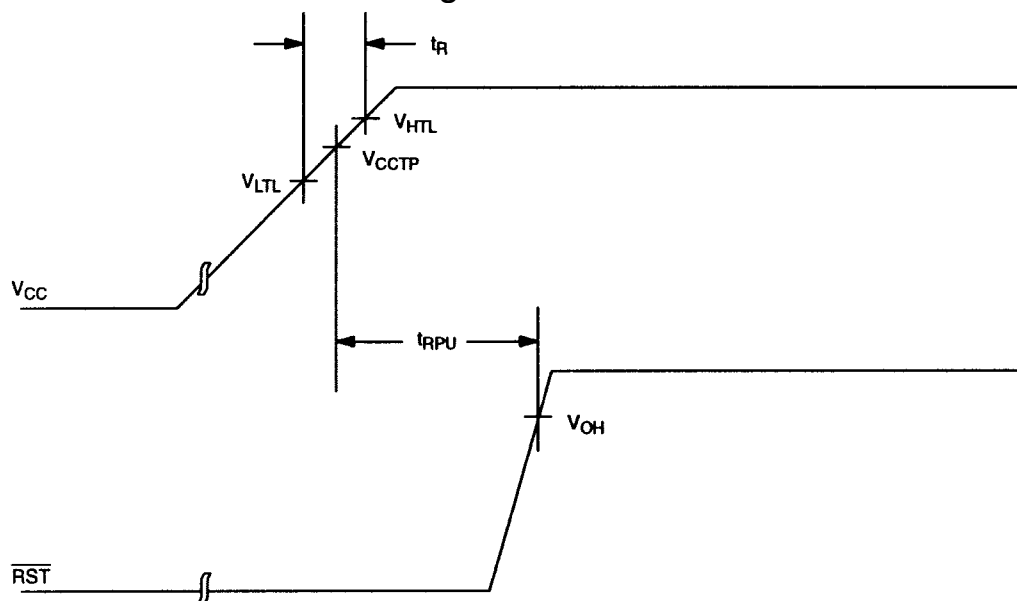
- |                    |                           |
|--------------------|---------------------------|
| 1 $\overline{RST}$ | - Active Low Reset Output |
| 2 $V_{CC}$         | - Power Supply            |
| 3 GND              | - Ground                  |

### 8-Pin SOIC

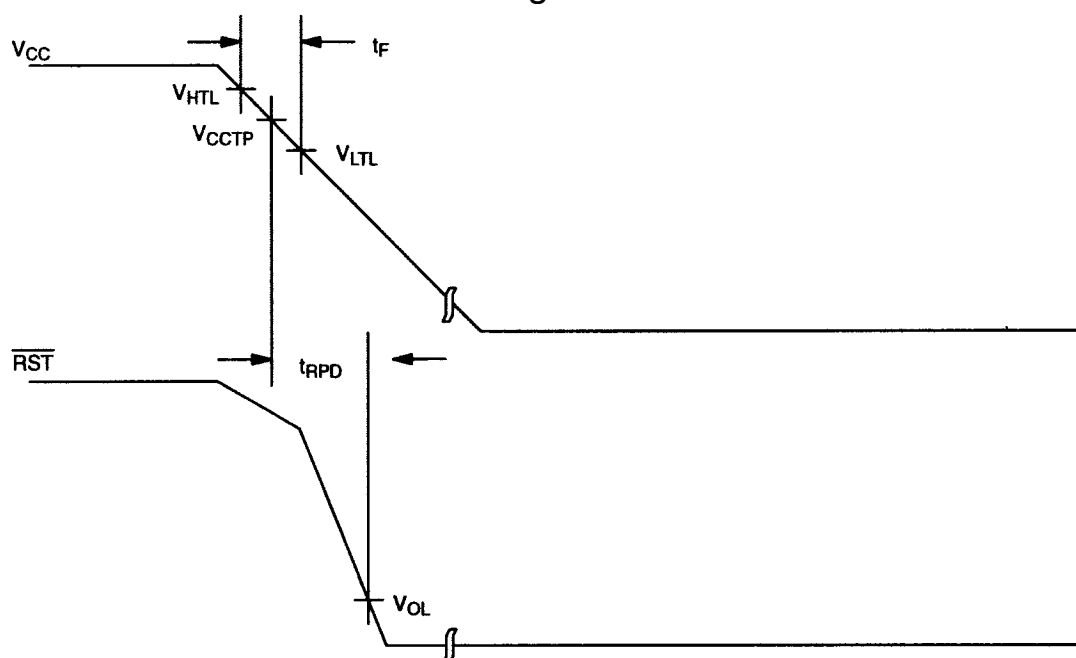
- |                  |                           |
|------------------|---------------------------|
| $\overline{RST}$ | - Active Low Reset Output |
| $V_{CC}$         | - Power Supply            |
| NC               | - No Connect              |
| GND              | - Ground                  |

## DESCRIPTION

The DS1233M EconoReset uses a precision temperature-compensated 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 (low) state. When  $V_{CC}$  returns to an intolerance condition, the reset signal is kept in the active state for approximately 350 ms to allow the power supply and processor to stabilize.

**TIMING DIAGRAM: POWER-UP** Figure 3**VOLTAGE TRIP LEVELS**

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Voltage High Trip Level	$V_{HTL}$			4.75	V	DS1233M-5, DS1233M-55
Voltage Low Trip Level	$V_{LTL}$			4.00	V	DS1233M-5, DS1233M-55
Voltage High Trip Level	$V_{HTL}$			3.14	V	DS1233M-3
Voltage Low Trip Level	$V_{LTL}$			2.48	V	DS1233M-3

**TIMING DIAGRAM: POWER-DOWN** Figure 4

**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	-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	$V_{CC}$	1.2		5.5	V	1

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

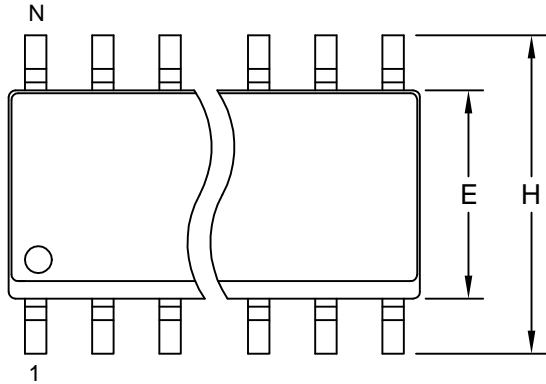
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Output Voltage @ -500 $\mu A$	$V_{OH}$	$V_{CC}-0.5V$	$V_{CC}-0.1V$		V	1
Output Current @ 0.4V	$I_{OL}$	+8			mA	2,3
Operating Current	$I_{CC}$			50	$\mu A$	4
$V_{CC}$ Trip Point (DS1233M-5)	$V_{CCTP}$	4.25	4.375	4.49	V	1
$V_{CC}$ Trip Point (DS1233M-55)	$V_{CCTP}$	4.5	4.625	4.75	V	1
$V_{CC}$ Trip Point (DS1233M-3)	$V_{CCTP}$	2.64	2.72	2.8	V	1
Output Capacitance	$C_{OUT}$			10	pF	
Internal Pullup Resistor	$R_P$	3.75	5	6.50	k $\Omega$	

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

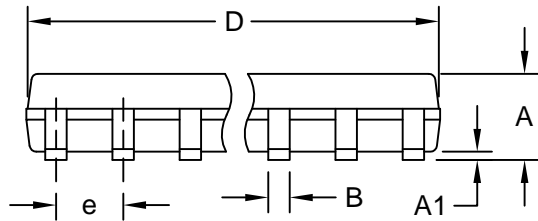
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Reset Active Time	$t_{RST}$	200	350	500	ms	
$V_{CC}$ Detect to $\overline{RST}$	$t_{RPD}$		2	10	$\mu s$	
$V_{CC}$ Slew Rate ( $V_{HTL} - V_{LTL}$ )	$t_F$	300			$\mu s$	
$V_{CC}$ Slew Rate ( $V_{LTL} - V_{HTL}$ )	$t_R$	0			ns	
$V_{CC}$ Detect to RST	$t_{RPU}$	200	350	500	ms	5

**NOTES:**

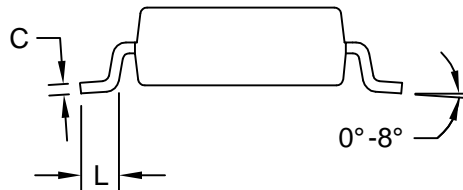
- All voltages are referenced to ground.
- Measured with  $V_{CC} \geq 2.7V$ .
- A 1 k $\Omega$  external resistor may be required in some applications for proper operation of the microprocessor reset control circuit.
- Measured with outputs open.
- $t_R = 5 \mu s$ .



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

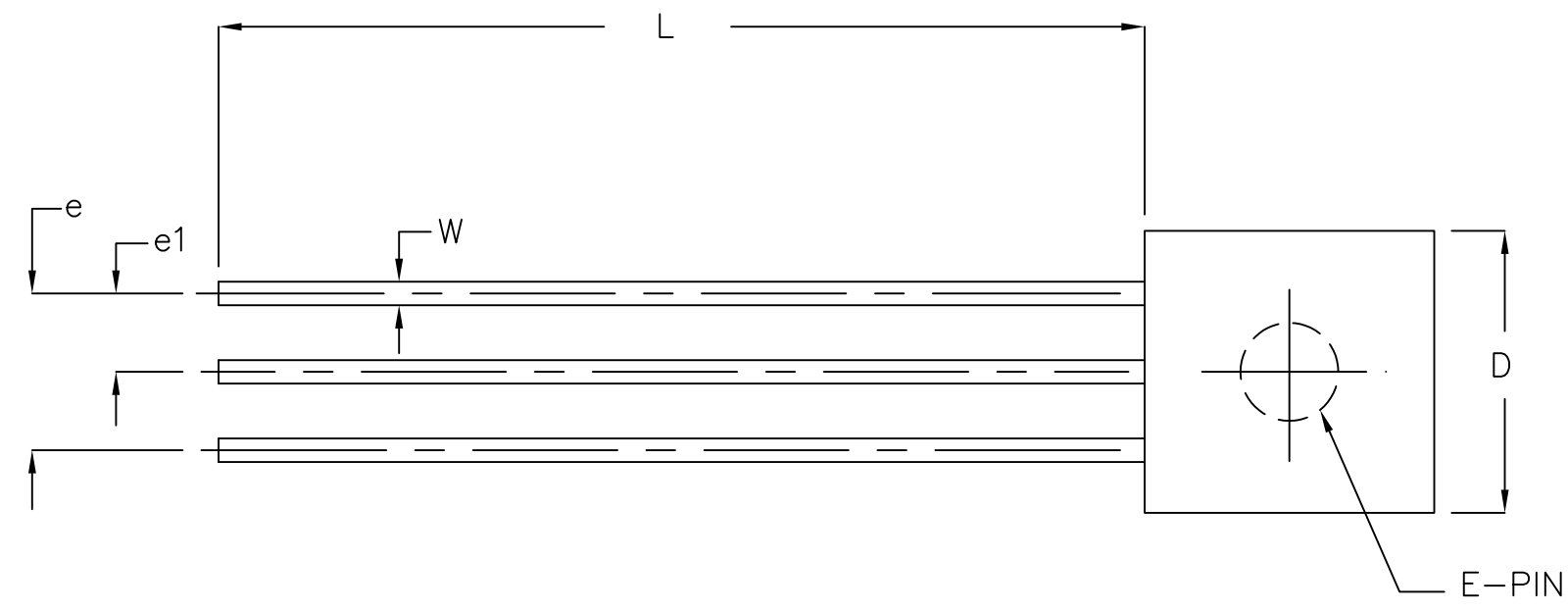
**NOTES:**

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.

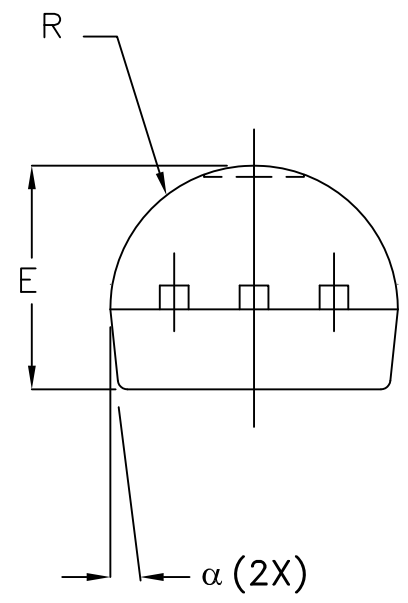
PROPRIETARY INFORMATION			
TITLE: <b>PACKAGE OUTLINE, .150" SOIC</b>			
APPROVAL	DOCUMENT CONTROL NO. <b>21-0041</b>	REV. <b>B</b>	<b>1/1</b>



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