TS831

MICROPOWER VOLTAGE SUPERVISOR RESET ACTIVE LOW

- ULTRA LOW POWER CONSUMPTION : 12µA max. @ V_{CC} = 5V
- PRECISION RESET THRESHOLD (guaranteed over Temperature)
- 4.33Vtyp. THRESHOLD VOLTAGE (TS831-5) 4.50Vtyp. THRESHOLD VOLTAGE (TS831-4)
- GUARANTEED RESET OPERATION FOR V_{CC} DOWN TO 1V
- OPEN DRAIN OUTPUT COMPARATOR WITH V_{ol} = 450mVtyp. @ I_{ol} = 8mA & V_{CC} = 4V
- FAST RESPONSE TIME : 20µs FOR A 10mV OVERDRIVE
- 100mV INTERNAL HYSTERESIS
- PIN TO PIN COMPATIBLE WITH MC33064 AND MC33164

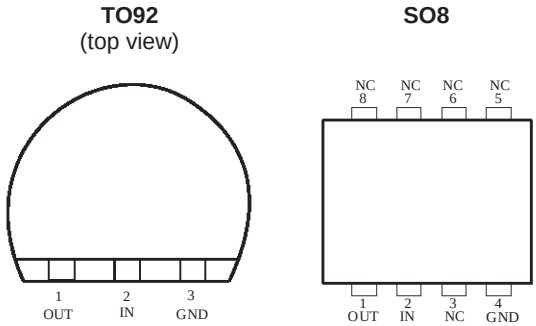
D
SO8
(Plastic Micropackage)

Z
TO92
(Plastic Package)

ORDER CODES

Part Number	Temperature Range	Package	
		D	Z
TS831-5I	-40, +125°C	•	ù
TS831-4I	-40, +125°C	•	ù

PIN CONNECTIONS



DESCRIPTION

The TS831 ultra low power integrated circuit incorporates a high stability band gap voltage reference and a comparator with open drain output.
The threshold voltage is set at 4.33V for TS831-5 and 4.5V for TS831-4 by internal thermally matched resistances.
The comparator exhibits a 20µs response (with 10mV overdrive) and has an open drain output active when input voltage is lower than the threshold.
An internal hysteresis of 100mV increases the comparator's noise margin and prevents false reset operation.

APPLICATIONS

- Power-on reset generator for microcontroler
- Power failure detector

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{CC}	Supply Voltage - note 1		7	V
V_{out}	Output Voltage		-0.3 to V_{CC}^{+} 0.3	V
I_{out}	Output Current		20	mA
Pd	Power Dissipation - note 2	TO92 SO8	650 700	mW
I_F	Clamp Diode Forward Current, pin 1 to pin 2 - note 3		100	mA
T_{oper}	Operating Free Air Temperature Range		-40 to +125	°C
T_{stg}	Storage Temperature		-65 to +150	°C

Note: 1. All voltages values, except differential voltage are with respect to network ground terminal.
2. T_j = 150°C, T_{amb} = 25°C with R_{thja} = 200°C/W for TO92 package
R_{thja} = 175°C/W for SO8 package
3. Maximum package power dissipation limits must be observed.

OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	1 to 5.5	V

TS831-5

ELECTRICAL CHARACTERISTICS T_{amb} = 25°C (unless otherwise specified)

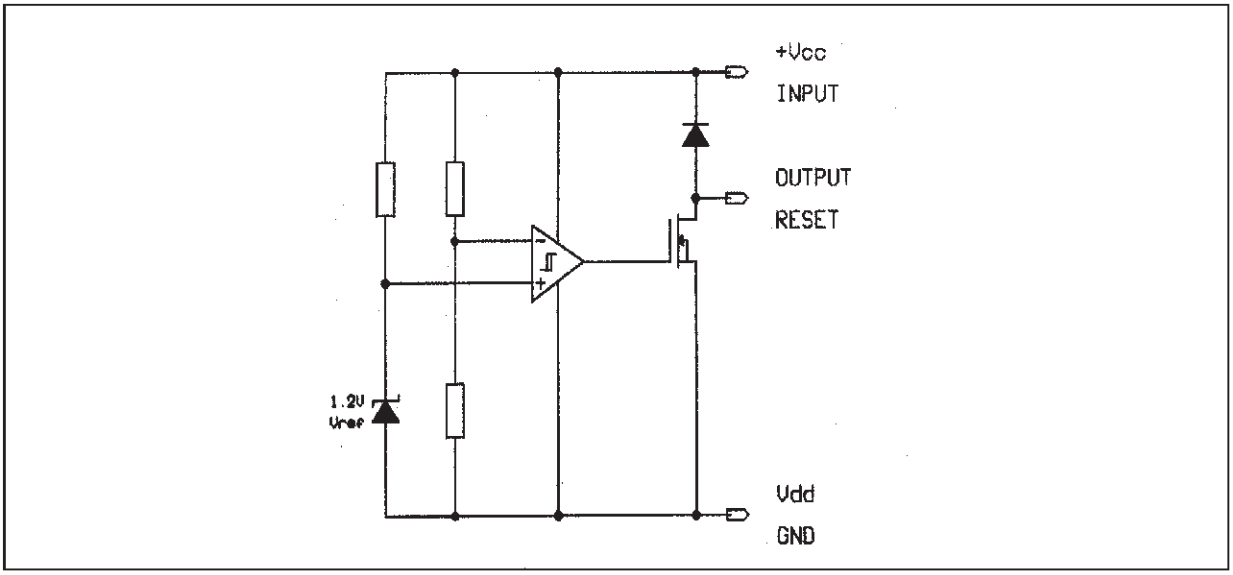
Symbol	Parameter		Min.	Typ.	Max.	Unit
V_{thi}	Threshold Voltage - V_{CC} Increasing -40°C ≤ T_{amb} ≤ +125°C -40°C ≤ T_{amb} ≤ +125°C		 4.10 4.10	4.33	 4.46 4.50	V
V_{thd}	Threshold Voltage - V_{CC} Decreasing -40°C ≤ T_{amb} ≤ +125°C -40°C ≤ T_{amb} ≤ +125°C		 4.10 4.06	4.21	 4.46 4.46	V
V_{hys}	Hysteresis Voltage		50	100	200	mV
I_{CC}	Current Consumption	V_{CC} = 5V			12	µA
V_{OL}	Low Level Output Voltage -40°C ≤ T_{amb} ≤ +125°C -40°C ≤ T_{amb} ≤ +125°C	V_{CC} = 4V, I_{OL} = 8mA		450	800 1000 1300	mV
I_{OH}	Output Off-state Leakage -40°C ≤ T_{amb} ≤ +125°C	V_{CC} = 5V		2	100 1000	nA
tphl	Response Time High to Low R_L = 10kΩ, C_L = 15pF, V_{CC} = V_{thd} -10mV			20		µs

TS831-4

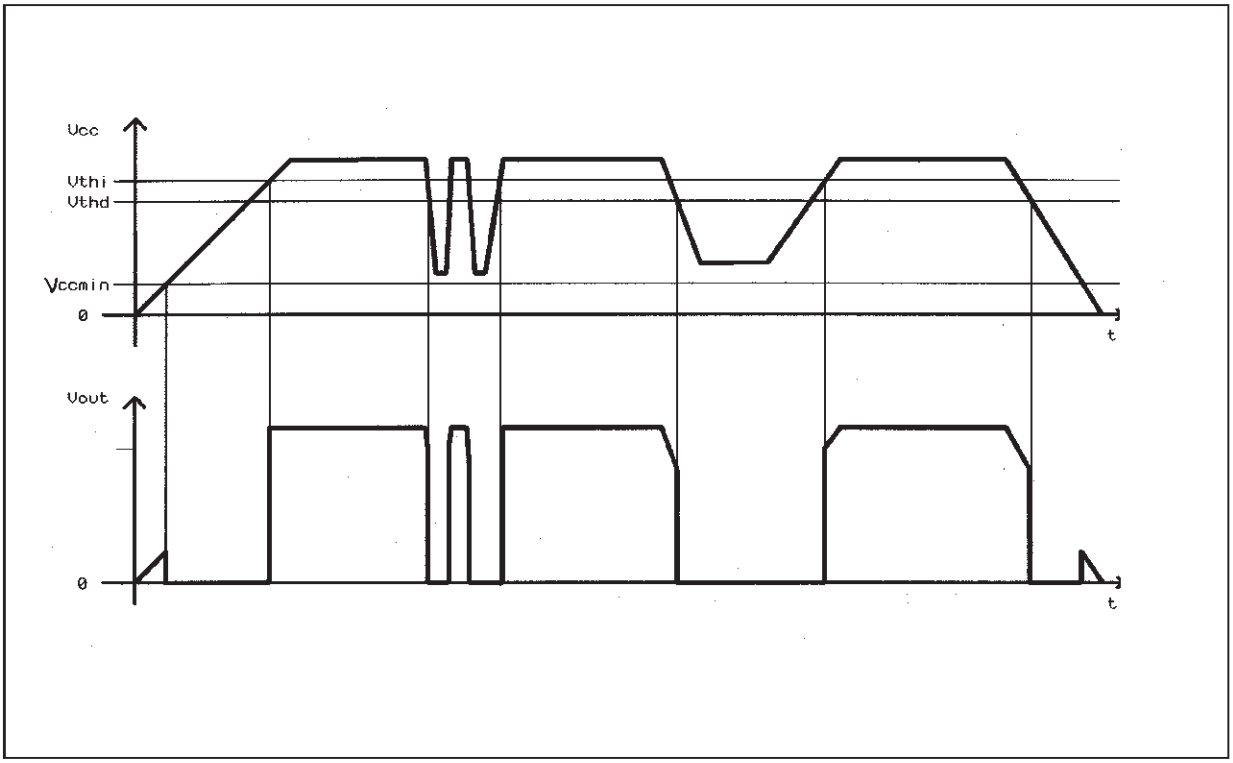
ELECTRICAL CHARACTERISTICS T_{amb} = 25°C (unless otherwise specified)

Symbol	Parameter		Min.	Typ.	Max.	Unit
V_{thi}	Threshold Voltage - V_{CC} Increasing -40°C ≤ T_{amb} ≤ +125°C -40°C ≤ T_{amb} ≤ +125°C		 4.17 4.17	4.5	 4.66 4.70	V
V_{thd}	Threshold Voltage - V_{CC} Decreasing -40°C ≤ T_{amb} ≤ +125°C -40°C ≤ T_{amb} ≤ +125°C		 4.17 4.13	4.4	 4.66 4.66	V
V_{hys}	Hysteresis Voltage		50	100	200	mV
I_{CC}	Current Consumption	V_{CC} = 5V			12	µA
V_{OL}	Low Level Output Voltage -40°C ≤ T_{amb} ≤ +125°C -40°C ≤ T_{amb} ≤ +125°C	V_{CC} = 4V, I_{OL} = 8mA		450	800 1000 1300	mV
I_{OH}	Output Off-state Leakage -40°C ≤ T_{amb} ≤ +125°C	V_{CC} = 5V		2	100 1000	nA
tphl	Response Time High to Low R_L = 10kΩ, C_L = 15pF, V_{CC} = V_{thd} -10mV			20		µs

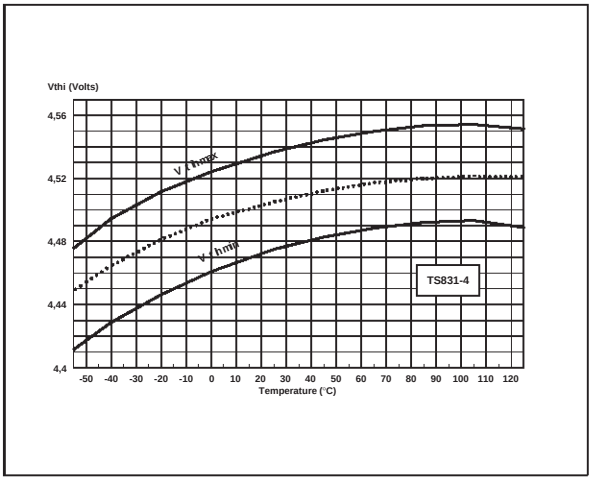
EQUIVALENT SCHEMATIC DIAGRAM



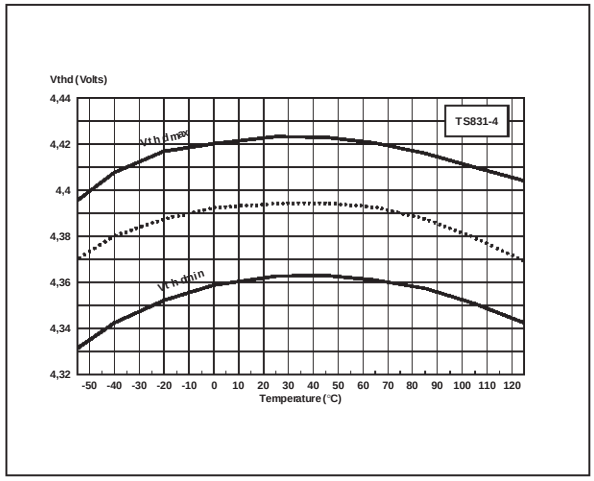
TIMING DIAGRAM



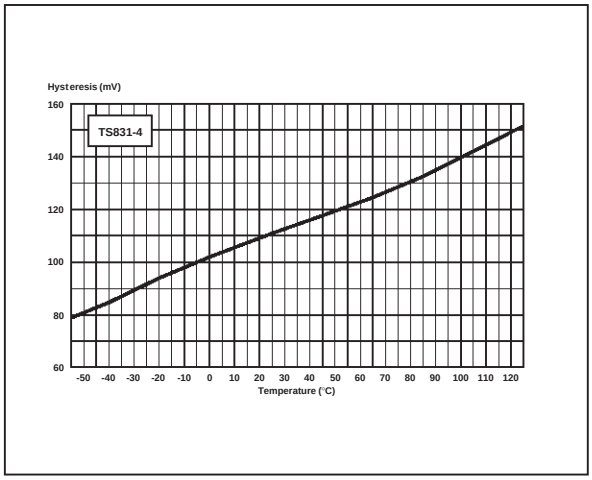
Vth vs Temperature while V_{CC} increasing



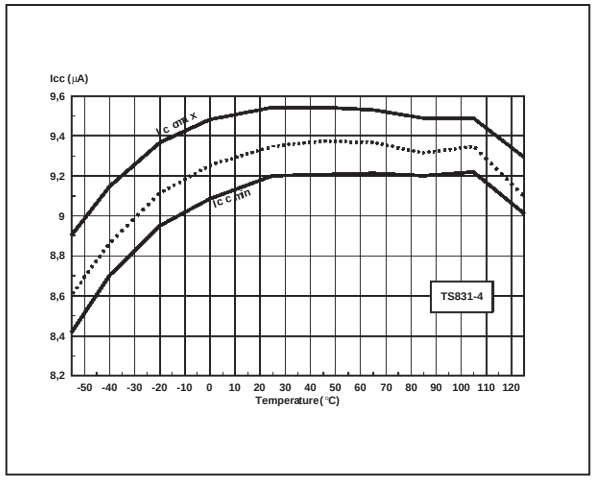
Vth vs Temperature while V_{CC} decreasing



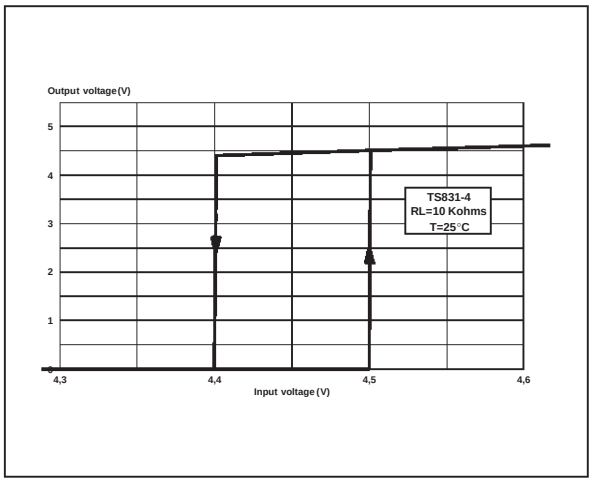
Hysteresis vs Temperature



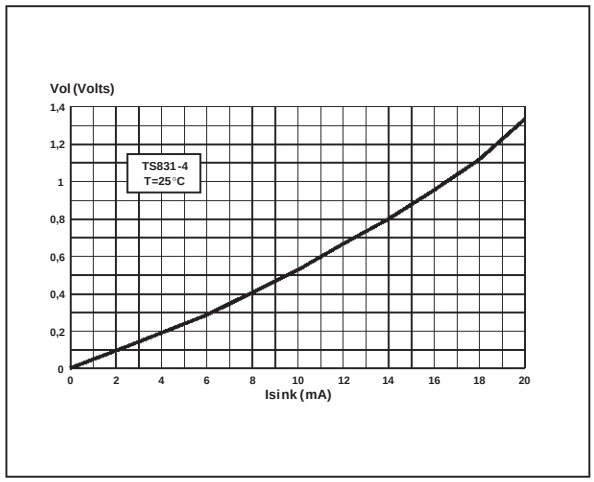
I_{CC} vs Temperature



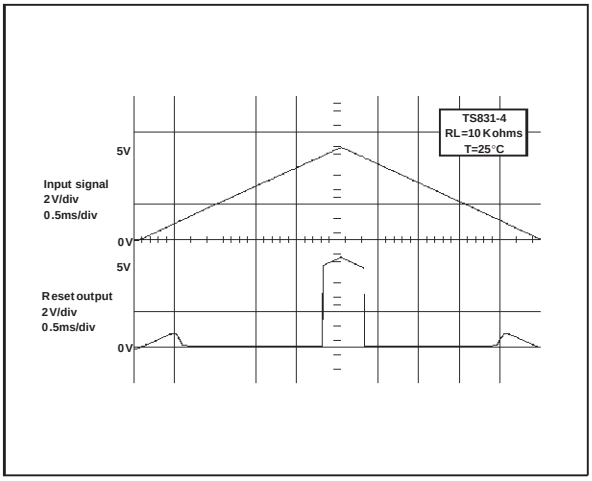
Reset Output Voltage vs Input Voltage



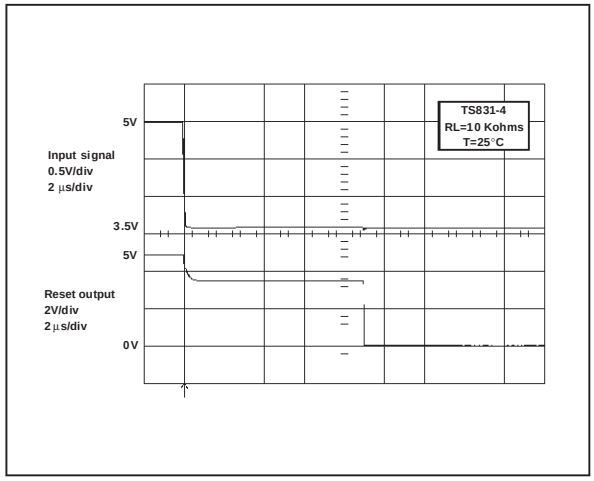
Voltage Output Low vs Sink Current



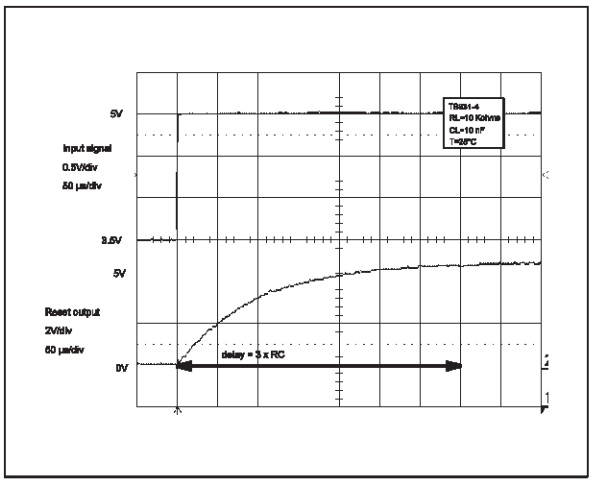
Reset Output Voltage vs Input Voltage



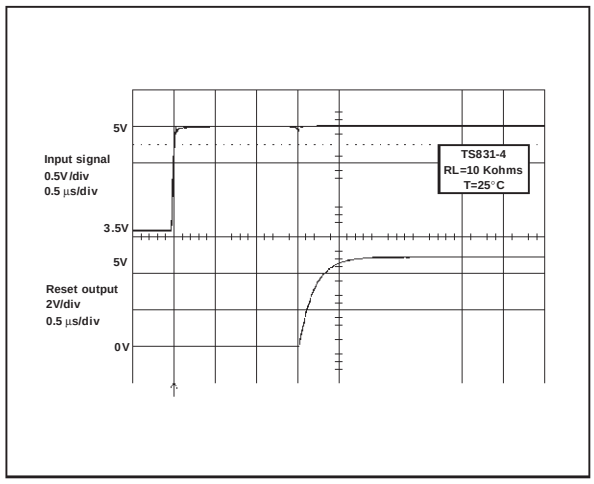
Supply Falling Down : Reset Delay Time



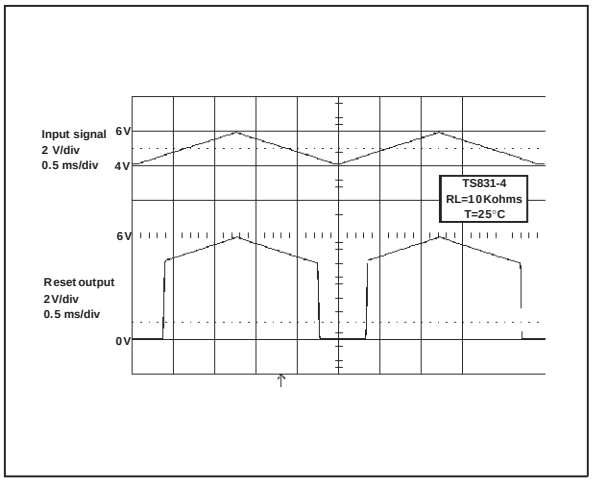
Extended Delay of Power-On-Reset with an External Capacitor



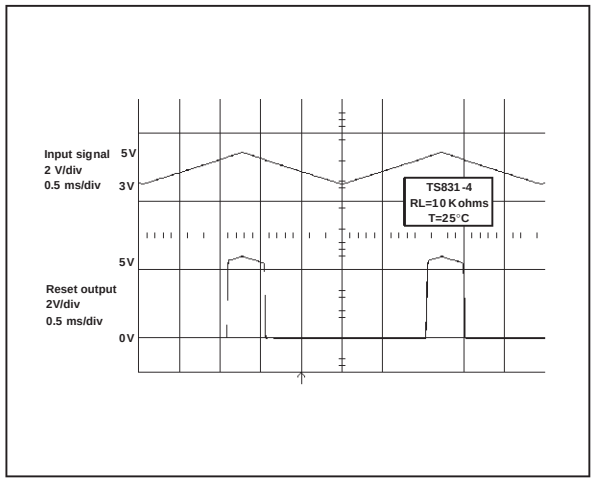
Supply Rising up : Output Delay Time



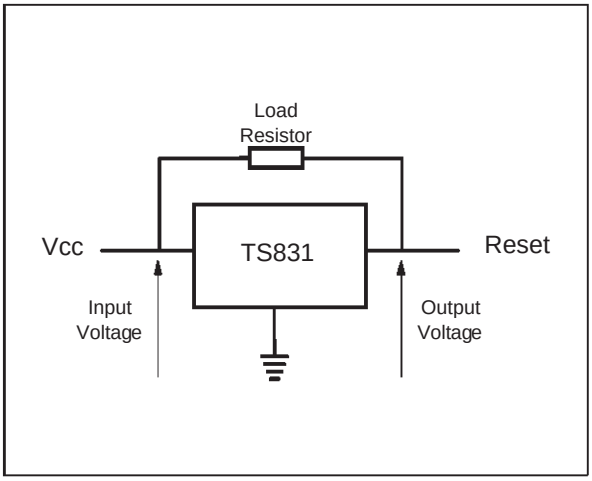
Reset Output Voltage vs Input Voltage (example)



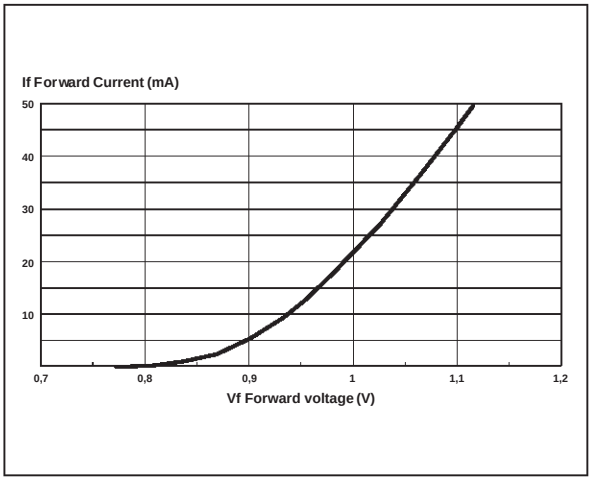
Reset Output Voltage vs Input Voltage (example)



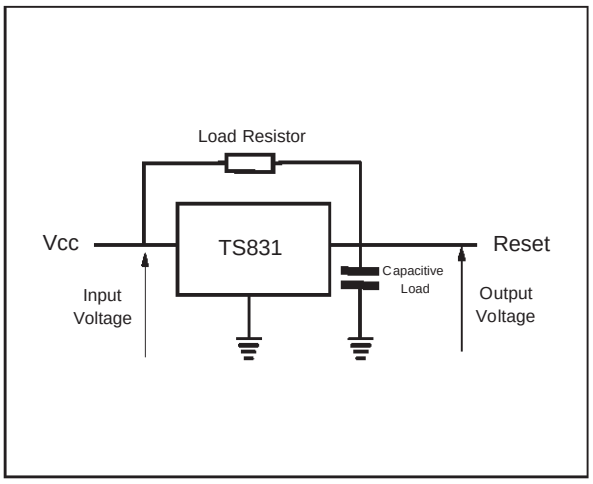
Basic Configuration



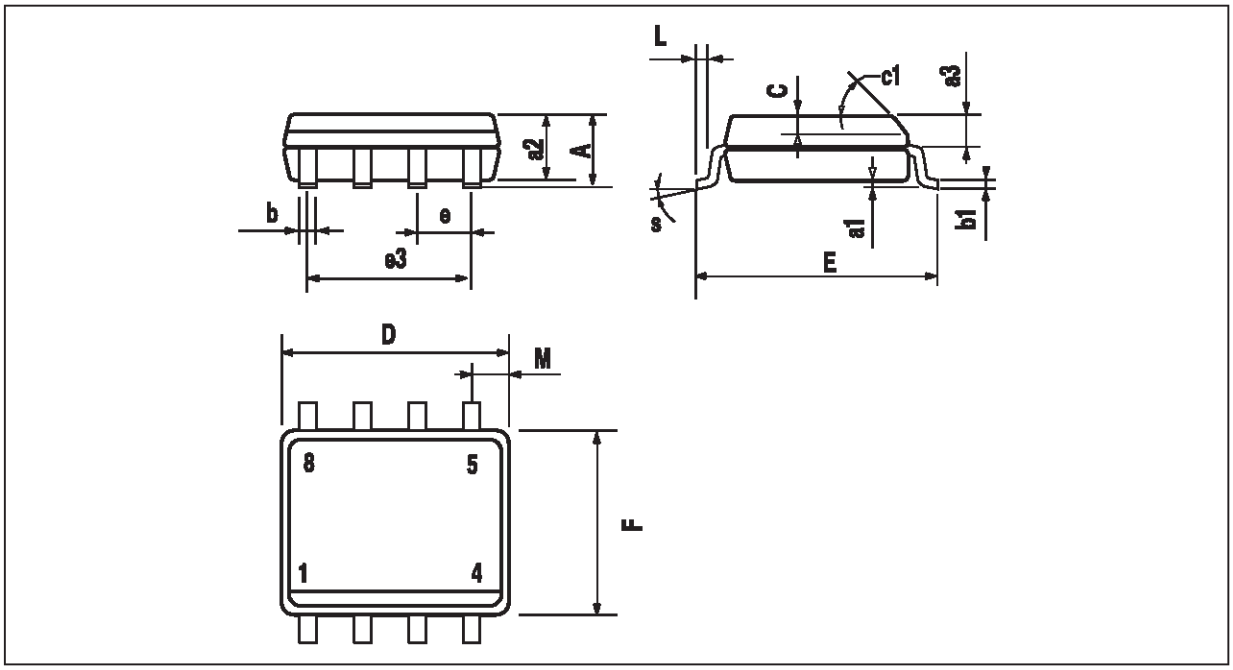
Clamp Diode Forward Current vs Voltage



Configuration with an Additional Capacitive Load



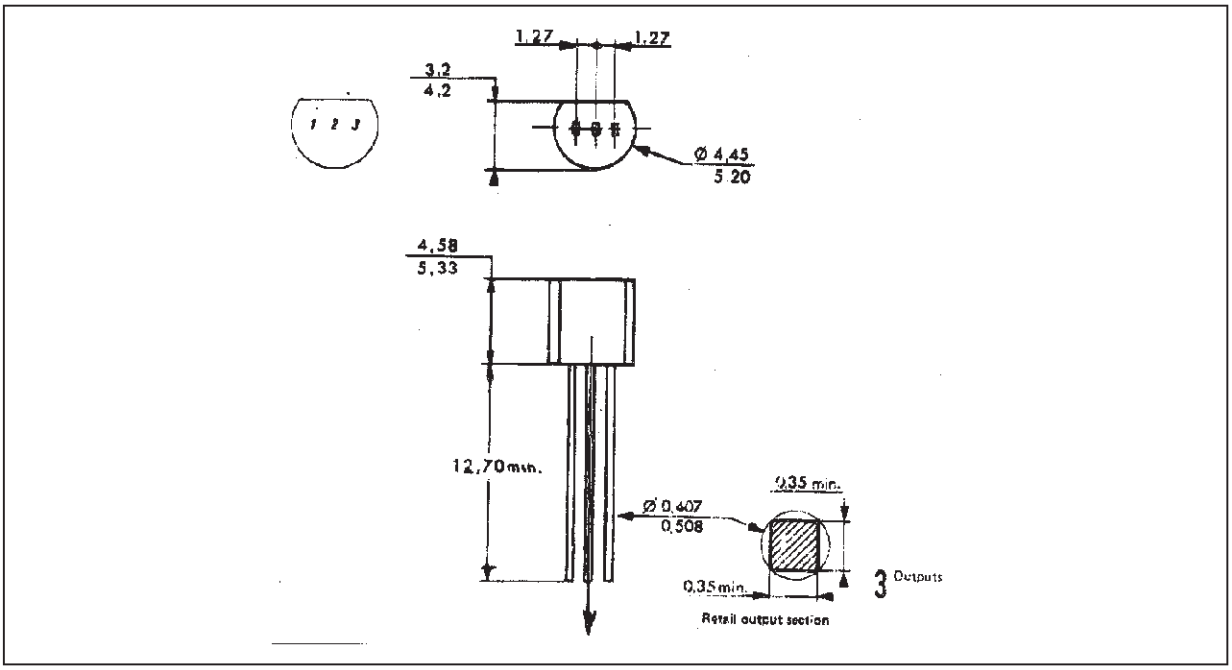
PACKAGE MECHANICAL DATA
8 PINS - PLASTIC MICROPACKAGE (SO)



Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45^o (typ.)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.150		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8^o (max.)					

PACKAGE MECHANICAL DATA

3 PINS - PLASTIC PACKAGE TO92



Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
L		1.27			0.05	
B	3.2	3.7	4.2	0.126	0.1457	0.1654
O1	4.45	5.00	5.2	0.1752	0.1969	0.2047
C	4.58	5.03	5.33	0.1803	0.198	0.2098
K	12.7			0.5		
O2	0.407	0.5	0.508	0.016	0.0197	0.02
a	0.35			0.0138		