

## LOW DROP-OUT 5V DUAL VOLTAGE REGULATOR

- OUTPUT CURRENT OF BOTH REGULATORS : 100 mA GUARANTEED
- INTERNAL SHORT-CIRCUIT AND THERMAL PROTECTION
- FIRST REGULATOR OUTPUT : LOW DISCHARGE CURRENT
- SECOND REGULATOR OUTPUT : SWITCHED-OFF WITH ACTIVE DISCHARGE
- RESET OUTPUT WITH ADJUSTABLE PULSE WIDTH

### DESCRIPTION

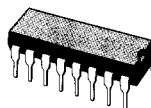
The TEA5110 is a dual positive 5V voltage regulator specially designed to supply a microprocessor and associated circuits.

The first regulator supplies the microprocessor in normal operating conditions. In standby mode, the regulator has a very high output impedance (current drain less than 1  $\mu$ A) and the microprocessor may be powered by a battery.

The second regulator supplies the peripherals and provides a halt signal to the microprocessor to turn it in standby mode.

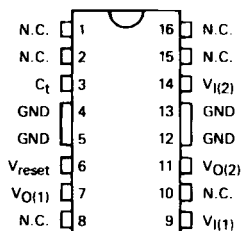
The circuit generates a reset pulse when :

- the supply voltage is applied to the circuit and the output of the second regulator is at its nominal value, and
- when the output of the second regulator is at its nominal value again after a shut-down on the output of the first regulator (see figure 2 page 4).



**TEA5110**  
**BATWING DIP16**  
(Plastic Package)

### PIN CONNECTIONS



E88TEA5110-01

- 1 - N.C.
- 2 - N.C.
- 3 -  $C_t$  : Time constant capacitor
- 4 - GND : Ground
- 5 - GND : Ground
- 6 -  $V_{reset}$  : Reset output
- 7 -  $V_{O(1)}$  : Output voltage 1
- 8 - N.C.
- 9 -  $V_{I(1)}$  : Input voltage
- 10 - N.C.
- 11 -  $V_{O(2)}$  : Output voltage 2
- 12 - GND : Ground
- 13 - GND : Ground
- 14 -  $V_{I(2)}$  : Input voltage 2
- 15 - N.C.
- 16 - N.C.

## ABSOLUTE MAXIMUM RATINGS

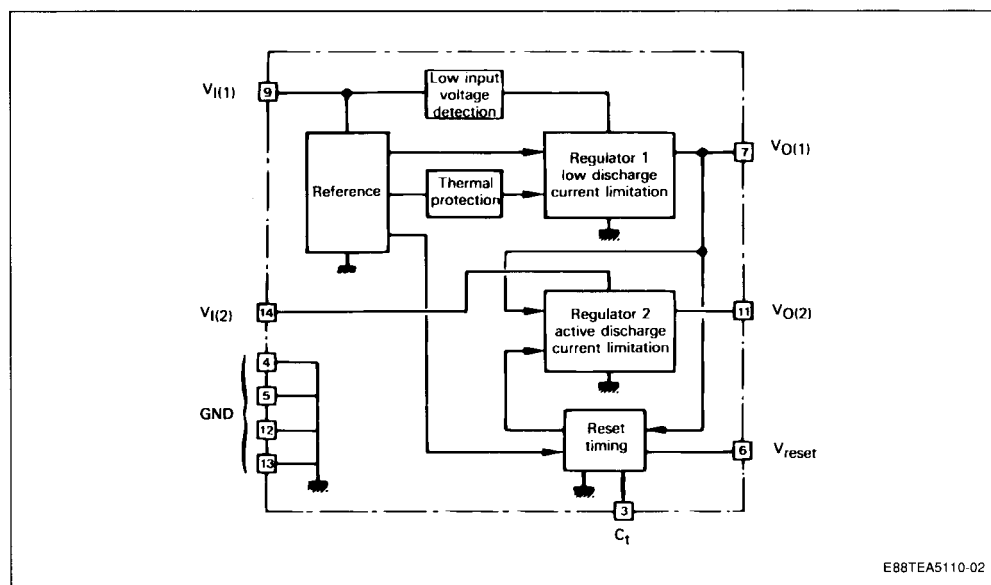
Symbol	Parameter	Value	Unit
$V_I$	Input Voltage	20	V
$I_O$	Output Current	Internally Limited	A
$P_{tot}$	Power Dissipation	Internally Limited	W
$T_{oper}$	Operating Ambient Temperature Range	0 to 70	°C
$T_{stg}$	Storage Temperature Range	- 65 to 150	°C

## THERMAL DATA

$R_{th(j-a)}^*$	Junction-ambient Thermal Resistance	45	°C/W
$R_{th(j-c)}$	Junction-case Thermal Resistance	11	°C/W

\* The  $R_{th(j-a)}$  is measured on devices soldered on 35  $\mu\text{m}$  thick copper surface of 40  $\text{cm}^2$ .

## BLOCK DIAGRAM

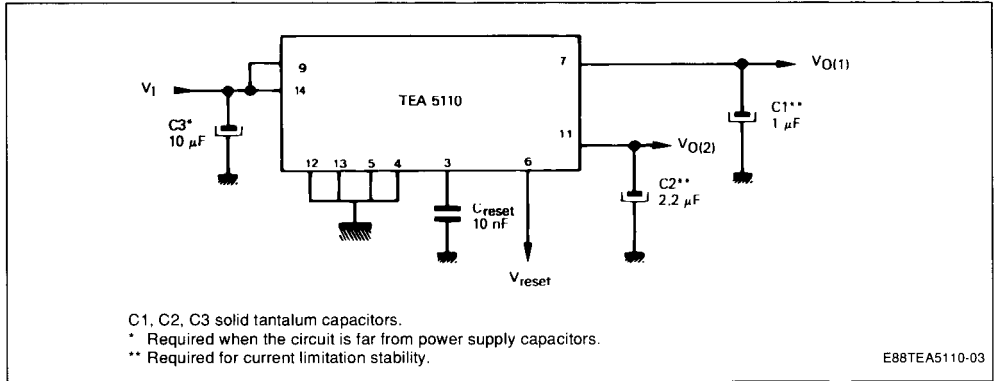
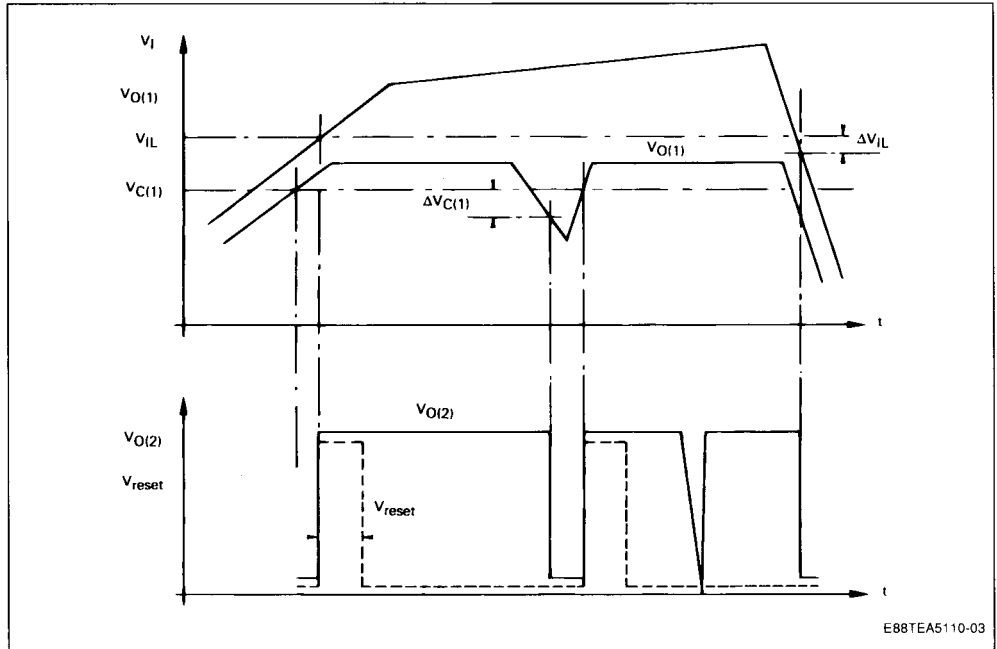


**ELECTRICAL CHARACTERISTICS** $T_j = +25\text{ }^{\circ}\text{C}$  (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{O(1)}$	Output Voltage ( $+7\text{ V} \leq V_i \leq +18\text{ V}$ , $0 \leq I_{O(1)} \leq 100\text{ mA}$ )	4.9	5.05	5.2	V
$V_{O(2)}$	Output Voltage ( $+7\text{ V} \leq V_i \leq +18\text{ V}$ , $0 \leq I_{O(2)} \leq 100\text{ mA}$ )	4.8	5	5.2	V
$V_{O(1)}-V_{O(2)}$	Output Voltage Difference $+7\text{ V} \leq V_i \leq +18\text{ V}$ , $0 \leq I_{O(1)} \leq 100\text{ mA}$ , $0 \leq I_{O(2)} \leq 100\text{ mA}$	0	50	100	mV
$K_{Vl(1)}$ $K_{Vl(2)}$	Line Regulation $+6.8\text{ V} \leq V_i \leq +18\text{ V}$ , $I_{O(1)} = 50\text{ mA}$ $+6.8\text{ V} \leq V_i \leq +18\text{ V}$ , $I_{O(2)} = 50\text{ mA}$		10 20	50 50	mV mV
$K_{VO(1)}$ $K_{VO(2)}$	Load Regulation $5\text{ mA} \leq I_{O(2)} \leq 100\text{ mA}$ , $V_i = +10\text{ V}$ $5\text{ mA} \leq I_{O(2)} \leq 100\text{ mA}$ , $V_i = +10\text{ V}$		10 20	50 50	mV mV
$I_Q$	Quiescent Current ( $+6.8\text{ V} \leq V_i \leq +18\text{ V}$ , $I_{Q(1)} = I_{Q(2)} = 0$ )		6	8	mA
$I_{SC(1)}$ $I_{SC(2)}$	Short-circuit Current $V_i = +10\text{ V}$ , $0 \leq V_{O(1)} \leq +5\text{ V}$ $V_i = +10\text{ V}$ , $0 \leq V_{O(2)} \leq +5\text{ V}$		200 200		mA mA
$V_i-V_{O(1)}$ $V_i-V_{O(2)}$	Minimum Dropout Voltage - (note 1) Output 1 $I_{O(1)} = 0$ $I_{O(1)} = 0.1\text{ A}$ Output 2 $I_{O(2)} = 0$ $I_{O(2)} = 0.1\text{ A}$		1.4 1.6 1.5 1.7		V V V V
$I_{dis(1)}$	$V_{O(1)}$ Discharge Current ( $V_i = 0$ , $V_{O(1)} = +5\text{ V}$ )			1	$\mu\text{A}$
	Minimum Input Voltage to Switch on $V_{O(2)}$ Output (fig. 1, note 2)	$(V_{O1}+1.4)$	$(V_{O1}+1.6)$	$(V_{O1}+1.8)$	V
$\Delta V_{IL}$	Input Hysteresis to Switch off $V_{O(2)}$ Output (fig. 1)	200	300	400	mV
	Minimum $V_{O(1)}$ Output Voltage to Switch on $V_{O(2)}$	4.5	4.6	4.7	V
$\Delta V_{C(1)}$	$V_{O(1)}$ Hysteresis Voltage to switch off $V_{O(2)}$ (fig. 2)	30	50	70	mV
$V_{L(O2)}$	$V_{O(2)}$ Low Output Voltage (active discharge) $V_i = +10\text{ V}$ , $I_{O(2)} = -90\text{ mA}$ $V_i = +10\text{ V}$ , $I_{O(2)} = -10\text{ mA}$		1.3 120	1.6 180	V mV
$V_{L(reset)}$	Reset Low Output Voltage ( $V_i = +10\text{ V}$ , $I_{reset} = -16\text{ mA}$ )		120	400	mV
$V_{H(reset)}$	Reset High Output Voltage ( $V_i = +10\text{ V}$ , $I_{reset} = 1\text{ mA}$ )	$V_{O(2)}-1\text{ V}$		$V_{O(2)}$	V
$t_{reset}$	Reset Pulse Duration ( $V_i = +10\text{ V}$ , $C_{reset} = 10\text{ nF}$ ) – Note 3	4	8	16	ms
KVT	Average Temperature Coefficient of Output Voltage ( $T_j = 0\text{ }^{\circ}\text{C}$ to $-70\text{ }^{\circ}\text{C}$ )		0.5		mV/ $^{\circ}\text{C}$
$\theta$	Thermal Shut Down Temperature	110			$^{\circ}\text{C}$
SVR	Supply Voltage Rejection Ratio $V_i = +12\text{ V}$ , $\Delta V_i = 4\text{ Vpp}$ , $I_O = 10\text{ mA}$ , $f = 100\text{ Hz}$		50		dB

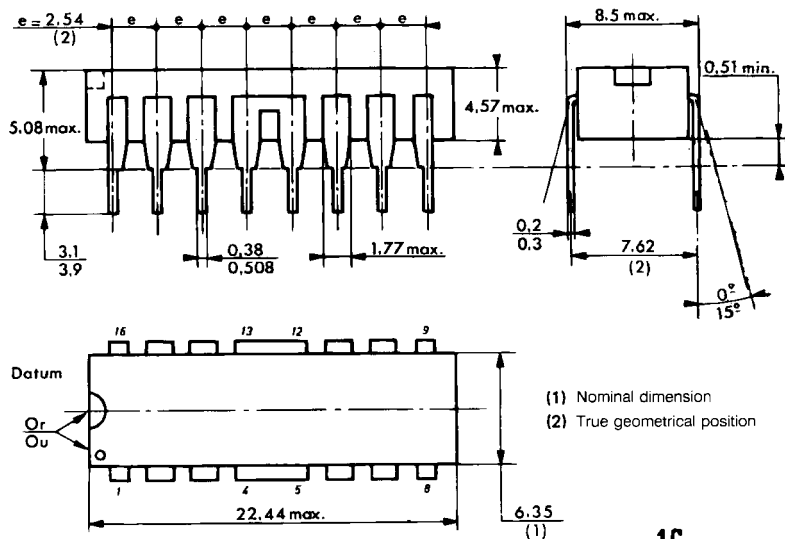
- Notes :**
- The dropout voltage (input-output voltage difference) is measured when the output voltage has dropped 100 mV from the nominal value obtained at 10 V input voltage.  
Dropout voltage is dependent upon load current and junction temperature.
  - $V_{O(1)}$  voltage is measured at 10 V input voltage.
  - $t_{reset}$  (ms) = 0.8  $C_{reset}$  (nF).

Figure 1 : Typical Application and Test Circuit.

Figure 2 : Dynamic Characteristics of  $V_{O(1)}$ ,  $V_{O(2)}$ ,  $V_{reset}$  Outputs.

## PACKAGE MECHANICAL DATA

16 PINS – PLASTIC DIP



16 Pins