LOW DROP-OUT 5V DUAL VOLTAGE REGULATOR

- OUTPUT CURRENT OF BOTH REGULA-TORS : 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 μA) 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.
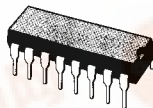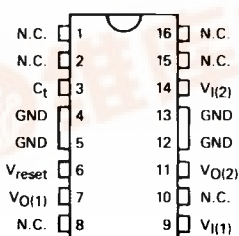
The circuit generates a reset pulse when :

- 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

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.	

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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 μm thick copper surface of 40 cm2.

BLOCK DIAGRAM
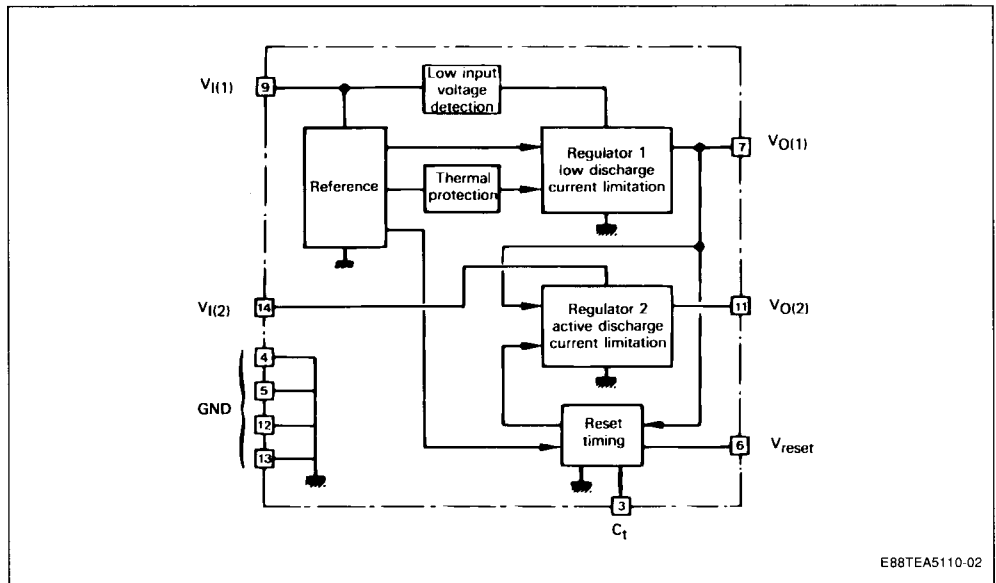
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ELECTRICAL CHARACTERISTICS

$T_j = + 25\ °C$ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
$V_{O(1)}$	Output Voltage (+ 7 V $\leq V_I \leq$ + 18 V, 0 $\leq I_{O(1)} \leq$ 100 mA)	4.9	5.05	5.2	V
$V_{O(2)}$	Output Voltage (+ 7 V $\leq V_I \leq$ + 18 V, 0 $\leq I_{O(2)} \leq$ 100 mA)	4.8	5	5.2	V
$V_{O(1)} - V_{O(2)}$	Output Voltage Difference + 7 V $\leq V_I \leq$ + 18 V, 0 $\leq I_{O(1)} \leq$ 100 mA, 0 $\leq I_{O(2)} \leq$ 100 mA	0	50	100	mV
$K_{VI(1)}$ $K_{VI(2)}$	Line Regulation + 6.8 V $\leq V_I \leq$ + 18 V, $I_{O(1)} =$ 50 mA + 6.8 V $\leq V_I \leq$ + 18 V, $I_{O(2)} =$ 50 mA		10 20	50 50	mV mV
$K_{VO(1)}$ $K_{VO(2)}$	Load Regulation 5 mA $\leq I_{O(2)} \leq$ 100 mA, $V_I = $ + 10 V 5 mA $\leq I_{O(2)} \leq$ 100 mA, $V_I = $ + 10 V		10 20	50 50	mV mV
I_Q	Quiescent Current (+ 6.8 V $\leq V_I \leq$ + 18 V, $I_{Q(1)} = I_{Q(2)} = 0$)		6	8	mA
$I_{SC(1)}$ $I_{SC(2)}$	Short–circuit Current $V_I = $ + 10 V, 0 $\leq V_{O(1)} \leq$ + 5 V $V_I = $ + 10 V, 0 $\leq V_{O(2)} \leq$ + 5 V		200 200		mA mA

$V_I - V_{O(1)}$
 	
$V_I - V_{O(2)}$
	Minimum Dropout Voltage - (note 1)
	Output 1 $I_{O(1)} = 0$
	            $I_{O(1)} = 0.1$ A
	Output 2 $I_{O(2)} = 0$
	            $I_{O(2)} = 0.1$ 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 V)			1	μA
	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
ΔV_{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
$V_{L(02)}$	$V_{O(2)}$ Low Output Voltage (active discharge) $V_I = $ + 10 V, $I_{O(2)} = - 90$ mA $V_I = $ + 10 V, $I_{O(2)} = - 10$ mA		1.3 120	1.6 180	V mV
$V_{L(reset)}$	Reset Low Output Voltage ($V_I = $ + 10 V, $I_{reset} = - 16$ mA)		120	400	mV
$V_{H(reset)}$	Reset High Output Voltage ($V_I = $ + 10 V, $I_{reset} = 1$ mA)	$V_{O(2)} - 1$V		$V_{O(2)}$	V
t_{reset}	Reset Pulse Duration ($V_I = $ + 10 V, $C_{reset} = 10$ nF) – Note 3	4	8	16	ms
KVT	Average Temperature Coefficient of Output Voltage ($T_j = 0$ °C to $- 70$ °C)		0.5		mV/°C
θ	Thermal Shut Down Temperature	110			°C
SVR	Supply Voltage Rejection Ratio $V_I = $ + 12 V, $\Delta V_I = 4$ Vpp, $I_O = 10$ mA, f = 100 Hz		50		dB

Notes :   1. 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.
2. $V_{O(1)}$ voltage is measured at 10 V input voltage.
3. t_{reset} (ms) = 0.8 C_{reset} (nF).
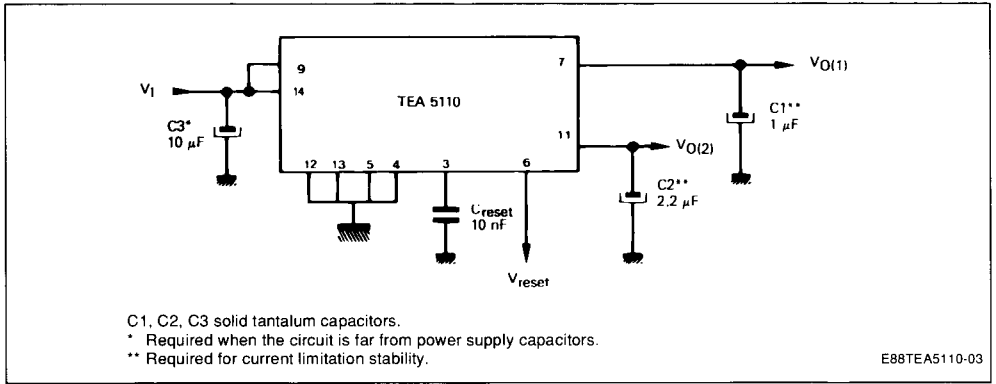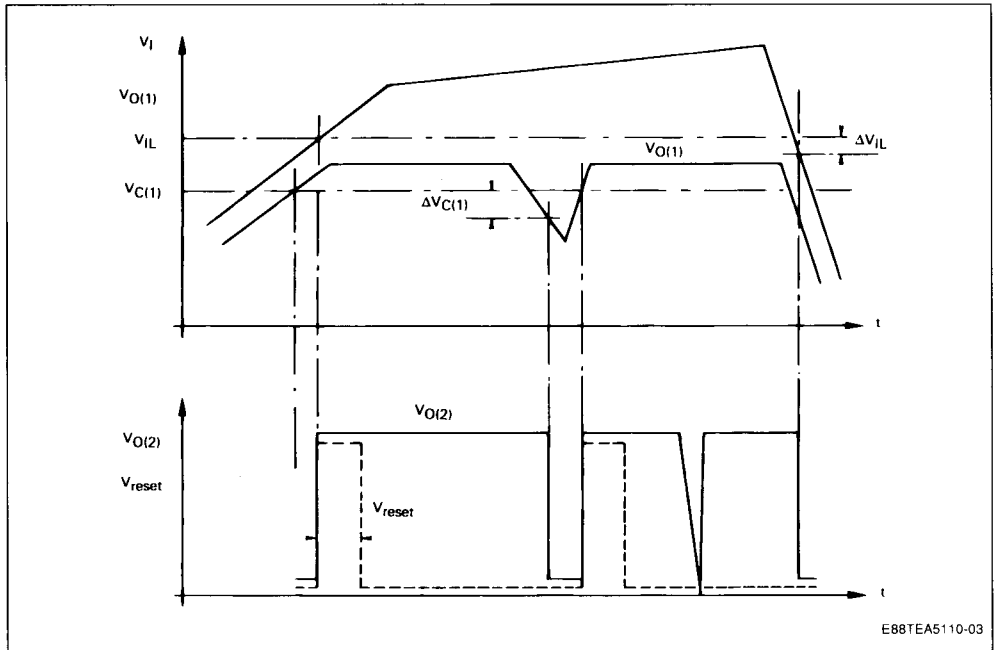
Figure 1 : Typical Application and Test Circuit.

C1, C2, C3 solid tantalum capacitors.
*   Required when the circuit is far from power supply capacitors.
** Required for current limitation stability.

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

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PACKAGE MECHANICAL DATA

16 PINS – PLASTIC DIP

e = 2.54 (2)

8.5 max.

0.51 min.

4.57 max.

5.08 max.

3.1 / 3.9

0.38 / 0.508

1.77 max.

0.2 / 0.3

7.62 (2)

0°
15°

Datum
Or
Ou

(1) Nominal dimension
(2) True geometrical position

22.44 max.

6.35 (1)

16 Pins