

IC of adjustable voltage regulator of positive polarity with low residual voltage and load current 3 A

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IC IL1084 is a powerful adjustable voltage regulator of positive polarity with low residual voltage and load current 3,2 A.

IC of powerful adjustable voltage regulator with low residual voltage lower than 1,5A and reference voltage 1,25 V is purposed for producing constant temperature-stabilized voltage of positive polarity by means of the value set by external resistive divider and used in electronic equipment as a source of stabilized supply.

Properties:

- Reference voltage 1,25V
- Output current up to 3,2 A
- Input-output voltage difference, $U_{IN} - U_O$ up to 30 V
- Residual voltage lower than 1,5 V
- Overload protection
- Embedded temperature protection
- Operation range of chip temperature from 0 up to +125°C.

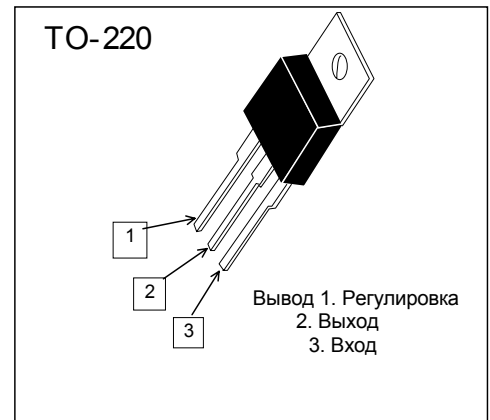
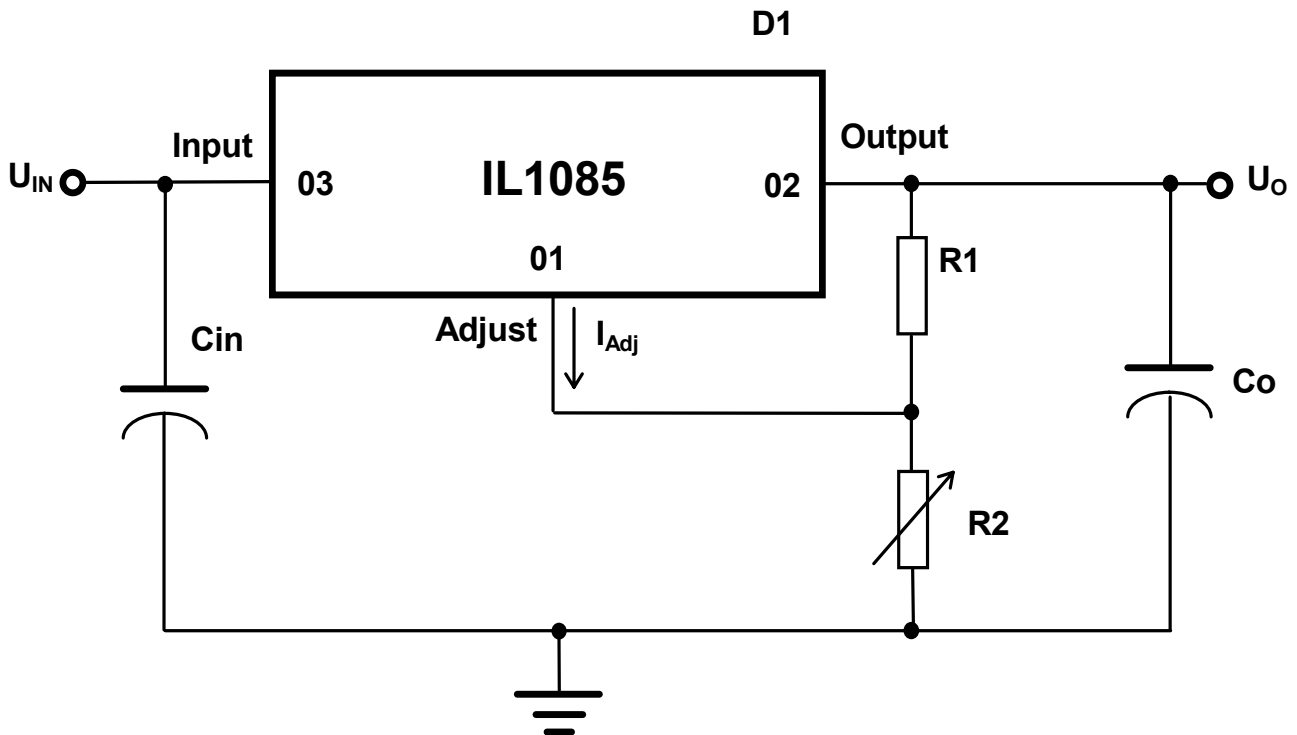


Table 1 – Description of regulator IC pins in 3-pin package TO-220

Pin No.	Description	Name
01	Adjustment	Adjust
02	Output	Output
03	Input	Input



C1, C2 – smoothing capacitors, C1=10 mkF, C2=100 mkF (Ta),

D1 - IC

R1, R2 - resistors, R1=121 Om ± 1%, R2 – adjusted with accuracy 1%.

Output voltage U_o , V, is defined by formula::

$$U_o = U_{ref} \left(1 + \frac{R_2}{R_1}\right) + I_{Adj} R_2 ,$$

Where U_{ref} - reference voltage, V,

I_{Adj} - adjustment current, mA.

Since I_{ADJ} has values not more than 120 mA, inaccuracy dependent on this value for U_o – is minor..

Figure 1 – Connection circuit of adjustable voltage regulator

TABLE 2 – TABLE OF ELECTRICAL CHARACTERISTICS

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Characteristic, measurement unit	Symbol	Measurement mode	Standard		Temperature $T_J, ^\circ\text{C}$
			min	Max	
Reference voltage, V	U_{ref}	$I_O=10\text{mA}$ $(U_{IN} - U_O)=3\text{B}$	1,238	1,262	25 ± 10
		$10\text{mA} \leq I_O \leq I_{FULL\ LOAD}$ $1,5\text{B} \leq (U_{IN} - U_O) \leq 25\text{B}$	1,225	1,270	$0 \div 125$
Change of output voltage when input voltage changes, %	Regline	$I_O=10\text{mA}$, $1,5\text{B} \leq (U_{IN} - U_O) \leq 15\text{B}$	-	0,2	$0 \div 125$
Change of output voltage when load current changes, %		$I_O=10\text{mA}$, $15\text{B} \leq (U_{IN} - U_O) \leq 30\text{B}$	-	0,5	$0 \div 125$
Residual voltage, V	Regload	$(U_{IN} - U_O) = 3\text{B}$ $10\text{mA} \leq I_O \leq I_{FULL\ LOAD}$	-	0,3	25 ± 10
Maximum output current, A		U_{ds}	$\Delta U_{ref} = 1\%$, $I_O = I_{FULL\ LOAD}$	-	0,4
Minimum output current, mA	$I_{O\ max}$	$(U_{IN} - U_O) = 5\text{B}$	-	1,5	$0 \div 125$
Thermostabilization, %/W		$(U_{IN} - U_O) = 25\text{B}$	3,2	-	$0 \div 125$
Pulsation smoothing ratio, dB	$I_{O\ min}$	$(U_{IN} - U_O) = 25\text{B}$	-	10	$0 \div 125$
Adjustment current, mkA	Regterm	$t_{импульс}=30\text{мс}$, $T_A=25^\circ\text{C}$		0,020	
Change of adjustment current, mkA	RR	$f=120\text{Гц}$, $C_{Adj}=25\text{мкФ}$, $C_O=25\text{ мкФ}$ (ТАНТАЛ), $I_O=I_{FULL\ LOAD}$, $(U_{IN} - U_O)=3\text{B}$	60	-	$0 \div 125$
Ratio of output voltage temporary instability, %	I_{Adj}	$10\text{mA} \leq I_O \leq I_{FULL\ LOAD}$ $1,5\text{B} \leq (U_{IN} - U_O) \leq 25\text{B}$	-	120	$0 \div 125$
Characteristic, measurement unit	ΔI_{Adj}	$10\text{mA} \leq I_O \leq I_{FULL\ LOAD}$ $1,5\text{B} \leq (U_{IN} - U_O) \leq 25\text{B}$	-	5	$0 \div 125$
	S	1000 ч ; $T_J = 125^\circ\text{C}$ (при испытаниях)	-	1	25 ± 10

Notes:

- 1 Measurement of electrical characteristics is carried out when capacitance $C_{IN}=10\text{ mkF}$ is connected to the input and $C_O=100\text{ mkF}$ – to the output;
- 2 Reference voltage U_{ref} in adjustable regulator is measured between outputs Output and Adjust on resistance R1 (figure 1);
- 3 Parameters stipulated in table 1 are ensured for constant chip temperature T_J . Measurement of parameters should be performed using heatsink and pulse technique;
- 4 $I_{FULL\ LOAD}$ – value of maximum output current dependent on input-output voltage difference $(U_{IN} - U_O)$ with power dissipation in package KT-28 - 30 W.

Table 3 – Typical values of electrical characteristics

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Characteristic, Measurement unit	Symbol	Measurement mode	Typical value
Adjustment current, mA	I_{Adj}	$T_J = 25^{\circ}C$	55
Temperature ratio of output voltage instability, %	TS	$T_J = 0 \div 125^{\circ}C$	0,5
Noise voltage on output, (%)	$U_{n\ rms}$	$T_J = 25^{\circ}C$ $10\ \Gamma\text{Ц} \leq f \leq 10\ \text{к}\Gamma\text{Ц}$	0,003

Table 4 – Table of maximum and absolute maximum ratings

Parameter	Measurement unit	Maximum ratings		Absolute maximum ratings	
		min	max	min	max
Input-output voltage difference, $U_{IN} - U_O$	V	2,77	30	0	31
Chip temperature, T_J	$^{\circ}C$	0	125	-65	150
Storage temperature, T_{stg}	$^{\circ}C$			-65	150