

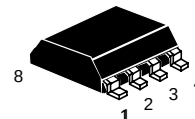
Low-Powered Adjustable Voltage Regulator with low drop-out voltage

KK2931CD

IC KK2931CD is an adjustable voltage regulator of positive polarity with low drop-out voltage.

IC is purposed for formation of temperature-constant voltage of the value set by external resistive divider in the range from 3 to 24 V and used in the supply of electronic equipment.

SO (MS-012AA)



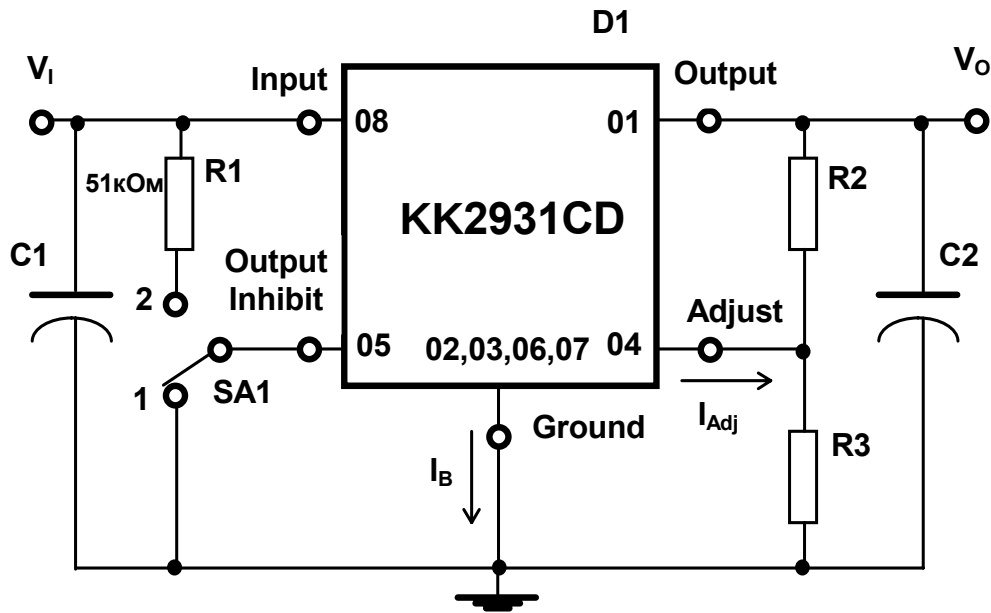
- Output voltage 3-24V.
- Drop-out voltage not less than 0,2V at load current of 10 mA and less than 0,6V at load current of 100 mA.
- Internal limitation of maximum load current.
- Protection against overvoltage of positive and negative polarity
- Temperature protection

Pin No.	Purpose	Name
01	Output	Output
02,03,06,07	Common	Ground
04	Adjustment	Adjust
05	Disconnection output	Output Inhibit
08	Input	Input

Table 1 - pins purpose of IC in 8-pin SO package

Table 2 - Maximum and absolute maximum operation conditions

Parameter	Unit	Maximum mode		Absolute maximum mode	
		min	max	min	max
Junction temperature, T_J	$^{\circ}\text{C}$	-40	125	-	-
Storage temperature, T_{stg}	$^{\circ}\text{C}$	-	-	-60	150
Input voltage, U_I	V	$U_O+0,6$	26	-15	40
Input voltage, $U_{I(\tau)}$, $\tau \leq 100$ ms	V			-50	60
Output current, I_O	mA	-	100	-	100
Resistance junction-case, $R_{\theta_{JC}}$	$^{\circ}\text{C/W}$	-	25(typ.)	-	25(typ.)
Resistance junction-ambient, $R_{\theta_{JA}}$	$^{\circ}\text{C/W}$	-	160(typ.)	-	160(typ.)



C1, C2 - input and output capacitance,
 D1 - IC,
 R1, R2, R3 - resistors,
 SA1 - switch (in position 1 - output is «on»,
 in position 2 - output is «off»).

Output voltage is defined from formula:

$$V_o = V_{ref} \left(1 + \frac{R_3}{R_2}\right) + I_{Adj} R_3, \quad (1)$$

where resistors R2, R3 must meet the following condition:

$$22,5 \kappa O M \geq \frac{R_2 \times R_3}{R_2 + R_3}, \quad (2)$$

where V_{ref} - reference voltage,

R_2 , R_3 - resistors,

I_{Adj} - adjustment current

Figure 1 - Connection circuit of adjustable voltage regulator

Table 3 - Electrical parameters ($U_I=14V$, $U_O = 3,0V$, $I_O = 10mA$, $R_2 = 27\ k\Omega$, (unless specified otherwise)

Parameter, unit	Symbol	Test conditions	Rate		Temperature $T_J, ^\circ C$
			min	max	
Reference voltage *, V	U_{ref}	$I_O=10mA$	1,14	1,26	25 ± 10
		$I_O\leq100mA$	1,08	1,32	$-40\div125$
Output voltage, V	$U_{O\ range}$	-	$3 \div 24$	-	25 ± 10
Output voltage versus input voltage, mV/V	Regline	$(U_O+0,6)\ V < U_I < 26\ V$	-	1,5	25 ± 10
Output voltage versus load current, %/V	Regload	$5mA < I_O < 100mA$	-	1,0	25 ± 10
Consumption current, mA	I_B	$I_O=10mA$	-	1,0	25 ± 10
		Output is «off» ($U_{th(OI)}=2,5\ V$)	-	1,0	25 ± 10
Pulse-smoothing ratio, %/V	RR	$f = 120\ Hz$	0,10	-	25 ± 10
Drop-out voltage, V	U_{ds}	$I_O=10mA$	-	0,2	25 ± 10
		$I_O=100mA$	-	0,6	25 ± 10
Maximum input voltage threshold, V	$U_{th\ (OV)}$		26	40	25 ± 10
Output voltage at negative input voltage, V	$-U_O$	$U_I = -15\ V$	-0,3	-	25 ± 10
Voltage threshold of disconnection output, V	$U_{th\ (OI)}$	Output is «on»	-	1,9	25 ± 10
				1,2	$-40\div125$
		Output is «off»	2,5	-	25 ± 10
			3,25	-	$-40\div125$
Disconnection output current, mkA	$I_{th\ (OI)}$	$U_{th\ (OI)} = 2,5\ V$	-	50	25 ± 10

Notes:

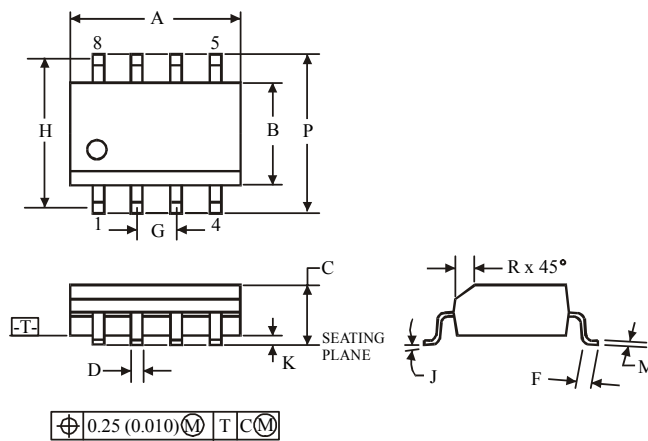
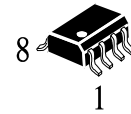
1. Measurement of electrical parameters is conducted with capacitance $C_1=0.1mkF$ connected on input and $C_O=100mkF$ - on output.
2. *- Reference voltage in adjustable regulator is measured between outputs Output and Adjust on resistance R_2 (figure 1).
3. Parameters stipulated in table 3 are guaranteed for constant junction temperature T_J . Parameters measurement should be performed using pulse equipment.

Table 4 - Typical values of electrical parameters ($U_I=14B$, $U_O = 3,0B$, $I_O = 10mA$, $R_2 = 27\ k\Omega$, unless specified otherwise)

Parameter unit	Symbol	Test conditions	Typical value	Temperature $T_J, ^\circ C$
Output resistance, mOhm/V	Z_O	$\Delta I_O=1,0mA$, $f=10Hz\div100kHz$	40	25 ± 10
Consumption current, mA	I_B	$I_O = 100\ mA$	6,0	25 ± 10
Adjustment current, mkA	I_{Adj}		0,2	25 ± 10
Noise voltage on output, mV/V	U_n	$f=10\ Hz\div100\ kHz$;	140	25 ± 10
Temporary unstability of output voltage, %/1000h	S	-	0,4	25 ± 10

Notes:

Measurement of electrical parameters is conducted with capacitance $C_1 = 0.1mkF$ connected on input and $C_O = 100\ mkF$ - on output.

**D SUFFIX SOIC
(MS - 012AA)**

NOTES:

1. Dimensions A and B do not include mold flash or protrusion.
2. Maximum mold flash or protrusion 0.15 mm (0.006) per side for A; for B - 0.25 mm (0.010) per side.

Symbol	Dimension, mm	
	MIN	MAX
A	4.8	5
B	3.8	4
C	1.35	1.75
D	0.33	0.51
F	0.4	1.27
G	1.27	
H	5.72	
J	0°	8°
K	0.1	0.25
M	0.19	0.25
P	5.8	6.2
R	0.25	0.5