

KA723

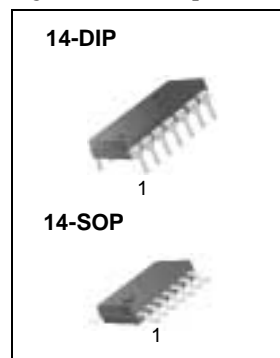
Precision Voltage Regulator

Features

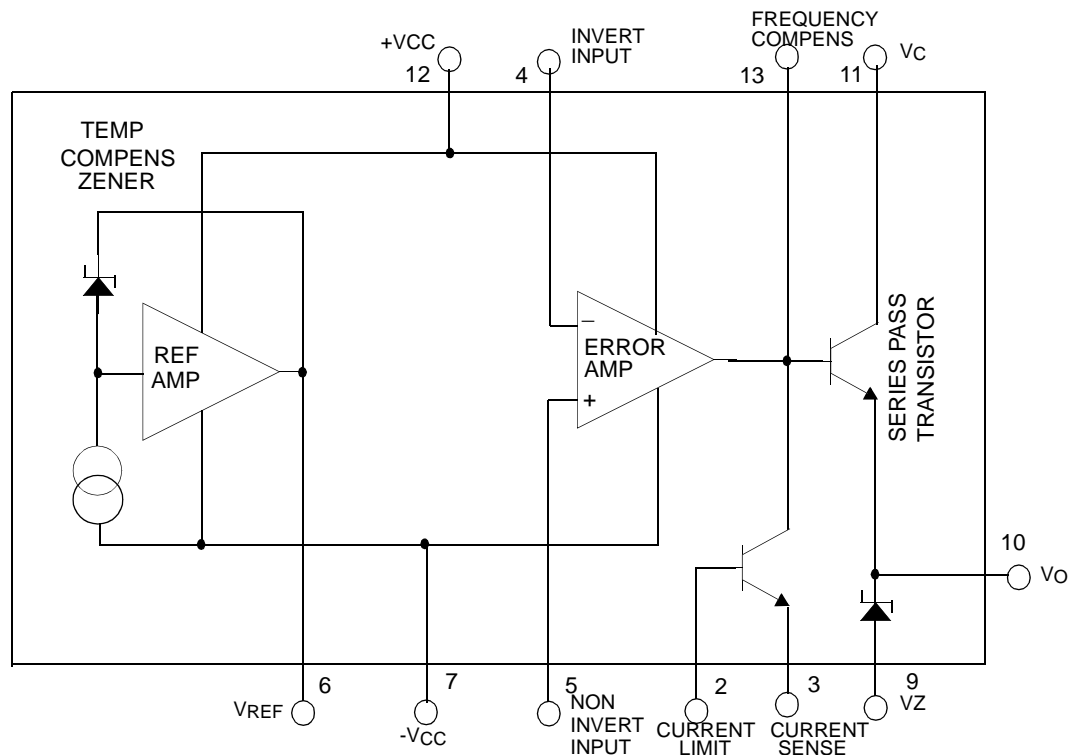
- Positive or Negative Supply Operation
- 0.01% Line and Load Regulation
- Output Voltage Adjustable from 2V to 37V
- Output Current to 150mA Without External Pass Transistor

Description

The KA723 are monolithic integrated circuit voltage regulators featuring high ripple rejection, excellent output and load regulation, excellent temperature stability, and low standby current. The KA723 are also useful in a wide range of other applications such as a shunt regulator, a current regulator or a temperature controller.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Pulse Voltage From V+ to V- (50ms)	$V_{I(P)}$	50	V _{PEAK}
Continuous Voltage from V+ to V-	V_I	40	V
Input-Output Voltage Differential	$V_I - V_O$	40	V
Maximum Output Current	I_O	150	mA
Differential Input Voltage	V_{ID}	±5	V
Voltage Between Non-Inverting Input and V-	V_{IE}	8	V
Current From VZ	I_Z	25	mA
Current From VREF	I_{REF}	15	mA
Power Dissipation	PD	1000	mW
Operating Temperature Range	T_{OPR}	0 ~ +70	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Electrical Characteristics

(Unless otherwise specified, $T_A = 25^\circ\text{C}$, $V_{IN} = V^+ = V_C = 12\text{V}$, $V^- = 0$, $V_{OUT} = 5\text{V}$, $I_L = 1\text{mA}$, $R_{SC} = 0$, $C_I = 100\text{pF}$, $C_{REF} = 0$ and divider impedance as seen by error amplifier $\leq 10\text{K}\Omega$ connected as shown in figure 1)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Line Regulation	ΔV_O	$V_I = 12\text{V to } 15\text{V}$ $V_I = 12\text{V to } 40\text{V}$	-	0.01 0.1	0.1 0.5	%
		$T_{MIN} \leq T_A \leq T_{MAX}$ $V_I = 12\text{V to } 15\text{V}$	-	-	0.3	
Load Regulation	ΔV_O	$I_O = 1\text{mA to } 50\text{mA}$	-	0.03	0.2	%
		$T_{MIN} \leq T \leq T_{MAX}$ $I_O = 1\text{ to } 50\text{mA}$	-	-	0.6	
Ripple Rejection	dB	$f = 100\text{kHz to } 10\text{kHz}, C_{REF} = 0$	-	74	-	dB
		$f = 100\text{kHz to } 10\text{kHz}, C_{REF} = 5\mu\text{F}$	-	86	-	
Average Temperature Coefficient of Output Voltage	$\Delta V_O / \Delta T$	$T_{MIN} \leq T \leq T_{MAX}$	-	0.003	0.015	%/°C
Short Circuit Current Limit	I_{SC}	$R_{SC} = 10\Omega, V_O = 0$	-	65	-	mA
Reference Voltage	V_{REF}	-	6.80	7.15	7.50	V
Output Noise Voltage	V_N	$f = 100\text{kHz to } 10\text{kHz}, C_{REF} = 0$	-	20	-	μVms
		$f = 100\text{kHz to } 10\text{kHz}, C_{REF} = 5\mu\text{F}$	-	2.5	-	
Long-term Stability	ST	-	-	0.1	-	%/ 1000HR
Standby Current Drain	I_D	$I_L = 0, V_I = 30\text{V}$	-	2.0	4.0	mA
Input Voltage Range	V_I	-	9.5	-	40	V
Output Voltage Range	V_O	-	2.0	-	37	V
Input-Output Voltage Differential	V_D	-	3.0	-	38	V

Notes:

1. Line and load regulation specifications are given for the condition of constant chip temperature.
2. Temperature drifts must be taken into account separately for hit dissipation conditions.

Typical Application

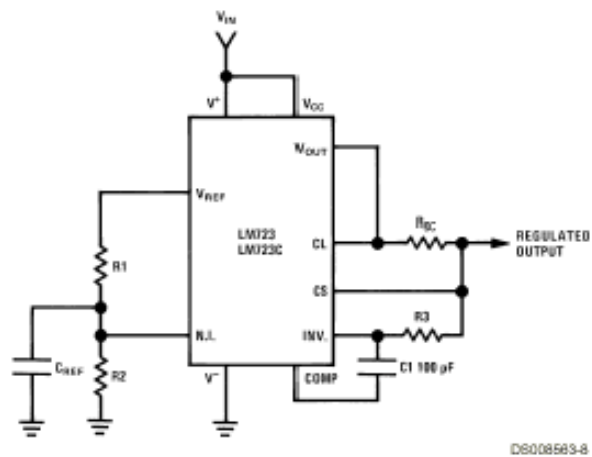


Figure 1. Basic Low Voltage Regulator
(V_{OUT} = 2 to 7Volts)

Note: $R3 = \frac{R1R2}{R1 + R2}$ for minimum temperature drift

Typical Performance

Regulated Output Voltage 5V

Line regulation ($\Delta V_{IN} = 3V$) 0.5mV

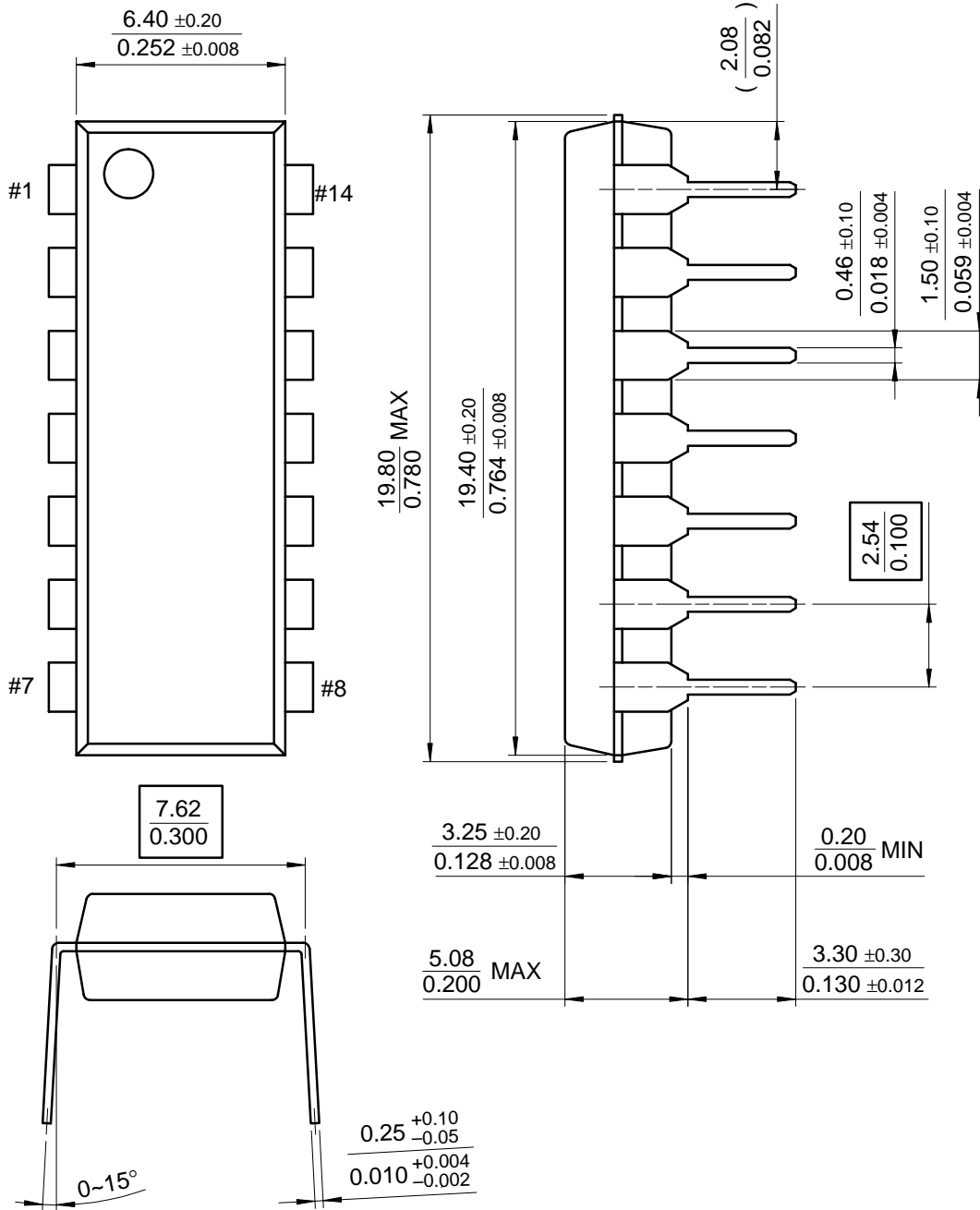
Load Regulation ($\Delta V_L = 50V$) 1.5mV

Mechanical Dimensions

Package

Dimensions in millimeters

14-DIP



Ordering Information

Product Number	Package	Operating Temperature
KA723	14-DIP	0 ~ +70°C
KA723D	14-SOP	

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