



LA5000 Series

2 to 5V 60mA

Low Saturation Voltage Regulators

Overview

The LA5002, 5003, 5004, 5005 are voltage regulators having a small input-output voltage drop (0.2V typ). They are especially suited for use in battery-powered low voltage equipment and commercial or industrial equipment having a large voltage regulation.

Features

- Small input-output voltage drop (0.2V/ $I_{OUT}=20\text{mA}$ typ).
- Minimum number of external parts required.
- Highly resistant against load short.
- Radio noise (radiation) control pin.

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input supply voltage	V_{IN} max		12	V
Output current	I_{OUT} max		60	mA
Allowable power dissipation	P_d max	$T_a=80^\circ\text{C}$	560	mW
Operating temperature	T_{opr}		-20 to +80	$^\circ\text{C}$
Storage temperature	T_{stg}		-30 to +125	$^\circ\text{C}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $C_{OUT}=10\mu\text{F}$, $I_{OUT}=20\text{mA}$, $V_{IN}=3\text{V}$ [LA5002], $V_{IN}=4\text{V}$ [5003], $V_{IN}=5\text{V}$ [5004], $V_{IN}=6\text{V}$ [LA5005]

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	V_O	LA5002	1.85	2.0	2.15	V
		LA5003	2.8	3.0	3.2	V
		LA5004	3.75	4.0	4.25	V
		LA5005	4.75	5.0	5.25	V
Line regulation	V_{Oline}	LA5002 : $2.5\text{V} < V_{IN} < 8\text{V}$			50	mV
		LA5003 : $3.5\text{V} < V_{IN} < 9\text{V}$			50	mV
		LA5004 : $4.5\text{V} < V_{IN} < 10\text{V}$			50	mV
		LA5005 : $5.5\text{V} < V_{IN} < 11\text{V}$			50	mV
Load regulation	V_{Oload}	$1\text{mA} < I_{OUT} < 40\text{mA}$			20	mV
		$1\text{mA} < I_{OUT} < 50\text{mA}$			25	mV

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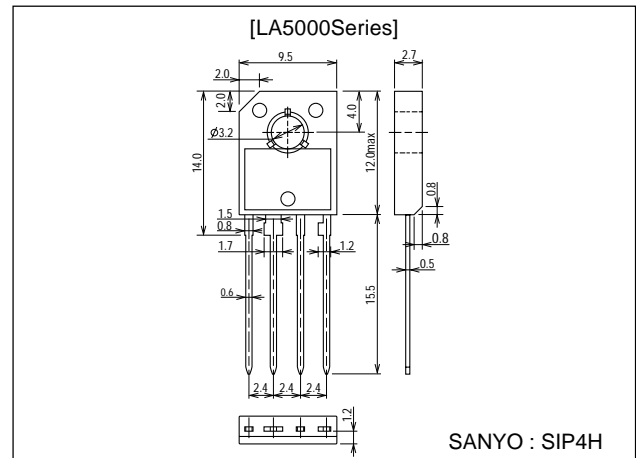
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Package Dimensions

unit:mm

3027A-SIP4H

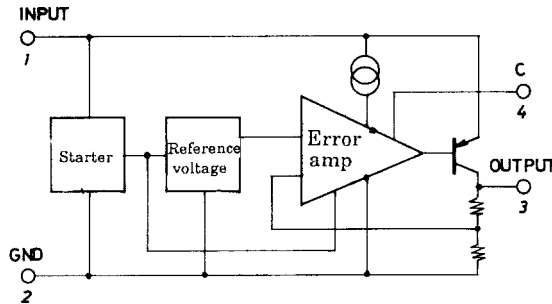


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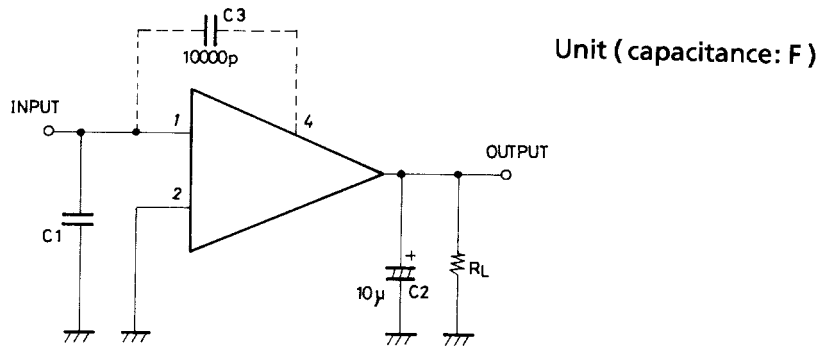
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CCO}	LA5002		1.2	2.0	mA
		LA5003		1.4	2.0	mA
		LA5004		1.5	2.3	mA
		LA5005		1.7	2.5	mA
Ripple voltage	R_r	LA5002, LA5004, LA5005 : $f=120\text{Hz}$	40			dB
		LA5003 : $f=120\text{Hz}$	43			dB
Input/output voltage drop	V_{drop}			0.2	0.3	V
Temperature coefficient of output voltage	$K\Delta V_o/\Delta T$		-1		+1	mV/°C
Output noise voltage	V_N	$10\text{Hz} < f < 100\text{kHz}$		30		μV

Equivalent Circuit Block Diagram

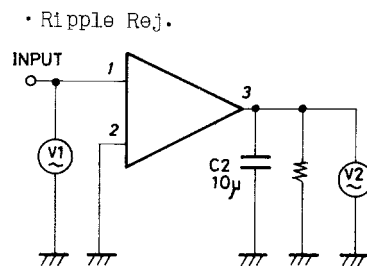
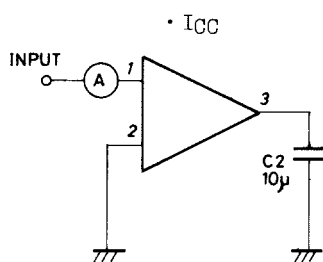
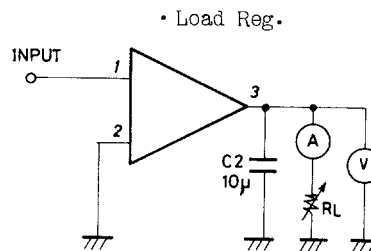
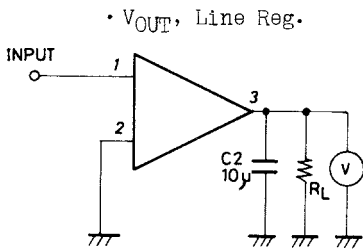


Sample Application Circuit



Note : Capacitor C3 is not required unless radio noise is a problem.

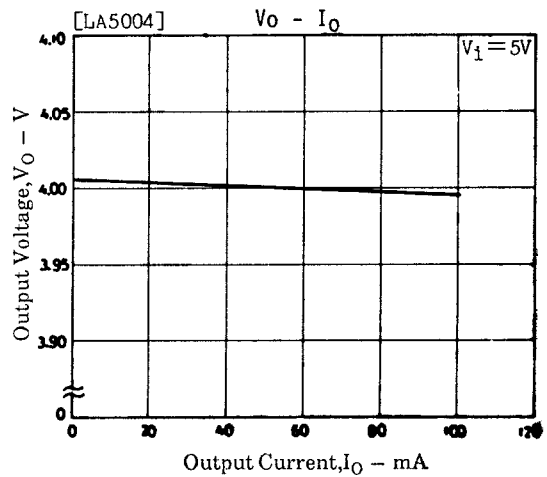
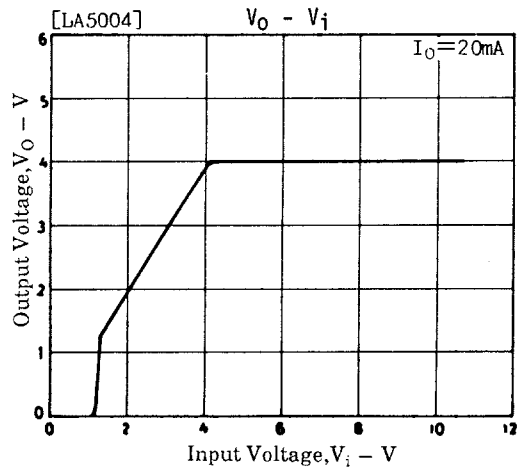
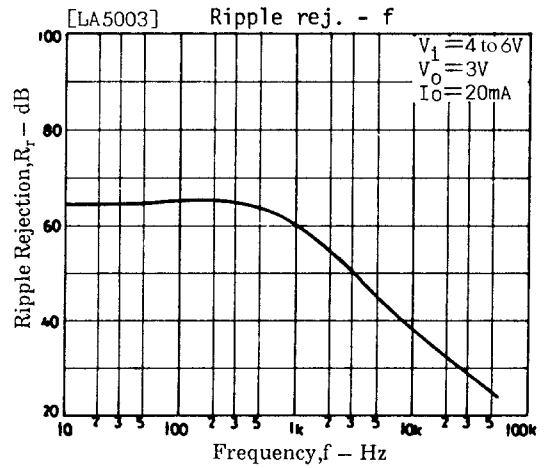
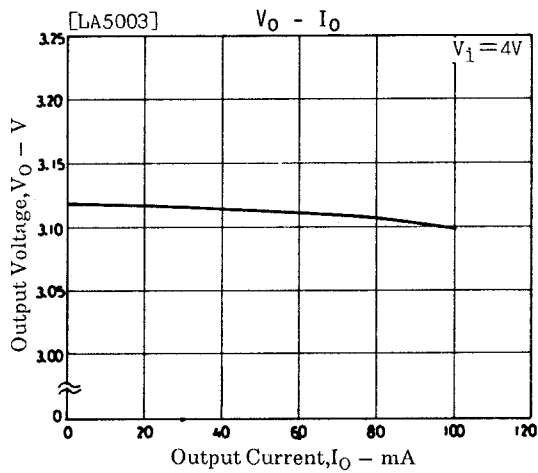
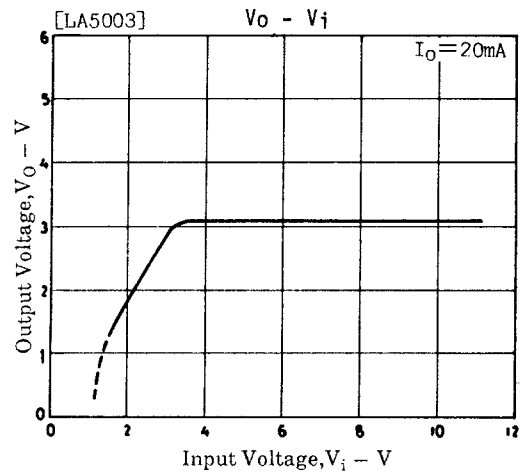
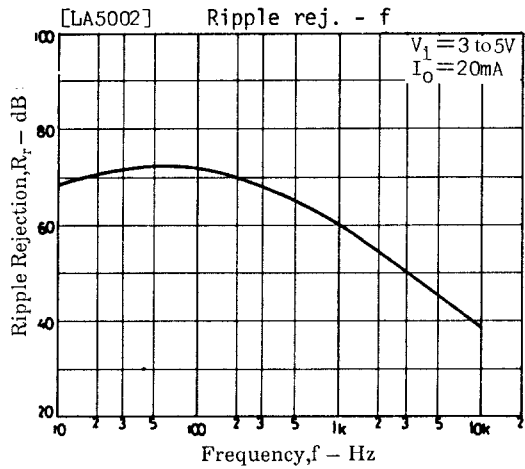
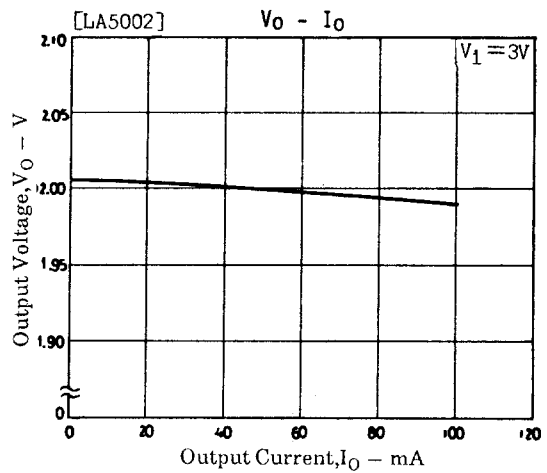
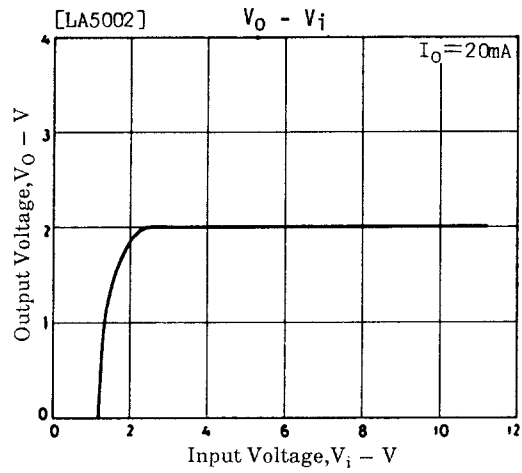
Test Circuits



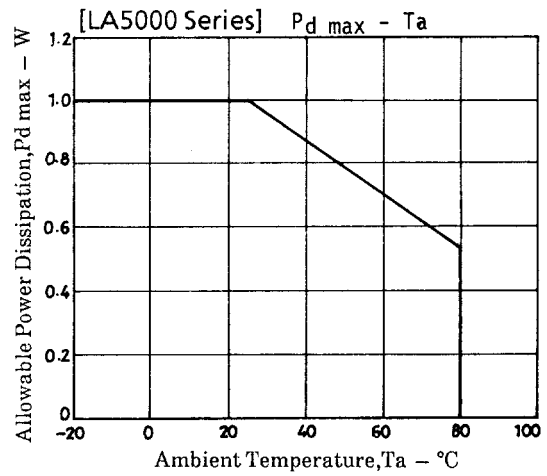
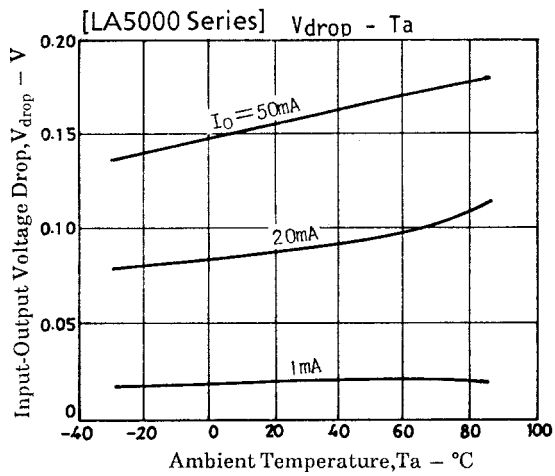
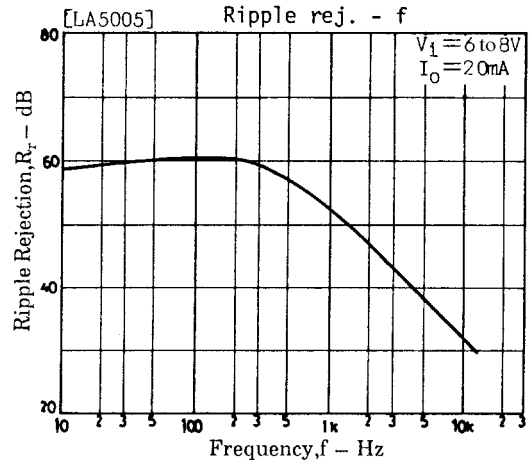
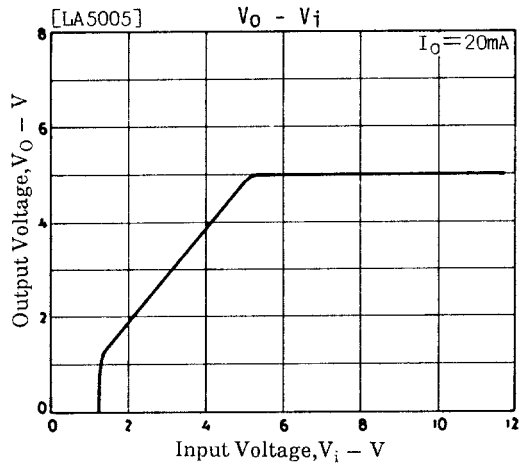
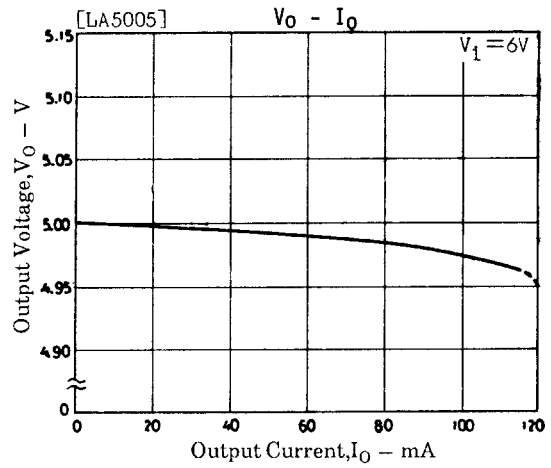
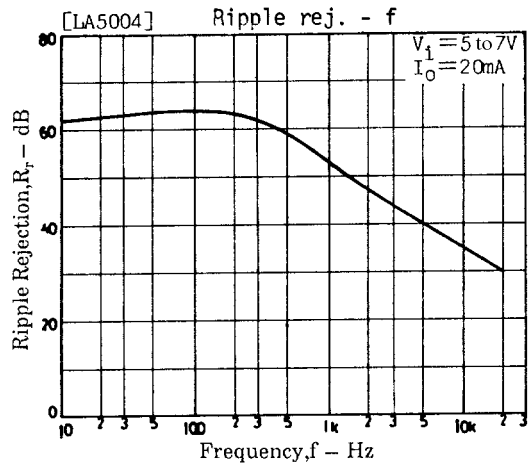
$$\text{Ripple Rej} = \frac{V_1}{V_2}$$

Unit (capacitance: F)

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