

**SANYO**

No.1415C

**LA5000M Series**

Monolithic Linear IC

2 to 10V 60mA  
Low Saturation Voltage Regulators

The LA5002M, 5003M, 5004M, 5005M, 5006M, 5008M, 5009M, 5010M 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

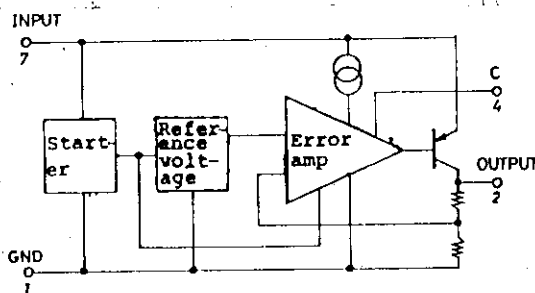
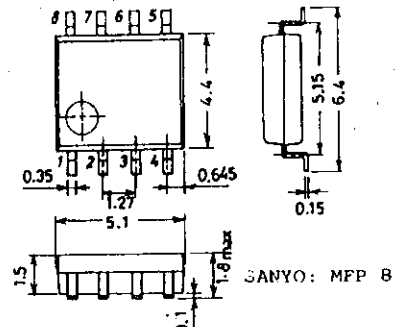
**Maximum Ratings at  $T_a=25^\circ\text{C}$** 

			unit
Input Supply Voltage	$V_{IN\text{max}}$ LA5002M, 5003M, 5004M, 5005M	12	V
	LA5006M, 5008M, 5009M, 5010M	16	V
Output Current	$I_{OUT\text{max}}$	60	mA
Allowable Power Dissipation	$P_d\text{max}$	300	mW
Operating Temperature	Topg	-20 to +80	$^\circ\text{C}$
Storage Temperature	Tstg	-30 to +125	$^\circ\text{C}$

**Operating Characteristics at  $T_a=25^\circ\text{C}$ ,  $C_{OUT}=10\mu\text{F}$ ,  $I_{OUT}=20\text{mA}$ ,  $V_{IN}=3\text{V}$ [LA5002M],  $V_{IN}=4\text{V}$ [LA5003M],  $V_{IN}=5\text{V}$ [LA5004M],  $V_{IN}=6\text{V}$ [LA5005M],  $V_{IN}=7\text{V}$ [LA5006M],  $V_{IN}=9\text{V}$ [LA5008M],  $V_{IN}=10\text{V}$ [LA5009M],  $V_{IN}=11\text{V}$ [LA5010M]**

Output Voltage	$V_o$	LA5002M	min	typ	max	unit
			LA5003M	1.85	2.0	2.15
LA5004M	2.8	3.0	3.2	V		
LA5005M	3.75	4.0	4.25	V		
LA5006M	4.75	5.0	5.25	V		
LA5008M	5.7	6.0	6.3	V		
LA5009M	7.6	8.0	8.4	V		
LA5010M	8.55	9.0	9.45	V		
LA5010M	9.4	10.0	10.6	V		
Line Regulation	$V_o$ line	LA5002M	2.5V	$<V_{IN}<8\text{V}$	50	mV
		LA5003M	3.5V	$<V_{IN}<9\text{V}$	50	mV
		LA5004M	4.5V	$<V_{IN}<10\text{V}$	50	mV
		LA5005M	5.5V	$<V_{IN}<11\text{V}$	50	mV

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**Equivalent Circuit Block Diagram****Case Outline 3032B-M8IC**  
(unit:mm)

Specifications and information herein are subject to change without notice.

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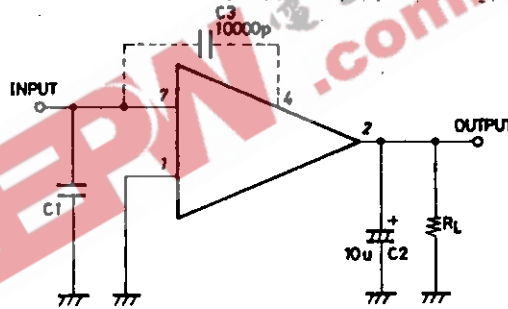
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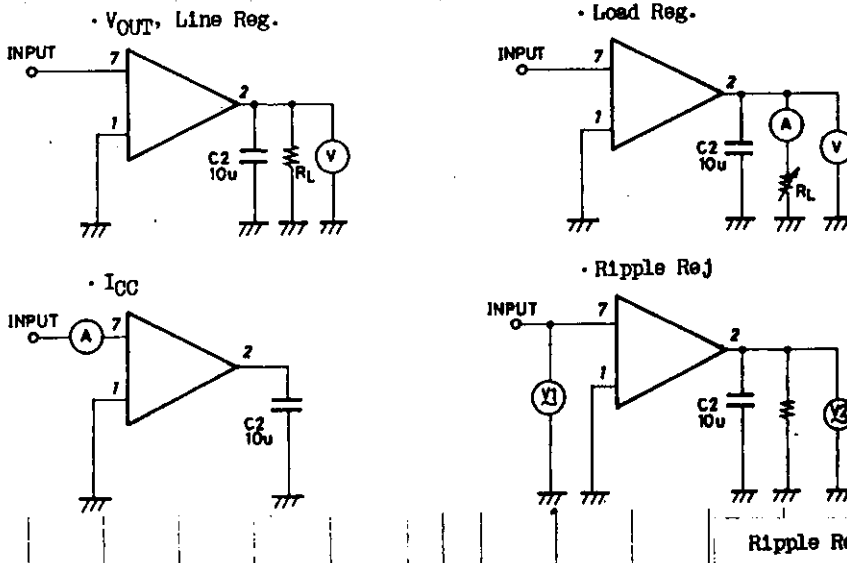
			min	typ	max	unit
Line Regulation		LA5006M $6.5V < V_{IN} < 12V$			50	mV
		LA5008M $9V < V_{IN} < 14V$			50	mV
		LA5009M $10V < V_{IN} < 15V$			50	mV
		LA5010M $11V < V_{IN} < 16V$			50	mV
Load Regulation	$V_o$ load	$1mA < I_{OUT} < 40mA$			20	mV
		$1mA < I_{OUT} < 50mA$			25	mV
Quiescent Current Dissipation	$I_{CCO}$	LA5002M	1.2	2.0		mA
		LA5003M	1.4	2.0		mA
		LA5004M	1.5	2.3		mA
		LA5005M, 5006M, 5008M, 5009M, 5010M	1.7	2.5		mA
Ripple Rejection	$R_r$	LA5002M, 5004M, 5005M $f=120Hz$	40			dB
		LA5003M $f=120Hz$	43			dB
		LA5006M, 5008M, 5009M, 5010M $f=120Hz$	35			dB
Input-Output Voltage Drop	$V_{drop}$		0.2	0.3		V
Temperature Coefficient of Output Voltage	$k\Delta v_o/\Delta T$	LA5002M, 5003M, 5004M, 5005M	-1			1 mV/°C
		LA5006M	-2			2 mV/°C
		LA5008M	-3			3 mV/°C
		LA5009M	-4			4 mV/°C
		LA5010M	-5			5 mV/°C
Output Noise Voltage	$V_N$	$10Hz < f < 100kHz$		30		$\mu V$

Sample Application Circuit

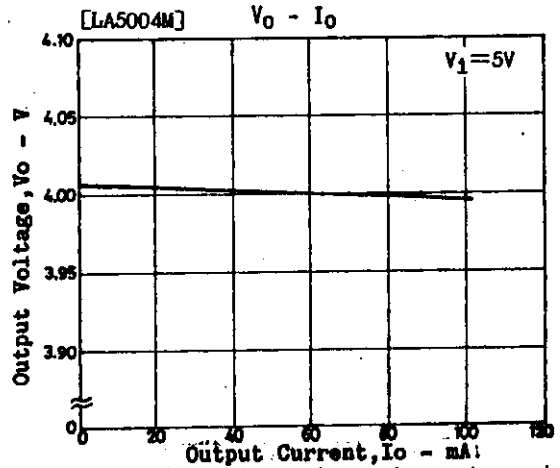
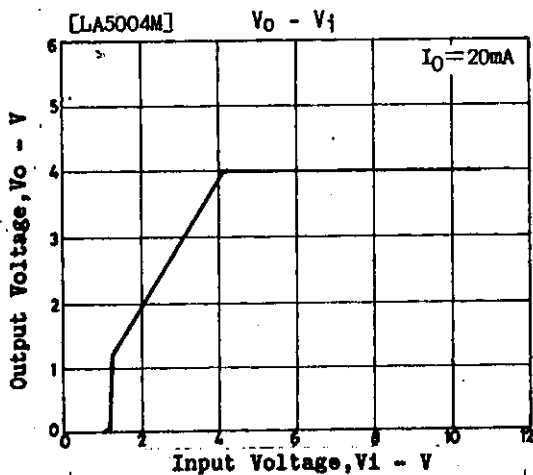
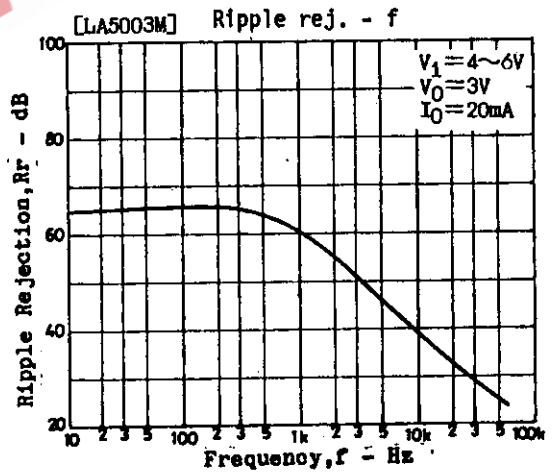
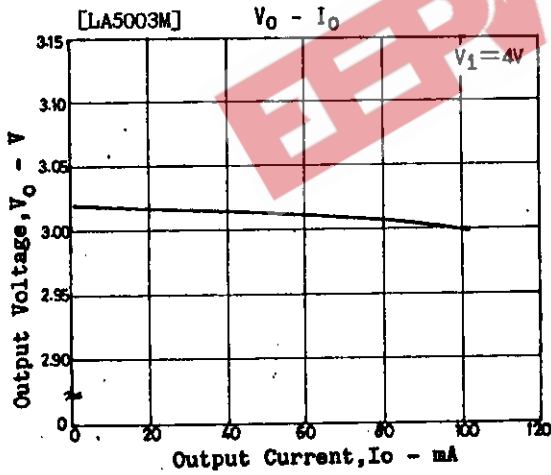
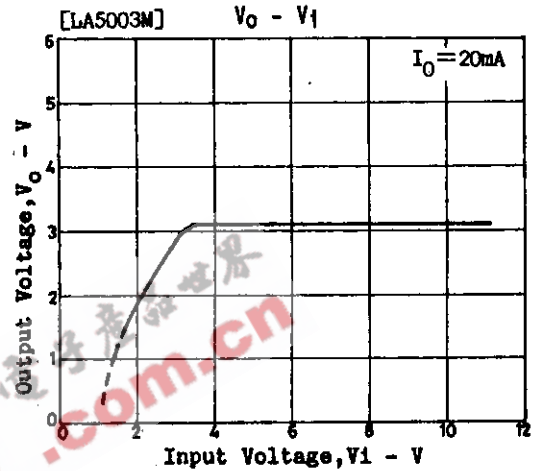
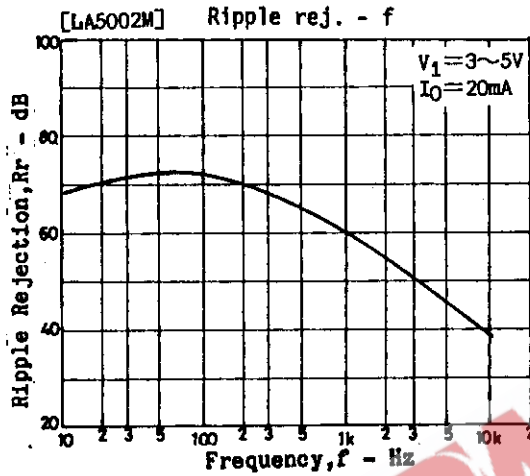
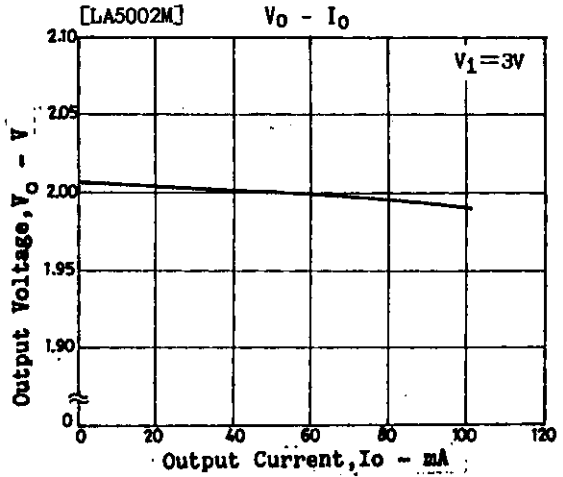
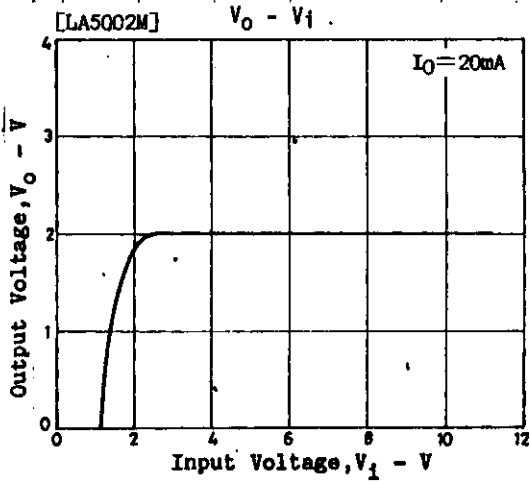


Note: Capacitor C3 is not required unless radio noise is a problem.

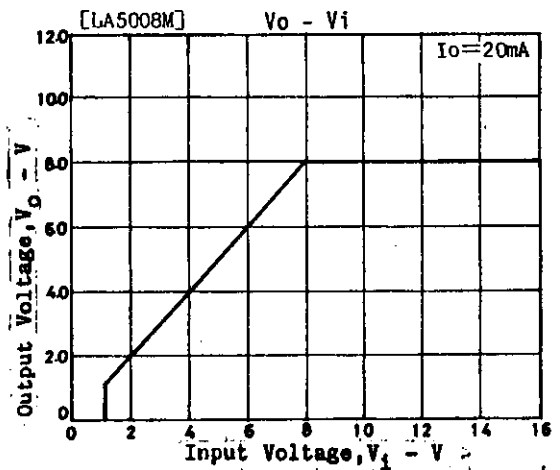
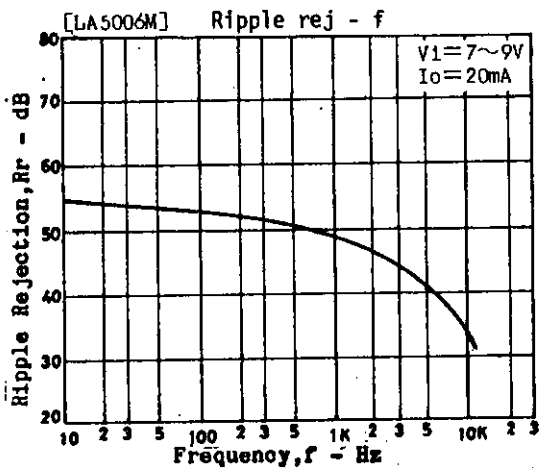
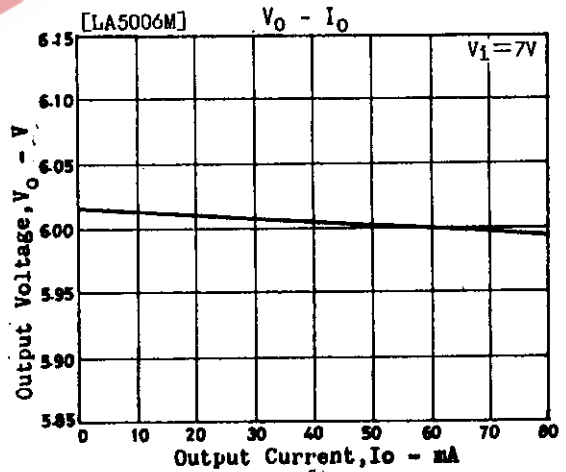
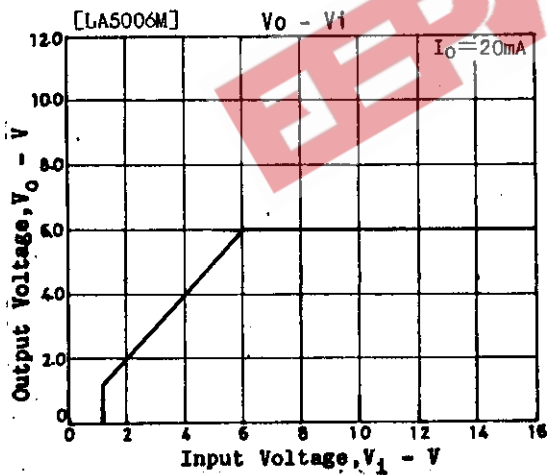
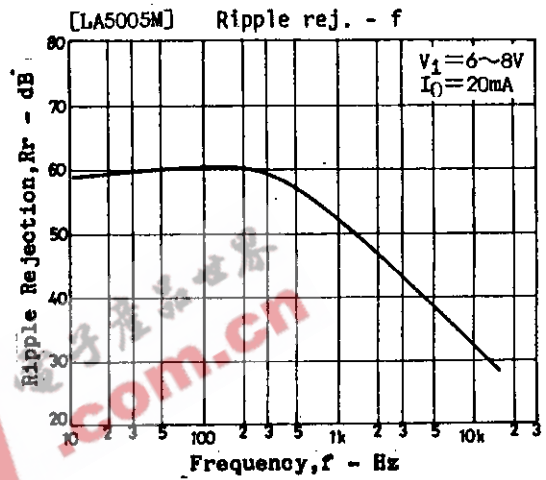
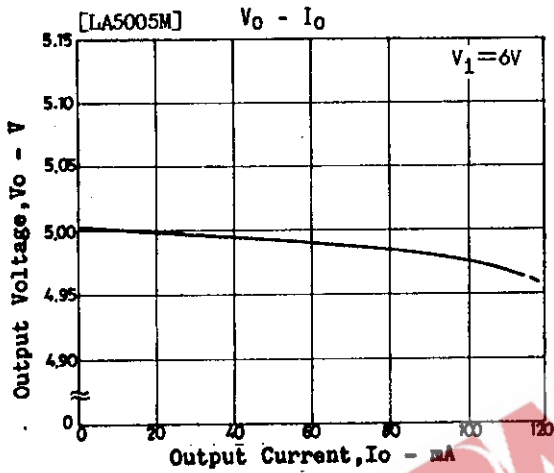
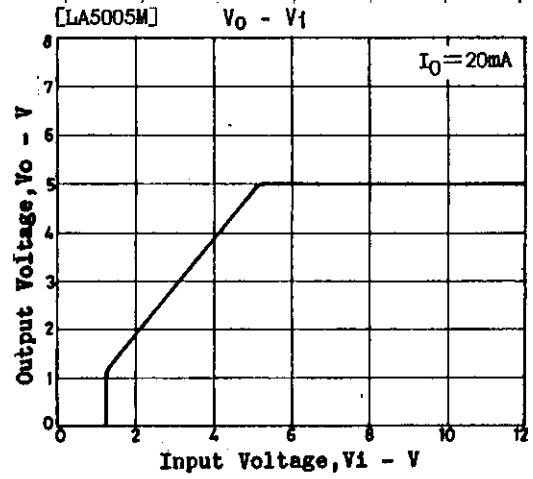
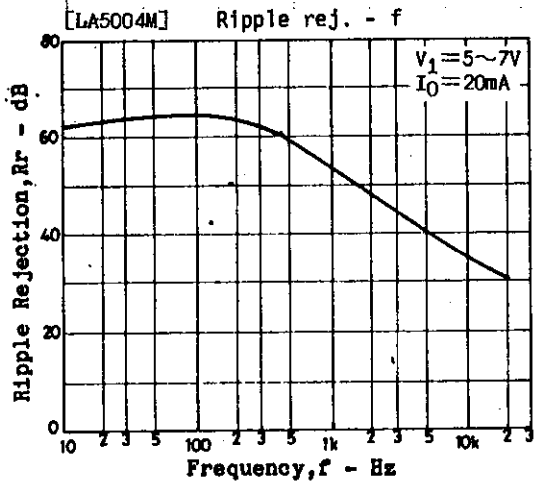
Test Circuits



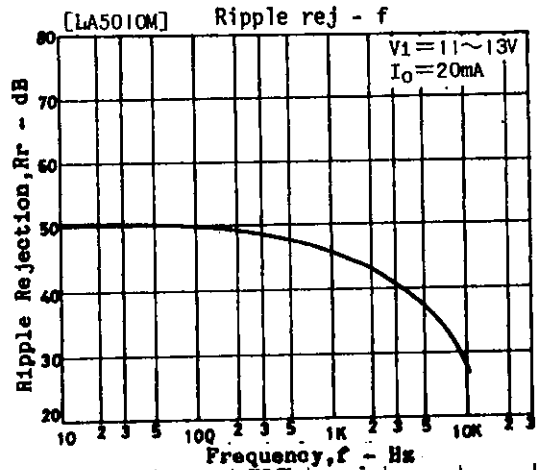
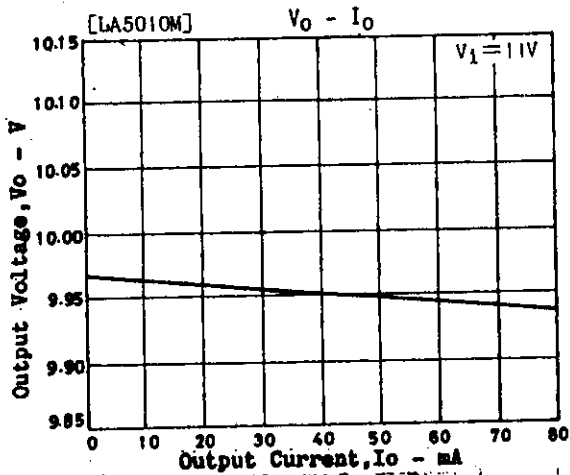
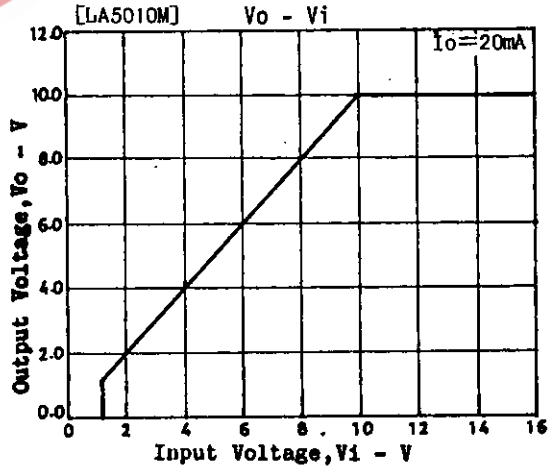
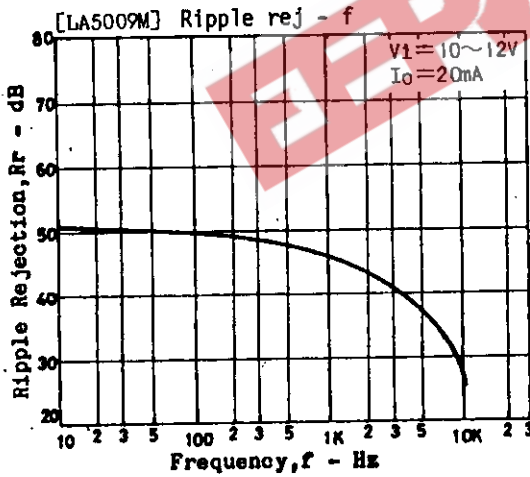
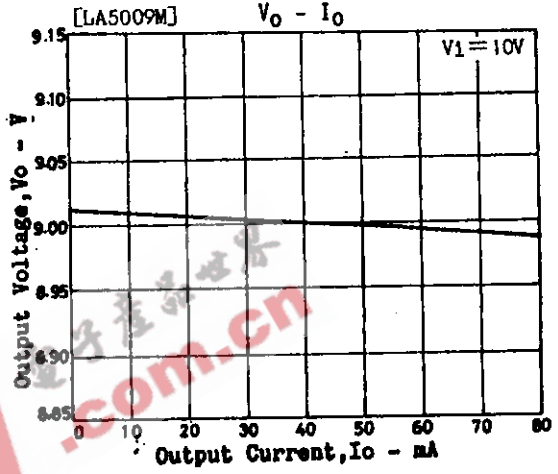
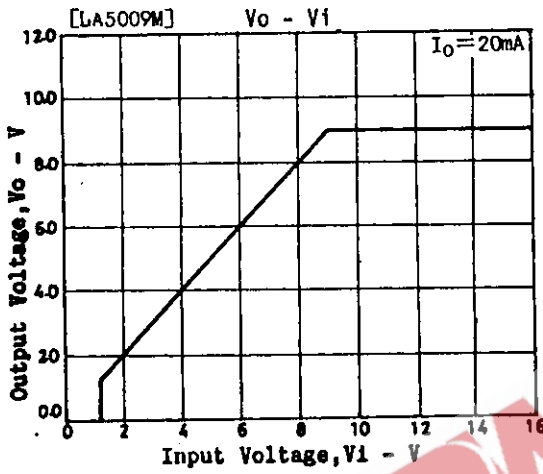
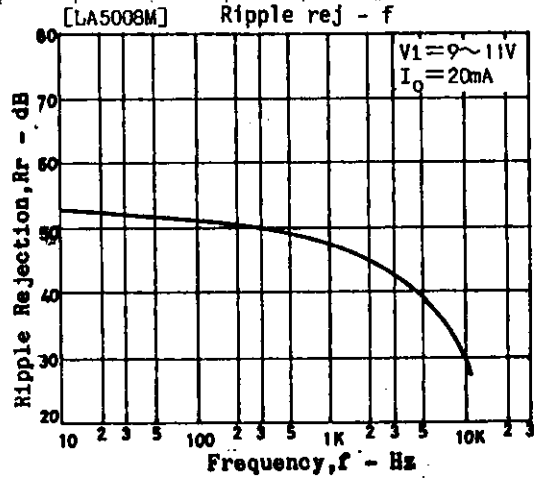
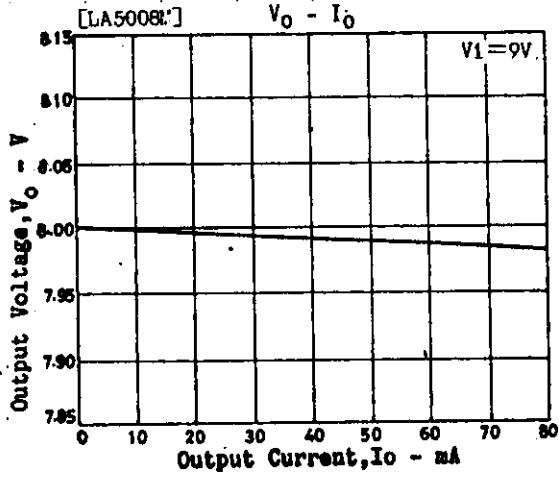
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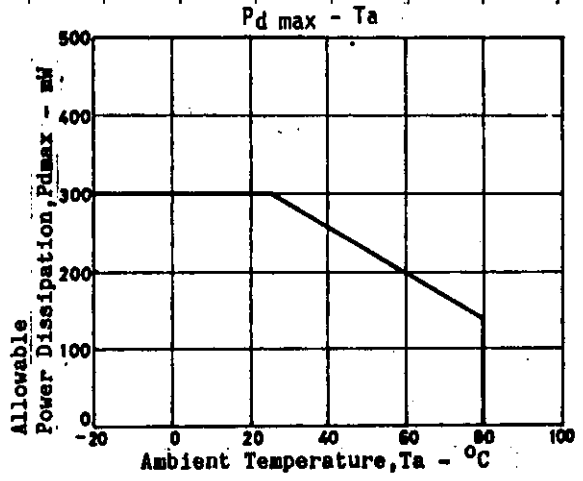
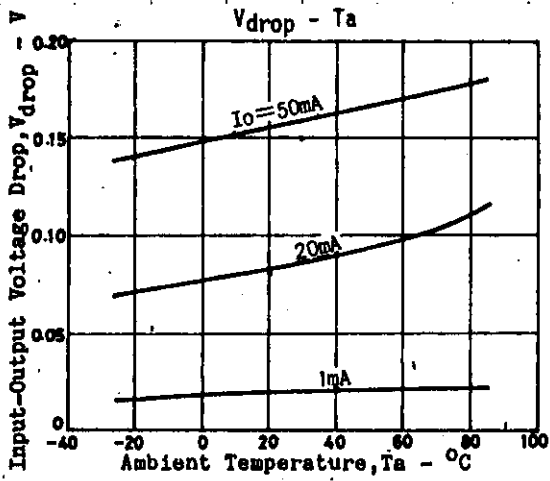
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