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}=20mA typ.)
- Minimum number of external parts required
- Highly resistant against load short
- Radio noise (radiation) control pin

Maximum Ratings at Ta=25°C

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

Operating Characteristics at Ta=25°C, C_{OUT}=10uF, I_{OUT}=20mA, V_{IN}=3V[LA5002M], V_{IN}=4V [LA5003M], V_{IN}=5V[LA5004M], V_{IN}=6V[LA5005M], V_{IN}=7V[LA5006M], V_{IN}=9V[LA5008M], V_{IN}=10V[LA5009M], V_{IN}=11V[LA5010M]

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

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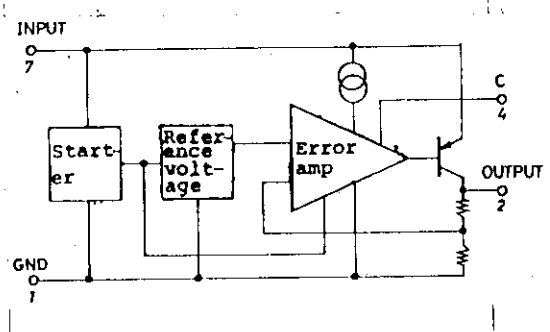
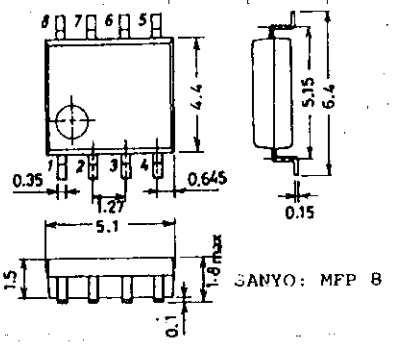
Equivalent Circuit Block Diagram



Case Outline 3032B-M8IC (unit:mm)



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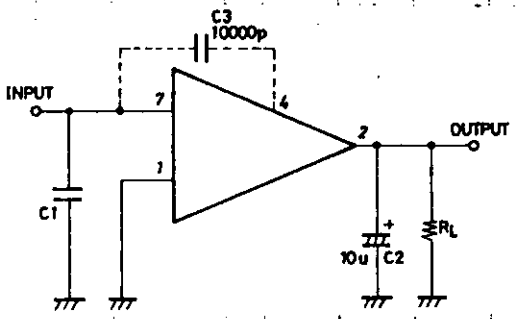
			min	typ	max	unit
Line Regulation		LA5006M 6.5V<V_{IN}<12V			50	mV
		LA5008M 9V<V_{IN}<14V			50	mV
		LA5009M 10V<V_{IN}<15V			50	mV
		LA5010M 11V<V_{IN}<16V			50	mV
Load Regulation	Vo load	1mA<I_{OUT}<40mA			20	mV
		1mA<I_{OUT}<50mA			25	mV
Quiescent Current Dissipation	Icco	LA5002M		1.2	2.0	mA
		LA5003M		1.4	2.0	mA
		LA5004M		1.5	2.3	mA
		LA5005M,5006M,5008M,5009M, 5010M		1.7	2.5	mA
Ripple Rejection	Rr	LA5002M,5004M,5005M f=120Hz	40			dB
		LA5003M f=120Hz	43			dB
		LA5006M,5008M,5009M,5010M f=120Hz	35			dB
Input-Output Voltage Drop	Vdrop			0.2	0.3	V
Temperature Coefficient of Output Voltage	k△vo/△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		uV

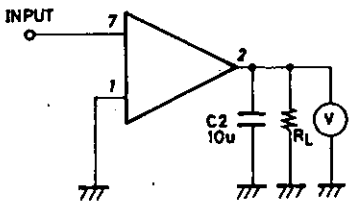
Sample Application Circuit



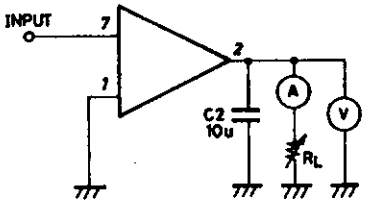
Note: Capacitor C3 is not required unless radio noise is a problem.

Test Circuits

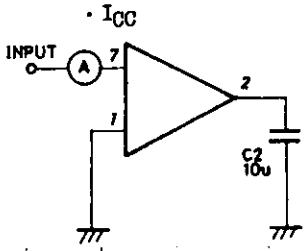
· V_{OUT}, Line Reg.



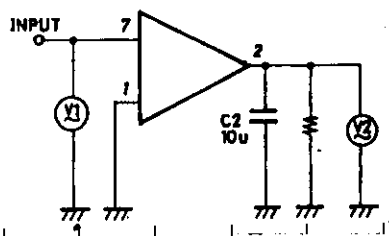
· Load Reg.



· I_{CC}

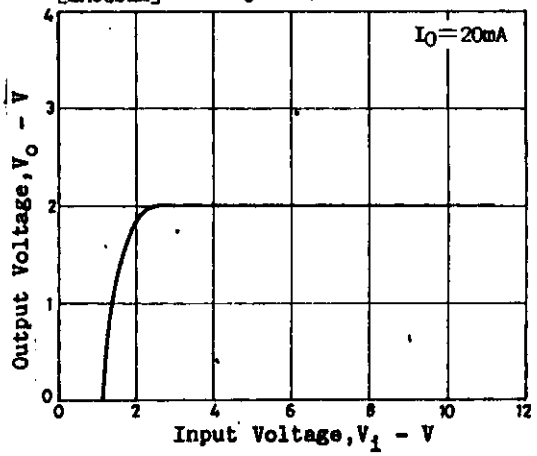


· Ripple Rej

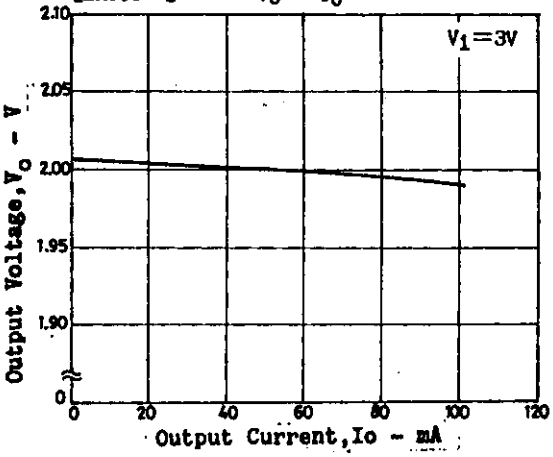


Ripple Rej = $\frac{V1}{V2}$

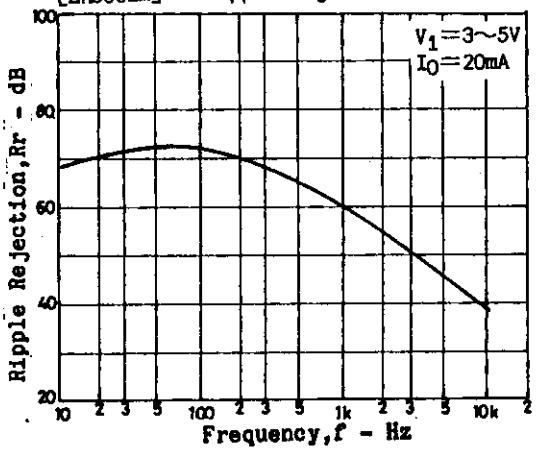
[LA5002M] V_O - V_I



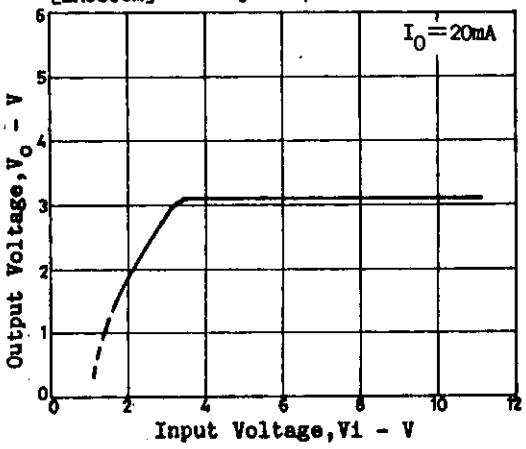
[LA5002M] V_O - I_O



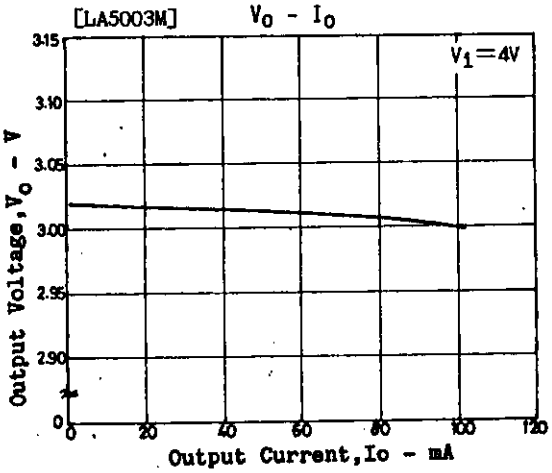
[LA5002M] Ripple rej. - f



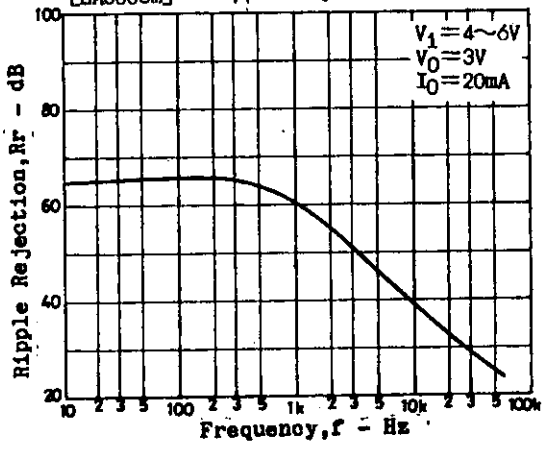
[LA5003M] V_O - V_I



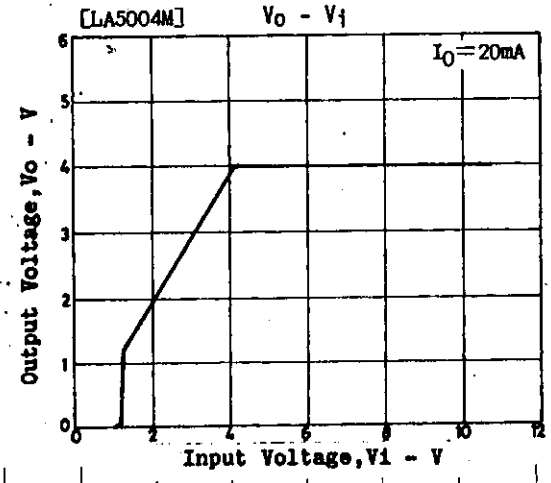
[LA5003M] V_O - I_O



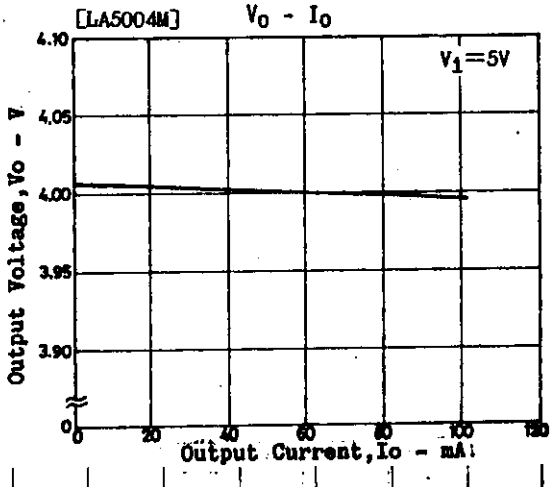
[LA5003M] Ripple rej. - f



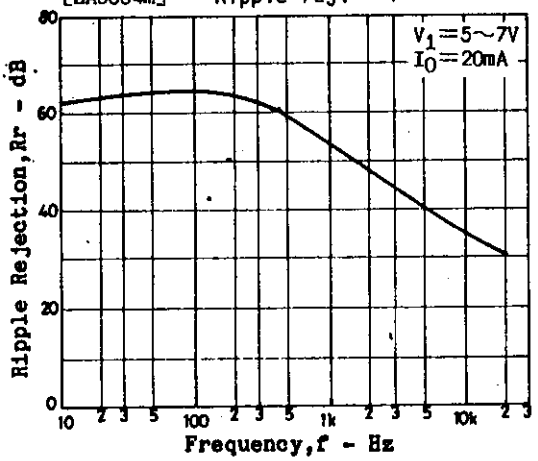
[LA5004M] V_O - V_I



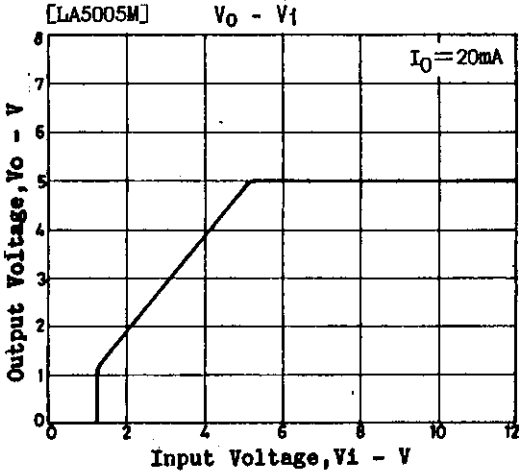
[LA5004M] V_O - I_O



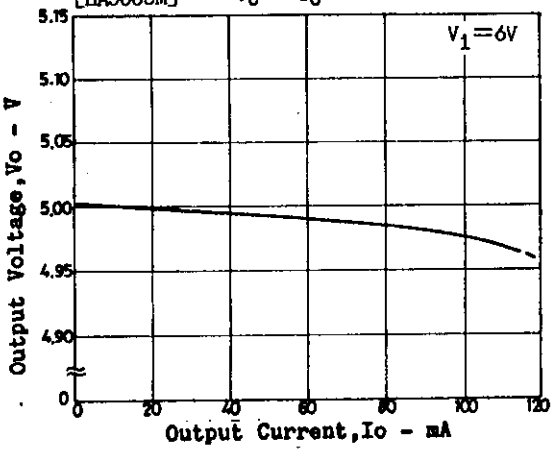
[LA5004M] Ripple rej. - f



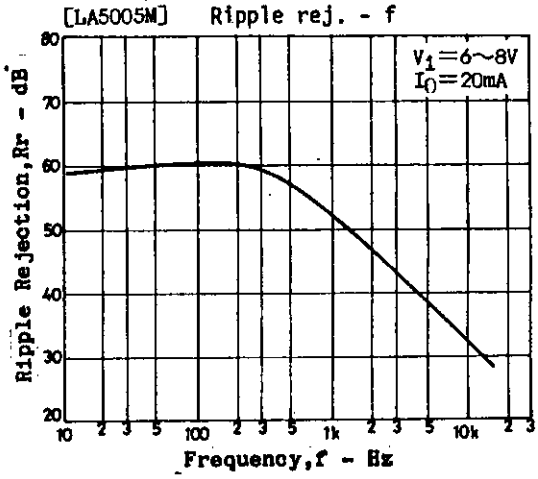
[LA5005M] V_O - V_I



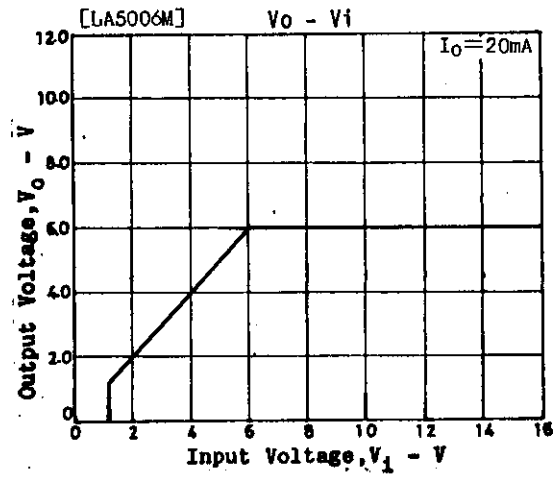
[LA5005M] V_O - I_O



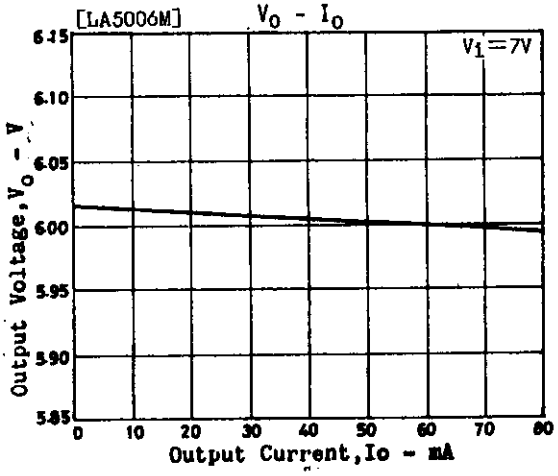
[LA5005M] Ripple rej. - f



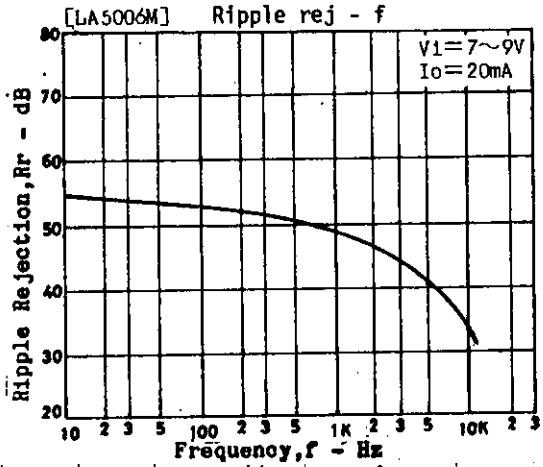
[LA5006M] V_O - V_I



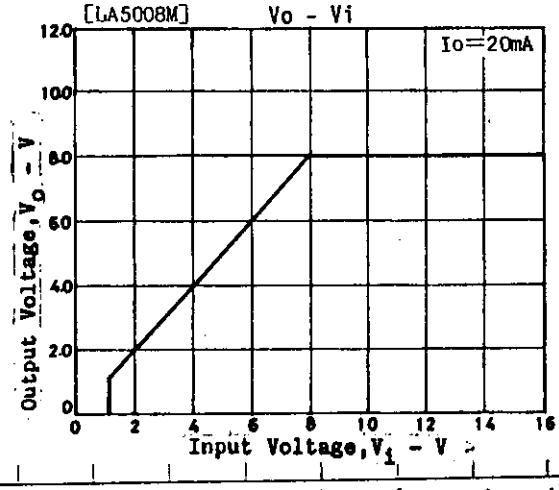
[LA5006M] V_O - I_O



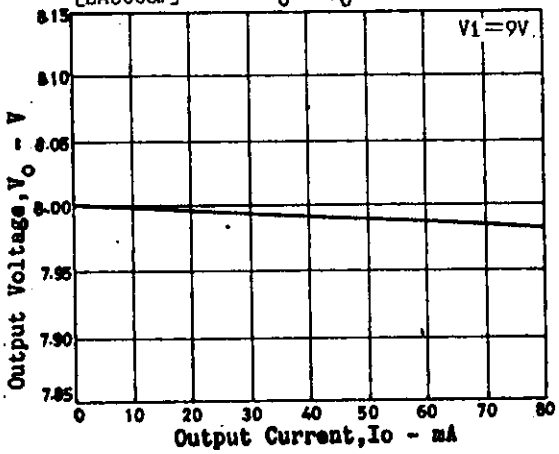
[LA5006M] Ripple rej - f



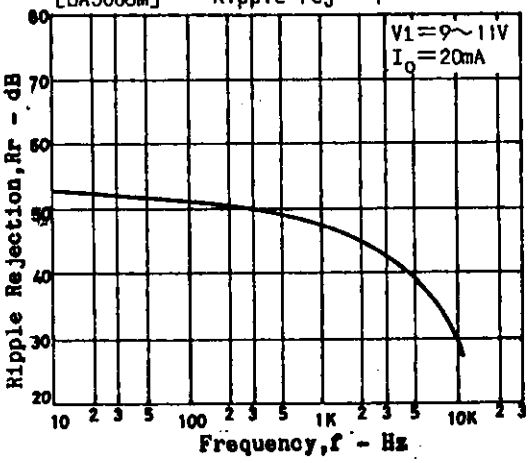
[LA5008M] Vo - Vi



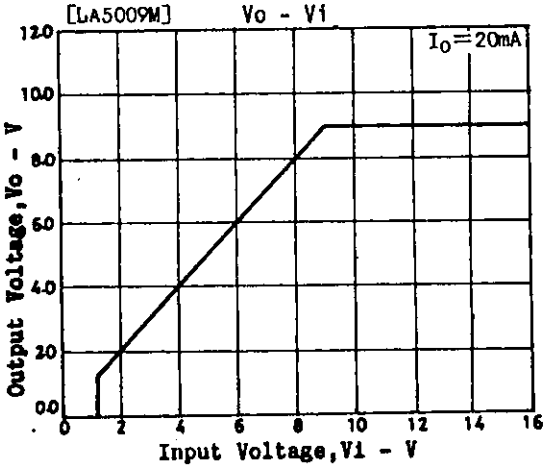
[LA5008M] $V_O - I_O$



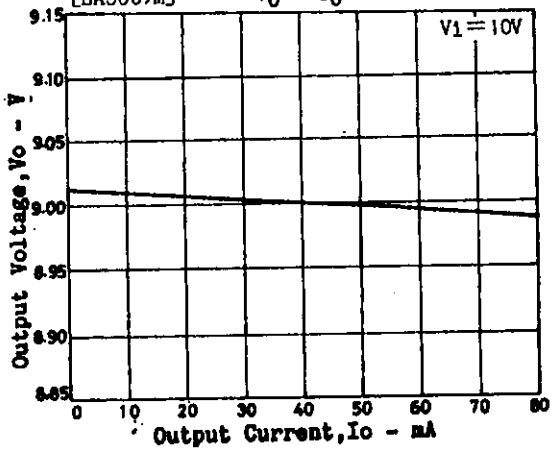
[LA5008M] Ripple rej - f



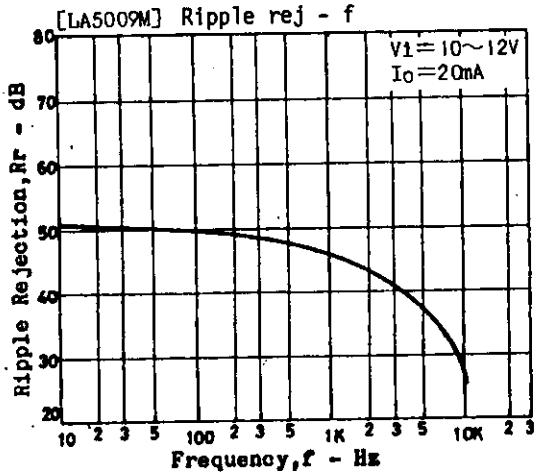
[LA5009M] Vo - Vi



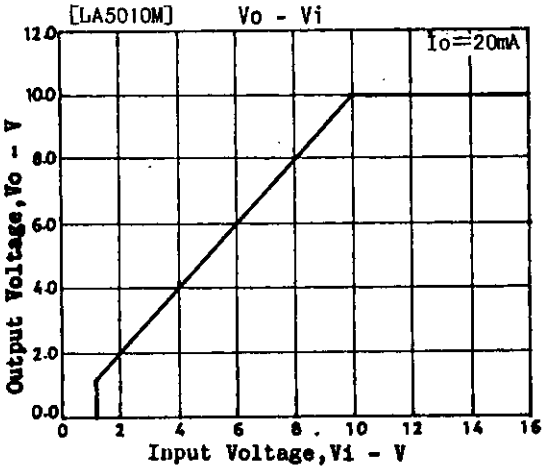
[LA5009M] $V_O - I_O$



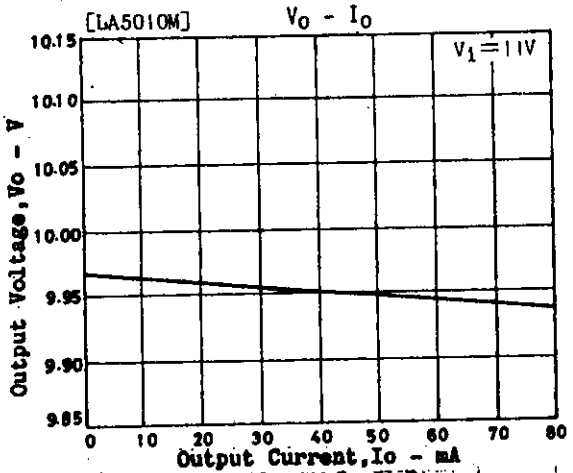
[LA5009M] Ripple rej - f



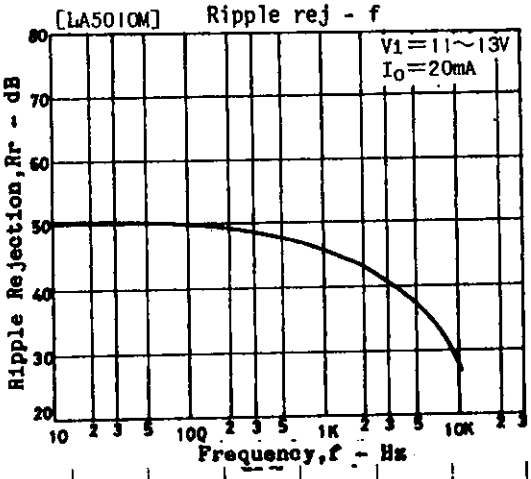
[LA5010M] Vo - Vi

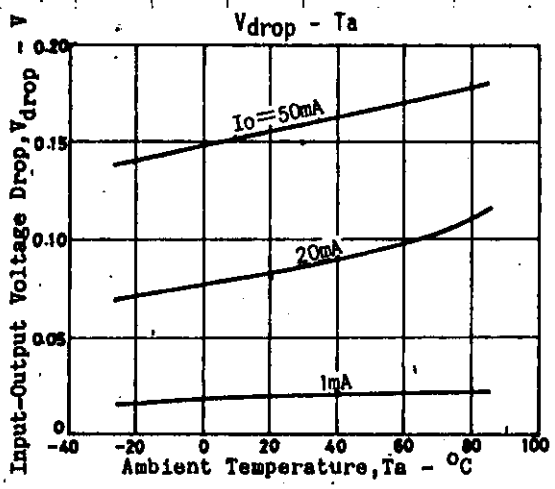


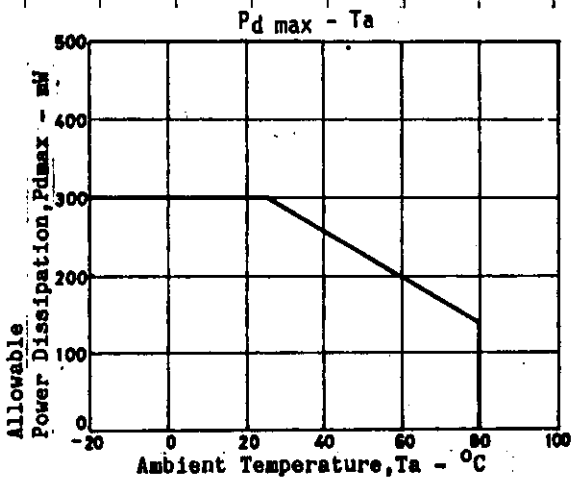
[LA5010M] $V_O - I_O$



[LA5010M] Ripple rej - f







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