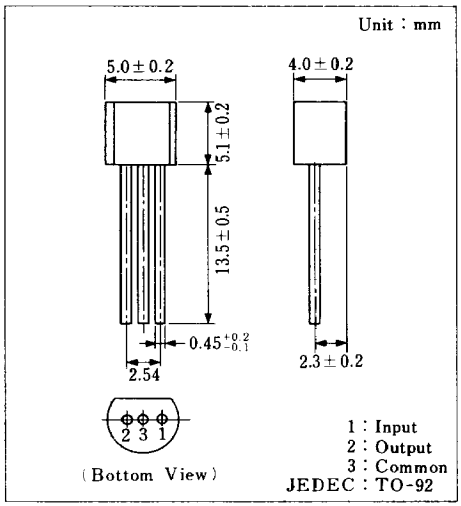
AN78L00 Series

3-Terminal Positive Output Voltage Regulators (100mA Type)

■ Outline

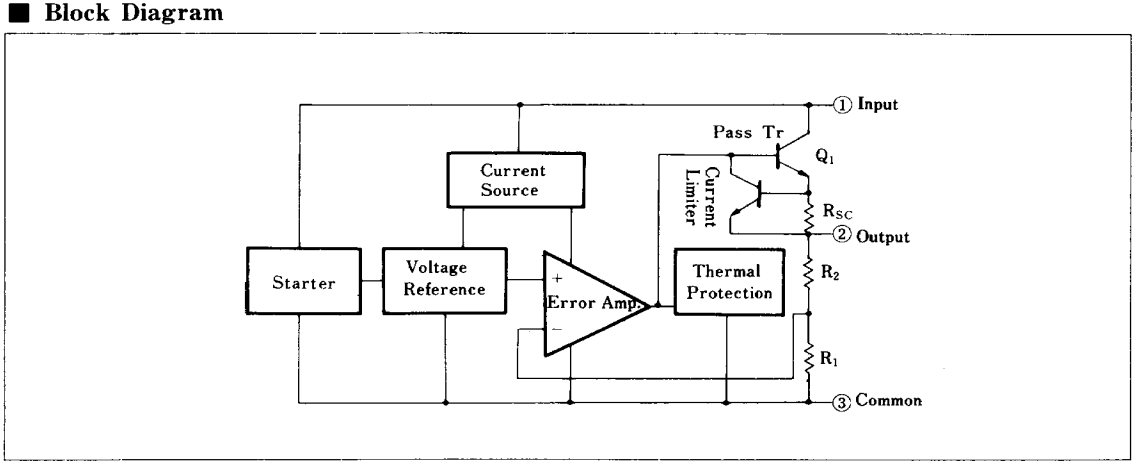
The AN78L00 series is 3-terminal fixed positive output voltage regulators. Stabilized fixed output voltage is obtained from unstable DC input voltage without using any external components. 12 types of fixed output voltage are available, 4V, 5V, 6V, 7V, 8V, 9V, 10V, 12V, 15V, 18V, 20V and 24V. They can be used widely in power circuits with current capacity up to 100mA.



■ Features

- No external components
- Can obtain more than 100mA output current
- Output voltage : 4V, 5V, 6V, 7V, 8V, 9V, 10V, 12V, 15V, 18V, 20V, 24V
- Short-circuit current limiting built in
- Thermal overload protection built in

■ Block Diagram



■ Absolute Maximum Ratings (Ta=25℃)

Item	Symbol	Rating	Unit
Input Voltage	V_I	35*1	V
		40*2	V
Power Dissipation	P_D	650*3	mW
Operating Ambient Temperature	T_{opr}	−20～+80	℃
Storage Temperature	T_{stg}	−55～+150	℃

*1 AN78L04, AN78L05, AN78L06, AN78L07, AL78L08, AN78L09, AN78L10, AN78L12, AN78L15 *2 AN78L18, AN78L20, AN78L24
*3 Follow the derating curve. When T_j exceeds 150℃, the internal circuit cuts off the output.

■ Electrical Characteristics (Ta=25℃)

● AN78L04 (4V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	3.84	4	4.16	V
Output Voltage Tolerance	V_O	1	V_I=6.5～19V, I_O=1～70mA	3.8		4.2	V
Line Regulation	REG_{IN}	1	V_I=6.5～19V, T_j=25℃		50	145	mV
			V_I=7～19V, T_j=25℃		40	95	mV
Load Regulation	REG_L	1	I_O=1～100mA, T_j=25℃		10	55	mV
			I_O=1～40mA, T_j=25℃		4.5	30	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=7～19V, T_j=25℃				
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1～40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz～100kHz		40		μV
Ripple Rejection Ratio	RR	3	V_I=7～17V, I_O=40mA, f=120Hz	48	58		dB
Minimum Input Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0～125℃		−0.6		mV/℃

Note 1 The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2 When not specified, V_I=9V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0～125℃

● AN78L05 (5V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	4.8	5	5.2	V
Output Voltage Tolerance	V_O	1	V_I=7.5～20V, I_O=1～70mA	4.75		5.25	V
Line Regulation	REG_{IN}	1	V_I=7.5～20V, T_j=25℃		55	150	mV
			V_I=8～20V, T_j=25℃		45	100	mV
Load Regulation	REG_L	1	I_O=1～100mA, T_j=25℃		11	60	mV
			I_O=1～40mA, T_j=25℃		5	30	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=8～20V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1～40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz～100kHz		40		μV
Ripple Rejection Ratio	RR	3	V_I=8～18V, I_O=40mA, f=120Hz	47	57		dB
Minimum Input Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0～125℃		−0.65		mV/℃

Note 1 The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2 When not specified, V_I=10V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0～125℃

■ Electrical Characteristics (Ta=25℃)

● AN78L06 (6V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	5.76	6	6.24	V
Output Voltage Tolerance	V_O	1	V_I=8.5~21V, I_O=1~70mA	5.7		6.3	V
Line Regulation	REG_{IN}	1	V_I=8.5~21V, T_j=25℃		60	155	mV
			V_I=9~21V, T_j=25℃		50	105	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		12	65	mV
			I_O=1~40mA, T_j=25℃		5.5	35	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=9~21V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		50		μV
Ripple Rejection Ratio	RR	3	V_I=9~19V, I_O=40mA, f=120Hz	46	56		dB
Minimum Input/Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−0.7		mV/℃

Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=11V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

● AN78L07 (7V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	6.72	7	7.28	V
Output Voltage Tolerance	V_O	1	V_I=9.5~22V, I_O=1~70mA	6.65		7.35	V
Line Regulation	REG_{IN}	1	V_I=9.5~22V, T_j=25℃		70	165	mV
			V_I=10~22V, T_j=25℃		60	115	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		13	75	mV
			I_O=1~40mA, T_j=25℃		6	35	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=10~22V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		50		μV
Ripple Rejection Ratio	RR	3	V_I=10~20V, I_O=40mA, f=120Hz	45	55		dB
Minimum Input/Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−0.75		mV/℃

Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=12V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

■ Electrical Characteristics (Ta = 25℃)

● AN78L08 (8V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j = 25℃	7.7	8	8.3	V
Output Voltage Tolerance	V_O	1	V_I = 10.5 ~ 23V, I_O = 1 ~ 70mA	7.6		8.4	V
Line Regulation	REG_{IN}	1	V_I = 10.5 ~ 23V, T_j = 25℃		80	175	mV
			V_I = 11 ~ 23V, T_j = 25℃		70	125	mV
Load Regulation	REG_L	1	I_O = 1 ~ 100mA, T_j = 25℃		15	80	mV
			I_O = 1 ~ 40mA, T_j = 25℃		7	40	mV
Bias Current	I_{Bias}	2	T_j = 25℃		2	3	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I = 11 ~ 23V, T_j = 25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O = 1 ~ 40mA, T_j = 25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f = 10Hz ~ 100kHz		60		μV
Ripple Rejection Ratio	RR	3	V_I = 11 ~ 21V, I_O = 40mA, f = 120Hz	44	54		dB
Minimum Input Output Voltage Difference	$V_{DIF(min.)}$		T_j = 25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j = 25℃, V_I = 35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O / T_a$		I_O = 5mA, T_j = 0 ~ 125℃		−0.8		mV/℃

Note 1) The specified condition T_j = 25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I = 14V, I_O = 40mA, C_I = 0.33μF, C_O = 0.1μF and T_j = 0 ~ 125℃

● AN78L09 (9V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j = 25℃	8.64	9	9.35	V
Output Voltage Tolerance	V_O	1	V_I = 11.5 ~ 24V, I_O = 1 ~ 70mA	8.55		9.45	V
Line Regulation	REG_{IN}	1	V_I = 11.5 ~ 24V, T_j = 25℃		90	190	mV
			V_I = 12 ~ 24V, T_j = 25℃		80	140	mV
Load Regulation	REG_L	1	I_O = 1 ~ 100mA, T_j = 25℃		16	85	mV
			I_O = 1 ~ 40mA, T_j = 25℃		8	45	mV
Bias Current	I_{Bias}	2	T_j = 25℃		2	3	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I = 12 ~ 24V, T_j = 25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O = 1 ~ 40mA, T_j = 25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f = 10Hz ~ 100kHz		65		μV
Ripple Rejection Ratio	RR	3	V_I = 12 ~ 22V, I_O = 40mA, f = 120Hz	43	53		dB
Minimum Input Output Voltage Difference	$V_{DIF(min.)}$		T_j = 25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j = 25℃, V_I = 35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O / T_a$		I_O = 5mA, T_j = 0 ~ 125℃		−0.85		mV/℃

Note 1) The specified condition T_j = 25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I = 15V, I_O = 40mA, C_I = 0.33μF, C_O = 0.1μF and T_j = 0 ~ 125℃

■ Electrical Characteristics (Ta=25℃)

● AN78L10 (10V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	9.6	10	10.4	V
Output Voltage Tolerance	V_O	1	V_I=12.5~25V, I_O=1~70mA	9.5		10.5	V
Line Regulation	REG_{IN}	1	V_I=12.5~25V, T_j=25℃		100	210	mV
			V_I=13~25V, T_j=25℃		90	160	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		17	90	mV
			I_O=1~40mA, T_j=25℃		9	45	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=13~25V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		70		μV
Ripple Rejection Ratio	RR	3	V_I=13~23V, I_O=40mA, f=120Hz	42	52		dB
Minimum Input/Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−0.9		mV/℃

Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=16V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

● AN78L12 (12V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	11.5	12	12.5	V
Output Voltage Tolerance	V_O	1	V_I=14.5~27V, I_O=1~70mA	11.4		12.6	V
Line Regulation	REG_{IN}	1	V_I=14.5~27V, T_j=25℃		120	250	mV
			V_I=15~27V, T_j=25℃		100	200	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		20	100	mV
			I_O=1~40mA, T_j=25℃		10	50	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3.5	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=15~27V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		80		μV
Ripple Rejection Ratio	RR	3	V_I=15~25V, I_O=40mA, f=120Hz	40	50		dB
Minimum Input/Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−1		mV/℃

Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=19V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

■ Electrical Characteristics (Ta=25℃)

● AN78L15 (15V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	14.4	15	15.6	V
Output Voltage Tolerance	V_O	1	V_I=17.5~30V, I_O=1~70mA	14.25		15.75	V
Line Regulation	REG_{IN}	1	V_I=17.5~30V, T_j=25℃		130	300	mV
			V_I=18~30V, T_j=25℃		110	250	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		25	150	mV
			I_O=1~40mA, T_j=25℃		12	75	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3.5	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=18~30V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		90		μV
Ripple Rejection Ratio	RR	3	V_I=18~28V, I_O=40mA, f=120Hz	38	48		dB
Minimum Input-Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−1.3		mV/℃

Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=23V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

● AN78L18 (18V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	17.3	18	18.7	V
Output Voltage Tolerance	V_O	1	V_I=20.5~33V, I_O=1~70mA	17.1		18.9	V
Line Regulation	REG_{IN}	1	V_I=20.5~33V, T_j=25℃		45	300	mV
			V_I=21~33V, T_j=25℃		35	250	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		30	170	mV
			I_O=1~40mA, T_j=25℃		15	85	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3.5	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=21~33V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		150		μV
Ripple Rejection Ratio	RR	3	V_I=21~31V, I_O=40mA, f=120Hz	36	46		dB
Minimum Input-Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−1.5		mV/℃

Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=27V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

■ Electrical Characteristics (Ta=25℃)

● AN78L20 (20V Type)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	19.2	20	20.8	V
Output Voltage Tolerance	V_O	1	V_I=22.5~35V, I_O=1~70mA	19		21	V
Line Regulation	REG_{IN}	1	V_I=22.5~35V, T_j=25℃		50	300	mV
			V_I=23~35V, T_j=25℃		40	250	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		35	180	mV
			I_O=1~40mA, T_j=25℃		17	90	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3.5	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=23~35V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		170		μV
Ripple Rejection Ratio	RR	3	V_I=23~33V, I_O=40mA, f=120Hz	34	44		dB
Minimum Input/Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−1.7		mV/℃

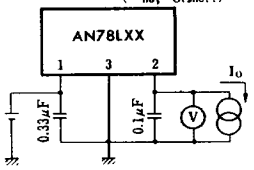
Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=29V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

● AN78L24 (24V Type)

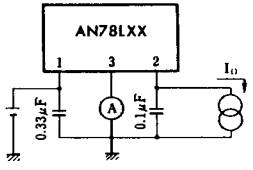
Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Output Voltage	V_O	1	T_j=25℃	23	24	25	V
Output Voltage Tolerance	V_O	1	V_I=26.5~39V, I_O=1~70mA	22.8		25.2	V
Line Regulation	REG_{IN}	1	V_I=26.5~39V, T_j=25℃		60	300	mV
			V_I=27~39V, T_j=25℃		50	250	mV
Load Regulation	REG_L	1	I_O=1~100mA, T_j=25℃		40	200	mV
			I_O=1~40mA, T_j=25℃		20	100	mV
Bias Current	I_{Bias}	2	T_j=25℃		2	3.5	mA
Input Bias Current Fluctuation	$\Delta I_{Bias(IN)}$	2	V_I=27~39V, T_j=25℃			1	mA
Load Bias Current Fluctuation	$\Delta I_{Bias(L)}$	2	I_O=1~40mA, T_j=25℃			0.1	mA
Output Noise Voltage	V_{no}	1	f=10Hz~100kHz		200		μV
Ripple Rejection Ratio	RR	3	V_I=27~37V, I_O=40mA, f=120Hz	34	44		dB
Minimum Input/Output Voltage Difference	$V_{DIF(min.)}$		T_j=25℃		1.7		V
Output Short Circuit Current	$I_{O(Short)}$	1	T_j=25℃, V_I=35V		140		mA
Output Voltage Temperature Coefficient	$\Delta V_O/T_a$		I_O=5mA, T_j=0~125℃		−2		mV/℃

Note 1) The specified condition T_j=25℃ means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) When not specified, V_I=33V, I_O=40mA, C_I=0.33μF, C_O=0.1μF and T_j=0~125℃

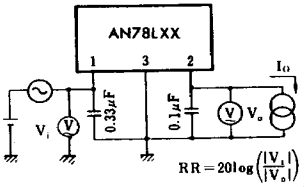
Test Circuit 1 (V_O, REG_{IN}, REG_L, V_{no}, $I_{O(short)}$)



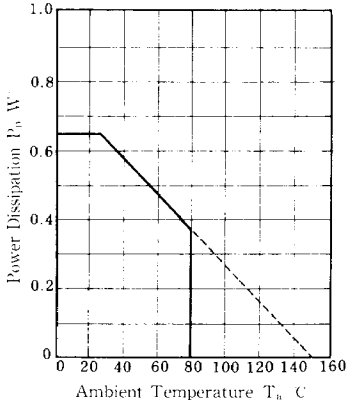
Test Circuit 2 (I_{Bias}, $\Delta I_{Bias(IN)}$, $\Delta I_{Bias(L)}$)



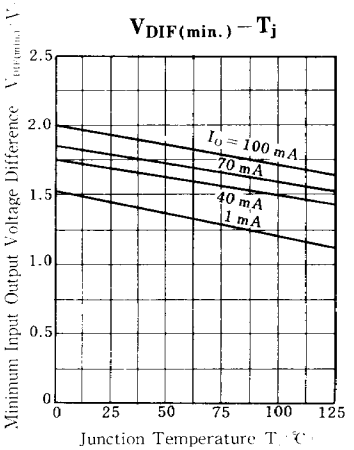
Test Circuit 3 (RR)



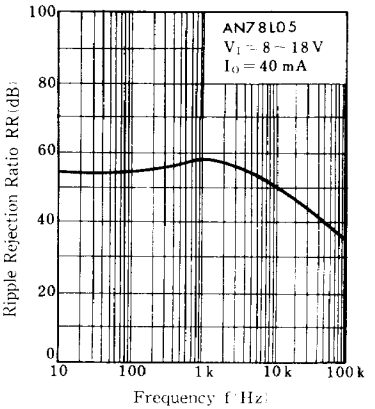
$P_D - Ta$



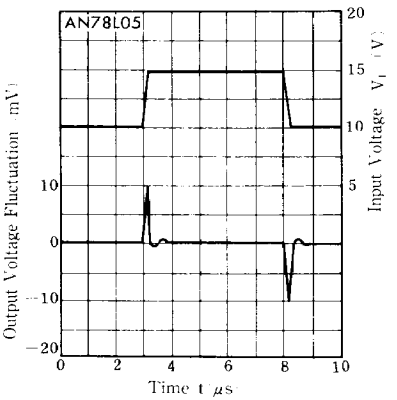
$V_{DIF(min.)} - T_j$



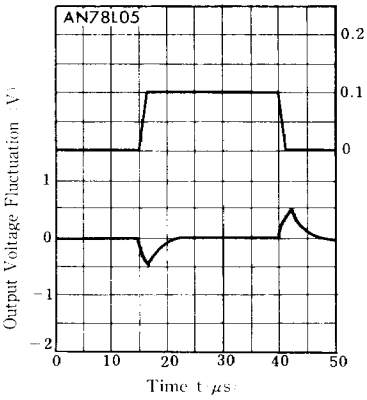
RR − f



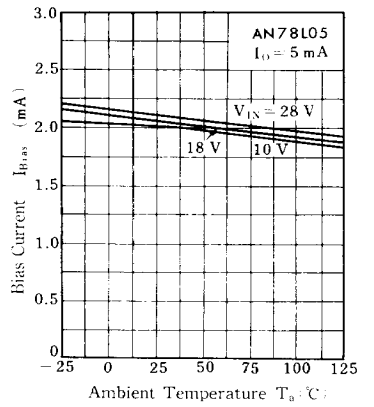
Input Response Characteristic



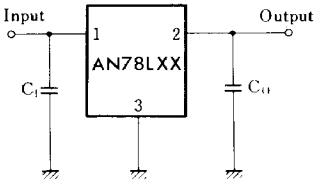
Load Response Characteristic



$I_{Bias} - Ta$



■ Basic Regulator Circuit



C_I is set when the input line is long.
C_O improves the transient response.

■ Application Circuit