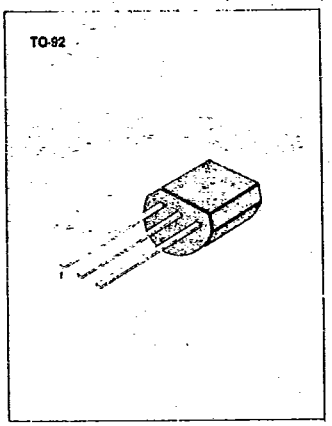
MC78LXXAC

LINEAR INTEGRATED CIRCUIT

T-58-11-13

3-TERMINAL 0.1A POSITIVE VOLTAGE REGULATORS

The MC78LXX series of fixed voltage monolithic integrated circuit voltage regulators are suitable for applications that required supply up to 100mA.



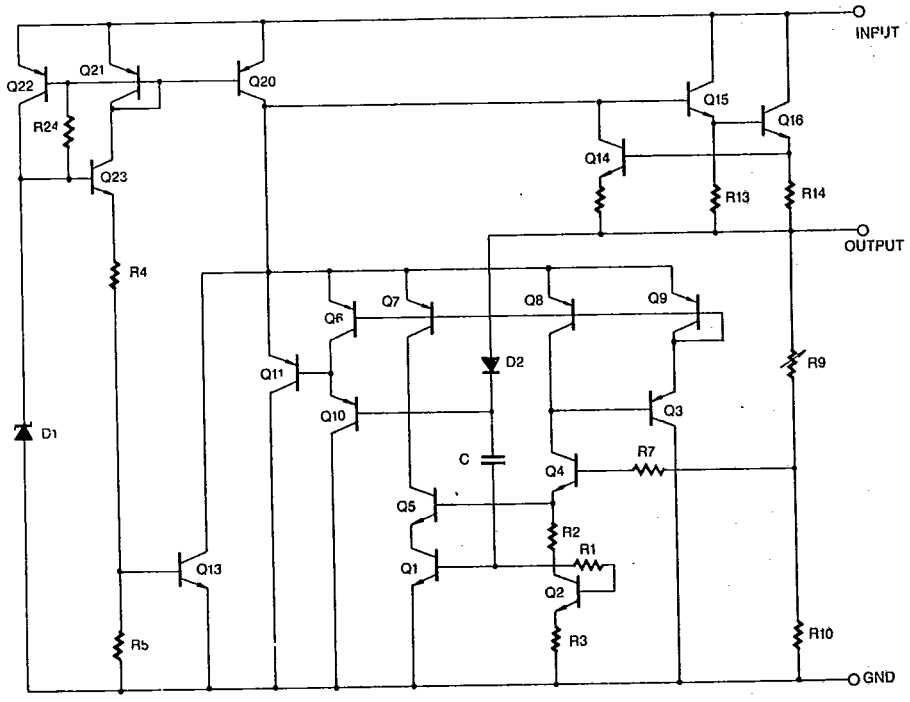
FEATURES

- Maximum Output Current of 100mA
- Output Voltage of 5;8;12; 15V
- Thermal Overload Protection
- Short Circuit Current Limiting
- Complementary MC79LXX Series

ORDERING INFORMATION

Device	Package	Operating Temperature
MC78LXXACZ	TO-92	0~+125°C

SCHEMATIC DIAGRAM



MC78LXXAC LINEAR INTEGRATED CIRCUIT

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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Input Voltage (for V_O = 5V, 8V) (for V_O = 12V, 15V)	V_{IN}	30 35	V V
Operating Junction Temperature Range	T_{opr}	0 ~ +125	°C
Storage Temperature Range	T_{stg}	−65 ~ +150	°C

Temperature Coefficient of V_O

2

MC78L05AC ELECTRICAL CHARACTERISTICS

V_{IN} = 10V, I_{OUT} = 40mA, 0°C ≤ Tj ≤ 125°C, C_{IN} = 0.33μF, C_{OUT} = 0.1μF, unless otherwise specified. (Note 1)

Characteristic		Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage		V_O	T_j = 25°C		4.8	5.0	5.2	V
Line Regulation		ΔV_O	T_j = 25°C	7V ≤ V_{IN} ≤ 20V		8	150	mV
				8V ≤ V_{IN} ≤ 20V		6	100	mV
Load Regulation		ΔV_O	T_j = 25°C	1mA ≤ I_{OUT} ≤ 100mA		11	60	mV
				1mA ≤ I_{OUT} ≤ 40mA		5.0	30	mV
Output Voltage		V_O	7V ≤ V_{IN} ≤ 20V	1mA ≤ I_{OUT} ≤ 40mA	4.75		5.25	V
			7V ≤ V_{IN} ≤ V_{max} (Note 2)	1mA ≤ I_{OUT} ≤ 70mA	4.75		5.25	V
Quiescent Current		I_d	T_j = 25°C			2.0	5.5	mA
Quiescent Current Change	with line	ΔI_d	8V ≤ V_{IN} ≤ 20V				1.5	mA
	with load	ΔI_d	1mA ≤ I_{OUT} ≤ 40mA				0.1	mA
Output Noise Voltage		V_N	T_a = 25°C, 10Hz ≤ f ≤ 100KHz			40		μV
Temperature Coefficient of V_O		$\frac{\Delta V_O}{\Delta T}$	I_{OUT} = 5mA			−0.65		mV/°C
Ripple Rejection		RR	f = 120Hz, 8V ≤ V_{IN} ≤ 18V, Tj = 25°C		41	80		dB
Dropout Voltage		V_D	T_j = 25°C			1.7		V
Peak Output/Short-Circuit Current		I_{SC}	T_j = 25°C			160		mA

MC78LXXAC LINEAR INTEGRATED CIRCUIT

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MC78L08AC ELECTRICAL CHARACTERISTICS

V_{IN} = 14V, I_{OUT} = 40mA, 0°C ≤ Tj ≤ 125°C, C_{IN} = 0.33μF, C_{OUT} = 0.1μF, unless otherwise specified. (Note 1)

Characteristic	Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage	V_O	T_j=25°C		7.7	8.0	8.3	V
Line Regulation	ΔV_O	T_j=25°C	10.5 ≤ V_{IN} ≤ 23V		10	175	mV
			11V ≤ V_{IN} ≤ 23V		8	125	mV
Load Regulation	ΔV_O	T_j=25°C	1mA ≤ I_{OUT} ≤ 100mA		15	80	mV
			1mA ≤ I_{OUT} ≤ 40mA		8.0	40	mV
Output Voltage	V_O	10.5V ≤ V_{IN} ≤ 23V	1mA ≤ I_{OUT} ≤ 40mA	7.6		8.4	V
		10.5V ≤ V_{IN} ≤ V_{max} (Note 2)	1mA ≤ I_{OUT} ≤ 70mA	7.6		8.4	V
Quiescent Current	I_d	T_j=25°C			2.0	5.5	mA
Quiescent Current Change with line	ΔI_d	11V ≤ V_{IN} ≤ 23V				1.5	mA
Quiescent Current Change with load	ΔI_d	1mA ≤ I_{OUT} ≤ 40mA				0.1	mA
Output Noise Voltage	V_N	T_a=25°C, 10Hz ≤ f ≤ 100KHz			60		μV
Temperature Coefficient of V_O	$\frac{\Delta V_O}{\Delta T}$	I_{OUT} = 5mA			−0.8		mV/°C
Ripple Rejection	RR	f=120Hz, 11V ≤ V_{IN} ≤ 21V, T_j = 25°C		39	70		dB
Dropout Voltage	V_D	Tj=25°C			1.7		V
Peak Output/Short-Circuit Current	I_{SC}	Tj=25°C			180		mA

MC78L12AC ELECTRICAL CHARACTERISTICS

V_{IN} = 19V, I_{OUT} = 40mA, 0°C ≤ Tj ≤ 125°C, C_{IN} = 0.33μF, C_{OUT} = 0.1μF, unless otherwise specified. (Note 1)

Characteristic	Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage	V_O	T_j = 25°C		11.5	12	12.5	V
Line Regulation	ΔV_O	T_j = 25°C	14.5V ≤ V_{IN} ≤ 27V		20	250	mV
			16V ≤ V_{IN} ≤ 27V		15	200	mV
Load Regulation	ΔV_O	T_j = 25°C	1mA ≤ I_{OUT} ≤ 100mA		20	100	mV
			1mA ≤ I_{OUT} ≤ 40mA		10	50	mV
Output Voltage	V_O	14.5V ≤ V_{IN} ≤ 27V	1mA ≤ I_{OUT} ≤ 40mA	11.4		12.6	V
		14.5V ≤ V_{IN} ≤ V_{max} (Note 2)	1mA ≤ I_{OUT} ≤ 70mA	11.4		12.6	V
Quiescent Current	I_d	T_j = 25°C			2.1	6.0	mA
Quiescent Current Change with line	ΔI_d	16V ≤ V_{IN} ≤ 27V				1.5	mA
Quiescent Current Change with load	ΔI_d	1mA ≤ I_{OUT} ≤ 40mA				0.1	mA
Output Noise Voltage	V_N	T_a = 25°C, 10Hz ≤ f ≤ 100KHz			80		μV
Temperature Coefficient of V_O	$\frac{\Delta V_O}{\Delta T}$	I_{OUT} = 5mA			−1.0		mV/°C
Ripple Rejection	RR	f = 120Hz, 15V ≤ V_{IN} ≤ 25V, Tj = 25°C		37	65		dB
Dropout Voltage	V_D	T_j = 25°C			1.7		V
Peak Output/Short-Circuit Current	I_{SC}	T_j = 25°C			160		mA

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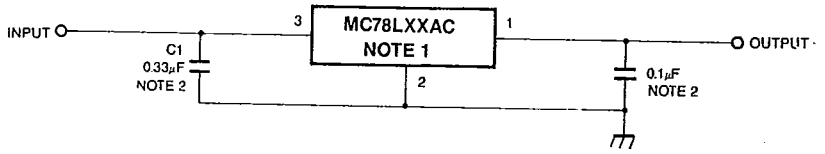
MC78L15AC ELECTRICAL CHARACTERISTICS

V_{IN} = 19V, I_{OUT} = 40mA, 0°C ≤ Tj ≤ 125°C, C_{IN} = 0.33μF, C_{OUT} = 0.1μF, unless otherwise specified. (Note 1)

Characteristic		Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage		V_O	T_j=25°C		14.4	15	15.6	V
Line Regulation		ΔV_O	T_j=25°C	17.5V ≤ V_{IN} ≤ 30V		25	300	mV
				20V ≤ V_{IN} ≤ 30V		20	250	nV
Load Regulation		ΔV_O	T_j=25°C	1mA ≤ I_{OUT} ≤ 100mA		25	150	mV
				1mA ≤ I_{OUT} ≤ 40mA		12	75	mV
Output Voltage		V_O	17.5V ≤ V_{IN} ≤ 30V	1mA ≤ I_{OUT} ≤ 40mA	14.25		15.75	V
			17.5V ≤ V_{IN} ≤ V_{max} (Note 2)	1mA ≤ I_{OUT} ≤ 70mA	14.25		15.75	V
Quiescent Current		I_d	T_j=25°C			2.2	6.0	mA
Quiescent Current Change	with line	ΔI_d	20V ≤ V_{IN} ≤ 30V				1.5	mA
	with load	ΔI_d	1mA ≤ I_{OUT} ≤ 40mA				0.1	mA
Output Noise Voltage		V_N	T_a=25°C, 10Hz ≤ f ≤ 100KHz			90		μV
Temperature Coefficient of V_O		$\frac{\Delta V_O}{\Delta T}$	I_{OUT} = 5mA			−1.3		mV/°C
Ripple Rejection		RR	f=120Hz, 18.5V ≤ V_{IN} ≤ 28.5V, Tj=25°C		34	60		dB
Dropout Voltage		V_D	T_j=25°C			1.7		V
Peak Output/Short-Circuit Current		I_{SC}	T_j=25°C			160		mA

Notes
1. Power dissipation ≤ 0.75W.

TYPICAL APPLICATION



Notes
1. To specify an output voltage, substitute voltage value for "xx".
2. Bypass Capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulator.

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TEMPERATURE DRIFT (IQ)
MC78L05AC