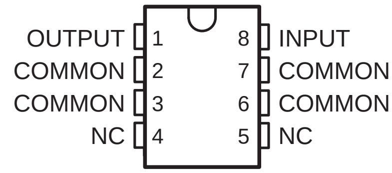
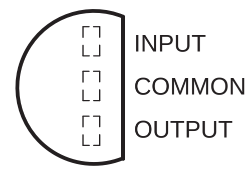
- **3-Terminal Regulators**
- **Output Current up to 100 mA**
- **No External Components**
- **Internal Thermal-Overload Protection**
- **Internal Short-Circuit Current Limiting**
- **Direct Replacements for Fairchild μA78L00 Series**

D PACKAGE
(TOP VIEW)



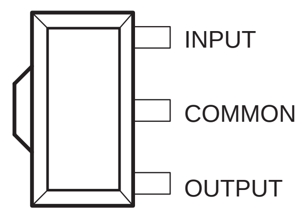
NC – No internal connection

LP PACKAGE
(TOP VIEW)



TO–226AA

PK PACKAGE
(TOP VIEW)



description

This series of fixed-voltage integrated-circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators. One of these regulators can deliver up to 100 mA of output current. The internal limiting and thermal-shutdown features of these regulators make them essentially immune to overload. When used as a replacement for a zener diode-resistor combination, an effective improvement in output impedance can be obtained, together with lower bias current.

The μA78L00C series is characterized for operation over the virtual junction temperature range of 0°C to 125°C.

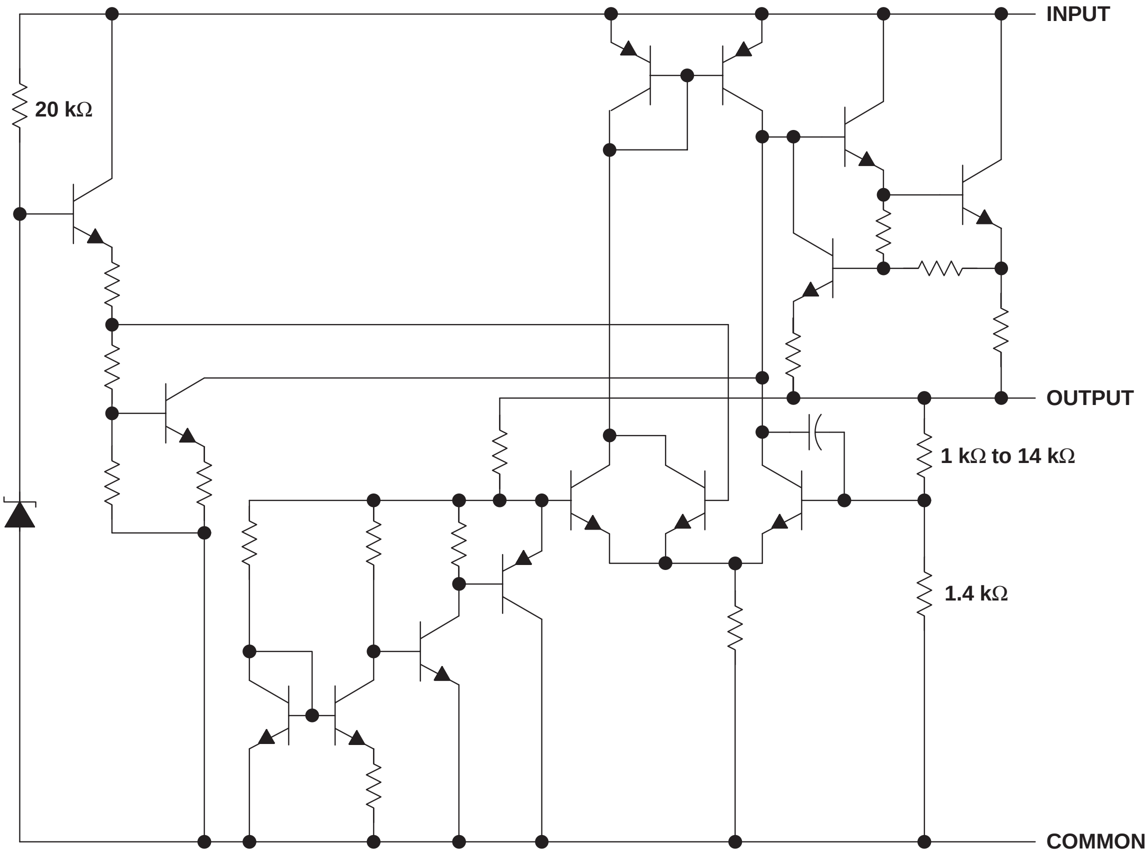
AVAILABLE OPTIONS

T_J	$V_{O(NOM)}$ (V)	PACKAGED DEVICES						CHIP FORM (Y)
		SMALL OUTLINE (D)		PLASTIC CYLINDRICAL (LP)		SOT-89 (PK)		
		OUTPUT VOLTAGE TOLERANCE						
		5%	10%	5%	10%	5%	10%	
0°C to 125°C	2.6	μA78L02ACD	–	μA78L02ACLP	μA78L02CLP	μA78L02ACPK	μA78L02CPK	μA78L02Y
	5	μA78L05ACD	μA78L05CD	μA78L05ACLP	μA78L05CLP	μA78L05ACPK	μA78L05CPK	μA78L05Y
	6.2	μA78L06ACD	μA78L06CD	μA78L06ACLP	μA78L06CLP	μA78L06ACPK	μA78L06CPK	μA78L06Y
	8	μA78L08ACD	μA78L08CD	μA78L08ACLP	μA78L08CLP	μA78L08ACPK	μA78L08CPK	μA78L08Y
	9	μA78L09ACD	μA78L09CD	μA78L09ACLP	μA78L09CLP	μA78L09ACPK	μA78L09CPK	μA78L09Y
	10	μA78L10ACD	–	μA78L10ACLP	μA78L10CLP	μA78L10ACPK	μA78L10CPK	μA78L10Y
	12	μA78L12ACD	μA78L12CD	μA78L12ACLP	μA78L12CLP	μA78L12ACPK	μA78L12CPK	μA78L12Y
	15	μA78L15ACD	μA78L15CD	μA78L15ACLP	μA78L15CLP	μA78L15ACPK	μA78L15CPK	μA78L15Y

D and LP packages are available taped and reeled. Add the suffix R to the device type (e.g., μA78L05ACDR). The PK package is only available taped and reeled (e.g., μA78L02ACPKR). Chip forms are tested at T_A = 25°C.

Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

schematic



NOTE: Resistor values shown are nominal.

absolute maximum ratings over operating temperature range (unless otherwise noted)†

		μA78Lxx	UNIT
Input voltage, V_I	μA78L02AC, μA78L05C–μA78L09C, μA78L10AC	30	V
	μA78L12C, μA78L12AC, μA78L15C, μA78L15AC	35	
Package thermal impedance, θ_{JA} (see Notes 1 and 2)	D package	97	°C
	LP package	156	
	PK package	52	
Virtual junction temperature range, T_J		0 to 150	°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds		260	°C
Storage temperature range, T_{stg}		–65 to 150	°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. Maximum power dissipation is a function of T_J(max), θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) – T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can impact reliability. Due to variations in individual device electrical characteristics and thermal resistance, the built-in thermal-overload protection may be activated at power levels slightly above or below the rated dissipation.

2. The package thermal impedance is calculated in accordance with JESD 51, except for through-hole packages, which use a trace length of zero.

recommended operating conditions

		MIN	MAX	UNIT
Input voltage, V_I	μA78L02AC	4.75	20	V
	μA78L05C, μA78L05AC	7	20	
	μA78L06C, μA78L06AC	8.5	20	
	μA78L08C, μA78L08AC	10.5	23	
	μA78L09C, μA78L09AC	11.5	24	
	μA78L10AC	12.5	25	
	μA78L12C, μA78L12AC	14.5	27	
	μA78L15C, μA78L15AC	17.5	30	
Output current, I_O			100	mA
Operating virtual junction temperature, T_J		0	125	°C

electrical characteristics at specified virtual junction temperature, V_I = 9 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_J†	μA78L02C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = 4.75 V to 20 V,	I_O = 1 mA to 40 mA	25°C	2.5	2.6	2.7	V
			0°C to 125°C	2.45		2.75	
	I_O = 1 mA to 70 mA		0°C to 125°C	2.45		2.75	
Input voltage regulation	V_I = 4.75 V to 20 V		25°C		20	100	mV
	V_I = 5 V to 20 V				16	75	
Ripple rejection	V_I = 6 V to 20 V,	f = 120 Hz	25°C	43	51		dB
Output voltage regulation	I_O = 1 mA to 100 mA		25°C		12	50	mV
	I_O = 1 mA to 40 mA				6	25	
Output noise voltage	f = 10 Hz to 100 kHz		25°C		30		μV
Dropout voltage			25°C		1.7		V
Bias current			25°C		3.6	6	mA
			125°C			5.5	
Bias current change	V_I = 5 V to 20 V		0°C to 125°C			2.5	mA
	I_O = 1 mA to 40 mA					0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 10 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS		T_J†	μA78L05C			μA78L05AC			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Output voltage	V_I = 7 V to 20 V,	I_O = 1 mA to 40 mA	25°C	4.6	5	5.4	4.8	5	5.2	V
			0°C to 125°C	4.5		5.5	4.75		5.25	
	I_O = 1 mA to 70 mA		0°C to 125°C	4.5		5.5	4.75		5.25	
Input voltage regulation	V_I = 7 V to 20 V		25°C		32	200		32	150	mV
	V_I = 8 V to 20 V				26	150		26	100	
Ripple rejection	V_I = 8 V to 18 V,	f = 120 Hz	25°C	40	49		41	49		dB
Output voltage regulation	I_O = 1 mA to 100 mA		25°C		15	60		15	60	mV
	I_O = 1 mA to 40 mA				8	30		8	30	
Output noise voltage	f = 10 Hz to 100 kHz		25°C		42			42		μV
Dropout voltage			25°C		1.7			1.7		V
Bias current			25°C		3.8	6		3.8	6	mA
			125°C			5.5			5.5	
Bias current change	V_I = 8 V to 20 V		0°C to 125°C			1.5			1.5	mA
	I_O = 1 mA to 40 mA					0.2			0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 12 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T_J†	μA78L06C			μA78L06AC			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Output voltage	V_I = 8.5 V to 20 V, I_O = 1 mA to 40 mA	25°C	5.7	6.2	6.7	5.95	6.2	6.45	V
		0°C to 125°C	5.6		6.8	5.9		6.5	
	I_O = 1 mA to 70 mA	0°C to 125°C	5.6		6.8	5.9		6.5	
Input voltage regulation	V_I = 8.5 V to 20 V	25°C		35	200		35	175	mV
	V_I = 9 V to 20 V			29	150		29	125	
Ripple rejection	V_I = 10 V to 20 V, f = 120 Hz	25°C	39	48		40	48		dB
Output voltage regulation	I_O = 1 mA to 100 mA	25°C		16	80		16	80	mV
	I_O = 1 mA to 40 mA			9	40		9	40	
Output noise voltage	f = 10 Hz to 100 kHz	25°C		46			46		μV
Dropout voltage		25°C		1.7			1.7		V
Bias current		25°C		3.9	6		3.9	6	mA
		125°C			5.5			5.5	
Bias current change	V_I = 9 V to 20 V	0°C to 125°C			1.5			1.5	mA
	I_O = 1 mA to 40 mA				0.2			0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 14 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T_J†	μA78L08C			μA78L08AC			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Output voltage	V_I = 10.5 V to 23 V, I_O = 1 mA to 40 mA	25°C	7.36	8	8.64	7.7	8	8.3	V
		0°C to 125°C	7.2		8.8	7.6		8.4	
	I_O = 1 mA to 70 mA	0°C to 125°C	7.2		8.8	7.6		8.4	
Input voltage regulation	V_I = 10.5 V to 23 V	25°C		42	200		42	175	mV
	V_I = 11 V to 23 V			36	150		36	125	
Ripple rejection	V_I = 13 V to 23 V, f = 120 Hz	25°C	36	46		37	46		dB
Output voltage regulation	I_O = 1 mA to 100 mA	25°C		18	80		18	80	mV
	I_O = 1 mA to 40 mA			10	40		10	40	
Output noise voltage	f = 10 Hz to 100 kHz	25°C		54			54		μV
Dropout voltage		25°C		1.7			1.7		V
Bias current		25°C		4	6		4	6	mA
		125°C			5.5			5.5	
Bias current change	V_I = 5 V to 20 V	0°C to 125°C			1.5			1.5	mA
	I_O = 1 mA to 40 mA				0.2			0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 16 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T_J†	μA78L09C			μA78L09AC			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Output voltage	V_I = 12 V to 24 V, I_O = 1 mA to 40 mA	25°C	8.3	9	9.7	8.6	9	9.4	V
		0°C to 125°C	8.1		9.9	8.55		9.45	
	I_O = 1 mA to 70 mA	0°C to 125°C	8.1		9.9	8.55		9.45	
Input voltage regulation	V_I = 12 V to 24 V	25°C		45	225		45	175	mV
	V_I = 13 V to 24 V			40	175		40	125	
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz	25°C	36	45		38	45		dB
Output voltage regulation	I_O = 1 mA to 100 mA	25°C		19	90		19	90	mV
	I_O = 1 mA to 40 mA			11	40		11	40	
Output noise voltage	f = 10 Hz to 100 kHz	25°C		58			58		μV
Dropout voltage		25°C		1.7			1.7		V
Bias current		25°C		4.1	6		4.1	6	mA
		125°C			5.5			5.5	
Bias current change	V_I = 13 V to 24 V	0°C to 125°C			1.5			1.5	mA
	I_O = 1 mA to 40 mA				0.2			0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 14 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T_J†	μA78L10AC			UNIT
			MIN	TYP	MAX	
Output voltage	V_I = 13 V to 25 V, I_O = 1 mA to 40 mA	25°C	9.6	10	10.4	V
		0°C to 125°C	9.5		10.5	
	I_O = 1 mA to 70 mA	0°C to 125°C	9.5		10.5	
Input voltage regulation	V_I = 13 V to 25 V	25°C		51	175	mV
	V_I = 14 V to 25 V			42	125	
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz	25°C	37	44		dB
Output voltage regulation	I_O = 1 mA to 100 mA	25°C		20	90	mV
	I_O = 1 mA to 40 mA			11	40	
Output noise voltage	f = 10 Hz to 100 kHz	25°C		62		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.2	6	mA
		125°C			5.5	
Bias current change	V_I = 14 V to 25 V	0°C to 125°C			1.5	mA
	I_O = 1 mA to 40 mA				0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 19 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T_J†	μA78L12C MIN	μA78L12C TYP	μA78L12C MAX	μA78L12AC MIN	μA78L12AC TYP	μA78L12AC MAX	UNIT
Output voltage	V_I = 14 V to 27 V, I_O = 1 mA to 40 mA	25°C	11.1	12	12.9	11.5	12	12.5	V
		0°C to 125°C	10.8		13.2	11.4		12.6	
	I_O = 1 mA to 70 mA	0°C to 125°C	10.8		13.2	11.4		12.6	
Input voltage regulation	V_I = 14.5 V to 27 V	25°C		55	250		55	250	mV
	V_I = 16 V to 27 V			49	200		49	200	
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz	25°C	36	42		37	42		dB
Output voltage regulation	I_O = 1 mA to 100 mA	25°C		22	100		22	100	mV
	I_O = 1 mA to 40 mA			13	50		13	50	
Output noise voltage	f = 10 Hz to 100 kHz	25°C		70			70		μV
Dropout voltage		25°C		1.7			1.7		V
Bias current		25°C		4.3	6.5		4.3	6.5	mA
		125°C			6			6	
Bias current change	V_I = 16 V to 27 V	0°C to 125°C			1.5			1.5	mA
	I_O = 1 mA to 40 mA				0.2			0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 23 V, I_O = 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T_J†	μA78L15C MIN	μA78L15C TYP	μA78L15C MAX	μA78L15AC MIN	μA78L15AC TYP	μA78L15AC MAX	UNIT
Output voltage	V_I = 17.5 V to 30 V, I_O = 1 mA to 40 mA	25°C	13.8	15	16.2	14.4	15	15.6	V
		0°C to 125°C	13.5		16.5	14.25		15.75	
	I_O = 1 mA to 70 mA	0°C to 125°C	13.5		16.5	14.25		15.75	
Input voltage regulation	V_I = 17.5 V to 30 V	25°C		65	300		65	300	mV
	V_I = 20 V to 30 V			58	250		58	250	
Ripple rejection	V_I = 18.5 V to 28.5 V, f = 120 Hz	25°C	33	39		34	39		dB
Output voltage regulation	I_O = 1 mA to 100 mA	25°C		25	150		25	150	mV
	I_O = 1 mA to 40 mA			15	75		15	75	
Output noise voltage	f = 10 Hz to 100 kHz	25°C		82			82		μV
Dropout voltage		25°C		1.7			1.7		V
Bias current		25°C		4.6	6.5		4.6	6.5	mA
		125°C			6			6	
Bias current change	V_I = 10 V to 30 V	0°C to 125°C			1.5			1.5	mA
	I_O = 1 mA to 40 mA				0.2			0.1	

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 9 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78L02Y			UNIT
		MIN	TYP	MAX	
Output voltage			2.6		V
Input voltage regulation	V_I = 4.75 V to 20 V		20		mV
	V_I = 5 V to 20 V		16		
Ripple rejection	V_I = 6 V to 20 V, f = 120 Hz		51		dB
Output voltage regulation	I_O = 1 mA to 100 mA		12		mV
	I_O = 1 mA to 40 mA		6		
Output noise voltage	f = 10 Hz to 100 kHz		30		μV
Dropout voltage			1.7		V
Bias current			3.6		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 10 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78L05Y			UNIT
		MIN	TYP	MAX	
Output voltage			5		V
Input voltage regulation	V_I = 7 V to 20 V		32		mV
	V_I = 8 V to 20 V		26		
Ripple rejection	V_I = 8 V to 18 V, f = 120 Hz		49		dB
Output voltage regulation	I_O = 1 mA to 100 mA		15		mV
	I_O = 1 mA to 40 mA		8		
Output noise voltage	f = 10 Hz to 100 kHz		42		μV
Dropout voltage			1.7		V
Bias current			3.8		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 12 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78L06Y			UNIT
		MIN	TYP	MAX	
Output voltage			6.2		V
Input voltage regulation	V_I = 8.5 V to 20 V		35		mV
	V_I = 9 V to 20 V		29		
Ripple rejection	V_I = 10 V to 20 V, f = 120 Hz		48		dB
Output voltage regulation	I_O = 1 mA to 100 mA		16		mV
	I_O = 1 mA to 40 mA		9		
Output noise voltage	f = 10 Hz to 100 kHz		46		μV
Dropout voltage			1.7		V
Bias current			3.9		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 14 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78L08Y			UNIT
		MIN	TYP	MAX	
Output voltage			8		V
Input voltage regulation	V_I = 10.5 V to 23 V		42		mV
	V_I = 11 V to 23 V		36		
Ripple rejection	V_I = 13 V to 23 V, f = 120 Hz		46		dB
Output voltage regulation	I_O = 1 mA to 100 mA		18		mV
	I_O = 1 mA to 40 mA		10		
Output noise voltage	f = 10 Hz to 100 kHz		54		μV
Dropout voltage			1.7		V
Bias current			4		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 16 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78L09Y			UNIT
		MIN	TYP	MAX	
Output voltage			9		V
Input voltage regulation	V_I = 12 V to 24 V		45		mV
	V_I = 13 V to 24 V		40		
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz		45		dB
Output voltage regulation	I_O = 1 mA to 100 mA		19		mV
	I_O = 1 mA to 40 mA		11		
Output noise voltage	f = 10 Hz to 100 kHz		58		μV
Dropout voltage			1.7		V
Bias current			4.1		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 14 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78L10Y			UNIT
		MIN	TYP	MAX	
Output voltage			10		V
Input voltage regulation	V_I = 13 V to 25 V		51		mV
	V_I = 14 V to 25 V		42		
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz		44		dB
Output voltage regulation	I_O = 1 mA to 100 mA		20		mV
	I_O = 1 mA to 40 mA		11		
Output noise voltage	f = 10 Hz to 100 kHz		62		μV
Dropout voltage			1.7		V
Bias current			4.2		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 19 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78L12Y		UNIT
		MIN	TYP	MAX	
Output voltage			12		V
Input voltage regulation	V_I = 14.5 V to 27 V		55		mV
	V_I = 16 V to 27 V		49		
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz		42		dB
Output voltage regulation	I_O = 1 mA to 100 mA		22		mV
	I_O = 1 mA to 40 mA		13		
Output noise voltage	f = 10 Hz to 100 kHz		70		μV
Dropout voltage			1.7		V
Bias current			4.3		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

electrical characteristics at specified virtual junction temperature, V_I = 23 V, I_O = 40 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78L15Y		UNIT
		MIN	TYP	MAX	
Output voltage			15		V
Input voltage regulation	V_I = 17.5 V to 30 V		65		mV
	V_I = 20 V to 30 V		58		
Ripple rejection	V_I = 18.5 V to 28.5 V, f = 120 Hz		39		dB
Output voltage regulation	I_O = 1 mA to 100 mA		25		mV
	I_O = 1 mA to 40 mA		15		
Output noise voltage	f = 10 Hz to 100 kHz		82		μV
Dropout voltage			1.7		V
Bias current			4.6		mA

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

APPLICATION INFORMATION

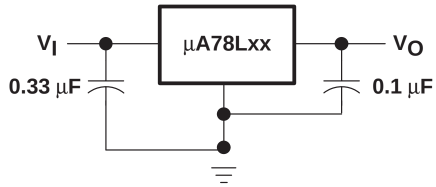


Figure 1. Fixed-Output Regulator

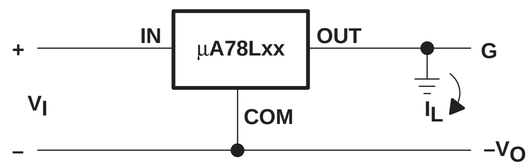


Figure 2. Positive Regulator in Negative Configuration (V_I Must Float)

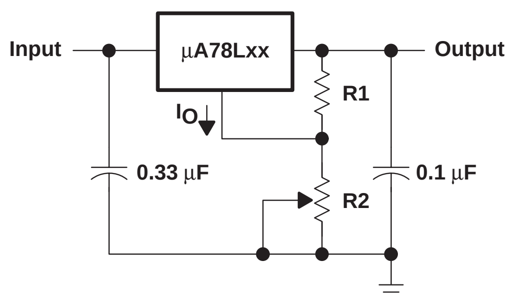
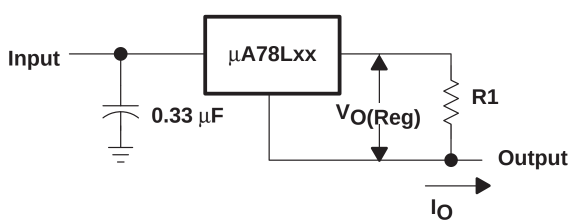


Figure 3. Adjustable-Output Regulator



$I_O = (V_O/R1) + I_O$ Bias Current

Figure 4. Current Regulator

APPLICATION INFORMATION

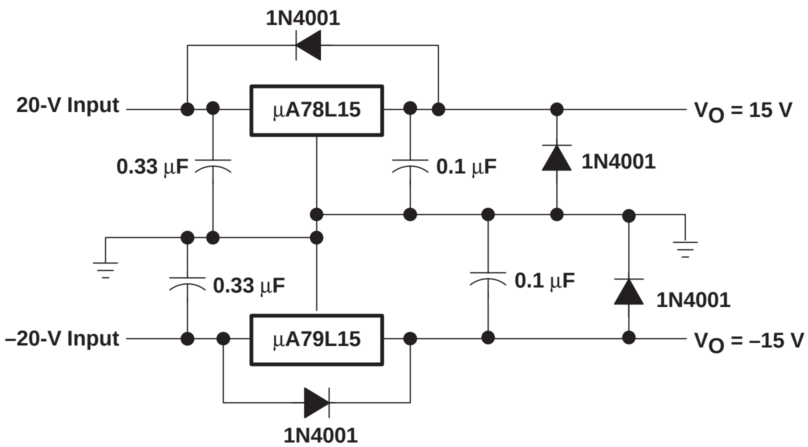


Figure 5. Regulated Dual Supply

operation with a load common to a voltage of opposite polarity

In many cases, a regulator powers a load that is not connected to ground but, instead, is connected to a voltage source of opposite polarity (e.g., operational amplifiers, level-shifting circuits, etc.). In these cases, a clamp diode should be connected to the regulator output as shown in Figure 6. This protects the regulator from output polarity reversals during startup and short-circuit operation.

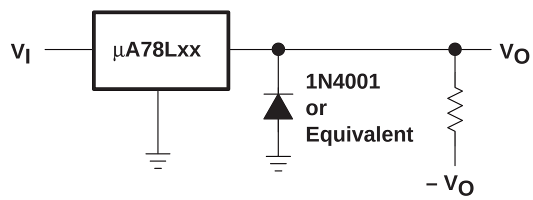


Figure 6. Output Polarity-Reversal-Protection Circuit

reverse-bias protection

Occasionally, the input voltage to the regulator can collapse faster than the output voltage. This can occur, for example, when the input supply is crowbarred during an output overvoltage condition. If the output voltage is greater than approximately 7 V, the emitter-base junction of the series-pass element (internal or external) could break down and be damaged. To prevent this, a diode shunt can be employed as shown in Figure 7.

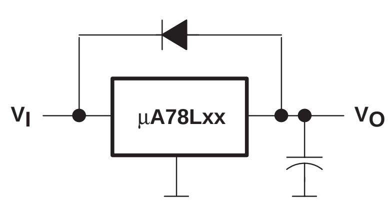


Figure 7. Reverse-Bias-Protection Circuit

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