

μ A78M00 SERIES POSITIVE-VOLTAGE REGULATORS

SLVS059E – JUNE 1976 – REVISED AUGUST 2001

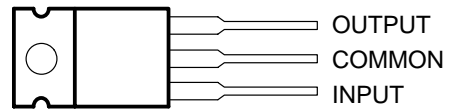
- 3-Terminal Regulators
- Output Current up to 500 mA
- No External Components
- Internal Thermal-Overload Protection
- High Power-Dissipation Capability
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation
- Direct Replacements for Fairchild μ A78M00 Series

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. Each of these regulators can deliver up to 500 mA of output current. The internal current-limiting and thermal-shutdown features of these regulators essentially make them immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents and also as the power-pass element in precision regulators.

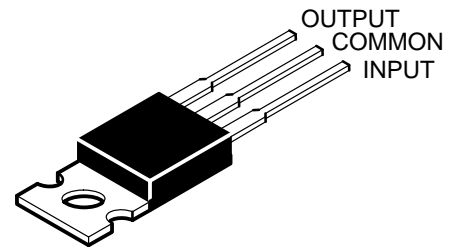
The μ A78M00C series is characterized for operation over the virtual junction temperature range of 0°C to 125°C.

KC PACKAGE
(TOP VIEW)

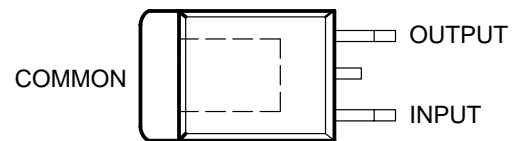


The COMMON terminal is in electrical contact with the mounting base.

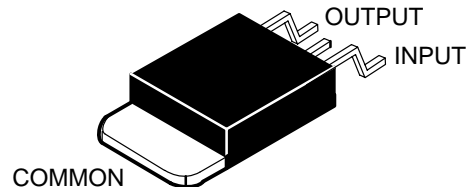
TO-220AB



KTP PACKAGE
(TOP VIEW)



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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.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS
INSTRUMENTS**

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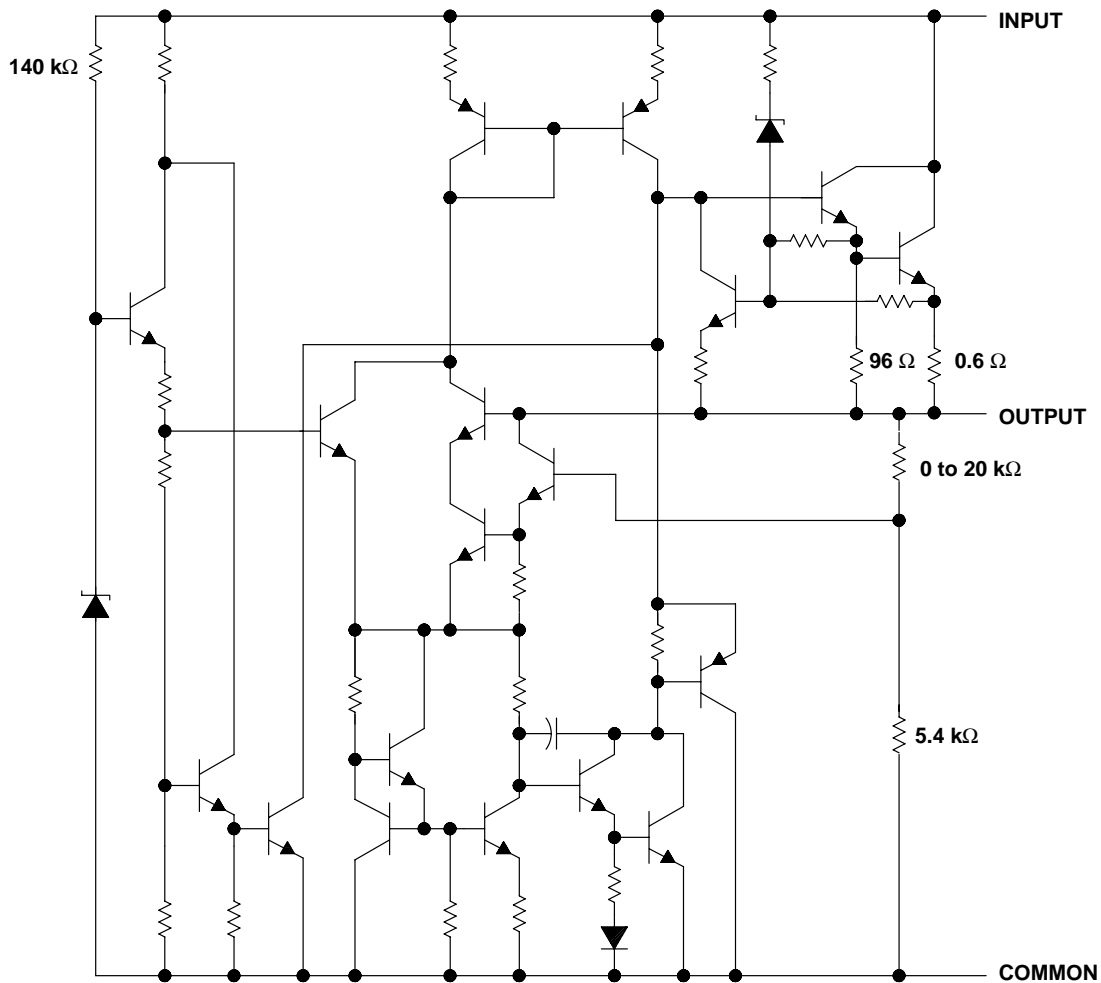
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AVAILABLE OPTIONS

T _J	V _{O(NOM)} (V)	PACKAGED DEVICES	
		HEAT-SINK MOUNTED (KC)	PLASTIC FLANGE MOUNTED (KTP)
0°C to 125°C	5	μA78M05CKC	μA78M05CKTP
	6	μA78M06CKC	μA78M06CKTP
	8	μA78M08CKC	μA78M08CKTP
	9	μA78M09CKC	μA78M09CKTP
	10	μA78M10CKC	μA78M10CKTP
	12	μA78M12CKC	μA78M12CKTP
	15	μA78M15CKC	μA78M15CKTP

The KTP package is only available taped and reeled. Add the suffix R to the device type (e.g., μA78M05CKTPR).

schematic



Resistor values shown are nominal.



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

Input voltage, V_I	35 V
Package thermal impedance, θ_{JA} (see Notes 1 and 2): KC package	22°C/W
KTP package	28°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C
Virtual junction temperature range, T_J	0°C to 150°C
Storage temperature range, T_{Stg}	–65°C 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 $P_D = (T_J(\max) - T_A)/\theta_{JA}$. Selecting the maximum of 150°C can impact reliability.
2. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

		MIN	MAX	UNIT	
V_I	Input voltage	μA78M05	7	25	V
		μA78M06	8	25	
		μA78M08	10.5	25	
		μA78M09	11.5	26	
		μA78M10	12.5	28	
		μA78M12	14.5	30	
		μA78M15	17.5	30	
I_O	Output current		500	mA	
T_J	Operating virtual junction temperature	0	125	°C	

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electrical characteristics at specified virtual junction temperature, $V_I = 10\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78M05C			UNIT	
		MIN	TYP	MAX		
Output voltage	$V_I = 7\text{ V to }20\text{ V}$ $T_J = 0^\circ\text{C to }125^\circ\text{C}$		4.8	5	5.2	V
			4.75		5.25	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 7\text{ V to }25\text{ V}$		3	100	mV
		$V_I = 8\text{ V to }20\text{ V}$				
		$V_I = 8\text{ V to }25\text{ V}$		1	50	
Ripple rejection	$V_I = 8\text{ V to }18\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	62			dB
		$I_O = 300\text{ mA}$	62	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		20	100	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	50		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		40	200	μV	
Dropout voltage			2		V	
Bias current			4.5	6	mA	
Bias current change	$I_O = 200\text{ mA}$, $V_I = 8\text{ V to }25\text{ V}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.8	mA	
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.5		
Short-circuit output current	$V_I = 35\text{ V}$		300		mA	
Peak output current			0.7		A	

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

electrical characteristics at specified virtual junction temperature, $V_I = 11\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78M06C			UNIT	
		MIN	TYP	MAX		
Output voltage	$I_O = 5\text{ mA to }350\text{ mA}$, $V_I = 8\text{ V to }21\text{ V}$ $T_J = 0^\circ\text{C to }125^\circ\text{C}$		5.75	6	6.25	V
			5.7		6.3	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 8\text{ V to }25\text{ V}$		5	100	mV
		$V_I = 9\text{ V to }25\text{ V}$		1.5	50	
Ripple rejection	$V_I = 9\text{ V to }19\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	59			dB
		$I_O = 300\text{ mA}$	59	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		20	120	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	60		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		45		μV	
Dropout voltage			2		V	
Bias current			4.5	6	mA	
Bias current change	$V_I = 9\text{ V to }25\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.8	mA	
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.5		
Short-circuit output current	$V_I = 35\text{ V}$		270		mA	
Peak output current			0.7		A	

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electrical characteristics at specified virtual junction temperature, $V_I = 14\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONST		μA78M08C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 10.5\text{ V to }23\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$	$T_J = 0^\circ\text{C to }125^\circ\text{C}$	7.7	8	8.3	V
			7.6		8.4	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 10.5\text{ V to }25\text{ V}$	6	100	mV	
		$V_I = 11\text{ V to }25\text{ V}$	2	50		
Ripple rejection	$V_I = 11.5\text{ V to }21.5\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	56		dB	
		$I_O = 300\text{ mA}$	56	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	160	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	80		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		52		μV	
Dropout voltage			2		V	
Bias current			4.6	6	mA	
Bias current change	$V_I = 10.5\text{ V to }25\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	$I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		0.8	mA	
				0.5		
Short-circuit output current	$V_I = 35\text{ V}$		250		mA	
Peak output current			0.7		A	

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

electrical characteristics at specified virtual junction temperature, $V_I = 16\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONST		μA78M09C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 11.5\text{ V to }24\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$	$T_J = 0^\circ\text{C to }125^\circ\text{C}$	8.6	9	9.4	V
			8.5		9.5	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 11.5\text{ V to }26\text{ V}$	6	100	mV	
		$V_I = 12\text{ V to }26\text{ V}$	2	50		
Ripple rejection	$V_I = 13\text{ V to }23\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	56		dB	
		$I_O = 300\text{ mA}$	56	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	180	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	90		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		58		μV	
Dropout voltage			2		V	
Bias current			4.6	6	mA	
Bias current change	$V_I = 11.5\text{ V to }26\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	$I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		0.8	mA	
				0.5		
Short-circuit output current	$V_I = 35\text{ V}$		250		mA	
Peak output current			0.7		A	

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



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electrical characteristics at specified virtual junction temperature, $V_I = 17\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78M10C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 12.5\text{ V to }25\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$		9.6	10	10.4	V
		$T_J = 0^\circ\text{C to }125^\circ\text{C}$	9.5		10.5	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 12.5\text{ V to }28\text{ V}$	7	100	mV	
		$V_I = 14\text{ V to }28\text{ V}$	2	50		
Ripple rejection	$V_I = 15\text{ V to }25\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	59		dB	
		$I_O = 300\text{ mA}$	55	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	200	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	100		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		64		μV	
Dropout voltage			2		V	
Bias current			4.7	6	mA	
Bias current change	$V_I = 12.5\text{ V to }28\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.8	mA	
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.5		
Short-circuit output current	$V_I = 35\text{ V}$		245		mA	
Peak output current			0.7		A	

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

electrical characteristics at specified virtual junction temperature, $V_I = 19\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78M12C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 14.5\text{ V to }27\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$		11.5	12	12.5	V
		$T_J = 0^\circ\text{C to }125^\circ\text{C}$	11.4		12.6	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 14.5\text{ V to }30\text{ V}$	8	100	mV	
		$V_I = 16\text{ V to }30\text{ V}$	2	50		
Ripple rejection	$V_I = 15\text{ V to }25\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	55		dB	
		$I_O = 300\text{ mA}$	55	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	240	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	120		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		75		μV	
Dropout voltage			2		V	
Bias current			4.8	6	mA	
Bias current change	$V_I = 14.5\text{ V to }30\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.8	mA	
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.5		
Short-circuit output current	$V_I = 35\text{ V}$		240		mA	
Peak output current			0.7		A	

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



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electrical characteristics at specified virtual junction temperature, $V_I = 23\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78M15C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 17.5\text{ V to }30\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$		14.4	15	15.6	V
		$T_J = 0^\circ\text{C to }125^\circ\text{C}$	14.25		15.75	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 17.5\text{ V to }30\text{ V}$		10	100	mV
		$V_I = 20\text{ V to }30\text{ V}$		3	50	
Ripple rejection	$V_I = 18.5\text{ V to }28.5\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	54			dB
		$I_O = 300\text{ mA}$	54	70		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	300		mV
	$I_O = 5\text{ mA to }200\text{ mA}$		10	150		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$,	$T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		90			μV
Dropout voltage			2			V
Bias current			4.8	6		mA
Bias current change	$V_I = 17.5\text{ V to }30\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$				0.8	mA
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$				0.5	
Short-circuit output current	$V_I = 35\text{ V}$		240			mA
Peak output current			0.7			A

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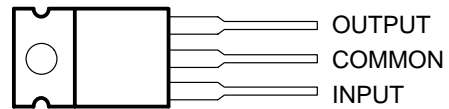
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description

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. Each of these regulators can deliver up to 500 mA of output current. The internal current-limiting and thermal-shutdown features of these regulators essentially make them immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents and also as the power-pass element in precision regulators.

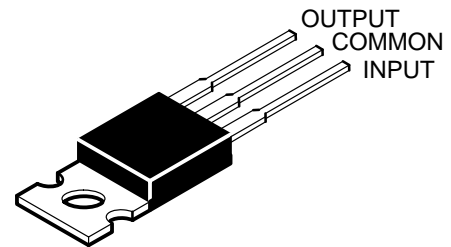
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(TOP VIEW)

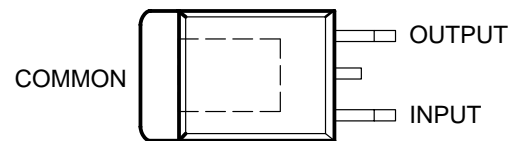


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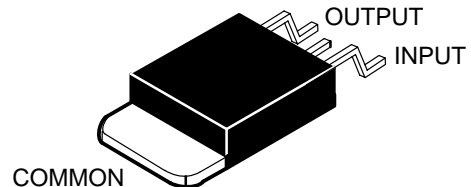
TO-220AB



KTP PACKAGE
(TOP VIEW)



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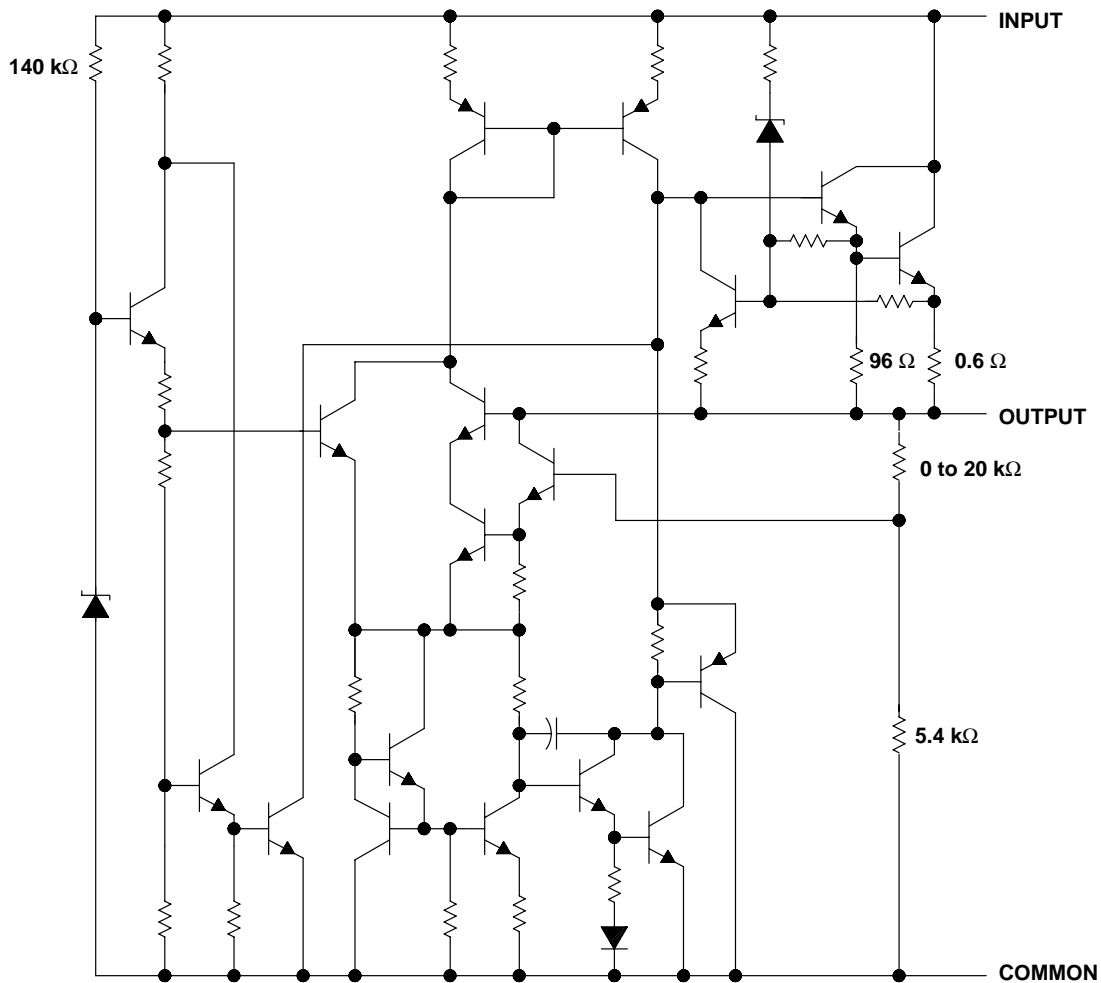
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AVAILABLE OPTIONS

T _J	V _{O(NOM)} (V)	PACKAGED DEVICES	
		HEAT-SINK MOUNTED (KC)	PLASTIC FLANGE MOUNTED (KTP)
0°C to 125°C	5	μA78M05CKC	μA78M05CKTP
	6	μA78M06CKC	μA78M06CKTP
	8	μA78M08CKC	μA78M08CKTP
	9	μA78M09CKC	μA78M09CKTP
	10	μA78M10CKC	μA78M10CKTP
	12	μA78M12CKC	μA78M12CKTP
	15	μA78M15CKC	μA78M15CKTP

The KTP package is only available taped and reeled. Add the suffix R to the device type (e.g., μA78M05CKTPR).

schematic



Resistor values shown are nominal.

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

Input voltage, V_I	35 V
Package thermal impedance, θ_{JA} (see Notes 1 and 2): KC package	22°C/W
KTP package	28°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C
Virtual junction temperature range, T_J	0°C to 150°C
Storage temperature range, T_{Stg}	–65°C 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 $P_D = (T_J(\max) - T_A)/\theta_{JA}$. Selecting the maximum of 150°C can impact reliability.
2. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

		MIN	MAX	UNIT	
V_I	Input voltage	μA78M05	7	25	V
		μA78M06	8	25	
		μA78M08	10.5	25	
		μA78M09	11.5	26	
		μA78M10	12.5	28	
		μA78M12	14.5	30	
		μA78M15	17.5	30	
I_O	Output current		500	mA	
T_J	Operating virtual junction temperature	0	125	°C	

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electrical characteristics at specified virtual junction temperature, $V_I = 10\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78M05C			UNIT	
		MIN	TYP	MAX		
Output voltage	$V_I = 7\text{ V to }20\text{ V}$ $T_J = 0^\circ\text{C to }125^\circ\text{C}$		4.8	5	5.2	V
			4.75		5.25	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 7\text{ V to }25\text{ V}$		3	100	mV
		$V_I = 8\text{ V to }20\text{ V}$				
		$V_I = 8\text{ V to }25\text{ V}$		1	50	
Ripple rejection	$V_I = 8\text{ V to }18\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	62			dB
		$I_O = 300\text{ mA}$	62	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		20	100	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	50		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		40	200	μV	
Dropout voltage			2		V	
Bias current			4.5	6	mA	
Bias current change	$I_O = 200\text{ mA}$, $V_I = 8\text{ V to }25\text{ V}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.8	mA	
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.5		
Short-circuit output current	$V_I = 35\text{ V}$		300		mA	
Peak output current			0.7		A	

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

electrical characteristics at specified virtual junction temperature, $V_I = 11\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	μA78M06C			UNIT	
		MIN	TYP	MAX		
Output voltage	$I_O = 5\text{ mA to }350\text{ mA}$, $V_I = 8\text{ V to }21\text{ V}$ $T_J = 0^\circ\text{C to }125^\circ\text{C}$		5.75	6	6.25	V
			5.7		6.3	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 8\text{ V to }25\text{ V}$		5	100	mV
		$V_I = 9\text{ V to }25\text{ V}$		1.5	50	
Ripple rejection	$V_I = 9\text{ V to }19\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	59			dB
		$I_O = 300\text{ mA}$	59	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		20	120	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	60		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		45		μV	
Dropout voltage			2		V	
Bias current			4.5	6	mA	
Bias current change	$V_I = 9\text{ V to }25\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.8	mA	
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.5		
Short-circuit output current	$V_I = 35\text{ V}$		270		mA	
Peak output current			0.7		A	

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



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electrical characteristics at specified virtual junction temperature, $V_I = 14\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITION [†]		μA78M08C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 10.5\text{ V to }23\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$	$T_J = 0^\circ\text{C to }125^\circ\text{C}$	7.7	8	8.3	V
			7.6		8.4	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 10.5\text{ V to }25\text{ V}$	6	100	mV	
		$V_I = 11\text{ V to }25\text{ V}$	2	50		
Ripple rejection	$V_I = 11.5\text{ V to }21.5\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	56		dB	
		$I_O = 300\text{ mA}$	56	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	160	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	80		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		52		μV	
Dropout voltage			2		V	
Bias current			4.6	6	mA	
Bias current change	$V_I = 10.5\text{ V to }25\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	$I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		0.8	mA	
				0.5		
Short-circuit output current	$V_I = 35\text{ V}$		250		mA	
Peak output current			0.7		A	

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

electrical characteristics at specified virtual junction temperature, $V_I = 16\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITION [†]		μA78M09C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 11.5\text{ V to }24\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$	$T_J = 0^\circ\text{C to }125^\circ\text{C}$	8.6	9	9.4	V
			8.5		9.5	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 11.5\text{ V to }26\text{ V}$	6	100	mV	
		$V_I = 12\text{ V to }26\text{ V}$	2	50		
Ripple rejection	$V_I = 13\text{ V to }23\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	56		dB	
		$I_O = 300\text{ mA}$	56	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	180	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	90		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		58		μV	
Dropout voltage			2		V	
Bias current			4.6	6	mA	
Bias current change	$V_I = 11.5\text{ V to }26\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	$I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		0.8	mA	
				0.5		
Short-circuit output current	$V_I = 35\text{ V}$		250		mA	
Peak output current			0.7		A	

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



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electrical characteristics at specified virtual junction temperature, $V_I = 17\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78M10C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 12.5\text{ V to }25\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$		9.6	10	10.4	V
		$T_J = 0^\circ\text{C to }125^\circ\text{C}$	9.5		10.5	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 12.5\text{ V to }28\text{ V}$		7	100	mV
		$V_I = 14\text{ V to }28\text{ V}$		2	50	
Ripple rejection	$V_I = 15\text{ V to }25\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	59			dB
		$I_O = 300\text{ mA}$	55	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	200		mV
	$I_O = 5\text{ mA to }200\text{ mA}$		10	100		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$,	$T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		64			μV
Dropout voltage			2			V
Bias current			4.7	6		mA
Bias current change	$V_I = 12.5\text{ V to }28\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$				0.8	mA
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$				0.5	
Short-circuit output current	$V_I = 35\text{ V}$		245			mA
Peak output current			0.7			A

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

electrical characteristics at specified virtual junction temperature, $V_I = 19\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78M12C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 14.5\text{ V to }27\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$		11.5	12	12.5	V
		$T_J = 0^\circ\text{C to }125^\circ\text{C}$	11.4		12.6	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 14.5\text{ V to }30\text{ V}$		8	100	mV
		$V_I = 16\text{ V to }30\text{ V}$		2	50	
Ripple rejection	$V_I = 15\text{ V to }25\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	55			dB
		$I_O = 300\text{ mA}$	55	80		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	240		mV
	$I_O = 5\text{ mA to }200\text{ mA}$		10	120		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$			-1		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		75			μV
Dropout voltage			2			V
Bias current			4.8	6		mA
Bias current change	$V_I = 14.5\text{ V to }30\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$				0.8	mA
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$				0.5	
Short-circuit output current	$V_I = 35\text{ V}$		240			mA
Peak output current			0.7			A

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



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electrical characteristics at specified virtual junction temperature, $V_I = 23\text{ V}$, $I_O = 350\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		μA78M15C			UNIT
			MIN	TYP	MAX	
Output voltage	$V_I = 17.5\text{ V to }30\text{ V}$, $I_O = 5\text{ mA to }350\text{ mA}$	$T_J = 0^\circ\text{C to }125^\circ\text{C}$	14.4	15	15.6	V
			14.25		15.75	
Input voltage regulation	$I_O = 200\text{ mA}$	$V_I = 17.5\text{ V to }30\text{ V}$	10	100	mV	
		$V_I = 20\text{ V to }30\text{ V}$	3	50		
Ripple rejection	$V_I = 18.5\text{ V to }28.5\text{ V}$, $f = 120\text{ Hz}$	$I_O = 100\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$	54		dB	
		$I_O = 300\text{ mA}$	54	70		
Output voltage regulation	$I_O = 5\text{ mA to }500\text{ mA}$		25	300	mV	
	$I_O = 5\text{ mA to }200\text{ mA}$		10	150		
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$		-1		mV/°C	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$		90		μV	
Dropout voltage			2		V	
Bias current			4.8	6	mA	
Bias current change	$V_I = 17.5\text{ V to }30\text{ V}$, $I_O = 200\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.8	mA	
	$I_O = 5\text{ mA to }350\text{ mA}$, $T_J = 0^\circ\text{C to }125^\circ\text{C}$			0.5		
Short-circuit output current	$V_I = 35\text{ V}$		240		mA	
Peak output current			0.7		A	

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

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