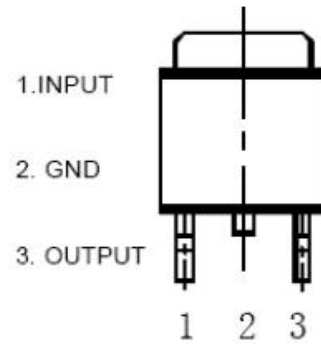


**FEATURES PIN CONNECTION**

- Maximum Output Current: 500mA
- Output Voltage is 3.3V, 5.0V, 6.0V, 8.0V, 12.0V, 15V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- L78M05 is available in TO-252-2L package

**PIN CONNECTION**

**ABSOLUTE MAXIMUM RATINGS** (Ta=25°C)

Parameter	Symbol	Value	Units
Input Voltage	$V_i$	36	V
Operating Temperature Range	$T_{opr}$	-40 ~ +125	°C
Storage Temperature Range	$T_{stg}$	-85 ~ +150	°C

**ELECTRICAL CHARACTERISTICS**
**78M33**(unless otherwise noted,  $V_i=10V, I_o=250mA, 0^\circ C < T_j < 125^\circ C, C_i=0.33\mu F, C_o=0.1\mu F$ )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_j=25^\circ C$	3.168	3.3	3.432	V
		$5.8V \leq V_i \leq 20V$ $I_o=5mA \sim 250mA$	3.135	3.3	3.465	
Load Regulation	$\Delta V_o$	$T_j=25^\circ C, I_o=5mA \sim 500mA$		25	100	mV
		$T_j=25^\circ C, I_o=5mA \sim 200mA$		10	50	
Line Regulation	$\Delta V_o$	$5.8V \leq V_i \leq 25V, T_j=25^\circ C$		4	100	mV
		$6V \leq V_i \leq 20V, T_j=25^\circ C$		2	50	
Quiescent Current	$I_q$	$T_j=25^\circ C$		4	6	mA
Quiescent Current Charge	$\Delta I_q$	$6V \leq V_i \leq 25V, I_o=200mA$			0.8	mA
		$5mA \leq V_i \leq 350mA$			0.5	
Output noise Voltage	$V_N$	$10Hz \leq f \leq 100kHz$		40	200	$\mu V$
Dropout Voltage	$V_d$	$T_j=25^\circ C$		1.8		V
Ripple Rejection	RR	$6V \leq V_i \leq 20V, f=120Hz,$ $T_j=25^\circ C$	56	80		dB
Short Circuit Current Limit	$I_{sc}$	$T_j=25^\circ C$		700		mA

**78M05**(unless otherwise noted,  $V_i=10V, I_o=250mA, 0^{\circ}C < T_j < 125^{\circ}C, C_i=0.33\mu F, C_o=0.1\mu F$ )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_j=25^{\circ}C$	4.8	5.0	5.2	V
		$7.5V \leq V_i \leq 20V$ $I_o=5mA \sim 250mA$	4.75	5.0	5.25	
Load Regulation	$\Delta V_o$	$T_j=25^{\circ}C, I_o=5mA \sim 500mA$		25	100	mV
		$T_j=25^{\circ}C, I_o=5mA \sim 200mA$		10	50	
Line Regulation	$\Delta V_o$	$7.5V \leq V_i \leq 25V, T_j=25^{\circ}C$		4	100	mV
		$8V \leq V_i \leq 20V, T_j=25^{\circ}C$		2	50	
Quiescent Current	$I_q$	$T_j=25^{\circ}C$		4	6	mA
Quiescent Current Charge	$\Delta I_q$	$8V \leq V_i \leq 25V, I_o=200mA$			0.8	mA
		$5mA \leq V_i \leq 350mA$			0.5	
Output noise Voltage	$V_N$	$10Hz \leq f \leq 100kHz$		40	200	$\mu V$
Dropout Voltage	$V_d$	$T_j=25^{\circ}C$		1.8		V
Ripple Rejection	RR	$8V \leq V_i \leq 20V, f=120Hz,$ $T_j=25^{\circ}C$	56	80		dB
Short Circuit Current Limit	$I_{sc}$	$T_j=25^{\circ}C$		700		mA

## ELECTRICAL CHARACTERISTICS

**78M06**(unless otherwise noted,  $V_i=11V, I_o=250mA, 0^{\circ}C < T_j < 125^{\circ}C, C_i=0.33\mu F, C_o=0.1\mu F$ )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_j=25^{\circ}C$	5.76	6.0	6.24	V
		$8.5V \leq V_i \leq 21V$ $I_o=5mA \sim 250mA$	5.70	6.0	6.30	
Load Regulation	$\Delta V_o$	$T_j=25^{\circ}C, I_o=5mA \sim 500mA$		25	120	mV
		$T_j=25^{\circ}C, I_o=5mA \sim 200mA$		10	60	
Line Regulation	$\Delta V_o$	$8.5V \leq V_i \leq 26V, T_j=25^{\circ}C$		4	100	mV
		$9V \leq V_i \leq 21V, T_j=25^{\circ}C$		2	50	
Quiescent Current	$I_q$	$T_j=25^{\circ}C$		4	6	mA
Quiescent Current Charge	$\Delta I_q$	$9V \leq V_i \leq 26V, I_o=200mA$			0.8	mA
		$5mA \leq V_i \leq 350mA$			0.5	
Output noise Voltage	$V_N$	$10Hz \leq f \leq 100kHz$		40	200	$\mu V$
Dropout Voltage	$V_d$	$T_j=25^{\circ}C$		1.8		V
Ripple Rejection	RR	$9V \leq V_i \leq 21V, f=120Hz,$ $T_j=25^{\circ}C$	56	80		dB
Short Circuit Current Limit	$I_{sc}$	$T_j=25^{\circ}C$		700		mA

**78M08**(unless otherwise noted,  $V_i=14V, I_o=250mA, 0^{\circ}C < T_j < 125^{\circ}C, C_i=0.33\mu F, C_o=0.1\mu F$ )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_j=25^{\circ}C$	7.68	8.0	8.32	V
		$10.5V \leq V_i \leq 23V$ $I_o=5mA \sim 250mA$	7.60	8.0	8.40	
Load Regulation	$\Delta V_o$	$T_j=25^{\circ}C, I_o=5mA \sim 500mA$		30	160	mV
		$T_j=25^{\circ}C, I_o=5mA \sim 200mA$		10	80	
Line Regulation	$\Delta V_o$	$10.5V \leq V_i \leq 28V, T_j=25^{\circ}C$		6	100	mV
		$11V \leq V_i \leq 23V, T_j=25^{\circ}C$		2	50	
Quiescent Current	$I_q$	$T_j=25^{\circ}C$		4	6	mA
Quiescent Current Charge	$\Delta I_q$	$11V \leq V_i \leq 28V, I_o=200mA$			0.8	mA
		$5mA \leq V_i \leq 350mA$			0.5	
Output noise Voltage	$V_N$	$10Hz \leq f \leq 100kHz$		40	200	$\mu V$
Dropout Voltage	$V_d$	$T_j=25^{\circ}C$		1.8		V
Ripple Rejection	RR	$11V \leq V_i \leq 23V, f=120Hz,$ $T_j=25^{\circ}C$	56	80		dB
Short Circuit Current Limit	Isc	$T_j=25^{\circ}C$		700		mA

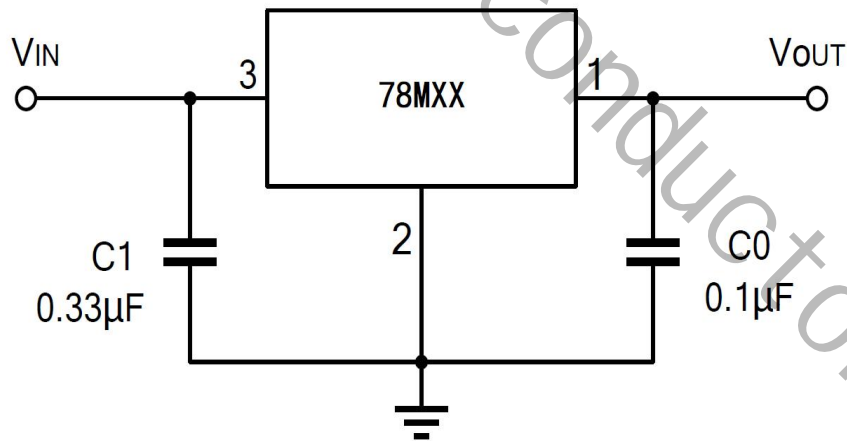
**78M12**(unless otherwise noted,  $V_i=19V, I_o=250mA, 0^{\circ}C < T_j < 125^{\circ}C, C_i=0.33\mu F, C_o=0.1\mu F$ )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_j=25^{\circ}C$	11.52	12.0	12.48	V
		$14.5V \leq V_i \leq 27V$ $I_o=5mA \sim 250mA$	11.40	12.0	12.60	
Load Regulation	$\Delta V_o$	$T_j=25^{\circ}C, I_o=5mA \sim 500mA$		30	240	mV
		$T_j=25^{\circ}C, I_o=5mA \sim 200mA$		10	120	
Line Regulation	$\Delta V_o$	$14.5V \leq V_i \leq 30V, T_j=25^{\circ}C$		7	100	mV
		$16V \leq V_i \leq 30V, T_j=25^{\circ}C$		3	50	
Quiescent Current	$I_q$	$T_j=25^{\circ}C$		4	6	mA
Quiescent Current Charge	$\Delta I_q$	$15V \leq V_i \leq 30V, I_o=200mA$			0.8	mA
		$5mA \leq V_i \leq 350mA$			0.5	
Output noise Voltage	$V_N$	$10Hz \leq f \leq 100kHz$		40	200	$\mu V$
Dropout Voltage	$V_d$	$T_j=25^{\circ}C$		2.0		V
Ripple Rejection	RR	$16V \leq V_i \leq 30V, f=120Hz,$ $T_j=25^{\circ}C$	56	80		dB
Short Circuit Current Limit	Isc	$T_j=25^{\circ}C$		700		mA

**78M15**(unless otherwise noted,  $V_i=23V, I_o=250mA, 0^\circ C < T_j < 125^\circ C, C_i=0.33\mu F, C_o=0.1\mu F$  )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_j=25^\circ C$	14.40	15.0	15.60	V
		$17.5V \leq V_i \leq 30V$ $I_o=5mA \sim 250mA$	14.25	15.0	15.75	
Load Regulation	$\Delta V_o$	$T_j=25^\circ C, I_o=5mA \sim 500mA$		30	300	mV
		$T_j=25^\circ C, I_o=5mA \sim 200mA$		10	150	
Line Regulation	$\Delta V_o$	$17.5V \leq V_i \leq 30V, T_j=25^\circ C$		8	100	mV
		$20V \leq V_i \leq 30V, T_j=25^\circ C$		4	50	
Quiescent Current	$I_q$	$T_j=25^\circ C$		4	6	mA
Quiescent Current Change	$\Delta I_q$	$18V \leq V_i \leq 30V, I_o=200mA$			0.8	mA
		$5mA \leq V_i \leq 350mA$			0.5	
Output noise Voltage	$V_N$	$10Hz \leq f \leq 100kHz$		70	300	$\mu V$
Dropout Voltage	$V_d$	$T_j=25^\circ C$		2.0		V
Ripple Rejection	RR	$18V \leq V_i \leq 30V, f=120Hz,$ $T_j=25^\circ C$	48	55		dB
Short Circuit Current Limit	$I_{sc}$	$T_j=25^\circ C$		700		mA

### Application Circuit



\*Bypass capacitors are recommended for optimum stability and transient response and should be located as close as Possible to the regulators.

**Outline Drawing**
