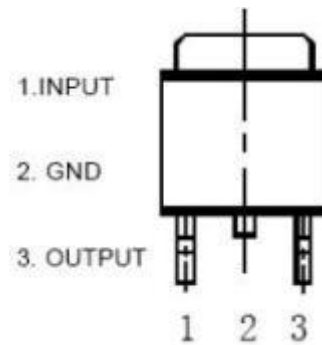


500mA Three-terminal Voltage Regulator

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
- 78M05 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}	-20~+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	ΔV_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	ΔV_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	ΔI_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	μV
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}	$T_j=25^{\circ}C$		600		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	ΔV_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	ΔV_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	ΔI_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	μV
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	Isc	$T_j=25^{\circ}C$		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	ΔV_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	ΔV_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	ΔI_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	μV
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	Isc	$T_j=25^{\circ}C$		600		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	ΔV_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	ΔV_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	ΔI_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	μV
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	$T_j=25^{\circ}C$		600		mA

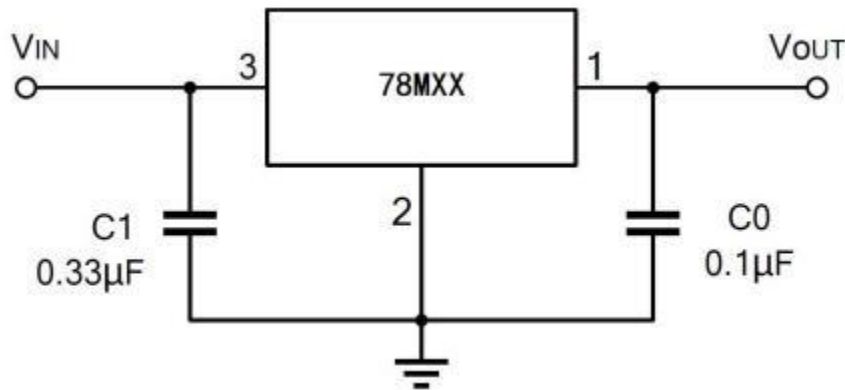
78M12(unless otherwise noted, $V_i=19V, I_o=250mA, 0^{\circ}C < T_j < 125^{\circ}C, C_i=0.33\mu F, C_o=0.1\mu F$)

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	ΔV_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	ΔV_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	ΔI_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	μV
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	$T_j=25^{\circ}C$		600		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	ΔV_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	ΔV_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 Charge	ΔI_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	μV
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}	$T_j=25^{\circ}C$		600		mA

Application Circuit

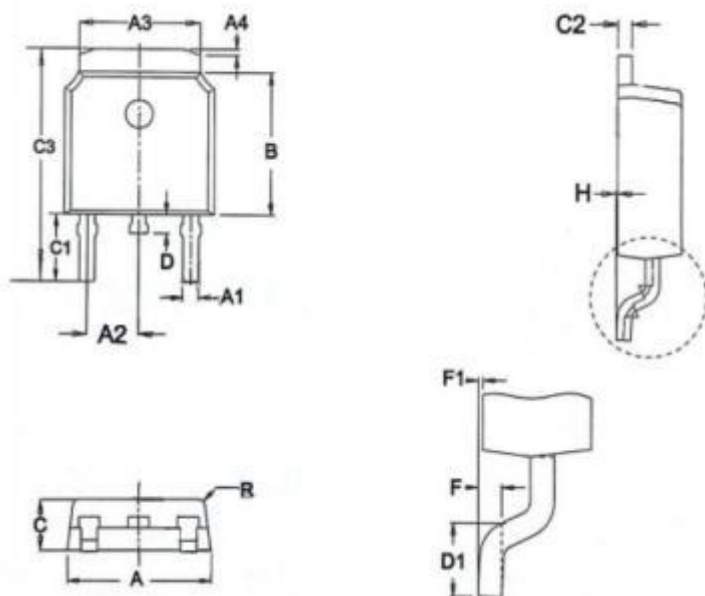


*Bypass capacitors are recommended for optimum stability and transient response and should be located as close as Possible to the regulators.

Outline Drawing

TO252-2L

Unit: mm



标注 \ 尺寸	最小值 (mm)	平均值 (mm)	最大值 (mm)
A	6.550	6.600	6.650
A1	0.640	0.690	0.740
A2		2.286	
A3	5.234	5.334	5.434
A4	0.070	0.270	0.470
B	6.050	6.100	6.150
C	2.250	2.300	2.350
D	0.700	0.800	0.900
D1	1.400	1.500	1.600
F		0.508	
F1	0	0.050	0.100
H	0	0.050	0.100
R		0.250	
C1	2.650	2.780	2.950
C2	0.504	0.508	0.510
C3	9.750	9.850	10.00