Features

- Output Current of 0.8A
- Output transistor safe area protection
- No external components
- Package：TO252, TO251

General Description

OSU78MXX is three-terminal positive regulators. One of these regulators can deliver up to 0.8A of output current. When used as a replacement for a Zener diode-resistor Combination, an effective improvement in output impedance can be obtained, together with lower quiescent current.

Selection Table

Part No.	Output Voltage	Package	Marking
OSU78M05-XX	5.0V		78M05/XXxxx
OSU78M06-XX	6.0V		78M06/XXxxx
OSU78M08-XX	8.0V		78M08/XXxxx
OSU78M09-XX	9.0V		78M09/XXxxx
OSU78M12-XX	12.0V		78M12/XXxxx
OSU78M15-XX	15.0V		78M15/XXxxx
OSU78M18-XX	18.0V		78M18/XXxxx
OSU78M20-XX	20.0V		78M20/XXxxx

Note: ① Stands for the package information.

② Stands for the Lot Number.

Order Information

OSU78M①②-③④

Designator	Symbol	Description
①②	Integer	Output Voltage(5.0~20V)
③④	DD	Package: TO-252
	TC	Package: TO-251

Pin Configuration

TO-252 (Top View)

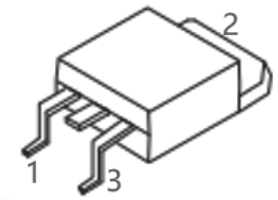

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Table1: OSU78MXX series (TO-252 PKG)

PIN NO.	PIN NAME	FUNCTION
1	VIN	Input voltage pin
2	GND	Ground pin
3	VOUT	Output voltage pin

TO-251 (Top View)

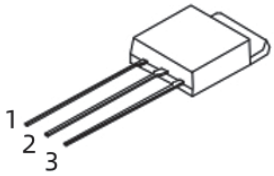
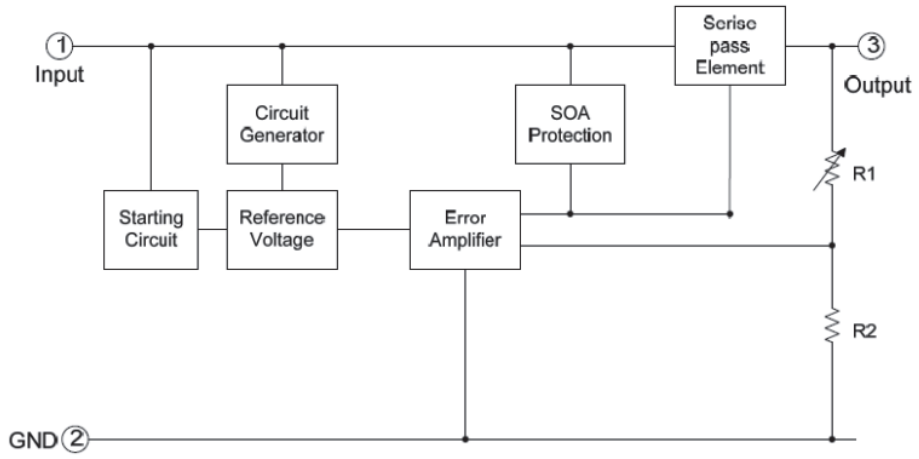


Table2: OSU78MXX series (TO-251 PKG)

PIN NO.	PIN NAME	FUNCTION
1	VOUT	Output voltage pin
2	GND	GND pin
3	VIN	Input voltage pin

Block Diagram



Absolute Maximum Ratings（Ta=25℃）

Parameter	Rating	Unit
Input supply voltage: VIN	40	V
MAX. Output current:Iout	1	A
MAX Power:Pmax	1	W
Maximum junction temperature:Tj	-25~125	℃
Storage temperature:Tstr	-55~125	℃
Soldering temperature and time	+260(Recommended 10S)	℃

Note: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

Electrical Characteristics

OSU78M05 (Cin=0.33uF, Co=0.1uF, Ta=25℃，unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vout	Io=200mA, VIN=10V	4.82	5.0	5.18	V
		Io=100mA VIN=7V~15V	4.8	5.0	5.2	
		Io=1mA~300mA VIN=8V	4.75	5.0	5.25	
Line Regulation	LNR	VIN=7V~18V, Io=20mA	-	50	-	mV
Load Regulation	LDR	VIN=10V, Io=1mA~500mA	-	100	-	mV
		VIN=10V, Io=1mA~40mA	-	20	-	
Dropout Voltage	V_{DIF}	Ta=25℃，Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25℃，f=120Hz, Io=10mA, VIN=8V	-	55	-	dB
Quiescent Current	I_Q	VIN=10V, IOUT=40mA	-	2	-	mA
Quiescent Current Change	$\triangle I_Q$	VIN=8V~20V, I_O=1mA	-	0.1	-	mA
		VIN=10V, IOUT=1mA~100mA	-	0.1	-	

LNR: Line Regulation. The change in output voltage for a change in the input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

LDR: Load Regulation. The change in output voltage for a change in load current at constant chip temperature.

OSU78M06 (Cin=0.33uF, Co=0.1uF, Ta=25℃，unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vout	Io=200mA, VIN=11V	5.784	6.0	6.216	V
		Io=100mA VIN=8V~16V	5.76	6.0	6.24	
		Io=1mA~300mA VIN=9V	5.7	6.0	6.3	
Line Regulation	LNR	VIN=8V~20V, Io=20mA	-	60	-	mV
Load Regulation	LDR	VIN=11V, Io=1mA~500mA	-	110	-	mV
		VIN=11V, Io=1mA~40mA	-	30	-	
Dropout Voltage	V_{DIF}	Ta=25℃，Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25℃，f=120Hz, Io=10mA, VIN=9V	-	55	-	dB
Quiescent Current	I_Q	VIN=11V, IOUT=40mA	-	2	-	mA
Quiescent Current Change	$\triangle I_Q$	VIN=9V~20V, I_O=1mA	-	0.1	-	mA
		VIN=11V, IOUT=1mA~100mA	-	0.1	-	

LNR: Line Regulation. The change in output voltage for a change in the input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

LDR: Load Regulation. The change in output voltage for a change in load current at constant chip temperature.

OSU78M08 (Cin=0.33uF, Co=0.1uF, Ta=25℃，unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vout	Io=200mA, VIN=13V	7.712	8.0	8.288	V
		Io=100mA VIN=10V~18V	7.68	8.0	8.32	
		Io=1mA~300mA VIN=11V	7.6	8.0	8.4	
Line Regulation	LNR	VIN=10V~23V, Io=20mA	-	30	-	mV
Load Regulation	LDR	VIN=13V, Io=1mA~500mA	-	110	-	mV
		VIN=13V, Io=1mA~40mA	-	30	-	
Dropout Voltage	V_{DIF}	Ta=25℃，Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25℃，f=120Hz, Io=10mA, VIN=11V	-	55	-	dB
Quiescent Current	I_Q	VIN=13V, IOUT=40mA	-	2	-	mA
Quiescent Current Change	$\triangle I_Q$	VIN=11V~23V, I_O=1mA	-	0.1	-	mA
		VIN=13V, IOUT=1mA~100mA	-	0.1	-	

LNR: Line Regulation. The change in output voltage for a change in the input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

LDR: Load Regulation. The change in output voltage for a change in load current at constant chip temperature.

OSU78M09 (Cin=0.33uF, Co=0.1uF, Ta=25℃，unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vout	Io=200mA, VIN=14V	8.676	9.0	9.324	V
		Io=100mA VIN=11V~19V	8.64	9.0	9.36	
		Io=1mA~300mA VIN=12V	8.55	9.0	9.45	
Line Regulation	LNR	VIN=11V~24V, Io=20mA	-	30	-	mV
Load Regulation	LDR	VIN=14V, Io=1mA~500mA	-	120	-	mV
		VIN=14V, Io=1mA~40mA	-	30	-	
Dropout Voltage	V_{DIF}	Ta=25℃，Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25℃，f=120Hz, Io=10mA, VIN=12V	-	55	-	dB
Quiescent Current	I_Q	VIN=14V, IOUT=40mA	-	2	-	mA
Quiescent Current Change	$\triangle I_Q$	VIN=12V~24V, I_O=1mA	-	0.1	-	mA
		VIN=14V, IOUT=1mA~100mA	-	0.1	-	

LNR: Line Regulation. The change in output voltage for a change in the input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

LDR: Load Regulation. The change in output voltage for a change in load current at constant chip temperature.

OSU78M12 (Cin=0.33uF, Co=0.1uF, Ta=25℃，unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vout	Io=200mA, VIN=17V	11.568	12.0	12.432	V
		Io=100mA VIN=14V~22V	11.52	12.0	12.432	
		Io=1mA~300mA VIN=15V	11.4	12.0	12.6	
Line Regulation	LNR	VIN=14V~27V, Io=20mA	-	60	-	mV
Load Regulation	LDR	VIN=17V, Io=1mA~500mA	-	130	-	mV
		VIN=17V, Io=1mA~40mA	-	40	-	
Dropout Voltage	V_{DIF}	Ta=25℃，Io=100mA	-	1.6	-	V
Ripple Rejection	PSRR	Ta=25℃，f=120Hz, Io=10mA, VIN=17V	-	55	-	dB
Quiescent Current	I_Q	VIN=17V, IOUT=40mA	-	2	-	mA
Quiescent Current Change	$\triangle I_Q$	VIN=14V~27V, I_O=1mA	-	0.1	-	mA
		VIN=17V, IOUT=1mA~100mA	-	0.1	-	

LNR: Line Regulation. The change in output voltage for a change in the input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

LDR: Load Regulation. The change in output voltage for a change in load current at constant chip temperature.

OSU78M15 (Cin=0.33uF, Co=0.1uF, Ta=25℃，unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vout	Io=200mA, VIN=20V	14.46	15.0	15.54	V
		Io=100mA VIN=17V~25V	14.4	15.0	15.6	
		Io=1mA~300mA VIN=18V	14.25	15.0	15.75	
Line Regulation	LNR	VIN=17V~30V, Io=20mA	-	60	-	mV
Load Regulation	LDR	VIN=20V, Io=1mA~500mA	-	130	-	mV
		VIN=20V, Io=1mA~40mA	-	40	-	
Dropout Voltage	V_{DIF}	Ta=25℃，Io=100mA	-	1.6	-	V
Ripple Rejection	PSRR	Ta=25℃，f=120Hz, Io=10mA, VIN=20V	-	55	-	dB
Quiescent Current	I_Q	VIN=20V, IOUT=40mA	-	2	-	mA
Quiescent Current Change	$\triangle I_Q$	VIN=17V~30V, I_O=1mA	-	0.1	-	mA
		VIN=20V, IOUT=1mA~100mA	-	0.1	-	

LNR: Line Regulation. The change in output voltage for a change in the input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

LDR: Load Regulation. The change in output voltage for a change in load current at constant chip temperature.

Typical Application

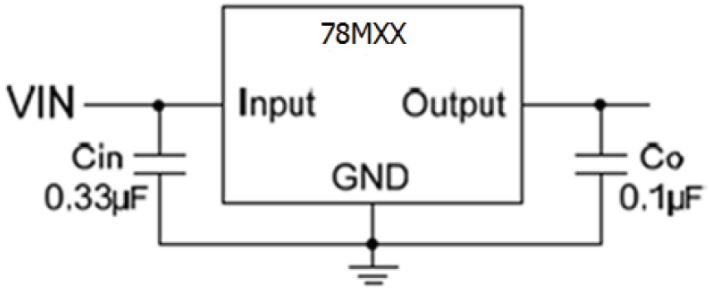
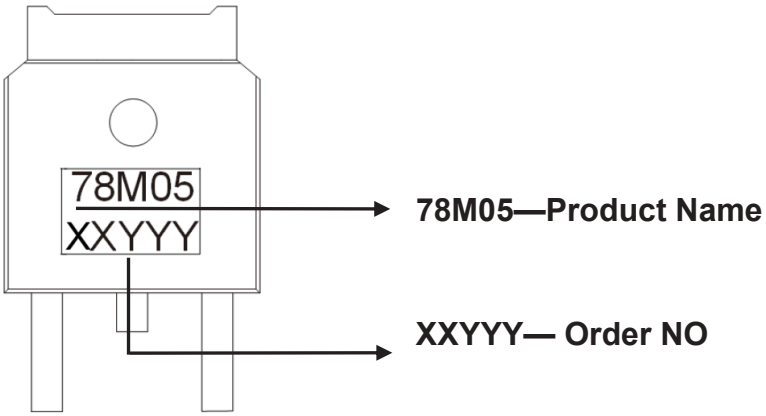


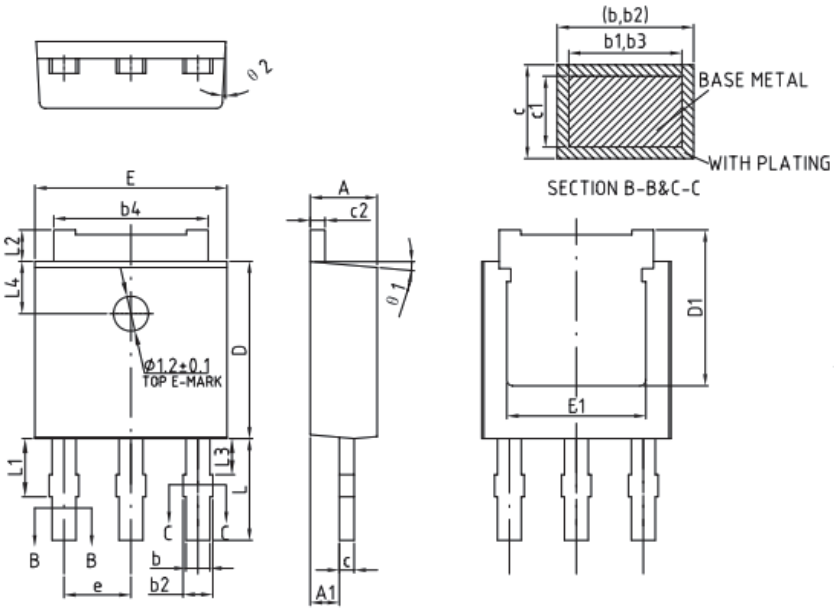
Fig.1 Fixed Output Regulator

Marking Rule



Package Information

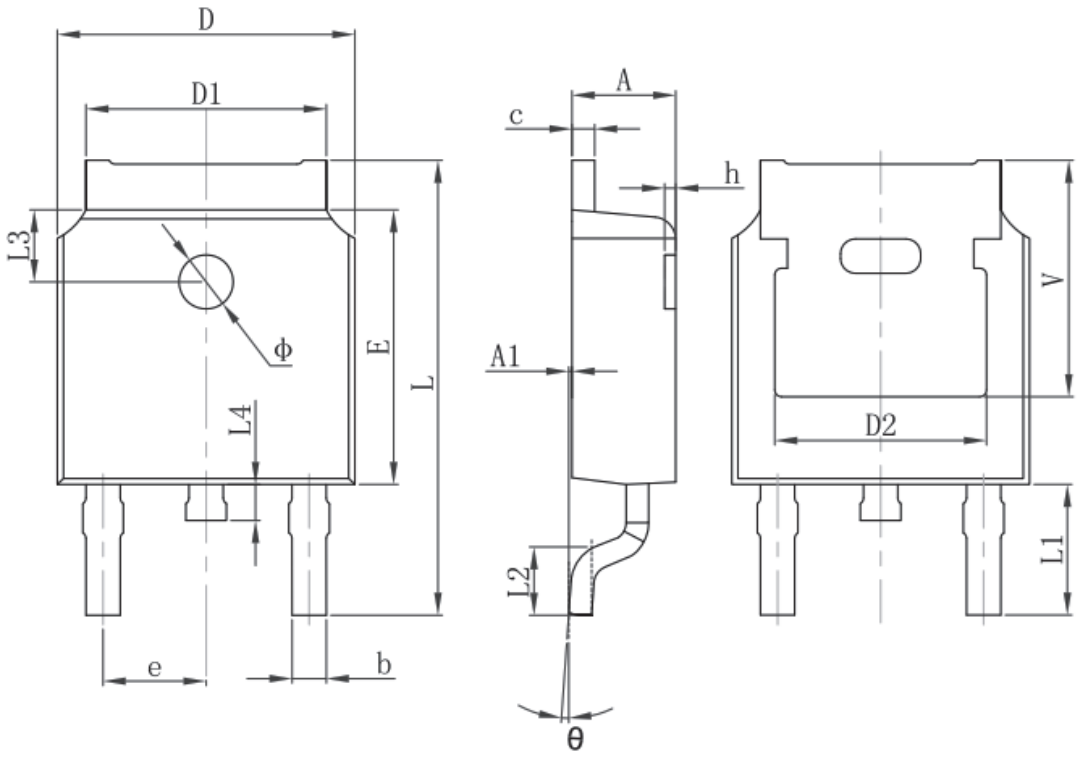
TO251 PACKAGE OUTLINE DIMENSIONS



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0.90	1.00	1.10
b	0.77	–	0.89
b1	0.76	0.81	0.86
b2	0.77	–	1.10
b3	0.77	–	1.10
b4	5.23	5.33	5.43
c	0.47	–	0.60
c1	0.46	0.51	0.56
c2	0.47	–	0.60
D	6.00	6.10	6.20
D1	5.25	–	–
E	6.50	6.60	6.70
E1	4.70	–	–
e		2.28BSC	
L	3.40	3.50	3.60
L1	1.90	2.00	2.10
L2	0.90	–	1.25
L3	1.15	–	1.50
L4		1.80REF	
θ1	3°	5°	7°
θ2	1°	3°	5°

TO-252-2L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	

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