



TX78MXX-AV

<http://www.txsemi.com>

Features

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

General Description

TX78MXX 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
TX78M05-XX-AV	5.0V		78M05/TXxxx
TX78M06-XX-AV	6.0V		78M06/TXxxx
TX78M08-XX-AV	8.0V		78M08/TXxxx
TX78M09-XX-AV	9.0V		78M09/TXxxx
TX78M12-XX-AV	12.0V		78M12/TXxxx
TX78M15-XX-AV	15.0V		78M15/TXxxx
TX78M18-XX-AV	18.0V		78M18/TXxxx
TX78M20-XX-AV	20.0V		78M20/TXxxx

Note: ① Stands for the package information.

② Stands for the Lot Number.

Order Information

TX78M①②-③④-AV

Designator	Symbol	Description
①②	Integer	Output Voltage(5.0~20V)
③④	TC	Package: TO-252
	TD	Package: TO-251
⑤	R	RoHS / Pb Free
	G	Halogen Free



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Pin Configuration

TO-252 (Top View)

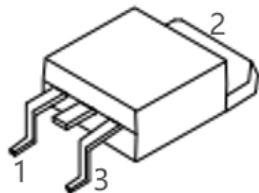


Table1: TX78MXX series (TO-252 PKG)

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

TO-251 (Top View)

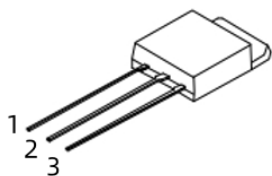


Table2: TX78MXX series (TO-251 PKG)

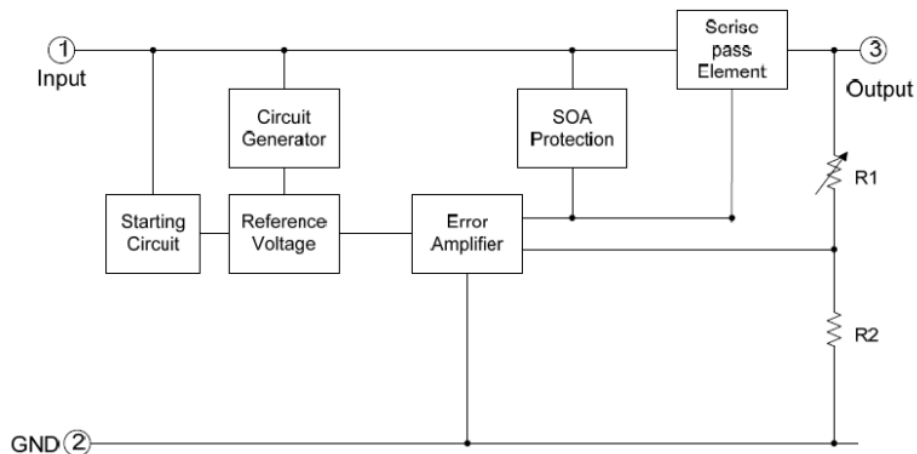
PIN NO.	PIN NAME	FUNCTION
1	VOUT	Output voltage pin
2	GND	GND pin
3	VIN	Input voltage pin



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Block Diagram



Absolute Maximum Ratings (Ta=25°C)

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	°C
Storage temperature:Tstr	-55~125	°C
Soldering temperature and time	+260(Recommended 10S)	°C

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.



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Electrical Characteristics

TX78M05 (Cin=0.33uF, Co=0.1uF, Ta=25°C, 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	VDIF	Ta=25°C, Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25°C, f=120Hz, Io=10mA, VIN=8V	-	55	-	dB
Quiescent Current	Iq	VIN=10V, IOU=40mA	-	2	-	mA
Quiescent Current Change	ΔI_q	VIN=8V~20V, Io=1mA	-	0.1	-	mA
		VIN=10V, IOU=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.



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TX78M06 (Cin=0.33uF, Co=0.1uF, Ta=25°C, 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	VDIF	Ta=25°C, Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25°C, f=120Hz, Io=10mA, VIN=9V	-	55	-	dB
Quiescent Current	Iq	VIN=11V, IOU=40mA	-	2	-	mA
Quiescent Current Change	ΔI_q	VIN=9V~20V, Io=1mA	-	0.1	-	mA
		VIN=11V, IOU=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.



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TX78M08 (Cin=0.33uF, Co=0.1uF, Ta=25°C, 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	VDIF	Ta=25°C, Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25°C, f=120Hz, Io=10mA, VIN=11V	-	55	-	dB
Quiescent Current	Iq	VIN=13V, IOU=40mA	-	2	-	mA
Quiescent Current Change	ΔI_q	VIN=11V~23V, Io=1mA	-	0.1	-	mA
		VIN=13V, IOU=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.



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TX78M09 (Cin=0.33uF, Co=0.1uF, Ta=25°C, 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	VDIF	Ta=25°C, Io=100mA	-	1.5	-	V
Ripple Rejection	PSRR	Ta=25°C, f=120Hz, Io=10mA, VIN=12V	-	55	-	dB
Quiescent Current	Iq	VIN=14V, IOU=40mA	-	2	-	mA
Quiescent Current Change	ΔI_q	VIN=12V~24V, Io=1mA	-	0.1	-	mA
		VIN=14V, IOU=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.



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TX78M12 (Cin=0.33uF, Co=0.1uF, Ta=25°C, 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	VDIF	Ta=25°C, Io=100mA	-	1.6	-	V
Ripple Rejection	PSRR	Ta=25°C, f=120Hz, Io=10mA, VIN=17V	-	55	-	dB
Quiescent Current	Iq	VIN=17V, IOU=40mA	-	2	-	mA
Quiescent Current Change	ΔI_q	VIN=14V~27V, Io=1mA	-	0.1	-	mA
		VIN=17V, IOU=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.



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TX78M15 (Cin=0.33uF, Co=0.1uF, Ta=25°C, 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	VDIF	Ta=25°C, Io=100mA	-	1.6	-	V
Ripple Rejection	PSRR	Ta=25°C, f=120Hz, Io=10mA, VIN=20V	-	55	-	dB
Quiescent Current	Iq	VIN=20V, IOU=40mA	-	2	-	mA
Quiescent Current Change	ΔI_q	VIN=17V~30V, Io=1mA	-	0.1	-	mA
		VIN=20V, IOU=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

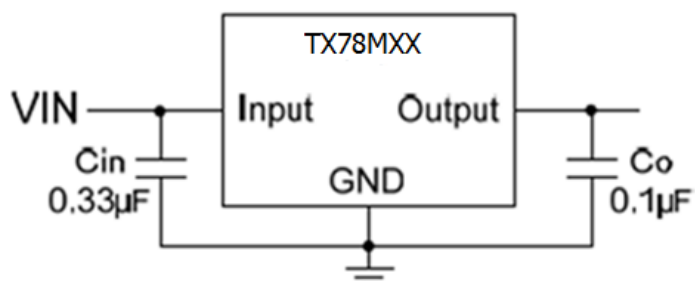
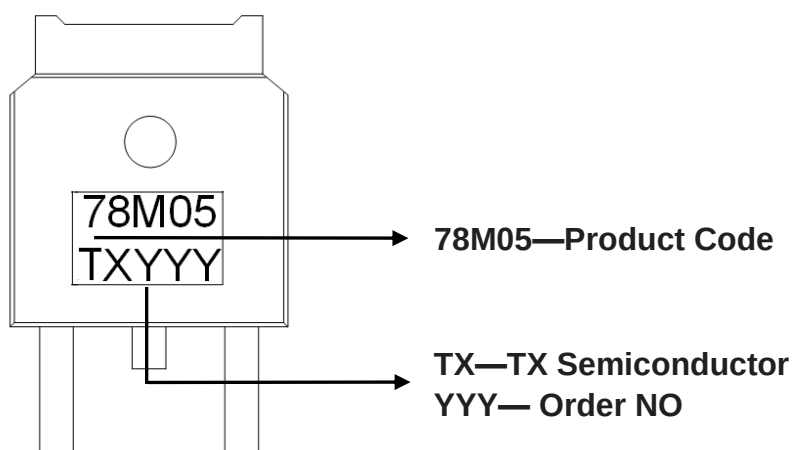


Fig.1 Fixed Output Regulator

Marking Rule



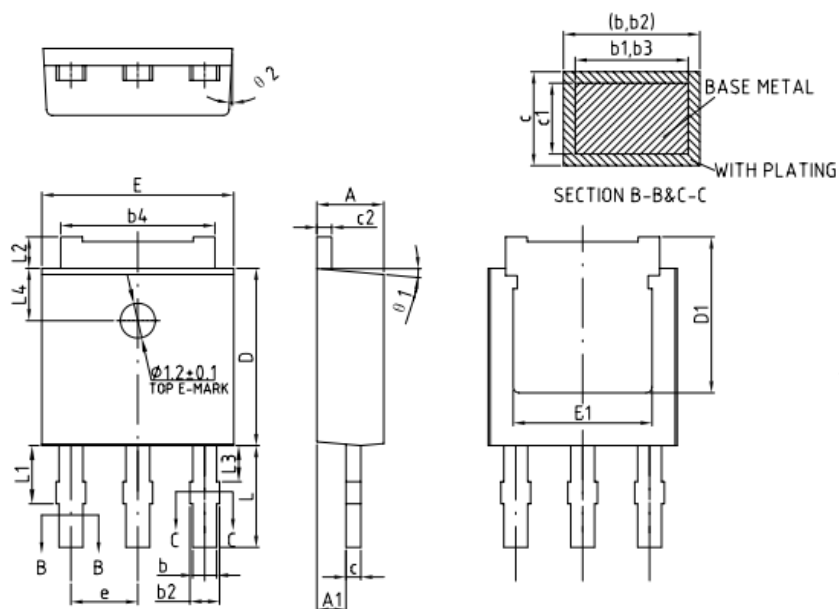


TX78MXS-AV

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Package Information

TO251 PACKAGE OUTLINE DIMENSIONS

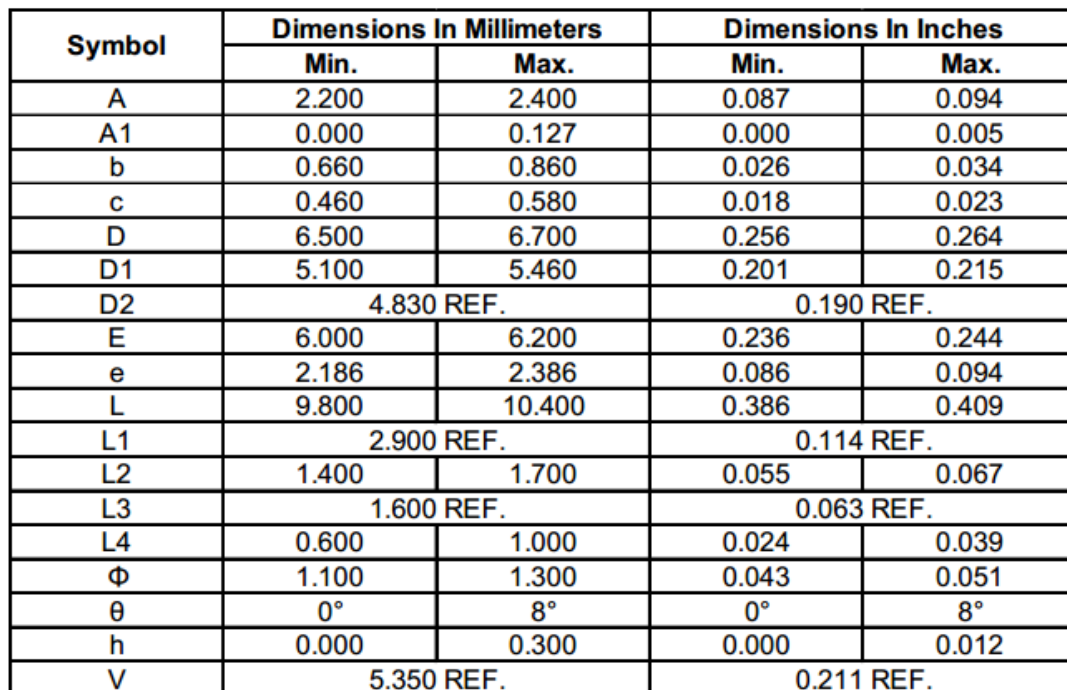


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

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		
$\theta 1$	3°	5°	7°
$\theta 2$	1°	3°	5°



TO-252-2L PACKAGE OUTLINE DIMENSIONS





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