

ZMR series Fixed 2.5, 3.3 and 5 volt miniature voltage regulators

Description

The ZMR series of three terminal fixed positive voltage regulators feature internal current limit and will shut down under thermal overload conditions making the devices difficult to destroy.

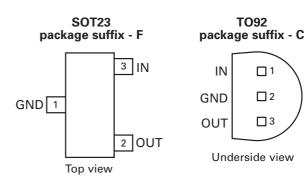
The circuit design offers an exceptionally low quiescent current, only 30μ A for the 2.5V device, ideal for low power applications. The initial devices in the series regulate to 2.5 or 5V with a drive capability up to 50mA.

The device is designed with space saving in mind and is available in the small outline SOT23 package. The ZMR250 has expanded its input voltage range to 22.5V and the ZMR500 has expanded its input voltage range to 25V; equalling that of the ZMR25H and ZMR50H respectively.

The ZMR330 provides a 3.3V output over an input range of 5V to 24V.

Features

- Small outline SOT23 package
- 2.5V, 3.3V and 5V output
- Output current up to 50mA
- Very low quiesent current (30μA)
- Unconditionally stable
- Internal short circuit current limit



Pinout details

Order reference	Package	Part mark	Status	Reel size (inches)	Quantity per reel	Tape width (mm)	Price (\$) 1k
ZMR25HCL	TO92	ZMR25H	Obsolete	Loose	4000	-	-
ZMR25HCSTZ	TO92	ZMR25H	Obsolete	-	1500	-	
ZMR25HFTA	SOT23	25X	LTB 30/06/2007	7"	3000	8mm	0.551
ZMR250CL	TO92	ZMR250	Obsolete	Loose	4000	-	
ZMR250CSTOB	TO92	ZMR250	Obsolete	12.5"	1500	-	-
ZMR250CSTZ	TO92	ZMR250	Obsolete	-	1500	-	-
ZMR250FTA	SOT23	25K	Active	7"	3000	8mm	0.382
ZMR330FTA	SOT23	330	Active	7"	3000	8mm	0.382
ZMR50HCL	TO92	ZMR50H	Obsolete	Loose	4000	-	
ZMR50HCSTZ	TO92	ZMR50H	Obsolete	-	1500	-	
ZMR50HFTA	SOT23	50R	LTB 30/06/2007	7"	3000	8mm	0.551
ZMR500CL	TO92	ZMR500	LTB 31/05/2007	Loose	4000	-	0.486
ZMR500CSTZ	TO92	ZMR500	LTB 31/05/2007	Concertina	1500	-	0.486
ZMR500FTA	SOT23	50K	Active	7"	3000	8mm	0.424
ZMR500FTC	SOT23	50K	LTB 30/06/2007	13"	10000	8mm	0.424

Ordering information

Absolute maximum ratings

Input voltage	(ZMR25H)	22.5V	ZMR250	20V	
	(ZMR50H)	25V	ZMR500	20V	
Package power dissipation SOT23 500mW (No				Note 3)	
(T _{amb} =25 °C)		TO92 600mW			
Output curren	t (I _O)		100mA		
Operating temperature -55 to 125°C					
Storage temperature -65 to 150°C			-65 to 150°C		

Note:

1. The maximum operating input voltage and output current of the device will be governed by the maximum power dissipation of the selected package. Maximum package power dissipation is specified at 25°C and must be linearly derated to zero at $T_{amb} = 125$ °C.

2. The following data represents pulse test conditions with junction temperatures as indicated atthe initiation of the test. Continuous operation of the devices with the stated conditions mightexceed the power dissipation limits of the chosen package.

3. Maximum power dissipation for the SOT23 package, is calculated assuming that the device is mounted on a ceramic substrate measuring $15 \times 15 \times 0.6$ mm.

ZMR25H and ZMR250

Electrical characteristics test conditions (unless otherwise stated):T_j=25°C, I_0 = 10mA, V_{IN} = 6.5V

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Units
Vo	Output voltage		2.438	2.5	2.563	V
		I _O =0 to 50mA T _j =-55 to 125°C	2.360		2.640	V
		V _{IN} =4.5 to 22.5V	2.360		2.640	V
		I _O =0 to 50mA				
		T _j =-55 to 125°C				
ΔV_{O}	Line regulation	V _{IN} =4.5 to 22.5V		5	15	mV
ΔV_{O}	Load regulation	I _O =0 to 50mA		20	30	mV
		I _O =0 to 10mA		12		mV
۱ _S	Supply current	T _j =-55 to 125°C		30	40	μA
ΔI_S	Supply current change	I _O =0 to 50mA		1	±10	μA
		V _{IN} =4.5 to 22.5V		2	10	μA
V _N	Output noise voltage	f=10Hz to 10kHz		65		µV rms
$\Delta V_{\rm IN} / \Delta V_{\rm O}$	Ripple rejection	V _{IN} =6.3 to 18V f=120Hz	55	75		dB
V _{IN}	Input voltage required to maintain regulation		4.2	3.9		V
$\Delta V_{O} / \Delta T$	Average temperature coefficient of V _O	I _O =5.0mA T _j =-55 to 125°C		0.275	0.700	mV/°C

ZMR330

Electrical characteristics test conditions (unless otherwise stated):T_j=25°C, I_0 = 10mA, V_{IN} = 7V

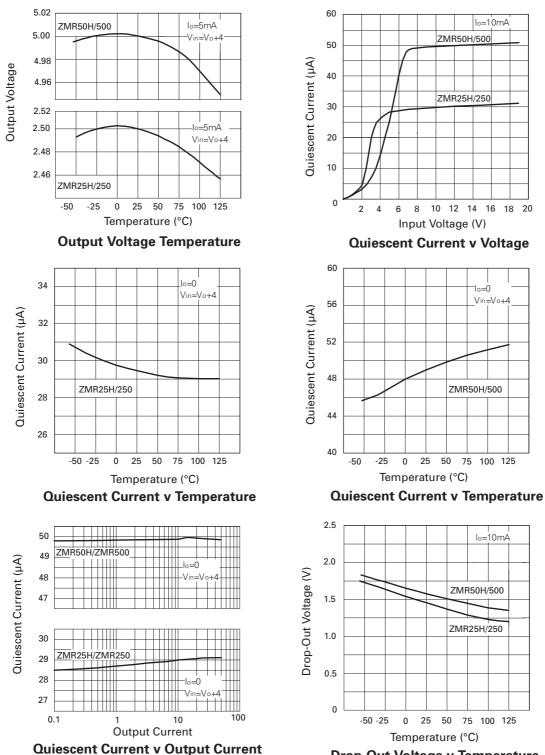
Symbol	Parameter	Conditions	Min.	Тур.	Max.	Units
Vo	Output voltage		3.217	3.3	3.383	V
		I _O =0 to 50mA T _j =-55 to 125°C	3.148		3.393	V
		V _{IN} =5 to 24V	3.148		3.408	V
		I _O =0 to 50mA				
		T _j =-55 to 125°C				
ΔV _O	Line regulation	V _{IN} =5 to 24V		1	10	mV
ΔV_{O}	Load regulation	I _O =0 to 50mA		20	50	mV
		I _O =0 to 10mA		13		mV
۱ _S	Supply current	T _j =-55 to 125°C		120	170	μA
ΔI_S	Supply current change	I _O =0 to 50mA		5	10	μA
		V _{IN} =5 to 20V		2	10	μA
V _N	Output noise voltage	f=10Hz to 10kHz		80		μV rms
$\Delta V_{\rm IN} / \Delta V_{\rm O}$	Ripple rejection	V _{IN} =6 to 20V f=120Hz	55			dB
V _{IN}	Input voltage required to maintain regulation	V _{OUT} = 3.217V	4.8	4.74		V

ZMR50H and ZMR500

Electrical characteristics test conditions (unless otherwise stated):T_j=25°C, I_O = 10mA, V_{IN} = 6.5V

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Units
Vo	Output voltage		4.785	5	5.125	V
		l _O =0 to 50mA T _j =-55 to 125°C	4.680		5.160	V
		V _{IN} =7 to 22.5V	4.780		5.175	V
		I _O =0 to 50mA				
		T _j =-55 to 125°C				
ΔV _O	Line regulation	V _{IN} =7 to 22.5V		5	15	mV
ΔV _O	Load regulation	I _O =0 to 50mA		25	40	mV
		I _O =0 to 10mA		15		mV
۱ _S	Supply current	T _j =-55 to 125°C		50	70	μA
ΔI_S	Supply current change	I _O =0 to 50mA		1	±10	μA
		V _{IN} =7 to 25V		2	10	μA
V _N	Output noise voltage	f=10Hz to 10kHz		90		µV rms
$\Delta V_{\rm IN} / \Delta V_{\rm O}$	Ripple rejection	V _{IN} =8 to 18V f=120Hz	55	72		dB
V _{IN}	Input voltage required to maintain regulation		7	6.7		V
$\Delta V_{O} / \Delta T$	Average temperature coefficient of V _O	l _O =5.0mA T _j =-55 to 125°C		0.275	0.700	mV/°C

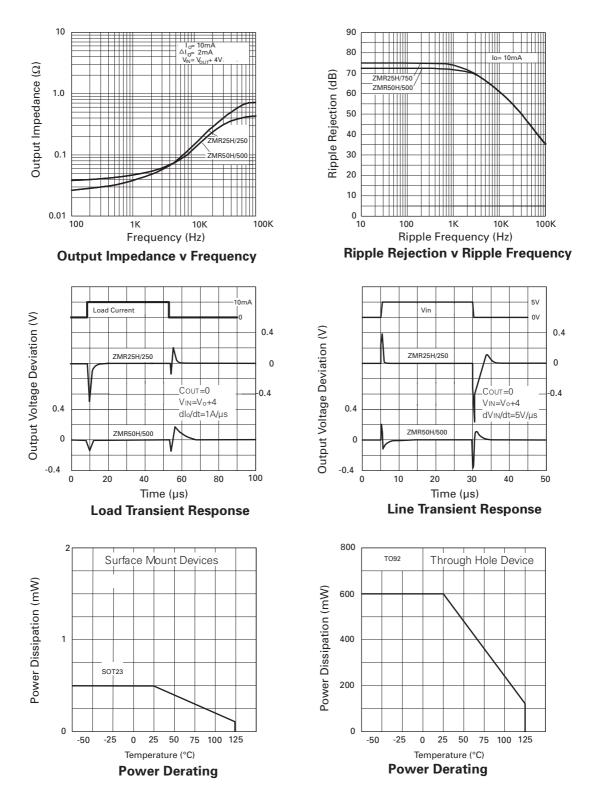
Typical characteristics



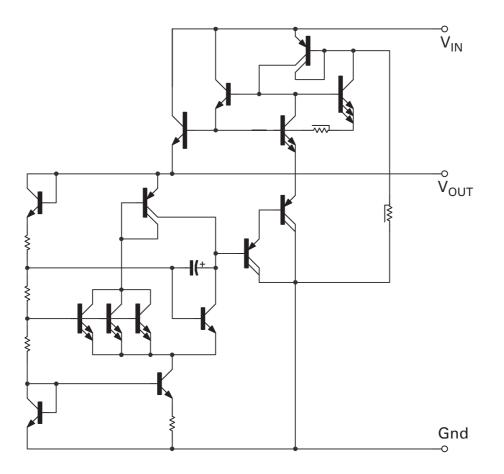
Drop-Out Voltage v Temperature

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Typical characteristics

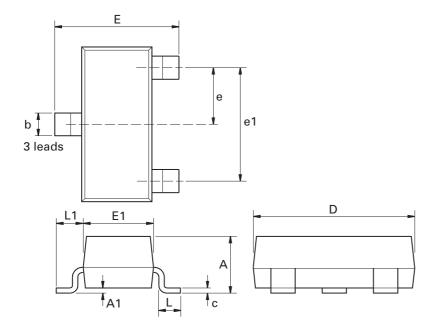


Schematic diagram



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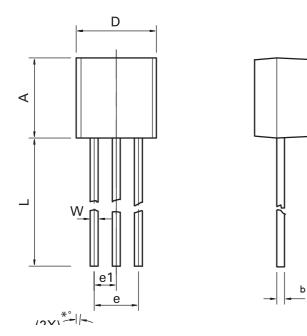
Package outline - SOT23



Dim.	Millin	neters	Inc	hes	Dim.	Millin	neters	Inc	hes
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
А	-	1.12	-	0.044	e1	1.90	NOM	0.075	NOM
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
С	0.085	0.120	0.003	0.008	L	0.25	0.62	0.018	0.024
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
е	0.95	NOM	0.0375	NOM	-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

Package outline - TO92



DIM	Millimeters		Inc	hes
	Min.	Max.	Min.	Max.
A	4.32	4.95	0.170	0.195
b	0.36	0.51	0.014	0.020
E	3.30	3.94	0.130	0.155
е	2.41	2.67	0.095	0.105
e1	1.14	1.40	0.045	0.055
L	12.70	15.49	0.500	0.610
R	2.16	2.41	0.085	0.095
S1	1.14	1.52	0.045	0.060
W	0.41	0.56	0.016	0.022
D	4.45	4.95	0.175	0.195
* o	4°	6°	4°	6°

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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