

**Absolute Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Parameter	Rating	Unit
Input Voltage		
ZMR250	22.5	V
ZMR330	24	
ZMR500	25	
Power Dissipation ( $T_{AMB} = +25^\circ\text{C}$ ) (Note 6)		
SOT23	500	mW
Output Current ( $I_O$ )	100	mA
Ambient Temperature	-55 to +125	$^\circ\text{C}$
Maximum Junction Temperature	125	$^\circ\text{C}$
Storage Temperature	-65 to +150	$^\circ\text{C}$

- Notes:
- 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  $25^\circ\text{C}$  and must be linearly derated to zero at  $T_{AMB} = +125^\circ\text{C}$ .
  - The following data represents pulse test conditions with junction temperatures as indicated at the initiation of the test. Continuous operation of the devices with the stated conditions might exceed the power dissipation limits of the chosen package.
  - Maximum power dissipation for the SOT23 package, is calculated assuming that the device is mounted on a ceramic substrate measuring  $15 \times 15 \times 0.6 \text{mm}$ .

**Recommended Operating Conditions** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Input Voltage Range	Min	Max	Unit
ZMR250	4.2	22.5	V
ZMR330	4.8	24	V
ZMR500	7.0	25	V

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ ,  $I_O = 10 \text{mA}$ ,  $V_{IN} = 6.5 \text{V}$ , unless otherwise specified.)

**ZMR250**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_O$	Output Voltage		2.438	2.5	2.563	V
		$I_O = 0$ to $50 \text{mA}$ $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	2.360		2.640	V
		$V_{IN} = 4.5$ to $22.5 \text{V}$ $I_O = 0$ to $50 \text{mA}$ $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	2.630		2.640	V
$\Delta V_O$	Line Regulation	$V_{IN} = 4.5$ to $22.5 \text{V}$		5	15	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to $50 \text{mA}$ $I_O = 0$ to $10 \text{mA}$		20 12	30	mV
$I_S$	Supply Current	$T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$		30	40	$\mu\text{A}$
$\Delta I_S$	Supply Current Change	$I_O = 0$ to $50 \text{mA}$ $V_{IN} = 4.5$ to $22.5 \text{V}$		1 2	$\pm 10$ 10	$\mu\text{A}$
$V_N$	Output Noise Voltage	$f = 10 \text{Hz}$ to $10 \text{kHz}$		65		$\mu\text{Vrms}$
$\Delta V_{IN}/\Delta V_O$	Ripple Rejection	$V_{IN} = 6.3$ to $18 \text{V}$ $f = 120 \text{Hz}$	55	75		dB
$V_{IN}$	Input Voltage Required to Maintain Regulation			3.9		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient $V_O$	$I_O = 5.0 \text{mA}$ $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$		0.275	0.700	$\text{mV}/^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ ,  $I_O = 10\text{mA}$ ,  $V_{IN} = 7\text{V}$ , unless otherwise specified.)

**ZMR330**

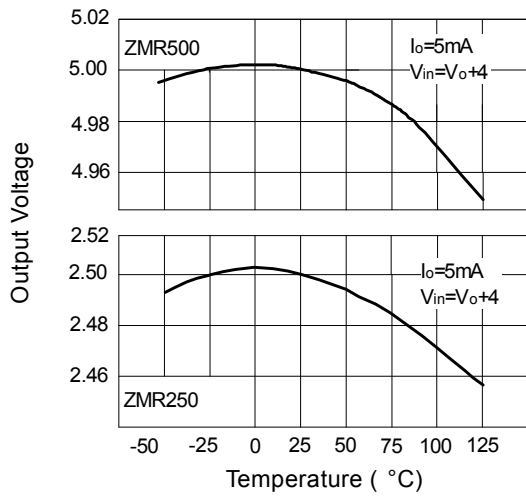
Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_O$	Output Voltage		3.217	3.3	3.383	V
		$I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	3.148		3.393	V
		$V_{IN} = 5$ to 24V $I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	3.148		3.408	V
$\Delta V_O$	Line Regulation	$V_{IN} = 5$ to 24V		5	15	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to 50mA $I_O = 0$ to 10mA		20 13	30	mV
$I_S$	Supply Current	$T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$		120	170	$\mu\text{A}$
$\Delta I_S$	Supply Current Change	$I_O = 0$ to 50mA $V_{IN} = 5$ to 20V		5 2	10 10	$\mu\text{A}$
$V_N$	Output Noise Voltage	$f = 10\text{Hz}$ to 10kHz		80		$\mu\text{Vrms}$
$\Delta V_{IN}/\Delta V_O$	Ripple Rejection	$V_{IN} = 6$ to 20V $f = 120\text{Hz}$	55			dB
$V_{IN}$	Input Voltage Required to Maintain Regulation			4.74		V

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ ,  $I_O = 10\text{mA}$ ,  $V_{IN} = 10\text{V}$ , unless otherwise specified.)

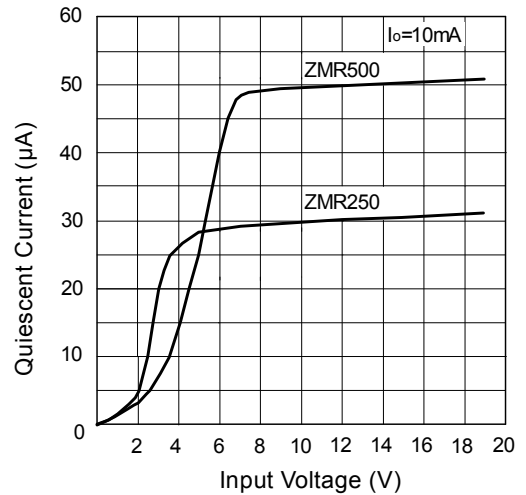
**ZMR500**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_O$	Output Voltage		4.785	5	5.125	V
		$I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	4.780		5.160	V
		$V_{IN} = 7$ to 25V $I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	4.780		5.175	V
$\Delta V_O$	Line Regulation	$V_{IN} = 7$ to 25V		5	15	mV
$\Delta V_O$	Load Regulation	$I_O = 0$ to 50mA $I_O = 0$ to 10mA		25 15	40	mV
$I_S$	Supply Current	$T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$		50	70	$\mu\text{A}$
$\Delta I_S$	Supply Current Change	$I_O = 0$ to 50mA $V_{IN} = 7$ to 25V		1 2	$\pm 10$ 10	$\mu\text{A}$
$V_N$	Output Noise Voltage	$f = 10\text{Hz}$ to 10kHz		90		$\mu\text{Vrms}$
$\Delta V_{IN}/\Delta V_O$	Ripple Rejection	$V_{IN} = 8$ to 18V $f = 120\text{Hz}$	55	72		dB
$V_{IN}$	Input Voltage Required to Maintain Regulation			6.2		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient $V_O$	$I_O = 5.0\text{mA}$ $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$		0.275	0.700	$\text{mV}/^\circ\text{C}$

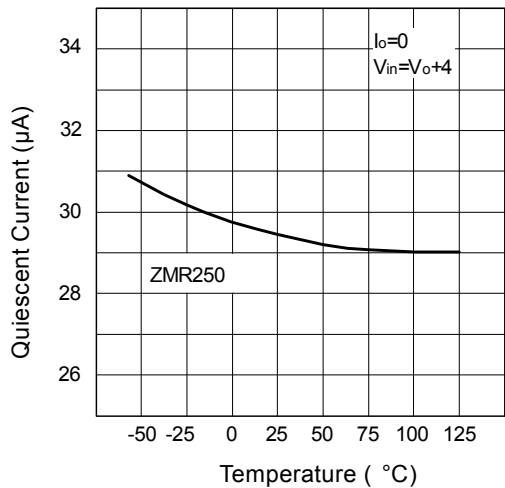
**Typical Characteristics**



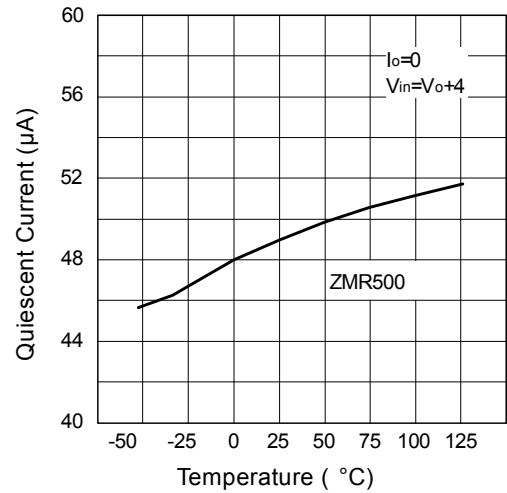
Output Voltage Temperature



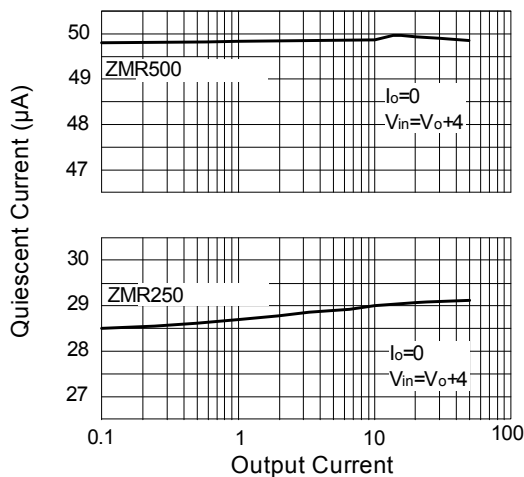
Quiescent Current v Voltage



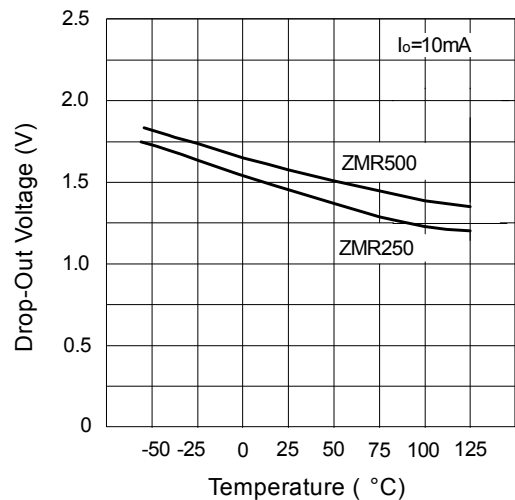
Quiescent Current v Temperature



Quiescent Current v Temperature

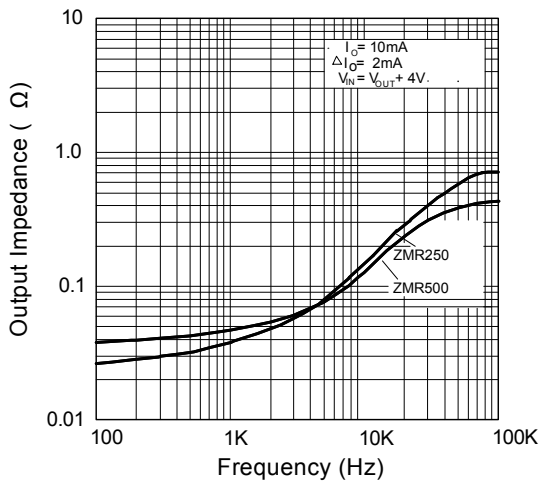


Quiescent Current v Output Current

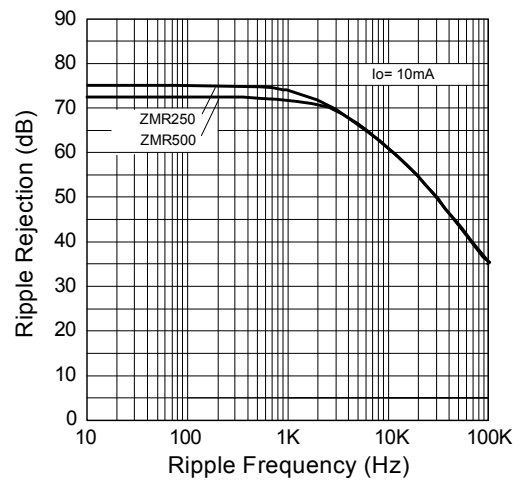


Drop-Out Voltage v Temperature

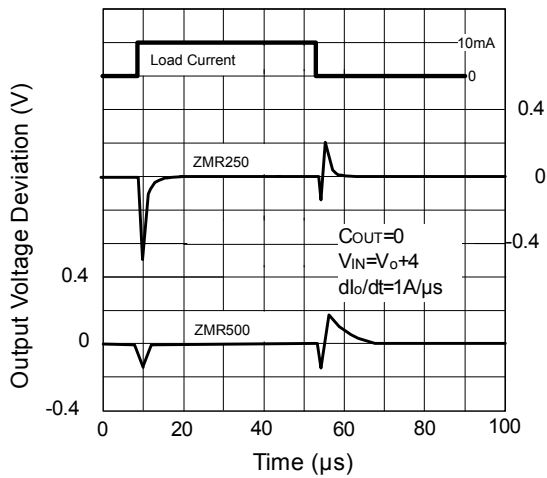
**Typical Characteristics (cont.)**



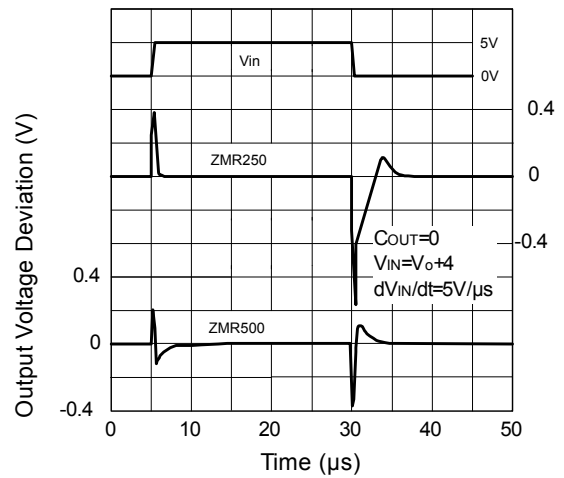
Output Impedance v Frequency



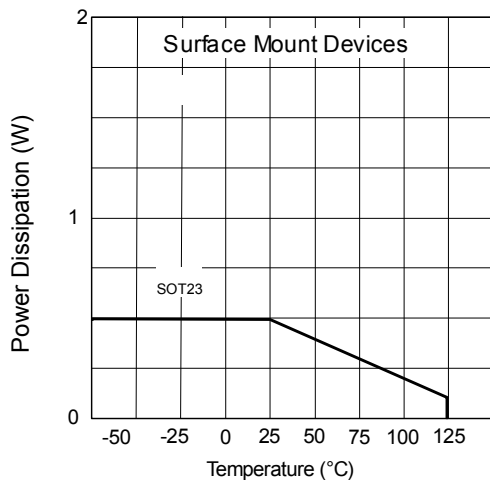
Ripple Rejection v Ripple Frequency



Load Transient Response



Line Transient Response



Power Derating

**Ordering Information**

Part Number	Package	Part Mark	Status	Reel Size (inches)	Quantity per reel	Tape Width (mm)
ZMR25HFTA	SOT23	25X	Obsolete replaced by ZMR250FTA	7"	3000	8mm
ZMR50HFTA	SOT23	50R	Obsolete replaced by ZMR500FTA	7"	3000	8mm
ZMR250FTA	SOT23	25K	Released	7"	3000	8mm
ZMR330FTA	SOT23	330	Released	7"	3000	8mm
ZMR330F-7*	SOT23	330	Released	7"	3000	8mm
ZMR500FTA	SOT23	50K	Released	7"	3000	8mm

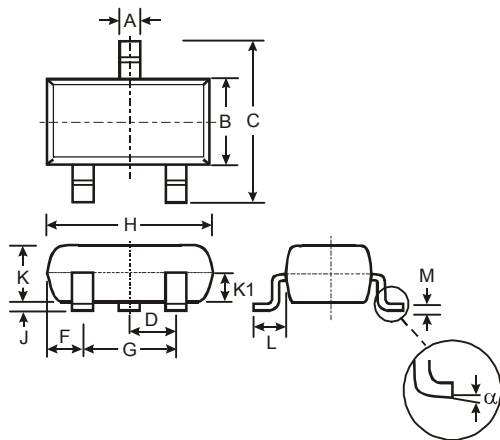


\* All TO92 variants (ZMRxxxC) are obsolete. Closest replacements are the ZMRxxxFTA.

**Package Outline Dimensions** (All dimensions in mm.)

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

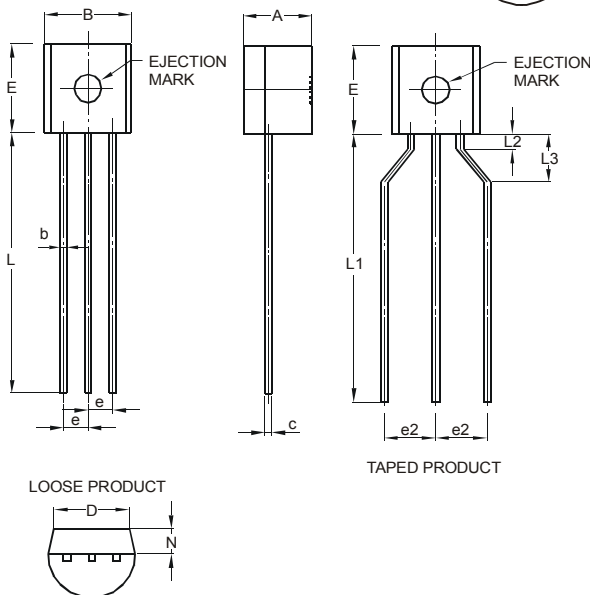
**SOT23**



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-

**All Dimensions in mm**

**TO92**



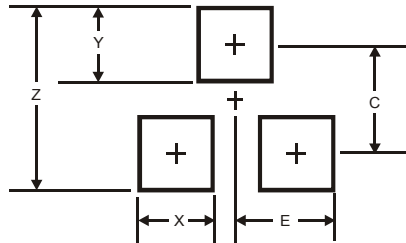
TO92			
Dim	Min	Max	Typ
A	3.45	3.66	—
B	4.27	4.78	—
b	—	—	0.38
c	—	—	0.38
D	—	—	3.87
E	4.32	4.83	—
e	—	—	1.27
e2	2.40	2.90	—
L	12.98	15.00	—
L1	12.80	15.00	—
L2	0.80	-	—
L3	2.00	3.00	—
N	1.22	1.37	—

**All Dimensions in mm**

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

### SOT23



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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