



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Description

The NK-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 30µA 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.

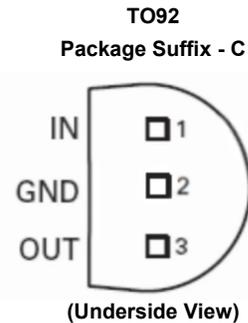
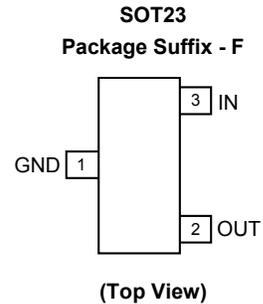
The device is designed with space saving in mind and is available in the small outline SOT23 package. The NK-ZMR250 has expanded its input voltage range to 22.5V and the NK-ZMR500 has expanded its input voltage range to 25V; equaling that of the NK-ZMR25H and NK-ZMR50H respectively.

The NK-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 Quiescent Current (30µA)
- Unconditionally Stable
- Internal Short Circuit Current Limit

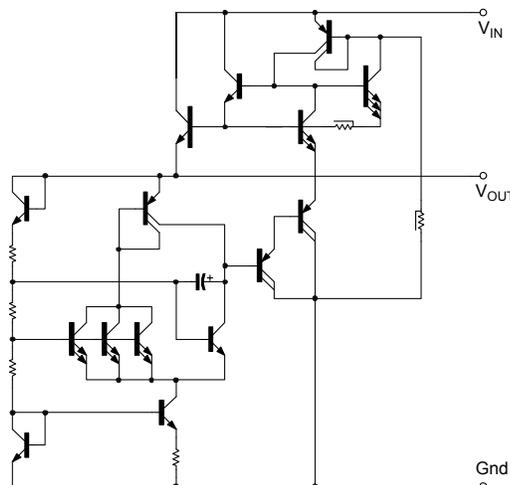
Pin Assignments



Applications

- Consumer Electronics
- DVD/Blu-Ray Player, CD-ROM, Set Top Box
- TV, Monitor, Security System
- Supply for Low Power Microcontroller
- Local Low Current Supply within Larger Systems

Equivalent Circuit



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

Parameter	Rating	Unit
Input Voltage		
NK-ZMR250	22.5	V
NK-ZMR330	24	
NK-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°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
NK-ZMR250	4.2	22.5	V
NK-ZMR330	4.8	24	V
NK-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.)

NK-ZMR250

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_O	Output Voltage		2.438	2.5	2.563	V
		$I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	2.360		2.640	V
		$V_{IN} = 4.5$ to 22.5V $I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	2.630		2.640	V
ΔV_O	Line Regulation	$V_{IN} = 4.5$ to 22.5V		5	15	mV
ΔV_O	Load Regulation	$I_O = 0$ to 50mA $I_O = 0$ to 10mA		20 12	30	mV
I_S	Supply Current	$T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$		30	40	μA
ΔI_S	Supply Current Change	$I_O = 0$ to 50mA $V_{IN} = 4.5$ to 22.5V		1 2	± 10 10	μA
V_N	Output Noise Voltage	$f = 10\text{Hz}$ to 10kHz		65		μVrms
$\Delta V_{IN}/\Delta V_O$	Ripple Rejection	$V_{IN} = 6.3$ to 18V $f = 120\text{Hz}$	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.)

NK-ZMR330

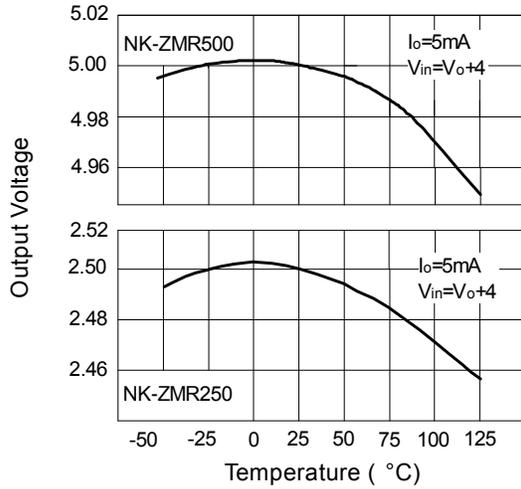
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_O	Output Voltage		3.217	3.3	3.383	V
		$I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	3.148		3.393	V
		$V_{IN} = 5$ to 24V $I_O = 0$ to 50mA $T_J = -55^\circ\text{C}$ to $+125^\circ\text{C}$	3.148		3.408	V
ΔV_O	Line Regulation	$V_{IN} = 5$ to 24V		5	15	mV
ΔV_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	μA
ΔI_S	Supply Current Change	$I_O = 0$ to 50mA $V_{IN} = 5$ to 20V		5 2	10 10	μA
V_N	Output Noise Voltage	$f = 10\text{Hz}$ to 10kHz		80		μVrms
$\Delta V_{IN}/\Delta V_O$	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.)

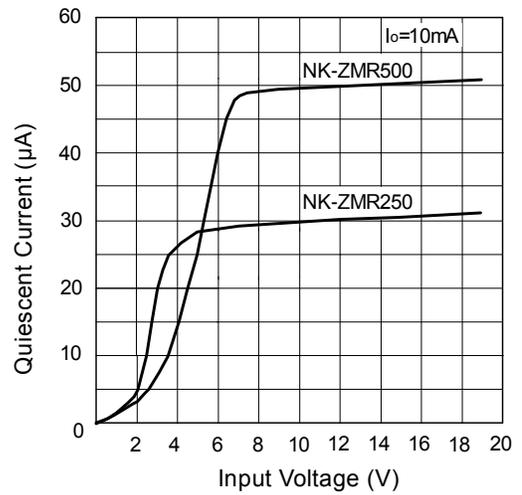
NK-ZMR500

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
ΔV_O	Line Regulation	$V_{IN} = 7$ to 25V		5	15	mV
ΔV_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	μA
ΔI_S	Supply Current Change	$I_O = 0$ to 50mA $V_{IN} = 7$ to 25V		1 2	± 10 10	μA
V_N	Output Noise Voltage	$f = 10\text{Hz}$ to 10kHz		90		μVrms
$\Delta V_{IN}/\Delta V_O$	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	$\text{mV}/^\circ\text{C}$

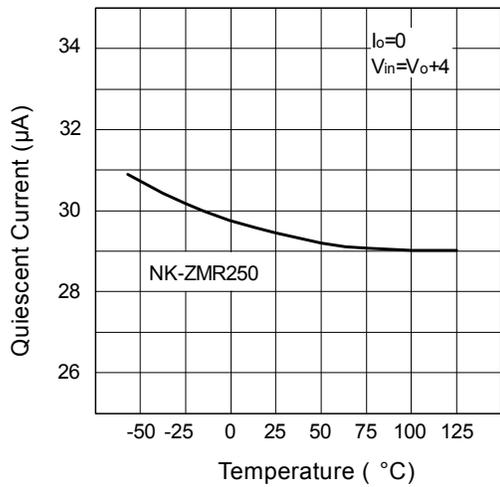
Typical Characteristics



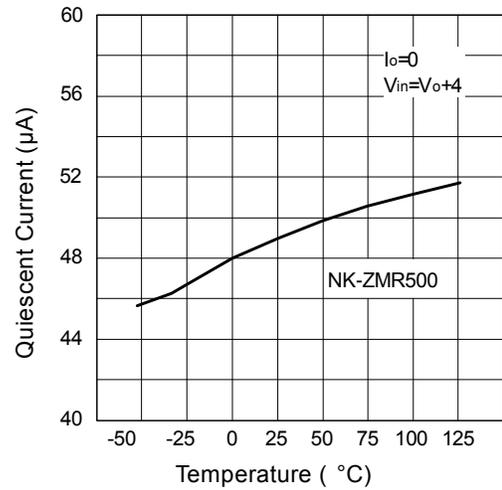
Output Voltage Temperature



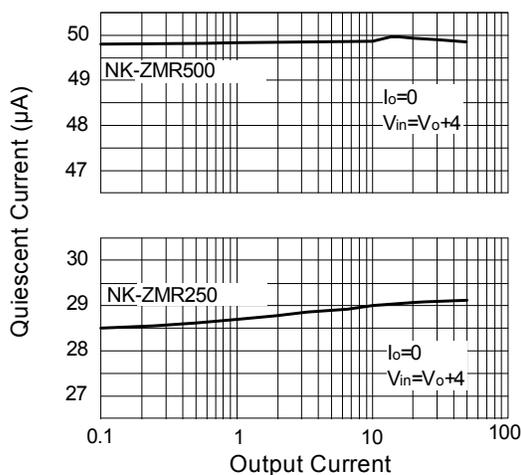
Quiescent Current v Voltage



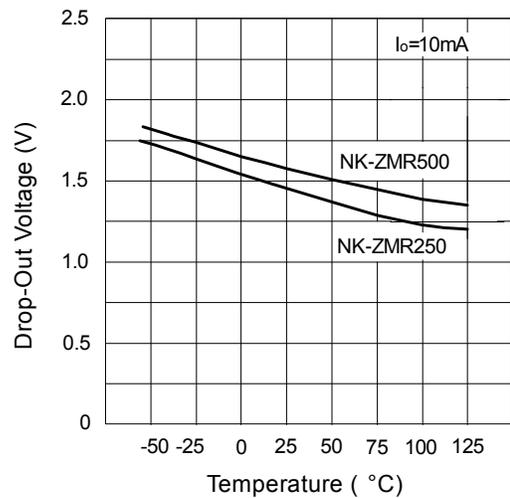
Quiescent Current v Temperature



Quiescent Current v Temperature

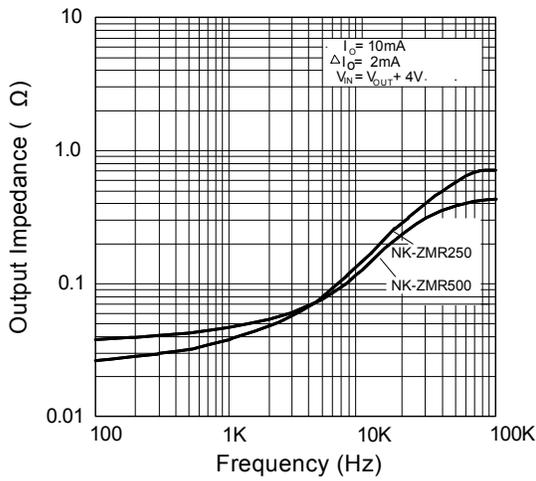


Quiescent Current v Output Current

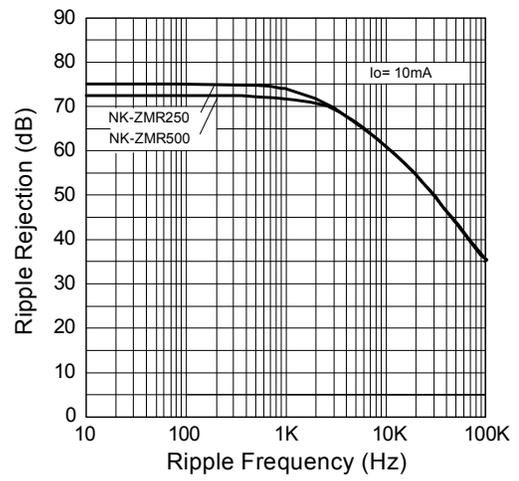


Drop-Out Voltage v Temperature

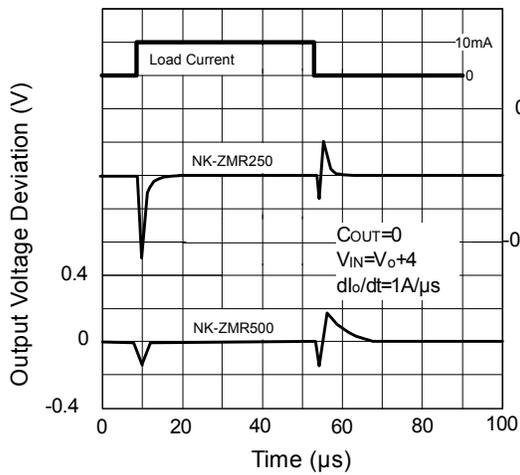
Typical Characteristics (cont.)



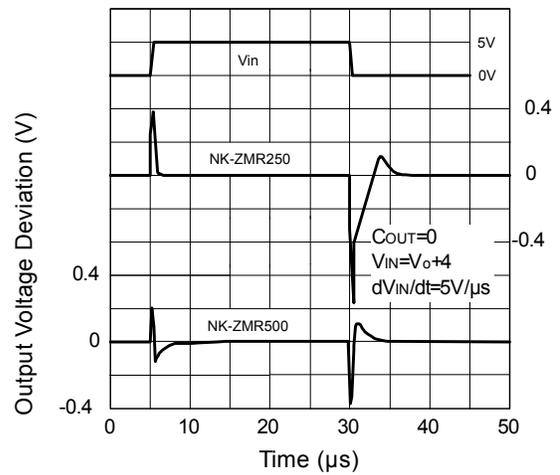
Output Impedance v Frequency



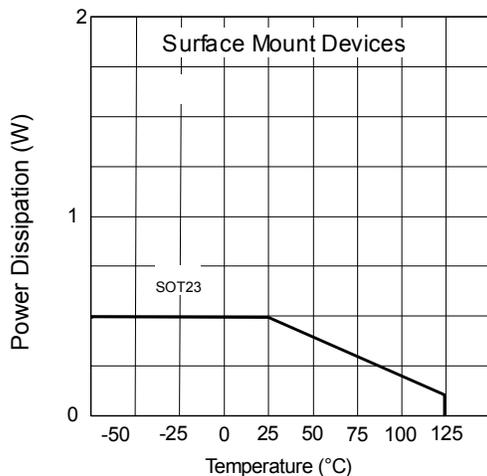
Ripple Rejection v Ripple Frequency



Load Transient Response



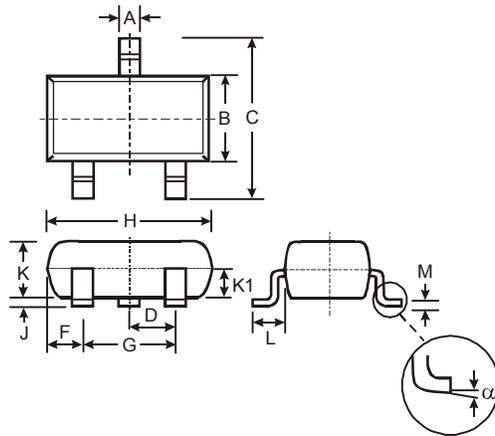
Line Transient Response



Power Derating

Package Outline Dimensions (All dimensions in mm.)

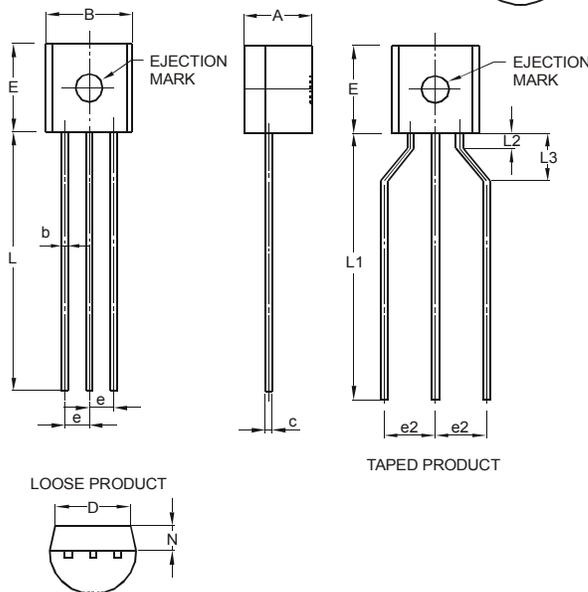
SOT23



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

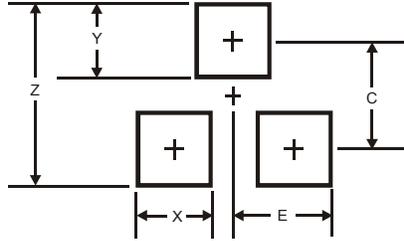


TO92			
Dim	Min	Max	Typ
A	3.45	3.66	—
B	4.27	4.78	—
b	—	—	0.38
c	—	—	0.38
D	—	—	3.87
E	4.32	4.83	—
e	—	—	1.27
e2	2.40	2.90	—
L	12.98	15.00	—
L1	12.80	15.00	—
L2	0.80	-	—
L3	2.00	3.00	—
N	1.22	1.37	—

All Dimensions in mm

Suggested Pad Layout

SOT23



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