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## 2.85 TO 12 VOLT FIXED POSITIVE LOCAL VOLTAGE REGULATOR

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### DEVICE DESCRIPTION

The ZSR Series three terminal fixed positive voltage regulators feature internal circuit current limit and thermal shutdown making the devices difficult to destroy. The circuit design allows creation of any custom voltage in the range 2.85 to 12 volts. The devices are available in a small outline surface mount package, ideal for applications where space saving is important, as well as through hole TO92 style packaging. The devices are suited to local voltage regulation applications, where problems could be encountered with distributed single source regulation, as well as more general voltage regulation applications.

The ZSR Series show performance characteristics superior to other local voltage regulators. The initial output voltage is maintained to within 2.5% with a quiescent current of typically 350 $\mu$ A. Output voltage change, with input voltage and load current, is much lower than competitive devices. The ZSR devices are completely stable with no external components.

### FEATURES

- Small outline SO8 and SOT223 package
- TO92 package
- 2.85 to 12 Volt
- Output current up to 200mA
- Tight initial tolerance
- Low quiescent current
- -55 to 125°C temperature range
- No external components
- Internal thermal shutdown
- Internal short circuit current limit

### VOLTAGE RANGE

ZSR285	2.85V
ZSR300	3.0V
ZSR330	3.3V
ZSR400	4.0V
ZSR485	4.85V
ZSR500	5.0V
ZSR520	5.2V
ZSR570	5.7V
ZSR600	6.0V
ZSR700	7.0V
ZSR800	8.0V
ZSR850	8.5V
ZSR900	9.0V
ZSR1000	10.0V
ZSR1200	12.0V

# ZSR SERIES

## ABSOLUTE MAXIMUM RATING

Input voltage	20V	<b>Power Dissipation (T<sub>amb</sub>=25°C)</b>	
Output Current(I <sub>o</sub> )	200mA	SOT223	2W(Note 3)
Operating Temperature	-55 to 125°C	TO92	600mW
Storage Temperature	-65 to 150°C	S08	780mW(Note 3)

## ELECTRICAL CHARACTERISTICS

### 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<sub>amb</sub>=125°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 SOT223 and S08 packages, is calculated assuming that the device is mounted on a PCB measuring 2 inches square.
- The shut down feature of the device operates if its temperature exceeds its design limit as might occur during external faults, short circuits etc. If the regulator is supplied from an inductive source then a large voltage transient, on the regulator input, can result should the shut down circuit operate. It is advised that a capacitor (1μF or greater) should be applied across the regulator input to ensure that the maximum voltage rating of the device is not exceeded under shutdown conditions.

### ZSR285 TEST CONDITIONS (Unless otherwise stated):T<sub>j</sub>=25°C, I<sub>O</sub>=100mA, V<sub>in</sub>=6.85V

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
V <sub>O</sub>	Output Voltage		2.78	2.85	2.92	V
		I <sub>O</sub> =1 to 200mA τ	2.736		2.964	V
		V <sub>in</sub> =4.85 to 20V I <sub>O</sub> =1 to 100mA τ	2.736		2.964	V
ΔV <sub>O</sub>	Line Regulation	V <sub>in</sub> =4.85 to 20V		10	40	mV
ΔV <sub>O</sub>	Load Regulation	I <sub>O</sub> =1 to 200mA I <sub>O</sub> =1 to 100mA		5 2	25	mV mV
I <sub>q</sub>	Quiescent Current	τ		350	600	μA
ΔI <sub>q</sub>	Quiescent Current Change	I <sub>O</sub> =1 to 200mA V <sub>in</sub> =4.85 to 20V			100 100	μA μA
V <sub>n</sub>	Output Noise Voltage	f=10Hz to 10kHz		75		μV rms
ΔV <sub>in</sub> /ΔV <sub>O</sub>	Ripple Rejection	V <sub>in</sub> =5.85 to 18V f=120Hz	48	62		dB
V <sub>in</sub>	Input Voltage Required To Maintain Regulation		4.85	4.55		V
ΔV <sub>O</sub> /ΔT	Average Temperature Coefficient of V <sub>O</sub>	I <sub>O</sub> =5.0mA τ		0.1		mV/°C

τ=T<sub>j</sub>=-55 to 125°C

# ZSR SERIES

## ZSR300 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=7\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		2.92	3.0	3.08	V
		$I_O=1$ to 200mA $\tau$	2.88		3.12	V
		$V_{in}=5$ to 20V $I_O=1$ to 100mA $\tau$	2.88		3.12	V
$\Delta V_O$	Line Regulation	$V_{in}=5$ to 20V		10	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		5 2	25	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=5$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		75		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=6$ to 18V $f=120\text{Hz}$	48	62		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		5	4.7		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.1		mV/ $^{\circ}\text{C}$

## ZSR330 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=7.3\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		3.218	3.3	3.382	V
		$I_O=1$ to 200mA $\tau$	3.168		3.432	V
		$V_{in}=5.3$ to 20V $I_O=1$ to 100mA $\tau$	3.168		3.432	V
$\Delta V_O$	Line Regulation	$V_{in}=5.3$ to 20V		7.5	30	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		5 2	25	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=5.3$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		50		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=6.3$ to 18V $f=120\text{Hz}$	50	64		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		5.3	5		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.1		mV/ $^{\circ}\text{C}$

$\tau=T_j=-55$  to  $125^{\circ}\text{C}$

# ZSR SERIES

## ZSR400 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=8\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		3.9	4.0	4.1	V
		$I_O=1$ to 200mA $\tau$	3.84		4.16	V
		$V_{in}=6$ to 20V $I_O=1$ to 100mA $\tau$	3.84		4.16	V
$\Delta V_O$	Line Regulation	$V_{in}=6$ to 20V		10	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		5 2	25	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=6$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		75		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=7$ to 18V $f=120\text{Hz}$	48	62		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		6	5.3		V

## ZSR485 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=8.85\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		4.729	4.85	4.971	V
		$I_O=1$ to 200mA $\tau$	4.656		5.044	V
		$V_{in}=6.8$ to 20V $I_O=1$ to 100mA $\tau$	4.656		5.044	V
$\Delta V_O$	Line Regulation	$V_{in}=6.85$ to 20V		10	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		5 2	25	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=6.85$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		50		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=7.85$ to 18V $f=120\text{Hz}$	50	64		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		6.85	6.55		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.1		$\text{mV}/^{\circ}\text{C}$

$\tau = T_j = -55$  to  $125^{\circ}\text{C}$

# ZSR SERIES

## ZSR1000 TEST CONDITIONS (Unless otherwise stated): $T_j=25^\circ\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=14\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		9.75	10	10.25	V
		$I_O=1$ to 200mA $\tau$	9.6		10.4	V
		$V_{in}=12$ to 20V $I_O=1$ to 100mA $\tau$	9.6		10.4	V
$\Delta V_O$	Line Regulation	$V_{in}=12$ to 20V		12	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		9 3	30	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=12$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		150		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=13$ to 18V $f=120\text{Hz}$	43	57		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		12	11.7		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.25		mV/ $^\circ\text{C}$

## ZSR1200 TEST CONDITIONS (Unless otherwise stated): $T_j=25^\circ\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=16\text{V}$

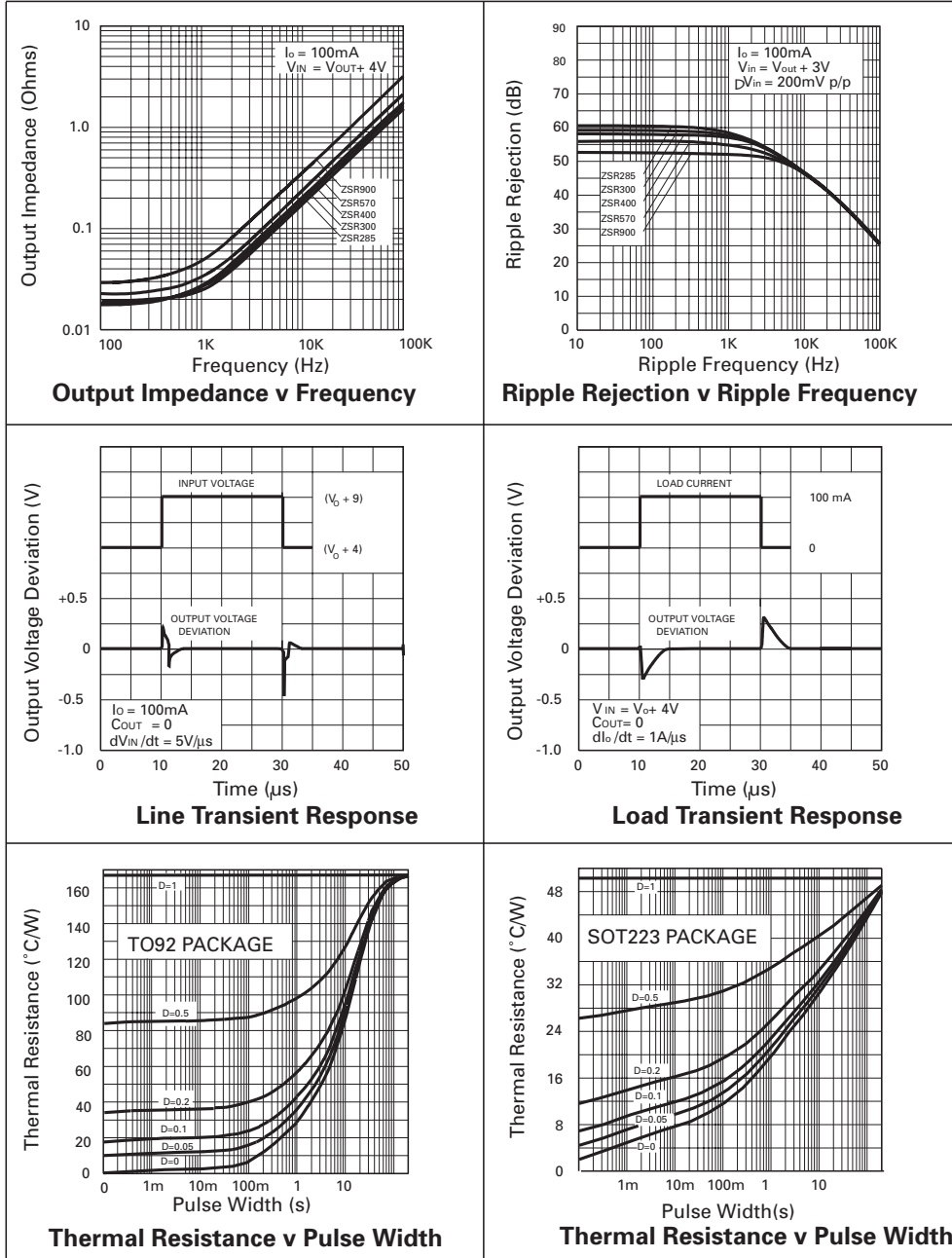
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		11.7	12	12.3	V
		$I_O=1$ to 200mA $\tau$	11.52		12.48	V
		$V_{in}=14$ to 20V $I_O=1$ to 100mA $\tau$	11.52		12.48	V
$\Delta V_O$	Line Regulation	$V_{in}=14$ to 20V		12	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		9 3	30	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=14$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		150		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=15$ to 18V $f=120\text{Hz}$	43	57		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		14	13.7		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.25		mV/ $^\circ\text{C}$

$\tau = T_j = -55$  to  $125^\circ\text{C}$

# ZSR SERIES

# ZSR285 ZSR300 ZSR400 ZSR570 ZSR900

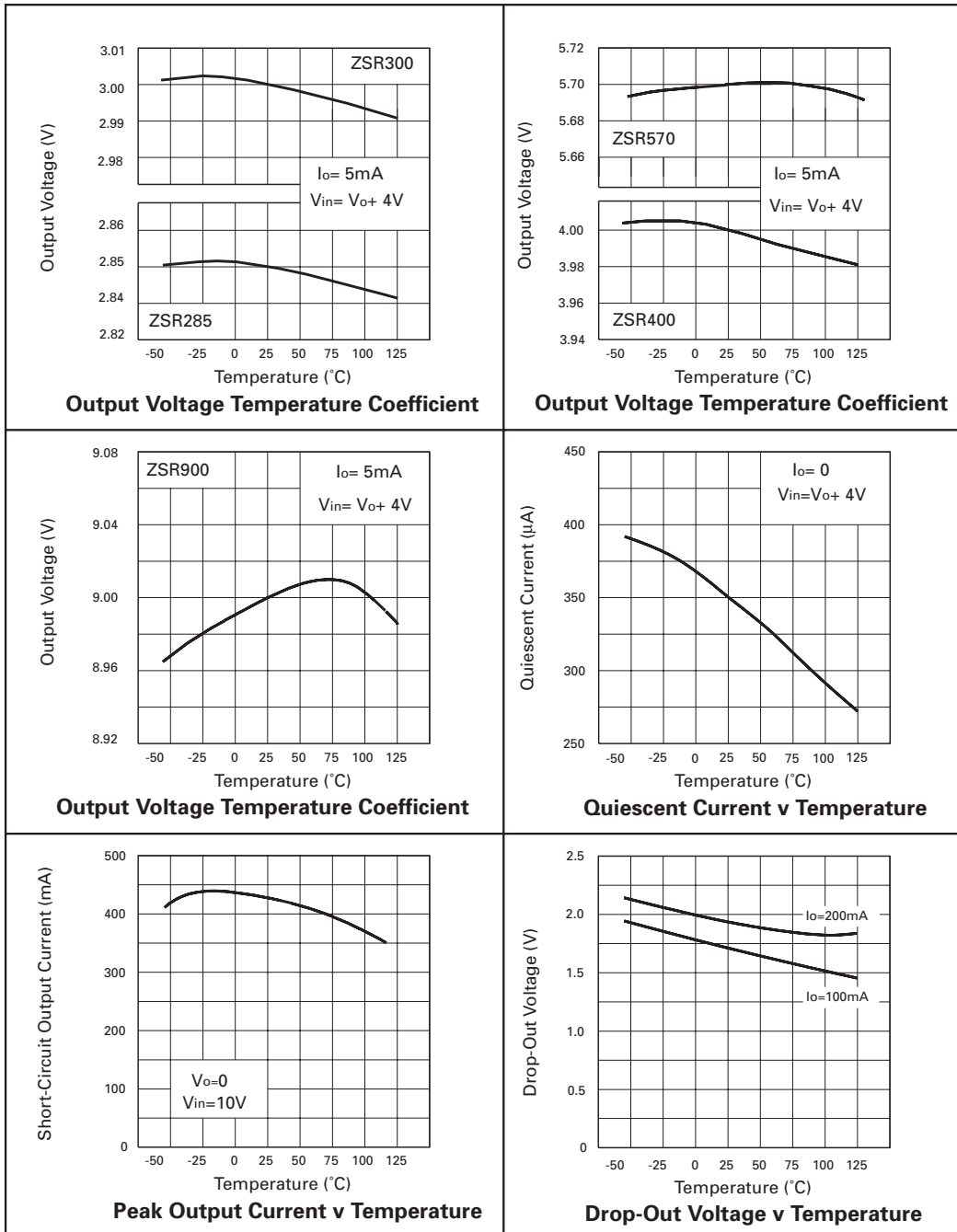
## TYPICAL CHARACTERISTICS



**ZSR285 ZSR300 ZSR400  
ZSR570 ZSR900**

**ZSR  
SERIES**

**TYPICAL CHARACTERISTICS**



# ZSR SERIES

## ZSR570 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=9.7\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	Typ.	MAX.	UNITS
$V_O$	Output Voltage		5.557	5.7	5.843	V
		$I_O=1$ to 200mA $\tau$	5.47		5.93	V
		$V_{in}=7.7$ to 20V $I_O=1$ to 100mA $\tau$	5.47		5.93	V
$\Delta V_O$	Line Regulation	$V_{in}=7.7$ to 20V		10	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		7 2.5	30	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=7.7$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		90		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=8.7$ to 18V $f=120\text{Hz}$	48	62		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		7.7	7.4		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.15		mV/ $^{\circ}\text{C}$

## ZSR600 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=10\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		5.85	6	6.15	V
		$I_O=1$ to 200mA $\tau$	5.76		6.24	V
		$V_{in}=8$ to 20V $I_O=1$ to 100mA $\tau$	5.76		6.24	V
$\Delta V_O$	Line Regulation	$V_{in}=8$ to 20V		10	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		7 2.5	30	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=8$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		90		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=9$ to 18V $f=120\text{Hz}$	48	62		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		8	7.7		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.15		mV/ $^{\circ}\text{C}$

$\tau = T_j = -55$  to  $125^{\circ}\text{C}$



# ZSR SERIES

## ZSR500 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=9\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		4.875	5	5.125	V
		$I_O=1$ to 200mA $\tau$	4.8		5.2	V
		$V_{in}=7$ to 20V $I_O=1$ to 100mA $\tau$	4.8		5.2	V
$\Delta V_O$	Line Regulation	$V_{in}=7$ to 20V		10	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		5 2	25	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=7$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		75		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=8$ to 18V $f=120\text{Hz}$	48	62		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		7	6.7		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.1		mV/ $^{\circ}\text{C}$

## ZSR520 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=9.2\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		5.070	5.2	5.330	V
		$I_O=1$ to 200mA $\tau$	4.99		5.41	V
		$V_{in}=7.2$ to 20V $I_O=1$ to 100mA $\tau$	4.99		5.41	V
$\Delta V_O$	Line Regulation	$V_{in}=7.2$ to 20V		10	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		5 2	25	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=7.2$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		75		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=8.2$ to 18V $f=120\text{Hz}$	48	62		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		7.2	6.9		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.1		mV/ $^{\circ}\text{C}$

$\tau = T_j = -55$  to  $125^{\circ}\text{C}$

# ZSR SERIES

## ZSR850 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=12.5\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		8.288	8.5	8.712	V
		$I_O=1$ to 200mA $\tau$	8.16		8.84	V
		$V_{in}=10$ to 20V $I_O=1$ to 100mA $\tau$	8.16		8.84	V
$\Delta V_O$	Line Regulation	$V_{in}=10.5$ to 20V		11	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		8 3	30	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=10.5$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		115		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=11.5$ to 18V $f=120\text{Hz}$	44	60		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		10.5	10.2		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.25		$\text{mV}/^{\circ}\text{C}$

## ZSR900 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_O=100\text{mA}$ , $V_{in}=13\text{V}$

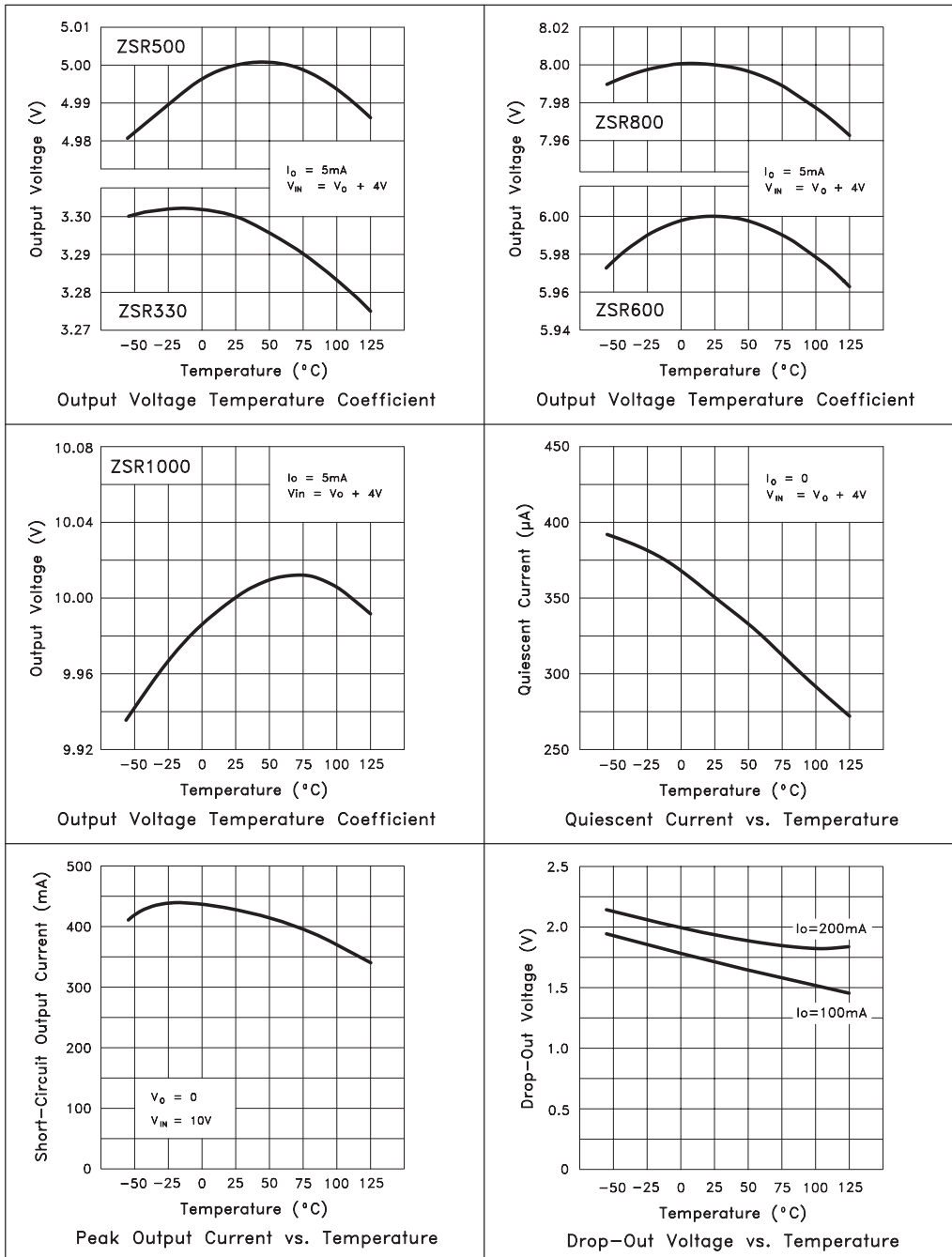
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_O$	Output Voltage		8.775	9.0	9.225	V
		$I_O=1$ to 200mA $\tau$	8.64		9.36	V
		$V_{in}=11$ to 20V $I_O=1$ to 100mA $\tau$	8.64		9.36	V
$\Delta V_O$	Line Regulation	$V_{in}=11$ to 20V		12	40	mV
$\Delta V_O$	Load Regulation	$I_O=1$ to 200mA $I_O=1$ to 100mA		9 3	30	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_O=1$ to 200mA $V_{in}=11$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		150		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	$V_{in}=12$ to 18V $f=120\text{Hz}$	43	57		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		11	10.7		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of $V_O$	$I_O=5.0\text{mA}$ $\tau$		0.25		$\text{mV}/^{\circ}\text{C}$

$\tau=T_j = -55$  to  $125^{\circ}\text{C}$

**ZSR330 ZSR500 ZSR600  
ZSR800 ZSR1000**

**ZSR  
SERIES**

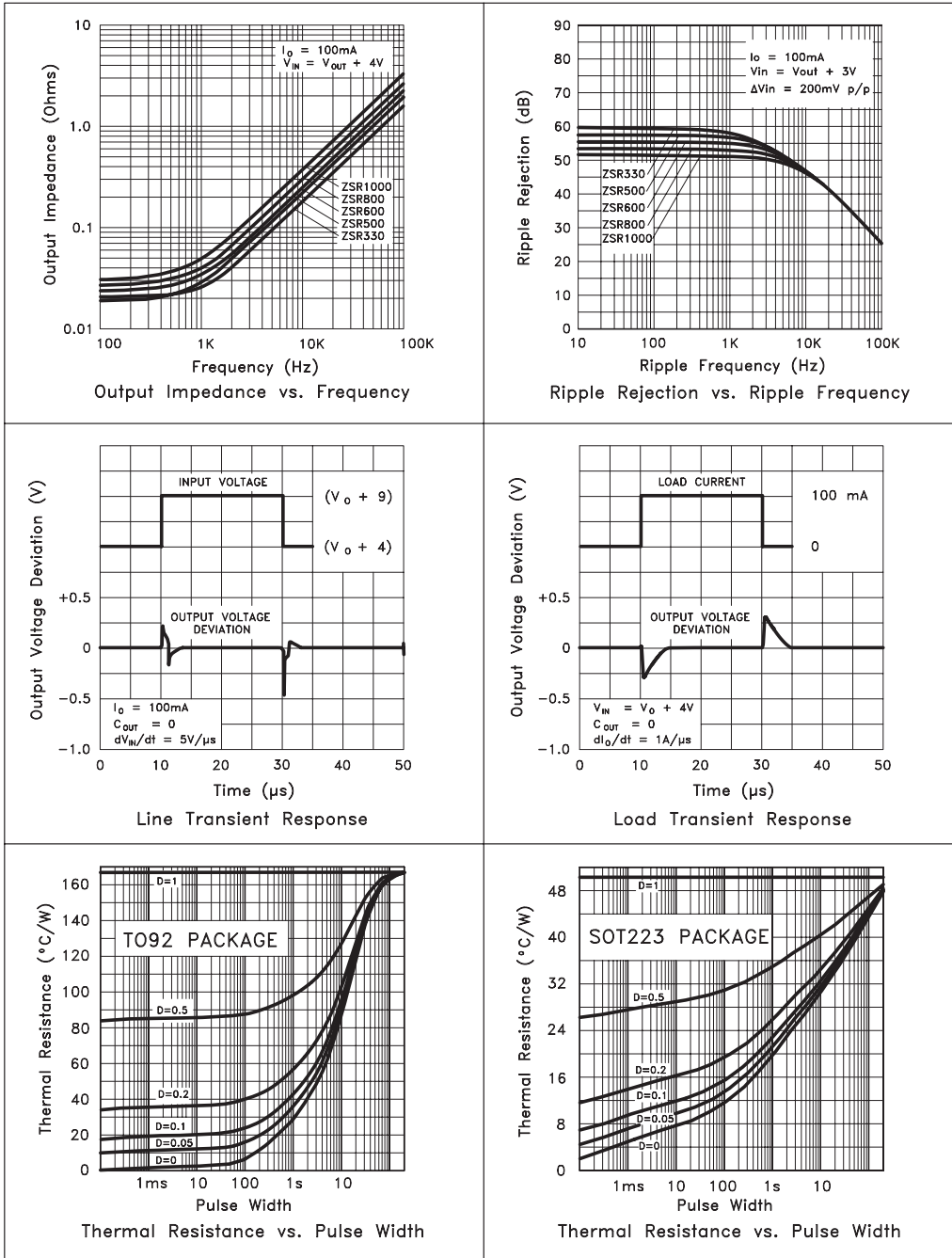
**TYPICAL CHARACTERISTICS**



# ZSR SERIES

# ZSR330 ZSR500 ZSR600 ZSR800 ZSR1000

## TYPICAL CHARACTERISTICS



# ZSR SERIES

## ZSR700 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_o=100\text{mA}$ , $V_{in}=11\text{V}$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_o$	Output Voltage		6.825	7	7.175	V
		$I_o=1$ to 200mA $\tau$	6.72		7.28	V
		$V_{in}=9$ to 20V $I_o=1$ to 100mA $\tau$	6.72		7.28	V
$\Delta V_o$	Line Regulation	$V_{in}=9$ to 20V		10	40	mV
$\Delta V_o$	Load Regulation	$I_o=1$ to 200mA $I_o=1$ to 100mA		5 2	25	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_o=1$ to 200mA $V_{in}=9$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		75		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_o$	Ripple Rejection	$V_{in}=10$ to 18V $f=120\text{Hz}$	48	62		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		9	8.7		V
$\Delta V_o/\Delta T$	Average Temperature Coefficient of $V_o$	$I_o=5.0\text{mA}$ $\tau$		0.1		$\text{mV}/^{\circ}\text{C}$

## ZSR800 TEST CONDITIONS (Unless otherwise stated): $T_j=25^{\circ}\text{C}$ , $I_o=100\text{mA}$ , $V_{in}=12\text{V}$

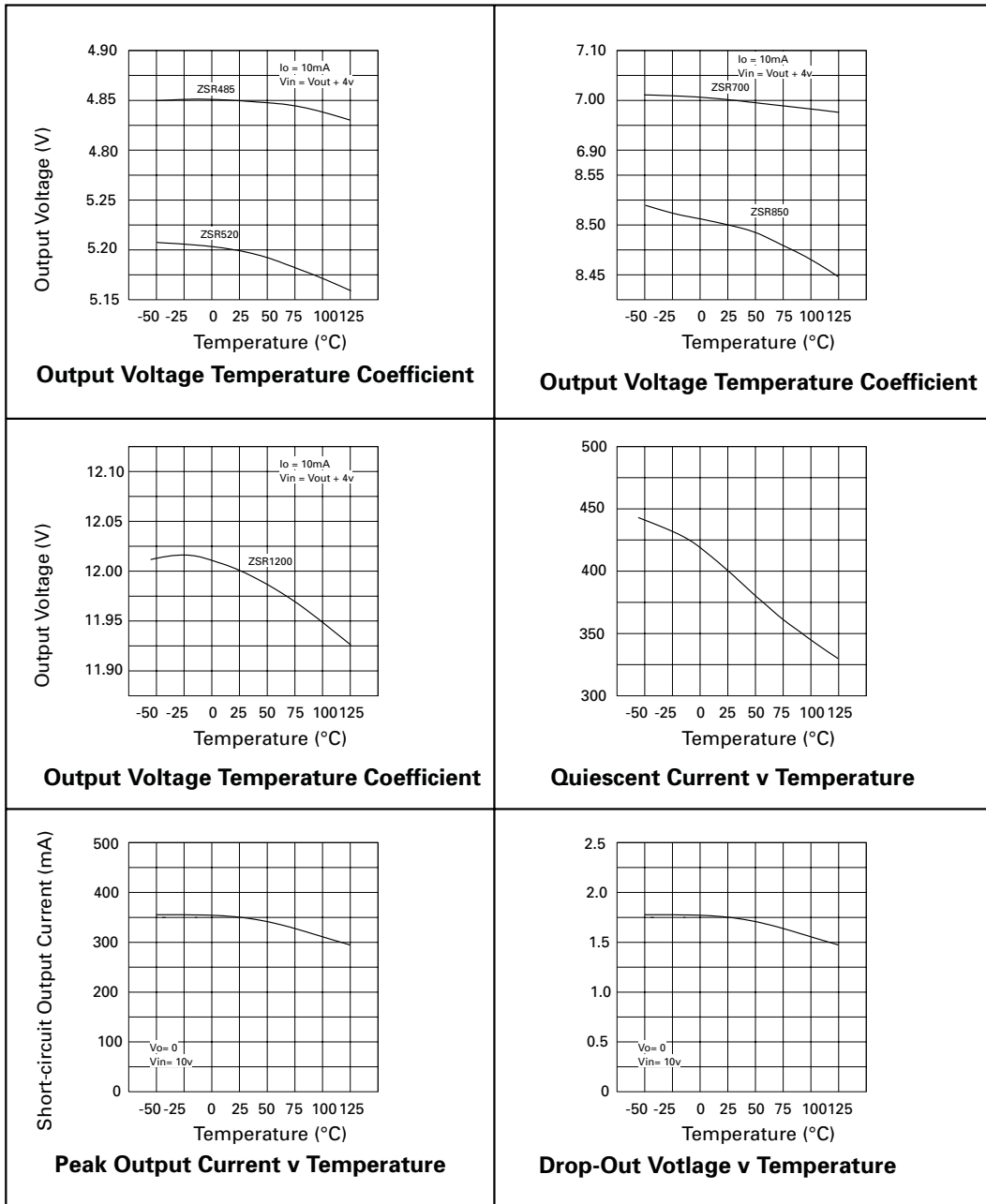
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
$V_o$	Output Voltage		7.8	8	8.2	V
		$I_o=1$ to 200mA $\tau$	7.68		8.32	V
		$V_{in}=10$ to 20V $I_o=1$ to 100mA $\tau$	7.68		8.32	V
$\Delta V_o$	Line Regulation	$V_{in}=10$ to 20V		11	40	mV
$\Delta V_o$	Load Regulation	$I_o=1$ to 200mA $I_o=1$ to 100mA		8 3	30	mV mV
$I_q$	Quiescent Current	$\tau$		350	600	$\mu\text{A}$
$\Delta I_q$	Quiescent Current Change	$I_o=1$ to 200mA $V_{in}=10$ to 20V			100 100	$\mu\text{A}$ $\mu\text{A}$
$V_n$	Output Noise Voltage	$f=10\text{Hz}$ to 10kHz		115		$\mu\text{V rms}$
$\Delta V_{in}/\Delta V_o$	Ripple Rejection	$V_{in}=11$ to 18V $f=120\text{Hz}$	44	60		dB
$V_{in}$	Input Voltage Required To Maintain Regulation		10	9.7		V
$\Delta V_o/\Delta T$	Average Temperature Coefficient of $V_o$	$I_o=5.0\text{mA}$ $\tau$		0.25		$\text{mV}/^{\circ}\text{C}$

$\tau = T_j = -55$  to  $125^{\circ}\text{C}$

# ZSR SERIES

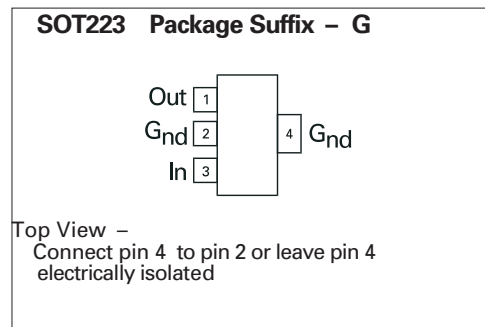
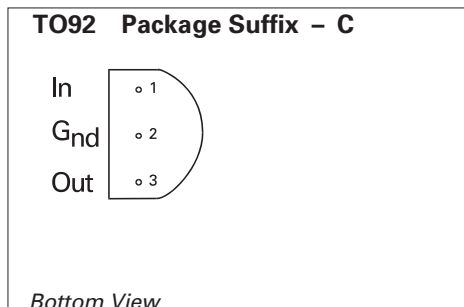
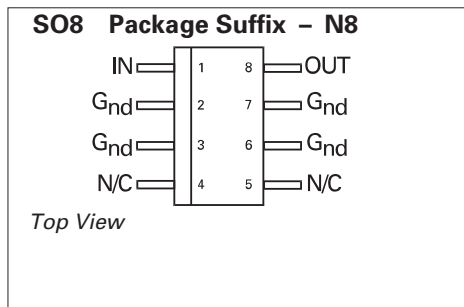
# ZSR485 ZSR520 ZSR700 ZSR850 ZSR1200

## TYPICAL CHARACTERISTICS



# ZSR SERIES

## CONNECTION DIAGRAMS



## OPTIONS

Voltage	Voltage Option ▲	TO92	SOT223	SO8
2.85V	285	3	3	3
3.0V	300	3	3	3
3.3V	330	3	3	3
4.0V	400	3	3	3
4.85V	485	3	3	3
5.0V	500	3	3	3
5.2V	520	3	3	3
5.7V	570	3	3	3
6.0V	600	3	3	3
7.0V	700	3	3	3
8.0V	800	3	3	3
8.5V	850	3	3	3
9.0V	900	3	3	3
10.0V	1000	3	3	3
12.0V	1200	3	3	3

\* NOTE: Exception. ZSR1000 part mark is ZSR100 for all package options

## ORDERING INFORMATION

Part No	Package	Partmark
ZSR ▲ C	TO92	ZSR ▲
ZSR ▲ G	SOT223	ZSR ▲
ZSR ▲ N8	SO8	ZSR ▲

### ▲ Voltage Option

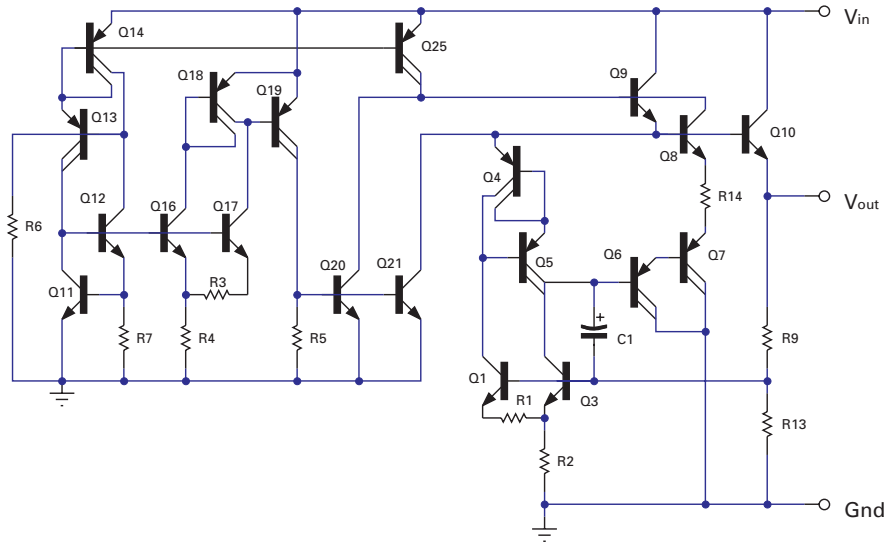
eg 3V device in TO92 package  
part number ZSR300C  
part marked ZSR300 \*

eg 12V device in SOT223 package  
part number ZSR1200G  
part marked ZSR1200 \*

eg 5V device in SO8 package  
part number ZSR500N8  
part marked ZSR500 \*

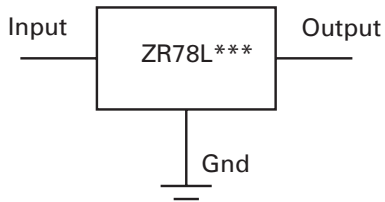
# ZSR SERIES

## SCHEMATIC DIAGRAM

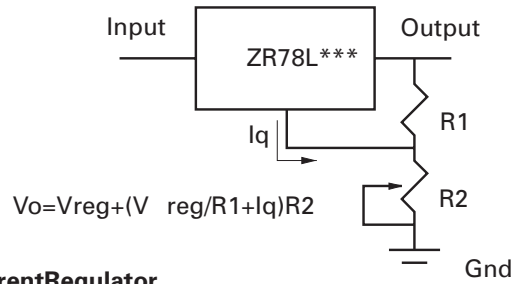


## APPLICATIONS

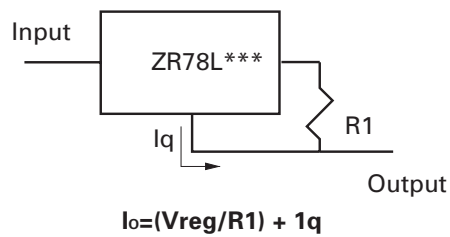
### FixedOutputRegulator



### AdjustableOutputRegulator



### CurrentRegulator

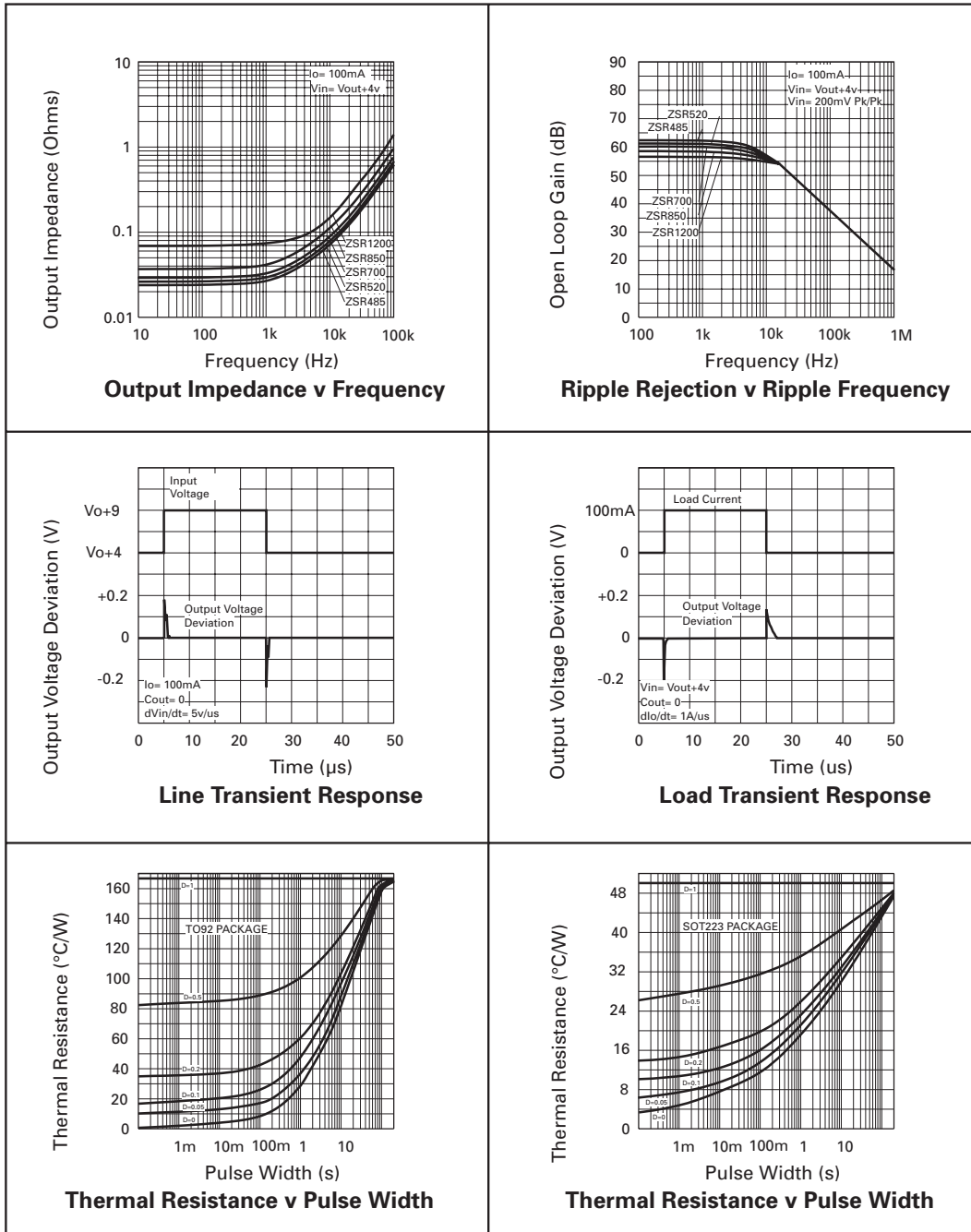




**ZSR485 ZSR520 ZSR700  
ZSR850 ZSR1200**

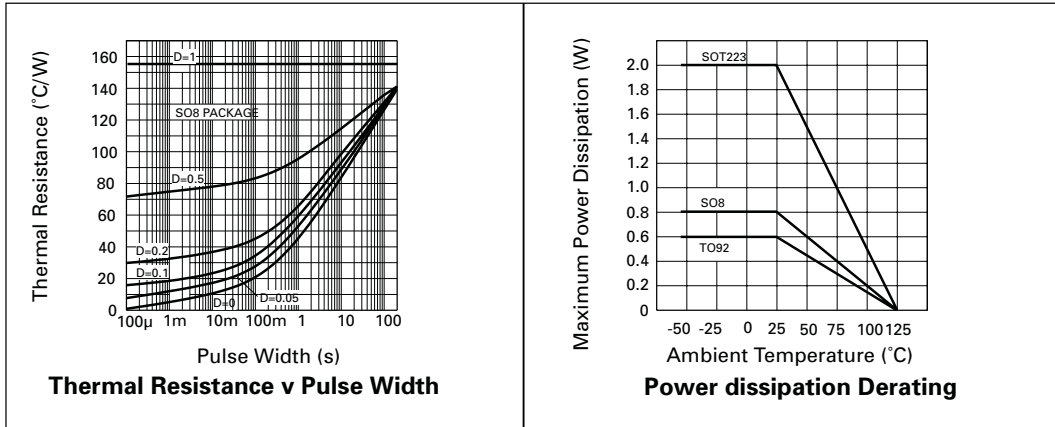
**ZSR  
SERIES**

**TYPICAL CHARACTERISTICS**



# ZSR SERIES

## TYPICAL CHARACTERISTICS



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