



**THE DATASHEET OF
ZSR485N8TA**



2.85 TO 12 VOLT FIXED POSITIVE LOCAL VOLTAGE REGULATOR

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 μ 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 | Power Dissipation (T_{amb}=25°C) | |
| Output Current(I _o) | 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_{amb}=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_j=25°C, I_O=100mA, V_{in}=6.85V

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

τ=T_j=-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 τ | 2.88 | | 3.12 | V |
| | | $V_{in}=5$ to 20V $I_O=1$ to 100mA τ | 2.88 | | 3.12 | V |
| ΔV_O | Line Regulation | $V_{in}=5$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 5 2 | 25 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=5$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 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 τ | 3.168 | | 3.432 | V |
| | | $V_{in}=5.3$ to 20V $I_O=1$ to 100mA τ | 3.168 | | 3.432 | V |
| ΔV_O | Line Regulation | $V_{in}=5.3$ to 20V | | 7.5 | 30 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 5 2 | 25 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=5.3$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.1 | | mV/ $^{\circ}\text{C}$ |

$\tau=T_j=-55$ to 125°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 τ | 3.84 | | 4.16 | V |
| | | $V_{in}=6$ to 20V $I_O=1$ to 100mA τ | 3.84 | | 4.16 | V |
| ΔV_O | Line Regulation | $V_{in}=6$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 5 2 | 25 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=6$ to 20V | | | 100 100 | μA μA |
| 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 τ | 4.656 | | 5.044 | V |
| | | $V_{in}=6.8$ to 20V $I_O=1$ to 100mA τ | 4.656 | | 5.044 | V |
| ΔV_O | Line Regulation | $V_{in}=6.85$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 5 2 | 25 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=6.85$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.1 | | $\text{mV}/^{\circ}\text{C}$ |

$\tau = T_j = -55$ to 125°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 τ | 9.6 | | 10.4 | V |
| | | $V_{in}=12$ to 20V $I_O=1$ to 100mA τ | 9.6 | | 10.4 | V |
| ΔV_O | Line Regulation | $V_{in}=12$ to 20V | | 12 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 9 3 | 30 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=12$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.25 | | mV/ $^\circ\text{C}$ |

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

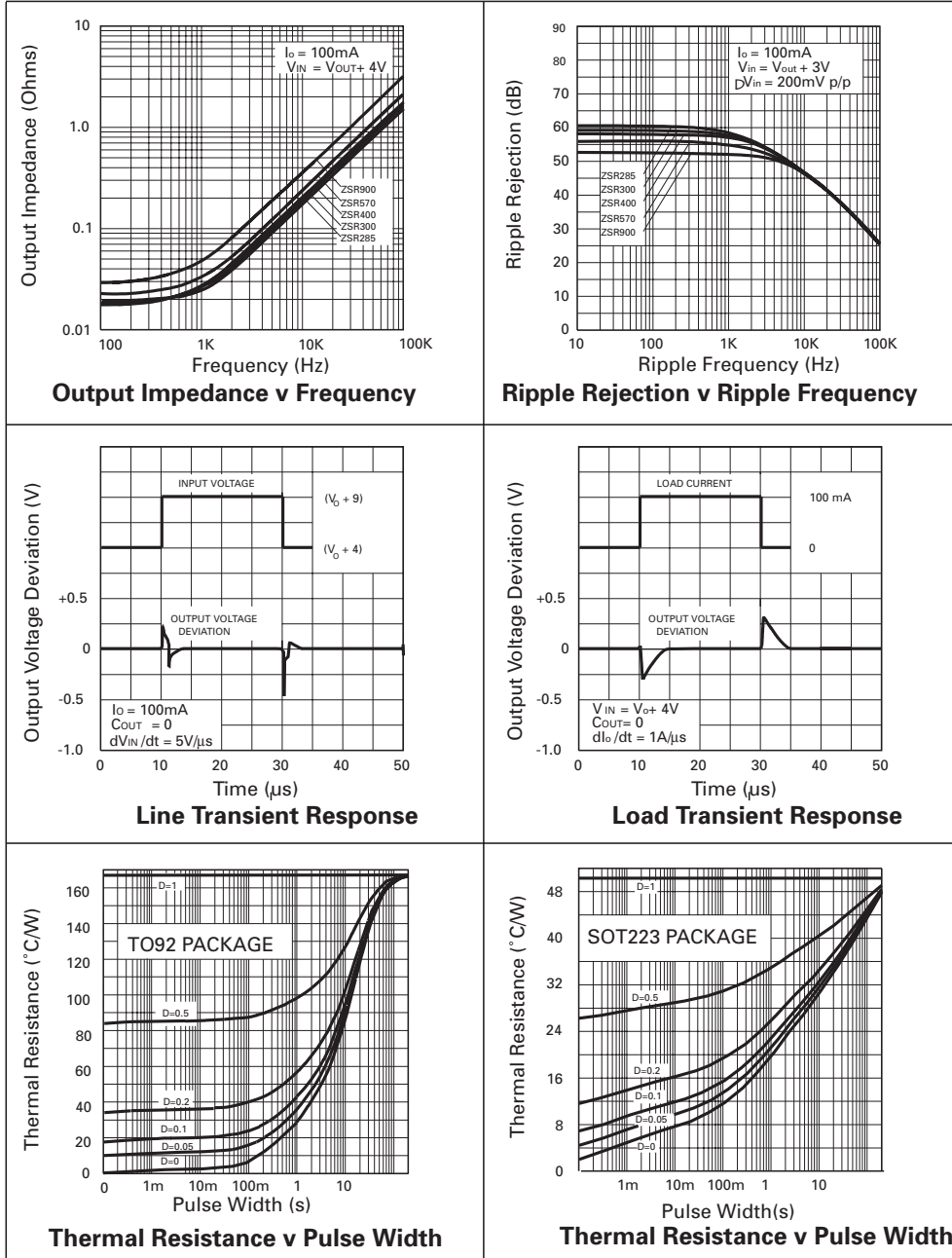
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|----------------------------|---|---|-------|--------|------------|--------------------------------|
| V_O | Output Voltage | | 11.7 | 12 | 12.3 | V |
| | | $I_O=1$ to 200mA τ | 11.52 | | 12.48 | V |
| | | $V_{in}=14$ to 20V $I_O=1$ to 100mA τ | 11.52 | | 12.48 | V |
| ΔV_O | Line Regulation | $V_{in}=14$ to 20V | | 12 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 9 3 | 30 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=14$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.25 | | mV/ $^\circ\text{C}$ |

$\tau = T_j = -55$ to 125°C

ZSR SERIES

ZSR285 ZSR300 ZSR400 ZSR570 ZSR900

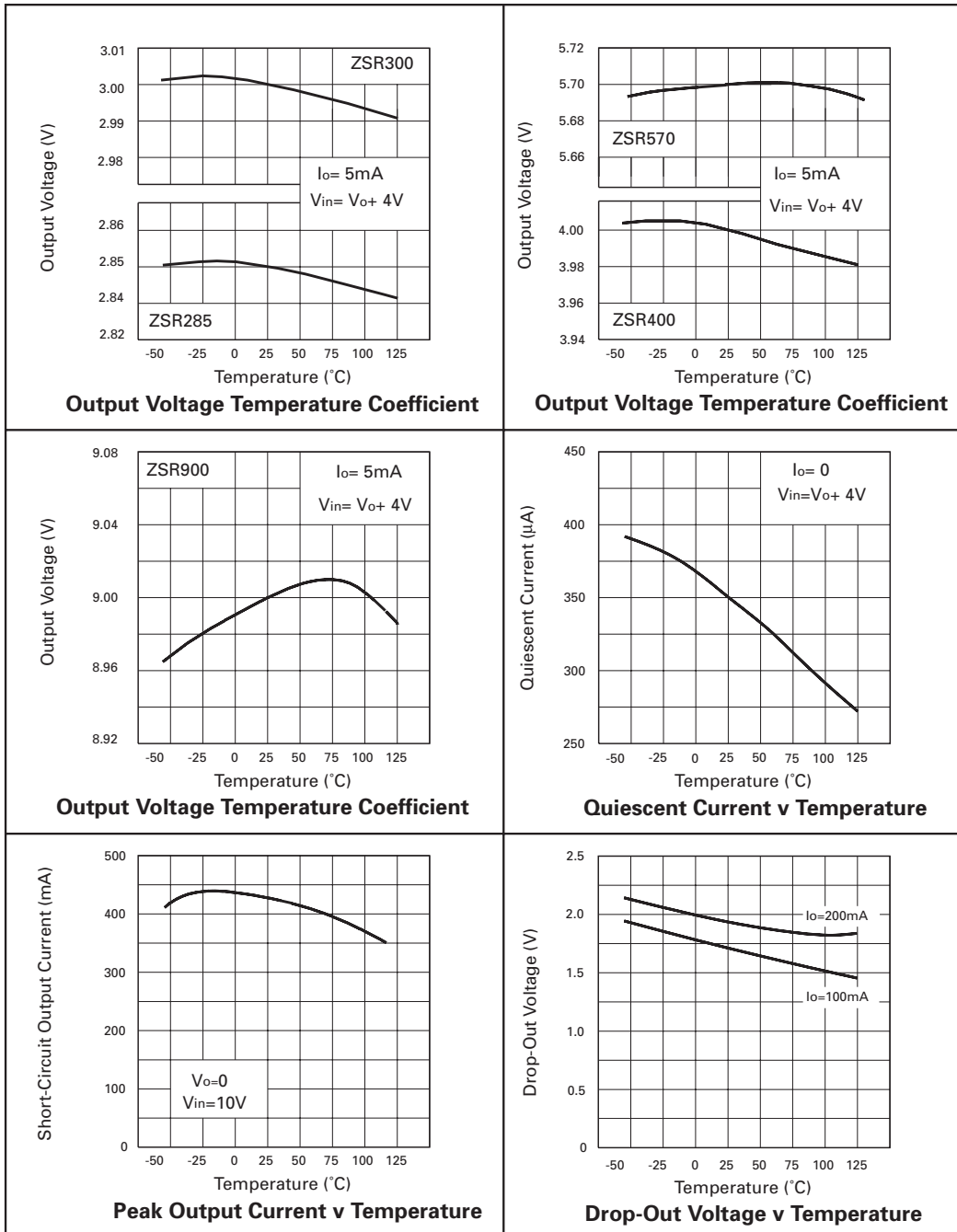
TYPICAL CHARACTERISTICS



**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 τ | 5.47 | | 5.93 | V |
| | | $V_{in}=7.7$ to 20V $I_O=1$ to 100mA τ | 5.47 | | 5.93 | V |
| ΔV_O | Line Regulation | $V_{in}=7.7$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 7 2.5 | 30 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=7.7$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 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 τ | 5.76 | | 6.24 | V |
| | | $V_{in}=8$ to 20V $I_O=1$ to 100mA τ | 5.76 | | 6.24 | V |
| ΔV_O | Line Regulation | $V_{in}=8$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 7 2.5 | 30 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=8$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.15 | | mV/ $^{\circ}\text{C}$ |

$\tau = T_j = -55$ to 125°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 τ | 4.8 | | 5.2 | V |
| | | $V_{in}=7$ to 20V $I_O=1$ to 100mA τ | 4.8 | | 5.2 | V |
| ΔV_O | Line Regulation | $V_{in}=7$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 5 2 | 25 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=7$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 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 τ | 4.99 | | 5.41 | V |
| | | $V_{in}=7.2$ to 20V $I_O=1$ to 100mA τ | 4.99 | | 5.41 | V |
| ΔV_O | Line Regulation | $V_{in}=7.2$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 5 2 | 25 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=7.2$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.1 | | mV/ $^{\circ}\text{C}$ |

$\tau = T_j = -55$ to 125°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 τ | 8.16 | | 8.84 | V |
| | | $V_{in}=10$ to 20V $I_O=1$ to 100mA τ | 8.16 | | 8.84 | V |
| ΔV_O | Line Regulation | $V_{in}=10.5$ to 20V | | 11 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 8 3 | 30 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=10.5$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.25 | | $\text{mV}/^{\circ}\text{C}$ |

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

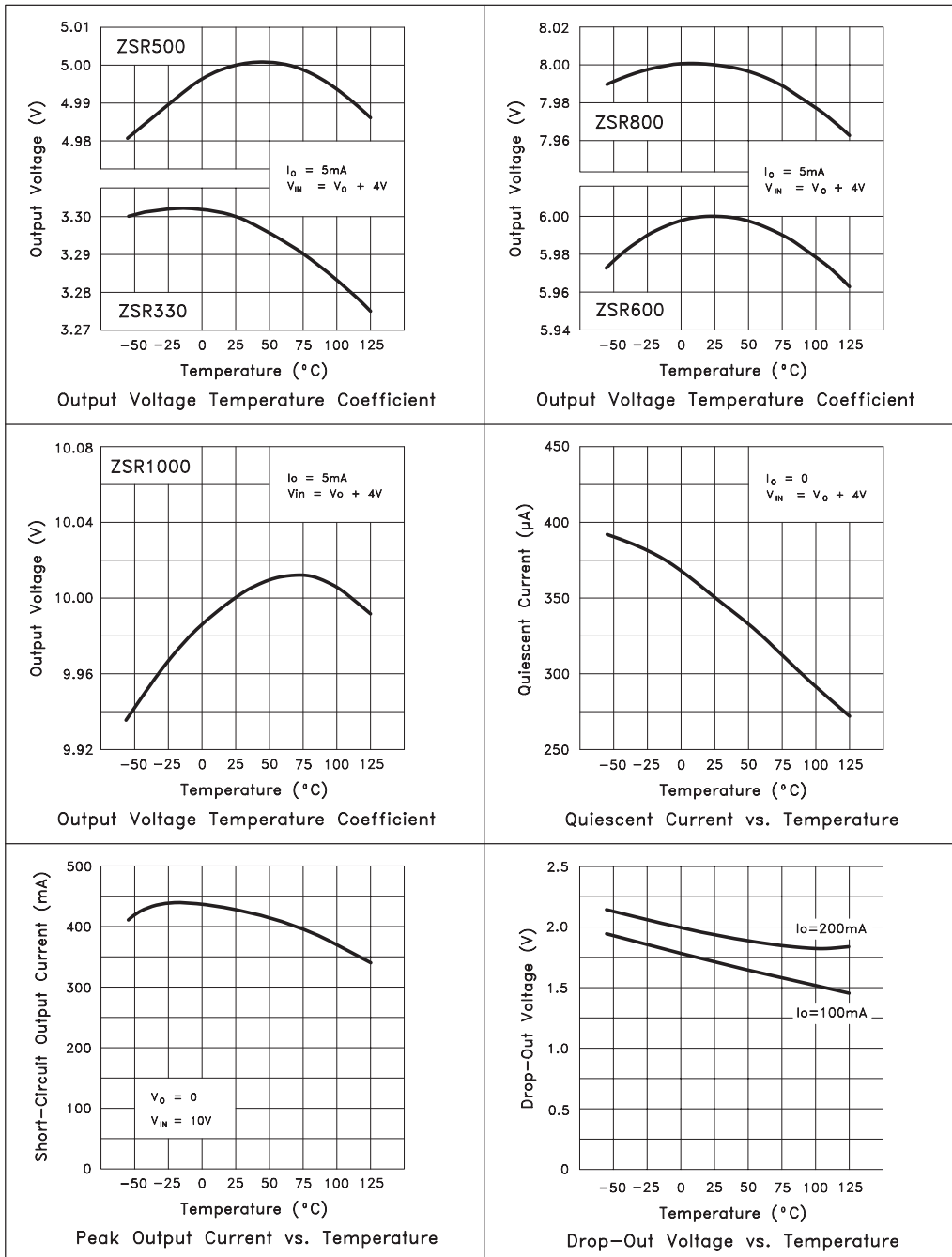
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|----------------------------|---|---|-------|--------|------------|--------------------------------|
| V_O | Output Voltage | | 8.775 | 9.0 | 9.225 | V |
| | | $I_O=1$ to 200mA τ | 8.64 | | 9.36 | V |
| | | $V_{in}=11$ to 20V $I_O=1$ to 100mA τ | 8.64 | | 9.36 | V |
| ΔV_O | Line Regulation | $V_{in}=11$ to 20V | | 12 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 9 3 | 30 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=11$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.25 | | $\text{mV}/^{\circ}\text{C}$ |

$\tau=T_j = -55$ to 125°C

**ZSR330 ZSR500 ZSR600
ZSR800 ZSR1000**

**ZSR
SERIES**

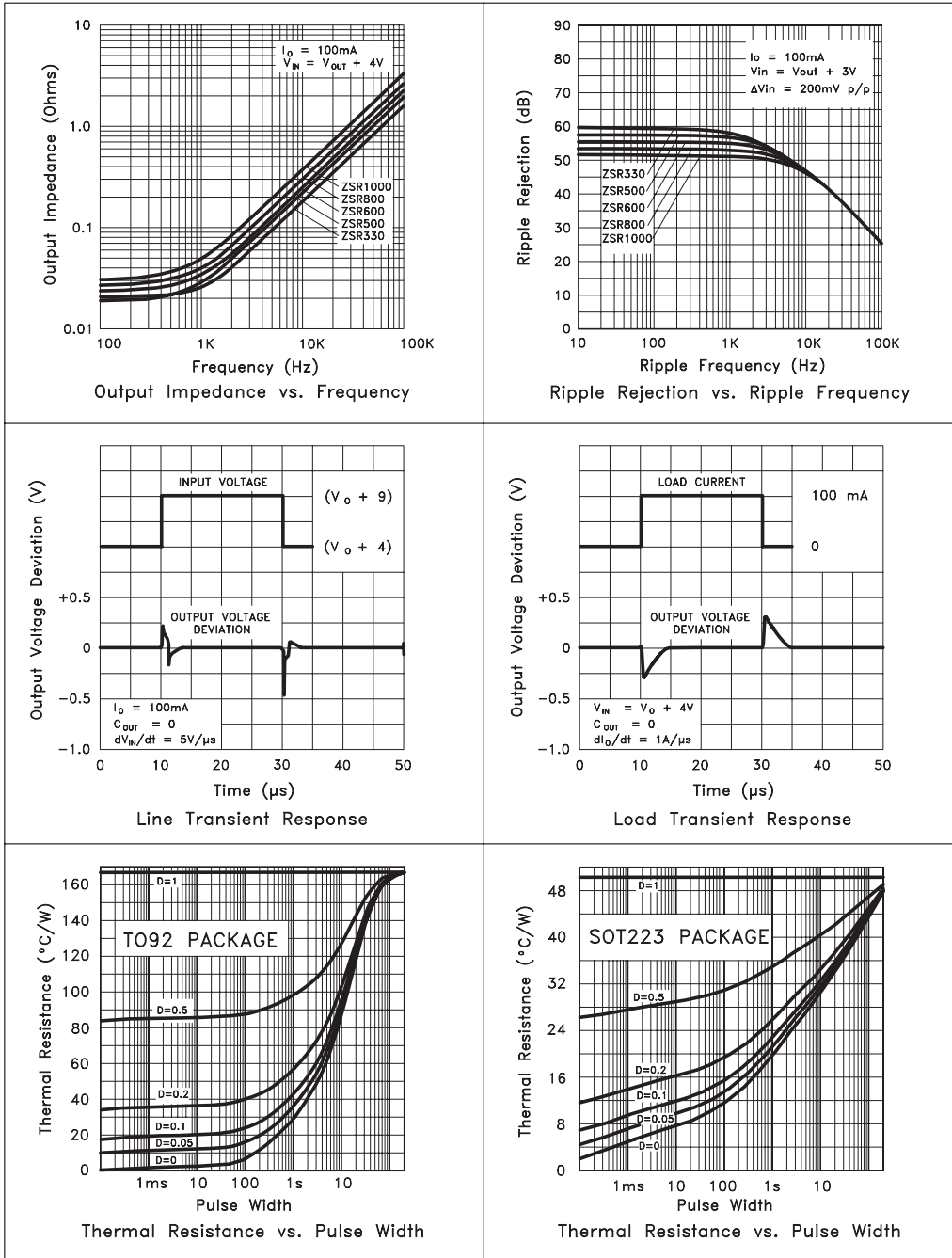
TYPICAL CHARACTERISTICS



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 τ | 6.72 | | 7.28 | V |
| | | $V_{in}=9$ to 20V $I_O=1$ to 100mA τ | 6.72 | | 7.28 | V |
| ΔV_O | Line Regulation | $V_{in}=9$ to 20V | | 10 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 5 2 | 25 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=9$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.1 | | $\text{mV}/^{\circ}\text{C}$ |

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

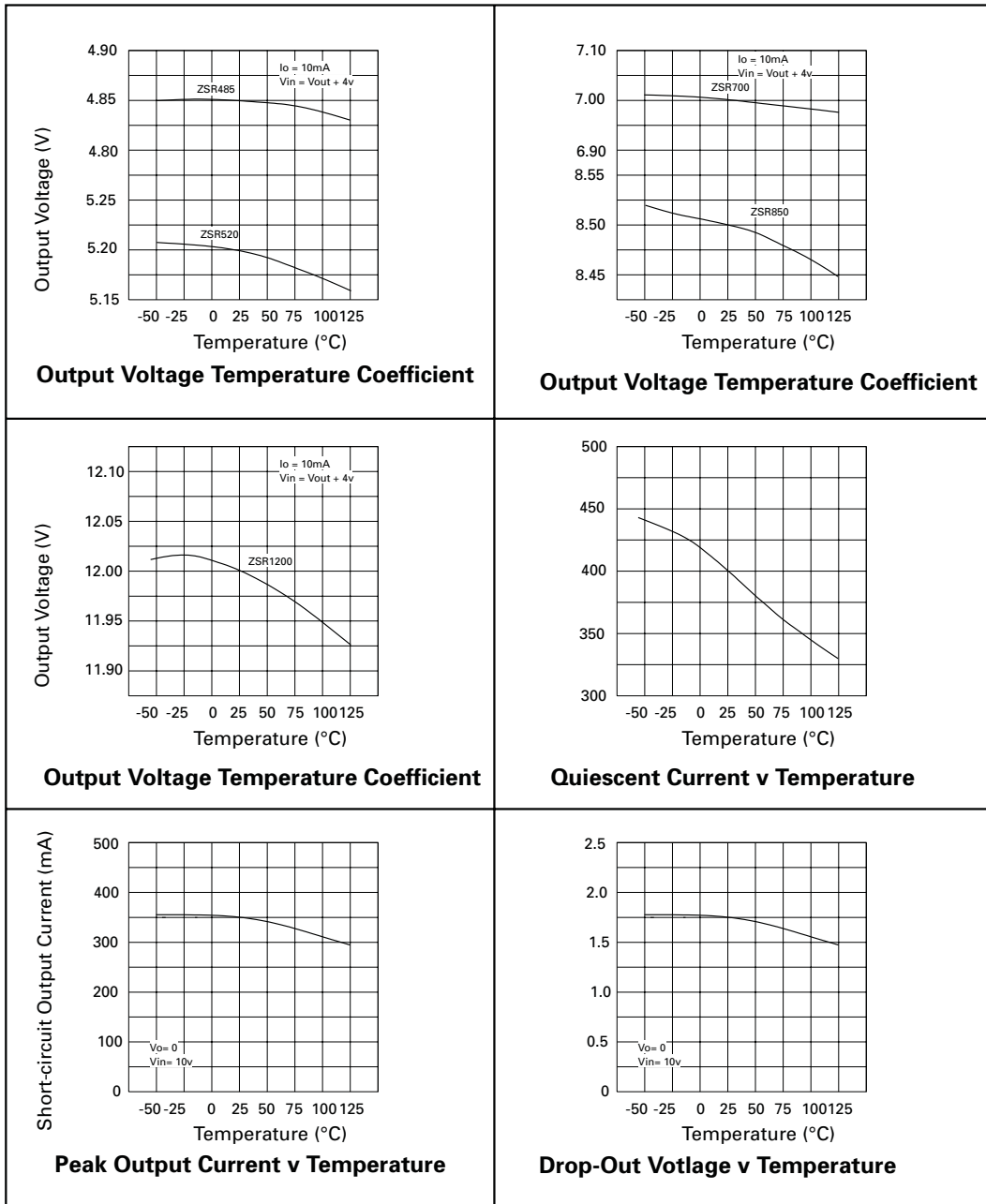
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|----------------------------|---|---|------|--------|------------|--------------------------------|
| V_O | Output Voltage | | 7.8 | 8 | 8.2 | V |
| | | $I_O=1$ to 200mA τ | 7.68 | | 8.32 | V |
| | | $V_{in}=10$ to 20V $I_O=1$ to 100mA τ | 7.68 | | 8.32 | V |
| ΔV_O | Line Regulation | $V_{in}=10$ to 20V | | 11 | 40 | mV |
| ΔV_O | Load Regulation | $I_O=1$ to 200mA $I_O=1$ to 100mA | | 8 3 | 30 | mV mV |
| I_q | Quiescent Current | τ | | 350 | 600 | μA |
| ΔI_q | Quiescent Current Change | $I_O=1$ to 200mA $V_{in}=10$ to 20V | | | 100 100 | μA μA |
| 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 | $I_O=5.0\text{mA}$ τ | | 0.25 | | $\text{mV}/^{\circ}\text{C}$ |

$\tau = T_j = -55$ to 125°C

ZSR SERIES

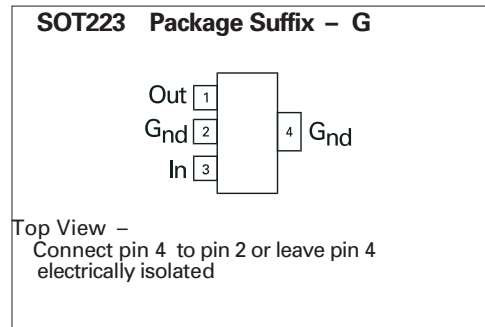
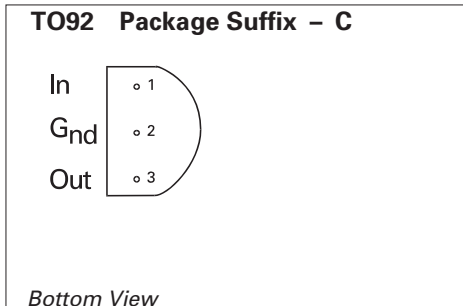
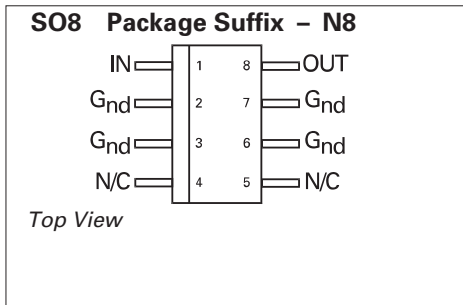
ZSR485 ZSR520 ZSR700 ZSR850 ZSR1200

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

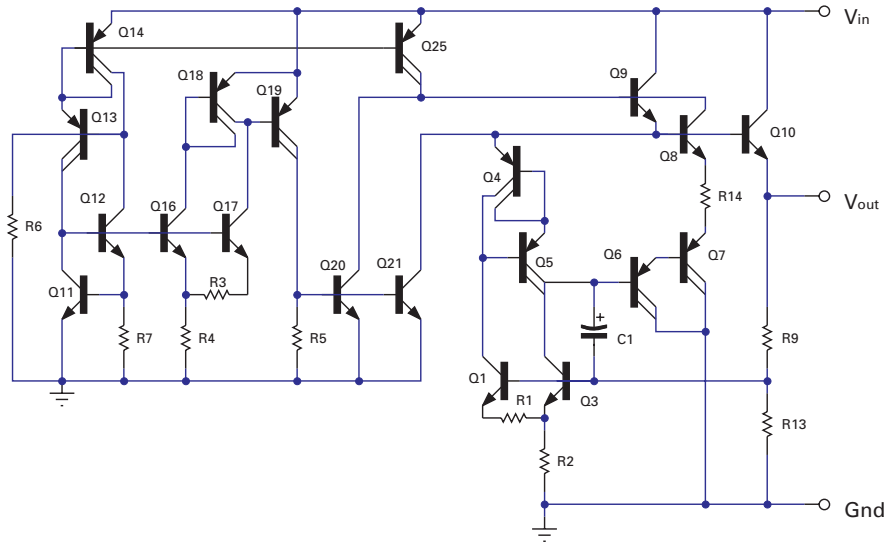
eg 3V device in TO92 package
part number ZSR300C
part marked ZSR300 *

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

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

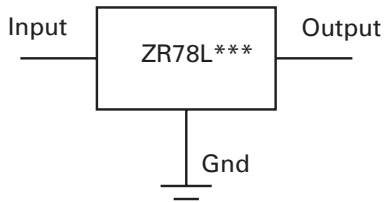
ZSR SERIES

SCHEMATIC DIAGRAM

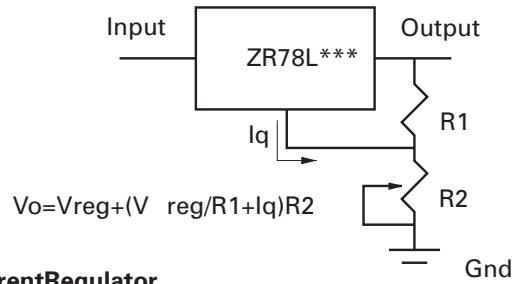


APPLICATIONS

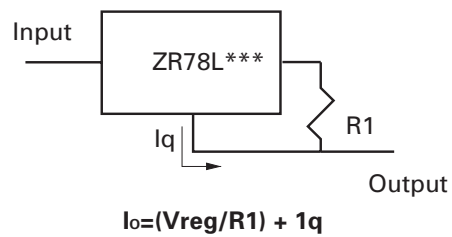
FixedOutputRegulator



AdjustableOutputRegulator



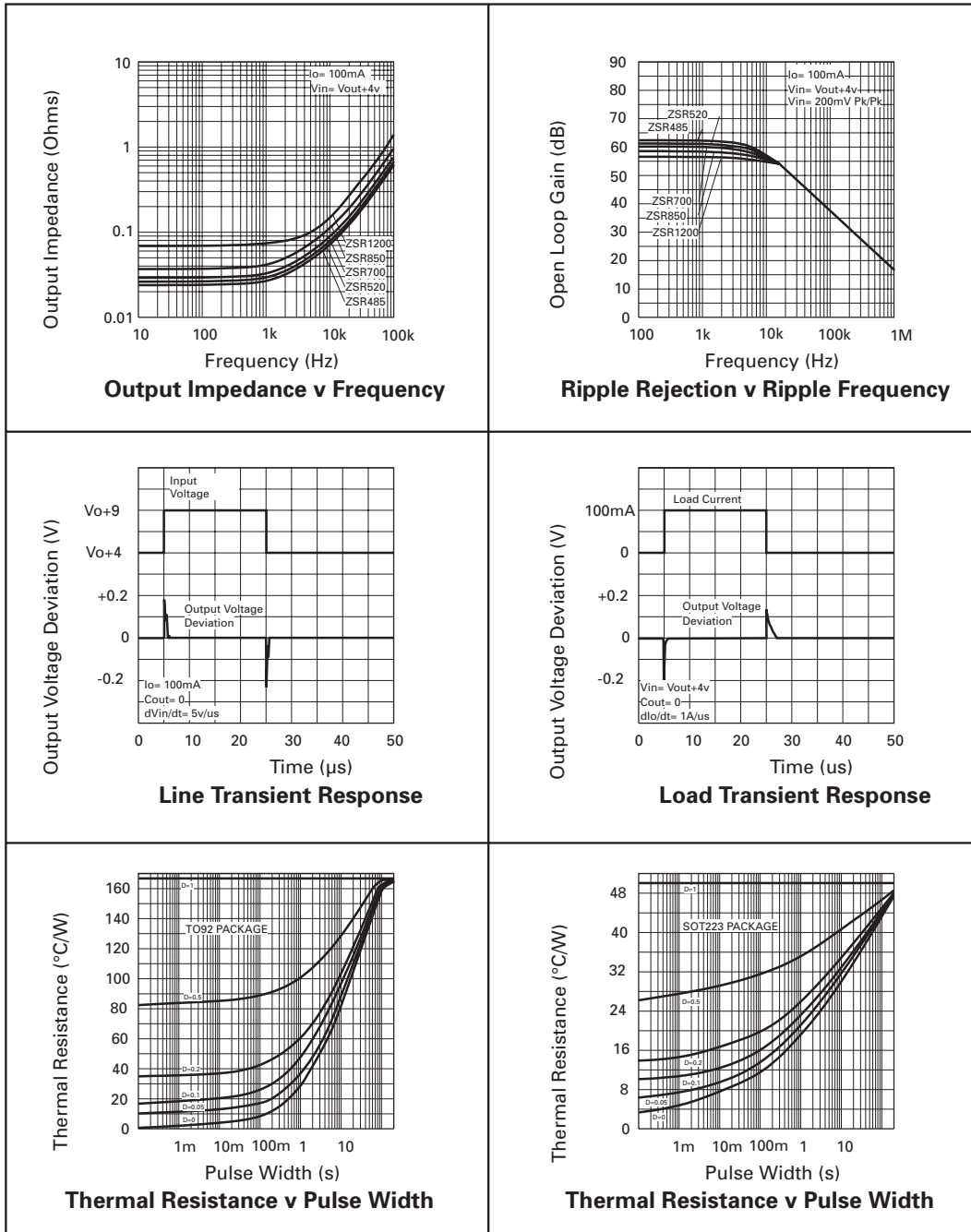
CurrentRegulator



**ZSR485 ZSR520 ZSR700
ZSR850 ZSR1200**

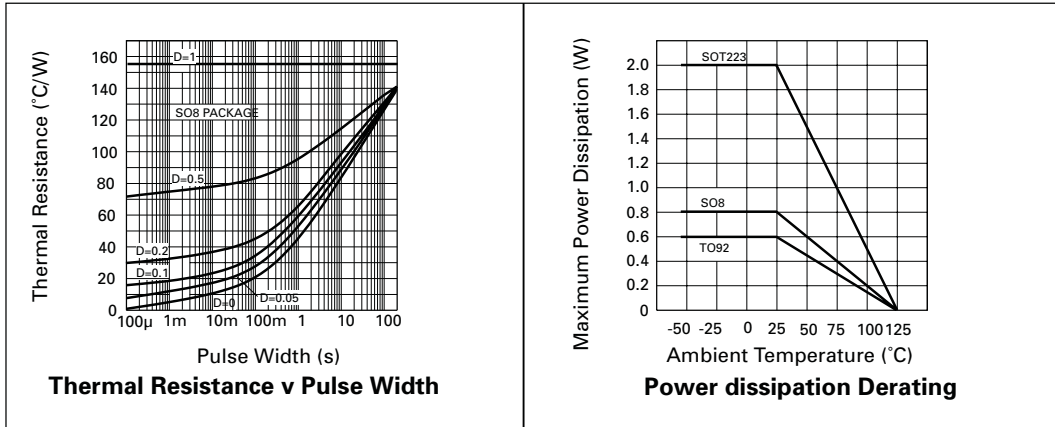
**ZSR
SERIES**

TYPICAL CHARACTERISTICS



ZSR SERIES

TYPICAL CHARACTERISTICS



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