2.85 TO 12 VOLT FIXED POSITIVE LOCAL VOLTAGE REGULATOR

ISSUE 5 - JUNE 2006

ZR78L SERIES

DEVICE DESCRIPTION

The ZR78L 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 ZR78L 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 350µA. Output voltage change, with input voltage and load current, is much lower than competitive devices. The ZR78L devices are completely stable with no external components. The device will shut down under thermal overload conditions but as the device cools, regulation will restart.

FEATURES

- 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

Device	Output voltage	Package options		
		TO92(C)	SOT223(G)	SO8(N8)
ZR78L028	2.85V	Obsolete	Obsolete	N/A
ZR78L03	3.0V	Obsolete	Obsolete	N/A
ZR78L033	3.3V	Obsolete	Obsolete	N/A
ZR78L04	4.0V	Obsolete	Obsolete	N/A
ZR78L048	4.85V	Obsolete	Obsolete	N/A
ZR78L05	5.0V	Not for new designs	Not for new designs	Obsolete
ZR78L052	5.2V	Obsolete	Obsolete	N/A
ZR78L057	5.7V	Obsolete	Obsolete	N/A
ZR78L06	6.0V	Not for new designs	Not for new designs	Obsolete
ZR78L07	7.0V	Obsolete	Obsolete	N/A
ZR78L08	8.0V	Obsolete	Obsolete	N/A
ZR78L085	8.5V	Obsolete	Obsolete	N/A
ZR78L09	9.0V	Obsolete	Obsolete	N/A
ZR78L10	10.0V	Obsolete	Obsolete	N/A
ZR78L12	12.0V	Obsolete	Obsolete	N/A

N/A - never available

The ZSRxxx family of linear regulators are alternatives to the ZR78L family

ZR78L SERIES

ABSOLUTE MAXIMUM RATING

Input voltage 20V
Output Current(I_o) 200mA
Operating Temperature -55 to 125°C
Storage Temperature -65 to 150°C

Power Dissipation (T_{amb}=25°C)
SOT223 2W(Note 3)
TO92 600mW
S08 780mW(Note 3)

ELECTRICAL CHARACTERISTICS:

Notes:

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 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.

3. Maximum power dissipation, for the SOT223 and SO8 packages, is calculated assuming that the device is mounted on a PCB measuring 2 inches square.

4. 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.

ZR78L028 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
$\Delta V_{in}/\Delta V_O$	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
$\Delta V_O/\Delta T$	Average Temperature Coefficient of V_O	I_O=5.0mA τ		0.1		mV/°C

τ=T_j=-55 to 125°C

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ZR78L03 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=7V

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=10Hz to 10kHz		75		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=6 to 18V f=120Hz	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=5.0mA τ		0.1		mV/°C

ZR78L033 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=7.3V

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=10Hz to 10kHz		50		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=6.3 to 18V f=120Hz	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=5.0mA τ		0.1		mV/°C

τ =T_j = -55 to 125 °C

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ZR78L04 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=8V

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=10Hz to 10kHz		75		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=7 to 18V f=120Hz	48	62		dB
V_{in}	Input Voltage Required To Maintain Regulation		6	5.3		V
$\Delta V_O/\Delta T$	Average Temperature Coefficient of V_O	I_O=5.0mA τ		0.1		mV/°C

ZR78L048 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=8.85V

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=10Hz to 10kHz		50		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=7.85 to 18V f=120Hz	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=5.0mA τ		0.1		mV/°C

τ =T_j = -55 to 125°C

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ZR78L10TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=14V

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=10Hz to 10kHz		150		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=13 to 18V f=120Hz	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=5.0mA τ		0.25		mV/°C

ZR78L12TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=16V

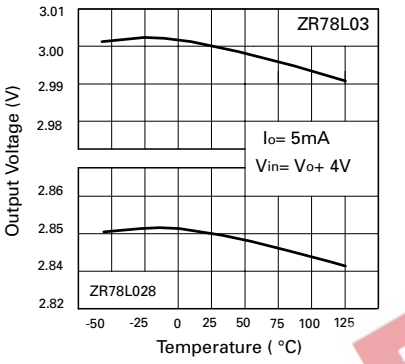
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
V_O	Output Voltage		11.7	12	12.3	V
		I_O=1 to 200mA τ	11.52		12.48	V
		V_{in}=14 to 20V I_O=1 to 100mA τ	11.52		12.48	V
ΔV_O	Line Regulation	V_{in}=14 to 20V		12	40	mV
ΔV_O	Load Regulation	I_O=1 to 200mA I_O=1 to 100mA		9 3	30	mV mV
I_q	Quiescent Current	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=10Hz to 10kHz		150		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=15 to 18V f=120Hz	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=5.0mA τ		0.25		mV/°C

τ =T_j = -55 to 125 °C

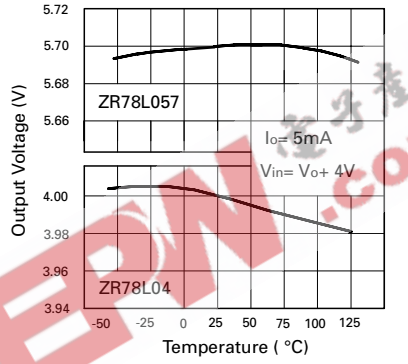
ZR78L028 ZR78L03
ZR78L04 ZR78L057
ZR78L09

ZR78L SERIES

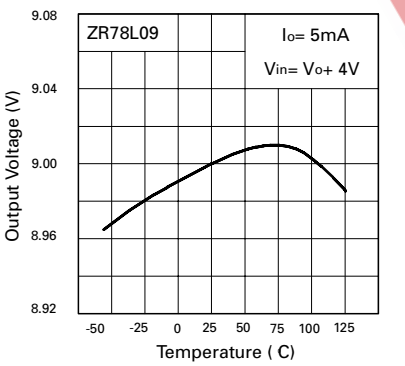
TYPICAL CHARACTERISTICS



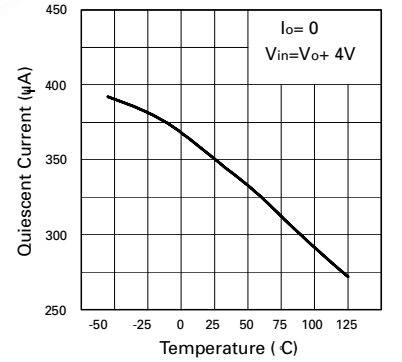
Output Voltage Temperature Coefficient



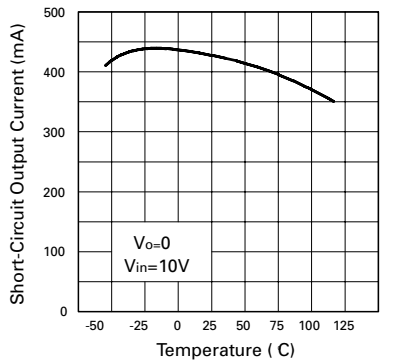
Output Voltage Temperature Coefficient



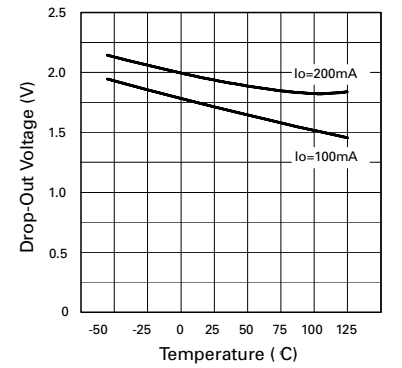
Output Voltage Temperature Coefficient



Quiescent Current vs. Temperature



Peak Output Current vs. Temperature

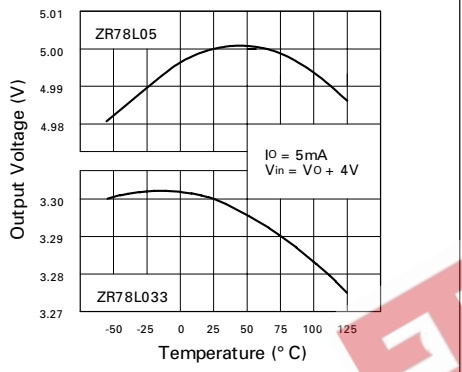


Drop-Out Voltage vs. Temperature

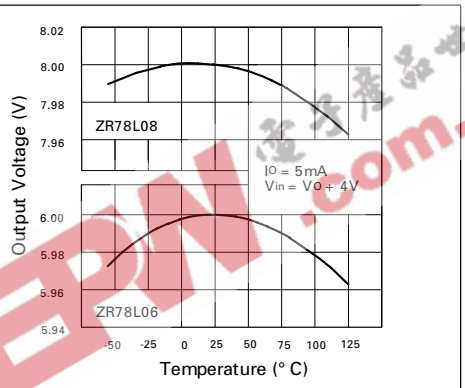
ZR78L033 ZR78L05
ZR78L06 ZR78L08
ZR78L10

ZR78L SERIES

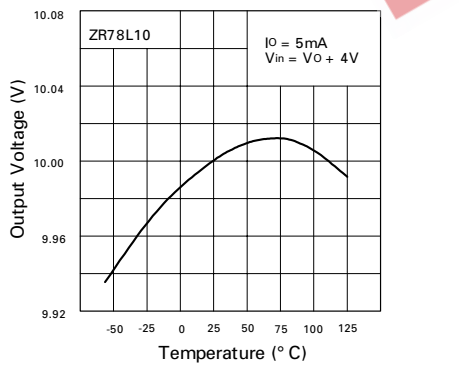
TYPICAL CHARACTERISTICS



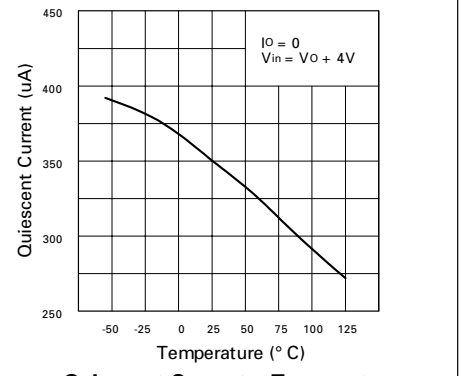
Output Voltage Temperature Coefficient



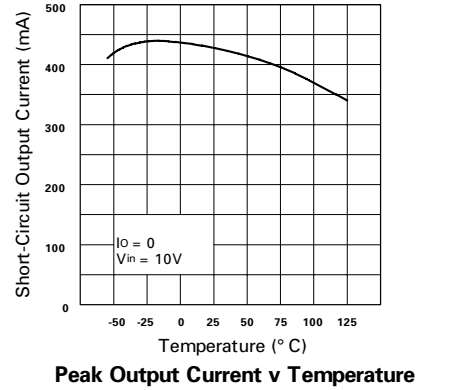
Output Voltage Temperature Coefficient



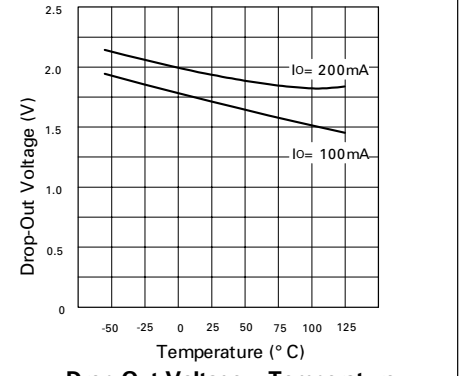
Output Voltage Temperature Coefficient



Quiescent Current v Temperature



Peak Output Current v Temperature



Drop-Out Voltage v Temperature

ZR78L SERIES

ZR78L057 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=9.7V

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=10Hz to 10kHz		90		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=8.7 to 18V f=120Hz	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=5.0mA τ		0.15		mV/°C

ZR78L06 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, IO=100mA, V_{in}=10V

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=10Hz to 10kHz		90		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=9 to 18V f=120Hz	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=5.0mA τ		0.15		mV/°C

τ =T_j = -55 to 125 °C

ZR78L SERIES

ZR78L05 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=9V

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=10Hz to 10kHz		75		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=8 to 18V f=120Hz	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=5.0mA τ		0.1		mV/°C

ZR78L052 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=9.2V

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=10Hz to 10kHz		75		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=8.2 to 18V f=120Hz	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=5.0mA τ		0.1		mV/°C

τ =T_j = -55 to 125 °C

ZR78L SERIES

ZR78L085 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=12.5V

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=10Hz to 10kHz		115		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=11.5 to 18V f=120Hz	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=5.0mA τ		0.25		mV/°C

ZR78L09TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=13V

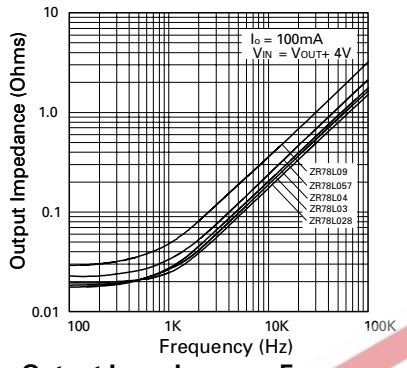
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
V_O	Output Voltage		8.775	9.0	9.225	V
		I_O=1 to 200mA τ	8.64		9.36	V
		V_{in}=11 to 20V I_O=1 to 100mA τ	8.64		9.36	V
ΔV_O	Line Regulation	V_{in}=11 to 20V		12	40	mV
ΔV_O	Load Regulation	I_O=1 to 200mA I_O=1 to 100mA		9 3	30	mV mV
I_q	Quiescent Current	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=10Hz to 10kHz		150		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=12 to 18V f=120Hz	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=5.0mA τ		0.25		mV/°C

τ =T_j = -55 to 125°C

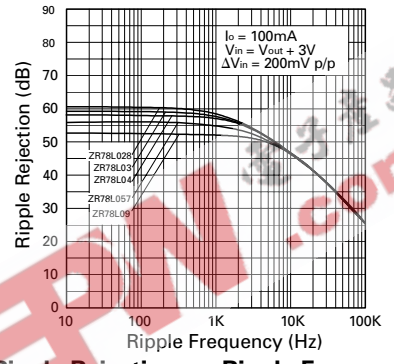
ZR78L SERIES

ZR78L028 ZR78L03
ZR78L04 ZR78L057
ZR78L09

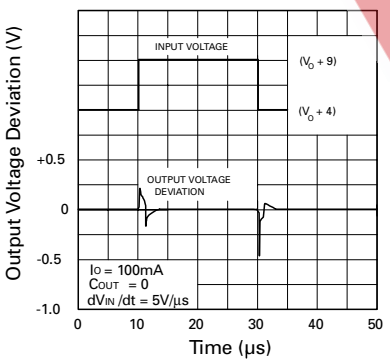
TYPICAL CHARACTERISTICS



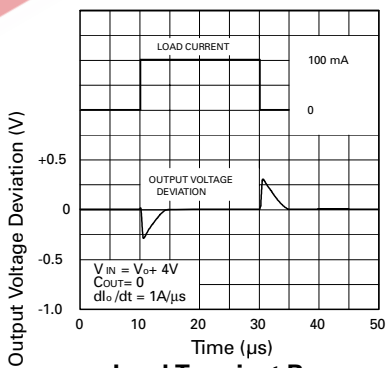
Output Impedance vs. Frequency



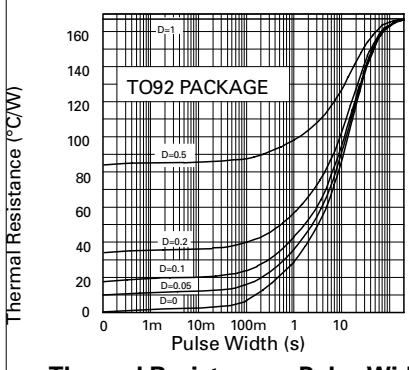
Ripple Rejection vs. Ripple Frequency



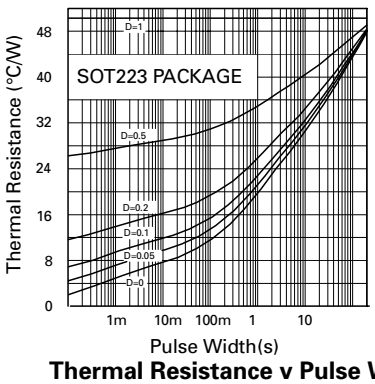
Line Transient Response



Load Transient Response



Thermal Resistance v Pulse Width

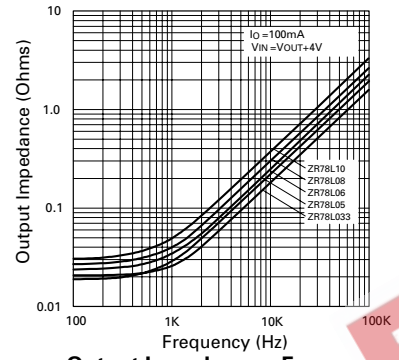


Thermal Resistance v Pulse Width

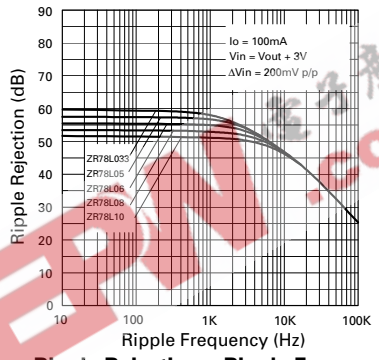
ZR78L SERIES

ZR78L033 ZR78L05
ZR78L06 ZR78L08
ZR78L10

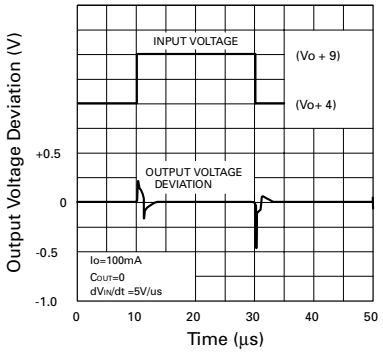
TYPICAL CHARACTERISTICS



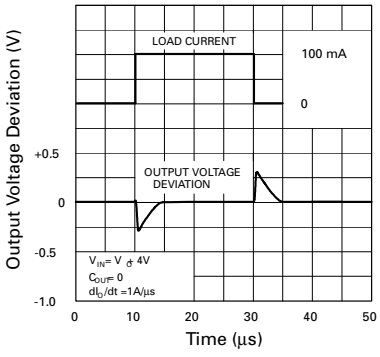
Output Impedance v Frequency



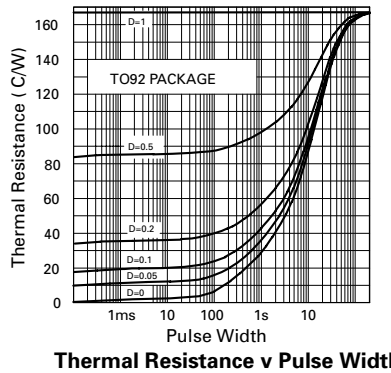
Ripple Rejection v Ripple Frequency



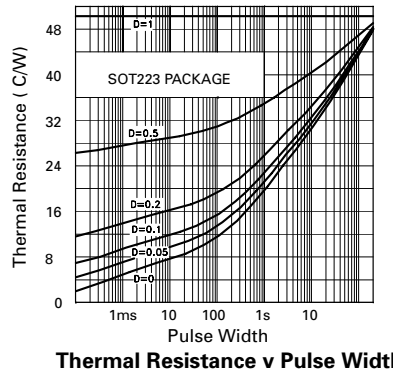
Line Transient Response



Load Transient Response



Thermal Resistance v Pulse Width



Thermal Resistance v Pulse Width

ZR78L SERIES

ZR78L07 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=11V

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=10Hz to 10kHz		75		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=10 to 18V f=120Hz	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=5.0mA τ		0.1		mV/°C

ZR78L08 TEST CONDITIONS (Unless otherwise stated):T_j=25°C, I_O=100mA, V_{in}=12V

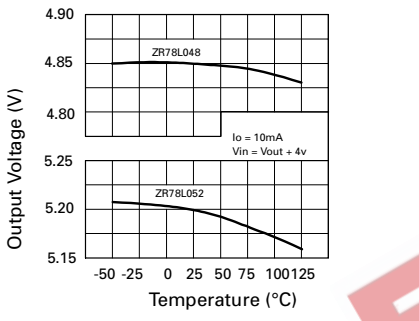
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNITS
V_O	Output Voltage		7.8	8	8.2	V
		I_O=1 to 200mA τ	7.68		8.32	V
		V_{in}=10 to 20V I_O=1 to 100mA τ	7.68		8.32	V
ΔV_O	Line Regulation	V_{in}=10 to 20V		11	40	mV
ΔV_O	Load Regulation	I_O=1 to 200mA I_O=1 to 100mA		8 3	30	mV mV
I_q	Quiescent Current	τ		350	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=10Hz to 10kHz		115		µV rms
$\Delta V_{in}/\Delta V_O$	Ripple Rejection	V_{in}=11 to 18V f=120Hz	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=5.0mA τ		0.25		mV/°C

τ =T_j = -55 to 125°C

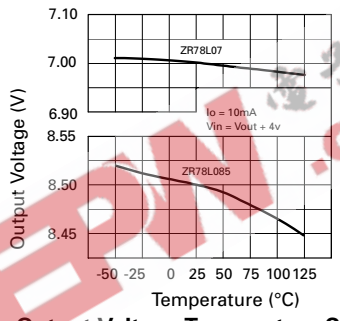
ZR78L SERIES

ZR78L048 ZR78L052
ZR78L07 ZR78L085
ZR78L12

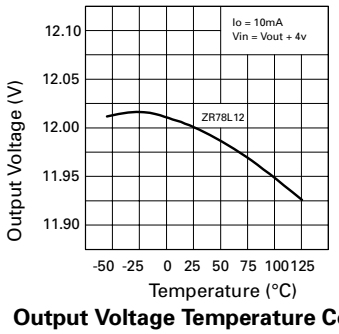
TYPICAL CHARACTERISTICS



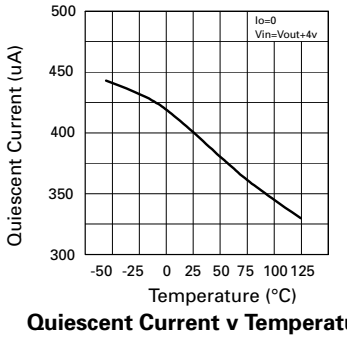
Output Voltage Temperature Coefficient



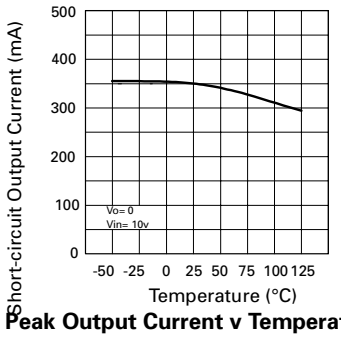
Output Voltage Temperature Coefficient



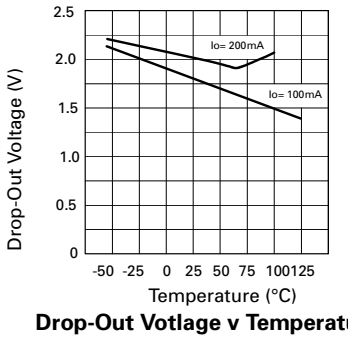
Output Voltage Temperature Coefficient



Quiescent Current v Temperature



Peak Output Current v Temperature

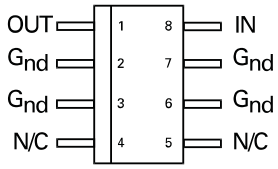


Drop-Out Votlage v Temperature

ZR78L SERIES

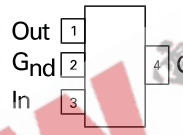
CONNECTION DIAGRAMS

SO8 Package Suffix – N8



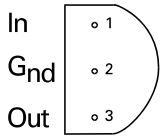
Top View

SOT223 Package Suffix – G



Top View –
Connect pin 4 to pin 2 or leave pin 4 electrically isolated

TO92 Package Suffix – C



Bottom View

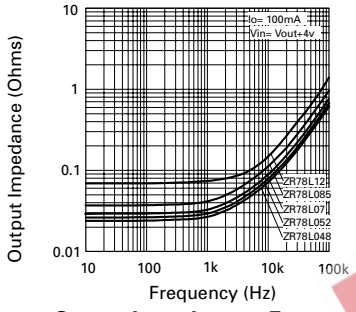
OPTIONS

Voltage	Voltage Options	TO92	SOT223	SO8
2.85V	028	✓	✓	
3.0V	03	✓	✓	
3.3V	033	✓	✓	✓
4.0V	04	✓	✓	
4.8V	048	✓	✓	
5.0V	05	✓	✓	✓
5.2V	052	✓	✓	
5.7V	057	✓	✓	
6.0V	06	✓	✓	
7.0V	07	✓	✓	
8.0V	08	✓	✓	
8.5V	085	✓	✓	
9.0V	09	✓	✓	
10.0V	10	✓	✓	
12.0V	12	✓	✓	

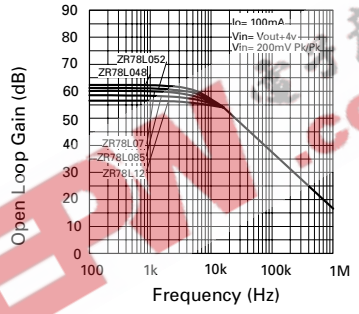
ZR78L048 ZR78L052
ZR78L07 ZR78L085
ZR78L12

ZR78L SERIES

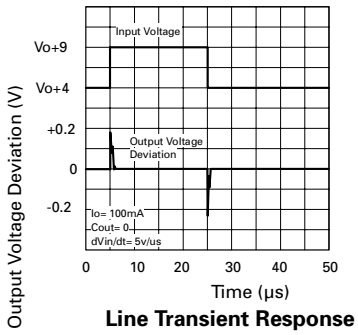
TYPICAL CHARACTERISTICS



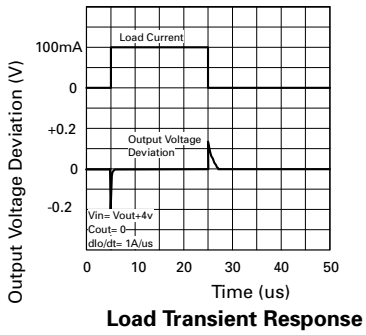
Output Impedance v Frequency



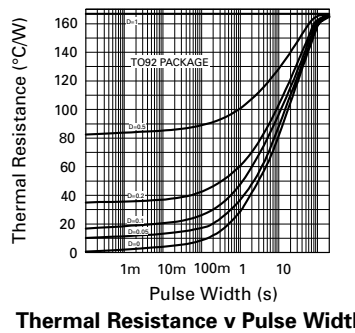
Ripple Rejection v Ripple Frequency



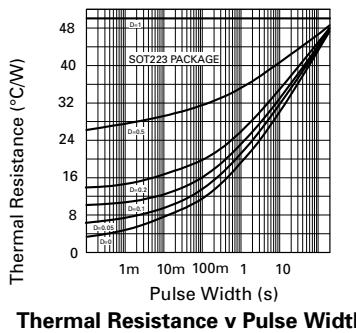
Line Transient Response



Load Transient Response



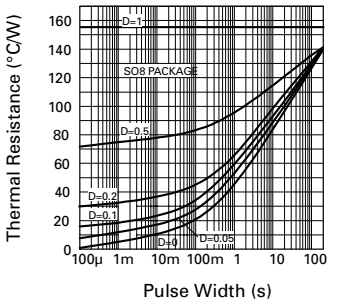
Thermal Resistance v Pulse Width



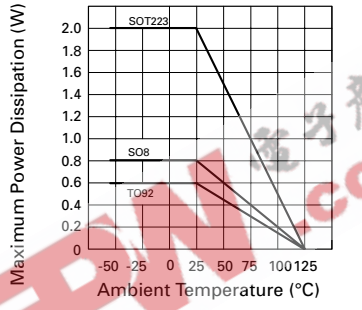
Thermal Resistance v Pulse Width

ZR78L SERIES

THERMAL CHARACTERISTICS



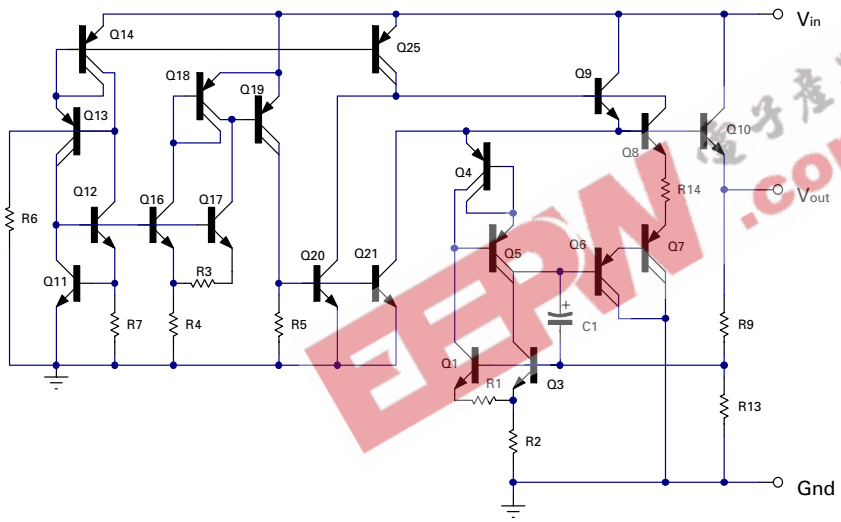
Thermal Resistance v Pulse Width



Power dissipation Derating

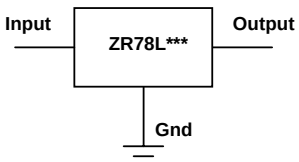
ZR78L SERIES

SCHEMATIC DIAGRAM

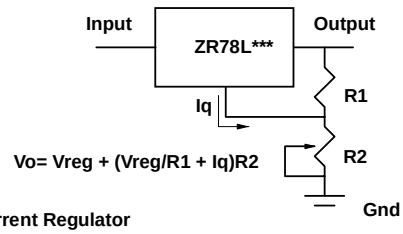


APPLICATIONS

Fixed Output Regulator

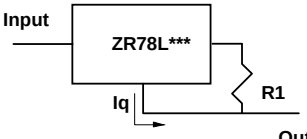


Adjustable Output Regulator



Vo= Vreg + (Vreg/R1 + Iq)R2

Current Regulator



Io= (Vreg/R1) + Iq