WR78LXX

3 Terminal 100mA Positive Voltage Regulator

1. General Description

The WR78LXX are 100mA bipolar linear regulators. They are available in TO92-3, SOT89-3, SOT-23 and SOP-8 packages. The fixed output voltage accuracy of the WR78LXX is less than 4%. This family of regulators is very suited for low output current applications.

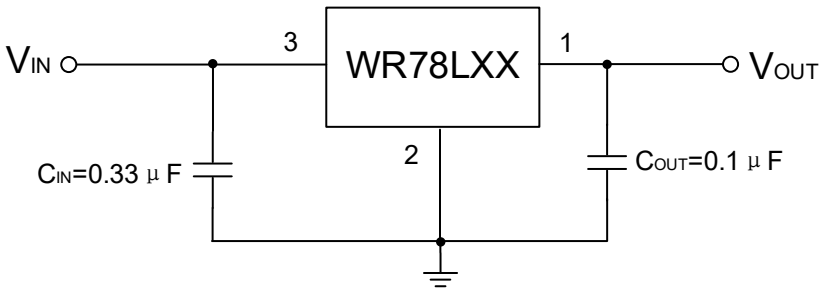
2. Features

- Maximum Output Current of 100mA
- Output Voltage Available in 5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 20V and 24V
- Thermal Shutdown Protection
- Output Transistor SOA Protection
- Internal Short Circuit Current Limiting
- 4% Output Voltage Tolerance
- Package:TO92-3, SOT89-3, SOT-23 and SOP-8

3. Applications）

- LCD TV/ Monitors
- Networking Applications
- Communication Devices.
- PC Applications

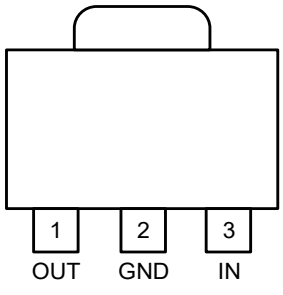
4. Typical Application



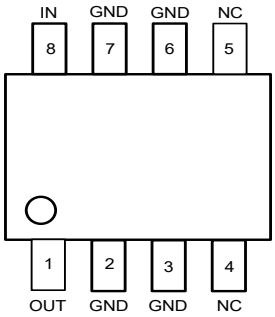
Note: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators.

5. Pin Configuration

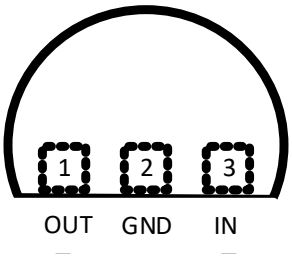
(Top View)



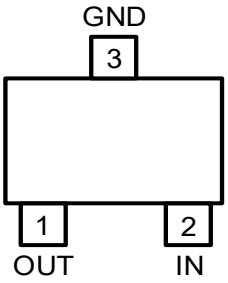
SOT89-3



SOP-8



TO-92-3



SOT-23

6. Pin Description

PIN NUMBER				PIN NAME	I/O	PIN FUNCTION
TO-92-3	SOT89-3	SOT-23	SOP-8			
3	3	2	8	IN	I	Input voltage supply. Bypass with a typical 0.33μF capacitor to GND. Place the input capacitor as close to IN and GND pins of the device as possible.
2	2	3	2,3,6,7	GND	-	Common ground.
1	1	1	1	OUT	O	Regulated output voltage. A low equivalent series resistance (ESR) capacitor, typically 0.1μF, is required from OUT to ground for stability.
-	-	-	4,5	NC	-	NC.

7. Absolute Maximum Ratings

Operating free-air temperature range (unless otherwise noted)[1]

SYMBOL	PARAMETER		RATING	UNIT
V_{IN}	Input Voltage		40	V
T_{JMAX}	Junction Temperature [2]		150	°C
T_{STG}	Storage Temperature Range		-60 to +150	°C
T_{SDR}	Lead Temperature Range		260	°C
$R_{\theta JC}$	Thermal Resistance [3][4] (Junction to Case)	SOT89-3	60	°C/W
		SOP-8	40	
		TO92-3	80	
		SOT-23	80	
$R_{\theta JA}$	Thermal Resistance [3][4] (Junction to Ambient)	SOT89-3	180	°C/W
		SOP-8	154	
		TO92-3	200	
		SOT-23	210	
P_D	Power Dissipation	SOT89-3	690	mW
		SOP-8	810	
		TO92-3	625	
		SOT-23	595	

NOTE1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE2: Maximum Junction Temperature is the temperature limit of this device. Over this limit, the IC may be damaged permanently. Operation Junction Temperature Range is the range the device intended to be functional, but specific performance is not guaranteed. For guaranteed specifications and the test conditions, please refer to the Electrical Characteristics.

NOTE3: Measured according to JEDEC board specification. Detailed description of the board can be found in JESD51−7.

NOTE4: Measured on 2cm x 2cm 2-layer FR4 PCB board, 2 oz copper, no via holes on GND copper.

8. Recommended Operating Conditions

SYMBOL	PARAMETER		RATING	UNIT
V_{IN}	Input Voltage	V_{OUT} = 5 V to 10 V	30	V
		V_{OUT} = 12 V to 18 V	36	
		V_{OUT} = 20 V to 24 V	36	
I_{OUT}	Output Current		0 to 100	mA
C_{IN}	Input capacitor		0.33	µF
C_{OUT}	Output capacitor		0.1	
T_J	Operating Junction Temperature Range [2]		-40 to 125	°C

9. Electrical Characteristics

9.1 WR78L05

(V_{IN}=10V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_A=25°C, unless otherwise noted

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{OUT}	Output Voltage		4.8	5.0	5.2	V
		7V ≤ V_{IN} ≤ 20V, 1mA ≤ I_{OUT} ≤ 100mA, -40℃ ≤ T_J ≤ 125℃, P_D ≤ 0.625W[5]	4.75		5.25	
V_{DO}	Dropout Voltage [6]	I_{OUT}=40mA		1.5		V
		I_{OUT}=100mA		1.6		
I_{LIM}	Output current limit	V_{IN}=10V		350		mA
I_{OUT}	Maximum output current in the accuracy range	V_{IN}=10V	100			mA
LNR	Line Regulation [7]	7V ≤ V_{IN} ≤ 20V		10	100	mV
LDR	Load Regulation [7]	1mA ≤ I_{OUT} ≤ 100mA		6	60	mV
I_Q	Quiescent Current	I_{OUT}=0mA		3	5.5	mA
ΔI_Q	Quiescent Current Change	7V ≤ V_{IN} ≤ 20V			1.5	mA
		1mA ≤ I_{OUT} ≤ 40mA			0.1	
PSRR	Power Supply Ripple Rejection	f=120Hz		65		dB
		f=1kHz		70		dB
V_{NO}	Output Noise Voltage [8]	10Hz ≤ f ≤ 100kHz		40		μV
$\frac{\Delta V_{OUT}}{\Delta T}$	Output Voltage Temperature Coefficient[9]	I_{OUT}=5mA, -40℃ ≤ T_J ≤ 125℃		0.27		mV/℃

9.2 WR78L06

(V_{IN}=12V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_A=25°C, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{OUT}	Output Voltage		5.76	6.0	6.24	V
		8.5V ≤ V_{IN} ≤ 20V, 1mA ≤ I_{OUT} ≤ 100mA, -40℃ ≤ T_J ≤ 125℃, P_D ≤ 0.625W[5]	5.70		6.30	
V_{DO}	Dropout Voltage [6]	I_{OUT}=40mA		1.5		V
		I_{OUT}=100mA		1.6		
I_{LIM}	Output current limit	V_{IN}=12V		350		mA
I_{OUT}	Maximum output current in the accuracy range	V_{IN}=12V	100			mA
LNR	Line Regulation [7]	8.5V ≤ V_{IN} ≤ 20V		10	110	mV
LDR	Load Regulation [7]	1mA ≤ I_{OUT} ≤ 100mA		10	70	mV
I_Q	Quiescent Current	I_{OUT}=0mA		3	5.5	mA
ΔI_Q	Quiescent Current Change	7V ≤ V_{IN} ≤ 20V			1.5	mA
		1mA ≤ I_{OUT} ≤ 40mA			0.1	
PSRR	Power Supply Ripple Rejection	f=120Hz		62		dB
V_{NO}	Output Noise Voltage [8]	10Hz ≤ f ≤ 100kHz		49		μV
$\frac{\Delta V_{OUT}}{\Delta T}$	Output Voltage Temperature Coefficient[9]	I_{OUT}=5mA, -40℃ ≤ T_J ≤ 125℃		0.65		mV/℃

9.3 WR78L08

(V_{IN}=14V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_A=25°C, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{OUT}	Output Voltage		7.68	8.0	8.32	V
		10.5V ≤ V_{IN} ≤ 23V, 1mA ≤ I_{OUT} ≤ 100mA, -40℃ ≤ T_J ≤ 125℃, P_D ≤ 0.625W[5]	7.60		8.40	
V_{DO}	Dropout Voltage [6]	I_{OUT}=40mA		1.5		V
		I_{OUT}=100mA		1.6		
I_{LIM}	Output current limit	V_{IN}=14V		350		mA
I_{OUT}	Maximum output current in the accuracy range	V_{IN}=14V	100			mA
LNR	Line Regulation [7]	10.5V ≤ V_{IN} ≤ 23V		17	120	mV
LDR	Load Regulation [7]	1mA ≤ I_{OUT} ≤ 100mA		18	80	mV
I_Q	Quiescent Current	I_{OUT}=0mA		3	5.5	mA
ΔI_Q	Quiescent Current Change	11V ≤ V_{IN} ≤ 23V			1.5	mA
		1mA ≤ I_{OUT} ≤ 40mA			0.1	
PSRR	Power Supply Ripple Rejection	f=120Hz		62		dB
V_{NO}	Output Noise Voltage [8]	10Hz ≤ f ≤ 100kHz		49		μV
$\frac{\Delta V_{OUT}}{\Delta T}$	Output Voltage Temperature Coefficient[9]	I_{OUT}=5mA, -40℃ ≤ T_J ≤ 125℃		0.75		mV/℃

9.4 WR78L09

(V_{IN}=15V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_A=25°C, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{OUT}	Output Voltage		8.64	9.0	9.36	V
		11.5V ≤ V_{IN} ≤ 24V, 1mA ≤ I_{OUT} ≤ 100mA, -40℃ ≤ T_J ≤ 125℃, P_D ≤ 0.625W[5]	8.55		9.45	
V_{DO}	Dropout Voltage [6]	I_{OUT}=40mA		1.5		V
		I_{OUT}=100mA		1.6		
I_{LIM}	Output current limit	V_{IN}=15V		350		mA
I_{OUT}	Maximum output current in the accuracy range	V_{IN}=15V	100			mA
LNR	Line Regulation [7]	11.5V ≤ V_{IN} ≤ 24V		20	120	mV
LDR	Load Regulation [7]	1mA ≤ I_{OUT} ≤ 100mA		20	90	mV
I_Q	Quiescent Current	I_{OUT}=0mA		3	5.5	mA
ΔI_Q	Quiescent Current Change	13V ≤ V_{IN} ≤ 24V			1.5	mA
		1mA ≤ I_{OUT} ≤ 40mA			0.1	
PSRR	Power Supply Ripple Rejection	f=120Hz		60		dB
V_{NO}	Output Noise Voltage [8]	10Hz ≤ f ≤ 100kHz		70		μV
$\frac{\Delta V_{OUT}}{\Delta T}$	Output Voltage Temperature Coefficient[9]	I_{OUT}=5mA, -40℃ ≤ T_J ≤ 125℃		0.75		mV/℃

9.5 WR78L10

(V_{IN}=17V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_A=25°C, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{OUT}	Output Voltage		9.6	10.0	10.4	V
		12.5V ≤ V_{IN} ≤ 25V, 1mA ≤ I_{OUT} ≤ 100mA, -40℃ ≤ T_J ≤ 125℃, P_D ≤ 0.625W[5]	9.5		10.5	
V_{DO}	Dropout Voltage [6]	I_{OUT}=40mA		1.5		V
		I_{OUT}=100mA		1.6		
I_{LIM}	Output current limit	V_{IN}=17V		350		mA
I_{OUT}	Maximum output current in the accuracy range	V_{IN}=17V	100			mA
LNR	Line Regulation [7]	12.5V ≤ V_{IN} ≤ 25V		25	130	mV
LDR	Load Regulation [7]	1mA ≤ I_{OUT} ≤ 100mA		20	90	mV
I_Q	Quiescent Current	I_{OUT}=0mA		3	5.5	mA
ΔI_Q	Quiescent Current Change	12.5V ≤ V_{IN} ≤ 25V			1.5	mA
		1mA ≤ I_{OUT} ≤ 40mA			0.1	
PSRR	Power Supply Ripple Rejection	f=120Hz, 14V ≤ V_{IN} ≤ 25V, I_{OUT}=40mA		60		dB
V_{NO}	Output Noise Voltage [8]	10Hz ≤ f ≤ 100kHz		60		μV
$\frac{\Delta V_{OUT}}{\Delta T}$	Output Voltage Temperature Coefficient[9]	I_{OUT}=5mA, -40℃ ≤ T_J ≤ 125℃		1.0		mV/℃

9.6 WR78L12

(V_{IN}=19V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_A=25°C, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{OUT}	Output Voltage		11.5	12.0	12.5	V
		14.5V ≤ V_{IN} ≤ 27V, 1mA ≤ I_{OUT} ≤ 100mA, -40℃ ≤ T_J ≤ 125℃, P_D ≤ 0.625W[5]	11.4		12.6	
V_{DO}	Dropout Voltage [6]	I_{OUT}=40mA		1.5		V
		I_{OUT}=100mA		1.6		
I_{LIM}	Output current limit	V_{IN}=19V		350		mA
I_{OUT}	Maximum output current in the accuracy range	V_{IN}=19V	100			mA
LNR	Line Regulation [7]	14.5V ≤ V_{IN} ≤ 27V		30	150	mV
LDR	Load Regulation [7]	1mA ≤ I_{OUT} ≤ 100mA		30	100	mV
I_Q	Quiescent Current	I_{OUT}=0mA		3	6	mA
ΔI_Q	Quiescent Current Change	14.5V ≤ V_{IN} ≤ 27V			1.5	mA
		1mA ≤ I_{OUT} ≤ 40mA			0.1	
PSRR	Power Supply Ripple Rejection	f=120Hz, 16V ≤ V_{IN} ≤ 27V, I_{OUT}=40mA		55		dB
V_{NO}	Output Noise Voltage [8]	10Hz ≤ f ≤ 100kHz		80		μV
$\frac{\Delta V_{OUT}}{\Delta T}$	Output Voltage Temperature Coefficient[9]	I_{OUT}=5mA, -40℃ ≤ T_J ≤ 125℃		1.2		mV/℃

9.7 WR78L15

(V_{IN}=23V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_A=25°C, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{OUT}	Output Voltage		14.4	15.0	15.6	V
		17.5V ≤ V_{IN} ≤ 30V, 1mA ≤ I_{OUT} ≤ 100mA, -40℃ ≤ T_J ≤ 125℃, P_D ≤ 0.625W[5]	14.25		15.75	
V_{DO}	Dropout Voltage [6]	I_{OUT}=40mA		1.5		V
		I_{OUT}=100mA		1.6		
I_{LIM}	Output current limit	V_{IN}=23V		350		mA
I_{OUT}	Maximum output current in the accuracy range	V_{IN}=23V	100			mA
LNR	Line Regulation [7]	17.5V ≤ V_{IN} ≤30V		40	150	mV
LDR	Load Regulation [7]	1mA ≤ I_{OUT} ≤ 100mA		45	150	mV
I_Q	Quiescent Current	I_{OUT}=0mA		3	6	mA
ΔI_Q	Quiescent Current Change	17.5V ≤ V_{IN} ≤30V			1.5	mA
		1mA ≤ I_{OUT} ≤ 40mA			0.1	
PSRR	Power Supply Ripple Rejection	f=120Hz, 19V ≤ V_{IN} ≤ 30V, I_{OUT}=40mA		50		dB
V_{NO}	Output Noise Voltage [8]	10Hz ≤ f ≤ 100kHz		90		μV
$\frac{\Delta V_{OUT}}{\Delta T}$	Output Voltage Temperature Coefficient[9]	I_{OUT}=5mA, -40℃ ≤ T_J ≤ 125℃		2.0		mV/℃

NOTE5: TO-92 package Power Dissipation (P_D) ≤ 0.625W.

NOTE6: The dropout voltage is defined as (V_{IN}-V_{OUT}) when V_{OUT} is $V_{OUT(NOM)}$×96%.

NOTE7: The maximum steady state usable output current and input voltage are very dependent on the heat sinking and/or lead length of the package. The data above represent pulse test conditions with junction temperature as indicated at the initiation of tests.

NOTE8: A 0.01μF minimum output capacitor is recommended to reduce high frequency noise.

NOTE9: Since products are not screened at high and low temperature, the specification for this temperature range is guaranteed by design, not tested in production.

10. Typical Performance Characteristics

(T_A=25℃, C_{IN} =0.33μF, C_{OUT}=0.1μF, unless otherwise noted)

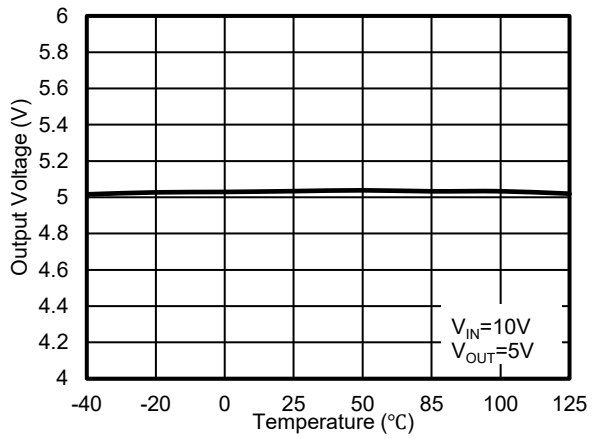


Figure 1. WR78L05-A20R
Output Voltage vs. Ambient Temperature

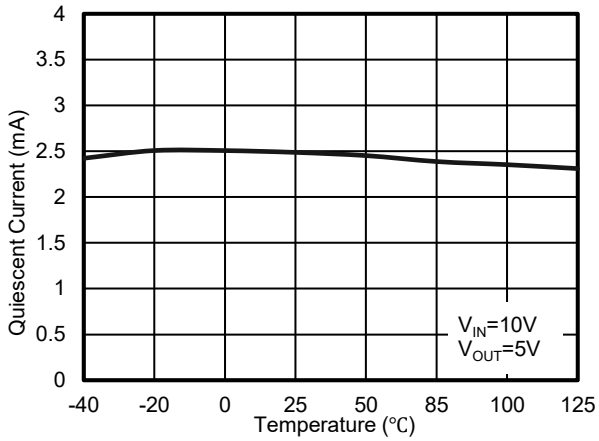


Figure 2. WR78L05-A20R
Quiescent Current vs. Ambient Temperature

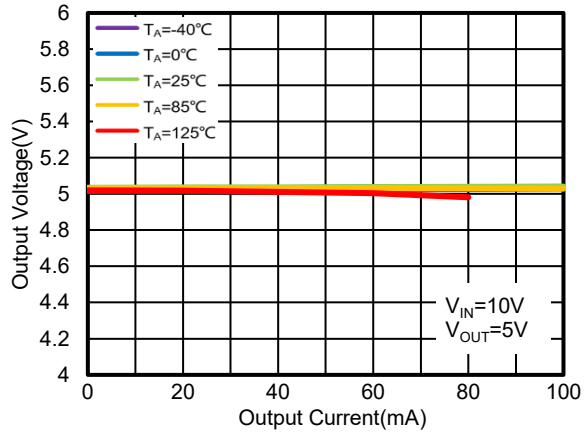


Figure 3. WR78L05-A20R
Load Regulation vs. I_{OUT} & Ambient Temperature

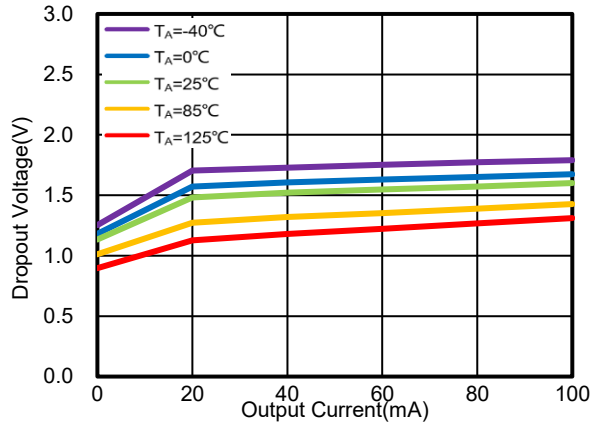


Figure 4. WR78L05-A20R
Dropout Voltage vs. I_{OUT} & Ambient Temperature

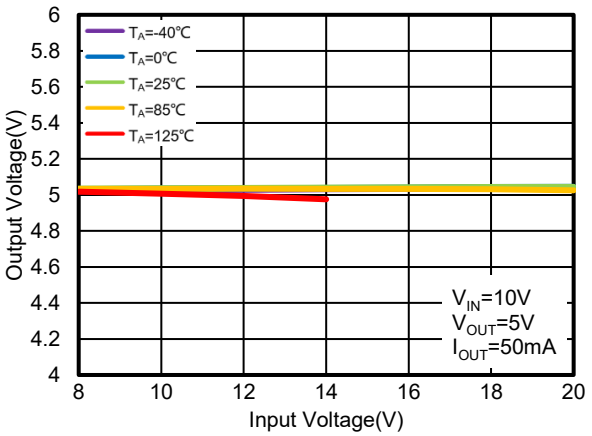


Figure 5. WR78L05-A20R
Line Regulation vs. V_{IN} & Ambient Temperature

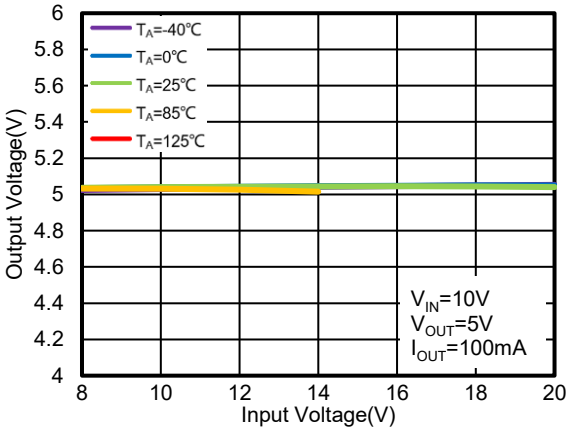


Figure 6. WR78L05-A20R
Line Regulation vs. V_{IN} & Ambient Temperature

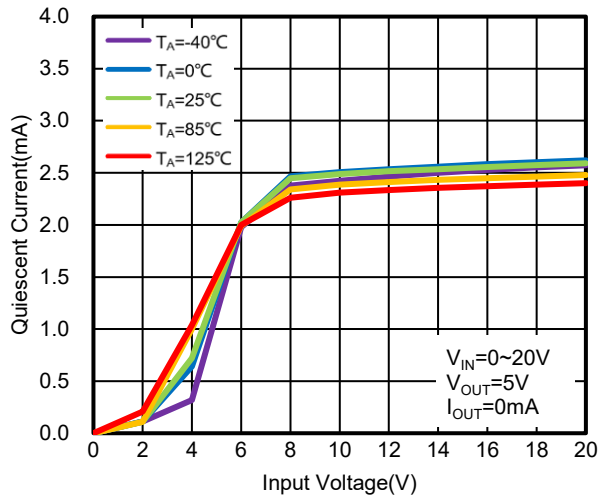


Figure 7. WR78L05-A20R
Quiescent Current vs. V_{IN} & Ambient Temperature

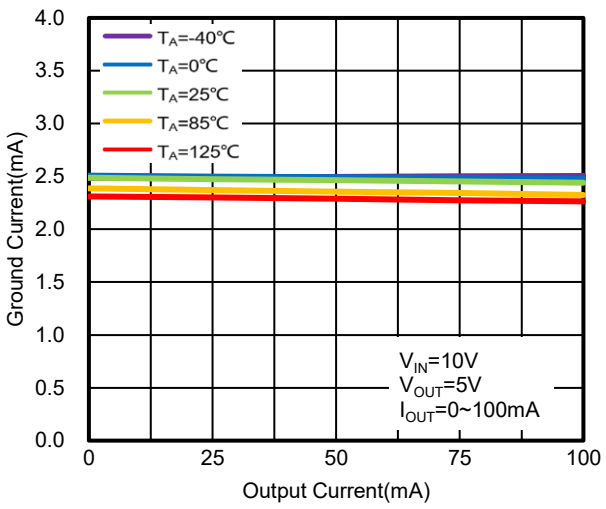


Figure 8. WR78L05-A20R
Ground Current vs. I_{OUT} & Ambient Temperature

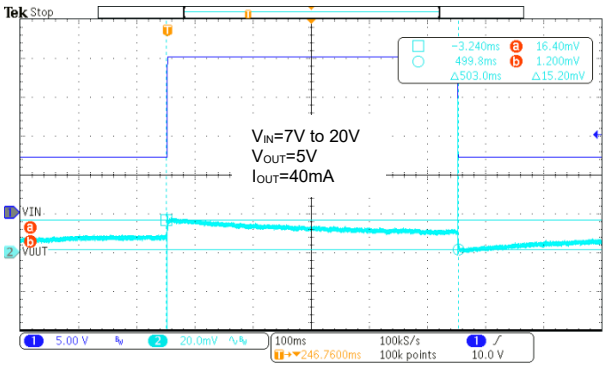


Figure 9. WR78L05-A20R
Line Transient

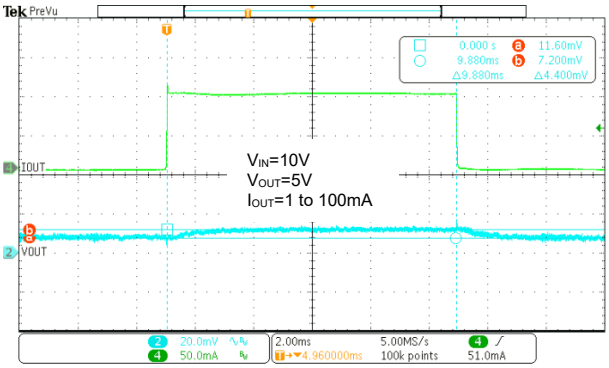


Figure 10. WR78L05-A20R
Load Transient

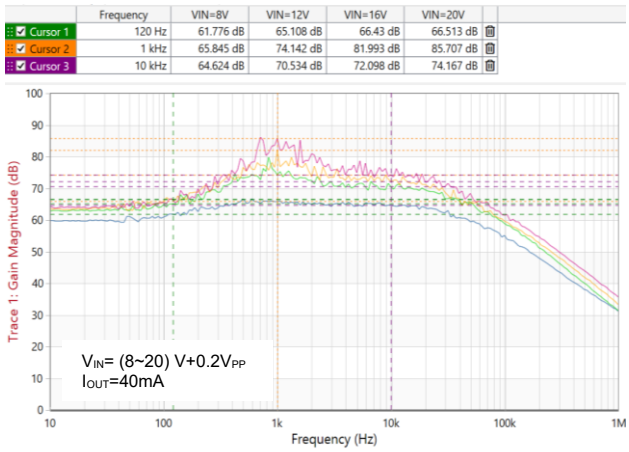
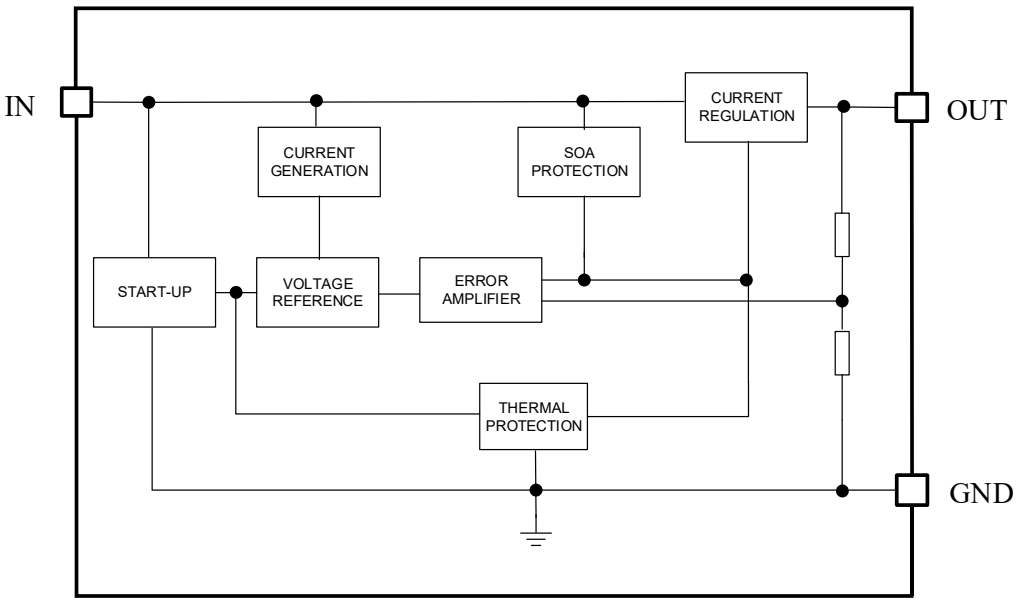


Figure 11. WR78L05-A20R
Power Supply Rejection Ratio vs. Frequency

11. Block Diagram



12. Naming Conventions

WR AAA BB-CCC D

WR: WAYON Regulator;

A: 78L-Product Name;

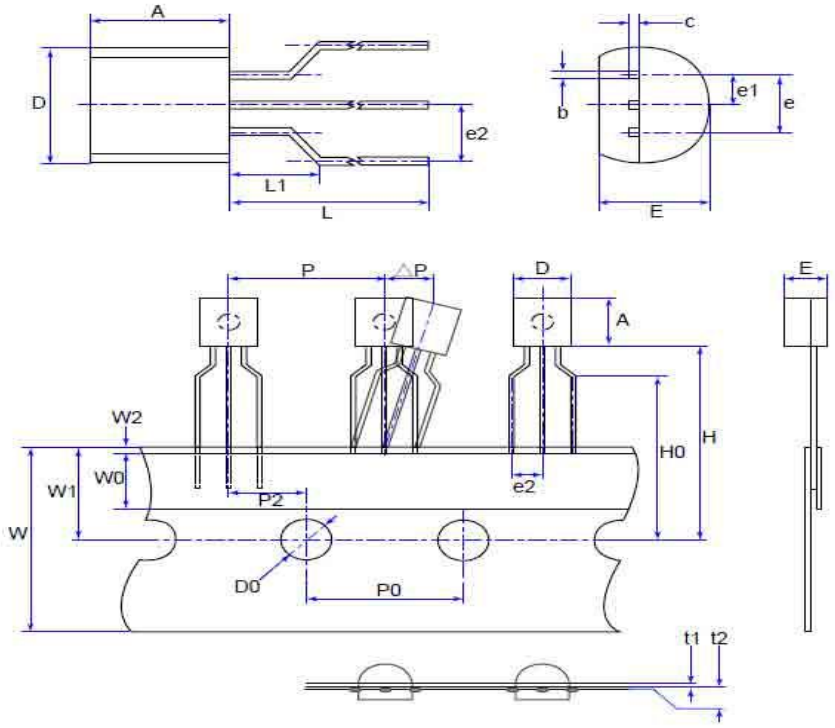
BB: 05-Output Voltage, 5V;
06-Output Voltage, 6V;
08-Output Voltage, 8V;
09-Output Voltage, 9V;
10-Output Voltage, 10V;
12-Output Voltage, 12V;
15-Output Voltage, 15V;
18-Output Voltage, 18V;
20-Output Voltage, 20V;
24-Output Voltage, 24V;

CCC: A20-Package, SOT89-3;
NM1-Package, TO92-3;
S80-Package, SOP-8;
S30R-Package,SOT-23;

D: R-Reel;
B-Tape box;

13. Package Information

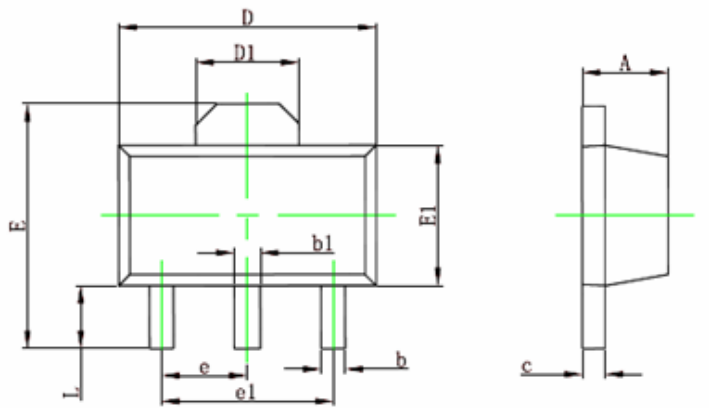
TO92-3



SYMBOL	DIMENSIONS IN MILLIMETERS	
	MIN	MAX
A	4.30	4.70
b	0.38	0.55
c	0.36	0.51
D	4.30	4.70
D0	3.80	4.20
E	3.30	3.70
e	2.44	2.64
e1	1.27TYP	

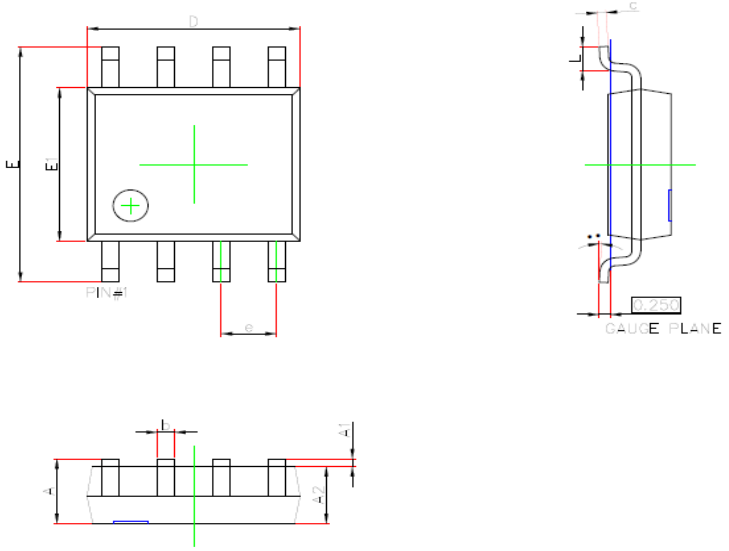
SYMBOL	DIMENSIONS IN MILLIMETERS	
	MIN	MAX
e2	2.20	2.96
H	18.00	21.00
H0	15.50	16.50
L	12.70	-
L1	2.50	4.50
p	12.40	13.00
p0	12.50	12.90
p2	6.05	6.65
t1	0.35	0.45
t2	0.15	0.25
W	17.50	19.00
W0	5.50	6.50
W1	8.50	9.50
W2	-	1.00
Δp	-	1.00

SOT89-3



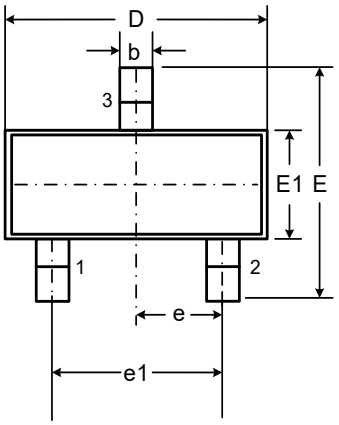
SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	1.4	1.5	1.6
b	0.32	0.42	0.52
b1	0.38	0.48	0.58
c	0.35	0.405	0.46
D	4.40	4.50	4.60
D1	1.5	1.65	1.8
E	3.94	4.12	4.30
E1	2.30	2.45	2.60
e	1.50BSC		
e1	3.00BSC		
L	0.80	1.00	1.20

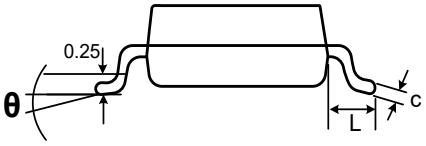
SOP-8

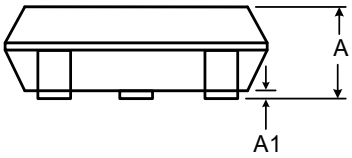


SYMBOLS	DIMENSIONS IN MILLIMETERS	
	MIN	MAX
A	1.350	1.900
A1	0.050	0.250
A2	1.250	1.650
b	0.310	0.510
c	0.170	0.250
D	4.700	5.200
e	1.270(BSC)	
E	5.800	6.200
E1	3.700	4.300
L	0.400	1.270
θ	0°	8°

SOT-23







SYMBOL	DIMENSIONS IN MILLIMETERS	
	MIN	MAX
A	0.90	1.15
A1	0.00	0.10
b	0.30	0.50
c	0.07	0.15
D	2.80	3.04
E	2.25	2.64
E1	1.20	1.40
e	0.95BSC	
e1	1.80	2.00
L	0.55REF	
θ	0°	8°

14. Ordering Information

PART NUMBER	OUTPUT VOLTAGE	PACKAGE	PACKING QUANTITY
WR78L05-NM1B	5.0V	TO92-3	2k/Tape box
WR78L06- NM1B	6.0V	TO92-3	2k/Tape box
WR78L08- NM1B	8.0V	TO92-3	2k/Tape box
WR78L09- NM1B	9.0V	TO92-3	2k/Tape box
WR78L10- NM1B	10V	TO92-3	2k/Tape box
WR78L12- NM1B	12V	TO92-3	2k/Tape box
WR78L15- NM1B	15V	TO92-3	2k/Tape box
WR78L18- NM1B	18V	TO92-3	2k/Tape box
WR78L20- NM1B	20V	TO92-3	2k/Tape box
WR78L24- NM1B	24V	TO92-3	2k/Tape box
WR78L05-A20R	5.0V	SOT89-3	1k/Reel
WR78L06-A20R	6.0V	SOT89-3	1k/Reel
WR78L08-A20R	8.0V	SOT89-3	1k/Reel
WR78L09-A20R	9.0V	SOT89-3	1k/Reel
WR78L10-A20R	10V	SOT89-3	1k/Reel
WR78L12-A20R	12V	SOT89-3	1k/Reel
WR78L15-A20R	15V	SOT89-3	1k/Reel
WR78L18-A20R	18V	SOT89-3	1k/Reel
WR78L20-A20R	20V	SOT89-3	1k/Reel
WR78L24-A20R	24V	SOT89-3	1k/Reel
WR78L05-S80R	5.0V	SOP-8	4k/Reel
WR78L06-S80R	6.0V	SOP-8	4k/Reel

PART NUMBER	OUTPUT VOLTAGE	PACKAGE	PACKING QUANTITY
WR78L08-S80R	8.0V	SOP-8	4k/Reel
WR78L09-S80R	9.0V	SOP-8	4k/Reel
WR78L10-S80R	10V	SOP-8	4k/Reel
WR78L12-S80R	12V	SOP-8	4k/Reel
WR78L15-S80R	15V	SOP-8	4k/Reel
WR78L18-S80R	18V	SOP-8	4k/Reel
WR78L20-S80R	20V	SOP-8	4k/Reel
WR78L24-S80R	24V	SOP-8	4k/Reel
WR78L05-S30R	5.0V	SOT-23	3k/Reel
WR78L06-S30R	6.0V	SOT-23	3k/Reel
WR78L08-S30R	8.0V	SOT-23	3k/Reel
WR78L09-S30R	9.0V	SOT-23	3k/Reel
WR78L10-S30R	10V	SOT-23	3k/Reel
WR78L12-S30R	12V	SOT-23	3k/Reel
WR78L15-S30R	15V	SOT-23	3k/Reel
WR78L18-S30R	18V	SOT-23	3k/Reel
WR78L20-S30R	20V	SOT-23	3k/Reel
WR78L24-S30R	24V	SOT-23	3k/Reel

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Product Specification Statement

1.The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

2.The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

3.WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

4.Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

5.The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.

6.Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. WAYON shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.