

# KA79XX/KA79XXA

## 3-Terminal 1A Negative Voltage Regulator

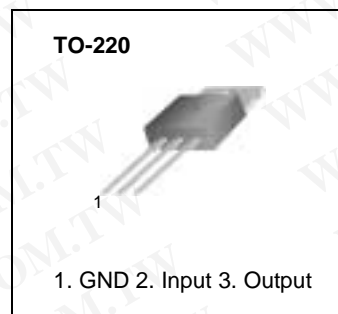
### Features

- Output Current in Excess of 1A
- Output Voltages of -5, -6, -8, -9, -10, -12, -15, -18, -24V
- Internal Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Compensation

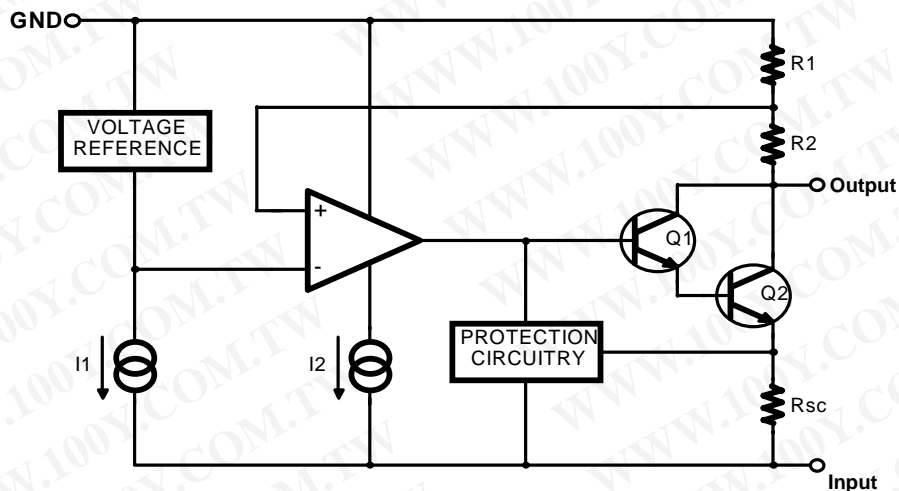
### Description

The KA79XX/KA79XXA series of three-terminal negative regulators are available in TO-220 package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shutdown and safe operating area protection, making it essentially indestructible.

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### Internal Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage	$V_I$	-35	V
Thermal Resistance Junction-Cases Junction-Air	$R_{\theta JC}$ $R_{\theta JA}$	5 65	$^{\circ}C/W$
Operating Temperature Range	TOPR	0 ~ +125	$^{\circ}C$
Storage Temperature Range	TSTG	- 65 ~ +150	$^{\circ}C$

## Electrical Characteristics (KA7905)

( $V_I = -10V$ ,  $I_O = 500mA$ ,  $0^{\circ}C \leq T_J \leq +125^{\circ}C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	$V_O$	$T_J = +25^{\circ}C$	- 4.8	- 5.0	- 5.2	V
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -7V$ to -20V	- 4.75	- 5.0	- 5.25	
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^{\circ}C$ $V_I = -7V$ to -20V $I_O = 1A$	-	5	50	mV
		$V_I = -8V$ to -12V $I_O = 1A$	-	2	25	
		$V_I = -7.5V$ to -25V	-	7	50	
		$V_I = -8V$ to -12V $I_O = 1A$	-	7	50	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^{\circ}C$ $I_O = 5mA$ to 1.5A	-	10	100	mV
		$T_J = +25^{\circ}C$ $I_O = 250mA$ to 750mA	-	3	50	
Quiescent Current	$I_Q$	$T_J = +25^{\circ}C$	-	3	6	mA
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	0.05	0.5	mA
		$V_I = -8V$ to -25V	-	0.1	0.8	
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	- 0.4	-	$mV/^{\circ}C$
Output Noise Voltage	$V_N$	$f = 10Hz$ to 100KHz $T_A = +25^{\circ}C$	-	40	-	$\mu V$
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB
Dropout Voltage	$V_D$	$T_J = +25^{\circ}C$ $I_O = 1A$	-	2	-	V
Short Circuit Current	$I_{SC}$	$T_J = +25^{\circ}C$ , $V_I = -35V$	-	300	-	mA
Peak Current	$I_{PK}$	$T_J = +25^{\circ}C$	-	2.2	-	A

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

## Electrical Characteristics (KA7906)

( $V_I = -11V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	- 5.75	- 6	- 6.25	V	
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -9V$ to -21V	- 5.7	- 6	- 6.3		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -8V$ to -25V	-	10	120	mV
			$V_I = -9V$ to -12V	-	5	60	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to 1.5A	-	10	120	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to 750mA	-	3	60		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	-	0.5	mA	
		$V_I = -9V$ to -25V	-	-	1.3		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.5	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to 100KHz $T_A = +25^\circ C$	-	130	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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**Electrical Characteristics (KA7908)**(V<sub>I</sub> = -14V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> =+25°C	- 7.7	- 8	- 8.3	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -10V to -23V	- 7.6	- 8	- 8.4		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> =+25°C	V <sub>I</sub> = -10.5V to -25V	-	10	100	mV
			V <sub>I</sub> = -11V to -17V	-	5	80	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> =+25°C I <sub>O</sub> = 5mA to 1.5A	-	12	160	mV	
		T <sub>J</sub> =+25°C I <sub>O</sub> = 250mA to 750mA	-	4	80		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> =+25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -11.5V to -25V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.6	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100KHz T <sub>A</sub> =+25°C	-	175	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> =+25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> =+25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> =+25°C	-	2.2	-	A	

**Note**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7909)

( $V_I = -14V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	- 8.7	- 9.0	- 9.3	V	
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -1.5V$ to -23V	- 8.6	- 9.0	- 9.4		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -10.5V$ to -25V	-	10	180	mV
			$V_I = -11V$ to -17V	-	5	90	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to 1.5A	-	12	180	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to 750mA	-	4	90		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	0.05	0.5	mA	
		$V_I = -11.5V$ to -25V	-	0.1	1		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.6	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to 100KHz $T_A = +25^\circ C$	-	175	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7910)

( $V_I = -17V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	- 10.5	- 10	- 11.5	V	
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -12V$ to -28	- 10.4	- 10	- 11.6		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -12.5V$ to -28V	-	12	200	mV
			$V_I = -14V$ to -20V	-	6	100	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to 1.5A	-	12	200	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to 750mA	-	4	100		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	0.05	0.5	mA	
		$V_I = -13$ to -28V	-	0.1	1		
Temperature Coefficient of $V_O$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-1	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ $T_A = +25^\circ C$	-	280	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7912)

( $V_I = -18V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	-11.5	-12	-12.5	V	
		$I_O = 5mA$ to $1A$ , $P_O \leq 15W$ $V_I = -15.5V$ to $-27V$	-11.4	-12	-12.6		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -14.5V$ to $-30V$	-	12	240	mV
			$V_I = -16V$ to $-22V$	-	6	120	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to $1.5A$	-	12	240	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to $750mA$	-	4	120		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to $1A$	-	0.05	0.5	mA	
		$V_I = -15V$ to $-30V$	-	0.1	1		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.8	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100KHz$ $T_A = +25^\circ C$	-	200	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7915)

( $V_I = -23V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	-14.4	-15	-15.6	V	
		$I_O = 5mA$ to $1A$ , $P_O \leq 15W$ $V_I = -18V$ to $-30V$	-14.25	-15	-15.75		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -17.5V$ to $-30V$	-	12	300	mV
			$V_I = -20V$ to $-26V$	-	6	150	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$I_O = 5mA$ to $1.5A$	-	12	300	mV
			$I_O = 250mA$ to $750mA$	-	4	150	
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to $1A$ $V_I = -18.5V$ to $-30V$	-	0.05	0.5	mA	
			-	0.1	1		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.9	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100KHz$ $T_A = +25^\circ C$	-	250	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7918)

( $V_I = -27V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	-17.3	-18	-18.7	V	
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -22.5V$ to -33V	-17.1	-18	-18.9		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -21V$ to -33V	-	15	360	mV
			$V_I = -24V$ to -30V	-	8	180	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to 1.5A	-	15	360	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to 750mA	-	5	180		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	-	0.5	mA	
		$V_I = -22V$ to -33V	-	-	1		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-1	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to 100KHz $T_A = +25^\circ C$	-	300	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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**Electrical Characteristics (KA7924)**(V<sub>I</sub> = -33V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> =+25°C	- 23	- 24	- 25	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -27V to -38V	- 22.8	- 24	- 25.2		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> =+25°C	V <sub>I</sub> = - 27V to - 38V	-	15	480	mV
			V <sub>I</sub> = - 30V to - 36V	-	8	180	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> =+25°C I <sub>O</sub> = 5mA to 1.5A	-	15	480	mV	
		T <sub>J</sub> =+25°C I <sub>O</sub> = 250mA to 750mA	-	5	240		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> =+25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	-	0.5	mA	
		V <sub>I</sub> = -27V to -38V	-	-	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-1	-	mV/ °C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100KHz T <sub>A</sub> =+25°C	-	400	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> =+25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> =+25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> =+25°C	-	2.2	-	A	

**Note**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7905A)

( $V_I = -10V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	- 4.9	- 5.0	- 5.1	V	
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -7V$ to -20V	- 4.8	-5.0	- 5.2		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -7V$ to -20V $I_O = 1A$	-	5	50	mV
			$V_I = -8V$ to -12V $I_O = 1A$	-	2	25	
		$T_J = +25^\circ C$ $V_I = -7.5V$ to -25V	-	7	50		
		$V_I = -8V$ to -12V $I_O = 1A$	-	7	50		
Load Regulation (Note1)	$\Delta V_O$	$I_O = 5mA$ to 1.5A	-	10	100	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to 750mA	-	3	50		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	0.05	0.5	mA	
		$V_I = -8V$ to -25V	-	0.1	0.8		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	- 0.4	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to 100KHz $T_A = +25^\circ C$	-	40	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7912A)

( $V_I = -18V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	-11.75	-12	-12.25	V	
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -15.5V$ to -27V	-11.5	-12	-12.5		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -14.5V$ to -30V	-	12	240	mV
			$V_I = -16V$ to -22V	-	6	120	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to 1.5A	-	12	240	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to 750mA	-	4	120		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	0.05	0.5	mA	
		$V_I = -15V$ to -30V	-	0.1	1		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.8	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to 100KHz $T_A = +25^\circ C$	-	200	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Electrical Characteristics (KA7915A)

( $V_I = -18V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	-14.7	-15	-15.3	V	
		$I_O = 5mA$ to $1A$ , $P_O \leq 15W$ $V_I = -18V$ to $-30V$	-14.4	-15	-15.6		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -17.5V$ to $-30V$	-	12	300	mV
			$V_I = -20V$ to $-26V$	-	6	150	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to $1.5A$	-	12	300	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to $750mA$	-	4	150		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to $1A$	-	0.05	0.5	mA	
		$V_I = -18.5V$ to $-30V$	-	0.1	1		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.9	-	mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100KHz$ $T_A = +25^\circ C$	-	250	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	ISC	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	IPK	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

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## Typical Performance Characteristics

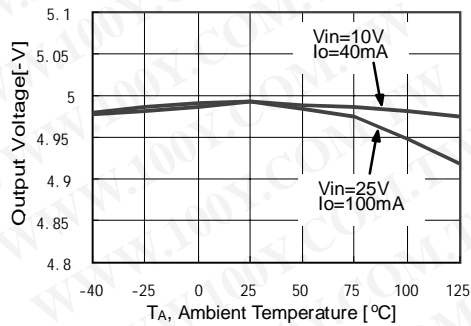


Figure 1. Output Voltage

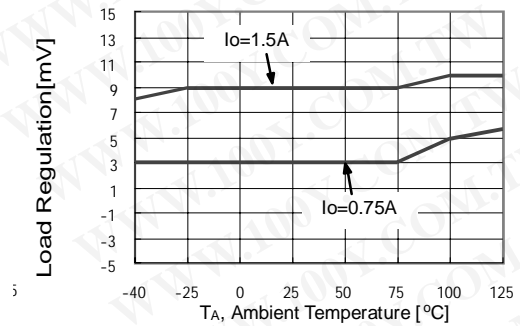


Figure 2. Load Regulation

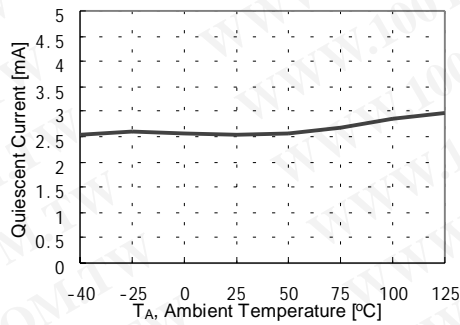


Figure 3. Quiescent Current

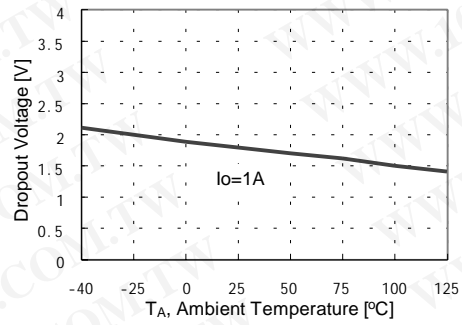


Figure 4. Dropout Voltage

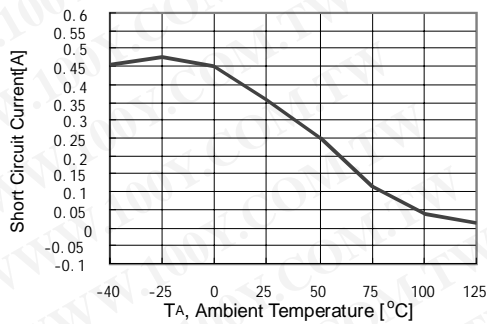


Figure 5. Short Circuit Current

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## Typical Applications

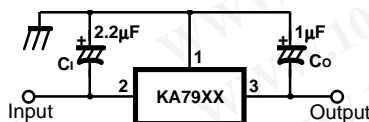


Figure 6. Negative Fixed output regulator

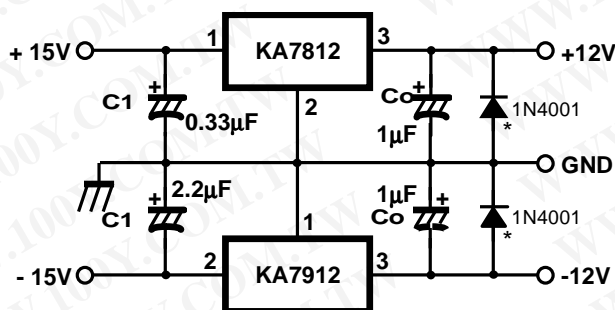


Figure 7. Split power supply ( ± 12V/1A)

### Notes:

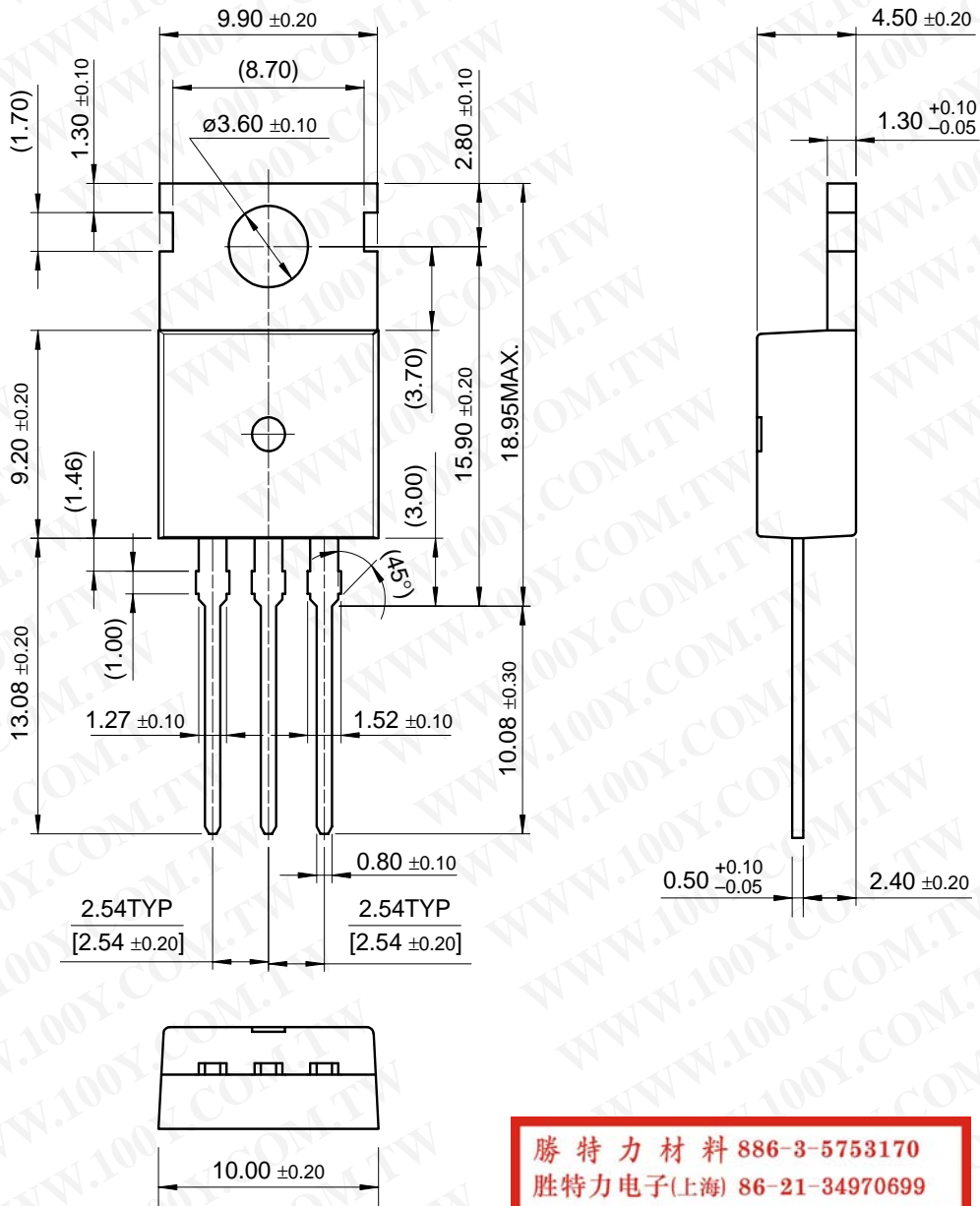
- (1) To specify an output voltage, substitute voltage value for "XX "
- (2) Required for stability. For value given, capacitor must be solid tantalum. If aluminium electronics are used, at least ten times value shown should be selected. C<sub>1</sub> is required if regulator is located an appreciable distance from power supply filter.
- (3) To improve transient response. If large capacitors are used, a high current diode from input to output (1N4001 or similar) should be introduced to protect the device from momentary input short circuit.

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# Mechanical Dimensions

## Package

### TO-220



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## Ordering Information

Product Number	Output Voltage Tolerance	Package	Operating Temperature
KA7905	±4%	TO-220	0 ~ + 125°C
KA7906			
KA7908			
KA7909			
KA7910			
KA7912			
KA7915			
KA7918			
KA7924			
KA7905A	± 2%		
KA7912A			
KA7915A			

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.