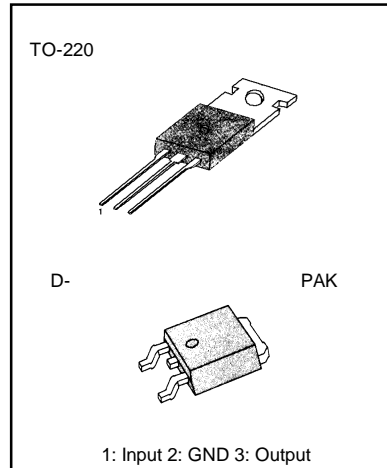


**3-TERMINAL 1A POSITIVE VOLTAGE REGULATORS**

The KA78XX series of three-terminal positive regulators are available in the 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 shut-down and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents

**FEATURES**

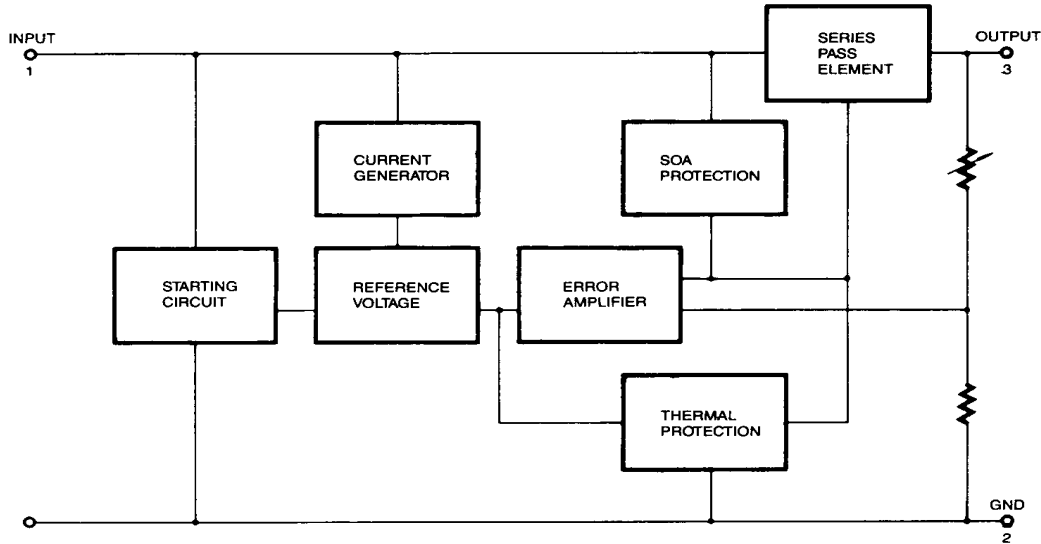
- Output Current up to 1A
- Output Voltages of 5, 6, 8, 9, 10, 11, 12, 15, 18, 24V
- Thermal Overload Protection
- Short Circuit Protection
- Output Transistor SOA Protection



**ORDERING INFORMATION**

Device	Package	Operating Temperature
KA78XX	TO-220	0 ~ +125°C
KA78XXA	TO-220	
KA78XXI	TO-220	-40 ~ +125°C
KA78XXR	D-PAK	0 ~ +125°C
KA78XXRA	D-PAK	
KA78XXRI	D-PAK	-40 ~ +125°C

**BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

Characteristic	Symbol	Value	Unit
Input Voltage (for $V_O = 5\text{V}$ to $18\text{V}$ ) (for $V_O = 24\text{V}$ )	$V_I$	35	V
	$V_I$	40	V
Thermal Resistance Junction-Cases	$R_{\theta JC}$	5	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-Air	$R_{\theta JA}$	65	$^\circ\text{C}/\text{W}$
Operating Temperature Range KA78XX/A KA78XXI	$T_{OPR}$	0~ +125	$^\circ\text{C}$
		-40~ +125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65~ +150	$^\circ\text{C}$

**KA7805/I ELECTRICAL CHARACTERISTICS**(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500\text{mA}$ ,  $V_I = 10\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7805I			KA7805			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	4.8	5.0	5.2	4.8	5.0	5.2	V
		$5.0\text{mA} \leq I_O \leq 1.0\text{A}$ , $P_O \leq 15\text{W}$ $V_I = 7\text{V}$ to $20\text{V}$ $V_I = 8\text{V}$ to $20\text{V}$	4.75	5.0	5.25	4.75	5.0	5.25	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$V_O = 7\text{V}$ to $25\text{V}$	4.0	100		4.0	100	mV
			$V_I = 8\text{V}$ to $12\text{V}$	1.6	50		1.6	50	
Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$I_O = 5.0\text{mA}$ to $1.5\text{A}$	9	100		9	100	mV
			$I_O = 250\text{mA}$ to $750\text{mA}$	4	50		4	50	
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.0	8		5.0	8	mA
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA}$ to $1.0\text{A}$		0.03	0.5		0.03	0.5	mA
		$V_I = 7\text{V}$ to $25\text{V}$					0.3	1.3	
		$V_I = 8\text{V}$ to $25\text{V}$		0.3	1.3				
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-0.8			-0.8		mV/ $^\circ\text{C}$
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{KHz}$ , $T_A = 25^\circ\text{C}$		42			42		$\mu\text{V}$
Ripple Rejection	RR	$f = 120\text{Hz}$ $V_O = 8$ to $18\text{V}$	62	73		62	73		dB
Dropout Voltage	$V_O$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2			2		V
Output Resistance	$R_O$	$f = 1\text{KHz}$		15			15		m $\Omega$
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		230			230		mA
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2			2.2		A

\*  $T_{MIN} < T_J < T_{MAX}$ KA78XXI;  $T_{MIN} = -40^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ KA78XX;  $T_{MIN} = 0^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ \* 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.

**KA7806/I ELECTRICAL CHARACTERISTICS**(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500mA$ ,  $V_I = 11V$   $C_I = 0.33 \mu F$ ,  $C_O = 0.1 \mu F$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7806I			KA7806			Unit	
			Min	Typ	Max	Min	Typ	Max		
Output Voltage	$V_O$	$T_J = 25^\circ C$	5.75	6.0	6.25	5.75	6.0	6.25	V	
		$5.0mA \leq I_O \leq 1.0A$ , $P_D \leq 15W$ $V_I = 8.0V$ to $21V$ $V_I = 9.0V$ to $21V$	5.7	6.0	6.3	5.7	6.0	6.3		
Line Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$V_I = 8V$ to $25V$		5	120		5	120	mV
			$V_I = 9V$ to $13V$		1.5	60		1.5	60	
Load Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$I_O = 5mA$ to $1.5A$		9	120		9	120	mV
			$I_O = 250mA$ to $750A$		3	60		3	60	
Quiescent Current	$I_Q$	$T_J = 25^\circ C$		5.0	8		5.0	8	mA	
Quiescent Current Change	$\Delta I_Q$		$I_O = 5mA$ to $1A$			0.5			0.5	mA
			$V_I = 8V$ to $25V$						1.3	
			$V_I = 9V$ to $25V$			1.3				
Output Voltage Drift	$\Delta V_O / \Delta T$			-0.8			-0.8		mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100KHz$ , $T_A = 25^\circ C$		45			45		$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $V_I = 9V$ to $19V$	59	75		59	75		dB	
Dropout Voltage	$V_D$	$I_O = 1A$ , $T_J = 25^\circ C$		2			2		V	
Output Resistance	$R_D$	$f = 1KHz$		19			19		m $\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35V$ , $T_A = 25^\circ C$		250			250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ C$		2.2			2.2		A	

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ C$ ,  $T_{MAX} = 125^\circ C$ KA78XX,  $T_{MIN} = 0^\circ C$ ,  $T_{MAX} = 125^\circ C$ \* Load and line regulation are specified at constant, junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**KA7808/I ELECTRICAL CHARACTERISTICS**(Refer to test Circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500mA$ ,  $V_I = 14V$ ,  $C_I = 0.33 \mu F$ ,  $C_O = 0.1 \mu F$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7808I			KA7808			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ C$	7.7	8.0	8.3	7.7	8.0	8.3	V
		$5.0mA \leq I_O \leq 1.0A$ , $P_O \leq 15W$ $V_I = 10.5V$ to $23V$ $V_I = 11.5V$ to $23V$	7.6	8.0	8.4	7.6	8.0	8.4	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$V_I = 10.5V$ to $25V$	5.0	160	5.0	160	mV	
			$V_I = 11.5V$ to $17V$	2.0	80	2.0	80		
Load Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$I_O = 5.0mA$ to $1.5A$	10	160	10	160	mV	
			$I_O = 250mA$ to $750mA$	5.0	80	5.0	80		
Quiescent Current	$I_O$	$T_J = 25^\circ C$	5.0	8	5.0	8	mA		
Quiescent Current Change	$\Delta I_O$	$I_O = 5mA$ to $1.0A$	0.05	0.5	0.05	0.5	mA		
		$V_I = 10.5A$ to $25V$			0.5	1.0			
		$V_I = 11.5V$ to $25V$	0.5	1.0					
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5mA$	-0.8		-0.8		mV/ $^\circ C$		
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100KHz$ , $T_A = 25^\circ C$	52		52		$\mu V$		
Ripple Rejection	RR	$f = 120Hz$ , $V_I = 11.5V$ to $21.5$	56	73	56	73	dB		
Droop Voltage	$V_D$	$I_O = 1A$ , $T_J = 25^\circ C$	2		2		V		
Output Resistance	$R_O$	$f = 1KHz$	17		17		$m\Omega$		
Short Circuit Current	$I_{SC}$	$V_I = 35V$ , $T_A = 25^\circ C$	230		230		mA		
Peak Current	$I_{PK}$	$T_J = 25^\circ C$	2.2		2.2		A		

\*

 $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ C$ ,  $T_{MAX} = 125^\circ C$ KA78XX,  $T_{MIN} = 0^\circ C$ ,  $T_{MAX} = 125^\circ C$ \* Load and line regulation are specified at constant, junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**KA7809/I ELECTRICAL CHARACTERISTICS**(Refer to test circuit.  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500\text{mA}$ ,  $V_I = 15\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7809I			KA7809			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	8.65	9	9.35	8.65	9	9.35	V
		$5.0\text{mA} \leq I_O \leq 1.0\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 11.5\text{V to } 24\text{V}$ $V_I = 12.5\text{V to } 24\text{V}$	8.6	9	9.4	8.6	9	9.4	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$V_I = 11.5\text{V to } 25\text{V}$	6	180	6	180	mV	
			$V_I = 12\text{V to } 25\text{V}$	2	90	2	90		
Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$I_O = 5\text{mA to } 1.5\text{A}$	12	180	12	180	mV	
			$I_O = 250\text{mA to } 750\text{mA}$	4	90	4	90		
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$	5.0	8	5.0	8	mA		
Quiescent Current Change	$\Delta I_Q$	$T_J = 25^\circ\text{C}$	$I_O = 5\text{mA to } 1.0\text{A}$		0.5		0.5	mA	
			$V_I = 11.5\text{V to } 26\text{V}$				1.3		
			$V_I = 12.5\text{V to } 26\text{V}$		1.3				
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$	-1		-1		mV/ $^\circ\text{C}$		
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{kHz}$ , $T_A = 25^\circ\text{C}$	58		58		$\mu\text{V}$		
Ripple Rejection	RR	$f = 120\text{Hz}$ $V_I = 13\text{V to } 23\text{V}$	56	71	56	71	dB		
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$	2		2		V		
Output Resistance	$R_O$	$f = 1\text{kHz}$	17		17		$\text{m}\Omega$		
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$	250		250		mA		
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$	2.2		2.2		A		

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ KA78XX,  $T_{MIN} = 0^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ \* Load and line regulation are specified at constant junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

## KA7810/I ELECTRICAL CHARACTERISTICS

(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500\text{mA}$ ,  $V_I = 16\text{V}$ ,  $C_I = 0.33 \mu\text{F}$ ,  $C_O = 0.1 \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7810I			KA7810			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	9.6	10	10.4	9.6	10	10.4	V
		$5.0\text{mA} \leq I_O \leq 1.0\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 12.5\text{V to } 25\text{V}$ $V_I = 13.5\text{V to } 25\text{V}$	9.5	10	10.5	9.5	10	10.5	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$V_I = 12.5\text{V to } 25\text{V}$	10	200	10	200	mV	
			$V_I = 13\text{V to } 25\text{V}$	3	100	3	100		
Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$I_O = 5\text{mA to } 1.5\text{A}$	12	200	12	200	mV	
			$I_O = 250\text{mA to } 750\text{mA}$	4	400	4	400		
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$	5.1	8	5.1	8	mA		
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA to } 1.0\text{A}$		0.5		0.5	mA		
		$V_I = 12.5\text{V to } 29\text{V}$				1.0			
		$V_I = 13.5\text{V to } 29\text{V}$		1.0					
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$	-1		-1		mV/°C		
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{kHz}$ , $T_A = 25^\circ\text{C}$	58		58		$\mu\text{V}$		
Ripple Rejection	RR	$f = 120\text{Hz}$ $V_I = 13\text{V to } 23\text{V}$	56	71	56	71	dB		
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$	2		2		V		
Output Resistance	$R_O$	$f = 1\text{kHz}$	17		17		$\text{m}\Omega$		
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$	250		250		mA		
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$	2.2		2.2		A		

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ KA78XX,  $T_{MIN} = 0^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ \* Load and line regulation are specified at constant, junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

## KA7811/I ELECTRICAL CHARACTERISTICS

(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500mA$ ,  $V_I = 18V$ ,  $C_I = 0.33 \mu F$ ,  $C_O = 0.1 \mu F$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7811I			KA7811			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ C$	10.6	11	11.4	10.6	11	11.4	V
		$5.0mA \leq I_O \leq 1.0A$ , $P_D \leq 15W$ $V_I = 13.5V$ to $26V$ $V_I = 14.5V$ to $26V$	10.5	11	11.5	10.5	11	11.5	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$V_I = 13.5V$ to $25V$		10	220	10	220	mV
			$V_I = 14V$ to $21V$		3.0	110	3	110	
Load Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$I_O = 5.0mA$ to $1.5A$		12	220	12	220	mV
			$I_O = 250mA$ to $750mA$		4	110	4	110	
Quiescent Current	$I_Q$	$T_J = 25^\circ C$		5.1	8		5.1	8	mA
Quiescent Current Change	$\Delta I_Q$	$T_J = 25^\circ C$	$I_O = 5mA$ to $1.0A$			0.5		0.5	mA
			$V_I = 13.5V$ to $29V$					1.0	
			$V_I = 14.5V$ to $29V$			1.0			
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5mA$		-1			-1		mV/ $^\circ C$
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100kHz$ , $T_A = 25^\circ C$		70			70		$\mu V$
Ripple Rejection	RR	$f = 120Hz$ $V_I = 14V$ to $24V$	55	71		55	71		dB
Dropout Voltage	$V_D$	$I_O = 1A$ , $T_J = 25^\circ C$		2			2		V
Output Resistance	$R_O$	$f = 1KHz$		18			18		$m\Omega$
Short Circuit Current	$I_{SC}$	$V_I = 35V$ , $T_A = 25^\circ C$		250			250		mA
Peak Current	$I_{PK}$	$T_J = 25^\circ C$		2.2			2.2		A

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ C$ ,  $T_{MAX} = 125^\circ C$ KA78XX,  $T_{MIN} = 0^\circ C$ ,  $T_{MAX} = 125^\circ C$ \* Load and line regulation are specified at constant, junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

## KA7812/I ELECTRICAL CHARACTERISTICS

(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500mA$ ,  $V_I = 19V$ ,  $C_I = 0.33 \mu F$ ,  $C_O = 0.1 \mu F$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7812I			KA7812			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ C$	11.5	12	12.5	11.5	12	12.5	V
		$5.0mA \leq I_O \leq 1.0A$ , $P_D \leq 15W$ $V_I = 14.5V$ to $27V$ $V_I = 15.5V$ to $27V$	11.4	12	12.6	11.4	12	12.6	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$V_I = 14.5V$ to $30V$		10	240	10	240	mV
			$V_I = 16V$ to $22V$		3.0	120	3.0	120	
Load Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$I_O = 5mA$ to $1.5A$		11	240	11	240	mV
			$I_O = 250mA$ to $750mA$		5.0	120	5.0	120	
Quiescent Current	$I_Q$	$T_J = 25^\circ C$		5.1	8	5.1	8	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to $1.0A$		0.1	0.5	0.1	0.5	mA	
		$V_I = 14.5V$ to $30V$				0.5	1.0		
		$V_I = 15V$ to $30V$			1.0				
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5mA$	0.5	-1		-1		mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100KHz$ , $T_A = 25^\circ C$		76		76		$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $V_I = 15V$ to $25V$	55	71		55	71	dB	
Dropout Voltage	$V_D$	$I_O = 1A$ , $T_J = 25^\circ C$		2		2		V	
Output Resistance	$R_O$	$f = 1KHz$		18		18		m $\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35V$ , $T_A = 25^\circ C$		230		230		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ C$		2.2		2.2		A	

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ C$ ,  $T_{MAX} = 125^\circ C$ KA78XX,  $T_{MIN} = 0^\circ C$ ,  $T_{MAX} = 125^\circ C$ \* Load and line regulation are specified at constant, junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.



## KA7815/I ELECTRICAL CHARACTERISTICS

(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500mA$ ,  $V_I = 23V$ ,  $C_I = 0.33 \mu F$ ,  $C_O = 0.1 \mu F$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7815I			KA7815			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ C$	14.4	15	15.6	14.4	15	15.6	V
		$5.0mA \leq I_O \leq 1.0A$ , $P_D \leq 15W$ $V_I = 17.5V$ to $30V$ $V_I = 18.5V$ to $30V$	14.25	15	15.75	14.25	15	15.75	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$V_I = 17.5V$ to $30V$	11	300	11	300	mV	
			$V_I = 20V$ to $26V$	3	150	3	150		
Load Regulation	$\Delta V_O$	$T_J = 25^\circ C$	$I_O = 5mA$ to $1.5A$	12	300	12	300	mV	
			$I_O = 250mA$ to $750mA$	4	150	4	150		
Quiescent Current	$I_Q$	$T_J = 25^\circ C$		5.2	8	5.2	8	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to $1.0A$ $V_I = 17.5V$ to $30V$ $V_I = 18.5V$ to $30V$			0.5		0.5	mA	
							1.0		
					1.0				
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5mA$		-1		-1		mV/ $^\circ C$	
Output Noise Voltage	$V_N$	$f = 10Hz$ to $100KHz$ , $T_A = 25^\circ C$		90		90		$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $V_I = 18.5V$ to $28.5V$	54	70		54	70	dB	
Dropout Voltage	$V_D$	$I_O = 1A$ , $T_J = 25^\circ C$		2		2		V	
Output Resistance	$R_O$	$f = 1KHz$		19		19		$m\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35V$ , $T_A = 25^\circ C$		250		250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ C$		2.2		2.2		A	

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ C$ ,  $T_{MAX} = 125^\circ C$ KA78XX,  $T_{MIN} = 0^\circ C$ ,  $T_{MAX} = 125^\circ C$ \* Load and line regulation are specified at constant junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

## KA7818/I ELECTRICAL CHARACTERISTICS

(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500\text{mA}$ ,  $V_I = 27\text{V}$ ,  $C_I = 0.33 \mu\text{F}$ ,  $C_O = 0.1 \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7818I			KA7818			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	17.3	18	18.7	17.3	18	18.7	V
		$5.0\text{mA} \leq I_O \leq 1.0\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 21\text{V to } 33\text{V}$ $V_I = 22\text{V to } 33\text{V}$	17.1	18	18.9	17.1	18	18.9	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$V_I = 21\text{V to } 33\text{V}$		15	360	15	360	mV
			$V_I = 24\text{V to } 30\text{V}$		5	180	5	180	
Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$I_O = 5\text{mA to } 1.5\text{A}$		15	360	15	360	mV
			$I_O = 250\text{mA to } 750\text{mA}$		5.0	180	5.0	180	
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.2	8		5.2	8	mA
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA to } 1.0\text{A}$			0.5			0.5	mA
		$V_I = 21\text{V to } 33\text{V}$						1	
		$V_I = 22\text{V to } 33\text{V}$			1.0				
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-1			-1		mV/°C
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{kHz}$ , $T_A = 25^\circ\text{C}$		110			110		$\mu\text{V}$
Ripple Rejection	RR	$f = 120\text{Hz}$ $V_I = 22\text{V to } 32\text{V}$	53	69		53	69		dB
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2			2		V
Output Resistance	$R_O$	$f = 1\text{kHz}$		22			22		$\text{m}\Omega$
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250			250		mA
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2			2.2		A

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ KA78XX,  $T_{MIN} = 0^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ \* Load and line regulation are specified at constant junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

## KA7824/I ELECTRICAL CHARACTERISTICS

(Refer to test circuit,  $T_{MIN} < T_J < T_{MAX}$ ,  $I_O = 500\text{mA}$ ,  $V_I = 33\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	KA7824I			KA7824			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	23	24	25	23	24	25	V
		$5.0\text{mA} \leq I_O \leq 1.0\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 27\text{V to } 38\text{V}$ $V_I = 28\text{V to } 38\text{V}$	22.8	24	25.2	22.8	24	25.25	
Line Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$V_I = 27\text{V to } 38\text{V}$		17	480	17	480	mV
			$V_I = 30\text{V to } 36\text{V}$		6	240	6	240	
Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$	$I_O = 5\text{mA to } 1.5\text{A}$		15	480	15	480	mV
			$I_O = 250\text{mA to } 750\text{mA}$		5.0	240	5.0	240	
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.2	8	5.2	8	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA to } 1.0\text{A}$		0.1	0.5	0.1	0.5	mA	
		$V_I = 27\text{V to } 38\text{V}$				0.5	1		
		$V_I = 28\text{V to } 38\text{V}$		0.5	1				
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-1.5		-1.5		mV/°C	
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{kHz}$ , $T_A = 25^\circ\text{C}$		160		60		$\mu\text{V}$	
Ripple Rejection	RR	$f = 120\text{Hz}$ $V_I = 28\text{V to } 38\text{V}$	50	67		50	67	dB	
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2		2		V	
Output Resistance	$R_O$	$f = 1\text{KHz}$		28		28		$\text{m}\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		230		230		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		2.2		A	

\* $T_{MIN} < T_J < T_{MAX}$ KA78XXI:  $T_{MIN} = -40^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ KA78XX,  $T_{MIN} = 0^\circ\text{C}$ ,  $T_{MAX} = 125^\circ\text{C}$ \* Load and line regulation are specified at constant junction temperature. Change in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**KA7805A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $125^\circ\text{C}$ ,  $I_o = 1\text{A}$ ,  $V_i = 10\text{V}$ ,  $C_i = 0.33\ \mu\text{F}$ ,  $C_o = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_o$	$T_J = 25^\circ\text{C}$	4.9	5	5.1	V
		$I_o = 5\text{mA to } 1\text{A}$ , $P_D \leq 15\text{W}$ $V_i = 7.5$ to $20\text{V}$	4.8	5	5.2	
* Line Regulation	$\Delta V_o$	$V_i = 7.5$ to $25\text{V}$ $I_o = 500\text{mA}$		5	50	V
		$V_i = 8\text{V to } 12\text{V}$		3	50	
		$T_J = 25^\circ\text{C}$	$V_i = 7.3\text{V to } 25\text{V}$ $V_i = 8\text{V to } 12\text{V}$		5 1.5	
* Load Regulation	$\Delta V_o$	$T_J = 25^\circ\text{C}$ $I_o = 5\text{mA to } 1.5\text{A}$		9	100	V
		$I_o = 5\text{mA to } 1\text{A}$		9	100	
		$I_o = 250$ to $750\text{mA}$		4	50	
Quiescent Current	$I_o$	$T_J = 25^\circ\text{C}$		5.0	6	mA
Quiescent Current Change	$\Delta I_o$	$I_o = 5\text{mA to } 1\text{A}$			0.5	mA
		$V_i = 8\text{V to } 25\text{V}$ , $I_o = 500\text{mA}$			0.8	
		$V_i = 7.5\text{V to } 20\text{V}$ , $T_J = 25^\circ\text{C}$			0.8	
Output Voltage Drift	$\frac{\Delta V_o}{\Delta T}$	$I_o = 5\text{mA}$		-0.8		mV/ $^\circ\text{C}$
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\frac{\mu\text{V}}{V_o}$
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_o = 500\text{mA}$ $V_i = 8\text{V to } 18\text{V}$		68		dB
Dropout Voltage	$V_D$	$I_o = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2		V
Output Resistance	$R_o$	$f = 1\text{KHz}$		17		m $\Omega$
Short Circuit Current	$I_{SC}$	$V_i = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A

\* Load and line regulation are specified at constant, junction temperature. Change in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**KA7806A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $150^\circ\text{C}$ ,  $I_O = 1\text{A}$ ,  $V_I = 11\text{V}$ ,  $C_1 = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	5.58	6	6.12	V
		$I_O = 5\text{mA}$ to $1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 8.6$ to $21\text{V}$	5.76	6	6.24	
* Line Regulation	$\Delta V_O$	$V_I = 8.6$ to $25\text{V}$ $I_O = 500\text{mA}$		5	60	mV
		$V_I = 9\text{V}$ to $13\text{V}$		3	60	
		$T_J = 25^\circ\text{C}$	$V_I = 8.3\text{V}$ to $21\text{V}$		5	
		$V_I = 9\text{V}$ to $13\text{V}$		1.5	30	
* Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$ $I_O = 5\text{mA}$ to $1.5\text{A}$		9	100	mV
		$I_O = 5\text{mA}$ to $1\text{A}$		4	100	
		$I_O = 250$ to $750\text{mA}$		5.0	50	
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		4.3	6	mA
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA}$ to $1\text{A}$			0.5	mA
		$V_I = 9\text{V}$ to $25\text{V}$ , $I_O = 500\text{mA}$			0.8	
		$V_I = 8.5\text{V}$ to $21\text{V}$ , $T_J = 25^\circ\text{C}$			0.8	
Output Voltage Drift	$\frac{\Delta V_O}{\Delta T}$	$I_O = 5\text{mA}$		-0.8		mV/ $^\circ\text{C}$
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\frac{\mu\text{V}}{V_O}$
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_O = 500\text{mA}$ $V_I = 9\text{V}$ to $19\text{V}$		65		dB
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2		V
Output Resistance	$R_O$	$f = 1\text{KHz}$		17		$\text{m}\Omega$
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A

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

**KA7808A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $150^\circ\text{C}$ ,  $I_O = 1\text{A}$ ,  $V_I = 14\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	7.84	8	8.16	V	
		$I_O = 5\text{mA}$ to $1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 8.6$ to $21\text{V}$	7.7	8	8.3		
* Line Regulation	$\Delta V_O$	$V_I = 10.6$ to $25\text{V}$ $I_O = 500\text{mA}$		6	80	mV	
		$V_I = 11$ to $17\text{V}$		3	80		
		$T_J = 25^\circ\text{C}$	$V_I = 10.4\text{V}$ to $23\text{V}$		6		80
			$V_I = 11\text{V}$ to $17\text{V}$		2		40
* Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$ $I_O = 5\text{mA}$ to $1.5\text{A}$		12	100	mV	
		$I_O = 5\text{mA}$ to $1\text{A}$		12	100		
		$I_O = 250$ to $750\text{mA}$		5	50		
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.0	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA}$ to $1\text{A}$			0.5	mA	
		$V_I = 11\text{V}$ to $25\text{V}$ , $I_O = 500\text{mA}$			0.8		
		$V_I = 10.6\text{V}$ to $23\text{V}$ , $T_J = 25^\circ\text{C}$			0.8		
Output Voltage Drift	$\frac{\Delta V_O}{\Delta T}$	$I_O = 5\text{mA}$		-0.8		mV/ $^\circ\text{C}$	
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\frac{\mu\text{V}}{V_O}$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_O = 500\text{mA}$ $V_I = 11.5\text{V}$ to $21.5\text{V}$		62		dB	
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2		V	
Output Resistance	$R_O$	$f = 1\text{KHz}$		18		m $\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A	

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

**KA7809A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $125^\circ\text{C}$ ,  $I_o = 1\text{A}$ ,  $V_i = 15\text{V}$ ,  $C_1 = 0.33\ \mu\text{F}$ ,  $C_o = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
Output Voltage	$V_o$	$T_J = 25^\circ\text{C}$	8.82	9.0	9.18	V	
		$I_o = 5\text{mA to } 1\text{A}$ , $P_D \leq 15\text{W}$ $V_i = 11.2\text{ to } 24\text{V}$	8.65	9.0	9.35		
* Line Regulation	$\Delta V_o$	$V_i = 11.7\text{ to } 25\text{V}$ $I_o = 500\text{mA}$		6	90	mV	
		$V_i = 12.5\text{ to } 19\text{V}$		4	45		
		$T_J = 25^\circ\text{C}$	$V_i = 11.5\text{V to } 24\text{V}$		6		90
			$V_i = 12.5\text{V to } 19\text{V}$		2		45
* Load Regulation	$\Delta V_o$	$T_J = 25^\circ\text{C}$ $I_o = 5\text{mA to } 1.0\text{A}$		12	100	mV	
		$I_o = 5\text{mA to } 1.0\text{A}$		12	100		
		$I_o = 250\text{ to } 750\text{mA}$		5	50		
Quiescent Current	$I_q$	$T_J = 25^\circ\text{C}$		5.0	6.0	mA	
Quiescent Current Change	$\Delta I_q$	$V_i = 11.7\text{V to } 25\text{V}$ , $T_J = 25^\circ\text{C}$			0.8	mA	
		$V_i = 12\text{V to } 25\text{V}$ , $I_o = 500\text{mA}$ $I_o = 5\text{mA to } 1.0\text{A}$			0.8 0.5		
Output Voltage Drift	$\frac{\Delta V_o}{\Delta T}$	$I_o = 5\text{mA}$		-1.0		mV/°C	
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\frac{\mu\text{V}}{V_o}$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_o = 500\text{mA}$ $V_i = 12\text{V to } 22\text{V}$		62		dB	
Dropout Voltage	$V_D$	$I_o = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2.0		V	
Output Resistance	$R_o$	$f = 1\text{KHz}$		17		m $\Omega$	
Short Circuit Current	$I_{sc}$	$V_i = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A	

\* Load and line regulation are specified at constant, junction temperature. Change in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**KA7810A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $125^\circ\text{C}$ ,  $I_O = 1\text{A}$ ,  $V_I = 16\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	9.8	10	10.2	V
		$I_O = 5\text{mA}$ to $1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 12.8$ to $25\text{V}$	9.6	10	10.4	
* Line Regulation	$\Delta V_O$	$V_I = 12.8$ to $26\text{V}$ $I_O = 500\text{mA}$		8	100	mV
		$V_I = 13$ to $20\text{V}$		4	50	
		$T_J = 25^\circ\text{C}$ $V_I = 12.5\text{V}$ to $25\text{V}$		8	100	
		$V_I = 13\text{V}$ to $20\text{V}$		3	50	
* Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$ $I_O = 5\text{mA}$ to $1.5\text{A}$		12	100	mV
		$I_O = 5\text{mA}$ to $1.0\text{A}$		12	100	
		$I_O = 250$ to $750\text{mA}$		5	50	
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.0	6.0	mA
Quiescent Current Change	$\Delta I_Q$	$V_I = 13\text{V}$ to $26\text{V}$ , $T_J = 25^\circ\text{C}$			0.5	mA
		$V_I = 12.8\text{V}$ to $25\text{V}$ , $I_O = 500\text{mA}$			0.8	
		$I_O = 5\text{mA}$ to $1.0\text{A}$			0.5	
Output Voltage Drift	$\frac{\Delta V_O}{\Delta T}$	$I_O = 5\text{mA}$		-1.0		mV/°C
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\frac{\mu\text{V}}{V_O}$
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_O = 500\text{mA}$ $V_I = 14\text{V}$ to $24\text{V}$		62		dB
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2.0		V
Output Resistance	$R_O$	$f = 1\text{KHz}$		17		m $\Omega$
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A

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



## KA7811A ELECTRICAL CHARACTERISTICS

(Refer to the test circuits.  $T_J = 0$  to  $125^\circ\text{C}$ ,  $I_o = 1\text{A}$ ,  $V_I = 18\text{V}$ ,  $C_1 = 0.33\ \mu\text{F}$ ,  $C_o = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
Output Voltage	$V_o$	$T_J = 25^\circ\text{C}$	10.8	11.0	11.2	V	
		$I_o = 5\text{mA to } 1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 13.8\text{ to } 26\text{V}$	10.6	11.0	11.4		
* Line Regulation	$\Delta V_o$	$V_I = 12.8\text{ to } 26\text{V}$ $I_o = 500\text{mA}$		10	110	mV	
		$V_I = 15\text{ to } 21\text{V}$		4	55		
		$T_J = 25^\circ\text{C}$	$V_I = 13.5\text{V to } 26\text{V}$		10		110
			$V_I = 15\text{V to } 21\text{V}$		3		55
* Load Regulation	$\Delta V_o$	$T_J = 25^\circ\text{C}$ $I_o = 5\text{mA to } 1.5\text{A}$		12	100	mV	
		$I_o = 5\text{mA to } 1.0\text{A}$		12	100		
		$I_o = 250\text{ to } 750\text{mA}$		5	50		
Quiescent Current	$I_q$	$T_J = 25^\circ\text{C}$		5.1	6.0	mA	
Quiescent Current Change	$\Delta I_q$	$V_I = 13.8\text{V to } 26\text{V}$ , $T_J = 25^\circ\text{C}$			0.8	mA	
		$V_I = 14\text{V to } 27\text{V}$ , $I_o = 500\text{mA}$			0.8		
		$I_o = 5\text{mA to } 1.0\text{A}$			0.5		
Output Voltage Drift	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$		-1.0		mV/°C	
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\mu\text{V} / V_o$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_o = 500\text{mA}$ $V_I = 14\text{V to } 24\text{V}$		61		dB	
Dropout Voltage	$V_D$	$I_o = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2.0		V	
Output Resistance	$R_o$	$f = 1\text{KHz}$		18		m $\Omega$	
Short Circuit Current	$I_{sc}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A	

\* Load and line regulation are specified at constant, junction temperature. Change in  $V_o$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**KA7812A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $125^\circ\text{C}$ ,  $I_o = 1\text{A}$ ,  $V_I = 19\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	11.75	12	12.25	V	
		$I_o = 5\text{mA}$ to $1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 14.8$ to $27\text{V}$	11.5	12	12.5		
* Line Regulation	$\Delta V_O$	$V_I = 14.8$ to $30\text{V}$ $I_o = 500\text{mA}$		10	120	mV	
		$V_I = 16$ to $22\text{V}$		4	120		
		$T_J = 25^\circ\text{C}$	$V_I = 14.5\text{V}$ to $27\text{V}$		10		120
			$V_I = 16\text{V}$ to $22\text{V}$		3		60
* Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$ $I_o = 5\text{mA}$ to $1.5\text{A}$		12	100	mV	
		$I_o = 5\text{mA}$ to $1.0\text{A}$		12	100		
		$I_o = 250$ to $750\text{mA}$		5	50		
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.1	6.0	mA	
Quiescent Current Change	$\Delta I_Q$	$V_I = 15\text{V}$ to $30\text{V}$ , $T_J = 25^\circ\text{C}$			0.5	mA	
		$V_I = 14\text{V}$ to $27\text{V}$ , $I_o = 500\text{mA}$			0.8		
		$I_o = 5\text{mA}$ to $1.0\text{A}$			0.8		
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_o = 5\text{mA}$		-1.0		mV/°C	
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\mu\text{V} / V_O$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_o = 500\text{mA}$ $V_I = 14\text{V}$ to $24\text{V}$		60		dB	
Dropout Voltage	$V_D$	$I_o = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2.0		V	
Output Resistance	$R_O$	$f = 1\text{KHz}$		18		m $\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A	

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

**KA7815A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $150^\circ\text{C}$ ,  $I_o = 1\text{A}$ ,  $V_I = 23\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	14.7	15	15.3	V	
		$I_o = 5\text{mA}$ to $1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 17.7$ to $30\text{V}$	14.4	15	15.6		
* Line Regulation	$\Delta V_O$	$V_I = 17.9$ to $30\text{V}$ $I_o = 500\text{mA}$		10	150	mV	
		$V_I = 20$ to $26\text{V}$		5	150		
		$T_J = 25^\circ\text{C}$	$V_I = 17.5\text{V}$ to $30\text{V}$		11		150
			$V_I = 20\text{V}$ to $26\text{V}$		3		75
* Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$ $I_o = 5\text{mA}$ to $1.5\text{A}$		12	100	mV	
		$I_o = 5\text{mA}$ to $1.0\text{A}$		12	100		
		$I_o = 250$ to $750\text{mA}$		5	50		
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.2	6.0	mA	
Quiescent Current Change	$\Delta I_Q$	$V_I = 17.5\text{V}$ to $30\text{V}$ , $T_J = 25^\circ\text{C}$			0.5	mA	
		$V_I = 17.5\text{V}$ to $30\text{V}$ , $I_o = 500\text{mA}$			0.8		
		$I_o = 5\text{mA}$ to $1.0\text{A}$			0.8		
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_o = 5\text{mA}$		-1.0		mV/°C	
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\mu\text{V} / V_O$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_o = 500\text{mA}$ $V_I = 18.5\text{V}$ to $28.5\text{V}$		58		dB	
Dropout Voltage	$V_D$	$I_o = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2.0		V	
Output Resistance	$R_O$	$f = 1\text{KHz}$		19		m $\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A	

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

**KA7818A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $150^\circ\text{C}$ ,  $I_O = 1\text{A}$ ,  $V_I = 27\text{V}$ ,  $C_1 = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	17.64	18	18.36	V
		$I_O = 5\text{mA}$ to $1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 21$ to $33\text{V}$	17.3	18	18.7	
* Line Regulation	$\Delta V_O$	$V_I = 21$ to $33\text{V}$ $I_O = 500\text{mA}$		15	180	mV
		$V_I = 21$ to $33\text{V}$		5	180	
		$T_J = 25^\circ\text{C}$ $V_I = 20.6\text{V}$ to $33\text{V}$		15	180	
		$V_I = 24\text{V}$ to $30\text{V}$		5	90	
* Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$ $I_O = 5\text{mA}$ to $1.5\text{A}$		15	100	mV
		$I_O = 5\text{mA}$ to $1.0\text{A}$		15	100	
		$I_O = 250$ to $750\text{mA}$		7	50	
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.2	6.0	mA
Quiescent Current Change	$\Delta I_Q$	$V_I = 21\text{V}$ to $33\text{V}$ , $T_J = 25^\circ\text{C}$			0.5	mA
		$V_I = 21\text{V}$ to $33\text{V}$ , $I_O = 500\text{mA}$			0.8	
		$I_O = 5\text{mA}$ to $1.0\text{A}$			0.8	
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-1.0		mV/°C
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{kHz}$ $T_A = 25^\circ\text{C}$		10		$\mu\text{V} / V_O$
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_O = 500\text{mA}$ $V_I = 18.5\text{V}$ to $28.5\text{V}$		57		dB
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2.0		V
Output Resistance	$R_O$	$f = 1\text{KHz}$		19		m $\Omega$
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A

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

**KA7824A ELECTRICAL CHARACTERISTICS**(Refer to the test circuits.  $T_J = 0$  to  $150^\circ\text{C}$ ,  $I_O = 1\text{A}$ ,  $V_I = 33\text{V}$ ,  $C_I = 0.33\ \mu\text{F}$ ,  $C_O = 0.1\ \mu\text{F}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
Output Voltage	$V_O$	$T_J = 25^\circ\text{C}$	23.5	24	24.5	V	
		$I_O = 5\text{mA}$ to $1\text{A}$ , $P_D \leq 15\text{W}$ $V_I = 27.3$ to $38\text{V}$	23	24	25		
* Line Regulation	$\Delta V_O$	$V_I = 27$ to $38\text{V}$ $I_O = 500\text{mA}$		18	240	mV	
		$V_I = 21$ to $33\text{V}$		6	240		
		$T_J = 25^\circ\text{C}$	$V_I = 26.7$ to $38\text{V}$		18		240
			$V_I = 30$ to $36\text{V}$		6		120
* Load Regulation	$\Delta V_O$	$T_J = 25^\circ\text{C}$ $I_O = 5\text{mA}$ to $1.5\text{A}$		15	100	mV	
		$I_O = 5\text{mA}$ to $1.0\text{A}$		15	100		
		$I_O = 250$ to $750\text{mA}$		7	50		
Quiescent Current	$I_Q$	$T_J = 25^\circ\text{C}$		5.2	6.0	mA	
Quiescent Current Change	$\Delta I_Q$	$V_I = 27.3\text{V}$ to $38\text{V}$ , $T_J = 25^\circ\text{C}$			0.5	mA	
		$V_I = 27.3\text{V}$ to $38\text{V}$ , $I_O = 500\text{mA}$			0.8		
		$I_O = 5\text{mA}$ to $1.0\text{A}$			0.8		
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-1.5		mV/°C	
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{KHz}$ $T_A = 25^\circ\text{C}$		10		$\mu\text{V} / V_O$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $I_O = 500\text{mA}$ $V_I = 18.5\text{V}$ to $28.5\text{V}$		54		dB	
Dropout Voltage	$V_D$	$I_O = 1\text{A}$ , $T_J = 25^\circ\text{C}$		2.0		V	
Output Resistance	$R_O$	$f = 1\text{KHz}$		20		m $\Omega$	
Short Circuit Current	$I_{SC}$	$V_I = 35\text{V}$ , $T_A = 25^\circ\text{C}$		250		mA	
Peak Current	$I_{PK}$	$T_J = 25^\circ\text{C}$		2.2		A	

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

TEST CIRCUITS

Fig. 1 DC Parameters

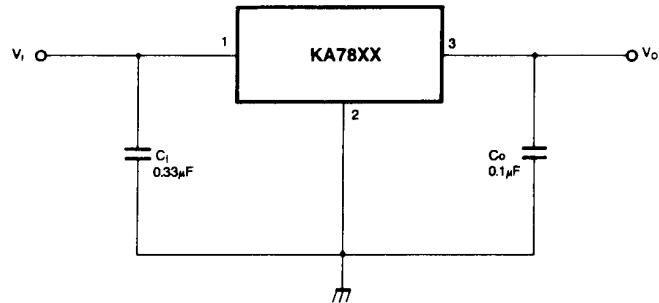


Fig. 2 Load Regulation

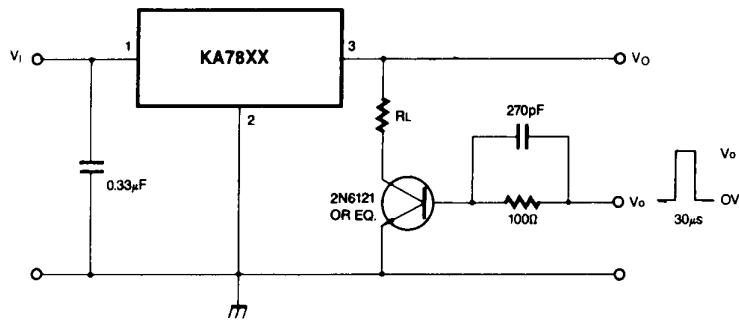
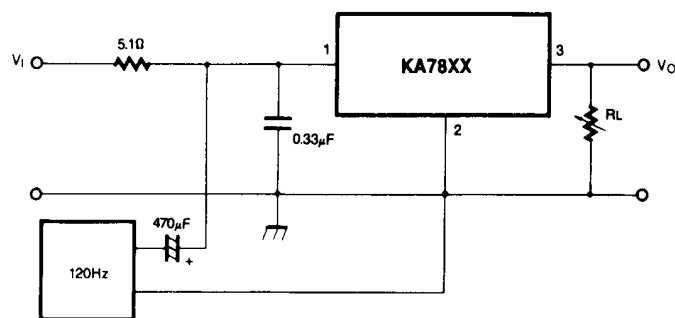


Fig. 3 Ripple Rejection



APPLICATION CIRCUITS

Fig. 4 Fixed Output Regulator

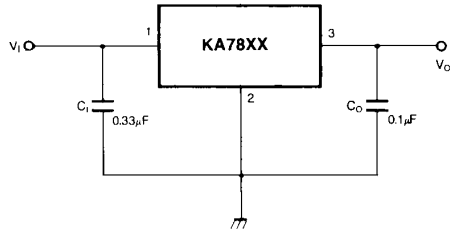
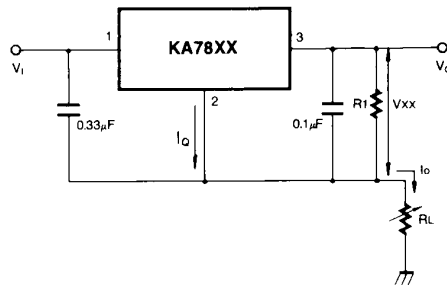


Fig. 5 Constant Current Regulator

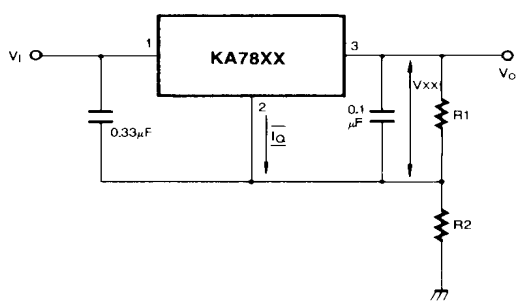


$$I_o = \frac{V_{XX}}{R_1} + I_Q$$

Notes:

- (1) To specify an output voltage, substitute voltage value for "XX."  
A common ground is required between the input and the Output voltage. The input voltage must remain typically 2.0V above the output voltage even during the low point on the input ripple voltage.
- (2) Ci is required if regulator is located an appreciable distance from power Supply filter.
- (3) Co improves stability and transient response.

Fig. 6 Circuit for Increasing Output Voltage



$$I_{R1} \geq 5 I_Q$$

$$V_o = V_{XX}(1+R_2/R_1)+I_Q R_2$$

Fig. 7 Adjustable Output Regulator (7 to 30V)

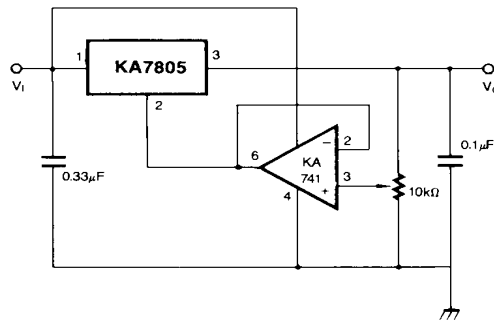
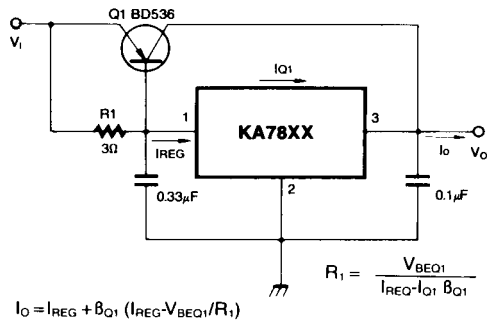


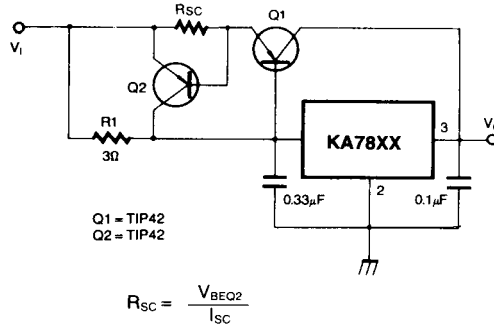
Fig. 8 High Current Voltage Regulator



$$I_o = I_{REG} + \beta_{O1} (I_{REG} - V_{BEQ1}/R_1)$$

$$R_1 = \frac{V_{BEQ1}}{I_{REG} - I_{O1} \beta_{O1}}$$

Fig. 9. High Output Current with Short Circuit Protection



Q1 = TIP42  
Q2 = TIP42

$$R_{SC} = \frac{V_{BEQ2}}{I_{SC}}$$

Fig. 10 Tracking Voltage Regulator

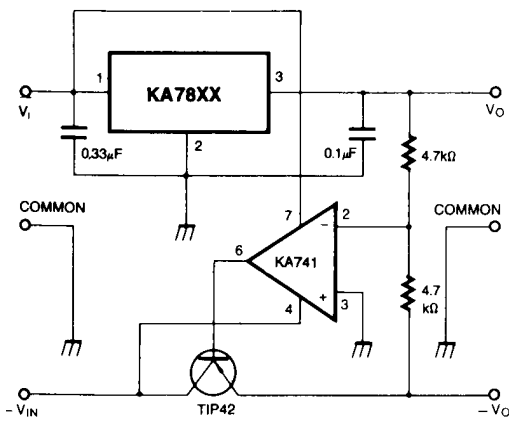


Fig. 11 Split Power Supply ( $\pm 15V-1A$ )

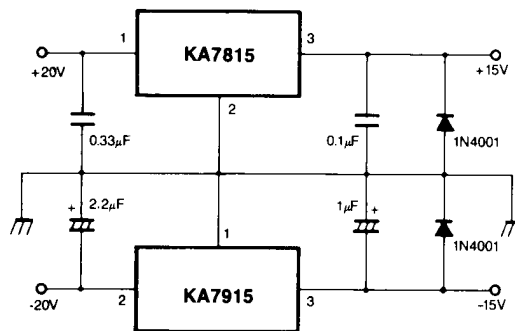




Fig. 12 Negative Output Voltage Circuit

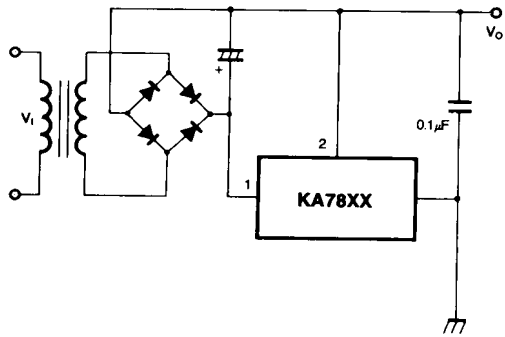
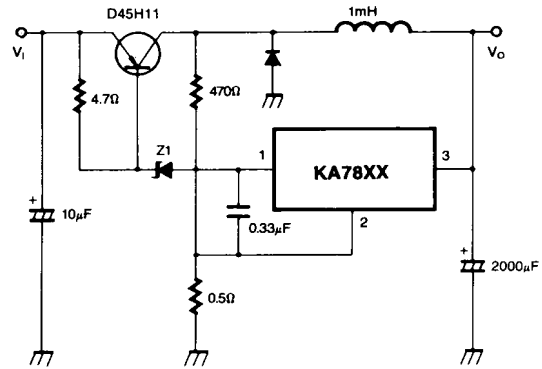


Fig. 13 switching Regulator



TYPICAL PERFORMANCE CHARACTERISTICS

Fig. 14 QUIESCENT CURRENT

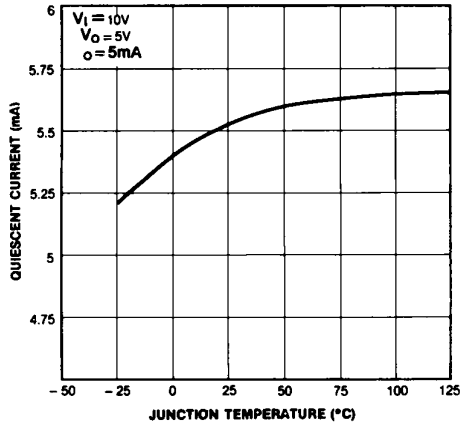


Fig. 15 PEAK OUTPUT CURRENT

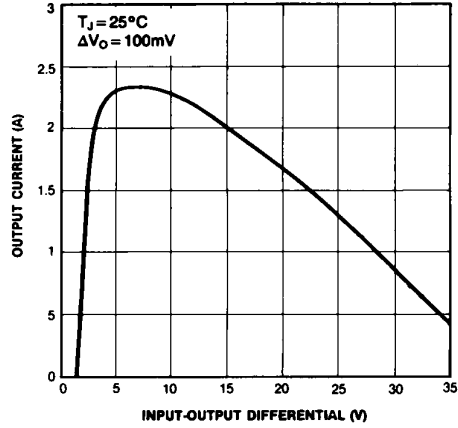


Fig. 16 OUTPUT VOLTAGE

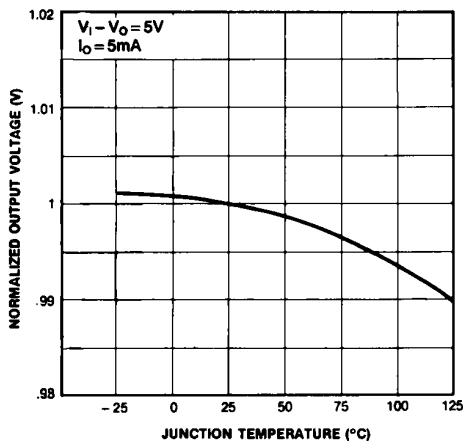
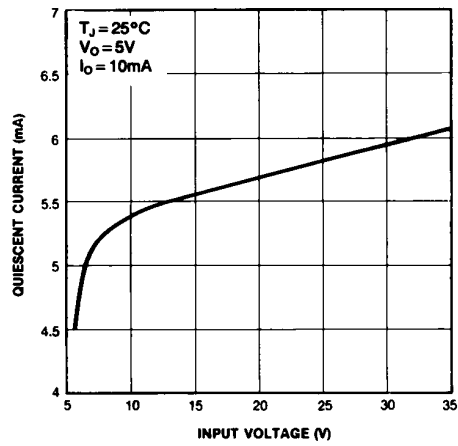
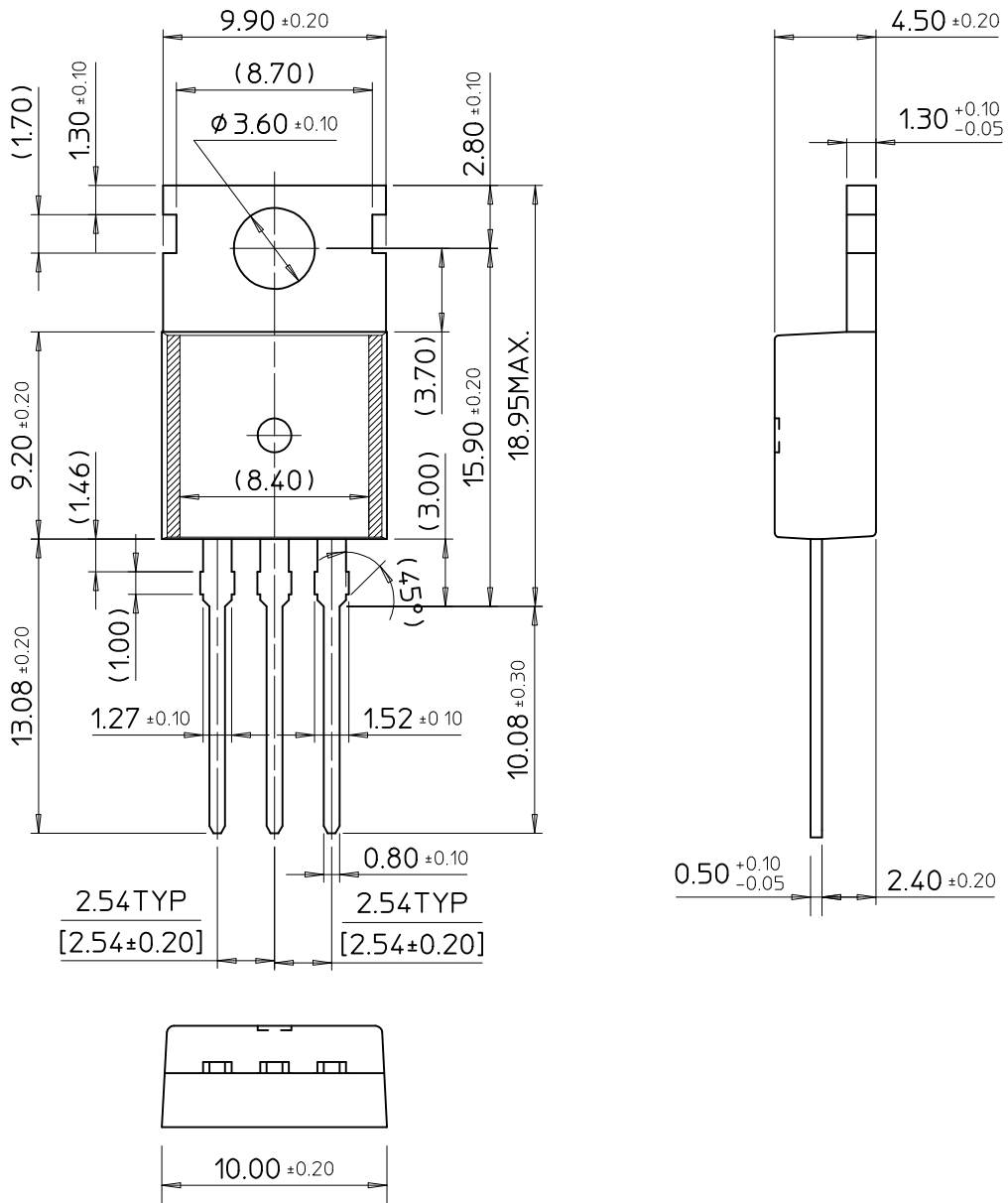


Fig. 17 QUIESCENT CURRENT



# TO-220

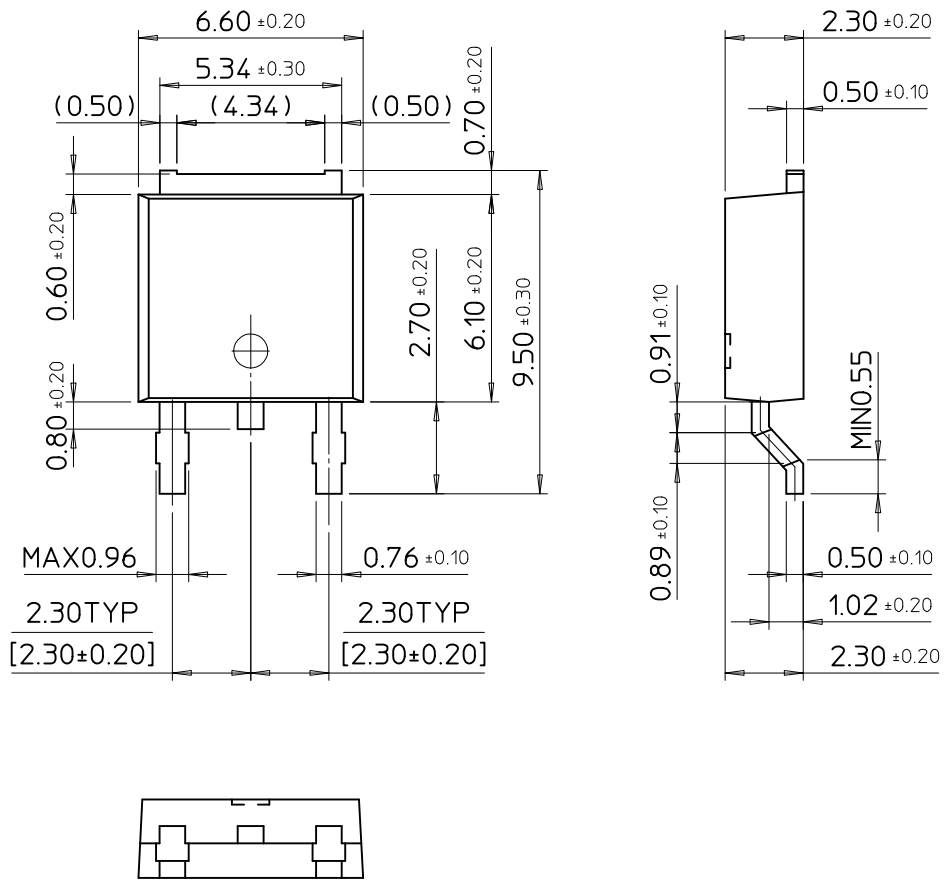
Dimensions in Millimeters



SAMSUNG ELECTRONICS CO.,LTD.

# D-PAK

Dimensions in Millimeters



SAMSUNG ELECTRONICS CO.,LTD.