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KA78XX/KA78XXA

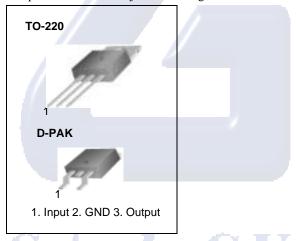
3-Terminal 1A Positive Voltage Regulator

Features

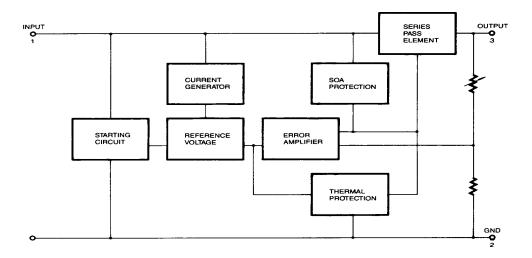
- Output Current up to 1A
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V
- Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Protection

Description

The KA78XX/KA78XXA series of three-terminal positive regulator are available in the TO-220/D-PAK 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 operating 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.



Internal Block Digram



Rev. 1.0.0

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage (for V _O = 5V to 18V) (for V _O = 24V)	V _I V _I	35 40	V V
Thermal Resistance Junction-Cases (TO-220)	R ₀ JC	5	°C/W
Thermal Resistance Junction-Air (TO-220)	RθJA	65	°C/W
Operating Temperature Range (KA78XX/A/R)	TOPR	0 ~ +125	°C
Storage Temperature Range	TSTG	-65 ~ +150	°C

Electrical Characteristics (KA7805/KA7805R)

(Refer to test circuit 0° C < TJ < 125° C, IO = 500mA, VI = 10V, CI= 0.33μ F, CO= 0.1μ F, unless otherwise specified)

Parameter	Symbol Conditions -			ŀ	(A780	5	Unit
Parameter	Symbol		onditions	Min.	Тур.	Max.	Onit
		TJ =+25 °C		4.8	5.0	5.2	
Output Voltage	Vo	5.0 mA \leq Io \leq 7 VI = 7V to 20V	1.0A, P _O ≤ 15W	4.75	5.0	5.25	V
Line Regulation (Note1)	Regline	TJ=+25 °C	Vo = 7V to 25V		4.0	100	mV
Line Regulation (Note 1)	Regilile	13=+23 0	$V_I = 8V$ to $12V$	-	1.6	50	1110
Load Regulation (Note1)	Regload	T.j=+25 °C	IO = 5.0mA to 1.5A	-	9	100	mV
Load Regulation (Note 1)	Regioau	13=+23 C	I _O =250mA to 750mA	-	4	50	IIIV
Quiescent Current	IQ	T _J =+25 °C		-	5.0	8.0	mA
Quiocoont Current Change	AIO.	$I_0 = 5mA \text{ to } 1.0$	A	-	0.03	0.5	mA
Quiescent Current Change	ΔlQ	V _I = 7V to 25V		-	0.3	1.3	IIIA
Output Voltage Drift	ΔV0/ΔΤ	IO= 5mA		-	-0.8	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 100	KHz, T _A =+25 °C	-	42	-v1 1	μV/V0
Ripple Rejection	RR	f = 120Hz Vo = 8V to 18V	S.A. (1	62	73	-	dB
Dropout Voltage	VDrop	IO = 1A, TJ =+2	IO = 1A, T _J =+25 °C			7	V
Output Resistance	ro	f = 1KHz		-	15	-	mΩ
Short Circuit Current	Isc	VI = 35V, TA =+	-25 °C	-	230	-	mA
Peak Current	IPK	T _J =+25 °C		-	2.2	-	Α

Load and line regulation are specified at constant junction temperature. Changes in V₀ due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7806/KA7806R)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I = 11V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Parameter	Cumbal	C	onditions		KA780	6	Unit
Parameter	Symbol)	onditions	Min.	Тур.	Max.	Unit
		TJ =+25 °C	TJ =+25 °C		6.0	6.25	
Output Voltage	Vo	$5.0 \text{mA} \le I_0 \le V_1 = 8.0 \text{V to } 21^{\circ}$	1.0A, P _O ≤ 15W V	5.7	6.0	6.3	V
Line Regulation (Note1)	Regline	T1-125 °C	V _I = 8V to 25V	-/	5	120	mV
Line Negulation (Note I)	Regilile	T _J =+25 °C	V _I = 9V to 13V	11	1.5	60	1111
Load Regulation (Note1)	Regload	load T.J =+25 °C	I _O =5mA to 1.5A	/-	9	120	mV
Load Regulation (Note I)	Regioau	1J =+25 C	IO =250mA to750mA	-	3	60	1111
Quiescent Current	IQ	TJ =+25 °C		-	5.0	8.0	mA
Quiescent Current Change	ΔlQ	$I_O = 5mA$ to $1A$		-	-	0.5	mA
Quiescent Current Change	ΔIQ	V _I = 8V to 25V		-	-	1.3	IIIA
Output Voltage Drift	ΔV _O /ΔT	IO = 5mA		- ,	-0.8	_	mV/ °C
Output Noise Voltage	VN	f = 10Hz to 100K	Hz, T _A =+25 °C	-//	45	-	μV/Vo
Ripple Rejection	RR	f = 120Hz VI = 9V to 19V		59	75	-	dB
Dropout Voltage	V _{Drop}	Io = 1A, T _J =+2	25 °C	-	2	-	V
Output Resistance	ro	f = 1KHz		-	19	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+2	25 °C	-	250	-	mA
Peak Current	IPK	T _J =+25 °C		-	2.2	-	Α

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



Electrical Characteristics (KA7808/KA7808R)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I = 14V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Domonoston	Cb. a.l	Conditions		KA7808			Unit
Parameter	Symbol		onaitions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		7.7	8.0	8.3	
Output Voltage	Vo	5.0mA ≤ I _O ≤ V _I = 10.5V to 2	1.0A, P _O ≤ 15W 23V	7.6	8.0	8.4	V
Line Regulation (Note1)	Doglino	TJ =+25 °C	V _I = 10.5V to 25V	-	5.0	160	mV
Line Regulation (Note1)	Regline	\	V _I = 11.5V to 17V	-//	2.0	80	IIIV
			I _O = 5.0mA to 1.5A	<i>]</i> /	10	160	
Load Regulation (Note1)	Regload	tegload TJ =+25 °C Id	IO= 250mA to 750mA	<i>/</i> -	5.0	80	mV
Quiescent Current	IQ	TJ =+25 °C	T _J =+25 °C		5.0	8.0	mA
Quiagoant Current Change	AIO.	I _O = 5mA to 1.0A		- /	0.05	0.5	mA
Quiescent Current Change	ΔlQ	VI = 10.5A to 25V		-/	0.5	1.0	IIIA
Output Voltage Drift	ΔV0/ΔΤ	I _O = 5mA		/-	-0.8	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 100	KHz, T _A =+25 °C	-/	52	-	μV/Vo
Ripple Rejection	RR	f = 120Hz, V _I =	: 11.5V to 21.5V	56	73	-	dB
Dropout Voltage	V _{Drop}	Io = 1A, TJ=+2	25 °C	-	2	-	V
Output Resistance	ro	f = 1KHz	//	-	17	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =	+25 °C	-	230	-	mA
Peak Current	IPK	TJ =+25 °C		-	2.2	-	Α

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



Electrical Characteristics (KA7809/KA7809R)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I =15V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Parameter	Cymbol	C	onditions	I	KA780	9	Unit
Farameter	Symbol		onations	Min.	Тур.	Max.	Unit
		TJ =+25 °C		8.65	9	9.35	
Output Voltage	Vo	5.0mA≤ I _O ≤1.0A V _I = 11.5V to 24V	, P _O ≤15W	8.6	9	9.4	V
Line Regulation (Note1)	Regline	TJ=+25 °C	V _I = 11.5V to 25V	-//	6	180	m\/
Line Regulation (Note I)	Regilile	1J=+25 C	V _I = 12V to 17V	-//	2	90	mV
Load Population (Note1)	Pagland	TJ=+25 °C	I _O = 5mA to 1.5A	/-	12	180	mV
Load Regulation (Note1)	Regload	1J=+25 C	IO = 250mA to 750mA	-	4	90	IIIV
Quiescent Current	IQ	T _J =+25 °C	TJ=+25 °C			8.0	mA
Quiescent Current Change	ΔIO	IO = 5mA to 1.0A		-	-	0.5	mA
Quiescent Current Change	ΔlQ	V _I = 11.5V to 26V		-/	-	1.3	IIIA
Output Voltage Drift	ΔV0/ΔΤ	IO = 5mA		/-	-1	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 100KHz	z, TA =+25 °C	- /	58	_	μV/Vo
Ripple Rejection	RR	f = 120Hz V _I = 13V to 23V		56	71	-	dB
Dropout Voltage	V _{Drop}	IO = 1A, TJ=+25	°C	-	2	-	V
Output Resistance	ro	f = 1KHz		-	17	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+25	5 °C	-	250	-	mA
Peak Current	IPK	TJ= +25 °C		-	2.2	-	А

^{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 (KA7810)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I =16V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Doromotor	Cumbal	Ca	anditi and	ŀ	CA781 0)	Unit
Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		9.6	10	10.4	
Output Voltage	Vo	$5.0 \text{mA} \le I_0 \le 1.0$ VI = 12.5V to 25V		9.5	10	10.5	V
Line Regulation (Note1)	Regline	TJ =+25 °C	V _I = 12.5V to 25V	-	10	200	mV
Line Regulation (Note I)	Regilile	1J = +25 C	V _I = 13V to 25V	-//	3	100	IIIV
Load Population (Note1)	Regload	TJ =+25 °C	I _O = 5mA to 1.5A	-/-	12	200	m\/
Load Regulation (Note1)	Regioau	1J=+25 C	IO = 250mA to 750mA	/-	4	400	mV
Quiescent Current	IQ	T _J =+25 °C		-	5.1	8.0	mA
Quinagent Current Change	Ma	$I_0 = 5 \text{mA to } 1.0 \text{A}$		-	/-	0.5 mA	m ^
Quiescent Current Change	ΔlQ	V _I = 12.5V to 29	V	- /	-	1.0	IIIA
Output Voltage Drift	ΔV0/ΔΤ	IO = 5mA		7	-1	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 100KH	Iz, T _A =+25 °C	-	58	-	μV/Vo
Ripple Rejection	RR	f = 120Hz V _I = 13V to 23V		56	71	-	dB
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25	I _O = 1A, T _J =+25 °C			-	V
Output Resistance	ro	f = 1KHz		-	17	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+2	5°C	-	250	-	mA
Peak Current	IPK	TJ =+25 °C		-	2.2	-	Α

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



Electrical Characteristics (KA7812/KA7812R)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I =19V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Parameter	Symbol	C	onditions	KA78	312/KA	7812R	Unit
Parameter	Symbol		onditions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		11.5	12	12.5	
Output Voltage	Vo	5.0mA ≤ I _O ≤1.0A V _I = 14.5V to 27V		11.4	12	12.6	V
Line Regulation (Note1)	Regline	T _J =+25 °C	V _I = 14.5V to 30V	- /	10	240	mV
Line Regulation (Note1)	Regime	1J =+25 C	V _I = 16V to 22V	-/	3.0	120	IIIV
Load Regulation (Note1)	Regload	T _J =+25 °C	I _O = 5mA to 1.5A	// -	11	240	mV
Load Regulation (Note1)	Regioau	1J =+25 C	IO = 250mA to 750mA	-	5.0	120	IIIV
Quiescent Current	IQ	T _J =+25 °C	T _J =+25 °C			8.0	mA
Quiacaant Current Change	ΔlQ	Io = 5mA to 1.0A		-	0.1	0.5	m ^
Quiescent Current Change	ΔiQ	$V_I = 14.5V \text{ to } 30V$		-/	0.5	1.0	- mA
Output Voltage Drift	ΔV0/ΔΤ	Io = 5mA		/ -	-1	-	mV/ °C
Output Noise Voltage	VN	f = 10Hz to 100KH	z, TA =+25 °C	-	76	-	μV/Vo
Ripple Rejection	RR	f = 120Hz V _I = 15V to 25V		55	71	-	dB
Dropout Voltage	V _{Drop}	IO = 1A, TJ=+25	I _O = 1A, T _J =+25 °C			-	V
Output Resistance	ro	f = 1KHz	f = 1KHz			-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+25	5 °C	-	230	-	mA
Peak Current	IPK	TJ = +25 °C		-	2.2	-	Α

^{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 (KA7815)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I =23V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Parameter	Symbol	Conditions		k	(A781	KA7815		
Farameter	Symbol		onunions	Min.	Тур.	Max.	Unit	
		TJ =+25 °C		14.4	15	15.6		
Output Voltage	Vo	5.0mA ≤ I _O ≤1.0A V _I = 17.5V to 30V		14.25	15	15.75	V	
Line Regulation (Note1)	Poglino	TJ =+25 °C	V _I = 17.5V to 30V	-//	11	300	mV	
Line Regulation (Note I)	Regline	1J=+25 C	VI = 20V to 26V	-//	3	150	IIIV	
Load Regulation (Note1)	Peglood	TJ =+25 °C	I _O = 5mA to 1.5A	7-	12	300	mV	
Load Regulation (Note1)	Regload	1J=+25 C	IO = 250mA to 750mA	-	4	150	IIIV	
Quiescent Current	IQ	T _J =+25 °C		-	5.2	8.0	mA	
Ouisseent Current Change	Alo.	$I_0 = 5 \text{mA to } 1.0 \text{A}$	1	-	-	0.5	mA	
Quiescent Current Change	ΔlQ	V _I = 17.5V to 30V	V	-/	-	1.0	IIIA	
Output Voltage Drift	ΔV0/ΔΤ	IO = 5mA		/-	-1	-	mV/°C	
Output Noise Voltage	VN	f = 10Hz to 100KH	Iz, TA =+25 °C	- /	90	_	μV/Vo	
Ripple Rejection	RR	f = 120Hz V _I = 18.5V to 28.	5V	54	70	-	dB	
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25	°C	-	2	-	V	
Output Resistance	ro	f = 1KHz		-	19	-	mΩ	
Short Circuit Current	Isc	V _I = 35V, T _A =+2	5°C	-	250	-	mA	
Peak Current	IPK	TJ =+25 °C		-	2.2	-	Α	

^{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 (KA7818)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I =27V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Parameter	Cumbal	C	onditions	ŀ	(A781	В	Unit
Farameter	Symbol		onanions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		17.3	18	18.7	
Output Voltage	Vo	5.0mA ≤ I _O ≤1.0A VI = 21V to 33V	a, P _O ≤15W	17.1	18	18.9	V
Line Regulation (Note1)	Regline	T _J =+25 °C	V _I = 21V to 33V	-/	15	360	m\/
Line Regulation (Note I)	Regilile	1J=+25 C	VI = 24V to 30V	-//	5	180	mV
Load Dogulation (Note1)	Dogland	T 25 °C	I _O = 5mA to 1.5A	7-	15	360	mV
Load Regulation (Note1)	Regload	TJ =+25 °C	IO = 250mA to 750mA	-	5.0	180	IIIV
Quiescent Current	IQ	T _J =+25 °C		-	5.2	8.0	mA
Quiacant Current Change	Mo	Io = 5mA to 1.0A		-	-	0.5	mA
Quiescent Current Change	ΔlQ	V _I = 21V to 33V		-/	-	1	IIIA
Output Voltage Drift	ΔV0/ΔΤ	Io = 5mA		/-	-1	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 100KH	z, TA =+25 °C	- /	110	-	μV/Vo
Ripple Rejection	RR	f = 120Hz V _I = 22V to 32V		53	69	-	dB
Dropout Voltage	V _{Drop}	IO = 1A, TJ=+25°	I _O = 1A, T _J =+25 °C			-	V
Output Resistance	ro	f = 1KHz		-	22	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+25	5 °C	-	250	-	mA
Peak Current	IPK	TJ =+25 °C		-	2.2	-	Α

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



Electrical Characteristics (KA7824)

(Refer to test circuit 0° C < T_J < 125° C, I_O = 500mA, V_I = 33V, C_I= 0.33μ F, C_O= 0.1μ F, unless otherwise specified)

Parameter	Symbol	Conditions			KA7824		
Parameter	Symbol	S.	onations	Min.	Тур.	Max.	Unit
		TJ =+25 °C		23	24	25	
Output Voltage	Vo	$5.0 \text{mA} \le I_0 \le 1.0 \text{A}$ VI = 27V to 38V	A, P _O ≤ 15W	22.8	24	25.25	V
Line Regulation (Note1)	Regline	TJ =+25 °C	V _I = 27V to 38V	-/	17	480	mV
Line Regulation (Note I)	Regilile	1J =+25 C	V _I = 30V to 36V	-//	6	240	IIIV
Load Regulation (Note1)	Regload	TJ =+25 °C	I _O = 5mA to 1.5A	//-	15	480	mV
Load Regulation (Note I)	Regioau	1J =+25 C	IO = 250mA to 750mA	<i>/</i> -	5.0	240	IIIV
Quiescent Current	lQ	T _J =+25 °C		-	5.2	8.0	mA
Quiescent Current Change	ΔlQ	$I_O = 5mA$ to 1.0A		-	0.1	0.5 mA	
Quiescent Current Change	ΔiQ	$V_{I} = 27V \text{ to } 38V$		-/	0.5	1	IIIA
Output Voltage Drift	ΔV _O /ΔT	IO = 5mA		-	-1.5	_	mV/ °C
Output Noise Voltage	VN	f = 10Hz to 100KHz	z, T _A =+25 °C	-//	60	-	μV/Vo
Ripple Rejection	RR	f = 120Hz VI = 28V to 38V		50	67	-	dB
Dropout Voltage	V _{Drop}	$I_0 = 1A, T_J = +25^{\circ}$)C	-	2	-	V
Output Resistance	ro	f = 1KHz		-	28	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+25	oC €	-	230	-	mA
Peak Current	IPK	T _J =+25 °C		-	2.2	-	А

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



Electrical Characteristics (KA7805A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I_{0} =1A, V I = 10V, C I=0.33 μ F, C O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Condi	tions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		4.9	5	5.1	
Output Voltage	Vo	I _O = 5mA to 1A, F V _I = 7.5V to 20V	P _O ≤ 15W	4.8	5	5.2	V
		$V_I = 7.5V \text{ to } 25V$ IO = 500mA		-	5	50	
Line Regulation (Note1)	Regline	$V_I = 8V$ to 12V		-	3	50	m∨
		TJ=+25 °C VI	= 7.3V to 20V	- /	5	50	
	//	1J = +25 °C VI	= 8V to 12V		1.5	25	
Load Regulation (Note1)	Dankard	$T_J = +25 ^{\circ}C$ IO = 5mA to 1.5A		/-	9	100	>/
ŭ (Regload	IO = 5mA to 1A		-	9	100	— mV
		I _O = 250mA to 75	0mA	-	4	50	
Quiescent Current	IQ	TJ =+25 °C		- /	5.0	6.0	mA
0.1		$I_O = 5mA \text{ to } 1A$		1	7/	0.5	
Quiescent Current Change	Δ lQ	V _I = 8 V to 25V, I _O = 500mA		/ -	-	0.8	mA
Orlange		V _I = 7.5V to 20V, T _J =+25 °C		-	-	0.8	
Output Voltage Drift	ΔV/ΔΤ	lo = 5mA		-	-0.8	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 100KH TA =+25 °C	·lz	-	10	-	μV/Vo
Ripple Rejection	RR	f = 120Hz, I _O = 50 V _I = 8V to 18V	00mA	-	68	-	dB
Dropout Voltage	V _{Drop}	Io = 1A, T _J =+25	°C	-	2	-	V
Output Resistance	ro	f = 1KHz		-	17	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+25	°C		250	#* Y 1	mA
Peak Current	IPK	TJ= +25 °C	N /		2.2		Α
Note:	VII	ecu i	J.A.	U			7.

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7806A)

(Refer to the test circuits. $0^{\circ}C$ < TJ < +125 $^{\circ}C$, I_{0} =1A, V I = 11V, C I=0.33 μ F, C O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		5.58	6	6.12	
Output Voltage	Vo	I _O = 5mA to 1 V _I = 8.6V to 2		5.76	6	6.24	V
		V _I = 8.6V to 25 IO = 500mA	5V	-	5	60	
Line Regulation (Note1)	Regline	V _I = 9V to 13V	1	-//	3	60	mV
	//	TJ =+25 °C	V _I = 8.3V to 21V	-/	5	60	
		1J=+25 C	V _I = 9V to 13V	7-	1.5	30	
Load Regulation (Note1)	Dealerd	T _J =+25 °C I _O = 5mA to 1.5A		-	9	100	
ů ,	Regload	IO = 5mA to 1A		-	4	100	mV
		I _O = 250mA to	o 750mA	-/	5.0	50	
Quiescent Current	IQ	TJ =+25 °C		/-	4.3	6.0	mA
		I _O = 5mA to 1A		- /	/-	0.5	
Quiescent Current Change	Δ lQ	V _I = 9V to 25V, I _O = 500mA		- 4	-	0.8	mA
		V _I = 8.5V to 2°	1V, TJ =+25 °C	-	-	0.8	
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA	7	-	-0.8	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 10 TA =+25 °C	00KHz	-	10	-	μV/Vo
Ripple Rejection	RR	f = 120Hz, I _O V _I = 9V to 19V		-	65	-	dB
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =-	+25 °C	-	2	-	V
Output Resistance	ro	f = 1KHz		-	17	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =	-+25 °C		250	/ Y 1	mA
Peak Current	IPK	TJ=+25 °C		7 77	2.2	_	A
Note:	ntt	UU A	JaA. (IC	1	/ •	7.

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7808A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I_{0} =1A, V I = 14V, C I=0.33 μ F, C O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit
		T _J =+25 °C		7.84	8	8.16	
Output Voltage	Vo	I _O = 5mA to 1A, P _O ≤15W V _I = 10.6V to 23V		7.7	8	8.3	V
		V _I = 10.6V to 25V IO = 500mA		-	6	80	
Line Regulation (Note1)	Regline	V _I = 11V to 17	V	-7/	3	80	m∨
		TJ =+25 °C	V _I = 10.4V to 23V	//	6	80	
		1J =+25 C	V _I = 11V to 17V	/-	2	40	
Load Regulation (Note1)	Dealead	$T_J = +25$ °C $I_O = 5$ mA to 1	.5A	-	12	100	
ů ,	Regload	IO = 5mA to 1A		- /	12	100	mV
		I _O = 250mA to 750mA		-/	5	50	
Quiescent Current	lQ	T _J =+25 °C		/-	5.0	6.0	mA
		IO = 5mA to 1A		- /	7 -	0.5	
Quiescent Current Change	Δ lQ	VI = 11V to 25	5V, IO = 500mA	-	-	0.8	mA
		V _I = 10.6V to 23V, T _J =+25 °C		-	-	0.8	
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA		-	-0.8	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 10 TA =+25 °C	00KHz	-	10	-	μV/Vo
Ripple Rejection	RR	f = 120Hz, I _O = 500mA V _I = 11.5V to 21.5V		1	62	-	dB
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25 °C		-	2	-	V
Output Resistance	rO	f = 1KHz		-	18	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+25 °C		7-	250	7 T	- mA
Peak Current	IPK T	T _J =+25 °C		I.n	2.2	-	/ A

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7809A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I₀ =1A, V _I = 15V, C _I=0.33 μ F, C _O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit	
		T _J =+25°C		8.82	9.0	9.18		
Output Voltage	Vo	$I_{O} = 5mA \text{ to } 1A, P_{O} \le 15W$ $V_{I} = 11.2V \text{ to } 24V$		8.65	9.0	9.35	V	
		V _I = 11.7V to 2 IO = 500mA	25V	-	6	90		
Line Regulation (Note1)	Regline	V _I = 12.5V to 1	19V	-//	4	45	mV	
		TJ =+25°C	V _I = 11.5V to 24V	7,5	6	90		
		1J =+25 C	V _I = 12.5V to 19V	/ -	2	45		
Load Regulation (Note1)	Dealerd	$T_J = +25^{\circ}C$ $I_O = 5mA \text{ to } 1$.0A	-	12	100		
,	Regload	IO = 5mA to 1.0A		- /	12	100	mV	
		I _O = 250mA to 750mA		-/	5	50		
Quiescent Current	lQ	T _J =+25 °C		-	5.0	6.0	mA	
//		V _I = 11.7V to 25V, T _J =+25 °C ΔIQ V _I = 12V to 25V, I _O = 500mA		- /	-	0.8		
Quiescent Current Change	ΔlQ				-	0.8	mA	
		I _O = 5mA to 1.0A		-	-	0.5		
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA		-	-1.0	-	mV/ °C	
Output Noise Voltage	VN	f = 10Hz to 10 TA =+25 °C	0KHz	-	10	_	μV/Vo	
Ripple Rejection	RR		f = 120Hz, I _O = 500mA V _I = 12V to 22V			-	dB	
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25 °C		-	2.0	-	V	
Output Resistance	ro	f = 1KHz		-	17	-	mΩ	
Short Circuit Current	Isc	V _I = 35V, T _A =+25 °C		-	250	TY I	mA	
Peak Current	IPK T	TJ=+25°C		In	2.2	-	A	
Peak Current Note:	IPK	TJ=+25 C).A. (le	2.2	70	/ -	

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7810A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I_{0} =1A, V I = 16V, C I=0.33 μ F, C O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Conditions		Min.	Тур.	Max.	Unit		
				T _J =+25°C		9.8	10	10.2	
Output Voltage	Vo			9.6	10	10.4	V		
		V _I = 12.8V to 26V IO = 500mA		-	8	100			
Line Regulation (Note1)	Regline	V _I = 13V to 20V		-/	4	50	mV		
	//	T _J =+25 °C	25V	-/	8	100			
		V _I = 13V to 2	0V	//-	3	50			
Load Regulation (Note1)		T _J =+25 °C I _O = 5mA to 1.5A		-	12	100			
	Regload	IO = 5mA to 1.0A		-	12	100	mV		
		I _O = 250mA to 750mA		-/	5	50			
Quiescent Current	lQ	TJ =+25 °C		7-	5.0	6.0	mA		
	ΔlQ	V _I = 13V to 26V, T _J =+25 °C			<i>/</i> - <i> </i>	0.5			
Quiescent Current Change		VI = 12.8V to 25V, IO = 500r	mA	- 1	-	0.8	mA		
		I _O = 5mA to 1.0A		-	-	0.5			
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA		-	-1.0	-	mV/°C		
Output Noise Voltage	VN	f = 10Hz to $100KHzTA =+25 °C$		-	10	7.	μV/Vο		
Ripple Rejection	RR	f = 120Hz, I _O = 500mA V _I = 14V to 24V		-	62	-	dB		
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25°C		-	2.0	-	V		
Output Resistance	ro	f = 1KHz		-	17	-	mΩ		
Short Circuit Current	_ Isc	V _I = 35V, T _A =+25 °C		7	250	/ Y 1	mA		
Peak Current	IPK	TJ=+25 °C	4	4-7	2.2	-	A		
Note:	7774	UU DA	· t	It	1	∠• I			

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7812A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I_{0} =1A, V I = 19V, C I=0.33 μ F, C O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit
		T _J =+25 °C		11.75	12	12.25	
Output Voltage	Vo	$I_{O} = 5mA \text{ to } 1A, P_{O} \le 15W$ VI = 14.8V to 27V		11.5	12	12.5	V
		V _I = 14.8V to 3 I _O = 500mA	30V	-	10	120	
Line Regulation (Note1)	Regline	V _I = 16V to 22	2V	-//	4	120	mV
	//	TJ =+25 °C	V _I = 14.5V to 27V	-/-	10	120	
		1J=+25 C	V _I = 16V to 22V	7-	3	60	
Load Regulation (Note1)		T _J =+25 °C I _O = 5mA to 1.5A		-	12	100	
	Regload	IO = 5mA to 1.0A		-	12	100	mV
		I _O = 250mA to 750mA		-/	5	50	
Quiescent Current	lQ	T _J =+25°C		/-	5.1	6.0	mA
		$V_I = 15V \text{ to } 30V, T_J = +25 ^{\circ}C$		- /	/	0.8	
Quiescent Current Change	ΔlQ	$V_{I} = 14V \text{ to } 2^{-1}$	7V, IO = 500mA	- 4		0.8	mA
		I _O = 5mA to 1.0A		-		0.5	
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA		-	-1.0	_	mV/°C
Output Noise Voltage	VN	f = 10Hz to 10 TA =+25°C	00KHz	-	10		μV/Vo
Ripple Rejection	RR	f = 120Hz, I _O = 500mA VI = 14V to 24V		-	60	-	dB
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25°C		-	2.0	-	V
Output Resistance	ro	f = 1KHz		-	18	-	mΩ
Short Circuit Current	Isc ■	V _I = 35V, T _A =+25 °C		7	250	Ty I	mA
Peak Current	IPK	T _{J=+25} °C		7 77	2.2	'-	JΑ
Note:	me	UU A	Jafle (A.C.	1	/ • I	

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7815A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I₀ =1A, V I =23V, C I=0.33 μ F, C O=0.1 μ F, unless otherwise specified)

Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		14.7	15	15.3	
Output Voltage	Vo		I _O = 5mA to 1A, P _O ≤15W V _I = 17.7V to 30V		15	15.6	V
		V _I = 17.9V to I _O = 500mA	30V	-	10	150	
Line Regulation (Note1)	Regline	V _I = 20V to 26	SV	- /	5	150	m∨
	//	TJ =+25°C	V _I = 17.5V to 30V	-/	11	150	
		1J =+25 C	V _I = 20V to 26V	<i>J-</i> -	3	75	
Load Regulation (Note1)	Regload	T _J =+25 °C I _O = 5mA to 1.5A		/ -	12	100	
3		IO = 5mA to 1.0A		-	12	100	mV
		I _O = 250mA to 750mA		- /	5	50	
Quiescent Current	/ IQ	TJ =+25 °C		-	5.2	6.0	mA
		$V_{I} = 17.5V \text{ to}$	30V, T _J =+25 °C	-	//-	0.8	
Quiescent Current Change	ΔlQ	V _I = 17.5V to	30V, IO = 500mA	- 4	-	0.8	mA
		I _O = 5mA to 1.0A (0.5			
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA		-	-1.0	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 1 T _A =+25 °C	00KHz	-	10		μV/Vo
Ripple Rejection	RR		f = 120Hz, I _O = 500mA V _I = 18.5V to 28.5V		58	-	dB
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25 °C		-	2.0	-	V
Output Resistance	ro	f = 1KHz		-	19	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A :	=+25 °C		250	ry 1	mA
Peak Current	IPK	TJ=+25°C		0 E A	2.2	-	A
Note:	UIU	itu	U.A.	ut	1	J 🛊 🛚	

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7818A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I_{0} =1A, V I = 27V, C I=0.33 μ F, C O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit
		TJ =+25 °C		17.64	18	18.36	
Output Voltage	Vo		I _O = 5mA to 1A, P _O ≤15W V _I = 21V to 33V		18	18.7	V
		V _I = 21V to 33 I _O = 500mA	3V	-	15	180	
Line Regulation (Note1)	Regline	V _I = 21V to 33	3V	-	5	180	mV
	//	TJ =+25 °C	V _I = 20.6V to 33V	-/	15	180	
		1J =+25 C	V _I = 24V to 30V	//	5	90	
Load Regulation (Note1)	Regload	$T_J = +25^{\circ}C$ $I_O = 5mA to 1$	1.5A	-	15	100	
ů (IO = 5mA to 1.0A		-	15	100	mV
		I _O = 250mA to 750mA		- /	7	50	
Quiescent Current	IQ	T _J =+25 °C		-	5.2	6.0	mA
	ΔlQ	V _I = 21V to 33V, T _J =+25 °C		7 - 7	7	0.8	
Quiescent Current Change		V _I = 21V to 3	3V, IO = 500mA	- 4	-	0.8	mA
		$I_O = 5mA \text{ to } 1$	1.0A	-	-	0.5	
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA		-	-1.0	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 10 T _A =+25°C	00KHz		10		μV/Vο
Ripple Rejection	RR	f = 120Hz, I _O V _I = 22V to 3		-	57	-	dB
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25°C		-	2.0	-	V
Output Resistance	ro	f = 1KHz		-	19	-	mΩ
Short Circuit Current	▶ Isc	V _I = 35V, T _A =+25°C			250	ry I	mA
Peak Current	IPK	TJ=+25 °C		r Fan	2.2	-	/ A
Note:	mi	tu	Uarle (4.kė		/ •	

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Electrical Characteristics (KA7824A)

(Refer to the test circuits. 0° C < T_J < +125 $^{\circ}$ C, I₀ =1A, V | = 33V, C |=0.33 μ F, C O=0.1 μ F, unless otherwise specing fied)

Parameter	Symbol	Co	onditions	Min.	Тур.	Max.	Unit
		T _J =+25 °C		23.5	24	24.5	
Output Voltage	Vo		$I_O = 5mA \text{ to } 1A, P_O \le 15W$ $V_I = 27.3V \text{ to } 38V$		24	25	V
		V _I = 27V to 38 IO = 500mA	V _I = 27V to 38V I _O = 500mA		18	240	
Line Regulation (Note1)	Regline	V _I = 21V to 33	3V	- /	6	240	mV
	//	TJ =+25 °C	V _I = 26.7V to 38V	-//	18	240	
	/ /	1J =+25 C	V _I = 30V to 36V	//	6	120	
Load Regulation (Note1)	Regload	T _J =+25 °C I _O = 5mA to 1.5A			15	100	
		IO = 5mA to 1.0A		-	15	100	mV
		I _O = 250mA to 750mA		-/	7	50	
Quiescent Current	lQ	TJ =+25 °C		-/-	5.2	6.0	mA
	ΔlQ	V _I = 27.3V to 38V, T _J =+25 °C		<i>y</i> - <i>y</i>	7-	0.8	
Quiescent Current Change		V _I = 27.3V to	38V, IO = 500mA	- 4	-	0.8	mA
		$I_O = 5mA$ to '	1.0A	-	-	0.5	
Output Voltage Drift	ΔV/ΔΤ	IO = 5mA		-	-1.5	-	mV/°C
Output Noise Voltage	VN	f = 10Hz to 10 T _A = 25 °C	00KHz		10		μV/Vo
Ripple Rejection	RR		f = 120Hz, I _O = 500mA V _I = 28V to 38V		54	-	dB
Dropout Voltage	V _{Drop}	I _O = 1A, T _J =+25 °C		-	2.0	-	V
Output Resistance	ro	f = 1KHz	f = 1KHz		20	-	mΩ
Short Circuit Current	Isc	V _I = 35V, T _A =+25 °C		7	250	r v	mA
Peak Current	IPK	TJ=+25 °C		r Fan	2.2	-	/ A
Note:	me	tu.	Ualle (ЦÁ	1	70 l	

^{1.} Load and line regulation are specified at constant junction temperature. Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

Typical Perfomance Characteristics

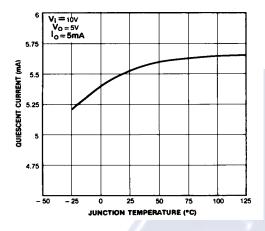


Figure 1. Quiescent Current

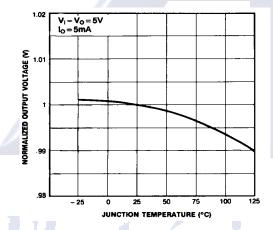


Figure 3. Output Voltage

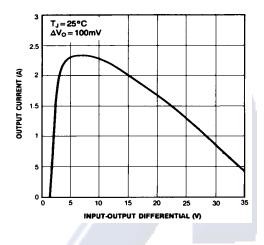


Figure 2. Peak Output Current

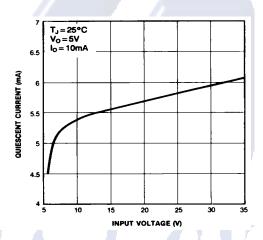


Figure 4. Quiescent Current

Typical Applications

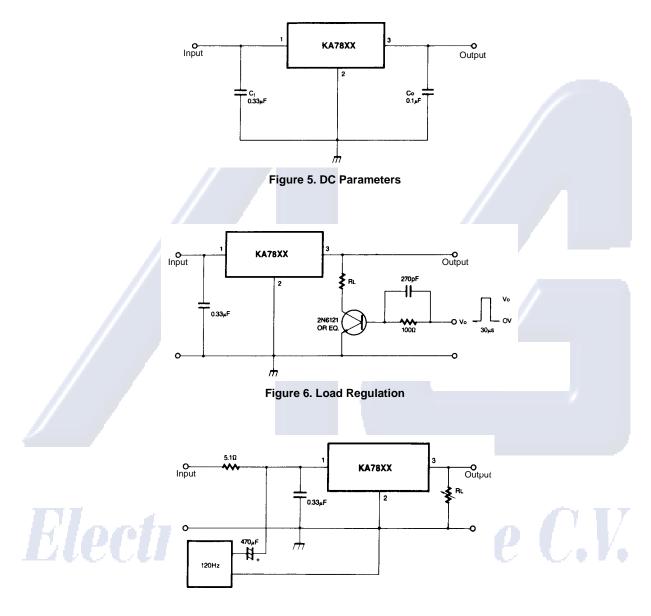


Figure 7. Ripple Rejection

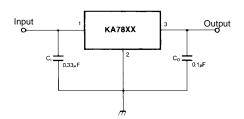


Figure 8. Fixed Output Regulator

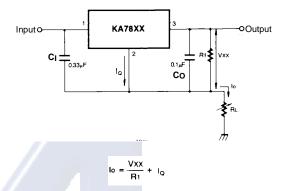
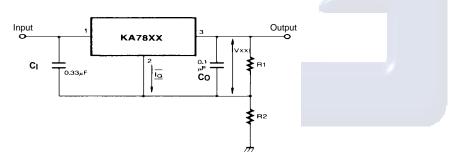


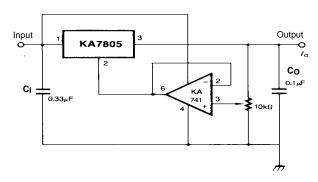
Figure 9. Constant Current Regulator

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.



I_{RI} ≥ 5IQ V_O = VXX(1+R₂/R₁)+I_QR₂ Figure 10. Circuit for Increasing Output Voltage



 $I_{RI} \ge 5 \ I_Q$ $V_O = V_{XX}(1 + R_2/R_1) + I_QR_2$ Figure 11. Adjustable Output Regulator (7 to 30V)

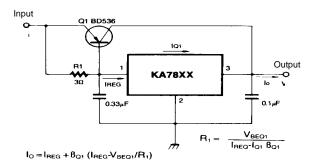


Figure 12. High Current Voltage Regulator

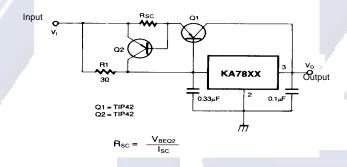


Figure 13. High Output Current with Short Circuit Protection

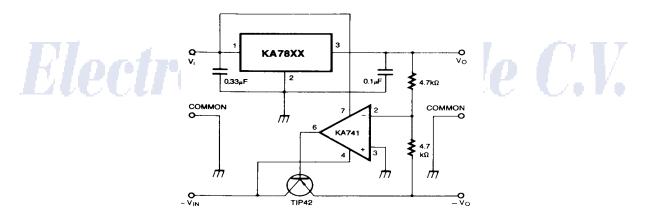


Figure 14. Tracking Voltage Regulator

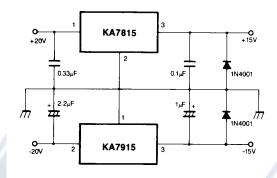


Figure 15. Split Power Supply (±15V-1A)

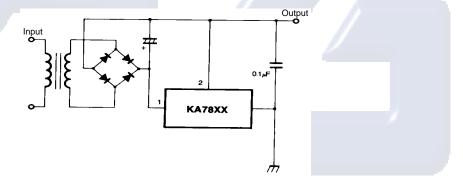


Figure 16. Negative Output Voltage Circuit

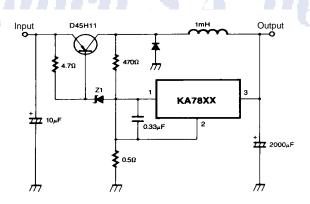
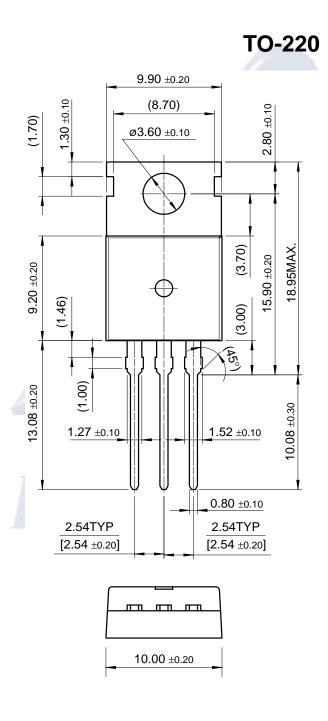
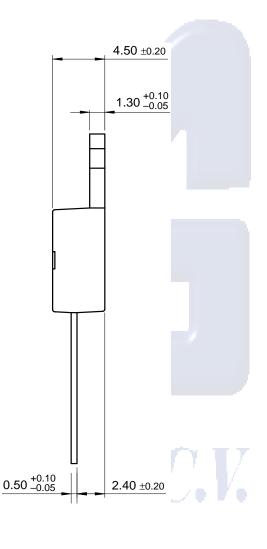


Figure 17. Switching Regulator

Mechanical Dimensions

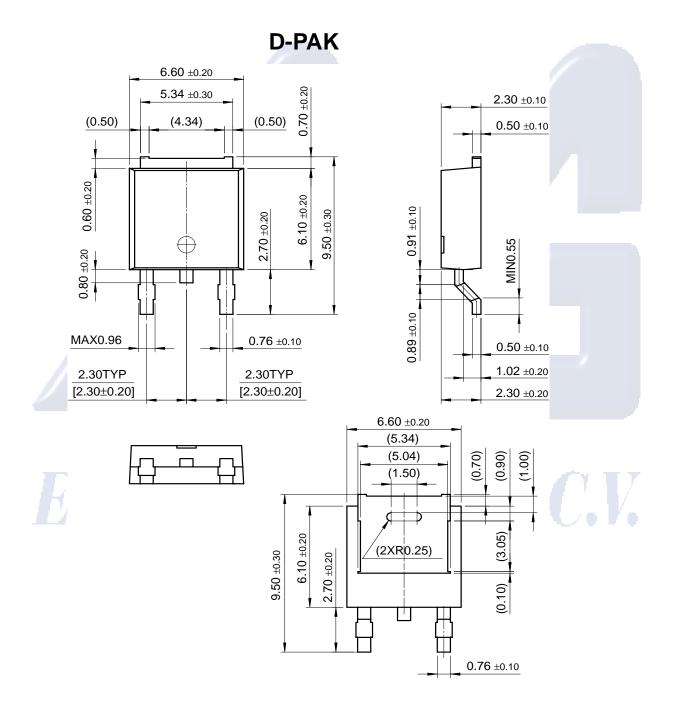
Package





Mechancal Dimensions (Continued)

Package



Ordering Information

Product Number	Output Voltage Tolerance	Package	Operating Temperature
KA7805 / KA7806			
KA7808 / KA7809			
KA7810	±4%		
KA7812 / KA7815			
KA7818 / KA7824		TO-220	
KA7805A / KA7806A		10-220	
KA7808A / KA7809A			0 ~ + 125°C
KA7810A / KA7812A	±2%		
KA7815A / KA7818A			
KA7824A			
KA7805R / KA7806R			
KA7808R / KA7809R	±4%	D-PAK	
KA7812R			

Electrónica S.A. de C.V.

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- Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
- 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.

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