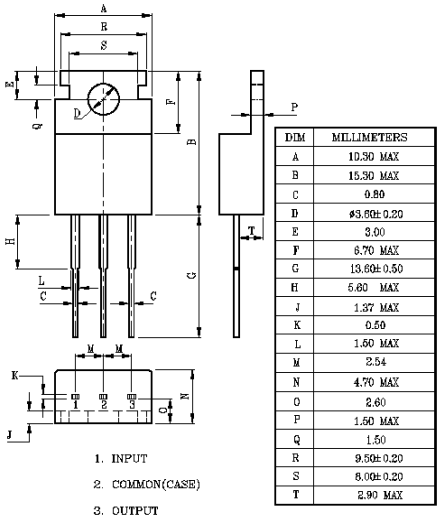
THREE TERMINAL POSITIVE VOLTAGE REGULATORS
5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, 20V, 24V.

FEATURES

- Suitable for C-MOS, TTL, the Other Digital IC's Power Supply.
- Internal Thermal Overload Protection.
- Internal Short Circuit Current Limiting.
- Output Current in Excess of 1A.
- Satisfies IEC-65 Specification. (International Electronical Commission).

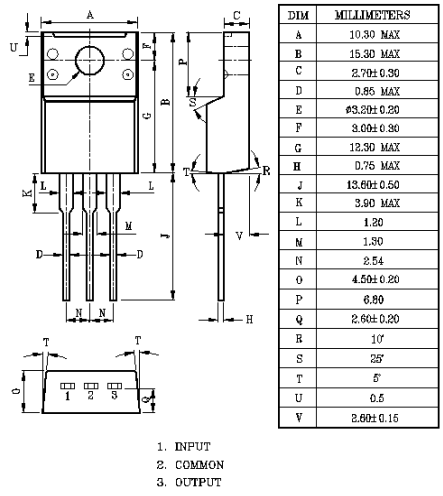
MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage	KIA7805AP/API~ KIA7815AP/API	V_{IN}	35	V
	KIA7818AP/API~ KIA7824AP/API		40	
Power Dissipation (Tc=25℃)		P_D	20.8	W
Power Dissipation (Without Heatsink)	KIA7805API~ KIA7824API	P_D	2.0	W
Operating Junction Temperature		T_j	-30~150	℃
Storage Temperature		T_{stg}	-55~150	℃



DIM	MILLIMETERS
A	10.30 MAX
B	15.30 MAX
C	9.80
D	ø3.60±0.20
E	3.00
F	6.70 MAX
G	13.60±0.50
H	5.60 MAX
J	1.37 MAX
K	0.50
L	1.50 MAX
M	2.54
N	4.70 MAX
O	2.60
P	1.50 MAX
Q	1.50
R	9.50±0.20
S	8.00±0.20
T	2.90 MAX

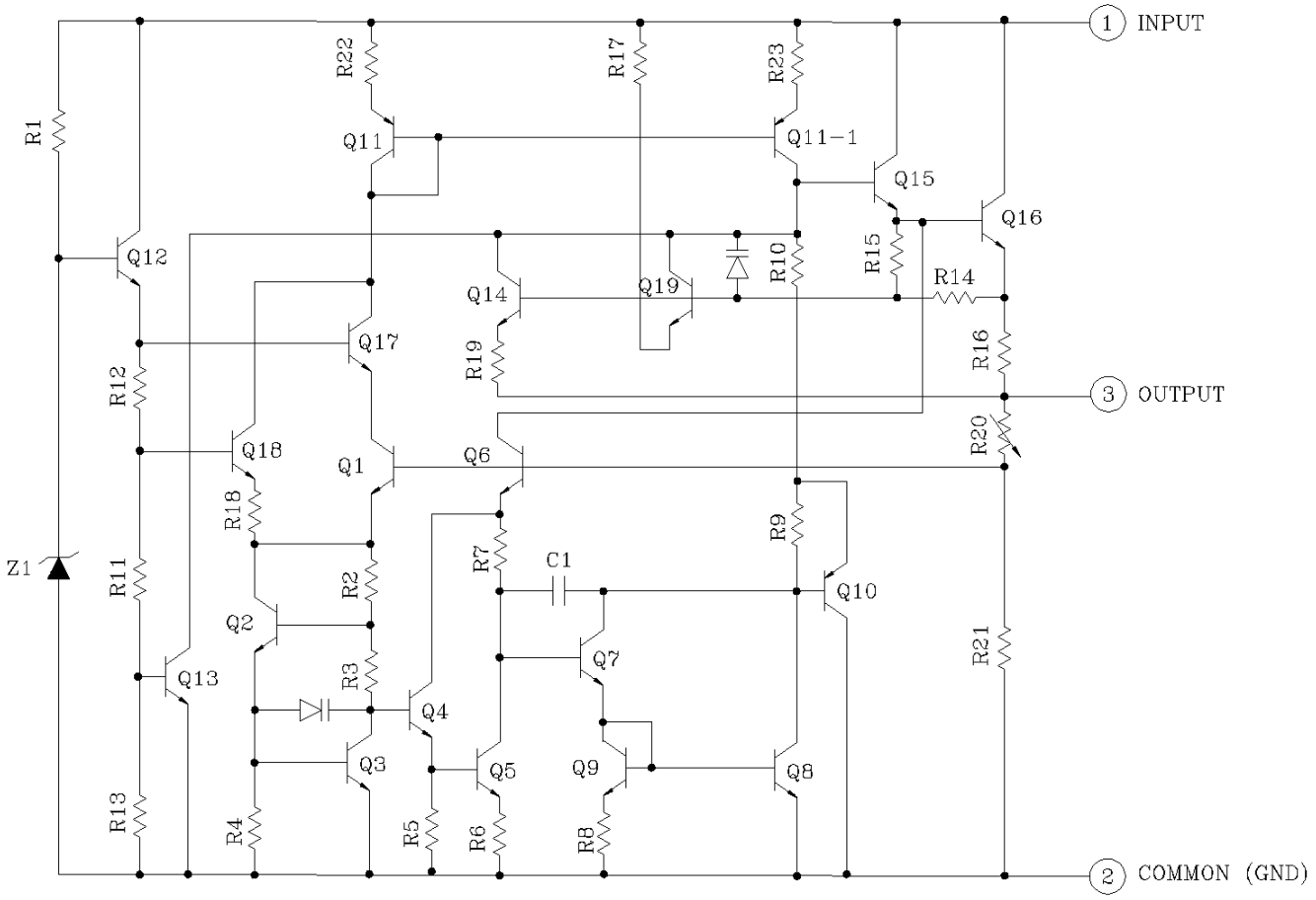
TO-220AB



DIM	MILLIMETERS
A	10.30 MAX
B	15.30 MAX
C	2.70±0.30
D	0.85 MAX
E	ø3.20±0.20
F	3.00±0.30
G	12.30 MAX
H	0.75 MAX
J	13.60±0.50
K	3.90 MAX
L	1.20
M	1.30
N	2.54
O	4.50±0.20
P	6.80
Q	2.60±0.20
R	10°
S	25°
T	5°
U	0.5
V	2.60±0.15

TO-220IS

EQUIVALENT CIRCUIT



KIA7805AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=10V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		4.8	5.0	5.2	V
Input Regulation	Reg line	1	T_j=25℃	7.0V≦V_{IN}≦25V	-	3	100	mV
				8.0V≦V_{IN}≦12V	-	1	50	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	15	100	mV
				250mA≦I_{OUT}≦750mA	-	5	50	
Output Voltage	V_{OUT}	1	7.0V≦V_{IN}≦20V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		4.75	-	5.25	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.2	8.0	mA
Quiescent Current Change	ΔI_B	1	7.0V≦V_{IN}≦25V		-	-	1.3	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	50	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 8.0V≦V_{IN}≦18V, I_{OUT}=50mA, T_j=25℃		62	78	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	1.6	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-0.6	-	mV/℃

KIA7806AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=11V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		5.75	6.0	6.25	V
Input Regulation	Reg line	1	T_j=25℃	8.0V≦V_{IN}≦25V	-	4	120	mV
				9V≦V_{IN}≦13V	-	2	60	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	15	120	mV
				250mA≦I_{OUT}≦750mA	-	5	60	
Output Voltage	V_{OUT}	1	8V≦V_{IN}≦21V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		5.7	-	6.3	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	8V≦V_{IN}≦25V		-	-	1.3	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	55	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 9V≦V_{IN}≦19V, I_{OUT}=50mA, T_j=25℃		61	77	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	1.5	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-0.7	-	mV/℃

KIA7808AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=14V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		7.7	8.0	8.3	V
Input Regulation	Reg line	1	T_j=25℃	10.5V≦V_{IN}≦25V	-	6	160	mV
				11V≦V_{IN}≦17V	-	2	80	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	160	mV
				250mA≦I_{OUT}≦750mA	-	4	80	
Output Voltage	V_{OUT}	1	10.5V≦V_{IN}≦23V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		7.6	-	8.4	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	10.5V≦V_{IN}≦25V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	70	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 11.5V≦V_{IN}≦21.5V I_{OUT}=50mA, T_j=25℃		58	74	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	1.1	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-1.0	-	mV/℃

KIA7809AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=15V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		8.64	9.0	9.36	V
Input Regulation	Reg line	1	T_j=25℃	11.5V≦V_{IN}≦26V	-	7.0	180	mV
				13V≦V_{IN}≦19V	-	2.5	90	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	180	mV
				250mA≦I_{OUT}≦750mA	-	4.0	90	
Output Voltage	V_{OUT}	1	11.5V≦V_{IN}≦26V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		8.55	-	9.45	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	11.5V≦V_{IN}≦26V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	75	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 12.5V≦V_{IN}≦22.5V I_{OUT}=50mA, T_j=25℃		56	72	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	1.0	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-1.1	-	mV/℃

KIA7810AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=16V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		9.6	10.0	10.4	V
Input Regulation	Reg line	1	T_j=25℃	12.5V≦V_{IN}≦27V	-	8	200	mV
				14V≦V_{IN}≦20V	-	2.5	100	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	200	mV
				250mA≦I_{OUT}≦750mA	-	4	100	
Output Voltage	V_{OUT}	1	12.5V≦V_{IN}≦25V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		9.5	-	10.5	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	12.5V≦V_{IN}≦27V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	80	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 13.5V≦V_{IN}≦23.5V I_{OUT}=50mA, T_j=25℃		55	72	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	0.9	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-1.3	-	mV/℃

KIA7812AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=19V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		11.5	12.0	12.5	V
Input Regulation	Reg line	1	T_j=25℃	14.5V≦V_{IN}≦30V	-	10	240	mV
				16V≦V_{IN}≦22V	-	3	120	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	240	mV
				250mA≦I_{OUT}≦750mA	-	4	120	
Output Voltage	V_{OUT}	1	14.5V≦V_{IN}≦27V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		11.4	-	12.6	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	14.5V≦V_{IN}≦30V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	90	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 15V≦V_{IN}≦25V I_{OUT}=50mA, T_j=25℃		55	71	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	0.7	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-1.6	-	mV/℃

KIA7815AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=23V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		14.4	15.0	15.6	V
Input Regulation	Reg line	1	T_j=25℃	17.5V≦V_{IN}≦30V	-	11	300	mV
				20V≦V_{IN}≦26V	-	3	150	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	300	mV
				250mA≦I_{OUT}≦750mA	-	4	150	
Output Voltage	V_{OUT}	1	17.5V≦V_{IN}≦30V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		14.25	-	15.75	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.4	8.0	mA
Quiescent Current Change	ΔI_B	1	17.5V≦V_{IN}≦30V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	110	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 18.5V≦V_{IN}≦28.5V I_{OUT}=50mA, T_j=25℃		54	70	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	0.5	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-2.0	-	mV/℃

KIA7818AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=27V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		17.3	18.0	18.7	V
Input Regulation	Reg line	1	T_j=25℃	21V≦V_{IN}≦33V	-	13	360	mV
				24V≦V_{IN}≦30V	-	4	180	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	360	mV
				250mA≦I_{OUT}≦750mA	-	4	180	
Output Voltage	V_{OUT}	1	21V≦V_{IN}≦33V, 5.0mA≦I_{OUT}≦1.0A, Po≦15W		17.1	-	18.9	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.5	8.0	mA
Quiescent Current Change	ΔI_B	1	21V≦V_{IN}≦33V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz, I_{OUT}=50mA		-	125	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 22V≦V_{IN}≦32V I_{OUT}=50mA, T_j=25℃		52	68	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	0.4	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-2.5	-	mV/℃

KIA7820AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=29V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

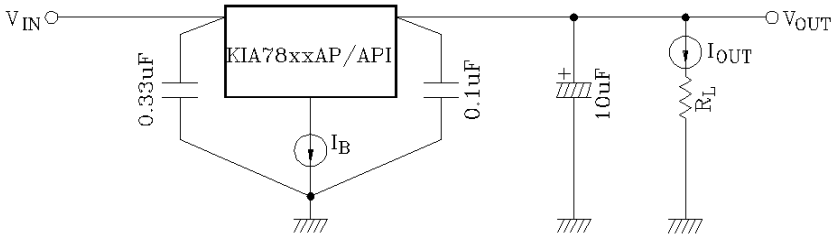
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		19.2	20.0	20.8	V
Input Regulation	Reg line	1	T_j=25℃	23V≦V_{IN}≦35V	-	15	400	mV
				26V≦V_{IN}≦32V	-	5	200	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	400	mV
				250mA≦I_{OUT}≦750mA	-	4	200	
Output Voltage	V_{OUT}	1	23V≦V_{IN}≦35V 5.0mA≦I_{OUT}≦1.0A, Po≦15W		19.0	-	21.0	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.6	8.0	mA
Quiescent Current Change	ΔI_B	1	23V≦V_{IN}≦35V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	135	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 24V≦V_{IN}≦34V, I_{OUT}=50mA, T_j=25℃		50	66	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current Limit	I_{SC}	1	T_j=25℃		-	0.4	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-3.0	-	mV/℃

KIA7824AP/API

ELECTRICAL CHARACTERISTICS (V_{IN}=33V, I_{OUT}=500mA, 0℃≦T_j≦125℃)

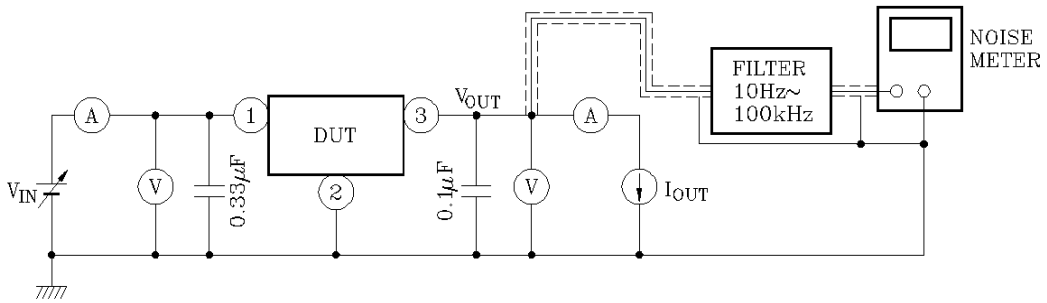
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃, I_{OUT}=100mA		23.0	24.0	25.0	V
Input Regulation	Reg line	1	T_j=25℃	27V≦V_{IN}≦38V	-	18	480	mV
				30V≦V_{IN}≦36V	-	6	240	
Load Regulation	Reg load	1	T_j=25℃	5mA≦I_{OUT}≦1.4A	-	12	480	mV
				250mA≦I_{OUT}≦750mA	-	4	240	
Output Voltage	V_{OUT}	1	27V≦V_{IN}≦38V, 5.0mA≦I_{OUT}≦1.0A, Po≦15W		22.8	-	25.2	V
Quiescent Current	I_B	1	T_j=25℃, I_{OUT}=5mA		-	4.6	8.0	mA
Quiescent Current Change	ΔI_B	1	27V≦V_{IN}≦38V		-	-	1.0	mA
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz I_{OUT}=50mA		-	150	-	μV_{rms}
Ripple Rejection Ratio	RR	1	f=120Hz, 28V≦V_{IN}≦38V I_{OUT}=50mA, T_j=25℃		50	66	-	dB
Dropout Voltage	V_D	1	I_{OUT}=1.0A, T_j=25℃		-	2.0	-	V
Short Circuit Current	I_{SC}	1	T_j=25℃		-	0.3	-	A
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA, 0℃≦T_j≦125℃		-	-3.5	-	mV/℃

TEST CIRCUIT1/STANDARD APPLICATION CIRCUIT

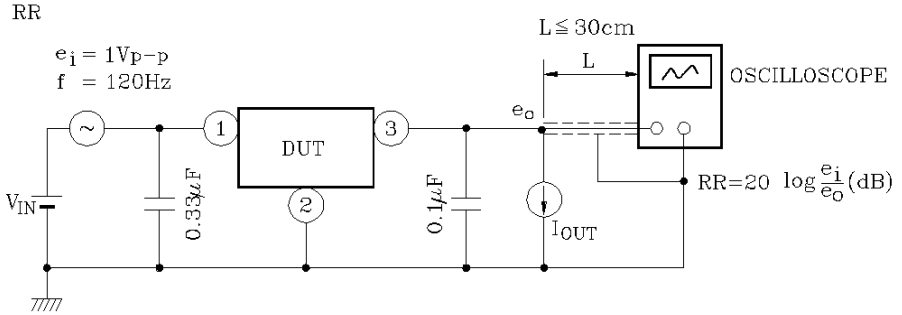


TEST CIRCUIT

1. V_{OUT} , Reg · line , Reg · load , V_{OUT} , I_B , ΔI_B , V_{NO} , ΔV_{OUT} /Δt , $|V_{IN} - V_{OUT}|$, TC_{VO}



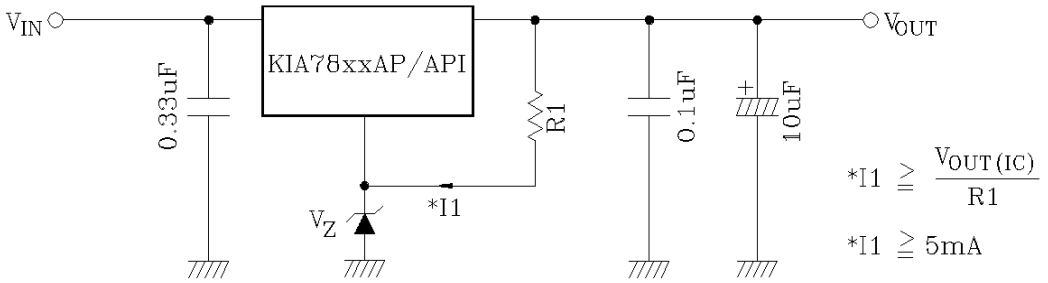
2. RR



APPLICATION CIRCUIT

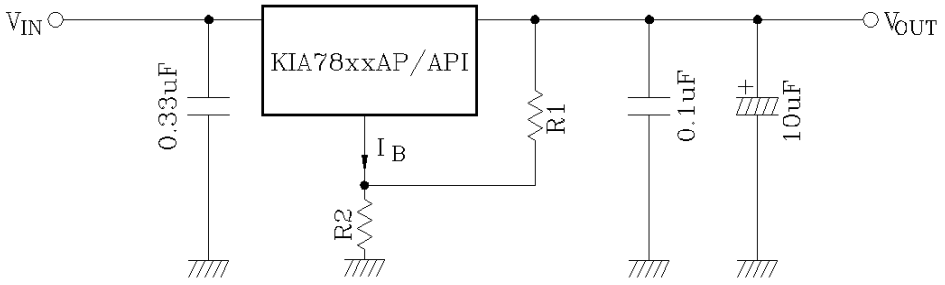
(1) VOLTAGE BOOST REGULATOR

(a) Voltage boost by use of zener diode



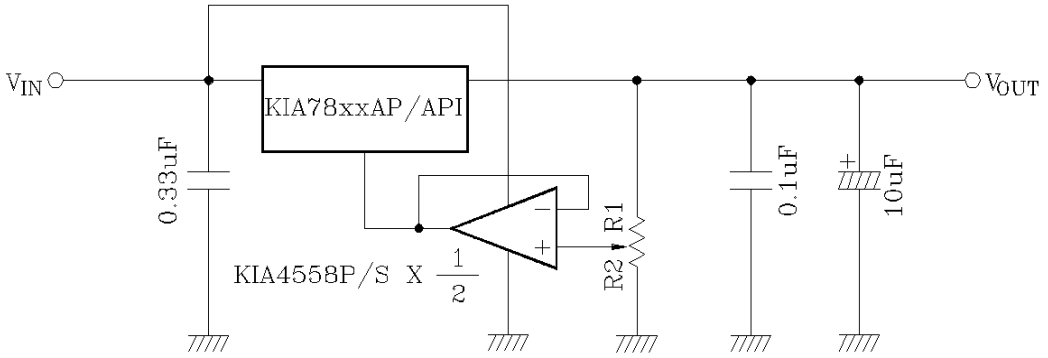
$$V_{OUT} = V_{OUT(IC)} + V_Z$$

(b) Voltage boost by use of resistor



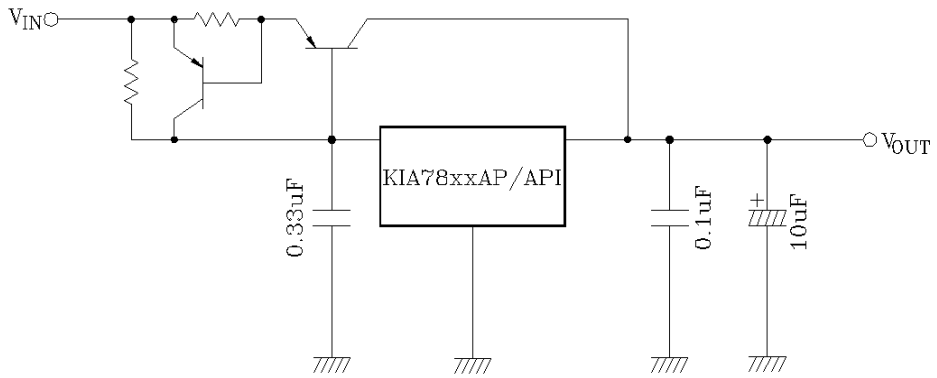
$$V_{OUT} = V_{OUT(IC)} \left(1 + \frac{R2}{R1}\right) + R2 \cdot I_B$$

(c) Adjustable output regulator



$$V_{OUT} = V_{OUT(IC)} \left(1 + \frac{R2}{R1}\right)$$

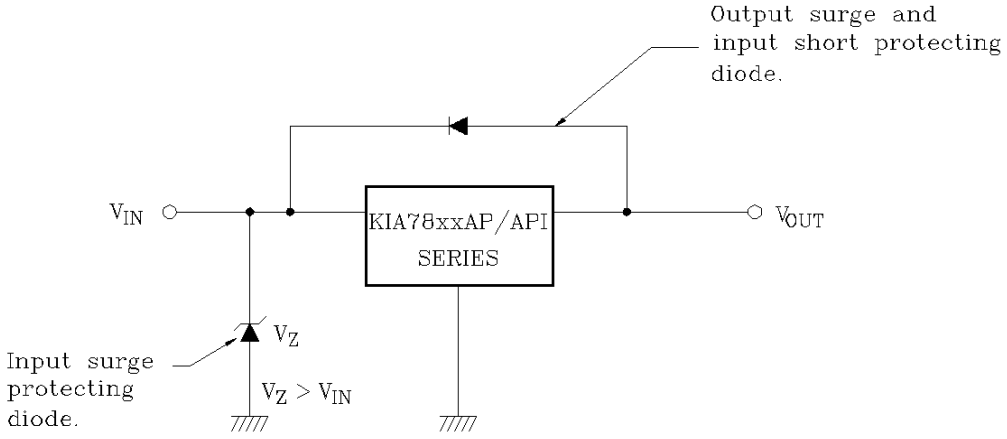
(2) CURRENT BOOST REGULATOR



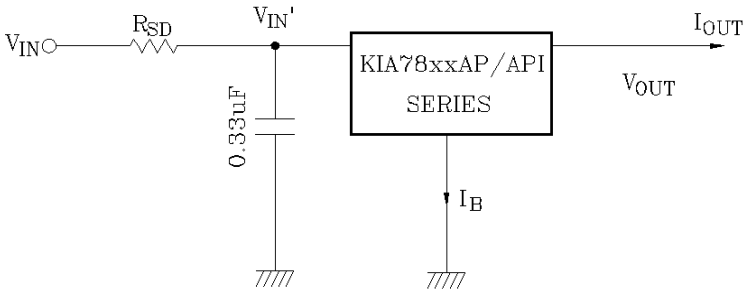
PRECAUTIONS ON APPLICATION

(1) In regard to GND, be careful not to apply a negative voltage to the input/ output terminal. Further, special care is necessary in case of a voltage boost application.

(2) When a surge voltage exceeding maximum rating is applied to the input terminal or when a voltage in excess of the input terminal voltage is applied to the output terminal, the circuit may be destroyed.
Specially, in the latter case, great care is necessary
Further, if the input terminal shorts to GND in a state of normal operation, the output terminal voltage becomes higher than the input voltage (GND potential), and the electric charge of a chemical capacitor connected to the output terminal flows into the input side, which may cause the destruction of circuit.
In these cases, take such steps as a zener diode and a general silicon diode are connected to the circuit, as shown in the following figure.



(3) When the input voltage is too high, the power dissipation of three terminal regulator increase because of series regulator, so that the junction temperature rises.
In such a case, it is recommended to reduce the power dissipation by inserting the power limiting resistor R_{SD} in the input terminal, and to reduce the junction temperature as a result.



The power dissipation P_D of IC is expressed in the following equation.

$$P_D = (V_{IN}'-V_{OUT}) \cdot I_{OUT} + V_{IN}' \cdot I_B$$

If V_{IN}' is reduced below the lowest voltage necessary for the IC, the parasitic oscillation will be caused according to circumstances.
In determining the resistance value of R_{SD}, design with margin should be made by making reference to the following equation.

$$R_{SD} < \frac{V_{IN} - V_{IN}'}{I_{OUT} + I_B}$$

(4) Connect the input terminal and GND, and the output terminal and GND, by capacitor respectively. The capacitances should be determined experimentally because they depend on printed patterns. In particular, adequate investigation should be made so that there is no problem even at time of high or low temperature.

(5) Installation of IC for power supply
For obtaining high reliability on the heat sink design of the regulator IC, it is generally required to derate more than 20% of maximum junction temperature (T_j MAX.)
Further, full consideration should be given to the installation of IC to the heat sink.

(a) Heat sink design
The thermal resistance of IC itself is required from the viewpoint of the design of elements, but the thermal resistance from the IC package to the open air varies with the contact thermal resistance.
Table 1 shows how much the value of the contact thermal resistance ($\theta_C + \theta_S$) is changed by insulating sheet (mica) and heat sink grease.

TABLE 1. UNIT:℃/W

PACKAGE	MODEL NO.	TORQUE	MICA	$\theta_C + \theta_S$
TO-220AB	KIA78xxAP	6kg·cm	Not Provided	0.3~0.5(1.5~2.0)
			Provided	2.0~2.5(4.0~6.0)

The figures given in parentheses denote the values at time of no grease.
The package of regulator IC serves as GND, therefore, usually use the value at time of "no mica"

(b) Silicon grease

When a circuit not exceeding maximum rating is designed, it is to be desired that the grease should be used if possible. If it is required that the contact thermal resistance is reduced from the view-point of the circuit design, It is recommended that the following methods be adopted.

A: Use Thercon (Fuji High Polymer Kogyo K.K)
B: Use SC101 (Torei Silicon) or G-640 (GE), if grease is used.

(c) Torque

When installing IC on a heat sink or the like, tighten the IC with the torque of less than the rated value. If it is tightened with the torque in excess of the rated value, sometimes the internal elements of the IC are adversely affected. Therefore, great care should be given to the installing operation. Further, if polycarbonate screws are used, the torque causes a change with the passage of time, which may lessen the effect of radiation.

(6) IEC (International Electronical Commission)-65 Specification.

(a) IEC (International Electronical Commission)-65 is the standard, parts testing method, machinery and tolls (used in connecting main power directly and indirectly) Which are used at home and general building. The purpose of the above standard is not to breaking out the risk which is related to an electric shock, a heating, a fire and the damage of surrounding parts in the case of normal or abnormal operating.

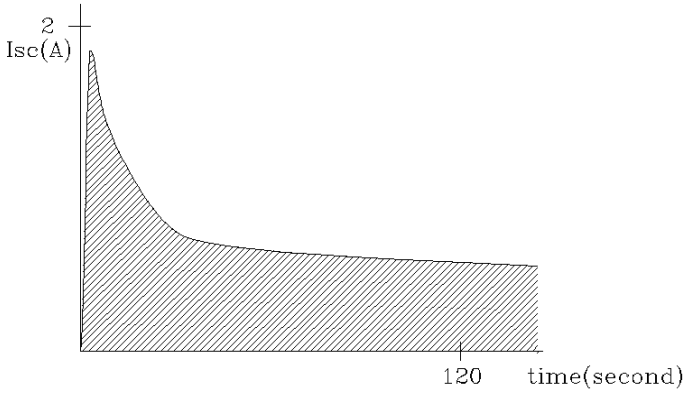
(b) In case temperature is limited by temperature overheating prevention device, fuse or the operation of fuse resistor

One must calculate the temperature of PCB substrate in 2 minute.

$\Delta T \leq 110℃$ regulated

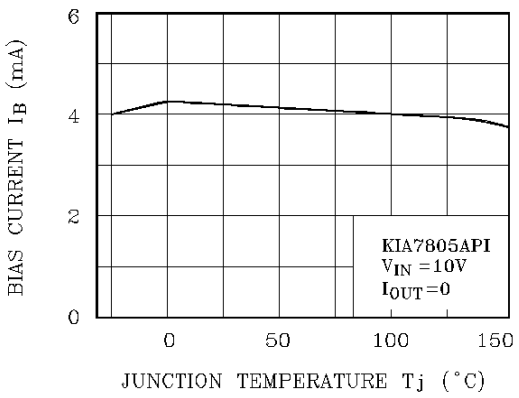
$\Delta T = T$(The PCB substrate temperature in 2 minute) $- Ta$(Ambient temperature)

(c) Graph

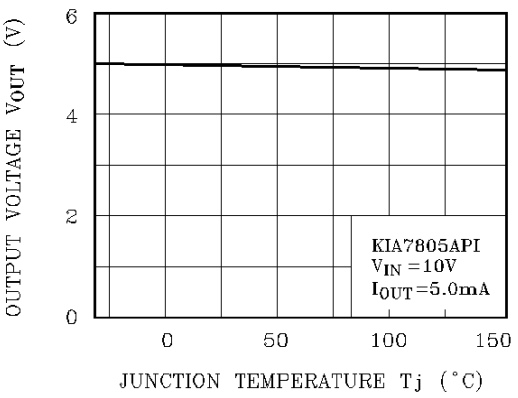


As the territory of the deviant line appear by the heat, as the area is wider, T(The PCB substrate temperature in 2 minute) is becoming high.

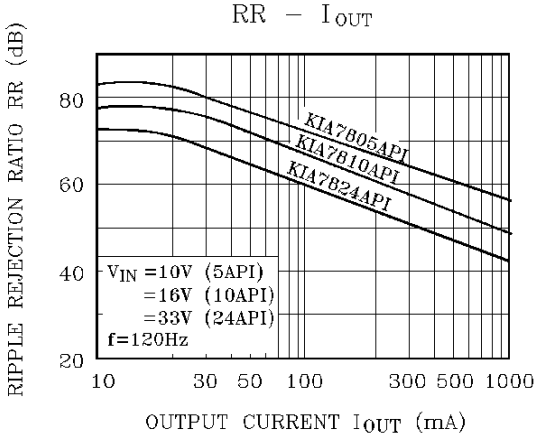
$I_B - T_j$



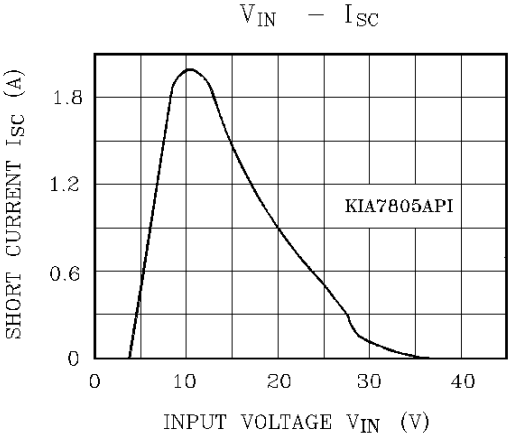
$V_{OUT} - T_j$



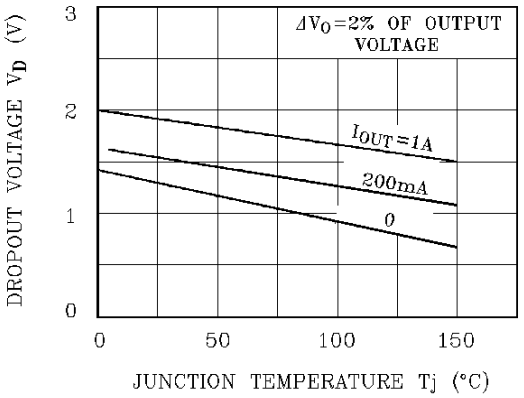
RR - I_{OUT}



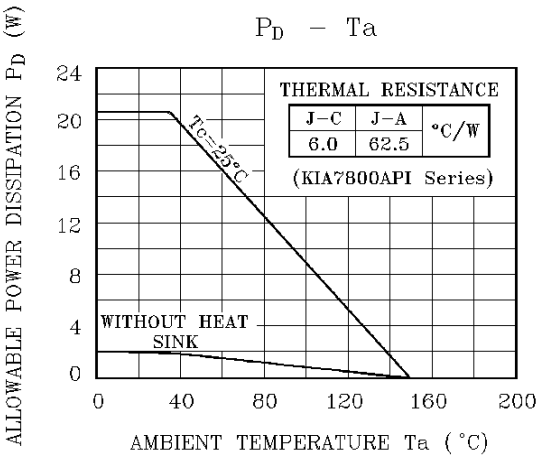
$V_{IN} - I_{SC}$



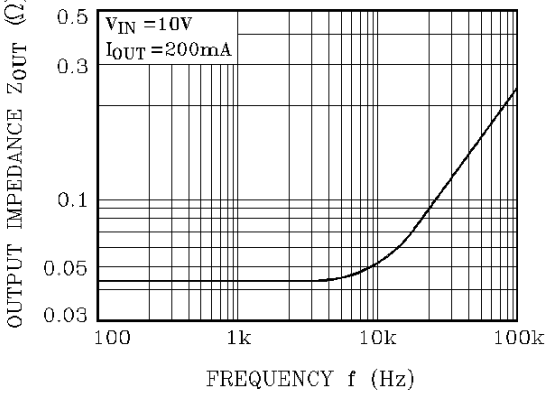
V_D – T_j



P_D – Ta



Z_{OUT} – f



P_D – Ta