

KEC

KOREA ELECTRONICS CO.,LTD.

SEMICONDUCTOR
TECHNICAL DATA

KIA7905P/PI~
KIA7924P/PI

BIPOLAR LINEAR INTEGRATED CIRCUIT

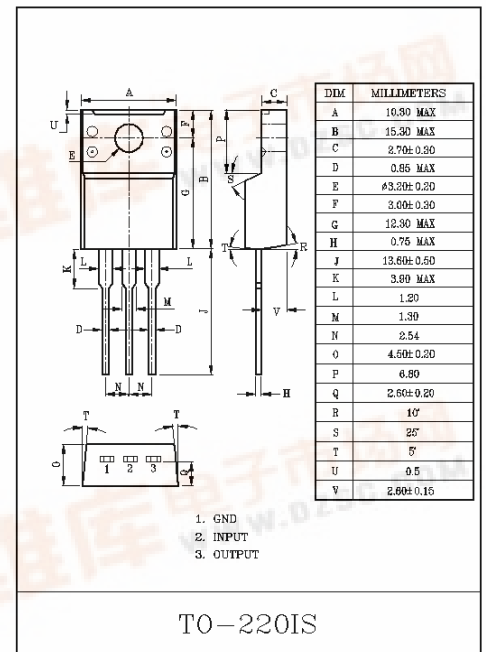
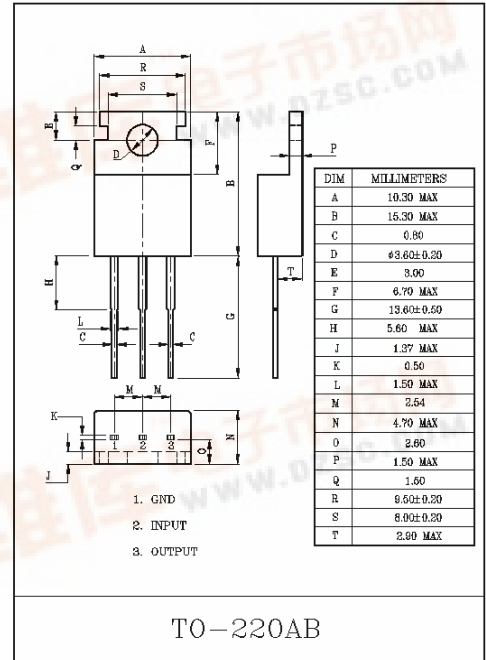
1A THREE TERMINAL NEGATIVE VOLTAGE REGULATORS
-5V, -6V, -8V, -9V, -10V, -12V, -15V, -18V, -20V, -24V

FEATURES:

- Suitable for C-MOS, TTL, and the other digital IC power supply.
- Internal thermal overload protecting.
- Internal short circuit current limiting.
- Output current in excess of 1.0A.

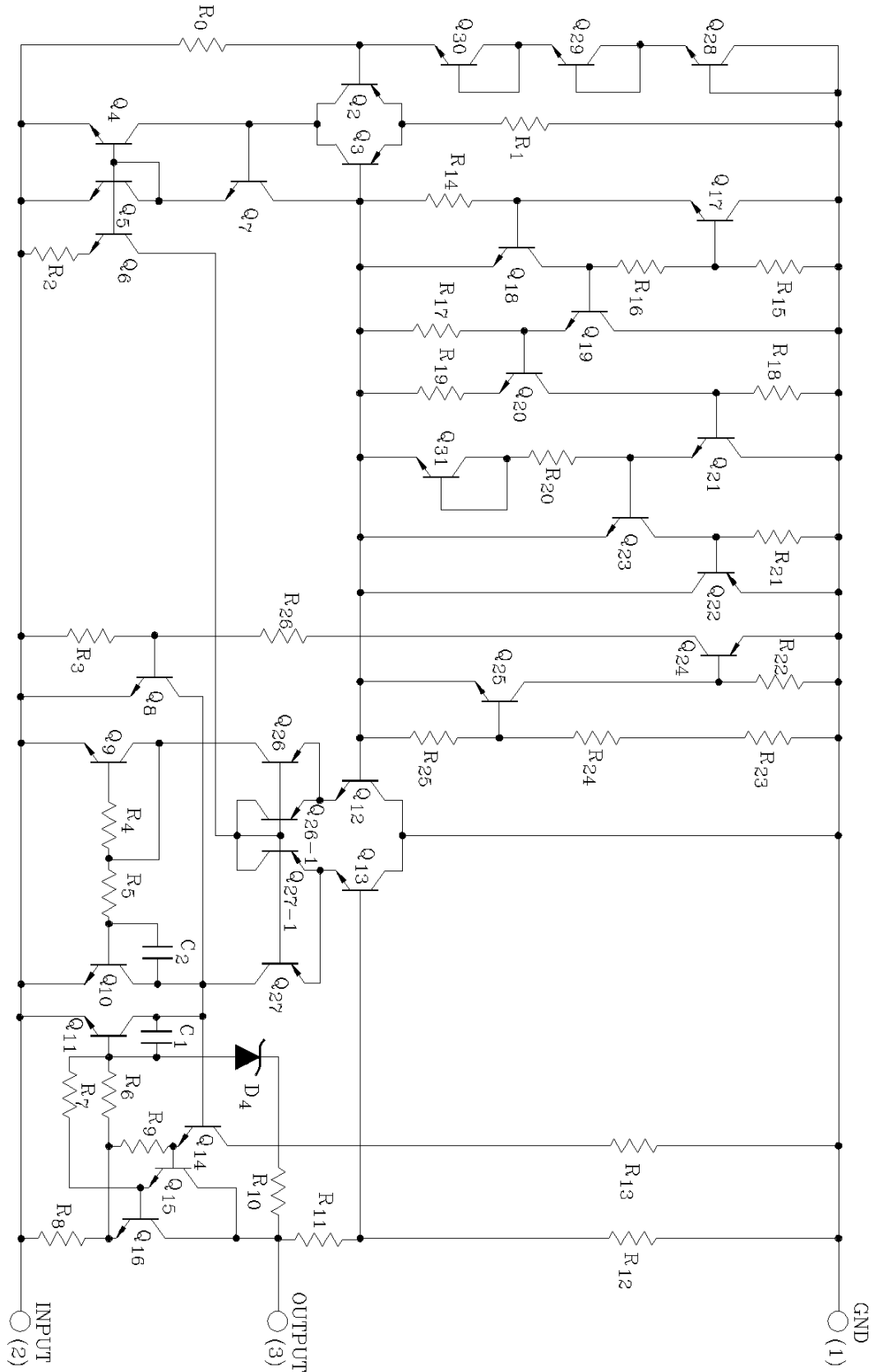
MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage	KIA7905P/PI~ KIA7915P/PI	V _{IN}	-35	V
	KIA7918P/PI~ KIA7924P/PI		-40	
Power Dissipation (Tc=25°C)	P _D	20.8	W	
Operating Junction Temperature	T _j	-30~150	°C	
Operating Temperature	T _{opr}	-30~75	°C	
Storage Temperature	T _{stg}	-55~150	°C	



KIA7905P/PI ~ KIA7924P/PI

EQUIVALENT CIRCUIT



KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7905P/PI

(Unless otherwise specified, $V_{IN} = -10V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1\mu F$)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V_{OUT}	1	$T_j = 25^{\circ}C$	-5.2	-5.0	-4.8	V	
Input Regulation	Reg line	1	$T_j = 25^{\circ}C$	$-12V \leq V_{IN} \leq -8V$	-	5	50	mV
				$-25V \leq V_{IN} \leq -7V$	-	10	100	
Load Regulation	Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	10	100	mV
				$250mA \leq I_{OUT} \leq 750mA$	-	3	50	
Output Voltage	V_{OUT}	1	$-20V \leq V_{IN} \leq -7V$ $5mA \leq I_{OUT} \leq 1.0A$	-5.25	-5.0	-4.75	V	
Quiescent Current	I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA	
Quiescent Current Change	ΔI_{BI}	1	$-25V \leq V_{IN} \leq -8V$ $5mA \leq I_{OUT} \leq 1.0A$	-	0.1	1.3	mA	
	ΔI_{BO}			-	0.05	0.5		
Output Noise Voltage	V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	100	-	μV_{rms}	
Ripple Rejection Ratio	RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB	
Short Circuit Current Limit	I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage	T_{CVO}	1	$I_{OUT} = 5.0mA$	-	-0.4	-	mV/ $^{\circ}C$	
Dropout Voltage	V_D	1	$T_j = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7906P/PI

(Unless otherwise specified, $V_{IN} = -11V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1\mu F$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage		V_{OUT}	1	$T_j = 25^{\circ}C$	-6.25	-6.0	-5.75	V	
Input Regulation		Reg line	1	$T_j = 25^{\circ}C$	$-13V \leq V_{IN} \leq -9V$	-	5	60	mV
					$-25V \geq V_{IN} \geq -8V$	-	10	120	
Load Regulation		Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	10	120	mV
					$250mA \leq I_{OUT} \leq 750mA$	-	3	60	
Output Voltage		V_{OUT}	1	$-21V \leq V_{IN} \leq -9V$ $5mA \leq I_{OUT} \leq 1.0A$	-6.3	-6.0	-5.7	V	
Quiescent Current		I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA	
Quiescent Current Change		Line	1	$-25V \leq V_{IN} \leq -9V$ $5mA \leq I_{OUT} \leq 1.0A$	-	-	1.3	mA	
		Load			-	-	0.5		
Output Noise Voltage		V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	130	-	μV_{rms}	
Ripple Rejection Ratio		RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB	
Short Circuit Current Limit		I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage		T_{CVO}	1	$I_{OUT} = 5mA$	-	-0.5	-	mV/ $^{\circ}C$	
Dropout Voltage		V_D	1	$T_j = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7908P/PI

(Unless otherwise specified, $V_{IN} = -14V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1\mu F$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage		V_{OUT}	1	$T_j = 25^{\circ}C$	-8.3	-8.0	-7.7	V
Input Regulation		Reg line	1	$T_j = 25^{\circ}C$	$-17V \leq V_{IN} \leq -11V$	-	5	80
					$-25V \leq V_{IN} \leq -10.5V$	-	10	100
Load Regulation		Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	12	160
					$250mA \leq I_{OUT} \leq 750mA$	-	4	80
Output Voltage		V_{OUT}	1	$-23V \leq V_{IN} \leq -11.5V$ $5mA \leq I_{OUT} \leq 1.0A$	-8.4	-8.0	-7.6	V
Quiescent Current		I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA
Quiescent Current Change		Line	1	$-25V \leq V_{IN} \leq -11.5V$ $5mA \leq I_{OUT} \leq 1.0A$	-	0.1	1.0	mA
		Load			-	0.05	0.5	
Output Noise Voltage		V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	175	-	μV_{rms}
Ripple Rejection Ratio		RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB
Short Circuit Current Limit		I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A
Average Temperature Coefficient of Output Voltage		T_{CVO}	1	$I_{OUT} = 5mA$	-	-0.6	-	mV/ $^{\circ}C$
Dropout Voltage		V_D	1	$T_j = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7909P/PI

(Unless otherwise specified, $V_{IN} = -15V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1\mu F$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage		V_{OUT}	1	$T_j = 25^{\circ}C$	-9.3	-9.0	-8.7	V	
Input Regulation		Reg line	1	$T_j = 25^{\circ}C$	$-19V \leq V_{IN} \leq -13V$	-	5	90	mV
					$-26V \leq V_{IN} \leq -11.5V$	-	10	100	
Load Regulation		Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	10	150	mV
					$250mA \leq I_{OUT} \leq 750mA$	-	5	120	
Output Voltage		V_{OUT}	1	$-24V \leq V_{IN} \leq -11.5V$ $5mA \leq I_{OUT} \leq 1.0A$	-9.4	-9.0	-8.6	V	
Quiescent Current		I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA	
Quiescent Current Change		Line	1	$-26.5V \leq V_{IN} \leq -13V$ $5mA \leq I_{OUT} \leq 1.0A$	-	0.1	1.0	mA	
		Load			ΔI_{BO}	-	0.05		0.5
Output Noise Voltage		V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	180	-	μV_{rms}	
Ripple Rejection Ratio		RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB	
Short Circuit Current Limit		I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage		T_{CVO}	1	$I_{OUT} = 5mA$	-	-0.7	-	mV/ $^{\circ}C$	
Dropout Voltage		V_D	1	$T_j = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7910IP/PI

(Unless otherwise specified, $V_{IN}=-16V$, $I_{OUT}=500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN}=2.2\mu F$, $C_{OUT}=1\mu F$)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V_{OUT}	1	$T_j=25^{\circ}C$	-10.4	-10	-9.6	V	
Input Regulation	Reg line	1	$T_j=25^{\circ}C$	$-20V \leq V_{IN} \leq -14V$	-	5	100	mV
				$-27V \leq V_{IN} \leq -12.5V$	-	10	110	
Load Regulation	Reg load	1	$T_j=25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	10	180	mV
				$250mA \leq I_{OUT} \leq 750mA$	-	6	120	
Output Voltage	V_{OUT}	1	$-25V \leq V_{IN} \leq -12.5V$ $5mA \leq I_{OUT} \leq 1.0A$	-10.5	-10	-9.5	V	
Quiescent Current	I_B	1	$T_j=25^{\circ}C$	-	3	6	mA	
Quiescent Current Change	Line	1	$-27.5V \leq V_{IN} \leq -14V$ $5mA \leq I_{OUT} \leq 1.0A$	-	0.1	1.0	mA	
	Load							ΔI_{BO}
Output Noise Voltage	V_{NO}	2	$T_a=25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	190	-	μV_{rms}	
Ripple Rejection Ratio	RR	3	$f=120Hz$, $I_{OUT}=20mA$	54	60	-	dB	
Short Circuit Current Limit	I_{SC}	1	$T_j=25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage	T_{CVO}	1	$I_{OUT}=5mA$	-	-0.7	-	mV/ $^{\circ}C$	
Dropout Voltage	V_D	1	$T_j=25^{\circ}C$, $I_{OUT}=1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7912P/PI

(Unless otherwise specified, $V_{IN}=-18V$, $I_{OUT}=500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN}=2.2\mu F$, $C_{OUT}=1\mu F$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage		V_{OUT}	1	$T_j=25^{\circ}C$	-12.5	-12	-11.5	V	
Input Regulation		Reg line	1	$T_j=25^{\circ}C$	$-22V \leq V_{IN} \leq -16V$	-	6	120	mV
					$-30V \leq V_{IN} \leq -14.5V$	-	12	240	
Load Regulation		Reg load	1	$T_j=25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	12	240	mV
					$250mA \leq I_{OUT} \leq 750mA$	-	4	120	
Output Voltage		V_{OUT}	1	$-27V \leq V_{IN} \leq -15.5V$ $5mA \leq I_{OUT} \leq 1.0A$	-12.6	-12	-11.4	V	
Quiescent Current		I_B	1	$T_j=25^{\circ}C$	-	3	6	mA	
Quiescent Current Change		Line	1	$-30V \leq V_{IN} \leq -15V$ $5mA \leq I_{OUT} \leq 1.0A$	-	0.1	1.0	mA	
		Load			ΔI_{BO}	-	0.05		0.5
Output Noise Voltage		V_{NO}	2	$T_a=25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	200	-	μV_{rms}	
Ripple Rejection Ratio		RR	3	$f=120Hz$, $I_{OUT}=20mA$,	54	60	-	dB	
Short Circuit Current Limit		I_{SC}	1	$T_j=25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage		T_{CVO}	1	$I_{OUT}=5mA$	-	-0.8	-	mV/ $^{\circ}C$	
Dropout Voltage		V_D	1	$T_j=25^{\circ}C$, $I_{OUT}=1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7915P/PI

(Unless otherwise specified, $V_{IN} = -23V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1\mu F$)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V_{OUT}	1	$T_j = 25^{\circ}C$	-15.6	-15	-14.4	V	
Input Regulation	Reg line	1	$T_j = 25^{\circ}C$	$-26V \leq V_{IN} \leq -20V$	-	6	150	mV
				$-30V \leq V_{IN} \leq -17.5V$	-	12	300	
Load Regulation	Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	12	300	mV
				$250mA \leq I_{OUT} \leq 750mA$	-	4	150	
Output Voltage	V_{OUT}	1	$-30V \leq V_{IN} \leq -18V$ $5mA \leq I_{OUT} \leq 1.0A$	-15.75	-15	-14.25	V	
Quiescent Current	I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA	
Quiescent Current Change	Line	1	$-30V \leq V_{IN} \leq -17.5V$ $5mA \leq I_{OUT} \leq 1.0A$	-	0.1	1.0	mA	
	Load							ΔI_{BO}
Output Noise Voltage	V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	250	-	μV_{rms}	
Ripple Rejection Ratio	RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB	
Short Circuit Current Limit	I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage	T_{CVO}	1	$I_{OUT} = 5mA$	-	-0.9	-	mV/ $^{\circ}C$	
Dropout Voltage	V_D	1	$T_j = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7918P/PI

(Unless otherwise specified, $V_{IN} = -27V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1\mu F$)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V_{OUT}	1	$T_j = 25^{\circ}C$	-18.7	-18	-17.3	V	
Input Regulation	Reg line	1	$T_j = 25^{\circ}C$	$-30V \leq V_{IN} \leq -24V$	-	8	180	mV
				$-33V \leq V_{IN} \leq -21V$	-	15	360	
Load Regulation	Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	15	360	mV
				$250mA \leq I_{OUT} \leq 750mA$	-	5	180	
Output Voltage	V_{OUT}	1	$-33V \leq V_{IN} \leq -22.5V$ $5mA \leq I_{OUT} \leq 1.0A$	-18.85	-18	-17.15	V	
Quiescent Current	I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA	
Quiescent Current Change	Line	1	$-33V \leq V_{IN} \leq -22V$ $5mA \leq I_{OUT} \leq 1.0A$	-	-	1.0	mA	
	Load							0.5
Output Noise Voltage	V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	300	-	μV_{rms}	
Ripple Rejection Ratio	RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB	
Short Circuit Current Limit	I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage	T_{CVO}	1	$I_{OUT} = 5mA$	-	-1.0	-	mV/ $^{\circ}C$	
Dropout Voltage	V_D	1	$T_j = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7920P/PI

(Unless otherwise specified, $V_{IN} = -30V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 1\mu F$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage		V_{OUT}	1	$T_j = 25^{\circ}C$	-20.8	-20	-19.2	V	
Input Regulation		Reg line	1	$T_j = 25^{\circ}C$	$-32V \leq V_{IN} \leq -26V$	-	10	180	mV
					$-35V \leq V_{IN} \leq -24V$	-	18	360	
Load Regulation		Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	18	360	mV
					$250mA \leq I_{OUT} \leq 750mA$	-	10	180	
Output Voltage		V_{OUT}	1	$-35V \leq V_{IN} \leq -24V$ $5mA \leq I_{OUT} \leq 1.0A$	-21.0	-20	-19.0	V	
Quiescent Current		I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA	
Quiescent Current Change		Line	1	$-36.5V \leq V_{IN} \leq -25V$ $5mA \leq I_{OUT} \leq 1.0A$	-	-	1.0	mA	
		Load			-	-	0.5		
Output Noise Voltage		V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	350	-	μV_{rms}	
Ripple Rejection Ratio		RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB	
Short Circuit Current Limit		I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage		T_{CVO}	1	$I_{OUT} = 5mA$	-	-1.0	-	mV/ $^{\circ}C$	
Dropout Voltage		V_D	1	$T_j = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

ELECTRICAL CHARACTERISTICS

KIA7924P/PI

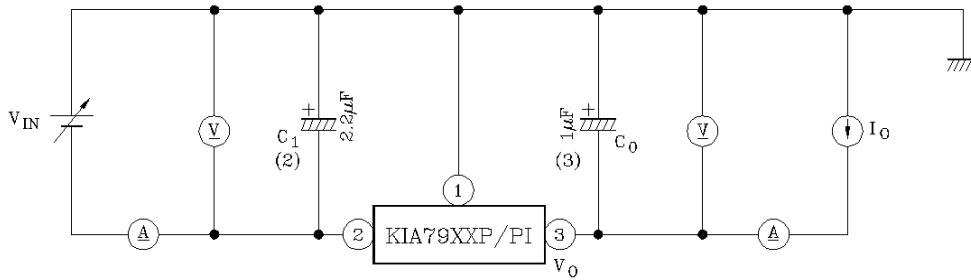
(Unless otherwise specified, $V_{IN} = -33V$, $I_{OUT} = 500mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{IN} = 0.33\mu F$, $C_{OUT} = 0.1\mu F$)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V_{OUT}	1	$T_j = 25^{\circ}C$	-25	-24	-23	V	
Input Regulation	Reg line	1	$T_j = 25^{\circ}C$	$-36V \leq V_{IN} \leq -30V$	-	8	240	mV
				$-38V \leq V_{IN} \leq -27V$	-	15	480	
Load Regulation	Reg load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.5A$	-	15	480	mV
				$250mA \leq I_{OUT} \leq 750mA$	-	5	240	
Output Voltage	V_{OUT}	1	$-38V \leq V_{IN} \leq -27V$ $5mA \leq I_{OUT} \leq 1.0A$	-25.2	-24	-22.5	V	
Quiescent Current	I_B	1	$T_j = 25^{\circ}C$	-	3	6	mA	
Quiescent Current Change	Line	ΔI_{BI}	1	$-38V \leq V_{IN} \leq -27V$ $5mA \leq I_{OUT} \leq 1.0A$	-	-	1.0	mA
	Load	ΔI_{BO}			-	-	0.5	
Output Noise Voltage	V_{NO}	2	$T_a = 25^{\circ}C$, $10Hz \leq f \leq 100kHz$	-	400	-	μV_{rms}	
Ripple Rejection Ratio	RR	3	$f = 120Hz$, $I_{OUT} = 20mA$,	54	60	-	dB	
Short Circuit Current Limit	I_{SC}	1	$T_j = 25^{\circ}C$	-	1.9	-	A	
Average Temperature Coefficient of Output Voltage	T_{CVO}	1	$I_{OUT} = 5mA$	-	-1.0	-	mV/ $^{\circ}C$	
Dropout Voltage	V_D	1	$T_a = 25^{\circ}C$, $I_{OUT} = 1A$	-	2.0	-	V	

KIA7905P/PI ~ KIA7924P/PI

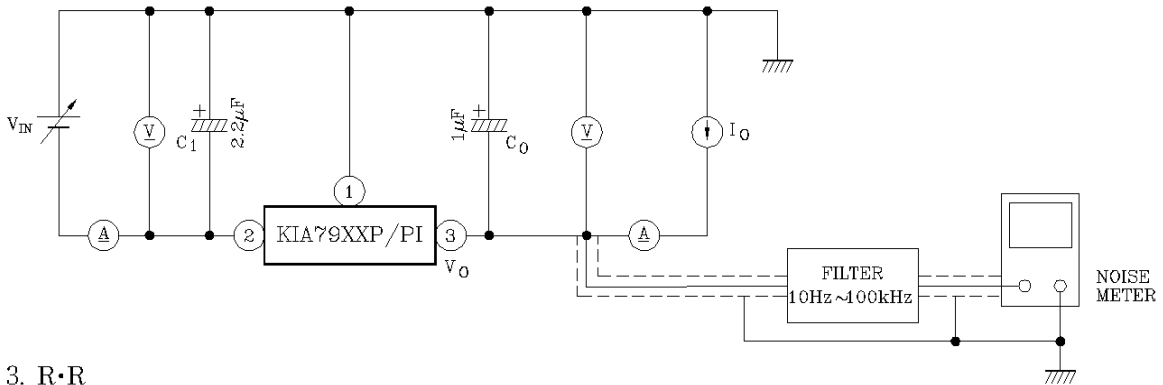
TEST CIRCUIT

1. V_{OUT} , Reg•Line, Reg•Load, I_B , ΔI_B , V_D , T_{CVO}



- Notes : (1) To specify an output voltage, substitute voltage value for "XX"
 (2) Required for stability. For value given, capacitor must be solid tantalum. If aluminium electrolytics are used, at least ten times value shown should be selected. C_1 is required if regulator is located an appreciable distance from power supply filter.
 (3) To improve transient response. If large capacitors are used, a high current diode from input to output (1N4001 or similar) should be introduced to protect the device from momentary input short circuit.

2. V_{NO}



3. R•R

