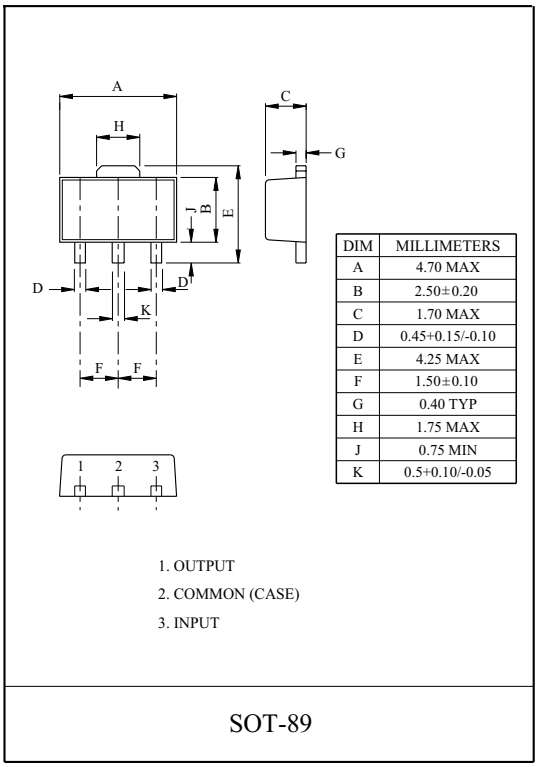
KIA78L05F~KIA78L24F

BIPOLAR LINEAR INTEGRATED CIRCUIT

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

FEATURES

- Best Suited to Power Supply for TTL, C²-MOS.
- No External Part Needed.
- Built-in Thermal Protective Circuit.
- Max. Output Current 150mA (T_j=25℃).
- Packaged in Power Mini.



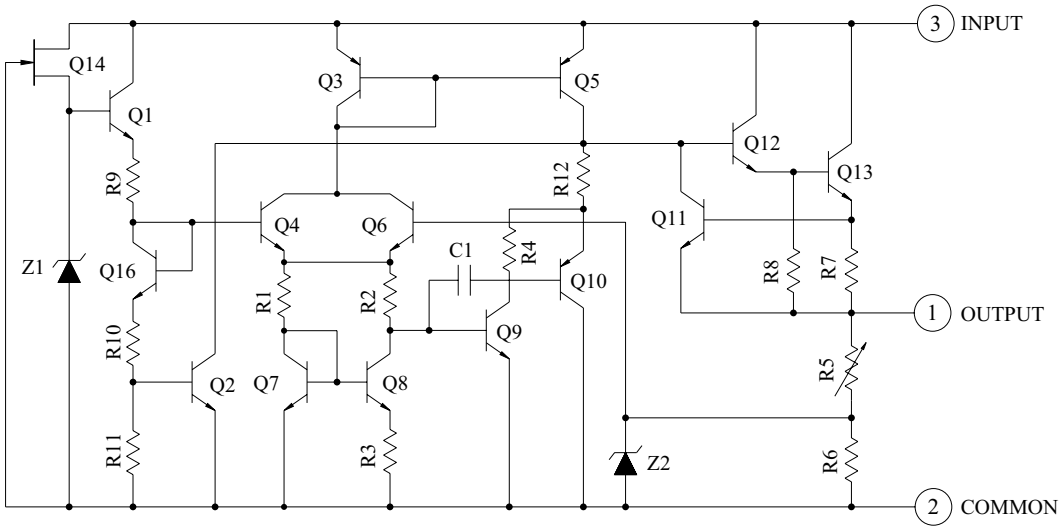
DIM	MILLIMETERS
A	4.70 MAX
B	2.50±0.20
C	1.70 MAX
D	0.45+0.15/-0.10
E	4.25 MAX
F	1.50±0.10
G	0.40 TYP
H	1.75 MAX
J	0.75 MIN
K	0.5+0.10/-0.05

SOT-89

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage	(5V ~ 15V)	V_{IN}	35	V
	(18V ~ 24V)		40	
Power Dissipation		P_D	500	mW
Operating Junction Temperature		T_j	-30 ~ 150	℃
Operating Temperature		T_{opr}	-30 ~ 75	℃
Storage Temperature		T_{stg}	-55 ~ 150	℃

EQUIVALENT CIRCUIT



Marking

Type No.	Marking	Type No.	Marking	Type No.	Marking
KIA78L05F	8A	KIA78L10F	8F	KIA78L20F	8K
KIA78L06F	8B	KIA78L12F	8G	KIA78L24F	8L
KIA78L08F	8D	KIA78L15F	8I		
KIA78L09F	8E	KIA78L18F	8J		

ELECTRICAL CHARACTERISTICS

KIA78L05F

(Unless otherwise specified, V_{IN}=10V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		4.75	5.0	5.25	V
Input Regulation	Reg line	1	T_j=25℃	7.0V≦V_{IN}≦20V	-	55	150	mV
				8.0V≦V_{IN}≦20V	-	45	100	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	11	60	mV
				1.0mA≦I_{OUT}≦40mA	-	5.0	30	
Output Voltage	V_{OUT}	1	7.0V≦V_{IN}≦20V, 1.0mA≦I_{OUT}≦40mA		4.65	-	5.3	V
			V_{IN}=10V, 1.0mA≦I_{OUT}≦70mA		4.65	-	5.3	
Quiescent Current	I_B	1	T_j=25℃		-	3.1	6.0	mA
			T_j=125℃		-	-	5.5	
Quiescent Current Change	⊿I_B	1	8.0V≦V_{IN}≦20V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	40	-	㎶V_{rms}
Long Term Stability	⊿V_{OUT}/⊿t	1			-	12	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 8.0V≦V_{IN}≦18V, T_j=25℃		41	49	-	dB
Dropout Voltage	| V_{IN}-V_{OUT} |	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-0.6	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L06F

(Unless otherwise specified, V_{IN}=11V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		5.7	6.0	6.3	V
Input Regulation	Reg line	1	T_j=25℃	8.1V≦V_{IN}≦21V	-	50	150	mV
				9.0V≦V_{IN}≦21V	-	45	110	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	12	70	mV
				1.0mA≦I_{OUT}≦40mA	-	5.5	35	
Output Voltage	V_{OUT}	1	8.1V≦V_{IN}≦21V, 1.0mA≦I_{OUT}≦40mA		5.58	-	6.42	V
			V_{IN}=11V, 1.0mA≦I_{OUT}≦70mA		5.58	-	6.42	
Quiescent Current	I_B	1	T_j=25℃		-	3.1	6.0	mA
			T_j=125℃		-	-	5.5	
Quiescent Current Change	⊿I_B	1	9.0V≦V_{IN}≦20V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	40	-	㎶V_{rms}
Long Term Stability	⊿V_{OUT}/⊿t	1			-	14	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 9.0V≦V_{IN}≦19V, T_j=25℃		39	47	-	dB
Dropout Voltage	| V_{IN}-V_{OUT} |	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-0.7	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L08F

(Unless otherwise specified, V_{IN}=14V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		7.6	8.0	8.4	V
Input Regulation	Reg line	1	T_j=25℃	10.5V≦V_{IN}≦23V	-	20	175	mV
				11V≦V_{IN}≦23V	-	12	125	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	15	80	mV
				1.0mA≦I_{OUT}≦40mA	-	7.0	40	
Output Voltage	V_{OUT}	1	10.5V≦V_{IN}≦23V 1.0mA≦I_{OUT}≦40mA		7.44	-	8.56	V
			V_{IN}=14V, 1.0mA≦I_{OUT}≦70mA		7.44	-	8.56	
Quiescent Current	I_B	1	T_j=25℃		-	3.1	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	⊿I_B	1	11V≦V_{IN}≦23V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	60	-	㎶V_{rms}
Long Term Stability	⊿V_{OUT}/⊿t	1			-	20	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 12V≦V_{IN}≦23V, T_j=25℃		37	45	-	dB
Dropout Voltage	| V_{IN}-V_{OUT} |	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-0.8	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L09F

(Unless otherwise specified, V_{IN}=15V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		8.55	9.0	9.45	V
Input Regulation	Reg line	1	T_j=25℃	11.4V≦V_{IN}≦24V	-	80	200	mV
				12V≦V_{IN}≦24V	-	20	160	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	17	90	mV
				1.0mA≦I_{OUT}≦40mA	-	8.0	45	
Output Voltage	V_{OUT}	1	11.4V≦V_{IN}≦24V 1.0mA≦I_{OUT}≦40mA		8.37	-	9.63	V
			V_{IN}=15V, 1.0mA≦I_{OUT}≦70mA		8.37	-	9.63	
Quiescent Current	I_B	1	T_j=25℃		-	3.2	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	ΔI_B	1	12V≦V_{IN}≦24V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	65	-	μV_{rms}
Long Term Stability	$\Delta V_{OUT}/\Delta t$	1			-	21	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 12V≦V_{IN}≦24V, T_j=25℃		36	44	-	dB
Dropout Voltage	$\lvert V_{IN}-V_{OUT} \rvert$	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-0.85	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L10F

(Unless otherwise specified, V_{IN}=16V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		9.5	10	10.5	V
Input Regulation	Reg line	1	T_j=25℃	12.5V≦V_{IN}≦25V	-	80	230	mV
				13V≦V_{IN}≦25V	-	30	170	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	18	90	mV
				1.0mA≦I_{OUT}≦40mA	-	8.5	45	
Output Voltage	V_{OUT}	1	12.5V≦V_{IN}≦25V 1.0mA≦I_{OUT}≦40mA		9.3	-	10.7	V
			V_{IN}=16V, 1.0mA≦I_{OUT}≦70mA		9.3	-	10.7	
Quiescent Current	I_B	1	T_j=25℃		-	3.2	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	ΔI_B	1	13V≦V_{IN}≦25V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	70	-	㎶V_{rms}
Long Term Stability	$\Delta V_{OUT}/\Delta t$	1			-	22	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 13V≦V_{IN}≦24V, T_j=25℃		36	43	-	dB
Dropout Voltage	$\lvert V_{IN}-V_{OUT} \rvert$	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-0.9	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L12F

(Unless otherwise specified, V_{IN}=19V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		11.4	12	12.6	V
Input Regulation	Reg line	1	T_j=25℃	14.5V≦V_{IN}≦27V	-	120	250	mV
				16V≦V_{IN}≦27V	-	100	200	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	20	100	mV
				1.0mA≦I_{OUT}≦40mA	-	10	50	
Output Voltage	V_{OUT}	1	14.5V≦V_{IN}≦27V 1.0mA≦I_{OUT}≦40mA		11.16	-	12.84	V
			V_{IN}=19V, 1.0mA≦I_{OUT}≦70mA		11.16	-	12.84	
Quiescent Current	I_B	1	T_j=25℃		-	3.2	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	⊿I_B	1	16V≦V_{IN}≦27V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	80	-	㎶V_{rms}
Long Term Stability	⊿V_{OUT}/⊿t	1			-	24	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 15V≦V_{IN}≦25V, T_j=25℃		36	41	-	dB
Dropout Voltage	| V_{IN}-V_{OUT} |	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-1.0	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L15F

(Unless otherwise specified, V_{IN}=23V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		14.25	15	15.75	V
Input Regulation	Reg line	1	T_j=25℃	17.5V≦V_{IN}≦30V	-	130	300	mV
				20V≦V_{IN}≦30V	-	110	250	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	25	150	mV
				1.0mA≦I_{OUT}≦40mA	-	12	75	
Output Voltage	V_{OUT}	1	17.5V≦V_{IN}≦30V 1.0mA≦I_{OUT}≦40mA		13.95	-	16.05	V
			V_{IN}=23V, 1.0mA≦I_{OUT}≦70mA		13.95	-	16.05	
Quiescent Current	I_B	1	T_j=25℃		-	3.3	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	ΔI_B	1	20V≦V_{IN}≦30V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	90	-	㎶$_{rms}$
Long Term Stability	$\Delta V_{OUT}/\Delta t$	1			-	30	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 18.5V≦V_{IN}≦28.5V, T_j=25℃		34	40	-	dB
Dropout Voltage	$\lvert V_{IN}-V_{OUT} \rvert$	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-1.3	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L18F

(Unless otherwise specified, V_{IN}=27V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		7.1	18	18.9	V
Input Regulation	Reg line	1	T_j=25℃	21.4V≦V_{IN}≦33V	-	32	325	mV
				22V≦V_{IN}≦33V	-	27	275	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	30	170	mV
				1.0mA≦I_{OUT}≦40mA	-	15	75	
Output Voltage	V_{OUT}	1	21.4V≦V_{IN}≦33V 1.0mA≦I_{OUT}≦40mA		16.74	-	19.26	V
			V_{IN}=27V, 1.0mA≦I_{OUT}≦70mA		16.74	-	19.26	
Quiescent Current	I_B	1	T_j=25℃		-	3.3	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	⊿I_B	1	22V≦V_{IN}≦33V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	150	-	㎶V_{rms}
Long Term Stability	⊿V_{OUT}/⊿t	1			-	45	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 23V≦V_{IN}≦33V, T_j=25℃		32	38	-	dB
Dropout Voltage	| V_{IN}-V_{OUT} |	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-1.5	-	mV/℃

ELECTRICAL CHARACTERISTICS

KIA78L20F

(Unless otherwise specified, V_{IN}=29V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		19.0	20	21.0	V
Input Regulation	Reg line	1	T_j=25℃	23.5V≦V_{IN}≦35V	-	33	330	mV
				24V≦V_{IN}≦35V	-	28	285	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	33	180	mV
				1.0mA≦I_{OUT}≦40mA	-	17	90	
Output Voltage	V_{OUT}	1	23.5V≦V_{IN}≦35V 1.0mA≦I_{OUT}≦40mA		18.6	-	21.4	V
			V_{IN}=29V, 1.0mA≦I_{OUT}≦70mA		18.6	-	21.4	
Quiescent Current	I_B	1	T_j=25℃		-	3.3	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	ΔI_B	1	24V≦V_{IN}≦35V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	170	-	㎶$_{rms}$
Long Term Stability	$\Delta V_{OUT}/\Delta t$	1			-	49	-	mV/ 1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 25V≦V_{IN}≦35V, T_j=25℃		31	37	-	dB
Dropout Voltage	$\lvert V_{IN}-V_{OUT} \rvert$	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-1.7	-	mV/℃

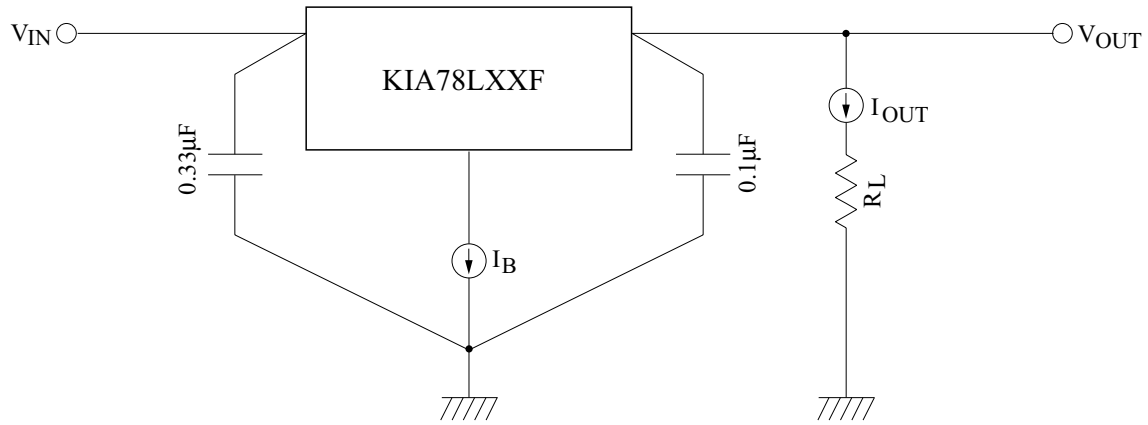
ELECTRICAL CHARACTERISTICS

KIA78L24F

(Unless otherwise specified, V_{IN}=33V, I_{OUT}=40mA, C_{IN}=0.33㎌, C_{OUT}=0.1㎌, 0℃≦T_j≦125℃)

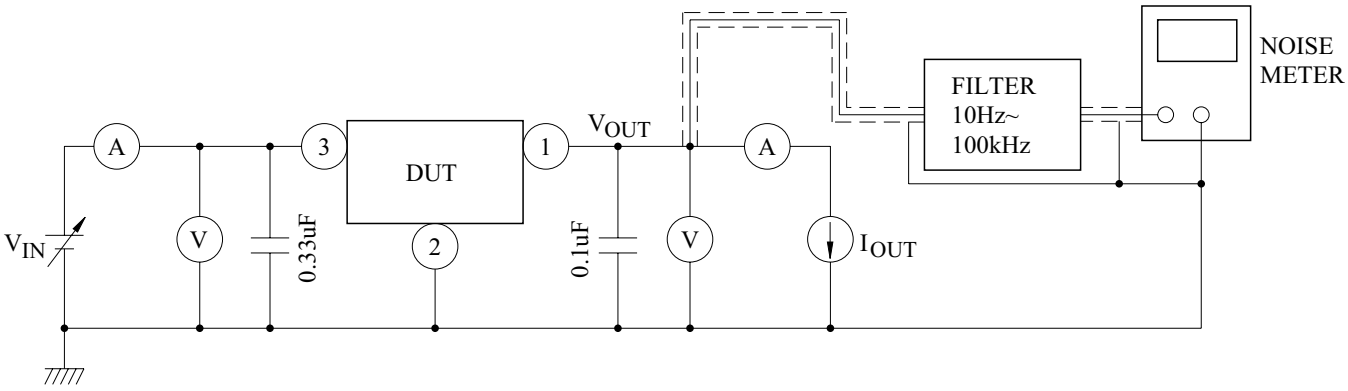
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j=25℃		22.8	24	25.2	V
Input Regulation	Reg line	1	T_j=25℃	27.5V≦V_{IN}≦38V	-	35	350	mV
				28V≦V_{IN}≦38V	-	30	300	
Load Regulation	Reg load	1	T_j=25℃	1.0mA≦I_{OUT}≦100mA	-	40	200	mV
				1.0mA≦I_{OUT}≦40mA	-	20	100	
Output Voltage	V_{OUT}	1	27.5V≦V_{IN}≦38V 1.0mA≦I_{OUT}≦40mA		22.32	-	25.68	V
			V_{IN}=33V, 1.0mA≦I_{OUT}≦70mA		22.32	-	25.68	
Quiescent Current	I_B	1	T_j=25℃		-	3.5	6.5	mA
			T_j=125℃		-	-	6.0	
Quiescent Current Change	ΔI_B	1	28V≦V_{IN}≦38V		-	-	1.5	mA
			1.0mA≦I_{OUT}≦40mA		-	-	0.1	
Output Noise Voltage	V_{NO}	1	Ta=25℃, 10Hz≦f≦100kHz		-	200	-	㎶V_{rms}
Long Term Stability	$\Delta V_{OUT}/\Delta t$	1			-	56	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	2	f=120Hz, 29V≦V_{IN}≦39V, T_j=25℃		31	35	-	dB
Dropout Voltage	$\lvert V_{IN}-V_{OUT} \rvert$	1	T_j=25℃		-	1.7	-	V
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	I_{OUT}=5mA		-	-2.0	-	mV/℃

TEST CIRCUIT / STANDARD APPLICATION CIRCUIT



TEST CIRCUIT

1. V_{OUT} , R_{eg} · line , R_{eg} · load , V_{OUT} , I_B , $\triangle I_B$, V_{NO} , $\triangle V_{OUT}$ / $\triangle t$, $| V_{IN} - V_{OUT} |$, TC_{VO}

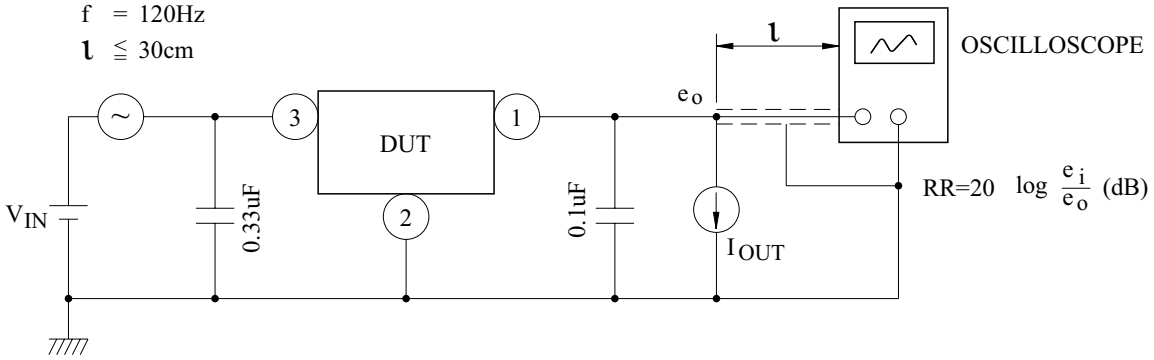


2. RR

e_i = 1V p-p

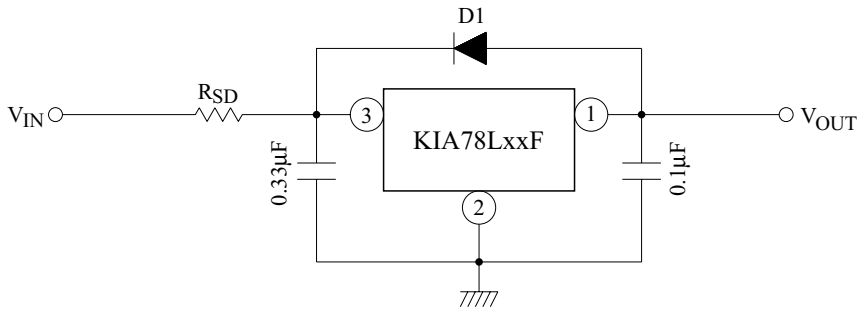
f = 120Hz

ℓ ≦ 30cm



EXAMPLS OF TYPICAL CIRCUIT

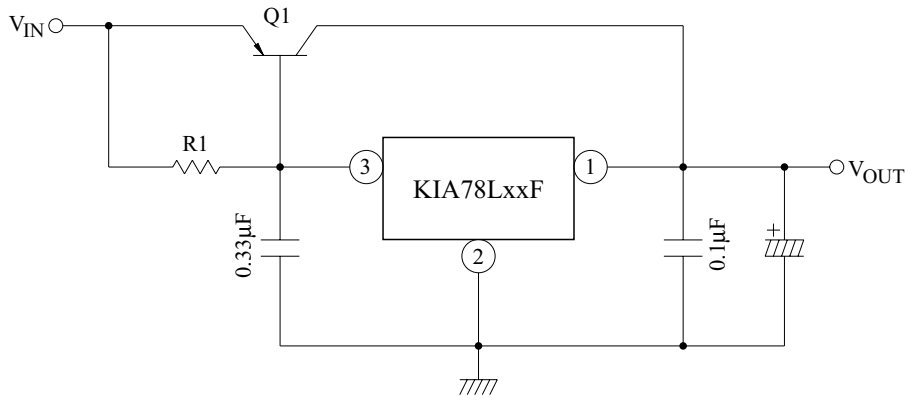
(1) STANDARD APPLICATION



D1 : Protection Diode
High speed diode D1 should be connected as shown in the figure if the condition $V_{IN} < V_{OUT}$ might occur by surge voltage or power supply ON/OFF.

R_{SD} : Power limiting resistor for large V_{IN}, resistor R_{SD} is needed to limit IC power dissipation.

(2) A. CURRENT BOOST VOLTAGE REGULATOR



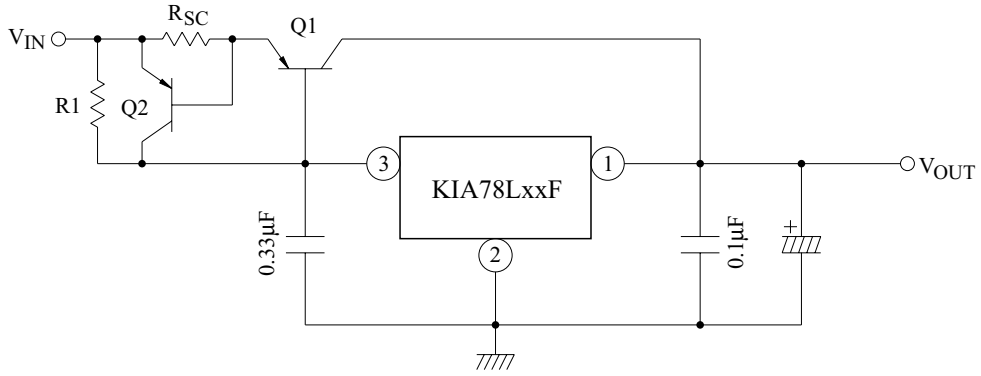
Heat sink is needed for Q1

$$R1 \leqq \frac{V_{BE1}}{I_{B(MAX)}}$$

where, V_{BE1} : V_{BE} of external transistor Q1

$I_{B(MAX)}$: Quiescent current of IC

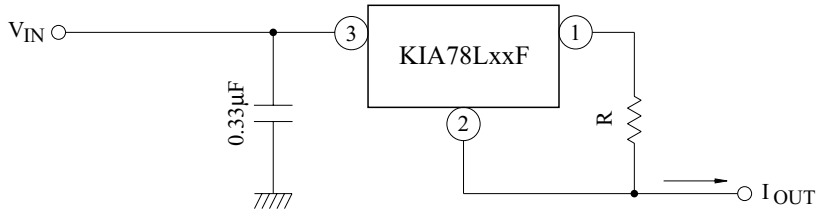
B. SHORT-CIRCUIT PROTECTION



$$R_{SC} = \frac{V_{BE2}}{I_{SC}}$$

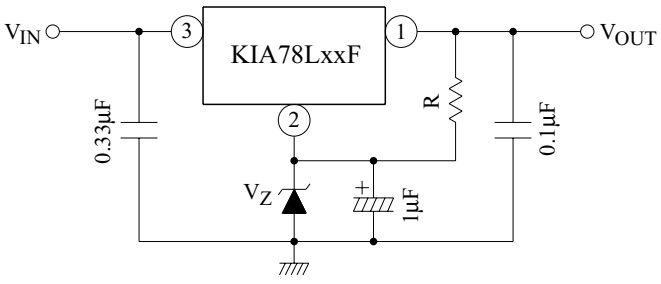
where, I_{SC} : Short-Circuit current

(3) CURRENT REGULATOR

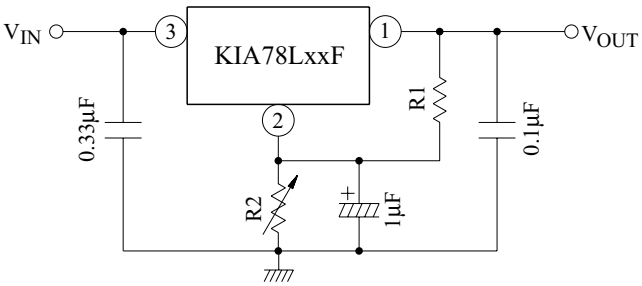


$$I_{OUT} = \frac{V_{OUT}}{R} + I_B$$

(4) VOLTAGE BOOST REGULATOR

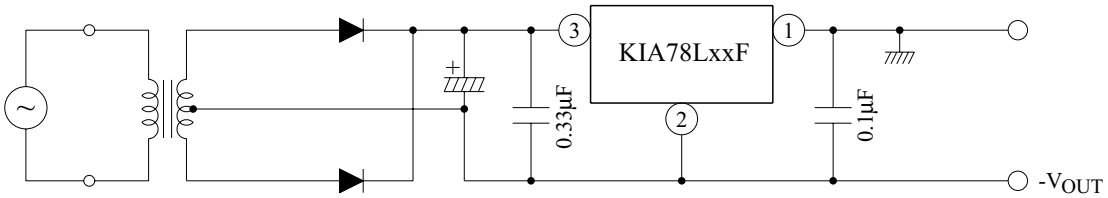


$V_{OUT} = V_Z + V_{OUT}$ (of IC)
Apply current of several mA to R.

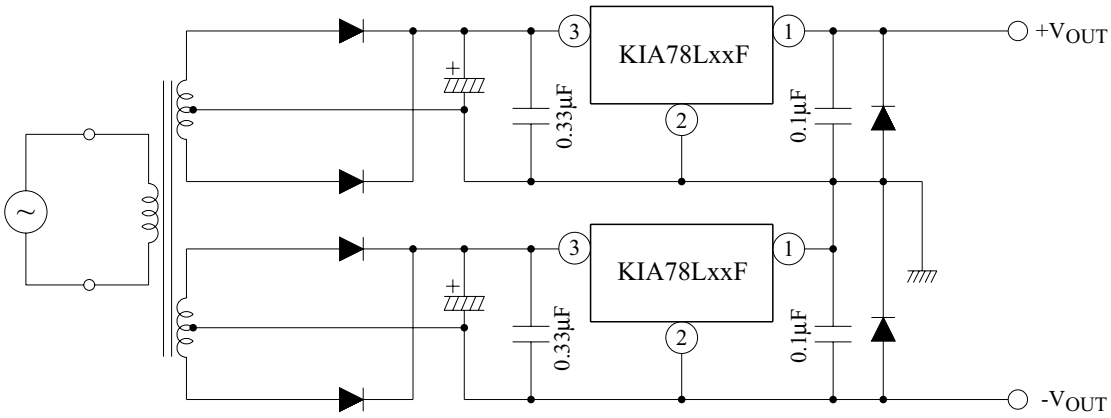


$$V_{OUT} = R2 \left(I_B + \frac{V_{OUT} \text{ (of IC)}}{R1} \right) + V_{OUT} \text{ (of IC)}$$

(5) NEGATIVE REGULATOR



(6) POSITIVE AND NEGATIVE REGULATOR



PRECAUTIONS FOR USE

When such a high voltage as exceeds 10V beyond the fixed output voltage(Typ. value) of is applied to its output terminal, IC may be destroyed. In this case, connect a zener diode between the output terminal and GND to prevent application of excessive voltage. In particular, in such a current boosting circuit as shown in application circuit example(2), if input voltage is suddenly applied by stages and furthermore load is light, excessive voltage may be applied transiently to the output terminal of IC. In such a case as this, it may become necessary to increase capacity of output capacitor as appropriate, use a smaller R1(a resistor for bypassing IC bias current) or gradually rise input voltage in addition to use of a zener diode as mentioned above.

SOLDERING

Flat Package (SOT-89 Package)

Elements mounting styles of electronic devices are gaining in further diversification over recent years, and needs for components are all the more expanding in varieties. Especially, surface mounting is steadily penetrating into industrial segments as a world-wide popular technical trend. Although exposure to high temperature is inevitable during soldering we recommend limiting the soldering temperature to low levels as shown in figure for the sake of retaining inherent excellent reliability.

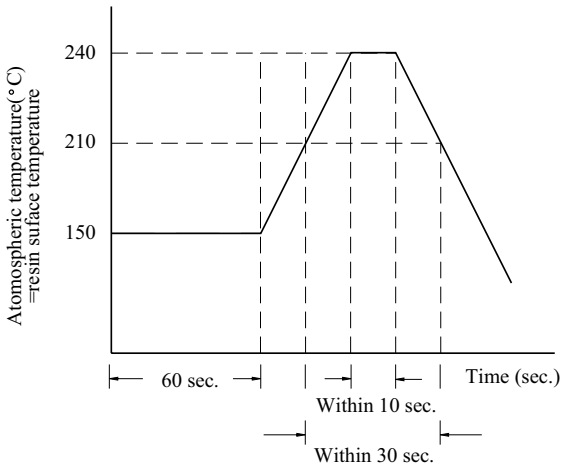


Fig 6

(a) When employing solder reflow method

① Atmospheric temperature around resin surfaces must be less than 240℃, not exceeding the time length of 10 sec.

② Recommend temperature profile

③ Precautions on heating method

When resin in kept exposed to high temperature for a long time, device reliability may be marred.

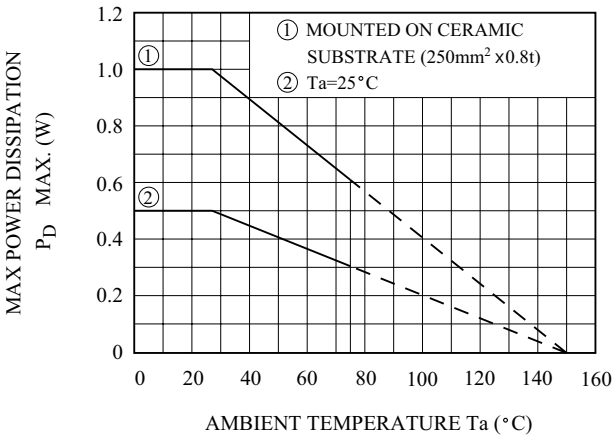
Therefore, it is essential to complete soldering in the shortest time possible to prevent temperature of resin from rising.

(b) When employing halogen lamps or infrared-ray heaters

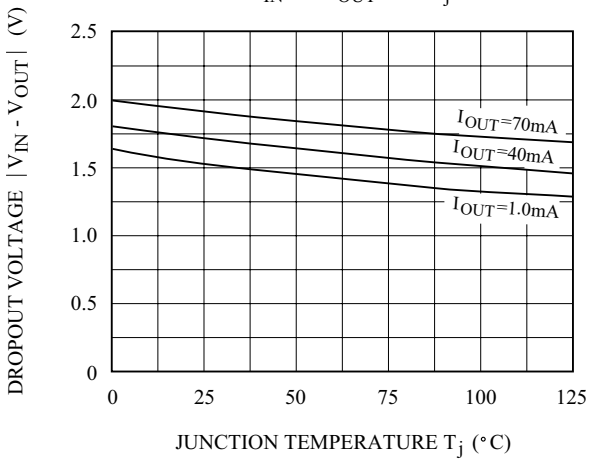
When halogen lamps or infrared-ray heaters are used, avoid direct irradiation onto resin surfaces; such devices cause extensive localized temperature rise.

※ Please keep a reflow solder operating when SOT-89 package's soldering.

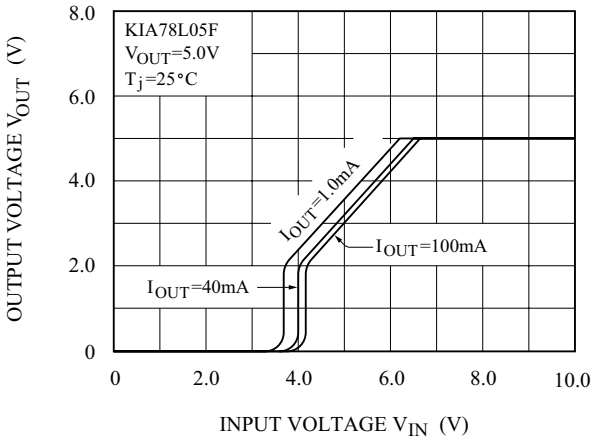
P_D MAX - Ta



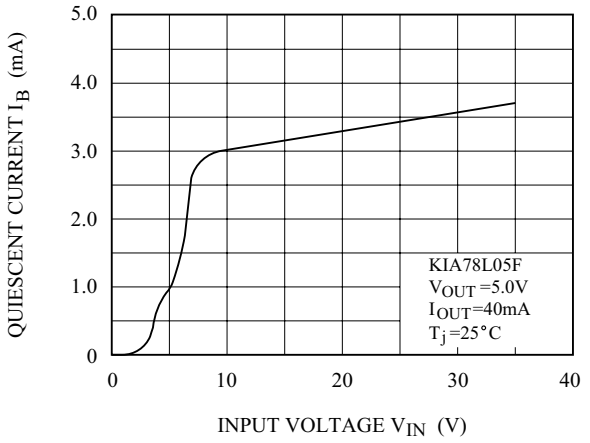
$|V_{IN} - V_{OUT}| - T_j$



$V_{OUT} - V_{IN}$



$I_B - V_{IN}$



$V_{OUT} - I_{OUT}$