4 TERMINAL LOW DROPOUT VOLTAGE REGULATOR

The KIA78R× × series are Low Dropout Voltage Regulator suitable for various electronic equipments. It provides constant voltage power source with TO-220IS-4 terminal surface mount type PKG.

The Regulator has multi function such as over current protection, overheat protection and ON/OFF control.

FEATURES

· 1.0A Output Low Dropout Voltage Regulator.
· Built in ON/OFF Control Terminal.
· Built in Over Current Protection, Over Heat Protection Function.

DIM	MILLIMETERS
A	10.00±0.20
B	15.00±0.20
C	2.70±0.20
D	0.60±0.10
E	Φ3.20±0.20
F	3.50±0.10
G	15.70±0.20
H	0.40±0.10
J	14.3+0.2/-0.1
K	1.45±0.10
L	1.00±0.10
M	2.54
N	4.50±0.20
O	7.5±0.1
P	1.50±0.10
R	5°
S	8°
T	1.30±0.1
U	3-1.00±0.1
V	1.30±0.1

① DC INPUT (V_{IN})
② DC OUTPUT (V_{OUT})
③ GND
④ ON/OFF CONTROL (V_C)

TO-220IS-4

LINE UP

ITEM	OUTPUT VOLTAGE (Typ.)	UNIT
KIA78R05PI	5	
KIA78R06PI	6	
KIA78R08PI	8	
KIA78R09PI	9	
KIA78R10PI	10	V
KIA78R12PI	12	
KIA78R15PI	15	
KIA78R25PI	2.5	
KIA78R33PI	3.3	
KIA78R35PI	3.5	
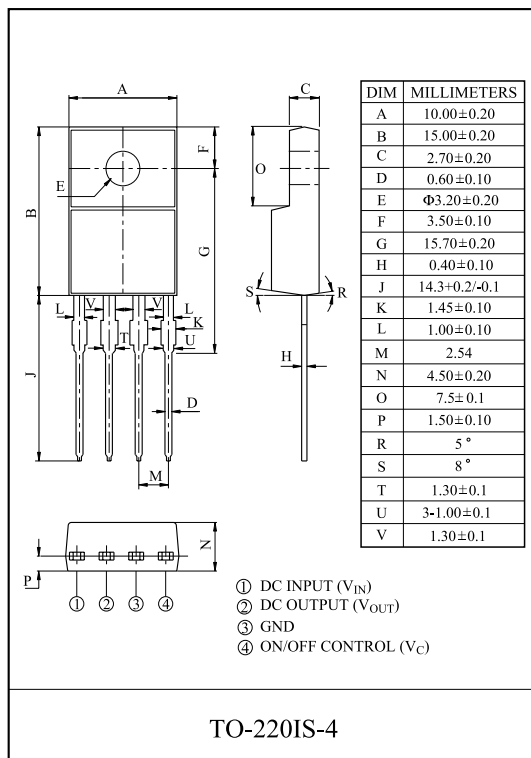
MAXIMUM RATINGS (Ta=25)

CHARACTERISTIC	SYMBOL	RATING	UNIT	REMARK
Input Voltage	V_{IN}	35	V	-
ON/OFF Control Voltage	V_C	35	V	-
Output Current	I_O	1	A	-
Power Dissipation 1	P_{D1}	1.5	W	No Heatsink
Power Dissipation 2	P_{D2}	15	W	Infinite Heatsink
Operating Junction Temperature	$T_{J(opr)}$	-40 150		-
Storage Temperature	T_{stg}	-45 150		-
Soldering Temperature (10sec)	T_{sol}	260		-

KIA78R05PI~KIA78R35PI

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, IO=0.5A, Ta=25 , Note1.)

CHARACTERISTIC		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	KIA78R05PI	V_O	-	4.88	5.0	5.12	V
	KIA78R06PI		-	5.85	6.0	6.15	
	KIA78R08PI		-	7.80	8.0	8.2	
	KIA78R09PI		-	8.78	9.0	9.22	
	KIA78R10PI		-	9.75	10.0	10.25	
	KIA78R12PI		-	11.70	12.0	12.30	
	KIA78R15PI		-	14.70	15.0	15.30	
	KIA78R25PI		-	2.438	2.50	2.562	
	KIA78R33PI		-	3.220	3.30	3.380	
	KIA78R35PI		-	3.413	3.50	3.587	
Load Regulation		Reg Load	5mA I_{OUT} 1A	-	0.1	2.0	%
Line Regulation		Reg Line	(Note 2)	-	0.5	2.5	%
Temperature Coefficient of Output Voltage		$T_C V_O$	Tj=0 125	-	± 0.02	± 0.05	%/
Ripple Rejection		R· R	-	45	55	-	dB
Drop Out Voltage		V_D	I_O=1A, V_{IN}=0.95 V_{OUT}	-	-	0.5	V
Output ON state for control Voltage		$V_{C(ON)}$	-	2.0	-	-	V
Output ON state for control Current		$I_{C(ON)}$	V_C=2.7V	-	-	20	μA
Output OFF state for control Voltage		$V_{C(OFF)}$	-	-	-	0.8	V
Output OFF state for control Current		$I_{C(OFF)}$	V_C=0.4V	-	-	-0.4	mA
Quiescent Current		I_Q	I_O=0	-	-	10	mA

Note1) V_{IN} of KIA78R05=7V   Note2) V_{IN} of KIA78R05=6~12V
    "   KIA78R06=8V   "   KIA78R06=7~15V
    "   KIA78R08=10V   "   KIA78R08=9~25V
    "   KIA78R09=15V   "   KIA78R09=10~25V
    "   KIA78R10=16V   "   KIA78R10=11~26V
    "   KIA78R12=18V   "   KIA78R12=13~29V
    "   KIA78R15=21V   "   KIA78R15=16~32V
    "   KIA78R25=4.2V   "   KIA78R25=3.2~10V
    "   KIA78R33=5.0V   "   KIA78R33=4.0~10V
    "   KIA78R35=5.2V   "   KIA78R35=4.2~10V

BLOCK DIAGRAM
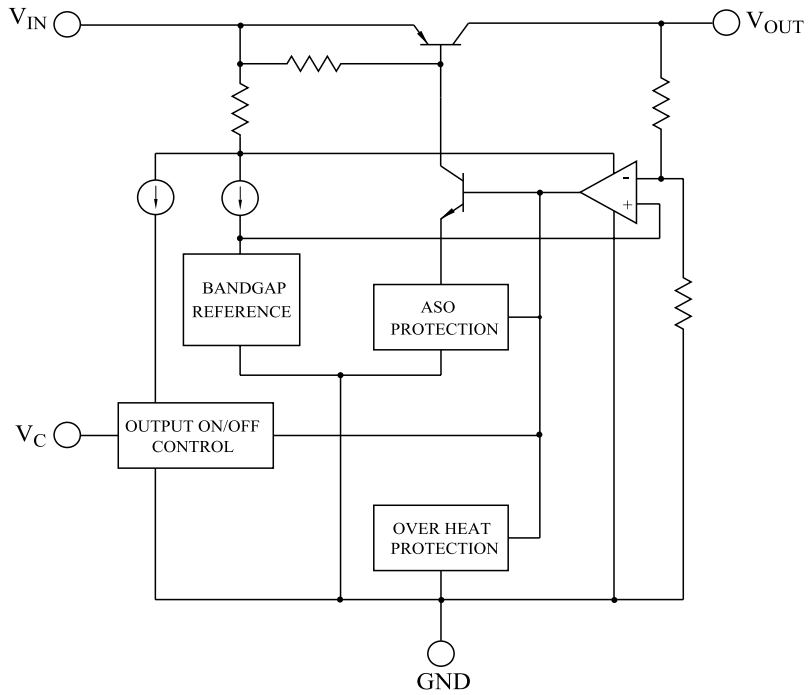
Fig. 1 Standard Test Circuit
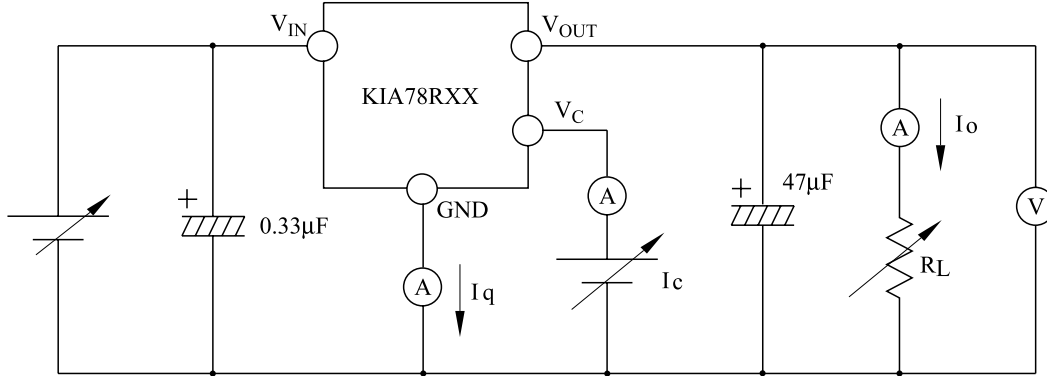
Fig. 2 Ripple Rejection Test Circuit

f=120Hz(sine wave)
ei=0.5Vrms
RR=20log(ei/eo)
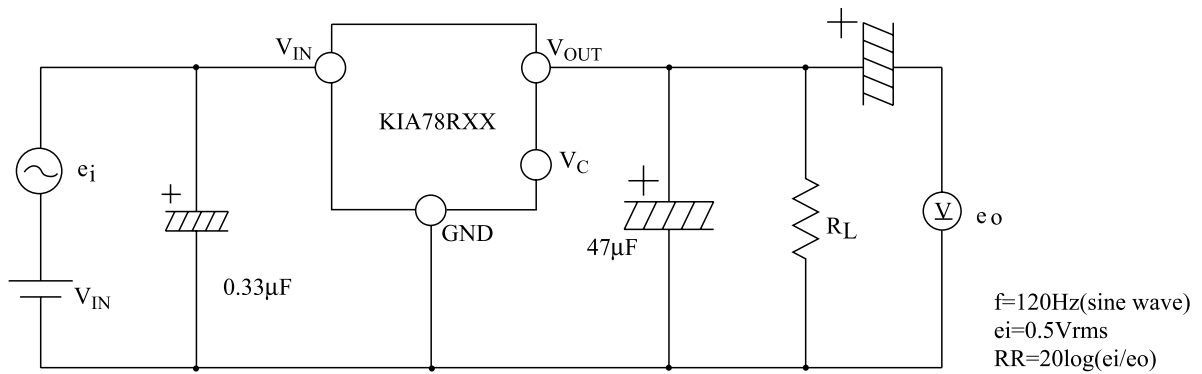
Fig. 3 Application Circuit for Standard

High or Open:Output ON
Low   :Output OFF

CMOS or TTL
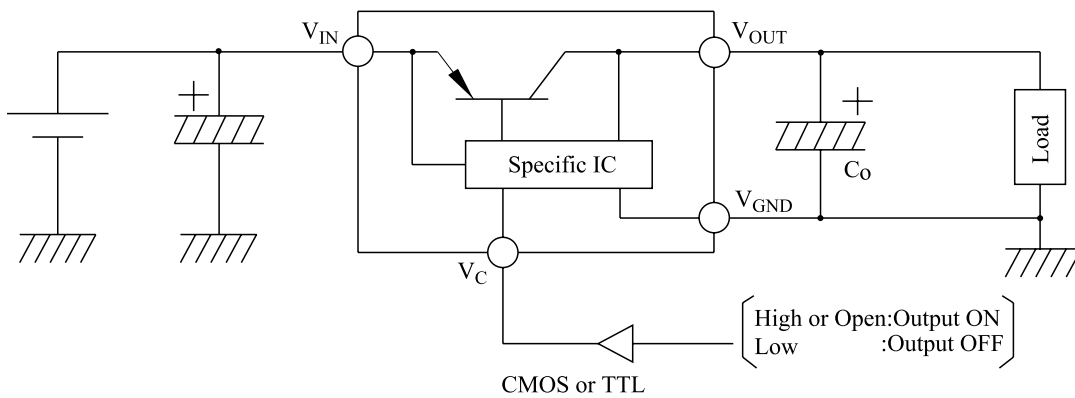
KIA78R05PI~KIA78R35PI

Fig.4 P_D - Ta (PI-Type : TO-220IS-4)

POWER DISSIPATION P_D (W) vs AMBIENT TEMPERATURE Ta (°C)

THERMAL RESISTANCE		
J-C	J-A	°C/W
8.33	83.3	

P_{D2}

P_{D1}

Fig. 5 V_{OUT} - I_{OUT}

RELATIVE OUTPUT VOLTAGE (%) vs OUTPUT CURRENT I_{OUT} (A)

Fig. 6 $\triangle V_O$ - T_j

OUTPUT VOLTAGE DEVIATION $\triangle V_O$ (mV) vs JUNCTION TEMPERATURE T_j (°C)

V_{IN}=7V (KIA78R05) V_{IN}=18V (KIA78R12)
V_{IN}=8V (KIA78R06) V_{IN}=21V (KIA78R15)
V_{IN}=10V (KIA78R08) V_{IN}=4.2V (KIA78R25)
V_{IN}=15V (KIA78R09) V_{IN}=5.0V (KIA78R33)
V_{IN}=16V (KIA78R10) V_{IN}=5.2V (KIA78R35)

I_O=0.5A

Fig. 7 V_D - T_j

DROPOUT VOLTAGE V_D (V) vs JUNCTION TEMPERATURE T_j (°C)

I_O=1A
I_O=0.75A
I_O=0.5A
I_O=0.25A

Fig. 8 I_q - T_j

QUIESCENT CURRENT I_q (mA) vs JUNCTION TEMPERATURE T_j (°C)

V_{IN} = 35V
I_O = 0A

Fig. 9 R.R - f

RIPPLE REJECTION RR (dB) vs INPUT RIPPLE FREQUENCY f (kHz)

I_O= 0.5A,ei=0.5Vrms
V_{IN} = 4.2V(KIA78R25) V_{IN} = 10V(KIA78R08)
V_{IN} = 5.0V(KIA78R33) V_{IN} = 15V(KIA78R09)
V_{IN} = 5.2V(KIA78R35) V_{IN} = 16V(KIA78R10)
V_{IN} = 7V (KIA78R05) V_{IN} = 18V(KIA78R12)
V_{IN} = 8V (KIA78R06) V_{IN} = 21V(KIA78R15)

KIA78R05PI~KIA78R35PI

Fig. 10 R.R - I_{OUT}
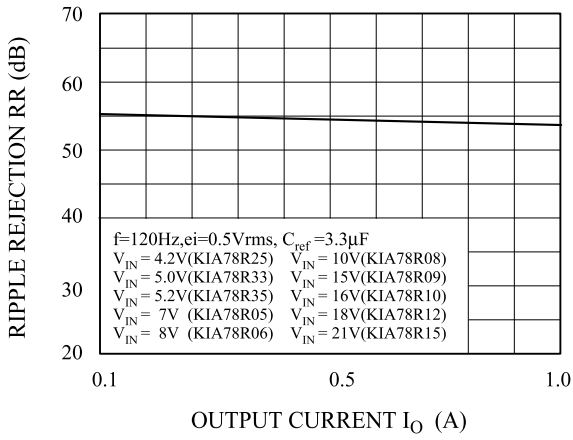
Fig. 11 V_{OUT} - V_{IN} (KIA78R05)

f=120Hz,ei=0.5Vrms, C_{ref} =3.3μF
V_{IN} = 4.2V(KIA78R25) V_{IN} = 10V(KIA78R08)
V_{IN} = 5.0V(KIA78R33) V_{IN} = 15V(KIA78R09)
V_{IN} = 5.2V(KIA78R35) V_{IN} = 16V(KIA78R10)
V_{IN} = 7V (KIA78R05) V_{IN} = 18V(KIA78R12)
V_{IN} = 8V (KIA78R06) V_{IN} = 21V(KIA78R15)
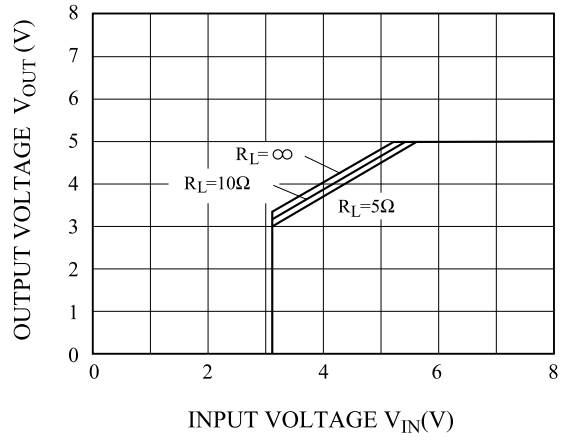
Fig. 12 V_{OUT} - V_{IN} (KIA78R06)
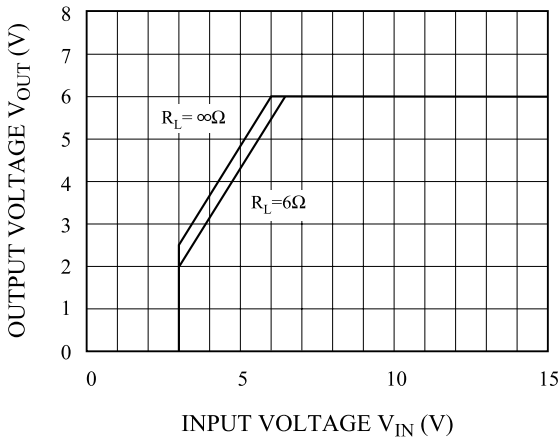
Fig. 13 V_{OUT} - V_{IN} (KIA78R08)
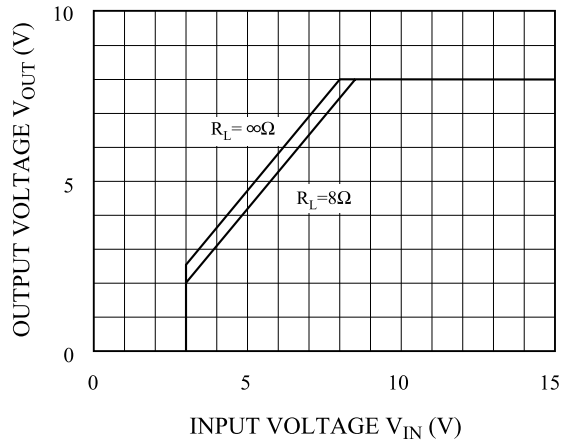
Fig. 14 V_{OUT} - V_{IN} (KIA78R09)
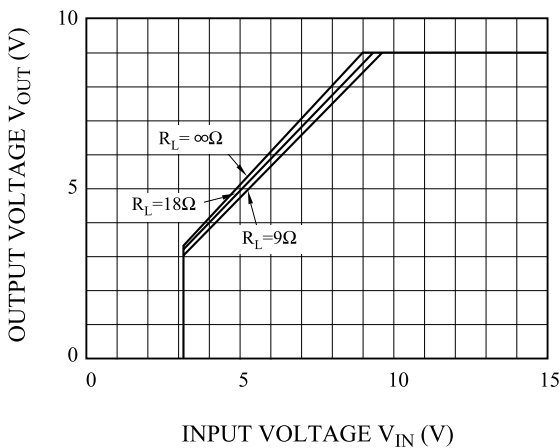
Fig. 15 V_{OUT} - V_{IN} (KIA78R10)
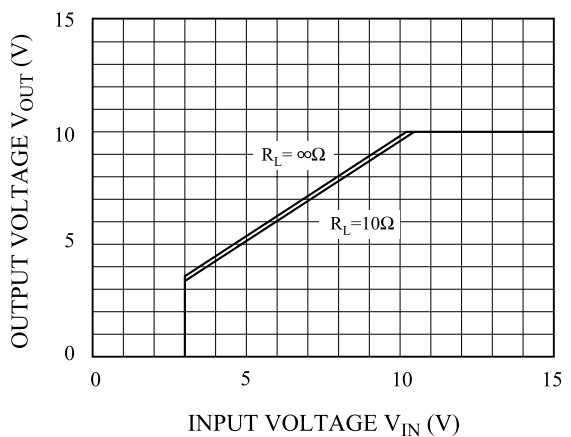
KIA78R05PI~KIA78R35PI

Fig. 16 V_{OUT} - V_{IN} (KIA78R12)
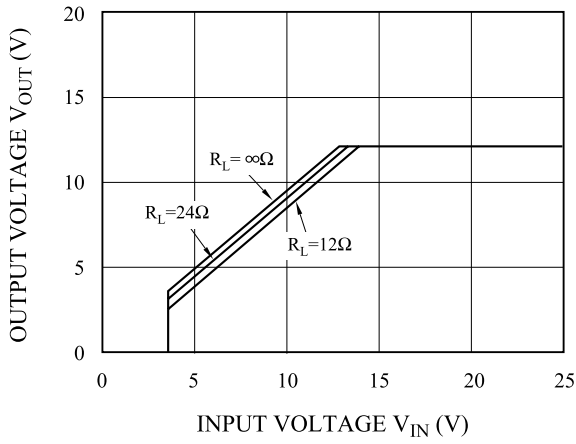
Fig. 17 V_{OUT} - V_{IN} (KIA78R15)
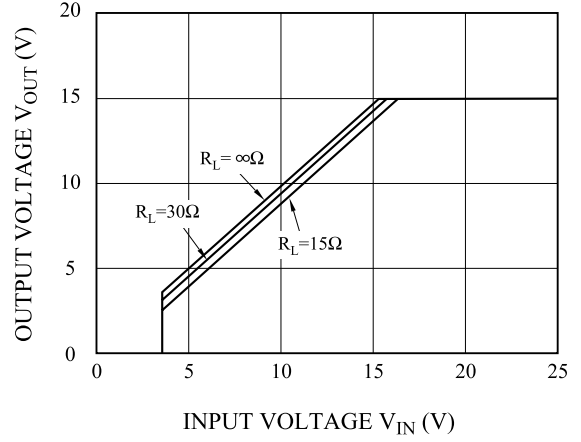
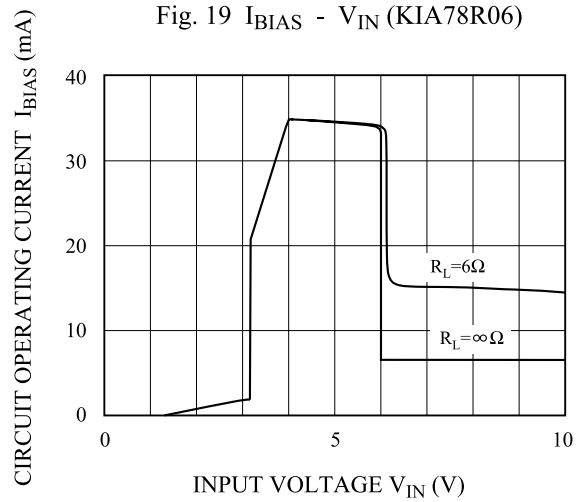Fig. 18 I_{BIAS} - V_{IN} (KIA78R05)
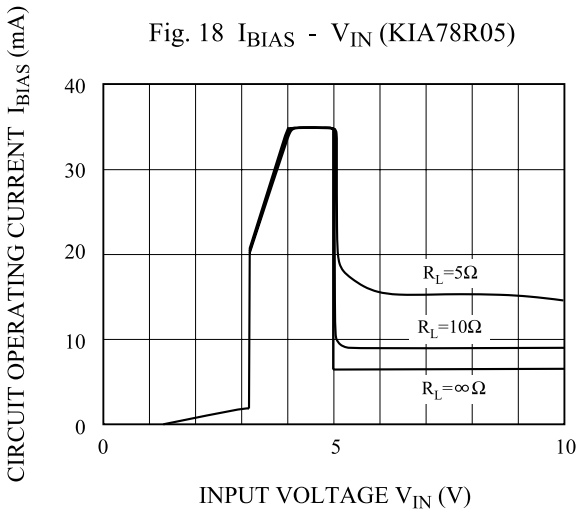
Fig. 19 I_{BIAS} - V_{IN} (KIA78R06)

Fig. 20 I_{BIAS} - V_{IN} (KIA78R08)
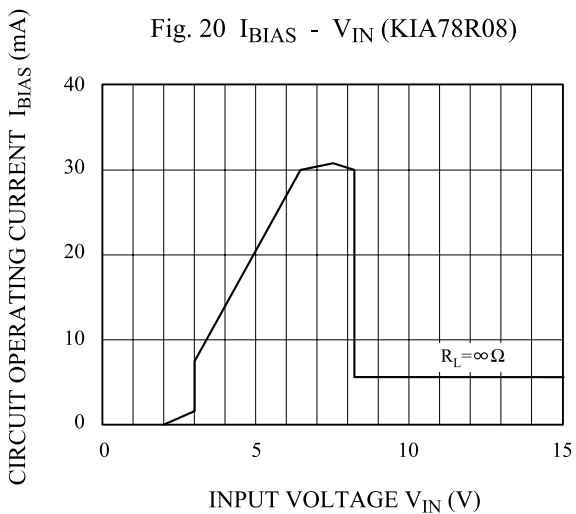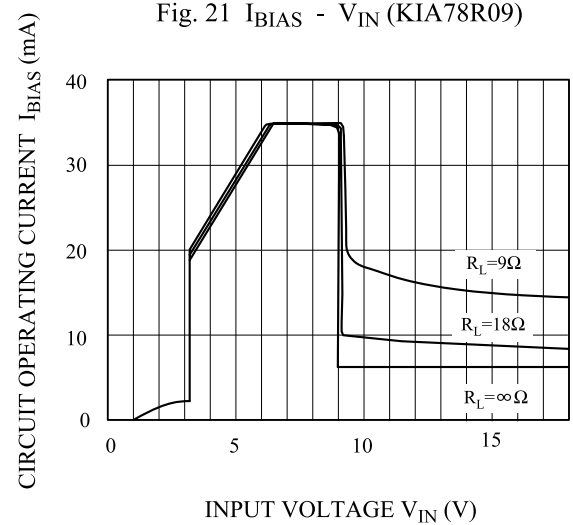

Fig. 21 I_{BIAS} - V_{IN} (KIA78R09)

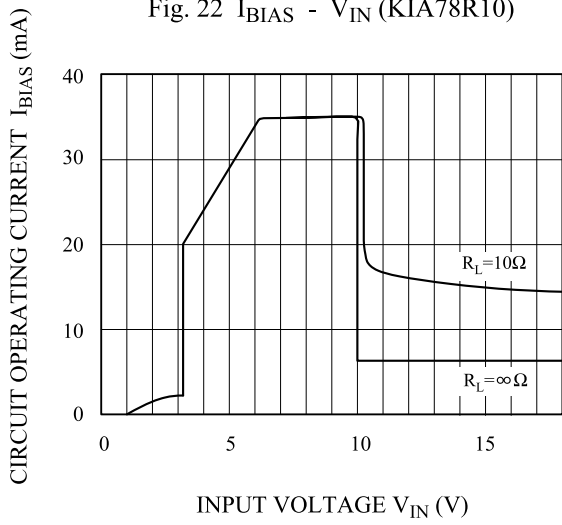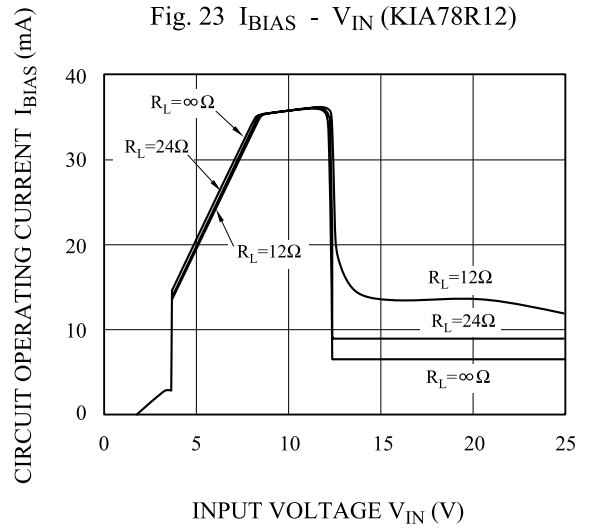Fig. 22 I_{BIAS} - V_{IN} (KIA78R10)

Fig. 23 I_{BIAS} - V_{IN} (KIA78R12)

Fig. 24 I_{BIAS} - V_{IN} (KIA78R15)