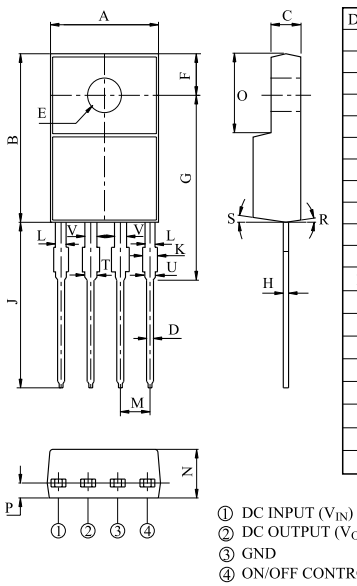
## 4 TERMINAL LOW DROPOUT VOLTAGE REGULATOR

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.




| 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 |

TO-220IS-4

### FEATURES

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

### LINE UP

| ITEM | OUTPUT VOLTAGE (Typ.) | UNIT |
|---|---|---|
| KIA78R05PI | 5 | V |
| KIA78R06PI | 6 | |
| KIA78R08PI | 8 | |
| KIA78R09PI | 9 | |
| KIA78R10PI | 10 | |
| 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 | ℃ | - |

**ELECTRICAL CHARACTERISTICS**

(Unless otherwise specified, $I_O$=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 | | $T_CV_O$ | 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
" KIA78R06=8V
" KIA78R08=10V
" KIA78R09=15V
" KIA78R10=16V
" KIA78R12=18V
" KIA78R15=21V
" KIA78R25=4.2V
" KIA78R33=5.0V
" KIA78R35=5.2V

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

**BLOCK DIAGRAM**

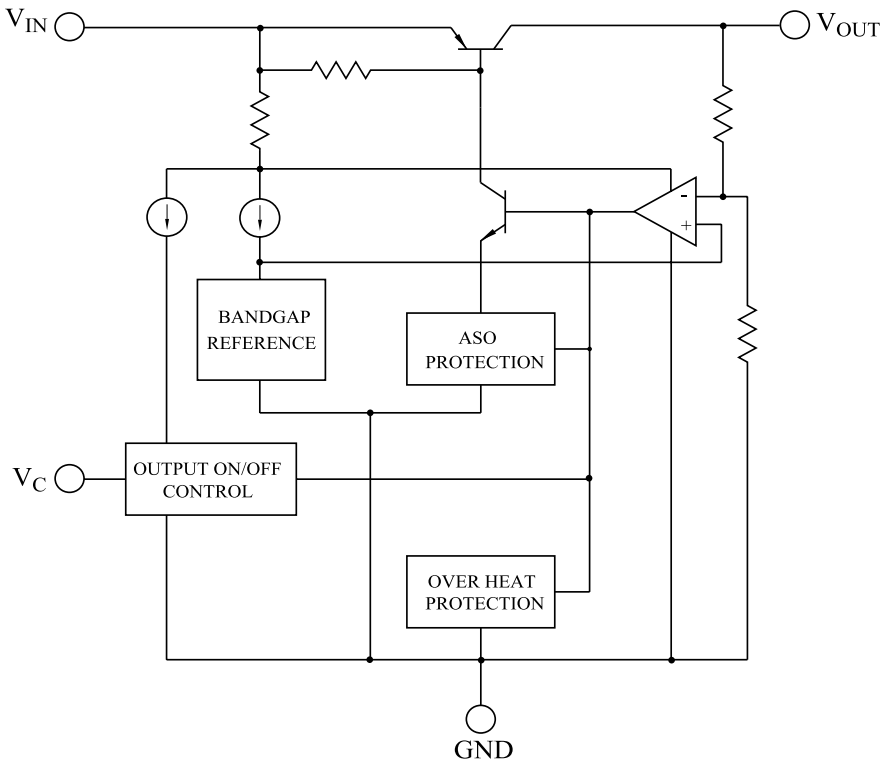


**Fig. 1 Standard Test Circuit**

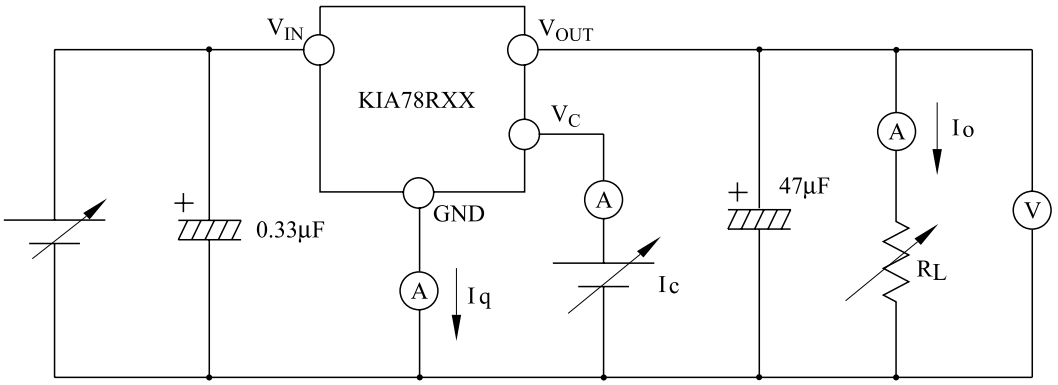



**Fig. 2 Ripple Rejection Test Circuit**

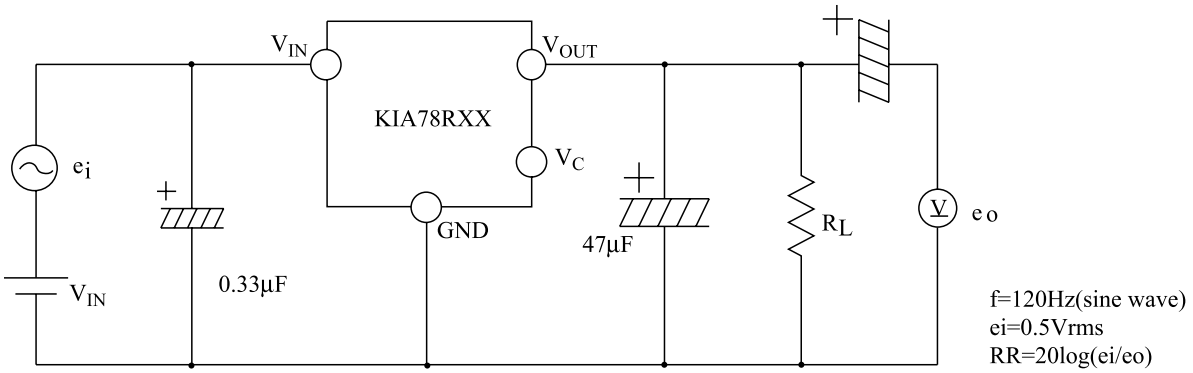



**Fig. 3 Application Circuit for Standard**

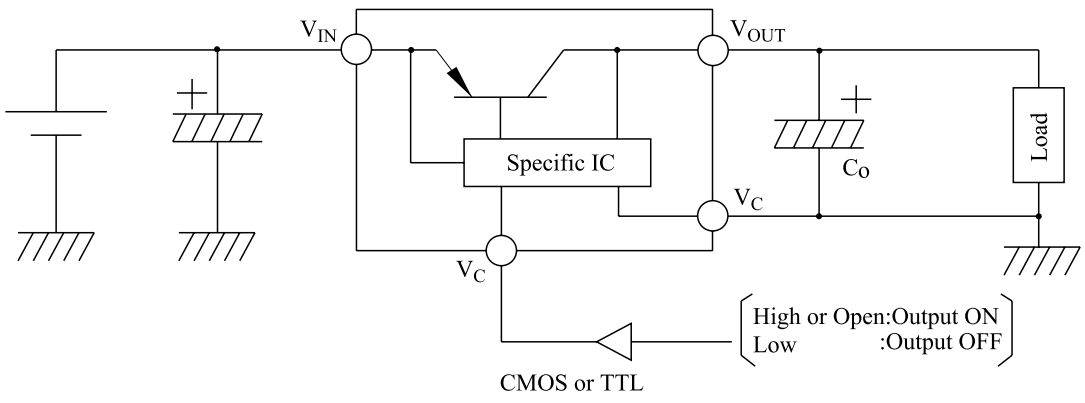


Fig.4 $P_D$ - Ta (PI-Type : TO-220IS-4)

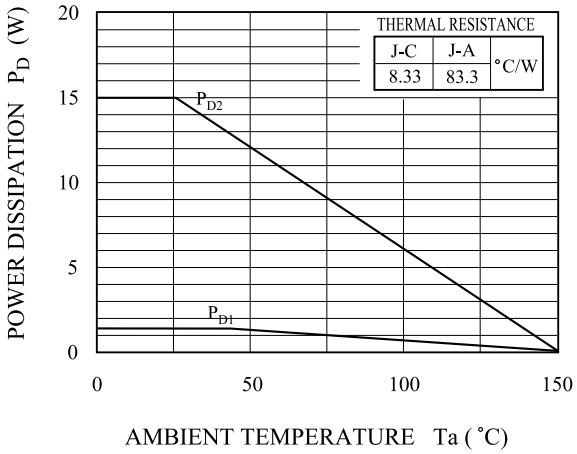



Fig. 5 $V_{OUT}$ - $I_{OUT}$

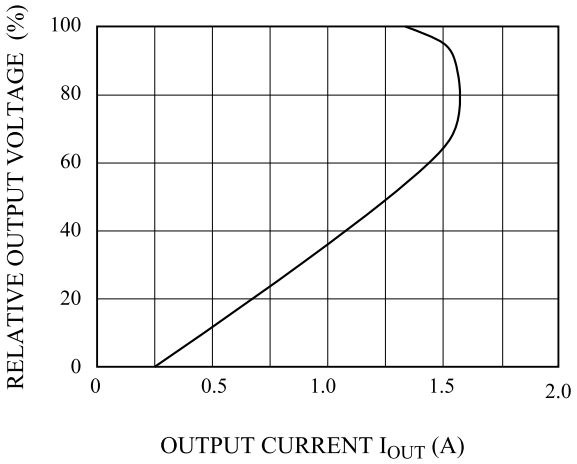



Fig. 6 $\Delta V_O$ - $T_j$

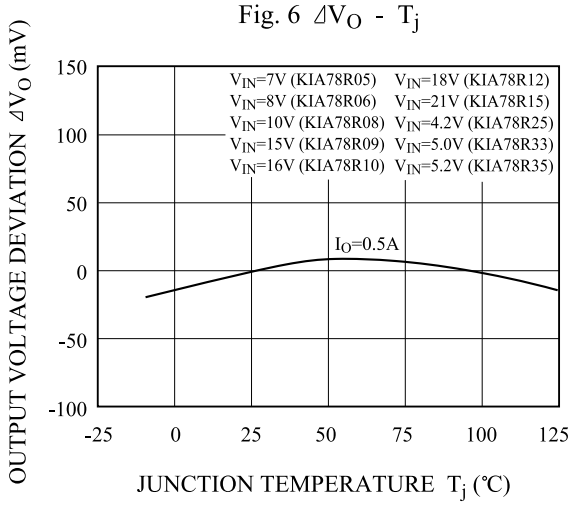



Fig. 7 $V_D$ - $T_j$

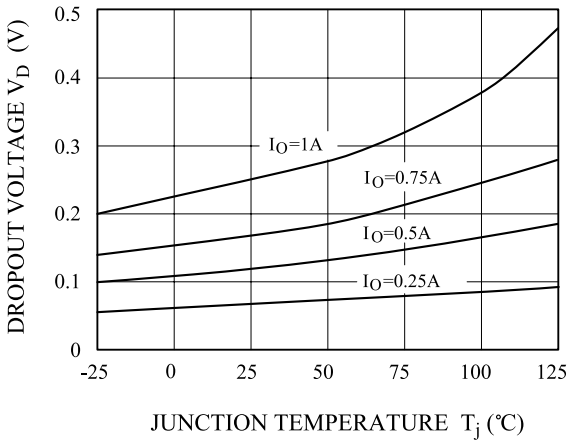



Fig. 8 $I_q$ - $T_j$

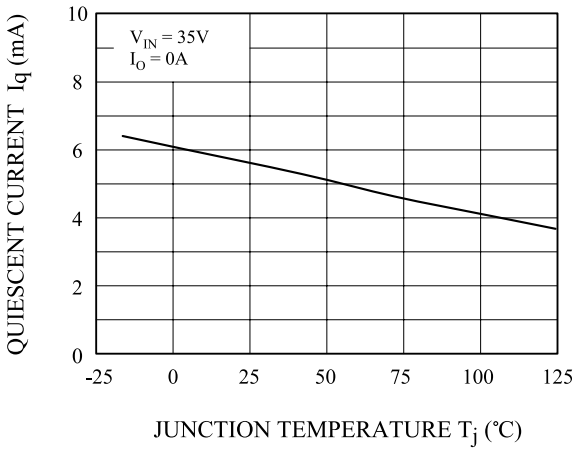



Fig. 9 R.R - f

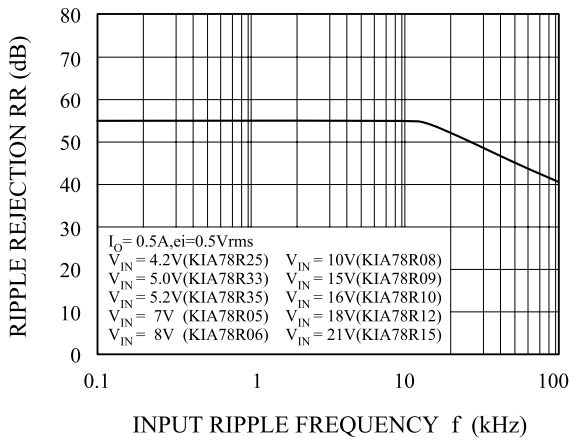


Fig. 10 R.R - $I_{OUT}$

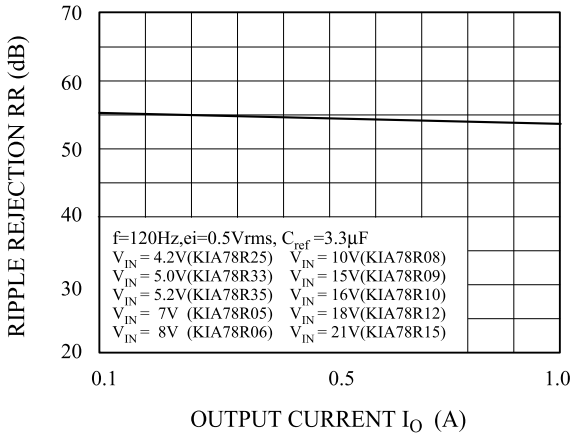



Fig. 11 $V_{OUT}$ - $V_{IN}$ (KIA78R05)

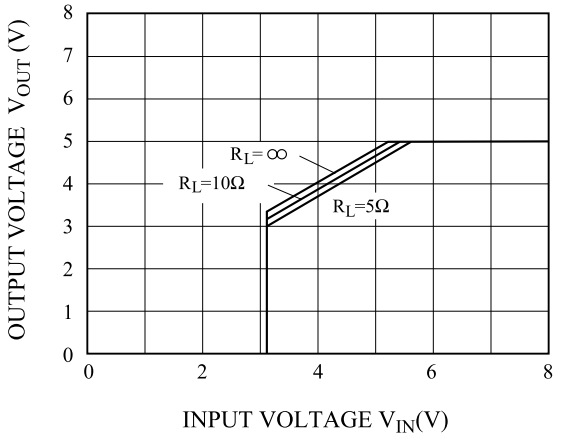



Fig. 12 $V_{OUT}$ - $V_{IN}$ (KIA78R06)

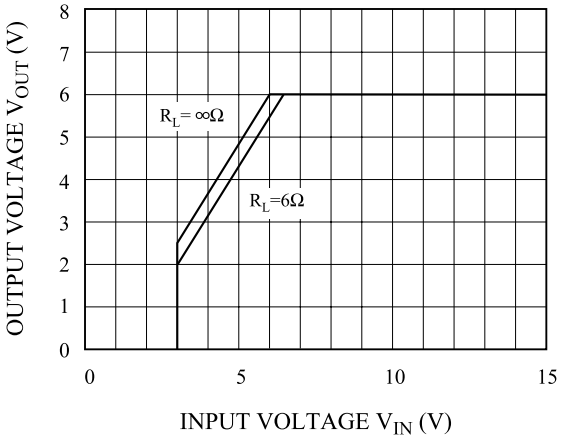



Fig. 13 $V_{OUT}$ - $V_{IN}$ (KIA78R08)

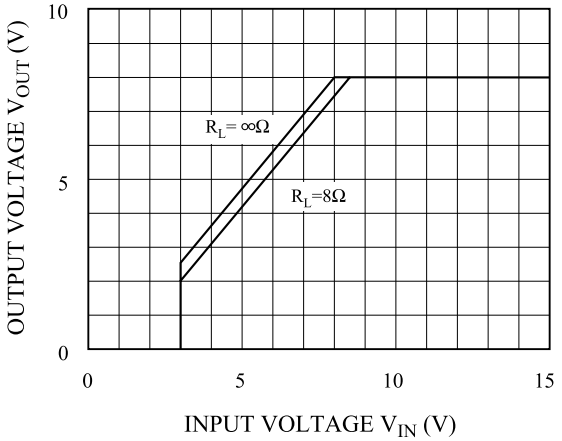



Fig. 14 $V_{OUT}$ - $V_{IN}$ (KIA78R09)

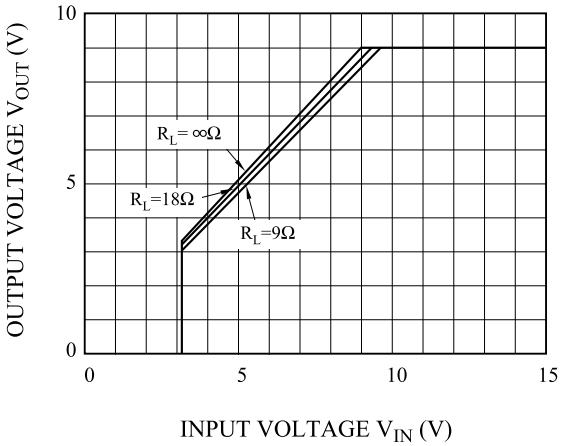



Fig. 15 $V_{OUT}$ - $V_{IN}$ (KIA78R10)

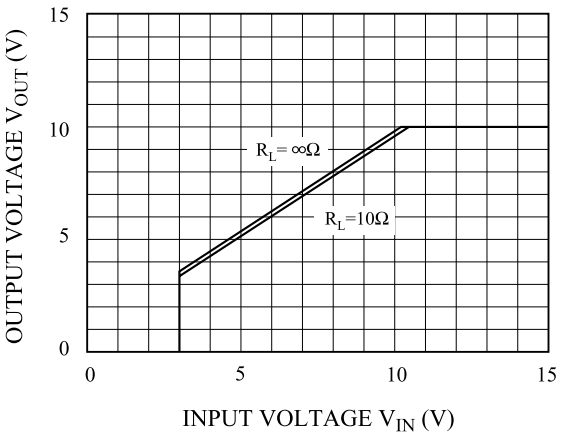


Fig. 16 $V_{OUT}$ - $V_{IN}$ (KIA78R12)

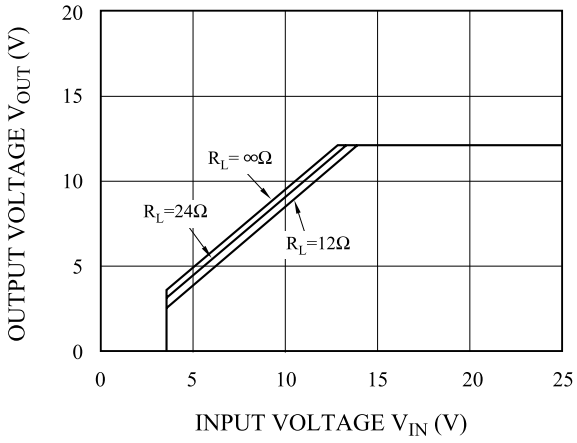



Fig. 17 $V_{OUT}$ - $V_{IN}$ (KIA78R15)

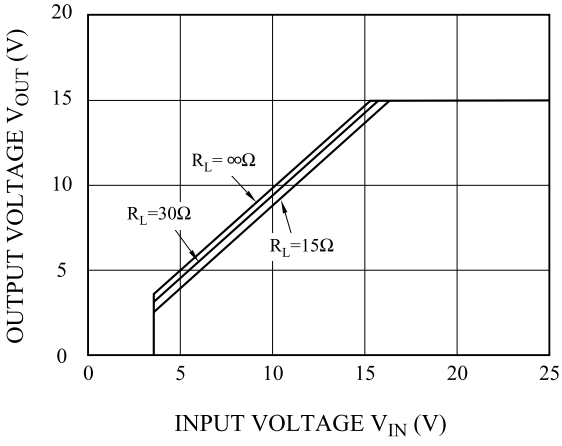



Fig. 18 $I_{BIAS}$ - $V_{IN}$ (KIA78R05)

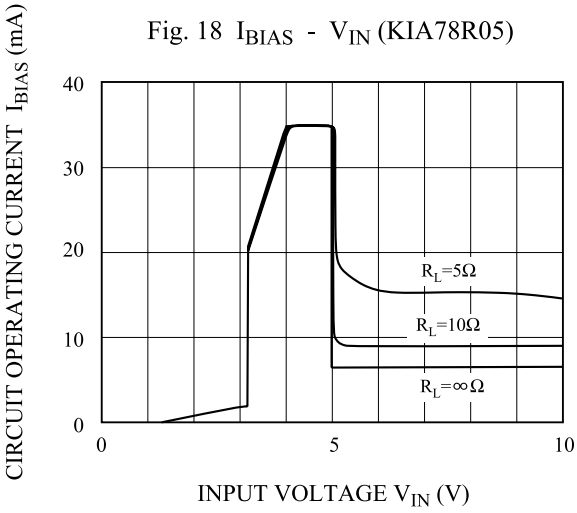



Fig. 19 $I_{BIAS}$ - $V_{IN}$ (KIA78R06)

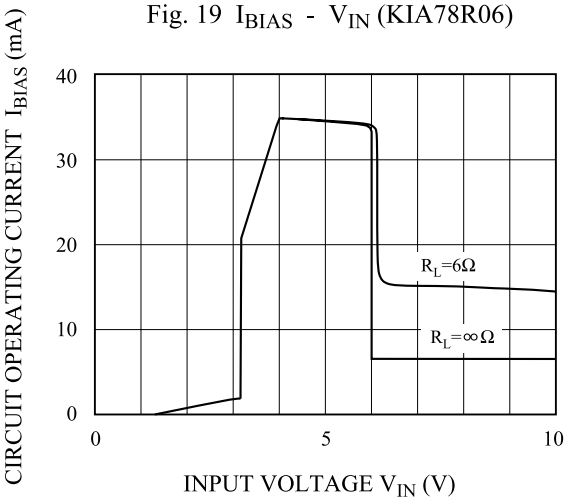



Fig. 20 $I_{BIAS}$ - $V_{IN}$ (KIA78R08)

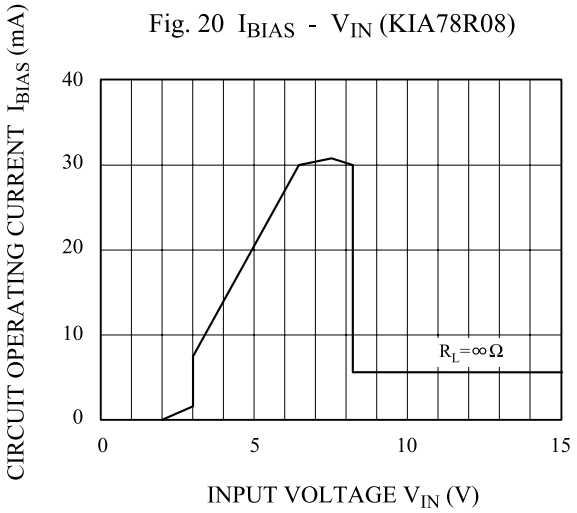



Fig. 21 $I_{BIAS}$ - $V_{IN}$ (KIA78R09)

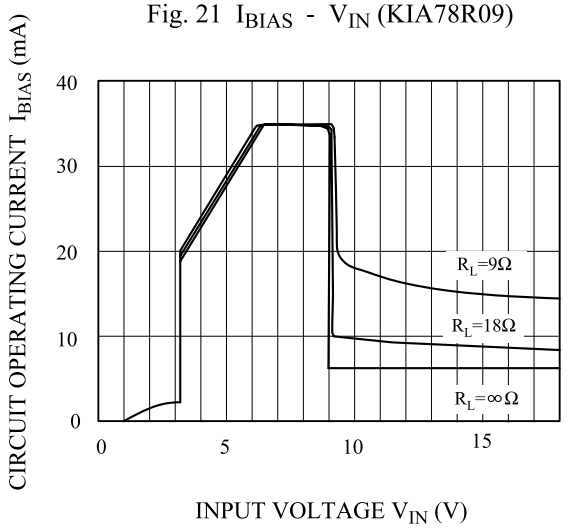


Fig. 22 $I_{BIAS}$ - $V_{IN}$ (KIA78R10)

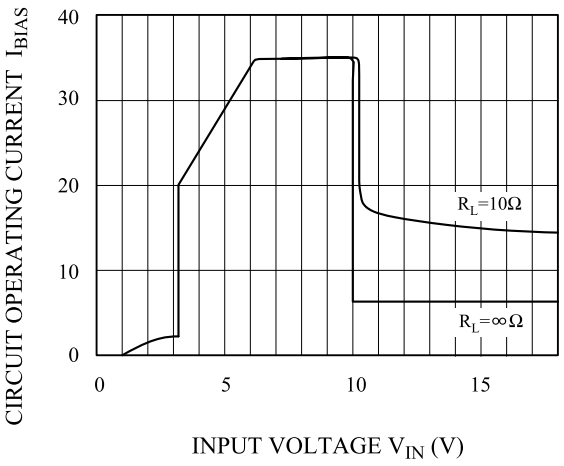



Fig. 23 $I_{BIAS}$ - $V_{IN}$ (KIA78R12)

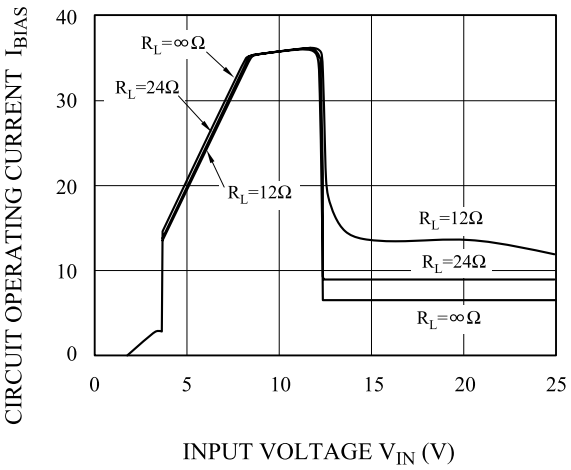



Fig. 24 $I_{BIAS}$ - $V_{IN}$ (KIA78R15)