

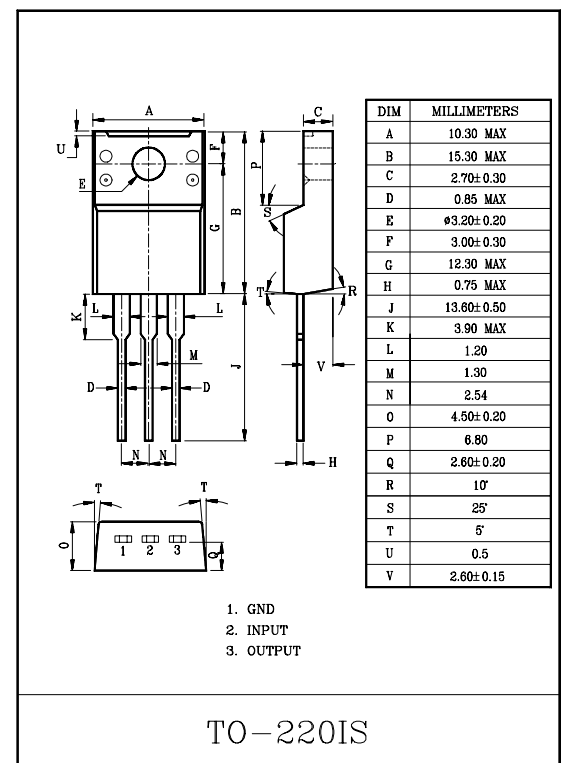
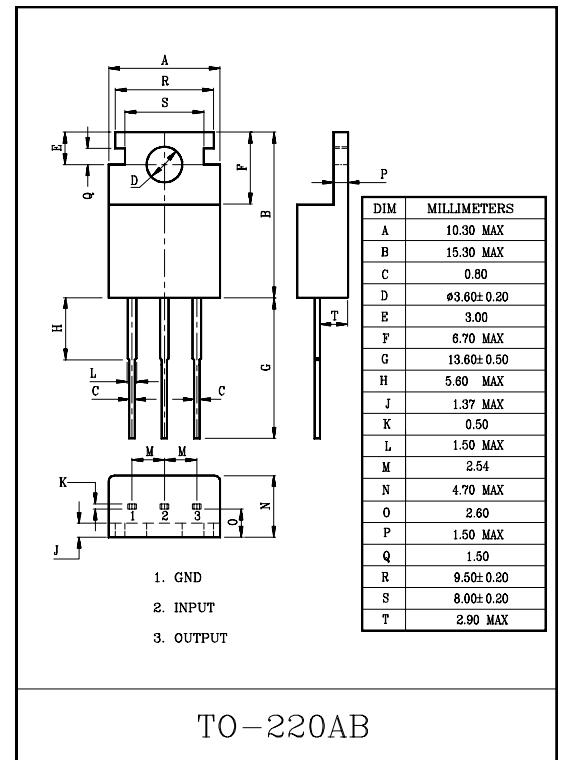
1A THREE TERMINAL NEGATIVE VOLTAGE REGULATORS  
-5V, -6V, -8V, -9V, -10V, -12V, -15V, -18V, -20V, -24V

#### 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.

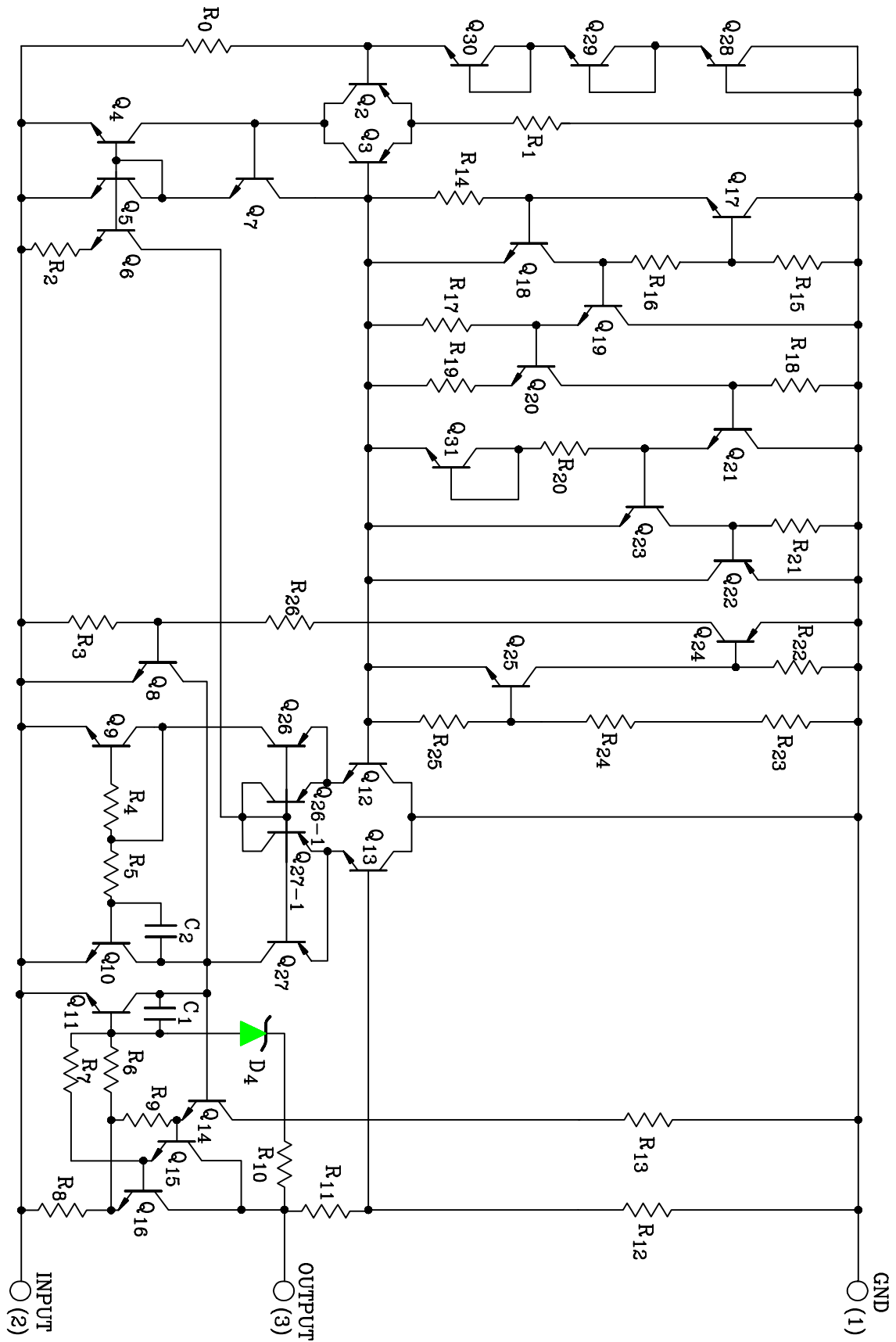
#### MAXIMUM RATINGS (Ta=25°C)

| CHARACTERISTIC                 |                             | SYMBOL           | RATING  | UNIT |
|--------------------------------|-----------------------------|------------------|---------|------|
| Input Voltage                  | KIA7905P/PI~<br>KIA7915P/PI | V <sub>IN</sub>  | -35     | V    |
|                                | KIA7918P/PI~<br>KIA7924P/PI |                  | -40     |      |
| Power Dissipation (Tc=25°C)    |                             | P <sub>D</sub>   | 20.8    | W    |
| Operating Junction Temperature |                             | T <sub>j</sub>   | -30~150 | °C   |
| Operating Temperature          |                             | T <sub>opr</sub> | -30~75  | °C   |
| Storage Temperature            |                             | T <sub>stg</sub> | -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            | $-20V \leq V_{IN} \leq -7V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -5.25                           | -5.0 | -4.75 | V               |     |
| Quiescent Current                                 | $I_B$           | 1            | $T_j = 25^{\circ}C$   | -                               | 3    | 6     | mA              |     |
| Quiescent Current Change                          | $\Delta I_{BI}$ | 1            | $-25V \leq V_{IN} \leq -8V$                                 | -                               | 0.1  | 1.3   | mA              |     |
|   | $\Delta I_{BO}$ |              |   | $5mA \leq I_{OUT} \leq 1.0A$    | -    | 0.05  |                 | 0.5 |
| Output Noise Voltage                              | $V_{NO}$        | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$             | -                               | 100  | -     | $\mu V_{rms}$   |     |
| 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            | $-21V \leq V_{IN} \leq -9V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -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            | $-25V \leq V_{IN} \leq -9V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -                               | -    | 1.3   | mA              |    |
|   |  | Load      |              |   | -                               | -    | 0.5   |                 |    |
| Output Noise Voltage                              |  | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$             | -                               | 130  | -     | $\mu V_{rms}$   |    |
| 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              | mV              |
|   |           |              |  | $-25V \leq V_{IN} \leq -10.5V$  | -    | 10   | 100             |                 |
| Load Regulation                                   | Reg load  | 1            | $T_j = 25^{\circ}C$  | $5mA \leq I_{OUT} \leq 1.5A$    | -    | 12   | 160             | mV              |
|   |           |              |  | $250mA \leq I_{OUT} \leq 750mA$ | -    | 4    | 80              |                 |
| Output Voltage                                    | $V_{OUT}$ | 1            | $-23V \leq V_{IN} \leq -11.5V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -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            | $-25V \leq V_{IN} \leq -11.5V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -                               | 0.1  | 1.0  | mA              |                 |
|   | Load      |              |  |                                 |      |      |                 | $\Delta I_{BO}$ |
| Output Noise Voltage                              | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$                | -                               | 175  | -    | $\mu V_{rms}$   |                 |
| 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            | $-24V \leq V_{IN} \leq -11.5V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -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            | $-26.5V \leq V_{IN} \leq -13V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -                               | 0.1  | 1.0  | mA              |                 |
|   | Load      |              |  |                                 |      |      |                 | $\Delta I_{BO}$ |
| Output Noise Voltage                              | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$                | -                               | 180  | -    | $\mu V_{rms}$   |                 |
| 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            | $-25V \leq V_{IN} \leq -12.5V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -10.5                           | -10  | -9.5 | V               |     |
| Quiescent Current                                 |  | $I_B$     | 1            | $T_j = 25^{\circ}C$  | -                               | 3    | 6    | mA              |     |
| Quiescent Current Change                          |  | Line      | 1            | $-27.5V \leq V_{IN} \leq -14V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -                               | 0.1  | 1.0  | mA              |     |
|   |  | Load      |              |  | $\Delta I_{BO}$                 | -    | 0.05 |                 | 0.5 |
| Output Noise Voltage                              |  | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$                | -                               | 190  | -    | $\mu V_{rms}$   |     |
| 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                   | $-27V \leq V_{IN} \leq -15.5V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -12.6 | -12  | -11.4 | V               |
| Quiescent Current                                 |          | $I_B$           | 1                   | $T_j = 25^{\circ}C$  | -     | 3    | 6     | mA              |
| Quiescent Current Change                          | Line     | $\Delta I_{BI}$ | 1                   | $-30V \leq V_{IN} \leq -15V$                                   | -     | 0.1  | 1.0   | mA              |
|   | Load     | $\Delta I_{BO}$ |                     | $5mA \leq I_{OUT} \leq 1.0A$                                   | -     | 0.05 | 0.5   |                 |
| Output Noise Voltage                              |          | $V_{NO}$        | 2                   | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$                | -     | 200  | -     | $\mu V_{rms}$   |
| 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            | $-30V \leq V_{IN} \leq -18V$<br>$5mA \leq I_{OUT} \leq 1.0A$   | -15.75                          | -15  | -14.25 | V               |    |
| Quiescent Current                                 |  | $I_B$     | 1            | $T_j = 25^{\circ}C$  | -                               | 3    | 6      | mA              |    |
| Quiescent Current Change                          |  | Line      | 1            | $-30V \leq V_{IN} \leq -17.5V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -                               | 0.1  | 1.0    | mA              |    |
|   |  | Load      |              |  | -                               | 0.05 | 0.5    |                 |    |
| Output Noise Voltage                              |  | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$                | -                               | 250  | -      | $\mu V_{rms}$   |    |
| 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            | $-33V \leq V_{IN} \leq -22.5V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -18.85                          | -18  | -17.15 | V               |     |
| Quiescent Current                                 |  | $I_B$     | 1            | $T_j = 25^{\circ}C$  | -                               | 3    | 6      | mA              |     |
| Quiescent Current Change                          |  | Line      | 1            | $-33V \leq V_{IN} \leq -22V$<br>$5mA \leq I_{OUT} \leq 1.0A$   | -                               | -    | 1.0    | mA              |     |
|   |  | Load      |              |  | $\Delta I_{BO}$                 | -    | -      |                 | 0.5 |
| Output Noise Voltage                              |  | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$                | -                               | 300  | -      | $\mu V_{rms}$   |     |
| 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            | $-35V \leq V_{IN} \leq -24V$<br>$5mA \leq I_{OUT} \leq 1.0A$   | -21.0                           | -20  | -19.0 | V               |     |
| Quiescent Current                                 |  | $I_B$     | 1            | $T_j = 25^{\circ}C$  | -                               | 3    | 6     | mA              |     |
| Quiescent Current Change                          |  | Line      | 1            | $-36.5V \leq V_{IN} \leq -25V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -                               | -    | 1.0   | mA              |     |
|   |  | Load      |              |  | $\Delta I_{BO}$                 | -    | -     |                 | 0.5 |
| Output Noise Voltage                              |  | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$                | -                               | 350  | -     | $\mu V_{rms}$   |     |
| 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

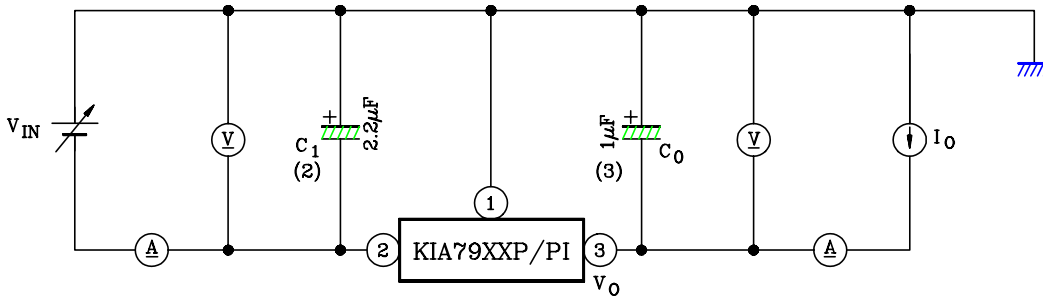
(Unless otherwise specified,  $V_{IN} = -33V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ ,  $C_{IN} = 0.33\mu F$ ,  $C_{OUT} = 0.1\mu F$ )

| 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            | $-38V \leq V_{IN} \leq -27V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -25.2                           | -24  | -22.5 | V               |    |
| Quiescent Current                                 |  | $I_B$     | 1            | $T_j = 25^{\circ}C$  | -                               | 3    | 6     | mA              |    |
| Quiescent Current Change                          |  | Line      | 1            | $-38V \leq V_{IN} \leq -27V$<br>$5mA \leq I_{OUT} \leq 1.0A$ | -                               | -    | 1.0   | mA              |    |
|   |  | Load      |              |  | -                               | -    | 0.5   |                 |    |
| Output Noise Voltage                              |  | $V_{NO}$  | 2            | $T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$              | -                               | 400  | -     | $\mu V_{rms}$   |    |
| 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

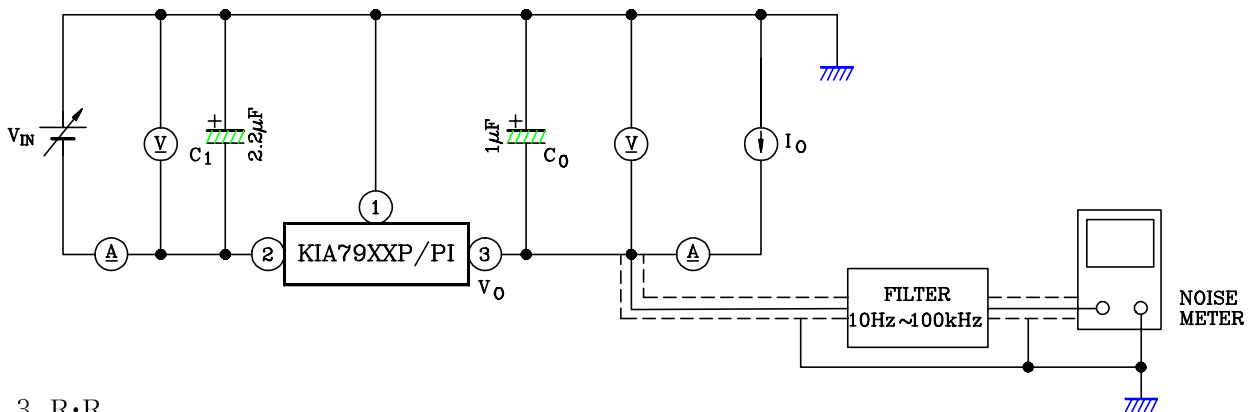
## TEST CIRCUIT

1.  $V_{OUT}$ , Reg·Line, Reg·Load,  $I_B$ ,  $\Delta I_B$ ,  $V_D$ ,  $T_{CVO}$

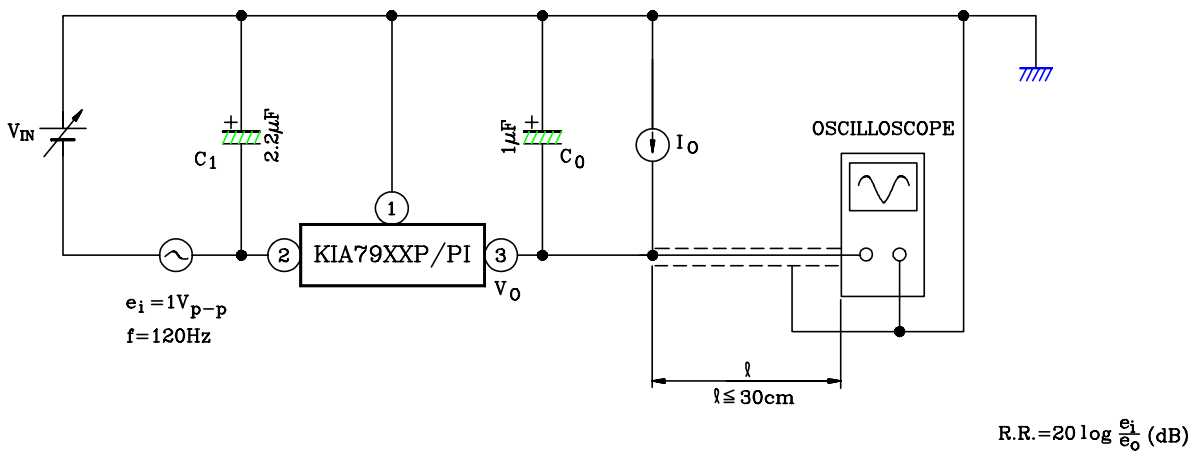


- Notes :
- (1) To specify an output voltage, substitute voltage value for "XX"
  - (2) Required for stability. For value given, capacitor must be solid tantalum. If aluminium electrolytics are used, at least ten times value shown should be selected.  $C_1$  is required if regulator is located an appreciable 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.

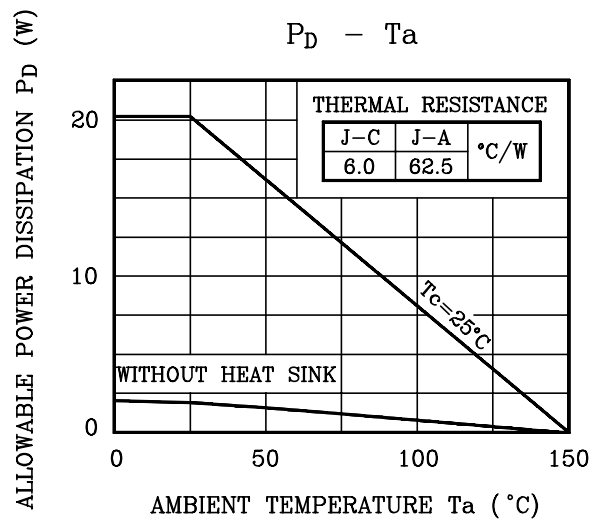
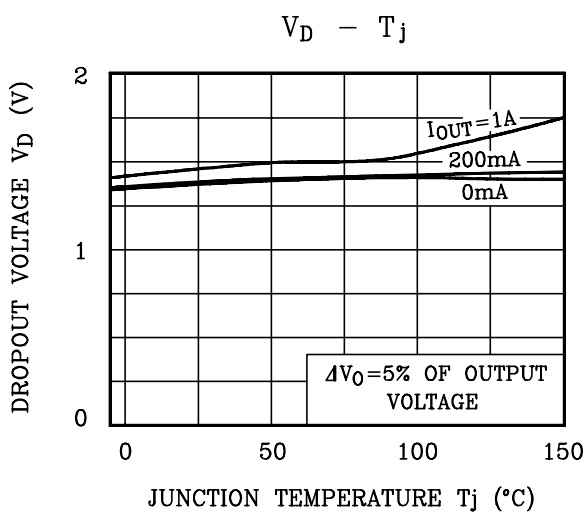
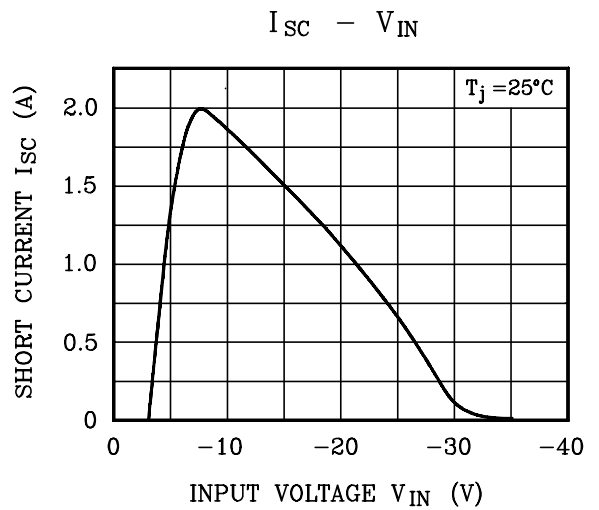
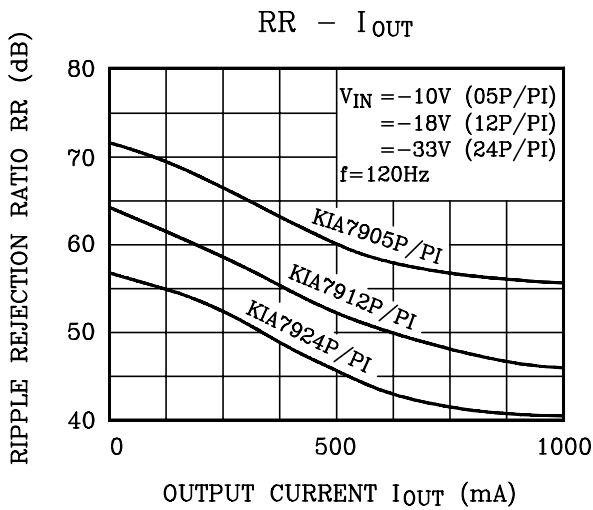
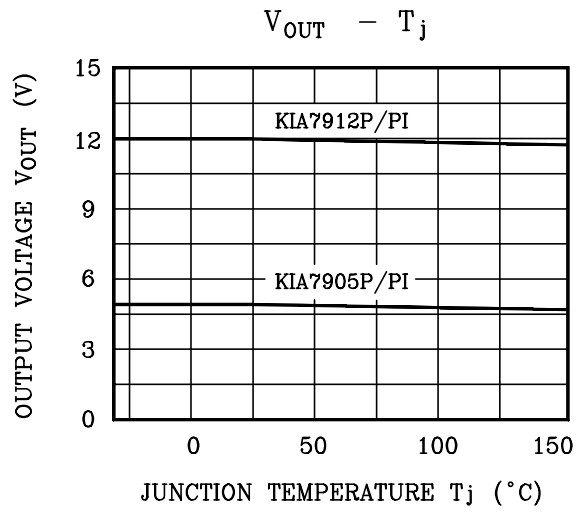
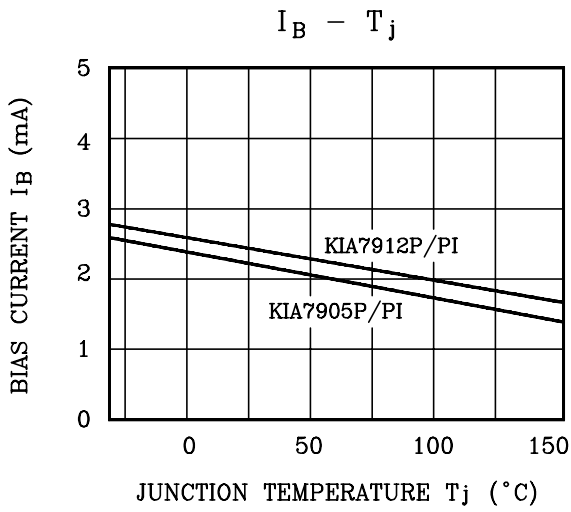
2.  $V_{NO}$



3. R·R



# KIA7905P/PI ~ KIA7924P/PI



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