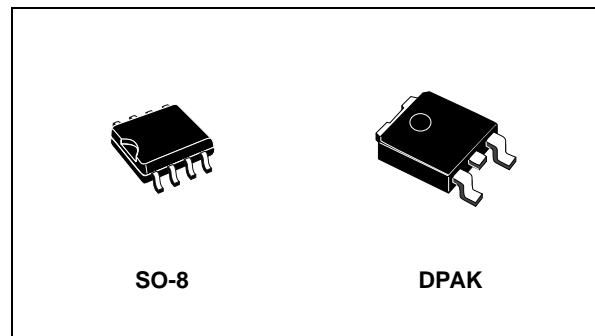




# KF00 SERIES

## VERY LOW DROP VOLTAGE REGULATORS WITH INHIBIT

- VERY LOW DROPOUT VOLTAGE (0.4V)
- VERY LOW QUIESCENT CURRENT (TYP. 50  $\mu$ A IN OFF MODE, 500  $\mu$ A IN ON MODE)
- OUTPUT CURRENT UP TO 500 mA
- LOGIC-CONTROLLED ELECTRONIC SHUTDOWN
- OUTPUT VOLTAGES OF 1.25; 1.5; 2.5; 2.7; 3; 3.3; 3.5; 4; 4.5; 4.7; 5; 5.2; 5.5; 6; 8; 8.5; 12V
- INTERNAL CURRENT AND THERMAL LIMIT
- ONLY 2.2  $\mu$ F FOR STABILITY
- AVAILABLE IN  $\pm$  2% ACCURACY AT 25  $^{\circ}$ C
- SUPPLY VOLTAGE REJECTION: 70 db (TYP.)
- TEMPERATURE RANGE: -40 TO 125  $^{\circ}$ C



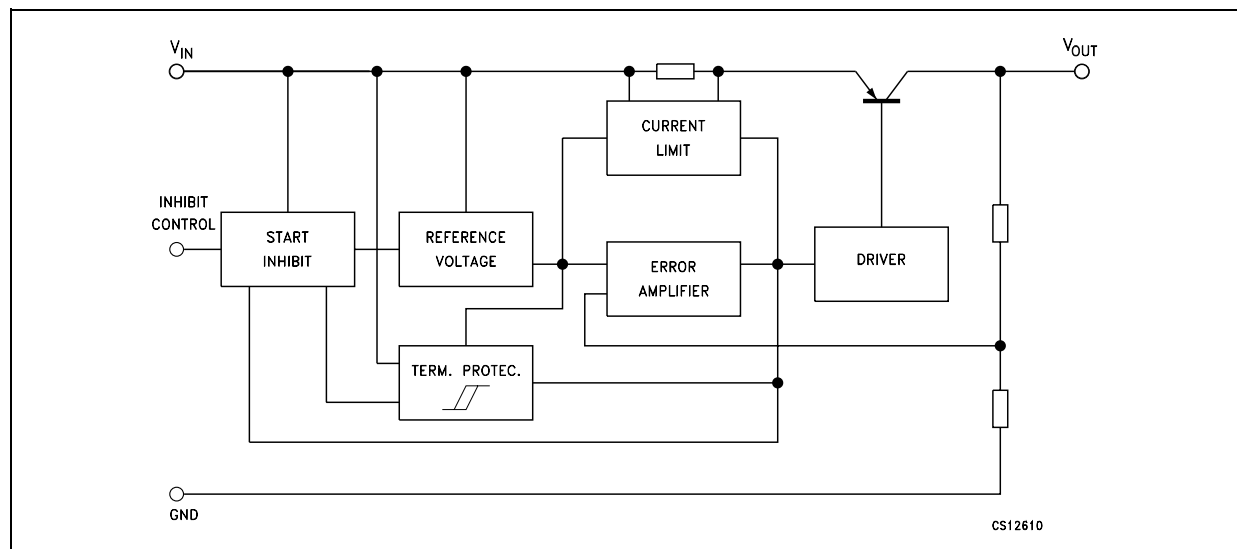
suitable for Low Noise, Low Power applications and specially in battery powered systems. A Shutdown Logic Control function is available (pin 5, TTL compatible). This means that when the device is used as a local regulator, it is possible to put a part of the board in standby, decreasing the total power consumption. It requires only a 2.2  $\mu$ F capacitor for stability allowing space and cost saving.

### DESCRIPTION

The KF00 series are very Low Drop regulators available in SO-8 package and in a wide range of output voltages.

The very Low Drop voltage (0.4V) and the very low quiescent current make them particularly

### SCHEMATIC DIAGRAM



## KF00

### ABSOLUTE MAXIMUM RATINGS

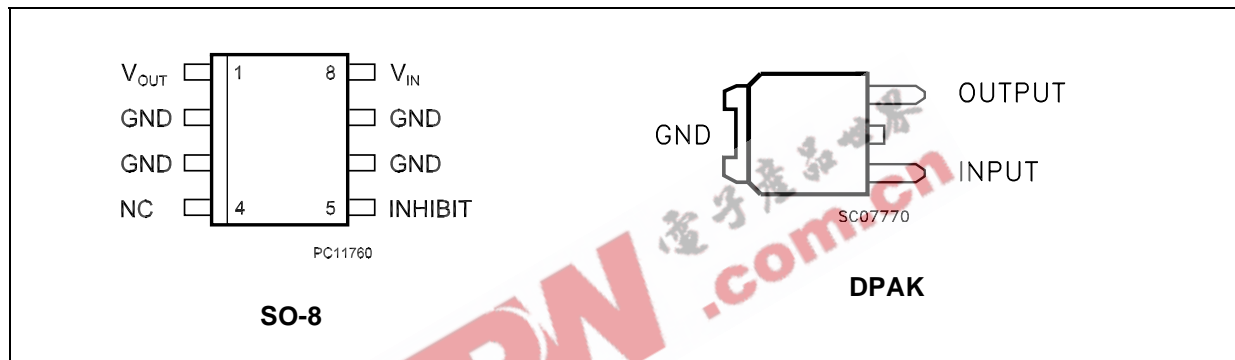
| Symbol    | Parameter                            | Value              | Unit |
|-----------|--------------------------------------|--------------------|------|
| $V_I$     | DC Input Voltage                     | -0.5 to 20         | V    |
| $I_O$     | Output Current                       | Internally Limited |      |
| $P_{tot}$ | Power Dissipation                    | Internally Limited |      |
| $T_{stg}$ | Storage Temperature Range            | -40 to 150         | °C   |
| $T_{op}$  | Operating Junction Temperature Range | -40 to 125         | °C   |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

### THERMAL DATA

| Symbol         | Parameter                        | DAK | SO-8 | Unit |
|----------------|----------------------------------|-----|------|------|
| $R_{thj-case}$ | Thermal Resistance Junction-case | 8   | 20   | °C/W |

### CONNECTION DIAGRAM (top view)



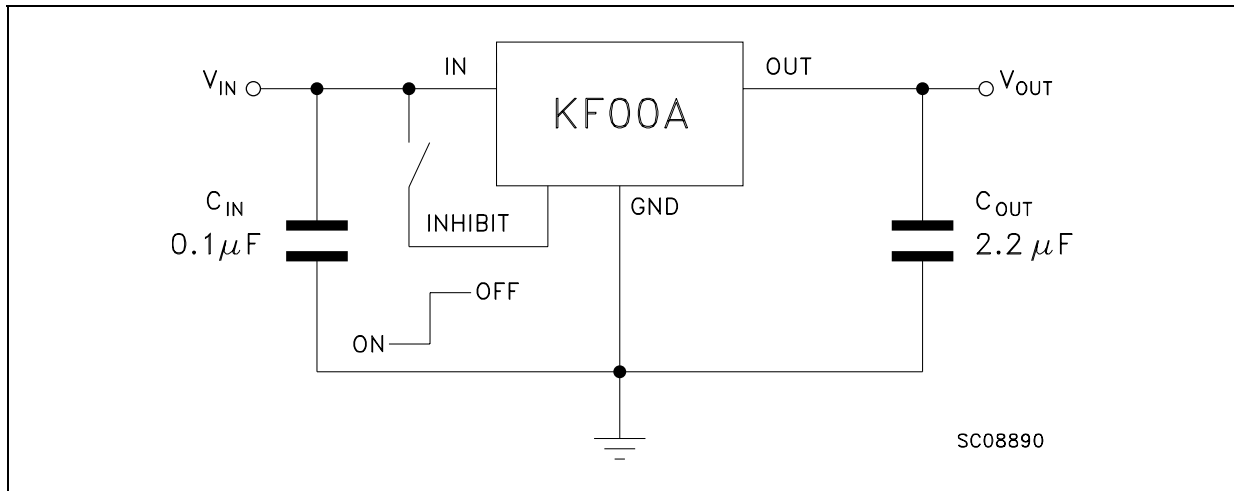
### ORDERING CODES

| TYPE    | SO-8(#) | DAK(#)   | OUTPUT VOLTAGE |
|---------|---------|----------|----------------|
| KF12(*) | KF12BD  | KF12BDT  | 1.25 V         |
| KF15    | KF15BD  | KF15BDT  | 1.5 V          |
| KF25    | KF25BD  | KF25BDT  | 2.5 V          |
| KF27    | KF27BD  | KF27BDT  | 2.7 V          |
| KF30    | KF30BD  | KF30BDT  | 3 V            |
| KF33    | KF33BD  | KF33BDT  | 3.3 V          |
| KF35    | KF35BD  | KF35BDT  | 3.5 V          |
| KF40    | KF40BD  | KF40BDT  | 4 V            |
| KF45(*) | KF45BD  | KF45BDT  | 4.5 V          |
| KF47    | KF47BD  | KF47BDT  | 4.75 V         |
| KF50    | KF50BD  | KF50BDT  | 5 V            |
| KF52    | KF52BD  | KF52BDT  | 5.2 V          |
| KF55(*) | KF55BD  | KF55BDT  | 5.5 V          |
| KF60    | KF60BD  | KF60BDT  | 6 V            |
| KF80    | KF80BD  | KF80BDT  | 8 V            |
| KF85    | KF85BD  | KF85BDT  | 8.5 V          |
| KF120   | KF120BD | KF120BDT | 12 V           |

(\*) Available on request.

(#) Available in Tape & Reel with the suffix "-TR".

## TEST CIRCUITS



**ELECTRICAL CHARACTERISTICS FOR KF12** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_I = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max.  | Unit          |               |
|--------------|---------------------------|--|----------------------|------|-------|---------------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 3.3 \text{ V}$  | 1.225                | 1.25 | 1.275 | V             |               |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 3.3 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 1.2                  |      | 1.3   |               |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   | 2.5                  |      | 20    | V             |               |
| $I_O$        | Output Current Limit      |  |                      | 1    |       | A             |               |
| $\Delta V_O$ | Line Regulation           | $V_I = 2.5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 2    | 12    | mV            |               |
| $\Delta V_O$ | Load Regulation           | $V_I = 2.8 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50    | mV            |               |
| $I_d$        | Quiescent Current         | $V_I = 2.5 \text{ to } 20 \text{ V}$ , $I_O = 0 \text{ mA}$                              | (ON MODE)            |      | 0.5   | 1             | mA            |
|              |                           | $V_I = 2.6 \text{ to } 20 \text{ V}$ , $I_O = 500 \text{ mA}$                            |                      |      |       | 12            |               |
|              |                           | $V_I = 6 \text{ V}$  | (OFF MODE)           |      | 50    | 100           | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 3.5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 82   |       | dB            |               |
|              |                           |  | $f = 1 \text{ KHz}$  | 77   |       |               |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |       |               |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |       | $\mu\text{V}$ |               |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 1.25 |       | V             |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8   | V             |               |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |       | V             |               |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |       | $\mu\text{A}$ |               |
| $C_O$        | Output Bypass Capacitance | ESR = 0.1 to 10 $\Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$                          | 2                    | 10   |       | $\mu\text{F}$ |               |

**ELECTRICAL CHARACTERISTICS FOR KF15** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 3.5 \text{ V}$  | 1.47                 | 1.5  | 1.53 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 3.5 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 1.44                 |      | 1.56 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   | 2.5                  |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 2.5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 2    | 12   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 2.8 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 2.5 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 2.8 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 3.5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 82   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 77   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 1    |      | V             |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF25** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 4.5 \text{ V}$  | 2.45                 | 2.5  | 2.55 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 4.5 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 2.4                  |      | 2.6  |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 3.5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 2    | 12   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 3.8 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 3.5 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 3.8 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 4.5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 82   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 77   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF27** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max.  | Unit          |
|--------------|---------------------------|--|----------------------|------|-------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 4.7 \text{ V}$  | 2.646                | 2.7  | 2.754 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 4.7 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 2.592                |      | 2.808 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20    | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |       | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 3.7 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 2    | 12    | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 4 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                               |                      | 2    | 50    | mV            |
| $I_d$        | Quiescent Current         | $V_I = 3.7 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1     | mA            |
|              |                           | $V_I = 4 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                  |                      |      | 12    |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100   | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 4.7 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 82   |       | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 77   |       |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |       |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |       | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35  | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7   |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8   | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |       | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |       | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |       | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF30** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 5 \text{ V}$  | 2.94                 | 3    | 3.06 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 5 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 2.88                 |      | 3.12 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 4 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 2    | 12   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 4.3 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                           |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 4 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 4.3 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                              |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 81   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 76   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$        | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF33** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max.  | Unit          |
|--------------|---------------------------|--|----------------------|------|-------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 5.3 \text{ V}$  | 3.234                | 3.3  | 3.366 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 5.3 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 3.168                |      | 3.432 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20    | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |       | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 4.3 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 2    | 12    | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 4.6 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50    | mV            |
| $I_d$        | Quiescent Current         | $V_I = 4.3 \text{ to } 20 \text{ V}$ , $I_O = 0 \text{ mA}$ (ON MODE)                    |                      | 0.5  | 1     | mA            |
|              |                           | $V_I = 4.6 \text{ to } 20 \text{ V}$ , $I_O = 500 \text{ mA}$                            |                      |      | 12    |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100   | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 5.3 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 80   |       | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 75   |       |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |       |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |       | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35  | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7   |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8   | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |       | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |       | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |       | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF35** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 5.5 \text{ V}$  | 3.43                 | 3.5  | 3.57 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 5.5 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 3.36                 |      | 3.64 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 4.5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 2    | 12   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 4.8 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 4.5 \text{ to } 20 \text{ V}$ , $I_O = 0 \text{ mA}$ (ON MODE)                    |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 4.8 \text{ to } 20 \text{ V}$ , $I_O = 500 \text{ mA}$                            |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 5.5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 79   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 74   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF40** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_0 = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 6 \text{ V}$  | 3.92                 | 4    | 4.08 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 6 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 3.84                 |      | 4.16 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 3    | 18   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 5.3 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                           |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 5 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 5.3 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                              |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 6 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 78   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 73   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_0$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$        | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF45** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_0 = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 6.5 \text{ V}$  | 4.41                 | 4.5  | 4.59 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 6.5 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 4.32                 |      | 4.68 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 5.5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 3    | 18   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 5.8 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 5.5 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 5.8 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 6.5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 77   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 72   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_0$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF47** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max.  | Unit          |
|--------------|---------------------------|--|----------------------|------|-------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 6.7 \text{ V}$  | 4.606                | 4.7  | 4.794 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 6.7 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 4.512                |      | 4.888 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20    | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |       | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 5.7 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 3    | 18    | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 6 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                               |                      | 2    | 50    | mV            |
| $I_d$        | Quiescent Current         | $V_I = 5.7 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1     | mA            |
|              |                           | $V_I = 6 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                  |                      |      | 12    |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100   | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 6.7 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 77   |       | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 72   |       |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |       |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |       | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35  | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7   |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8   | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |       | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |       | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |       | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF50** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 7 \text{ V}$  | 4.9                  | 5    | 5.1  | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 7 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 4.8                  |      | 5.2  |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 6 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 3    | 18   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 6.3 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                           |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 6 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 6.3 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                              |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 7 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 76   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 71   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$        | 2                    | 10   |      | $\mu\text{F}$ |



**ELECTRICAL CHARACTERISTICS FOR KF52** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_0 = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max.  | Unit          |
|--------------|---------------------------|--|----------------------|------|-------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 7.2 \text{ V}$  | 5.096                | 5.2  | 5.304 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 7.2 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 4.992                |      | 5.408 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20    | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |       | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 6.2 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 3    | 18    | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 6.5 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50    | mV            |
| $I_d$        | Quiescent Current         | $V_I = 6.2 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1     | mA            |
|              |                           | $V_I = 6.5 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                |                      |      | 12    |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100   | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 7.2 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 76   |       | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 71   |       |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |       |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |       | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35  | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7   |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8   | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |       | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |       | $\mu\text{A}$ |
| $C_0$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |       | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF55** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_0 = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 7.5 \text{ V}$  | 5.39                 | 5.5  | 5.61 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 7.5 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 5.28                 |      | 5.72 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 6.5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 3    | 18   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 6.8 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                             |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 6.5 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.5  | 1    | mA            |
|              |                           | $V_I = 6.8 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                |                      |      | 12   |               |
|              |                           | $V_I = 6 \text{ V}$ (OFF MODE)   |                      | 50   | 100  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 7.5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 76   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 71   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 6 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_0$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$          | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF60** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_0 = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions  | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|--|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 8 \text{ V}$  | 5.88                 | 6    | 6.12 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 8 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 5.76                 |      | 6.24 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$   |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |  |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 7 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 4    | 24   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 7.3 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                           |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 7 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.7  | 1.5  | mA            |
|              |                           | $V_I = 7.3 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                              |                      |      | 12   |               |
|              |                           | $V_I = 9 \text{ V}$ (OFF MODE)   |                      | 70   | 140  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 8 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 75   |      | dB            |
|              |                           |  | $f = 1 \text{ KHz}$  | 70   |      |               |
|              |                           |  | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$  |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$   |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$   |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$  |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$  | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 9 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$        | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF80B** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_0 = 2.2 \mu\text{F}$  unless otherwise specified.)

| Symbol       | Parameter                 | Test Conditions   | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|---|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 10 \text{ V}$  | 7.84                 | 8    | 8.16 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 10 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 7.68                 |      | 8.32 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$  |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |   |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 9 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                               |                      | 4    | 24   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 9.3 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                            |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 9 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                         |                      | 0.7  | 1.5  | mA            |
|              |                           | $V_I = 9.3 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                               |                      |      | 12   |               |
|              |                           | $V_I = 9 \text{ V}$ (OFF MODE)  |                      | 70   | 140  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 10 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 72   |      | dB            |
|              |                           |   | $f = 1 \text{ KHz}$  | 67   |      |               |
|              |                           |   | $f = 10 \text{ KHz}$ | 60   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$   |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$  |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$  |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$   |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$   | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 9 \text{ V}$ , $V_C = 6 \text{ V}$   |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$         | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF85B** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

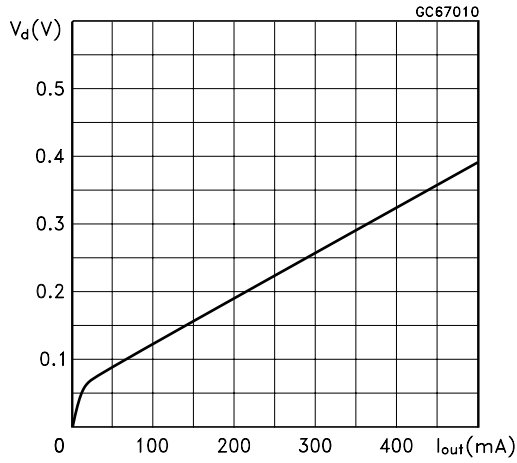
| Symbol       | Parameter                 | Test Conditions   | Min.                 | Typ. | Max. | Unit          |
|--------------|---------------------------|---|----------------------|------|------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 10.5 \text{ V}$  | 8.33                 | 8.5  | 8.67 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 10.5 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 8.16                 |      | 8.84 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$  |                      |      | 20   | V             |
| $I_O$        | Output Current Limit      |   |                      | 1    |      | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 9.5 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                               |                      | 4    | 24   | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 9.8 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                              |                      | 2    | 50   | mV            |
| $I_d$        | Quiescent Current         | $V_I = 9.5 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                         |                      | 0.7  | 1.5  | mA            |
|              |                           | $V_I = 9.8 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                                 |                      |      | 12   |               |
|              |                           | $V_I = 10 \text{ V}$ (OFF MODE)   |                      | 70   | 140  | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 10.5 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 67   |      | dB            |
|              |                           |   | $f = 1 \text{ KHz}$  | 63   |      |               |
|              |                           |   | $f = 10 \text{ KHz}$ | 53   |      |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$   |                      | 50   |      | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$  |                      | 0.2  | 0.35 | V             |
|              |                           | $I_O = 500 \text{ mA}$  |                      | 0.4  | 0.7  |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$   |                      |      | 0.8  | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$   | 2                    |      |      | V             |
| $I_I$        | Control Input Current     | $V_I = 10 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |      | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$           | 2                    | 10   |      | $\mu\text{F}$ |

**ELECTRICAL CHARACTERISTICS FOR KF120B** (refer to the test circuits,  $T_j = 25^\circ\text{C}$ ,  $C_1 = 0.1 \mu\text{F}$ ,  $C_O = 2.2 \mu\text{F}$  unless otherwise specified.)

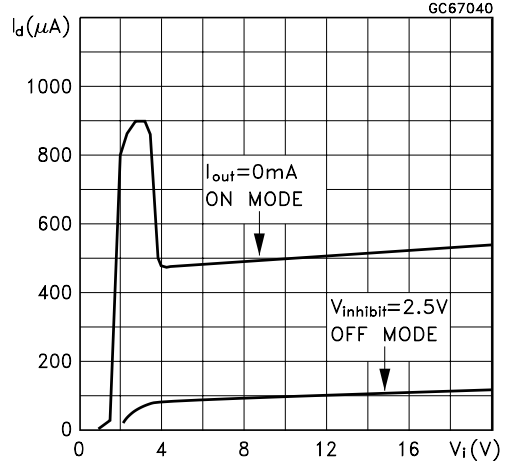
| Symbol       | Parameter                 | Test Conditions   | Min.                 | Typ. | Max.  | Unit          |
|--------------|---------------------------|---|----------------------|------|-------|---------------|
| $V_O$        | Output Voltage            | $I_O = 50 \text{ mA}$ , $V_I = 14 \text{ V}$  | 11.76                | 12   | 12.24 | V             |
|              |                           | $I_O = 50 \text{ mA}$ , $V_I = 14 \text{ V}$ , $T_a = -25 \text{ to } 85^\circ\text{C}$ | 11.52                |      | 12.48 |               |
| $V_I$        | Operating Input Voltage   | $I_O = 500 \text{ mA}$  |                      |      | 20    | V             |
| $I_O$        | Output Current Limit      |   |                      | 1    |       | A             |
| $\Delta V_O$ | Line Regulation           | $V_I = 13 \text{ to } 20 \text{ V}$ , $I_O = 5 \text{ mA}$                              |                      | 8    | 48    | mV            |
| $\Delta V_O$ | Load Regulation           | $V_I = 13.3 \text{ V}$ , $I_O = 5 \text{ to } 500 \text{ mA}$                           |                      | 2    | 50    | mV            |
| $I_d$        | Quiescent Current         | $V_I = 13 \text{ to } 20\text{V}$ , $I_O = 0\text{mA}$ (ON MODE)                        |                      | 0.7  | 1.5   | mA            |
|              |                           | $V_I = 13.3 \text{ to } 20\text{V}$ , $I_O = 500\text{mA}$                              |                      |      | 12    |               |
|              |                           | $V_I = 13 \text{ V}$ (OFF MODE)   |                      | 70   | 140   | $\mu\text{A}$ |
| SVR          | Supply Voltage Rejection  | $I_O = 5 \text{ mA}$<br>$V_I = 14 \pm 1 \text{ V}$                                      | $f = 120 \text{ Hz}$ | 69   |       | dB            |
|              |                           |   | $f = 1 \text{ KHz}$  | 64   |       |               |
|              |                           |   | $f = 10 \text{ KHz}$ | 54   |       |               |
| eN           | Output Noise Voltage      | $B = 10 \text{ Hz to } 100 \text{ KHz}$   |                      | 50   |       | $\mu\text{V}$ |
| $V_d$        | Dropout Voltage           | $I_O = 200 \text{ mA}$  |                      | 0.2  | 0.35  | V             |
|              |                           | $I_O = 500 \text{ mA}$  |                      | 0.4  | 0.7   |               |
| $V_{IL}$     | Control Input Logic Low   | $T_a = -40 \text{ to } 125^\circ\text{C}$   |                      |      | 0.8   | V             |
| $V_{IH}$     | Control Input Logic High  | $T_a = -40 \text{ to } 125^\circ\text{C}$   | 2                    |      |       | V             |
| $I_I$        | Control Input Current     | $V_I = 13 \text{ V}$ , $V_C = 6 \text{ V}$  |                      | 10   |       | $\mu\text{A}$ |
| $C_O$        | Output Bypass Capacitance | $\text{ESR} = 0.1 \text{ to } 10 \Omega$ , $I_O = 0 \text{ to } 500 \text{ mA}$         | 2                    | 10   |       | $\mu\text{F}$ |

**TYPICAL PERFORMANCE CHARACTERISTICS** (unless otherwise specified  $V_{O(NOM)} = 3.3\text{ V}$ )

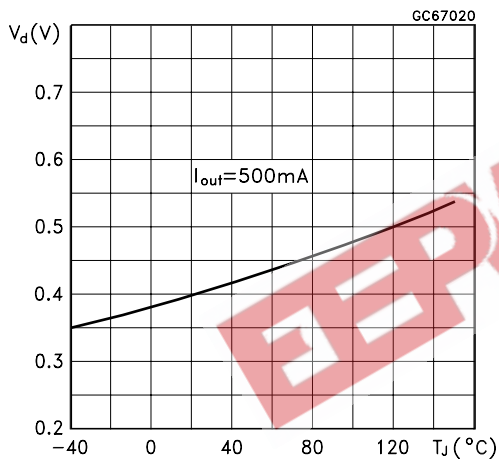
**Figure 1 : Dropout Voltage vs Output Current**



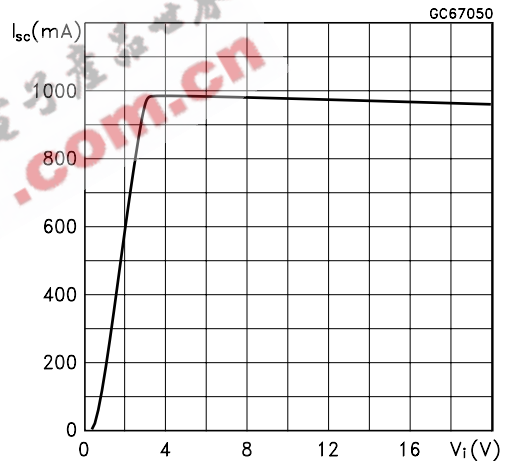
**Figure 4 : Supply Current vs Input Voltage**



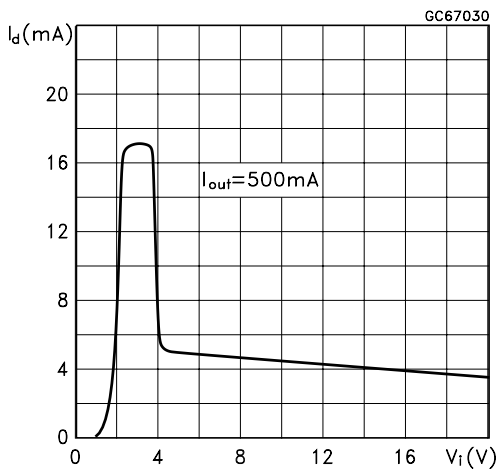
**Figure 2 : Dropout Voltage vs Temperature**



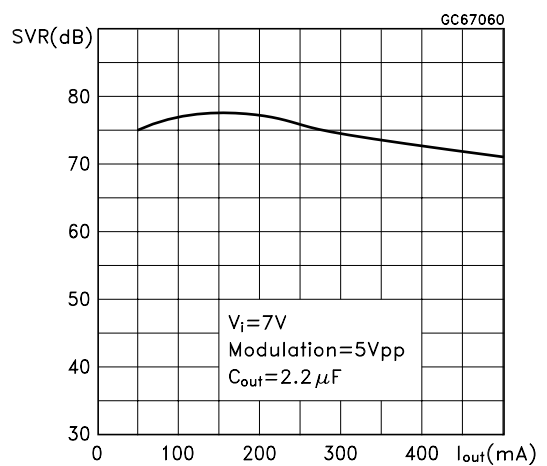
**Figure 5 : Short Circuit Current vs Input Voltage**



**Figure 3 : Supply Current vs Input Voltage**

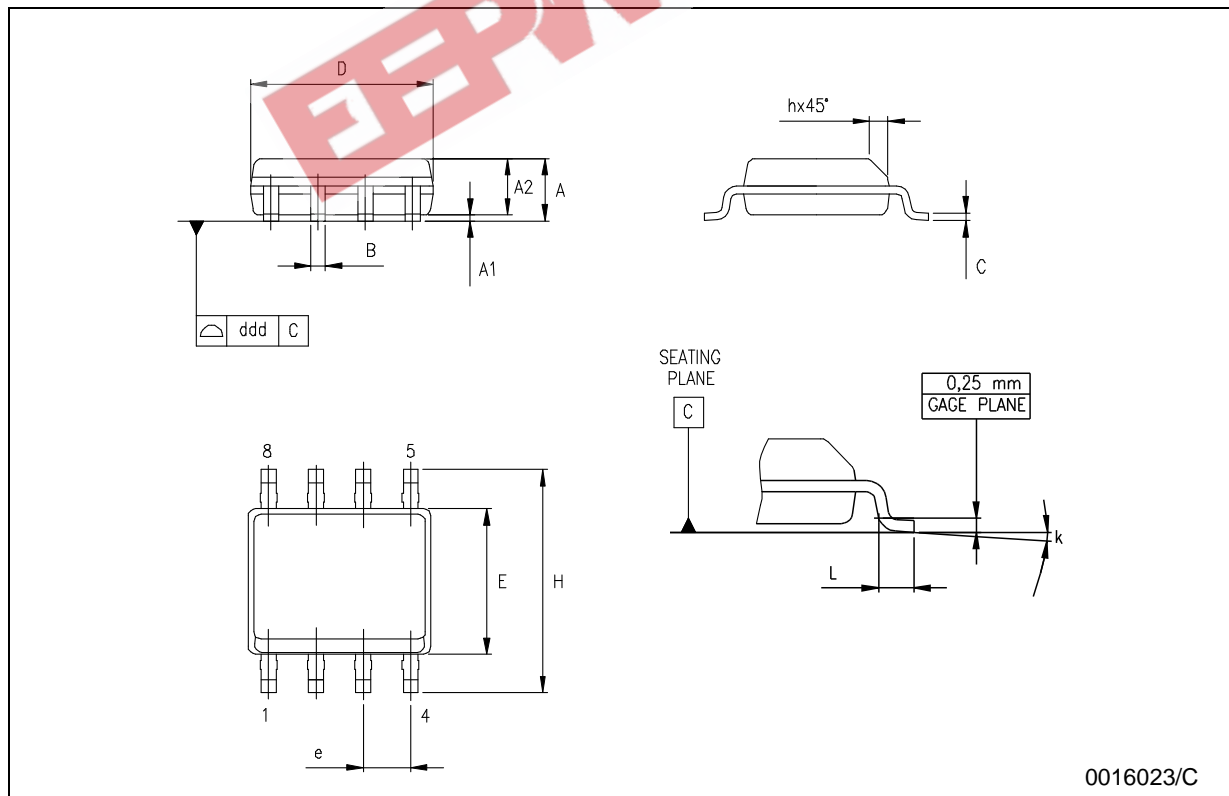


**Figure 6 : Supply Voltage Rejection vs Input Voltage**



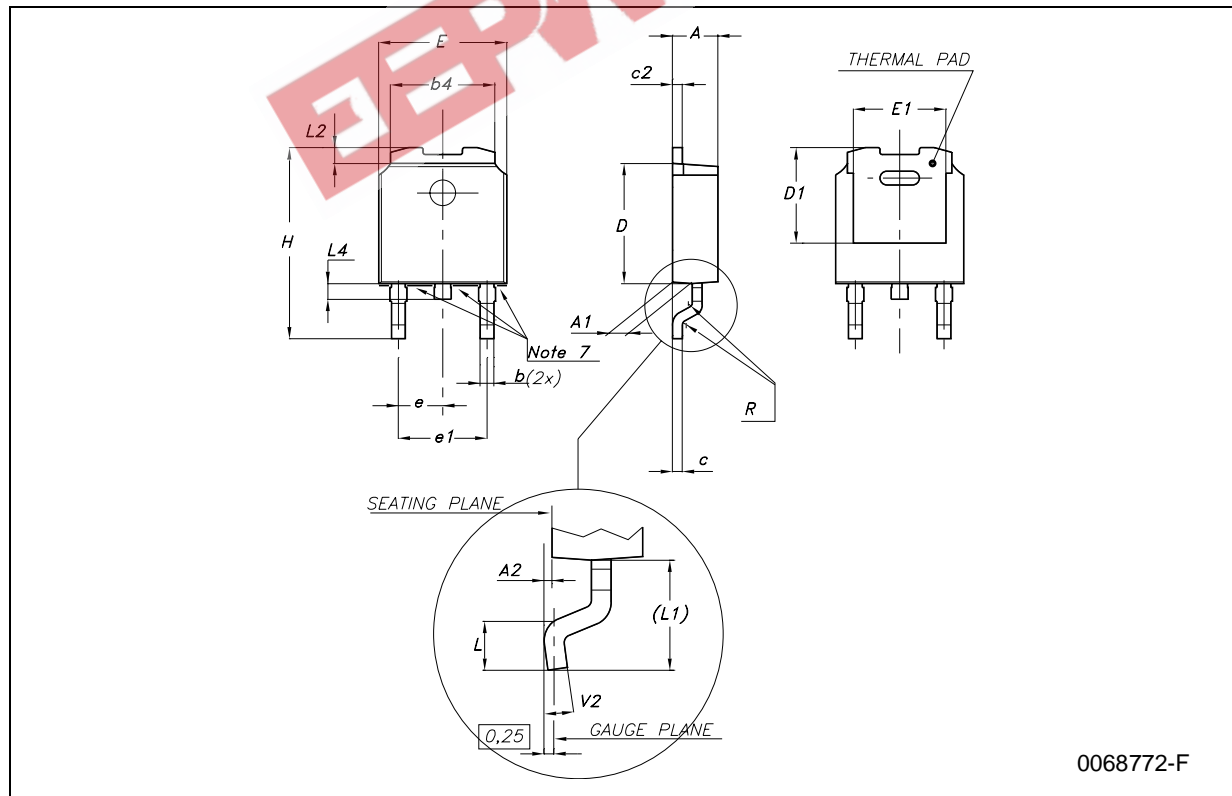
## SO-8 MECHANICAL DATA

| DIM. | mm.       |      |      | inch  |       |       |
|------|-----------|------|------|-------|-------|-------|
|      | MIN.      | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 1.35      |      | 1.75 | 0.053 |       | 0.069 |
| A1   | 0.10      |      | 0.25 | 0.04  |       | 0.010 |
| A2   | 1.10      |      | 1.65 | 0.043 |       | 0.065 |
| B    | 0.33      |      | 0.51 | 0.013 |       | 0.020 |
| C    | 0.19      |      | 0.25 | 0.007 |       | 0.010 |
| D    | 4.80      |      | 5.00 | 0.189 |       | 0.197 |
| E    | 3.80      |      | 4.00 | 0.150 |       | 0.157 |
| e    |           | 1.27 |      |       | 0.050 |       |
| H    | 5.80      |      | 6.20 | 0.228 |       | 0.244 |
| h    | 0.25      |      | 0.50 | 0.010 |       | 0.020 |
| L    | 0.40      |      | 1.27 | 0.016 |       | 0.050 |
| k    | 8° (max.) |      |      |       |       |       |
| ddd  |           |      | 0.1  |       |       | 0.04  |



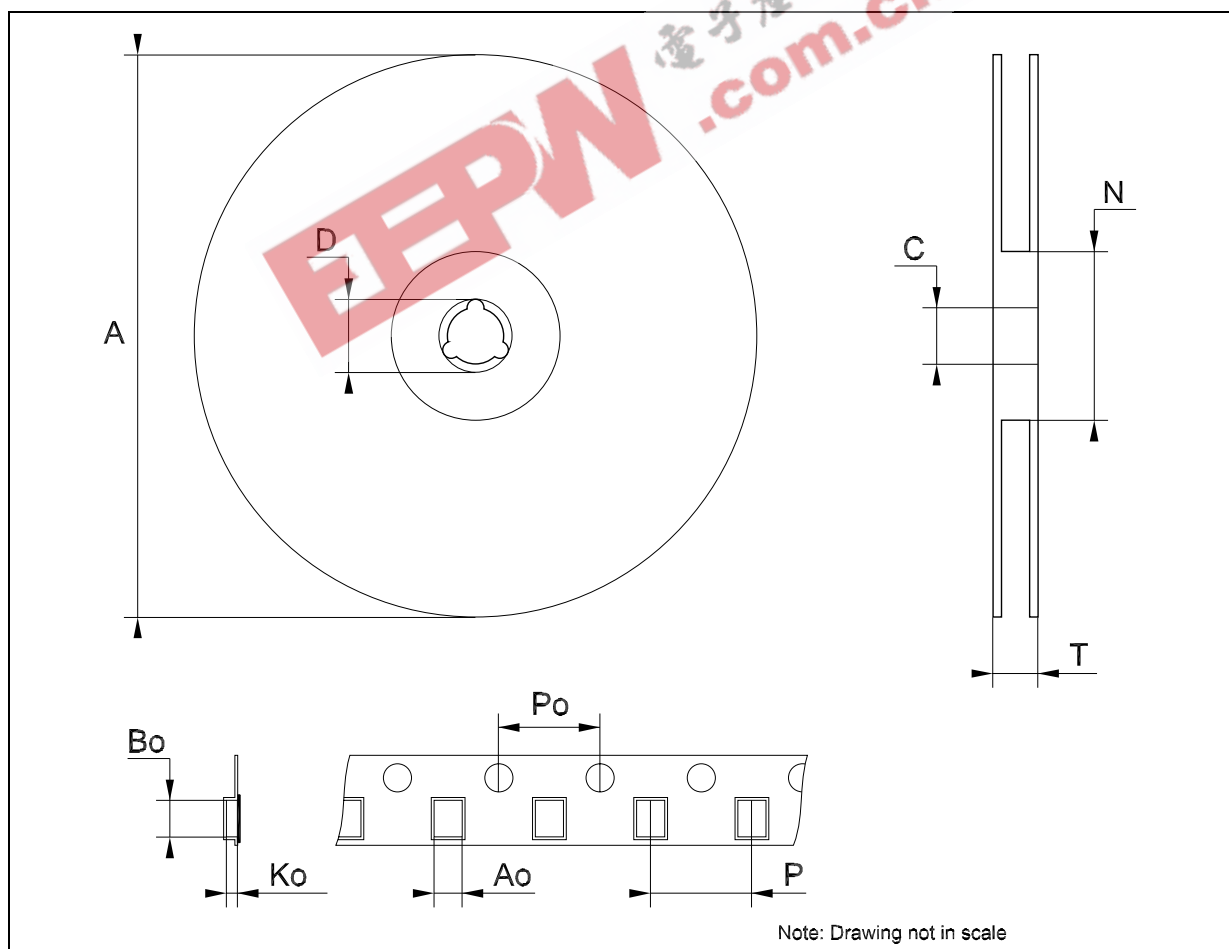
**DPAK MECHANICAL DATA**

| DIM. | mm.  |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP  | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 2.2  |      | 2.4  | 0.086 |       | 0.094 |
| A1   | 0.9  |      | 1.1  | 0.035 |       | 0.043 |
| A2   | 0.03 |      | 0.23 | 0.001 |       | 0.009 |
| B    | 0.64 |      | 0.9  | 0.025 |       | 0.035 |
| B2   | 5.2  |      | 5.4  | 0.204 |       | 0.212 |
| C    | 0.45 |      | 0.6  | 0.017 |       | 0.023 |
| C2   | 0.48 |      | 0.6  | 0.019 |       | 0.023 |
| D    | 6    |      | 6.2  | 0.236 |       | 0.244 |
| D1   |      | 5.1  |      |       | 0.200 |       |
| E    | 6.4  |      | 6.6  | 0.252 |       | 0.260 |
| E1   |      | 4.7  |      |       | 0.185 |       |
| e    |      | 2.28 |      |       | 0.090 |       |
| e1   | 4.4  |      | 4.6  | 0.173 |       | 0.181 |
| H    | 9.35 |      | 10.1 | 0.368 |       | 0.397 |
| L    |      | 1    |      |       | 0.039 |       |
| (L1) |      | 2.8  |      |       | 0.110 |       |
| L2   |      | 0.8  |      |       | 0.031 |       |
| L4   | 0.6  |      | 1    | 0.023 |       | 0.039 |



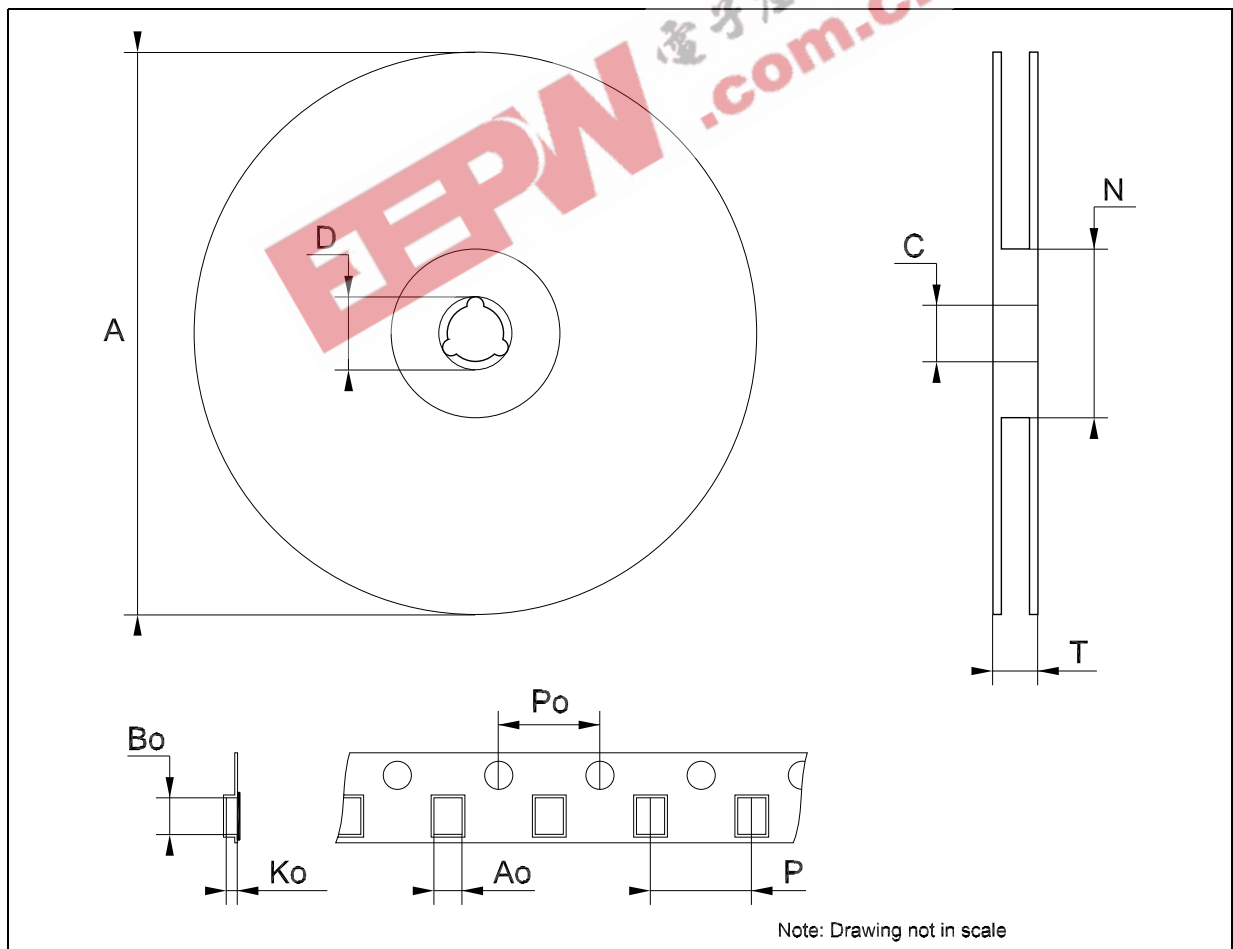
## Tape &amp; Reel SO-8 MECHANICAL DATA

| DIM. | mm.  |     |      | inch  |      |        |
|------|------|-----|------|-------|------|--------|
|      | MIN. | TYP | MAX. | MIN.  | TYP. | MAX.   |
| A    |      |     | 330  |       |      | 12.992 |
| C    | 12.8 |     | 13.2 | 0.504 |      | 0.519  |
| D    | 20.2 |     |      | 0.795 |      |        |
| N    | 60   |     |      | 2.362 |      |        |
| T    |      |     | 22.4 |       |      | 0.882  |
| Ao   | 8.1  |     | 8.5  | 0.319 |      | 0.335  |
| Bo   | 5.5  |     | 5.9  | 0.216 |      | 0.232  |
| Ko   | 2.1  |     | 2.3  | 0.082 |      | 0.090  |
| Po   | 3.9  |     | 4.1  | 0.153 |      | 0.161  |
| P    | 7.9  |     | 8.1  | 0.311 |      | 0.319  |



**Tape & Reel DPAK-PPAK MECHANICAL DATA**

| DIM. | mm.   |       |       | inch  |       |        |
|------|-------|-------|-------|-------|-------|--------|
|      | MIN.  | TYP   | MAX.  | MIN.  | TYP.  | MAX.   |
| A    |       |       | 330   |       |       | 12.992 |
| C    | 12.8  | 13.0  | 13.2  | 0.504 | 0.512 | 0.519  |
| D    | 20.2  |       |       | 0.795 |       |        |
| N    | 60    |       |       | 2.362 |       |        |
| T    |       |       | 22.4  |       |       | 0.882  |
| Ao   | 6.80  | 6.90  | 7.00  | 0.268 | 0.272 | 0.276  |
| Bo   | 10.40 | 10.50 | 10.60 | 0.409 | 0.413 | 0.417  |
| Ko   | 2.55  | 2.65  | 2.75  | 0.100 | 0.104 | 0.105  |
| Po   | 3.9   | 4.0   | 4.1   | 0.153 | 0.157 | 0.161  |
| P    | 7.9   | 8.0   | 8.1   | 0.311 | 0.315 | 0.319  |





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