



# SK7805A THRU SK7812A

Three-terminal positive voltage regulator

OUTPUT CURRENT TO 1.2A

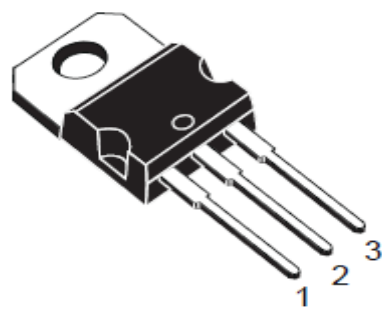
OUTPUT VOLTAGES OF 5; 6; 8; 9; 12V

THERMAL OVERLOAD PROTECTION

SHORT CIRCUIT PROTECTION

OUTPUT TRANSITION SOA PROTECTION

## 1、 Absolute Maximum Ratings $T_c=25^{\circ}\text{C}$

| Symbol | Parameter                   | Value      | UNIT               | <br><b>TO-220</b><br>1 Input 2 Gnd 3 Out |
|--------|-----------------------------|------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| VI     | Input Voltage               | 35         | V                  |                                                                                                                             |
| TOPR   | Operating Temperature Range | 0 ~ +125   | $^{\circ}\text{C}$ |                                                                                                                             |
| TSTG   | Storage Temperature Range   | -65 ~ +150 | $^{\circ}\text{C}$ |                                                                                                                             |

2、 Electrical Characteristics ( $T_c=25^{\circ}\text{C}$ ) Of SK7805A (refer to the test circuits ,  $T_J$  =  $-55$  to  $150^{\circ}\text{C}$   $V_I = 10\text{V}$ ,  $I_O = 500\text{mA}$  ,  $C_I = 0.33\text{ }\mu\text{F}$ ,  $C_O = 0.1\text{ }\mu\text{F}$  unless otherwise specified)。

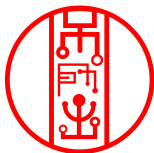
| Parameter                | Symbol                | Test Condition                                        | MIN  | TYP  | MAX  | UNIT                   |
|--------------------------|-----------------------|-------------------------------------------------------|------|------|------|------------------------|
| Output Voltage           | VO                    | $T_J = +25^{\circ}\text{C}$                           | 4.8  | 5    | 5.2  | V                      |
|                          |                       | $I_O = 5\text{mA to } 1\text{A}, P_O \leq 15\text{W}$ | 4.75 | 5    | 5.25 |                        |
|                          |                       | $V_I = 8\text{V to } 20\text{V}$                      |      |      |      |                        |
| Line Regulation (Notel)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$                           |      |      | 100  | mV                     |
|                          |                       | $V_I = 7\text{V to } 25\text{V}$                      |      |      |      |                        |
|                          |                       | $V_I = 8\text{V to } 12\text{V}$                      |      |      | 50   |                        |
| Load Regulation (Notel)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$                           |      |      | 100  | mV                     |
|                          |                       | $I_O = 5\text{mA to } 1.2\text{A}$                    |      |      |      |                        |
|                          |                       | $T_J = +25^{\circ}\text{C}$                           |      |      | 50   |                        |
|                          |                       | $I_O = 250\text{mA to } 750\text{mA}$                 |      |      |      |                        |
| Quiescent Current        | IQ                    | $T_J = +25^{\circ}\text{C}$                           |      |      | 6    | mA                     |
| Quiescent Current Change | $\Delta I_Q$          | $I_O = 5\text{mA to } 1\text{A}$                      |      |      | 0.5  | mA                     |
|                          |                       | $V_I = 8\text{V to } 25\text{V}$                      |      |      | 0.8  |                        |
| Quiescent Current Change | $\Delta V_O/\Delta T$ | $I_O = 5\text{mA}$                                    |      | 0.6  |      | mV/ $^{\circ}\text{C}$ |
| Short Circuit Current    | ISC                   | $T_J = +25^{\circ}\text{C}, V_I = 35\text{V}$         |      | 0.75 | 1.2  | A                      |



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3、Electrical Characteristics ( $T_c=25^{\circ}\text{C}$ ) Of SK7806A(refer to the test circuits ,  $T_J = -55$  to  $150^{\circ}\text{C}$   $V_I = 11\text{V}$ ,  $I_O = 500\text{ mA}$  ,  $C_I = 0.33\text{ }\mu\text{F}$ ,  $C_O = 0.1\text{ }\mu\text{F}$  unless otherwise

| Parameter                | Symbol                | Test Condition                                                                               | MIN  | TYP  | MAX  | UNIT                   |
|--------------------------|-----------------------|----------------------------------------------------------------------------------------------|------|------|------|------------------------|
| Output Voltage           | $V_O$                 | $T_J = +25^{\circ}\text{C}$                                                                  | 5.75 | 6    | 6.25 | V                      |
|                          |                       | $I_O = 5\text{mA to } 1\text{A}$ , $P_O \leq 15\text{W}$<br>$V_I = 9\text{V to } 21\text{V}$ | 5.65 | 6    | 6.35 |                        |
| Line Regulation (Notel)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$ $V_I = 8\text{V to } 25\text{V}$                                 |      |      | 100  | mV                     |
|                          |                       | $V_I = 9\text{V to } 13\text{V}$                                                             |      |      | 50   |                        |
| Load Regulation (Notel)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$<br>$I_O = 5\text{mA to } 1.2\text{A}$                            |      |      | 100  | mV                     |
|                          |                       | $T_J = +25^{\circ}\text{C}$<br>$I_O = 250\text{mA to } 750\text{mA}$                         |      |      | 50   |                        |
| Quiescent Current        | $I_Q$                 | $T_J = +25^{\circ}\text{C}$                                                                  |      |      | 6    | mA                     |
| Quiescent Current Change | $\Delta I_Q$          | $I_O = 5\text{mA to } 1\text{A}$                                                             |      |      | 0.5  | mA                     |
|                          |                       | $V_I = 9\text{V to } 25\text{V}$                                                             |      |      | 0.8  |                        |
| Quiescent Current Change | $\Delta V_O/\Delta T$ | $I_O = 5\text{mA}$                                                                           |      | 0.7  |      | mV/ $^{\circ}\text{C}$ |
| Short Circuit Current    | ISC                   | $T_J = +25^{\circ}\text{C}$ , $V_I = 35\text{V}$                                             |      | 0.75 | 1.2  | A                      |



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4、Electrical Characteristics ( $T_c=25^{\circ}\text{C}$ ) Of SK7808A(refer to the test circuits ,  $T_J = -55$  to  $150^{\circ}\text{C}$   $V_I = 14\text{V}$ ,  $I_O = 500\text{ mA}$  ,  $C_I = 0.33\text{ }\mu\text{F}$ ,  $C_O = 0.1\text{ }\mu\text{F}$  unless otherwise specified)。

| Parameter                | Symbol                | Test Condition                                                                                  | MIN | TYP  | MAX | UNIT                   |
|--------------------------|-----------------------|-------------------------------------------------------------------------------------------------|-----|------|-----|------------------------|
| Output Voltage           | $V_O$                 | $T_J = +25^{\circ}\text{C}$                                                                     | 7.7 | 8    | 8.3 | V                      |
|                          |                       | $I_O = 5\text{mA to } 1\text{A}$ , $P_O \leq 15\text{W}$<br>$V_I = 11.5\text{V to } 23\text{V}$ | 7.6 | 8    | 8.4 |                        |
| Line Regulation (Note1)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$ $V_I = 10.5\text{V to } 25\text{V}$                                 |     |      | 100 | mV                     |
|                          |                       | $V_I = 11\text{V to } 17\text{V}$                                                               |     |      | 50  |                        |
| Load Regulation (Note1)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$<br>$I_O = 5\text{mA to } 1.2\text{A}$                               |     |      | 100 | mV                     |
|                          |                       | $T_J = +25^{\circ}\text{C}$<br>$I_O = 250\text{mA to } 750\text{mA}$                            |     |      | 50  |                        |
| Quiescent Current        | $I_Q$                 | $T_J = +25^{\circ}\text{C}$                                                                     |     |      | 6   | mA                     |
| Quiescent Current Change | $\Delta I_Q$          | $I_O = 5\text{mA to } 1\text{A}$                                                                |     |      | 0.5 | mA                     |
|                          |                       | $V_I = 11.5\text{V to } 25\text{V}$                                                             |     |      | 1   |                        |
| Quiescent Current Change | $\Delta V_O/\Delta T$ | $I_O = 5\text{mA}$                                                                              |     | 1    |     | mV/ $^{\circ}\text{C}$ |
| Short Circuit Current    | $I_{SC}$              | $T_J = +25^{\circ}\text{C}$ , $V_I = 35\text{V}$                                                |     | 0.75 | 1.2 | A                      |



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5、Electrical Characteristics ( $T_c=25^{\circ}\text{C}$ ) Of SK7809A(refer to the test circuits ,  $T_J = -55$  to  $150^{\circ}\text{C}$   $V_I = 15\text{V}$ ,  $I_O = 500\text{ mA}$  ,  $C_I = 0.33\text{ }\mu\text{F}$ ,  $C_O = 0.1\text{ }\mu\text{F}$  unless otherwise specified)。

| Parameter                | Symbol                | Test Condition                                                                                  | MIN  | TYP  | MAX  | UNIT                   |
|--------------------------|-----------------------|-------------------------------------------------------------------------------------------------|------|------|------|------------------------|
| Output Voltage           | $V_O$                 | $T_J = +25^{\circ}\text{C}$                                                                     | 8.64 | 9    | 9.36 | V                      |
|                          |                       | $I_O = 5\text{mA to } 1\text{A}$ , $P_O \leq 15\text{W}$<br>$V_I = 11.5\text{V to } 26\text{V}$ | 8.55 | 9    | 9.45 |                        |
| Line Regulation (Note1)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$ $V_I = 11.5\text{V to } 26\text{V}$                                 |      |      | 100  | mV                     |
|                          |                       | $V_I = 12\text{V to } 18\text{V}$                                                               |      |      | 50   |                        |
| Load Regulation (Note1)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$<br>$I_O = 5\text{mA to } 1.2\text{A}$                               |      |      | 100  | mV                     |
|                          |                       | $T_J = +25^{\circ}\text{C}$<br>$I_O = 250\text{mA to } 750\text{mA}$                            |      |      | 50   |                        |
| Quiescent Current        | $I_Q$                 | $T_J = +25^{\circ}\text{C}$                                                                     |      |      | 6    | mA                     |
| Quiescent Current Change | $\Delta I_Q$          | $I_O = 5\text{mA to } 1\text{A}$                                                                |      |      | 0.5  | mA                     |
|                          |                       | $V_I = 11.5\text{V to } 26\text{V}$                                                             |      |      | 1    |                        |
| Quiescent Current Change | $\Delta V_O/\Delta T$ | $I_O = 5\text{mA}$                                                                              |      | 1    |      | mV/ $^{\circ}\text{C}$ |
| Short Circuit Current    | ISC                   | $T_J = +25^{\circ}\text{C}$ , $V_I = 35\text{V}$                                                |      | 0.75 | 1.2  | A                      |



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6、Electrical Characteristics ( $T_c=25^{\circ}\text{C}$ ) Of SK7812A (refer to the test circuits ,  $T_J = -55$  to  $150^{\circ}\text{C}$   $V_I = 19\text{V}$ ,  $I_O = 500\text{ mA}$  ,  $C_I = 0.33\text{ }\mu\text{F}$ ,  $C_O = 0.1\text{ }\mu\text{F}$  unless otherwise specified)。

| Parameter                | Symbol                | Test Condition                                                                                  |                                     | MIN  | TYP  | MAX  | UNIT                   |
|--------------------------|-----------------------|-------------------------------------------------------------------------------------------------|-------------------------------------|------|------|------|------------------------|
| Output Voltage           | $V_O$                 | $T_J = +25^{\circ}\text{C}$                                                                     |                                     | 11.5 | 12   | 12.5 | V                      |
|                          |                       | $I_O = 5\text{mA to } 1\text{A}$ , $P_O \leq 15\text{W}$<br>$V_I = 15.5\text{V to } 27\text{V}$ |                                     | 11.4 | 12   | 12.6 |                        |
| Line Regulation (Notel)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$                                                                     | $V_I = 14.5\text{V to } 30\text{V}$ |      |      | 100  | mV                     |
|                          |                       |                                                                                                 | $V_I = 16\text{V to } 22\text{V}$   |      |      | 50   |                        |
| Load Regulation (Notel)  | $\Delta V_O$          | $T_J = +25^{\circ}\text{C}$<br>$I_O = 5\text{mA to } 1.2\text{A}$                               |                                     |      |      | 100  | mV                     |
|                          |                       | $T_J = +25^{\circ}\text{C}$<br>$I_O = 250\text{mA to } 750\text{mA}$                            |                                     |      |      | 50   |                        |
| Quiescent Current        | $I_Q$                 | $T_J = +25^{\circ}\text{C}$                                                                     |                                     |      |      | 6    | mA                     |
| Quiescent Current Change | $\Delta I_Q$          | $I_O = 5\text{mA to } 1\text{A}$                                                                |                                     |      |      | 0.5  | mA                     |
|                          |                       | $V_I = 15\text{V to } 30\text{V}$                                                               |                                     |      |      | 1    |                        |
| Quiescent Current Change | $\Delta V_O/\Delta T$ | $I_O = 5\text{mA}$                                                                              |                                     |      | 1.5  |      | mV/ $^{\circ}\text{C}$ |
| Short Circuit Current    | $I_{SC}$              | $T_J = +25^{\circ}\text{C}$ , $V_I = 35\text{V}$                                                |                                     |      | 0.75 | 1.2  | A                      |

## 7、Typical Characteristics

Figure 1: Dropout Voltage vs Junction Temperature

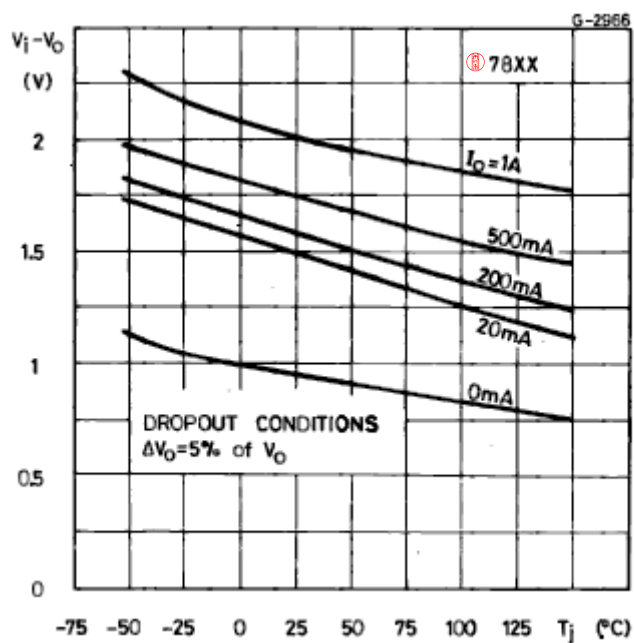


Figure 2: Peak Output Current vs Input/output Differential Voltage

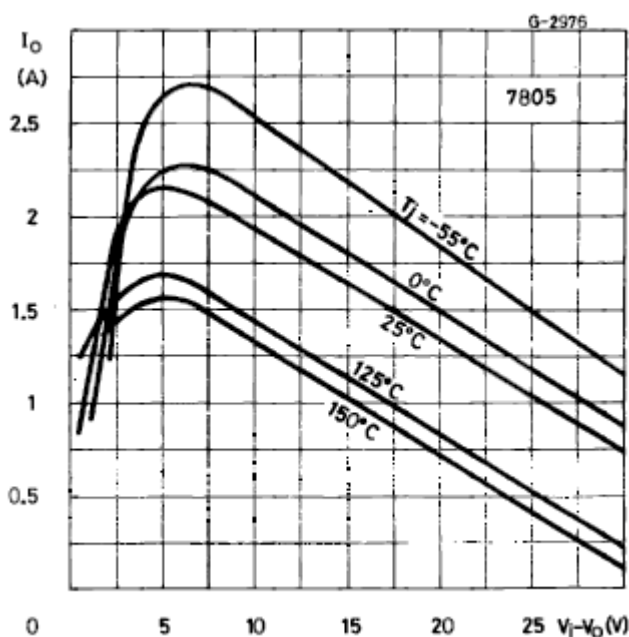


Figure3: Supply Voltage Rejection vs Frequency

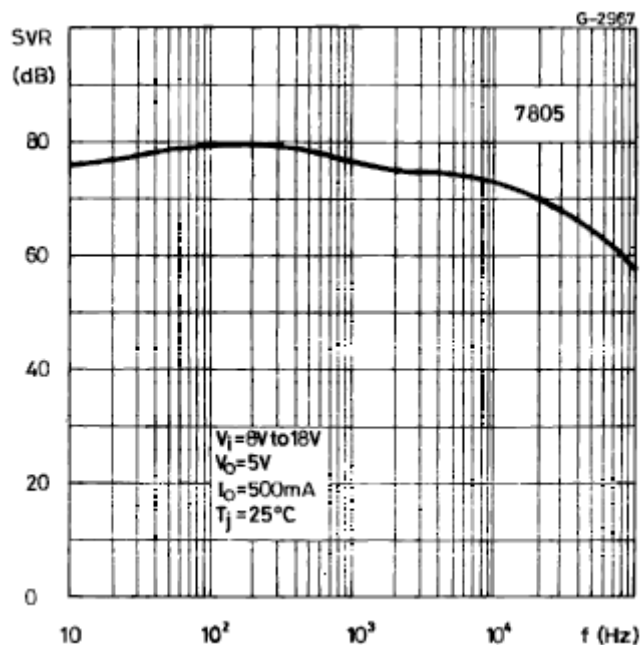


Figure 4: Quiescent Current vs Junction Temperature

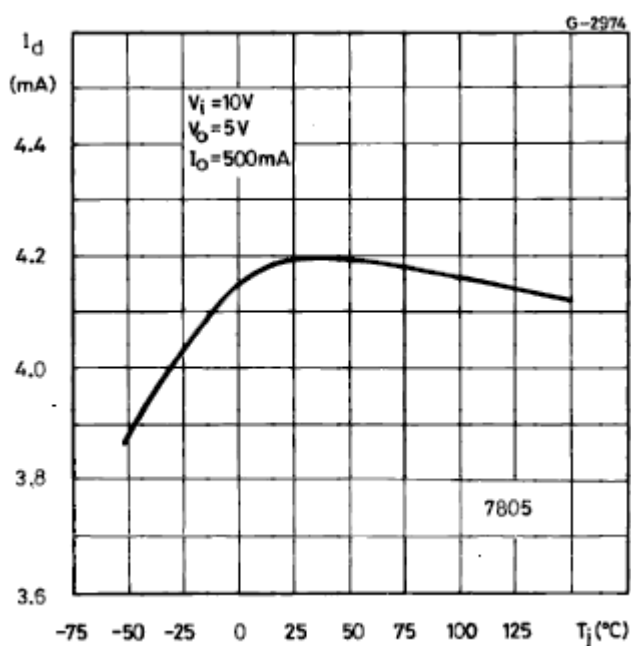


Figure 5: Output Voltage vs Junction Temperature

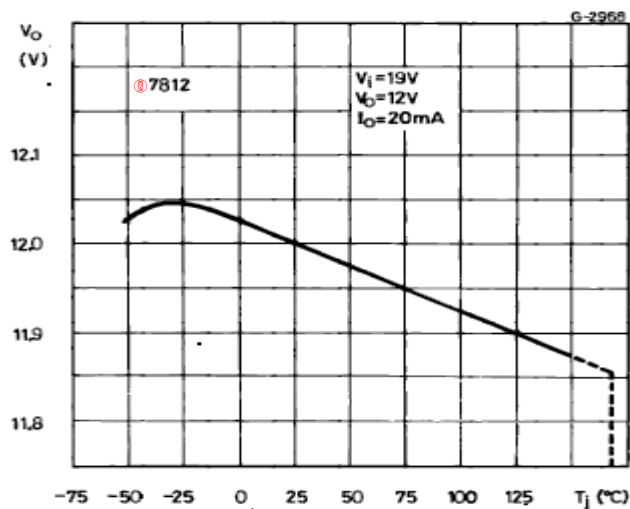


Figure 6: Load Transient Response

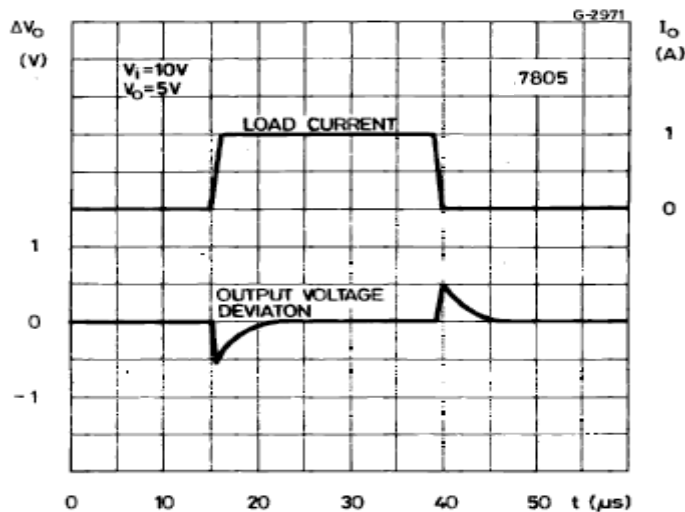


Figure 7: Output Impedance vs Frequency

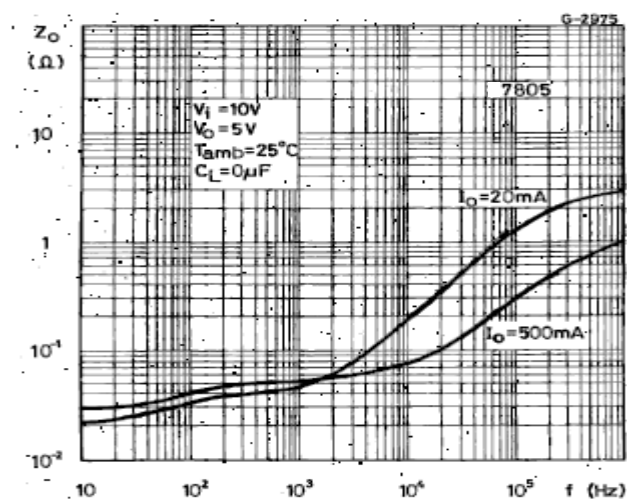


Figure 8: Line Transient Response

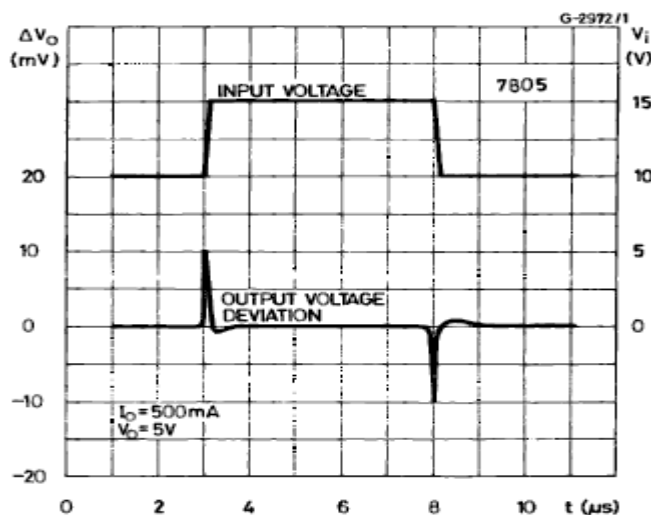
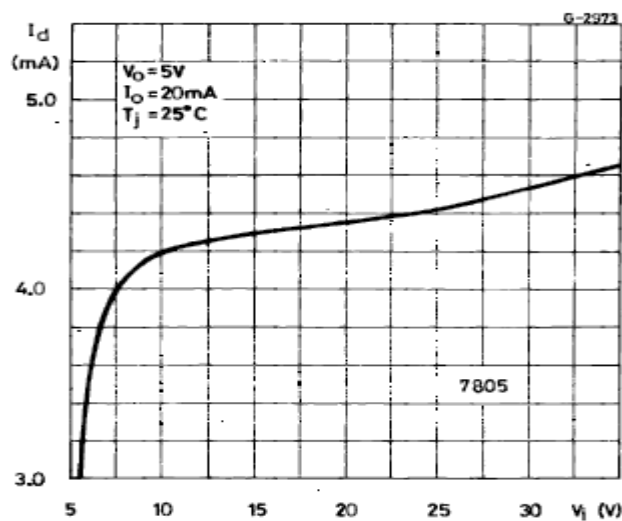


Figure 9: Quiescent Current vs Input Voltage





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## 8、Package Demensions

### TO-220 MECHANICAL DATA

| DIM. | mm    |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 4.40  |      | 4.60  | 0.173 |       | 0.181 |
| C    | 1.23  |      | 1.32  | 0.048 |       | 0.051 |
| D    | 2.40  |      | 2.72  | 0.094 |       | 0.107 |
| D1   |       | 1.27 |       |       | 0.050 |       |
| E    | 0.49  |      | 0.70  | 0.019 |       | 0.027 |
| F    | 0.61  |      | 0.88  | 0.024 |       | 0.034 |
| F1   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| F2   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| G    | 4.95  |      | 5.15  | 0.194 |       | 0.203 |
| G1   | 2.4   |      | 2.7   | 0.094 |       | 0.106 |
| H2   | 10.0  |      | 10.40 | 0.393 |       | 0.409 |
| L2   |       | 16.4 |       |       | 0.645 |       |
| L4   | 13.0  |      | 14.0  | 0.511 |       | 0.551 |
| L5   | 2.65  |      | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |      | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.2   |      | 6.6   | 0.244 |       | 0.260 |
| L9   | 3.5   |      | 3.93  | 0.137 |       | 0.154 |
| DIA. | 3.75  |      | 3.85  | 0.147 |       | 0.151 |

