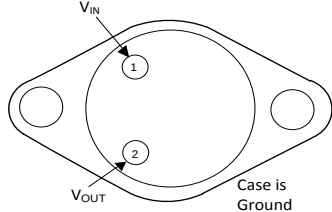
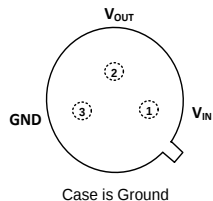
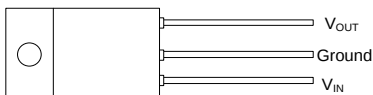
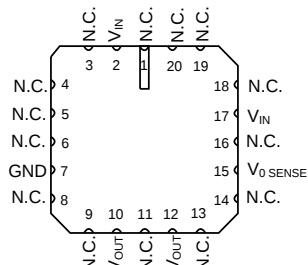
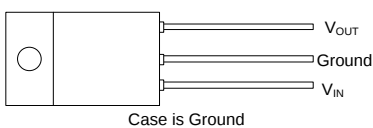


## Connection Diagrams and Ordering Information

| Ambient Temperature | Type | Package                         | Part Number    | Packaging Type        | Connection Diagram                                                                    |
|---------------------|------|---------------------------------|----------------|-----------------------|---------------------------------------------------------------------------------------|
| -55 °C to 125 °C    | K    | 3-Terminal Metal Can            | SG78xxAK-883B  | TO-3                  |    |
|                     |      |                                 | SG7805AK-DESC  |                       |                                                                                       |
|                     |      |                                 | SG7812AK-DESC  |                       |                                                                                       |
|                     |      |                                 | SG7815AK-DESC  |                       |                                                                                       |
|                     |      |                                 | SG78xxAK       |                       |                                                                                       |
|                     |      |                                 | SG78xxK-883B   |                       |                                                                                       |
|                     |      |                                 | SG7805K-JAN    |                       |                                                                                       |
|                     |      |                                 | SG7812K-JAN    |                       |                                                                                       |
|                     |      |                                 | SG7815K-JAN    |                       |                                                                                       |
|                     |      |                                 | SG78xxK        |                       |                                                                                       |
| -55 °C to 125 °C    | T    | 3-Pin Metal Can                 | SG78xxAT-883B  | TO-39                 |    |
|                     |      |                                 | SG7805AT-DESC  |                       |                                                                                       |
|                     |      |                                 | SG7812AT-DESC  |                       |                                                                                       |
|                     |      |                                 | SG7815AT-DESC  |                       |                                                                                       |
|                     |      |                                 | SG78xxAT       |                       |                                                                                       |
|                     |      |                                 | SG78xxT-883B   |                       |                                                                                       |
|                     |      |                                 | SG7805T-JAN    |                       |                                                                                       |
|                     |      |                                 | SG7812T-JAN    |                       |                                                                                       |
|                     |      |                                 | SG7815T-JAN    |                       |                                                                                       |
|                     |      |                                 | SG78xxT        |                       |                                                                                       |
| -55 °C to 125 °C    | IG   | 3-Pin Hermetic Isolated Package | SG78xxAIG-883B | TO-257                |  |
|                     |      |                                 | SG7805AIG-DESC |                       |                                                                                       |
|                     |      |                                 | SG7812AIG-DESC |                       |                                                                                       |
|                     |      |                                 | SG7815AIG-DESC |                       |                                                                                       |
|                     |      |                                 | SG78xxAIG      |                       |                                                                                       |
|                     |      |                                 | SG78xxIG-883B  |                       |                                                                                       |
|                     |      |                                 | SG78xxIG       |                       |                                                                                       |
| -55 °C to 125 °C    | L    | 20-Pin Ceramic Package          | SG7805AL-DESC  | Leadless Chip Carrier |  |
|                     |      |                                 | SG7812AL-DESC  |                       |                                                                                       |
|                     |      |                                 | SG7815AL-DESC  |                       |                                                                                       |
|                     |      |                                 | SG78xxL-883B   |                       |                                                                                       |
| -55 °C to 125 °C    | G    | 3-Pin Hermetic Package          | SG78xxAG-883B  | TO-257                |  |
|                     |      |                                 | SG7805AG-DESC  |                       |                                                                                       |
|                     |      |                                 | SG7812AG-DESC  |                       |                                                                                       |
|                     |      |                                 | SG7815AG-DESC  |                       |                                                                                       |
|                     |      |                                 | SG78xxAG       |                       |                                                                                       |
|                     |      |                                 | SG78xxG-883B   |                       |                                                                                       |
|                     |      |                                 | SG78xxG        |                       |                                                                                       |

**Notes:**

1. Contact factory for JAN and DESC product availability.
2. All parts are viewed from the top.
3. "xx" to be replaced by output voltage of specific fixed regulator.
4. Some products will be available in hermetic flat pack (F). Consult factory for price and availability.
5. Both inputs and outputs must be externally connected together at the device terminals.
6. For normal operation, the  $V_O$  SENSE pin must be externally connected to the load.

## Absolute Maximum Ratings

| Parameter                                             | Value      | Units |
|-------------------------------------------------------|------------|-------|
| Device Output Voltage                                 | 5, 12, 15  | V     |
| Input Voltage                                         | 35         | V     |
| Input Voltage (Transient) (Note 2)                    | 50         | V     |
| Input Voltage Differential (Output Shorted to Ground) | 35         | V     |
| Operating Junction Temperature                        | 150        | °C    |
| Storage Temperature Range                             | -65 to 150 | °C    |
| Lead Temperature (Soldering 10 seconds)               | 300        | °C    |

**Notes:**

1. Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.
2. Operation at high input voltages is dependent upon load current. When load current is less than 5 mA, output will rise out of regulation as input-output differential increases beyond 30 V. Note also from [Figure 2](#), that maximum load current is reduced at high voltages. The 50 V input rating of the SG78xxA series refers to ability to withstand high line or transient conditions without damage. Since the regulator's maximum current capability is reduced, the output may fall out of regulation at high input voltages under nominal loading.

## Thermal Data

| Parameter                                                                                                                                                                                                                                                        | Value | Units |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|
| <b>K Package TO-3 3-Terminal Metal Can (Two pins and case)</b>                                                                                                                                                                                                   |       |       |
| Thermal Resistance-Junction to Case, $\theta_{JC}$                                                                                                                                                                                                               | 3     | °C/W  |
| Thermal Resistance-Junction to Ambient, $\theta_{JA}$                                                                                                                                                                                                            | 35    | °C/W  |
| <b>T Package TO-39 3-Pin Metal Can</b>                                                                                                                                                                                                                           |       |       |
| Thermal Resistance-Junction to Case, $\theta_{JC}$                                                                                                                                                                                                               | 15    | °C/W  |
| Thermal Resistance-Junction to Ambient, $\theta_{JA}$                                                                                                                                                                                                            | 120   | °C/W  |
| <b>G Package TO-257 3-Pin Hermetic</b>                                                                                                                                                                                                                           |       |       |
| Thermal Resistance-Junction to Case, $\theta_{JC}$                                                                                                                                                                                                               | 3.5   | °C/W  |
| Thermal Resistance-Junction to Ambient, $\theta_{JA}$                                                                                                                                                                                                            | 42    | °C/W  |
| <b>IG Package TO-257 3-Pin Hermetic (Isolated)</b>                                                                                                                                                                                                               |       |       |
| Thermal Resistance-Junction to Case, $\theta_{JC}$                                                                                                                                                                                                               | 4     | °C/W  |
| Thermal Resistance-Junction to Ambient, $\theta_{JA}$                                                                                                                                                                                                            | 42    | °C/W  |
| <b>L Package Leadless Chip Carrier 20-Pin Ceramic</b>                                                                                                                                                                                                            |       |       |
| Thermal Resistance-Junction to Case, $\theta_{JC}$                                                                                                                                                                                                               | 35    | °C/W  |
| Thermal Resistance-Junction to Ambient, $\theta_{JA}$                                                                                                                                                                                                            | 120   | °C/W  |
| <b>Notes:</b><br>1. Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$ .<br>2. The $\theta_{JA}$ numbers are meant to be guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow. |       |       |

## Recommended Operating Conditions

| Parameter                                               | SG78xx / 78xxA |     |     | Units |
|---------------------------------------------------------|----------------|-----|-----|-------|
|                                                         | Min            | Typ | Max |       |
| Operating Junction Temperature Range                    | -55            |     | 150 | °C    |
| <b>Note:</b> Range over which the device is functional. |                |     |     |       |

## Electrical Characteristics

Unless specified, these specifications apply over the operating ambient temperatures for SG7805A / SG7805 with  $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ ,  $V_{IN} = 10\text{ V}$ ,  $I_O = 500\text{ mA}$  for the K, G, and IG – Power Packages,  $I_O = 100\text{ mA}$  for the T and L packages,  $C_{IN} = 0.33\text{ }\mu\text{F}$  and  $C_{OUT} = 0.1\text{ }\mu\text{F}$ . Low duty cycle pulse testing techniques are used, which maintains junction and case temperatures equal to the ambient temperature.

| Parameter                                                                                                                                                                      | Test Conditions                                                                                                                  | SG7805A |     |      | SG7805 |     |      | Units              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|--------|-----|------|--------------------|
|                                                                                                                                                                                |                                                                                                                                  | Min     | Typ | Max  | Min    | Typ | Max  |                    |
| Output Voltage                                                                                                                                                                 | $T_J = 25^{\circ}\text{C}$                                                                                                       | 4.92    | 5   | 5.08 | 4.80   | 5   | 5.20 | V                  |
| Line Regulation<br>(Note 1)                                                                                                                                                    | $V_{IN} = 7.5\text{ V to }20\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                              |         | 5   | 25   |        | 5   | 25   | mV                 |
|                                                                                                                                                                                | $V_{IN} = 8\text{ V to }12\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                |         | 2   | 12   |        | 2   | 25   | mV                 |
| Load Regulation<br>(Note 1)                                                                                                                                                    | Power Pkgs: $I_O = 5\text{ mA to }1.5\text{ A}$ , $T_J = 25^{\circ}\text{C}$                                                     |         | 15  | 50   |        | 15  | 50   | mV                 |
|                                                                                                                                                                                | $I_O = 250\text{ mA to }750\text{ mA}$ , $T_J = 25^{\circ}\text{C}$                                                              |         | 5   | 25   |        | 5   | 25   | mV                 |
|                                                                                                                                                                                | T, L – Pkg: $I_O = 5\text{ mA to }500\text{ mA}$ , $T_J = 250^{\circ}\text{C}$                                                   |         | 5   | 25   |        | 20  | 25   | mV                 |
| Total Output Voltage<br>Tolerance                                                                                                                                              | $V_{IN} = 8\text{ V to }20\text{ V}$<br>Power Pkgs: $I_O = 5\text{ mA to }1.0\text{ A}$ , $P \leq 20\text{ W}$                   | 4.85    | 5   | 5.15 | 4.65   | 5   | 5.35 | V                  |
|                                                                                                                                                                                | $V_{IN} = 8\text{ V to }20\text{ V}$<br>T, L – Pkg: $I_O = 5\text{ mA to }500\text{ mA}$ , $P \leq 2\text{ W}$                   | 4.85    | 5   | 5.15 | 4.65   | 5   | 5.35 | V                  |
| Quiescent Current                                                                                                                                                              | Over Temperature Range                                                                                                           |         |     | 7    |        |     | 7    | mA                 |
|                                                                                                                                                                                | $T_J = 25^{\circ}\text{C}$                                                                                                       |         | 4   | 6    |        | 4   | 6    | mA                 |
| Quiescent Current<br>Change                                                                                                                                                    | With Line: $V_{IN} = 8\text{ V to }25\text{ V}$                                                                                  |         |     | 0.8  |        |     | 0.8  | mA                 |
|                                                                                                                                                                                | With Load: $I_O = 5\text{ mA to }1.0\text{ A}$ (Power Pkgs)                                                                      |         |     | 0.5  |        |     | 0.5  | mA                 |
|                                                                                                                                                                                | $I_O = 5\text{ mA to }500\text{ mA}$ (T, L)                                                                                      |         |     | 0.5  |        |     | 0.5  | mA                 |
| Dropout Voltage                                                                                                                                                                | $\Delta V_O = 100\text{ mV}$ , $T_J = 25^{\circ}\text{C}$<br>Power Pkgs: $I_O = 1.0\text{ A}$ , T, L -Pkg: $I_O = 500\text{ mA}$ |         | 2   | 2.5  |        | 2   | 2.5  | V                  |
| Peak Output Current                                                                                                                                                            | Power Pkgs: $V_{IN} = 10\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                  | 1.5     | 2   | 3.3  | 1.5    | 2   | 3.3  | A                  |
|                                                                                                                                                                                | T, L – Pkg: $V_{IN} = 10\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                  | 0.5     | 1   | 2    | 0.5    | 1   | 2    | A                  |
| Short Circuit Current                                                                                                                                                          | Power Pkgs: $V_{IN} = 35\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                  |         |     | 1.2  |        |     | 1.2  | A                  |
|                                                                                                                                                                                | T, L – Pkg: $V_{IN} = 35\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                  |         |     | 0.7  |        |     | 0.7  | A                  |
| Ripple Rejection                                                                                                                                                               | $\Delta V_{IN} = 10\text{ V}$ , $f = 120\text{ Hz}$ , $T_J = 25^{\circ}\text{C}$                                                 | 68      |     |      | 68     |     |      | dB                 |
| Output Noise Voltage<br>(rms)                                                                                                                                                  | $f = 10\text{ Hz to }100\text{ kHz}$ (Note 2)                                                                                    |         |     | 40   |        |     | 40   | $\mu\text{V/V}$    |
| Long Term Stability                                                                                                                                                            | 1000 hours @ $T_J = 125^{\circ}\text{C}$                                                                                         |         | 20  |      |        | 20  |      | mV                 |
| Thermal Shutdown                                                                                                                                                               | $I_O = 5\text{ mA}$                                                                                                              |         | 175 |      |        | 175 |      | $^{\circ}\text{C}$ |
| <b>Notes:</b><br>1. All regulation tests are made at constant junction temperature with low duty cycle testing.<br>2. This test is guaranteed but is not tested in production. |                                                                                                                                  |         |     |      |        |     |      |                    |

## Electrical Characteristics

Unless specified, these specifications apply over the operating ambient temperatures for SG7812A / SG7812 with  $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ ,  $V_{\text{IN}} = 19\text{ V}$ ,  $I_O = 500\text{ mA}$  for the K, G, and IG – Power Packages,  $I_O = 100\text{ mA}$  for the T and L packages,  $C_{\text{IN}} = 0.33\text{ }\mu\text{F}$  and  $C_{\text{OUT}} = 0.1\text{ }\mu\text{F}$ . Low duty cycle pulse testing techniques are used, which maintains junction and case temperatures equal to the ambient temperature.

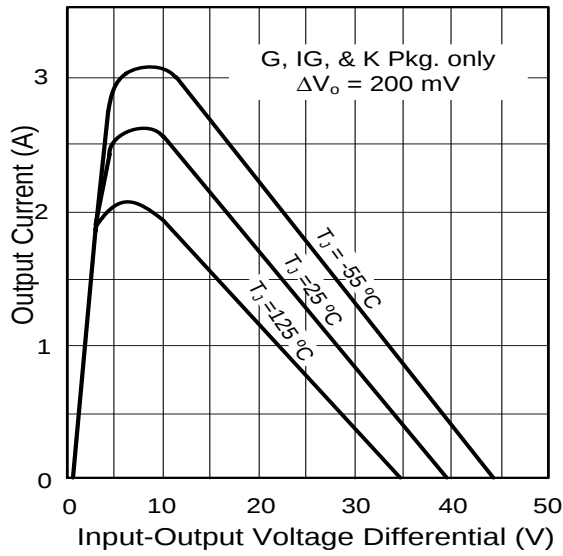
| Parameter                                                                                                                                                                      | Test Conditions                                                                                                                   | SG7812A |     |      | SG7812 |     |      | Units              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|--------|-----|------|--------------------|
|                                                                                                                                                                                |                                                                                                                                   | Min     | Typ | Max  | Min    | Typ | Max  |                    |
| Output Voltage                                                                                                                                                                 | $T_J = 25^{\circ}\text{C}$                                                                                                        | 11.8    | 12  | 12.2 | 11.5   | 12  | 12.5 | V                  |
| Line Regulation<br>(Note 1)                                                                                                                                                    | $V_{\text{IN}} = 14.5\text{ V to }30\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                       |         | 12  | 60   |        | 12  | 120  | mV                 |
|                                                                                                                                                                                | $V_{\text{IN}} = 16\text{ V to }22\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                         |         | 6   | 30   |        | 6   | 60   | mV                 |
| Load Regulation<br>(Note 1)                                                                                                                                                    | Power Pkgs: $I_O = 5\text{ mA to }1.5\text{ A}$ , $T_J = 25^{\circ}\text{C}$                                                      |         | 28  | 80   |        | 28  | 120  | mV                 |
|                                                                                                                                                                                | $I_O = 250\text{ mA to }750\text{ mA}$ , $T_J = 25^{\circ}\text{C}$                                                               |         | 10  | 40   |        | 10  | 60   | mV                 |
|                                                                                                                                                                                | T, L – Pkg: $I_O = 5\text{ mA to }500\text{ mA}$ , $T_J = 25^{\circ}\text{C}$                                                     |         | 10  | 40   |        | 10  | 60   | mV                 |
| Total Output Voltage<br>Tolerance                                                                                                                                              | $V_{\text{IN}} = 15.5\text{ V to }27\text{ V}$<br>Power Pkgs: $I_O = 5\text{ mA to }1.0\text{ A}$ , $P \leq 20\text{ W}$          | 11.7    | 12  | 12.3 | 11.4   | 12  | 12.6 | V                  |
|                                                                                                                                                                                | $V_{\text{IN}} = 15.5\text{ V to }27\text{ V}$<br>T, L – Pkg: $I_O = 5\text{ mA to }500\text{ mA}$ , $P \leq 2\text{ W}$          | 11.7    | 12  | 12.3 | 11.4   | 12  | 12.6 | V                  |
| Quiescent Current                                                                                                                                                              | Over Temperature Range                                                                                                            |         |     | 7    |        |     | 7    | mA                 |
|                                                                                                                                                                                | $T_J = 25^{\circ}\text{C}$                                                                                                        |         | 4   | 6    |        | 4   | 6    | mA                 |
| Quiescent Current<br>Change                                                                                                                                                    | With Line: $V_{\text{IN}} = 15\text{ V to }30\text{ V}$                                                                           |         |     | 0.8  |        |     | 0.8  | mA                 |
|                                                                                                                                                                                | With Load: $I_O = 5\text{ mA to }1.0\text{ A}$ (Power Pkgs)                                                                       |         |     | 0.5  |        |     | 0.5  | mA                 |
|                                                                                                                                                                                | $I_O = 5\text{ mA to }500\text{ mA}$ (T, L)                                                                                       |         |     | 0.5  |        |     | 0.5  | mA                 |
| Dropout Voltage                                                                                                                                                                | $\Delta V_O = 100\text{ mV}$ , $T_J = 25^{\circ}\text{C}$<br>Power Pkgs: $I_O = 1.0\text{ A}$ , T, L – Pkg: $I_O = 500\text{ mA}$ |         | 2   | 2.5  |        | 2   | 2.5  | V                  |
| Peak Output Current                                                                                                                                                            | Power Pkgs: $T_J = 25^{\circ}\text{C}$                                                                                            | 1.5     | 2   | 3.3  | 1.5    | 2   | 3.3  | A                  |
|                                                                                                                                                                                | T, L – Pkg: $T_J = 25^{\circ}\text{C}$                                                                                            | 0.5     | 1   | 1.7  | 0.5    | 1   | 1.7  | A                  |
| Short Circuit Current                                                                                                                                                          | Power Pkgs: $V_{\text{IN}} = 35\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                            |         |     | 1.2  |        |     | 1.2  | A                  |
|                                                                                                                                                                                | T, L – Pkg: $V_{\text{IN}} = 35\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                            |         |     | 0.7  |        |     | 0.7  | A                  |
| Ripple Rejection                                                                                                                                                               | $\Delta V_{\text{IN}} = 10\text{ V}$ , $f = 120\text{ Hz}$ , $T_J = 25^{\circ}\text{C}$                                           | 61      |     |      | 61     |     |      | dB                 |
| Output Noise Voltage<br>(rms)                                                                                                                                                  | $f = 10\text{ Hz to }100\text{ kHz}$ (Note 2)                                                                                     |         |     | 40   |        |     | 40   | $\mu\text{V/V}$    |
| Long Term Stability                                                                                                                                                            | 1000 hours @ $T_J = 125^{\circ}\text{C}$                                                                                          |         | 48  |      |        | 48  |      | mV                 |
| Thermal Shutdown                                                                                                                                                               | $I_O = 5\text{ mA}$                                                                                                               |         | 175 |      |        | 175 |      | $^{\circ}\text{C}$ |
| <b>Notes:</b><br>1. All regulation tests are made at constant junction temperature with low duty cycle testing.<br>2. This test is guaranteed but is not tested in production. |                                                                                                                                   |         |     |      |        |     |      |                    |

## Electrical Characteristics

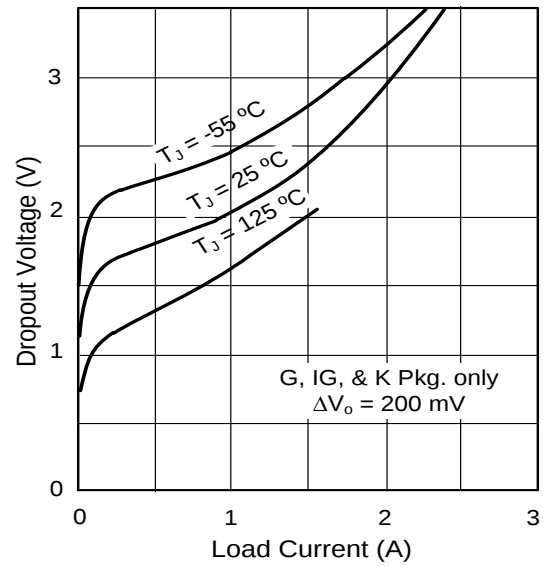
Unless specified, these specifications apply over the operating ambient temperatures for SG7815A / SG7815 with  $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ ,  $V_{IN} = 23\text{ V}$ ,  $I_O = 500\text{ mA}$  for the K, G, and IG – Power Packages,  $I_O = 100\text{ mA}$  for the T and L packages,  $C_{IN} = 0.33\text{ }\mu\text{F}$  and  $C_{OUT} = 0.1\text{ }\mu\text{F}$ . Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.

| Parameter                                                                                                                                                                      | Test Conditions                                                                                                                   | SG7815A |     |      | SG7815 |     |      | Units              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------|-----|------|--------|-----|------|--------------------|
|                                                                                                                                                                                |                                                                                                                                   | Min     | Typ | Max  | Min    | Typ | Max  |                    |
| Output Voltage                                                                                                                                                                 | $T_J = 25^{\circ}\text{C}$                                                                                                        | 14.8    | 15  | 15.2 | 14.4   | 15  | 15.6 | V                  |
| Line Regulation<br>(Note 1)                                                                                                                                                    | $V_{IN} = 17.5\text{ V to }30\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                              |         | 15  | 75   |        | 15  | 150  | mV                 |
|                                                                                                                                                                                | $V_{IN} = 20\text{ V to }26\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                |         | 8   | 40   |        | 8   | 75   | mV                 |
| Load Regulation<br>(Note 1)                                                                                                                                                    | Power Pkgs: $I_O = 5\text{ mA to }1.5\text{ A}$ , $T_J = 25^{\circ}\text{C}$                                                      |         | 30  | 100  |        | 30  | 150  | mV                 |
|                                                                                                                                                                                | $I_O = 250\text{ mA to }750\text{ mA}$ , $T_J = 25^{\circ}\text{C}$                                                               |         | 12  | 50   |        | 12  | 75   | mV                 |
|                                                                                                                                                                                | T, L – Pkg: $I_O = 5\text{ mA to }500\text{ mA}$ , $T_J = 25^{\circ}\text{C}$                                                     |         | 12  | 50   |        | 12  | 75   | mV                 |
| Total Output Voltage<br>Tolerance                                                                                                                                              | $V_{IN} = 18.5\text{ V to }30\text{ V}$<br>Power Pkgs: $I_O = 5\text{ mA to }1.0\text{ A}$ , $P \leq 20\text{ W}$                 | 14.6    | 15  | 15.4 | 14.3   | 15  | 15.7 | V                  |
|                                                                                                                                                                                | $V_{IN} = 18.5\text{ V to }30\text{ V}$<br>T, L – Pkg: $I_O = 5\text{ mA to }500\text{ mA}$ , $P \leq 2\text{ W}$                 | 14.6    | 15  | 15.4 | 14.3   | 15  | 15.7 | V                  |
| Quiescent Current                                                                                                                                                              | Over Temperature Range                                                                                                            |         |     | 7    |        |     | 7    | mA                 |
|                                                                                                                                                                                | $T_J = 25^{\circ}\text{C}$                                                                                                        |         | 4   | 6    |        | 4   | 6    | mA                 |
| Quiescent Current<br>Change                                                                                                                                                    | With Line: $V_{IN} = 18.5\text{ V to }30\text{ V}$                                                                                |         |     | 0.8  |        |     | 0.8  | mA                 |
|                                                                                                                                                                                | With Load: $I_O = 5\text{ mA to }1.0\text{ A}$ (Power Pkgs)                                                                       |         |     | 0.5  |        |     | 0.5  | mA                 |
|                                                                                                                                                                                | $I_O = 5\text{ mA to }500\text{ mA}$ (T, L)                                                                                       |         |     | 0.5  |        |     | 0.5  | mA                 |
| Dropout Voltage                                                                                                                                                                | $\Delta V_O = 100\text{ mV}$ , $T_J = 25^{\circ}\text{C}$<br>Power Pkgs: $I_O = 1.0\text{ A}$ , T, L – Pkg: $I_O = 500\text{ mA}$ |         | 2   | 2.5  |        | 2   | 2.5  | V                  |
| Peak Output Current                                                                                                                                                            | Power Pkgs: $T_J = 25^{\circ}\text{C}$                                                                                            | 1.5     | 2.2 | 3.3  | 1.5    | 2.2 | 3.3  | A                  |
|                                                                                                                                                                                | T, L – Pkg: $T_J = 25^{\circ}\text{C}$                                                                                            | 0.5     | 0.9 | 1.7  | 0.5    | 0.9 | 1.7  | A                  |
| Short Circuit Current                                                                                                                                                          | Power Pkgs: $V_{IN} = 35\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                   |         |     | 1.2  |        |     | 1.2  | A                  |
|                                                                                                                                                                                | T, L – Pkg: $V_{IN} = 35\text{ V}$ , $T_J = 25^{\circ}\text{C}$                                                                   |         |     | 0.7  |        |     | 0.7  | A                  |
| Ripple Rejection                                                                                                                                                               | $\Delta V_{IN} = 10\text{ V}$ , $f = 120\text{ Hz}$ , $T_J = 25^{\circ}\text{C}$                                                  | 60      |     |      | 60     |     |      | dB                 |
| Output Noise Voltage<br>(rms)                                                                                                                                                  | $f = 10\text{ Hz to }100\text{ kHz}$ (Note 2)                                                                                     |         |     | 40   |        |     | 40   | $\mu\text{V/V}$    |
| Long Term Stability                                                                                                                                                            | 1000 hours @ $T_J = 125^{\circ}\text{C}$                                                                                          |         | 60  |      |        | 60  |      | mV                 |
| Thermal Shutdown                                                                                                                                                               | $I_O = 5\text{ mA}$                                                                                                               |         | 175 |      |        | 175 |      | $^{\circ}\text{C}$ |
| <b>Notes:</b><br>1. All regulation tests are made at constant junction temperature with low duty cycle testing.<br>2. This test is guaranteed but is not tested in production. |                                                                                                                                   |         |     |      |        |     |      |                    |

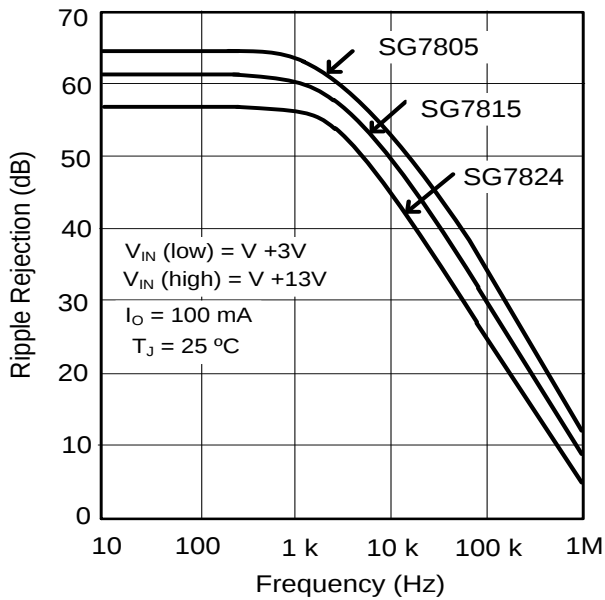
## Characteristic Curves



**Figure 2** • Peak Output Current versus Input-Output Differential

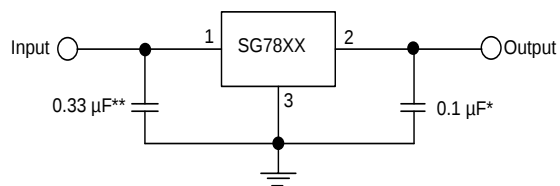


**Figure 3** • Minimum Input-Output Voltage versus Load Current



**Figure 4** • Ripple Rejection versus Frequency

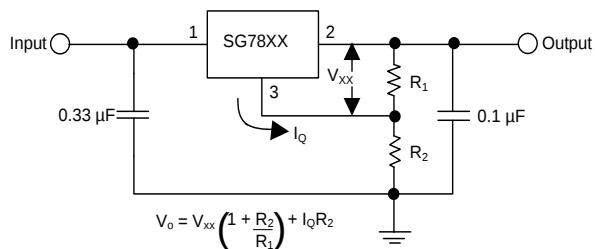
## Application Information



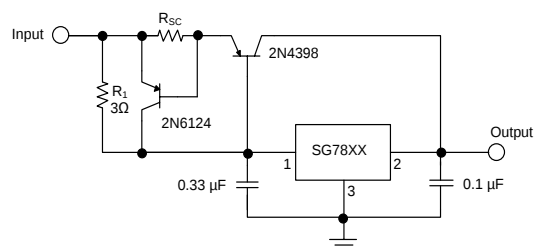
\* Increasing value of output capacitor improves system transient response

\*\*Required only if regulator is located an appreciable distance from power supply filter

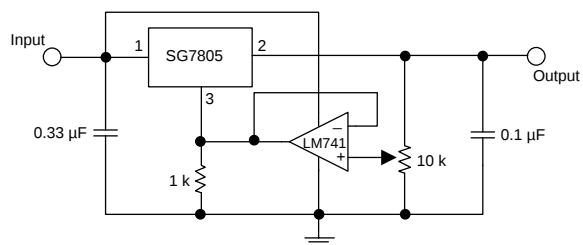
**Figure 5 • Fixed Output Regulator**



**Figure 6 • Circuit for Increasing Output Voltage**



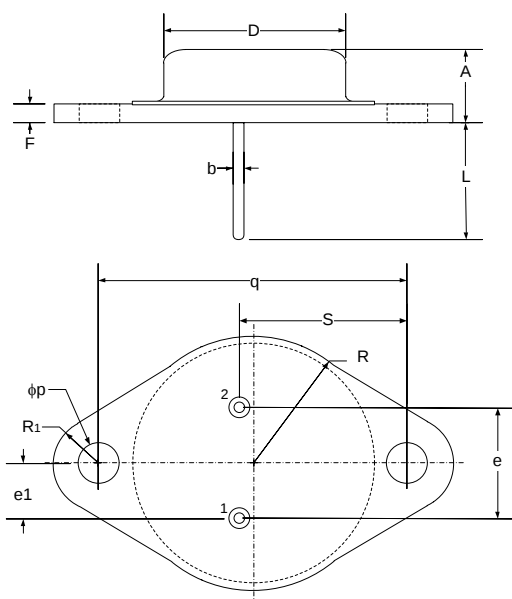
**Figure 7 • High Output Current, Short Circuit Protected**



**Figure 8 • Adjustable Output Regulator, 7 V to 30 V**

## Package Outline Dimensions

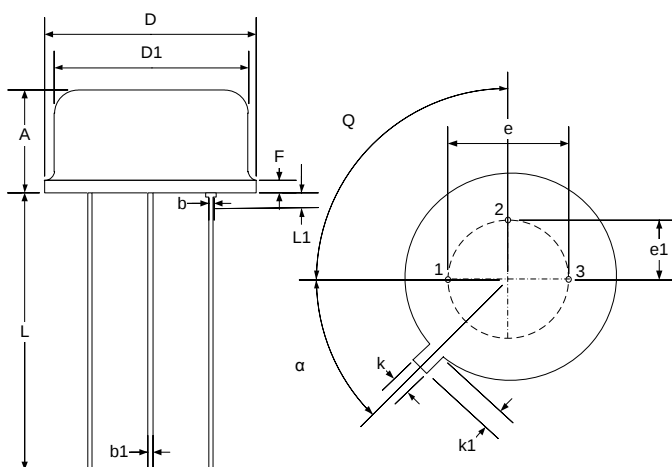
Controlling dimensions are in inches, metric equivalents are shown for general information.



| Dim | MILLIMETERS |       | INCHES |       |
|-----|-------------|-------|--------|-------|
|     | MIN         | MAX   | MIN    | MAX   |
| A   | 6.86        | 7.62  | 0.270  | 0.300 |
| q   | 29.90       | 30.40 | 1.177  | 1.197 |
| b   | 0.97        | 1.09  | 0.038  | 0.043 |
| D   | 19.43       | 19.68 | 0.765  | 0.775 |
| S   | 16.64       | 17.14 | 0.655  | 0.675 |
| e   | 10.67       | 11.18 | 0.420  | 0.440 |
| e1  | 5.21        | 5.72  | 0.205  | 0.225 |
| F   | 1.52        | 2.03  | 0.060  | 0.080 |
| φp  | 3.84        | 4.09  | 0.151  | 0.161 |
| L   | 10.79       | 12.19 | 0.425  | 0.480 |
| R1  | 3.33        | 4.78  | 0.131  | 0.188 |
| R   | 12.57       | 13.34 | 0.495  | 0.525 |

**Note:** Dimensions do not include protrusions; these shall not exceed 0.155 mm (0.006") on any side. Lead dimension shall not include solder coverage.

**Figure 9 • K 3-Pin Metal Can TO-3**



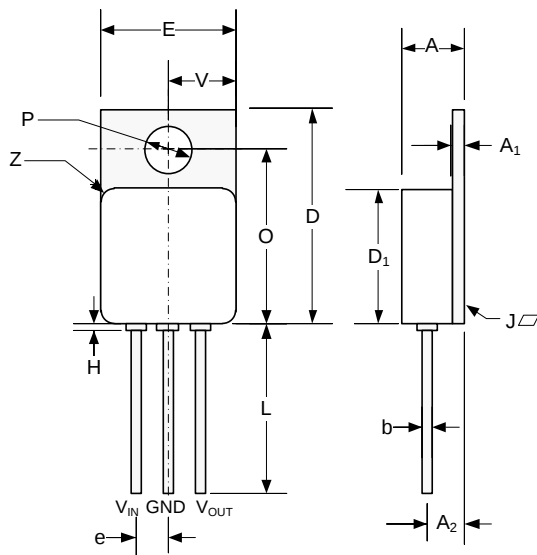
| Dim | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 4.19        | 4.70  | 0.165     | 0.185 |
| b   | 0.41        | 0.48  | 0.016     | 0.019 |
| b1  | 0.41        | 0.53  | 0.016     | 0.021 |
| D   | 8.89        | 9.40  | 0.350     | 0.370 |
| D1  | 8.13        | 8.51  | 0.320     | 0.335 |
| e   | 5.08 BSC    |       | 0.200 BSC |       |
| e1  | 2.54 Typ    |       | 0.100 Typ |       |
| F   | -           | 1.02  | -         | 0.040 |
| k   | 0.71        | 0.86  | 0.028     | 0.034 |
| k1  | 0.74        | 1.14  | 0.029     | 0.045 |
| L   | 12.70       | 14.48 | 0.500     | 0.570 |
| L1  | -           | 1.27  | -         | 0.050 |
| Q   | 90° Typ     |       | 90° Typ   |       |
| α   | 45° Typ     |       | 45° Typ   |       |

\* Lead Coplanarity

**Note:** Dimensions do not include protrusions; these shall not exceed 0.155 mm (0.006") on any side. Lead dimension shall not include solder coverage.

**Figure 10 • T 3-Pin Metal Can TO-39**

## Package Outline Dimensions (continued)

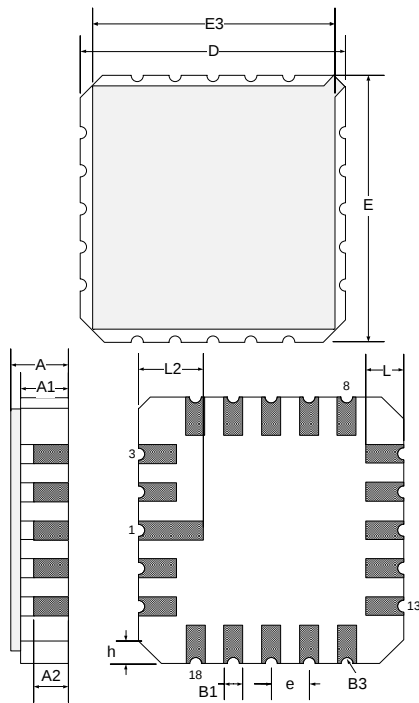


| Dim | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 4.70        | 5.21  | 0.185     | 0.205 |
| A1  | 0.89        | 1.14  | 0.035     | 0.045 |
| A2  | 2.92        | 3.18  | 0.115     | 0.125 |
| b   | 0.71        | 0.081 | 0.027     | 0.032 |
| D   | 16.38       | 16.76 | 0.645     | 0.660 |
| D1* | 10.41       | 10.92 | 0.410     | 0.430 |
| e   | 2.54 BSC    |       | 0.100 BSC |       |
| E*  | 10.41       | 10.67 | 0.410     | 0.420 |
| H   |             | 0.50  |           | 0.020 |
| L   | 12.70       |       | 0.500     |       |
| O   | 13.39       | 13.64 | 0.527     | 0.537 |
| P   | 3.56        | 3.81  | 0.140     | 0.150 |
| J   |             | 0.10  |           | 0.004 |
| V   | 5.13        | 5.38  | 0.202     | 0.212 |
| Z   | 1.40 Typ    |       | 0.055 Typ |       |

\*Excludes Weld Fillet Around Lid.

**Note:** Dimensions do not include protrusions; these shall not exceed 0.155 mm (0.006") on any side. Lead dimension shall not include solder coverage.

Figure 11 • G/G 3-Pin Hermetic TO-257



| Dim  | MILLIMETERS |       | INCHES    |       |
|------|-------------|-------|-----------|-------|
|      | MIN         | MAX   | MIN       | MAX   |
| D, E | 8.64        | 9.14  | 0.340     | 0.360 |
| E3   | -           | 8.128 | -         | 0.320 |
| e    | 1.270 BSC   |       | 0.050 BSC |       |
| B1   | 0.635 Typ   |       | 0.025 Typ |       |
| L    | 1.02        | 1.52  | 0.040     | 0.060 |
| A    | 1.626       | 2.286 | 0.064     | 0.090 |
| h    | 1.016 Typ   |       | 0.040 Typ |       |
| A1   | 1.372       | 1.68  | 0.054     | 0.066 |
| A2   | -           | 1.168 | -         | 0.046 |
| L2   | 1.91        | 2.41  | 0.075     | 0.95  |
| B3   | 0.203R      |       | 0.008R    |       |

**Note:** All exposed metalized area shall be gold plated 60 μ-inch minimum thickness over nickel plated unless specified in purchase order. Lead dimension shall not include solder coverage

Figure 12 • L 20-Pin Ceramic Leadless Chip Carrier



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