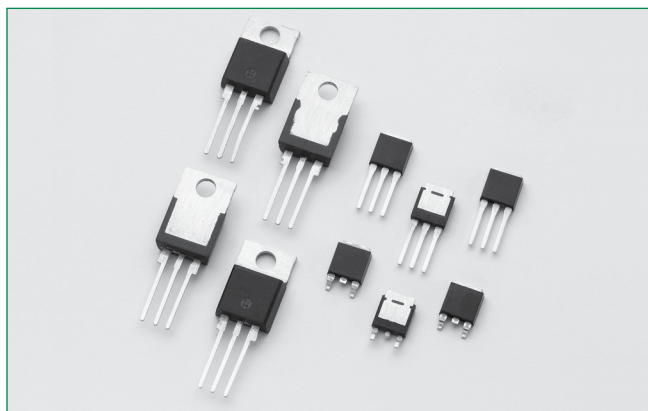


### Sxx06xSx & Sxx06x Series



#### Agency Approval

| Agency                                                                            | Agency File Number |
|-----------------------------------------------------------------------------------|--------------------|
|  | E71639*            |

\* - L Package Only

#### Main Features

| Symbol            | Value       | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$      | 6           | A    |
| $V_{DRM}/V_{RRM}$ | 400 to 1000 | V    |
| $I_{GT}$          | 0.2 to 15   | mA   |

#### Additional Information



Datasheet



Resources



Samples

#### Description

This Sxx06x SCR series is ideal for uni-directional switch applications such as phase control, heating, motor speed controls, converters/rectifiers and capacitive discharge ignitions.

These SCRs have a low gate current trigger level of 0.2 to 15 mA at approximately 1.5V, with a sensitive version of this series having a gate trigger current less than 500µA. The sensitive gate SCR version is easily triggered by sense coils, proximity switches, and microprocessors.

#### Features & Benefits

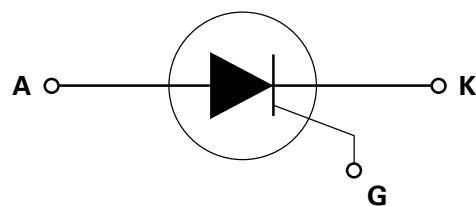
- Halogen free and RoHS compliant
- Glass – passivated junctions
- Voltage capability up to 1000 V
- Surge capability up to 100 A at 60 Hz half cycle
- L-Package is UL recognized for 2500Vrms

#### Applications

Typical applications are capacitive discharge systems for strobe lights, nailers, staplers and gas engine ignition. Also, AC control & rectification for power tools, home/ brown goods and white goods appliances and 2-wheeler rectifier/battery regulators.

Internally constructed isolated packages are offered for ease of heat sinking with highest isolation voltage.

#### Schematic Symbol



### Absolute Maximum Ratings — Sensitive SCRs

| Symbol       | Parameter                                 | Test Conditions                                                                      |                            | Value      | Unit                   |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------------|----------------------------|------------|------------------------|
| $I_{T(RMS)}$ | RMS on-state current                      | Sxx06LSy                                                                             | $T_c = 80^{\circ}\text{C}$ | 6          | A                      |
|              |                                           | Sxx06NSy                                                                             | $T_c = 95^{\circ}\text{C}$ |            |                        |
|              |                                           | Sxx06RSy                                                                             |                            |            |                        |
|              |                                           | Sxx06DSy                                                                             |                            |            |                        |
|              |                                           | Sxx06VSy                                                                             |                            |            |                        |
| $I_{T(AV)}$  | Average on-state current                  | Sxx06LSy                                                                             | $T_c = 80^{\circ}\text{C}$ | 3.8        | A                      |
|              |                                           | Sxx06NSy                                                                             | $TC = 95^{\circ}\text{C}$  |            |                        |
|              |                                           | Sxx06RSy                                                                             |                            |            |                        |
|              |                                           | Sxx06DSy                                                                             |                            |            |                        |
|              |                                           | Sxx06VSy                                                                             |                            |            |                        |
| $I_{TSM}$    | Peak non-repetitive surge current         | single half cycle; $f = 50\text{Hz}$ ;<br>$T_J(\text{initial}) = 25^{\circ}\text{C}$ |                            | 83         | A                      |
|              |                                           | single half cycle; $f = 60\text{Hz}$ ;<br>$T_J(\text{initial}) = 25^{\circ}\text{C}$ |                            | 100        |                        |
| $I^2t$       | $I^2t$ Value for fusing                   | $t_p = 8.3\text{ ms}$                                                                |                            | 41         | $\text{A}^2\text{s}$   |
| $di/dt$      | Critical rate of rise of on-state current | $f = 60\text{Hz}$ ; $T_J = 110^{\circ}\text{C}$                                      |                            | 100        | $\text{A}/\mu\text{s}$ |
| $I_{GTM}$    | Peak gate current                         | $T_J = 110^{\circ}\text{C}$                                                          |                            | 1          | A                      |
| $P_{G(AV)}$  | Average gate power dissipation            | $T_J = 110^{\circ}\text{C}$                                                          |                            | 0.1        | W                      |
| $T_{stg}$    | Storage temperature range                 |                                                                                      |                            | -40 to 150 | $^{\circ}\text{C}$     |
| $T_J$        | Operating junction temperature range      |                                                                                      |                            | -40 to 110 | $^{\circ}\text{C}$     |

Note: xx = voltage, y = sensitivity

### Absolute Maximum Ratings — Standard SCRs

| Symbol       | Parameter                                 |                                                                                      |                             | Value      | Unit                   |
|--------------|-------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------|------------|------------------------|
| $I_{T(RMS)}$ | RMS on-state current                      | Sxx06L                                                                               | $T_c = 100^{\circ}\text{C}$ | 6          | A                      |
|              |                                           | Sxx06N                                                                               | $T_c = 110^{\circ}\text{C}$ |            |                        |
|              |                                           | Sxx06R                                                                               |                             |            |                        |
|              |                                           | Sxx06D                                                                               |                             |            |                        |
|              |                                           | Sxx06V                                                                               |                             |            |                        |
| $I_{T(AV)}$  | Average on-state current                  | Sxx06L                                                                               | $T_c = 100^{\circ}\text{C}$ | 3.8        | A                      |
|              |                                           | Sxx06N                                                                               | $T_c = 110^{\circ}\text{C}$ |            |                        |
|              |                                           | Sxx06R                                                                               |                             |            |                        |
|              |                                           | Sxx06D                                                                               |                             |            |                        |
|              |                                           | Sxx06V                                                                               |                             |            |                        |
| $I_{TSM}$    | Peak non-repetitive surge current         | single half cycle; $f = 50\text{Hz}$ ;<br>$T_J(\text{initial}) = 25^{\circ}\text{C}$ |                             | 83         | A                      |
|              |                                           | single half cycle; $f = 60\text{Hz}$ ;<br>$T_J(\text{initial}) = 25^{\circ}\text{C}$ |                             | 100        |                        |
| $I^2t$       | $I^2t$ value for fusing                   | $t_p = 8.3\text{ ms}$                                                                |                             | 41         | $\text{A}^2\text{s}$   |
| $di/dt$      | Critical rate-of-rise of on-state current | $f = 60\text{Hz}$ ; $T_J = 125^{\circ}\text{C}$                                      |                             | 100        | $\text{A}/\mu\text{s}$ |
| $I_{GTM}$    | Peak gate current                         | $T_J = 125^{\circ}\text{C}$                                                          |                             | 2          | A                      |
| $P_{G(AV)}$  | Average gate power dissipation            | $T_J = 125^{\circ}\text{C}$                                                          |                             | 0.5        | W                      |
| $T_{stg}$    | Storage temperature range                 |                                                                                      |                             | -40 to 150 | $^{\circ}\text{C}$     |
| $T_J$        | Operating junction temperature range      |                                                                                      |                             | -40 to 125 | $^{\circ}\text{C}$     |

Note: xx = voltage

### Electrical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified) — Sensitive SCRs

| Symbol    | Test Conditions                                                                        |      | Value    |          | Unit             |
|-----------|----------------------------------------------------------------------------------------|------|----------|----------|------------------|
|           |                                                                                        |      | Sxx06xS2 | Sxx06xS3 |                  |
| $I_{GT}$  | $V_D = 6V$ $R_L = 100\ \Omega$                                                         | MAX. | 200      | 500      | $\mu\text{A}$    |
| $V_{GT}$  | $V_D = 6V$ $R_L = 100\ \Omega$                                                         | MAX. | 0.8      |          | V                |
| $dv/dt$   | $V_D = V_{DRM}$ ; $R_{GK} = 1k\Omega$ ; $T_J = 110^\circ\text{C}$                      | TYP. | 8        |          | V/ $\mu\text{s}$ |
| $V_{GD}$  | $V_D = V_{DRM}$ $R_L = 3.3\ k\Omega$ $T_J = 110^\circ\text{C}$                         | MIN. | 0.2      |          | V                |
| $V_{GRM}$ | $I_{GR} = 10\mu\text{A}$                                                               | MIN. | 6        |          | V                |
| $I_H$     | $I_T = 20\text{mA}$ (initial)                                                          | MAX. | 6        | 8        | mA               |
| $t_q$     | $I_T = 2A$ ; $t_p = 50\mu\text{s}$ ; $dv/dt=5V/\mu\text{s}$ ; $di/dt=-30A/\mu\text{s}$ | MAX. | 50       | 45       | $\mu\text{s}$    |
| $t_{gt}$  | $I_G = 2 \times I_{GT}$ $PW = 15\mu\text{s}$ $I_T = 12A$                               | TYP. | 4        | 5        | $\mu\text{s}$    |

Note: xx = voltage, x = package

### Electrical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified) — Standard SCRs

| Symbol   | Test Conditions                                                                        |       |      | Value  | Unit             |
|----------|----------------------------------------------------------------------------------------|-------|------|--------|------------------|
|          |                                                                                        |       |      | Sxx06x |                  |
| $I_{GT}$ | $V_D = 12V$ $R_L = 60\ \Omega$                                                         |       | MAX. | 15     | mA               |
| $V_{GT}$ | $V_D = 12V$ $R_L = 60\ \Omega$                                                         |       | MAX. | 1.5    | V                |
| $dv/dt$  | $V_D = V_{DRM}$ ; gate open; $T_J = 100^\circ\text{C}$                                 | 400V  | MIN. | 350    | V/ $\mu\text{s}$ |
|          |                                                                                        | 600V  |      | 300    |                  |
|          |                                                                                        | 800V  |      | 250    |                  |
|          |                                                                                        | 1000V |      | 100    |                  |
|          | $V_D = V_{DRM}$ ; gate open; $T_J = 125^\circ\text{C}$                                 | 400V  |      | 250    |                  |
|          |                                                                                        | 600V  |      | 225    |                  |
|          |                                                                                        | 800V  |      | 200    |                  |
|          |                                                                                        |       |      |        |                  |
| $V_{GD}$ | $V_D = V_{DRM}$ $R_L = 3.3\ k\Omega$ $T_J = 125^\circ\text{C}$                         |       | MIN. | 0.2    | V                |
| $I_H$    | $I_T = 200\text{mA}$ (initial)                                                         |       | MAX. | 30     | mA               |
| $t_q$    | $I_T = 2A$ ; $t_p = 50\mu\text{s}$ ; $dv/dt=5V/\mu\text{s}$ ; $di/dt=-30A/\mu\text{s}$ |       | MAX. | 35     | $\mu\text{s}$    |
| $t_{gt}$ | $I_G = 2 \times I_{GT}$ $PW = 15\mu\text{s}$ $I_T = 12A$                               |       | TYP. | 2      | $\mu\text{s}$    |

Note: xx = voltage, x = package

### Static Characteristics

| Symbol              | Test Conditions              |          |                     |            | Value | Unit |
|---------------------|------------------------------|----------|---------------------|------------|-------|------|
| $V_{TM}$            | $I_T = 12A; t_p = 380 \mu s$ |          |                     |            | MAX.  | 1.6  |
| $I_{DRM} / I_{RRM}$ | $V_{DRM} = V_{RRM}$          | Sxx06xyy | $T_J = 25^\circ C$  | 400 – 600V | MAX.  | 5    |
|                     |                              |          | $T_J = 110^\circ C$ | 400 – 600V |       | 250  |
|                     | Sxx06x                       |          | $T_J = 25^\circ C$  | 400 – 800V |       | 10   |
|                     |                              |          |                     | 1000V      |       | 20   |
|                     |                              |          | $T_J = 100^\circ C$ | 400 – 800V |       | 200  |
|                     |                              |          |                     | 1000V      |       | 3000 |
|                     |                              |          | $T_J = 125^\circ C$ | 400 – 800V |       | 500  |

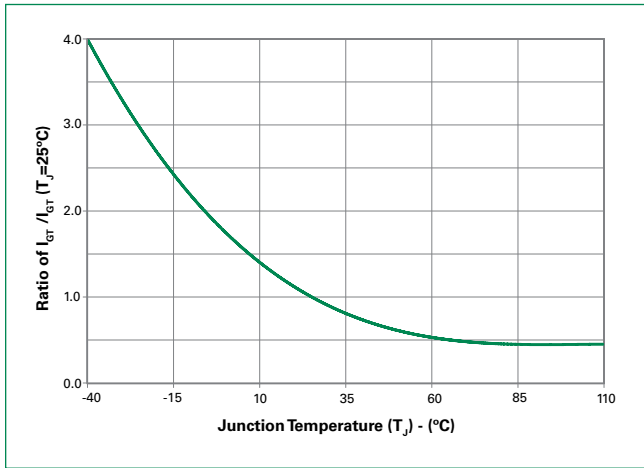
Note: xx = voltage, x = package, yy = sensitivity

### Thermal Resistances

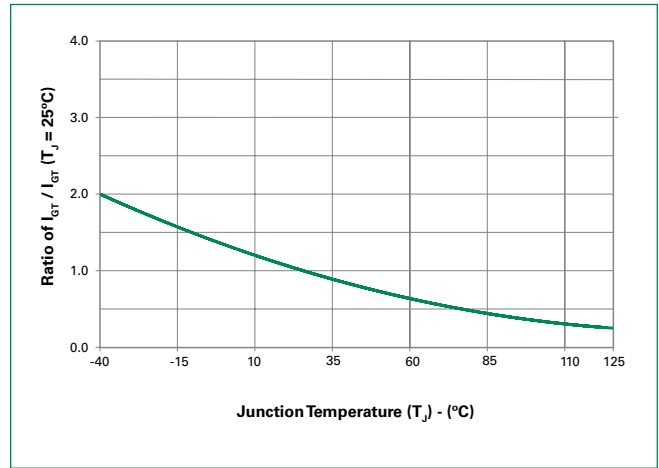
| Symbol            | Parameter             |                     | Value | Unit         |
|-------------------|-----------------------|---------------------|-------|--------------|
| $R_{\theta(J-C)}$ | Junction to case (AC) | Sxx06RSy / Sxx06NSy | 2.6   | $^\circ C/W$ |
|                   |                       | Sxx06LSy            | 4.3   |              |
|                   |                       | Sxx06VSY            | 2.4   |              |
|                   |                       | Sxx06DSy            | 1.8   |              |
|                   |                       | Sxx06R / Sxx06N     | 2.5   |              |
|                   |                       | Sxx06L              | 4.0   |              |
|                   |                       | Sxx06V              | 2.3   |              |
|                   |                       | Sxx06D              | 1.7   |              |
| $R_{\theta(J-A)}$ | Junction to ambient   | Sxx06RSy            | 40    | $^\circ C/W$ |
|                   |                       | Sxx06LSy            | 65    |              |
|                   |                       | Sxx06VSY            | 85    |              |
|                   |                       | Sxx06R              | 40    |              |
|                   |                       | Sxx06L              | 50    |              |
|                   |                       | Sxx06V              | 70    |              |

Note: xx = voltage, y = sensitivity

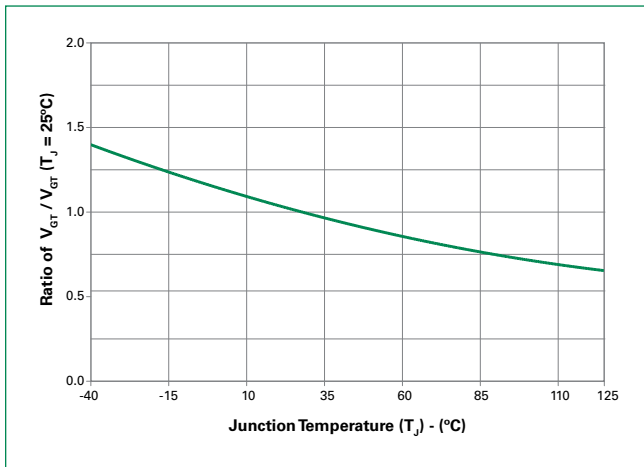
**Figure 1: Normalized DC Gate Trigger Current vs. Junction Temperature (Sensitive SCR)**



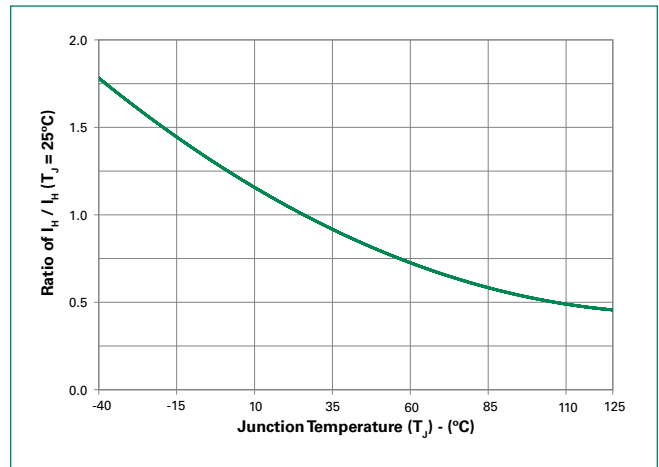
**Figure 2: Normalized DC Gate Trigger Current vs. Junction Temperature (Standard SCR)**



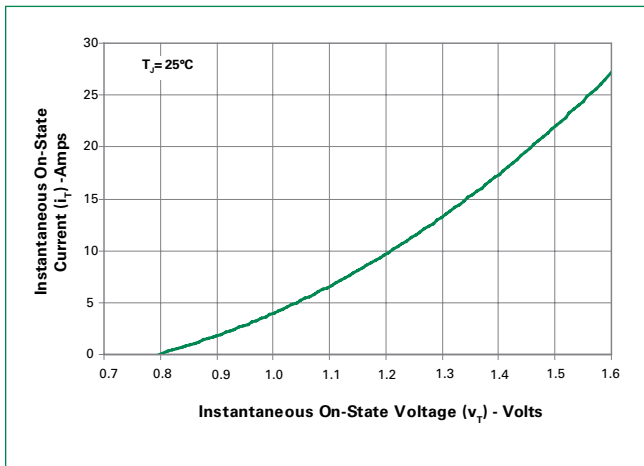
**Figure 3: Normalized DC Gate Trigger Voltage vs. Junction Temperature**



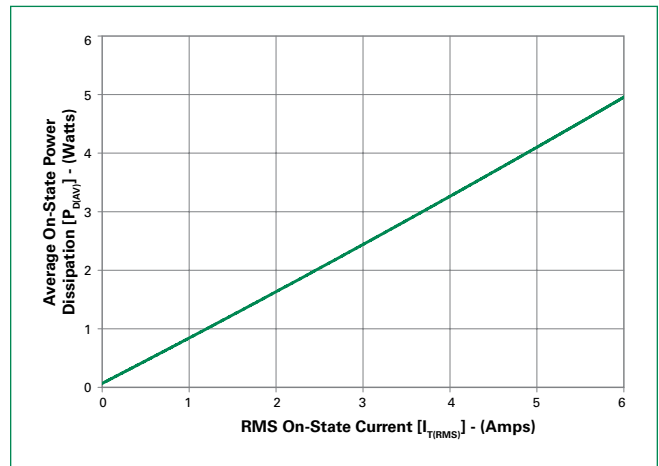
**Figure 4: Normalized DC Holding Current vs. Junction Temperature**



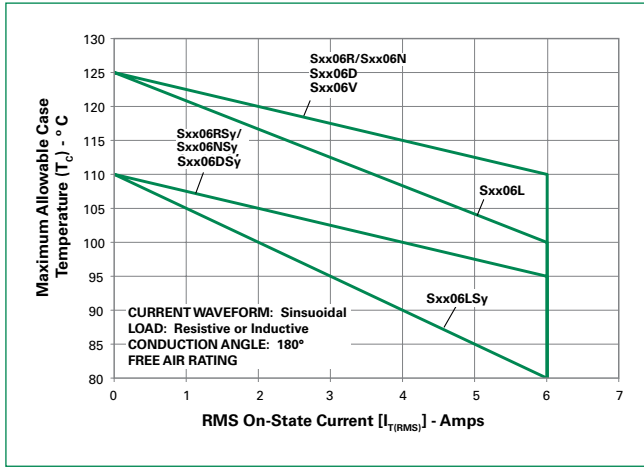
**Figure 5: On-State Current vs. On-State Voltage (Typical)**



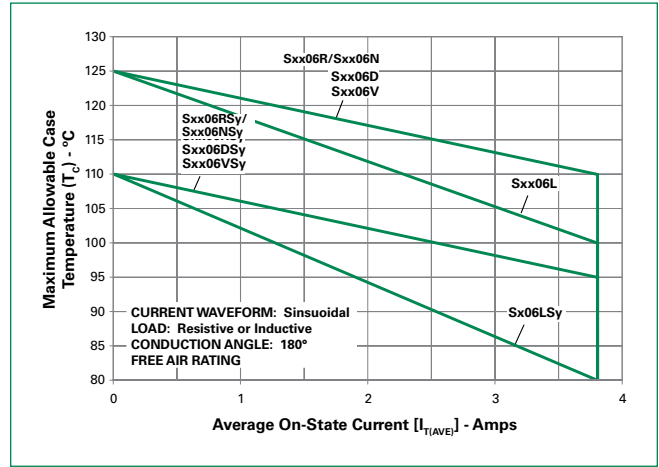
**Figure 6: Power Dissipation (Typical) vs. RMS On-State Current**



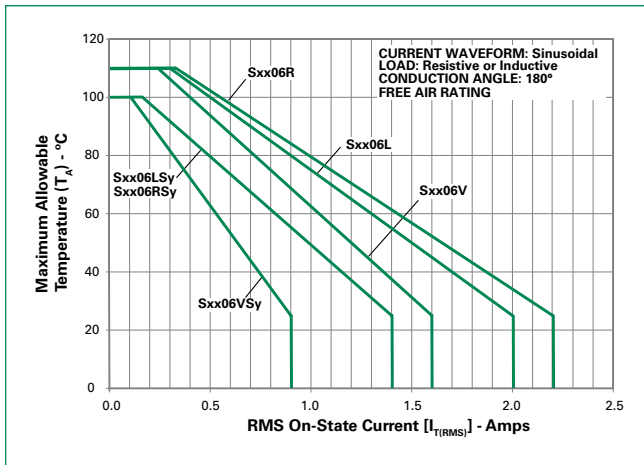
**Figure 7: Maximum Allowable Case Temperature vs. RMS On-State Current**



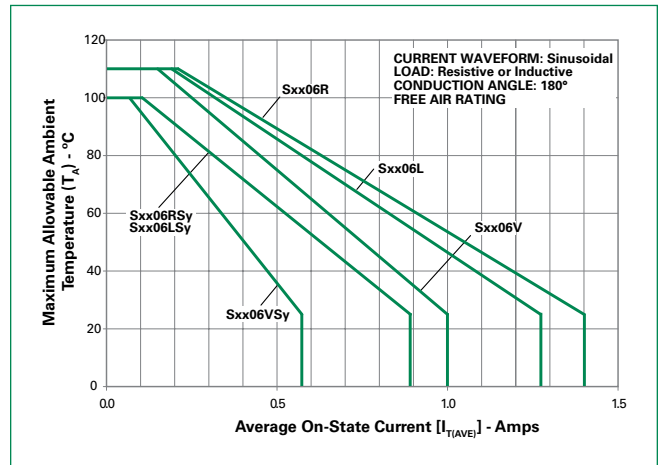
**Figure 8: Maximum Allowable Case Temperature vs. Average On-State Current**



**Figure 9: Maximum Allowable Ambient Temperature vs. RMS On-State Current**

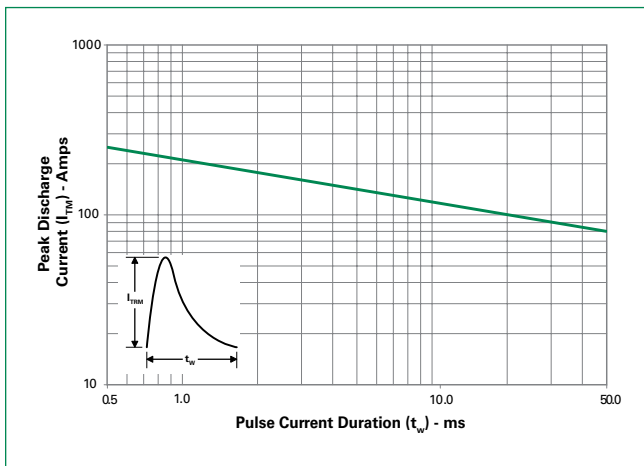


**Figure 10: Maximum Allowable Ambient Temperature vs. Average On-State Current**

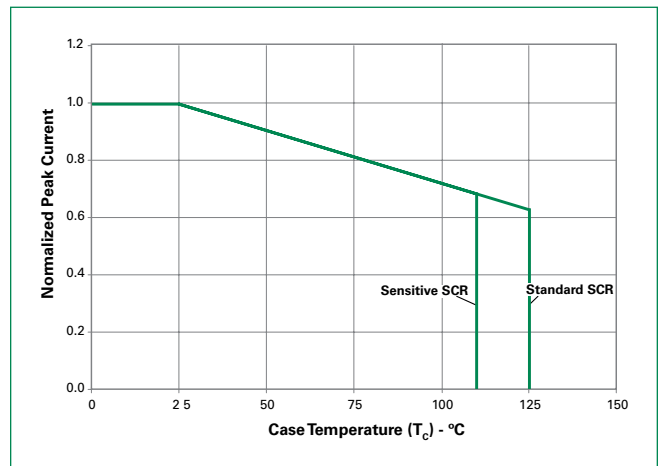


Note: xx = voltage, y = sensitivity

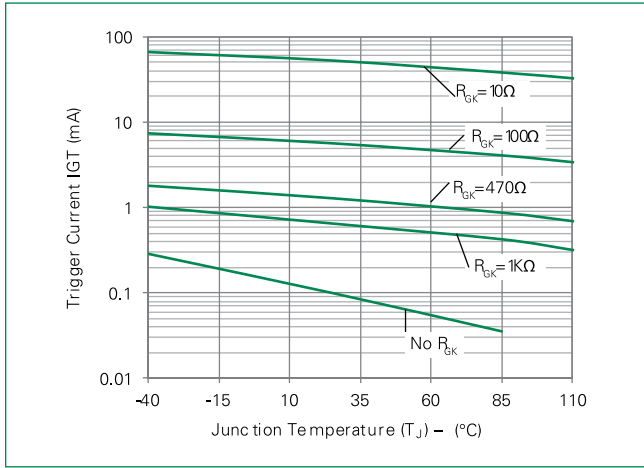
**Figure 11: Peak Capacitor Discharge Current**



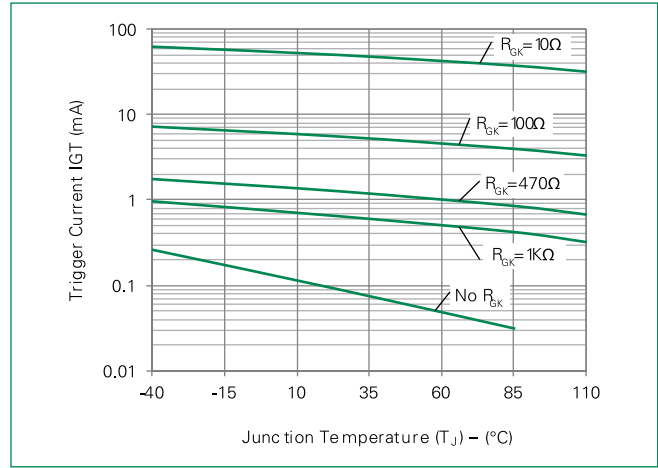
**Figure 12: Peak Capacitor Discharge Current Derating**



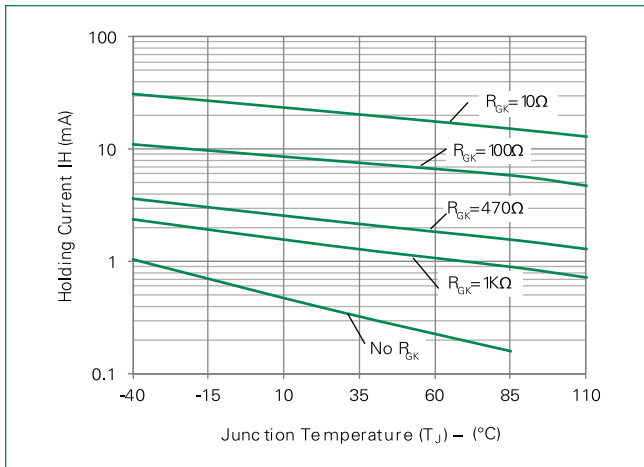
**Figure 13-1: Typical DC Gate Trigger Current with  $R_{GK}$  vs. Junction Temperature for S6008DS2**



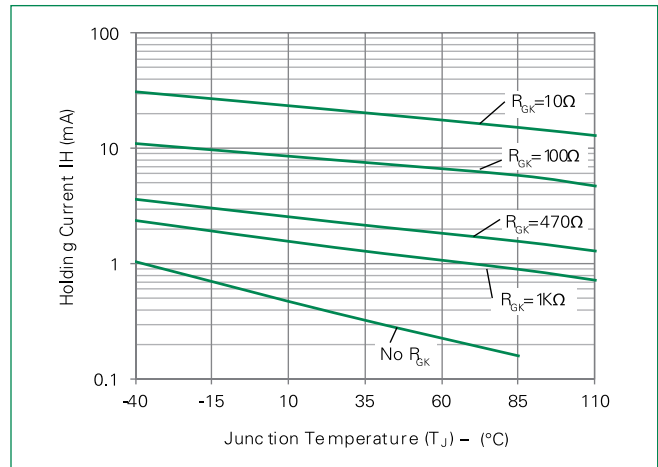
**Figure 13-2: Typical DC Gate Trigger Current with  $R_{GK}$  vs. Junction Temperature for SS6008DS3**



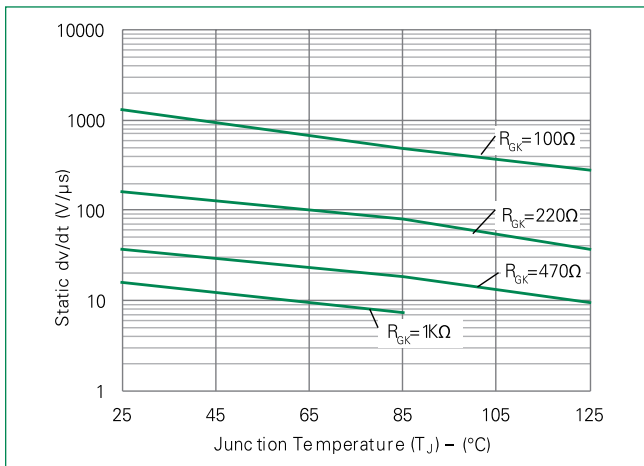
**Figure 14-1: Typical DC Holding Current with  $R_{GK}$  vs. Junction Temperature for S6008DS2**



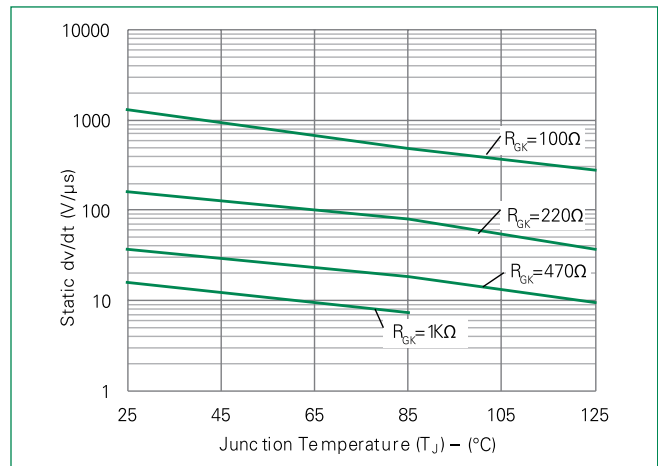
**Figure 14-2: Typical DC Holding Current with  $R_{GK}$  vs. Junction Temperature for SS6008DS3**



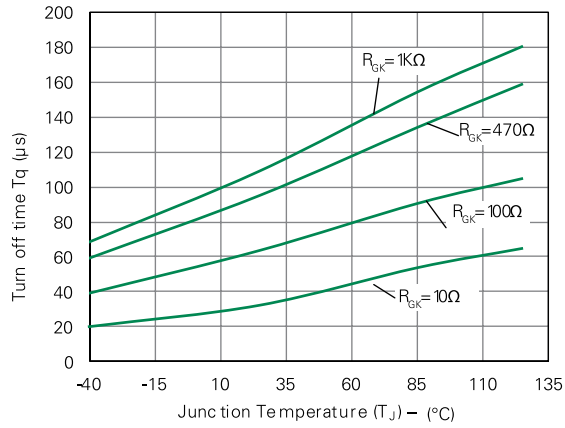
**Figure 15-1: Typical Static dv/dt with  $R_{GK}$  vs. Junction Temperature for S6008DS2**



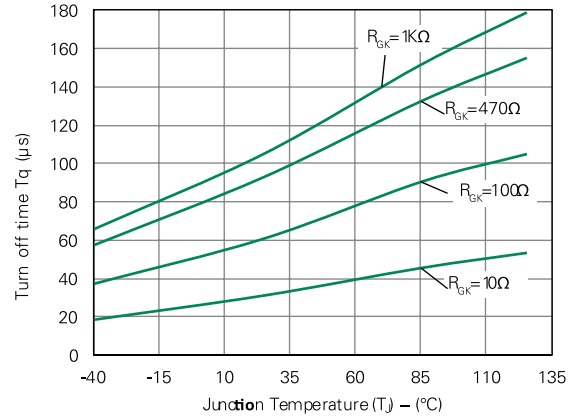
**Figure 15-2: Typical Static dv/dt with  $R_{GK}$  vs. Junction Temperature for SS6008DS3**



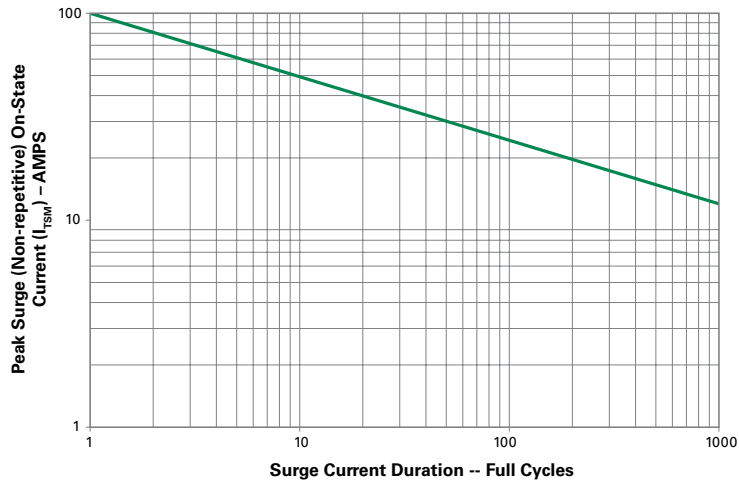
**Figure 16-1: Typical Static dv/dt with  $R_{GK}$  vs. Junction Temperature for S6008DS2**



**Figure 16-2 Typical Static dv/dt with  $R_{GK}$  vs. Junction Temperature for SS6008DS3**



**Figure 17: Surge Peak On-State Current vs. Number of Cycles**



**SUPPLY FREQUENCY:** 60 Hz Sinusoidal

**LOAD:** Resistive

**RMS On-State Current [ $I_{T(RMS)}$ ]:** Maximum Rated Value at Specified Case Temperature

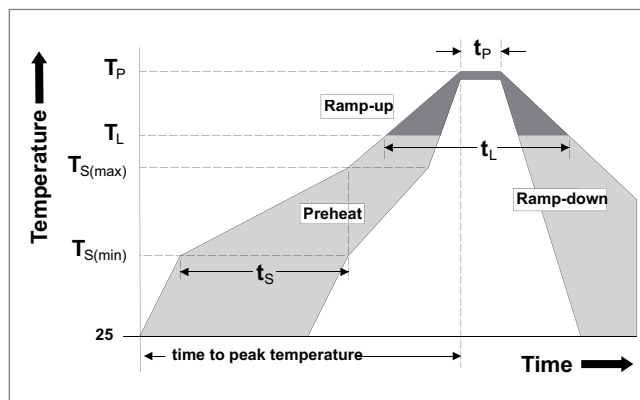
**Notes:**

1. Gate control may be lost during and immediately following surge current interval.
2. Overload may not be repeated until junction temperature has returned to steady-state rated value.



### Soldering Parameters

|                                                                        |                                    |                         |
|------------------------------------------------------------------------|------------------------------------|-------------------------|
| <b>Reflow Condition</b>                                                |                                    | Pb – Free assembly      |
| <b>Pre Heat</b>                                                        | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                                        | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                                        | - Time (min to max) ( $t_s$ )      | 60 – 180 secs           |
| <b>Average ramp up rate (Liquidus Temp) (<math>T_L</math>) to peak</b> |                                    | 5°C/second max          |
| <b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>      |                                    | 5°C/second max          |
| <b>Reflow</b>                                                          | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                                        | - Temperature ( $t_L$ )            | 60 – 150 seconds        |
| <b>Peak Temperature (<math>T_p</math>)</b>                             |                                    | 260 <sup>+0/-5</sup> °C |
| <b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>   |                                    | 20 – 40 seconds         |
| <b>Ramp-down Rate</b>                                                  |                                    | 5°C/second max          |
| <b>Time 25°C to peak Temperature (<math>T_p</math>)</b>                |                                    | 8 minutes Max.          |
| <b>Do not exceed</b>                                                   |                                    | 280°C                   |



### Physical Specifications

|                        |                                                       |
|------------------------|-------------------------------------------------------|
| <b>Terminal Finish</b> | 100% Matte Tin-plated                                 |
| <b>Body Material</b>   | UL recognized epoxy meeting flammability rating 94V-0 |
| <b>Lead Material</b>   | Copper Alloy                                          |

### Design Considerations

Careful selection of the correct component for the application's operating parameters and environment will go a long way toward extending the operating life of the Thyristor. Good design practice should limit the maximum continuous current through the main terminals to 75% of the component rating. Other ways to ensure long life for a power discrete semiconductor are proper heat sinking and selection of voltage ratings for worst case conditions. Overheating, overvoltage (including  $dv/dt$ ), and surge currents are the main killers of semiconductors. Correct mounting, soldering, and forming of the leads also help protect against component damage.

### Environmental Specifications

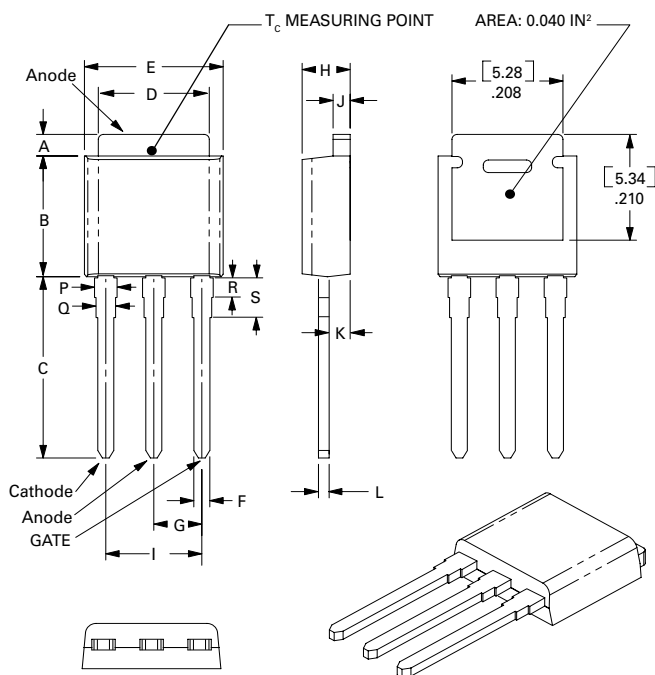
| Test                             | Specifications and Conditions                                              |
|----------------------------------|----------------------------------------------------------------------------|
| <b>AC Blocking</b>               | MIL-STD-750, M-1040, Cond A Applied Peak AC voltage @ 125°C for 1008 hours |
| <b>Temperature Cycling</b>       | MIL-STD-750, M-1051, 100 cycles; -40°C to +150°C; 15-min dwell-time        |
| <b>Temperature/Humidity</b>      | EIA / JEDEC, JESD22-A101 1008 hours; 320V - DC: 85°C; 85% rel humidity     |
| <b>High Temp Storage</b>         | MIL-STD-750, M-1031, 1008 hours; 150°C                                     |
| <b>Low-Temp Storage</b>          | 1008 hours; -40°C                                                          |
| <b>Resistance to Solder Heat</b> | MIL-STD-750 Method 2031                                                    |
| <b>Solderability</b>             | ANSI/J-STD-002, category 3, Test A                                         |
| <b>Lead Bend</b>                 | MIL-STD-750, M-2036 Cond E                                                 |

### Product Selector

| Part Number | Voltage |      |      |       | Gate Sensitivity | Type          | Package |
|-------------|---------|------|------|-------|------------------|---------------|---------|
|             | 400V    | 600V | 800V | 1000V |                  |               |         |
| Sxx06RS2    | X       | X    | -    | -     | 0.2mA            | Sensitive SCR | TO-220R |
| Sxx06LS2    | X       | X    | -    | -     | 0.2mA            | Sensitive SCR | TO-220L |
| Sxx06VS2    | X       | X    | -    | -     | 0.2mA            | Sensitive SCR | TO-251  |
| Sxx06DS2    | X       | X    | -    | -     | 0.2mA            | Sensitive SCR | TO-252  |
| Sxx06RS3    | X       | X    | -    | -     | 0.5mA            | Sensitive SCR | TO-220R |
| Sxx06LS3    | X       | X    | -    | -     | 0.5mA            | Sensitive SCR | TO-220L |
| Sxx06VS3    | X       | X    | -    | -     | 0.5mA            | Sensitive SCR | TO-251  |
| Sxx06DS3    | X       | X    | -    | -     | 0.5mA            | Sensitive SCR | TO-252  |
| Sxx06R      | X       | X    | X    | X     | 15mA             | Standard SCR  | TO-220R |
| Sxx06L      | X       | X    | X    | X     | 15mA             | Standard SCR  | TO-220L |
| Sxx06V      | X       | X    | X    | X     | 15mA             | Standard SCR  | TO-251  |
| Sxx06D      | X       | X    | X    | X     | 15mA             | Standard SCR  | TO-252  |

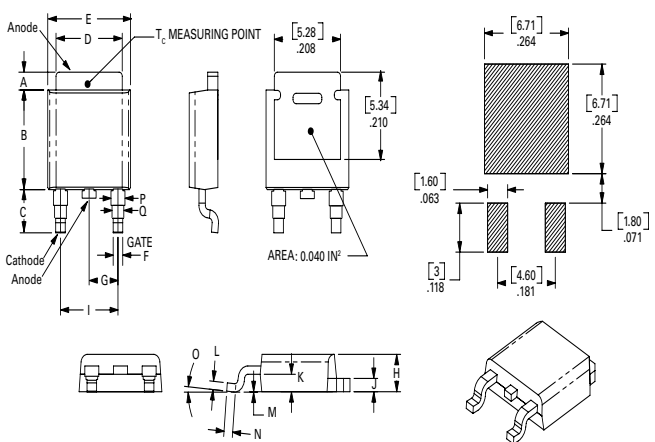
**Note:** xx = voltage

### Dimensions — TO-251AA (V/I-Package) — V/I-PAK Through Hole



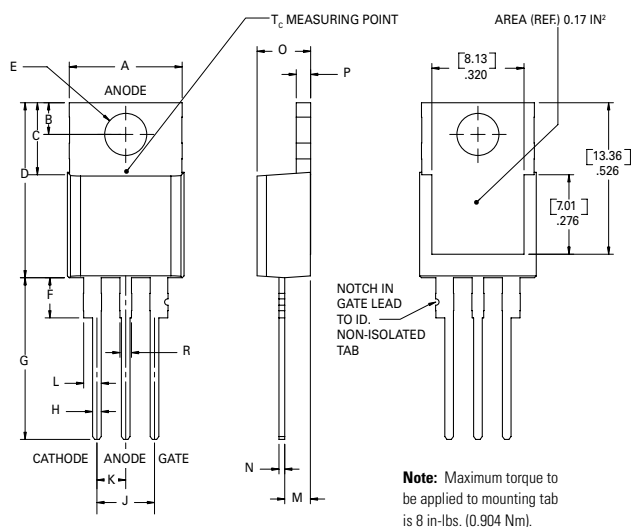
| Dimension | Inches |       |       | Millimeters |      |      |
|-----------|--------|-------|-------|-------------|------|------|
|           | Min    | Typ   | Max   | Min         | Typ  | Max  |
| A         | 0.037  | 0.040 | 0.043 | 0.94        | 1.01 | 1.09 |
| B         | 0.235  | 0.242 | 0.245 | 5.97        | 6.15 | 6.22 |
| C         | 0.350  | 0.361 | 0.375 | 8.89        | 9.18 | 9.53 |
| D         | 0.205  | 0.208 | 0.213 | 5.21        | 5.29 | 5.41 |
| E         | 0.255  | 0.262 | 0.265 | 6.48        | 6.66 | 6.73 |
| F         | 0.027  | 0.031 | 0.033 | 0.69        | 0.80 | 0.84 |
| G         | 0.087  | 0.090 | 0.093 | 2.21        | 2.28 | 2.36 |
| H         | 0.085  | 0.092 | 0.095 | 2.16        | 2.34 | 2.41 |
| I         | 0.176  | 0.180 | 0.184 | 4.47        | 4.57 | 4.67 |
| J         | 0.018  | 0.020 | 0.023 | 0.46        | 0.51 | 0.58 |
| K         | 0.035  | 0.037 | 0.039 | 0.90        | 0.95 | 1.00 |
| L         | 0.018  | 0.020 | 0.023 | 0.46        | 0.52 | 0.58 |
| P         | 0.042  | 0.047 | 0.052 | 1.06        | 1.20 | 1.32 |
| Q         | 0.034  | 0.039 | 0.044 | 0.86        | 1.00 | 1.11 |
| R         | 0.034  | 0.039 | 0.044 | 0.86        | 1.00 | 1.11 |
| S         | 0.074  | 0.079 | 0.084 | 1.86        | 2.00 | 2.11 |

### Dimensions — TO-252AA (D-Package) — D-PAK Surface Mount



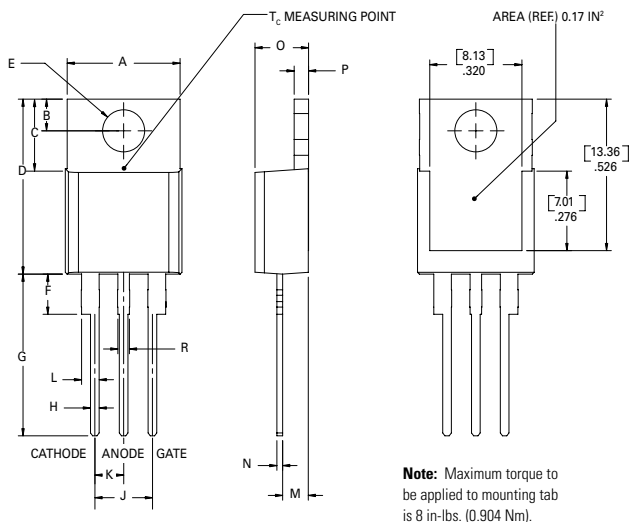
| Dimension | Inches |       |       | Millimeters |      |      |
|-----------|--------|-------|-------|-------------|------|------|
|           | Min    | Typ   | Max   | Min         | Typ  | Max  |
| A         | 0.037  | 0.040 | 0.043 | 0.94        | 1.01 | 1.09 |
| B         | 0.235  | 0.243 | 0.245 | 5.97        | 6.16 | 6.22 |
| C         | 0.106  | 0.108 | 0.113 | 2.69        | 2.74 | 2.87 |
| D         | 0.205  | 0.208 | 0.213 | 5.21        | 5.29 | 5.41 |
| E         | 0.255  | 0.262 | 0.265 | 6.48        | 6.65 | 6.73 |
| F         | 0.027  | 0.031 | 0.033 | 0.69        | 0.80 | 0.84 |
| G         | 0.087  | 0.090 | 0.093 | 2.21        | 2.28 | 2.36 |
| H         | 0.085  | 0.092 | 0.095 | 2.16        | 2.33 | 2.41 |
| I         | 0.176  | 0.179 | 0.184 | 4.47        | 4.55 | 4.67 |
| J         | 0.018  | 0.020 | 0.023 | 0.46        | 0.51 | 0.58 |
| K         | 0.035  | 0.037 | 0.039 | 0.90        | 0.95 | 1.00 |
| L         | 0.018  | 0.020 | 0.023 | 0.46        | 0.51 | 0.58 |
| M         | 0.000  | 0.000 | 0.004 | 0.00        | 0.00 | 0.10 |
| N         | 0.021  | 0.026 | 0.027 | 0.53        | 0.67 | 0.69 |
| O         | 0°     | 0°    | 5°    | 0°          | 0°   | 5°   |
| P         | 0.042  | 0.047 | 0.052 | 1.06        | 1.20 | 1.32 |
| Q         | 0.034  | 0.039 | 0.044 | 0.86        | 1.00 | 1.11 |

### Dimensions — TO-220AB (R-Package) — Non-Isolated Mounting Tab Common with Center Lead



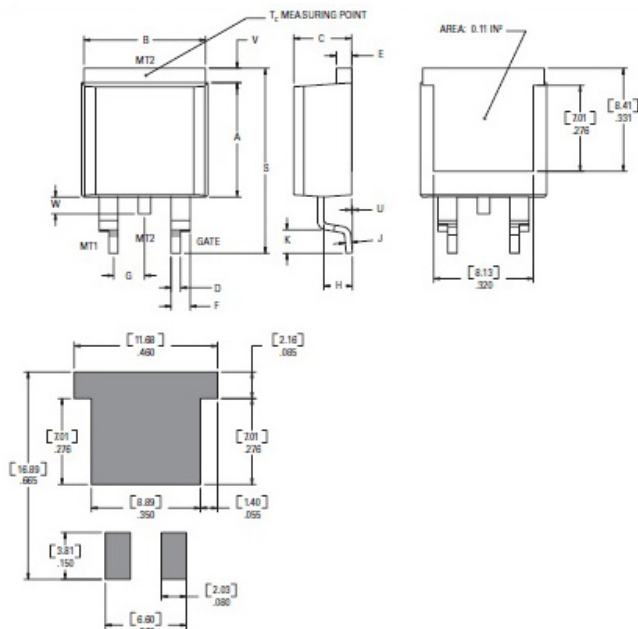
| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | Min    | Max   | Min         | Max   |
| A         | 0.380  | 0.420 | 9.65        | 10.67 |
| B         | 0.105  | 0.115 | 2.67        | 2.92  |
| C         | 0.230  | 0.250 | 5.84        | 6.35  |
| D         | 0.590  | 0.620 | 14.99       | 15.75 |
| E         | 0.142  | 0.147 | 3.61        | 3.73  |
| F         | 0.110  | 0.130 | 2.79        | 3.30  |
| G         | 0.540  | 0.575 | 13.72       | 14.61 |
| H         | 0.025  | 0.035 | 0.64        | 0.89  |
| J         | 0.195  | 0.205 | 4.95        | 5.21  |
| K         | 0.095  | 0.105 | 2.41        | 2.67  |
| L         | 0.060  | 0.075 | 1.52        | 1.91  |
| M         | 0.085  | 0.095 | 2.16        | 2.41  |
| N         | 0.018  | 0.024 | 0.46        | 0.61  |
| O         | 0.178  | 0.188 | 4.52        | 4.78  |
| P         | 0.045  | 0.060 | 1.14        | 1.52  |
| R         | 0.038  | 0.048 | 0.97        | 1.22  |

### Dimensions — TO-220AB (L-Package) — Isolated Mounting Tab



| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | Min    | Max   | Min         | Max   |
| A         | 0.380  | 0.420 | 9.65        | 10.67 |
| B         | 0.105  | 0.115 | 2.67        | 2.92  |
| C         | 0.230  | 0.250 | 5.84        | 6.35  |
| D         | 0.590  | 0.620 | 14.99       | 15.75 |
| E         | 0.142  | 0.147 | 3.61        | 3.73  |
| F         | 0.110  | 0.130 | 2.79        | 3.30  |
| G         | 0.540  | 0.575 | 13.72       | 14.61 |
| H         | 0.025  | 0.035 | 0.64        | 0.89  |
| J         | 0.195  | 0.205 | 4.95        | 5.21  |
| K         | 0.095  | 0.105 | 2.41        | 2.67  |
| L         | 0.060  | 0.075 | 1.52        | 1.91  |
| M         | 0.085  | 0.095 | 2.16        | 2.41  |
| N         | 0.018  | 0.024 | 0.46        | 0.61  |
| O         | 0.178  | 0.188 | 4.52        | 4.78  |
| P         | 0.045  | 0.060 | 1.14        | 1.52  |
| R         | 0.038  | 0.048 | 0.97        | 1.22  |

### Dimensions — TO-263 (N Package) — D<sup>2</sup>Pak Surface Mount



| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | Min    | Max   | Min         | Max   |
| A         | 0.360  | 0.370 | 9.14        | 9.40  |
| B         | 0.380  | 0.420 | 9.65        | 10.67 |
| C         | 0.178  | 0.188 | 4.52        | 4.78  |
| D         | 0.025  | 0.035 | 0.64        | 0.89  |
| E         | 0.045  | 0.060 | 1.14        | 1.52  |
| F         | 0.060  | 0.075 | 1.52        | 1.91  |
| G         | 0.095  | 0.105 | 2.41        | 2.67  |
| H         | 0.092  | 0.102 | 2.34        | 2.59  |
| J         | 0.018  | 0.024 | 0.46        | 0.61  |
| K         | 0.090  | 0.110 | 2.29        | 2.79  |
| S         | 0.590  | 0.625 | 14.99       | 15.88 |
| V         | 0.035  | 0.045 | 0.89        | 1.14  |
| U         | 0.002  | 0.010 | 0.05        | 0.25  |
| W         | 0.040  | 0.070 | 1.02        | 1.78  |

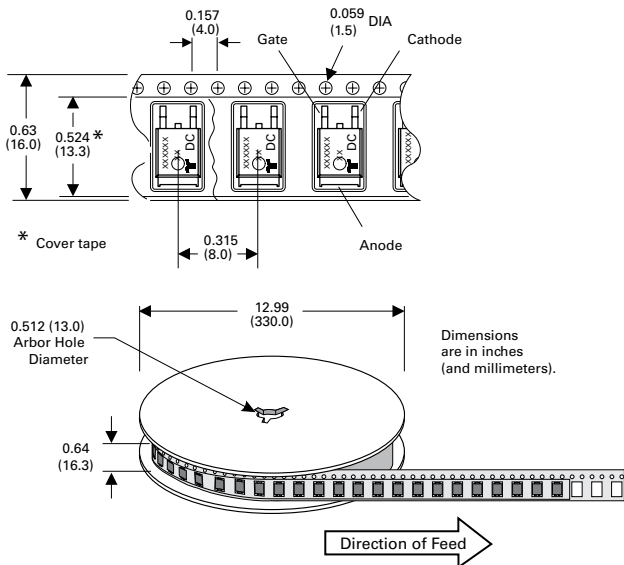
### Packing Options

| Part Number  | Marking    | Weight | Packing Mode     | Base Quantity      |
|--------------|------------|--------|------------------|--------------------|
| Sxx06L/RyyTP | Sxx06L/Ryy | 2.2 g  | Tube             | 1000 (50 per tube) |
| Sxx06DyyTP   | Sxx06Dyy   | 0.3 g  | Tube             | 750 (75 per tube)  |
| Sxx06DyyRP   | Sxx06Dyy   | 0.3 g  | Embossed Carrier | 2500               |
| Sxx06VyyTP   | Sxx06Vyy   | 0.4 g  | Tube             | 750 (75 per tube)  |
| Sxx06L/RTP   | Sxx06L/R   | 2.2 g  | Tube             | 1000 (50 per tube) |
| Sxx06DTP     | Sxx06D     | 0.3 g  | Tube             | 750 (75 per tube)  |
| Sxx06DRP     | Sxx06D     | 0.3 g  | Embossed Carrier | 2500               |
| Sxx06VTP     | Sxx06V     | 0.4 g  | Tube             | 750 (75 per tube)  |
| Sxx06NyyRP   | Sxx6Nyy    | 1.6g   | Embossed Carrier | 500                |
| Sxx06NyyTP   | Sxx6Nyy    | 1.6g   | Tube             | 1000 (50 per tube) |
| Sxx06NRP     | Sxx6N      | 1.6g   | Embossed Carrier | 500                |
| Sxx06NTP     | Sxx6N      | 1.6g   | Tube             | 1000 (50 per tube) |

Note: xx = Voltage/10; yy = Sensitivity

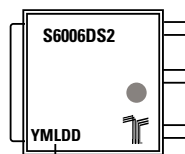
### TO-252 Embossed Carrier Reel Pack (RP) Specs

Meets all EIA-481-2 Standards



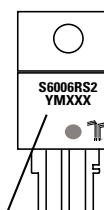
### Part Marking System

**TO-251AA- (V Package)**  
**TO-252AA- (D Package)**



Date Code Marking  
Y: Year Code  
M: Month Code  
L: Location Code  
DD: Calendar Code

**TO-263 AA - (N Package)**  
**TO-220 AB - (L and R Package)**



Date Code Marking  
Y: Year Code  
M: Month Code  
XXX: Lot Trace Code

### Part Numbering System

