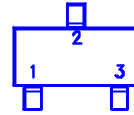
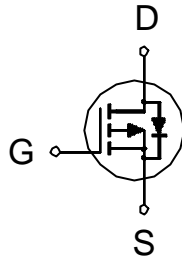


**PRODUCT SUMMARY**

|               |              |       |
|---------------|--------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
| -20           | 150m         | -3A   |



1 :GATE  
2 :DRAIN  
3 :SOURCE

**ABSOLUTE MAXIMUM RATINGS ( $T_C = 25\text{ }^\circ\text{C}$  Unless Otherwise Noted)**

| PARAMETERS/TEST CONDITIONS                     |                                  | SYMBOL         | LIMITS     | UNITS            |
|--|----------------------------------|----------------|------------|------------------|
| Drain-Source Voltage                           |                                  | $V_{DS}$       | -20        | V                |
| Gate-Source Voltage                            |                                  | $V_{GS}$       | $\pm 12$   | V                |
| Continuous Drain Current                       | $T_C = 25\text{ }^\circ\text{C}$ | $I_D$          | -3         | A                |
|  | $T_C = 70\text{ }^\circ\text{C}$ |                | -1.4       |                  |
| Pulsed Drain Current <sup>1</sup>              |                                  | $I_{DM}$       | -10        |                  |
| Power Dissipation                              | $T_C = 25\text{ }^\circ\text{C}$ | $P_D$          | 1.25       | W                |
|  | $T_C = 70\text{ }^\circ\text{C}$ |                | 0.8        |                  |
| Operating Junction & Storage Temperature Range |                                  | $T_j, T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

**THERMAL RESISTANCE RATINGS**

| THERMAL RESISTANCE  | SYMBOL          | TYPICAL | MAXIMUM | UNITS                       |
|---------------------|-----------------|---------|---------|-----------------------------|
| Junction-to-Ambient | $R_{\theta JA}$ |         | 166     | $^\circ\text{C} / \text{W}$ |

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle  $\leq 1\%$

**ELECTRICAL CHARACTERISTICS ( $T_C = 25\text{ }^\circ\text{C}$ , Unless Otherwise Noted)**

| PARAMETER                                     | SYMBOL        | TEST CONDITIONS   | LIMITS |      |           | UNIT          |
|---|---------------|---|--------|------|-----------|---------------|
|   |               |   | MIN    | TYP  | MAX       |               |
| <b>STATIC</b>                                 |               |   |        |      |           |               |
| Drain-Source Breakdown Voltage                | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu\text{A}$                          | -20    |      |           | V             |
| Gate Threshold Voltage                        | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$                      | -0.5   | -0.9 | -1.2      |               |
| Gate-Body Leakage                             | $I_{GSS}$     | $V_{DS} = 0V, V_{GS} = \pm 12V$                               |        |      | $\pm 100$ | nA            |
| Zero Gate Voltage Drain Current               | $I_{DSS}$     | $V_{DS} = -16V, V_{GS} = 0V$                                  |        |      | -1        | $\mu\text{A}$ |
|   |               | $V_{DS} = -16V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$ |        |      | -10       |               |
| On-State Drain Current <sup>1</sup>           | $I_{D(ON)}$   | $V_{DS} = -5V, V_{GS} = -4.5V$                                | -6     |      |           | A             |
| Drain-Source On-State Resistance <sup>1</sup> | $R_{DS(ON)}$  | $V_{GS} = -4.5V, I_D = -2A$                                   |        | 100  | 150       | m             |
|   |               | $V_{GS} = -2.5V, I_D = -1A$                                   |        | 180  | 250       |               |

|   |              |   |  |      |      |    |
|---|--------------|---|--|------|------|----|
| Forward Transconductance <sup>1</sup>   | $g_{fs}$     | $V_{DS} = -5V, I_D = -2A$                                   |  | 16   |      | S  |
| <b>DYNAMIC</b>  |              |   |  |      |      |    |
| Input Capacitance   | $C_{iss}$    | $V_{GS} = 0V, V_{DS} = -6V, f = 1MHz$                       |  | 410  |      | pF |
| Output Capacitance  | $C_{oss}$    |   |  | 220  |      |    |
| Reverse Transfer Capacitance  | $C_{rss}$    |   |  | 85   |      |    |
| Total Gate Charge <sup>2</sup>  | $Q_g$        | $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -4.5V,$<br>$I_D = -2A$   |  | 5.8  | 10   | nC |
| Gate-Source Charge <sup>2</sup>   | $Q_{gs}$     |   |  | 0.85 |      |    |
| Gate-Drain Charge <sup>2</sup>  | $Q_{gd}$     |   |  | 1.70 |      |    |
| Turn-On Delay Time <sup>2</sup>   | $t_{d(on)}$  | $V_{DD} = -10V$<br>$I_D \cong -1A, V_{GS} = -4.5V, R_G = 6$ |  | 13   |      | nS |
| Rise Time <sup>2</sup>  | $t_r$        |   |  | 36   |      |    |
| Turn-Off Delay Time <sup>2</sup>  | $t_{d(off)}$ |   |  | 42   |      |    |
| Fall Time <sup>2</sup>  | $t_f$        |   |  | 34   |      |    |
| <b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (<math>T_C = 25\text{ }^\circ\text{C}</math>)</b> |              |   |  |      |      |    |
| Continuous Current  | $I_S$        |   |  |      | -1.6 | A  |
| Pulsed Current <sup>3</sup>   | $I_{SM}$     |   |  |      | -3   |    |
| Forward Voltage <sup>1</sup>  | $V_{SD}$     | $I_F = -1A, V_{GS} = 0V$                                    |  |      | -1.2 | V  |

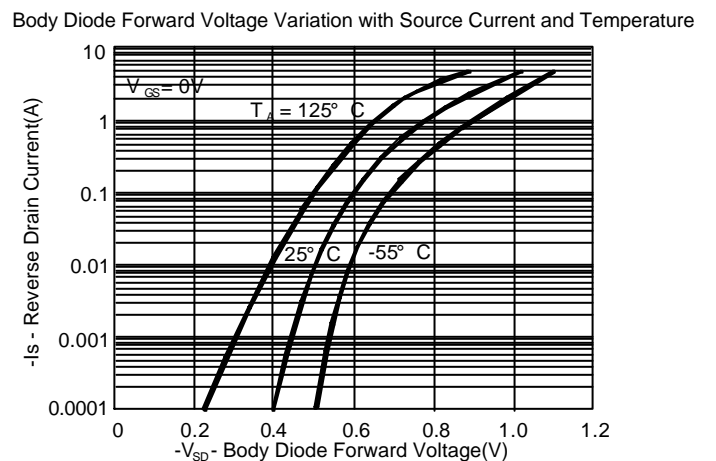
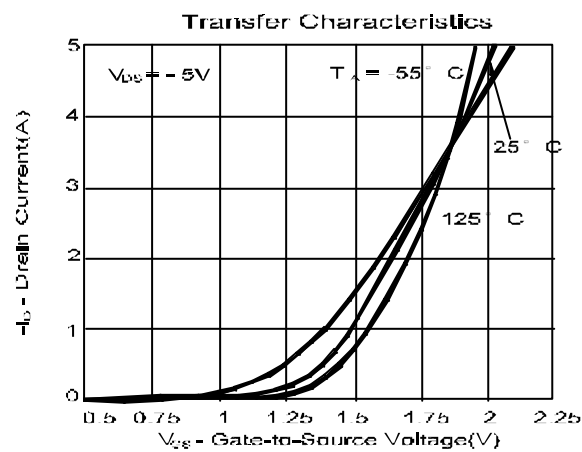
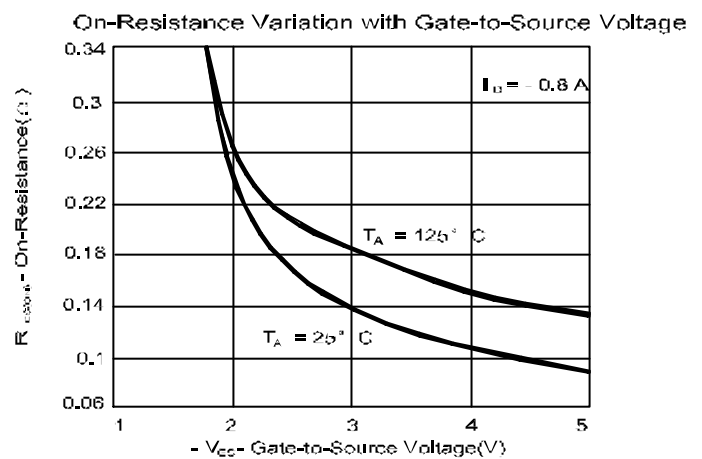
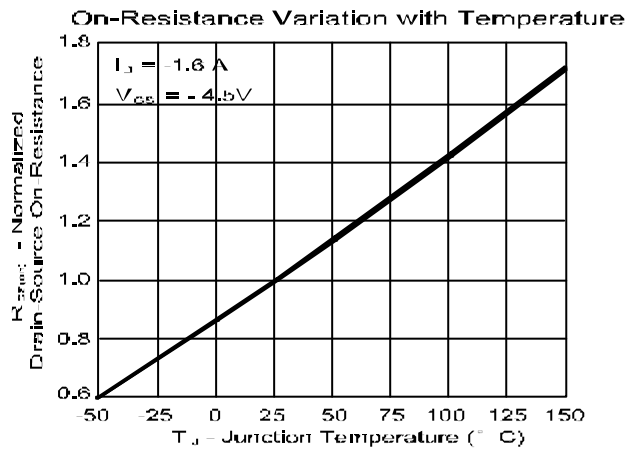
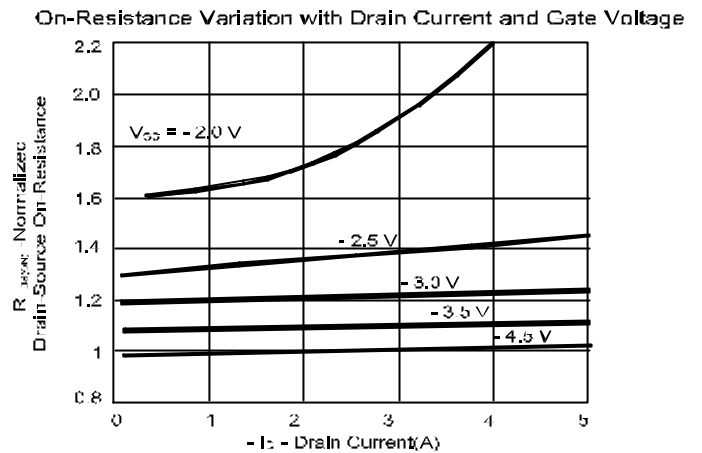
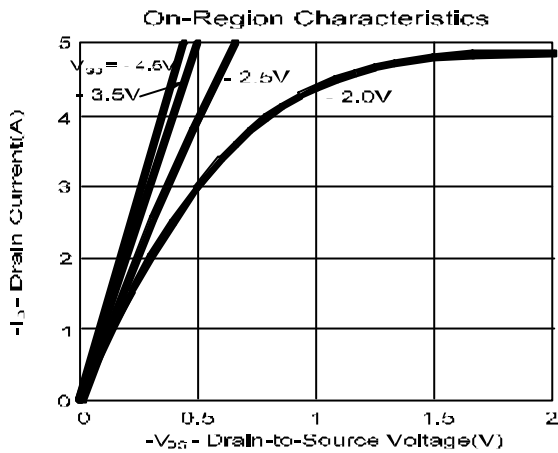
<sup>1</sup>Pulse test : Pulse Width  $\leq 300\ \mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

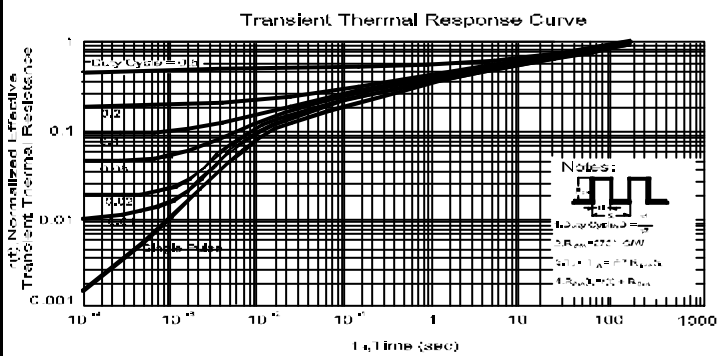
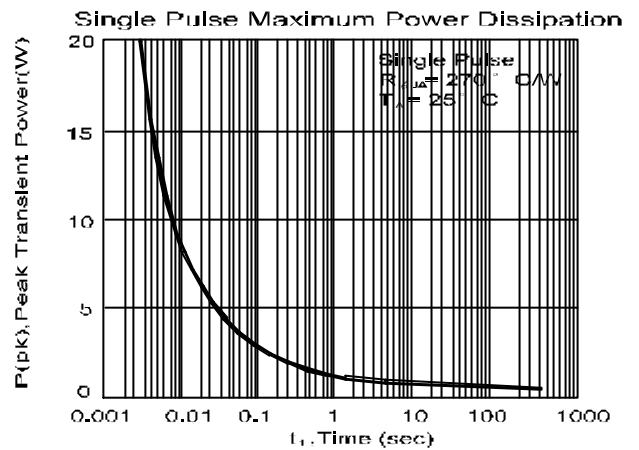
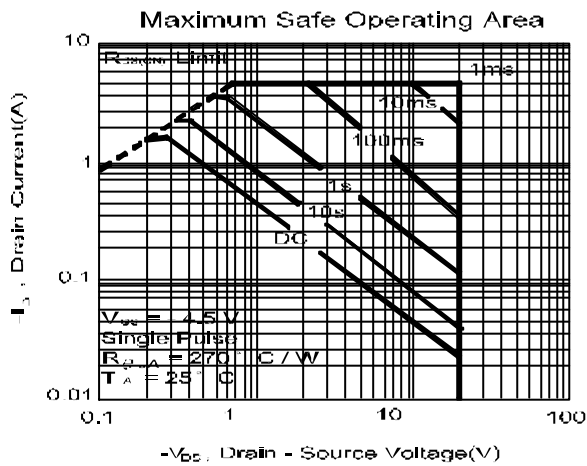
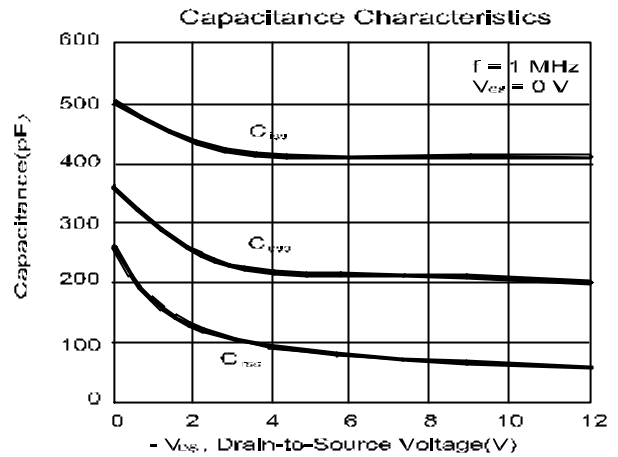
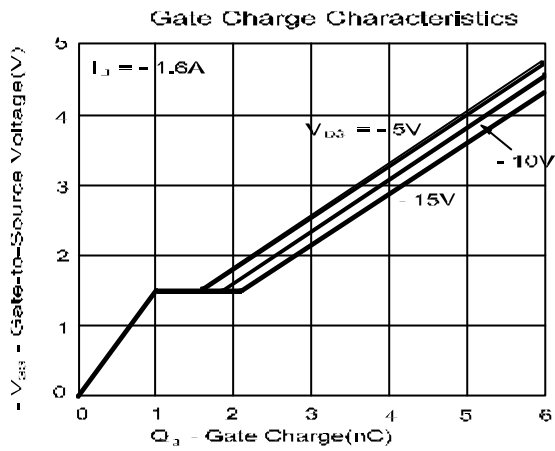
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Pulse width limited by maximum junction temperature.

**REMARK: THE PRODUCT MARKED WITH “20YWW”, DATE CODE or LOT #**

**Orders for parts with Lead-Free plating can be placed using the PXXXXXXG parts name.**





**SOT-23 (M3) MECHANICAL DATA**

| Dimension | mm   |      |      | Dimension | mm   |      |      |
|-----------|------|------|------|-----------|------|------|------|
|           | Min. | Typ. | Max. |           | Min. | Typ. | Max. |
| A         | 0.85 |      | 1.15 | H         | 0.1  | 0.15 | 0.25 |
| B         | 2.4  |      | 3    | I         | 0.37 |      |      |
| C         | 1.4  | 1.6  | 1.8  | J         |      |      |      |
| D         | 2.7  | 2.9  | 3.1  | K         |      |      |      |
| E         | 1    | 1.1  | 1.3  | L         |      |      |      |
| F         | 0    |      | 0.1  | M         |      |      |      |
| G         | 0.35 |      | 0.5  | N         |      |      |      |

