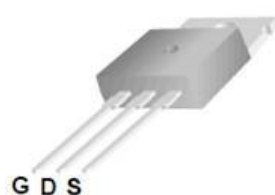


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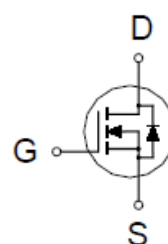
## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$                  | $I_D$ |
|---------------|-------------------------------|-------|
| 100V          | 50m $\Omega$ @ $V_{GS} = 10V$ | 30A   |



TO-220



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

| PARAMETERS/TEST CONDITIONS                     |                                     | SYMBOL         | LIMITS     | UNITS              |
|------------------------------------------------|-------------------------------------|----------------|------------|--------------------|
| Drain-Source Voltage                           |                                     | $V_{DS}$       | 100        | V                  |
| Gate-Source Voltage                            |                                     | $V_{GS}$       | $\pm 20$   |                    |
| Continuous Drain Current                       | $T_C = 25\text{ }^{\circ}\text{C}$  | $I_D$          | 30         | A                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | 18         |                    |
| Pulsed Drain Current <sup>1</sup>              |                                     | $I_{DM}$       | 70         |                    |
| Avalanche Current                              |                                     | $I_{AS}$       | 37         |                    |
| Avalanche Energy                               | $L = 0.1\text{mH}$                  | $E_{AS}$       | 70         | mJ                 |
| Power Dissipation                              | $T_C = 25\text{ }^{\circ}\text{C}$  | $P_D$          | 96         | W                  |
|                                                | $T_C = 100\text{ }^{\circ}\text{C}$ |                | 38         |                    |
| 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-Case   | $R_{\theta JC}$ |         | 1.3     | $^{\circ}\text{C} / \text{W}$ |

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

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## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

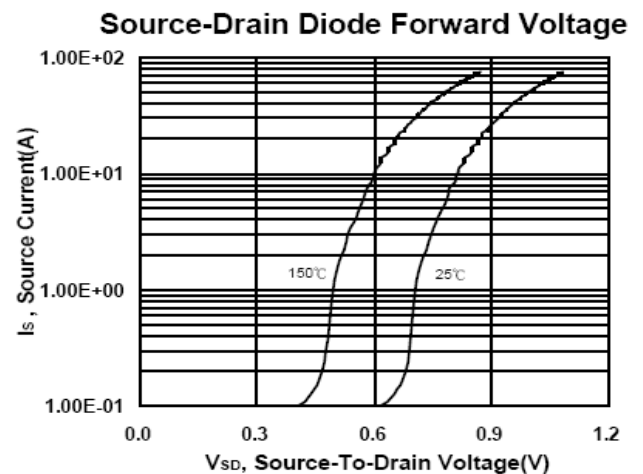
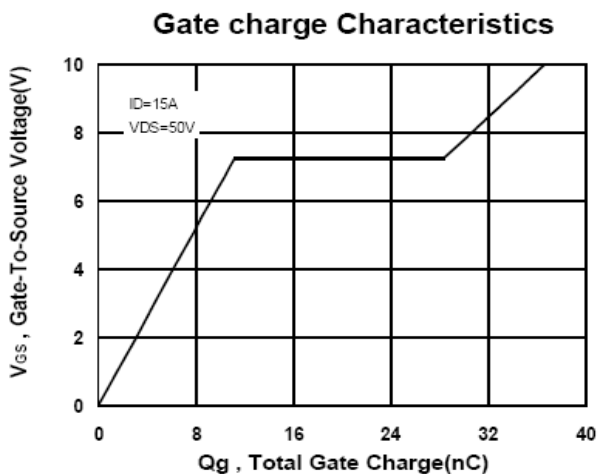
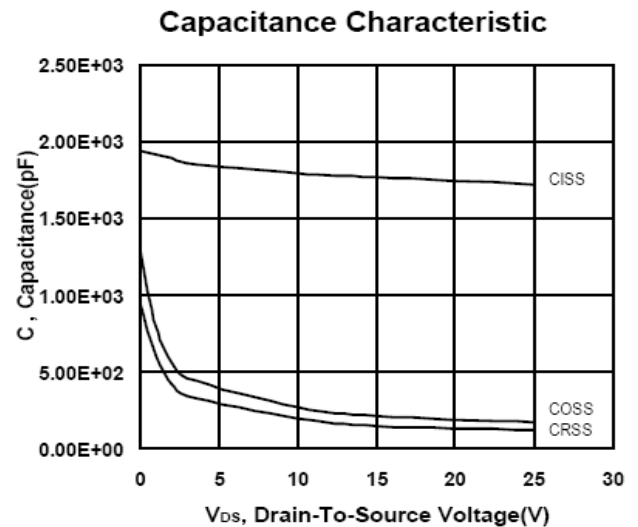
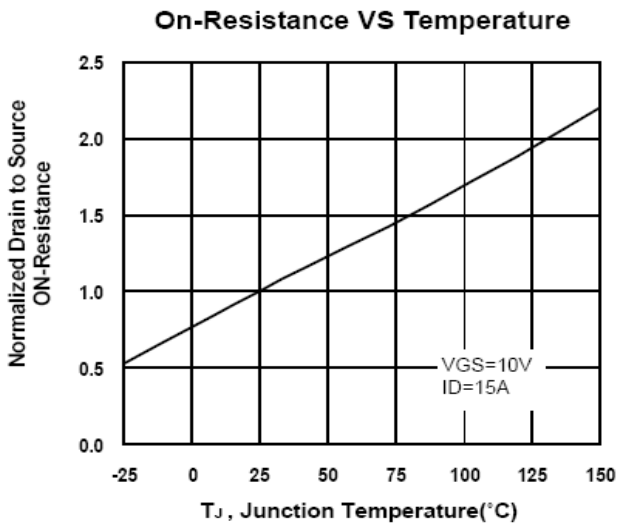
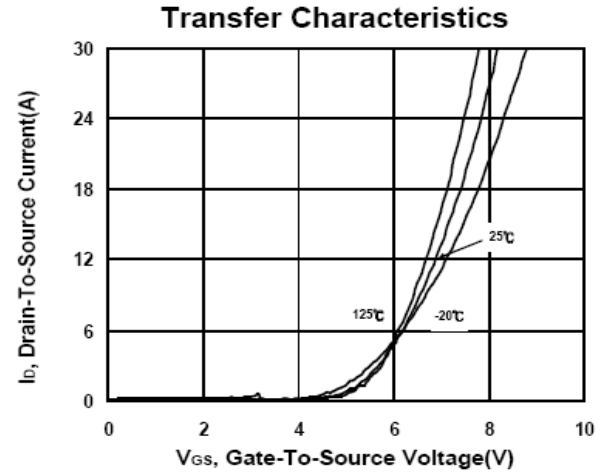
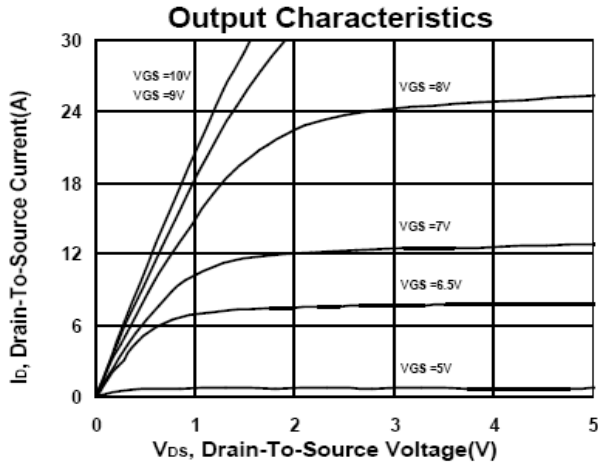
| PARAMETER                                                               | SYMBOL               | TEST CONDITIONS                                                                              | LIMITS |      |      | UNIT |
|-------------------------------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------|--------|------|------|------|
|                                                                         |                      |                                                                                              | MIN    | TYP  | MAX  |      |
| STATIC                                                                  |                      |                                                                                              |        |      |      |      |
| Drain-Source Breakdown Voltage                                          | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                 | 100    |      |      | V    |
| Gate Threshold Voltage                                                  | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                   | 2      | 3    | 4    |      |
| Gate-Body Leakage                                                       | I <sub>GSS</sub>     | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V                                                 |        |      | ±100 | nA   |
| Zero Gate Voltage Drain Current                                         | I <sub>DSS</sub>     | V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V                                                  |        |      | 1    | μA   |
|                                                                         |                      | V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V , T <sub>J</sub> = 125 °C                        |        |      | 10   |      |
| On-State Drain Current <sup>1</sup>                                     | I <sub>D(ON)</sub>   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V                                                 | 70     |      |      | A    |
| Drain-Source On-State Resistance <sup>1</sup>                           | R <sub>DS(ON)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A                                                  |        | 39   | 50   | mΩ   |
| Forward Transconductance <sup>1</sup>                                   | g <sub>fs</sub>      | V <sub>DS</sub> = 10V, I <sub>D</sub> = 15A                                                  |        | 10   |      | S    |
| DYNAMIC                                                                 |                      |                                                                                              |        |      |      |      |
| Input Capacitance                                                       | C <sub>iss</sub>     | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1MHz                                        |        | 1723 |      | pF   |
| Output Capacitance                                                      | C <sub>oss</sub>     |                                                                                              |        | 173  |      |      |
| Reverse Transfer Capacitance                                            | C <sub>rss</sub>     |                                                                                              |        | 120  |      |      |
| Gate Resistance                                                         | R <sub>g</sub>       | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz                                         |        | 2.2  |      | Ω    |
| Total Gate Charge <sup>2</sup>                                          | Q <sub>g</sub>       | V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A                           |        | 38   |      | nC   |
| Gate-Source Charge <sup>2</sup>                                         | Q <sub>gs</sub>      |                                                                                              |        | 12   |      |      |
| Gate-Drain Charge <sup>2</sup>                                          | Q <sub>gd</sub>      |                                                                                              |        | 18   |      |      |
| Turn-On Delay Time <sup>2</sup>                                         | t <sub>d(on)</sub>   | V <sub>DD</sub> = 50V,<br>I <sub>D</sub> ≅ 15A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 6Ω |        | 15   |      | nS   |
| Rise Time <sup>2</sup>                                                  | t <sub>r</sub>       |                                                                                              |        | 130  |      |      |
| Turn-Off Delay Time <sup>2</sup>                                        | t <sub>d(off)</sub>  |                                                                                              |        | 30   |      |      |
| Fall Time <sup>2</sup>                                                  | t <sub>f</sub>       |                                                                                              |        | 90   |      |      |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T <sub>J</sub> = 25 °C) |                      |                                                                                              |        |      |      |      |
| Continuous Current                                                      | I <sub>S</sub>       |                                                                                              |        |      | 30   | A    |
| Forward Voltage <sup>1</sup>                                            | V <sub>SD</sub>      | I <sub>F</sub> = 15A, V <sub>GS</sub> = 0V                                                   |        |      | 1.2  | V    |
| Reverse Recovery Time                                                   | t <sub>rr</sub>      | I <sub>F</sub> = 15A, dI <sub>F</sub> /dt = 100A / μS                                        |        | 72   |      | nS   |
| Reverse Recovery Charge                                                 | Q <sub>rr</sub>      |                                                                                              |        | 206  |      | nC   |

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

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

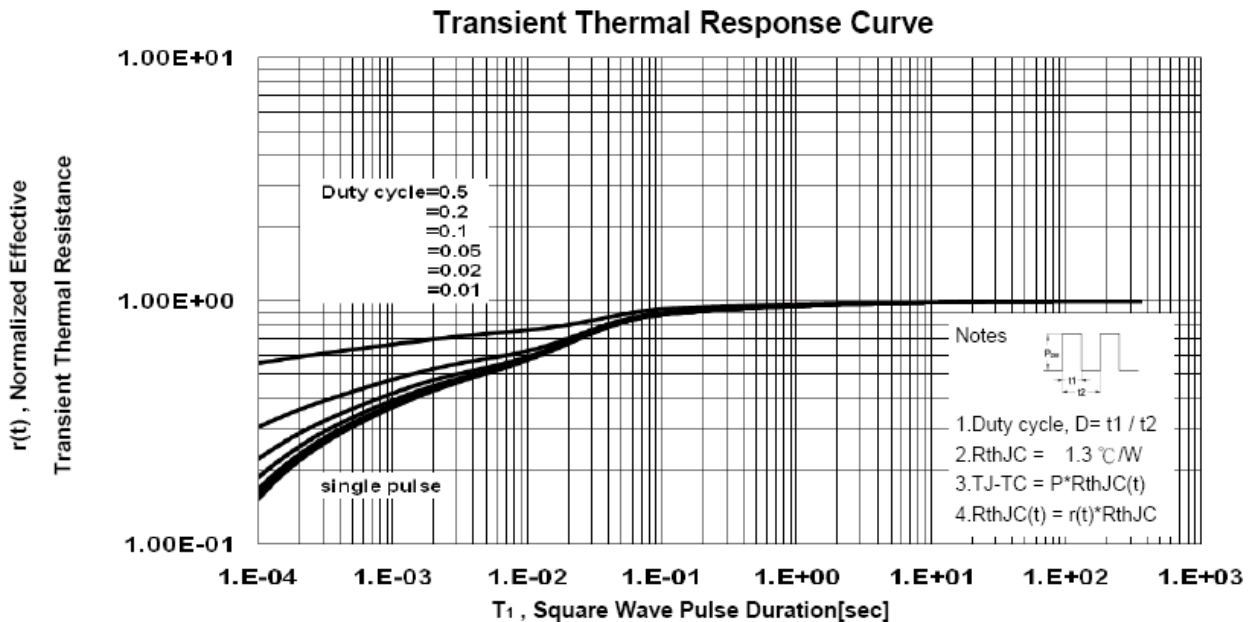
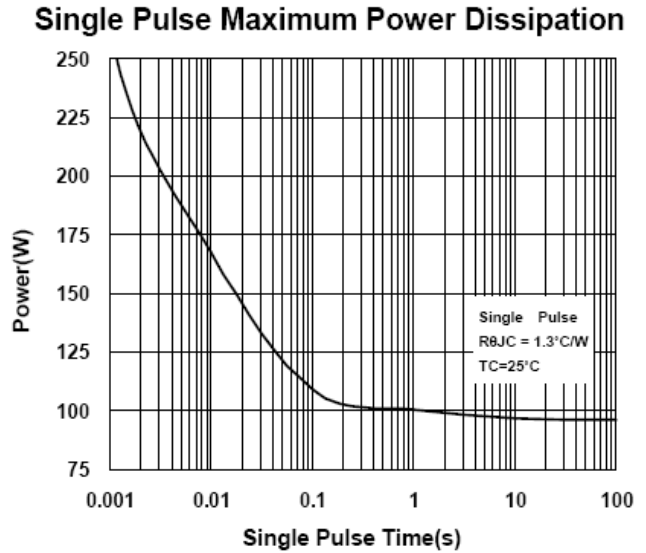
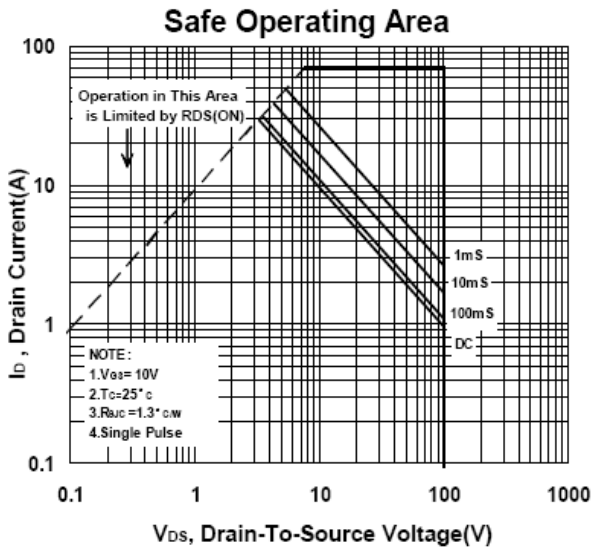
## P5010AT

### N-Channel Enhancement Mode MOSFET



# P5010AT

## N-Channel Enhancement Mode MOSFET



# P5010AT

## N-Channel Enhancement Mode MOSFET

### Package Dimension

### TO-220 (3-Lead) MECHANICAL DATA

| Dimension | mm     |       |        | Dimension | mm    |      |       |
|-----------|--------|-------|--------|-----------|-------|------|-------|
|           | Min.   | Typ.  | Max.   |           | Min.  | Typ. | Max.  |
| A         | 9.652  | 10.16 | 11.5   | H         | 2.04  | 2.54 | 3.04  |
| B         | 2.54   | 2.79  | 3.048  | I         | 1.15  | 1.52 | 1.778 |
| C         | 17.3   |       | 22.86  | J         | 3.556 | 4.57 | 4.826 |
| D         | 26.924 | 29.03 | 31.242 | K         | 0.508 | 1.3  | 1.45  |
| E         | 14.224 | 15.45 | 16.510 | L         | 1.89  | 2.69 | 3.09  |
| F         | 8.382  | 9.20  | 9.40   | M         | 0.34  | 0.5  | 0.6   |
| G         | 0.381  | 0.81  | 1.016  | N         |       |      |       |

