UNIKC Semiconductor

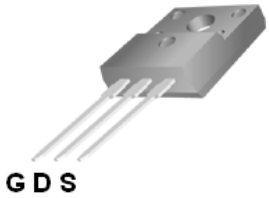
RoHS Compliant

# P2610ATFG

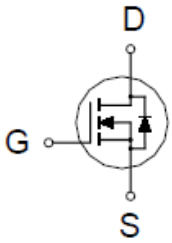
## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|---|---|---|
| 100V | 26mΩ @$V_{GS}$ = 10V | 31A |




TO-220F




**100% UIS tested**

### ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25 °C Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNITS |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $T_C$ = 25 °C | $I_D$ | 31 | A |
| | $T_C$ = 100 °C | | 19 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | 130 | |
| Avalanche Current | | $I_{AS}$ | 77 | |
| Avalanche Energy | L = 0.3mH | $E_{AS}$ | 900 | mJ |
| Power Dissipation | $T_C$ = 25 °C | $P_D$ | 50 | W |
| | $T_C$ = 100 °C | | 20 | |
| Operating Junction & Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to 150 | °C |
| Lead Temperature ( $^1/_{16}$" from case for 10 sec.) | | $T_L$ | 275 | |

### THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNITS |
|---|---|---|---|---|
| Junction-to-Case | $R_{\theta JC}$ | | 2.5 | °C / W |
| Junction-to-Ambient | $R_{\theta JA}$ | | 62.5 | |
| Case-to-Heatsink | $R_{\theta CS}$ | 0.5 | | |

[1]Pulse width limited by maximum junction temperature.

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### ELECTRICAL CHARACTERISTICS ($T_J$ = 25 °C, Unless Otherwise Noted)

| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| **STATIC** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 100 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1.5 | 2.3 | 4.0 | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | | | ±250 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 80V, $V_{GS}$ = 0V | | | 1 | μA |
| | | $V_{DS}$ = 80V, $V_{GS}$ = 0V , $T_J$ = 125 °C | | | 10 | |
| On-State Drain Current[1] | $I_{D(ON)}$ | $V_{DS}$ = 10V, $V_{GS}$ = 10V | 31 | | | A |
| Drain-Source On-State | $R_{DS(ON)}$ | $V_{GS}$ = 10V, $I_D$ = 25A | | 21 | 26 | mΩ |
| Forward Transconductance[1] | $g_{fs}$ | $V_{DS}$ = 40V, $I_D$ = 25A | | 38 | | S |
| **DYNAMIC** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1MHz | | 4900 | | pF |
| Output Capacitance | $C_{oss}$ | | | 887 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 186 | | |
| Total Gate Charge[2] | $Q_g$ | $V_{DS}$ = 80V, $V_{GS}$ = 10V, $I_D$ = 50A | | 79 | | nC |
| Gate-Source Charge[2] | $Q_{gs}$ | | | 31 | | |
| Gate-Drain Charge[2] | $Q_{gd}$ | | | 30 | | |
| Turn-On Delay Time[2] | $t_{d(on)}$ | $V_{DD}$ = 50V, $I_D \cong$ 30A, $V_{GS}$ = 10V, $R_{GS}$ = 25Ω | | 25 | | nS |
| Rise Time[2] | $t_r$ | | | 250 | | |
| Turn-Off Delay Time[2] | $t_{d(off)}$ | | | 110 | | |
| Fall Time[2] | $t_f$ | | | 140 | | |
| **SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_J$ = 25 °C)** | | | | | | |
| Continuous Current | $I_S$ | | | | 31 | A |
| Forward Voltage[1] | $V_{SD}$ | $I_F$ = $I_S$, $V_{GS}$ = 0V | | | 1.5 | V |
| Reverse Recovery Time | $t_{rr}$ | | | 100 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 380 | | nC |

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

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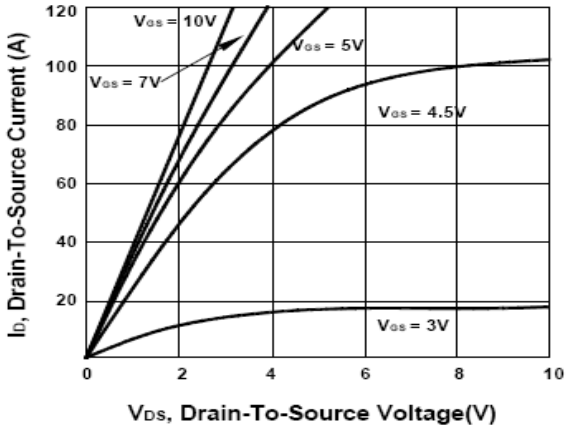
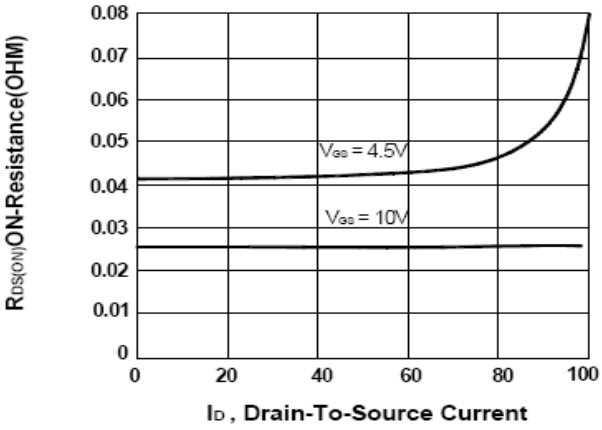
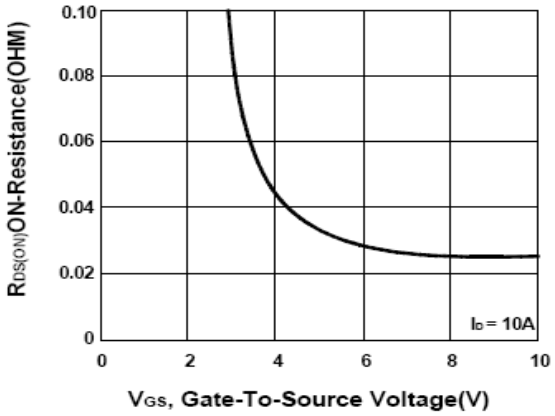
### Output Characteristics



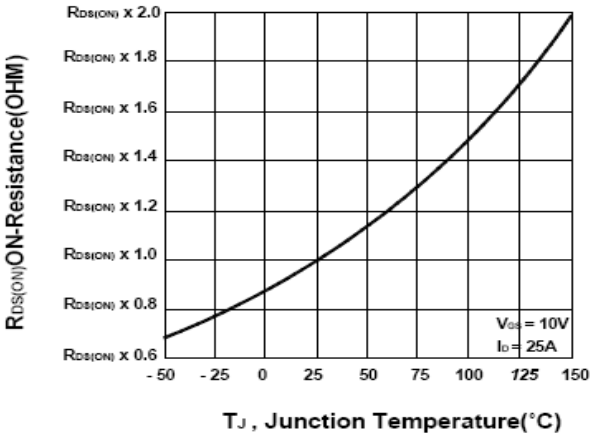

### On-Resistance VS Drain Current



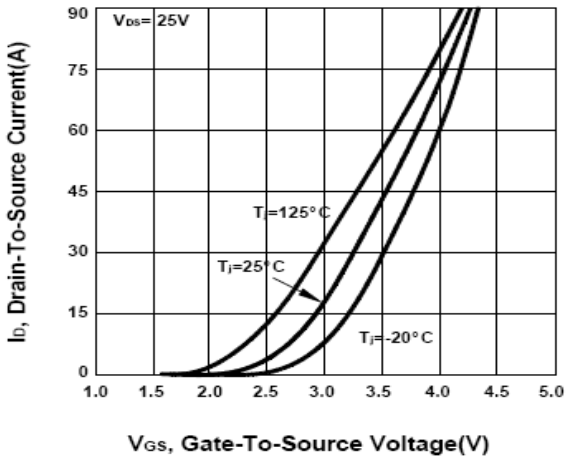

### On-Resistance VS Gate-To-Source



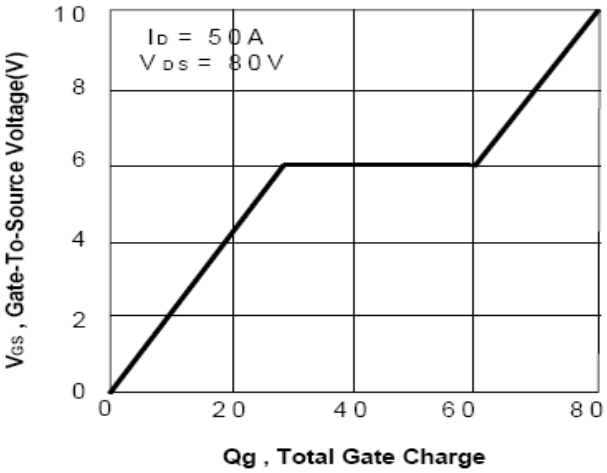

### On-Resistance VS Temperature




### Transfer Characteristics




### Gate charge Characteristics



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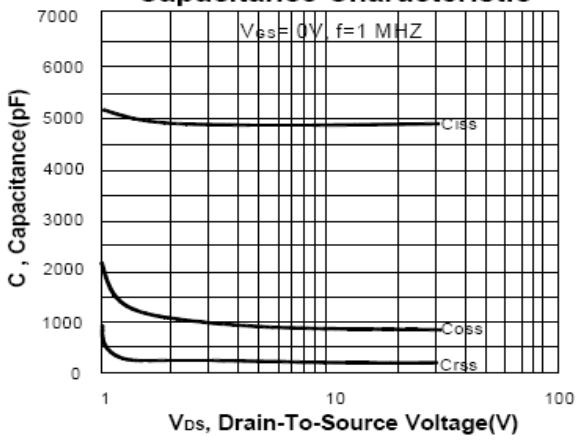
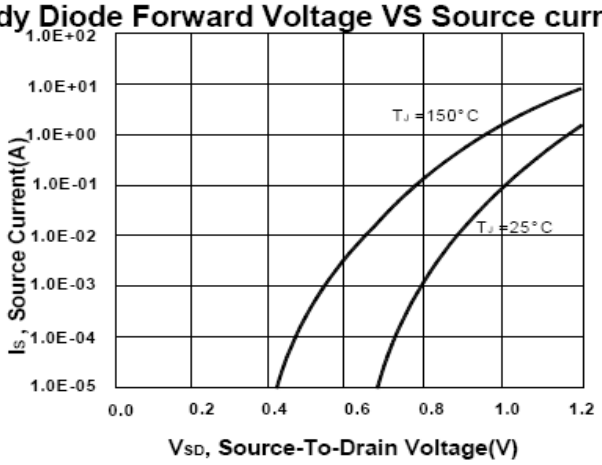
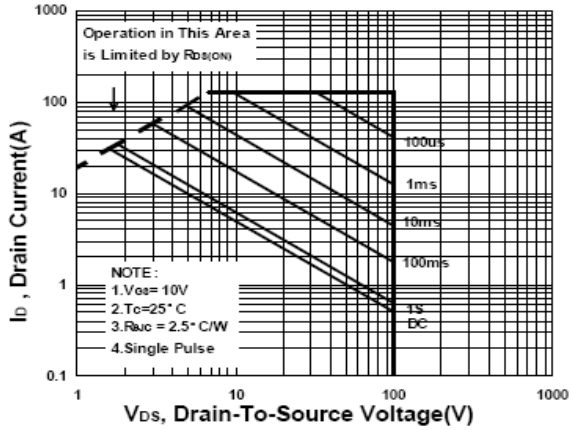
### Capacitance Characteristic



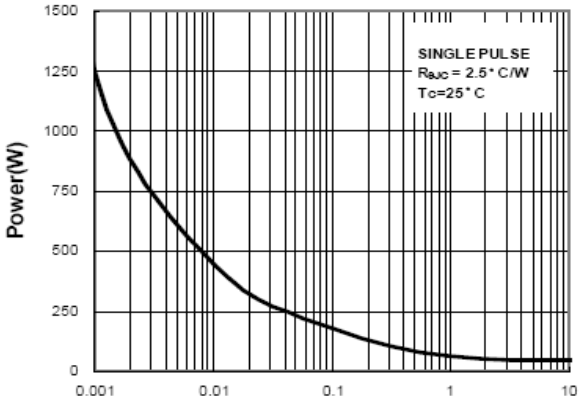

### Body Diode Forward Voltage VS Source current



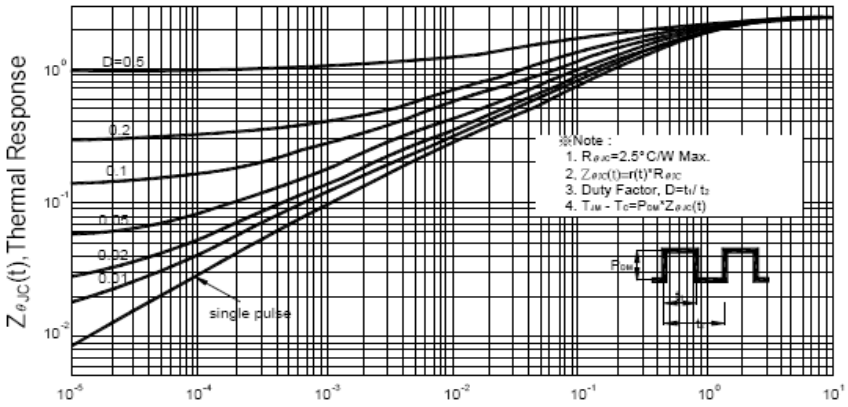

### Safe Operating Area




### Single Pulse Maximum Power Dissipation




### Transient Thermal Response Curve



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### Package Dimension

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

| Dimension | mm | | | Dimension | mm | | |
|---|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | | Min. | Typ. | Max. |
| A | 4.2 | | 4.93 | e | 2.05 | 2.55 | 3.05 |
| A1 | 2.34 | | 3.1 | F | 27.45 | | 30.6 |
| B | 17.77 | | 20.3 | G | 7.72 | | 9.3 |
| b | 0.6 | | 1.05 | H | 6.1 | | 7.1 |
| b1 | 0.9 | 1.23 | 1.62 | L | 12.5 | | 14.5 |
| b2 | 0.6 | | 1.9 | L1 | 1.97 | | 3.8 |
| c | 0.4 | | 1.0 | P | 2.98 | | 3.4 |
| D | 14.7 | | 16.4 | Q | 2.1 | | 2.96 |
| D1 | 6.4 | | 7.5 | q | 3.0 | | 3.8 |
| E | 9.7 | | 10.4 | | | | |