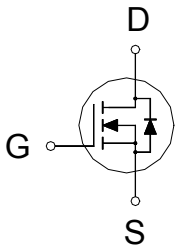
**NIKO-SEM**

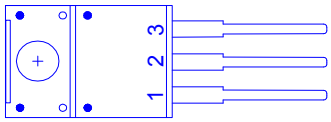
# N-Channel Enhancement Mode Field Effect Transistor

**P2806ATF**
**TO-220F**
**Halogen-Free & Lead-Free**

## PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|---|---|---|
| 60V | 30mΩ | 27A |




1. GATE
2. DRAIN
3. SOURCE

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

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNITS |
|---|---|---|---|---|
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$ = 25 °C | $I_D$ | 27 | A |
| | $T_C$ = 100 °C | | 17 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | 105 | |
| Avalanche Current | | $I_{AS}$ | 29 | |
| Avalanche Energy | L = 0.1mH | $E_{AS}$ | 41 | mJ |
| Power Dissipation | $T_C$ = 25 °C | $P_D$ | 40 | W |
| | $T_C$ = 100 °C | | 16 | |
| Operating Junction & Storage Temperature Range | | $T_j$, $T_{stg}$ | -55 to 150 | °C |

## THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNITS |
|---|---|---|---|---|
| Junction-to-Case | $R_{\theta JC}$ | | 3.1 | °C / W |
| Junction-to-Ambient | $R_{\theta JA}$ | | 62.5 | |

[1]Pulse width limited by maximum junction temperature.

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

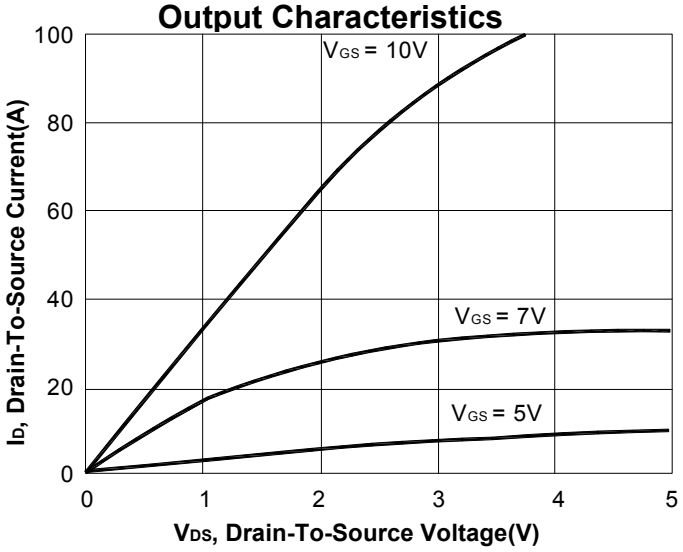
| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| **STATIC** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 60 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1.8 | 2.4 | 4 | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | | | ±250 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 48V, $V_{GS}$ = 0V | | | 1 | μA |
| | | $V_{DS}$ = 40V, $V_{GS}$ = 0V, $T_J$ = 125 °C | | | 10 | |
| On-State Drain Current[1] | $I_{D(ON)}$ | $V_{DS}$ = 5V, $V_{GS}$ = 10V | 110 | | | A |
| Drain-Source On-State Resistance[1] | $R_{DS(ON)}$ | $V_{GS}$ = 10V, $I_D$ = 25A | | 26 | 30 | mΩ |
| Forward Transconductance[1] | $g_{fs}$ | $V_{DS}$ = 5V, $I_D$ = 25A | | 25 | | S |

| | | | | | | |
|---|---|---|---|---|---|---|
| **DYNAMIC** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1MHz | | 1240 | | pF |
| Output Capacitance | $C_{oss}$ | | | 173 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 97 | | |
| Gate Resistance | Rg | $V_{GS}$ = 0V, $V_{DS}$ = 0V, f = 1MHz | | 1.7 | | Ω |
| Total Gate Charge[2] | $Q_g$ | $V_{DS}$ =30V, $V_{GS}$ = 10V, $I_D$ = 25A | | 21 | | nC |
| Gate-Source Charge[2] | $Q_{gs}$ | | | 7 | | |
| Gate-Drain Charge[2] | $Q_{gd}$ | | | 5 | | |
| Turn-On Delay Time[2] | $t_{d(on)}$ | $V_{DS}$ = 0.5$V_{(BR)DSS}$, $R_L$ = 1.5Ω $I_D$ ≅ 20A, $V_{GS}$ = 10V, $R_G$ = 5.6 Ω | | 10 | | nS |
| Rise Time[2] | $t_r$ | | | 145 | | |
| Turn-Off Delay Time[2] | $t_{d(off)}$ | | | 28 | | |
| Fall Time[2] | $t_f$ | | | 77 | | |
| **SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C$ = 25 °C)** | | | | | | |
| Continuous Current | $I_S$ | | | | 34 | A |
| Forward Voltage[1] | $V_{SD}$ | $I_F$ = 25A, $V_{GS}$ = 0V | | | 1.3 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$ = $I_S$, $dI_F/dt$ = 100A / μS | | 40 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 48 | | nC |

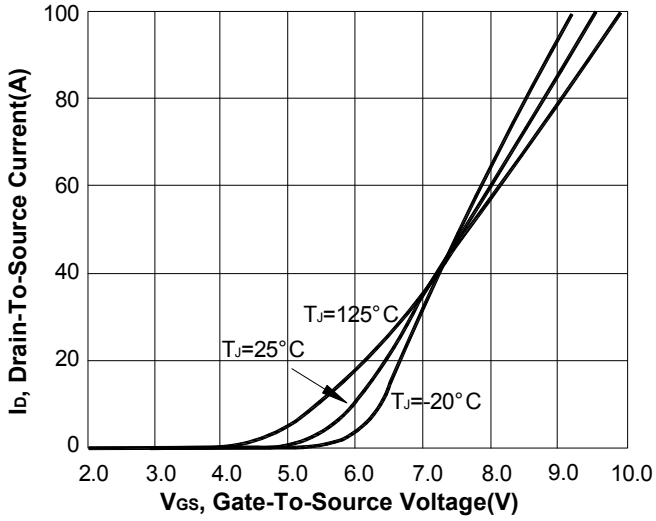
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

**REMARK: THE PRODUCT MARKED WITH "P2806ATF", DATE CODE or LOT #**

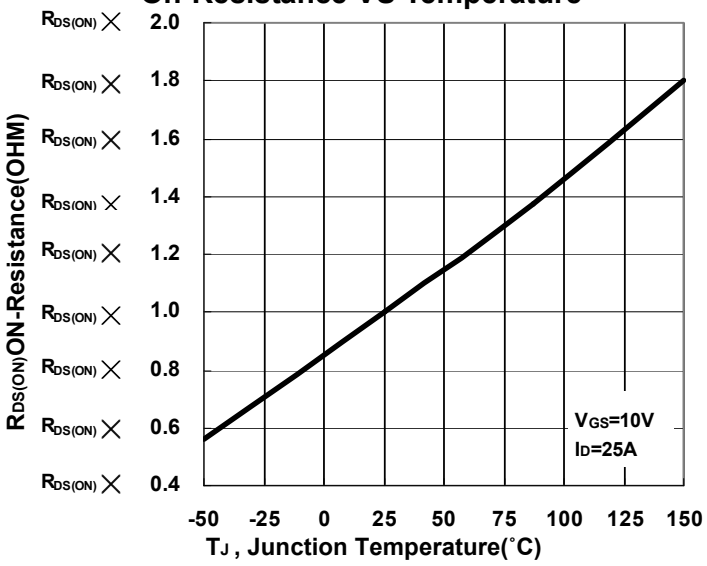
## Output Characteristics



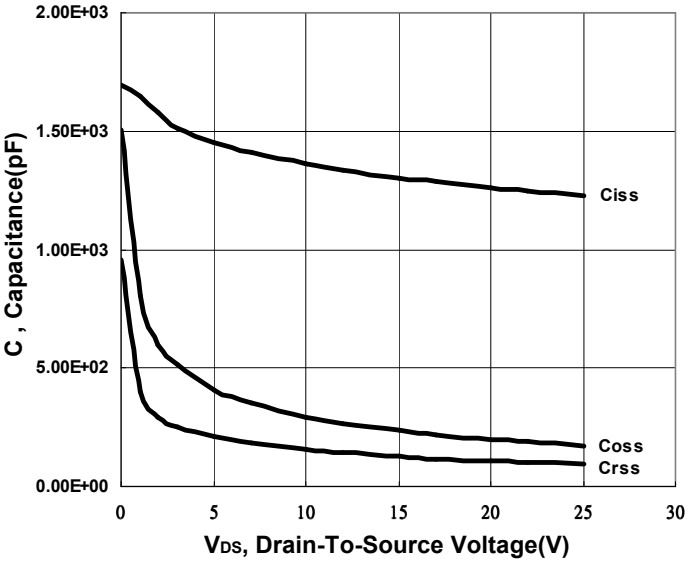

## Transfer Characteristics



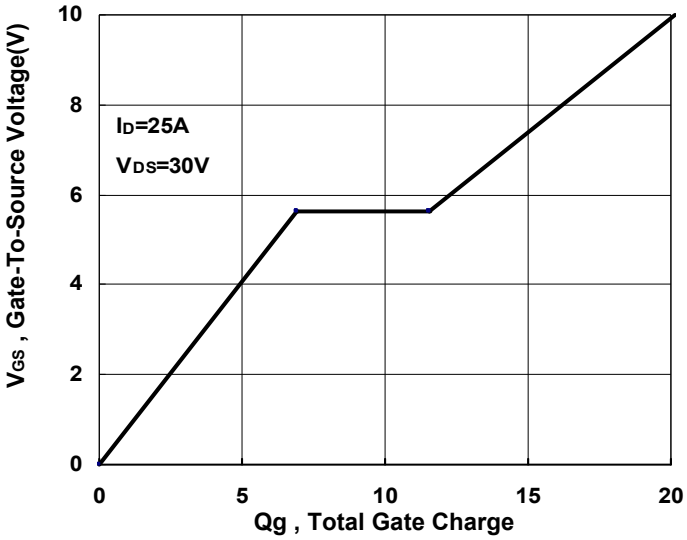

## On-Resistance VS Temperature



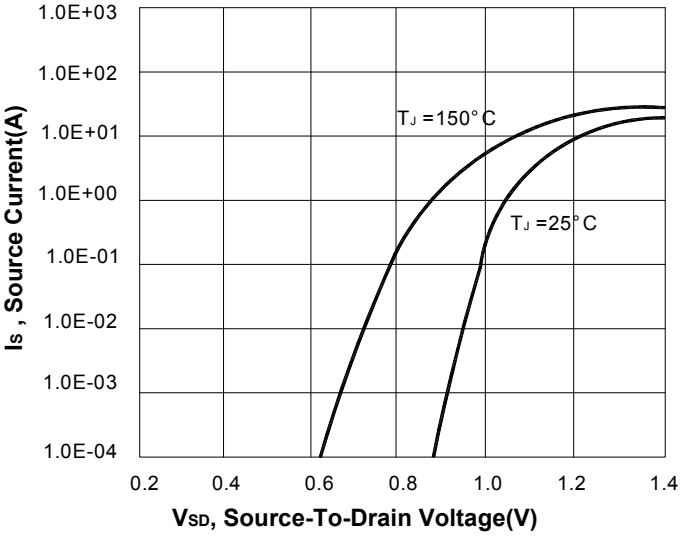

## Capacitance Characteristic



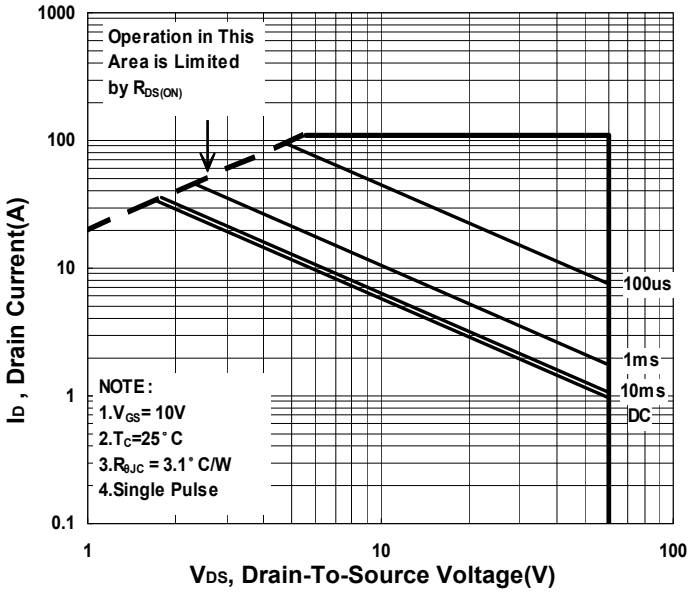

## Gate charge Characteristics



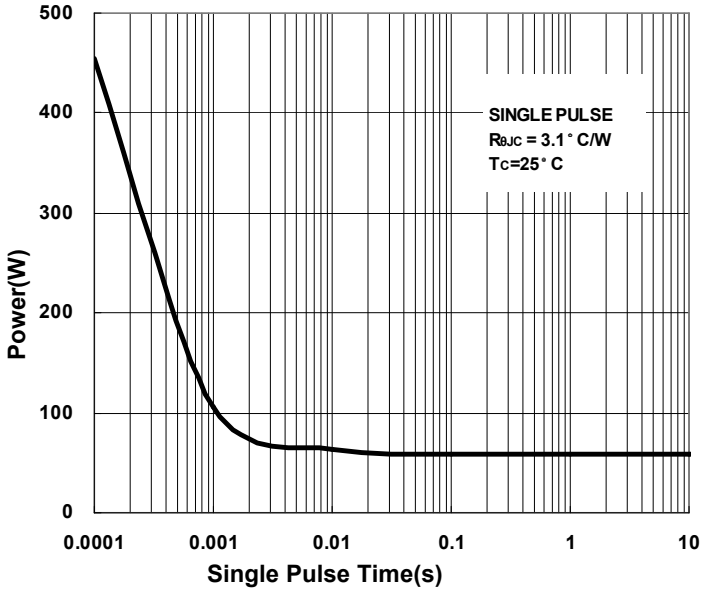

## Source-Drain Diode Forward Voltage



## Safe Operating Area




## Single Pulse Maximum Power Dissipation




## Transient Thermal Response Curve