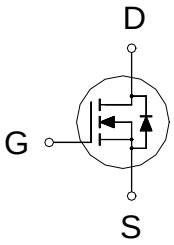
**NIKO-SEM**

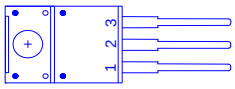
# N-Channel High Voltage Mode Field Effect Transistor

**P0760ZTF:TO-220F**
**P0760ZTFS:TO-220FS**
**Halogen-Free & Lead-Free**

## PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|---|---|---|
| 600V | 640mΩ | 7A |




1. GATE
2. DRAIN
3. SOURCE

RoHS Compliant

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

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNITS |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 600 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±30 | V |
| Continuous Drain Current[2] | $T_C$ = 25 °C | $I_D$ | 7 | A |
| | $T_C$ = 100 °C | | 4.4 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | 16 | |
| Avalanche Current[3] | | $I_{AS}$ | 2 | A |
| Avalanche Energy[3] | | $E_{AS}$ | 80 | mJ |
| Power Dissipation | $T_C$ = 25 °C | $P_D$ | 32 | W |
| | $T_C$ = 100 °C | | 12 | |
| 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 | $R_{\theta JC}$ | | 3.9 | °C / W |
| Junction-to-Ambient | $R_{\theta JA}$ | | 62.5 | °C / W |

[1]Pulse width limited by maximum junction temperature.
[2]Ensure that the channel temperature does not exceed 150°C.
[3]$V_{DD}$ = 50V , L = 40mH ,starting $T_J$ = 25°C.

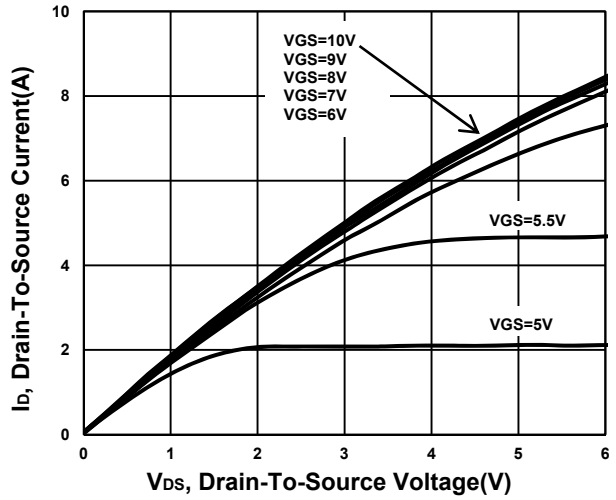
## ELECTRICAL CHARACTERISTICS ($T_J$ = 25 °C, Unless Otherwise Noted)

| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS MIN | LIMITS TYP | LIMITS MAX | UNIT |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 600 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 2 | 3.4 | 4 | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±30V | | | ±100 | nA |
| Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 600V, $V_{GS}$ = 0V , $T_C$ = 25 °C | | | 1 | μA |
| | | $V_{DS}$ = 480V, $V_{GS}$ = 0V , $T_C$ = 100 °C | | | 100 | |

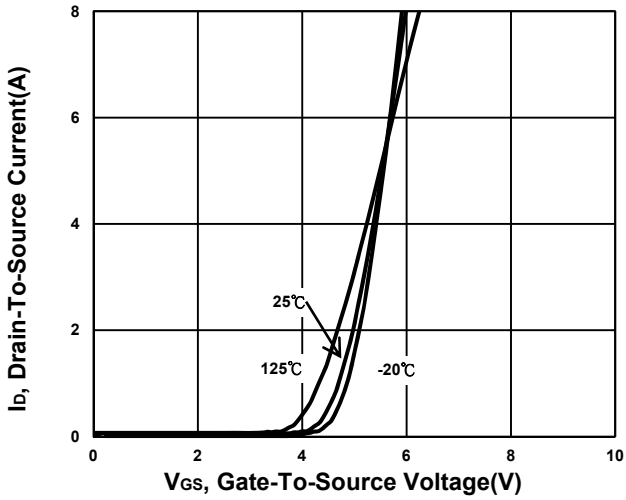
| | | | | | | |
|---|---|---|---|---|---|---|
| Drain-Source On-State Resistance[1] | $R_{DS(ON)}$ | $V_{GS}$ = 10V, $I_D$ = 3.5A | | 560 | 640 | mΩ |
| Forward Transconductance[1] | $g_{fs}$ | $V_{DS}$ = 10V, $I_D$ = 3.5A | | 5.2 | | S |
| **DYNAMIC** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1MHz | | 559 | | pF |
| Output Capacitance | $C_{oss}$ | | | 432 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 11 | | |
| Effective Output Capacitance[4] | $C_{o(er)}$ | $V_{GS}$ = 0V, $V_{DS}$ = 0 to 480V | | 33 | | |
| Total Gate Charge[2] | $Q_g$ | $V_{DD}$ = 480V, $I_D$ =7A, $V_{GS}$ = 10V | | 20 | | nC |
| Gate-Source Charge[2] | $Q_{gs}$ | | | 3.4 | | |
| Gate-Drain Charge[2] | $Q_{gd}$ | | | 9.5 | | |
| Turn-On Delay Time[2] | $t_{d(on)}$ | $V_{DD}$ = 300V, $I_D$ =7A, $R_G$= 10Ω | | 27 | | nS |
| Rise Time[2] | $t_r$ | | | 52 | | |
| Turn-Off Delay Time[2] | $t_{d(off)}$ | | | 70 | | |
| Fall Time[2] | $t_f$ | | | 34 | | |
| **SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_J$ = 25 °C)** | | | | | | |
| Continuous Current[3] | $I_S$ | | | | 7 | A |
| Forward Voltage[1] | $V_{SD}$ | $I_F$ =7A, $V_{GS}$ = 0V | | | 1.5 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$ =7A, $dI_F/dt$ = 100A / μS | | 256 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 2.5 | | uC |

[1]Pulse test : Pulse Width ≤ 380 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.
[4]$C_{o(er)}$ is a fixed capacitance that gives the same stored energy as Coss while $V_{DS}$ is rising from 0 to 80% $V_{(BR)DSS}$.

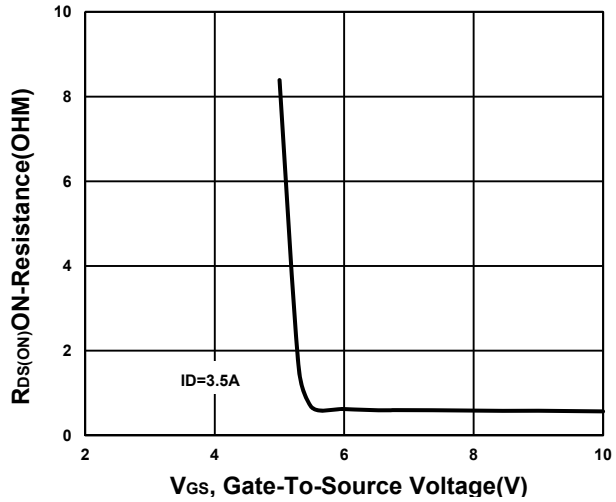
## Output Characteristics



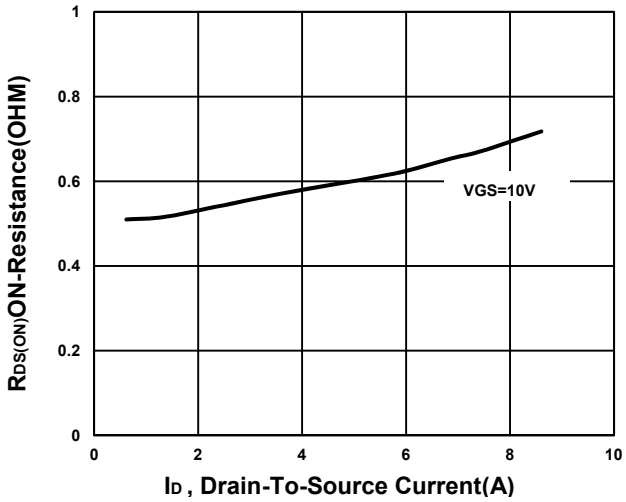

## Transfer Characteristics



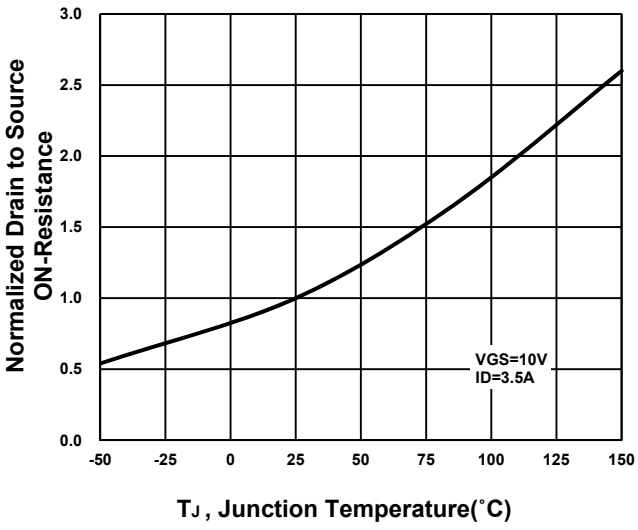

## On-Resistance VS Gate-To-Source



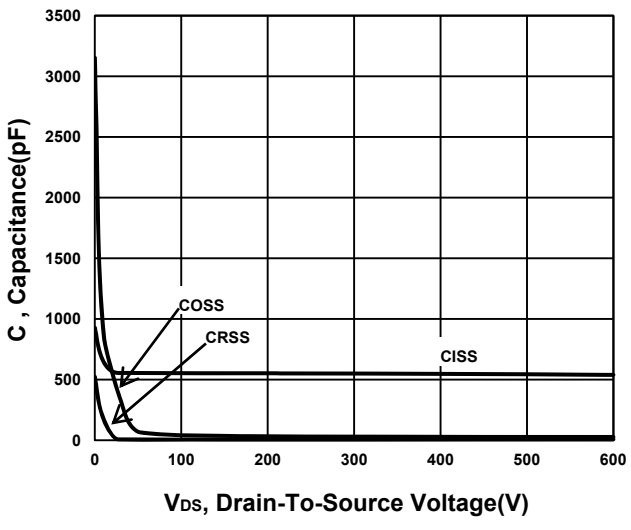

## On-Resistance VS Drain Current



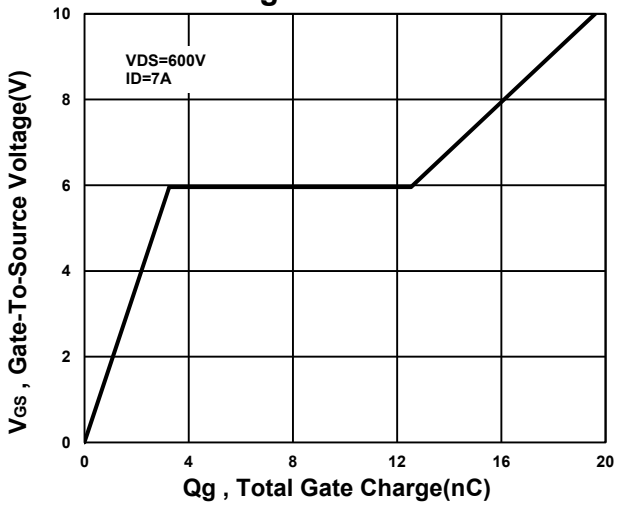

## On-Resistance VS Temperature



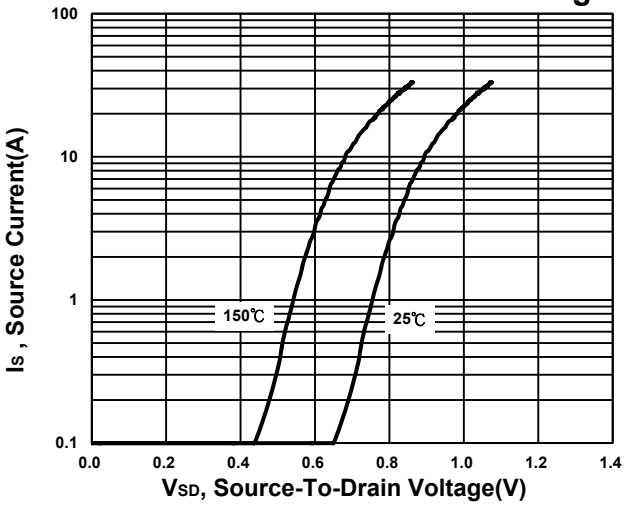

## Capacitance Characteristic



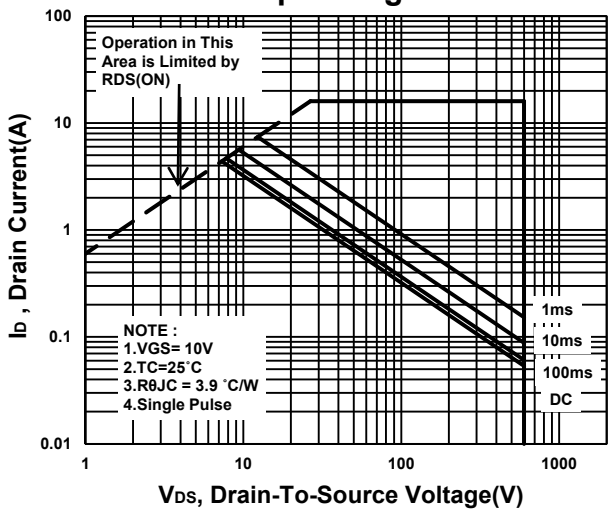
## Gate charge Characteristics



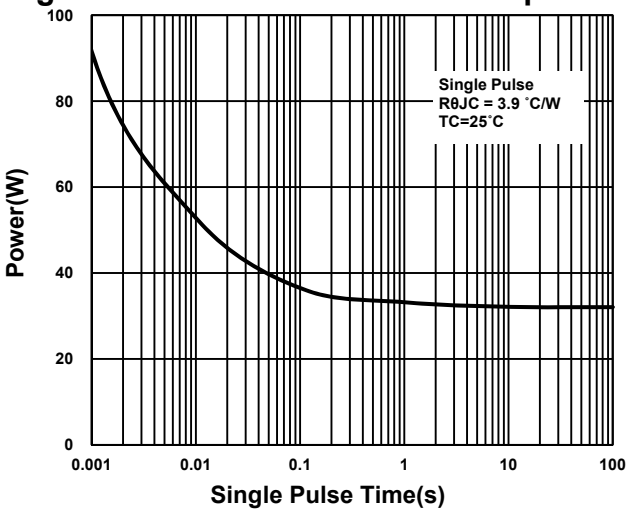

## Source-Drain Diode Forward Voltage




## Safe Operating Area




## Single Pulse Maximum Power Dissipation




## Transient Thermal Response Curve