**NIKO-SEM**

# N-Channel Enhancement Mode Field Effect Transistor

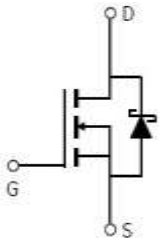
# PE534SA

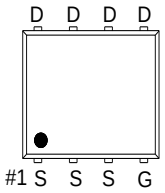
**PDFN 3x3P**

**Halogen-Free & Lead-Free**

## PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|---|---|---|
| 30V | 7.5mΩ | 52A |




G : GATE
D : DRAIN
S : SOURCE

RoHS Compliant

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

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNITS |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current[3] | $T_C$ = 25 °C | $I_D$ | 52 | A |
| | $T_C$ = 100 °C | | 33 | |
| | $T_A$ = 25 °C | | 14 | |
| | $T_A$ = 70 °C | | 11 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | 100 | |
| Avalanche Current | | $I_{AS}$ | 22 | |
| Avalanche Energy | L = 0.1mH | $E_{AS}$ | 24 | mJ |
| Power Dissipation | $T_C$ = 25 °C | $P_D$ | 36 | W |
| | $T_C$ = 100 °C | | 14 | |
| | $T_A$ = 25 °C | | 2.5 | |
| | $T_A$ = 70 °C | | 1.6 | |
| Operating Junction & Storage Temperature Range | | $T_j$, $T_{stg}$ | -55 to 150 | °C |

## THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNITS |
|---|---|---|---|---|
| Junction-to-Ambient[2] | $R_{\theta JA}$ | | 50 | °C／W |
| Junction-to-case | $R_{\theta JC}$ | | 3.5 | |

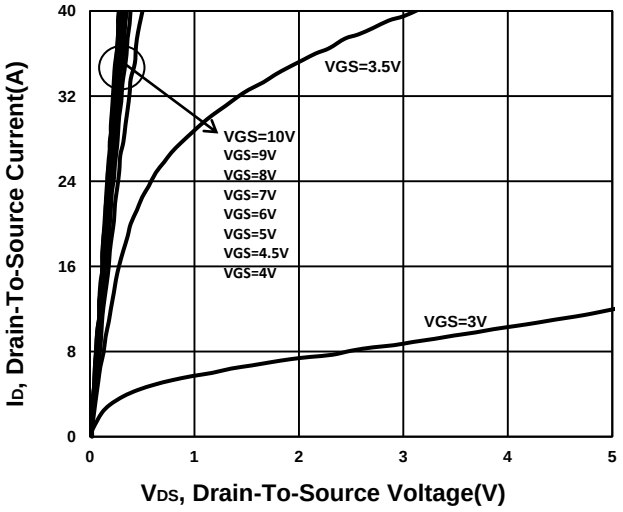
[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$ =25°C. The value in any given application depends on the user's specific board design
[3]Package limitation current is 26A

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

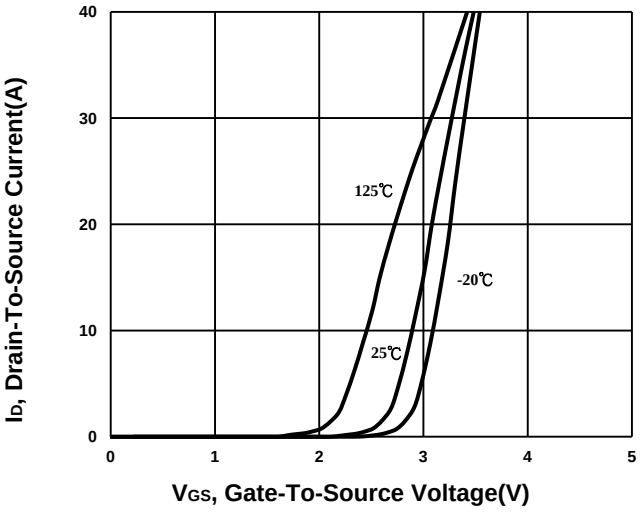
| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS MIN | LIMITS TYP | LIMITS MAX | UNIT |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 30 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1.3 | 1.75 | 2.35 | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 24V, $V_{GS}$ = 0V | | | 0.1 | mA |
| | | $V_{DS}$ = 20V, $V_{GS}$ = 0V, $T_J$ = 125 °C | | | 10 | mA |
| Drain-Source On-State Resistance[1] | $R_{DS(ON)}$ | $V_{GS}$ = 4.5V, $I_D$ = 10A | | 8.4 | 10.5 | mΩ |
| | | $V_{GS}$ = 10V, $I_D$ = 10A | | 6.2 | 7.5 | mΩ |
| Forward Transconductance[1] | $g_{fs}$ | $V_{DS}$ = 5V, $I_D$ = 10A | | 40 | | S |
| **DYNAMIC** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 15V, f = 1MHz | | 1075 | | pF |
| Output Capacitance | $C_{oss}$ | | | 215 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 155 | | pF |
| Gate Resistance | $R_g$ | $V_{GS}$ = 0V, $V_{DS}$ = 0V, f = 1MHz | | 1.8 | | Ω |
| Total Gate Charge[2] | $Q_{g(V_{GS}=10V)}$ | $V_{DS}$ = 15V, $I_D$ = 10A | | 22.5 | | nC |
| | $Q_{g(V_{GS}=4.5V)}$ | | | 11.7 | | nC |
| Gate-Source Charge[2] | $Q_{gs}$ | | | 3.3 | | nC |
| Gate-Drain Charge[2] | $Q_{gd}$ | | | 5.3 | | nC |
| Turn-On Delay Time[2] | $t_{d(on)}$ | $V_{DD}$ = 15V, $I_D$ ≅ 10A, $V_{GEN}$ = 10V, $R_G$ = 6Ω | | 18 | | nS |
| Rise Time[2] | $t_r$ | | | 10 | | nS |
| Turn-Off Delay Time[2] | $t_{d(off)}$ | | | 33 | | nS |
| Fall Time[2] | $t_f$ | | | 10 | | nS |
| **SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_J$ = 25 °C)** | | | | | | |
| Continuous Current[3] | $I_S$ | | | | 30 | A |
| Forward Voltage[1] | $V_{SD}$ | $I_F$ = 1A, $V_{GS}$ = 0V | | | 0.6 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$ = 10A , $dI_F/dt$ = 100A / μS | | 11.5 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 2.2 | | nC |

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Package limitation current is 26A

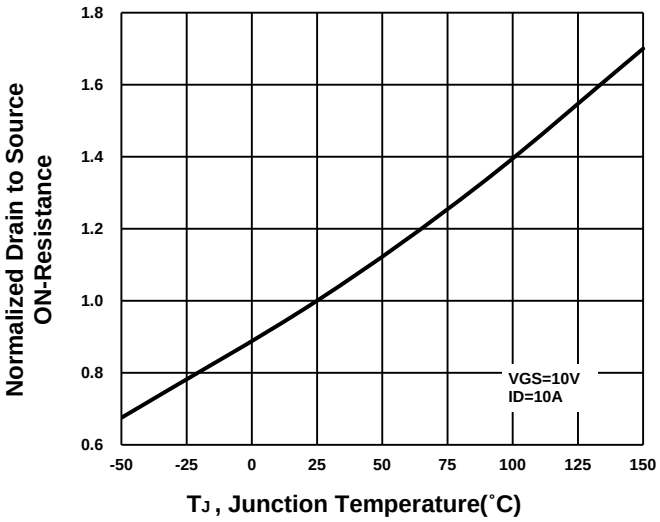
## Output Characteristics



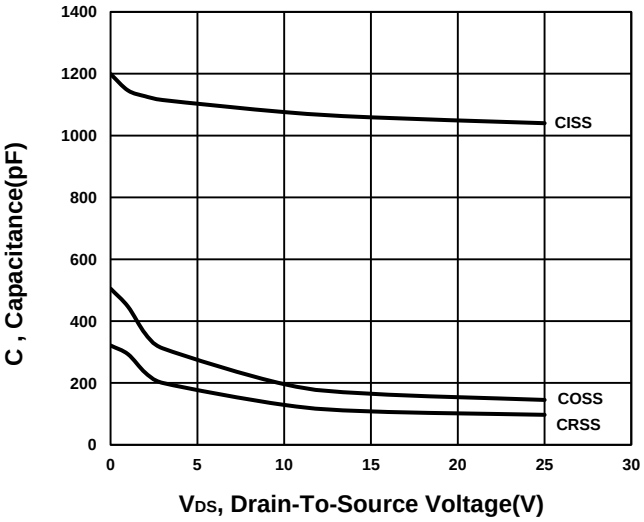

## Transfer Characteristics



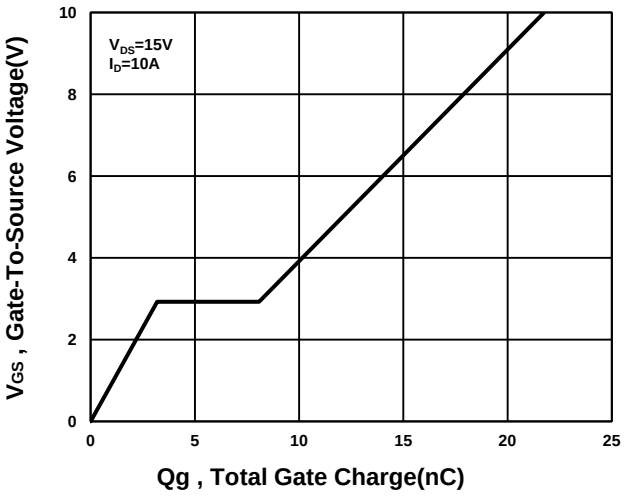

## On-Resistance VS Temperature



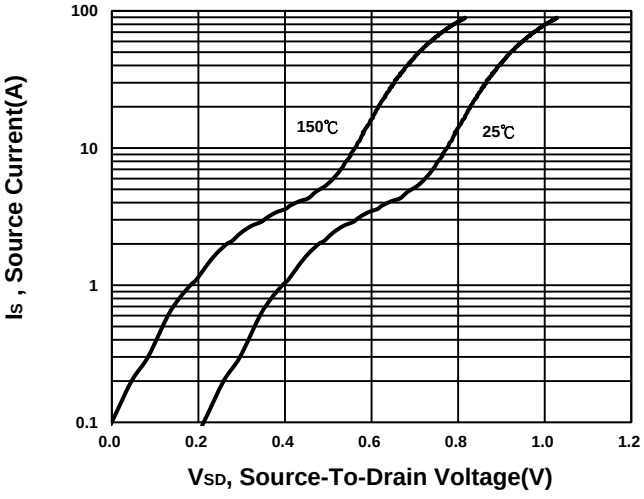

## Capacitance Characteristic



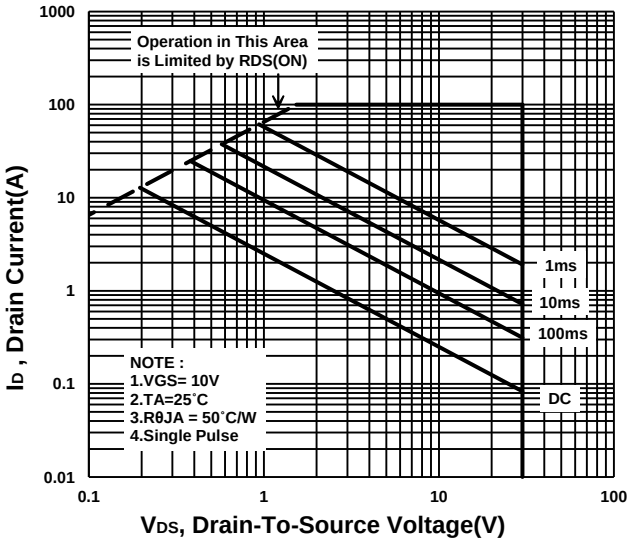

## Gate charge Characteristics



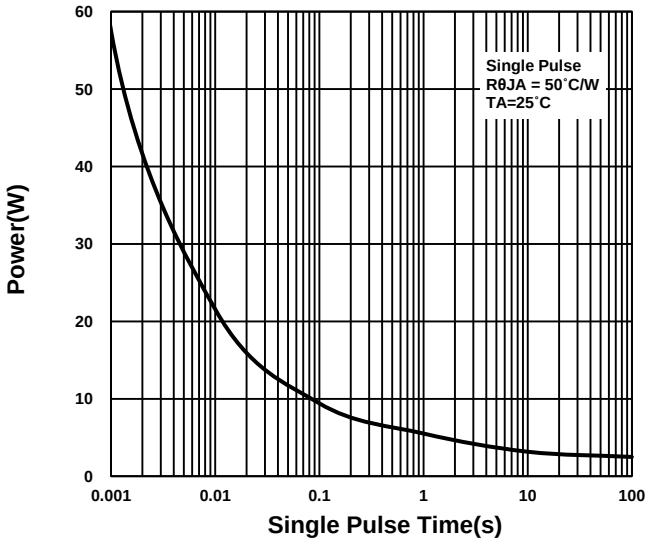

## Source-Drain Diode Forward Voltage



## Safe Operating Area




## Single Pulse Maximum Power Dissipation




## Transient Thermal Response Curve