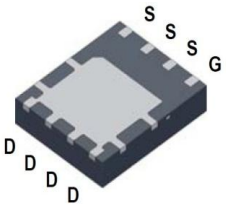
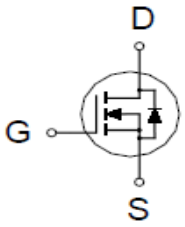
# PK618BA

## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|---|---|---|
| 30V | 5.5mΩ @$V_{GS}$ = 10V | 59A |




**PDFN 5X6P**

### 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 | |
| Continuous Drain Current[3] | $T_c$ = 25 °C | $I_D$ | 59 | A |
| | $T_c$ = 100 °C | | 37 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | 150 | |
| Continuous Drain Current | $T_A$ = 25 °C | $I_D$ | 15 | |
| | $T_A$= 70 °C | | 12 | |
| Avalanche Current | | $I_{AS}$ | 31 | |
| Avalanche Energy | L =0.1mH | $E_{AS}$ | 48 | mJ |
| Power Dissipation | $T_C$ = 25 °C | $P_D$ | 34 | W |
| | $T_C$ = 100 °C | | 13 | |
| Power Dissipation | $T_A$ = 25 °C | $P_D$ | 2.5 | W |
| | $T_A$ = 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 | $R_{\theta JC}$ | | 3.6 | |

[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.

[3]Package limitation current is 26A.

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

| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS | | | UNITS |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| **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 | 1.5 | 1.75 | 2.35 | |
| 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 | | | 1 | μA |
| | | $V_{DS}$ = 20V, $V_{GS}$ = 0V, $T_J$ = 55 °C | | | 10 | |
| Drain-Source On-State Resistance[1] | $R_{DS(ON)}$ | $V_{GS}$ = 4.5V, $I_D$ = 15A | | 4.5 | 6.8 | mΩ |
| | | $V_{GS}$ = 10V , $I_D$ = 20A | | 3.7 | 5.5 | |
| Forward Transconductance[1] | $g_{fs}$ | $V_{DS}$ = 5V, $I_D$ = 20A | | 60 | | S |
| **DYNAMIC** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 15V, f = 1MHz | | 1330 | | pF |
| Output Capacitance | $C_{oss}$ | | | 257 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 154 | | |
| Gate Resistance | $R_g$ | $V_{GS}$ = 0V, $V_{DS}$ = 0V, f = 1MHz | | 1.6 | | Ω |
| Total Gate Charge[2] | $Q_g$ $V_{GS}$ =10V | $V_{DS}$ = 15V, $V_{GS}$ = 10V, $I_D$ = 20A | | 28 | | nC |
| | $Q_g$ $V_{GS}$ =4.5V | | | 15 | | |
| Gate-Source Charge[2] | $Q_{gs}$ | | | 4 | | |
| Gate-Drain Charge[2] | $Q_{gd}$ | | | 7.1 | | |
| Turn-On Delay Time[2] | $t_{d(on)}$ | $V_{DS}$ = 15V, $I_D$ ≅ 20A, $V_{GS}$ = 10V, $R_{GEN}$ = 6Ω | | 19 | | nS |
| Rise Time[2] | $t_r$ | | | 10 | | |
| Turn-Off Delay Time[2] | $t_{d(off)}$ | | | 40 | | |
| Fall Time[2] | $t_f$ | | | 12 | | |
| **SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_J$ = 25 °C)** | | | | | | |
| Continuous Current[3] | $I_S$ | | | | 59 | A |
| Forward Voltage[1] | $V_{SD}$ | $I_F$ = 20A, $V_{GS}$ = 0V | | | 1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$ = 20A, $dI_F/dt$ = 100A / μS | | 22 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 8 | | nC |

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

[2]Independent of operating temperature.

[3]Package limitation current is 26A.

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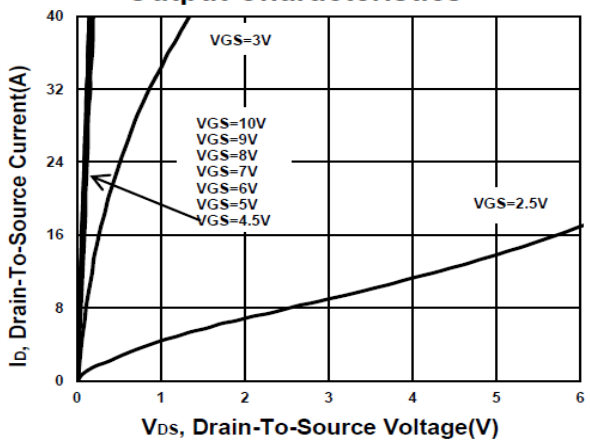
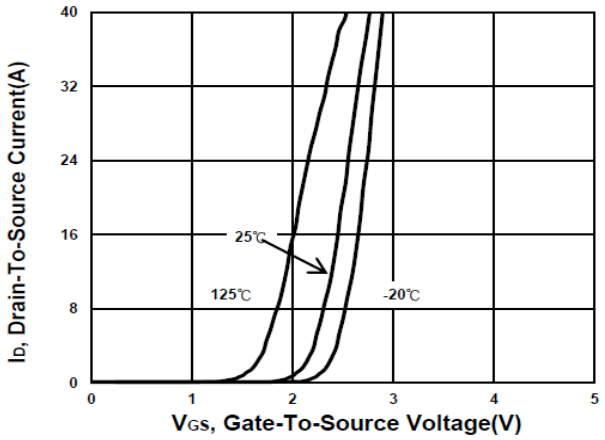
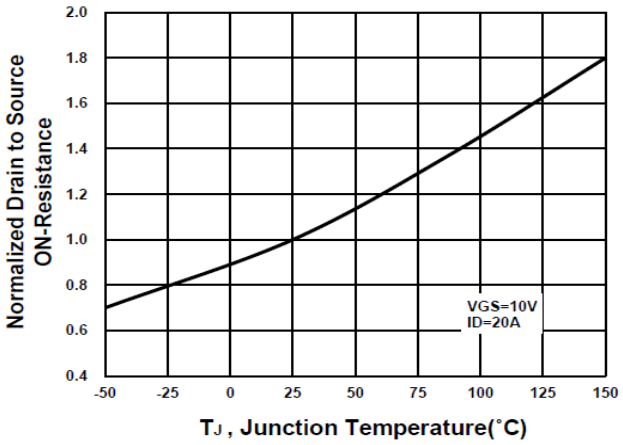
### Output Characteristics



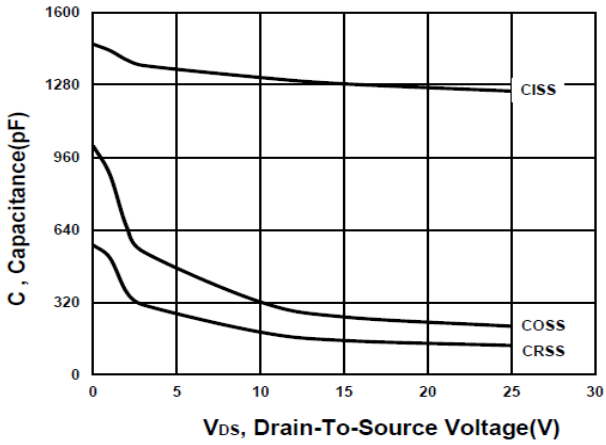

### Transfer Characteristics



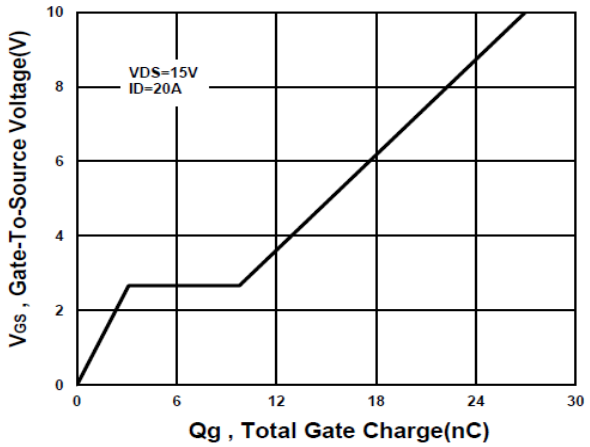

### On-Resistance VS Temperature



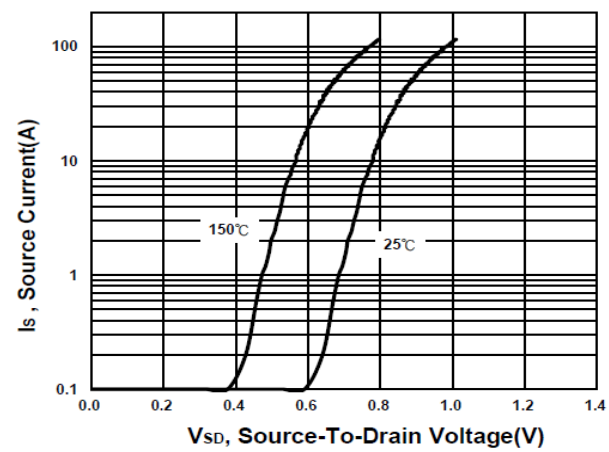

### Capacitance Characteristic




### Gate charge Characteristics




### Source-Drain Diode Forward Voltage



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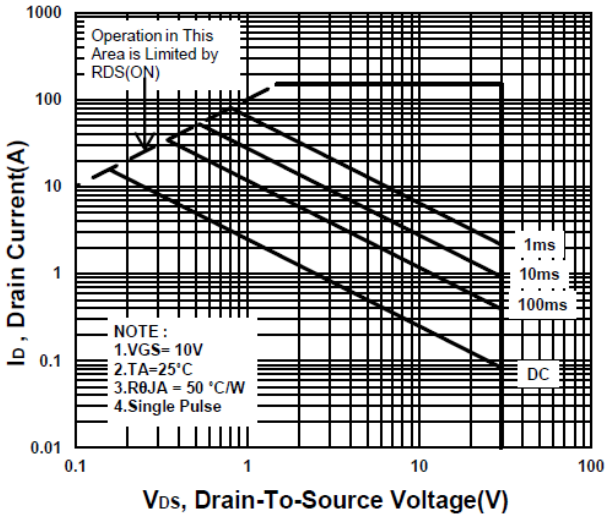
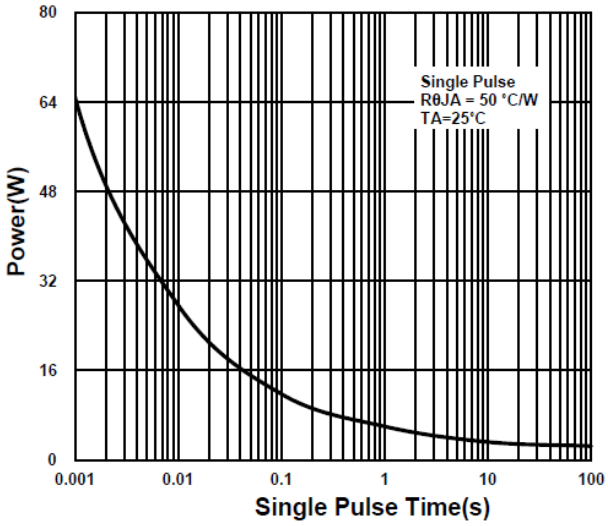
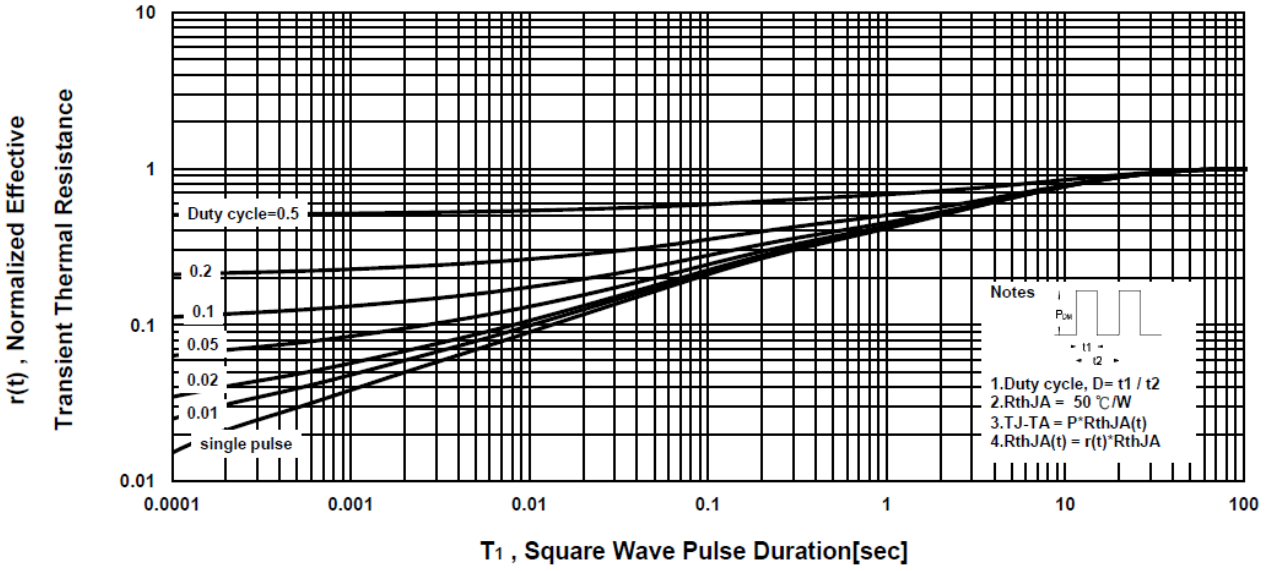
### Safe Operating Area




### Single Pulse Maximum Power Dissipation




### Transient Thermal Response Curve



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## PDFN 5x6P MECHANICAL DATA

| Dimension | mm | | | Dimension | mm | | |
|---|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | | Min. | Typ. | Max. |
| A | 4.8 | | 5.15 | J | 3.33 | | 3.78 |
| B | 5.44 | | 5.9 | K | 0.9 | | |
| C | 5.9 | | 6.35 | L | 0.35 | | 0.712 |
| D | 0.33 | | 0.51 | M | 0° | | 12° |
| E | | 1.27 | | N | 4.8 | | 5.5 |
| F | 0.8 | | 1.25 | O | 0.05 | | 0.3 |
| G | 0.15 | | 0.34 | P | 0.06 | | 0.2 |
| H | 3.61 | | 4.31 | S | 3.69 | | 4.19 |
| I | 0.35 | | 0.71 | | | | |