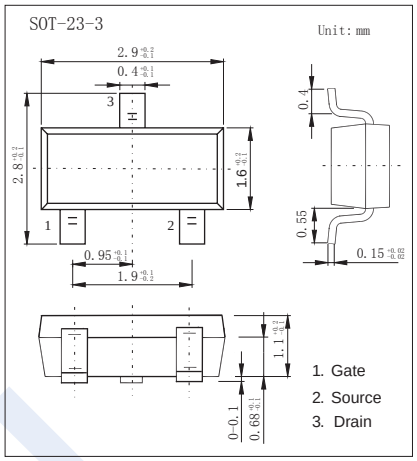
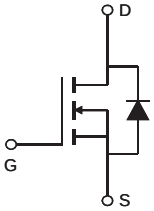
# N-Channel MOSFET
# 2KK5040




## ■ Features

- $V_{DS\ (V)}$ = 30V
- $I_D$ = 5.7 A ($V_{GS}$ = 10V)
- $R_{DS(ON)}$ < 26.5mΩ ($V_{GS}$ = 10V)
- $R_{DS(ON)}$ < 32mΩ ($V_{GS}$ = 4.5V)
- $R_{DS(ON)}$ < 48mΩ ($V_{GS}$ = 2.5V)




## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | |
| Continuous Drain Current | TA=25℃ | $I_D$ | 5.7 | A |
| | TA=70℃ | | 4.7 | |
| Pulsed Drain Current | | $I_{DM}$ | 30 | |
| Power Dissipation | TA=25℃ | $P_D$ | 1.4 | W |
| | TA=70℃ | | 0.9 | |
| Thermal Resistance.Junction- to-Ambient | t ⩽ 10s | $R_{thJA}$ | 90 | ℃/W |
| | Steady-State | | 125 | |
| Thermal Resistance.Junction- to-Lead | | $R_{thJL}$ | 80 | |
| Junction Temperature | | $T_J$ | 150 | ℃ |
| Storage Temperature Range | | $T_{stg}$ | -55 to 150 | |

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■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 30 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=30V, $V_{GS}$=0V | | | 1 | uA |
| | | $V_{DS}$=30V, $V_{GS}$=0V, $T_J$=55℃ | | | 5 | |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±12V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ , $I_D$=250μA | 0.65 | | 1.45 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=5.7A | | | 26.5 | mΩ |
| | | $V_{GS}$=10V, $I_D$=5.7A $T_J$=125℃ | | | 38 | |
| | | $V_{GS}$=4.5V, $I_D$=5A | | | 32 | |
| | | $V_{GS}$=2.5V, $I_D$=3A | | | 38 | |
| On State Drain Current | $I_{D(ON)}$ | $V_{GS}$=4.5V, $V_{DS}$=5V | 30 | | | A |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=5V, $I_D$=5.7A | | 33 | | S |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=15V, f=1MHz | | 630 | | pF |
| Output Capacitance | $C_{oss}$ | | | 75 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 50 | | |
| Gate Resistance | $R_g$ | $V_{GS}$=0V, $V_{DS}$=0V, f=1MHz | 1.5 | | 4.5 | Ω |
| Total Gate Charge | $Q_g$ | $V_{GS}$=4.5V, $V_{DS}$=15V, $I_D$=5.7A | | 6 | 7 | nC |
| Gate Source Charge | $Q_{gs}$ | | | 1.3 | | |
| Gate Drain Charge | $Q_{gd}$ | | | 1.8 | | |
| Turn-On DelayTime | $t_{d(on)}$ | $V_{GS}$=10V, $V_{DS}$=15V, $R_L$=2.6Ω,$R_G$=3Ω | | 3 | | ns |
| Turn-On Rise Time | $t_r$ | | | 2.5 | | |
| Turn-Off DelayTime | $t_{d(off)}$ | | | 25 | | |
| Turn-Off Fall Time | $t_f$ | | | 4 | | |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$= 5.7A, $di/dt$= 100A/us | | 8.5 | | |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | | | 2.6 | | nC |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 2 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1A,$V_{GS}$=0V | | | 1 | V |

* The static characteristics in Figures 1 to 6 are obtained using <300us pulses, duty cycle 0.5% max.

■ Marking

| Marking | KBN |
|---|---|

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■ Typical Characterisitics

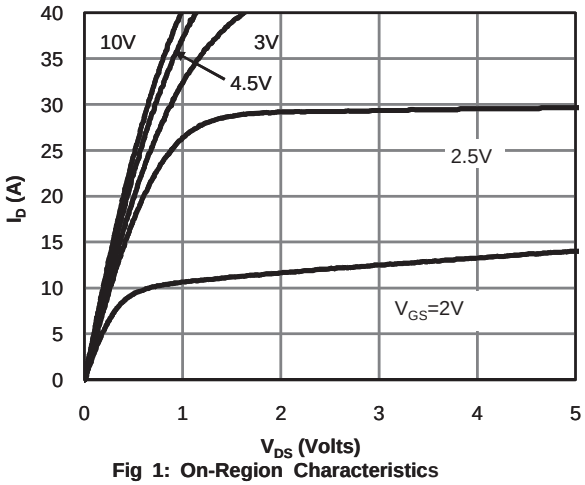


Fig 1: On-Region Characteristics

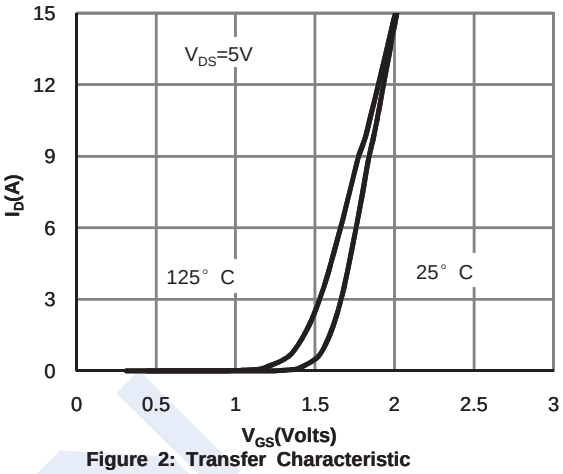


Figure 2: Transfer Characteristic

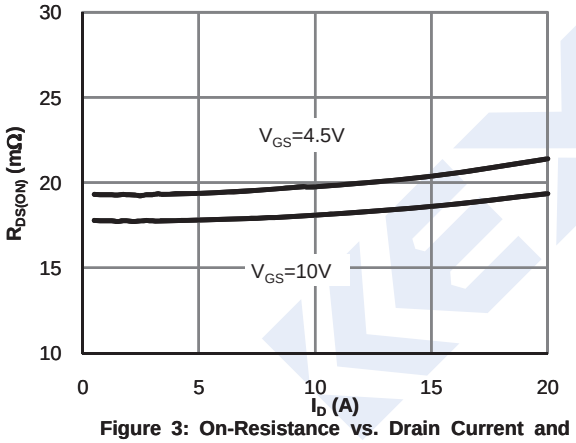


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

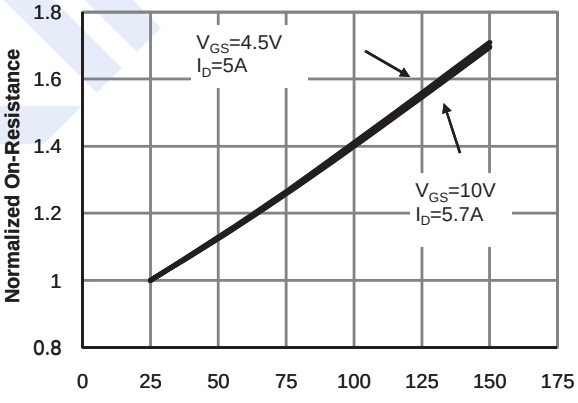


Figure 4: On-Resistance vs. Junction Temperature

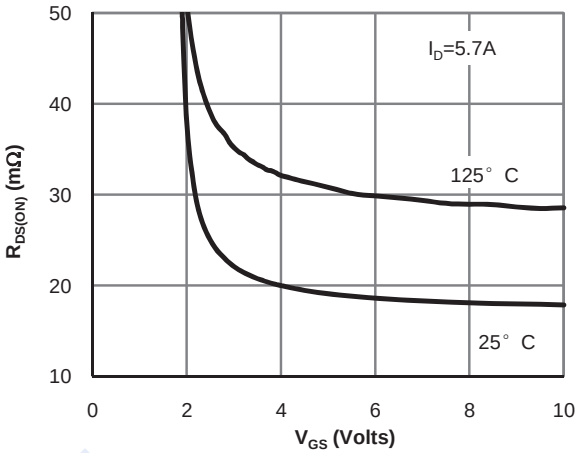


Figure 5: On-Resistance vs. Gate-Source Voltage

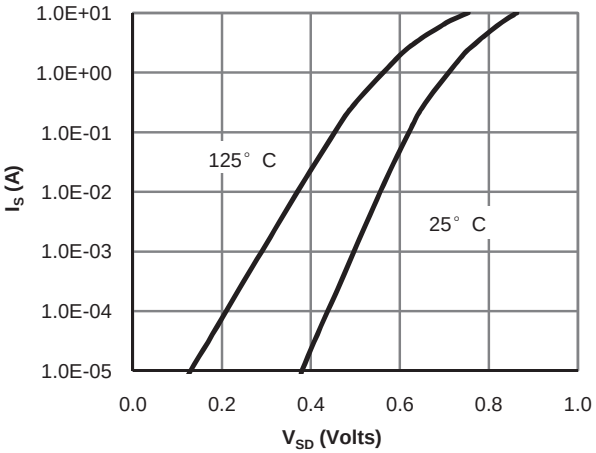


Figure 6: Body-Diode Characteristics

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■ Typical Characterisitics

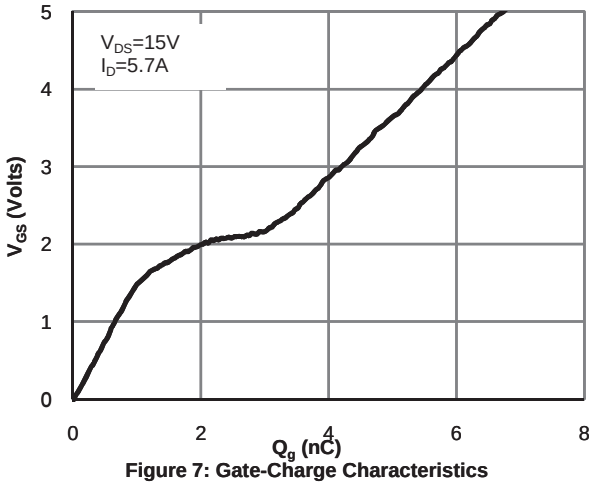



Figure 7: Gate-Charge Characteristics

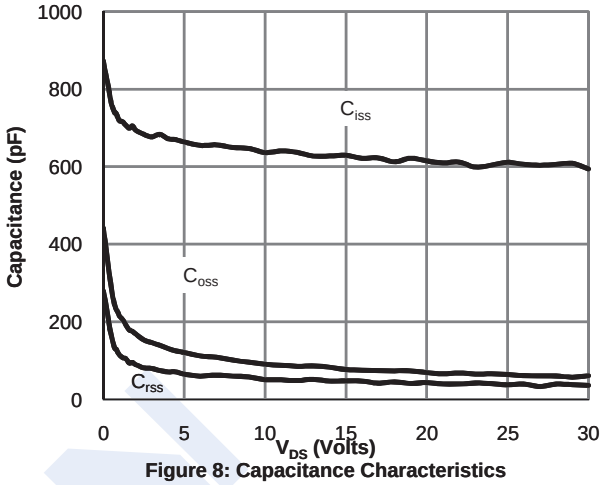



Figure 8: Capacitance Characteristics

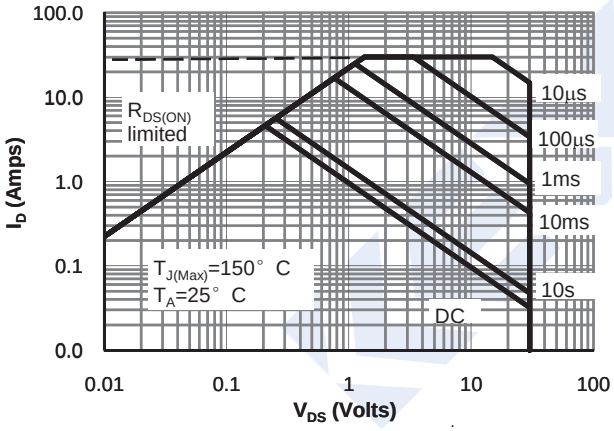
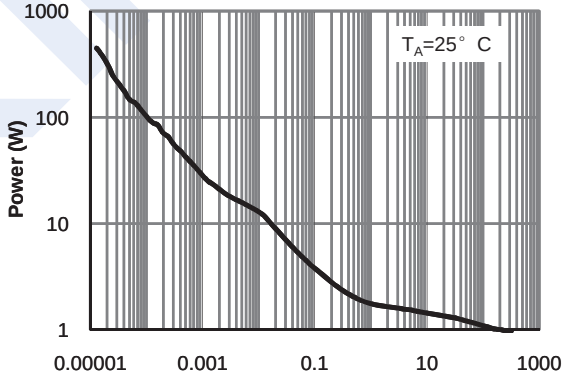



Figure 9: Maximum Forward Biased Safe Operating Area




Pulse Width (s)

Figure 10: Single Pulse Power Rating Junction-to-Ambient

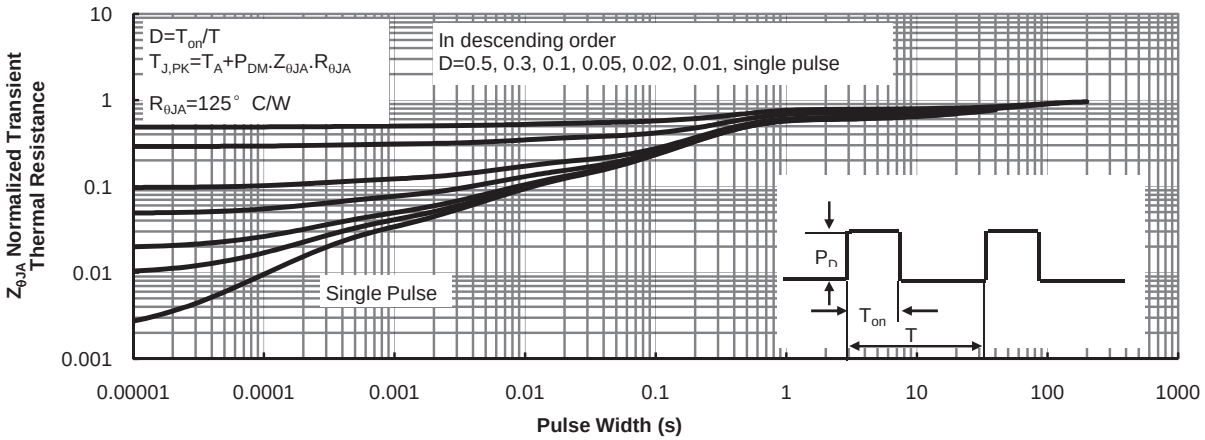



Figure 11: Normalized Maximum Transient Thermal Impedance