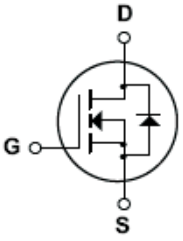
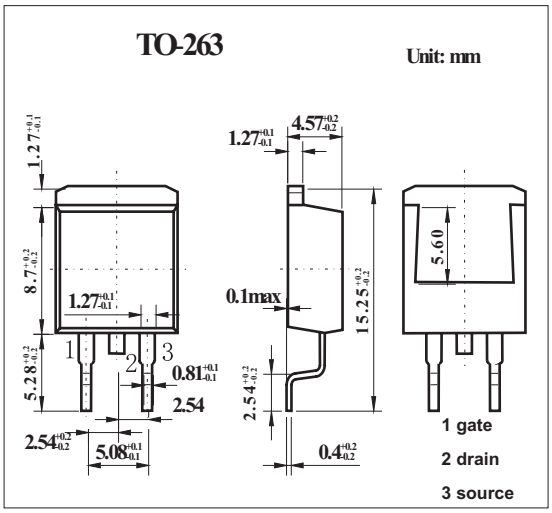
# 300V N-Channel MOSFET
# KQB3N30

## ■ Features

- 3.2A, 300 V. $R_{DS(ON)}$ = 2.2Ω @ $V_{GS}$ = 10 V
- Low gate charge (typical 5.5nC)
- Low Crss(typical 6.0pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability




## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain to Source Voltage | $V_{DSS}$ | 300 | V |
| Drain Current Continuous (Tc=25℃) | $I_D$ | 3.2 | A |
| Drain Current Continuous (Tc=100℃) | | 2.02 | A |
| Drain Current Pulsed *1 | $I_{DM}$ | 12.8 | A |
| Gate-Source Voltage | $V_{GSS}$ | ±30 | V |
| Single Pulsed Avalanche Energy*2 | $E_{AS}$ | 140 | mJ |
| Avalanche Current *1 | $I_{AR}$ | 3.2 | A |
| Repetitive Avalanche Energy *1 | $E_{AR}$ | 5.5 | mJ |
| Peak Diode Recovery dv/dt *3 | dv/dt | 4.5 | V/ns |
| Power dissipation @ Ta=25℃ | $P_D$ | 3.13 | W |
| Power dissipation @ Tc=25℃ | $P_D$ | 55 | W |
| Derate above 25℃ | | 0.44 | W/℃ |
| Operating and Storage Temperature | $T_J$, $T_{STG}$ | -55 to150 | ℃ |
| Maximum lead temperature for soldering purposes,1/8" from case for 5 seconds | $T_L$ | 300 | ℃ |
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | 2.27 | ℃/W |
| Thermal Resistance Junction to Ambient *4 | $R_{\theta JA}$ | 40 | ℃/W |
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 62.5 | ℃/W |

*1 Repetitive Rating:Pulse width limited by maximum junction temperature

*2 l=22.5mH,$I_{AS}$=3.2A,$V_{DD}$=50V,$R_G$=25Ω,Startion $T_J$=25℃

*3 $I_{SD}$≤3.2A,di/dt≤200A/μS,$V_{DD}$≤$B_{VDSS}$,Startiong $T_J$=25℃

*4 When mounted on the minimum pad size recommended (PCB Mount)

# KQB3N30

■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Testconditons | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 250 μA | 300 | | | V |
| Breakdown Voltage Temperature Coefficient | $\frac{\Delta BV_{DSS}}{\Delta T_J}$ | $I_D$ = 250 μA, Referenced to 25℃ | | 0.35 | | mV/℃ |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 300 V, $V_{GS}$ = 0 V | | | 1 | μA |
| | | $V_{DS}$ = 240 V, $T_C$=125℃ | | | 10 | μA |
| Gate-Body Leakage Current,Forward | $I_{GSSF}$ | $V_{GS}$ = 30 V, $V_{DS}$ = 0 V | | | 100 | nA |
| Gate-Body Leakage Current,Reverse | $I_{GSSR}$ | $V_{GS}$ =-30 V, $V_{DS}$ = 0 V | | | -100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250 μA | 3.0 | | 5.0 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 1.6A | | 1.65 | 2.2 | Ω |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 50 V, $I_D$ = 1.6A * | | 1.75 | | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 25 V, $V_{GS}$ = 0 V,f = 1.0 MHz | | 175 | 230 | pF |
| Output Capacitance | $C_{oss}$ | | | 40 | 50 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 6 | 8 | pF |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 150 V, $I_D$ = 3.2A,RG=25Ω * | | 10 | 30 | ns |
| Turn-On Rise Time | tr | | | 40 | 90 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 10 | 30 | ns |
| Turn-Off Fall Time | $t_f$ | | | 25 | 60 | ns |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 240 V, $I_D$ = 3.2A,$V_{GS}$ = 10 V * | | 5.5 | 7.0 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.5 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.5 | | nC |
| Maximum Continuous Drain-Source Diode Forwrad Current | $I_S$ | | | | 3.2 | A |
| Maximum Pulsed Drain-Source Diode Forward Current | $I_{SM}$ | | | | 12.8 | A |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$ = 0 V, $I_S$ = 3.2 A | | | 1.5 | V |
| Diode Reverse Recovery Time | trr | $V_{GS}$ = 0 V,$dI_F/dt$ = 100 A/μs,$I_S$=3.2A * | | 120 | | ns |
| Diode Reverse Recovery Current | Qrr | | | 0.4 | | nC |

* Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%