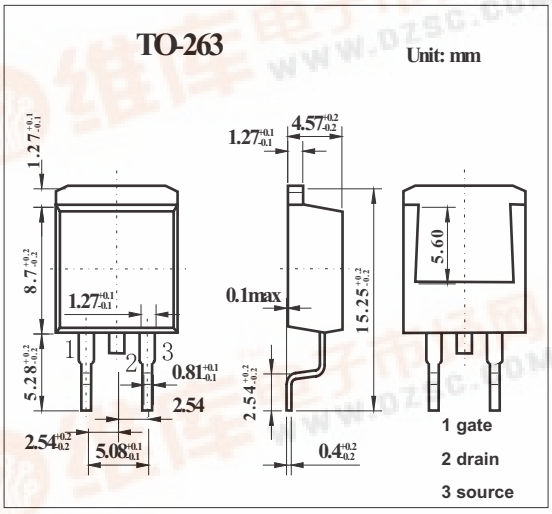
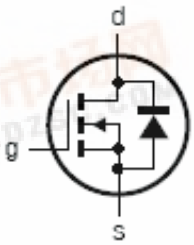
# TrenchMOS™ standard level FET

# KUK7604-40A




## ■ Features

- TrenchMOS™ technology
- Q101 compliant
- 175℃ rated
- Standard level compatible.




## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| drain-source voltage (DC) | $V_{DS}$ | 40 | V |
| drain-gate voltage (DC) $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 40 | V |
| gate-source voltage (DC) | $V_{GS}$ | ±20 | V |
| drain current (DC) $T_{mb}$ = 25℃; $V_{GS}$ = 10 V | $I_D$ | 198 | A |
| drain current (DC) $T_{mb}$ = 100℃; $V_{GS}$ = 10 V | | 75 | A |
| peak drain current *1 | $I_{DM}$ | 794 | A |
| total power dissipation $T_{mb}$ = 25 ℃ | $P_{tot}$ | 300 | W |
| storage temperature | $T_{stg}$ | -55 to 175 | ℃ |
| operating junction temperature | $T_j$ | -55 to 175 | ℃ |
| reverse drain current (DC) $T_{mb}$ = 25℃ | $I_{DR}$ | 198 | A |
| | | 75 | A |
| pulsed reverse drain current *2 | $I_{DRM}$ | 794 | A |
| non-repetitive avalanche energy | $W_{DSS}$ | 1.6 | J |
| thermal resistance from junction to ambient | $R_{th(j-a)}$ | 50 | K/W |
| thermal resistance from junction to mounting base | $R_{th(j-mb)}$ | 0.5 | K/W |

*1 $T_{mb}$ = 25℃; pulsed; $t_p \leqslant 10$ μs;

*2 unclamped inductive load; $I_D$ =75 A;$V_{DS} \leqslant$ 40 V; $V_{GS}$ = 10 V; $R_{GS}$ = 50Ω,starting $T_{mb}$= 25℃

# KUK7604-40A

■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Testconditons | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| drain-source breakdown voltage | $V_{(BR)DSS}$ | $I_D$ = 0.25 mA; $V_{GS}$ = 0 V;$T_j$ = 25℃ | 40 | | | V |
| | | $I_D$ = 0.25 mA; $V_{GS}$ = 0 V;$T_j$ = -55℃ | 36 | | | V |
| gate-source threshold voltage | $V_{GS(th)}$ | $I_D$ = 1 mA; $V_{DS}$ = $V_{GS}$;$T_j$ = 25℃ | 2 | 3 | 4 | V |
| | | $I_D$ = 1 mA; $V_{DS}$ = $V_{GS}$;$T_j$ = 175℃ | 1 | | | V |
| | | $I_D$ = 1 mA; $V_{DS}$ = $V_{GS}$;$T_j$ = -55℃ | | | 4.4 | V |
| drain-source leakage current | $I_{DSS}$ | $V_{DS}$ = 40 V; $V_{GS}$ = 0 V;$T_j$ = 25℃ | | 0.05 | 10 | mA |
| | | $V_{DS}$ = 40 V; $V_{GS}$ = 0 V;$T_j$ = 175℃ | | | 500 | mA |
| gate-source leakage current | $I_{GSS}$ | $V_{GS}$ = ±20 V; $V_{DS}$ = 0 V | | 2 | 100 | nA |
| drain-source on-state resistance | $R_{DSon}$ | $V_{GS}$ = 10 V; $I_D$ = 25 A;$T_j$ = 25℃ | | 3.9 | 4.5 | mΩ |
| | | $V_{GS}$ = 10 V; $I_D$ = 25 A;$T_j$ = 175℃ | | | 8.5 | mΩ |
| total gate charge | $Q_{g(tot)}$ | $V_{GS}$ = 10 V; $V_{DD}$ = 32 V;$I_D$ = 25 A | | 117 | | nC |
| gate-to-source charge | $Q_{gs}$ | | | 19 | | nC |
| gate-to-drain (Miller) charge | $Q_{gd}$ | | | 50 | | nC |
| input capacitance | $C_{iss}$ | $V_{GS}$ = 0 V; $V_{DS}$ = 25 V;f = 1 MHz | | 4300 | 5730 | pF |
| output capacitance | $C_{oss}$ | | | 1400 | 1680 | pF |
| reverse transfer capacitance | $C_{rss}$ | | | 800 | 1100 | pF |
| turn-on delay time | $t_{d(on)}$ | $V_{DD}$ = 30 V; $R_L$ = 1.2Ω;$V_{GS}$ = 10 V; $R_G$ = 10Ω | | 33 | | ns |
| rise time | $t_r$ | | | 110 | | ns |
| turn-off delay time | $t_{d(off)}$ | | | 151 | | ns |
| fall time | $t_f$ | | | 76 | | ns |
| internal drain inductance | $L_d$ | from drain lead 6 mm from package to centre of die | | 4.5 | | nH |
| | | | | 2.5 | | nH |
| internal source inductance | $L_s$ | from source lead to source bond pad | | 7.5 | | nH |
| source-drain (diode forward) voltage | $V_{SD}$ | $I_S$ = 40 A; $V_{GS}$ = 0 V; | | 0.85 | 1.2 | V |
| reverse recovery time | $t_{rr}$ | $I_S$ = 20 A;$dI_S/dt$ = -100 A/μs | | 96 | | ns |
| recovered charge | $Q_r$ | $V_{GS}$ = -10 V; $V_{DS}$ = 30 V | | 224 | | nC |