## General Description

This Trench MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for Back-light Inverter and power Supply.

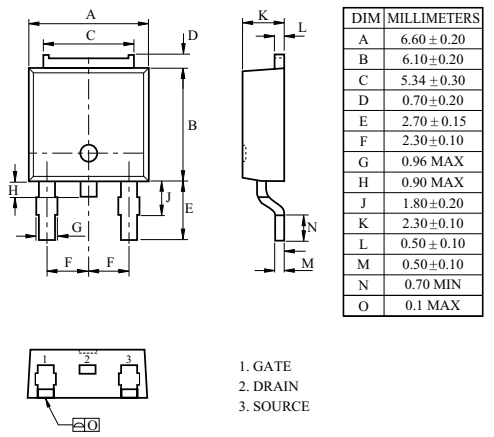
## FEATURES

☐$V_{DSS}$=40V, $I_D$=35A.

☐Low Drain to Source On-state Resistance.

: $R_{DS(ON)}$=17.5mΩ (Max.) @ $V_{GS}$=10V

: $R_{DS(ON)}$=27.0mΩ (Max.) @ $V_{GS}$=4.5V




| DIM | MILLIMETERS |
|---|---|
| A | 6.60 ± 0.20 |
| B | 6.10 ± 0.20 |
| C | 5.34 ± 0.30 |
| D | 0.70 ± 0.20 |
| E | 2.70 ± 0.15 |
| F | 2.30 ± 0.10 |
| G | 0.96 MAX |
| H | 0.90 MAX |
| J | 1.80 ± 0.20 |
| K | 2.30 ± 0.10 |
| L | 0.50 ± 0.10 |
| M | 0.50 ± 0.10 |
| N | 0.70 MIN |
| O | 0.1 MAX |

DPAK (1)

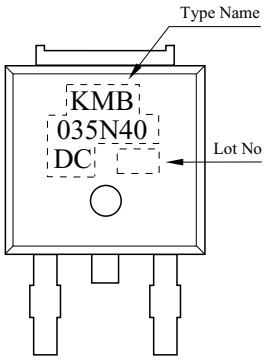
## MAXIMUM RATING (Ta=25℃ Unless otherwise Noted)

| CHARACTERISTIC | | SYMBOL | N-Ch | UNIT |
|---|---|---|---|---|
| Drain to Source Voltage | | $V_{DSS}$ | 40 | V |
| Gate to Source Voltage | | $V_{GSS}$ | ± 20 | V |
| Drain Current | DC@$T_C$=25℃ (Note1) | $I_D$ | 35 | A |
| | Pulsed (Note2) | $I_{DP}$ | 140 | |
| Drain Power Dissipation | @$T_C$=25℃ (Note1) | $P_D$ | 42 | W |
| | @Ta=25℃ (Note2) | | 3.1 | |
| Maximum Junction Temperature | | $T_j$ | 150 | ℃ |
| Storage Temperature Range | | $T_{stg}$ | -55 ~ 150 | ℃ |
| Thermal Resistance, Junction to Case (Note1) | | $R_{thJC}$ | 3.0 | ℃/W |
| Thermal Resistance, Junction to Ambient (Note2) | | $R_{thJA}$ | 40 | ℃/W |

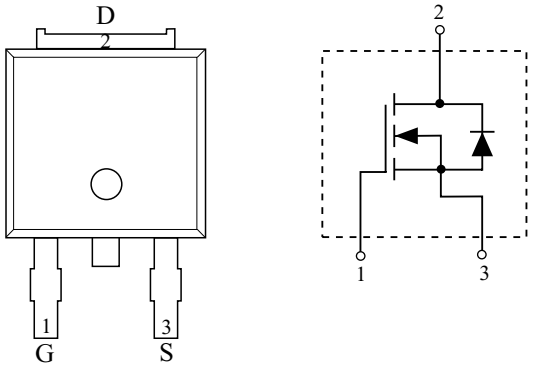
Note 1) $R_{thJC}$ means that the infinite heat sink is mounted.

Note 2) Surface Mounted on 1 × 1 Pad of 2 oz copper.

Marking




## PIN CONNECTION (TOP VIEW)



**ELECTRICAL CHARACTERISTICS (Ta=25℃)**

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| **Static** | | | | | | | |
| Drain-Source Breakdown Voltage | | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 40 | - | - | V |
| Drain Cut-off Current | | $I_{DSS}$ | $V_{GS}$=0V, $V_{DS}$=32V | - | - | 1 | μA |
| Gate to Source Leakage Current | | $I_{GSS}$ | $V_{GS}$=± 20V, $V_{DS}$=0V | - | - | ± 100 | nA |
| Gate to Source Threshold Voltage | | $V_{th}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1 | - | 3 | V |
| Drain to Source On Resistance | | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=18A (Note3) | - | 14.0 | 17.5 | mΩ |
| | | | $V_{GS}$=4.5V, $I_D$=16A (Note3) | - | 20.0 | 27.0 | |
| Forward Transconductance | | $g_{fs}$* | $V_{DS}$=5V, $I_D$=18A (Note3) | - | 35 | - | S |
| **Dynamic** | | | | | | | |
| Input Capaclitance | | $C_{iss}$ | $V_{DS}$=20V, f=1MHz, $V_{GS}$=0V | - | 524 | - | pF |
| Ouput Capacitance | | $C_{oss}$ | | - | 103 | - | |
| Reverse Transfer Capacitance | | $C_{rss}$ | | - | 51 | - | |
| Gate Resistance | | $R_g$ | f=1MHz | - | 2.4 | - | Ω |
| Total Gate Charge | $V_{GS}$=10V | $Q_g$ | $V_{DS}$=20V, $V_{GS}$=10V, $I_D$=18A (Note3) | - | 12.2 | - | nC |
| | $V_{GS}$=5V | $Q_g$ | | - | 6.3 | - | |
| Gate to Source Charge | | $Q_{gs}$ | | - | 1.9 | - | |
| Gate to Drain Charge | | $Q_{gd}$ | | - | 3.3 | - | |
| Turn-On Delat Time | | $t_{d(on)}$ | $V_{DD}$=20V, $V_{GS}$=10V, $I_D$=18A, $R_G$=6Ω (Note3) | - | 16 | - | ns |
| Turn-On Rise Time | | $t_r$ | | - | 18 | - | |
| Turn-Off Deley Time | | $t_{d(off)}$ | | - | 52 | - | |
| Turn-Off Fall Time | | $t_f$ | | - | 13 | - | |
| **Source-Drain Diode Ratings** | | | | | | | |
| Continuous Source Current | | $I_S$ | - | - | 35 | - | A |
| Rulsed Source Current | | $I_{SP}$ | - | - | 140 | - | A |
| Source to Drain Forward Voltage | | $V_{SD}$ | $V_{GS}$=0V, $I_S$=3A (Note3) | - | 0.8 | 1.2 | V |
| Reverse Recovery time | | $t_{rr}$ | $I_S$=18A, dI/dt=100A/μs | - | 22 | - | ns |
| Reverse Recovered Charge | | $Q_{rr}$ | $I_S$=18A, dI/dt=100A/μs | - | 8.6 | - | nC |
| Note3) Pulse Test : Pulse width <300μs , Duty cycle < 2% | | | | | | | |

Fig1. $I_D$ - $V_{DS}$

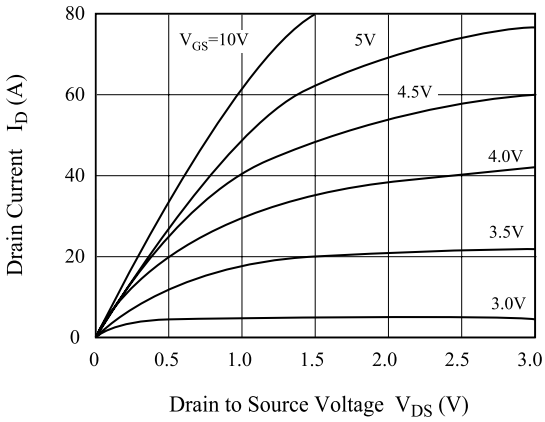



Fig2. $R_{DS(on)}$ - $I_D$

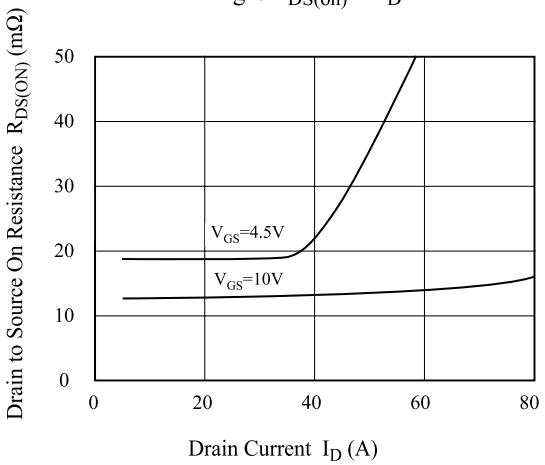



Fig3. $I_D$ - $V_{GS}$

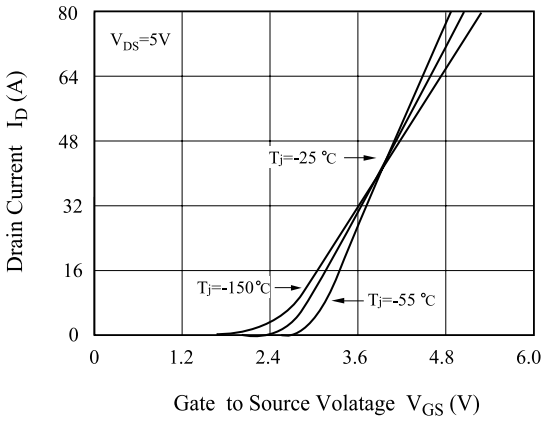



Fig4. $R_{DS(on)}$ - $T_j$

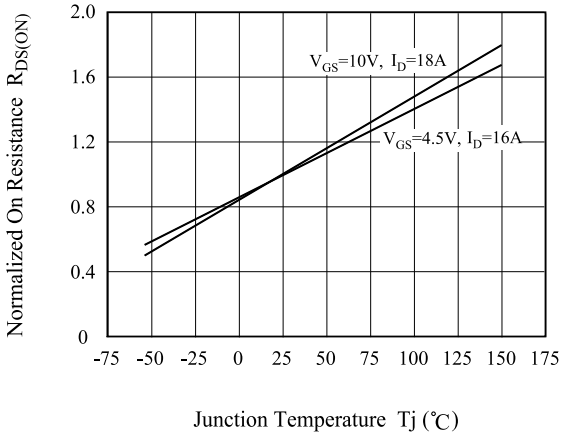



Fig5. $V_{th}$ - $T_j$

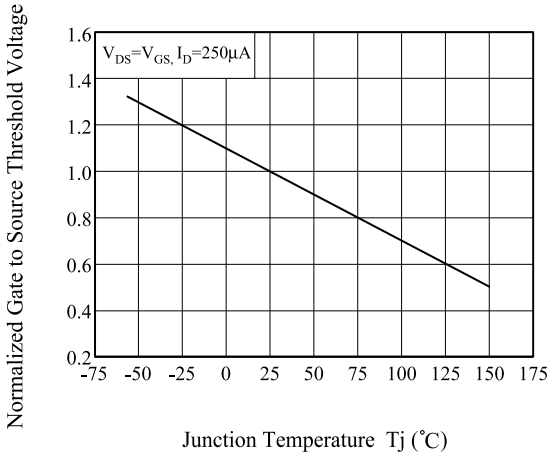



Fig6. $I_S$ - $V_{SD}$

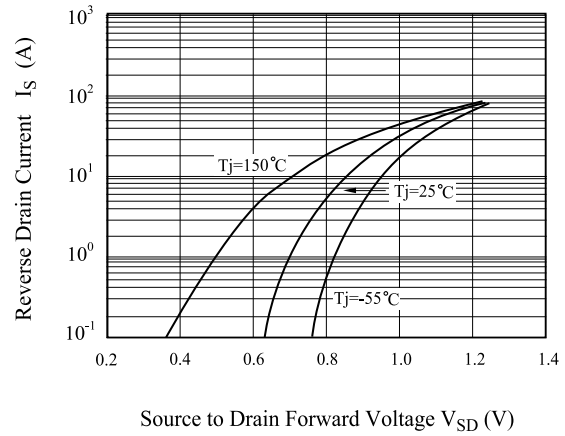


Fig7. $R_{DS(on)}$ - $V_{GS}$

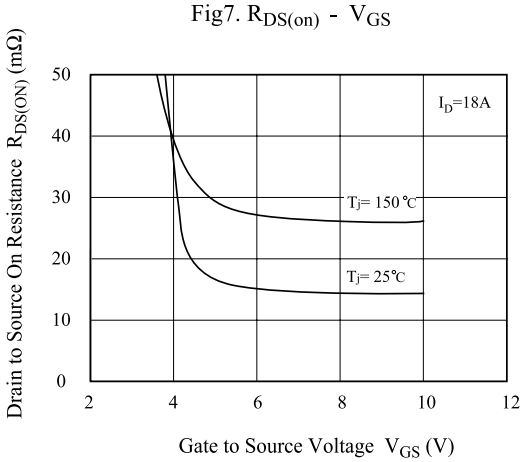



Fig 8. C - $V_{DS}$

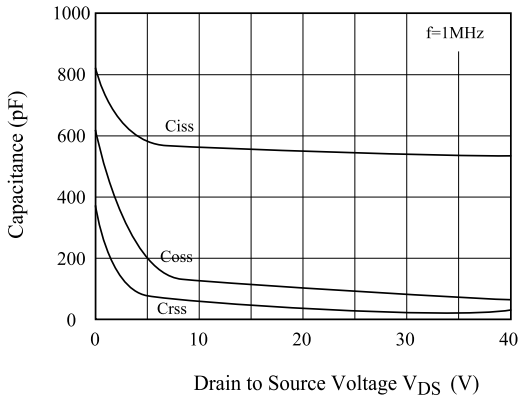



Fig 9. $V_{GS}$ - $Q_g$

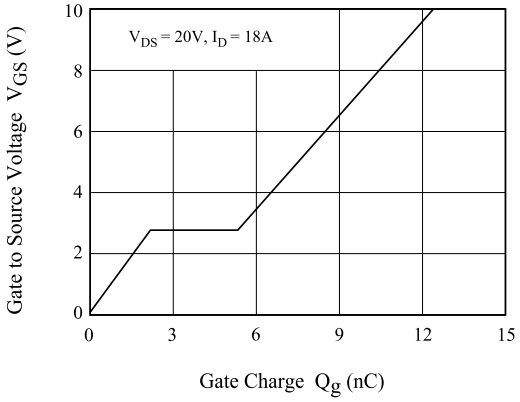



Fig10. Safe Operation Area

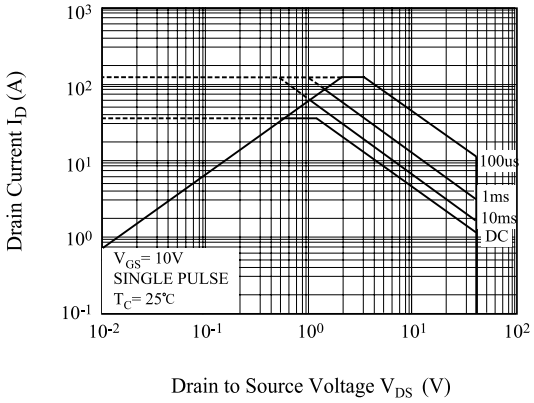



Fig11. Transient Thermal Response Curve