

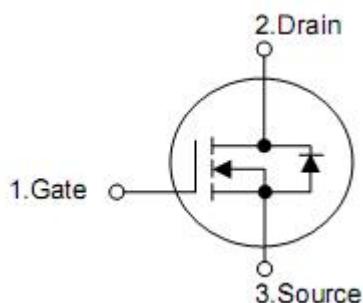
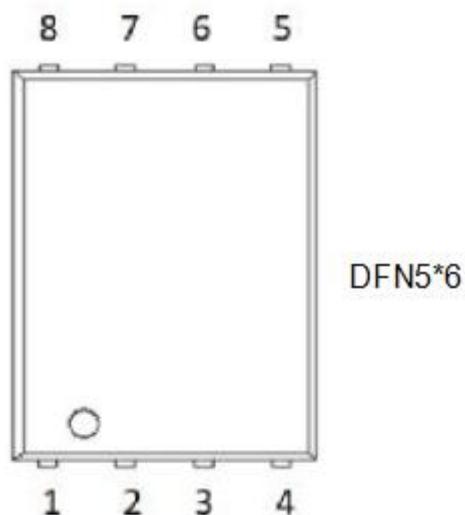
1. Features

- $R_{DS(on)}=2.2\text{m}\Omega$ (typ.) @ $V_{GS}=10\text{V}$
- Advanced Trench Technology
- Low Gate Charge
- High Current Capability
- RoHS and Halogen-Free Compliant

2. Description

- Power Management in Desktop Computer
- DC/DC Converters

3. Symbol



| Pin | Function |
|---------|----------|
| 4 | Gate |
| 5,6,7,8 | Drain |
| 1,2,3 | Source |

4. Ordering Information

| Part Number | Package | Brand |
|-------------|---------|-------|
| KCY3303S | DFN5*6 | KIA |

5. Absolute maximum ratings

| Parameter | Symbol | Rating | Units |
|---|----------------|------------|-------|
| Drain-source voltage | V_{DS} | 30 | V |
| Gate-source voltage | V_{GS} | ± 20 | V |
| Continuous drain current V_{GS} @10V ^{1,6} | I_D | 95 | A |
| | | 76 | |
| Pulsed drain current ² | I_{DM} | 280 | A |
| Single pulse avalanche energy ³ | EAS | 151 | mJ |
| Avalanche current | I_{AS} | 55 | A |
| Total power dissipation ⁴ | P_D | 48 | W |
| Junction and storage temperature range | T_J, T_{STG} | -55 to 150 | °C |

6. Thermal Data

| Parameter | Symbol | Ratings | Units |
|---|-----------------|---------|-------|
| Thermal resistance, junction-ambient ¹ | $R_{\theta JA}$ | 50 | °C/W |
| Thermal resistance, Junction-case ¹ | $R_{\theta JC}$ | 2.6 | |

7. Electrical characteristics

($T_J=25^\circ\text{C}$,unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---|----------------------------|--|-----|------|-----------|------------------|
| Drain-Source breakdown voltage | BV_{DSS} | $V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$ | 30 | - | - | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{\text{DS}}=24\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$ | - | - | 1 | μA |
| | | $V_{\text{DS}}=24\text{V}, V_{\text{GS}}=0\text{V}, T_J=55^\circ\text{C}$ | - | - | 5 | |
| Gate-source leakage current | I_{GSS} | $V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$ | - | - | ± 100 | nA |
| Gate threshold voltage | $V_{\text{GS}(\text{th})}$ | $V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$ | 1.2 | 1.6 | 2.5 | V |
| Static drain-source on- resistance ² | $R_{\text{DS}(\text{on})}$ | $V_{\text{GS}}=10\text{V}, I_{\text{D}}=20\text{A}$ | - | 2.2 | 2.8 | $\text{m}\Omega$ |
| | | $V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=20\text{A}$ | - | 3.2 | 3.8 | |
| Forward transconductance | g_{FS} | $V_{\text{DS}}=5\text{V}, I_{\text{D}}=20\text{A}$ | - | 90 | - | S |
| Gate Resistance | R_g | $V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V} F=1\text{MHZ}$ | - | 1.6 | - | Ω |
| Total gate charge(4.5V) | Q_g | $V_{\text{DS}}=15\text{V}, V_{\text{GS}}=10\text{V}$ $I_{\text{D}}=20\text{A}$ | - | 20 | - | nC |
| Gate-source charge | Q_{gs} | | - | 12 | - | |
| Gate-drain charge | Q_{gd} | | - | 14.5 | - | |
| Turn-on delay time | $t_{\text{d}(\text{on})}$ | $V_{\text{DD}}=15\text{V},$ $R_g=3.3\Omega, V_{\text{GS}}=10\text{V}$ $I_{\text{D}}=-20\text{A}$ | - | 11 | - | ns |
| Rise time | t_r | | - | 6 | - | |
| Turn-off delay time | $t_{\text{d}(\text{off})}$ | | - | 38 | - | |
| Fall time | t_f | | - | 11 | - | |
| Input capacitance | C_{iss} | $V_{\text{GS}}=0\text{V}, V_{\text{DS}}=15\text{V}$ $F=1.0\text{MHZ}$ | - | 3030 | - | pF |
| Output capacitance | C_{oss} | | - | 1580 | - | |
| Reverse transfer capacitance | C_{rss} | | - | 205 | - | |
| Diode characteristics | | | | | | |
| Continuous source current ^{1,6} | I_s | $V_G=V_D=0\text{V}$,Force current | - | - | 95 | A |
| Diode forward voltage ² | V_{SD} | $V_{\text{GS}}=0\text{V}, I_{\text{S}}=1\text{A}, T_J=25^\circ\text{C}$ | - | - | 1.4 | V |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=55\text{A}$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_{D} and I_{DM} , in real applications , should be limited by total power dissipation.
- 6.Package limitation current is 85A.

8. Test circuits and waveforms

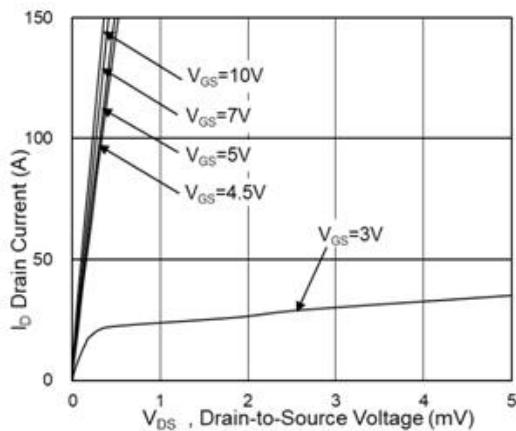


Fig.1 Typical Output Characteristics

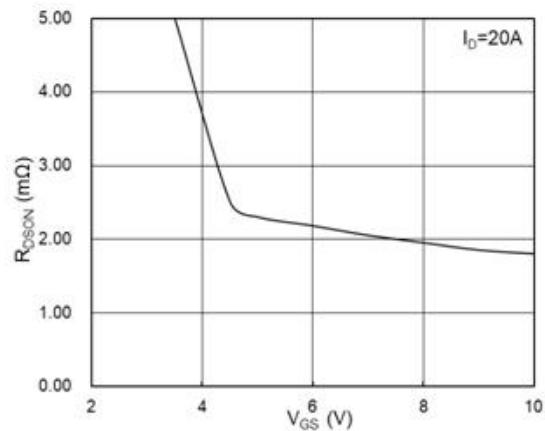


Fig.2 On-Resistance vs G-S Voltage

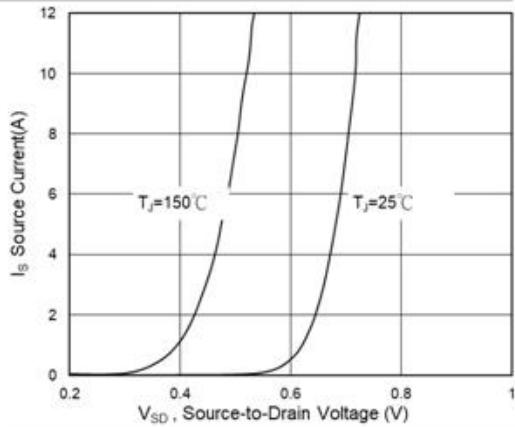


Fig.3 Source Drain Forward Characteristics

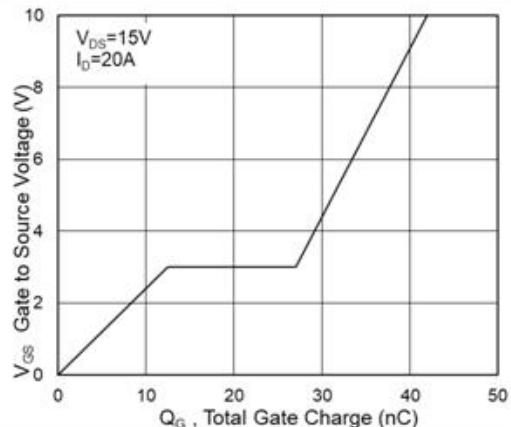


Fig.4 Gate-Charge Characteristics

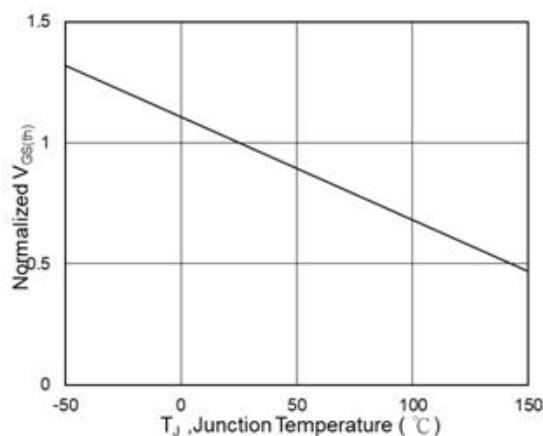


Fig.5 Normalized $V_{GS(th)}$ vs T_J

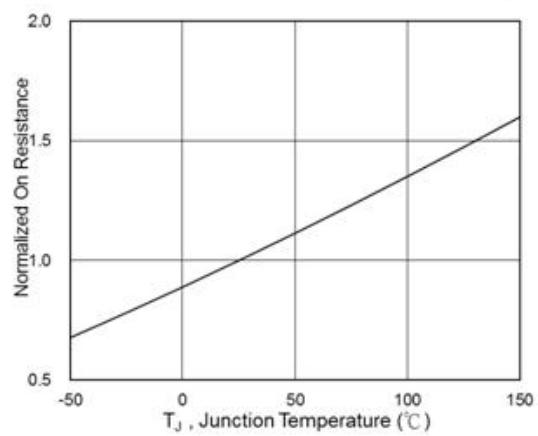


Fig.6 Normalized $R_{DS(on)}$ vs T_J

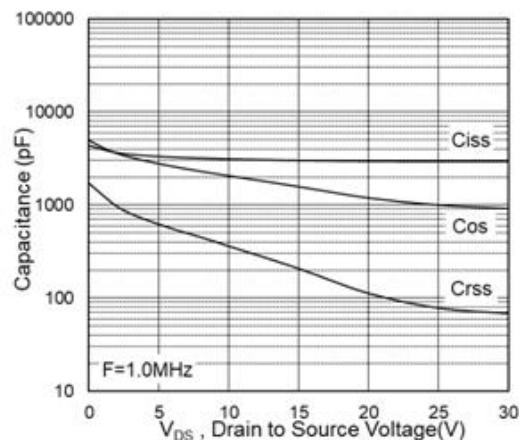


Fig.7 Capacitance

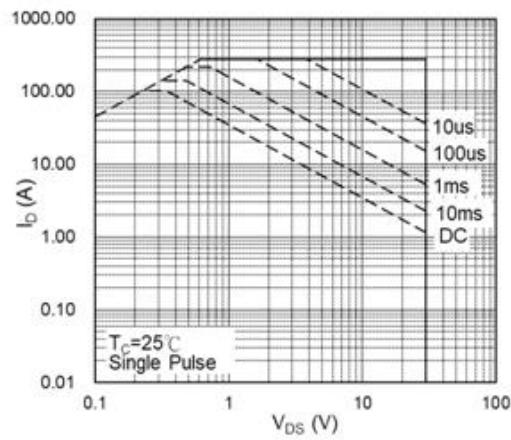


Fig.8 Safe Operating Area

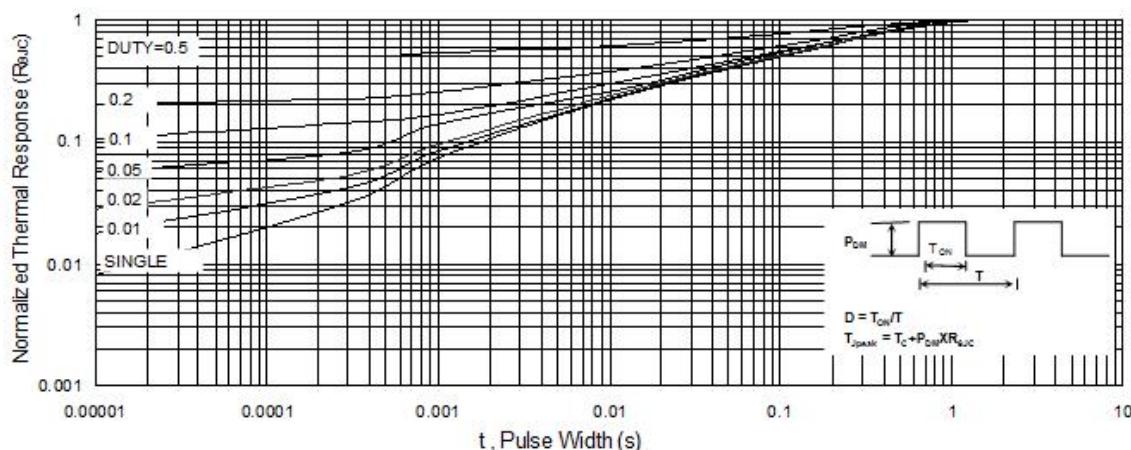


Fig.9 Normalized Maximum Transient Thermal Impedance

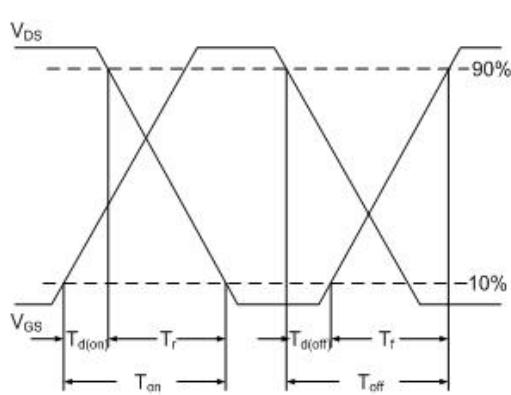


Fig.10 Switching Time Waveform

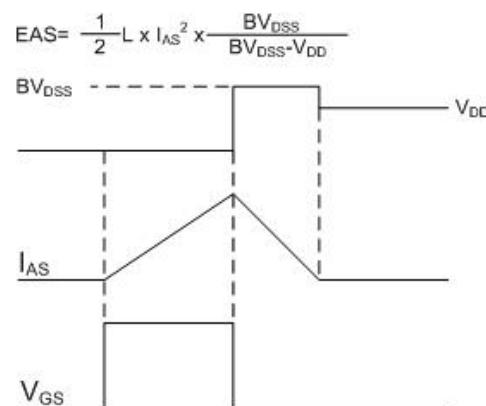


Fig.11 Unclamped Inductive Switching Waveform