

1. Description

- n SGT MOSFET technology
- n Advanced Trench MOS Technology
- n Low Gate Charge
- n Low $R_{DS(ON)}$
- n 100% EAS Guaranteed
- n Green Device Available

2. Features

- n $R_{DS(ON)}=7.3m\Omega$ (typ.) @ $V_{GS}=10V$

3. Applications

- n Load Switch
- n LED Applications
- n Networking Applications
- n Quick Charger

4. Pin configuration



| Pin | Function |
|------|----------|
| 1 | Gate |
| 2, 4 | Drain |
| 3 | Source |

5. Ordering Information

| Part Number | Package | Brand |
|-------------|---------|-------|
| KCP2915B | TO-220 | KIA |

6. Absolute maximum ratings

TC=25°C unless otherwise specified

| Parameter | Symbol | Ratings | Unit | |
|----------------------------------------|-------------------------|------------|------|---|
| Drain-to-Source Voltage | V_{DS} | 150 | V | |
| Gate-to-Source Voltage | V_{GS} | ±20 | V | |
| Continuous Drain Current ¹⁾ | $T_C=25^\circ\text{C}$ | I_D | 130 | A |
| | $T_C=100^\circ\text{C}$ | I_D | 80 | A |
| Pulsed Drain Current ²⁾ | I_{DM} | 450 | A | |
| Avalanche Energy ³⁾ | EAS | 784 | mJ | |
| Avalanche Current | I_{AS} | 56 | A | |
| Total Power Dissipation ⁴⁾ | P_D | 178 | W | |
| Operation Junction Temperature Range | T_J | -55 to 150 | °C | |
| Storage Temperature Range | T_{STG} | -55 to 150 | °C | |

7. Thermal characteristics

| Parameter | Symbol | Typ. | Max. | Unit |
|-------------------------------------------------------|-----------------|------|------|------|
| Thermal Resistance, Junction-to-Ambient ¹⁾ | $R_{\theta JA}$ | - | 50 | °C/W |
| Thermal Resistance, Junction-to-Case ¹⁾ | $R_{\theta JC}$ | - | 0.7 | °C/W |

8. Electrical characteristics

(T_J=25°C, unless otherwise notes)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------------------|---------------------|-------------------------------------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250uA | 150 | - | - | V |
| Static Drain-Source On-Resistance ²⁾ | R _{DS(ON)} | V _{GS} =10V, I _D =20A | - | 7.3 | 9 | mΩ |
| Gate Threshold Voltage | V _{GS(th)} | V _{GS} =V _{DS} , I _D =250uA | 2 | 3 | 4 | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =120V, V _{GS} =0V, T _J =25°C | - | - | 1 | uA |
| | | V _{DS} =120V, V _{GS} =0V, T _J =55°C | - | - | 5 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| Gate Resistance | R _g | V _{DS} =0V, V _{GS} =0V, f=1MHz | - | 1.9 | - | Ω |
| Total Gate Charge | Q _g | V _{DS} =75V, V _{GS} =10V, I _D =20A | - | 110 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 25.9 | - | nC |
| Gate-Drain Charge | Q _{gd} | | - | 31.8 | - | nC |
| Turn-On Delay Time | T _{d(on)} | V _{DD} =30V, V _{GS} =10V, R _G =3.3, I _D =1A | - | 33 | - | ns |
| Rise Time | T _r | | - | 26 | - | ns |
| Turn-Off Delay Time | T _{d(off)} | | - | 98 | - | ns |
| Fall Time | T _f | | - | 90 | - | ns |
| Input Capacitance | C _{iss} | V _{DS} =75V, V _{GS} =0V, f=1MHz | - | 5750 | - | pF |
| Output Capacitance | C _{oss} | | - | 414 | - | pF |
| Reverse Transfer Capacitance | C _{rss} | | - | 9.5 | - | pF |
| Continuous Source Current ¹⁾ | I _S | V _G =V _D =0V, Force Current | - | - | 130 | A |
| Diode Forward Voltage ²⁾ | V _{SD} | V _{GS} =0V, I _S =1A, T _J =25°C | - | - | 1.2 | V |

Notes:

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 ≤ 300us, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=56A
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.

9. Typical Characteristics

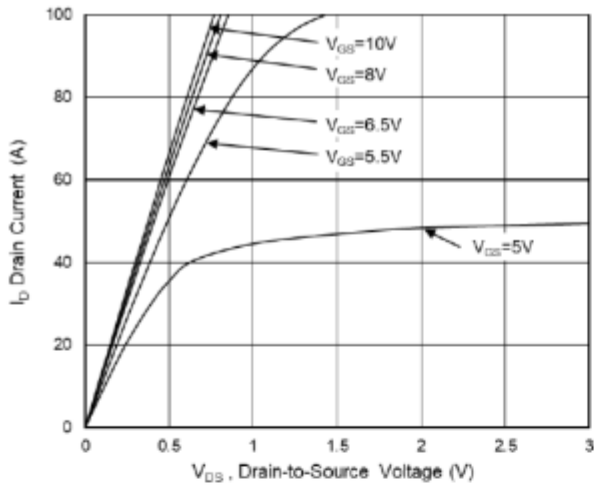


Fig.1 Typical Output Characteristics

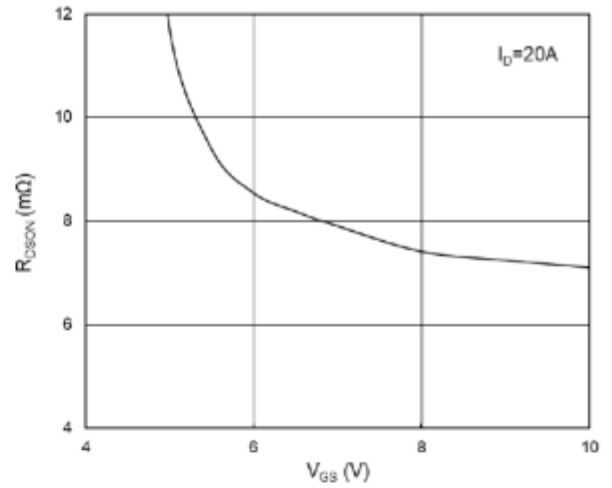


Fig.2 On-Resistance vs G-S Voltage

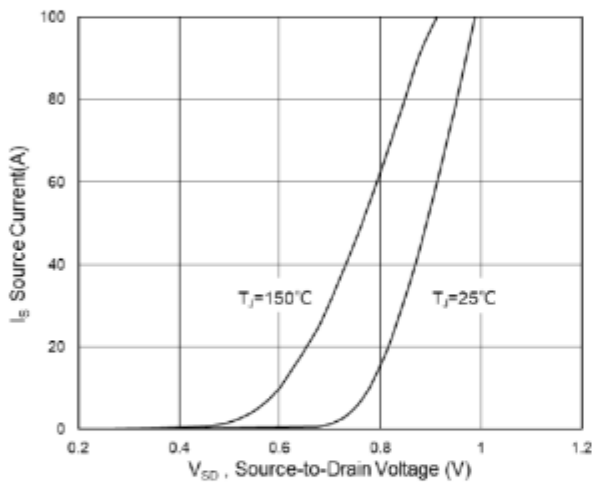


Fig.3 Source Drain Forward Characteristics

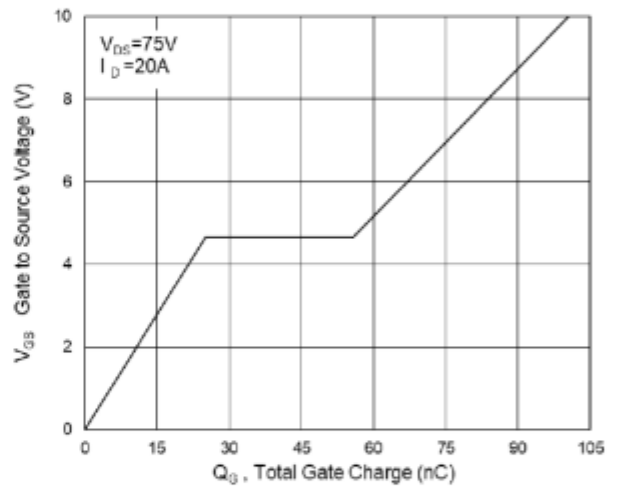


Fig.4 Gate-Charge Characteristics

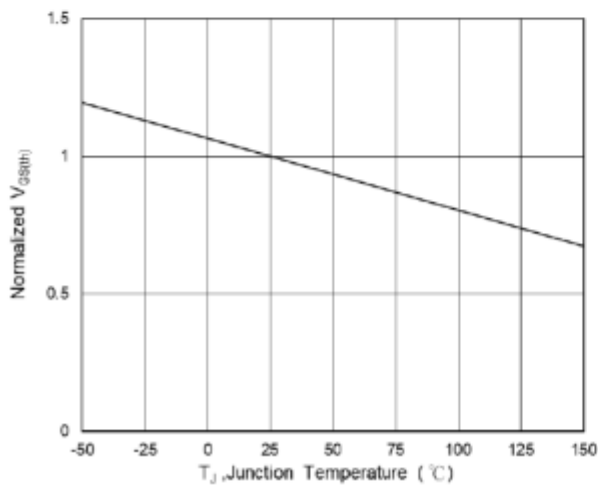


Fig.5 Normalized $V_{GS(th)}$ vs T_J

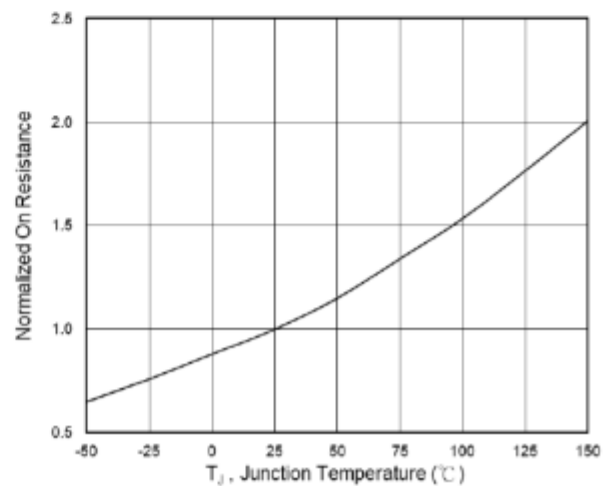


Fig.6 Normalized $R_{DS(on)}$ vs T_J

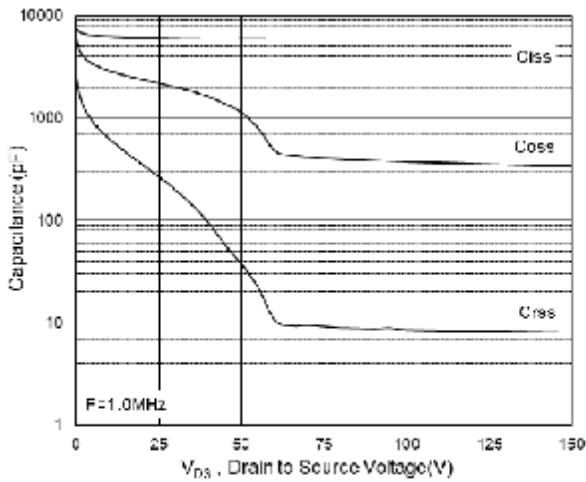


Fig.7 Capacitance

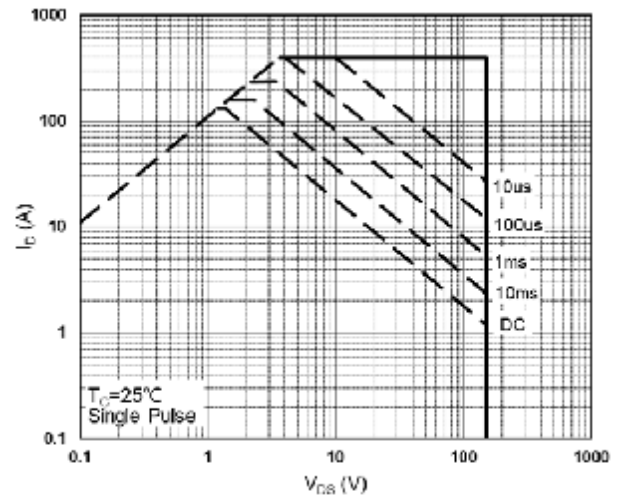


Fig.8 Safe Operating Area

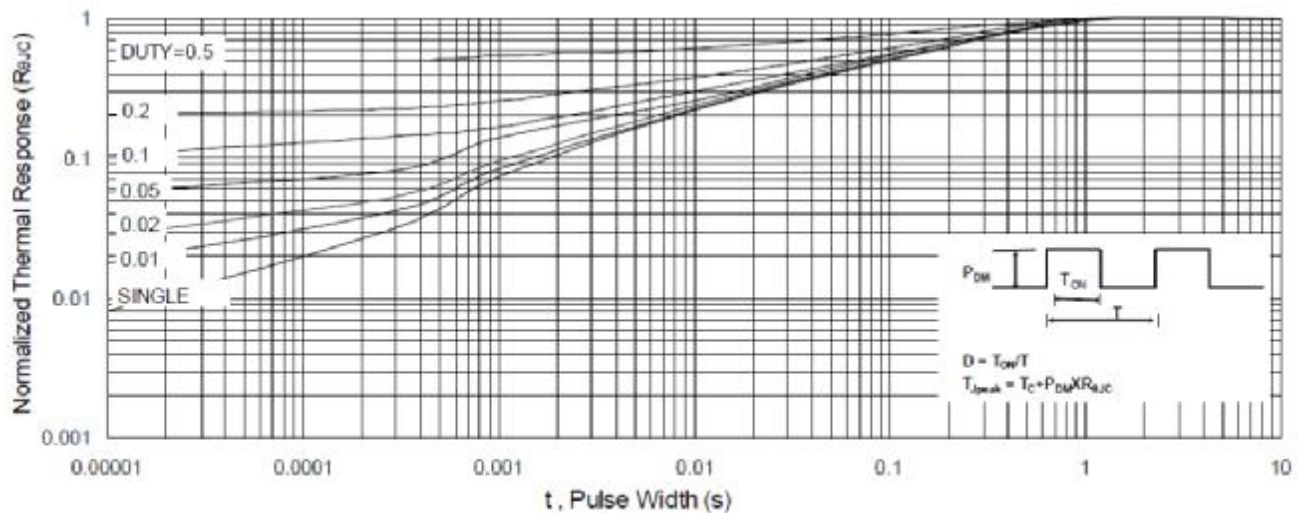


Fig.9 Normalized Maximum Transient Thermal Impedance

10. Test Circuits and Waveforms

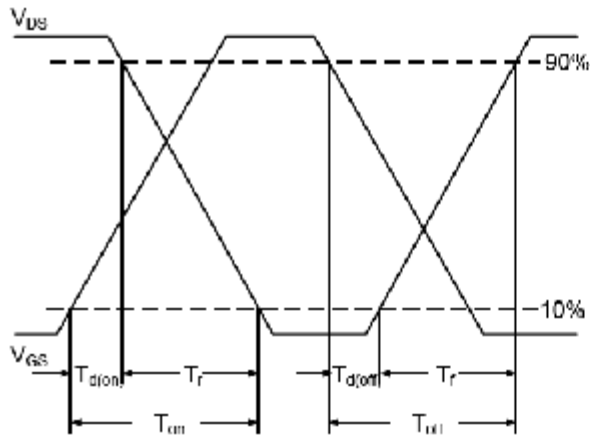


Fig.10 Switching Time Waveform

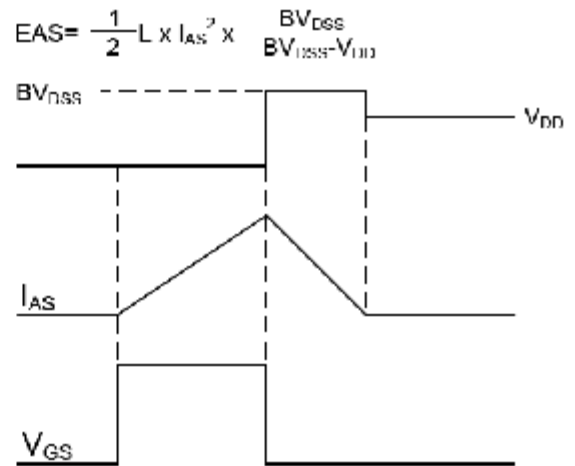


Fig.11 Unclamped Inductive Switching Waveform

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