

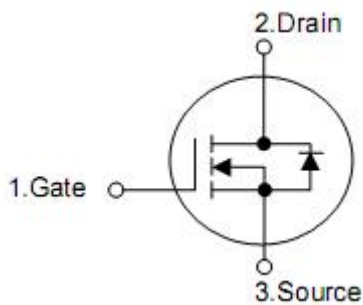
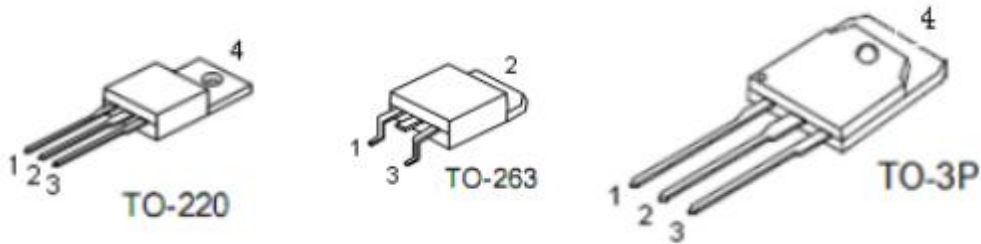
1. Applications

- n High efficiency synchronous rectification in SMPS
- n High speed power switching

2. Features

- n $R_{DS(on)}=5.0m\Omega$ @ $V_{GS}= 10 V$
- n Super high dense cell design
- n Ultra low On-Resistance
- n 100% avalanche tested
- n Lead Free and Green devices available (RoHS Compliant)

3. Pin configuration



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

4. Ordering Information

| Part Number | Package | Brand |
|-------------|---------|-------|
| KNB2910A | TO-263 | KIA |
| KNP2910A | TO-220 | KIA |
| KNH2910A | TO-3P | KIA |

5. Absolute maximum ratings

($T_C=25\text{ }^\circ\text{C}$, unless otherwise specified)

| Parameter | Symbol | Ratings | | Units | |
|--|-----------|---------------------------------|-------|------------------|---|
| | | TO-220/263 | TO-3P | | |
| Drain-source voltage | V_{DSS} | 100 | | V | |
| Gate-source voltage | V_{GSS} | ± 25 | | V | |
| Continuous drain current $T_C=25\text{ }^\circ\text{C}^2$ | I_D | 130 | | A | |
| Continuous drain current $T_C=100\text{ }^\circ\text{C}^2$ | | 99 | | A | |
| 300us pulsed drain current tested $T_C=25\text{ }^\circ\text{C}^1$ | I_{DP} | 560 | | A | |
| Avalanche energy single pulse ³ | E_{AS} | 552 | | mJ | |
| Power dissipation | P_D | $T_C=25\text{ }^\circ\text{C}$ | 300 | 375 | W |
| | | $T_C=100\text{ }^\circ\text{C}$ | 150 | 187.5 | W |
| Maximum junction temperature | T_J | 175 | | $^\circ\text{C}$ | |
| Storage temperature range | T_{STG} | -55~+175 | | $^\circ\text{C}$ | |
| Diode continuous forward current $T_C=25\text{ }^\circ\text{C}$ | I_S | 140 | | A | |

6. Thermal characteristics

| Parameter | Symbol | Rating | Unit |
|--|---------------|--------|--------------------|
| Thermal resistance,Junction-to-case | θ_{JC} | 0.5 | $^\circ\text{C/W}$ |
| Thermal resistance,Junction-to-ambient | θ_{JA} | 62.5 | $^\circ\text{C/W}$ |

7. Electrical characteristics

(T_C=25°C, unless otherwise notes)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---------------------|---|-----|------|------|------|
| Off Characteristics | | | | | | |
| Drain-source breakdown voltage | BV _{DSS} | V _{GS} =0V, I _D =250μA | 100 | - | - | V |
| Drain-to-source leakage current | I _{DSS} | V _{DS} =100V, V _{GS} =0V | - | - | 1 | μA |
| | | T _J =125 °C | - | - | 30 | μA |
| Gate-to-source leakage current | I _{GSS} | V _{GS} =25V, V _{DS} =0V | - | - | 100 | nA |
| | | V _{GS} =-25V, V _{DS} =0V | - | - | -100 | nA |
| On characteristics | | | | | | |
| Gate threshold voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 2.0 | - | 4.0 | V |
| Static drain-source on-resistance ⁴ | R _{DS(on)} | V _{GS} =10V, I _D =40A | - | 5.0 | 7.0 | mΩ |
| Gate charge characteristics⁵ | | | | | | |
| Total gate charge | Q _g | V _{DS} =80V, I _D =70A, V _{GS} =10V | - | 130 | - | nC |
| Gate-source charge | Q _{gs} | | - | 32 | - | |
| Gate-drain (Miller)charge | Q _{gd} | | - | 55 | - | |
| Dynamic characteristics⁵ | | | | | | |
| Gate series resistance | R _G | V _{DS} =0V, V _{GS} =0V, f=1.0MHz | - | 1 | - | Ω |
| Turn-on delay time | T _{d(ON)} | V _{DD} =50V, I _D =70A, V _{GEN} =10V, R _G =5Ω | - | 24 | - | nS |
| Rise time | t _{rise} | | - | 91 | - | |
| Turn-off delay time | T _{d(OFF)} | | - | 75 | - | |
| Fall time | t _{fall} | | - | 65 | - | |
| Input capacitance | C _{iss} | V _{DS} =50V, V _{GS} =0V, f=1.0MHz | - | 6800 | - | pF |
| Output capacitance | C _{oss} | | - | 630 | - | |
| Reverse transfer capacitance | C _{rss} | | - | 350 | - | |
| Source-drain body diode characteristics T_J=25°C, unless otherwise notes | | | | | | |
| Diode forward voltage ⁴ | V _{SD} | V _{GS} =0V, I _S =70A | - | - | 1.2 | V |
| Reverse recovery time | t _{rr} | I _{SD} =70A, di _F /dt=100A/μs, | - | 43 | - | ns |
| Reverse recovery charge | Q _{rr} | | - | 67 | - | nC |

Note: 1. Pulse width limited by safe operating area.

2. Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A

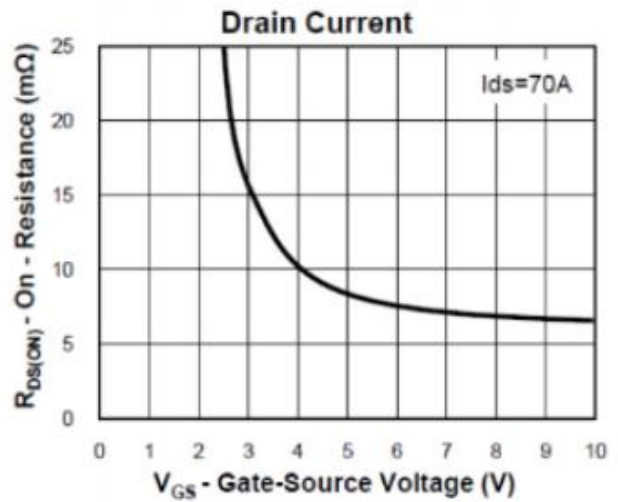
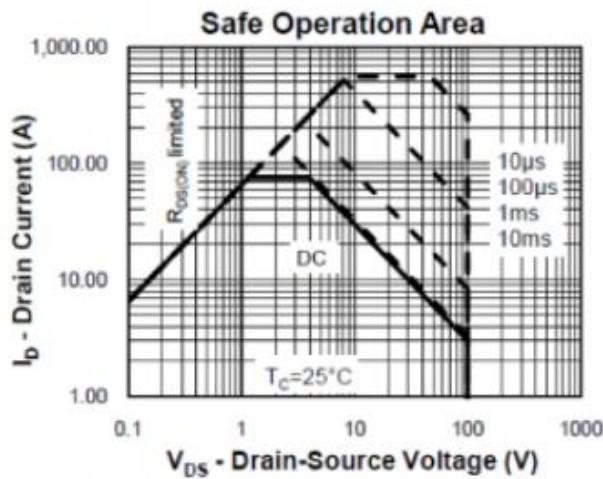
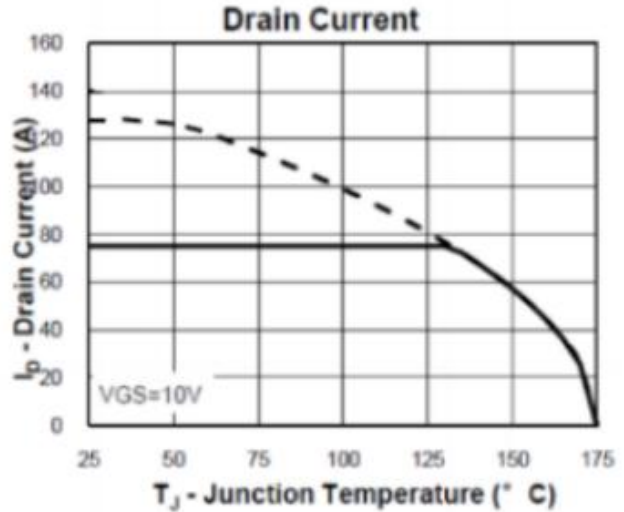
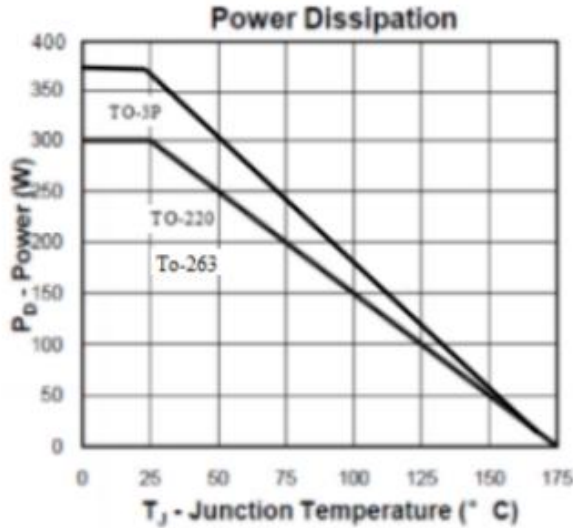
3. Limited by T_{Jmax}, I_{AS}=47A, V_{DD}=48V, R_G=50Ω, Starting T_J=25°C.

4. Pulse test; Pulse width ≤300μs; duty cycle ≤2%.

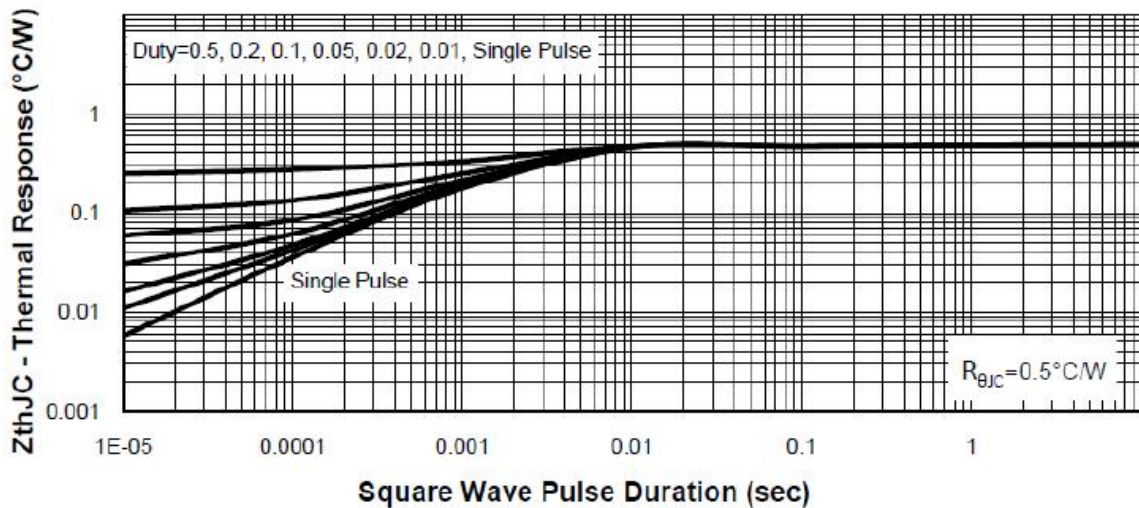
5. Guaranteed by design, not subject to production testing.

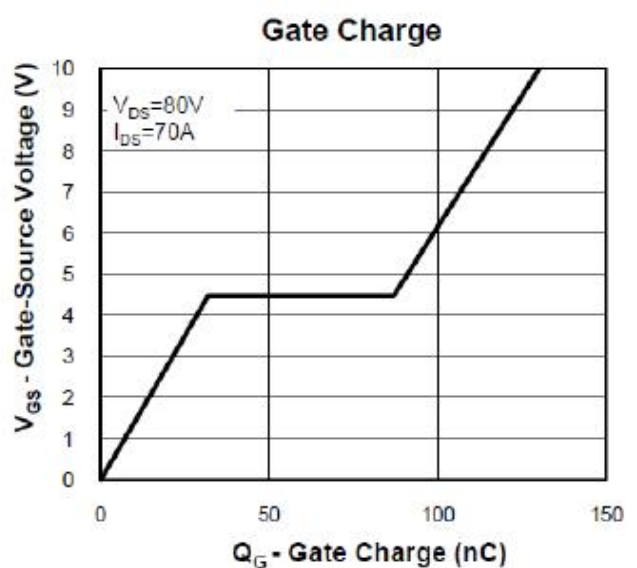
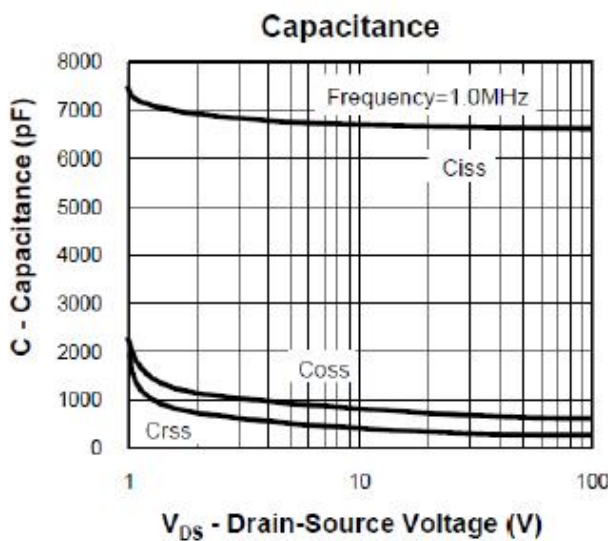
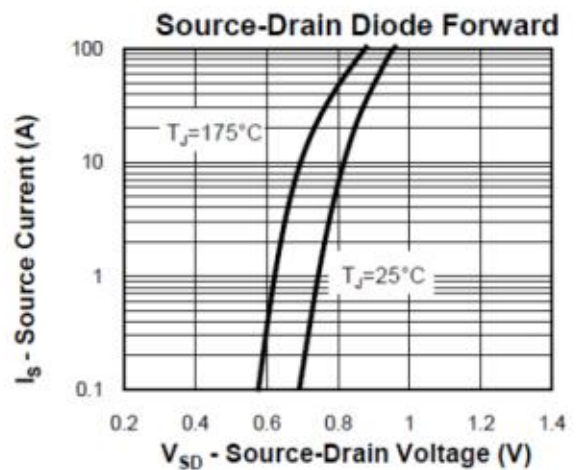
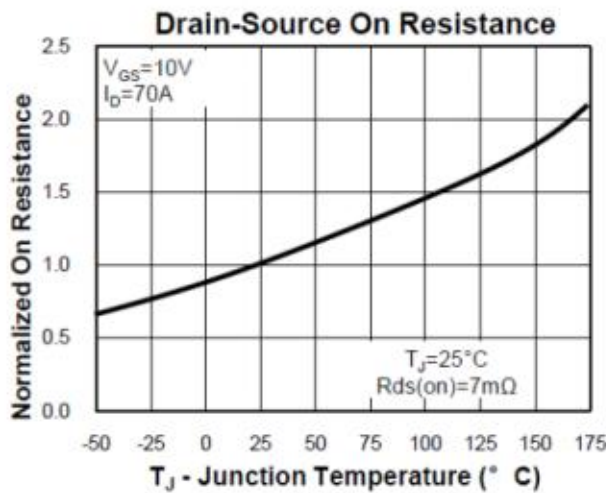
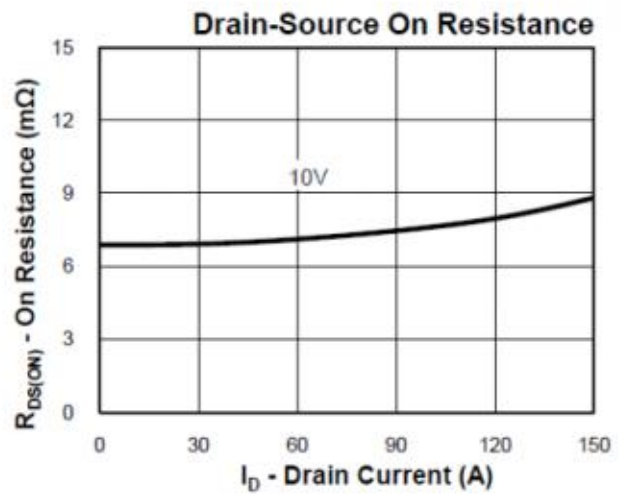
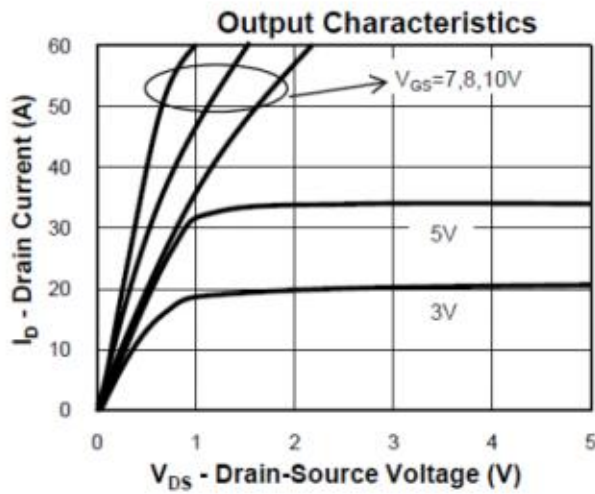
6. KIA finished product specifications please customer before placing order, should obtain the latest version of the finished product specifications.

8. Typical characteristics



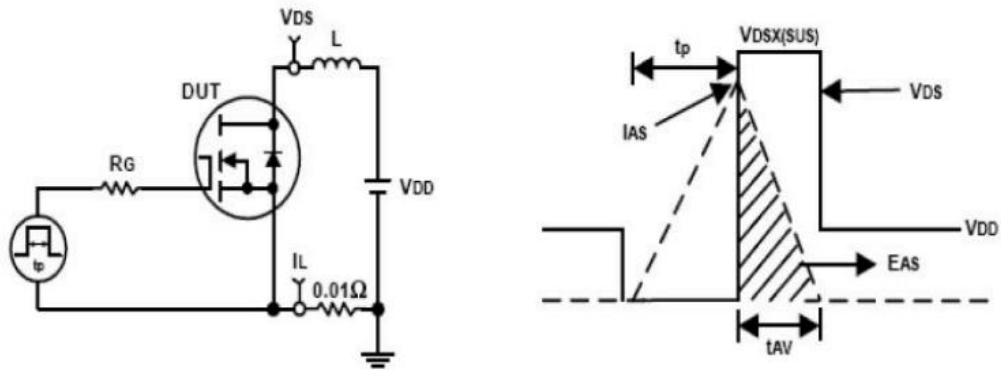
Thermal Transient Impedance



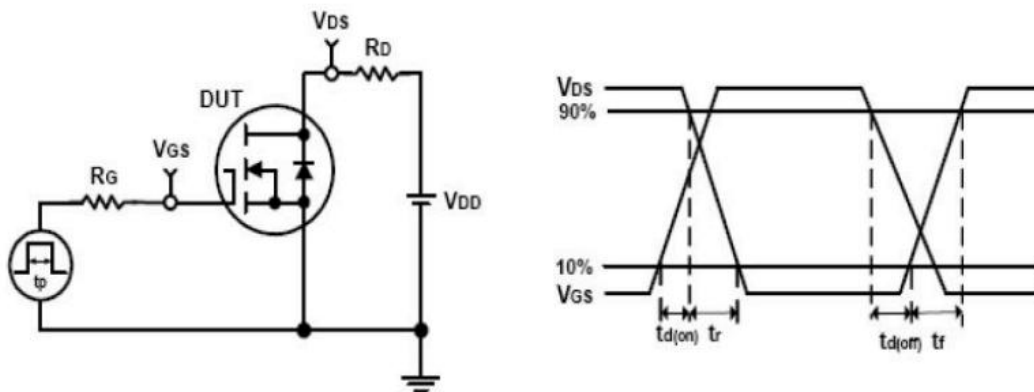


9. Test circuits and waveforms

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



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