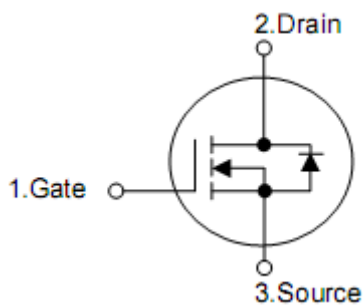


1. Features

- Robust High Voltage Termination
- $R_{DS(ON)}=1.35\Omega(\text{typ.}) @ V_{GS}=10V$ (DFN5*6)
- $R_{DS(ON)}=1.38\Omega(\text{typ.}) @ V_{GS}=10V$ (TO-252)
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Diode is Characterized for Use in Bridge Circuits
- I_{DSS} and $V_{DS(on)}$ Specified at Elevated Temperature

2. Pin configuration



| Pin | | Function |
|---------|--------|----------|
| DFN5*6 | TO-252 | |
| 4 | 1 | Gate |
| 5,6,7,8 | 2 | Drain |
| 1,2,3 | 3 | Source |

3. Ordering Information

| Part Number | Package | Brand |
|-------------|---------|-------|
| KIA5N50SY | DFN5*6 | KIA |
| KIA5N50SD | TO-252 | KIA |

4. Absolute maximum ratings

(T_c= 25 °C , unless otherwise specified)

| Parameter | Symbol | Ratings | | Unit |
|---|----------------------------------|------------|--------|------|
| | | DFN5*6 | TO-252 | |
| Drain-to-Source Voltage | V _{DSS} | 500 | | V |
| Gate-to-Source Voltage | V _{GSS} | ±30 | | V |
| Continuous Drain Current | I _D | 5 | | A |
| Pulsed Drain Current | I _{DM} | 15 | | A |
| Single Pulse Avalanche Energy* | EAS | 80 | | mJ |
| Power Dissipation | P _D | 68 | 44.6 | W |
| Derating Factor above 25°C | P _D | 0.55 | 0.36 | W/°C |
| Maximum Temperature for Soldering | T _L | 260 | | °C |
| Operating and Storage Temperature Range | T _J &T _{STG} | -55 to 150 | | °C |

*T_J=25 °C, V_{DD}=100V, V_{GS}=10V, I_L=4A, L=10mH, R_G=25Ω

5. Thermal characteristics

| Parameter | Symbol | Ratings | | Unit |
|---|------------------|---------|--------|------|
| | | DFN5*6 | TO-252 | |
| Thermal Resistance, Junction-to-Case | R _{θJC} | 1.84 | 2.8 | °C/W |
| Thermal Resistance, Junction-to-Ambient | R _{θJA} | 106.2 | 120 | °C/W |

6. Electrical characteristics

(T_J=25°C, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min. | Typ. | | Max. | Unit |
|-----------------------------------|---------------------|--|------|--------|--------|------|------|
| | | | | DFN5*6 | TO-252 | | |
| Drain-to-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250uA | 500 | - | | - | V |
| Drain-to-Source Leakage Current | I _{DSS} | V _{DS} =500V, V _{GS} =0V | - | - | | 1 | uA |
| Gate-to-Source Leakage Current | I _{GSS} | V _{GS} =±30V, V _{DS} =0V | - | - | | ±100 | nA |
| Drain-to-Source ON Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =2.5A ²⁾ | - | 1.35 | 1.38 | 1.55 | Ω |
| Gate Threshold Voltage | V _{GS(TH)} | V _{DS} =V _{GS} , I _D =250uA | 2.5 | 3.5 | | 4.5 | V |
| Forward Transconductance | g _{fs} | V _{DS} =30V, I _D =13A | - | 15 | | - | S |
| Input Capacitance | C _{iss} | V _{GS} =0V, V _{DS} =25V, f=1.0MHZ | - | 525 | | - | pF |
| Reverse Transfer Capacitance | C _{oss} | | - | 50 | | - | |
| Output Capacitance | C _{rss} | | - | 4 | | - | |
| Total Gate Charge | Q _g | V _{DD} =400V, I _D =5A, V _{GS} =10V ²⁾ | - | 12 | | - | nC |
| Gate-to-Source Charge | Q _{gs} | | - | 2 | | - | |
| Gate-to-Drain (Miller) Charge | Q _{gd} | | - | 6 | | - | |
| Turn-on Delay Time | t _{d(ON)} | V _{DD} =250V, I _D =5A, R _G =25Ω ²⁾ | - | 14 | | - | nS |
| Rise Time | t _{rise} | | - | 14.5 | | - | |
| Turn-Off Delay Time | t _{d(OFF)} | | - | 29 | | - | |
| Fall Time | t _{fall} | | - | 12 | | - | |
| Forward Voltage ¹⁾ | V _{SD} | I _S =2A, V _{GS} =0V diF/dt=100A/μs, | - | - | | 1.5 | V |
| Forward Turn-On Time | t _{on} | | - | 3) | | - | ns |
| Reverse recovery time | t _{rr} | | - | 213 | | - | ns |

Note:

- 1) Calculation by temperature 100°C.
- 2) Pulse Test: Pulse Width≤300us, Duty Cycle≤2%.
- 3) Negligible, Dominated by circuit inductance.

7. Test circuits and waveforms

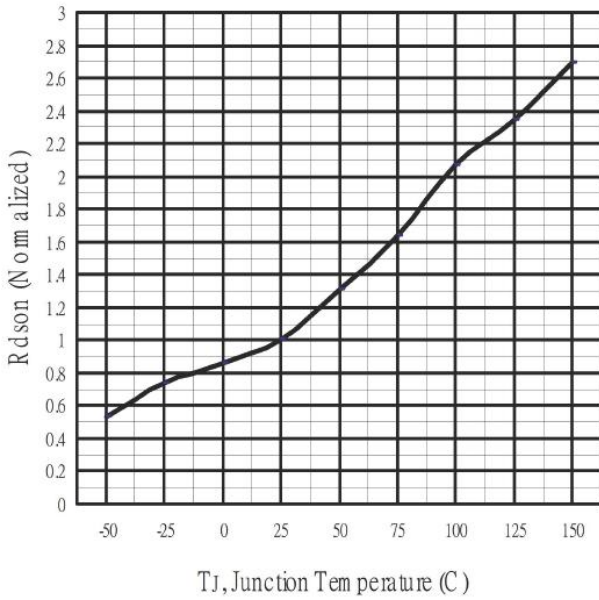


Fig 1. On-Resistance Variation with vs. Temperature

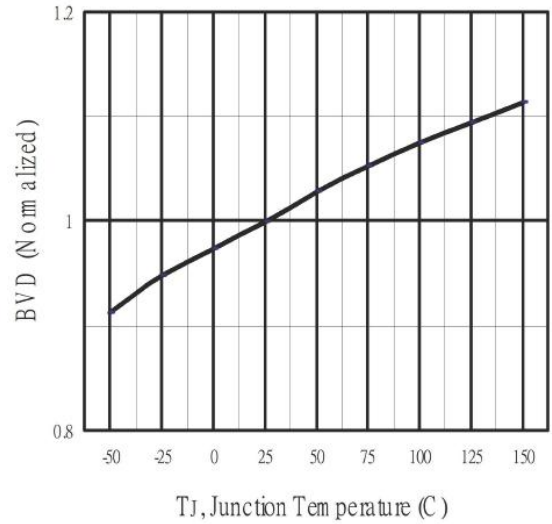


Fig 2. Breakdown Voltage Variation vs. Temperature

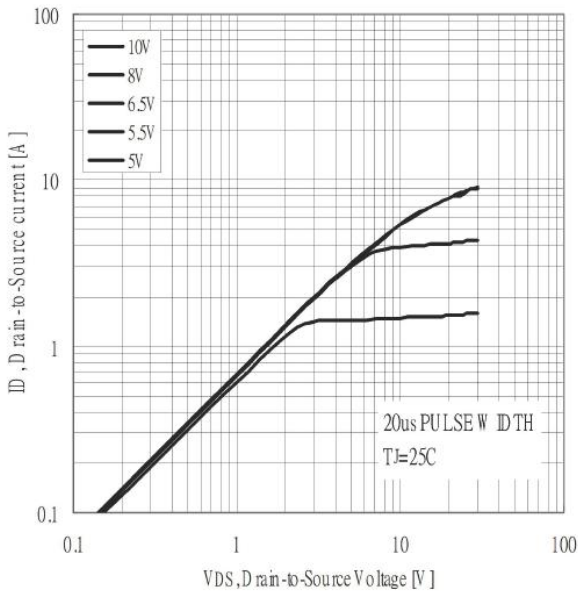


Fig 3. Typical Output Characteristics

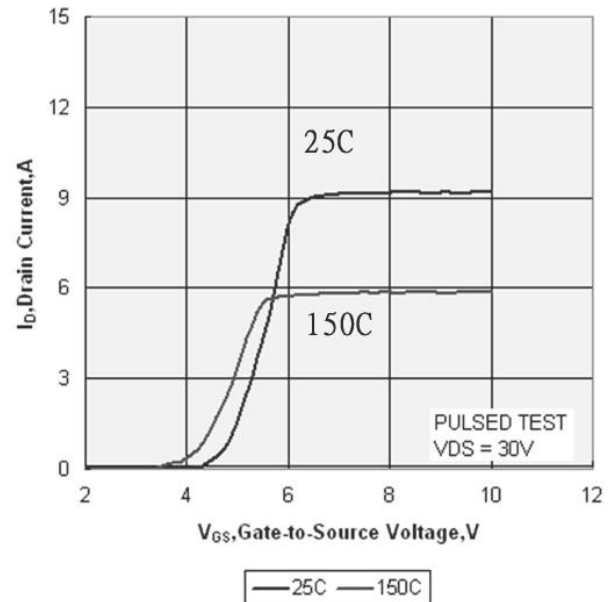


Fig 4. Typical Transfer Characteristics

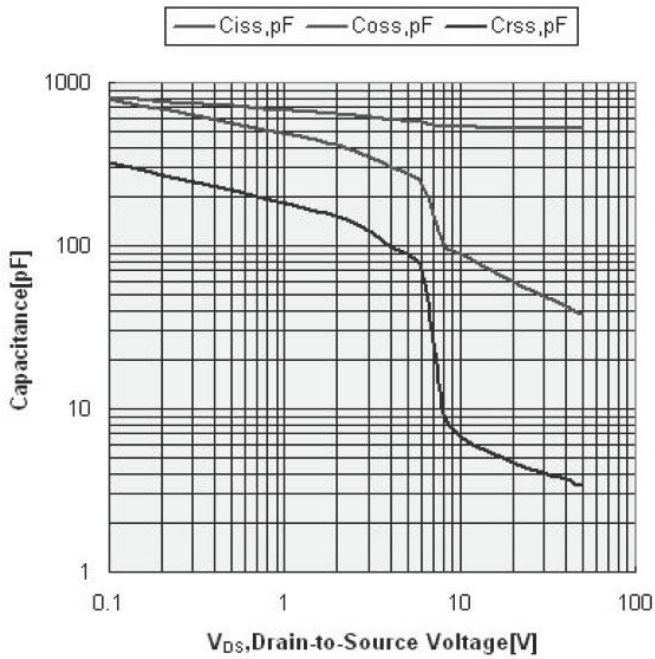


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

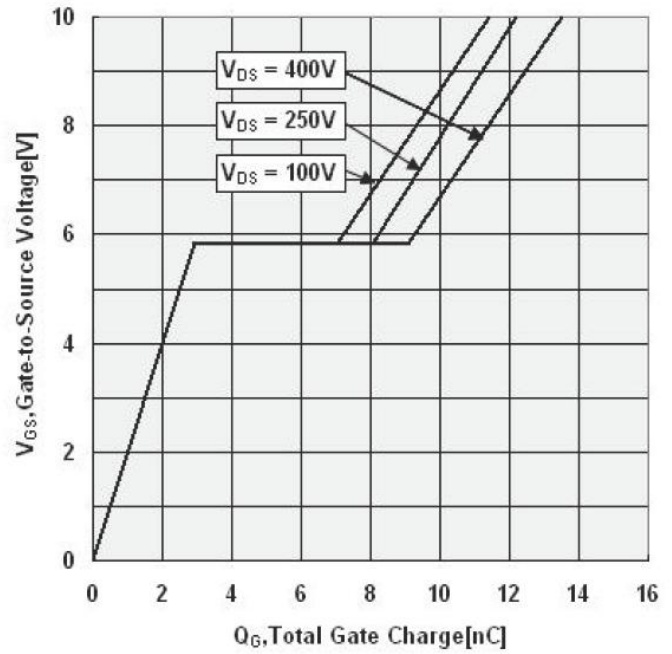


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage