

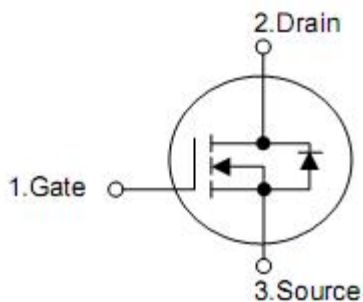
1. Features

- n Advanced trench process technology
- n High density cell design for ultra low on-resistance
- n Fully characterized avalanche voltage and current

2. Features

- n 50A, 30V, $R_{DS(on)}$ typ. = $6.5m\Omega$ (typ.)@ $V_{GS} = 10 V$
- n Low gate charge
- n Low C_{rss}
- n Fast switching
- n Improved dv/dt capability

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KIA50N03BD	TO-252	KIA

5. Absolute maximum ratings

(T_C= 25°C , unless otherwise noted)

Symbol	Parameter	Value	Units
V _{DSS}	Drain-Source Voltage	30	V
I _D	Drain Current -Continuous (T _C = 25 °C) -Continuous (T _C = 100 °C)	50	A
		30	A
I _{DM}	Drain Current -Pulsed	200	A
V _{GSS}	Gate-Source Voltage	±20	V
E _{AS}	Single Pulsed Avalanche Energy (Note 1)	85	mJ
P _D	Power Dissipation (T _C = 25 °C) -Derate above 25 °C	60	W
		0.5	W/°C
T _J ,T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C

6. Thermal Characteristics

Symbol	Parameter	Value	Units
R _{θJC}	Thermal Resistance, Junction-to-Case	1.8	°C /W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	62	°C /W

7. Electrical characteristics

(T_C = 25°C , unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
B _{VDS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 uA	30	--	--	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = 30 V, V _{GS} = 0 V	--	--	1	uA
I _{GSS}	Gate- Source Leakage Current	V _{GS} = ±20 V, V _{DS} = 0 V	--	--	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 uA	1.0	1.6	3.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 15 A	--	6.5	9.9	mΩ
R _G	Gate Resistance	f = 1.0 MHz	--	5.0	--	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 30 V, V _{GS} = 0 V, f = 1.0 MHz	--	1200	--	pF
C _{oss}	Output Capacitance		--	150	--	pF
Cr _{ss}	Reverse Transfer Capacitance		--	115	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 20 V, V _{GS} = 10V, I _D = 15 A, R _G = 6 Ω (Note 2,3)	--	4.6	--	ns
t _r	Turn-On Rise Time		--	35	--	ns
t _{d(off)}	Turn-Off Delay Time		--	40	--	ns
t _f	Turn-Off Fall Time		--	16	--	ns
Q _g	Total Gate Charge	V _{DD} = 24 V, I _D = 15A, V _{GS} = 10 V (Note 2,3)	--	25	--	nC
Q _{gs}	Gate-Source Charge		--	5.0	--	nC
Q _{gd}	Gate-Drain Charge		--	5.5	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Continuous Source Current	Integral Reverse P-N Junction Diode in the MOSFET	--	--	50	A
I _{SM}	Pulsed Source Current		--	--	200	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 15 A	--	--	1.5	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 15 A, dI _F / dt = 100 A/us (Note 2)	--	12.5	--	ns
Q _{rr}	Reverse Recovery Charge		--	0.005	--	uC

Notes:

1. L = 0.5mH, V_{DD} = 15V, V_{GS} = 10V, R_G = 25Ω, Starting T_J = 25°C
2. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
3. Essentially independent of operating temperature

8. Typical Characteristics

Figure 1. Output Characteristics

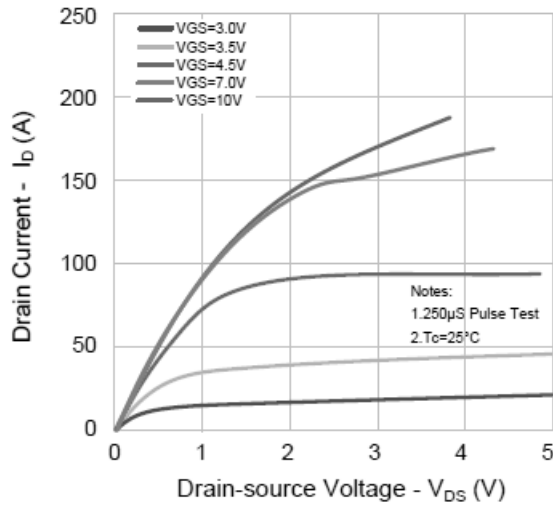


Figure 2. Transfer Characteristics

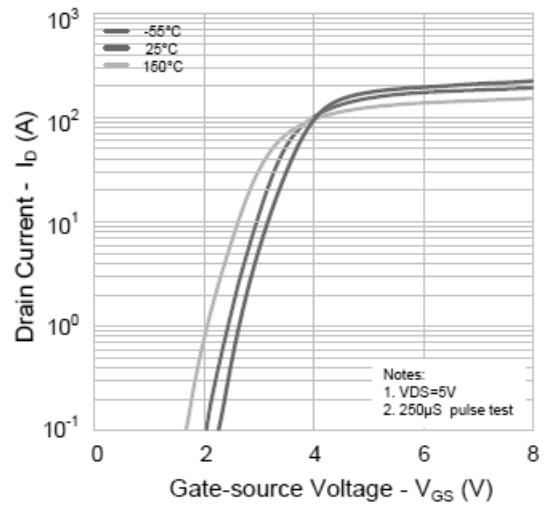


Figure 3. On-resistance vs. Drain Current

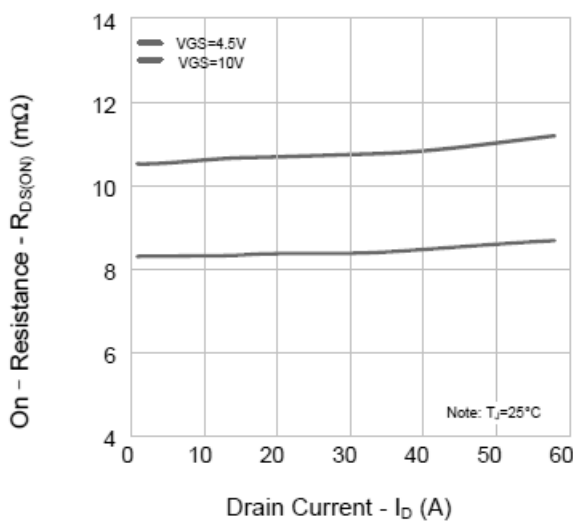


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

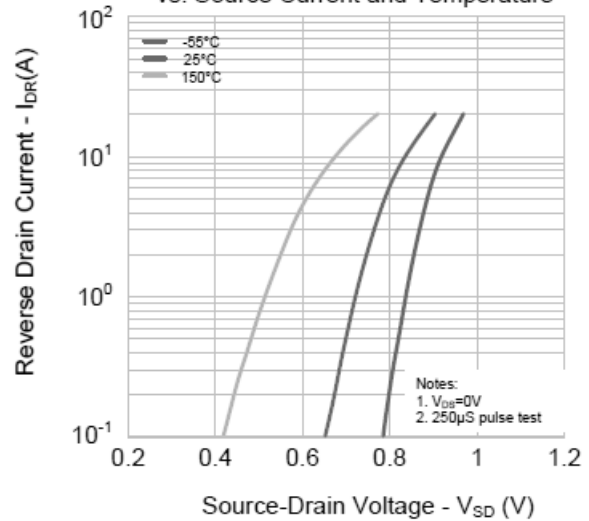


Figure 5. Capacitance Characteristics

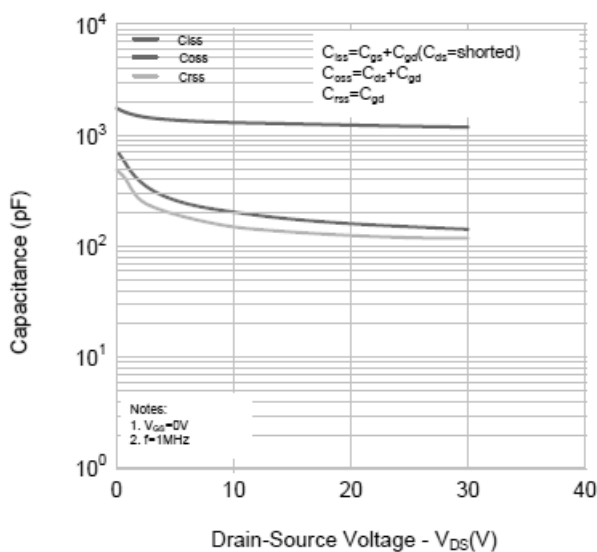
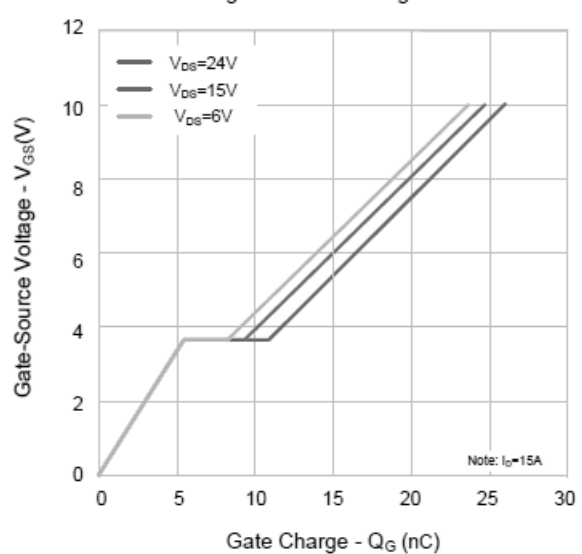
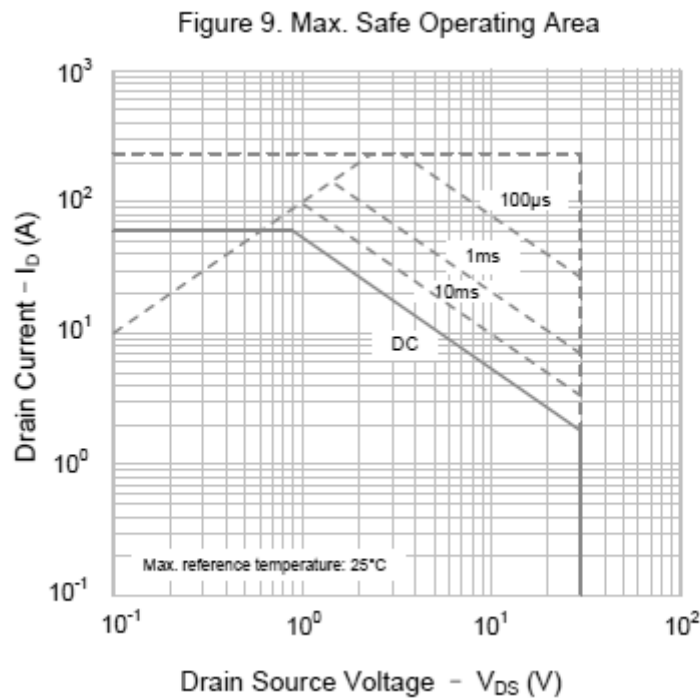
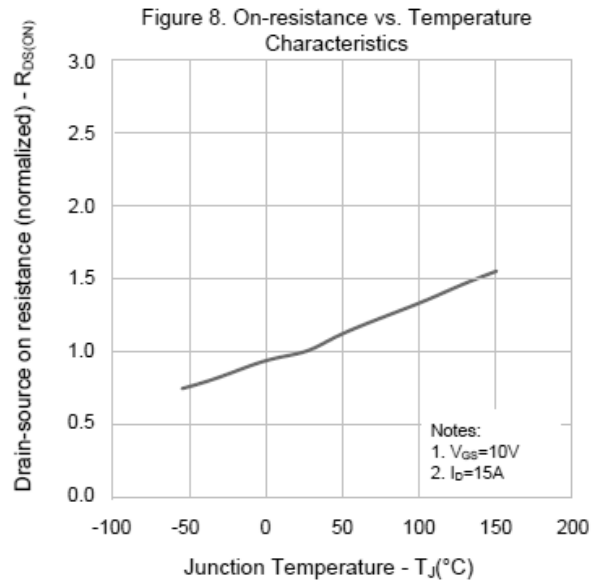
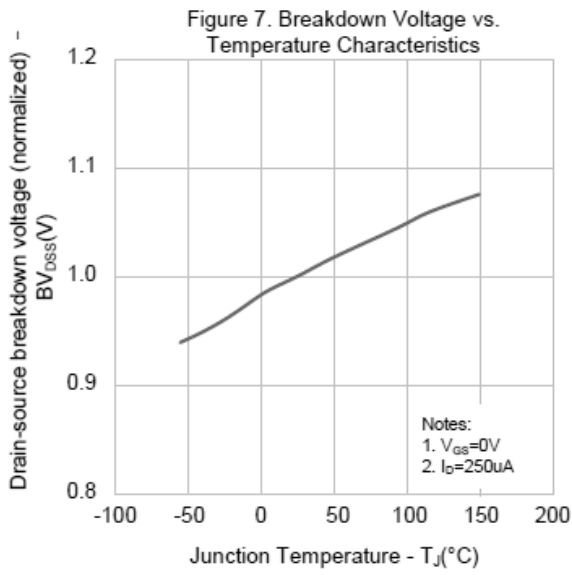


Figure 6. Gate Charge





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