

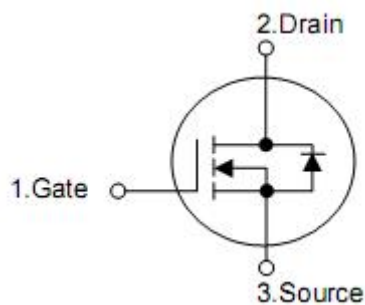
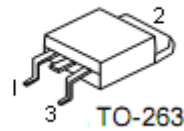
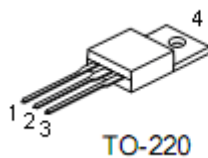
1. Features

- n $R_{DS(on)}=2.2m\Omega$ (typ.) @ $V_{GS}=10V$
- n Low On-Resistance
- n Fast Switching
- n 100% Avalanche Tested
- n Repetitive Avalanche Allowed up to T_{jmax}
- n Lead-Free, RoHS Compliant

2. Features

KIA2803A designed by the trench processing techniques to achieve extremely low on-resistance. Additional features of this design are a 175°C junction operating temperature, fast switching speed and improved repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in Motor applications and a wide variety of other applications.

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Absolute maximum ratings

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

Parameter	Symbol	Ratings	Units
Drain-source voltage	V_{DSS}	30	V
Gate-source voltage	V_{GSS}	± 20	V
Continuous drain current @ $V_{GS}=10V, T_C=25\text{ }^\circ\text{C}$, (See Fig2)	I_D	150	A
Pulsed drain current tested $T_C=25\text{ }^\circ\text{C}$ (Silicon Limit)	I_{DM}	600	A
Avalanche energy single pulse ²	E_{AS}	625	mJ
Maximum Power dissipation $T_C=25\text{ }^\circ\text{C}$	P_D	160	W
Maximum junction temperature	T_J	175	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55~+175	$^\circ\text{C}$
Diode continuous forward current $T_C=25\text{ }^\circ\text{C}$ ¹	I_S	150	A

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance, Junction-to-case	θ_{JC}	0.8	$^\circ\text{C/W}$

6. Electrical characteristics

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Drain-to-source leakage current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$	-	-	1	μA
		$T_C=125^\circ C$	-	-	100	μA
Gate-to-source leakage current	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
		$V_{GS}=-20V, V_{DS}=0V$	-	-	-100	nA
On characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8	1.3	2.0	V
Static drain-source on-resistance ¹	$R_{DS(on)}$	$V_{GS}=10V, I_D=40A$	-	2.2	3.0	m Ω
Static drain-source on-resistance ¹	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=40A$	-	2.8	4.0	m Ω
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$	-	4050	-	pF
Output capacitance	C_{oss}		-	680	-	
Reverse transfer capacitance	C_{rss}		-	355	-	
Total gate charge	Q_g	$V_{DS}=15V, I_D=20A, V_{GS}=4.5V$	-	110	-	nC
Gate-source charge	Q_{gs}		-	35	-	
Gate-drain (Miller) charge	Q_{gd}		-	14	-	
Resistive switching characteristics						
Turn-on delay time	$T_{d(ON)}$	$V_{DD}=15V, I_D=10A, V_{GS}=4.5V,$ $R_G=6.8\Omega$	-	19	-	nS
Rise time	t_{rise}		-	50	-	
Turn-off delay time	$T_{d(OFF)}$		-	20	-	
Fall time	t_{fall}		-	26	-	
Source-drain body diode characteristics $T_J=25^\circ C$, unless otherwise notes						
Diode forward voltage ¹	V_{SD}	$V_{GS}=0V, I_{SD}=20A$	-	-	1.3	V
Reverse recovery time	t_{rr}	$I_{SD}=30A, di_f/dt=100A/\mu s,$	-	32	-	ns
Reverse recovery charge	Q_{rr}	$T_J=25^\circ C, V_{GS}=0V$	-	33	-	nC

Note: 1. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

2. Limited by T_{Jmax} , Starting $T_J=25^\circ C$. $L=0.5mH$ $R_G=25\Omega$, $I_{AS}=50A$, $V_{GS}=10V$,
Part not recommended for use above this value.

3. Repetitive rating; pulse width limited by max, junction temperature.

7. Typical characteristics

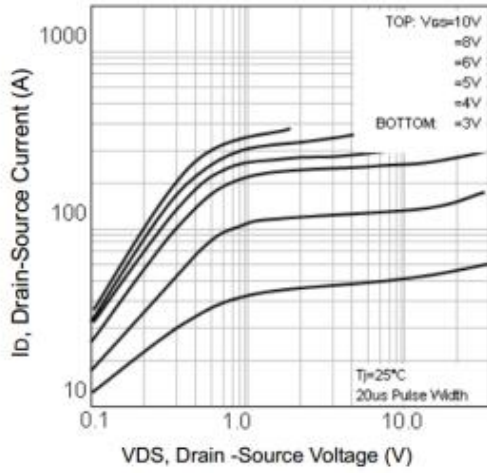


Fig1. Typical Output Characteristics

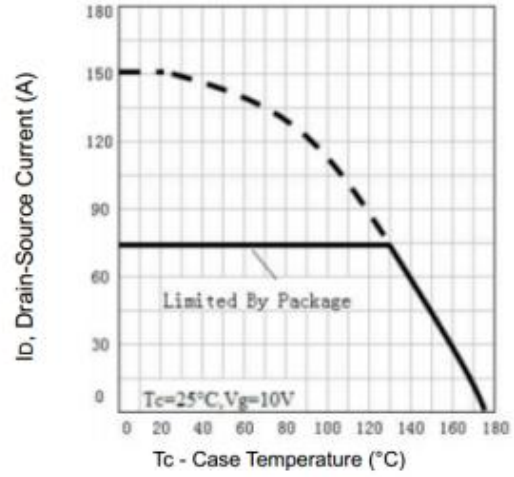


Fig2. Maximum Drain Current Vs. Case Temperature

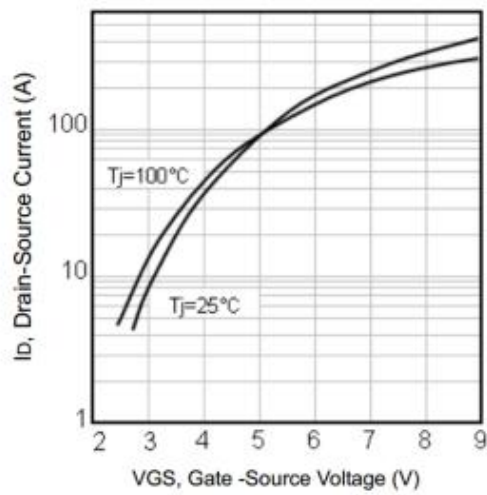


Fig3. Typical Transfer Characteristics

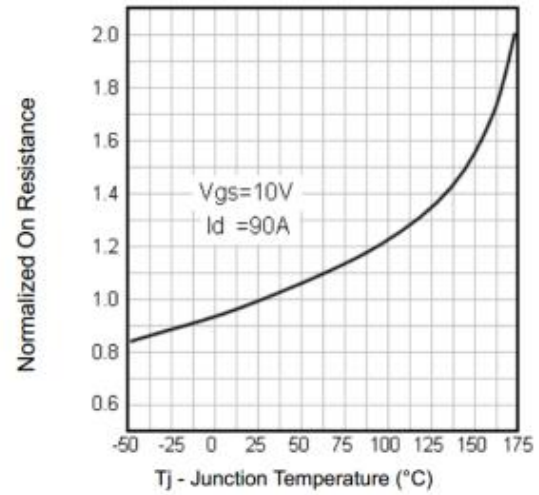


Fig4. Normalized On-Resistance Vs. Temperature

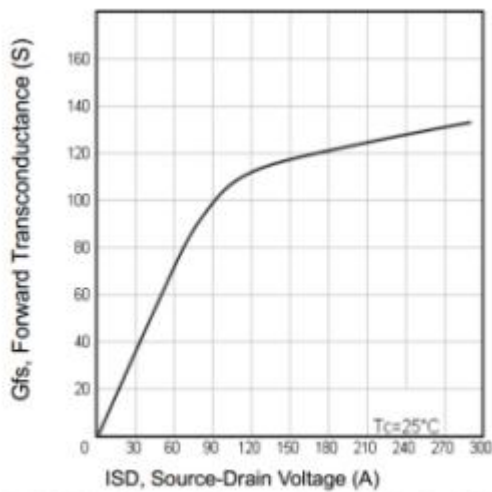


Fig5. Typical Forward Transconductance Vs. Drain Current

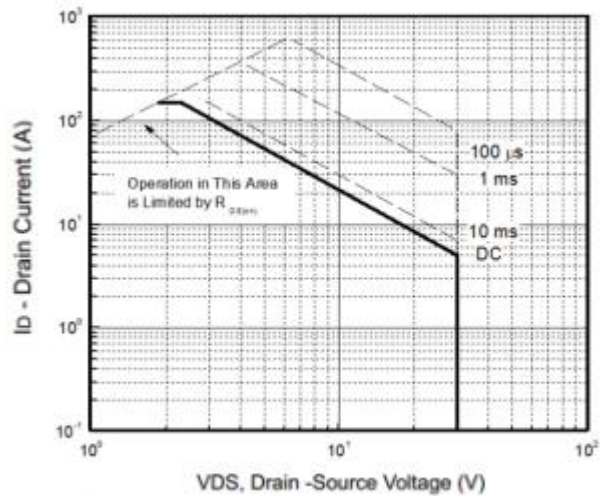


Fig6. Maximum Safe Operating Area

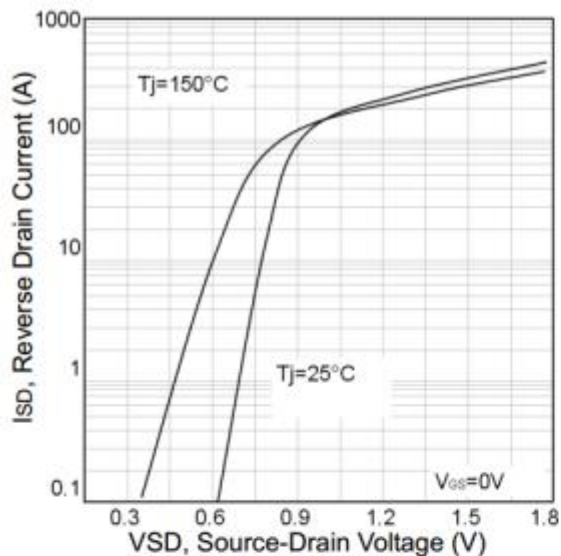


Fig7. Typical Source-Drain Diode Forward Voltage

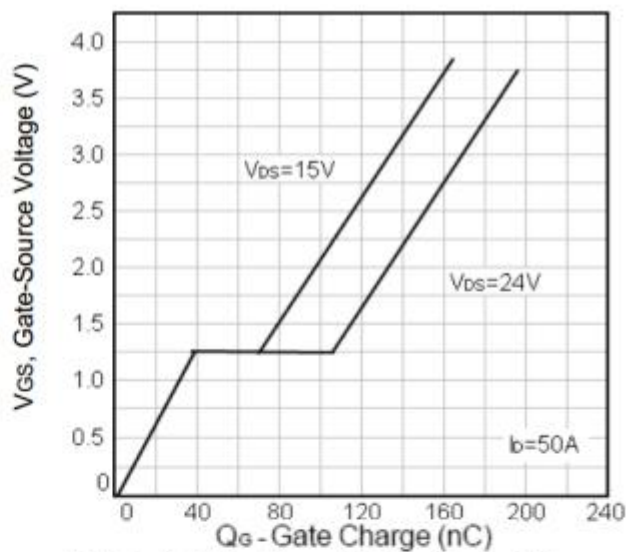


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

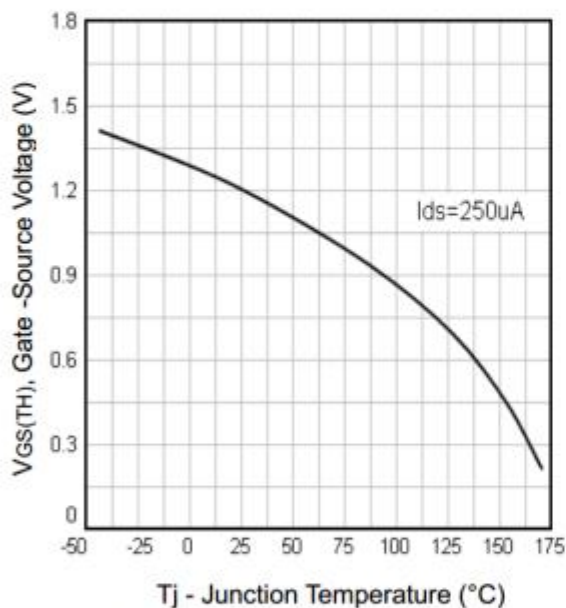


Fig9. Threshold Voltage Vs. Temperature

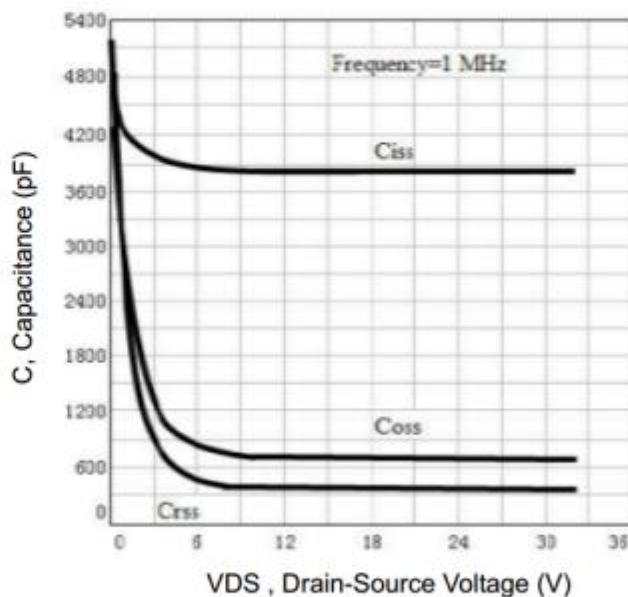


Fig10. Typical Capacitance Vs. Drain-Source Voltage

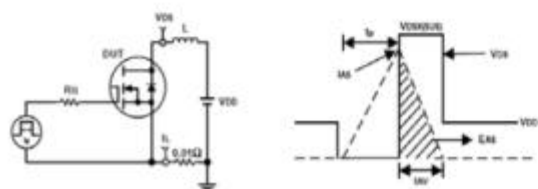


Fig11. Unclamped Inductive Test Circuit and waveforms

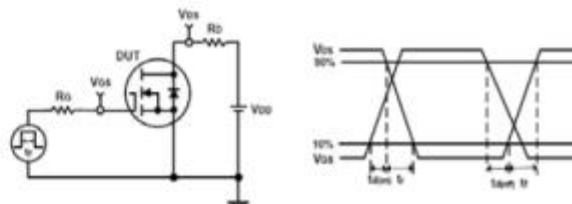


Fig12. Switching Time Test Circuit and waveforms