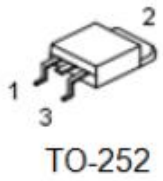
1. Features

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

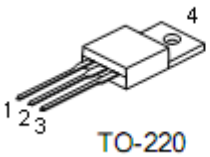
2. Features

KNX2803A 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.

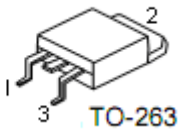
3. Pin configuration



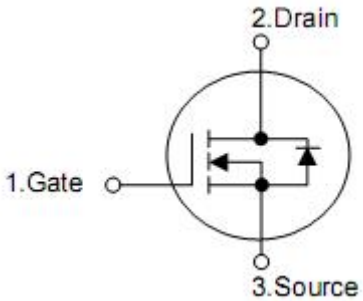
TO-252



TO-220



TO-263



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Ordering Information

Part Number	Package	Brand
KNP2803A	TO-220	KIA
KNB2803A	TO-263	KIA
KND2803A	TO-252	KIA

5. Absolute maximum ratings

(T_C=25 ºC , unless otherwise specified)

Parameter	Symbol	Ratings		Units
		TO-252	TO-263/220	
Drain-source voltage	V_{DSS}	30		V
Gate-source voltage	V_{GSS}	±20		V
Continuous drain current @V_{GS}=10V,T_C=25 ºC,(See Fig2)	I_D	150		A
Pulsed drain current tested T_C=25 ºC (Sillicon Limit)	I_{DM}	600		A
Avalanche energy single pulse[2]	E_{AS}	625		mJ
Maximum Power dissipation T_C=25 ºC	P_D	50	160	W
Maximum junction temperature	T_J	175		˚C
Storage temperature range	T_{STG}	-55~+175		˚C
Diode continuous forward current T_C=25 ºC[1]	I_S	150		A

6. Thermal characteristics

Parameter	Symbol	Rating		Unit
		TO-252	TO-263/220	
Thermal resistance,Junction-to-case	θ_{JC}	3.0	0.93	ºC/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	30	-	-	V
Drain-to-source leakage current	I_{DSS}	V_{DS}=24V ,V_{GS}=0V	-	-	1	μA
		T_C=125 ºC	-	-	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=250μA	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	mΩ
Static drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS}=4.5V,I_D=40A	-	2.8	4.0	mΩ
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=6.8Ω	-	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°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/μs, T_J=25°C, V_{GS}=0V	-	32	-	ns
Reverse recovery charge	Q_{rr}		-	33	-	nC

Note: 1. Pulse width ≤300μs; duty cycle ≤2%.

2. Limited by T_{Jmax}, Starting T_J=25°C.L=0.5mH R_G=25Ω,,I_{AS}=50A, V_{GS}=10V,

Part not recommended for use above this value.

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

8. Typical characteristics

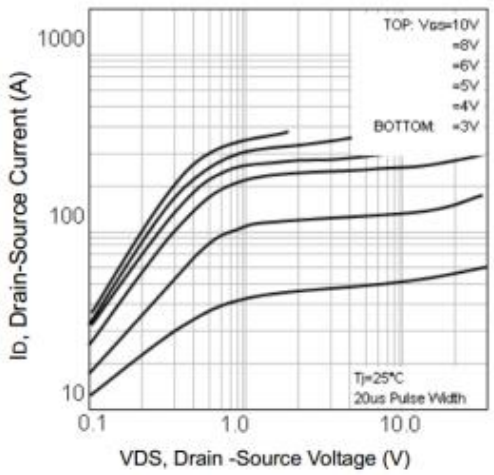


Fig1. Typical Output Characteristics

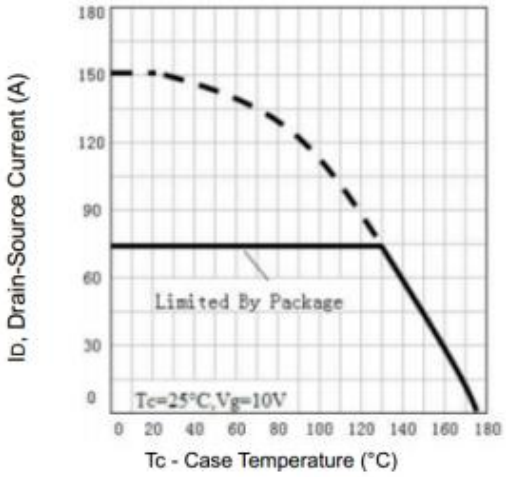


Fig2. Maximum Drain Current Vs.Case Temperature

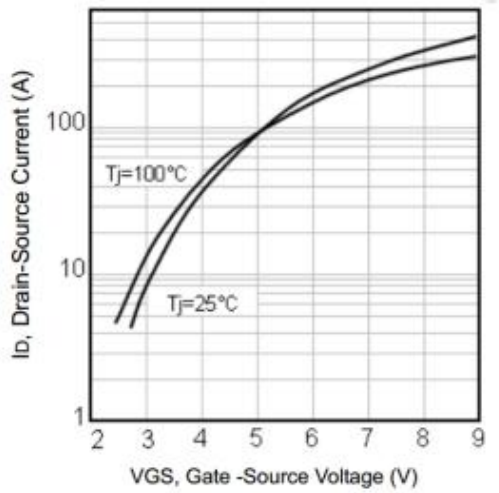


Fig3. Typical Transfer Characteristics

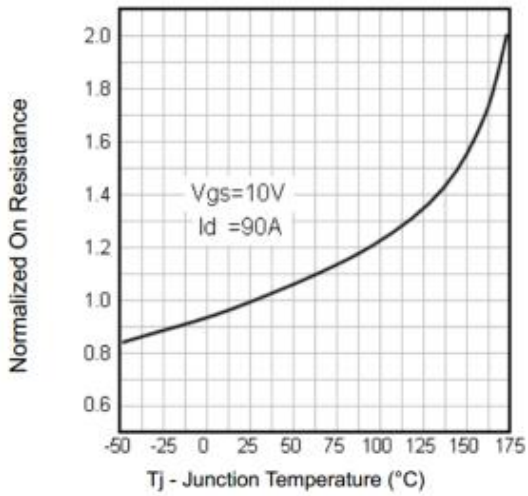


Fig4. Normalized On-Resistance Vs. Temperature

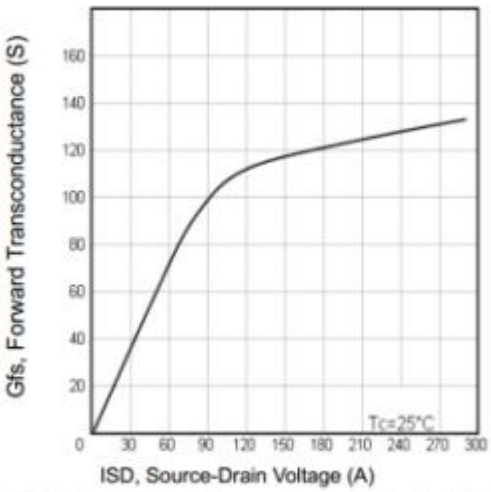


Fig5.Typical Forward Transconductance Vs. Drain Current

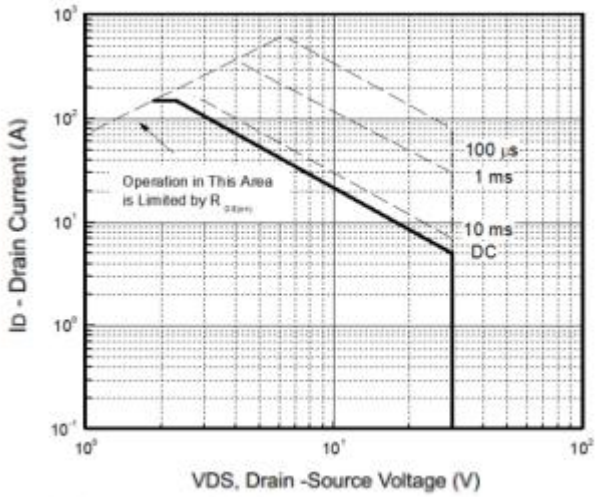


Fig6. Maximum Safe Operating Area

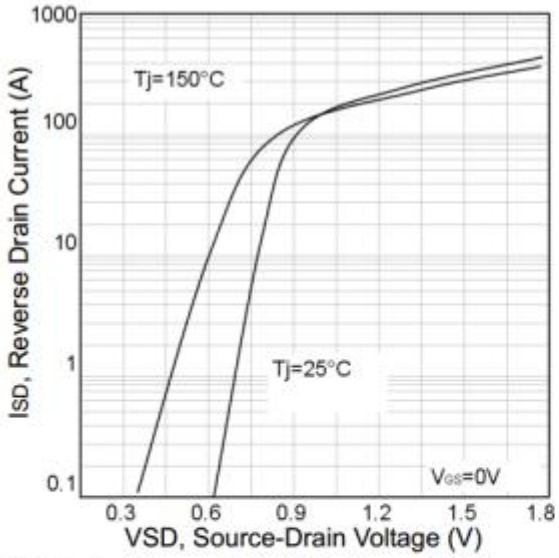


Fig7. Typical Source-Drain Diode Forward Voltage

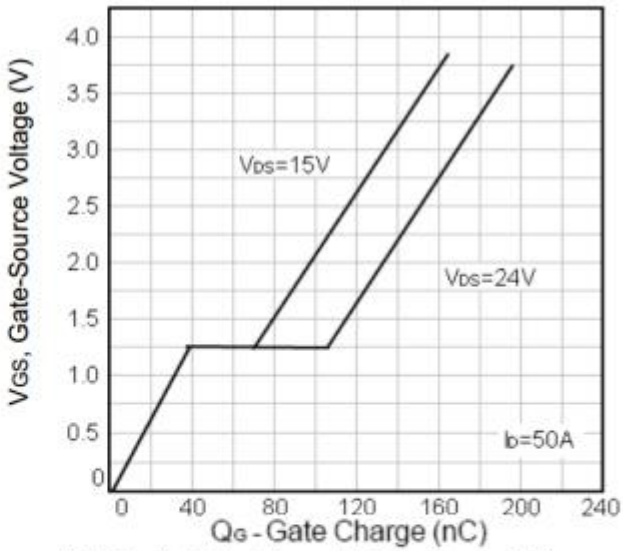


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

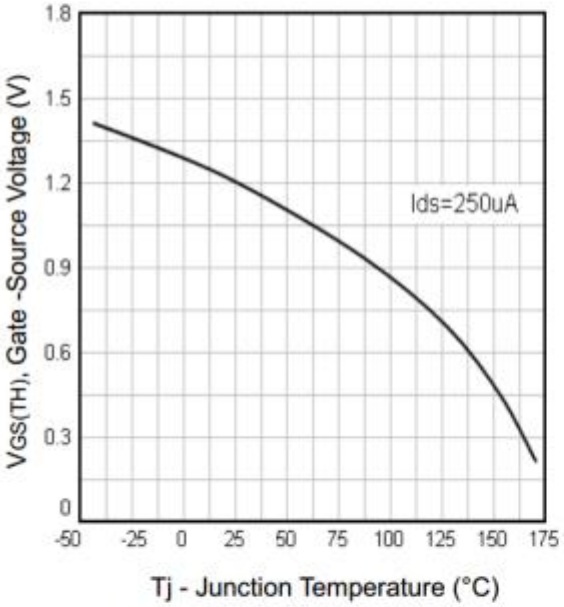


Fig9. Threshold Voltage Vs. Temperature

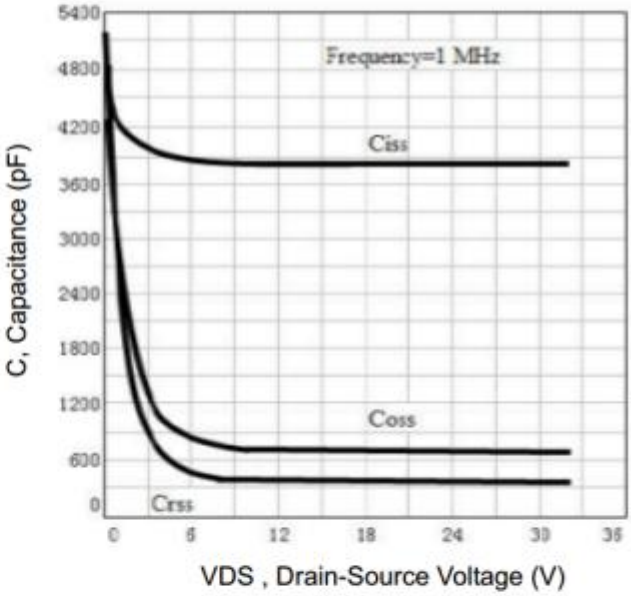


Fig10. Typical Capacitance Vs.Drain-Source Voltage

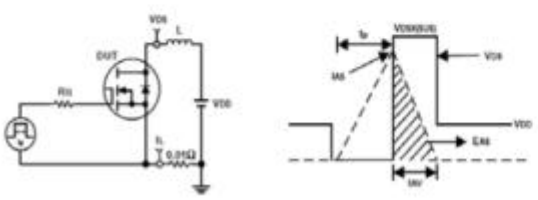


Fig11. Unclamped Inductive Test Circuit and waveforms

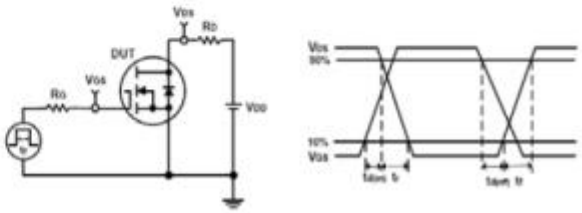


Fig12. Switching Time Test Circuit and waveforms

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