

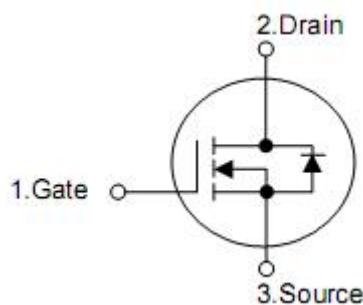
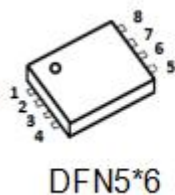
## 1. Features

- n  $R_{DS(on)}=2.1m\Omega$  (typ.) @  $V_{GS}=10V$
- n Low On-Resistance
- n 5V Logic Level Control
- n 100% Avalanche Tested
- n Lead-Free, RoHS Compliant

## 2. Features

KNX2803B designed by the trench processing techniques to achieve extremely low on-resistance. Additional features of this design are a 150°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 DFN5*6	Pin TO-263	Function
4	1	Gate
5,6,7,8	2	Drain
1,2,3	3	Source

## 4. Ordering Information

Part Number	Package	Brand
KND2803B	TO-252	KIA
KNB2803B	TO-263	KIA
KNX2803B	DFN5*6	KIA

## 5. Absolute maximum ratings

(T<sub>C</sub>=25 °C , unless otherwise specified)

Parameter	Symbol	Ratings		Units
		TO-252 DNF5*6	TO-263	
Drain-source voltage	V <sub>DSS</sub>	30		V
Gate-source voltage	V <sub>GSS</sub>	±20		V
Continuous Drain Current(VGS=4.5V) <sup>3</sup>	I <sub>D</sub>	T <sub>C</sub> =25 °C	150	A
		T <sub>C</sub> =70 °C	105	
Pulsed drain current tested T <sub>C</sub> =25 °C <sup>1</sup>	I <sub>DM</sub>	600		A
Avalanche energy single pulse <sup>2</sup>	E <sub>AS</sub>	625		mJ
Maximum Power dissipation T <sub>C</sub> =25 °C	P <sub>D</sub>	50	160	W
Maximum junction temperature	T <sub>J</sub>	150		°C
Storage temperature range	T <sub>STG</sub>	-55~+150		°C

## 6. Thermal characteristics

Parameter	Symbol	Rating		Unit
		TO-252 DNF5*6	TO-263	
Thermal resistance,Junction-to-case	R <sub>thJC</sub>	2.5	0.79	°C/W
Thermal Resistance Junction-Ambient <sup>2</sup>	R <sub>thJA</sub>	62		°C/W

## 7. Electrical characteristics

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
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	$\mu A$
		$T_C=125^{\circ}\text{C}$	-	-	100	$\mu A$
Gate-to-source leakage current	$I_{GSS}$	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
		$V_{GS}=-20V, V_{DS}=0V$	-	-	-100	nA
<b>On characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	3.0	V
Static drain-source on-resistance <sup>1</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=40A$	-	2.1	2.8	m $\Omega$
Static drain-source on-resistance <sup>1</sup>	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=40A$	-	2.6	3.8	m $\Omega$
<b>Dynamic characteristics</b>						
Input capacitance	$C_{iss}$	$V_{DS}=24V, V_{GS}=0V, f=1.0\text{MHz}$	-	5060	-	pF
Output capacitance	$C_{oss}$		-	500	-	
Reverse transfer capacitance	$C_{rss}$		-	206	-	
Total gate charge	$Q_g$	$V_{DS}=24V, I_D=15A, V_{GS}=10V$	-	90	-	nC
Gate-source charge	$Q_{gs}$		-	28	-	
Gate-drain (Miller) charge	$Q_{gd}$		-	60	-	
<b>Resistive switching characteristics</b>						
Turn-on delay time	$T_{d(ON)}$	$V_{DD}=18V, I_D=80A, V_{GS}=10V, R_G=3.3\Omega$	-	33	-	nS
Rise time	$t_{rise}$		-	60	-	
Turn-off delay time	$T_{d(OFF)}$		-	36	-	
Fall time	$t_{fall}$		-	42	-	
<b>Source-drain body diode characteristics <math>T_J=25^{\circ}\text{C}</math>, unless otherwise notes</b>						
Diode continuous forward current <sup>1</sup>	$I_S$	$T_J=25^{\circ}\text{C}$	-	-	150	A
Diode forward voltage <sup>1</sup>	$V_{SD}$	$V_{GS}=0V, I_{SD}=20A$	-	0.82	1.3	V

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

2. Limited by  $T_{Jmax}$ , Starting  $T_J=25^{\circ}\text{C}$ .  $L=1\text{mH}$   $R_G=25\Omega$ ,  $I_{AS}=36A$ ,  $V_{GS}=10V$ ,

Part not recommended for use above this value.

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

8. Typical characteristics

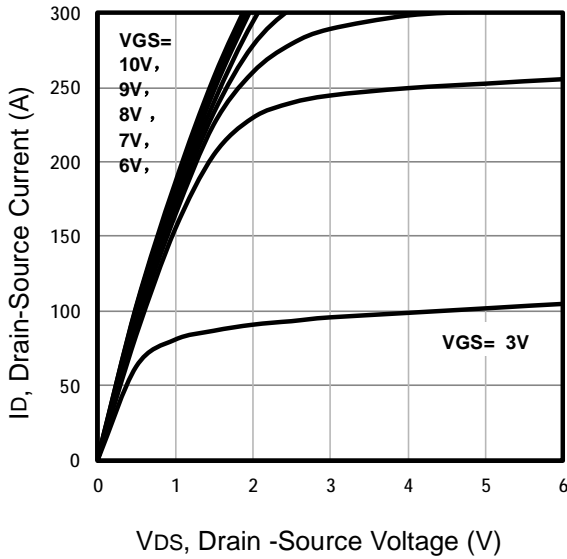


Fig1. Typical Output Characteristics

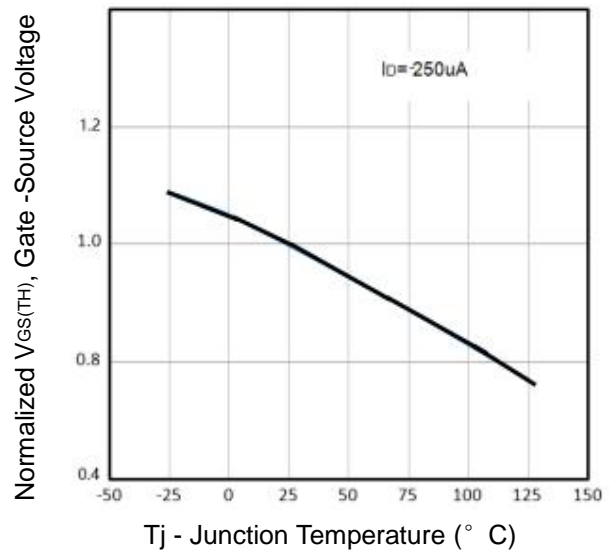


Fig2. Normalized Threshold Voltage Vs. Temperature

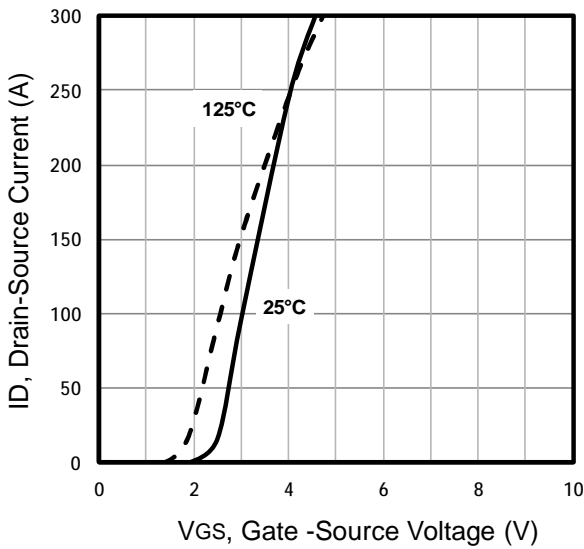


Fig3. Typical Transfer Characteristics

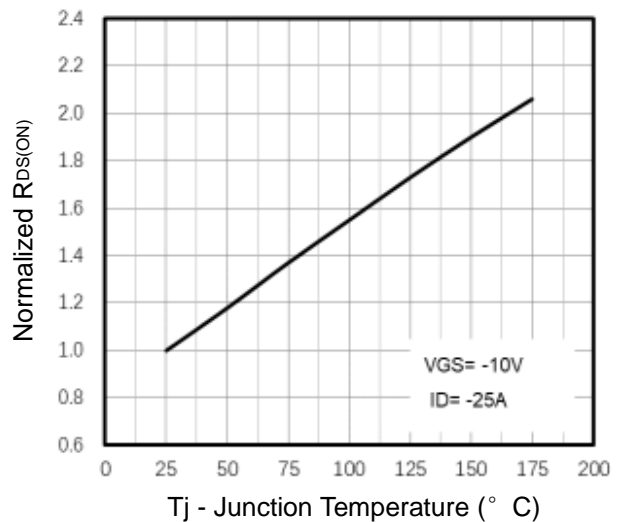


Fig4. Normalized Threshold Voltage Vs. Temperature

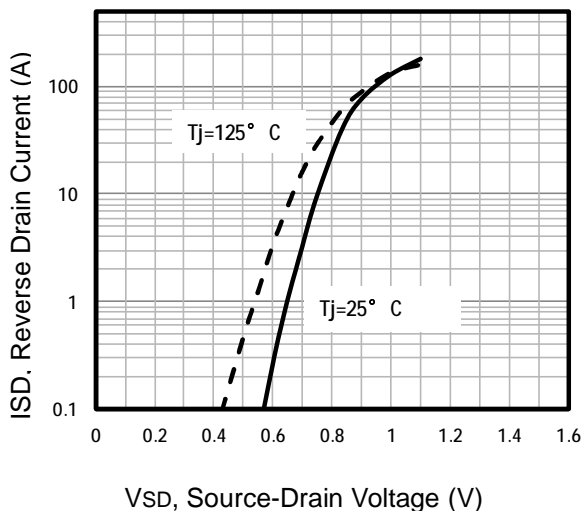


Fig5. Typical Source-Drain Diode Forward

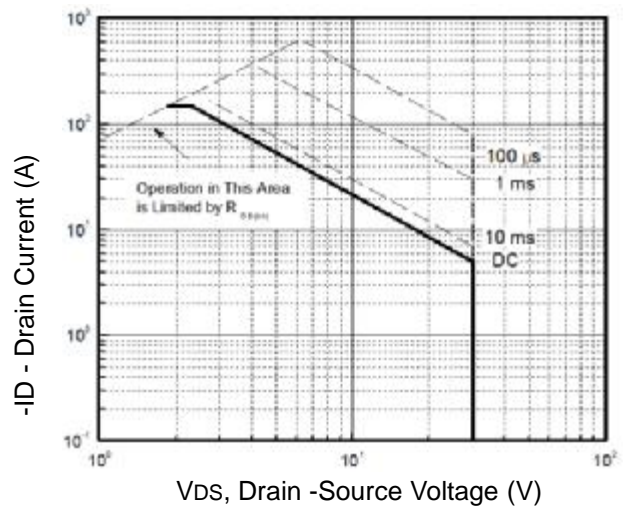
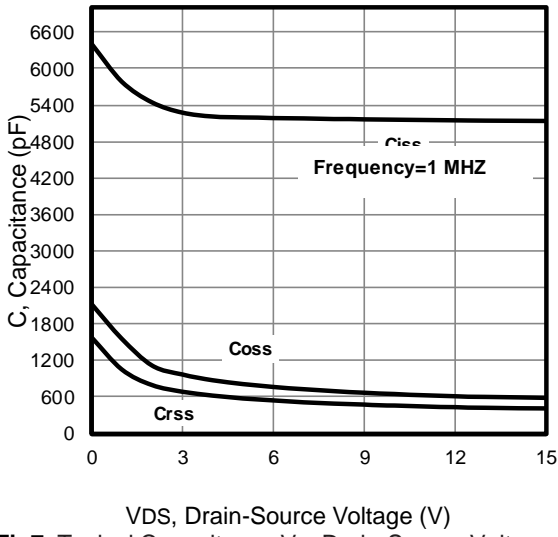
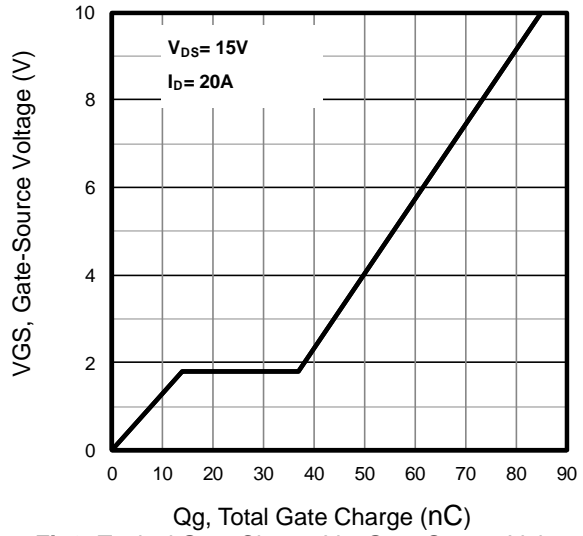


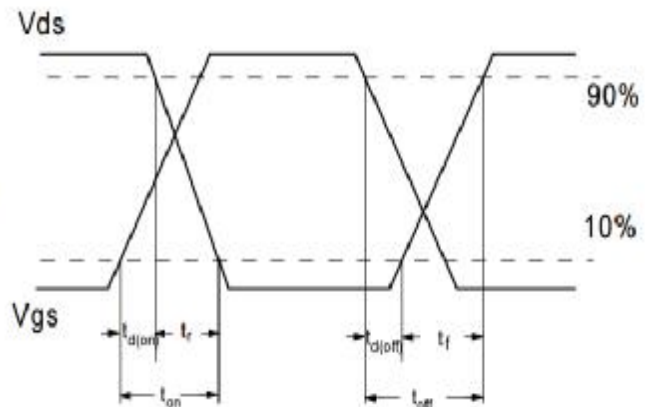
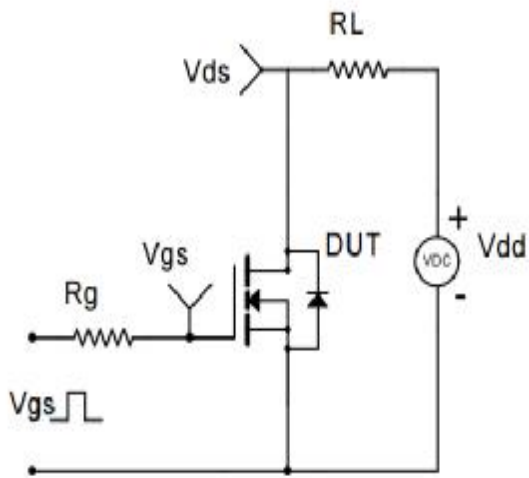
Fig6. Maximum Safe Operating Area



**Fig7.** Typical Capacitance Vs. Drain-Source Voltage



**Fig8.** Typical Gate Charge Vs. Gate-Source Voltage



**Fig9.** Switching Time Test Circuit and waveforms