

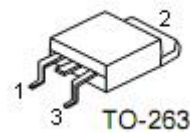
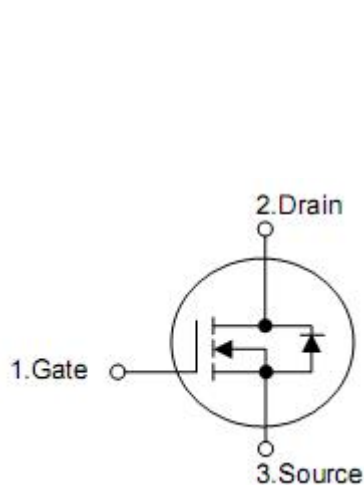
## 1. Features

- $R_{DS(on)}=5.5m\Omega(\text{typ.})@ V_{GS}=10V$
- Lead free and green device available
- Low Rds-on to minimize conductive loss
- High avalanche current

## 2. Applications

- Power Supply
- UPS
- Power Tool

## 3. Symbol



Pin	Function
1	Gate
2	Drain
3	Source

## 4. Ordering Information

Part Number	Package	Brand
KND2906A	TO-252	KIA
KNB2906A	TO-263	KIA

## 5. Absolute maximum ratings

Parameter	Symbol	Rating		Units	
		To-252	To-263		
Drain-source voltage	$V_{DSS}$	60		V	
Gate-source voltage	$V_{GSS}$	±25		V	
Junction and storage temperature range	$T_{STG}$	-55 to 175		°C	
Continuous drain current	$I_D^3$	$T_C=25^{\circ}C$	130	A	
		$T_C=100^{\circ}C$	90	A	
Pulse drain current	$I_{DP}^4$	$T_C=25^{\circ}C$ 360		A	
Avalanche current	$I_{AS}^5$	25		A	
Maximum power dissipation	$E_{AS}^5$	576		mJ	
Maximum power dissipation	$P_D$	$T_C=25^{\circ}C$	80	200	W
		$T_C=100^{\circ}C$	40	100	W

## 6. Thermal characteristics

Parameter	Symbol	Rating		Unit
		To-252	To-263	
Thermal resistance, Junction-ambient	$R_{\theta JA}$	62.5		°C/W
Thermal resistance, Junction-case	$R_{\theta JC}$	1.87	0.75	°C/W

## 7. Electrical characteristics

( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_{DS}=250\mu A$	60	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=48V, V_{GS}=0V$	-	-	1	$\mu A$
		$T_J=125^{\circ}\text{C}$	-	-	30	
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Gate leakage current	$I_{GSS}$	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain-source on-state resistance	$R_{DS(on)}^1$	$V_{GS}=10V, I_D=50A$	-	5.5	7	m $\Omega$
Gate resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	-	1.2	-	$\Omega$
Diode forward voltage	$V_{SD}^1$	$I_{SD}=50A, V_{GS}=0V$	-	0.88	1.3	V
Diode continuous forward current	$I_S^3$		-	-	50	A
Reverse recovery time	$t_{rr}$	$I_{SD}=70A, V_{DD}=50V,$ $di_{SD}/dt=100A/\mu s$	-	15.2	-	nS
Reverse recovery charge	$Q_{rr}$		-	6.16	-	nC
Input capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $f=1\text{MHz}$	-	3100	-	$\mu F$
Output capacitance	$C_{oss}$		-	926	-	
Reverse transfer capacitance	$C_{rss}$		-	451	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=30V, I_D=70A,$ $R_G=25\Omega, V_{GS}=10V$	-	20	-	ns
Rise time	$t_r$		-	83.7	-	
Turn-off delay time	$t_{d(off)}$		-	108	-	
Fall time	$t_f$		-	92.6	-	
Total gate charge	$Q_g$	$V_{DS}=50V, V_{GS}=10V$ $I_D=70A$	-	66.34	-	nC
Gate-source charge	$Q_{gs}$		-	12.35	--	
Gate-drain charge	$Q_{gd}$		-	33.52	--	

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

2. Guaranteed by design, not subject to production testing.

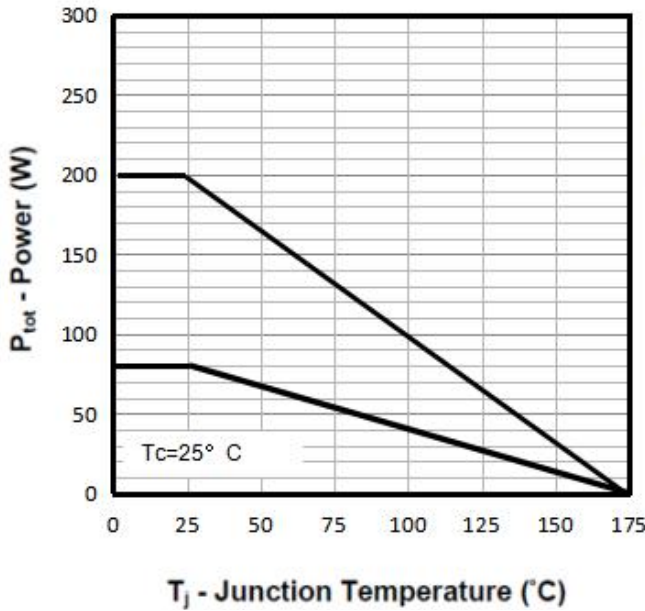
3. Package limitation current is 50A. Calculated continuous current based on maximum allowable junction temperature.

4. Repetitive rating, pulse width limited by max junction temperature.

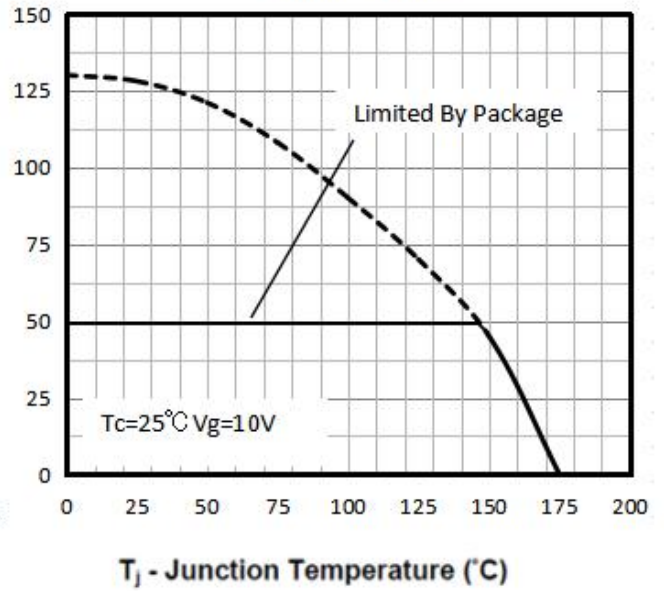
5. Starting  $T_J=25^{\circ}\text{C}, L=0.5\text{mH}, I_{AS}=48A$ .

**8. Test circuits and waveforms**

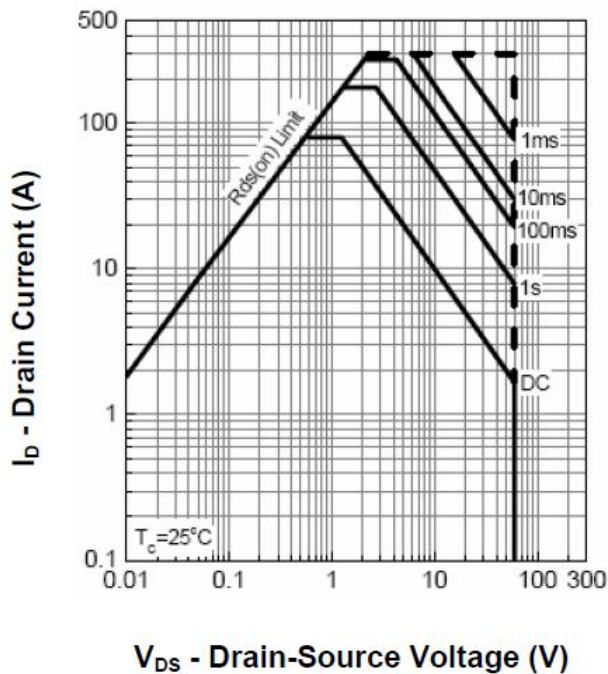
**Power Dissipation**



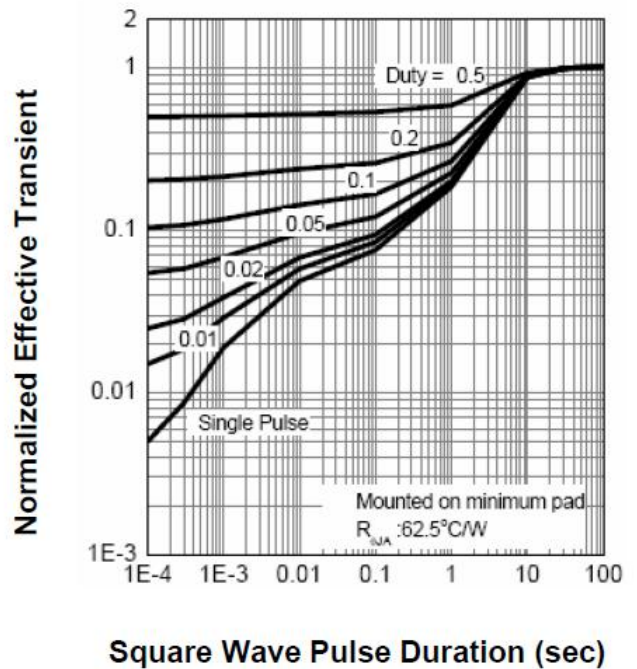
**Drain Current**



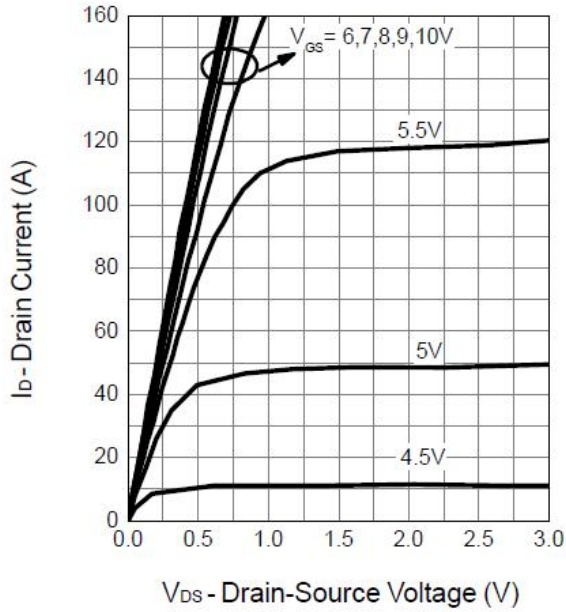
**Safe Operation Area**



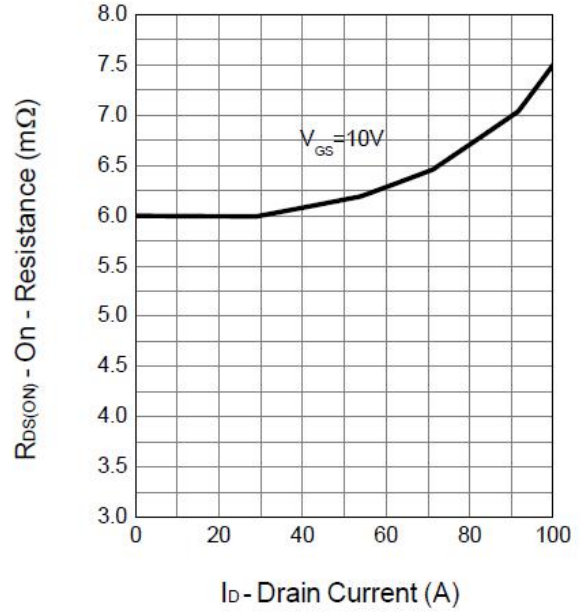
**Thermal Transient Impedance**



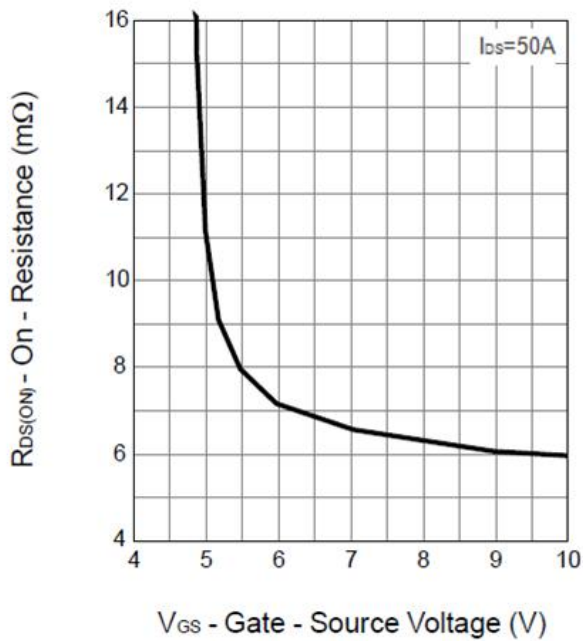
**Output Characteristics**



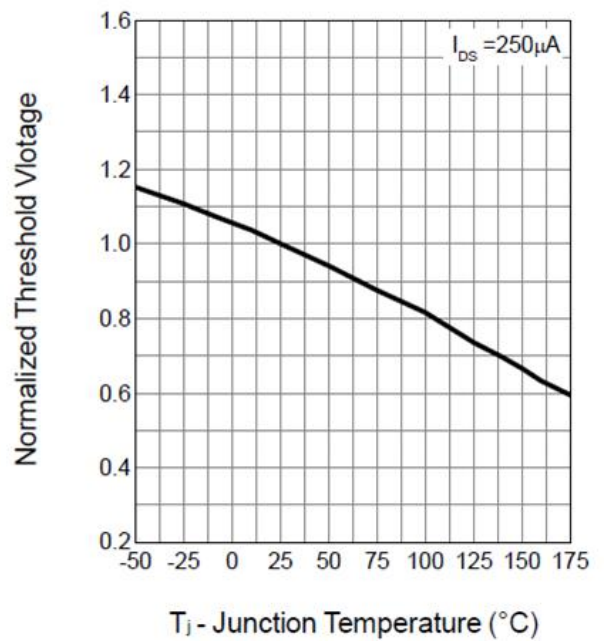
**Drain-Source On Resistance**



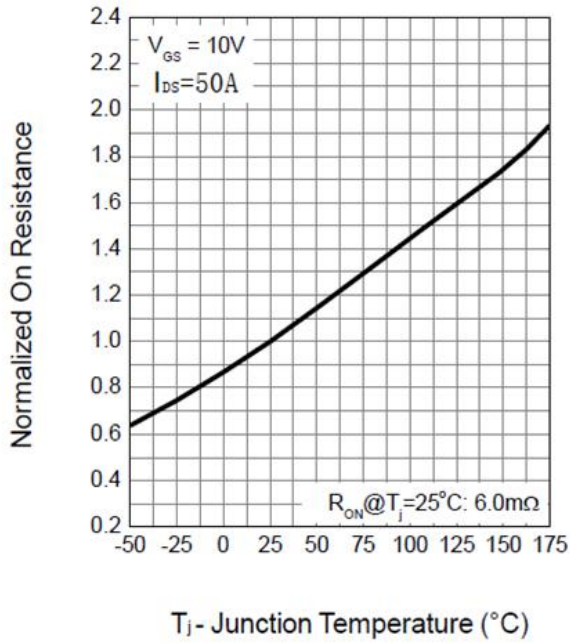
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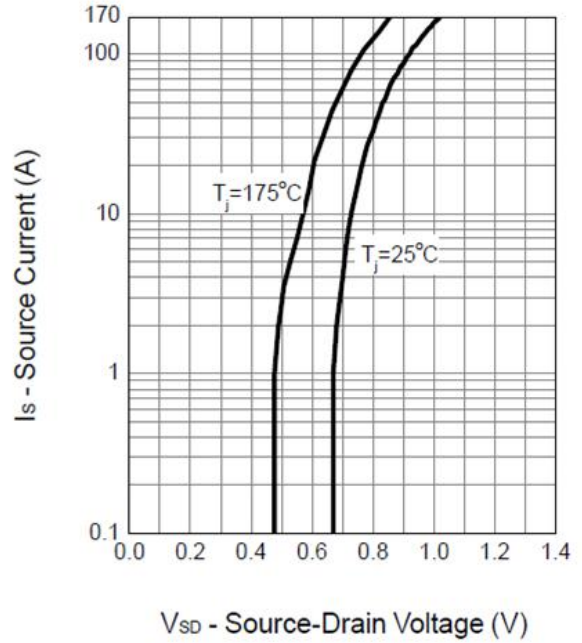
**Gate Threshold Voltage**



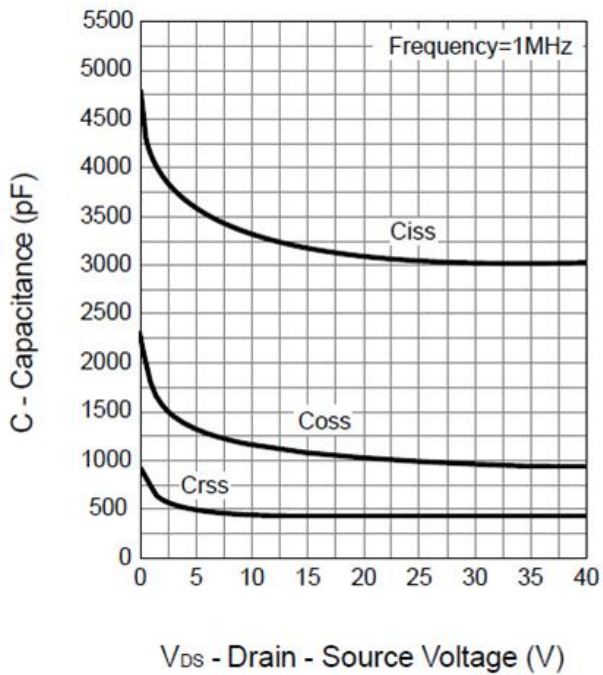
**Drain-Source On Resistance**



**Source-Drain Diode Forward**



**Capacitance**



**Gate Charge**

