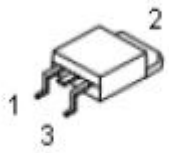
1. Features

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

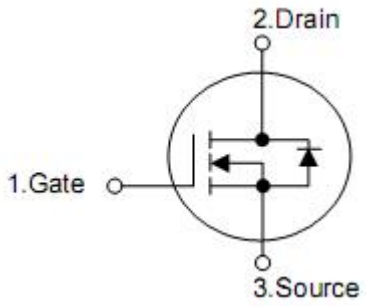
2. Features

- High current load applications
- Low On-Resistance (typ.) RDS(on)=7.0mΩ
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

3. Pin configuration



TO-252



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KND3504A	TO-252	KIA

5. Absolute maximum ratings

TC=25 °C unless otherwise specified

Parameter		Symbol	Ratings	Unit
Drain-to-Source Voltage		V_{DSS}	40	V
Continuous Drain Current	T_C=25 °C	I_D	70	A
	T_C=100 °C		49	
Pulsed drain current(note1)		I_{DM}	270	
Avalanche energy(note2)		E_{AS}	110	mJ
Gate-Source voltage		V_{GS}	±20	V
Power dissipation	T_C=25 °C	P_D	48	W
	T_C=100 °C		24	
Thermal resistance, Junction-case(note3)		$R_{\theta JC}$	3.1	°C/W
Junction & Storage Temperature Range		T_J& T_{STG}	-55 to 150	°C

6. Electrical characteristics

(T_J=25°C,unless otherwise notes)

Parameter		Symbol	Conditions	Min	Typ	Max	Units
Static characteristics							
Drain-source breakdown voltage		BV_{DSS}	V_{GS}=0V,I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	T_J=25ºC	I_{DSS}	V_{DS}=32V , V_{GS}=0V	-	-	1	μA
	T_J=55ºC			-	-	5	
Gate threshold voltage		$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.7	1.2	2.5	V
Gate leakage current		I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Drain-source on-resistance		$R_{DS(on)}$	V_{GS}=10V,I_D=20A	-	7.0	8.5	mΩ
			V_{GS}=4.5V,I_D=10A	-	8.0	10.5	
Dynamic characteristics							
Input capacitance		C_{iss}	V_{DS}=20V,V_{GS}=0V, F=1MHz	-	1760	-	pF
Output capacitance		C_{oss}		-	220	-	pF
Reverse transfer capacitance		C_{rss}		-	190	-	pF
Turn-on delay time		$t_{d(on)}$	V_{DD}=20V,I_D=2A, V_{GS}=10V,R_G=3Ω	-	5	-	ns
Rise time		t_r		-	22	-	ns
Turn-off delay time		$t_{d(off)}$		-	50	-	ns
Fall time		t_f		-	32	-	ns
Gate Charge Characteristics							
Total gate charge		Q_g	V_{DS}=20V,I_D=20A, V_{GS}=10V	-	46.5	-	nC
Gate-source charge		Q_{gs}		-	5.6	-	nC
Gate-drain charge		Q_{gd}		-	10.5	-	nC
Diode characteristics							
Diode forward voltage		V_{SD}	V_{GS}=0V,I_S=20A	-	0.85	1.3	V
Body Diode Continuous Forward Current		I_S		-	-	70	A
Reverse recovery time		t_{rr}	I_F=20A DI$_F$/dt=100A/μs	-	8.5	-	ns
Reverse recovery charge		Q_{rr}		-	0.5	-	nC

NOTE:

1. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
2. VDD=40V，VGS=10V，L=0.5mH，ID=20A
3. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

7. Typical Characteristics

■ **Typical Performance Characteristics**

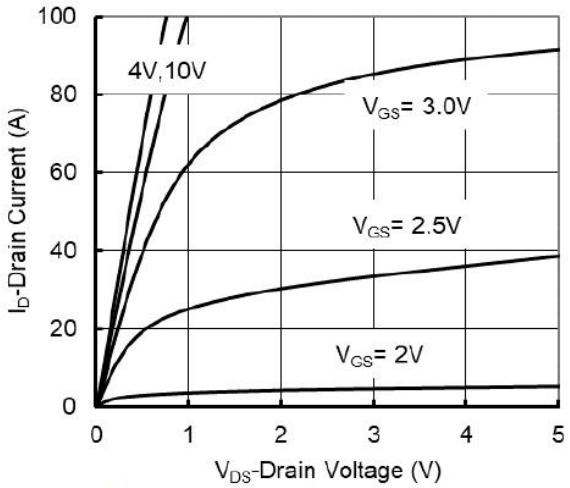


Figure 1. Output Characteristics

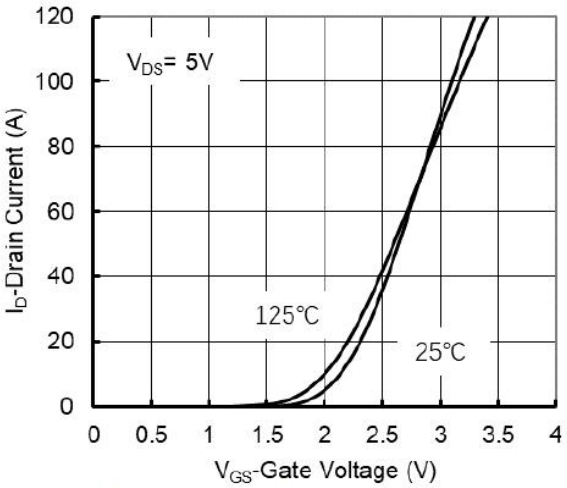


Figure 2. Transfer Characteristics

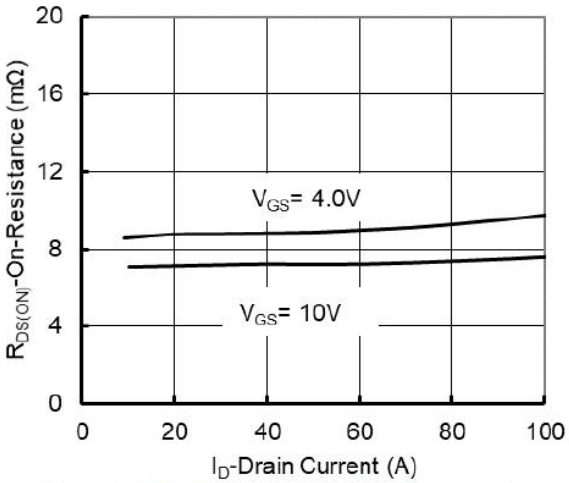


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

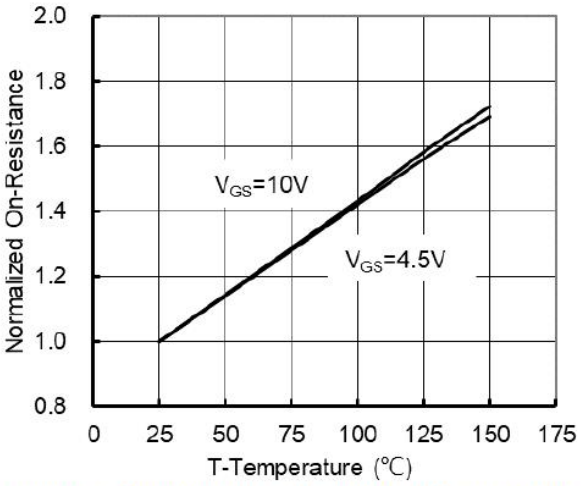


Figure 4. On-Resistance vs. Junction Temperature

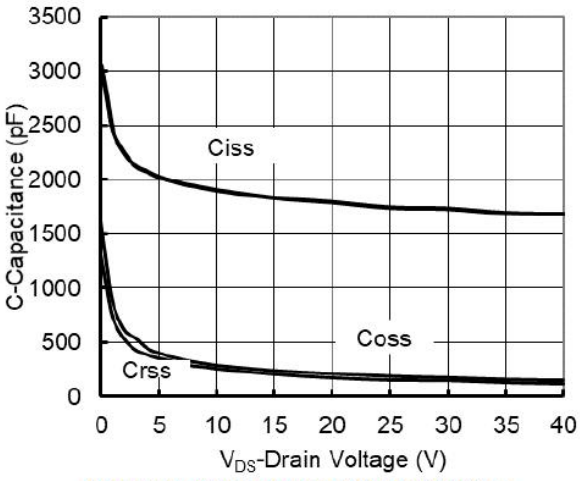


Figure 5. Capacitance Characteristics

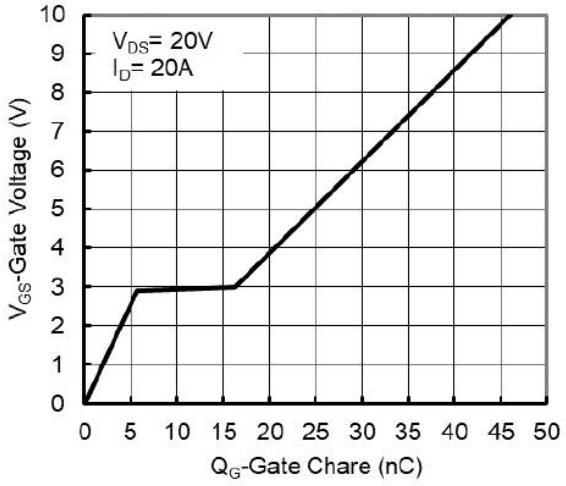


Figure 6. Gate Charge

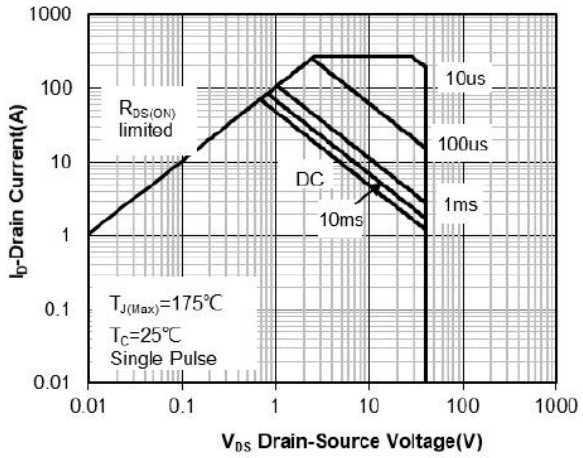


Figure 7. Safe Operation Area

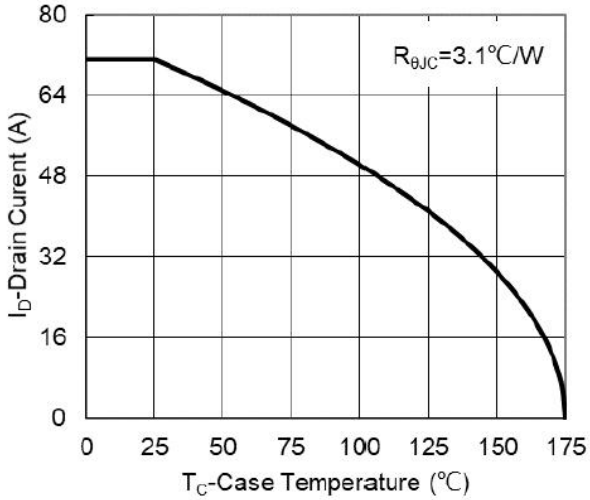


Figure 8. Maximum Continuous Drain Current vs Case Temperature

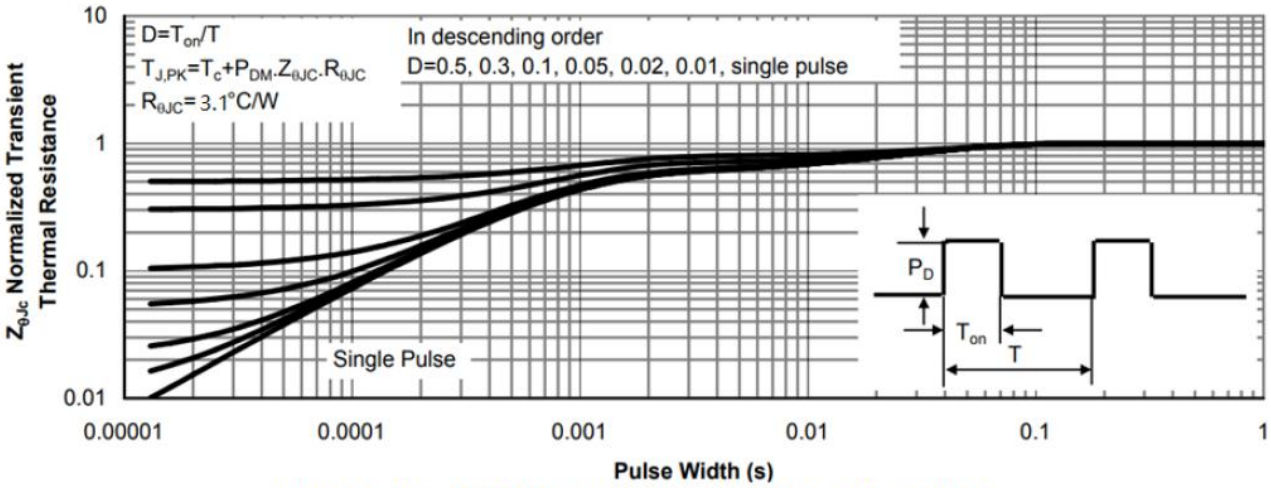


Figure 9. Normalized Maximum Transient Thermal Impedance