

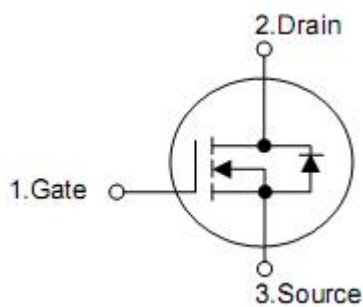
1. Features

- $R_{DS(ON),typ.}=5.0m\Omega(typ.)@V_{GS}=10V$
- Uses CRM(CQ) advanced Trench MOS technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

2. Applications

- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KND3404B	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 ¹	$T_C=25\text{ °C}$	80	A
	$T_C=100\text{ °C}$	58	
Pulsed drain current ($T_C = 25\text{ °C}$, t_p limited by T_{jmax}) ²	I_{DP}	320	
Avalanche energy, single pulse ³	E_{AS}	225	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation ($T_C = 25\text{ °C}$) ⁴	P_{tot}	92	W
Junction & Storage Temperature Range	T_J & T_{STG}	-55 to 150	°C

6. Thermal characteristics

Parameter	Symbol	Ratings	Units
Thermal resistance, junction-ambient	$R_{\theta JA}$	94	°C/W
Thermal resistance, Junction-case	$R_{\theta JC}$	1.37	

7. 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	I _{DSS}	V _{DS} =40V, V _{GS} =0V, T _J =25 °C	-	-	1	μA
		V _{DS} =40V, V _{GS} =0V, T _J =125°C	-	-	10	
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.8	2.5	V
Gate leakage current	I _{GSS}	V _{GS} =20V, V _{DS} =0V	-	1	100	nA
Drain-source on-resistance ²	R _{DS(on)}	V _{GS} =10V, I _D =30A	-	5.0	6.5	mΩ
		V _{GS} =4.5V, I _D =30A	-	5.5	8.0	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =40A	-	110	-	S
Dynamic characteristics						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V Frequency=1MHz	-	2.0	-	Ω
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1MHz	-	2300	-	pF
Output capacitance	C _{oss}		-	290	-	pF
Reverse transfer capacitance	C _{rss}		-	150	-	pF
Turn-on delay time	t _{d(on)}		-	9.5	-	ns
Rise time	t _r	V _{DD} =20V, I _D =40A, V _{GS} =10V, R _G =3Ω	-	30	-	ns
Turn-off delay time	t _{d(off)}		-	55	-	ns
Fall time	t _f		-	17.5	-	ns
Gate Charge Characteristics						
Total gate charge	Q _g	V _{DS} =20V, I _D =40A, V _{GS} =10V, F=1MHz	-	47.5	-	nC
Gate-source charge	Q _{gs}		-	9.0	-	nC
Gate-drain charge	Q _{gd}		-	10.0	-	nC
Diode characteristics						
Diode forward voltage ²	V _{SD}	V _{GS} =0V, I _{SD} =40A	-	-	1.5	V
Reverse recovery time	t _{rr}	I _F =40A DI _F /dt=100A/μs	-	20	-	ns
Reverse recovery charge	Q _{rr}		-	9.0	-	nC

- Note: 1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
 2. The data tested by pulsed, pulse width ≤300us, duty cycle ≤2%.
 3. The EAS data shows Max.rating. The test condition is V_{DD}=40V, V_{GS}=10V, L=0.5mH, I_{AS}=30A.
 4. The power dissipation is limited by 150 °C junction temperature.

8. Typical Characteristics

Fig 1: Output Characteristics

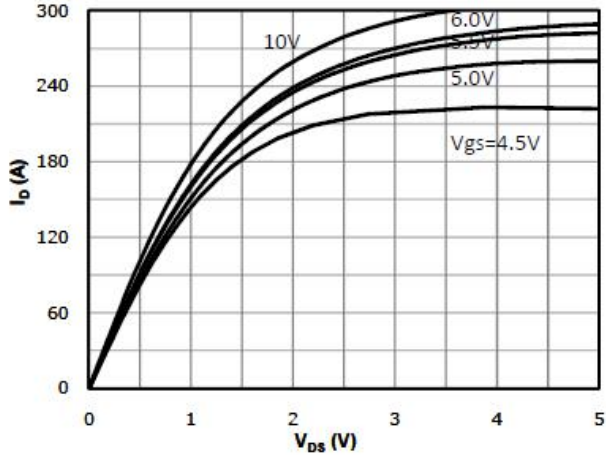


Fig 2: Transfer Characteristics

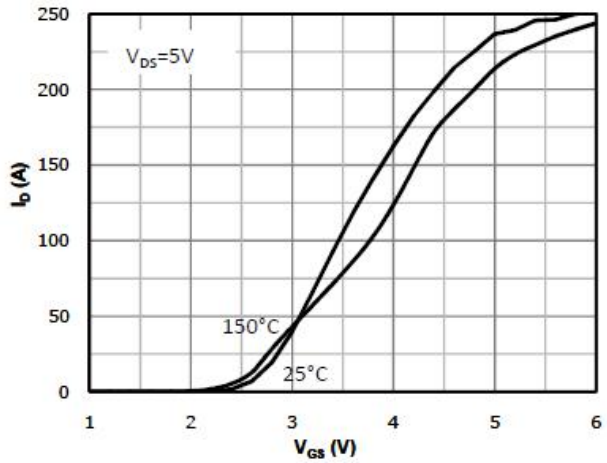


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

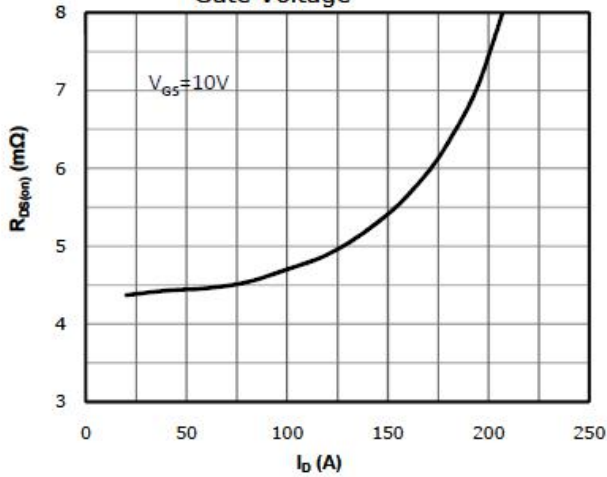


Fig 4: $R_{DS(on)}$ vs Gate Voltage

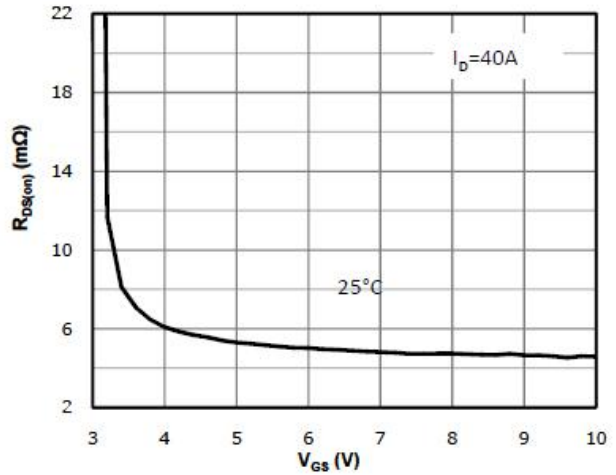


Fig 5: $R_{DS(on)}$ vs. Temperature

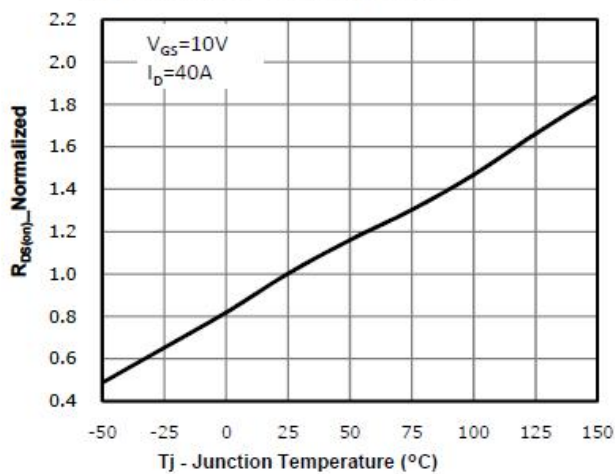


Fig 6: Capacitance Characteristics

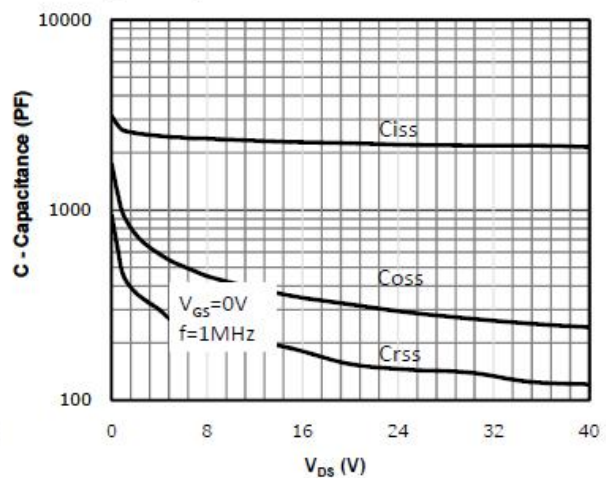


Fig 7: Gate Charge Characteristics

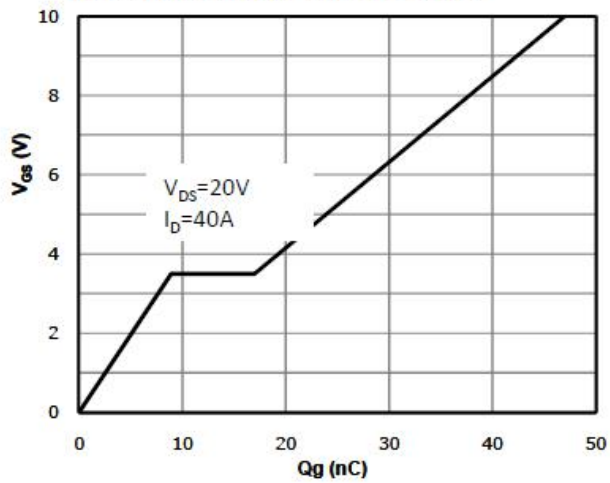


Fig 8: Body-diode Forward Characteristics

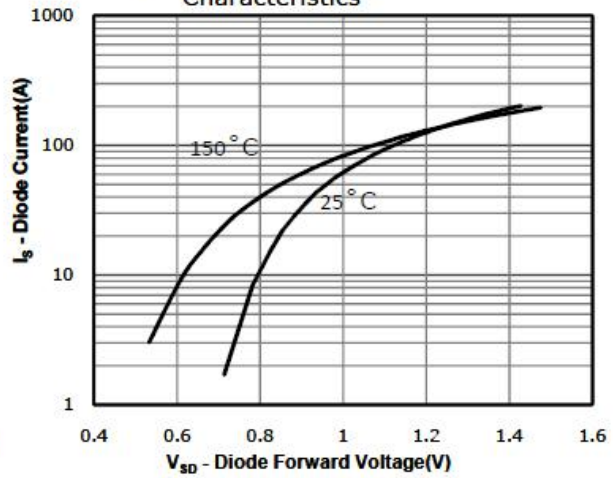


Fig 9: Power Dissipation

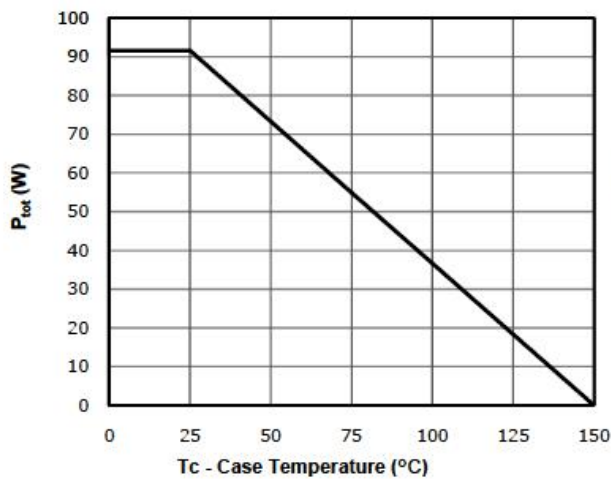


Fig 10: Drain Current Derating

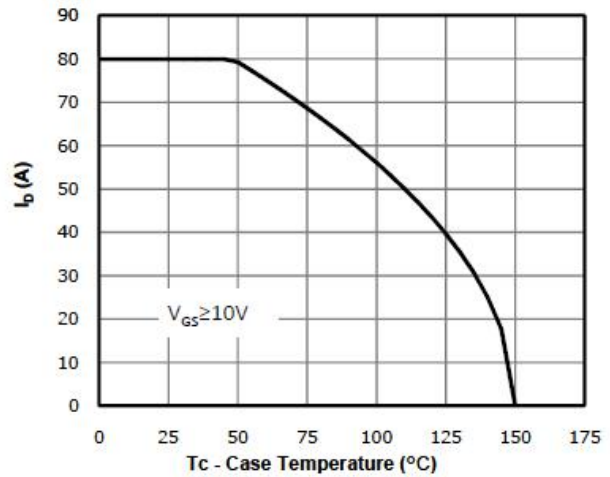


Fig 11: Safe Operating Area

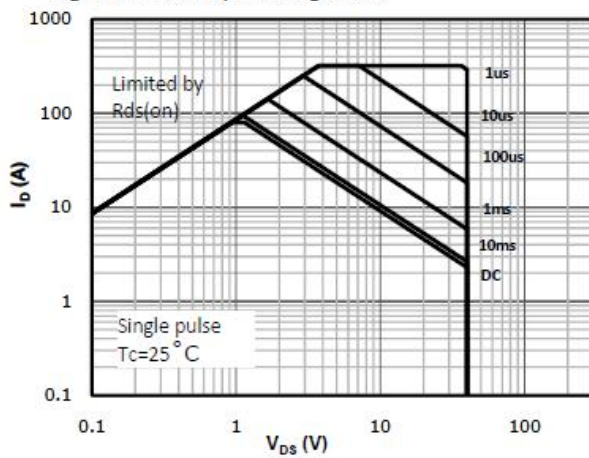


Fig 12: Max. Transient Thermal Impedance

