

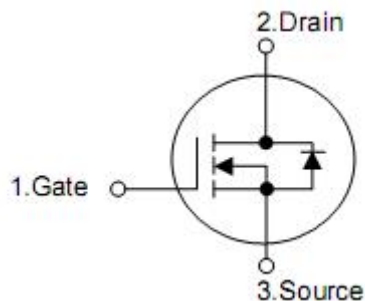
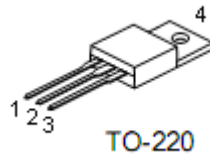
1. Features

- n $R_{DS(ON),typ.}=3.0m\Omega(typ.)@V_{GS}=10V$
- n Uses CRM(CQ) advanced Trench MOS technology
- n Excellent $Q_{gx}R_{DS(on)}$ product(FOM)
- n Extremely low on-resistance $R_{DS(on)}$

2. Application

- n Motor control and drive
- n Battery management
- n UPS

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Ordering Information

Part Number	Package	Brand
KNP2804C	TO-220	KIA

5. Absolute maximum ratings

TC=25 °C unless otherwise specified

Parameter		Symbol	Ratings	Unit
Drain-to-Source Voltage		V_{DSS}	40	V
Gate-to-Source Voltage		V_{GSS}	±20	
Continuous Drain Current	$T_C=25\text{ °C}$ (Silicon limited)	I_D	150	A
	$T_C=100\text{ °C}$ (Silicon limited)		90	
	$T_C=25\text{ °C}$ (Package limited)		80	
Pulsed Drain Current	$T_C=25\text{ °C}$ (t_p limited by T_{jmax})	I_{DM}	320	
Avalanche Energy (L=0.5mH,RG=25Ω)		E_{AS}	225	mJ
Maximum power Dissipation	$T_C=25\text{ °C}$	P_D	230	W
Junction & Storage Temperature Range		T_J & T_{STG}	-55 to 150	°C

6. Thermal characteristics

Parameter	Symbol	Ratings	Units
Thermal resistance, Junction-case	$R_{\theta JC}$	0.54	°C/W
Thermal resistance, junction-ambient	$R_{\theta JA}$	105	°C/W

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} =36V, V _{GS} =0V	-	-	1	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	2.0	3.0	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 =30A	-	3.0	4.0	mΩ
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =40A	-	126	-	S
Dynamic characteristics						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V Frequency=1MHz	-	1.5	-	Ω
Input capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, F=1MHz	-	5900	-	pF
Output capacitance	C _{oss}		-	690	-	pF
Reverse transfer capacitance	C _{rss}		-	640	-	pF
Turn-on delay time	t _{d(on)}	V _{DS} =20V, I _D =40A, V _{GS} =10V, R _G =3Ω	-	28	-	ns
Rise time	t _r		-	68	-	ns
Turn-off delay time	t _{d(off)}		-	110	-	ns
Fall time	t _f		-	32	-	ns
Gate Charge Characteristics						
Total gate charge	Q _g	V _{DS} =32V, I _D =40A, V _{GS} =10V	-	120	-	nC
Gate-source charge	Q _{gs}		-	18	-	nC
Gate-drain charge	Q _{gd}		-	34	-	nC
Diode characteristics						
Diode forward voltage	V _{SD}	V _{GS} =0V, I _{SD} =30A	-	0.85	1.3	V
Drain Continuous Forward current	I _S		-	-	150	A
Reverse recovery time	t _{rr}	I _F =40A di/dt=100A/μs	-	40	-	ns
Reverse recovery charge	Q _{rr}		-	41	-	nC

8. Typical Characteristics

Fig 1: Output Characteristics

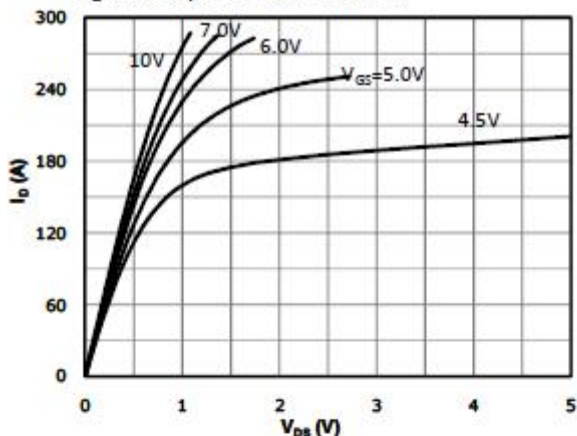


Fig 2: Transfer Characteristics

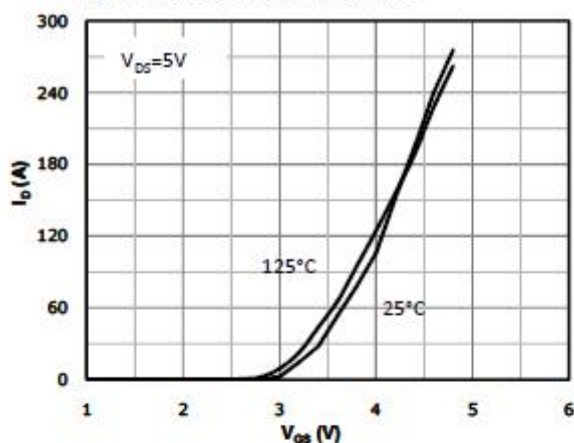


Fig 3: $R_{ds(on)}$ vs Drain Current and Gate Voltage

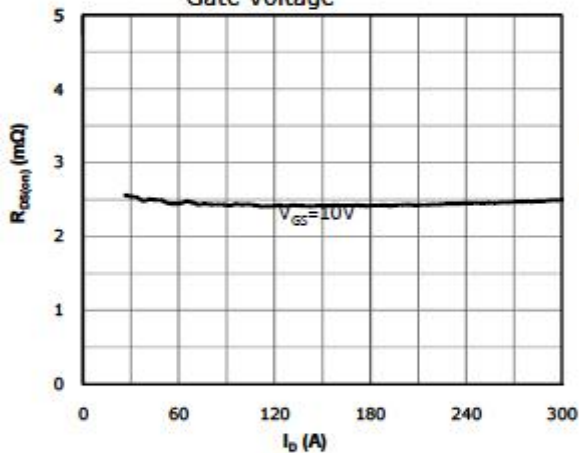


Fig 4: $R_{ds(on)}$ vs Gate Voltage

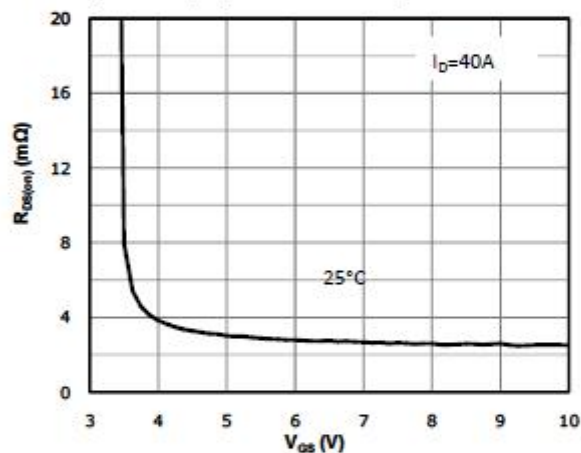


Fig 5: $R_{ds(on)}$ vs. Temperature

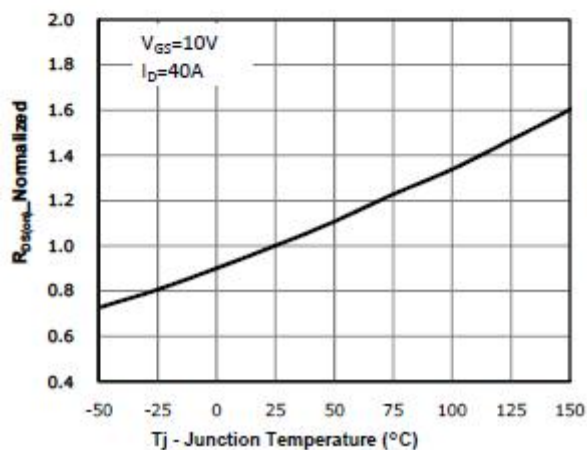


Fig 6: Capacitance Characteristics

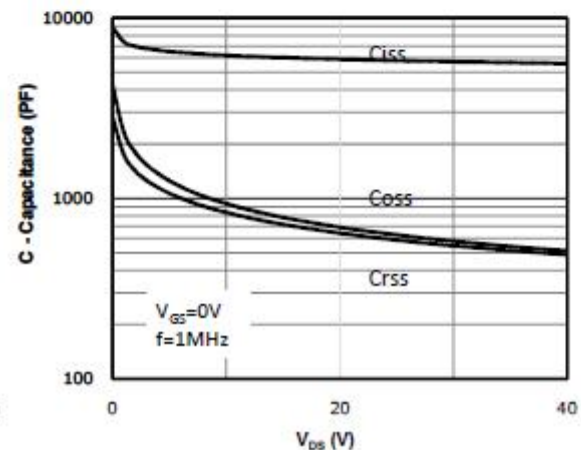


Fig 7: Gate Charge Characteristics

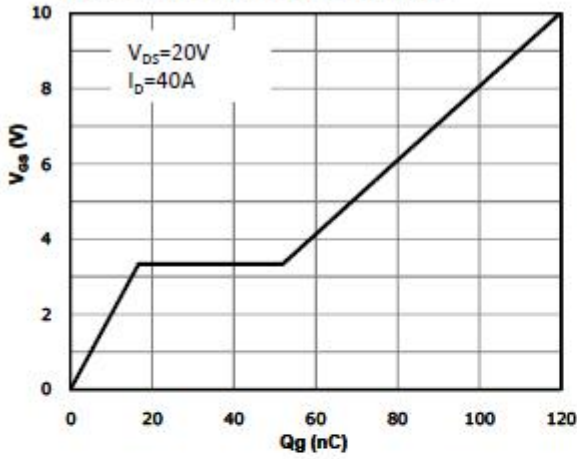


Fig 8: Body-diode Forward Characteristics

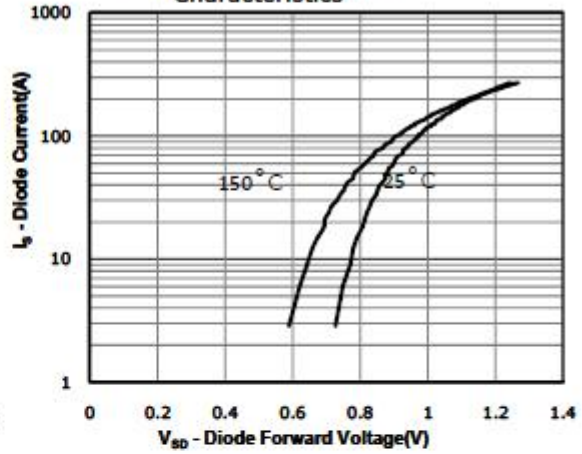


Fig 9: Safe Operating Area

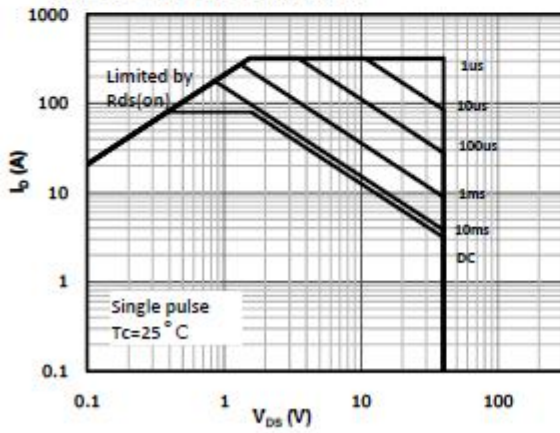


Fig 10: Drain Current Derating

