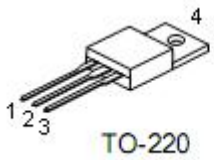
1. Features

- $R_{DS(ON),typ.}$=3.0mΩ(typ.)@V_{GS}=10V
- Uses CRM(CQ) advanced Trench MOS technology
- Excellent QgxRDS(on) product(FOM)
- Extremely low on-resistance RDS(on)

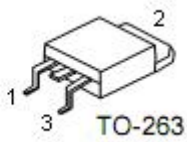
2. Application

- Motor control and drive
- Battery management
- UPS

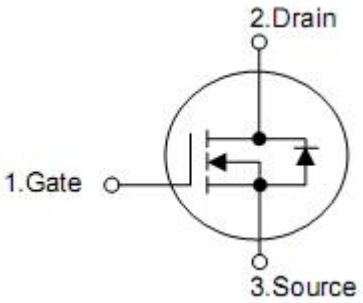
3. Pin configuration



TO-220



TO-263



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Ordering Information

Part Number	Package	Brand
KNP2804C	TO-220	KIA
KNB2804C	TO-263	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 °C(Silicon limited)	I_D	150	A
	T_C=100 °C(Silicon limited)		90	
	T_C=25 °C(Package limited)		80	
Pulsed Drain Current	T_C=25 °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 °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	gfs	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}	IF=40A di/dt=100A/μs	-	40	-	ns
Reverse recovery charge	Q_{rr}		-	41	-	nC

8. Typical Characteristics

Fig 1: Output Characteristics

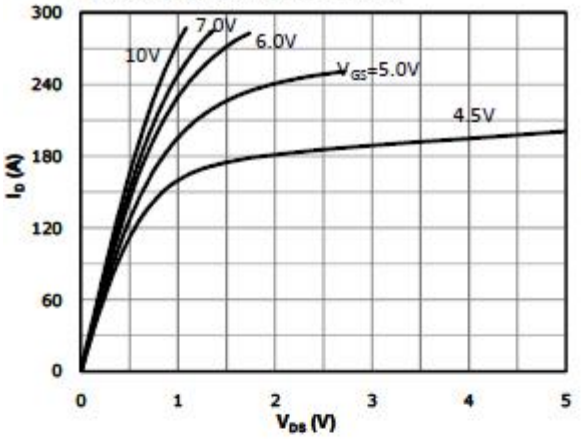


Fig 2: Transfer Characteristics

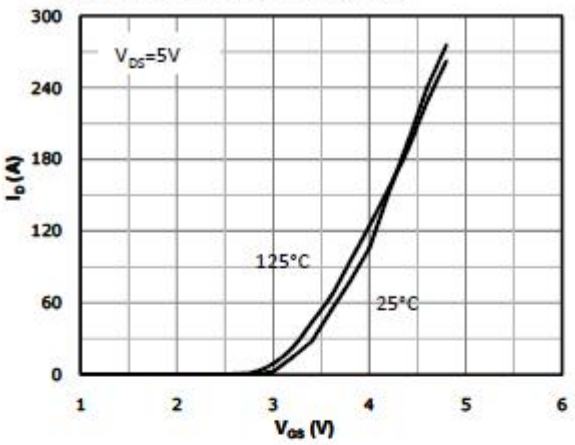


Fig 3: Rds(on) vs Drain Current and Gate Voltage

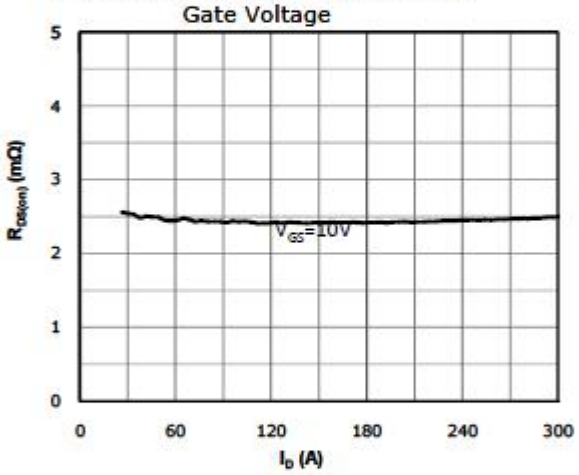


Fig 4: Rds(on) vs Gate Voltage

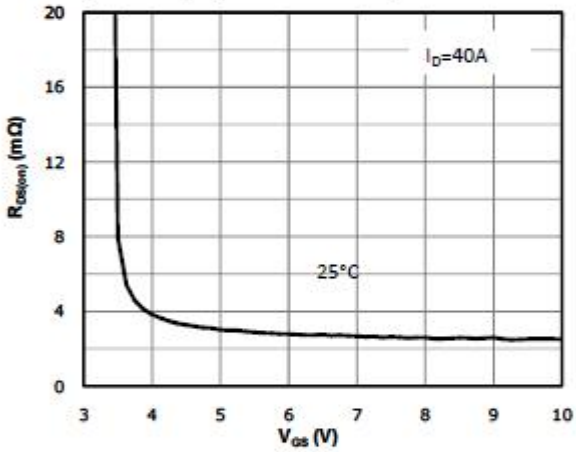


Fig 5: Rds(on) vs. Temperature

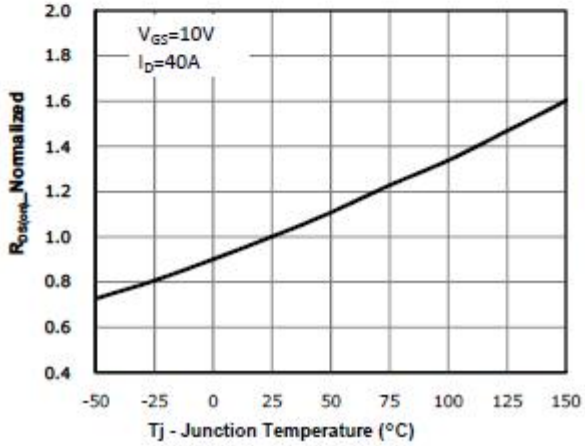


Fig 6: Capacitance Characteristics

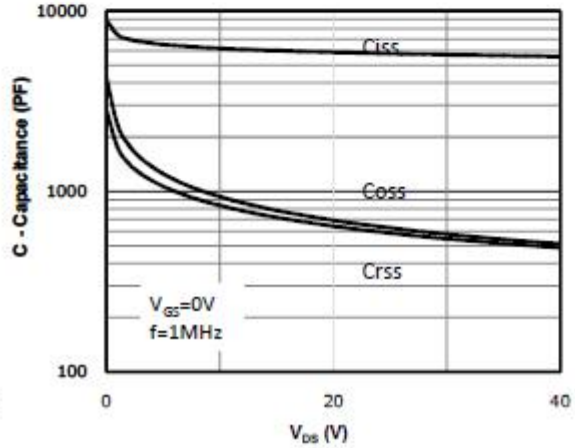


Fig 7: Gate Charge Characteristics

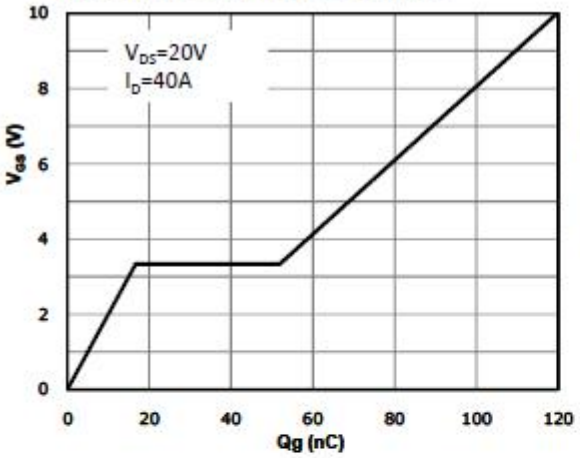


Fig 8: Body-diode Forward Characteristics

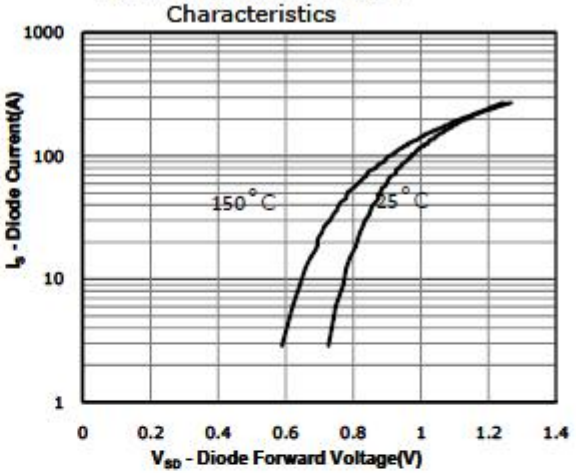


Fig 9: Safe Operating Area

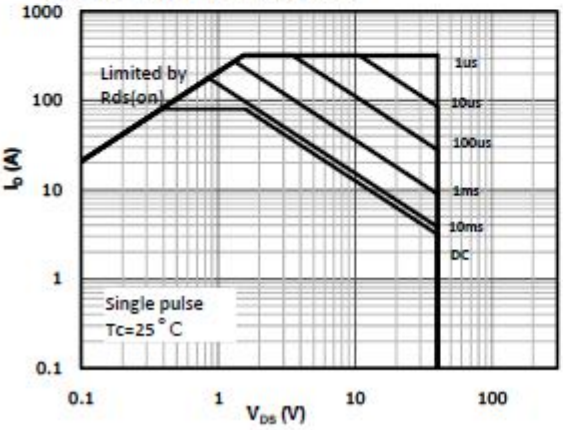


Fig 10: Drain Current Derating