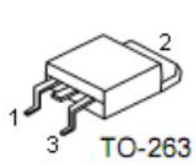
1. Features

- $R_{DS(ON),typ.}$=3.5mΩ(typ.)@V_{GS}=10V
- Uses CRM(CQ) advanced Trench MOS technology
- Excellent QgxRDS(on) product(FOM)
- Extremely low on-resistance RDS(on)

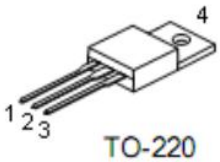
2. Application

- Motor control and drive
- Battery management
- UPS

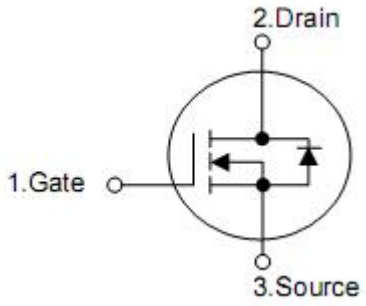
3. Pin configuration



TO-263



TO-220



Pin	Function
1	Gate
2,4	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNP2804B	TO-220	KIA
KNB2804B	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	I_D	150	A
	T_C=100 °C		90	
Pulsed Drain Current	T_C=25 °C(t_p limited by T_{jmax})	I_{DM}	600	
Avalanche Energy [1]		E_{AS}	625	mJ
Maximum power Dissipation	T_C=25 °C	P_D	178	W
			1.42	W/°C
Junction & Storage Temperature Range		T_J& T_{STG}	-55 to 150	°C

6. Thermal characteristics

Parameter	Symbol	Ratings	Units
Thermal resistance, Junction-case	$R_{\theta JC}$	0.7	°C/W
Thermal resistance, junction-ambient	$R_{\theta JA}$	62.5	°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}=40V , V_{GS}=0V	-	-	1	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	3.0	4.0	V
Gate leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS}=10V,I_D=30A	-	3.5	4.5	mΩ
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	-	5600	-	pF
Output capacitance	C_{oss}		-	545	-	pF
Reverse transfer capacitance	C_{rss}		-	400	-	pF
Turn-on delay time	$t_{d(on)}$	V_{DS}=20V,I_D=150A, V_{GS}=10V,R_G=24Ω	-	51	-	ns
Rise time	t_r		-	130	-	ns
Turn-off delay time	$t_{d(off)}$		-	245	-	ns
Fall time	t_f		-	180	-	ns
Gate Charge Characteristics						
Total gate charge	Q_g	V_{DS}=32V,I_D=80A , V_{GS}=10V	-	110	-	nC
Gate-source charge	Q_{gs}		-	29	-	nC
Gate-drain charge	Q_{gd}		-	31	-	nC
Diode characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0V,I_{SD}=30A	-	0.83	1.3	V
Drain Continuous Forward current	I_S		-	-	150	A
Reverse recovery time	t_{rr}	IF=40A,V_{GS}=0V di/dt=100A/μs	-	28.5	-	ns
Reverse recovery charge	Q_{rr}		-	0.02	-	uC

Note:
[1] L=0.5mH,VDD=40V,RG=25Ω.
[2] Repetitive rating; pulse width limited by maximum junction temperature.
[3] Pulse width≤380μs; duty cycle≤2%.

8. Typical Characteristics

图 1. 输出特性

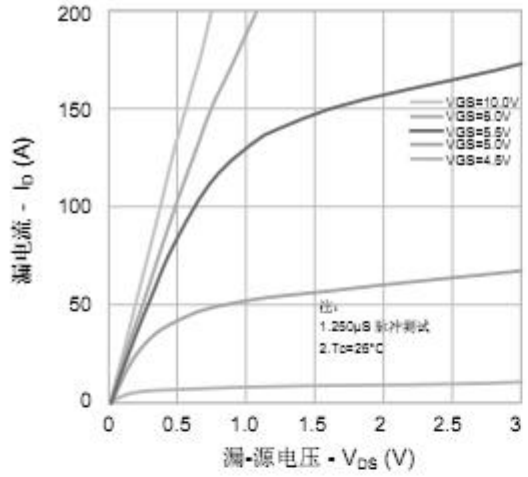


图 2. 传输特性

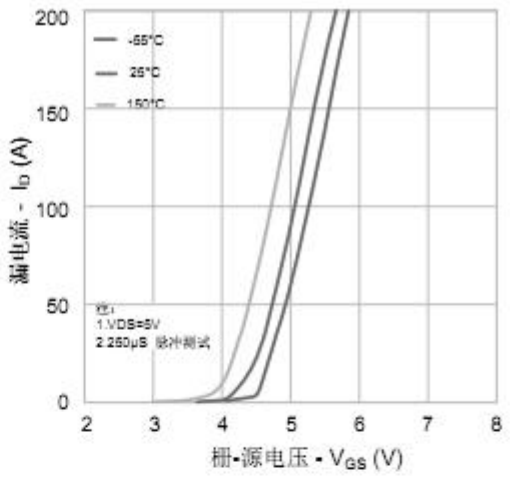


图 3. 导通电阻 vs. 漏电流

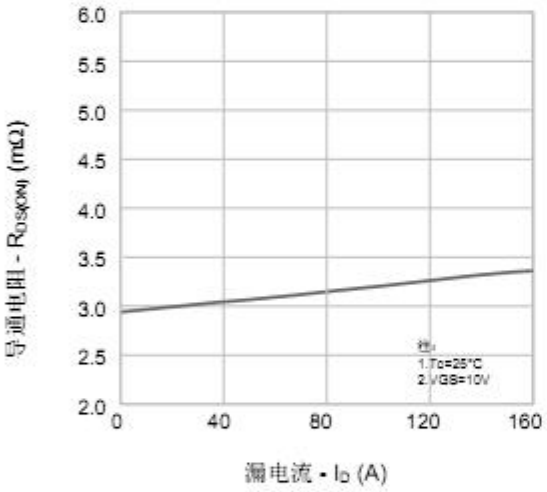


图 4. 体二极管正向压降 vs. 源电流和温度

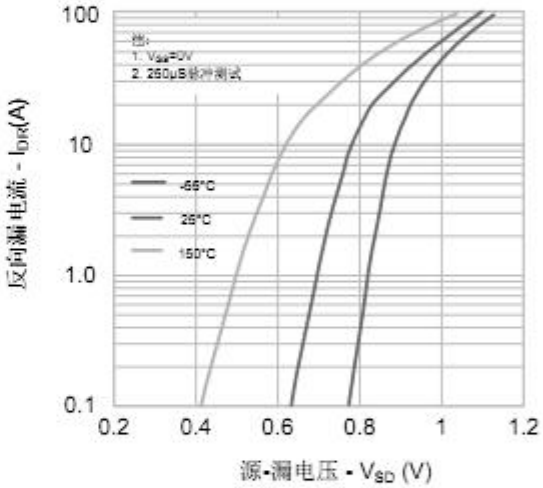


图 5. 电容特性

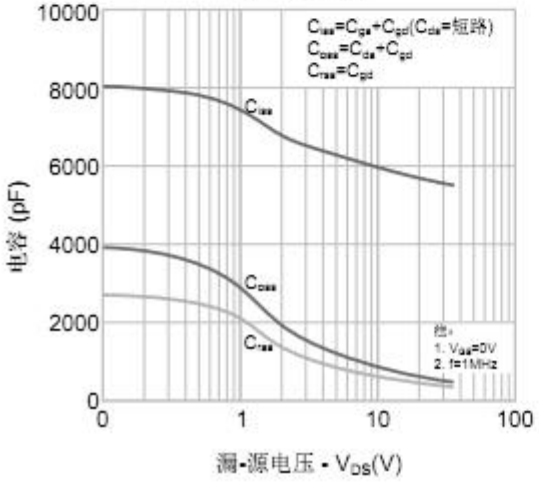


图 6. 栅极电荷特性

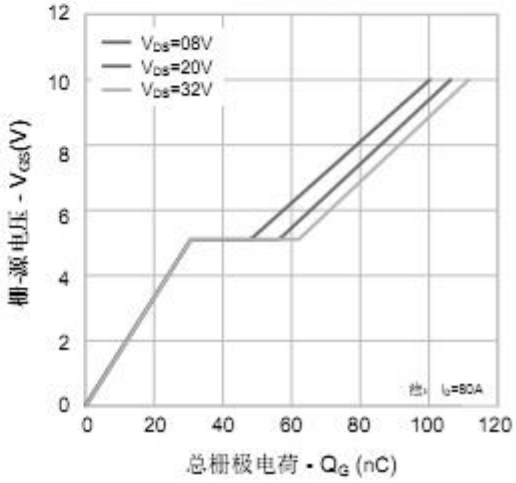


图 7. 击穿电压 vs. 温度特性

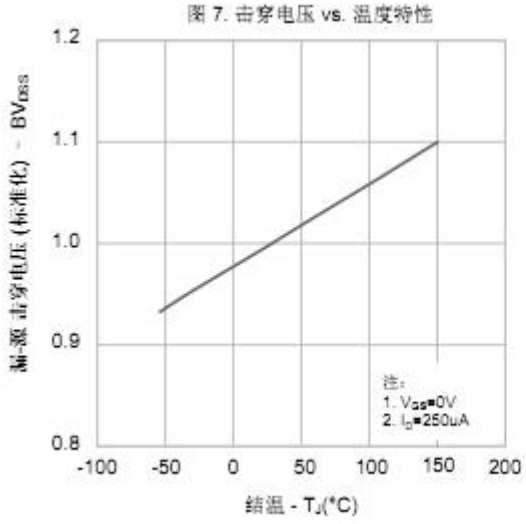


图 8. 导通电阻 vs. 温度特性

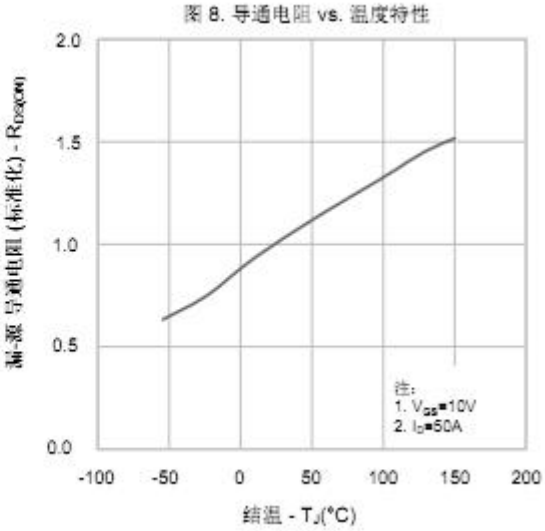


图 9- . 最大安全工作区域