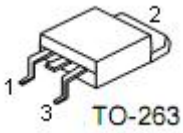
1. Features

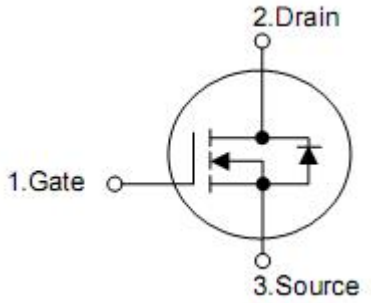
- $R_{DS(ON)}$=5.5mΩ(Typ.)@V_{GS}=10V
- Lead free and green device available
- Low Rds-on to minimize conductive loss
- High avalanche current

2. Applications

- Power supply
- DC-DC converters

3. Pin configuration





Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNB3108A	TO-263	KIA

5. Absolute maximum ratings

Parameter		Symbol	Maximum	Units
Drain-source voltage		V_{DSS}	80	V
Gate-source voltage		V_{GSS}	±25	V
Continuous drain current	T_C=25 ºC	I_D[3]	110	A
	T_C=100 ºC		80	A
Pulse drain current	T_C=25 ºC	I_{DP}[4]	340	A
Avalanche current		I_{AS}[5]	20	A
Avalanche energy		E_{AS}[5]	625	mJ
Maximum power dissipation	T_C=25 ºC	P_D	227	W
	T_C=100 ºC		113	W
Junction & storage temperature range		T_J,T_{STG}	-55～175	ºC

6. Thermal characteristics

Parameter	Symbol	Typical	Units
Thermal resistance-junction to case	$R_{\theta jc}$	0.66	ºC/W
Thermal resistance-junction to ambient	$R_{\theta ja}$	62.5	

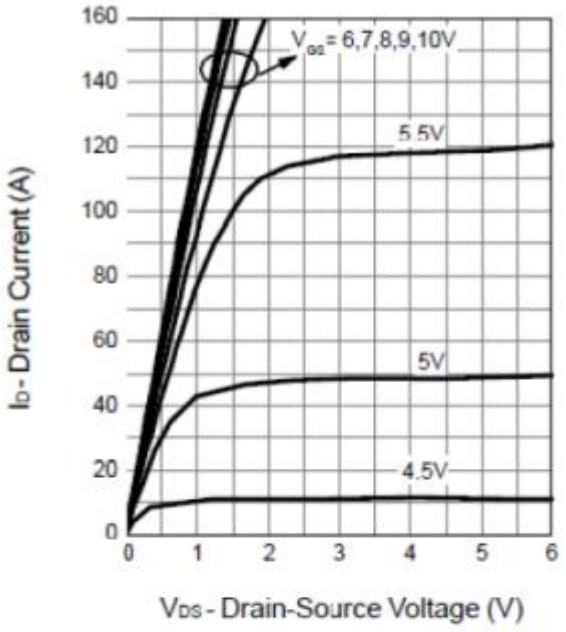
7. Electrical characteristics

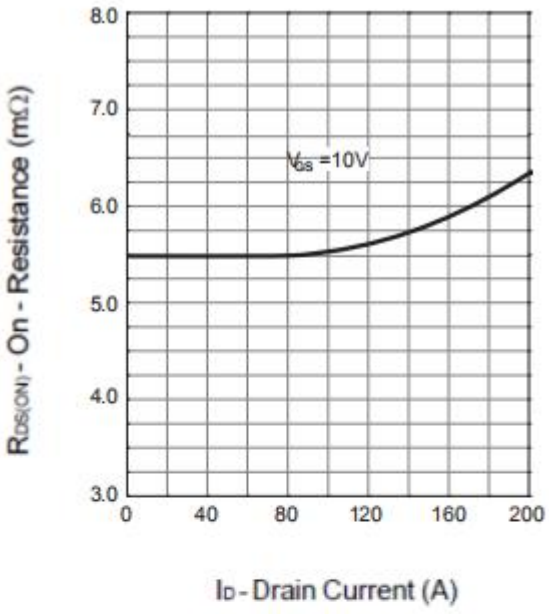
(T_A=25°C,unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_{DS}=250μA	80	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=64V,V_{GS}=0V	-	-	1	μA
		T_J=125 ºC	-	-	100	
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	2	3	4	V
Gate leakage current	I_{GSS}	V_{GS}=±25V,V_{DS}=0V	-	-	±100	nA
Drain-source on-state resistance	$R_{DS(on)}$[1]	V_{GS}=10V,I_{DS}=40A	-	5.5	7.0	mΩ
Diode characteristics						
Diode forward voltage	V_{SD}[1]	I_{SD}=30A,V_{GS}=0V	-	-	1.5	V
Diode continuous forward current	I_S		-	-	110	A
Reverse recovery time	t_{rr}	I_F=60A,dI/dt=100A/μs	-	45	-	nS
Reverse recovery charge	Q_{rr}		-	95	-	nC
Dynamic characteristics[2]						
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V,F=1MHz	-	1.3	-	Ω
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, F=1.0MHz	-	3690	-	pF
Output capacitance	C_{oss}		-	525	-	
Reverse transfer capacitance	C_{rss}		-	350	-	
Turn-on delay time	$t_{d(ON)}$	V_{DD}=40V,I_D=60A, V_{GS}=10V,R_G=6.0Ω	-	25	-	nS
Turn-on rise time	t_r		-	40	-	
Turn-off delay time	$t_{d(OFF)}$		-	78	-	
Turn-off fall time	t_f		-	49	-	
Gate charge characteristics[2]						
Total gate charge	Q_g	V_{DS}=64V, V_{GS}=10V, I_D=60A,	-	97.2	-	nC
Gate-source charge	Q_{gs}		-	17.1	-	
Gate-drain charge	Q_{gd}		-	34.2	-	

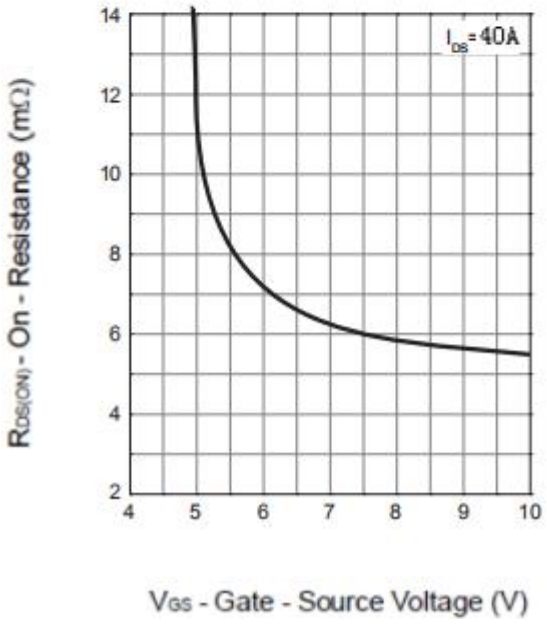
Note:1. Pulse test; pulse width ≤300μs, duty cycle ≤2%.
2.Guaranteed by design,not subject to production testing.
3.Calculated continuous current based on maximum allowable junction temperature.
4.Repetitive rating, pulse width limited by max junction temperature.
5.Starting T_J=25 ºC, L=0.5mH,I_{AS}=50A.

8. Test circuits and waveforms

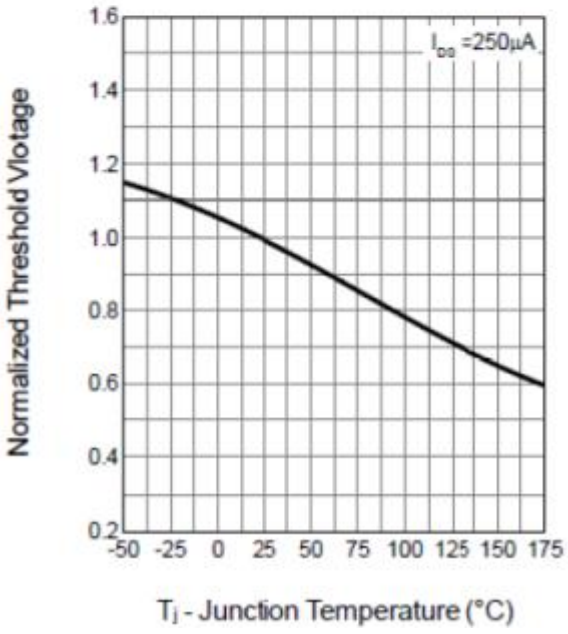




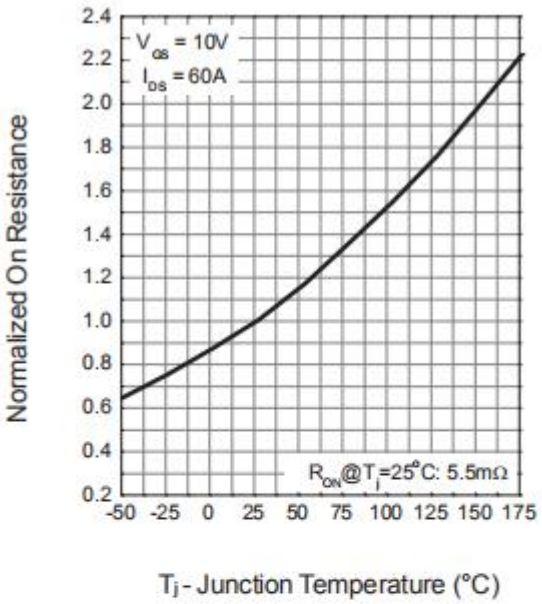
Drain-Source On Resistance



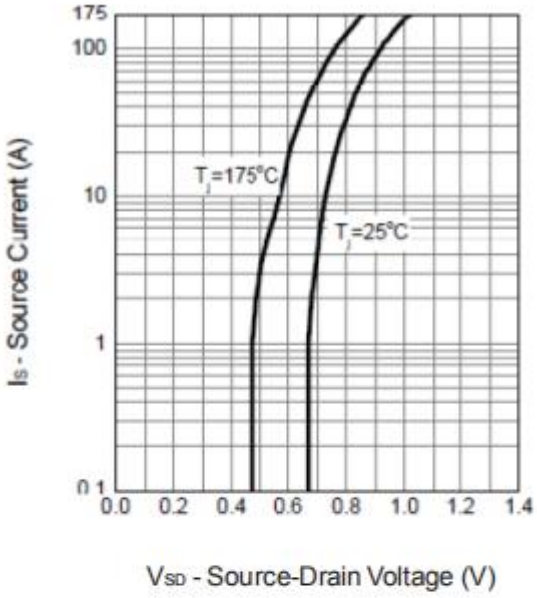
Gate Threshold Voltage



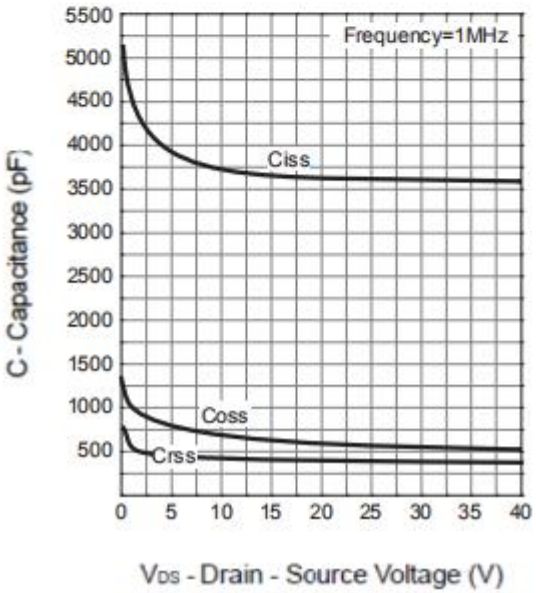
Drain-Source On Resistance



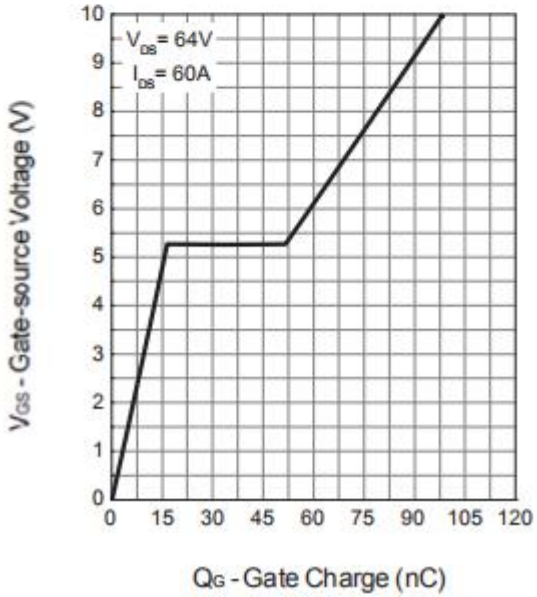
Source-Drain Diode Forward



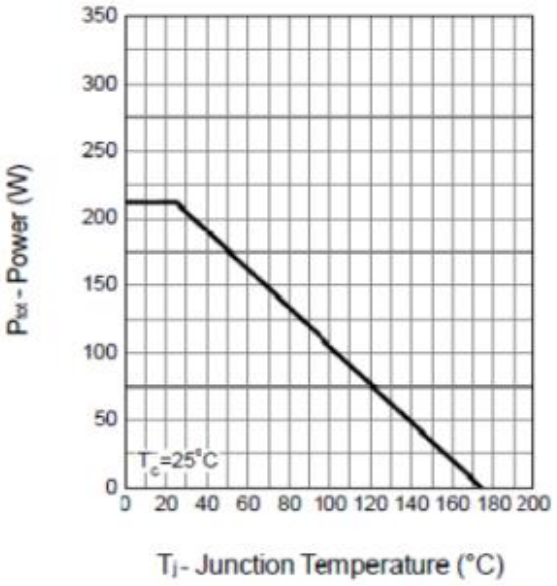
Capacitance



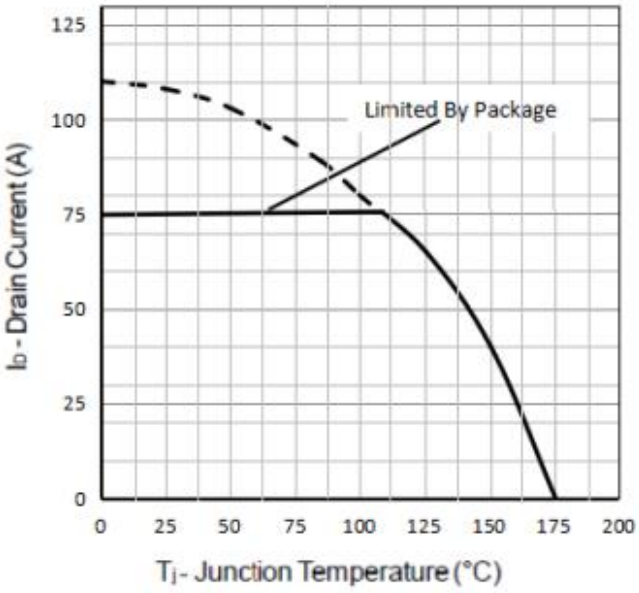
Gate Charge



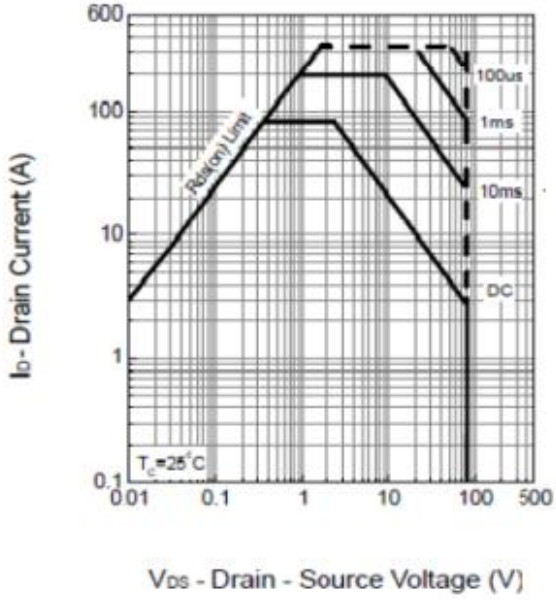
Power Dissipation



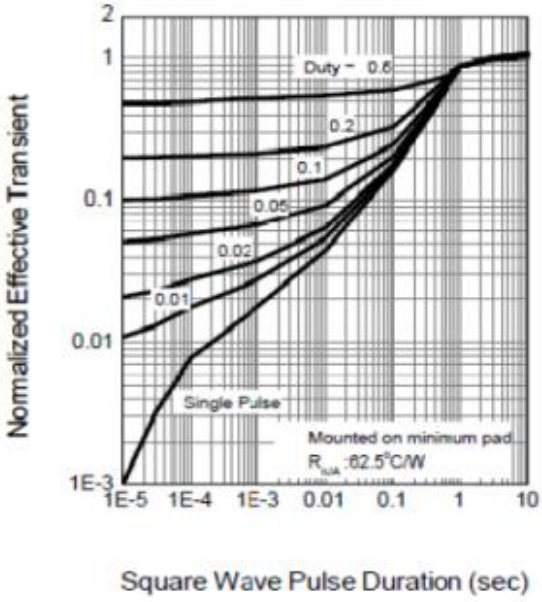
Drain Current

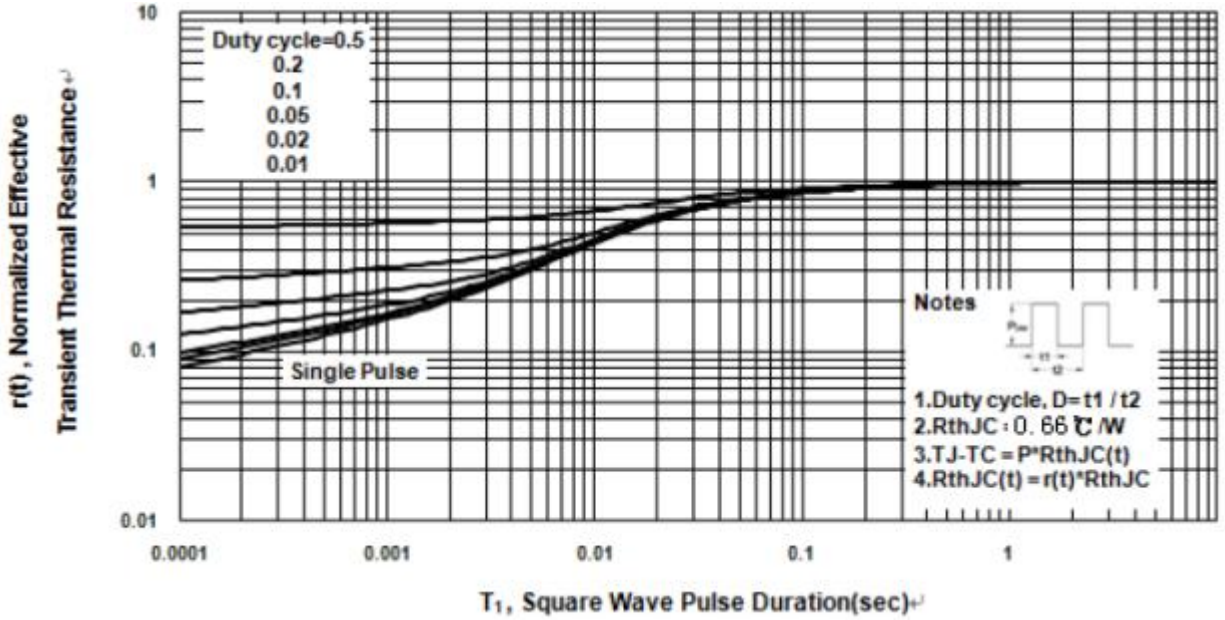


Safe Operation Area



Thermal Transient Impedance




r(t) , Normalized Effective Transient Thermal Resistance
10
1
0.1
0.01
Duty cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Notes
1.Duty cycle, D=t1 /t2
2.RthJC : 0. 66 ℃ /W
3.TJ-TC = P*RthJC(t)
4.RthJC(t) = r(t)*RthJC
0.0001
0.001
0.01
0.1
1
T1, Square Wave Pulse Duration(sec)