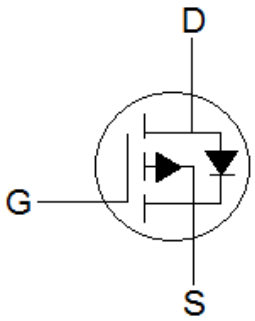
1. Features

- $R_{DS(ON)}$=3.2mΩ (typ.) @ V_{GS}=-10V
- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench

2. Pin configuration

TO-252



Pin	Function
1	Gate
2	Drain
3	Source

3. Ordering Information

Part Number	Package	Brand
KPD3204B	TO-252	KIA

4. Absolute maximum ratings

T_A=25℃ unless otherwise specified

Parameter		Symbol	Rating	Unit
Drain-Source Breakdown Voltage		V_D	-40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current , V_{GS} @ -10V [1]	T_C=25°C	I_D	-100	A
	T_C=100°C	I_D	-77	A
	T_A=25°C	I_D	-18	A
	T_A=70°C	I_D	-15	A
Pulse Drain Current Tested [2]		I_{DM}	-300	A
Single Pulse Avalanche Energy [3]		EAS	361	mJ
Avalanche Current		I_{AS}	-85	A
Maximum Power Dissipation [4]	T_C=25°C	P_D	83	W
	T_C=100°C	P_D	42	W
	T_A=25°C	P_D	2.4	W
	T_A=70°C	P_D	1.7	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 175	°C

5. Thermal characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient [1]	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case [1]	$R_{\theta JC}$	1.8	°C/W

6. Electrical characteristics

(T_J=25°C, unless otherwise notes)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-40	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=-1mA	-	-0.023	-	V/°C
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=55°C	-	-	-5	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Forward Transconductance	gfs	V_{DS}=-15V,I_D=-18A	-	50	-	S
Gate Resistance	R_g	V_{DS}=0V, V_{GS}=0V f=1MHz	-	7	14	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.2	-1.8	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-	4.74	-	mV/°C
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-20A	-	3.2	3.8	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	4.5	5.6	mΩ
Input Capacitance	C_{iss}	V_{DS}=-20V, V_{GS}=0V, f=1MHz	-	6760	-	pF
Output Capacitance	C_{oss}		-	650	-	pF
Reverse Transfer Capacitance	C_{rss}		-	440	-	pF
Total Gate Charge	Q_g	V_{DS}=-20V I_D=-8A, V_{GS}=-10V	-	115	-	nC
Gate Source Charge	Q_{gs}		-	10	-	nC
Gate Drain Charge	Q_{gd}		-	20	-	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-20V, I_D=-10A, R_G=1.6Ω, V_{GS}=-10V	-	15	-	nS
Turn-on Rise Time	t_r		-	16	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	70	-	nS
Turn-Off Fall Time	t_f		-	30	-	nS
Continuous Source Current [1),5)]	I_S	V_G=V_D=0V, Force Current	-	-	-100	A
Forward on voltage [2)]	V_{SD}	I_S=-1A, V_{GS}=0V, T_J=25°C	-	-	-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-15A, T_J=25°C, dI/dt=100A/μs	-	28	-	nS
Reverse Recovery Charge	Q_{rr}		-	16	-	nC

Notes:
1) The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ 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}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-85A.
4) The power dissipation is limited by 175°C junction temperature.
5) The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

7. Typical Characteristics

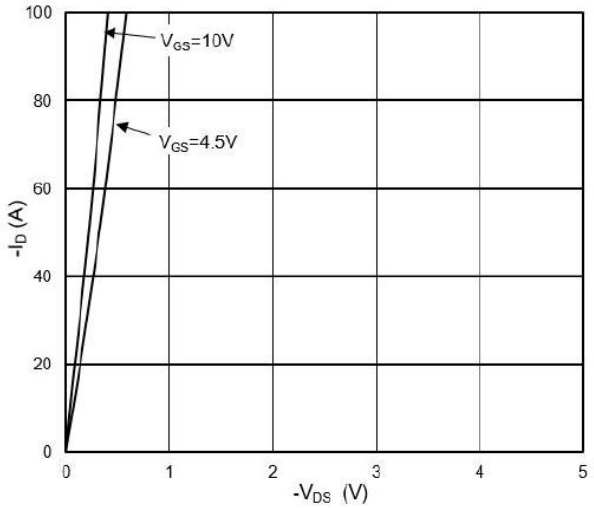


Fig.1 Typical Output Characteristics

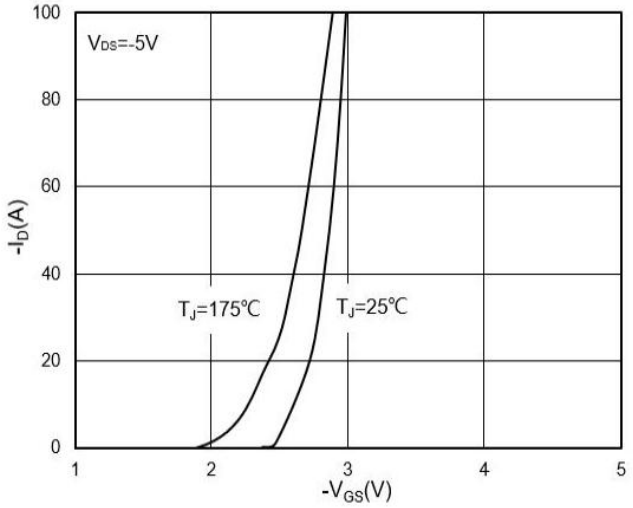


Fig.2 Transfer Characteristics

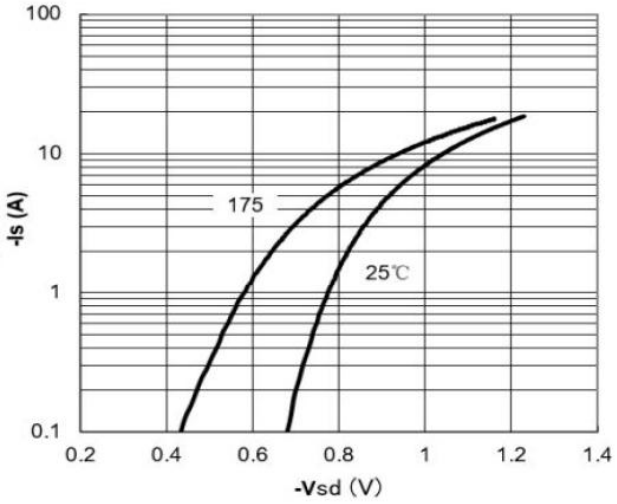


Fig.3 Forward Characteristics Of Reverse

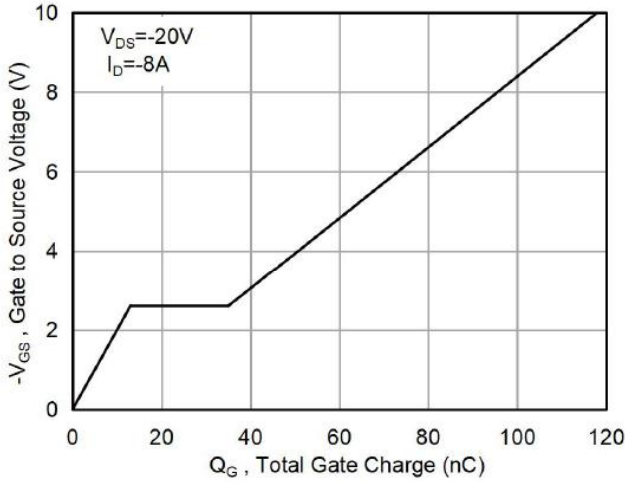


Fig.4 Gate-Charge Characteristics

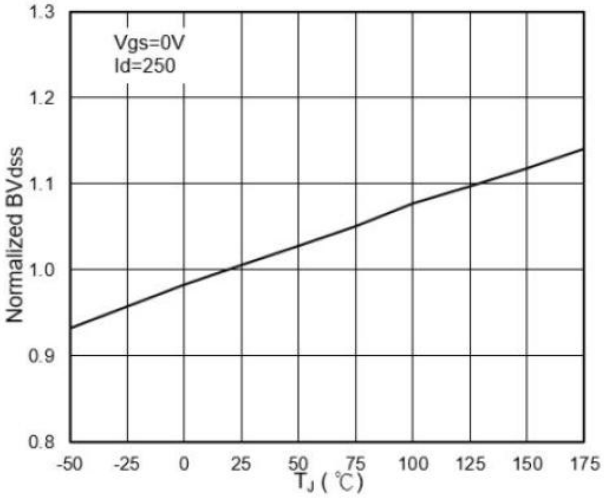


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

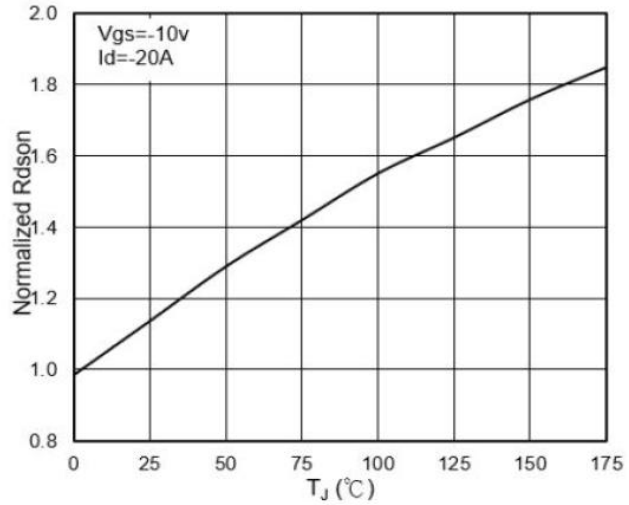


Fig.6 Normalized R_{DSON} vs. T_J

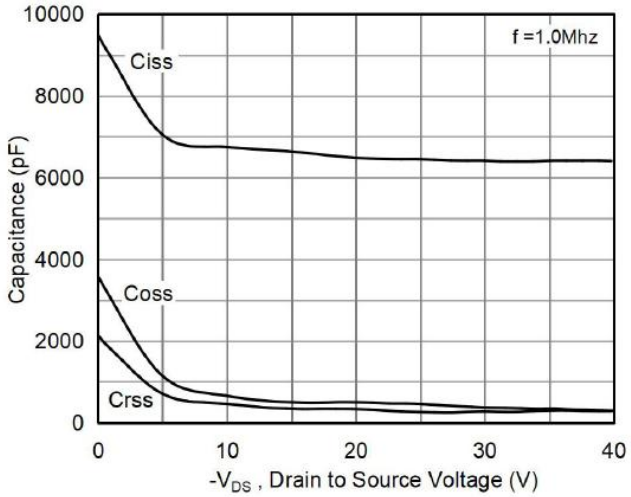


Fig.7 Capacitance

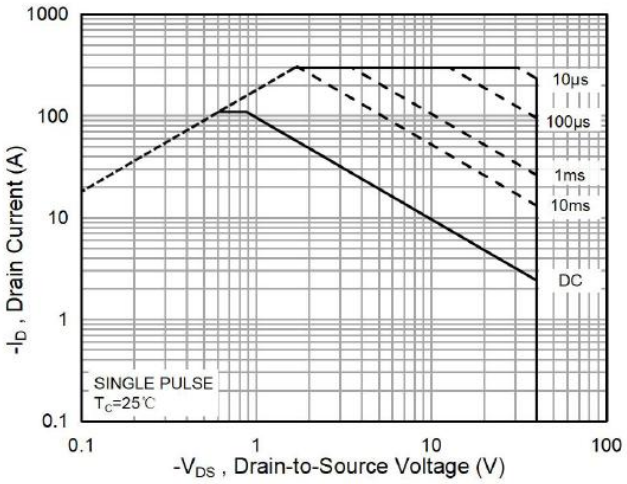


Fig.8 Safe Operating Area

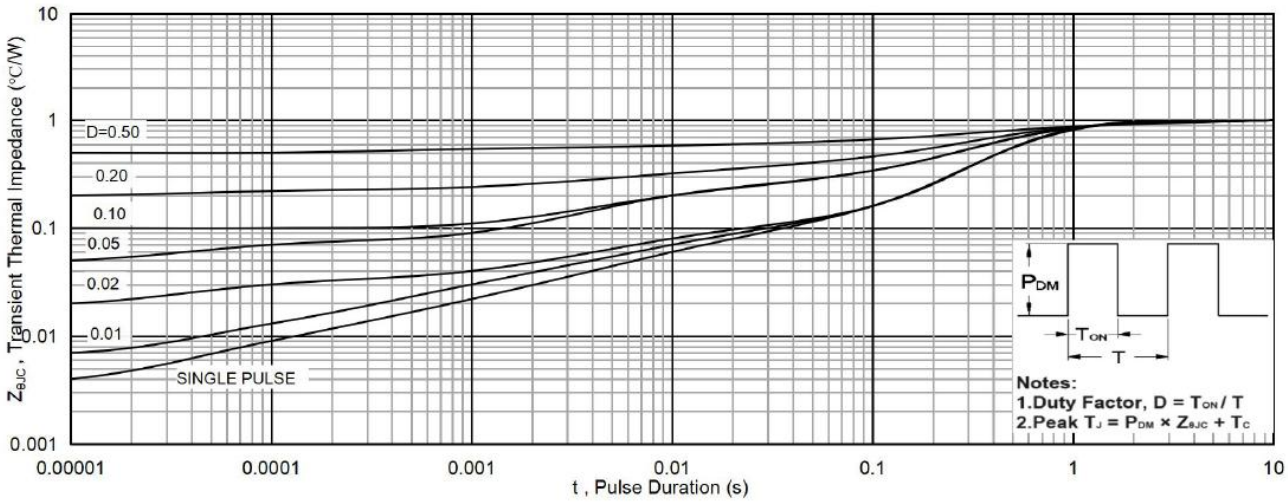


Fig.9 Normalized Maximum Transient Thermal Impedance

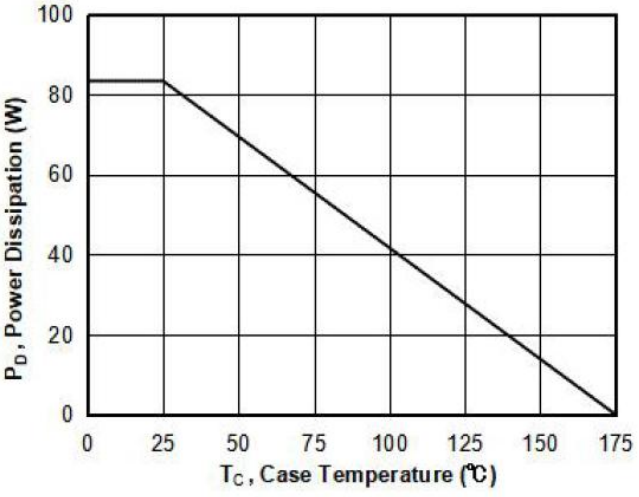


Fig.10 Power Dissipation

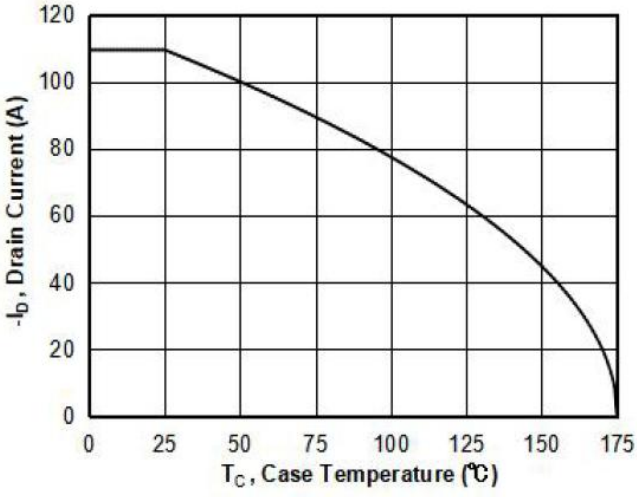


Fig.11 Drain Current