

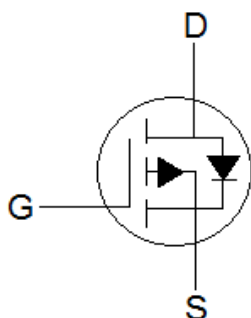
1. Features

- $R_{DS(ON)}=11.6m\Omega$ (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
KPD3606A	TO-252	KIA

4. Absolute maximum ratings

$T_A=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Rating	Unit
Drain-Source Breakdown Voltage	V_D	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current $V_{GS}@-10\text{V}$ ¹⁾	$T_C=25^{\circ}\text{C}$ I_D	-60	A
	$T_C=100^{\circ}\text{C}$ I_D	-35	A
Pulse Drain Current Tested ²⁾	I_{DM}	-170	A
Single Pulse Avalanche Energy ³⁾	EAS	330	mJ
Avalanche Current	I_{AS}	-40	A
Maximum Power Dissipation @ $T_C=25^{\circ}\text{C}$ ⁴⁾	P_D	90	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$

5. Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient ¹⁾	$R_{\theta JA}$	-	62	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case ¹⁾	$R_{\theta JC}$	-	1.4	$^{\circ}\text{C/W}$

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	-60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-48V, V _{GS} =0V	-	-	-1	uA
		V _{DS} =-48V, T _J =55°C	-	-	-5	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-18A	-	43	-	S
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-	-2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-	4.28	-	mV/°C
Drain-Source On-State Resistance ²⁾	R _{DS(ON)}	V _{GS} =-10V, I _D =-18A	-	11.6	14	mΩ
		V _{GS} =-4.5V, I _D =-12A	-	14	17	mΩ
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1MHz	-	2.6	-	Ω
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f=1MHz	-	4640	-	pF
Output Capacitance	C _{oss}		-	526	-	pF
Reverse Transfer Capacitance	C _{rss}		-	240	-	pF
Total Gate Charge	Q _g	V _{DS} =-30V I _D =-12A, V _{GS} =-10V	-	86	-	nC
Gate Source Charge	Q _{gs}		-	10	-	nC
Gate Drain Charge	Q _{gd}		-	32	-	nC
Turn-on Delay Time	t _{d(on)}	V _{DD} =-30V, I _D =-1A, R _G =6Ω, V _{GS} =-10V	-	20	-	nS
Turn-on Rise Time	t _r		-	15	-	nS
Turn-Off Delay Time	t _{d(off)}		-	100	-	nS
Turn-Off Fall Time	t _f		-	70	-	nS
Continuous Source Current ^{1),5)}	I _S	V _G =V _D =0V, Force Current	-	-	-40	A
Forward on voltage ²⁾	V _{SD}	I _S =-1A, V _{GS} =0V	-	-	-1.2	V

Notes:

1) The data tested by surface mounted on a 1 inch² 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}=-300V, V_{GS}=-10V, L=0.5mH, I_{AS}=-40A.

4) 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

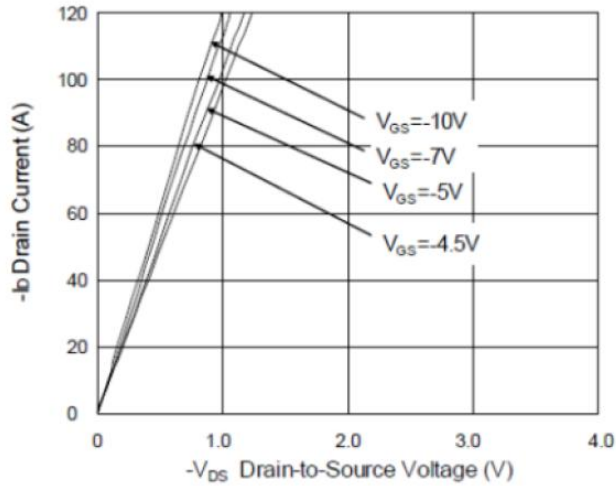


Fig.1 Typical Output Characteristics

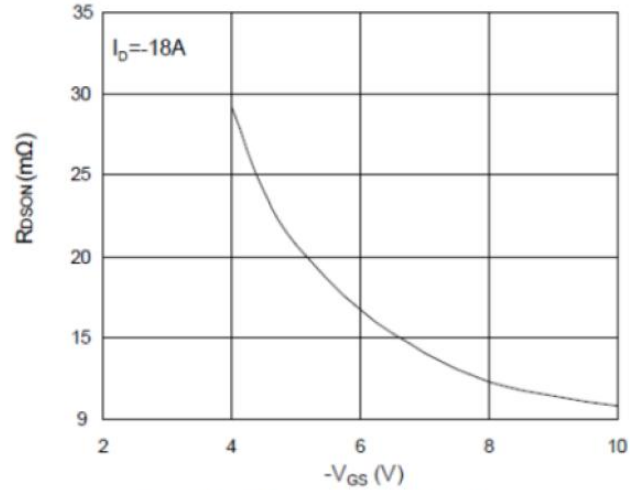


Fig.2 On-Resistance v.s Gate-Source

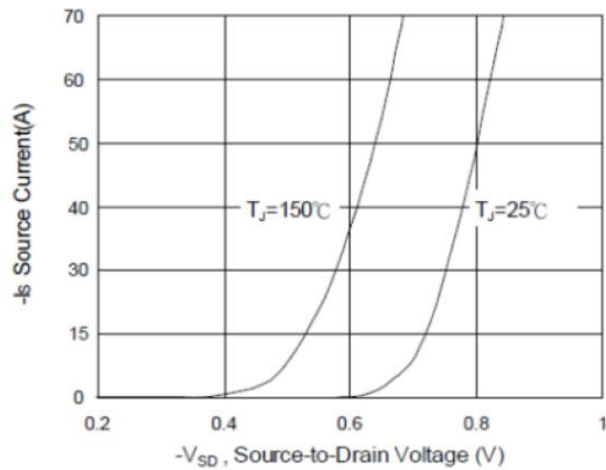


Fig.3 Source Drain Forward Characteristics

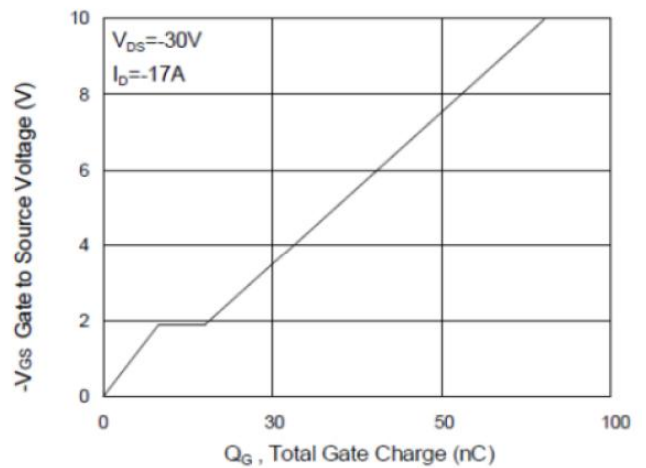


Fig.4 Gate-Charge Characteristics

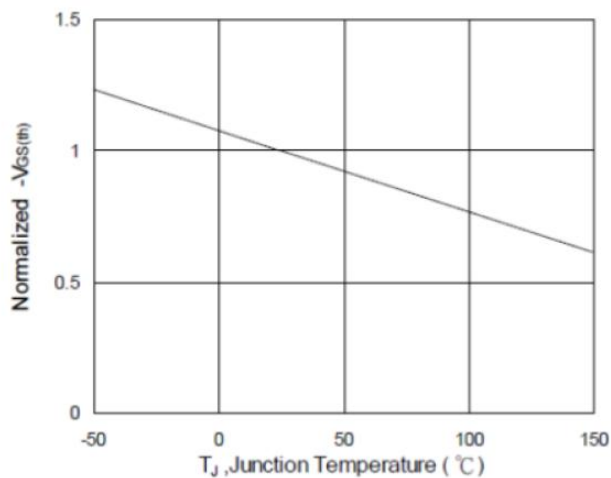


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

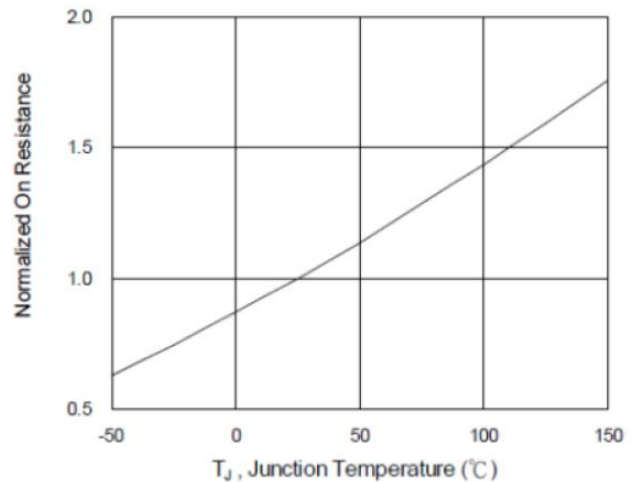


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

