

1. Features

- $R_{DS(ON)}=26m\Omega$ (typ.) @ $V_{GS}=-10V$
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

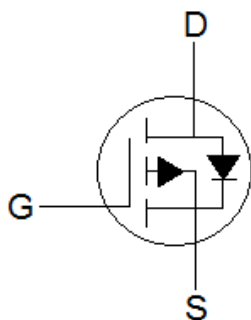
2. Application

- PWM Application
- Load Switch
- Power Management

3. Pin configuration



TO-252



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KPD8106A	TO-252	KIA

5. Absolute maximum ratings

T _C =25°C unless otherwise specified				
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DSS}	-60	V
Gate-Source Voltage		V _{GS}	±20	V
Drain Current* ¹⁾	T _C =25°C	I _D	-30	A
	T _C =100°C	I _D	-20	A
Pulse Drain Current Tested ¹⁾		I _{DM}	-120	A
Single Pulse Avalanche Energy ²⁾		EAS	196	mJ
Maximum Power Dissipation @ T _C =25°C		P _D	57	W
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T _L	300	°C

*Drain current limited by maximum junction temperature.

6. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Case	R _{θJC}	2.2	°C/W

7. Electrical characteristics

(T_C=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} =-60V, V _{GS} =0V	-	-	-1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.7	-2.5	V
Drain-Source On-State Resistance ²⁾	R _{DS(ON)}	V _{GS} =-10V, I _D =-20A	-	26	31	mΩ
		V _{GS} =-4.5V, I _D =-20A	-	29	35	mΩ
Gate Resistance	R _G	f=1MHz	-	6	-	Ω
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f=1MHz	-	3060	-	pF
Output Capacitance	C _{oss}		-	180	-	pF
Reverse Transfer Capacitance	C _{rss}		-	150	-	pF
Total Gate Charge	Q _g	V _{DS} =-20V I _D =-10A, V _{GS} =-10V	-	40	-	nC
Gate Source Charge	Q _{gs}		-	8	-	nC
Gate Drain Charge	Q _{gd}		-	5	-	nC
Turn-on Delay Time	t _{d(on)}	V _{GS} =-15V, I _D =-1A, R _G =3.3Ω, V _{GS} =-10V, T _J =25°C	-	40	-	nS
Turn-on Rise Time	t _r		-	25	-	nS
Turn-Off Delay Time	t _{d(off)}		-	75	-	nS
Turn-Off Fall Time	t _f		-	6	-	nS
Maximum Continuous Drain-Source Diode Forward Current	I _S	—	-	-	-30	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	—	-	-	-120	A
Drain to Source Diode Forward Voltage	V _{SD}	I _S =-10A, V _{GS} =0V T _J =25°C	-	-	-1.2	V

Notes:

- 1) Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2) EAS condition: T_J=25°C, V_{DD}=-20V, V_G=-10V, L=0.5mH.
- 3) These curves are based on the junction-to-case thermal impedance R_{θJC}, assuming maximum junction temperature is 150°C. These curves provide a single pulse rating.

8. Typical Characteristics

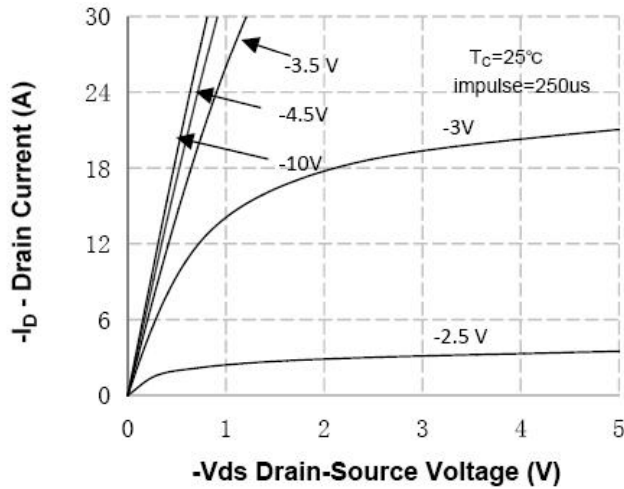


Figure 1. On-Region Characteristics

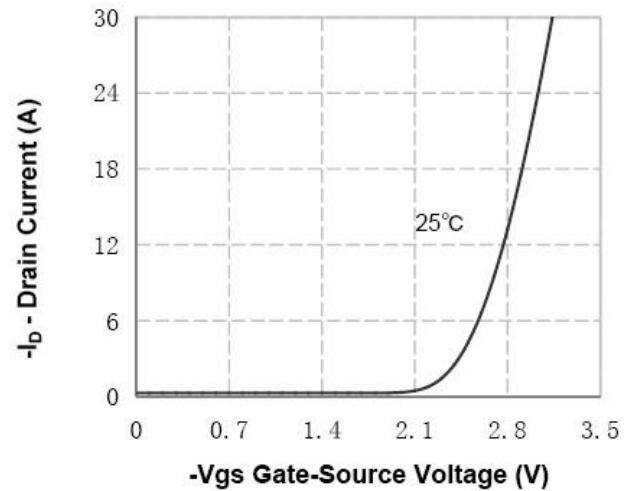


Figure 2. Transfer Characteristics

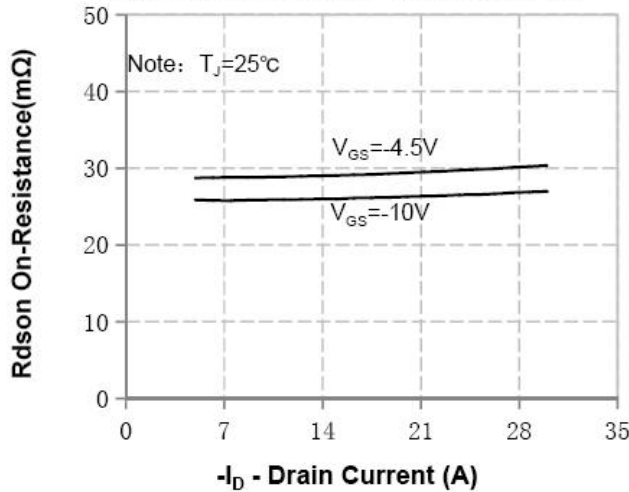


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

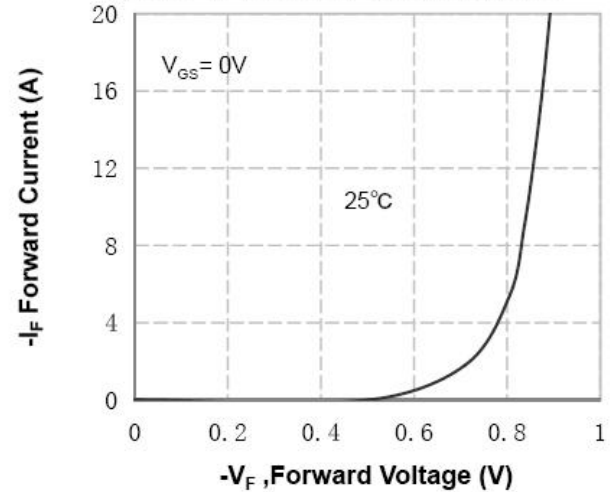


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

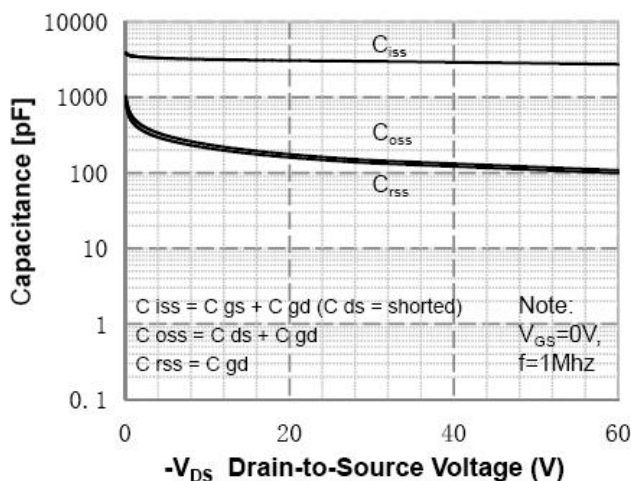


Figure 5. Capacitance Characteristics

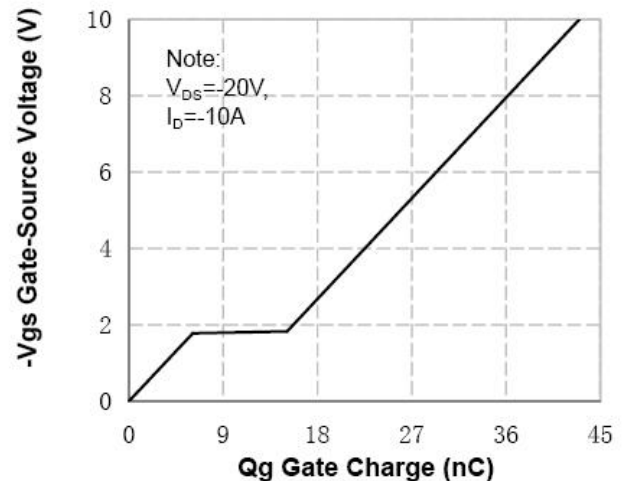


Figure 6. Gate Charge Characteristics

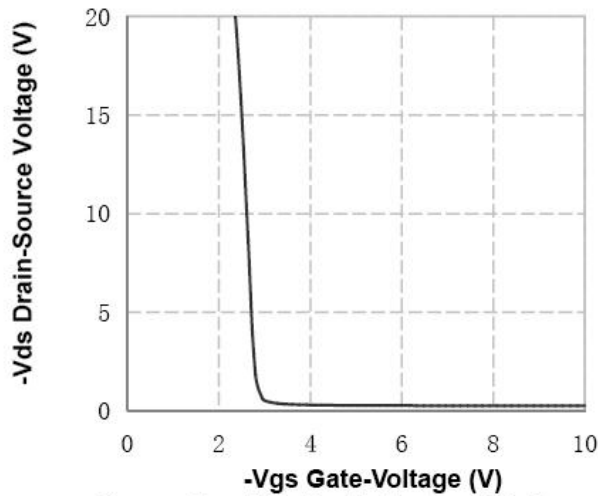


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

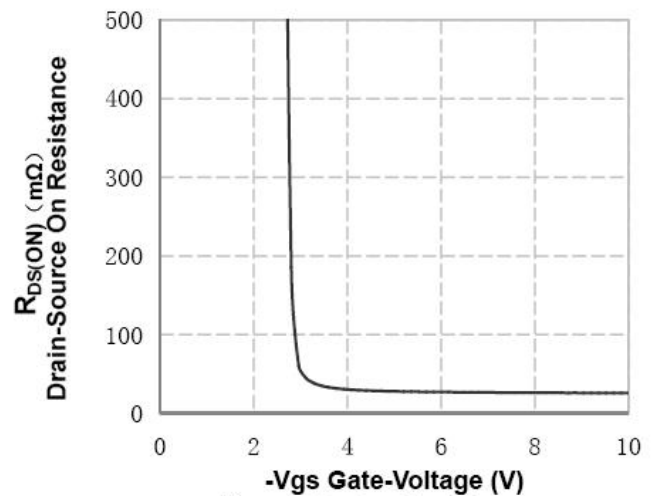


Figure 8. On-Resistance vs Gate Voltage

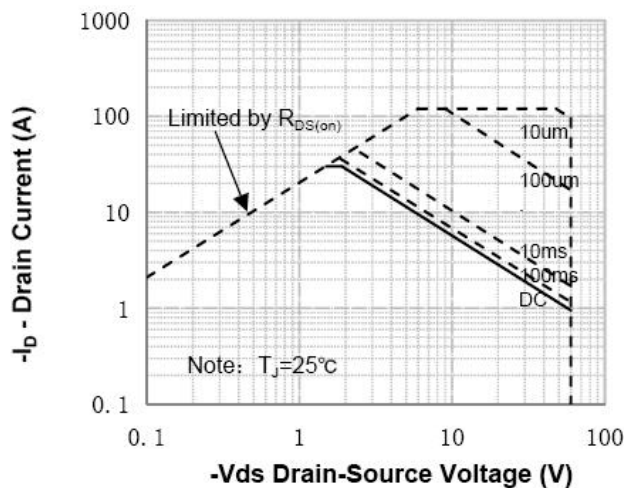


Figure 9. Maximum Safe Operating Area

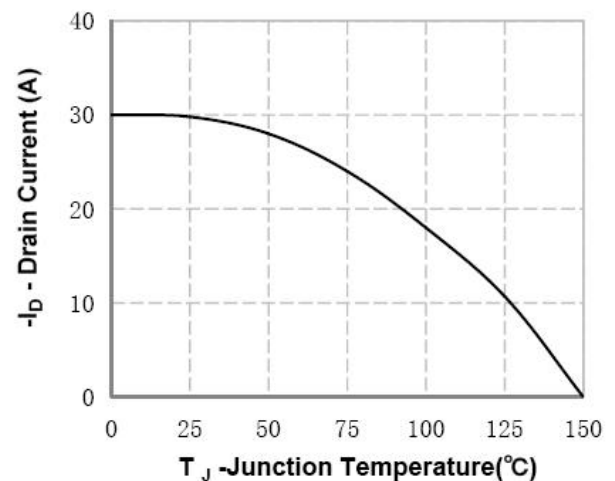


Figure 10. Maximum Continuous Drain Current vs Temperature

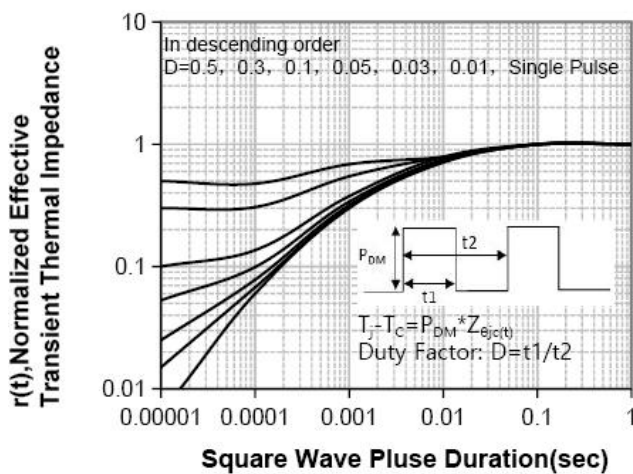
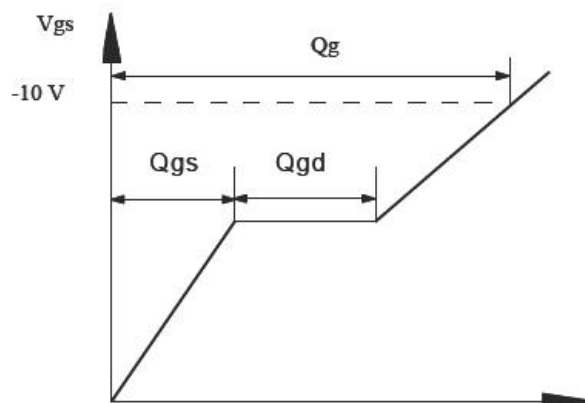
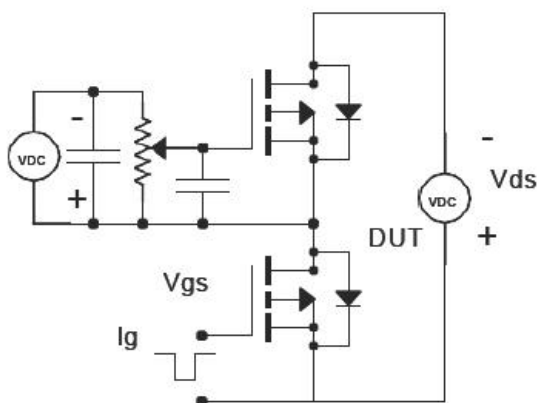


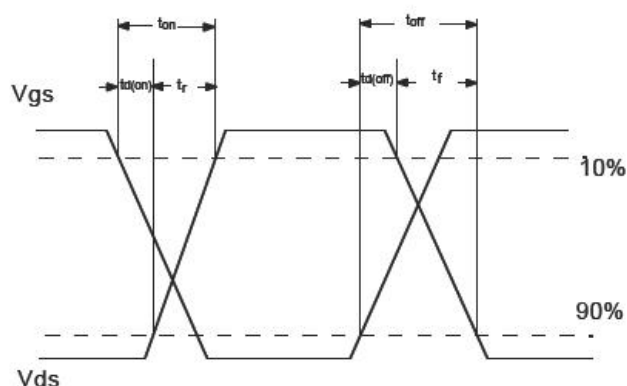
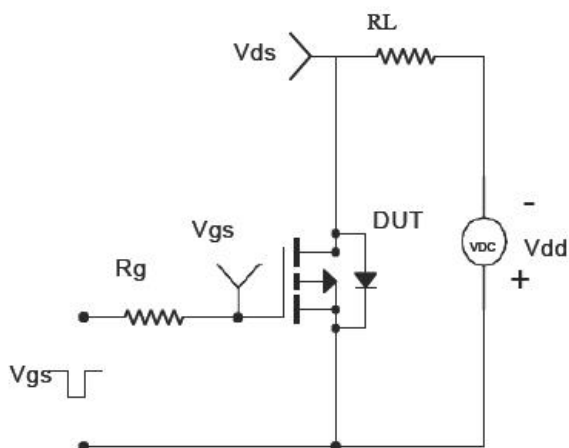
Figure 11. Transient Thermal Response Curve

9. Test Circuits and Waveforms

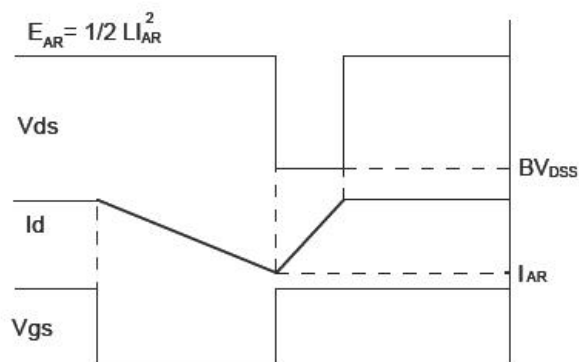
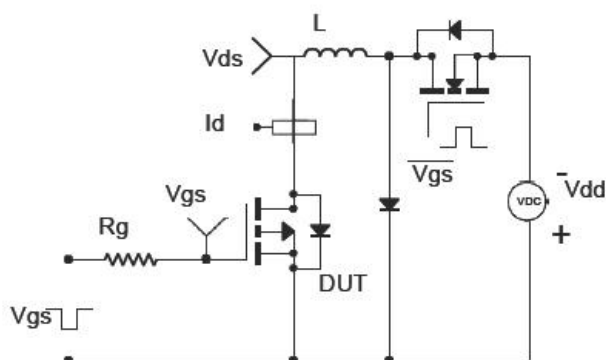
Gate Charge Test Circuit & Waveform



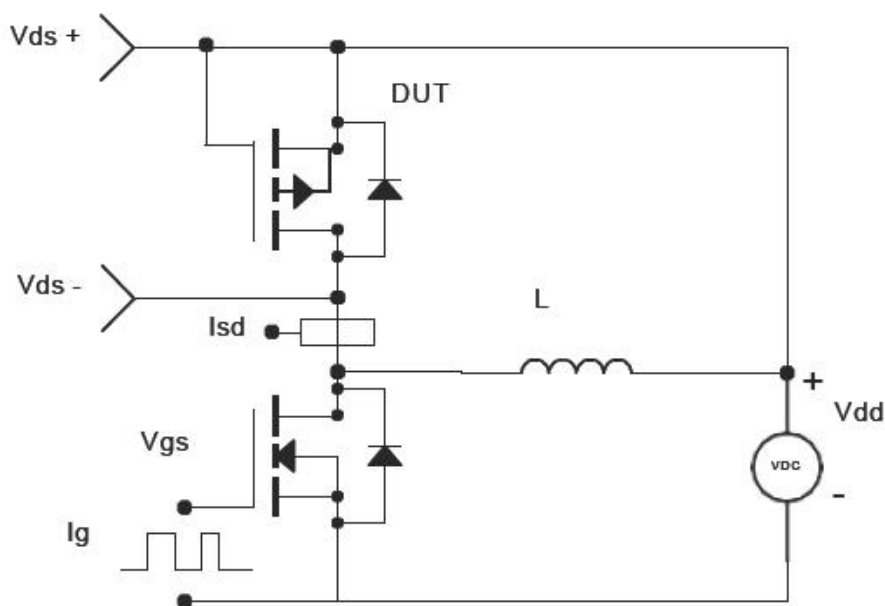
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms



- dv/dt controlled by R_G
- I_{SD} controlled by pulse period

