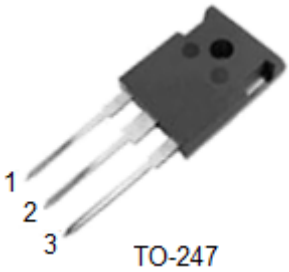
1. Product Features

- $R_{DS(ON),typ.}$=2.8Ω@V_{GS}=10V
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

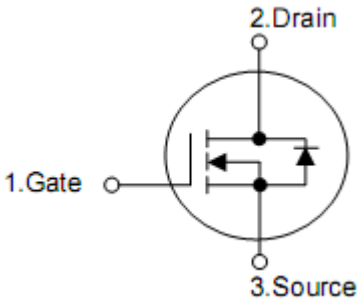
2. Applications

- Adaptor
- Charger
- SMPS Standby Power

3. Pin configuration



TO-247



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNM48150A	TO-247	KIA

5. Absolute maximum ratings

(T_C= 25ºC , unless otherwise specified)

Parameter		Symbol		Unit
Drain-to-Source Voltage [1)]		V_{DSS}	1500	V
Gate-to-Source Voltage		V_{GSS}	±30	
Continuous Drain Current		I_D	9	A
Pulsed Drain Current at V_{GS}=10V		I_{DM}	36	
Single Pulse Avalanche Energy		E_{AS}	450	mJ
Maximum Power Dissipation	T_C=25°C	P_D	320	W
	Derate above 25°C		2.56	W/ºC
Soldering Temperature Distance of 1.6mm from case for 10 seconds		T_L	300	ºC
Storage Temperature Range		T_J&T_{STG}	-55 to 150	

Caution: Stresses greater than those listed in the ‘‘Absolute Maximum Ratings’’ may cause permanent damage to the device.

6. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.39	ºC/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	55	ºC/W

7. Electrical characteristics

(T_J=25°C,unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_D=250uA	1500	-	-	V
Drain-source leakage current	I_{DSS}	V_{DS}=1500V, V_{GS}=0V	-	-	1	uA
		V_{DS}=1200V, T_C=125°C	-	-	500	uA
Gate-source forward leakage	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
Drain-source on-resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=5.4A	-	2.8	4	Ω
Gate threshold voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	2.5	-	4.5	V
Gate Resistance	R_g	f=1 MHz Gate DC Bias=0,Test signal level=20mVopen drain	-	1.17	-	Ω
Input capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V f=1MHz	-	3385	-	pF
Reverse transfer capacitance	C_{rss}		-	54.6	-	pF
Output capacitance	C_{oss}		-	176	-	pF
Total gate charge(10V)	Q_g	V_{DD}=750V, I_D=9A V_{GS}=0~10V	-	68	-	nC
Gate-source charge	Q_{gs}		-	21	-	nC
Gate-drain charge	Q_{gd}		-	25	-	nC
Turn-on delay time	$t_{d(on)}$	V_{DD}=750V,V_{GS}=10V, R_G=25Ω, I_D=9A	-	65	-	ns
Rise time	t_r		-	186	-	ns
Turn-off delay time	$t_{d(off)}$		-	82	-	ns
Fall time	t_f		-	114	-	ns
Continuous Source Current [2)]	I_{SD}	Integral PN-diode in MOSFET	-	-	9	A
Pulsed Source Current [2)]	I_{SM}		-	-	36	A
Diode forward voltage	V_{SD}	I_S=9A,V_{GS}=0V,	-	-	1.3	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_F=9A, dI_F/dt=100A/μs	-	461	-	nS
Reverse Recovery Charge	Q_{rr}		-	3.36	-	nC

Note:

1) T_J=+25°C to +150℃

2) Pulse width≤380us; duty cycle≤2%.

8. Test circuits and waveforms

Figure 1.Safe operating area

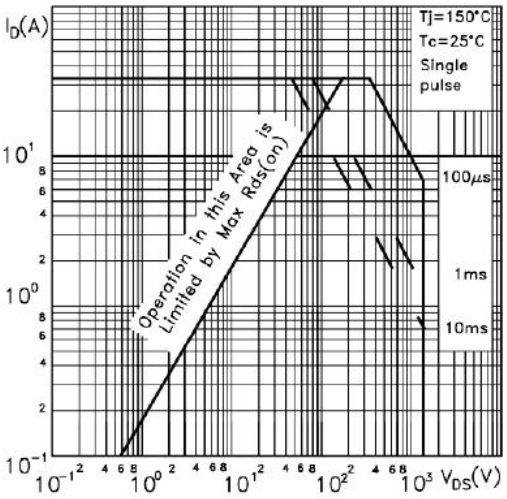


Figure 2.Thermal impedance

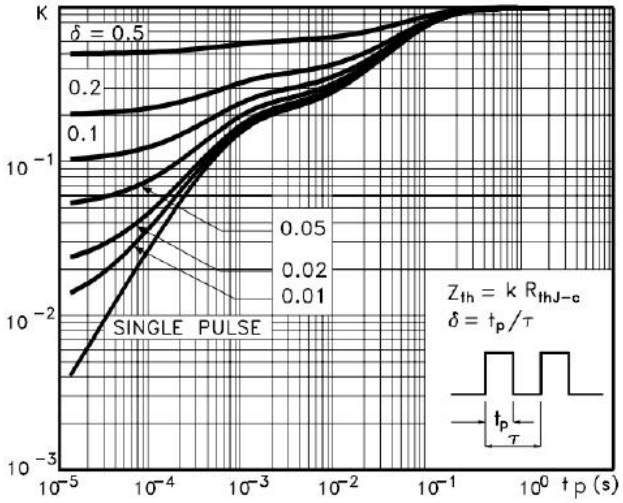


Figure 3.Output characteristics

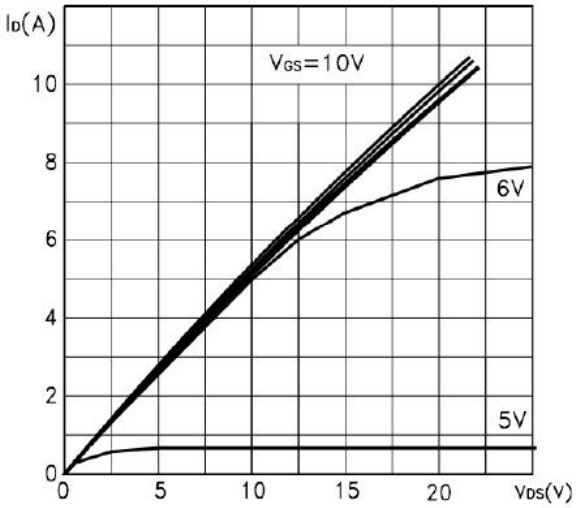


Figure 4.Transfer characteristics

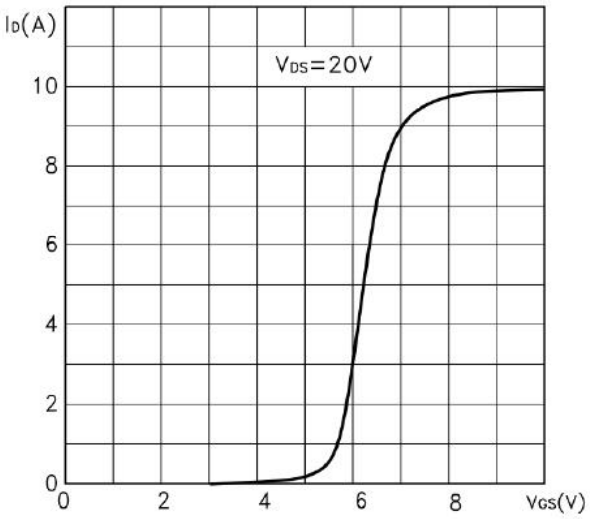


Figure 5.Normalized BV_{DSS} vs temperature

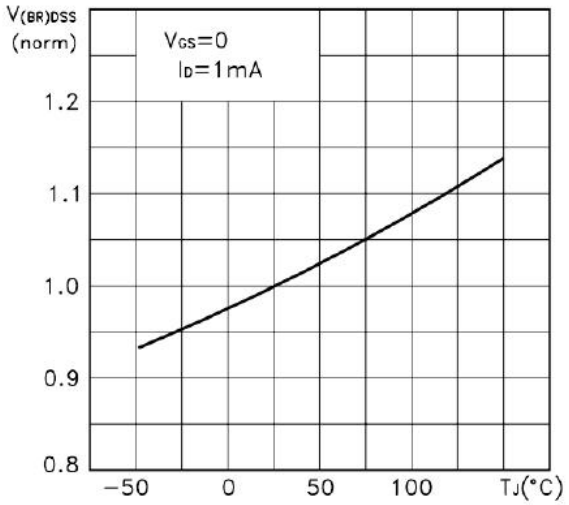


Figure 6.Static drain-source on resistance

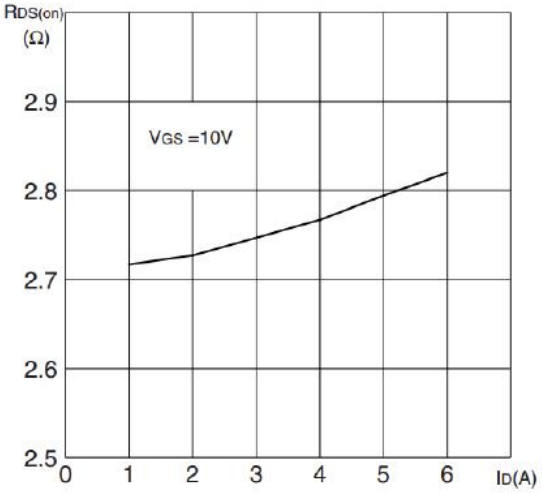


Figure 7.Gate charge vs gate-source voltage

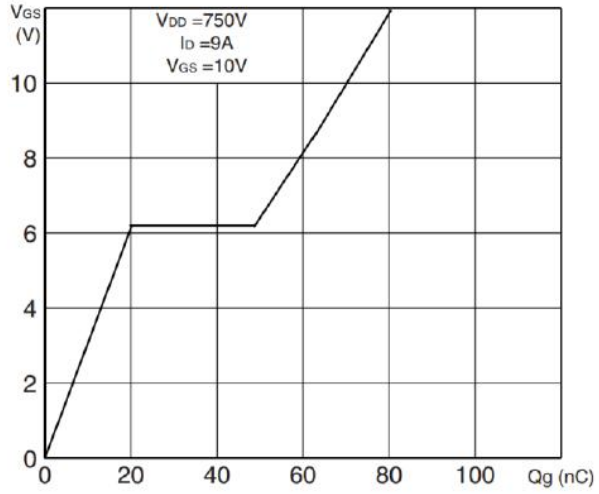


Figure 8.Capacitance variations

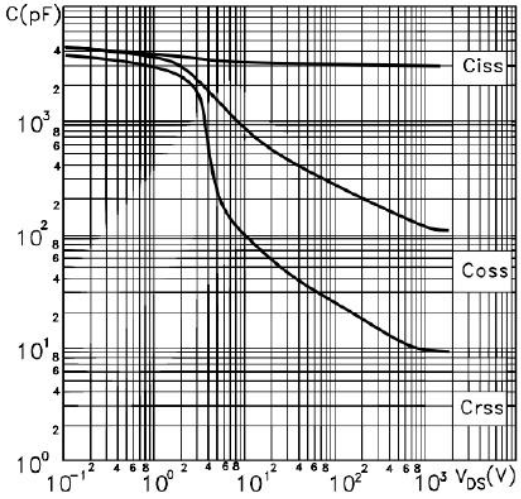


Figure 9.Normalized gate threshold voltage vs temperature

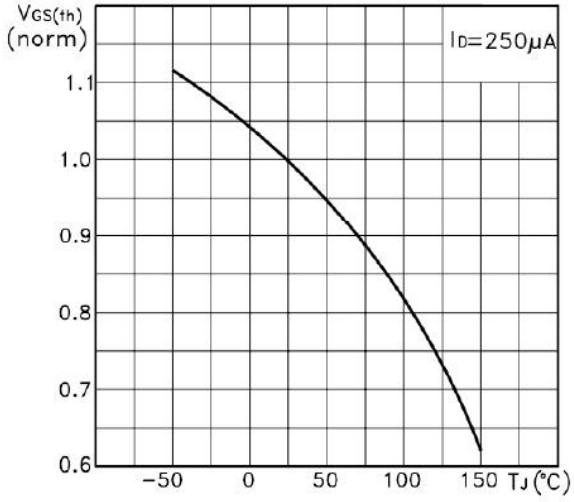


Figure 10.Normalized on resistance vs temperature

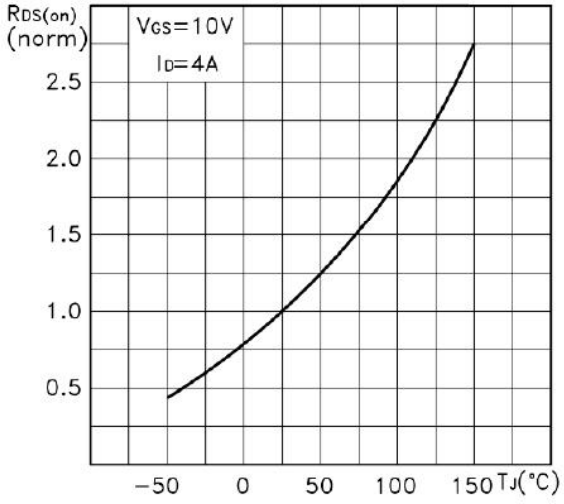
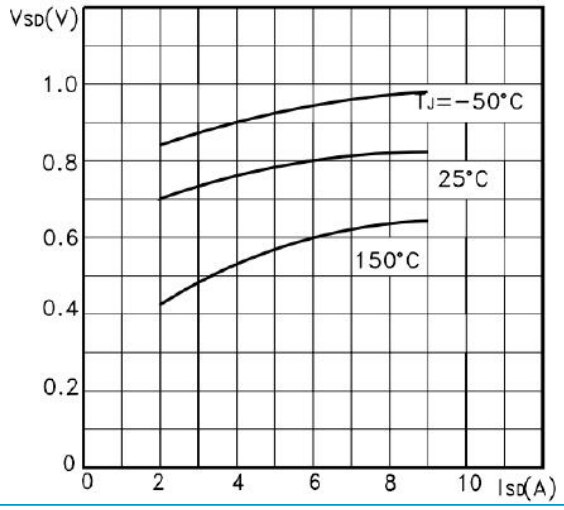


Figure 11.Source-drain diode forward characteristics



9. Test Circuits and Waveform

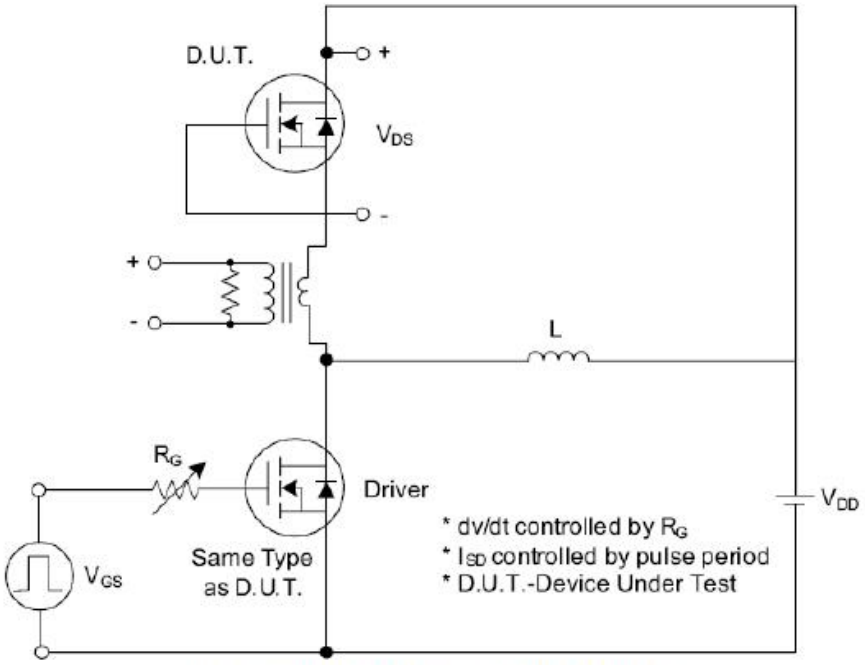


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

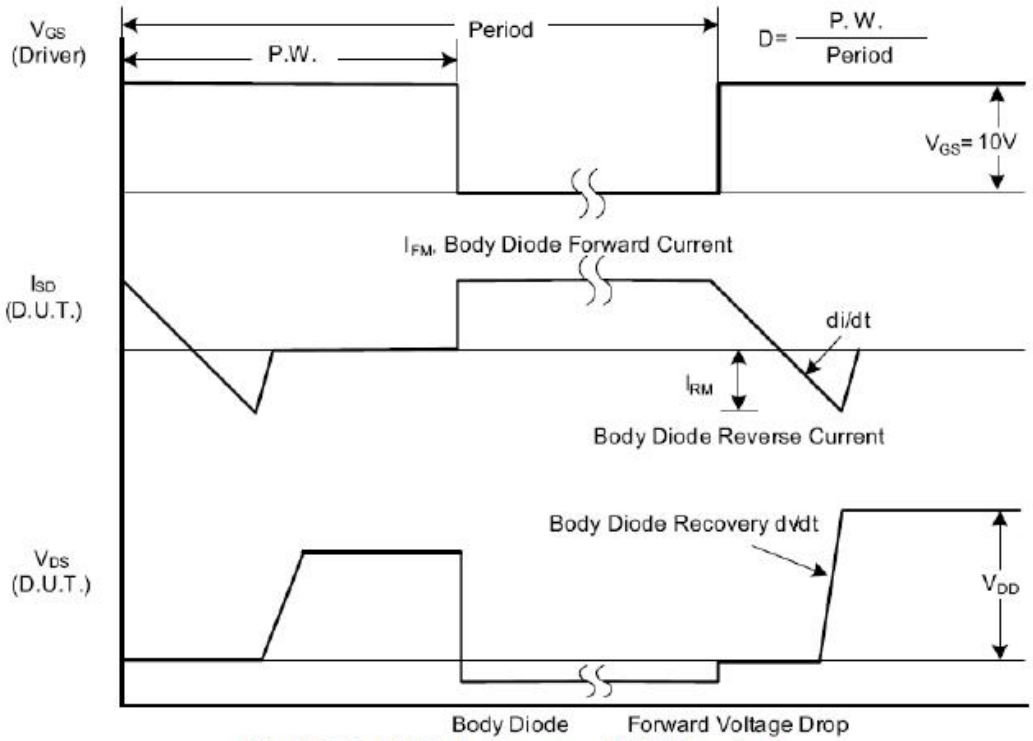


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

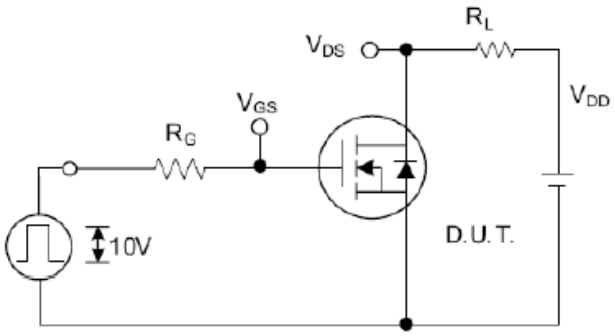


Fig. 2.1 Switching Test Circuit

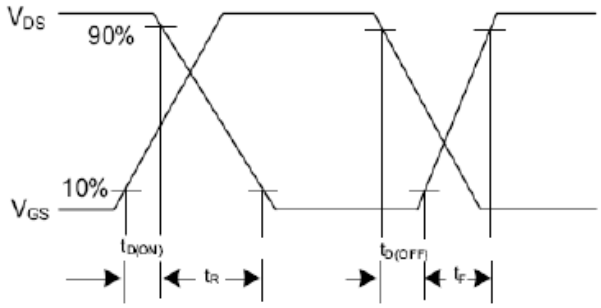


Fig. 2.2 Switching Waveforms

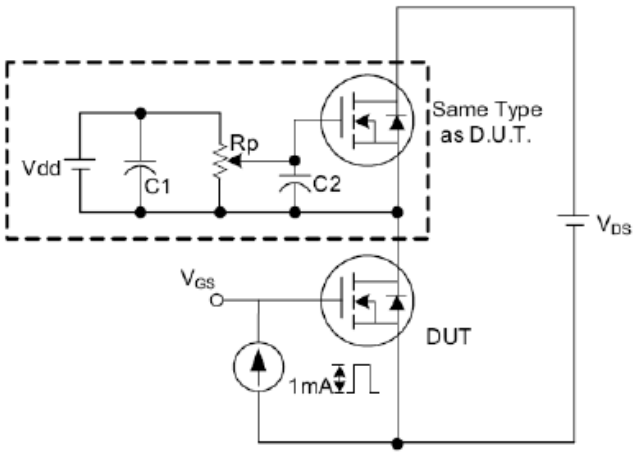


Fig. 3 . 1 Gate Charge Test Circuit

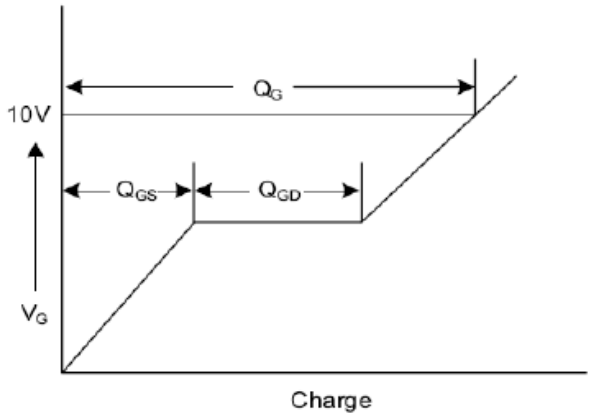


Fig. 3 . 2 Gate Charge Waveform

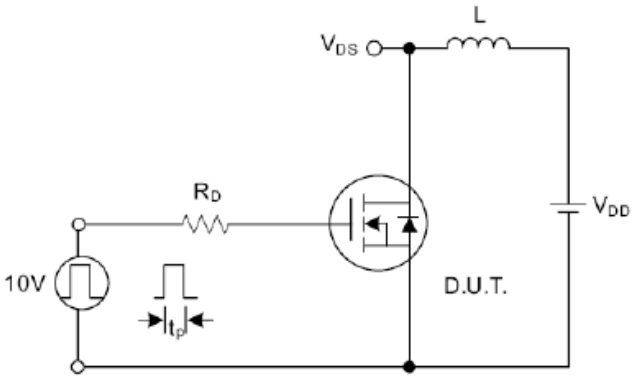


Fig. 4.1 Unclamped Inductive Switching Test Circuit

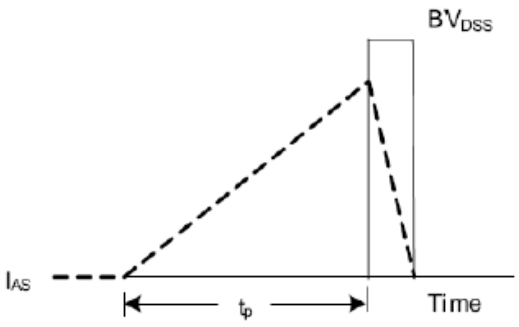


Fig. 4.2 Unclamped Inductive Switching Waveforms