

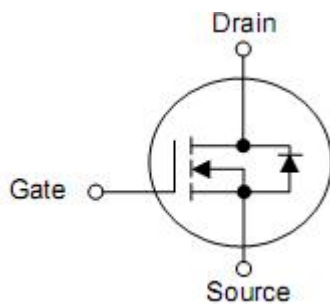
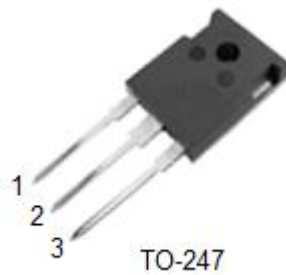
1. Features

- n Fast Switching
- n $R_{DS(ON)}=0.85\Omega(\text{typ.})@V_{GS}=10V$
- n Low Gate Charge Minimize Switching Loss
- n Fast Recovery Body Diode

2. Applications

- n DC-DC converters
- n DC choppers
- n AC motor control

3. Symbol



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNM64100A	TO-247	KIA

5. Absolute maximum ratings

$T_C=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Rating	Units	
Drain-source voltage	V_{DSS}	1000	V	
Gate-to-Source Voltage	V_{GSS}	± 30	V	
Continuous drain current	$T_C=25^{\circ}\text{C}$	I_D	13	A
	$T_C=100^{\circ}\text{C}$	I_D	8.2	A
Pulsed Drain Current at $V_{GS}=10\text{V}^2$	I_{DM}	52	A	
Single pulse avalanche energy ($L=0.5\text{mH}$)	E_{AS}	1000	mJ	
Peak Diode Recovery dv/dt	dv/dt	5.0	V/ns	
Power dissipation	P_D	312	W	
Derate above 25°C		2.5	$\text{W}/^{\circ}\text{C}$	
Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	T_L T_{PAK}	300 260	$^{\circ}\text{C}$	
Operating junction and storage temperature range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$	

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-case	$R_{\theta JC}$	0.4	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^{\circ}\text{C}/\text{W}$

7. Electrical characteristics

(T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	1000	-	-	V
Drain-source leakage current	I _{DSS}	V _{DS} =1000V, V _{GS} =0V	-	-	10	uA
		V _{DS} =800V, T _C =125°C			250	
Gate-source forward leakage	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Drain-source on-resistance ³⁾	R _{DS(on)}	V _{GS} =10V, I _D =6.5A	-	0.85	1.15	Ω
Gate threshold voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA	2.5	-	4.5	V
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1MHz	-	3865	-	pF
Reverse transfer capacitance	C _{rss}		-	104	-	pF
Output capacitance	C _{oss}		-	240	-	pF
Total gate charge	Q _g	V _{DD} =500V, I _D =13A V _{GS} =0~10V	-	82	-	nC
Gate-source charge	Q _{gs}		-	20	-	nC
Gate-drain charge	Q _{gd}		-	26	-	nC
Turn-on delay time	t _{d(on)}	V _{DD} =500V, V _{GS} =10V, R _G =4.7Ω, I _D =13A		30		ns
Rise time	t _r			65		ns
Turn-off delay time	t _{d(off)}			38		ns
Fall time	t _f			35		ns
Continuous Source Current ²⁾	I _{SD}	Integral PN-diode in MOSFET			13	A
Pulsed Source Current ²⁾	I _{SM}		-	-	52	
Diode forward voltage	V _{SD}	I _S =13A, V _{GS} =0V,	-	-	1.5	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _F =13A, dI _F /dt=100A/μs	-	591	-	nS
Reverse Recovery Charge	Q _{rr}		-	5.4	-	uC

Note:

1) T_J=+25°C to +150°C.

2) Repetitive rating; pulse width limited by maximum junction temperature.

3) Pulse width ≤ 380us; duty cycle ≤ 2%.

8. Typical operating characteristics

Fig. 1 Output Characteristics

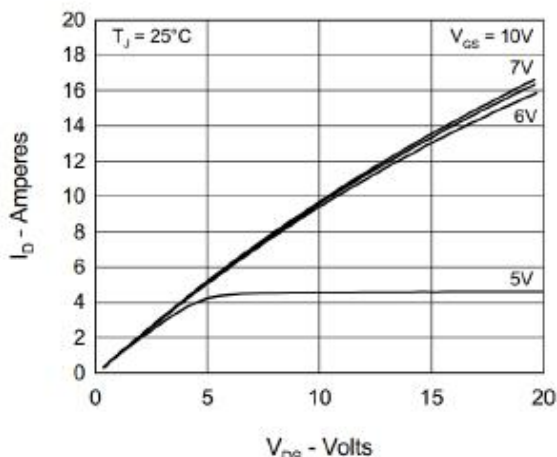


Fig. 2 Input Admittance

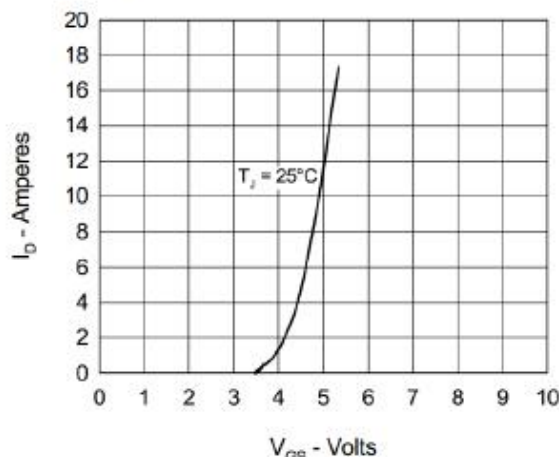


Fig. 3 $R_{DS(on)}$ vs. Drain Current

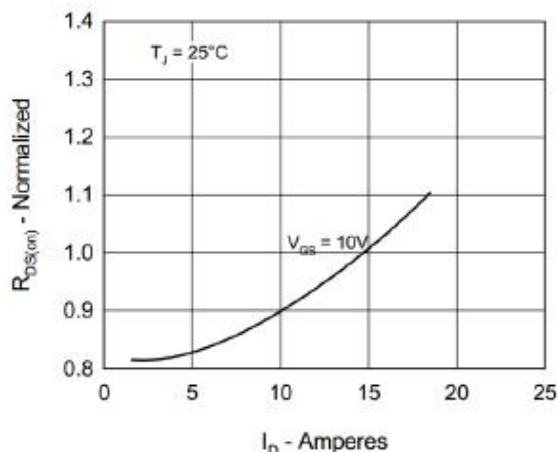


Fig. 4 Temperature Dependence of Drain to Source Resistance

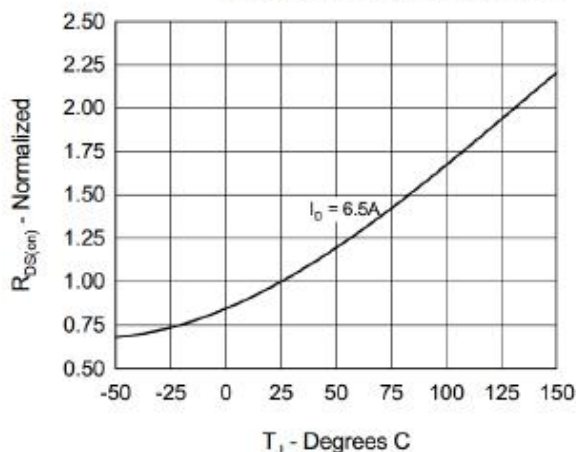


Fig. 5 Drain Current vs. Case Temperature

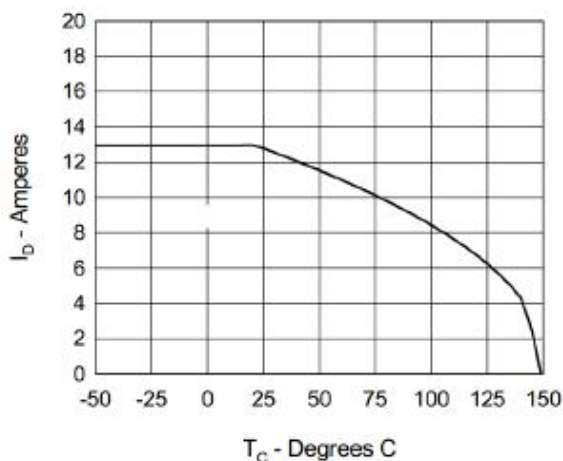


Fig.6 Gate Charge Characteristic Curve

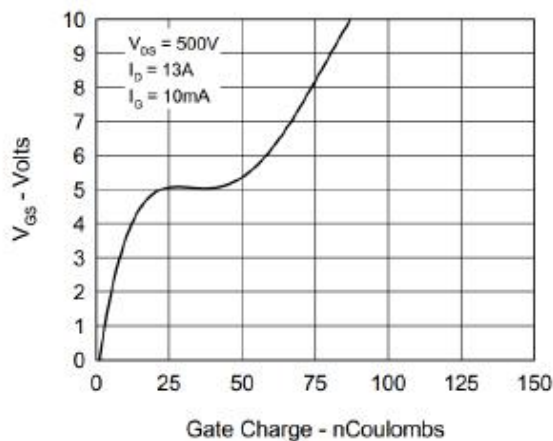


Fig.7 Capacitance Curves

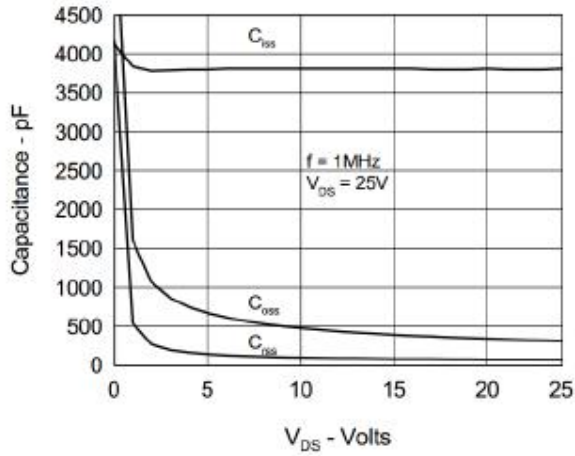


Fig.8 Source Current vs. Source to Drain Voltage

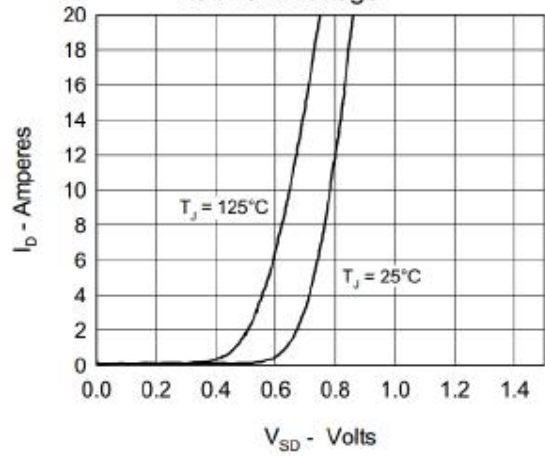
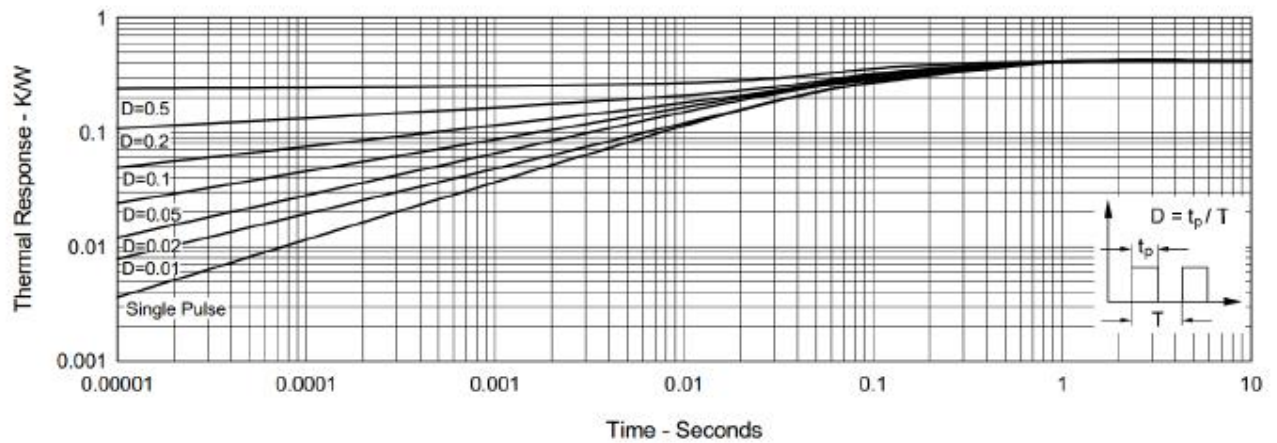


Fig.9 Transient Thermal Impedance



9. Test Circuits and Waveforms

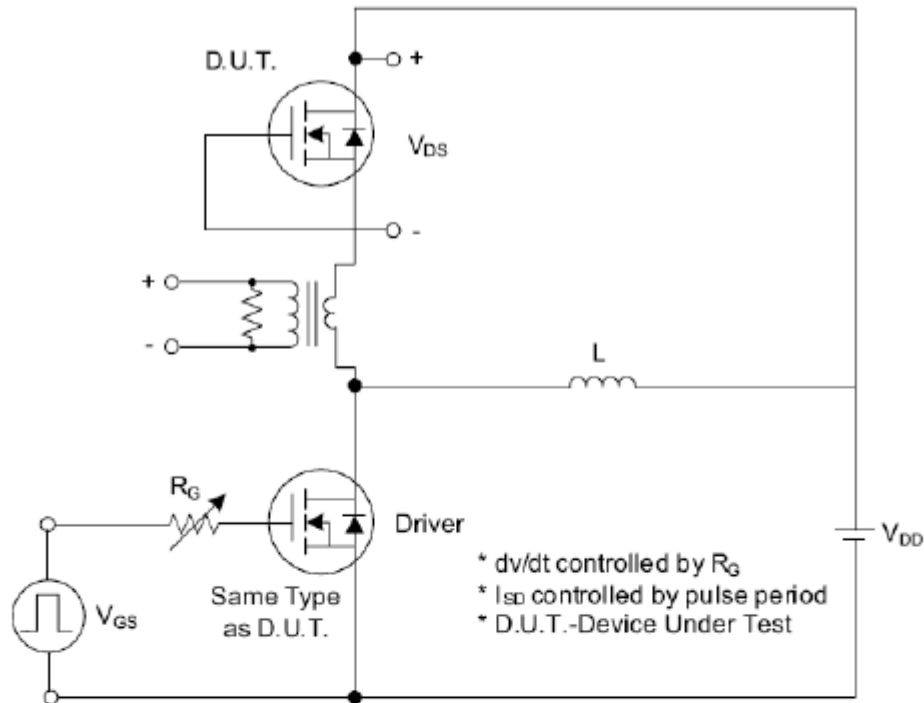


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

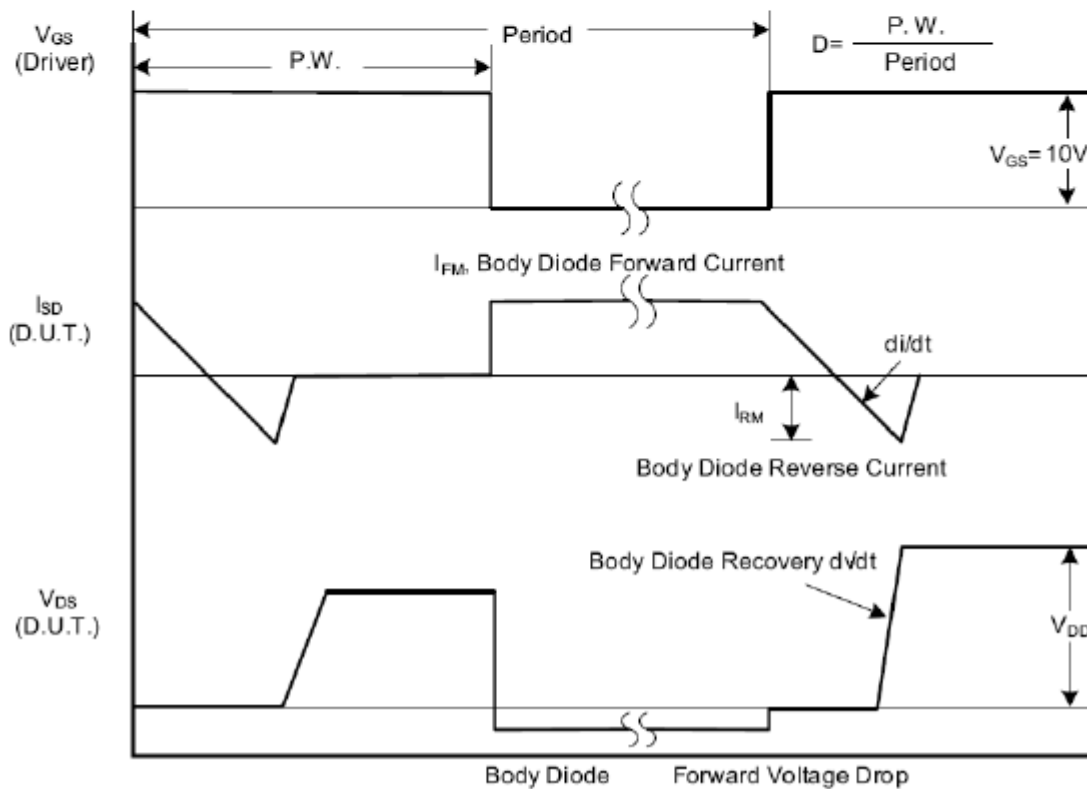


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

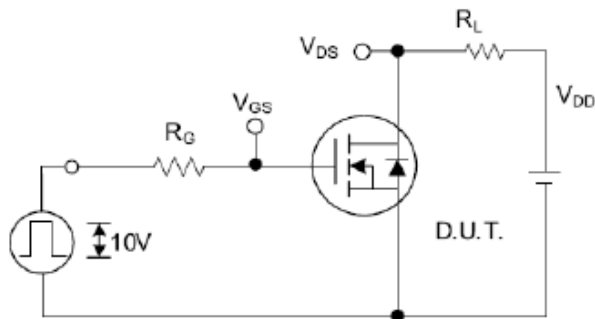


Fig. 2.1 Switching Test Circuit

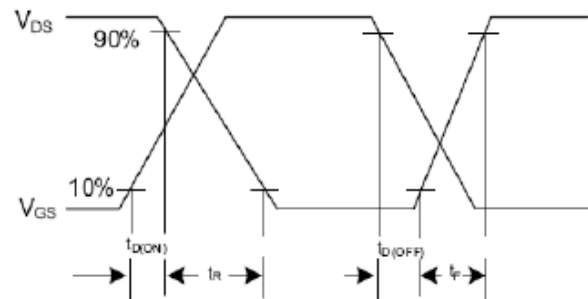


Fig. 2.2 Switching Waveforms

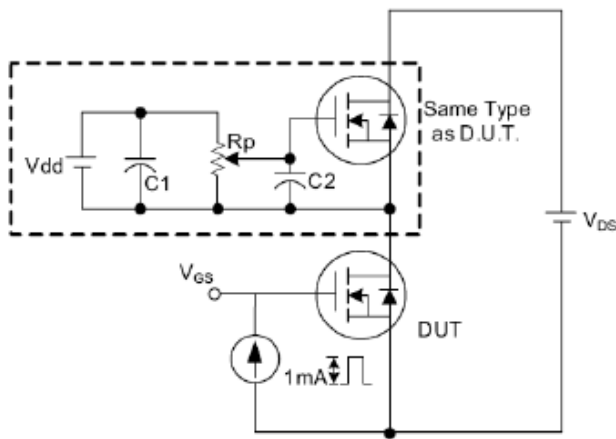


Fig. 3.1 Gate Charge Test Circuit

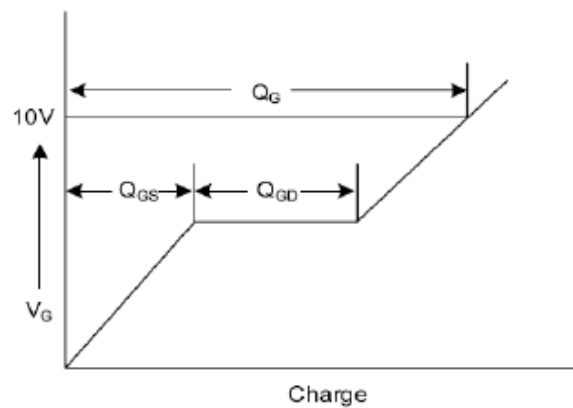


Fig. 3.2 Gate Charge Waveform

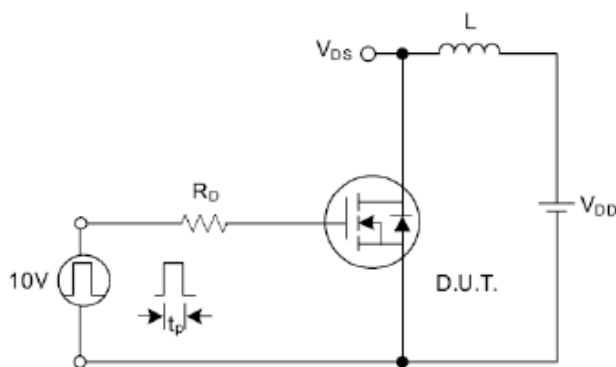


Fig. 4.1 Unclamped Inductive Switching Test Circuit

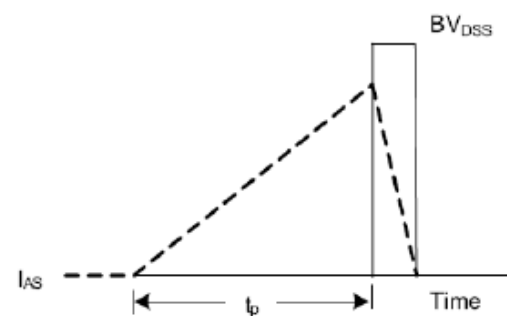


Fig. 4.2 Unclamped Inductive Switching Waveforms