

1. Features

- $R_{DS(ON)}=12m\Omega(typ.)@V_{GS}=10V$
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

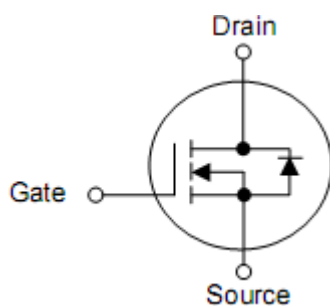
2. Applications

- PWM Application
- Power Management
- Load switch

3. Symbol



SOT-89



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNS8104A	SOT-89	KIA

5. Absolute maximum ratings

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

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	40	V
Continuous drain current	$T_C=25^{\circ}\text{C}$	I_D	30	A
	$T_C=100^{\circ}\text{C}$	I_D	19	A
Pulsed drain current	-Pulsed ¹⁾	I_{DM}	120	A
Gate-source voltage		V_{GS}	± 20	V
Single pulse avalanche energy ²⁾		E_{AS}	25	mJ
Power dissipation ($T_C=25^{\circ}\text{C}$)		P_D	48	W
Operating junction and storage temperature range		T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	$^{\circ}\text{C}$

*Drain current limited by maximum junction temperature.

6. Electrical characteristics

(T_C=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	40	-	-	V
Drain-source leakage current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	-	-	1	uA
Gate-source forward leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Gate threshold voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D =250uA	1.0	1.5	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	12	16	mΩ
		V _{GS} =4.5V, I _D =10A	-	16.5	24	mΩ
Gate Resistance	R _G	f=1MHz	-	4	-	Ω
Input capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V f=1MHz	-	850	-	pF
Output capacitance	C _{oss}		-	70	-	pF
Reverse transfer capacitance	C _{rss}		-	62	-	pF
Turn-on delay time	t _{d(on)}	V _{GS} =10V, V _{DS} =30V, R _G =4.7Ω, I _D =30A ³⁾	-	4	-	ns
Rise time	t _r		-	8	-	ns
Turn-off delay time	t _{d(off)}		-	30	-	ns
Fall time	t _f		-	10	-	ns
Total gate charge(10V)	Q _g	V _{DS} =20V, I _D =30A V _{GS} =10V ³⁾	-	18	-	nC
Gate-source charge	Q _{gs}		-	2.5	-	nC
Gate-drain charge	Q _{gd}		-	5	-	nC
Maximum Continuous Drain-Source Diode Forward Current	I _S	—	-	-	30	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	—	-	-	120	A
Diode forward voltage	V _{SD}	I _{SD} =20A, V _{GS} =0V, T _J =25°C	-	-	1.2	V

Note:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25Ω
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

7. Typical operating characteristics

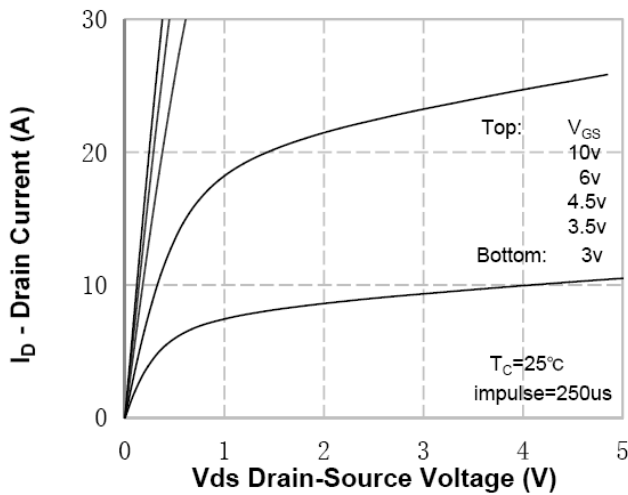


Figure 1. On-Region Characteristics

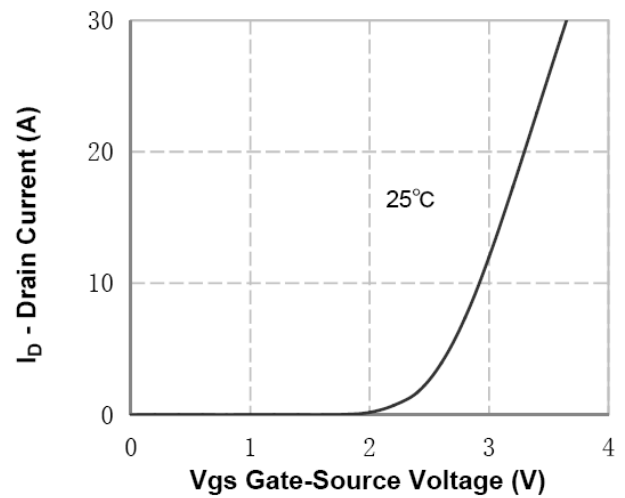


Figure 2. Transfer Characteristics

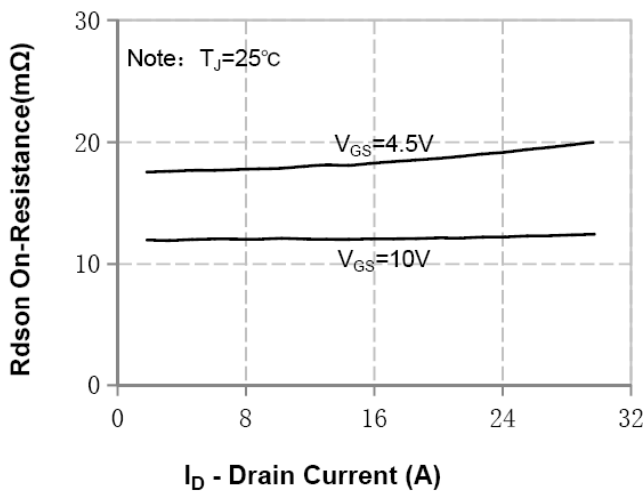


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

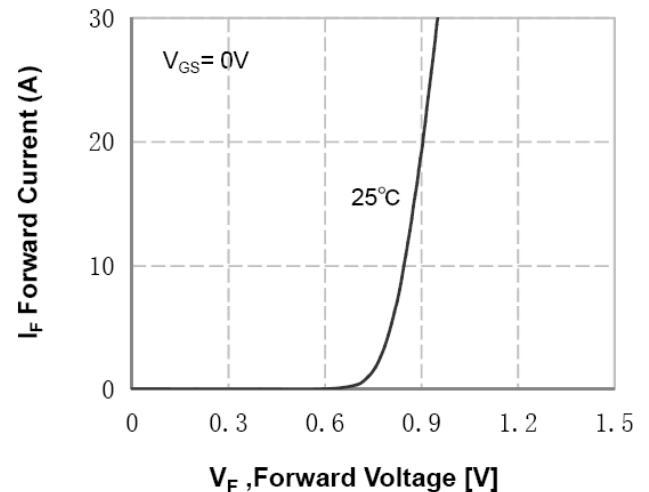


Figure 4. Body Diode Forward Voltage Variation with Source Current

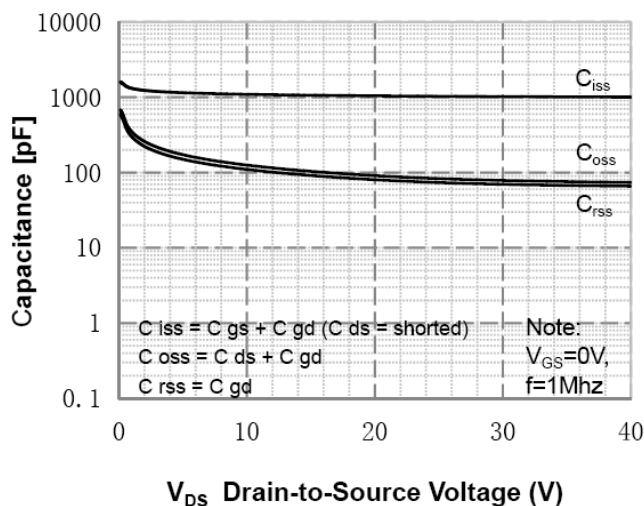


Figure 5. Capacitance Characteristics

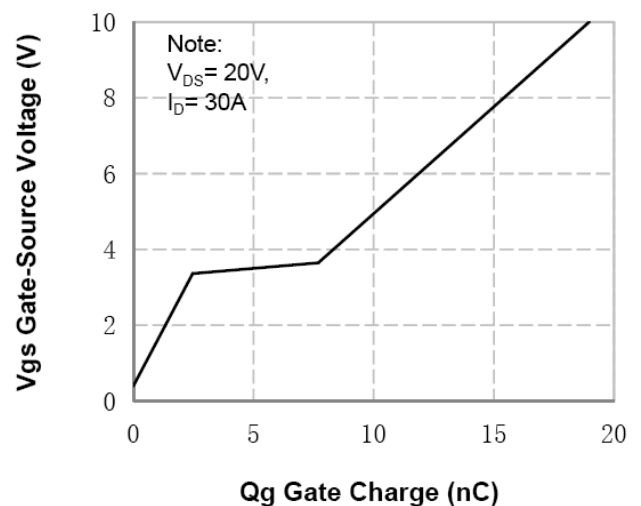


Figure 6. Gate Charge Characteristics

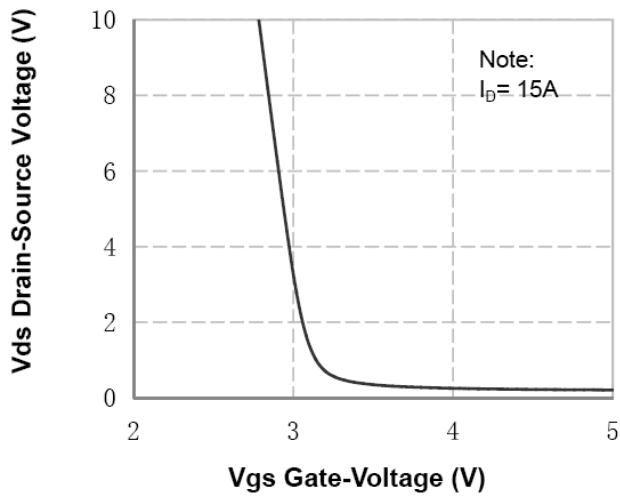


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

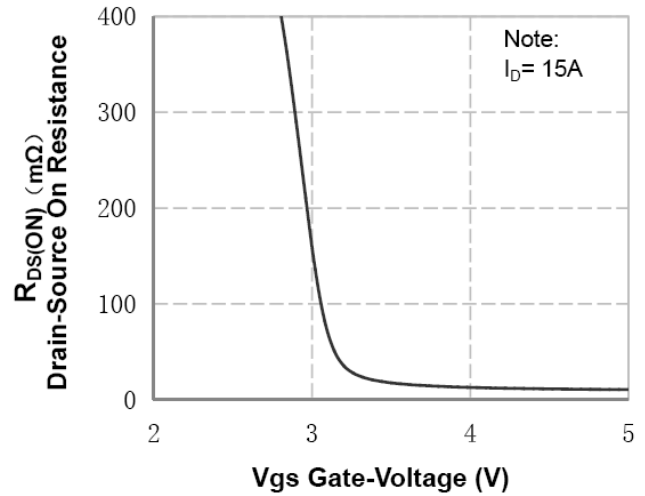


Figure 8. On-Resistance vs Gate Voltage

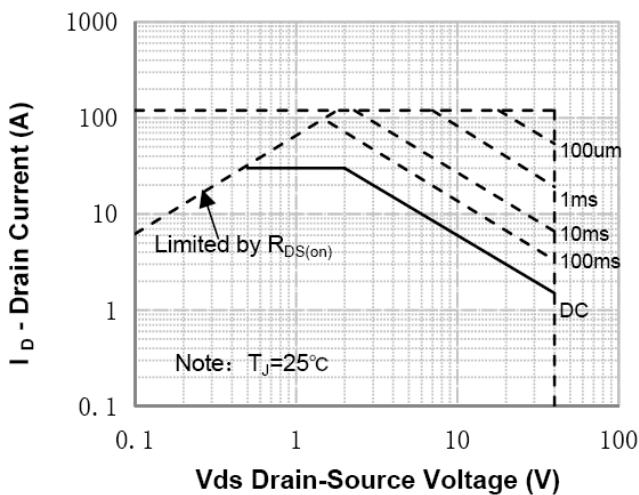


Figure 9. Maximum Safe Operating Area

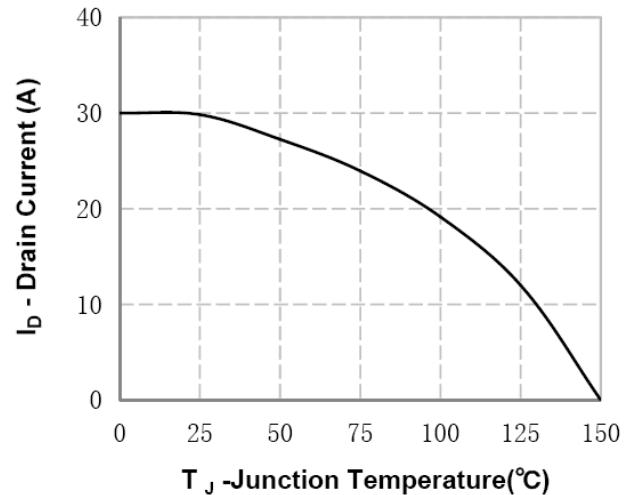
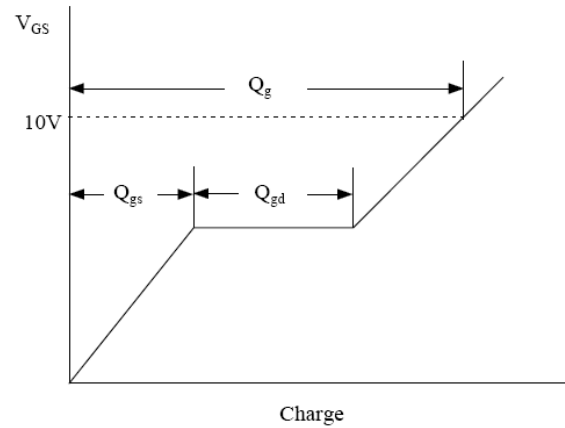
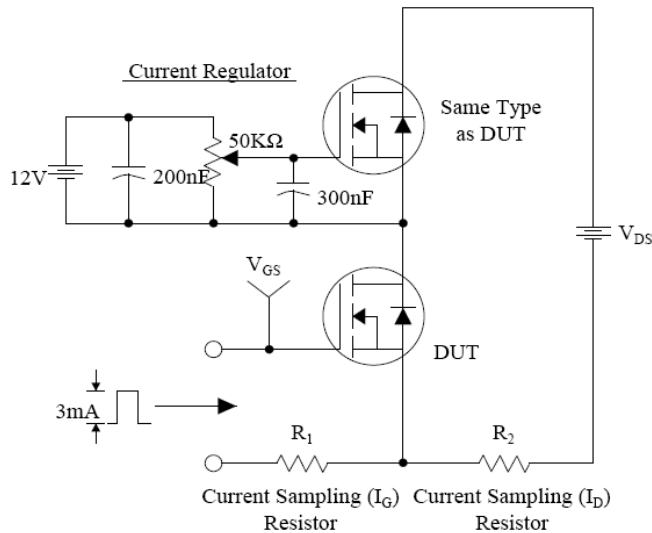


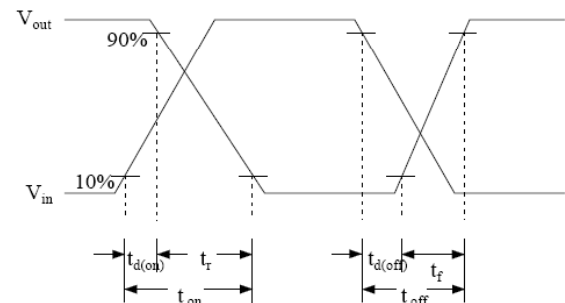
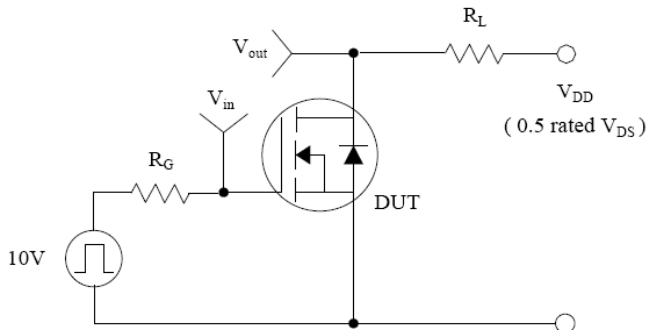
Figure 10. Maximum Continuous Drain Current vs Temperature

8. Test Circuits and Waveforms

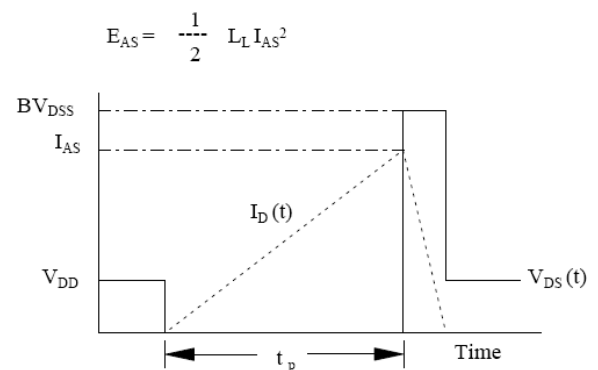
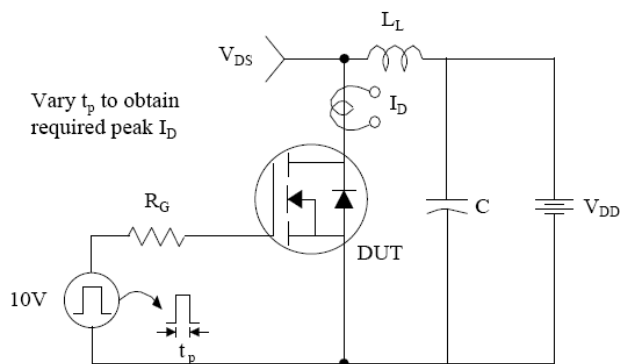
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms

