

1. Features

This Power MOSFET is produced using KIA advanced planar stripe TRENCH technology. This advanced technology has been especially tailored to minimize conduction loss, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

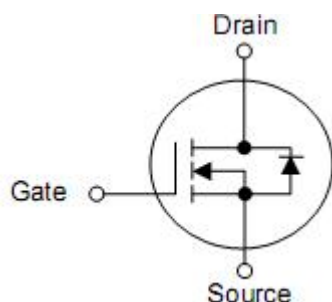
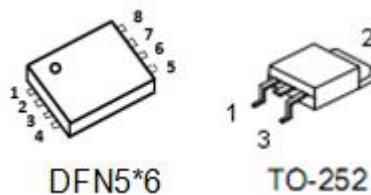
2. Features

- n $R_{DS(ON)}=83m\Omega(\text{typ.})@V_{GS}=10V$
- n Very Low On-resistance $R_{DS(ON)}$
- n Low C_{rss}
- n Fast switching
- n 100% avalanche tested
- n Improved dv/dt capability

3. Applications

- n PWM Application
- n Power Management
- n Load switch

4. Symbol



Pin		Function
DFN5*6	TO-252	
1,2,3	3	Source
4	1	Gate
5,6,7,8	2	Drain

5. Ordering Information

Part Number	Package	Brand
KNY6610A	DFN5*6	KIA
KND6610A	TO-252	KIA

6. Absolute maximum ratings

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

Parameter	Symbol	Rating	Units	
Drain-source voltage	V_{DSS}	100	V	
Continuous drain current	$T_C=25^\circ\text{C}$	I_D	15	A
	$T_C=100^\circ\text{C}$	I_D	10	A
Pulsed drain current -Pulsed ¹⁾	I_{DM}	60	A	
Gate-source voltage	V_{GS}	± 20	V	
Single pulse avalanche energy ²⁾	E_{AS}	3.5	mJ	
Power dissipation ($T_C=25^\circ\text{C}$)	P_D	55	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	TL	300	$^\circ\text{C}$	

*Drain current limited by maximum junction temperature.

7. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance junction-case	$R_{\theta JC}$	2.73	$^\circ\text{C/W}$

8. Electrical characteristics

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Drain-source leakage current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-source forward leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 1	μA
Gate threshold voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	83	110	$m\Omega$
		$V_{GS}=4.5V, I_D=8A$	-	90	130	$m\Omega$
Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$	-	1073	-	pF
Output capacitance	C_{oss}		-	57	-	pF
Reverse transfer capacitance	C_{rss}		-	31	-	pF
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=30V,$ $R_G=1.8\Omega, I_D=10A^{3)}$		12.6		ns
Rise time	t_r			6		ns
Turn-off delay time	$t_{d(off)}$			32.5		ns
Fall time	t_f			4.3		ns
Total gate charge(10V)	Q_g	$V_{DS}=30V, I_D=15A$ $V_{GS}=10V^{3)}$	-	19.2	-	nC
Gate-source charge	Q_{gs}		-	3.4	-	nC
Gate-drain charge	Q_{gd}		-	6.1	-	nC
Maximum Continuous Drain-Source Diode Forward Current	I_S	—	-	-	15	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	—	-	-	60	A
Diode forward voltage	V_{SD}	$I_{SD}=15A, V_{GS}=0V,$ $T_J=25^{\circ}\text{C}$	-	-	1.2	V

Note:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=3.75A$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

9. Typical operating characteristics

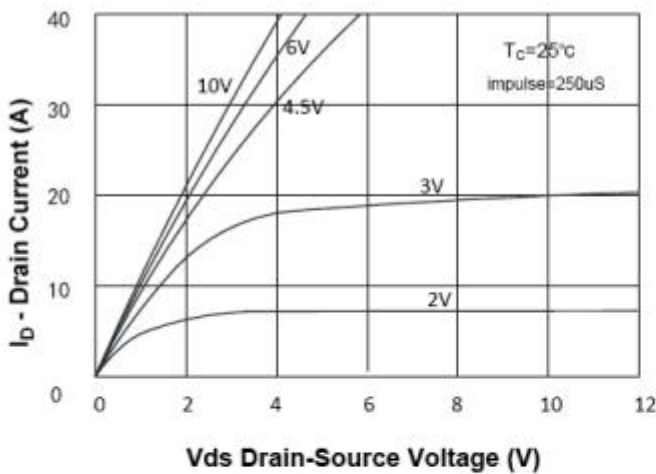


Figure 1. On-Region Characteristics

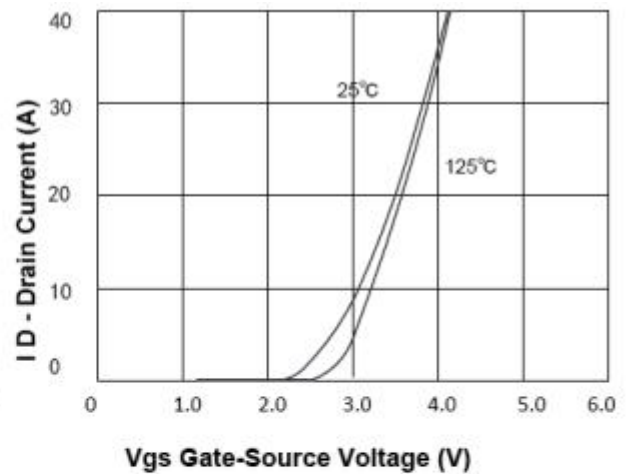


Figure 2. Transfer Characteristics

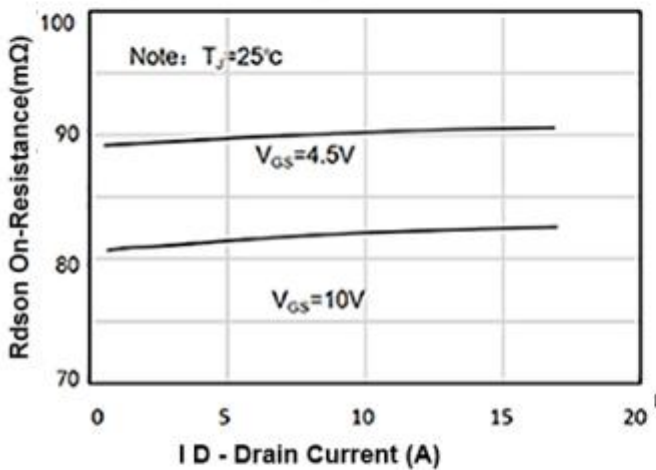


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

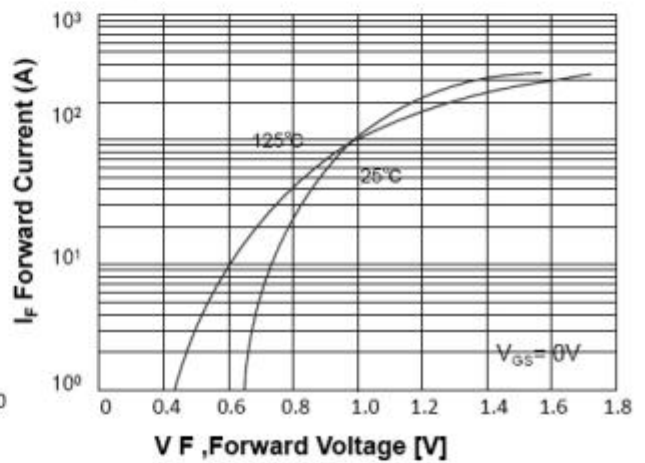


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

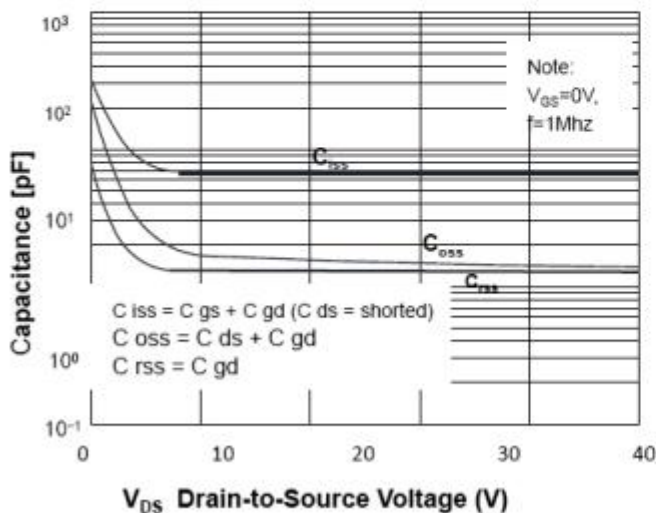


Figure 5. Capacitance Characteristics

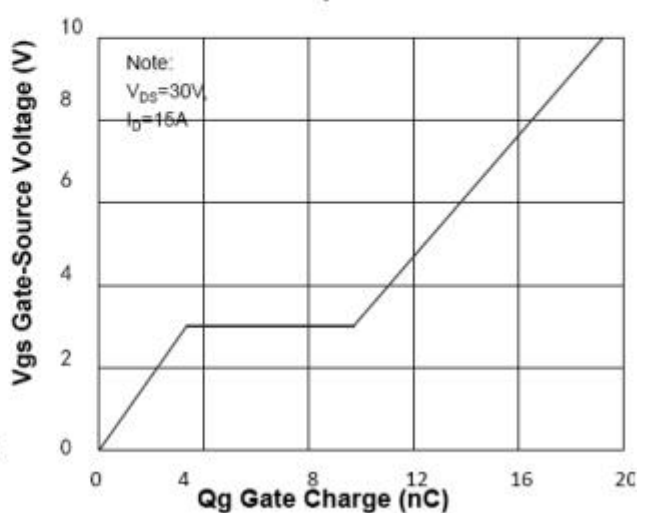


Figure 6. Gate Charge Characteristics

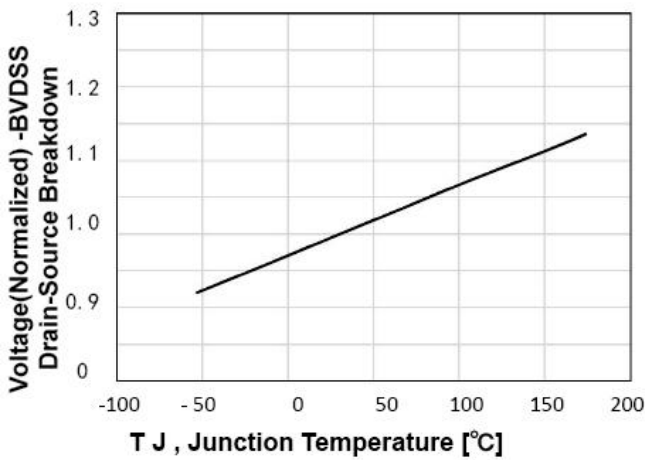


Figure 7. Breakdown Voltage Variation vs Temperature

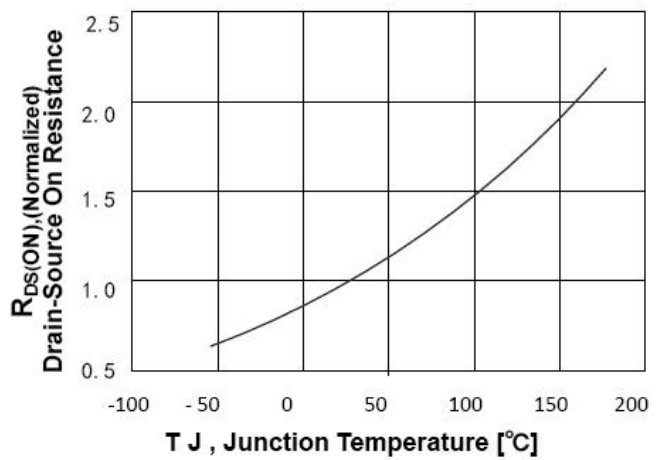


Figure 8. On-Resistance Variation vs Temperature

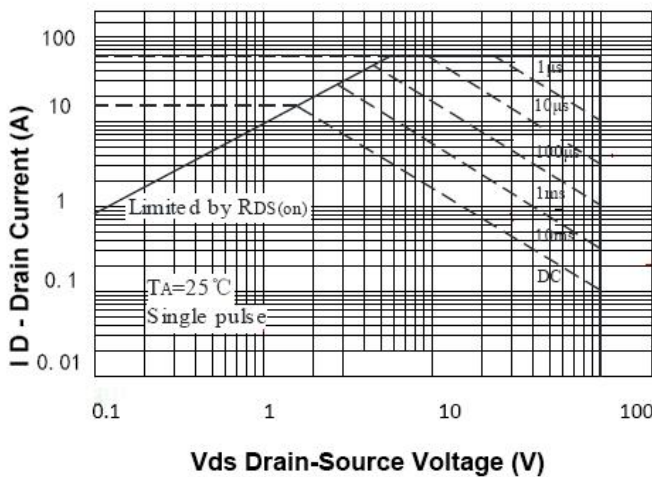


Figure 9. Maximum Safe Operating Area

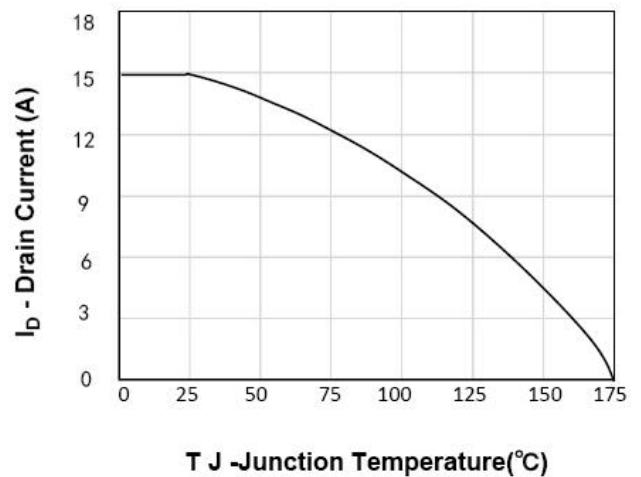


Figure 10. Maximum PContinuous Drain Current vs Case Temperature

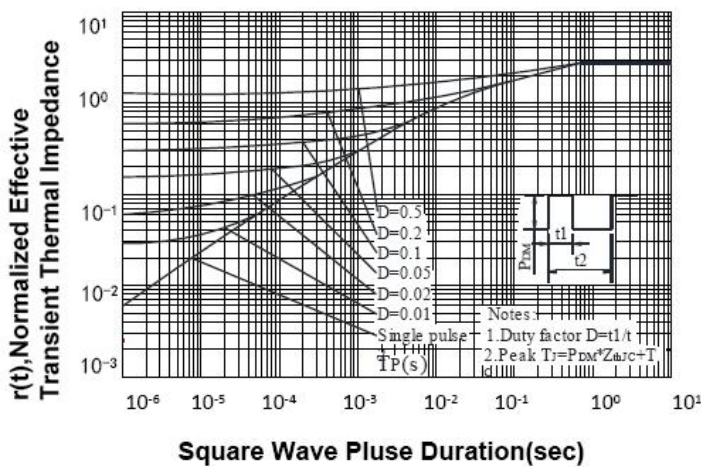
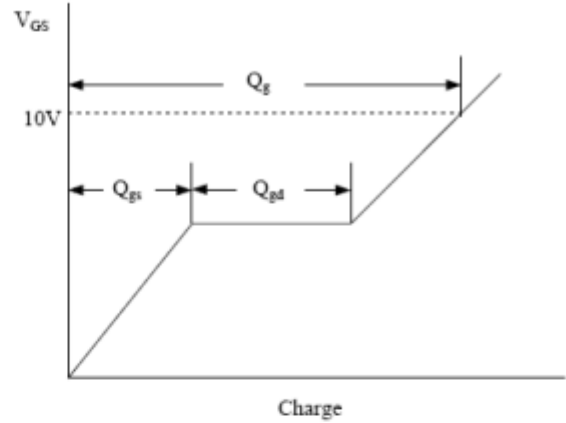
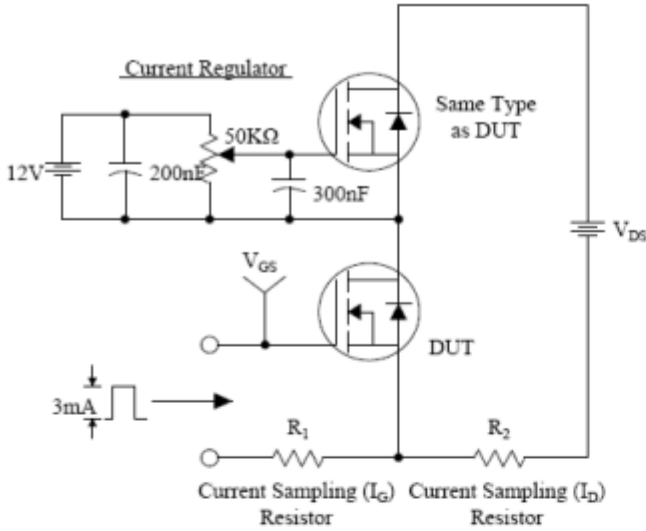


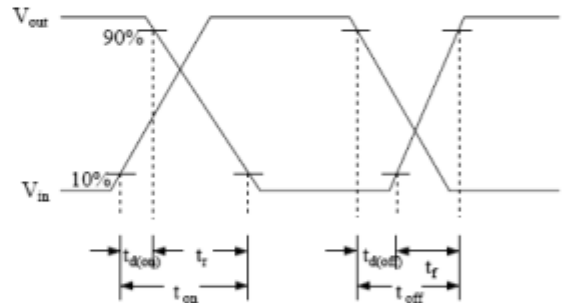
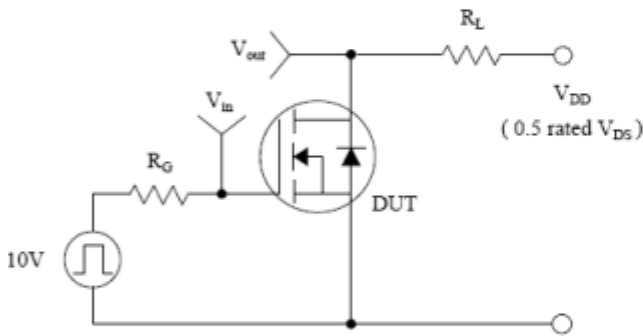
Figure 11. Transient Thermal Response Curve

10. Test Circuits and Waveforms

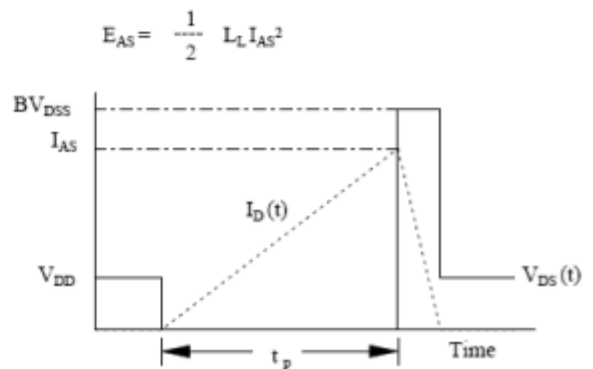
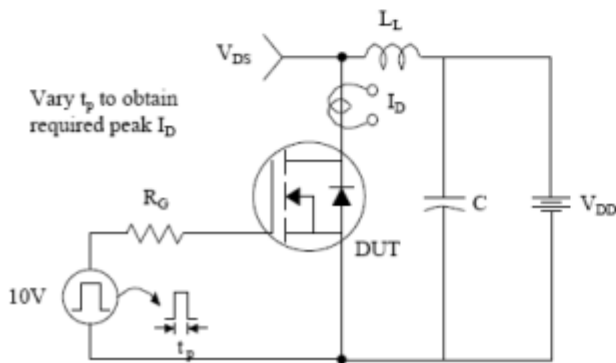
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms

