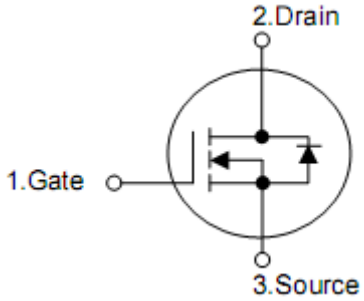
1. Features

- Robust High Voltage Termination
- $R_{DS(ON)}$=1.35Ω(typ.) @ V_{GS}=10V (DFN5*6)
- $R_{DS(ON)}$=1.38Ω(typ.) @ V_{GS}=10V (TO-252)
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Diode is Characterized for Use in Bridge Circuits
- I_{DSS} and V_{DS}(on) Specified at Elevated Temperature

2. Pin configuration

DFN5*6

TO-252



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

3. Ordering Information

Part Number	Package	Brand
KIA5N50SY	DFN5*6	KIA
KIA5N50SD	TO-252	KIA

4. Absolute maximum ratings

(T_C= 25 ºC , unless otherwise specified)

Parameter	Symbol	Ratings		Unit
		DFN5*6	TO-252	
Drain-to-Source Voltage	V_{DSS}	500		V
Gate-to-Source Voltage	V_{GSS}	±30		V
Continuous Drain Current	I_D	5		A
Pulsed Drain Current	I_{DM}	15		A
Single Pulse Avalanche Energy*	EAS	80		mJ
Power Dissipation	P_D	68	44.6	W
Derating Factor above 25°C	P_D	0.55	0.36	W/°C
Maximum Temperature for Soldering	T_L	260		ºC
Operating and Storage Temperature Range	T_J&T_{STG}	-55 to 150		ºC

*T_J=25 ºC, V_{DD}=100V, V_{GS}=10V, I_L=4A, L=10mH, R_G=25Ω

5. Thermal characteristics

Parameter	Symbol	Ratings		Unit
		DFN5*6	TO-252	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.84	2.8	ºC/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	106.2	120	° C/W

6. Electrical characteristics

(T_J=25°C,unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.		Max.	Unit
				DFN5*6	TO-252		
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	500	-		-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=500V, V_{GS}=0V	-	-		1	uA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	-	-		±100	nA
Drain-to-Source ON Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.5A [2]	-	1.35	1.38	1.55	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	2.5	3.5		4.5	V
Forward Transconductance	gfs	V_{DS}=30V,I_D=13A	-	15		-	S
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}=25V, f=1.0MHZ	-	525		-	pF
Reverse Transfer Capacitance	C_{oss}		-	50		-	
Output Capacitance	C_{rss}		-	4		-	
Total Gate Charge	Q_g	V_{DD}=400V,I_D=5A, V_{GS}=10V [2]	-	12		-	nC
Gate-to-Source Charge	Q_{gs}		-	2		-	
Gate-to-Drain (Miller) Charge	Q_{gd}		-	6		-	
Turn-on Delay Time	$t_{d(ON)}$	V_{DD}=250V, I_D=5A, R_G=25Ω [2]	-	14		-	nS
Rise Time	t_{rise}		-	14.5		-	
Turn-Off Delay Time	$t_{d(OFF)}$		-	29		-	
Fall Time	t_{fall}		-	12		-	
Forward Voltage [1]	V_{SD}	I_s=2A, V_{GS}=0V diF/dt=100A/μs,	-	-		1.5	V
Forward Turn-On Time	t_{on}		-	[3]		-	ns
Reverse recovery time	t_{rr}		-	213		-	ns

Note:
1) Calculation by temperature 100°C.
2) Pulse Test: Pulse Width≤300us, Duty Cycle≤2%.
3) Negligible, Dominated by circuit inductance.

7. Test circuits and waveforms

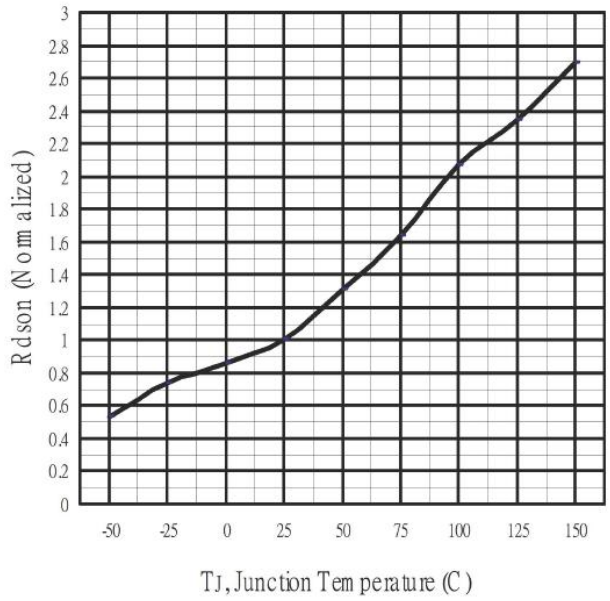


Fig 1. On-Resistance Variation with vs. Temperature

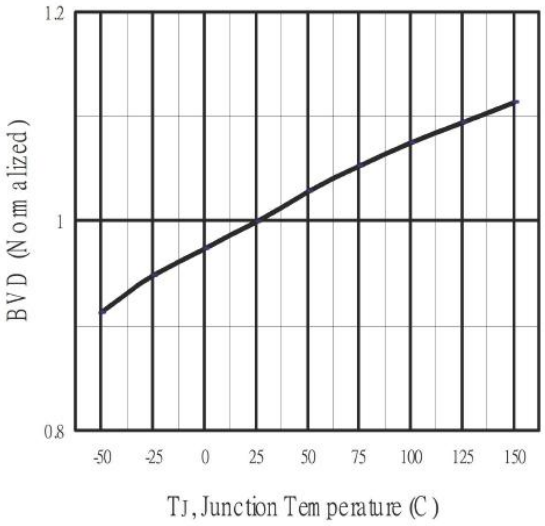


Fig 2. Breakdown Voltage Variation vs. Temperature

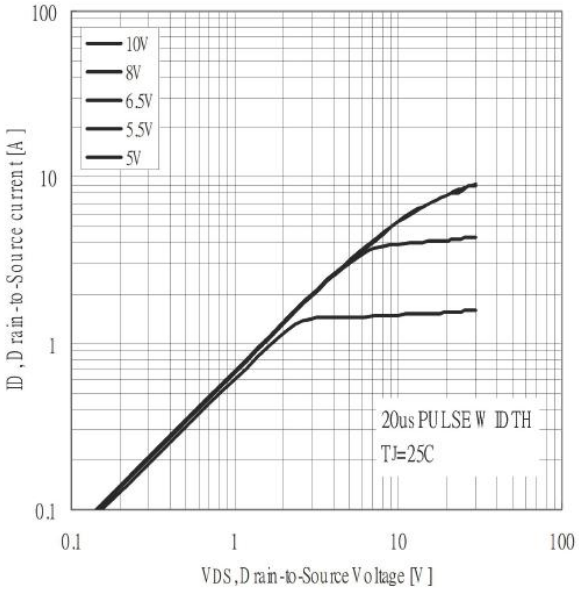


Fig 3. Typical Output Characteristics

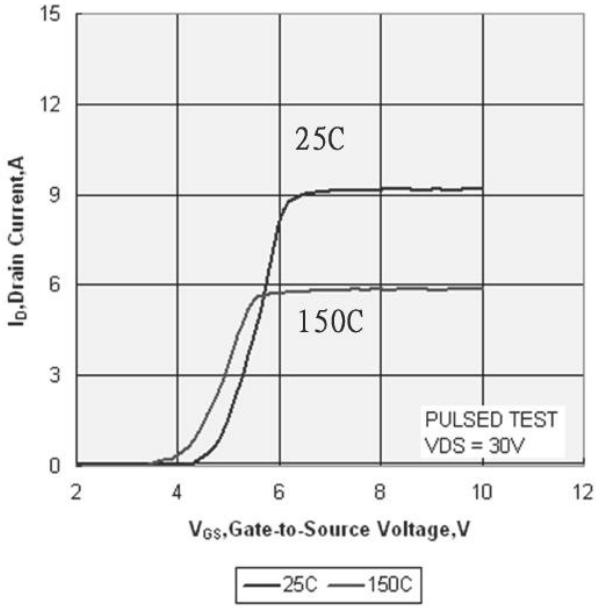


Fig 4. Typical Transfer Characteristics

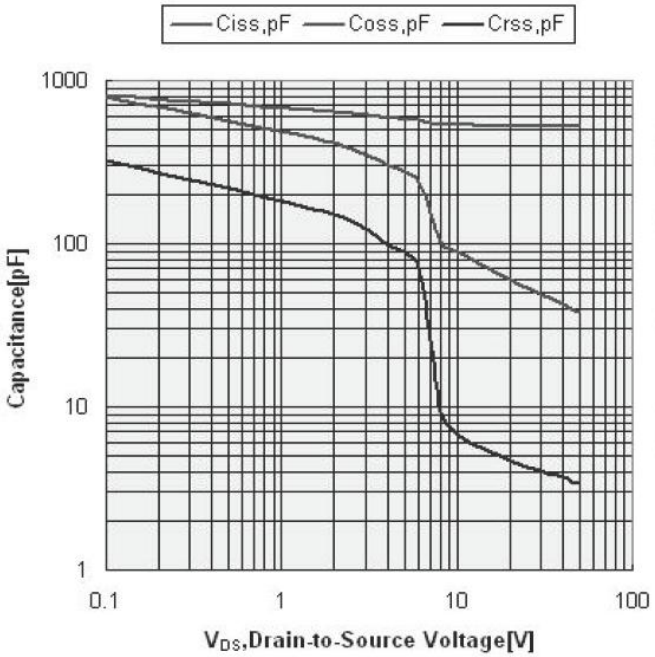


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

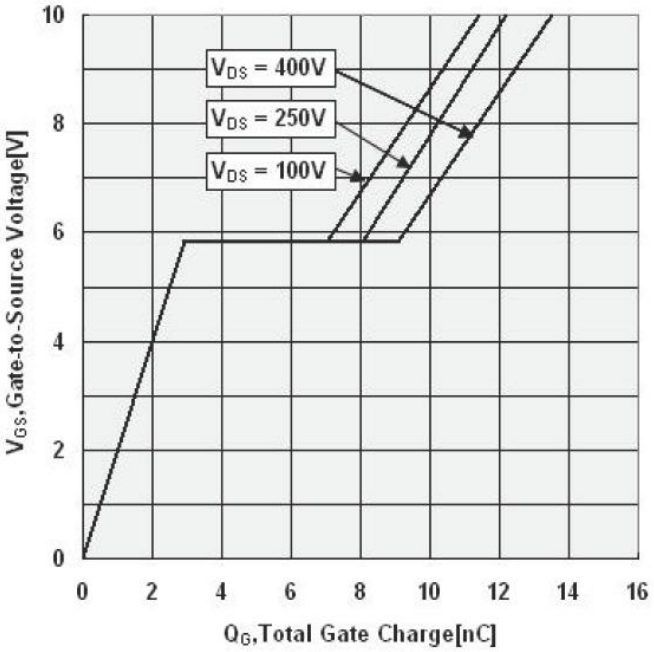


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage