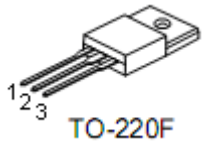
1. Applications

- Adaptor
- Charger
- SMPS Standby Power

2. Features

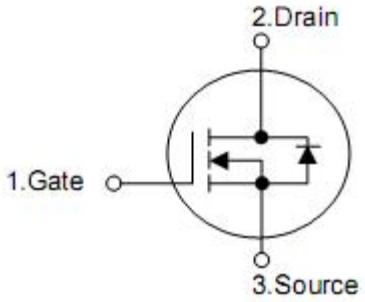
- RoHS Compliant
- $R_{DS(on)}$= 0.7Ω (typ.)@V_{GS}= 10 V
- Low gate charge minimize switching loss
- Fast recovery body diode

3. Pin configuration



TO-220F

Pin	Function
1	Gate
2	Drain
3	Source



4. Ordering Information

Part Number	Package	Brand
KNF4850A	TO-220F	KIA

5. Absolute maximum ratings

(T_C=25 ºC , unless otherwise specified)

Parameter		Symbol	Ratings	Units
Drain-source voltage		V_{DSS}	500	V
Gate-source voltage		V_{GSS}	±30	V
Continuous drain currenet		I_D	9.0*	A
Pulsed drain current at V_{GS}=10V		I_{DM}	32*	A
Single pulse Avalanche energy		E_{AS}	400	mJ
Peak diode recovery dv/dt		dv/dt	5.5	V/ns
Power dissipation		P_D	36	W
	Derating factor above 25°C		0.96	W/°C
Soldering temperature distance of 1.6mm from case for 10seconds		T_L	300	°C
Operating and Storage temperature range		T_J &T_{STG}	-55~+150	°C

*Drain current limited by maximum junction temperature
Caution: Stresses greater than those listed in the “ Absolute maximum ratings” may cause permanent damage to the device.

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance,Junction-to-case	θ_{JC}	3.52	ºC/W
Thermal resistance,Junction-to-ambient	θ_{JA}	62.5	ºC/W

6. Electrical characteristics

(T_J=25°C,unless otherwise notes)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	500	-	-	V
Gate source breakdown voltage	V_{GSO}	I_{GS}=±1mA(Open drain)	±30	-	-	V
Drain-to-source leakage current	I_{DSS}	V_{DS}=500V ,V_{GS}=0V	-	-	1	μA
		V_{DS}=400V ,V_{GS}=0V,T_J=125 ºC	-	-	100	μA
Gate-to-source leakage current	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	10	uA
		V_{GS}=-20V,V_{DS}=0V	-	-	-10	uA
On characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	-	4.0	V
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=4A	-	0.7	0.9	Ω
Forward transconductance	gfs	V_{DS}=15V,I_D=3A	-	8.5	-	S
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1.0MHz	-	960	-	pF
Output capacitance	C_{oss}		-	110	-	pF
Reverse transfer capacitance	C_{rss}		-	10	-	pF
Gate resistance	R_g	V_{DS}=0V, F=1MHz	-	1.3	-	Ω
Total gate charge	Q_g	V_{DD}=30V, ,V_{GS}=0V-10V, I_D=8A(TO-252)I_D=9A(TO-220)	-	24	-	nC
Gate-source charge	Q_{gs}		-	4.0	-	nC
Gate-drain (Miller)charge	Q_{gd}		-	10	-	nC
Resisitive switching characteristics						
Turn-on delay time	$td_{(ON)}$	V_{DD}=250V,V_{GS}=10V,R_g=12Ω, I_D=8A(TO-252)I_D=9A(TO-220)	-	11	-	nS
Rise time	t_{rise}		-	17	-	
Turn-off delay time	$td_{(OFF)}$		-	46	-	
Fall time	t_{fall}		-	22	-	
Source-drain body diode characteristics	T_J=25°C,unless otherwise notes					
Diode forward voltage	V_{SD}	V_{GS}=0V,I_S=8A(TO-252) I_S=9A(TO-220)	-	-	1.5	V
Continuous source current(TO-252)[2]	I_{SD}	Intergra PN-diode in MOSFET	-	-	8	A
Continuous source current(TO-220)[2]	I_{SD}		-	-	9	A
Pulsed source current[2]	I_{SM}		-	-	32	A
Reverse recovery time	t_{rr}	di_F/dt=100A/μs, V_{GS}=0V	-	175	-	ns
Reverse recovery charge	Q_{rr}	I_F=8A(TO-252) I_F=9A(TO-220)	-	750	-	nC

Note: 1. T_J=25°C to 150°C

2. Pulse width ≤380μs; duty cycle ≤2%.

3.KIA finished product specifications please customer before placing order, should obtain the latest version of the finished product specifications.

7. Typical operating characteristics

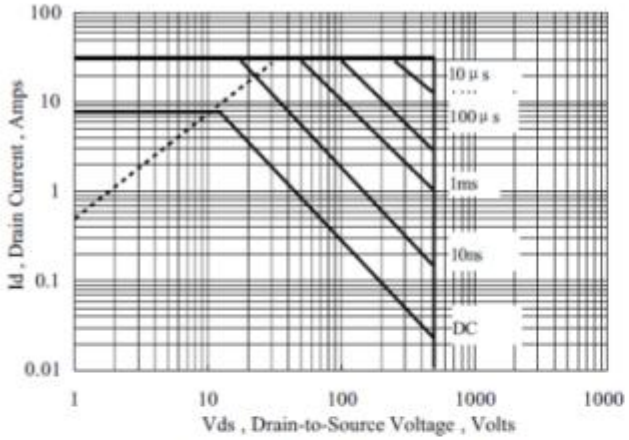


Figure 1 Maximun Forward Bias Safe Operating Area

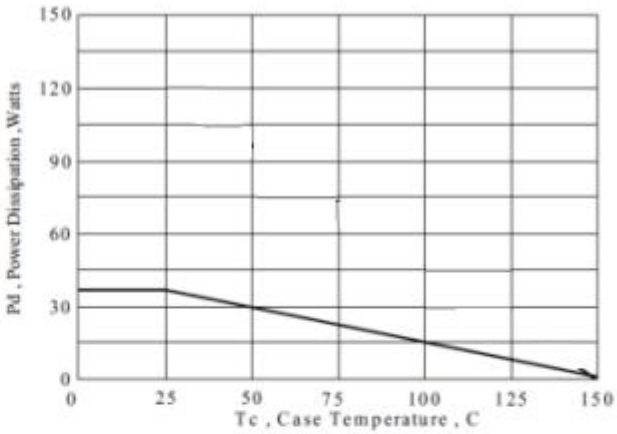


Figure 2 Maximun Power Dissipation vs Case Temperature

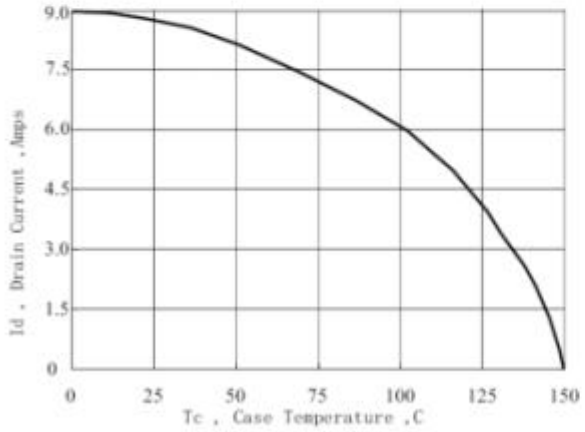


Figure 3 Maximum Continuous Drain Current vs Case Temperature

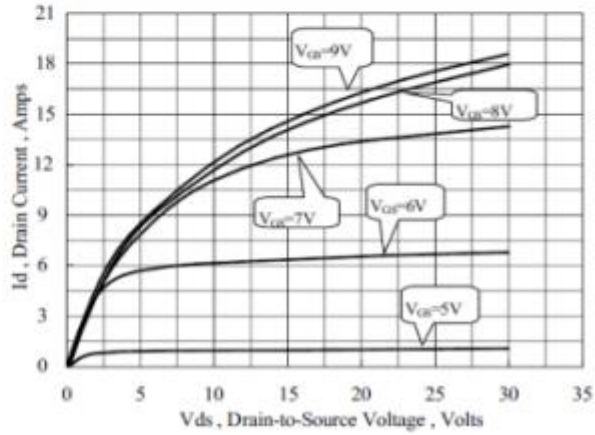


Figure 4 Typical Output Characteristics

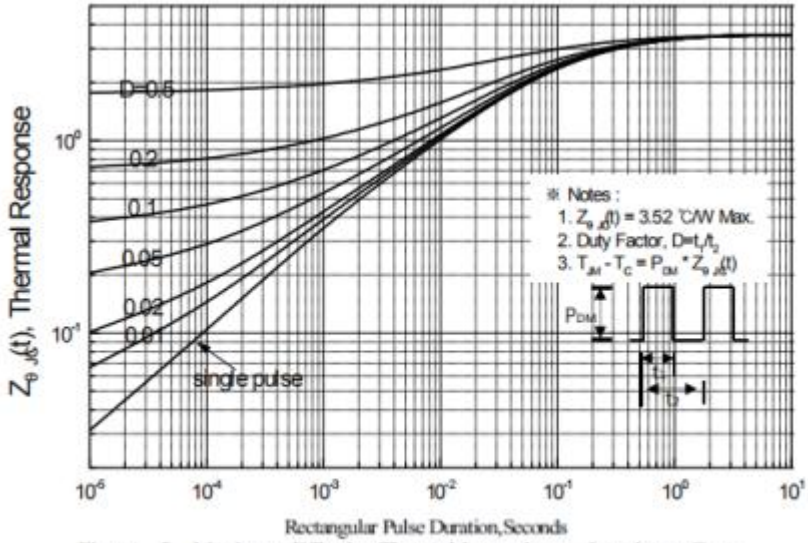


Figure 5 Maximum Effective Thermal Impendance , Junction to Case

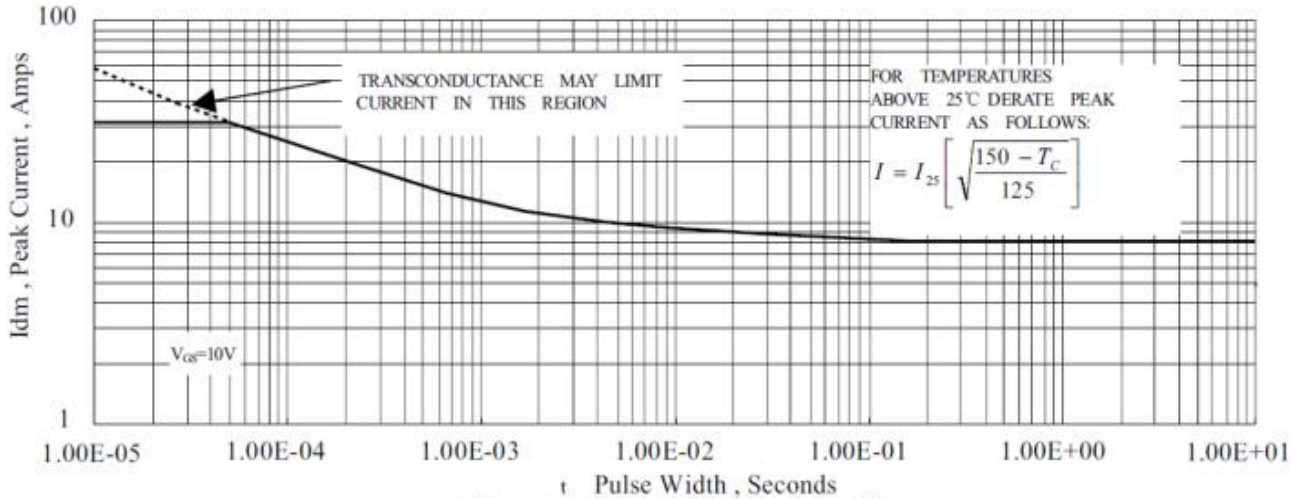


Figure 6 Maximun Peak Current Capability

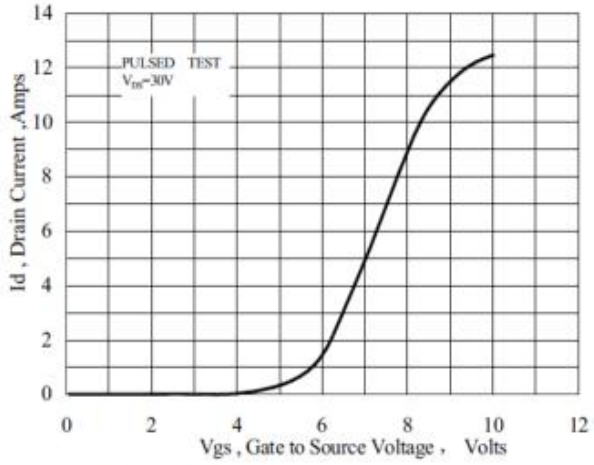


Figure 7 Typical Transfer Characteristics

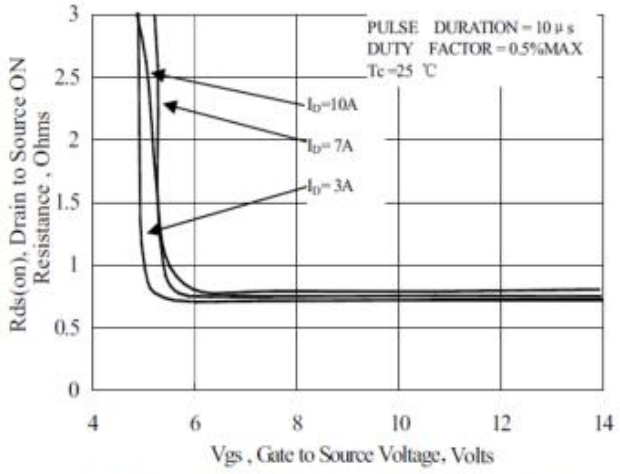


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage

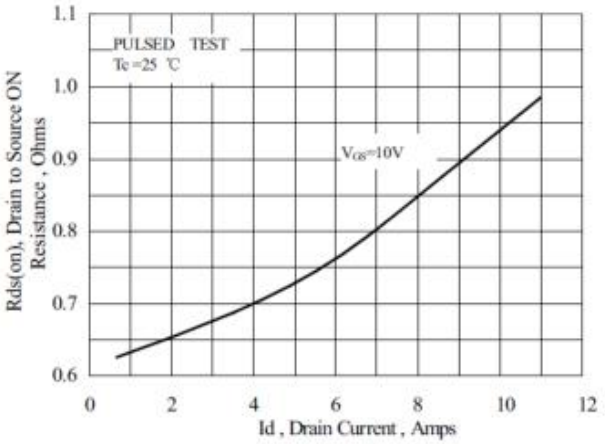


Figure 9 Typical Drain to Source ON Resistance vs Drain Current

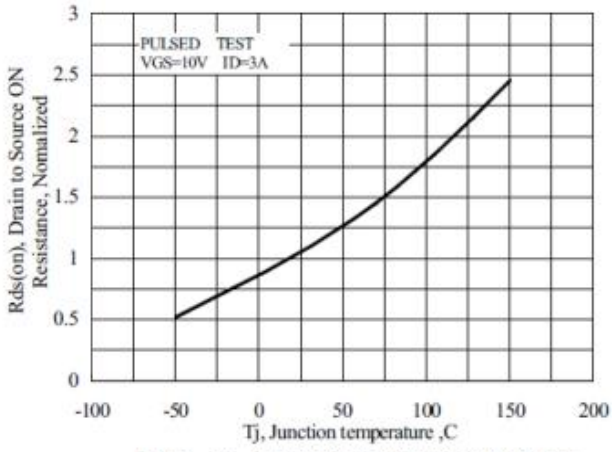


Figure 10 Typical Drian to Source on Resistance vs Junction Temperature

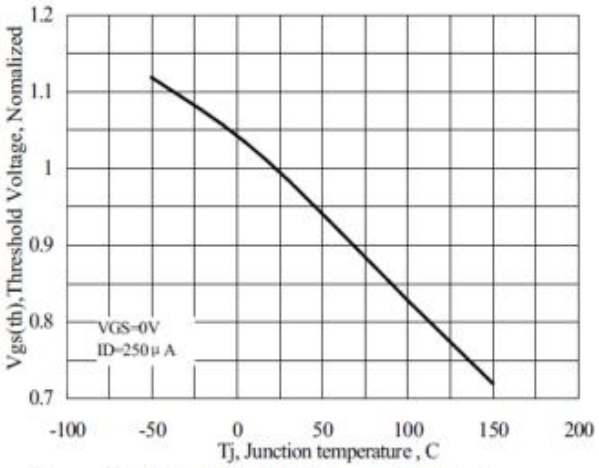


Figure 11 Typical Theshold Voltage vs Junction Temperature

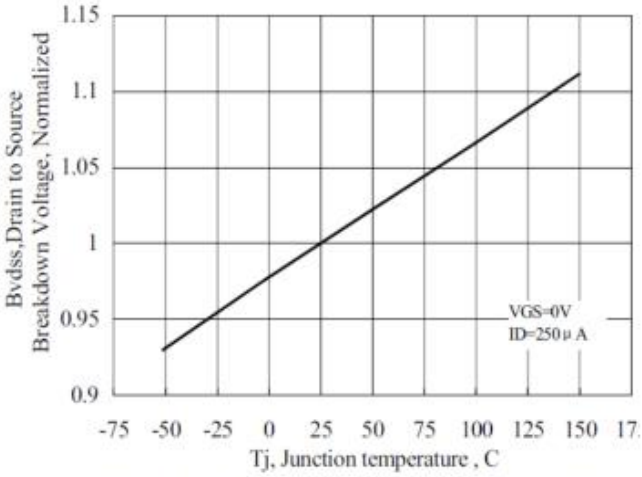


Figure 12 Typical Breakdown Voltage vs Junction Temperatun

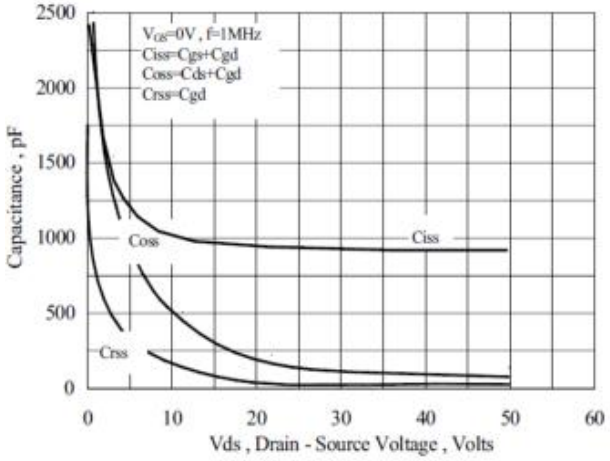


Figure 13 Typical Capacitance vs Drain to Source Voltage

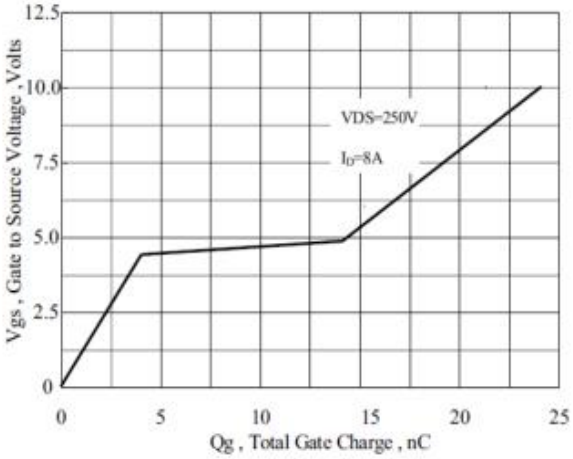


Figure 14 Typical Gate Charge vs Gate to Source Voltage

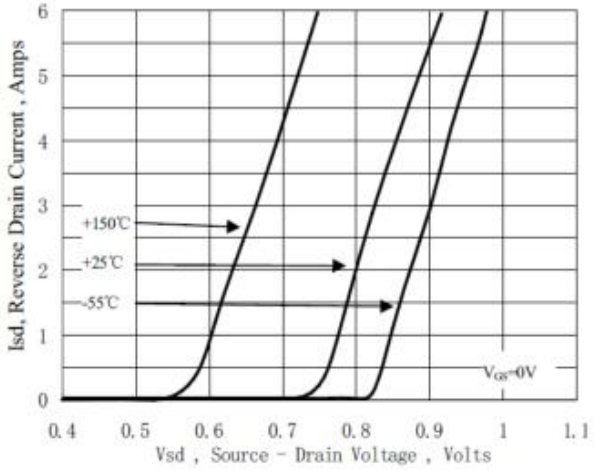


Figure 15 Typical Body Diode Transfer Characteristics

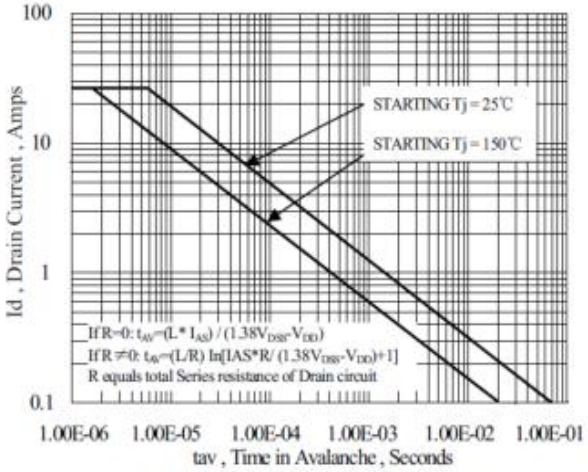


Figure 16 Unclamped Inductive Switching Capability