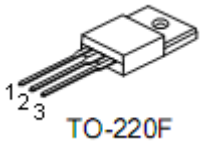
1. Features

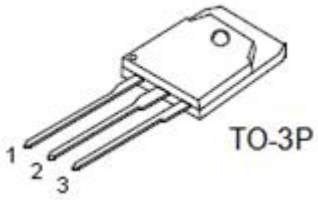
- Proprietary New Planar Technology
- $R_{DS(ON),typ.}$=45mΩ@V_{GS}=10V
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

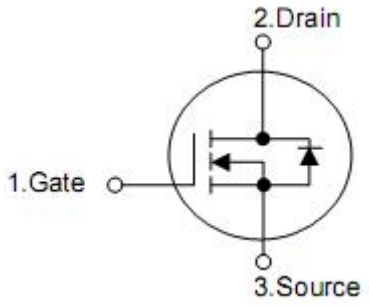
2. Features

- DC-DC Converters
- DC-AC Inverters for UPS
- SMPS and Motor controls

3. Pin configuration







Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNF3725A	TO-220F	KIA
KNH3725A	TO-3P	KIA

5. Absolute maximum ratings

TC=25 ºC unless otherwise specified

Parameter	Symbol	Ratings		Unit
		TO-220F	TO-3P	
Drain-to-Source Voltage	V_{DSS}	250		V
Gate-to-Source Voltage	V_{GSS}	±20		
Continuous Drain Current	I_D	50		A
Continuous Drain Current @ Tc=100 ºC		25		
Pulsed Drain Current at V_{GS}=10V [2]	I_{DM}	200		
Single Pulse Avalanche Energy	E_{AS}	1250		mJ
Peak Diode Recovery dv/dt[3]	dv/dt	5.0		V/ns
Power Dissipation	P_D	125	260	W
Derating Factor above 25 ºC		1.0	2.08	W/ ºC
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		ºC
Operating and Storage Temperature Range	T_J& T_{STG}	-55 to 150		

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

6. Thermal characteristics

Parameter	Symbol	Ratings		Units
		TO-220F	TO-3P	
Thermal resistance, junction-ambient	$R_{\theta JA}$	90	-	ºC/W
Thermal resistance, Junction-case	$R_{\theta JC}$	1.0	0.48	

7. Electrical characteristics

(T_J=25°C,unless otherwise notes)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	250	-	-	V
Drain-to-source Leakage Current	I_{DSS}	V_{DS}=250V ,V_{GS}=0V	-	-	1	μA
		V_{DS}=200V , V_{GS}=0V T_J=125°C,	-	-	100	μA
Gate-body leakage current	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	+100	nA
		V_{GS}=-20V,V_{DS}=0V	-	-	-100	nA
On characteristics						
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=25A	-	45	60	mΩ
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	-	4.0	V
Forward Transconductance [4]	gfs	V_{DS}=15V,I_D=20A	-	65	-	S
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1MHz	-	4000	-	pF
Output capacitance	C_{oss}		-	510	-	pF
Reverse transfer capacitance	C_{rss}		-	255	-	pF
Total gate charge						
Turn-on delay time	$t_{d(on)}$	V_{DD}=100V,I_D=20A, V_{GS}=10V,R_G=3.9Ω	-	21	-	ns
Rise time	t_r		-	29	-	ns
Turn-off delay time	$t_{d(off)}$		-	66	-	ns
Fall time	t_f		-	24	-	ns
Total gate charge	Q_g	V_{DD}=100V,I_D=20A , V_{GS}=0 to10V	-	75	-	nC
Gate-source charge	Q_{gs}		-	25	-	nC
Gate-drain charge	Q_{gd}		-	20	-	nC
Drain-source diode characteristics						
Drain-source diode forward voltage	V_{SD}	V_{GS}=0V,I_S=30A	-	-	1.5	V
Continuous drain-source current [4]	I_{SD}	Integral pn-diode In MOSFET	-	-	50	A
Pulsed drain-source current[4]	I_{SM}		-	-	200	A
Reverse recovery time	t_{rr}	V_{GS}=0V,I_F=20A di_F/dt=100A/μs	-	185	-	ns
Reverse recovery charge	Q_{rr}		-	400	-	μC

Note: 1.TJ=+25°C to +150°C

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

3. ISD= 20A di/dt < 100 A/μs, VDD < BVDSS, TJ=+150 ºC.

4. Pulse width≤380μs; duty cycle≤2%.

8. Typical Characteristics

Figure 1. Maximum Transient Thermal Impedance

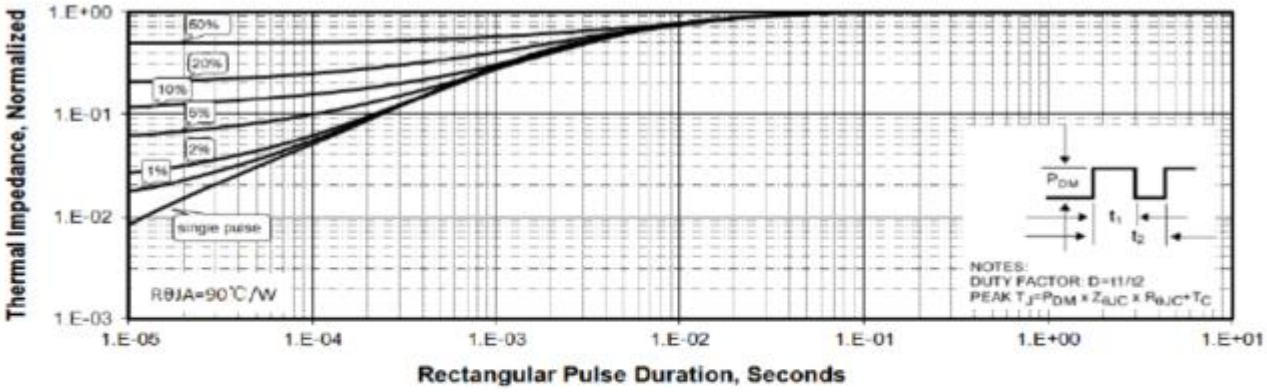


Figure 2 . Max. Power Dissipation vs Case Temperature

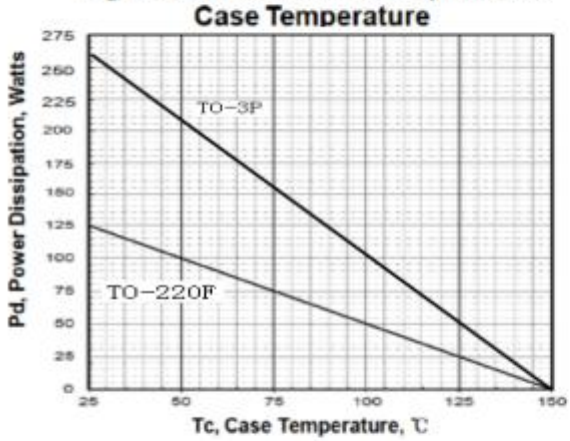


Figure 3 .Maximum Continuous Drain Current vs Tc

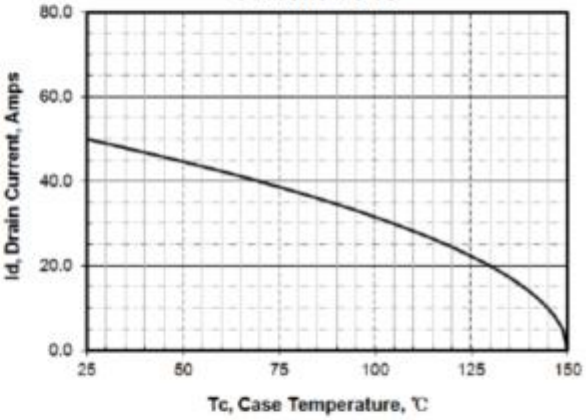


Figure 4. Output Characteristics

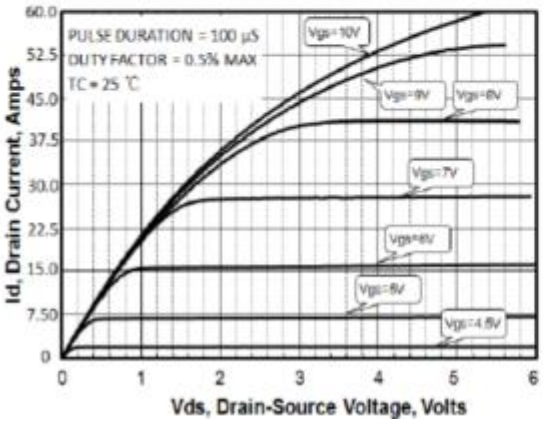


Figure 5. Rdson vs Gate Voltage

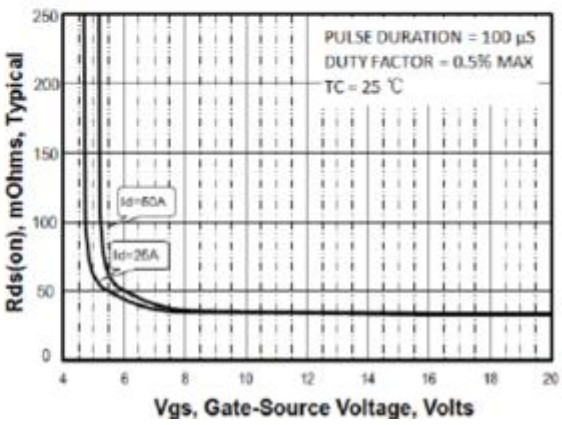


Figure 6. Peak Current Capability

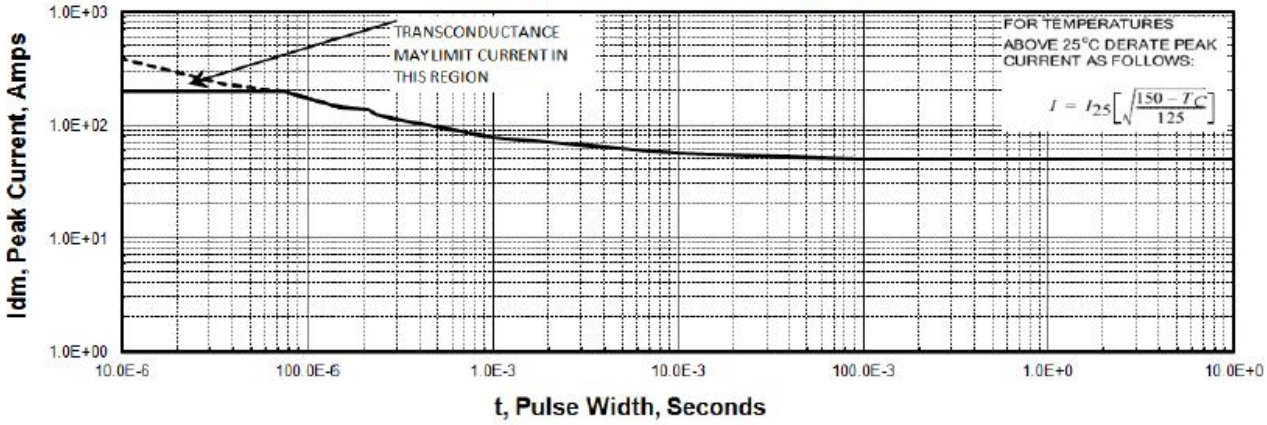


Figure 7. Transfer Characteristics

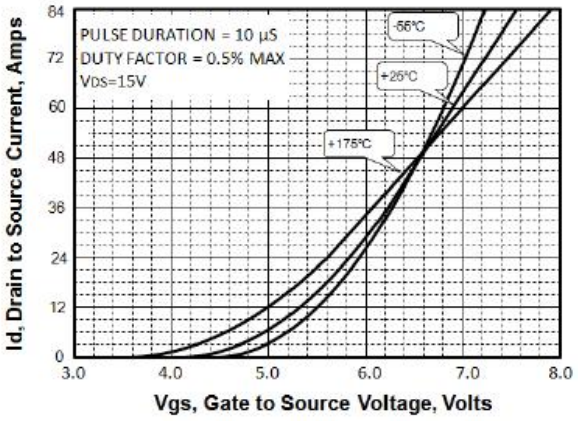


Figure 8. Unclamped Inductive Switching Capability

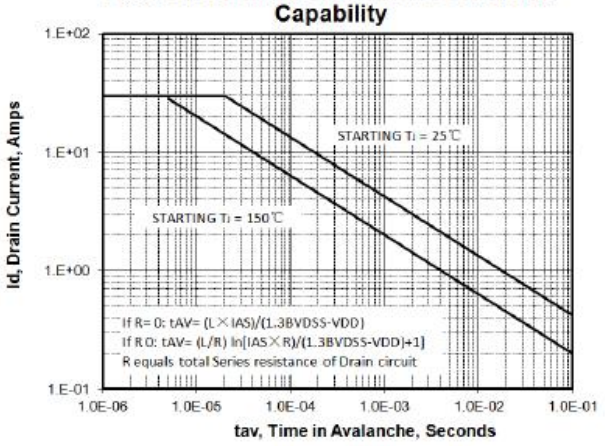


Figure 9. Drain to Source ON Resistance vs Drain Current

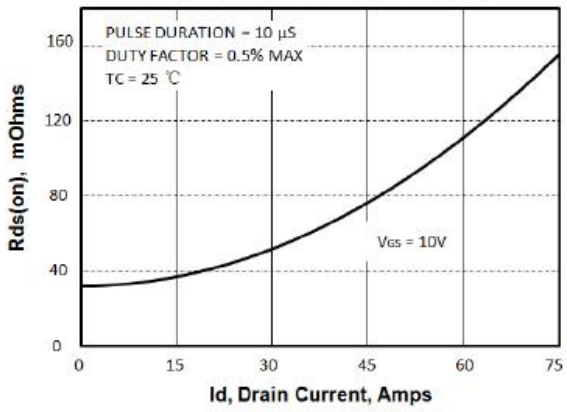


Figure 10. Rdson vs Junction Temperature

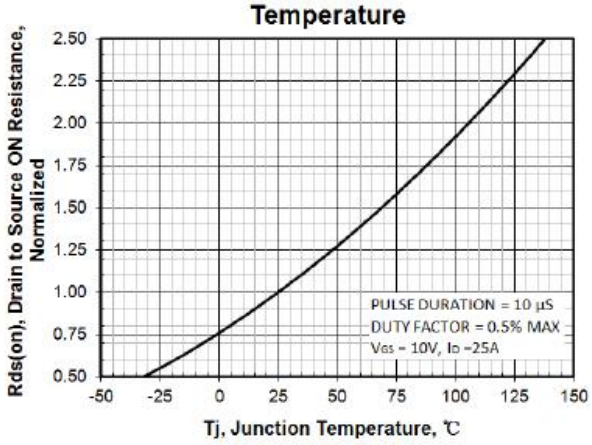


Figure 11. Typical Breakdown Voltage vs Junction Temperature

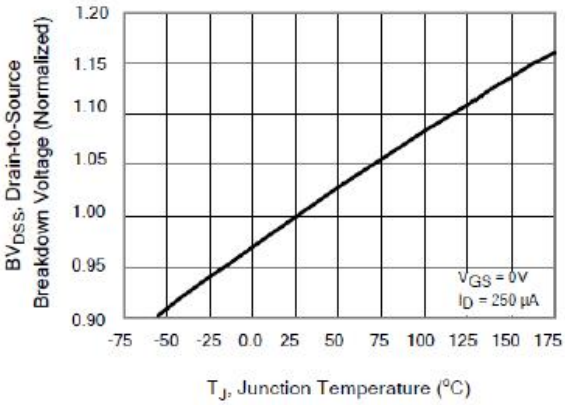


Figure 12. Typical Threshold Voltage vs Junction Temperature

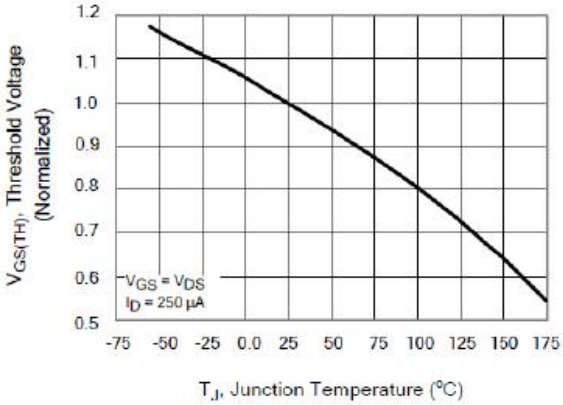


Figure 13 . Maximum Safe Operating Area(TO-220F)

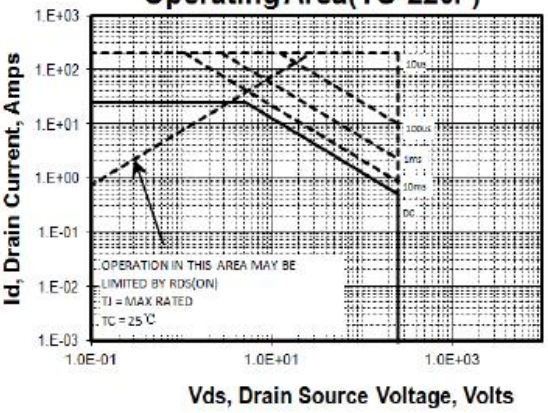


Figure 14. Capacitance vs Vds

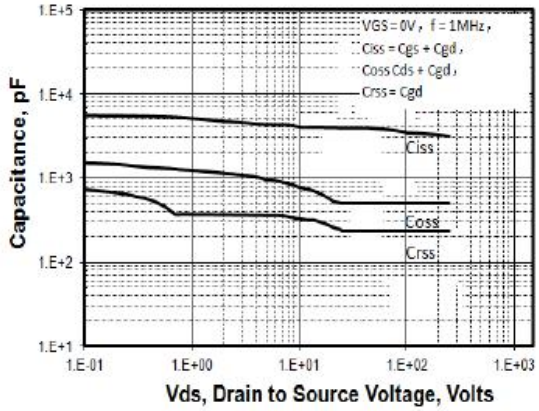


Figure 15 .Typical Gate Charge

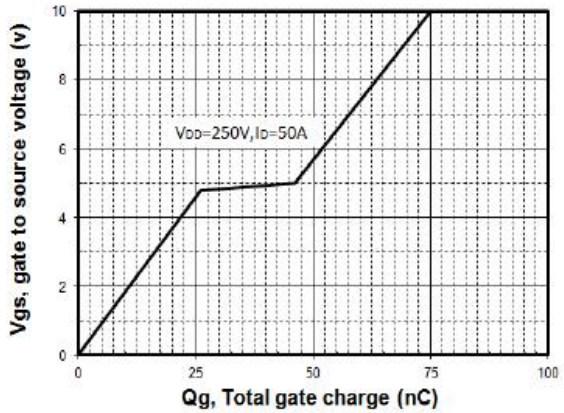


Figure 16.Body Diode Transfer Characteristics