

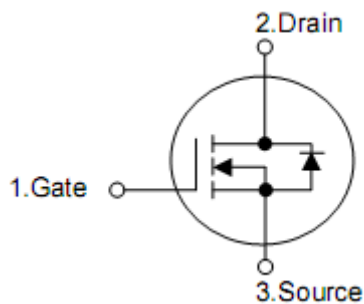
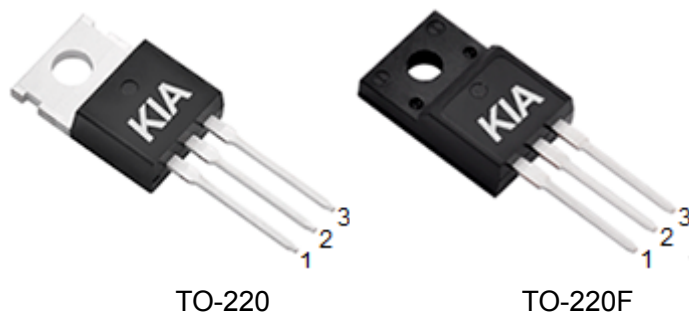
1. Features

- Fast Switching
- $R_{DS(ON)}=0.35\Omega(\text{typ.}) @ V_{GS}=10V$
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

2. Applications

- Power switch circuit of adaptor and charger

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNP6450B	TO-220	KIA
KNF6450B	TO-220F	KIA

5. Absolute maximum ratings

(T_c= 25 °C , unless otherwise specified)

Parameter	Symbol	Ratings		Unit
		TO-220	TO-220F	
Drain-to-Source Voltage	V _{DSS}	500		V
Gate-to-Source Voltage	V _{GSS}	±30		V
Continuous Drain Current	I _D	13		A
Pulsed Drain Current ¹⁾	I _{DM}	52		A
Single Pulse Avalanche Energy ²⁾	EAS	900		mJ
Power Dissipation	P _D	150	48	W
Derating Factor above 25°C	P _D	1.2	0.38	W/°C
Maximum Temperature for Soldering	T _L	300		°C
Operating and Storage Temperature Range	T _J &T _{STG}	-55 to 150		°C

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

6. Thermal characteristics

Parameter	Symbol	Ratings		Unit
		TO-220	TO-220F	
Thermal Resistance, Junction-to-Case	R _{θJC}	0.83	2.6	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	100	°C/W

7. Electrical characteristics

(T_C=25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	500	-	-	V
BVDSS Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I _D =250uA, Reference 25°C	-	0.55	-	V/°C
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =500V, V _{GS} =0V	-	-	1	uA
		V _{DS} =400V, T _J =125°C	-	-	100	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 =6.5A	-	0.35	0.5	Ω
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA	2.0	-	4.0	V
Forward Transconductance ³⁾	g _{fs}	V _{DS} =30V, I _D =13A	-	15	-	S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1.0MHZ	-	2155	-	pF
Reverse Transfer Capacitance	C _{oss}		-	215	-	
Output Capacitance	C _{rss}		-	25	-	
Total Gate Charge	Q _g	V _{DD} =250V, I _D =13A, V _{GS} =10V	-	46	-	nC
Gate-to-Source Charge	Q _{gs}		-	12	-	
Gate-to-Drain (Miller) Charge	Q _{gd}		-	20	-	
Turn-on Delay Time	t _{d(ON)}	V _{DD} =200V, I _D =10A, R _G =6.1Ω, V _{GS} =13V	-	16	-	nS
Rise Time	t _{rise}		-	26	-	
Turn-Off Delay Time	t _{d(OFF)}		-	46	-	
Fall Time	t _{fall}		-	36	-	
Continuous Source Current	I _{SD}	-	-	-	13	A
Pulsed Source Current	I _{SM}	-	-	-	52	A
Forward Voltage	V _{SD}	I _S =13A, V _{GS} =0V	-	-	1.5	V
Reverse recovery time	t _{rr}	I _F =13A, T _J =25°C diF/dt=100A/μs, V _{GS} =10V	-	500	-	ns
Reverse recovery charge	Q _{rr}		-	4	-	uC

Note:

1) Repetitive rating; pulse width limited by maximum junction temperature.

2) L=10mH, I_D=13A, Start T_J=25°C.

3) Pulse width≤380μs; duty cycle≤2%.

8. Test circuits and waveforms

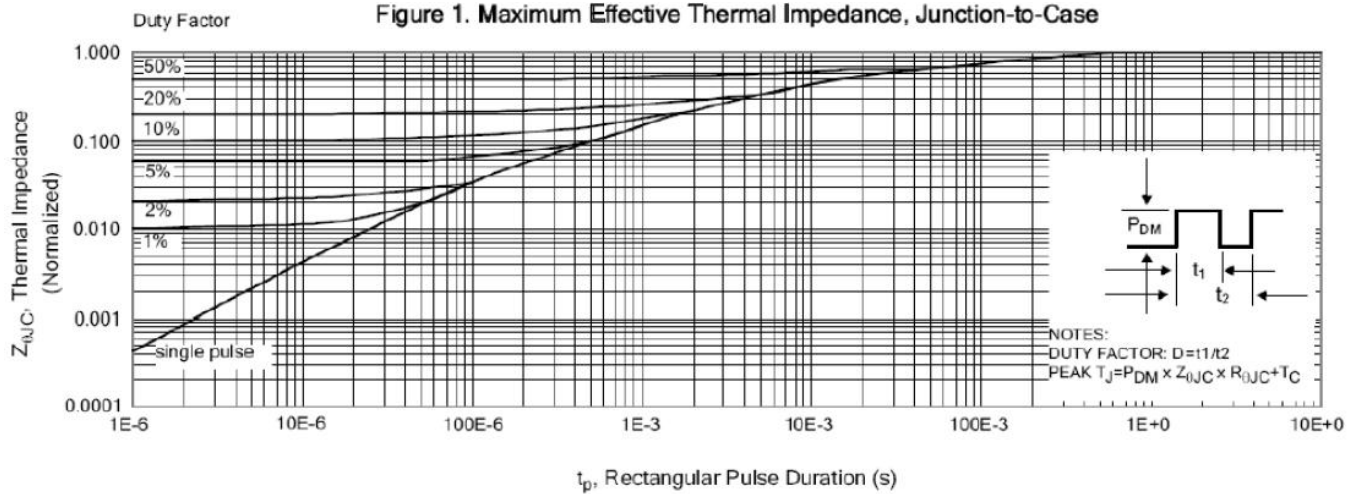


Figure 2. Maximum Power Dissipation vs Case Temperature

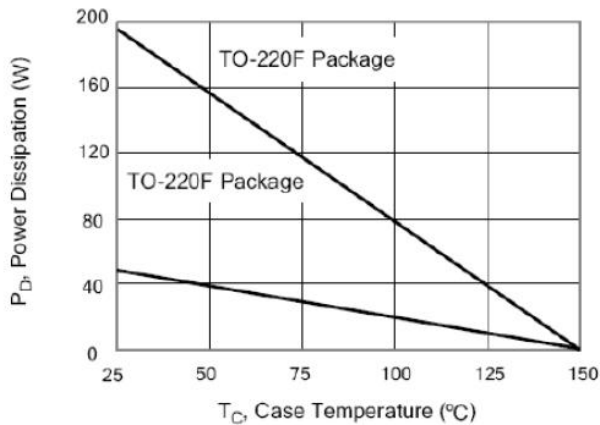


Figure 3. Maximum Continuous Drain Current vs Case Temperature

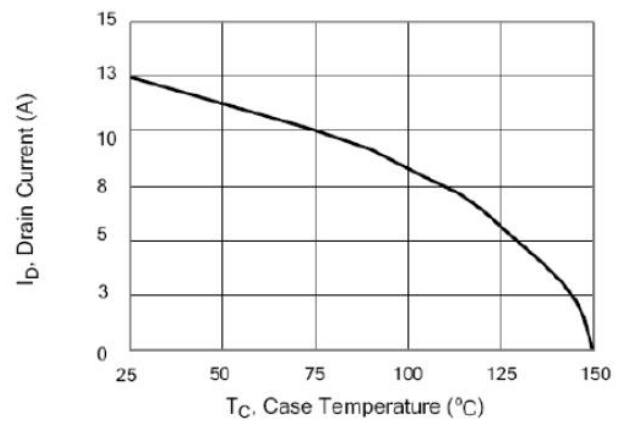


Figure 4. Typical Output Characteristics

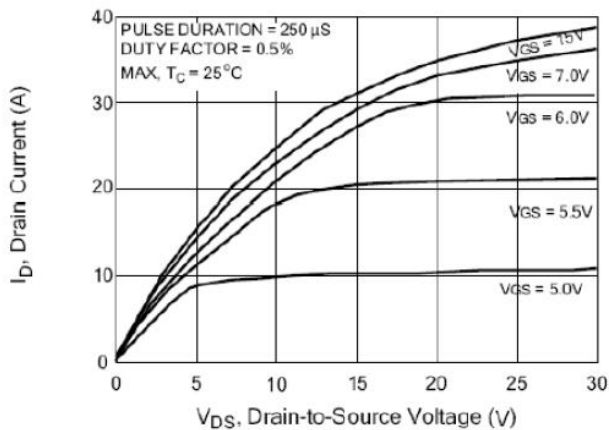


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

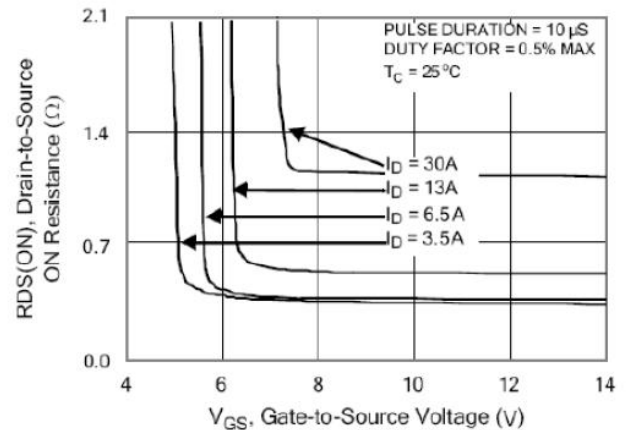


Figure 6. Maximum Peak Current Capability

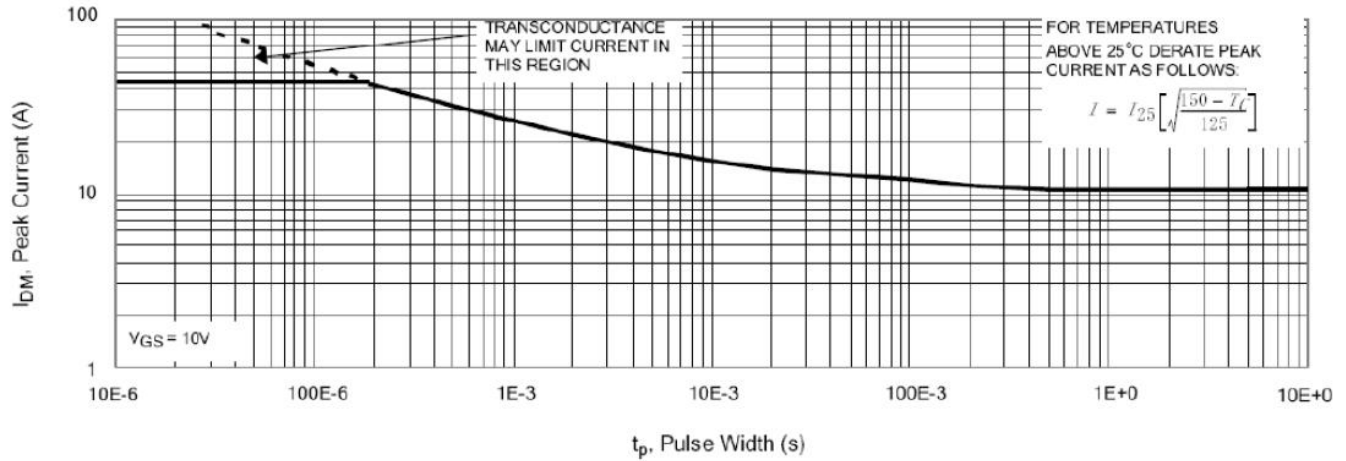


Figure 7. Typical Transfer Characteristics

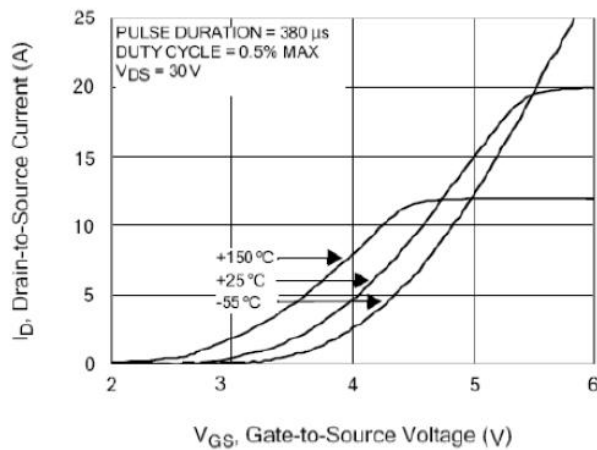


Figure 8. Unclamped Inductive Switching Capability

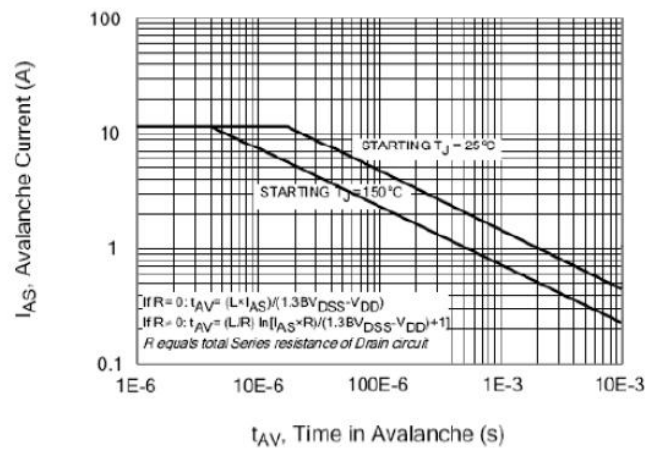


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

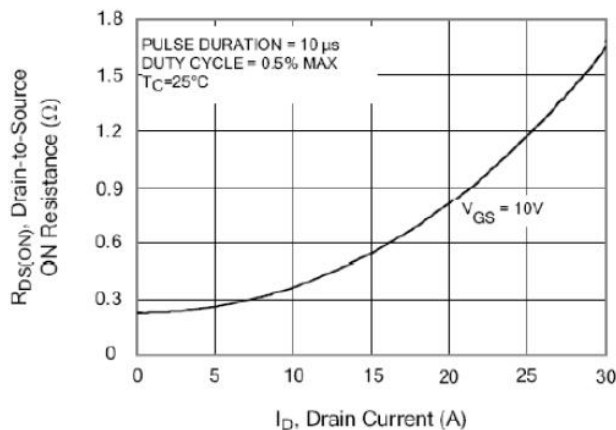


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

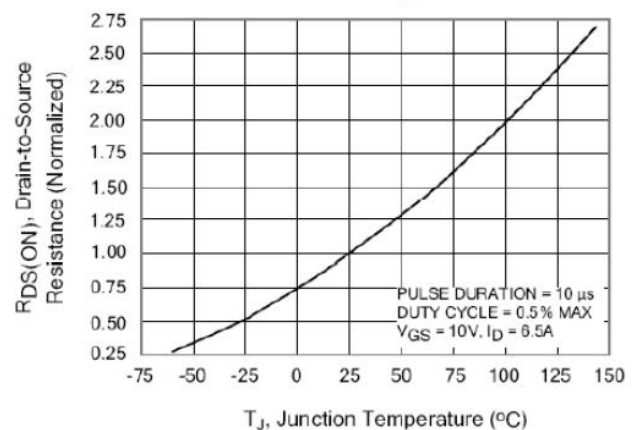


Figure 11. Typical Breakdown Voltage vs Junction Temperature

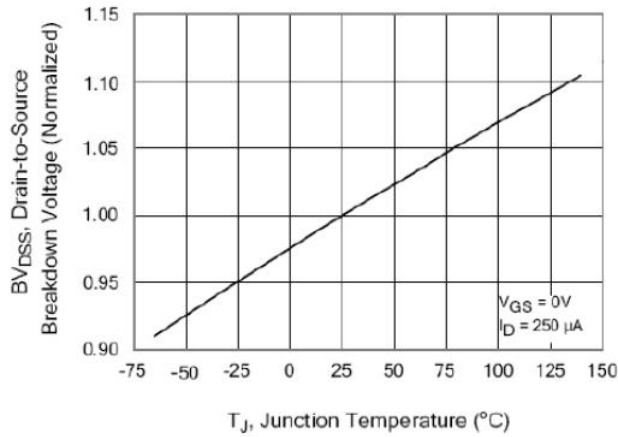


Figure 12. Typical Threshold Voltage vs Junction Temperature

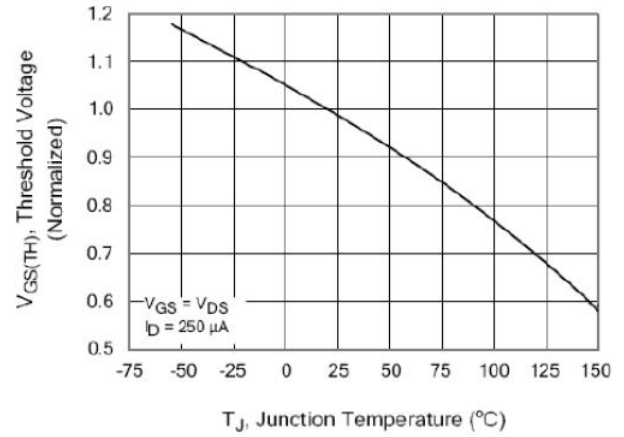


Figure 13. Maximum Forward Bias Safe Operating Area

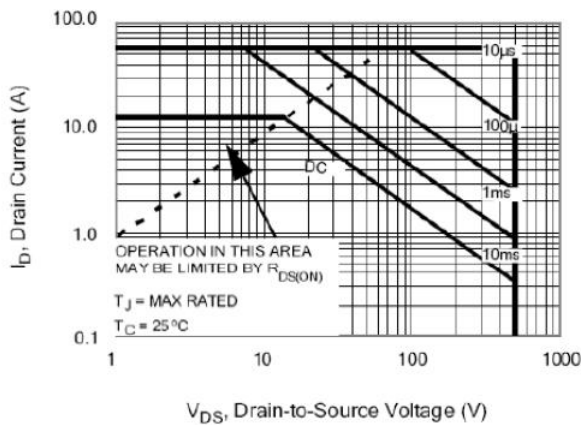


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

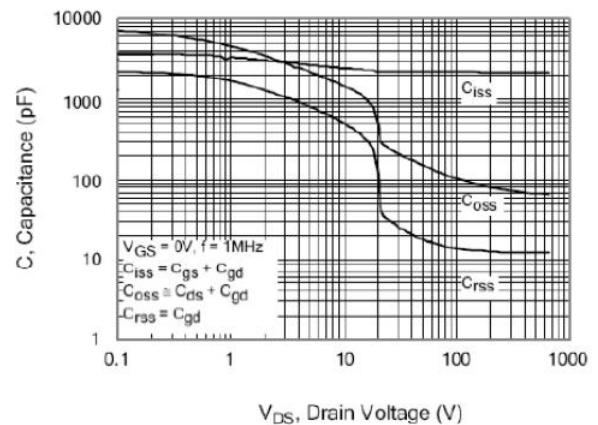


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

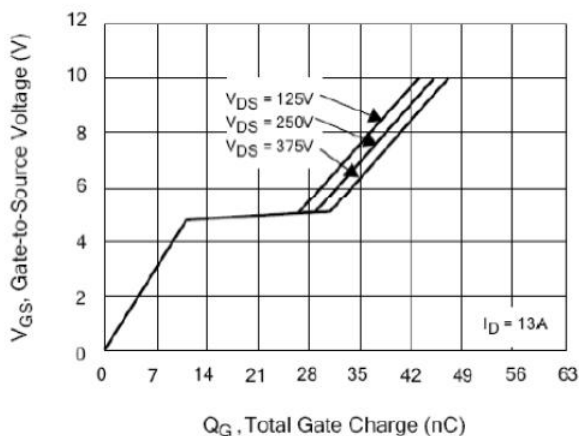


Figure 16. Typical Body Diode Transfer Characteristics

