

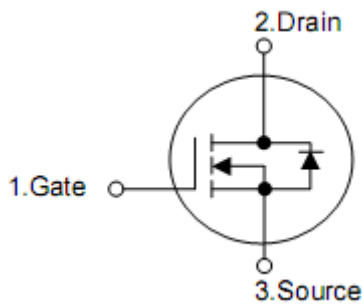
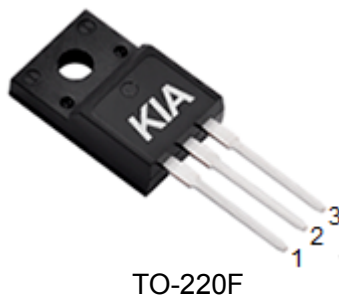
1. Features

- Fast Switching
- $R_{DS(ON)}=0.8\Omega(\text{typ.})@V_{GS}=10V$
- 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
KNF6165C	TO-220F	KIA

5. Absolute maximum ratings

(T_c= 25 °C , unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-to-Source Voltage		V _{DSS}	650	V
Gate-to-Source Voltage		V _{GSS}	±30	V
Continuous Drain Current	T _c =25°C	I _D	10	A
	T _c =100°C	I _D	6.3	A
Pulsed Drain Current ¹⁾		I _{DM}	40	A
Single Pulse Avalanche Energy ²⁾		EAS	500	mJ
Peak Diode Recovery dv/dt ³⁾		dv/dt	5.0	V/ns
Power Dissipation		P _D	40	W
Derating Factor above 25°C		P _D	0.32	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
Thermal Resistance, Junction-to-Case	R _{θJC}	3.13	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62.5	°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	650	-	-	V
BVDSS Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250uA, Reference 25°C	-	0.7	-	V/°C
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V	-	-	1	uA
		V _{DS} =520V, 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 =5A	-	0.8	0.9	Ω
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA	2.0	-	4.0	V
Forward Transconductance ⁴⁾	g _{fs}	V _{DS} =15V, I _D =5A	-	9.5	-	S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1.0MHZ	-	1645	-	pF
Reverse Transfer Capacitance	C _{oss}		-	130	-	
Output Capacitance	C _{rss}		-	8	-	
Total Gate Charge	Q _g	V _{DD} =325V, I _D =10A, V _{GS} =10V	-	35	-	nC
Gate-to-Source Charge	Q _{gs}		-	10	-	
Gate-to-Drain (Miller) Charge	Q _{gd}		-	15	-	
Turn-on Delay Time	t _{d(ON)}	V _{DD} =325V, I _D =10A, R _G =10Ω, V _{GS} =10V	-	29	-	nS
Rise Time	t _{rise}		-	25	-	
Turn-Off Delay Time	t _{d(OFF)}		-	56	-	
Fall Time	t _{fall}		-	26	-	
Continuous Source Current	I _{SD}	-	-	-	10	A
Pulsed Source Current	I _{SM}	-	-	-	40	A
Forward Voltage	V _{SD}	I _S =10A, V _{GS} =0V	-	-	1.5	V
Reverse recovery time	t _{rr}	I _F =10A, T _J =25°C diF/dt=100A/μs, V _{GS} =10V	-	540	-	ns
Reverse recovery charge	Q _{rr}		-	3310	-	uC

Note:

- 1) Repetitive rating; pulse width limited by maximum junction temperature.
- 2) L=10mH, I_D=10A, Start T_J=25°C.
- 3) I_{SD}=10A, di/dt≤100A/μs, V_{DD}≤BV_{DS}, Start T_J=25°C.
- 4) Pulse width≤380μs; duty cycle≤2%.

8. Test circuits and waveforms

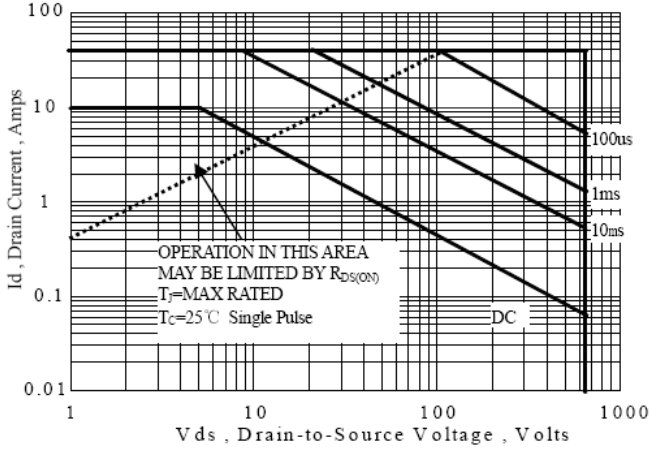


Figure 1 Maximum Forward Bias Safe Operating Area

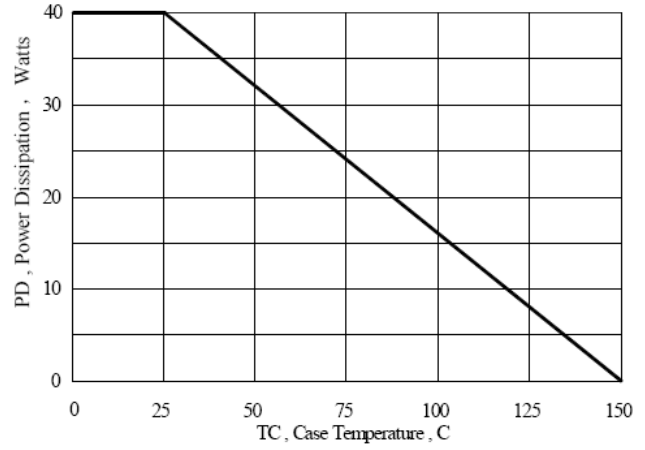


Figure 2 Maximum Power Dissipation vs Case Temperature

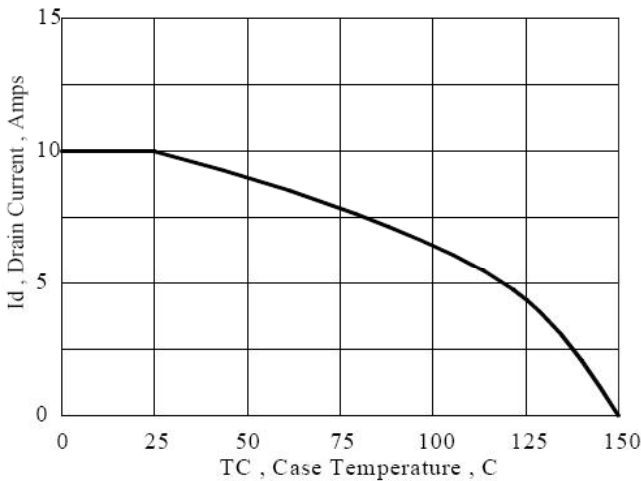


Figure 3 Maximum Continuous Drain Current vs Case Temperature

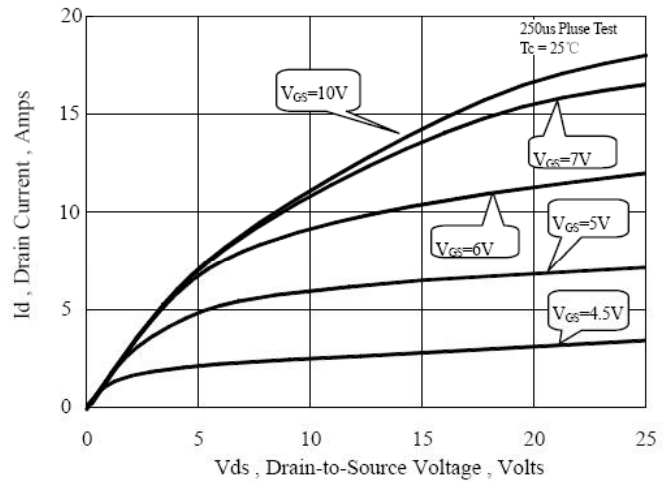


Figure 4 Typical Output Characteristics

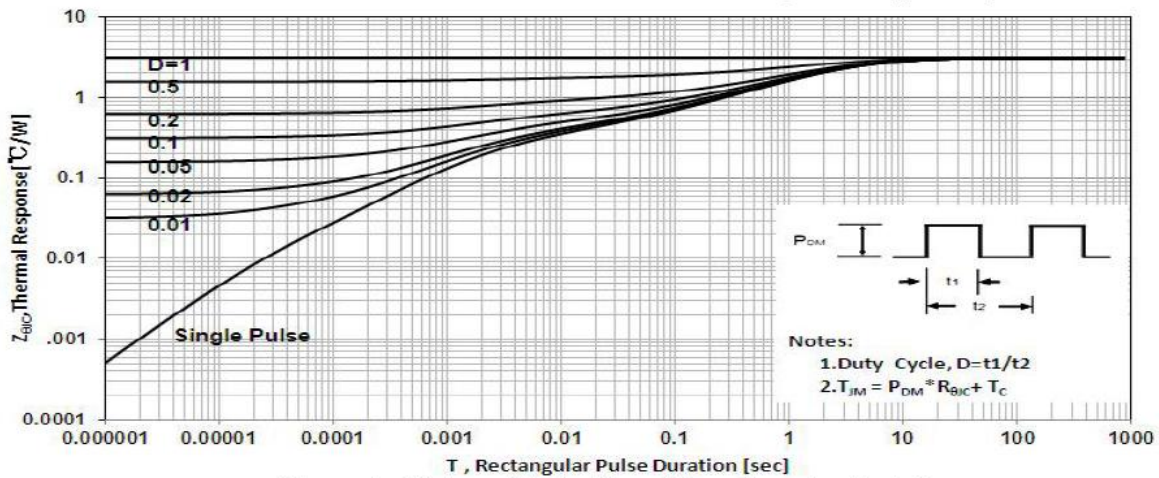


Figure 5 Maximum Effective Thermal Impedance, Junction to Case

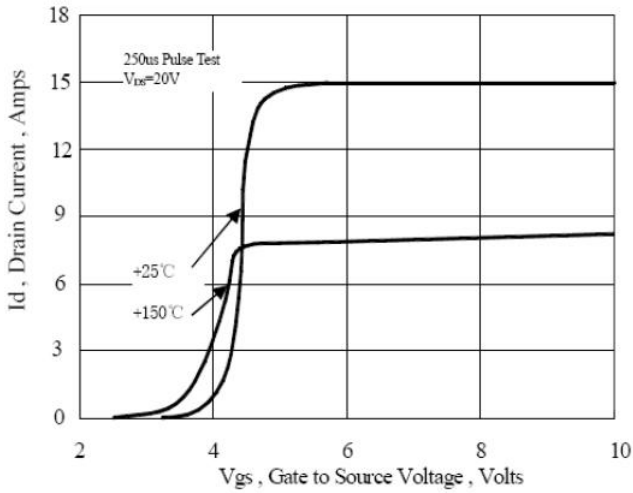


Figure 6 Typical Transfer Characteristics

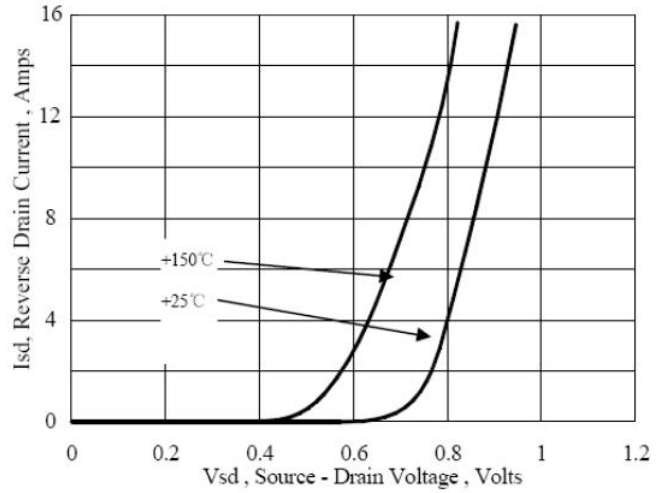


Figure 7 Typical Body Diode Transfer Characteristics

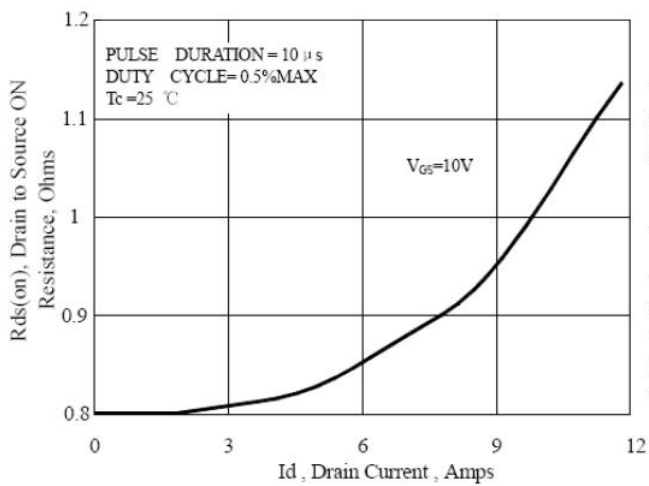


Figure 8 Typical Drain to Source ON Resistance vs Drain Current

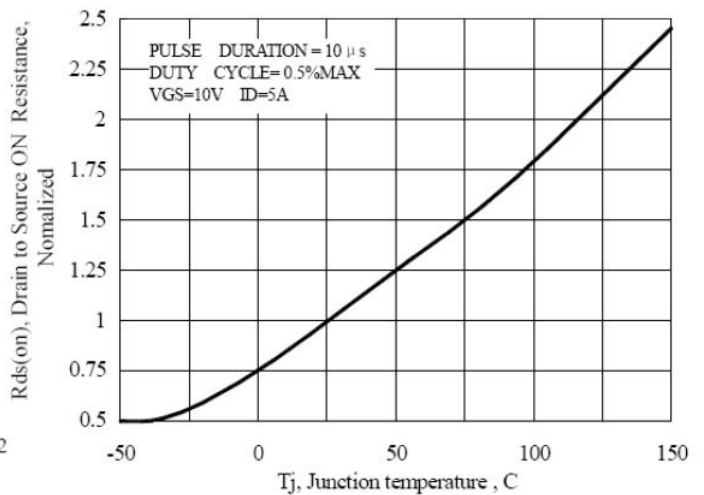


Figure 9 Typical Drain to Source on Resistance vs Junction Temperature

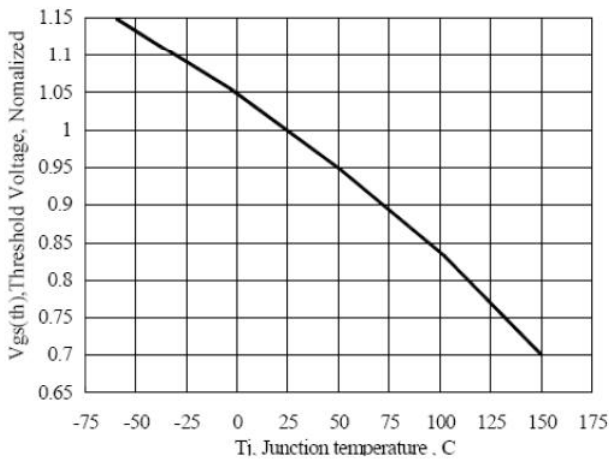


Figure 10 Typical Theshold Voltage vs Junction Temperature

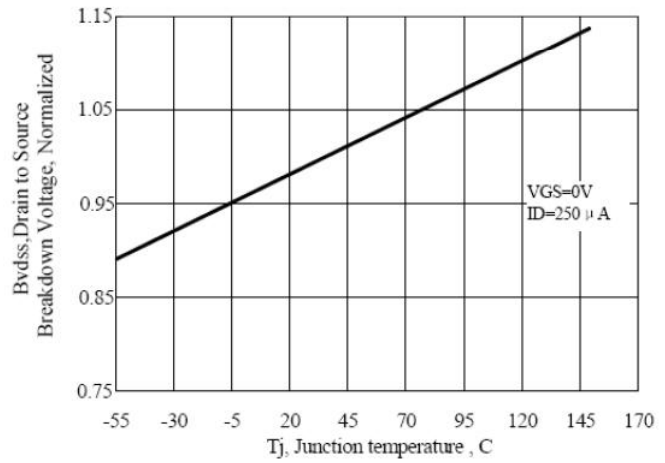


Figure 11 Typical Breakdown Voltage vs Junction Temperature

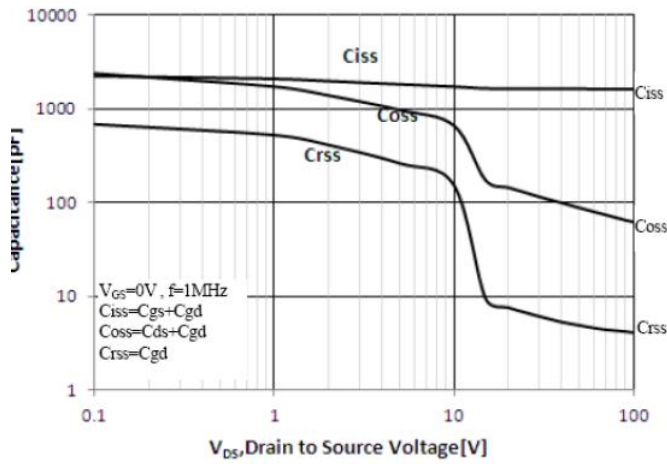


Figure 12 Typical Capacitance vs Drain to Source Voltage

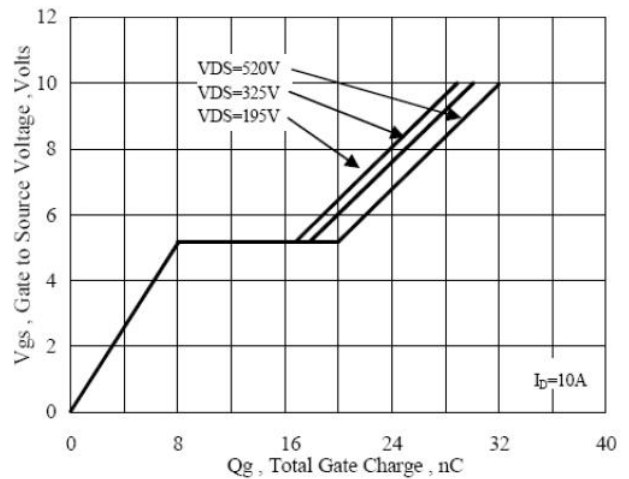


Figure 13 Typical Gate Charge vs Gate to Source Voltage