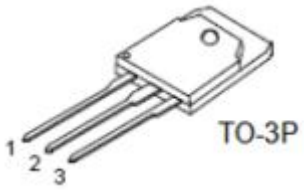
1. Features

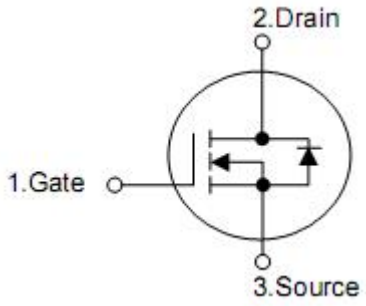
- Proprietary New Planar Technology
- $R_{DS(ON),typ.}$=20mΩ@V_{GS}=10V
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

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
KNH3320A	TO-3P	KIA

5. Absolute maximum ratings

TC=25 °C unless otherwise specified

Parameter	Symbol	Ratings	Unit
Drain-to-Source Voltage [1]	V_{DSS}	200	V
Gate-to-Source Voltage	V_{GSS}	±20	
Continuous Drain Current	I_D	90	A
Continuous Drain Current @ Tc=100 °C		70	
Pulsed Drain Current at V_{GS}=10V [2]	I_{DM}	360	
Single Pulse Avalanche Energy	E_{AS}	2500	mJ
Peak Diode Recovery dv/dt[3]	dv/dt	5.0	V/ns
Power Dissipation	P_D	575	W
Derating Factor above 25 °C		3.8	W/ °C
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	°C
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
Thermal resistance, junction-ambient	$R_{\theta JA}$	50	°C/W
Thermal resistance, Junction-case	$R_{\theta JC}$	0.26	

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	200	-	-	V
Drain-to-source Leakage Current	I_{DSS}	V_{DS}=200V ,V_{GS}=0V	-	-	10	μA
		V_{DS}=160V , V_{GS}=0V T_J=125ºC,	-	-	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[4]	$R_{DS(on)}$	V_{DS}=10V,I_D=45A	-	20	25	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=56A	-	62	-	S
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1MHz	-	6350	-	pF
Output capacitance	C_{oss}		-	1200	-	pF
Reverse transfer capacitance	C_{rss}			800	-	pF
Total gate charge						
Turn-on delay time	$t_{d(on)}$	V_{DD}=100V,I_D=56A, V_{GS}=10V,R_G=1.2Ω	-	18	-	ns
Rise time	t_r		-	120	-	ns
Turn-off delay time	$t_{d(off)}$		-	68	-	ns
Fall time	t_f		-	100	-	ns
Total gate charge	Q_g	V_{DD}=100V,I_D=56A , V_{GS}=0 to10V	-	200	-	nC
Gate-source charge	Q_{gs}		-	31	-	nC
Gate-drain charge	Q_{gd}		-	88	-	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	-	-	90	A
Pulsed drain-source current[4]	I_{SM}		-	-	360	A
Reverse recovery time	t_{rr}	V_{GS}=0V,I_F=56A DI_F/dt=100A/μs	-	390	-	ns
Reverse recovery charge	Q_{rr}		-	2.5	-	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 Effective Thermal Impedance, Junction-to-Case

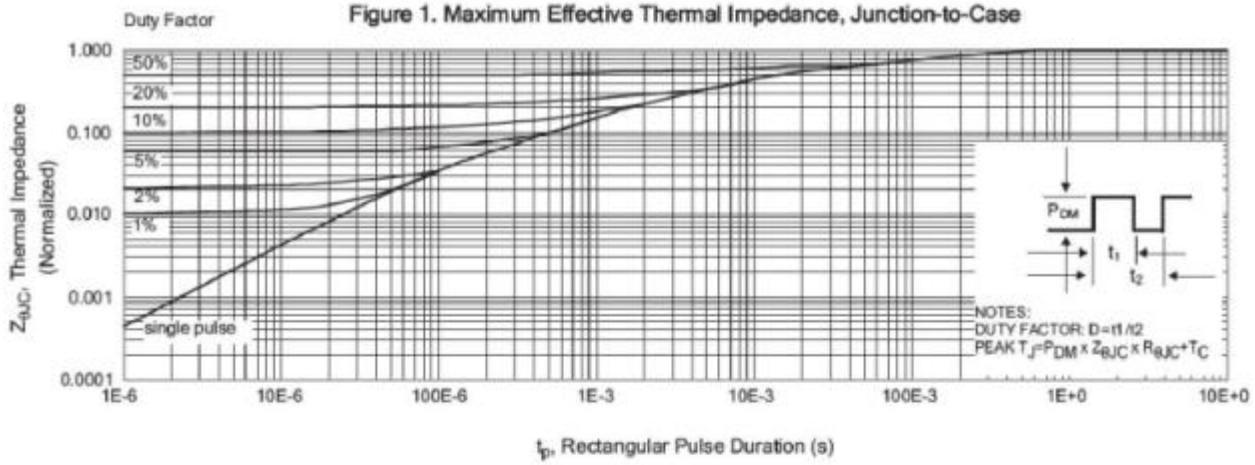


Figure 2 . Max. Power Dissipation vs Case Temperature

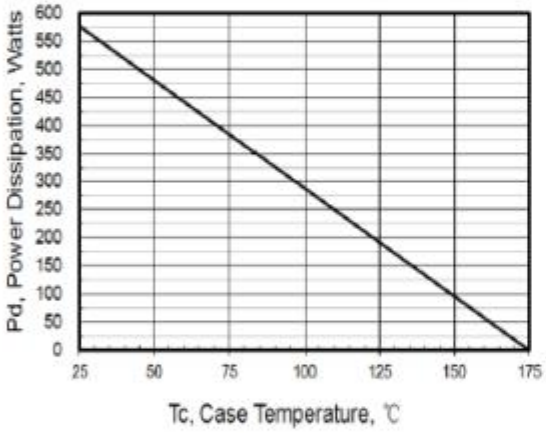


Figure 3 .Maximum Continuous Drain Current vs Tc

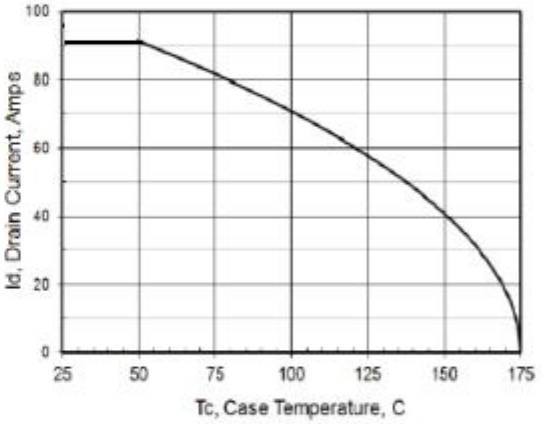


Figure 4. Typical Output Characteristics

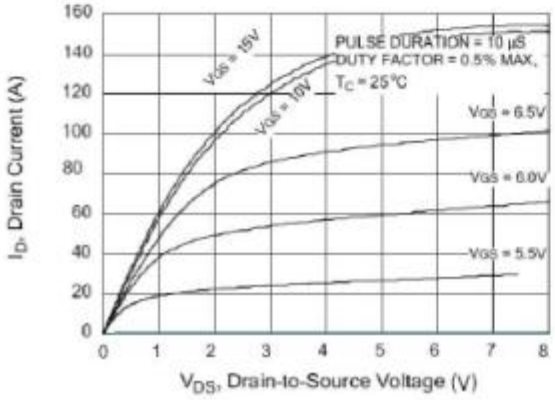


Figure5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

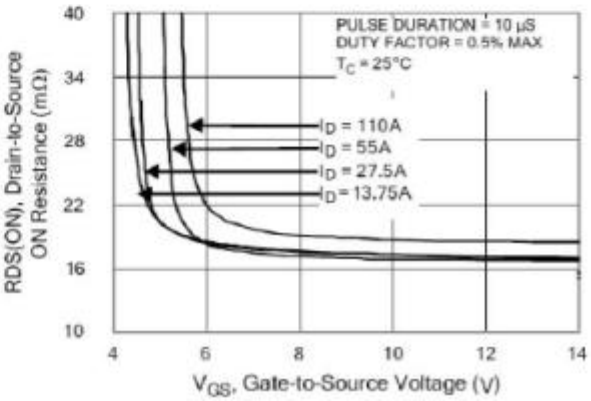


Figure 6. Peak Current Capability

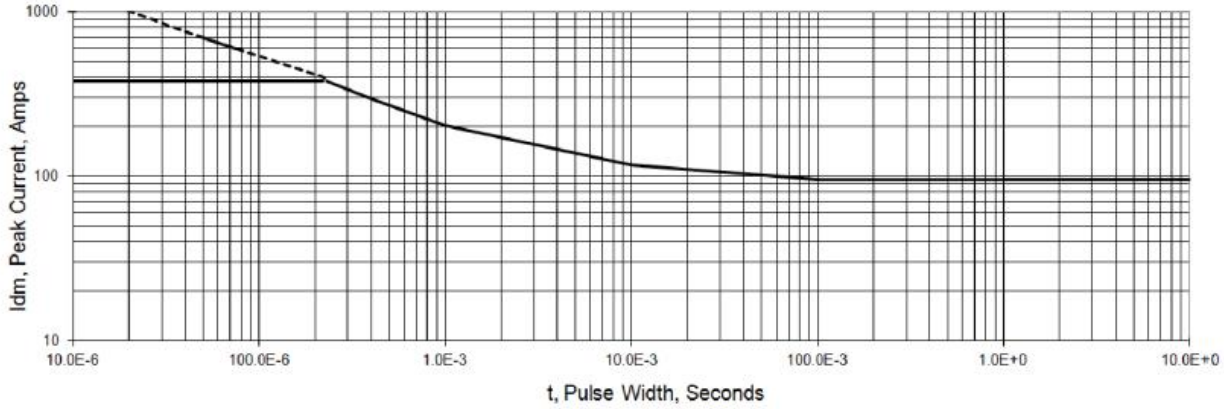


Figure 7. Typical Transfer Characteristics

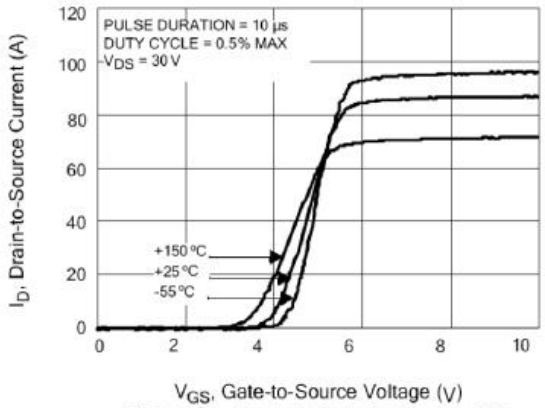


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

Figure 8. Unclamped Inductive Switching Capability

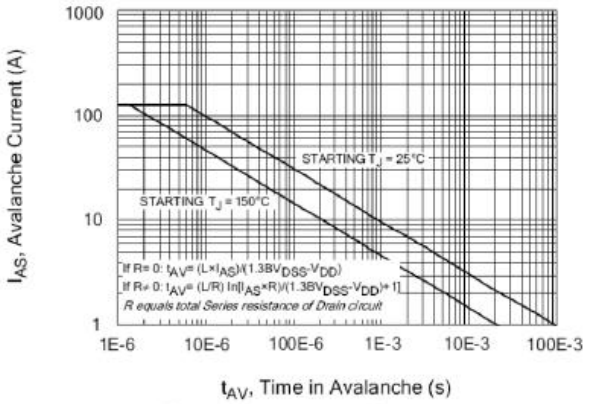
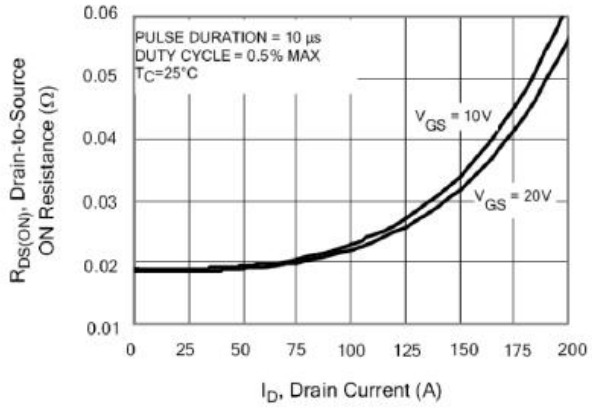


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature



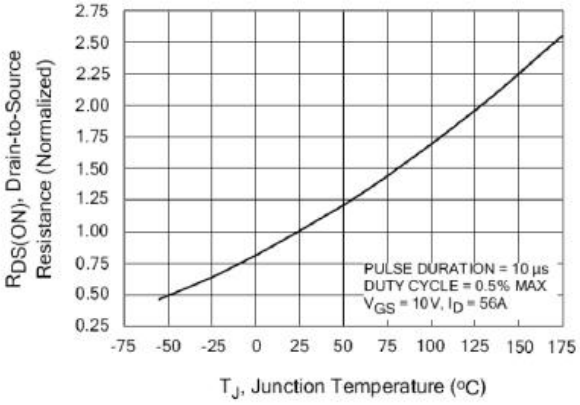


Figure 11. Typical Breakdown Voltage vs Junction Temperature

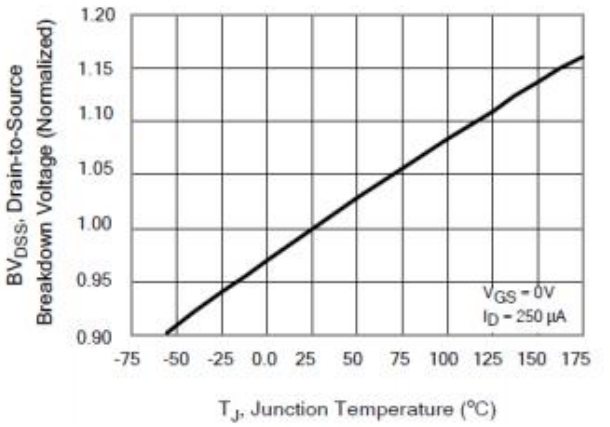


Figure 12. Typical Threshold Voltage vs Junction Temperature

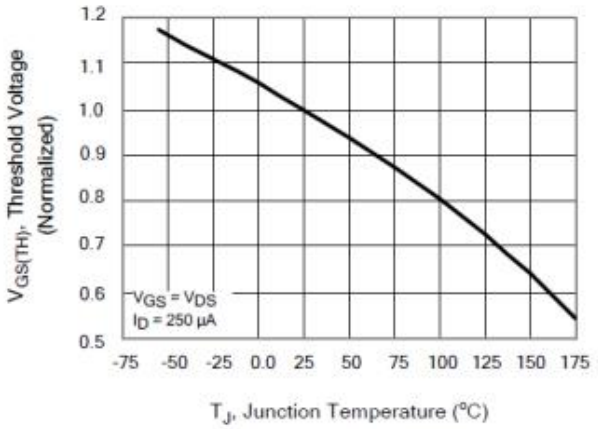


Figure 13 . Maximum Safe Operating Area

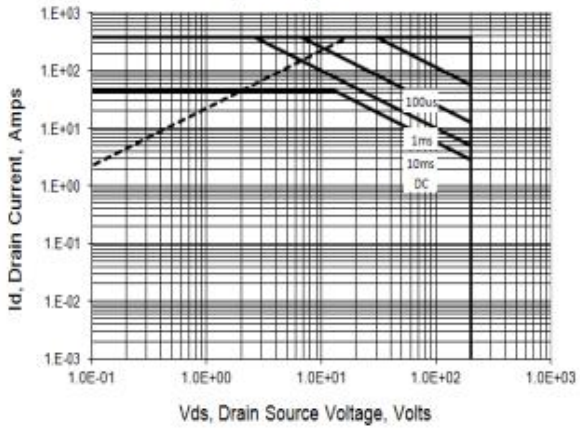


Figure 14. Capacitance vs Vds

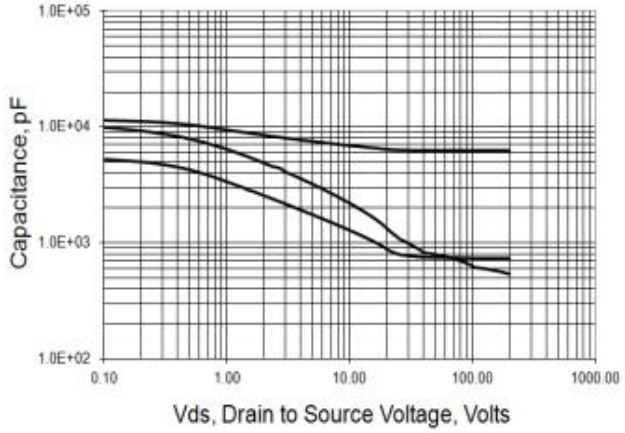


Figure 15 .Typical Gate Charge

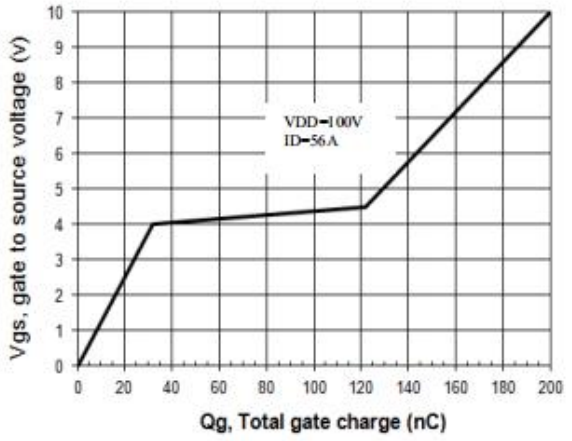


Figure 16. Typical Body Diode Transfer Characteristics