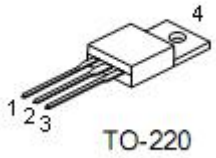
1. General Features

- $R_{DS(ON),typ.}$=4mΩ(typ.)@V_{GS}=10V
- Proprietary New Trench Technology
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

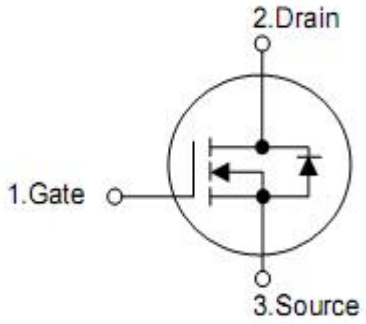
2. Applications

- DC-DC converters
- DC-DC Inverters
- Power Supply

3. Pin configuration



TO-220



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Ordering Information

Part Number	Package	Brand
KNP2404N	TO-220	KIA

5.Absolute maximum ratings

(T_C= 25 ºC , unless otherwise specified)

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain-to-Source Voltage[1]	40	V
V_{GSS}	Gate-to-Source Voltage	±20	
I_D	Continuous Drain Current[2]	190	A
	Continuous Drain Current[3]	80	
I_{DM}	Pulsed Drain Current at V_{GS}=10V[2,4]	480	
E_{AS}	Single Pulse Avalanche Energy	1200	mJ
dv /dt	Peak Diode Recovery dv/dt[3]	5.0	V/ns
P_D	Power Dissipation	333	W
	Derating Factor above 25 ºC	2	W/ ºC
T_L T_{PAK}	Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	300 260	ºC
T_J&T_{STG}	Operating and Storage Temperature Range	-55 to 175	

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

* Drain current limited by maximum junction temperature.

6. Thermal characteristics

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.45	ºC /W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	

6. Electrical characteristics

OFF Characteristics		(TJ=25°C,unless otherwise specified)				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-to-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	40	--	--	V
I_{DSS}	Drain-to-Source Leakage Current	V_{DS}=40V, V_{GS}=0V	--	--	1	uA
		V_{DS}=32V,V_{GS}=0V, T_J=125°C	--	--	100	
I_{GSS}	Gate-to-Source Leakage Current	V_{GS}=+20V,V_{DS}=0V	--	--	+100	nA
		V_{GS}=-20V, V_{DS}=0V	--	--	-100	
ON Characteristics		(TJ=25°C,unless otherwise specified)				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance[4]	V_{GS}=10V, I_D=80A[5]	--	4.0	5.0	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	2.0	--	4.0	V
Dynamic Characteristics		Essentially independent of operating temperature				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1.0MHZ	--	3850	--	pF
C_{oss}	Output Capacitance		--	1750	--	
C_{rss}	Reverse Transfer Capacitance		--	420	--	
R_g	Gate Series Resistance	f=1.0MHZ	--	1.5	--	Ω
Q_g	Total Gate Charge	V_{DD}=20V, I_D=80A, V_{GS}=0 to 10V	--	97	--	nC
Q_{gs}	Gate-to-Source Charge		--	18	--	
Q_{gd}	Gate-to-Drain (Miller) Charge		--	37	--	
Resistive Switching Characteristics		Essentially independent of operating temperature				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, I_D=50A, V_{GS}= 10V R_G=10Ω	--	32	--	nS
t_{rise}	Rise Time		--	90	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	100	--	
t_{fall}	Fall Time		--	72	--	
Source-Drain Body Diode Characteristics		(T_J=25°C,unless otherwise specified)				
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Unit
I_{SD}	Continuous Source Current[4]	Integral PN-diode in MOSFET	--	--	190	A
I_{SM}	Pulsed Source Current[4]		--	--	480	
V_{SD}	Diode Forward Voltage	I_S=80A, V_{GS}=0V	--	--	1.3	V
t_{rr}	Reverse recovery time	V_{GS}=0V ,I_F=80A, diF/dt=100A/μs	--	76	--	ns
Q_{rr}	Reverse recovery charge		--	35	--	nC

Note:
[1] T J =+25 ºC to +175 ºC.
[2] [2] Silicon limited current only.
[3] [3] Package limited current.
[4] Repetitive rating; pulse width limited by maximum junction temperature.
[5] Pulse width≤380μs; duty cycle≤2%.

7. Test circuits and waveforms

Figure 1. Maximum Transient Thermal Impedance

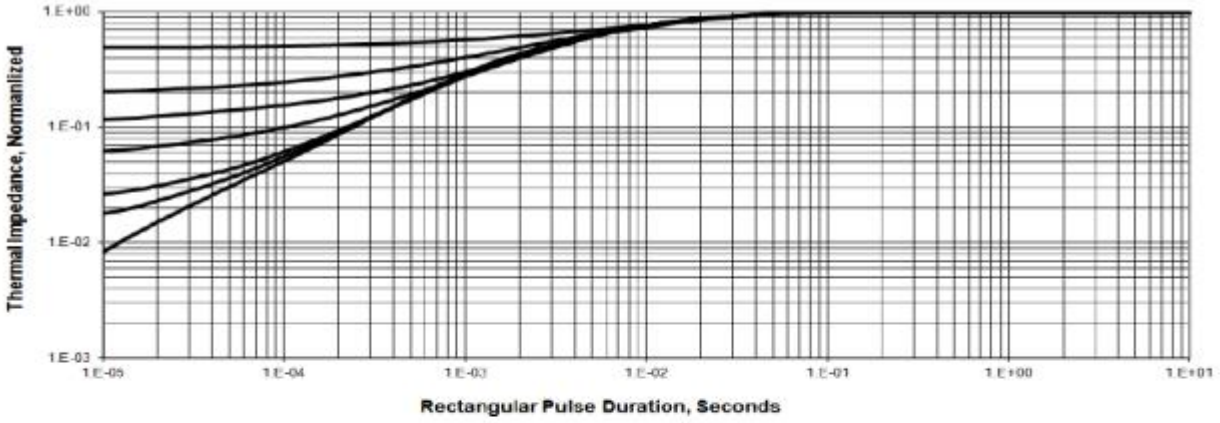


Figure 2 . Max. Power Dissipation vs Case Temperature

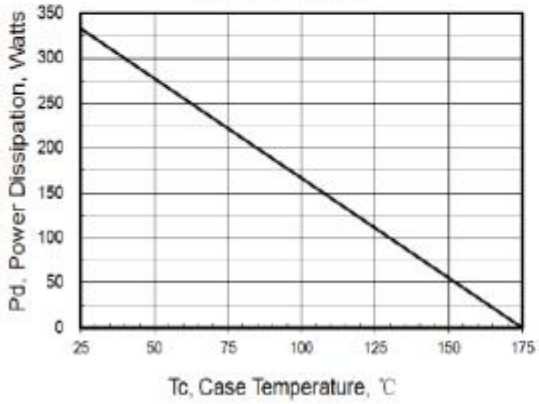


Figure 3 .Maximum Continuous Drain Current vs Tc

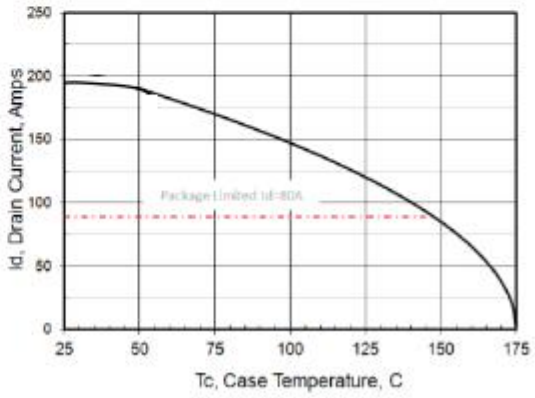


Figure 4. Typical Output Characteristics

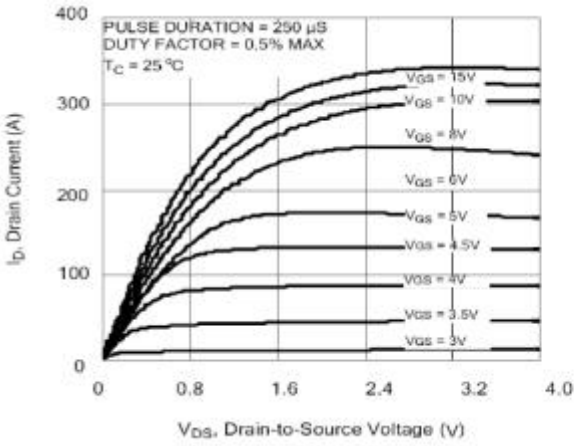


Figure5. Typical Drain-to-Source ON Resistanc vs Gate Voltage and Drain Current

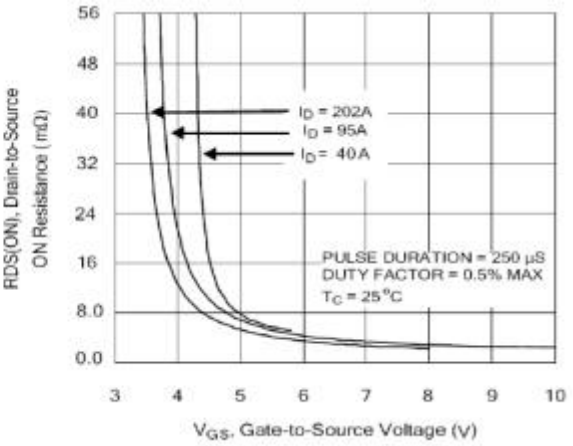


Figure 6. Peak Current Capability

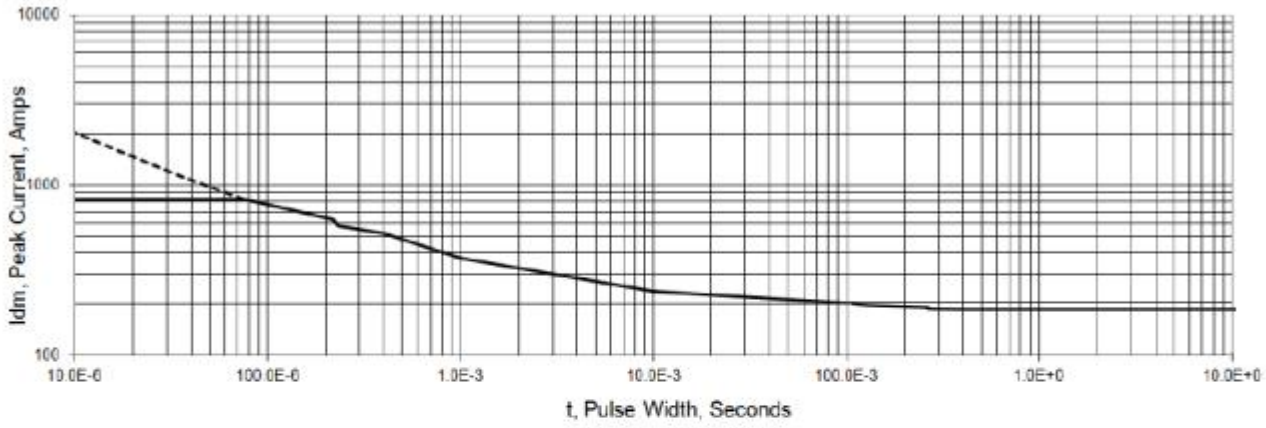


Figure 7. Typical Transfer Characteristics

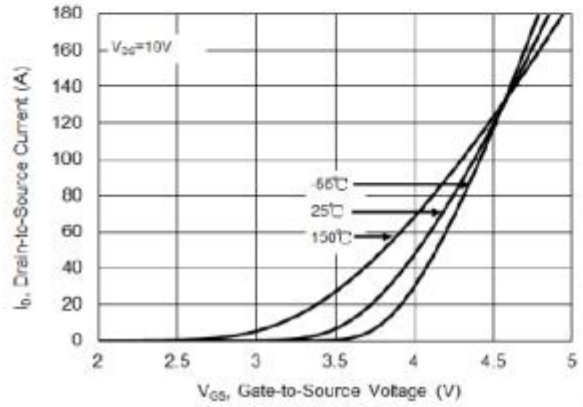


Figure 8. Unclamped Inductive Switching Capability

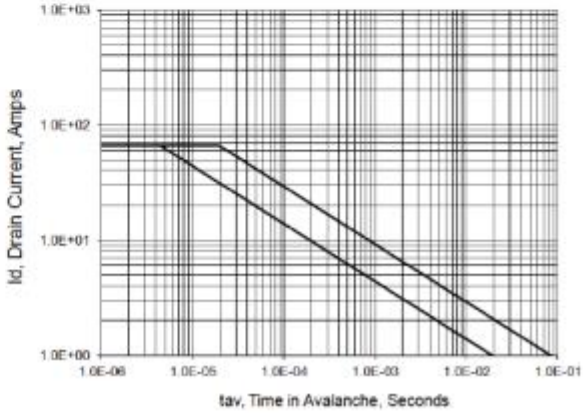


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

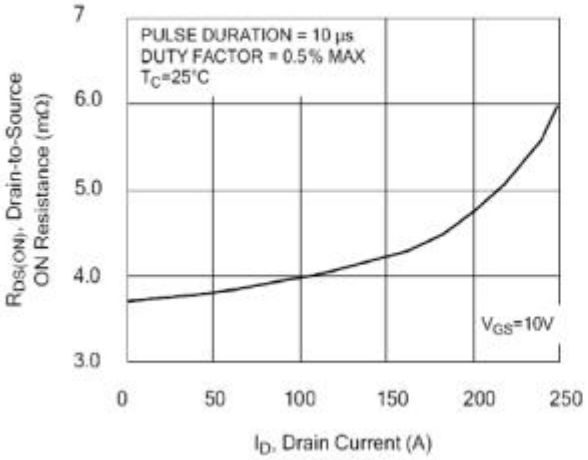


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

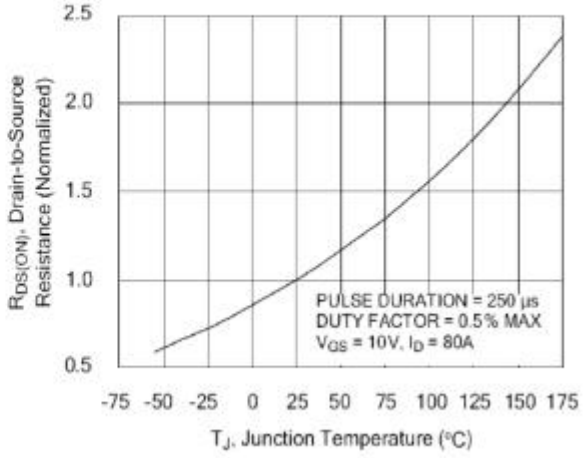


Figure 11.Typical Breakdown Voltage vs. Junction Temperature

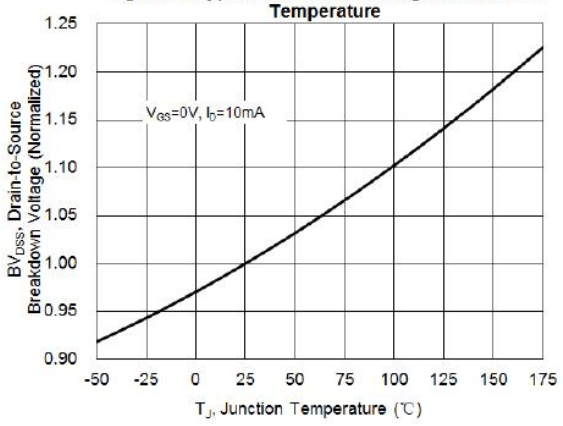


Figure 12.Typical Threshold Voltage vs. Junction Temperature

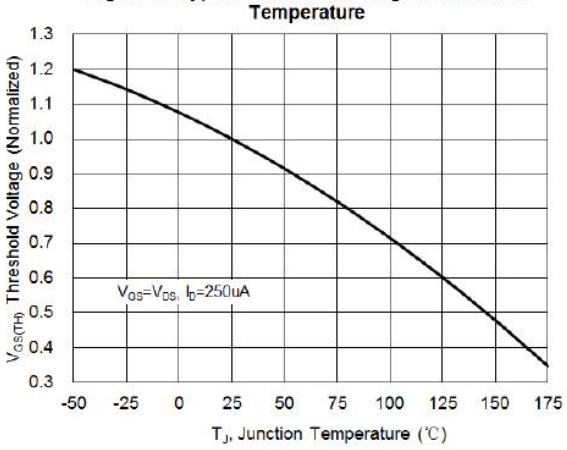


Figure 13. Maximum Forward Safe Operation Area

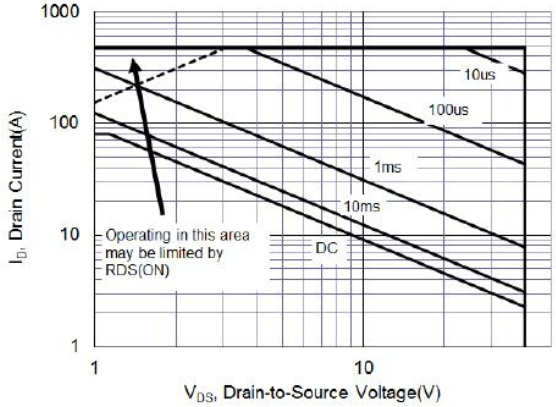


Figure 14. Typical Capacitance vs. Drain-to-Source Voltage

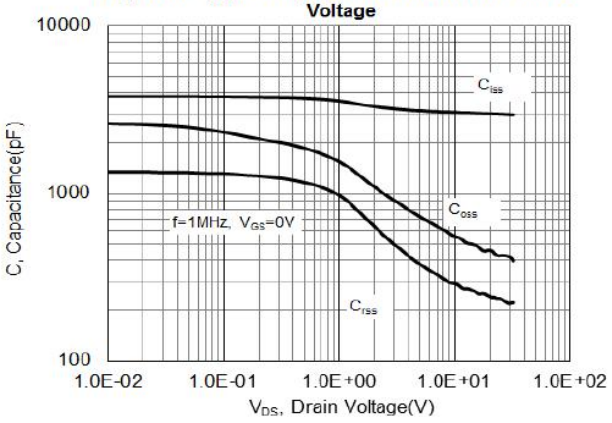


Figure 15 .Typical Gate Charge

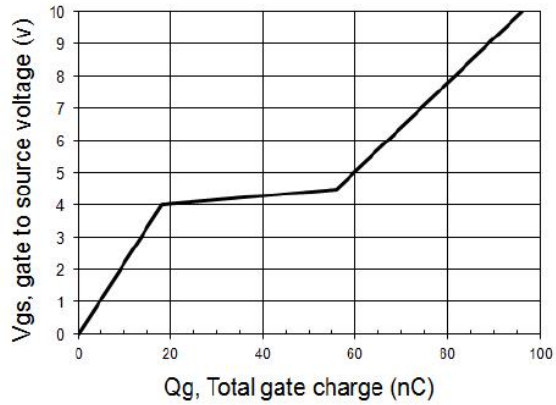
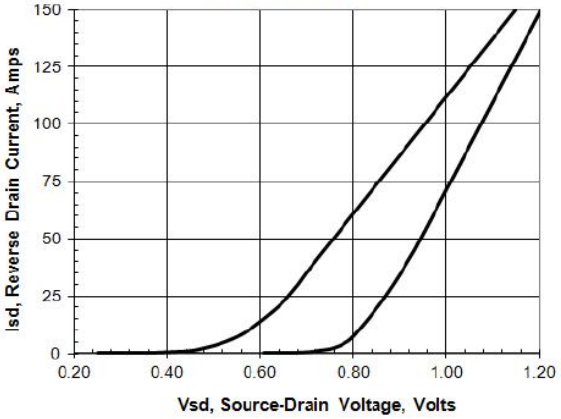


Figure 16 .Body Diode Transfer Characteristics



X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET ***category:***

Click to view products by KIA ***manufacturer:***

Other Similar products are found below :

IRFD120 JANTX2N5237 BUK455-60A/B MIC4420CM-TR VN1206L NDP4060 SI4482DY IPS70R2K0CEAKMA1 SQD23N06-31L-GE3 TK16J60W,S1VQ(O 2SK2614(TE16L1,Q) DMN1017UCP3-7 DMN1053UCP4-7 SQJ469EP-T1-GE3 NTE2384 DMC2700UDMQ-7 DMN2080UCB4-7 DMN61D9UWQ-13 US6M2GTR DMN31D5UDJ-7 DMP22D4UFO-7B DMN1006UCA6-7 DMN16M9UCA6-7 STF5N65M6 IRF40H233XTMA1 STU5N65M6 DMN6022SSD-13 DMN13M9UCA6-7 DMTH10H4M6SPS-13 DMN2990UFB-7B IPB80P04P405ATMA2 2N7002W-G MCAC30N06Y-TP MCQ7328-TP BXP7N65D BXP4N65F AOL1454G WMJ80N60C4 BXP2N20L BXP2N65D BXT1150N10J BXT1700P06M TSM60NB380CP ROG RQ7L055BGTCR DMNH15H110SK3-13 SLF10N65ABV2 BSO203SP BSO211P IPA60R230P6 IPA60R460CE