

1. Description

KNX2408A, uses advanced trench technology to provide excellent $R_{DS(ON)}$, Low gate charge, It can be used in a wide variety of applications.

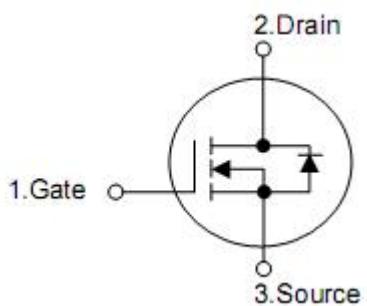
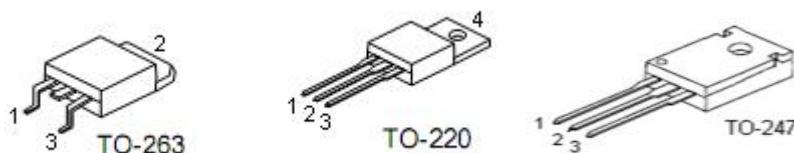
2. Features

- $V_{DS}=80V, I_D=190A R_{DS(ON)\text{ (typ.)}}=3.7m\Omega @ V_{GS}=10V$
- High density cell design for lower $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

3. Applications

- Power switching application
- Hard switched and High frequency circuits
- Uninterruptible power supply

4. Symbol



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

5. Ordering Information

Part Number	Package	Brand
KNB2408A	TO-263	KIA
KNP2408A	TO-220	KIA
KNM2408A	TO-247	KIA

6. Absolute maximum ratings

Parameter	Symbol	Rating		Units
		TO-220	TO-247	
Drain-source voltage	V_{DSS}	80		V
Gate-source voltage	V_{GSS}	± 20		V
Maximum junction temperature	T_J	175		°C
Storage temperature range	T_{STG}	-55 to 175		°C
Continuous drain current	I_D	190		A
Pulse drain current ^(Note1)	I_{DM}	760		A
Avalanche energy, single pulsed ^(Note2)	E_{AS}	1.4		J
Maximum power dissipation	P_D	270	326	W

7. Thermal characteristics

Symbol	Parameter	Max		Unit
		TO-220	TO-247	
R_{eJC}	Thermal Resistance, Junction-to-Case	0.55	0.46	°C / W

8. Electrical characteristics

($T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	80	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=80\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
Gate-Soure Forward Leakage	$I_{\text{GSS(F)}}$	$V_{\text{GS}}=+20\text{V}$	-	-	100	nA
Gate-Soure Reverse Leakage	$I_{\text{GSS(R)}}$	$V_{\text{GS}}=-20\text{V}$	-	-	-100	nA
On Characteristics						
Drain-source on-Resistance ^(Note 3)	$R_{\text{DS(on)}}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=40\text{A}$	-	3.7	4.5	$\text{m}\Omega$
Gate threshold voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$	2.0	2.8	4.0	V
Forward Transconductance	g_{fs}	$V_{\text{DS}}=5\text{V}, I_{\text{D}}=15\text{A}$	-	15	-	S
Dynamic Characteristics						
Total gate charge	Q_g	$V_{\text{DS}}=64\text{V}, V_{\text{GS}}=10\text{V}$ $I_{\text{D}}=80\text{A}$	-	260	-	nC
Gate-source charge	Q_{gs}		-	75	-	
Gate-drain charge	Q_{gd}		-	80	-	
Turn-on delay time	$t_{\text{d(on)}}$	$V_{\text{DD}}=40\text{V},$ $I_{\text{D}}=40\text{A},$ $R_{\text{GEN}}=3\Omega,$ $V_{\text{GS}}=10\text{V},$	-	25	-	ns
Rise time	t_r		-	21	-	
Turn-off delay time	$t_{\text{d(off)}}$		-	48	-	
Fall time	t_f		-	18	-	
Switching Characteristics ^(Note 4)						
Input capacitance	C_{iss}	$V_{\text{DS}}=25\text{V}, V_{\text{GS}}=0\text{V},$ $f=1\text{MHz}$	-	13500	-	pF
Output capacitance	C_{oss}		-	950	-	
Reverse transfer capacitance	C_{rss}		-	810	-	
Drain-Source Diode Characteristics						
Diode Forward voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{s}}=40\text{A}$	-	-	1.3	V

Note

- Repetitive Rating: Pulse width limited by maximum junction temperature.
- EAS condition : $T_j=25^\circ\text{C}, V_{\text{DD}}=50\text{V}, V_G=10\text{V}, L=0.5\text{mH}, R_g=25\Omega$
- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- Guaranteed by design, not subject to production.

9. Test circuits

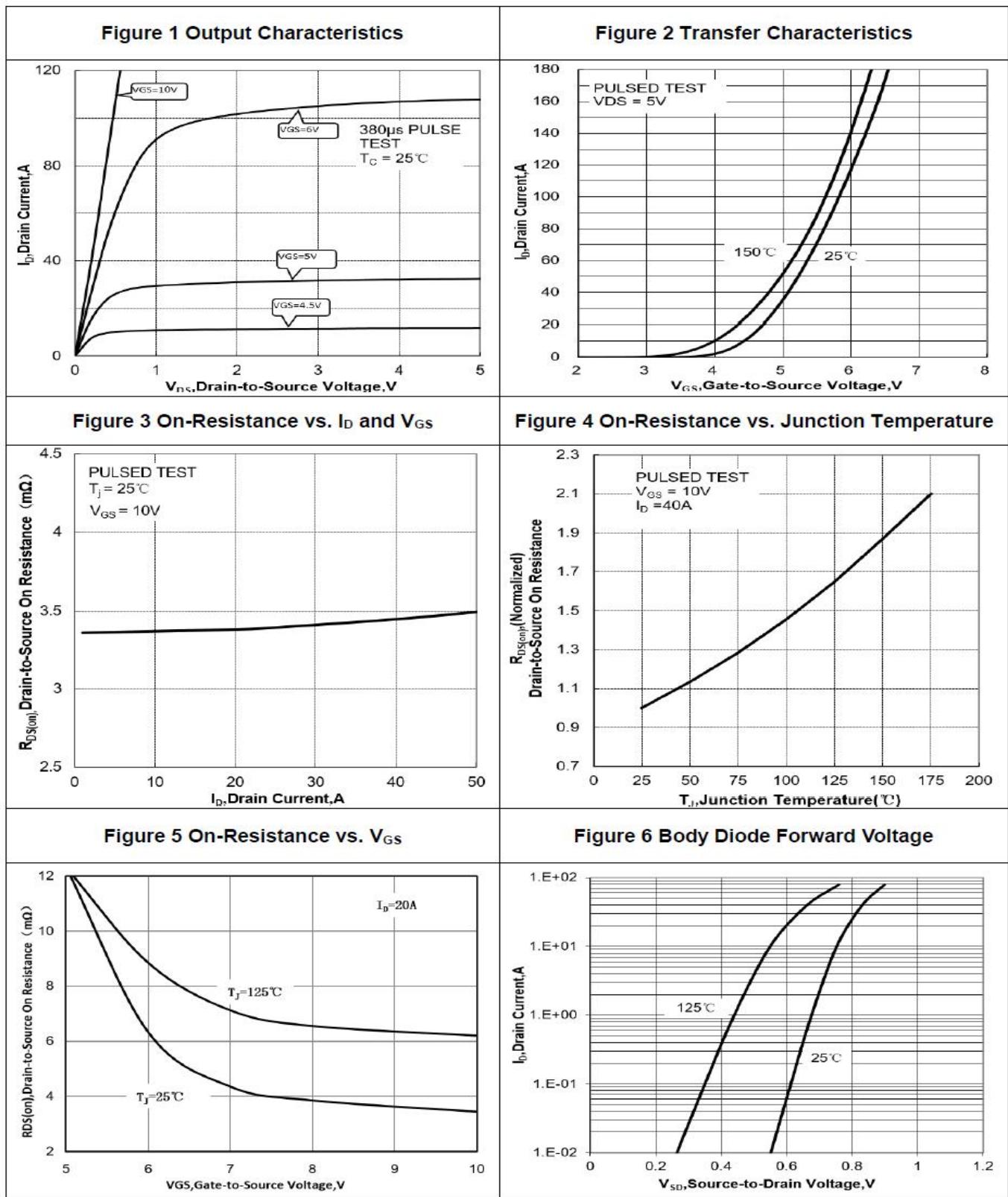


Figure 7 Gate-Charge Characteristics

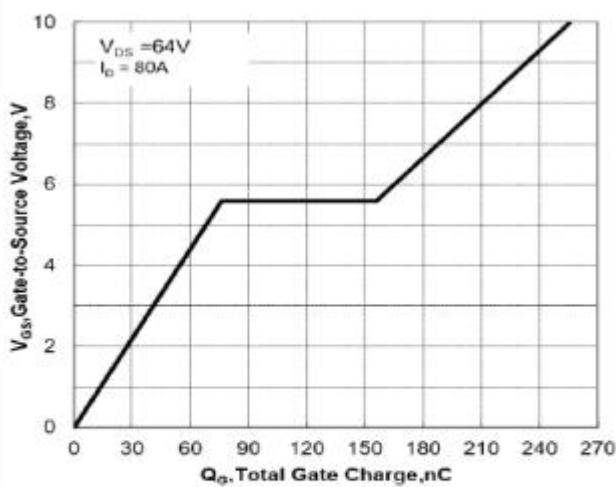


Figure 8 Capacitance Characteristics

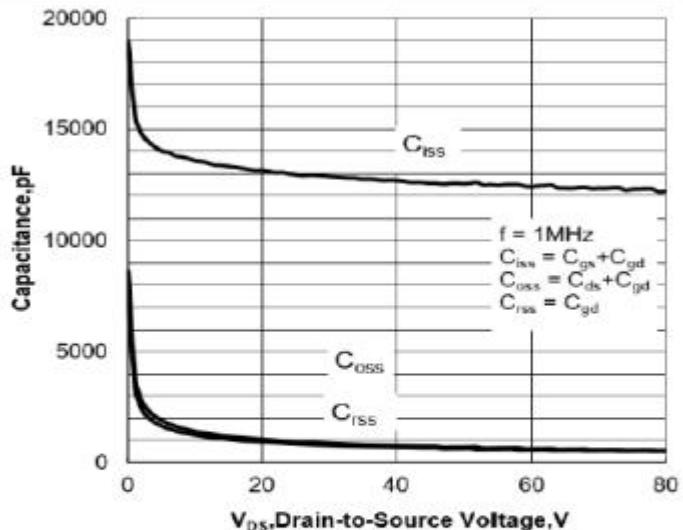


Figure 9 Maximum Forward Biased Safe Operation Area

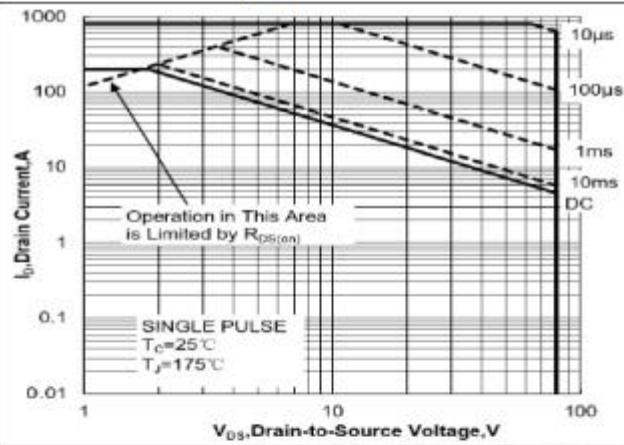


Figure 10 Single Pulse Power Rating Junction-to-Ambient

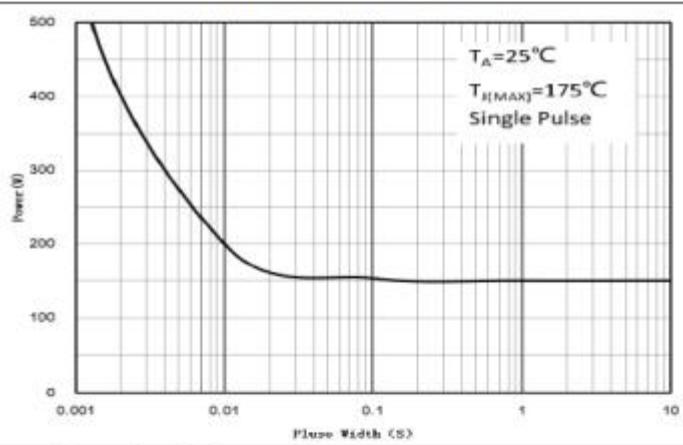


Figure 11 Normalized Maximum Transient Thermal Impedance

