1. Description

The KNX3302A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching applications.

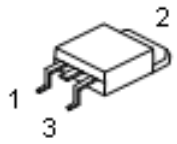
2. Features

- $R_{DS(on)}$=3.8mΩ(typ.) @ V_{GS}=4.5V
- V_{DS}=20V I_D=85A

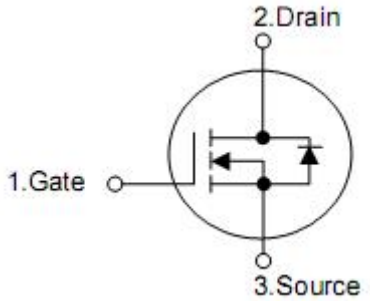
3. Applications

- Battery protection
- Load switch
- Uninterruptible power supply

4.Symbol



TO-252



Pin	Function
1	Gate
2	Drain
3	Source

5. Ordering Information

Part Number	Package	Brand
KND3302A	TO-252	KIA

6. Absolute maximum ratings

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DS}	20	V
Gate-source voltage		V_{GS}	±12	V
Continuous drain current, V_{GS} @10V	T_C=25ºC	I_D	85	A
	T_C=100ºC		59	A
Pulsed drain current		I_{DM}	340	A
Single pulse avalanche energy(Note5)		E_{AS}	338	mJ
Maximum power dissipation		P_D	87	W
Operation junction and temperature range		T_J, T_{STG}	-55 to150	ºC

7. Thermal characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal resistance,Junction-case	$R_{\theta JC}$	--	1.43	ºC/W

8. Electrical characteristics

(T_A=25°C,unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	20	-	-	V
Drain-source on-State resistance	$R_{DS(on)}$	V_{GS}=4.5V,I_D=25A	-	3.8	5.5	mΩ
		V_{GS}=2.5V,I_D=20A	-	5.0	7.5	
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.4	0.65	1.1	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V, V_{GS}=0V	-	-	1	μA
Gate- Body Leakage current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
Forward transconductance	gfs	V_{DS}=10V, I_D=20A	-	20	-	S
Total gate charge	Q_g	V_{DS}=10V, V_{GS}=10V I_D =20A	-	28	-	nC
Gate-source charge	Q_{gs}		-	6.5	-	
Gate-drain charge	Q_{gd}		-	6.4	-	
Turn-on delay time	$t_{d(on)}$	V_{DS}=10V,I_D=20A, R_G=3Ω, V_{GS}=4.5V	-	6.5	-	ns
Rise time	t_r		-	17.2	-	
Turn-off delay time	$t_{d(off)}$		-	29.5	-	
Fall time	t_f		-	16.7	-	
Input capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V, f=1MHz	-	3850	-	pF
Output capacitance	C_{oss}		-	500	-	
Reverse transfer capacitance	C_{rss}		-	480	-	
Diode Forward Current(Note2)	I_S		-	-	85	A
Diode Forward voltage(Note3)	V_{SD}	V_{GS}=0V,I_S=10A	-	-	1.3	V
Body diode reverse recovery time	t_{rr}	IF=20A.TJ=25 °C dI/dt=100A/us(Note3)	-	25	-	ns
Body diode reverse recovery charge	Q_{rr}		-	24	-	nC

Note:
1.Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition : Tj=25 °C, V_{DD}=20V,V_{GS}=4.5V,L=0.5mH,Id=26A

9. Test circuits

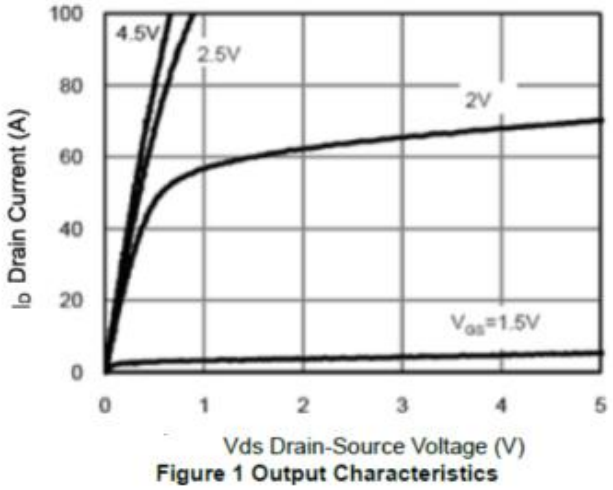


Figure 1 Output Characteristics

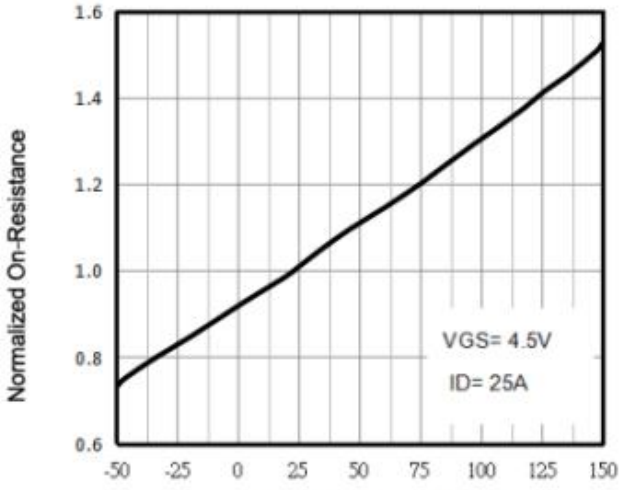


Figure 4 Rdson-JunctionTemperature

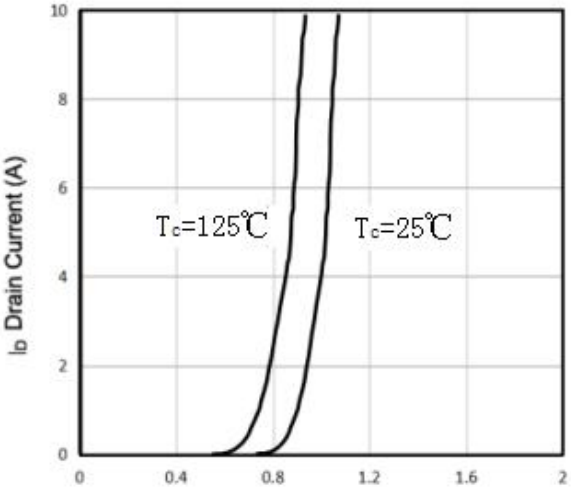


Figure 2 Transfer Characteristics

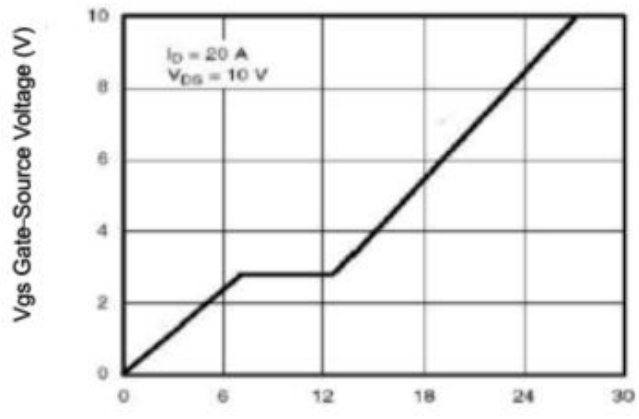


Figure 5 Gate Charge

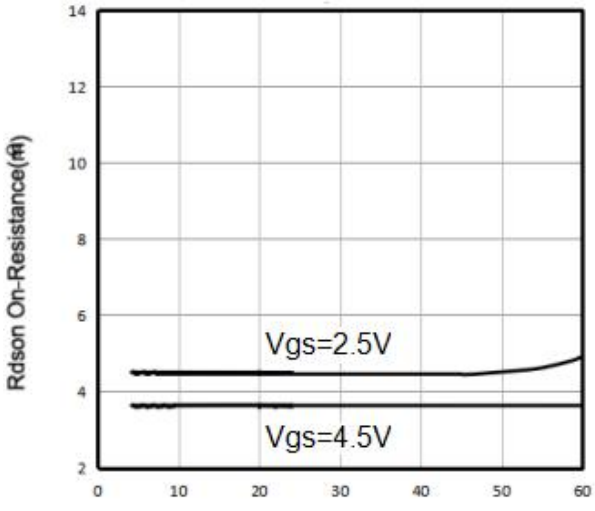


Figure 3 Rdson- Drain Current

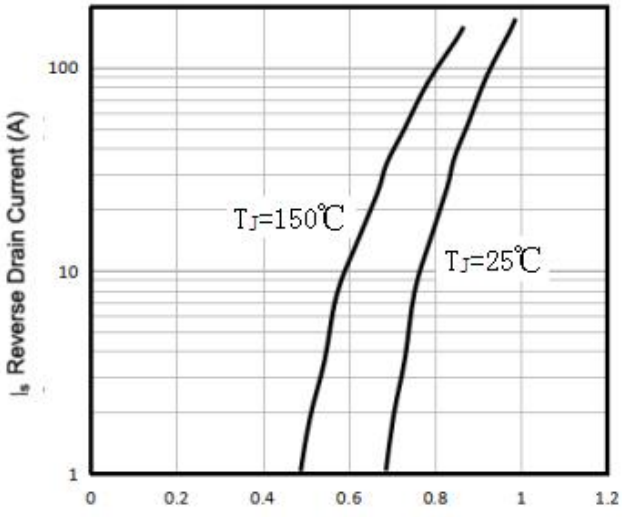


Figure 6 Source- Drain Diode Forward

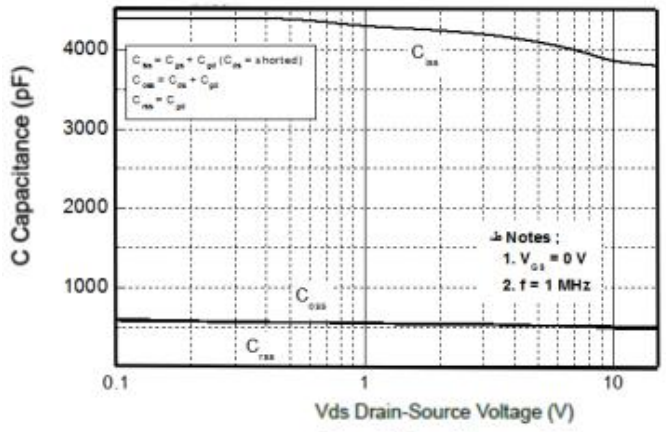


Figure 7 Capacitance vs Vds

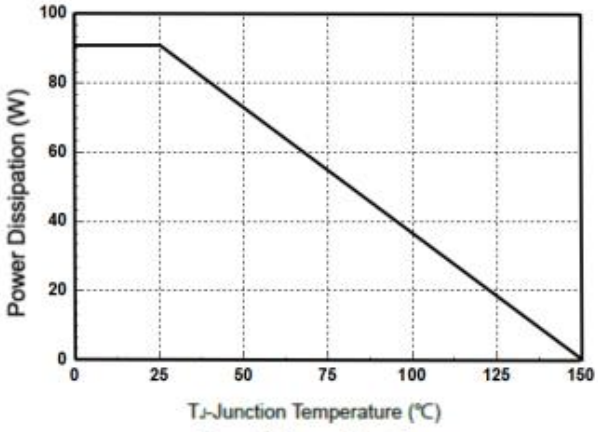


Figure 9 Power De-rating

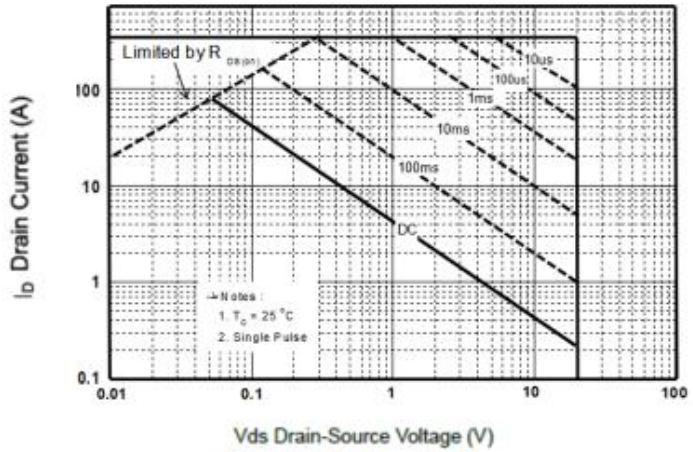


Figure 8 Safe Operation Area

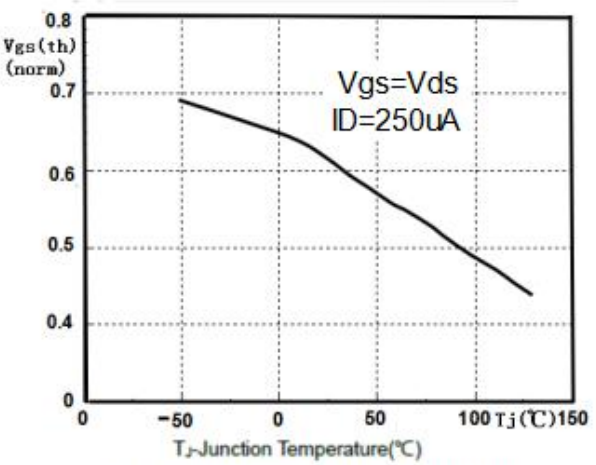
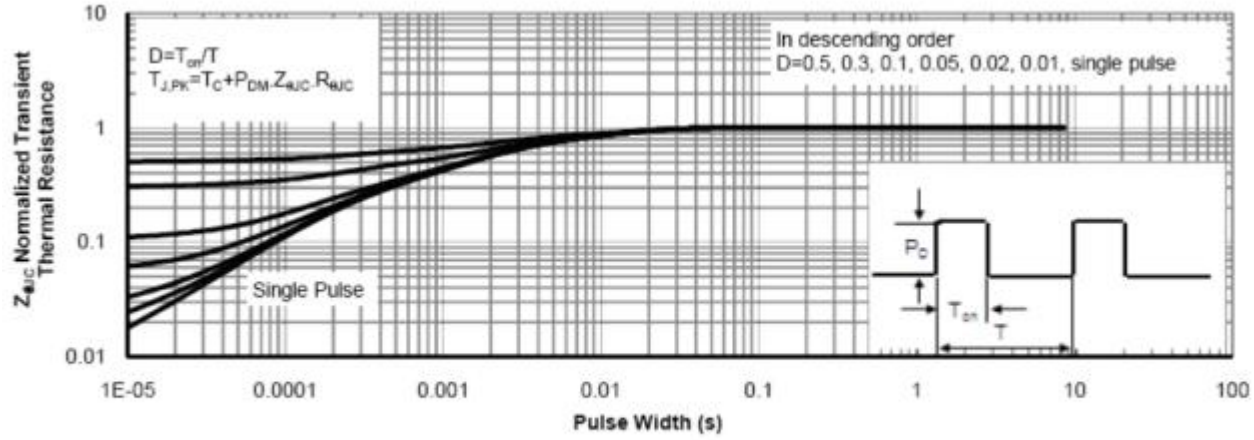


Figure 10 $V_{GS(th)}$ vs Junction Temperature



Square Wave Pluse Duration(sec)

Figure 11 Normalized Maximum Transient Thermal Impedance