1. Description

The KIA3302A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a wide variety of applications.

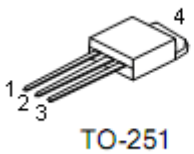
2. Features

- $R_{DS(on)}$=3.9mΩ @ V_{DS}=4.5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

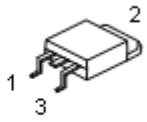
3. Applications

- Battery protection
- Load switch
- Power management

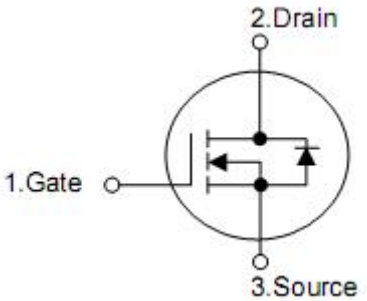
4.Symbol



TO-251



TO-252



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

5. 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=25℃[1]	I_D	85	A
	T_C=100℃		59	A
Pulsed drain current [2]		I_{DM}	340	A
Single pulse avalanche energy[3]		E_{AS}	340	mJ
Total power dissipation	T_C=25 ℃	P_D	87	W
Total power dissipation	T_C=100 ℃	P_D	43	W
Operation junction temperature range		T_J	-55 to175	℃
Storage temperature range		T_{STG}	-55 to175	℃

6. Thermal characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal resistance,Junction-case	$R_{\theta JC}$	--	1.72	℃/W

7. 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	25	-	V
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS}=4.5V,I_D=20A T_C=25°C	-	3.9	5.5	mΩ
		V_{GS}=2.5V,I_D=15A T_C=25°C	-	6	9	
		V_{GS}=4.5V,I_D=20A T_C=125°C	-	5.4	8	
		V_{GS}=2.5V,I_D=15A	-	6	9	
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.5	0.7	1.1	V
Drain-source leakage current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
Gate- source leakage current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
Forward transconductance	gfs	V_{DS}=5V, I_D=15A	-	40	-	S
Gate resistance	R_g	V_{DS}=0V, V_{GS}=0V,f=1MHz	-	1.1	-	Ω
Total gate charge(4.5V)	Q_g	V_{DS}=10V, V_{GS}=4.5V I_D =12A	-	32	-	nC
Gate-source charge	Q_{gs}		-	3	-	
Gate-drain charge	Q_{gd}		-	11	-	
Turn-on delay time	$t_{d(on)}$	V_{DS}=15V,R_L=0.75Ω, R_{GEN}=3Ω, V_{GS}=4.5V	-	17	-	ns
Rise time	t_r		-	49	-	
Turn-off delay time	$t_{d(off)}$		-	74	-	
Fall time	t_f		-	26	-	
Input capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V, f=1MHz	-	2800	-	pF
Output capacitance	C_{oss}		-	353	-	
Reverse transfer capacitance	C_{rss}		-	265	-	
Source-drain current(Body diode)	I_{SD}		-	-	85	A
Diode forward voltage	V_{SD}	V_{GS}=0V,I_S=20A	-	-	1.2	V
Body diode reverse recovery time	t_{rr}	I_f=20A. dI/dt=100A/us	-	23	-	ns
Body diode reverse recovery charge	Q_{rr}		-	10	-	nC

Note:1.The maximum current rating is package limited

2.Repetitive rating: pulse width limited by maximum junction temperature.

3.EAS condition: T_J25°C, V_{DD}=30V, V_G=4.5V, R_G=25Ω.

8. Test circuits

Figure 1. Output Characteristics

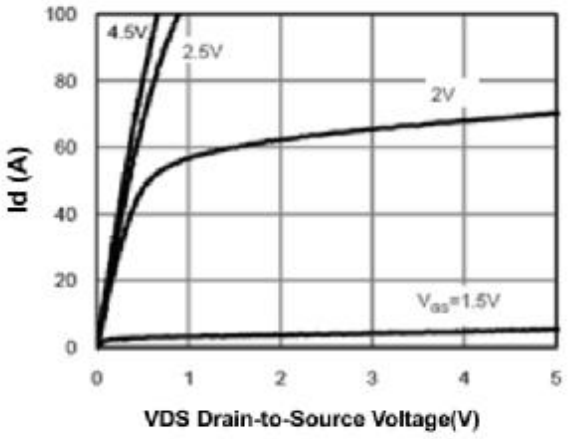


Figure 2. Transfer Characteristics

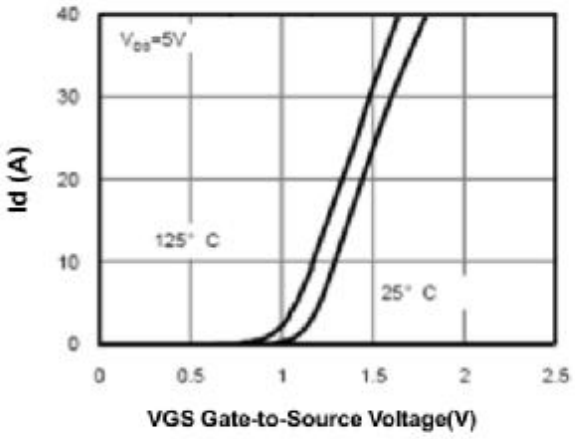


Figure 3. Max BV_{DSS} vs Junction Temperature

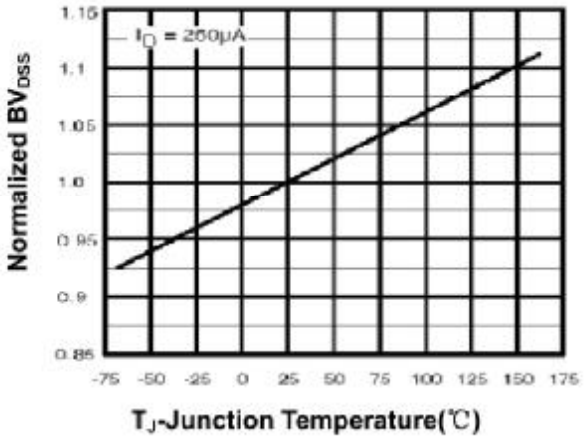


Figure 4. Drain Current

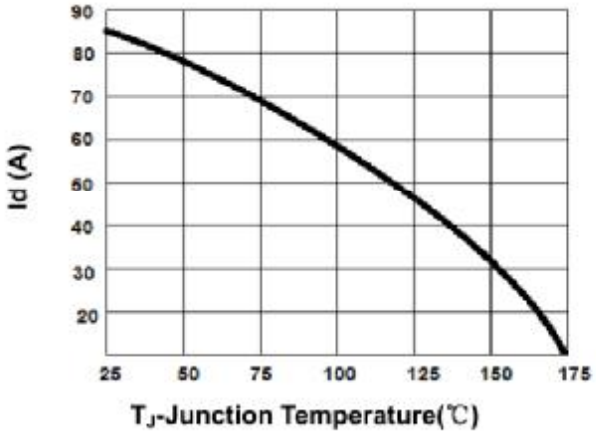


Figure 5. $V_{GS(th)}$ vs Junction Temperature

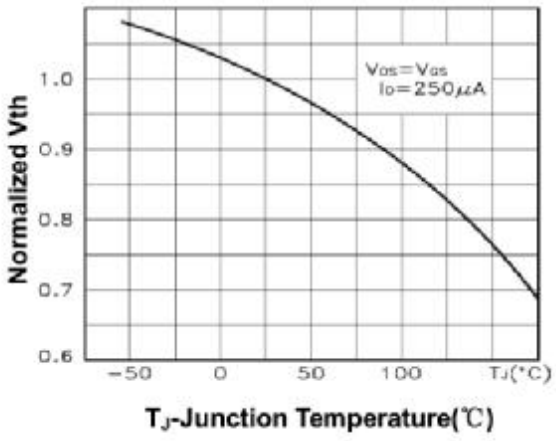


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

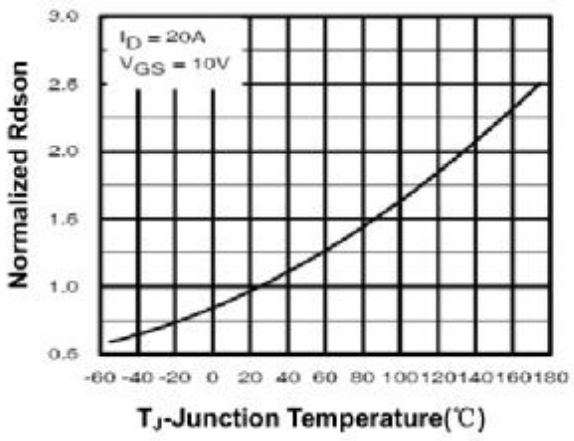


Figure 7. Gate Charge Waveforms

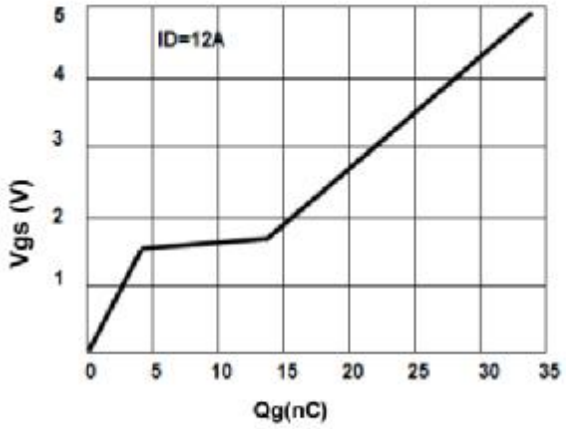


Figure 8. Capacitance

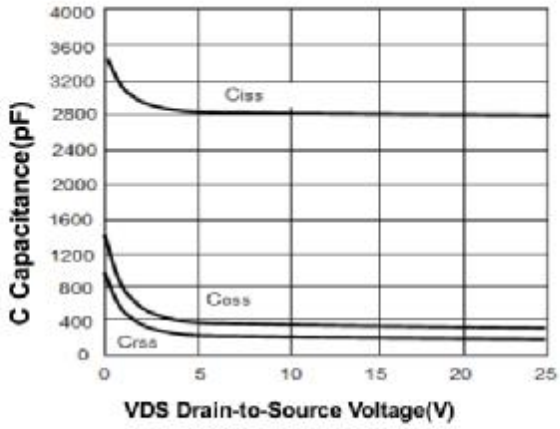


Figure 9. Body-Diode Characteristics

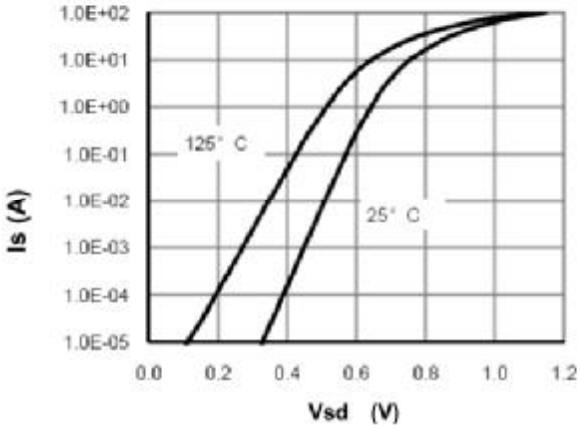


Figure 10. Maximum Safe Operating Area

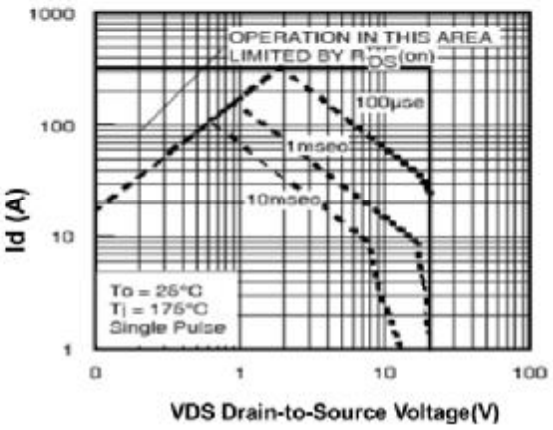


Figure 11. Normalized Maximum Transient Thermal Impedance