

## 1. Description

KNX3610A, uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , Low gate charge, It can be used in a wide variety of applications.

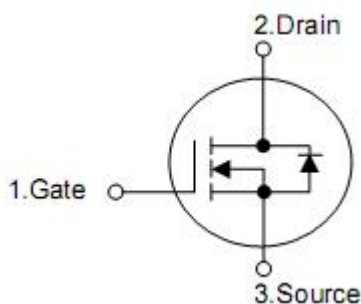
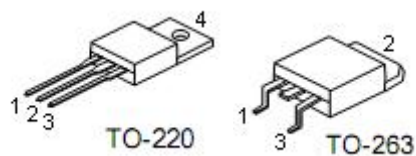
## 2. Features

- $V_{DS}=100V, I_D=60A$   $R_{DS(ON)}$  (typ.)= $17m\Omega$  @  $V_{GS}=10V$
- High density cell design for lower  $R_{dson}$
- 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
KNB3610A	TO-263	KIA
KNP3610A	TO-220	KIA

## 6. Absolute maximum ratings

Parameter	Symbol	Rating	Units
Drain-source voltage	$V_{DS}$	100	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Continuous drain current	$I_D$	60	A
Pulsed drain current (Note1)	$I_{DM}$	240	A
Single pulse avalanche energy (Note2)	$E_{AS}$	250	mJ
Derating Factor above 25°C	$P_D$	160	W/°C
Operation junction and temperature range	$T_J, T_{STG}$	-55 to 175	°C

## 7. Thermal characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.93	°C /W

**8. Electrical characteristics**

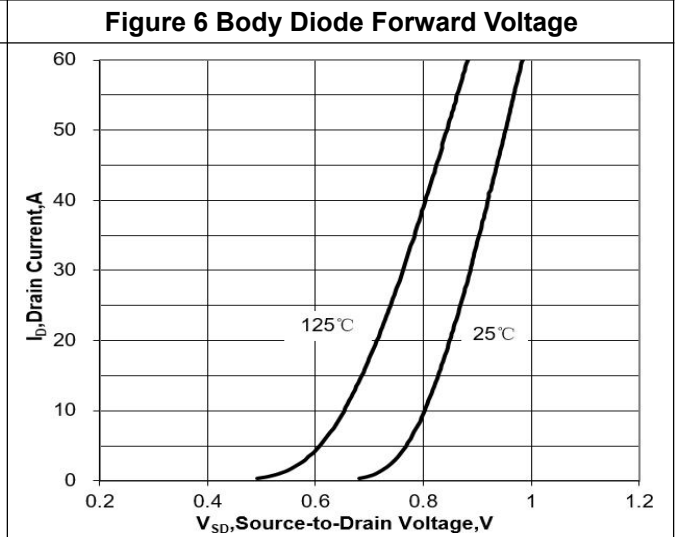
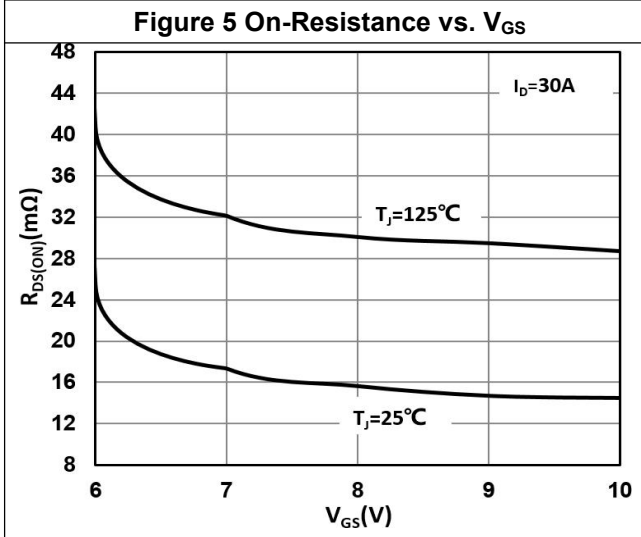
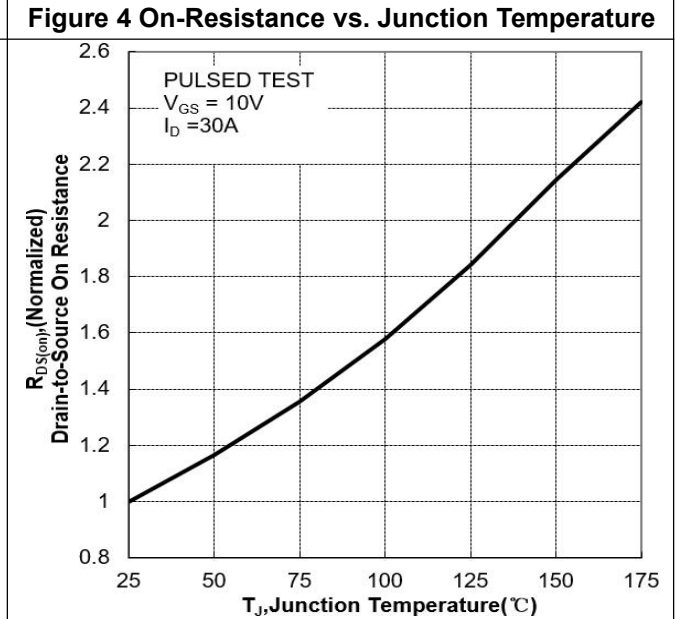
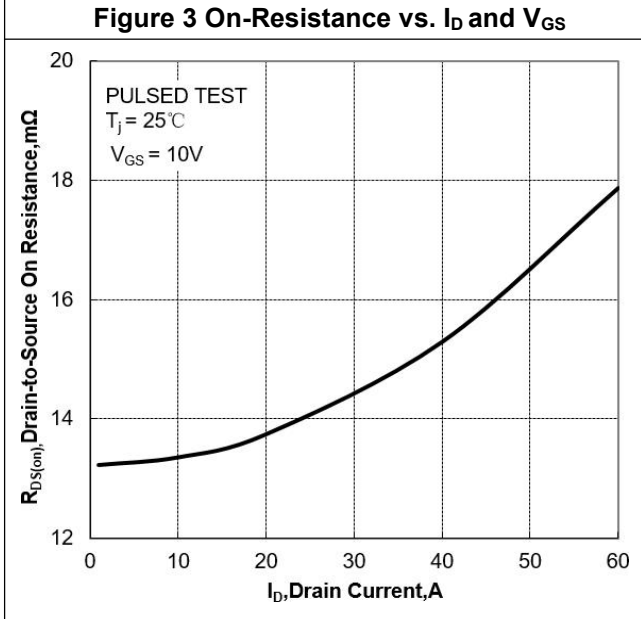
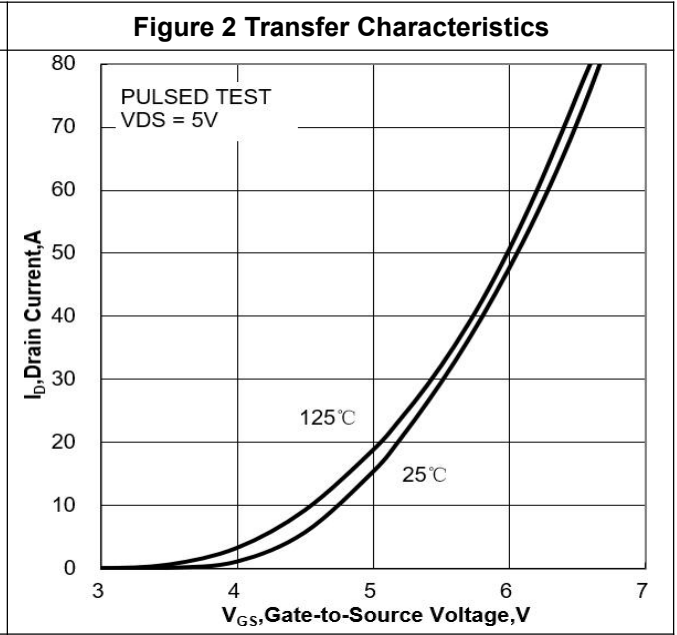
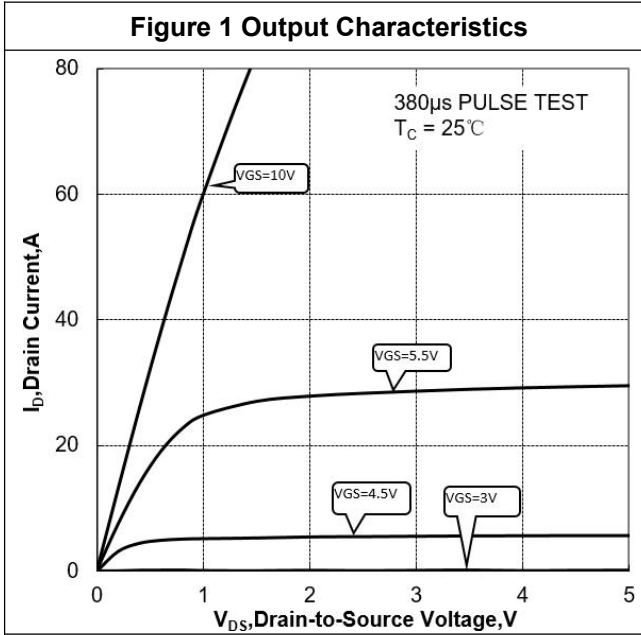
 (T<sub>A</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	-	-	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Source Forward Leakage	I <sub>GSS(F)</sub>	V <sub>GS</sub> =+20V	-	-	100	nA
Gate-Source Reverse Leakage	I <sub>GSS(R)</sub>	V <sub>GS</sub> =-20V	-	-	-100	nA
<b>On Characteristics</b>						
Drain-source on-Resistance <sup>(Note3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	17	20	mΩ
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	3.0	4.0	V
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =20A	-	20	-	S
<b>Dynamic Characteristics</b>						
Total gate charge	Q <sub>g</sub>	V <sub>DD</sub> =80V, V <sub>GS</sub> =10V I <sub>D</sub> =30A	-	82	-	nC
Gate-source charge	Q <sub>gs</sub>		-	24	-	
Gate-drain charge	Q <sub>gd</sub>		-	28	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =30A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V,	-	13	-	ns
Rise time	t <sub>r</sub>		-	10	-	
Turn-off delay time	t <sub>d(off)</sub>		-	21	-	
Fall time	t <sub>f</sub>		-	18	-	
<b>Switching Characteristics</b> <sup>(Note 4)</sup>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	-	3830	-	pF
Output capacitance	C <sub>oss</sub>		-	235	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	208	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A	-	-	1.2	V

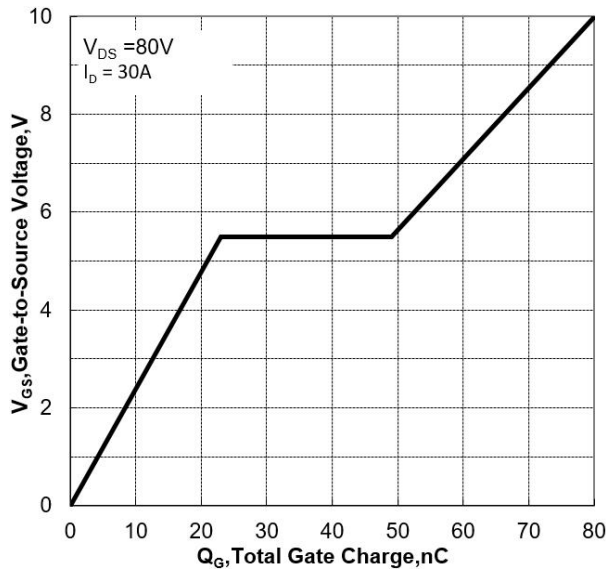
**Note**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. EAS condition : T<sub>j</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, L=0.5mH, R<sub>g</sub>=25Ω
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production.

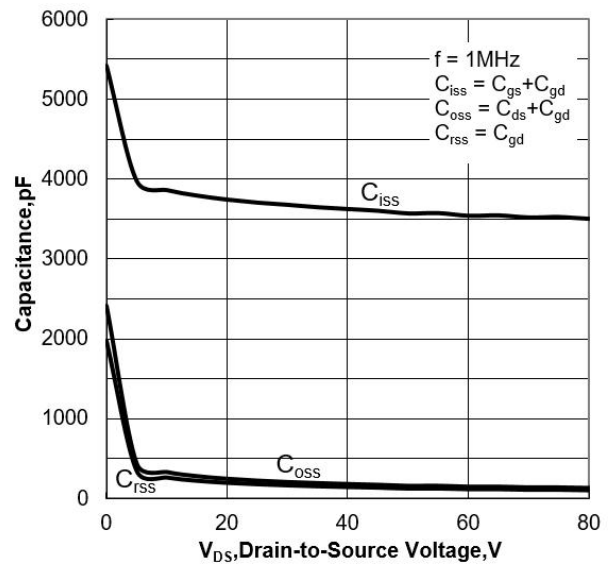
**9. Test circuits**



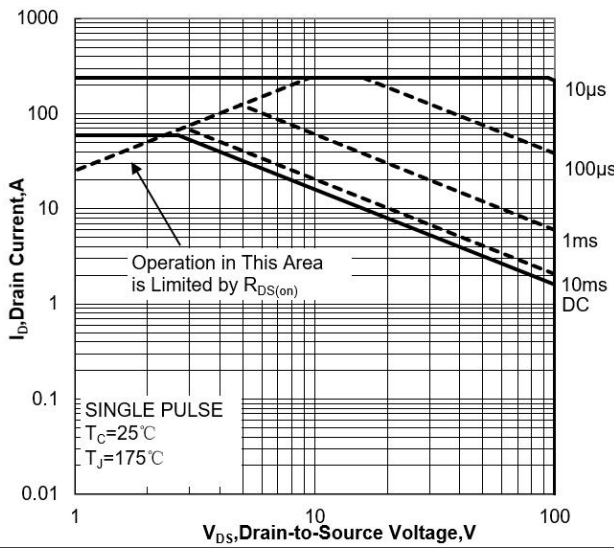
**Figure 7 Gate-Charge Characteristics**



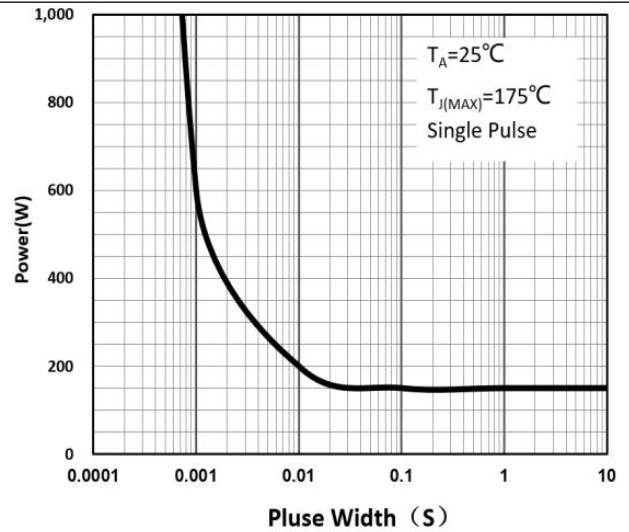
**Figure 8 Capacitance Characteristics**



**Figure 9 Maximum Forward Biased Safe Operation Area**



**Figure 10 Single Pulse Power Rating Junction-to-Ambient**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

