

## 1. Description

The KNX3502A 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.

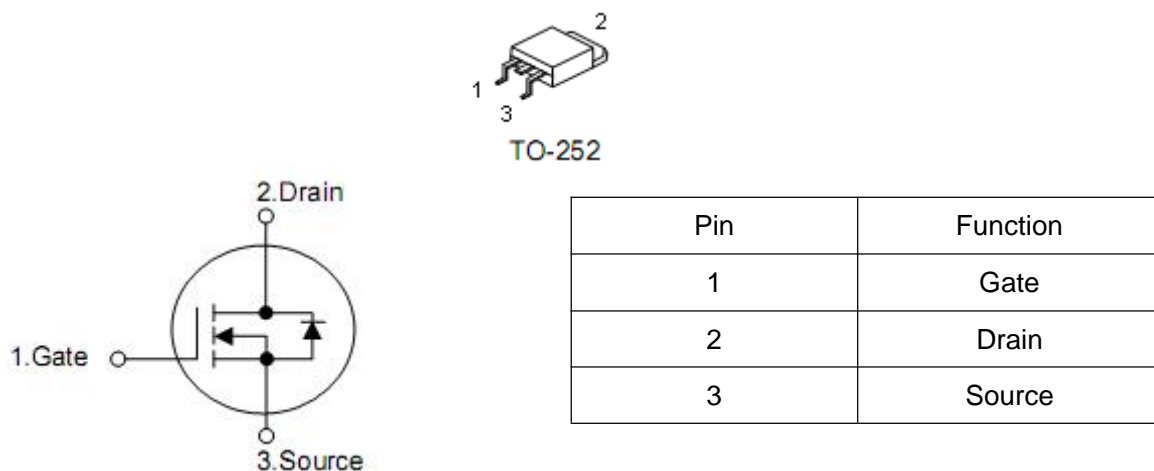
## 2. Features

- n  $R_{DS(on)}=7m\Omega$ (typ.) @  $V_{DS}=4.5V$
- n High power and current handing capability
- n Lead free product is acquired
- n Surface mount package

## 3. Applications

- n Battery protection
- n Load switch
- n Power management

## 4. Symbol



## 5. Ordering Information

Part Number	Package	Brand
KND3502A	TO-252	KIA

## 6. Absolute maximum ratings

Parameter	Symbol	Rating	Units
Drain-source voltage	$V_{DS}$	20	V
Gate-source voltage	$V_{GS}$	$\pm 12$	V
Continuous drain current	$I_D$	$T_C=25^\circ\text{C}^1$	A
		$T_C=100^\circ\text{C}$	A
Pulsed drain current <sup>2</sup>	$I_{DM}$	240	A
Single pulse avalanche energy <sup>3</sup>	$E_{AS}$	340	mJ
Total power dissipation $T_C=25^\circ\text{C}$	$P_D$	50	W
Operation junction temperature range	$T_J$	-55 to 150	$^\circ\text{C}$
Storage temperature range	$T_{STG}$	-55 to 150	$^\circ\text{C}$

## 7. Thermal characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal resistance, Junction-case	$R_{\theta JC}$	--	2.5	$^\circ\text{C}/\text{W}$
Thermal resistance-junction to ambient	$R_{\theta JA}$	--	50	$^\circ\text{C}/\text{W}$

## 8. Electrical characteristics

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	-	-	V
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.4	0.65	1.1	V
Drain-source leakage current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V	-	-	1	μA
Gate- source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
Static drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A T <sub>C</sub> =25°C	-	7	9	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =6A T <sub>C</sub> =25°C	-	8.5	11	mΩ
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	-	2.8	-	Ω
Total gate charge(10V)	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =10V I <sub>D</sub> =20A	-	48.5	-	nC
Total gate charge(4.5V)			-	23.4	-	
Gate-source charge			-	2.7	-	
Gate-drain charge			-	7.2	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =20A R <sub>G</sub> =3Ω, V <sub>GS</sub> =10V	-	5.3	-	ns
Rise time	t <sub>r</sub>		-	75.4	-	
Turn-off delay time	t <sub>d(off)</sub>		-	64	-	
Fall time	t <sub>f</sub>		-	62	-	
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	-	1800	-	pF
Output capacitance	C <sub>oss</sub>		-	200	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	185	-	
Source-drain current(Body diode)	I <sub>SD</sub>		-	-	70	A
Diode forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =15A	-	-	1.4	V
Body diode reverse recovery time	t <sub>rr</sub>	I <sub>f</sub> =15A. dI/dt=100A/us	-	26.5	-	ns
Body diode reverse recovery charge	Q <sub>rr</sub>		-	11.5	-	nC

Note:1.The maximum current rating is package limited

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

3.EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=10V, V<sub>G</sub>=4.5V, R<sub>G</sub>=25Ω.

9. Test circuits

Figure 1. Output Characteristics

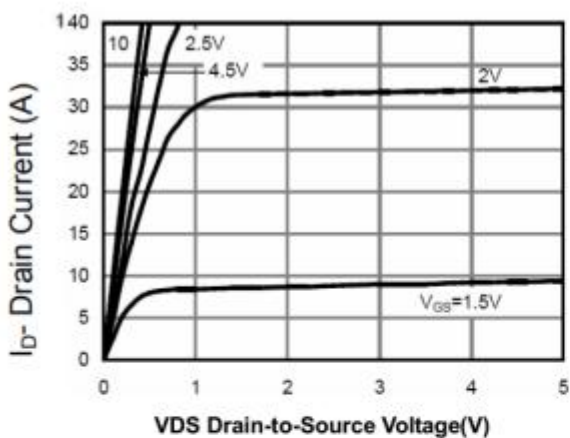


Figure 2. Transfer Characteristics

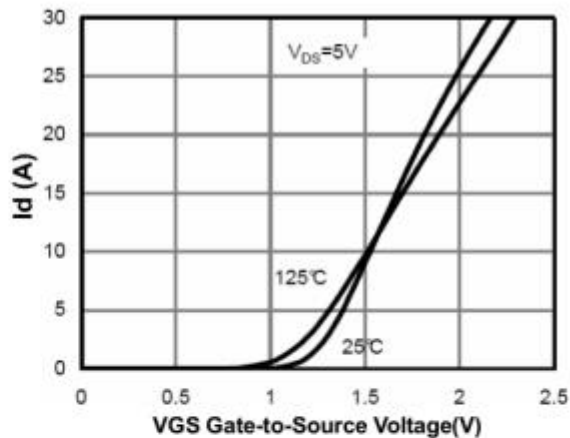


Figure 3. Drain-Source On-Resistance

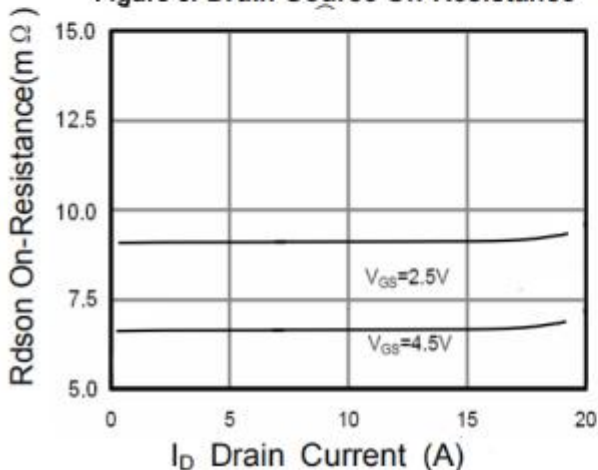


Figure 4. Drain Current

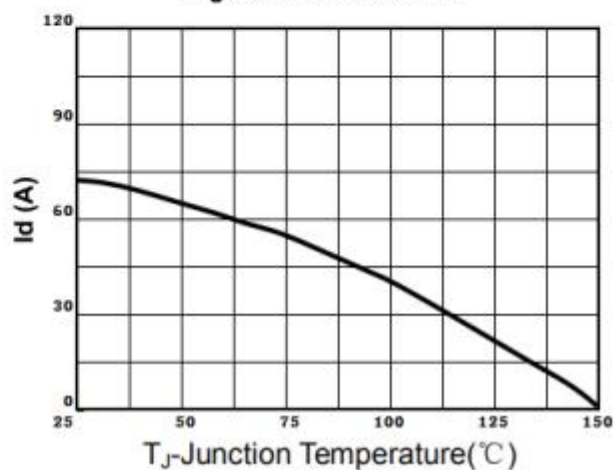


Figure 5. Power De-rating

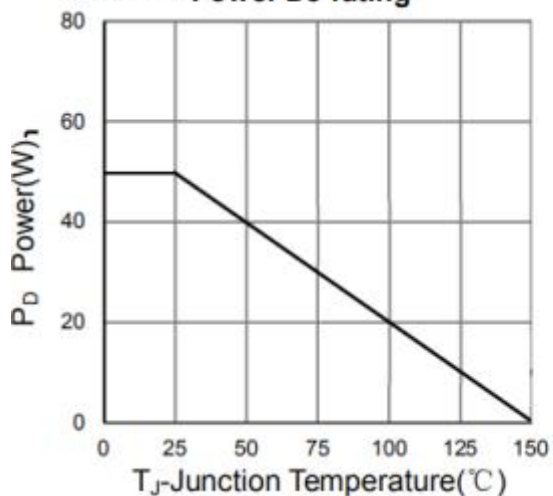
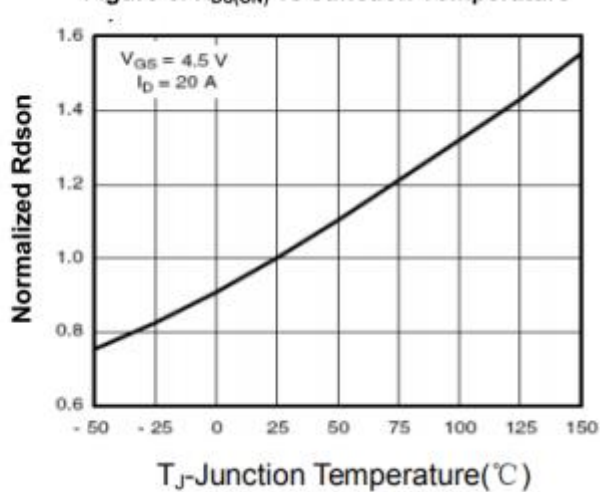
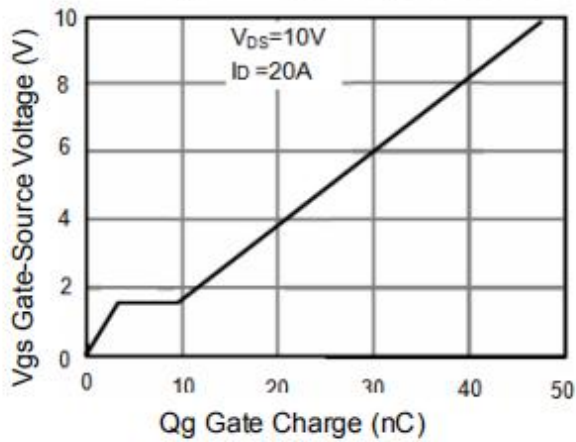


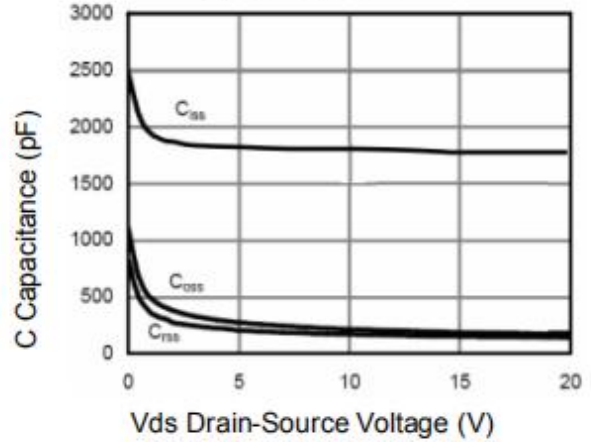
Figure 6.  $R_{DS(ON)}$  vs Junction Temperature



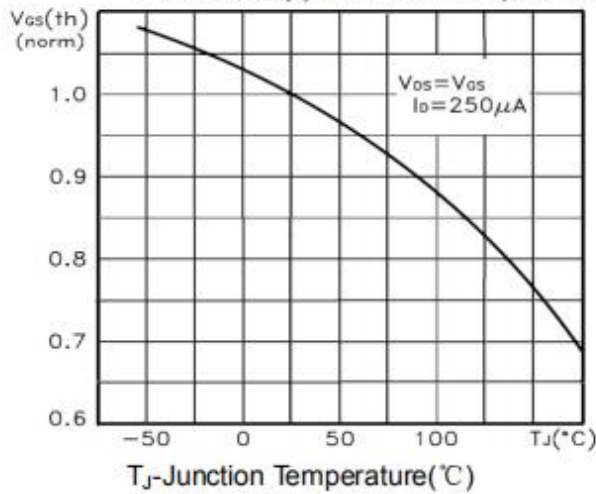
**Figure 7. Gate Charge Waveforms**



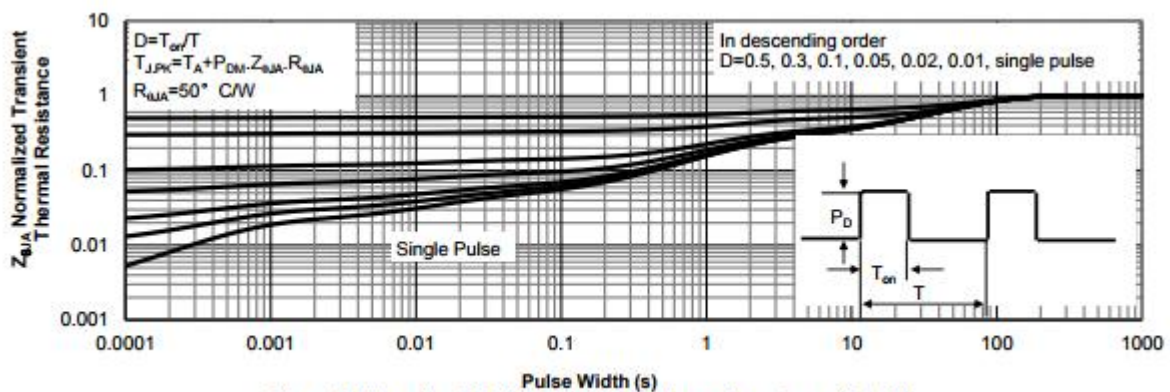
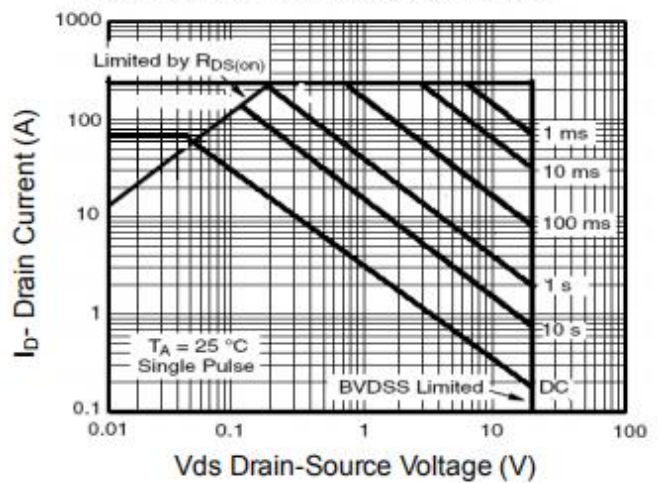
**Figure 8. Capacitance**



**Figure 9. VGS(th) vs Junction Temperature**



**Figure 10. Maximum Safe Operating Area**



**Figure 16: Normalized Maximum Transient Thermal Impedance (Note H)**

## 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 :

[614233C](#) [648584F](#) [MCH3443-TL-E](#) [MCH6422-TL-E](#) [FDPF9N50NZ](#) [FW216A-TL-2W](#) [FW231A-TL-E](#) [APT5010JVR](#) [NTNS3A92PZT5G](#)  
[IRF100S201](#) [JANTX2N5237](#) [2SK2464-TL-E](#) [2SK3818-DL-E](#) [FCA20N60\\_F109](#) [FDZ595PZ](#) [STD6600NT4G](#) [FSS804-TL-E](#) [2SJ277-DL-E](#)  
[2SK1691-DL-E](#) [2SK2545\(Q,T\)](#) [D2294UK](#) [405094E](#) [423220D](#) [MCH6646-TL-E](#) [TPCC8103,L1Q\(CM](#) [367-8430-0972-503](#) [VN1206L](#)  
[424134F](#) [026935X](#) [051075F](#) [SBVS138LT1G](#) [614234A](#) [715780A](#) [NTNS3166NZT5G](#) [751625C](#) [873612G](#) [IRF7380TRHR](#)  
[IPS70R2K0CEAKMA1](#) [RJK60S3DPP-E0#T2](#) [RJK60S5DPK-M0#T0](#) [APT5010JVFR](#) [APT12031JFLL](#) [APT12040JVR](#) [DMN3404LQ-7](#)  
[NTE6400](#) [JANTX2N6796U](#) [JANTX2N6784U](#) [JANTXV2N5416U4](#) [SQM110N05-06L-GE3](#) [SIHF35N60E-GE3](#)