1.Description

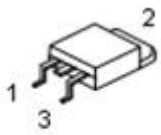
The KND3404C is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The KND3404C meet the RoHs and Green Product requirement 100% EAS Guaranteed with full function reliability approved.

2. Features

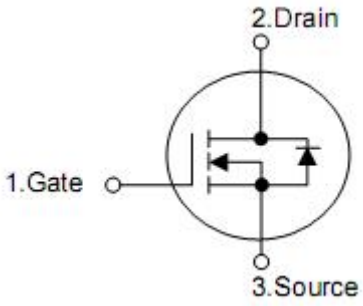
- $R_{DS(ON),typ.}$=5.0mΩ@V_{GS}=10V
- Super low gate charge
- 100% EAS Guaranteed
- Green device available
- Excellent Cdv/dt effect decline
- Advanced high cell density trench technology

3.Symbol

DFN5*6



TO-252



Pin TO-252	Pin DFN5*6	Function
1	4	Gate
2	5,6,7,8	Drain
3	1,2,3	Source

4. Ordering Information

Part Number	Package	Brand
KND3404C	TO-252	KIA
KNY3404C	DFN5*6	KIA

5.Absolute maximum ratings

(T_A=25°C,unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DS}	40	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current V_{GS}@10V[1]	T_C=25ºC	I_D	80	A
	T_C=100ºC	I_D	58	A
Pulsed drain current[2]		I_{DM}	150	A
Single pulse avalanche energy[3]		EAS	110	mJ
Avalanche current		I_{AS}	47	A
Total power dissipation[4]	T_c=25ºC	P_D	52.1	W
Junction and storage temperature range		T_J ,T_{STG}	-55 to150	ºC

6.Thermal Data

Parameter	Symbol	Ratings	Units
Thermal resistance,junction-ambient	R_{thJA}	62	ºC/W
Thermal resistance,Junction-case	R_{thJC}	2.4	ºC/W

7.Electrical characteristics

(T_J=25°C,unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	40	--	--	V
BVDSS Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to25℃, I_D=1mA	--	0.034	--	V/℃
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	TO-252 V_{GS}=10V , I_D=15A DFN5*6 V_{GS}=10V , I_D=10A	--	5.0	6.5	mΩ
		TO-252 V_{GS}=4.5V , I_D=12A DFN5*6 V_{GS}=4.5V , I_D=5A		6.5	9	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D=250uA	1.0	--	2.5	V
VGS(th) Temperature Coefficient	$\Delta V_{GS(th)}$	V_{GS}=VDS , I_D=250uA	--	-5.84	--	mV/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=32V , V_{GS}=0V , T_J=25°C	--	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=55°C	--	---	5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	--	---	±100	nA
Forward Transconductance	gfs	V_{DS}=5V , I_D=15A	--	25	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V, f=1MHz	--	1.5	---	Ω
TotalGate Charge (4.5V)	Q_g	V_{DS}=20V , V_{GS}=4.5V , I_D=12A	--	28	---	nC
Gate-Source Charge	Q_{gs}		--	7.8	---	nC
Gate-Drain Charge	Q_{gd}		--	12.5	---	nC
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω，I_D=1A	--	20	---	ns
Rise Time	T_r		--	11.5	---	ns
Turn-Off Delay Time	$T_{d(off)}$		--	84	---	ns
Fall Time	T_f		--	8.5	---	ns
Input Capacitance	C_{iss}	V_{DS}=15V , V_{GS}=0V , f=1MHz	--	3330	---	pF
Output Capacitance	C_{oss}		--	270	---	pF
Reverse Transfer Capacitance	C_{rss}		--	200	---	pF
Diode Characteristics						
Continuous Source Current[1,5]	I_S	V_G=V_D=0V , Force Current	--	--	80	A
Pulsed Source Current[2,5]	I_{SM}		--	--	150	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	--	--	1	V

Note:1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤300us,duty cycle ≤2%.
3. The EAS data shows Max.rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=47A.
4. The power dissipation is limited by 150 ºC junction temperature.
5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation

8. Test circuits

Typical Characteristics

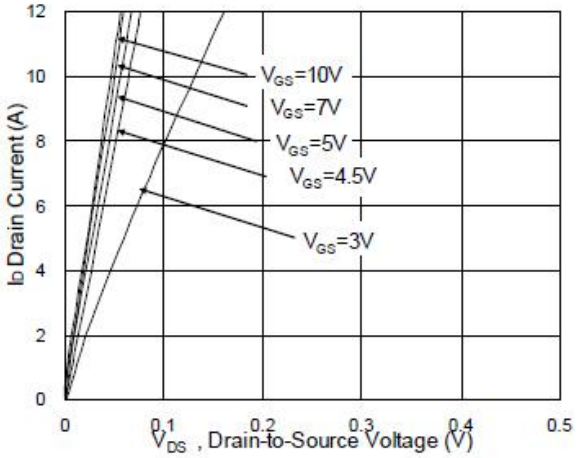


Fig.1 Typical Output Characteristics

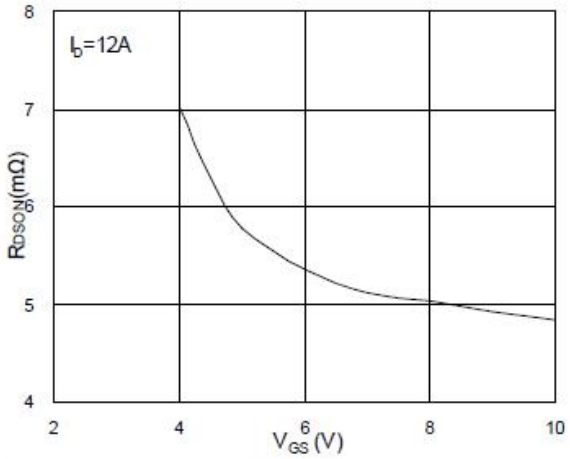


Fig.2 On-Resistance vs. G-S Voltage

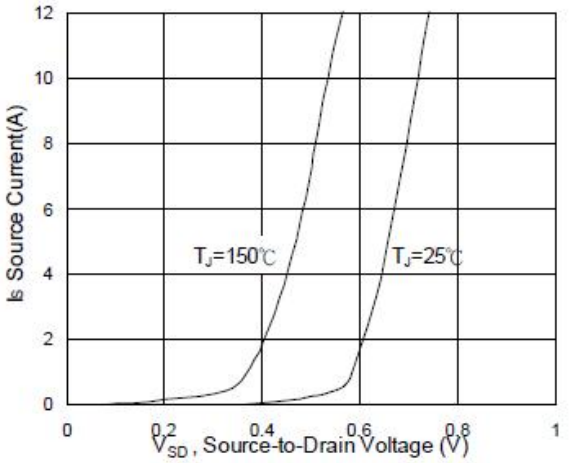


Fig.3 Forward Characteristics Of Reverse

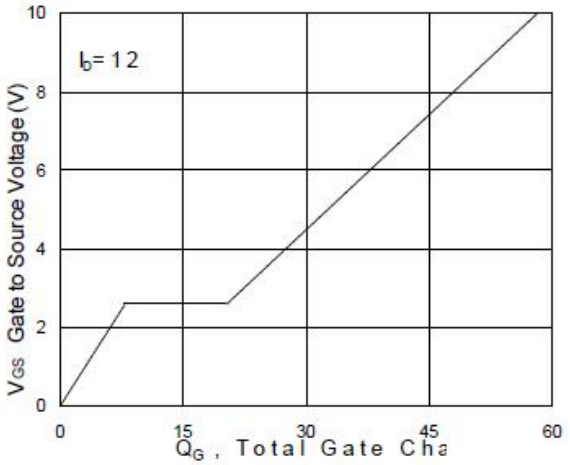


Fig.4 Gate-Charge Characteristics

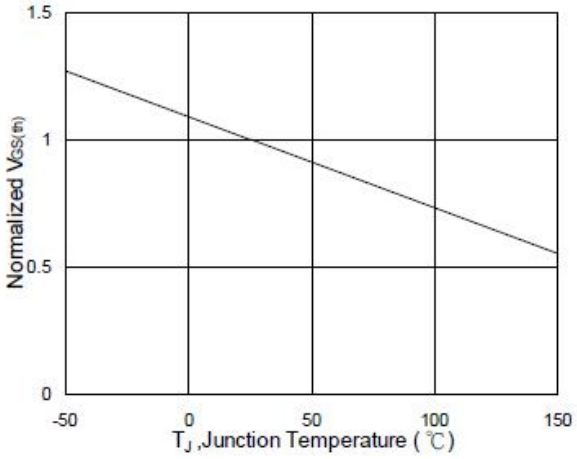


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

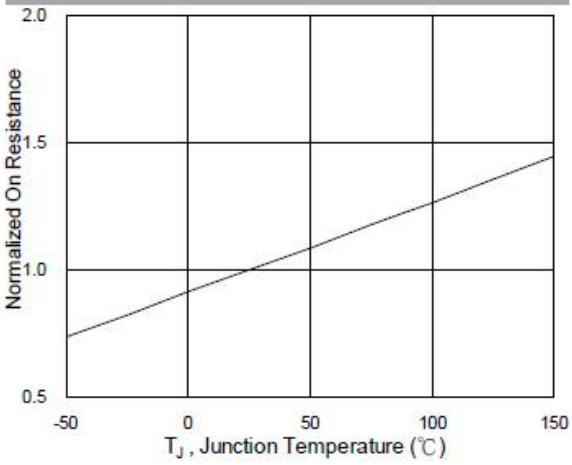


Fig.6 Normalized R_{DSON} vs. T_J

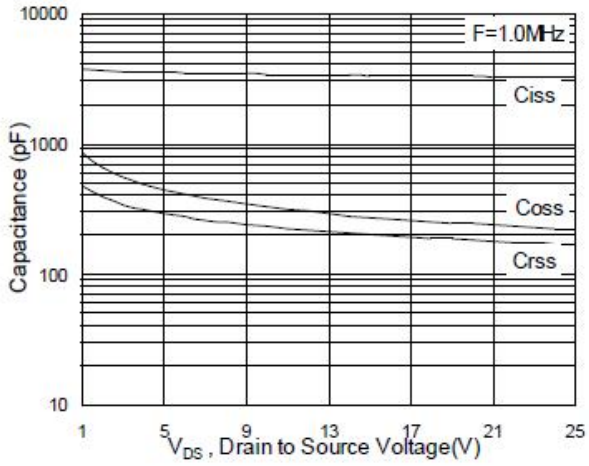


Fig.7 Capacitance

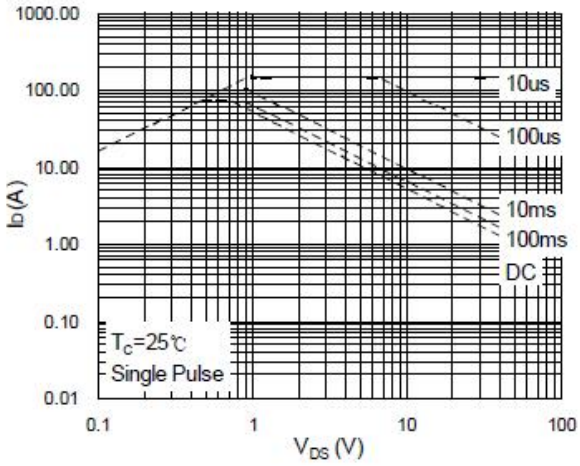


Fig.8 Safe Operating Area

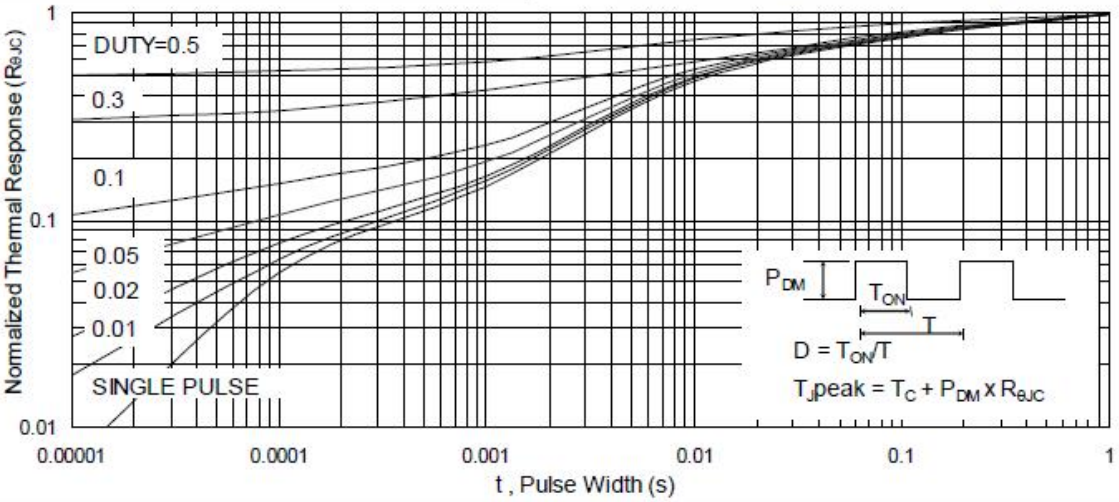


Fig.9 Normalized Maximum Transient Thermal Impedance

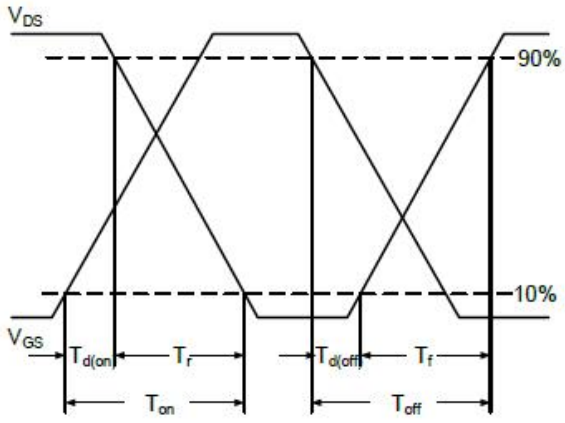


Fig.10 Switching Time Waveform

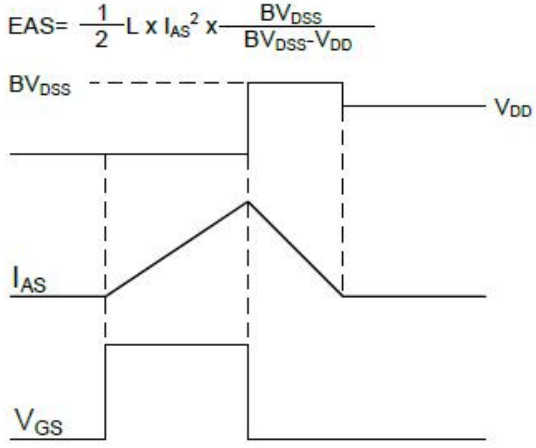


Fig.11 Unclamped Inductive Switching Wave

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