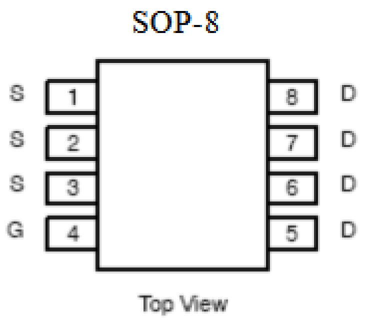
1. Features

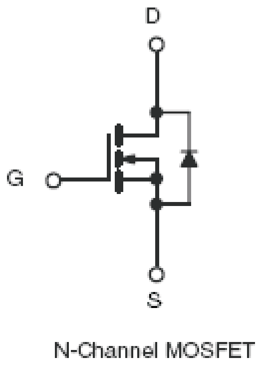
- $R_{DS(on)}$=14.5mΩ(typ)@ V_{GS}=10 V
- Super low gate charge
- Green device available
- Excellent Cdv/dt effect decline
- Advanced high cell density trench technology

2.Description

The KIA4603A 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 KIA4603A meet the RoHs and Green Product requirement.

3.Symbol





4.Absolute maximum ratings

(T_A=25°C,unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	30	V
Gate-source voltage		V_{GS}	$\pm$20	V
Continuous drain current V_{GS}@10V[1]	T_A=25ºC	I_D	7.0	A
	T_A=70ºC		5.6	
Pulsed drain current[2]		I_{DM}	35	A
Single pulse avalanche energy[3]		EAS	20	mJ
Avalanche current		I_{AS}	20	A
Total power dissipation[4]	T_A=25ºC	P_D	1.5	W
Junction and storage temperature range		T_J ,T_{STG}	-55 to150	ºC
Thermal resistance-junction to ambient[1]		$R_{\theta JA}$	85	ºC/W
Thermal resistance-junction to case[1]		$R_{\theta JC}$	25	ºC/W

5.Electrical characteristics

(T_J=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	30	-	-	V
BV_{DSS} Temperature coefficient	△BV_{DSS}/△T_J	Reference to 25°C, I_D=1mA	-	0.034	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=24V,V_{GS}=0V, T_J=55°C	-	-	5	
Gate-source leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.5	2.5	V
$V_{GS(th)}$ Temperature coefficient	△$V_{GS(th)}$		-	3.84	-	mV/°C
Static drain-source on- resistance[2]	$R_{DS(on)}$	V_{GS}=10V,I_D=7A	-	14.5	18	mΩ
		V_{GS}=4.5V,I_D=4A	-	20	26	
Forward transcend ductance	g_{FS}	V_{DS}=5V, I_D=7A	-	6.2	-	S
Diode forward voltage[2]	V_{SD}	V_{GS}=0V,I_S=1A, T_J=25°C	-	-	1.2	V
Gate resistance	R_g	V_{DS}=0V, V_{GS}=0V,f=1MHz	-	1.04	2.1	Ω
Total gate charge(4.5V)	Q_g	V_{DS}=15V, V_{GS}=4.5V I_D =7A	-	6	8.4	nC
Gate-source charge	Q_{gs}		-	2.2	3.1	
Gate-drain charge	Q_{gd}		-	2	2.8	
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, R_G=3.3Ω, V_{GS}=10V I_D=7A	-	1.2	2.4	ns
Rise time	t_r		-	40	72	
Turn-off delay time	$t_{d(off)}$		-	18	36	
Fall time	t_f		-	7.2	14.4	
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V F=1.0MHZ	-	583	816.2	pF
Output capacitance	C_{oss}		-	77	107.8	
Reverse transfer capacitance	C_{rss}		-	59	82.6	
Diode characteristics						
Continuous source current[1.5]	I_S	V_G=V_D=0V,Force current	-	-	7	A
Pulsed source current[2.5]	I_{SM}		-	-	35	A
Reverse recovery time	t_{rr}	I_F=7A,dI/dt=100A/us, T_J=25°C	-	7.2	-	nS
Reverse recovery charge	Q_{rr}		-	2.9	-	nC

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}=20A.

4. The power dissipation is limited by 150 ℃ 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.

6. Test circuits and waveforms

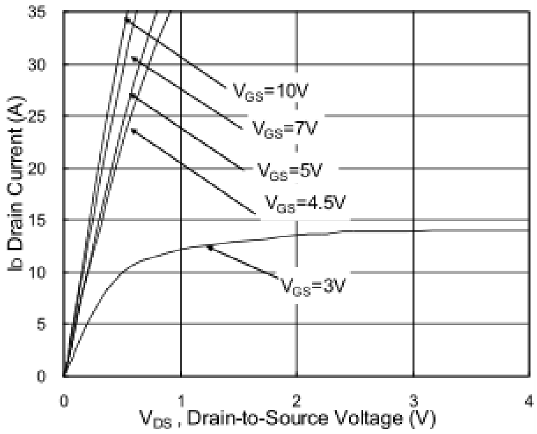


Fig.1 Typical Output Characteristics

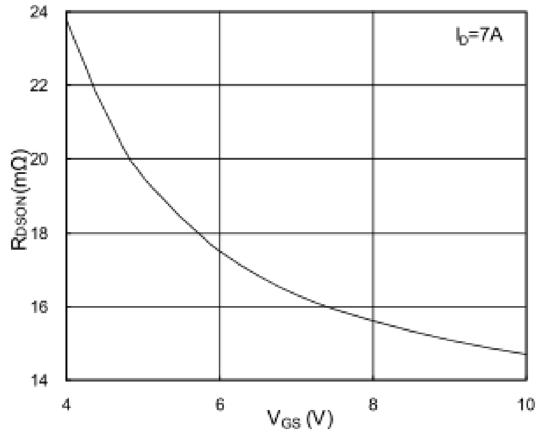


Fig.2 On-Resistance vs. Gate-Source

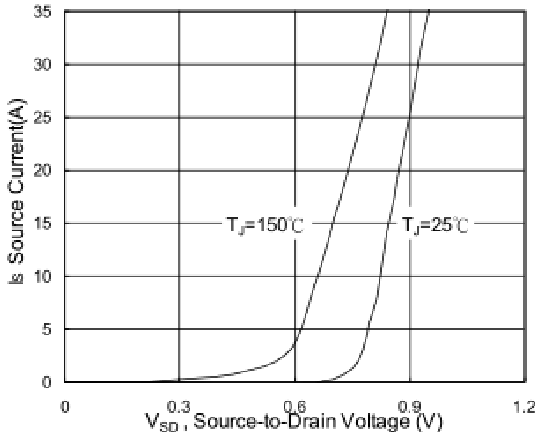


Fig.3 Forward Characteristics Of Reverse

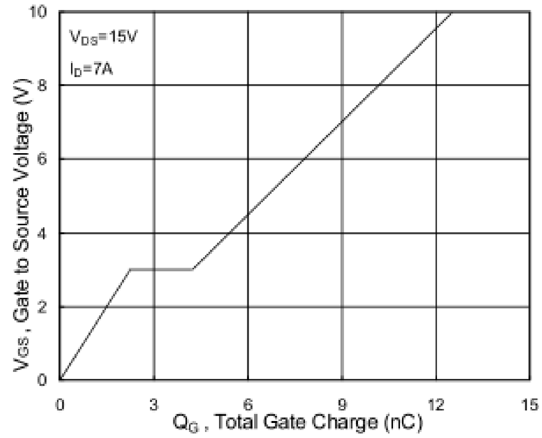


Fig.4 Gate-Charge Characteristics

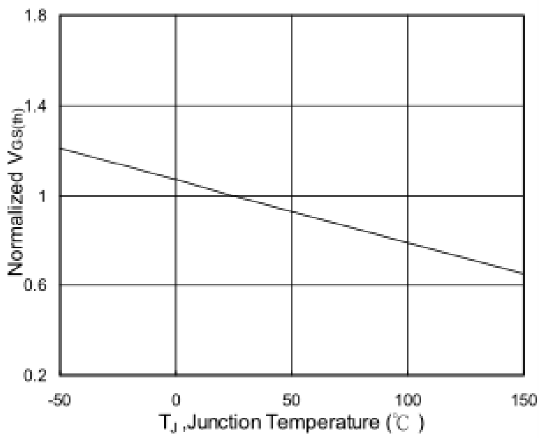


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

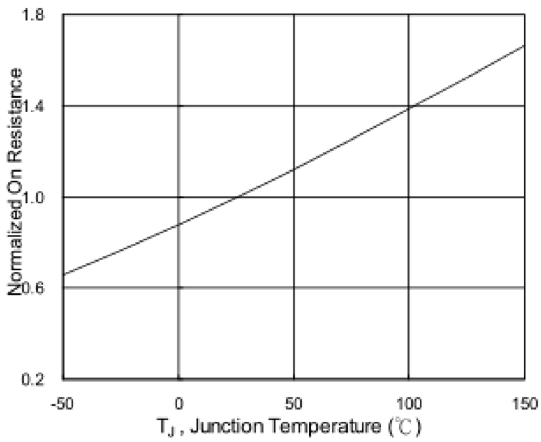


Fig.6 Normalized R_{DSON} vs. T_J

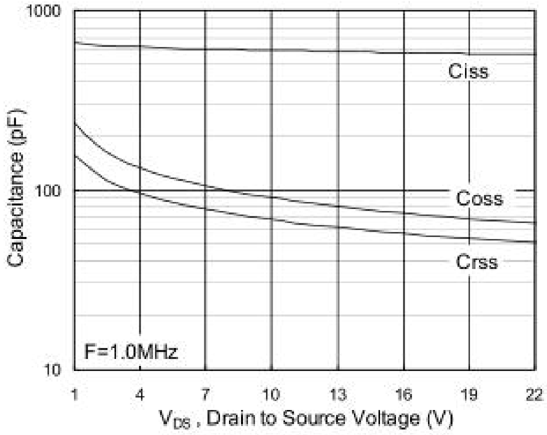


Fig.7 Capacitance

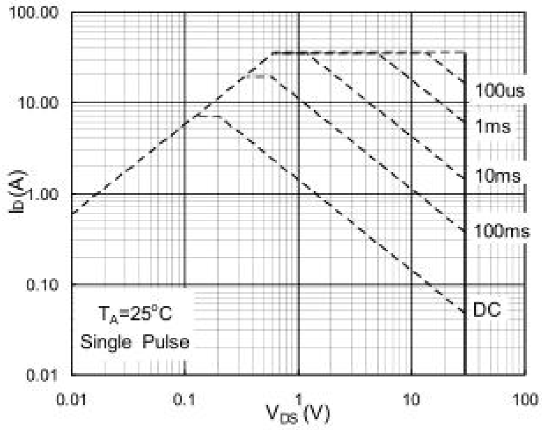


Fig.8 Safe Operating Area

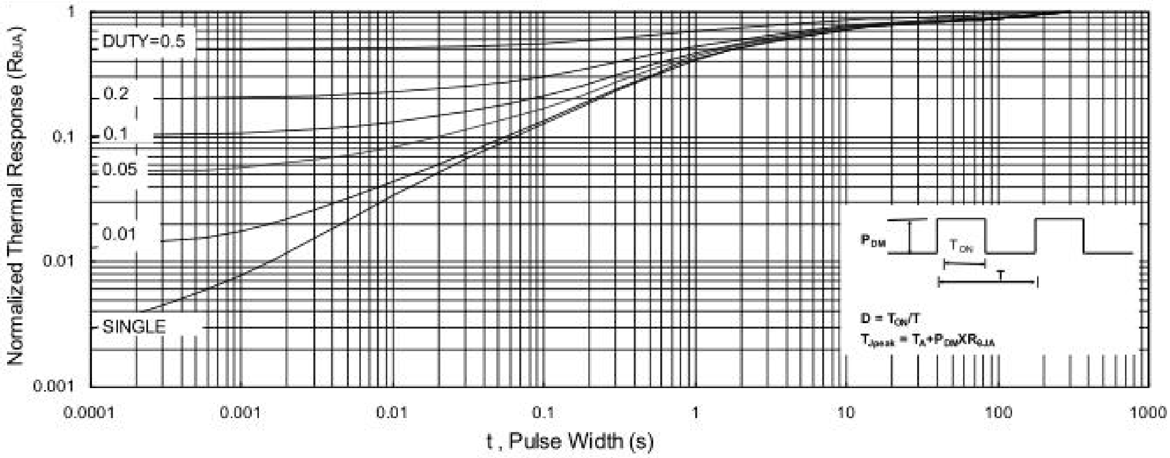


Fig.9 Normalized Maximum Transient Thermal Impedance

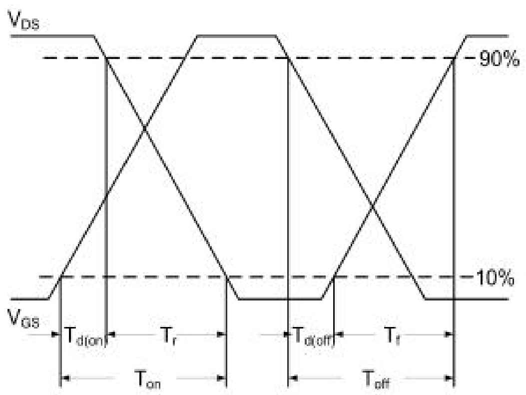


Fig.10 Switching Time Waveform

$$EAS=\frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

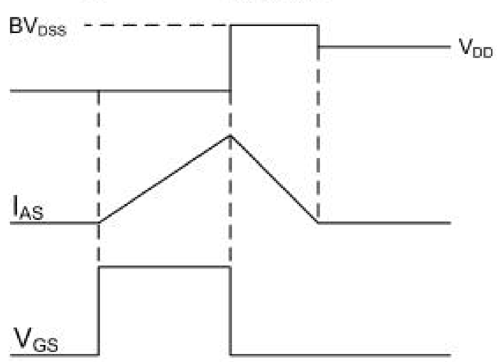


Fig.11 Unclamped Inductive Switching Waveform

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 FDPF9N50NZ IRFD120 IRFF430 JANTX2N5237 2N7000 FCA20N60_F109 FDZ595PZ 2SK2267(Q) 2SK2545(Q,T) 405094E 423220D MIC4420CM-TR VN1206L 614234A 715780A SSM6J414TU,LF(T 751625C PSMN4R2-30MLD TK31J60W5,S1VQ(O 2SK2614(TE16L1,Q) DMN1017UCP3-7 EFC2J004NUZTDG FCAB21350L1 P85W28HP2F-7071 DMN1053UCP4-7 NTE2384 NTE2969 NTE6400A DMN61D9UWQ-13 US6M2GTR DMN31D5UDJ-7 SSM6P54TU,LF DMP22D4UFO-7B IPS60R3K4CEAKMA1 DMN1006UCA6-7 DMN16M9UCA6-7 STF5N65M6 STU5N65M6 C3M0021120D DMN13M9UCA6-7 BSS340NWH6327XTSA1 MCM3400A-TP DMTH10H4M6SPS-13 IPS60R1K0PFD7SAKMA1 IPS60R360PFD7SAKMA1 IPS60R600PFD7SAKMA1 IPS60R210PFD7SAKMA1 DMN2990UFB-7B