1. Features

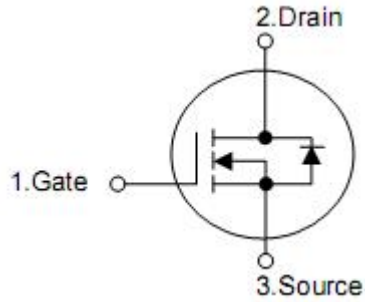
- $R_{DS(on)}$=1.5mΩ(typ.)@ V_{GS}=10V
- Advanced Trench Technology
- Low Gate Charge
- High Current Capability
- RoHS and Halogen-Free Compliant

2.Description

- SMPS Synchronous Rectification
- DC/DC Converters
- Or-ing

3.Symbol

DFN5*6



Pin	Function
4	Gate
5,6,7,8	Drain
1,2,3	Source

4. Ordering Information

Part Number	Package	Brand
KCY3104S	DFN5*6	KIA

5.Absolute maximum ratings

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DS}	40	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current V_{GS}@10V[1,6]	T_C=25℃	I_D	110	A
	T_C=100℃		93	
Pulsed drain current[2]		I_{DM}	400	A
Single pulse avalanche energy[3]		EAS	400	mJ
Avalanche current		I_{AS}	40	A
Total power dissipation[4]	T_C=25℃	P_D	125	W
Junction and storage temperature range		T_J ,T_{STG}	-55 to150	℃

6.Thermal Data

Parameter	Symbol	Ratings	Units
Thermal resistance,junction-ambient[1]	$R_{\theta JA}$	50	℃/W
Thermal resistance,Junction-case[1]	$R_{\theta Jc}$	1	

7. 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	40	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=32V,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	1.6	2.5	V
Static drain-source on- resistance[2]	$R_{DS(on)}$	V_{GS}=10V,I_D=20A	-	1.5	2.0	mΩ
		V_{GS}=4.5V,I_D=20A	-	2.0	2.8	
Forward transcend ductance	g_{FS}	V_{DS}=5V, I_D=20A	-	50	-	S
Gate Resistance	Rg	V_{GS}=0V, V_{DS}=0V F=1MHZ	-	1.0	-	Ω
Total gate charge(4.5V)	Q_g	V_{DS}=15V, V_{GS}=10V I_D =20A	-	45	-	nC
Gate-source charge	Q_{gs}		-	12	-	
Gate-drain charge	Q_{gd}		-	18	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, R_G=3.3Ω, V_{GS}=10V I_D=20A	-	19	-	ns
Rise time	t_r		-	10	-	
Turn-off delay time	$t_{d(off)}$		-	58	-	
Fall time	t_f		-	32	-	
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V F=1.0MHZ	-	3950	-	pF
Output capacitance	C_{oss}		-	1100	-	
Reverse transfer capacitance	C_{rss}		-	80	-	
Diode characteristics						
Continuous source current[1.6]	I_S	V_G=V_D=0V,Force current	-	-	110	A
Diode forward voltage[2]	V_{SD}	V_{GS}=0V,I_S=1A, T_J=25°C	-	-	1.4	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=0.5mH,I_{AS}=40A
4.The power dissipation is limited by 150˚C 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.Package limitation current is 100A.

8. Test circuits and waveforms

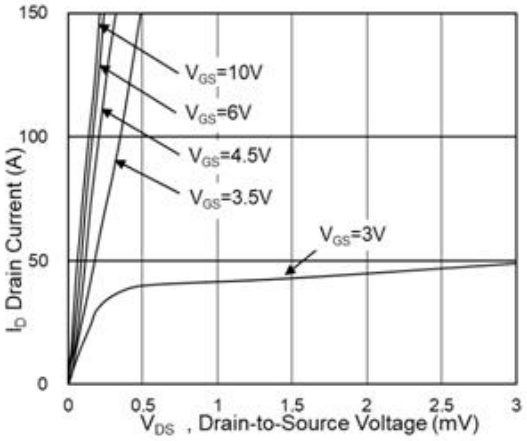


Fig.1 Typical Output Characteristics

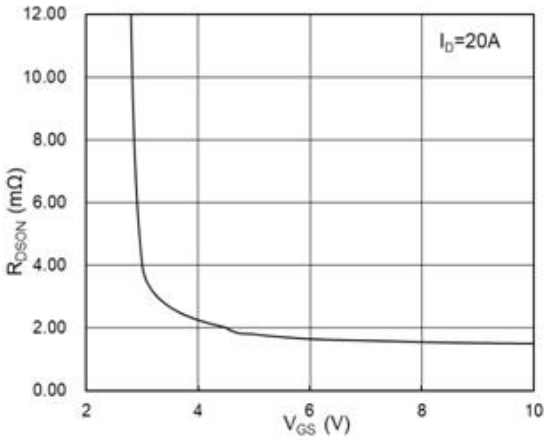


Fig.2 On-Resistance vs G-S Voltage

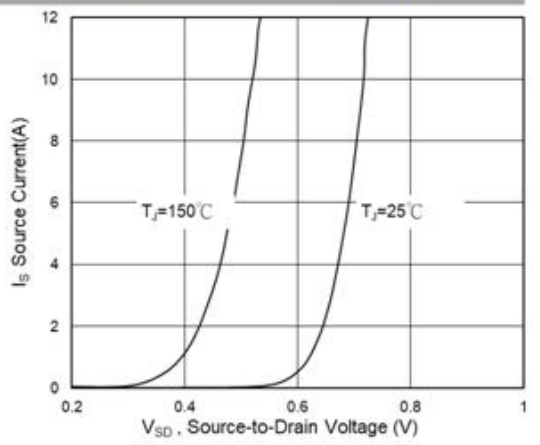


Fig.3 Source Drain Forward Characteristics

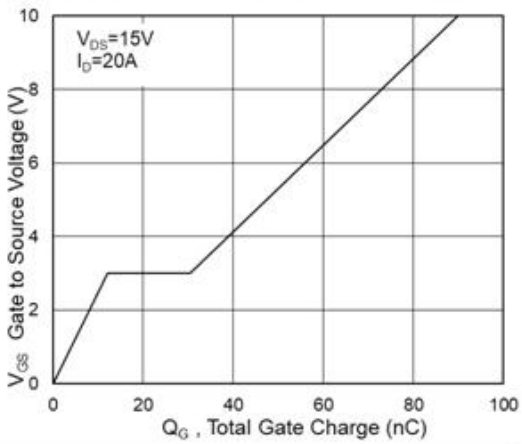


Fig.4 Gate-Charge Characteristics

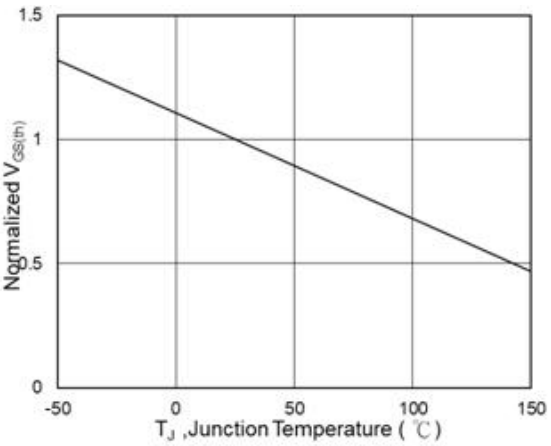


Fig.5 Normalized $V_{GS(th)}$ vs T_J

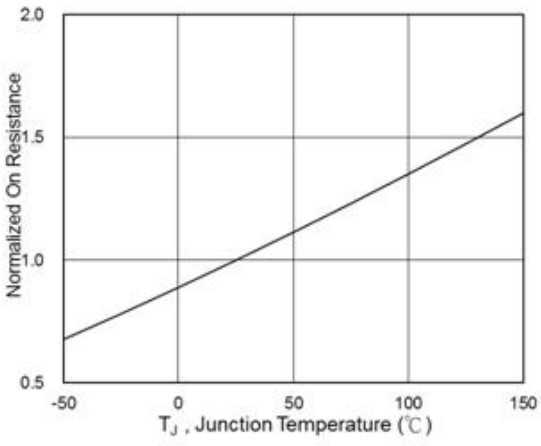


Fig.6 Normalized R_{DSON} vs T_J

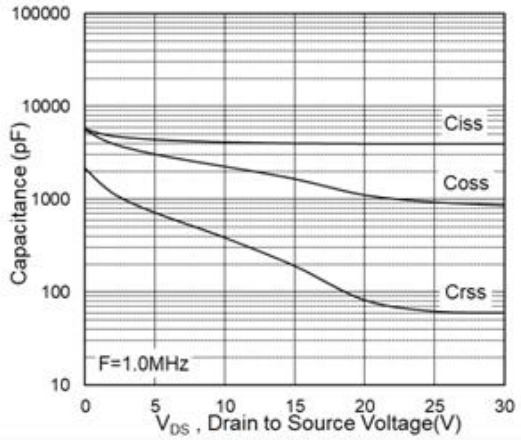


Fig.7 Capacitance

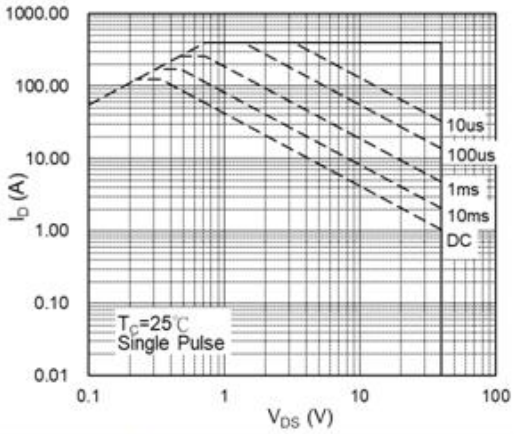


Fig.8 Safe Operating Area

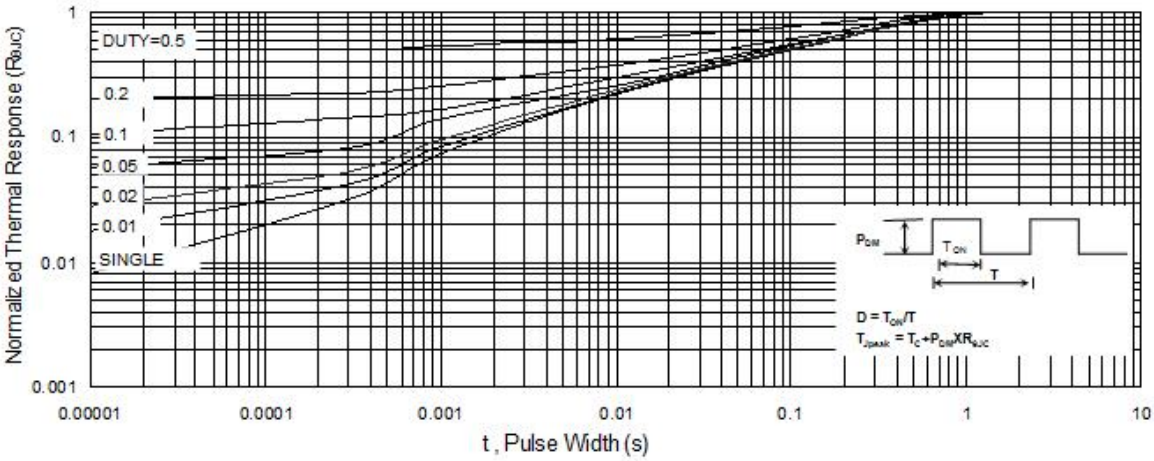


Fig.9 Normalized Maximum Transient Thermal Impedance

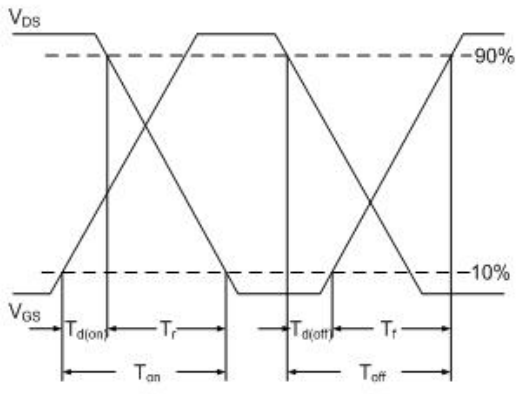


Fig.10 Switching Time Waveform

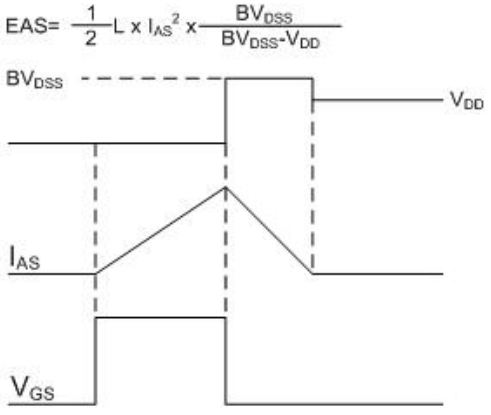


Fig.11 Unclamped Inductive Switching Waveform