

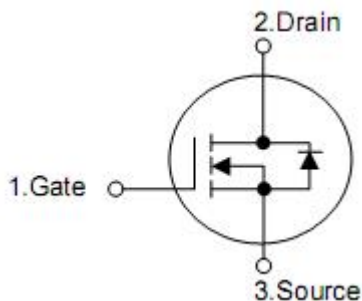
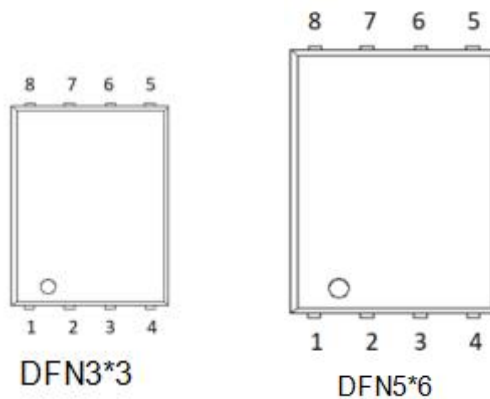
1.Features

- n $R_{DS(on)}(typ.)=7.5m\Omega, V_{GS}=10V$
- n Advanced trench process technology
- n High density cell design for ultra low on-resistance
- n Fully characterized avalanche voltage and current

2.Applications

- n High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- n Networking DC-DC Power System
- n Load Switch

3. Pin configuration



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

4. Ordering information

Part Number	Package	Brand
KNG3703A	DFN3*3	KIA
KNY3703A	DFN5*6	KIA

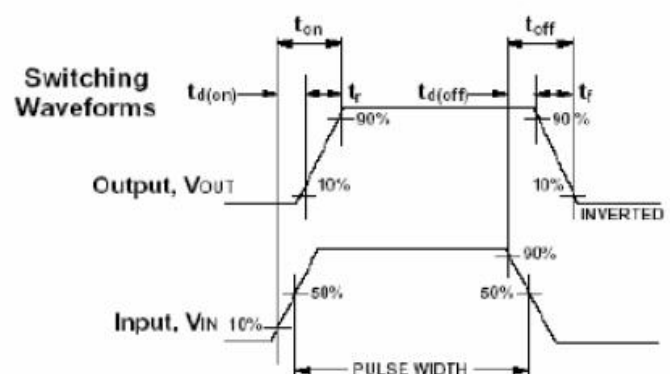
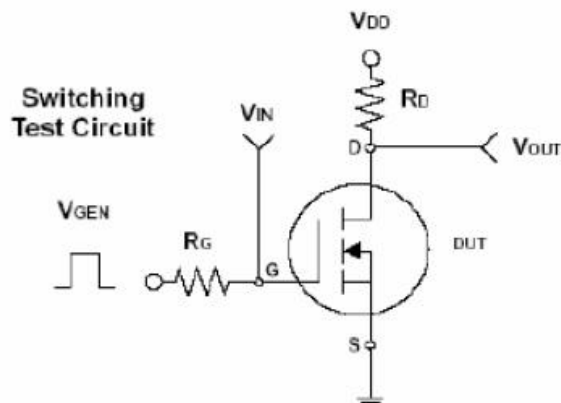
5. Maximum ratings and thermal characteristics

($T_A=25^\circ\text{C}$, unless otherwise notes)

Rating	Symbol	Value		Unit	
		DNF5*6	DNF3*3		
Drain-source voltage	V_{DS}	30		V	
Gate-source voltage	V_{GS}	± 20		V	
Continuous drain current ⁴⁾	I_D	50	50	A	
Pulsed drain current ^{1,4)}	I_{DM}	200	200	A	
Maximum power dissipation	$T_A=25^\circ\text{C}$	P_D	46	28	W
	$T_A=75^\circ\text{C}$	P_D	17.9	11.1	W
Operating junction and storage temperature range	T_J/T_{STG}	-55 to 150		$^\circ\text{C}$	
Junction-to-case thermal resistance	$R_{\theta JC}$	2.71	4.46	$^\circ\text{C/W}$	
Junction-to ambient thermal resistance (PCB mount) ²⁾	$R_{\theta JA}$	47	72	$^\circ\text{C/W}$	

Note: 1. Repetitive rating; pulse width limited by the maximum junction temperature
 2. 1-in² 2oz Cu PCB board
 3. Guaranteed by design; not subject to production testing
 4. Drain current limited by maximum junction temperature.

6. Typical application circuit



ENHANCEMENT-MODE MOSFET

7. Electrical characteristics

(Ta=25°C, unless otherwise notes)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units	
Static							
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30	-	-	V	
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =25A	-	11.5	14	mΩ	
		V _{GS} =10V, I _D =25A	-	7.5	9.0	mΩ	
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	1	1.5	3	V	
Forward transconductance	g _{fs}	V _{DS} =15V, I _D =15A	-	12	-	S	
Zero gate voltage drain current	I _{DSS}	V _{DS} =25V, V _{GS} =0V	-	-	1	μA	
Gate-source forward leakage	I _{GSS}	V _{GS} =+20V, V _{DS} =0V	-	-	±100	nA	
Dynamic ³⁾							
Total gate charge	Q _g	I _D =35A V _{DS} =15V V _{GS} =10V	-	10		nC	
Gate-source charge	Q _{gs}				3.5		nC
Gate-drain ("miller") charge	Q _{gd}			-	3		nC
Turn-on delay time	t _{d(off)}	V _{DD} =15V I _D =1A R _G =6Ω R _L =15Ω V _{GEN} =10V	-	12	-	ns	
Rise time	t _r		-	4	-	ns	
Turn-off delay time	t _{d(off)}		-	32	-	ns	
Fall time	t _f		-	6	-	ns	
Input capacitance	C _{iss}	V _{GS} =0V V _{DS} =15V f=1.0MHz	-	1300	-	pF	
Output capacitance	C _{oss}		-	270	-	pF	
Reverse transfer capacitance	C _{rss}		-	145	-	pF	

Source-drain diode

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Units
Diode forward voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	0.87	1.5	V
Max. diode forward current	I _S		-	-	20	A

Notes: Pulse width ≤ 300μs, duty cycle ≤ 2%

8. Test circuits and waveforms

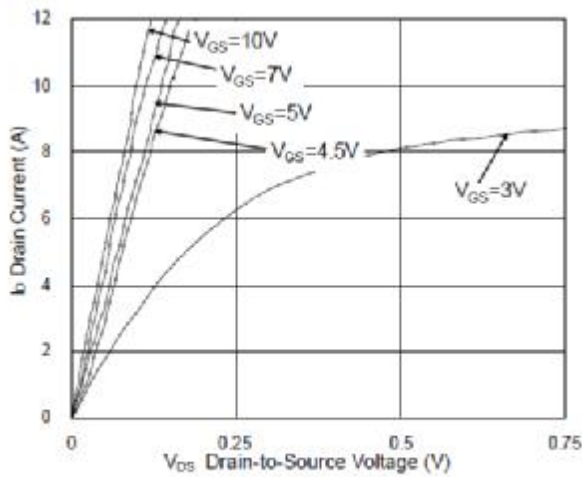


Fig.1 Typical Output Characteristics

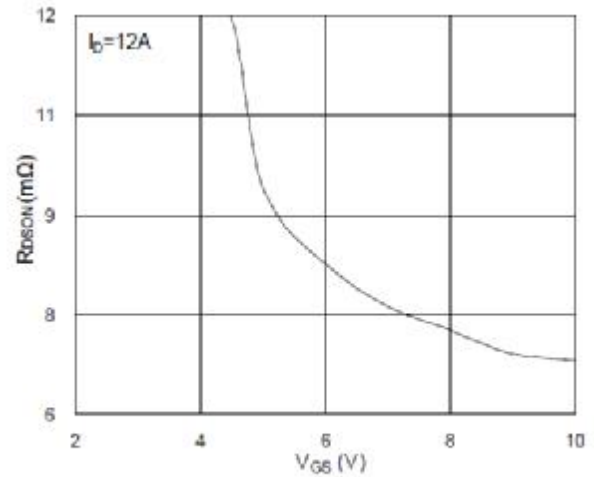


Fig.2 On-Resistance vs. G-S Voltage

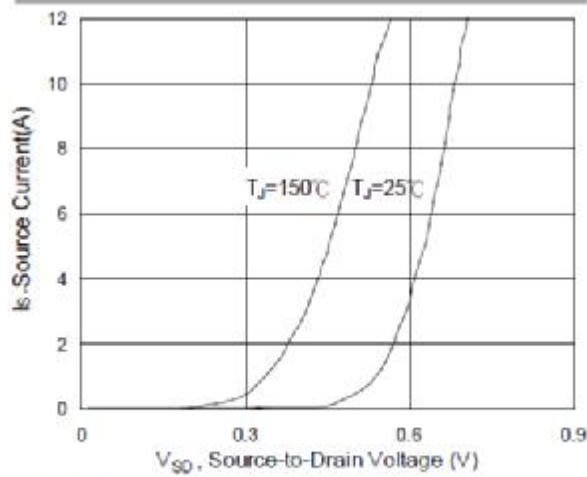


Fig.3 Forward Characteristics of Reverse

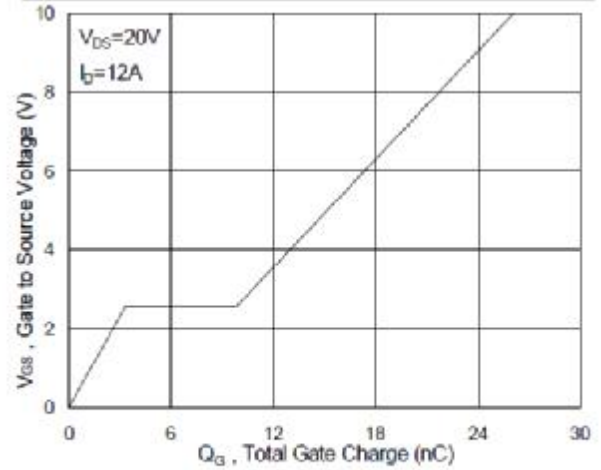


Fig.4 Gate-Charge Characteristics

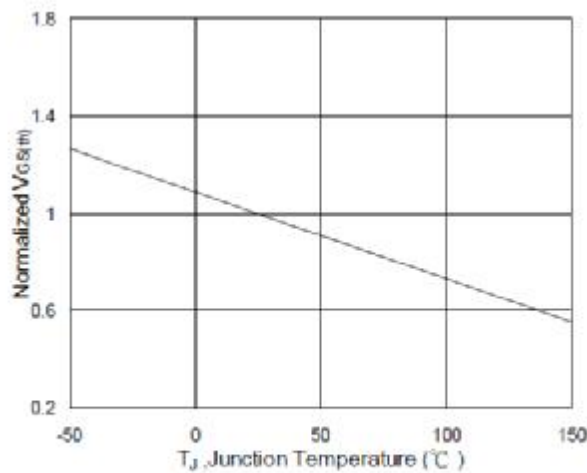


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

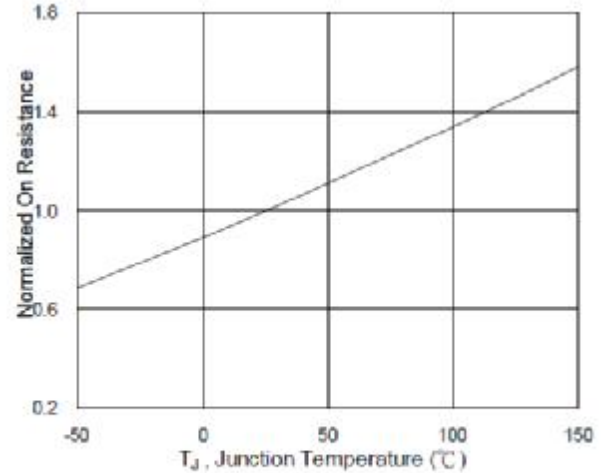


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

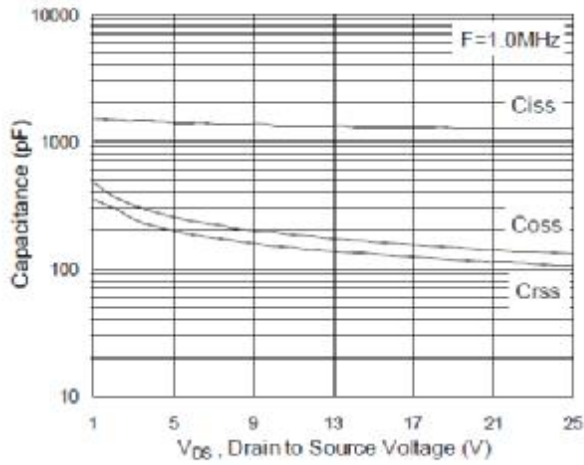


Fig.7 Capacitance

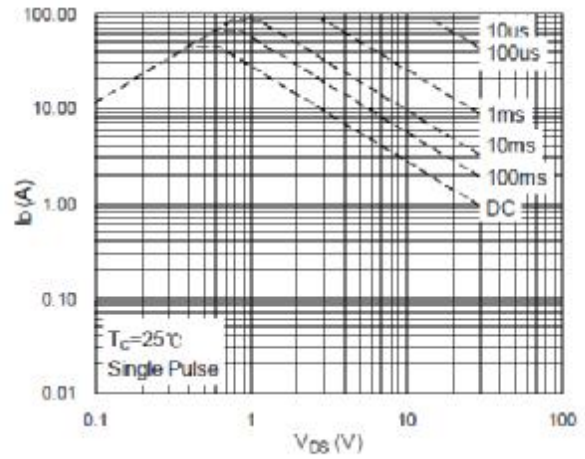


Fig.8 Safe Operating Area

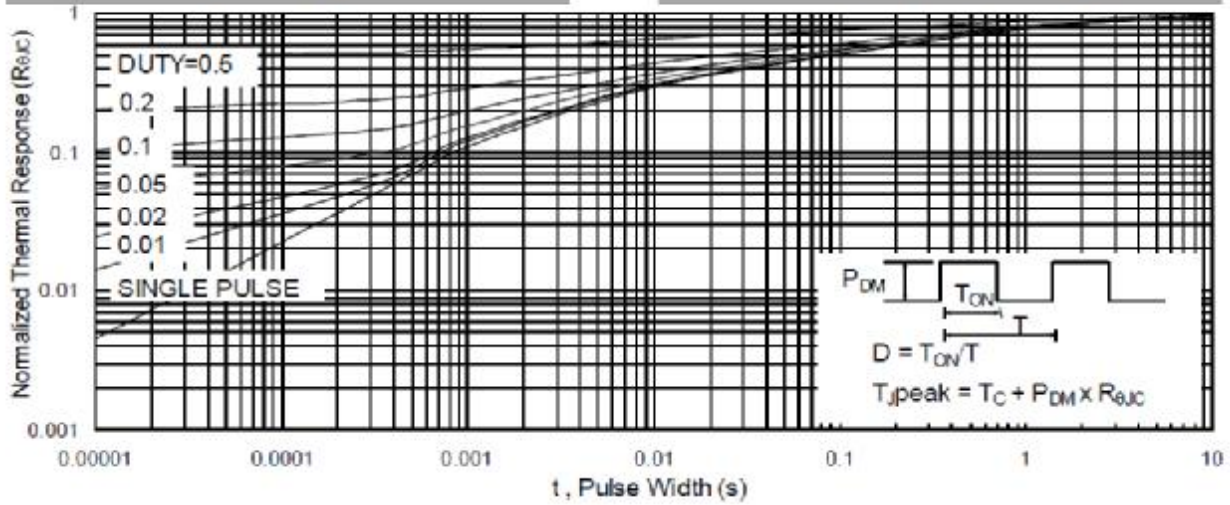


Fig.9 Normalized Maximum Transient Thermal Impedance

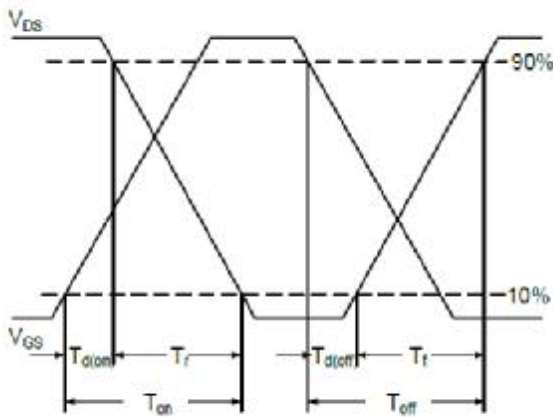


Fig.10 Switching Time Waveform

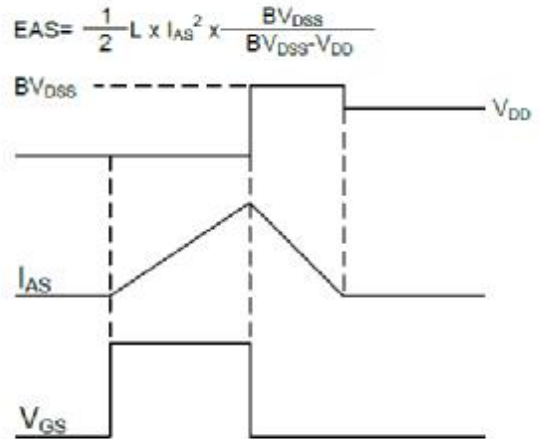


Fig.11 Unclamped Inductive Switching Waveform