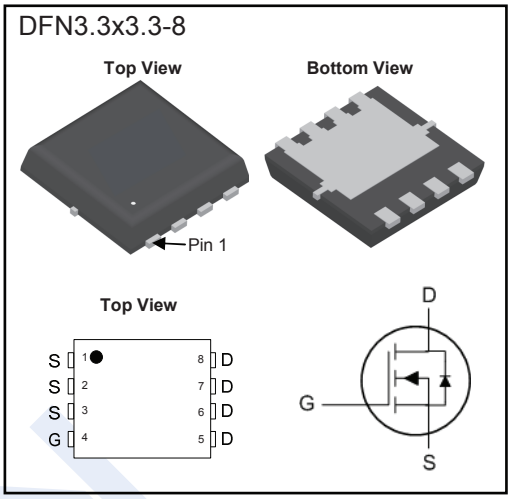
N-Channel MOSFET

KI30N03DFN



■ Features

- $V_{DS\ (V)}$ = 30 V
- I_{DMAX} = 28 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) < 18 mΩ

■ Absolute Maximum Ratings (T_A = 25℃ unless otherwise noted)

Parameter			Symbol	Rating	Unit
Drain-Source Voltage			V_{DS}	30	V
Gate-Source Voltage			V_{GS}	±20	
Continuous Drain Current, V_{GS} @ 10V (Note 1)	T_C=25℃		I_D	28	A
	T_C=100℃			18	
	T_A=25℃	10s		11.7	
		Steady State		7.4	
	T_A=70℃	10s		9.4	
		Steady State		6	
Pulsed Drain Current (Note 2)			I_{DM}	56	
Avalanche Current			I_{AS}	21	
Single Pulse Avalanche Energy (Note 3)			E_{AS}	72	mJ
Power Dissipation (Note 4)	T_C=25℃		P_D	20.8	W
	T_A=25℃	10s		4.2	
		Steady State		1.67	
Thermal Resistance.Junction- to-Ambient (Note 1)		Steady State	R_{thJA}	75	℃/W
		t ⩽ 10s		30	
Thermal Resistance.Junction- to-Case (Note 1)			R_{thJC}	6	
Junction Temperature			T_J	150	℃
Storage Temperature Range			T_{stg}	-55 to 150	

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■ Electrical Characteristics (T_J = 25℃ unless othewise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24 V, V_{GS} = 0 V			1	μA
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55 ℃			5	
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	1.2		2.5	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 15 A			18	mΩ
		V_{GS} = 4.5 V, I_D = 10 A			30	
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 30 A		19.4		S
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 15 V, f = 1 MHz		572	801	pF
Output Capacitance	C_{oss}			80	112	
Reverse Transfer Capacitance	C_{rss}			65	91	
Gate Resistance	R_g	V_{GS} = 0 V, V_{DS} = 0 V, f = 1 MHz		2.5	5	Ω
Single Pulse Avalanche Energy (Note 5)	E_{AS}	V_{DD}=25V , L=0.1mH , I_{AS}=10A	16			mJ
Total Gate Charge	Q_g(4.5V)	V_{GS} = 4.5V, V_{DS} = 15 V, I_D = 15 A		6.2	8.7	nC
Gate Source Charge	Q_{gs}			2.4	3.4	
Gate Drain Charge	Q_{gd}			2.5	3.5	
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 15 V, R_G = 3.3 Ω, I_D = 15A		3	6	ns
Turn-On Rise Time	t_r			7.6	14	
Turn-Off DelayTime	$t_{d(off)}$			20.8	42	
Turn-Off Fall Time	t_f			4	8	
Body Diode Reverse Recovery Time	t_{rr}	I_F = 30 A, dI/dt = 100 A/μs		17		
Body Diode Reverse Recovery Charge	Q_{rr}			3		nC
Maximum Body-Diode Continuous Current (Note 1,6)	I_S	V_G=V_D=0V , Force Current			28	A
Pulsed Source Current (Note 2,6)	I_{SM}				56	
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS} = 0 V, I_S = 1 A			1.2	V

Notes:

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}=21A

4.The power dissipation is limited by 150℃ junction temperature

5.The Min. value is 100% EAS tested guarantee.

6.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

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■ Typical Characterisitics

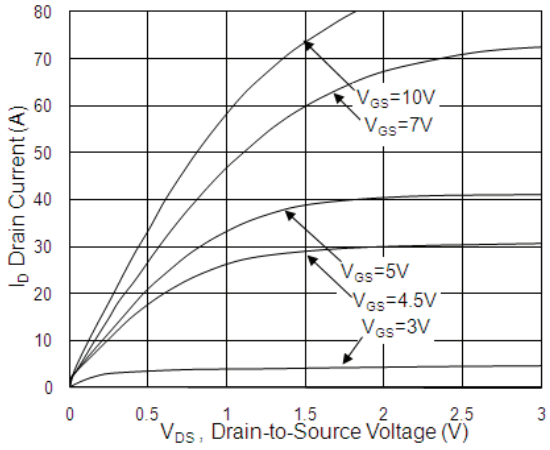

Fig.1 Typical Output Characteristics

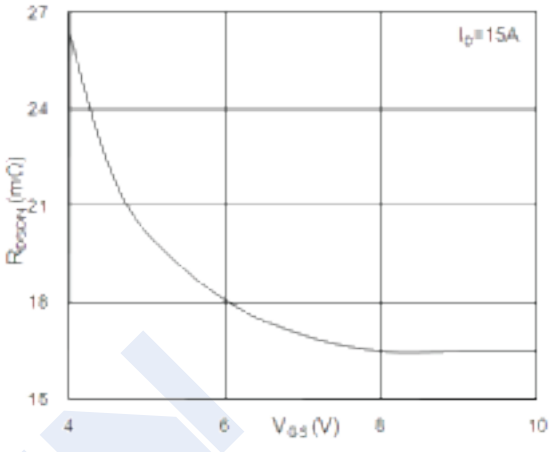

Fig.2 On-Resistance vs. Gate-Source

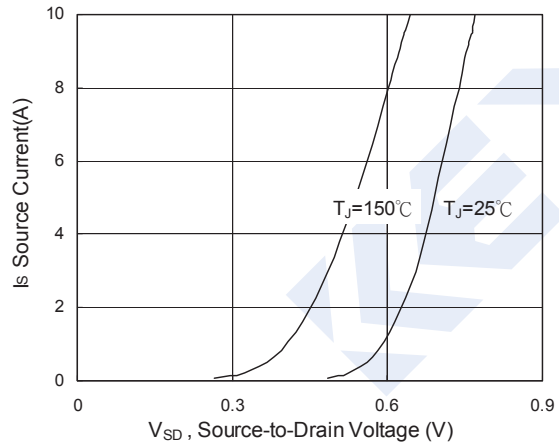

Fig.3 Forward Characteristics Of Reverse

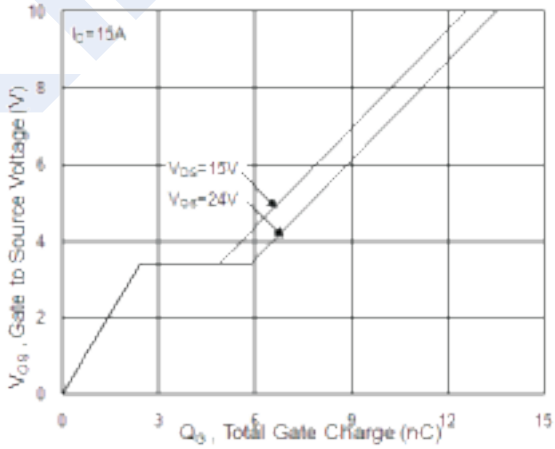

Fig.4 Gate-Charge Characteristics

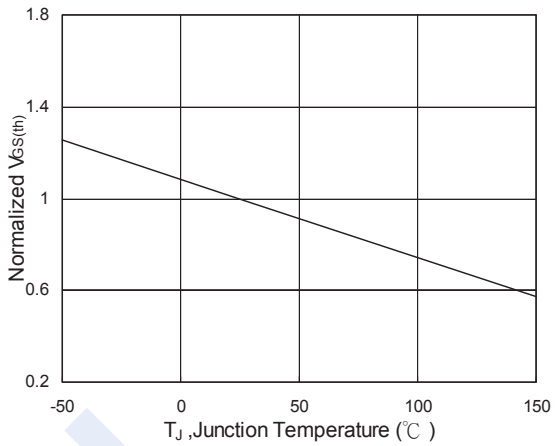

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

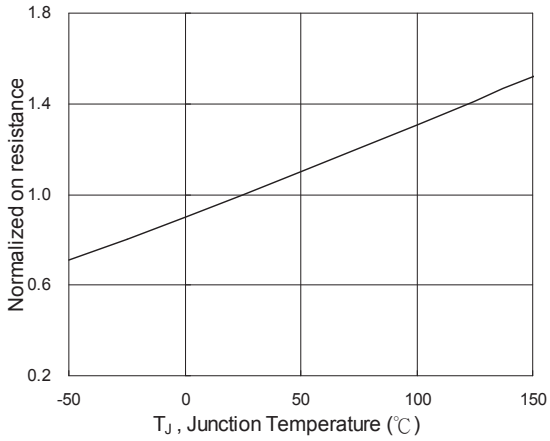

Fig.6 Normalized R_{DSON} vs. T_J

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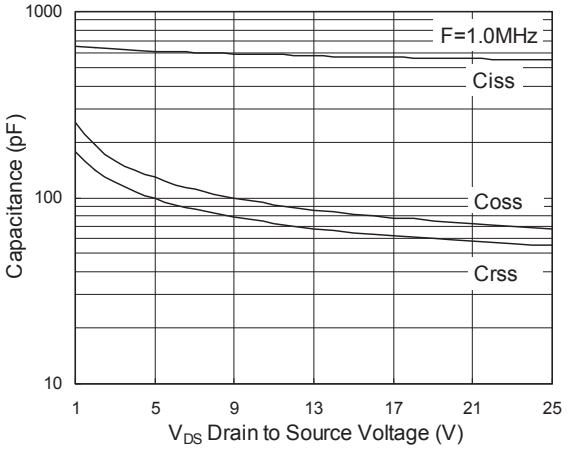

Fig.7 Capacitance

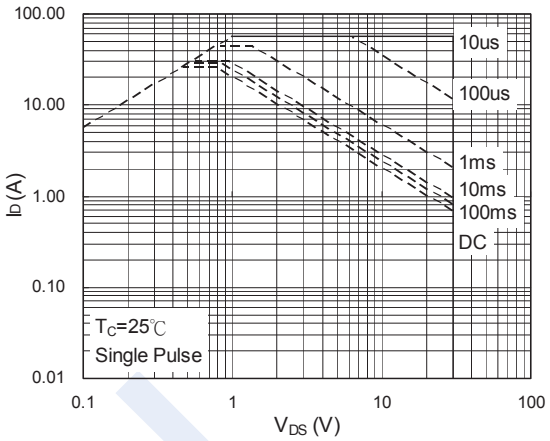

Fig.8 Safe Operating Area

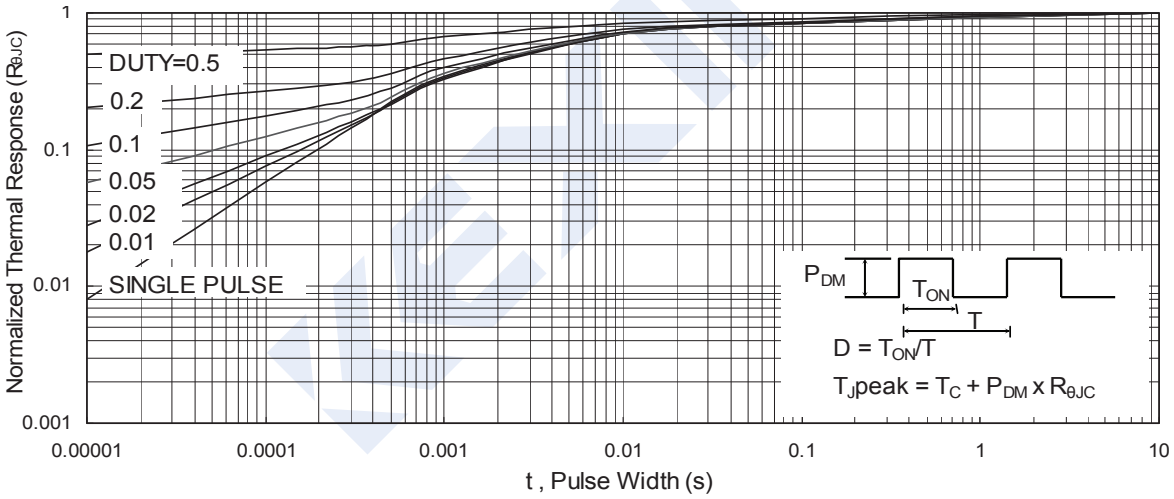

Fig.9 Normalized Maximum Transient Thermal Impedance

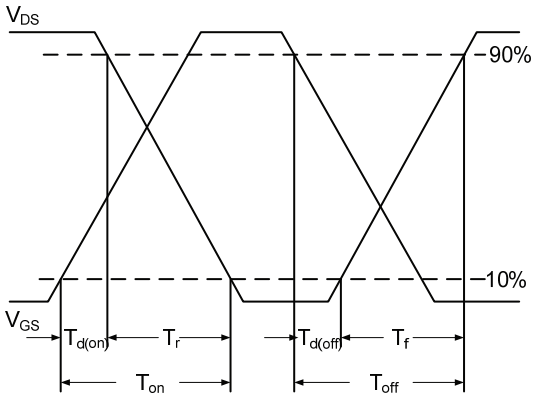

Fig.10 Switching Time Waveform

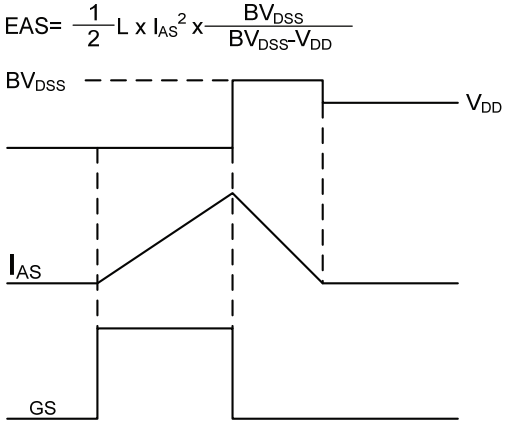

Fig.11 Unclamped Inductive Switching Waveform

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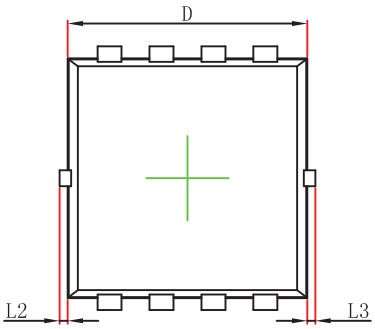
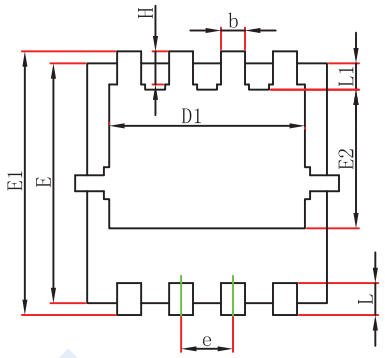
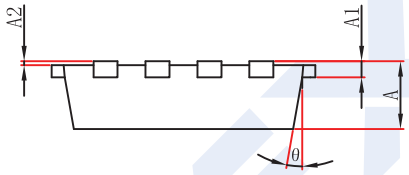
■ DFN3.3x3.3-8 Package Outline Dimensions



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°