



XNM90N03DF

30V N-Channel MOSFET

1. Features

- V_{DS} 30V
- I_D (at $V_{GS}=10V$) 90A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) 3.0m Ω (Typ)
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) 4.3m Ω (Typ)

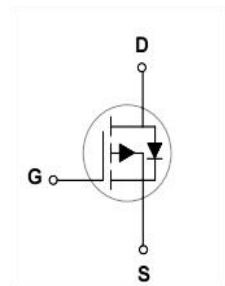
2. Mechanical Data

- Case:Molded Plastic,PDFN5*6 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking:90N03
- Mounting Position : Any.

PDFN5*6



- 1 Gate
- 2 Source
- 3 Drain



3. Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

Parameter		Symbol	Value	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	90	A
	$T_C = 100^\circ\text{C}$		57	
Drain Current-Pulsed ¹		I_{DM}	300	A
Power Dissipation		P_{tot}	80	W
Thermal Resistance from Junction to Lead		$R_{\theta JL}$	1.67	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient ²		$R_{\theta JA}$	62	$^\circ\text{C/W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~ +150	$^\circ\text{C}$

**4. Electrical Characteristics**

Rating at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V,V _{GS} =0V			1	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V			±10	nA
On characteristics³						
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =30A		3	4	mΩ
		V _{GS} =-4.5V, I _D =20A		4	6.5	mΩ
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	1	1.6	2.5	V
Dynamic Characteristics⁴						
Input capacitance	C _{iss}	V _{DS} =15V,V _{GS} =0V,f =1MHz		1950		pF
Output capacitance	C _{oss}			320		pF
Reverse transfer capacitance	C _{rss}			240		pF
Switching Characteristics⁴						
Gate charge total	Q _g	V _{DS} = 15 V, I _D = 30 A, V _{GS} = 10 V		42		nC
Gate-Source Charge	Q _{gs}			4.2		nC
Gate-Drain Charge	Q _{gd}			14		nC
Turn-on delay time	t _{d(on)}	V _{GS} = 10 V, V _{DS} = 15V, R _L =0.75Ω, R _{GEN} = 3 Ω		13		nS
Turn-on rise time	t _r			36		nS
Turn-off delay time	t _{d(off)}			43.2		nS
Turn-off fall time	t _f			15.6		nS
Source-Drain Diode characteristics⁴						
Body Diode Voltage	V _{SD}	I _{SD} =30A,V _{GS} =0V		0.72	1.2	V
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V,F=1MHz		2		Ω

Notes :

- 1.Repetitive Rating : Pulsed width limited by maximum junction temperature.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 3.Essentially independent of operating temperature.



5. Rating And Characteristic Curves

Fig1: Continuous Drain Current vs. T_C

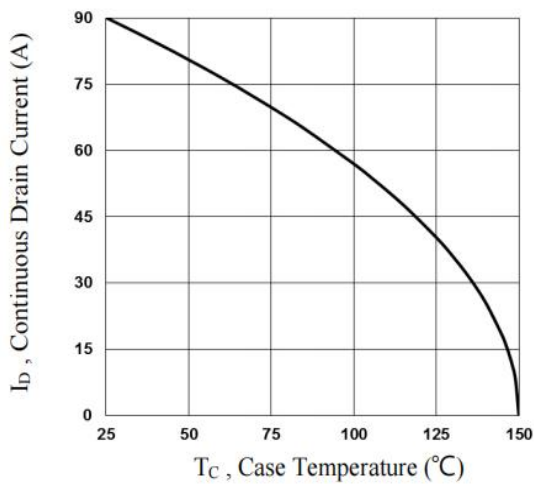


Fig2: Normalized $R_{DS(on)}$ vs. T_J

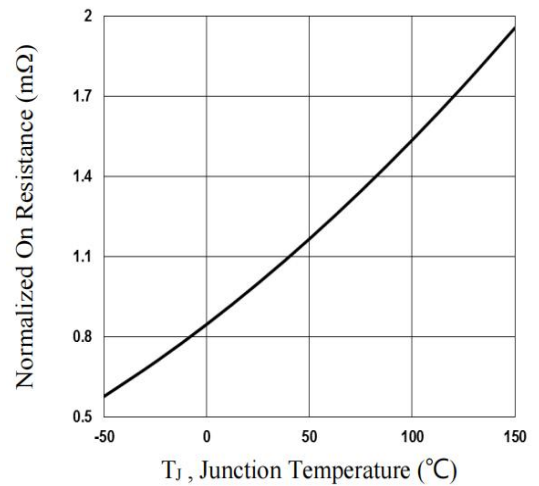


Fig.3 Normalized V_{th} vs. T_J

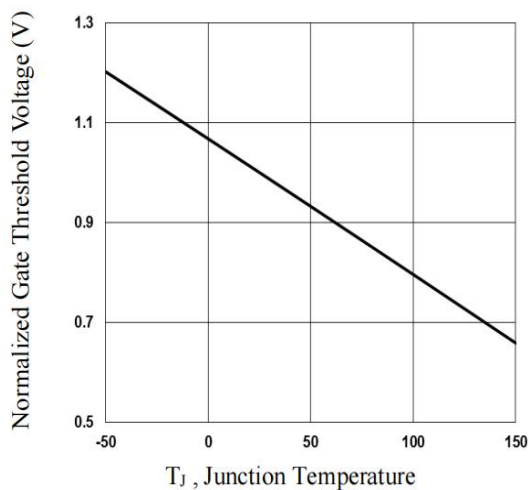


Fig.4 Gate Charge Waveform

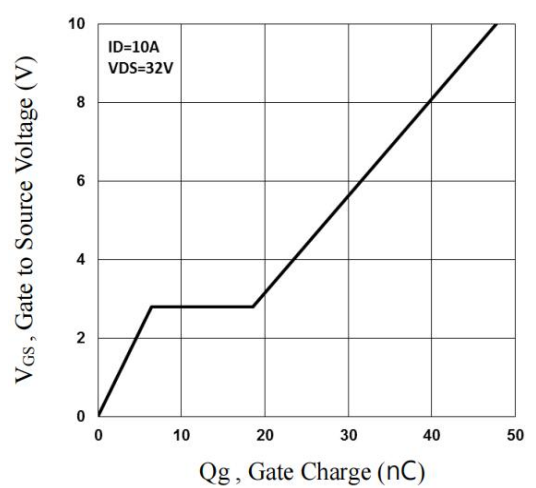


Fig.5 Normalized Transient Impedance

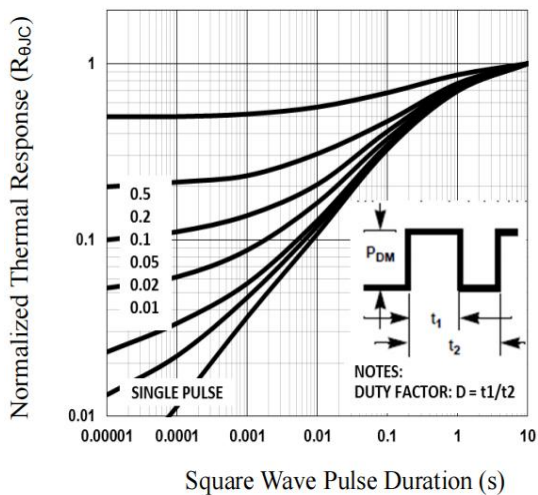
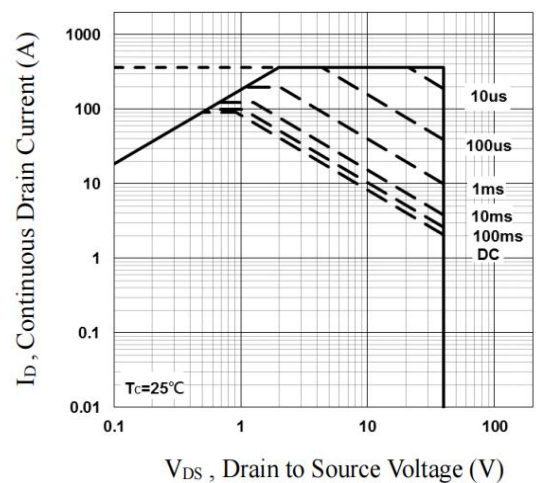


Fig.6 Maximum Safe Operation Area



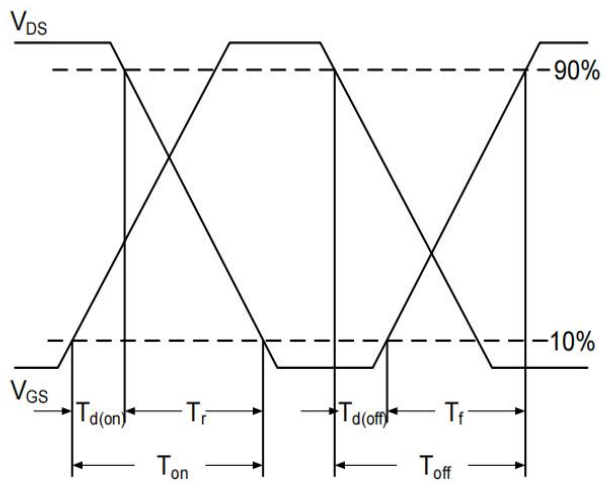


Fig.7 Switching Time Waveform

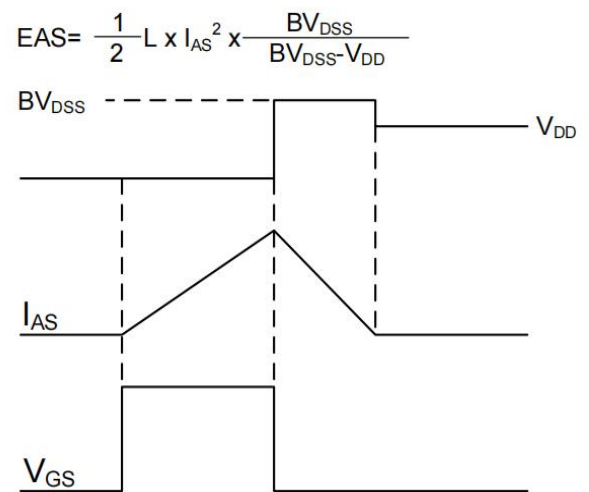
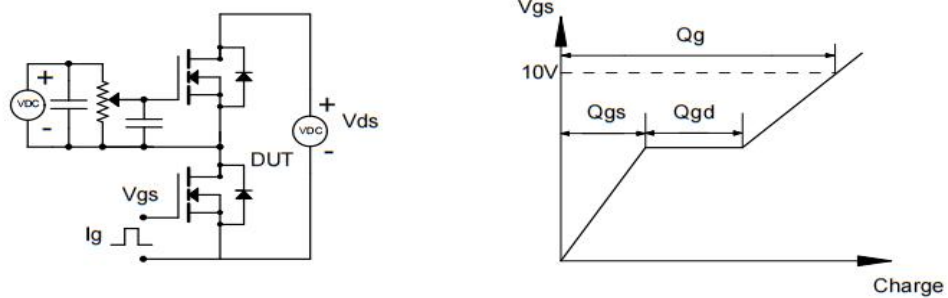


Fig.8 EAS Waveform

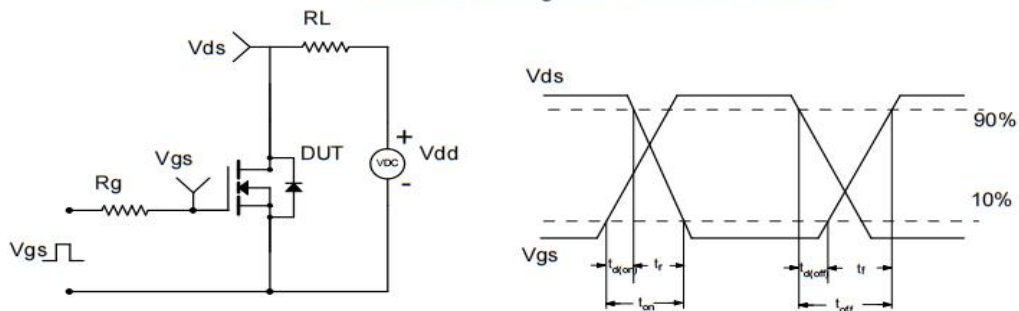


6. Test Circuits

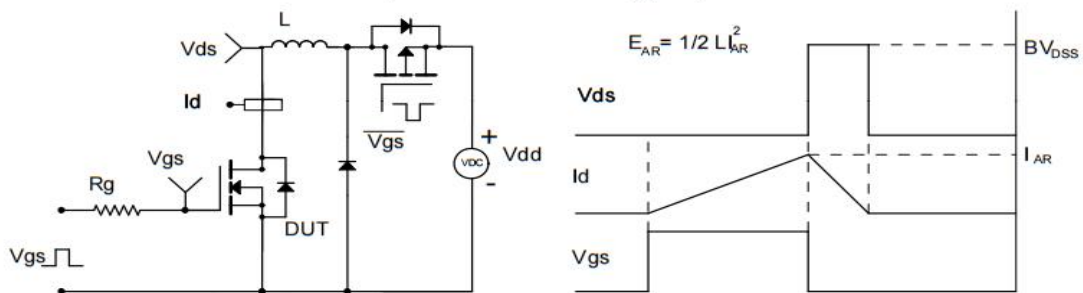
Gate Charge Test Circuit & Waveform



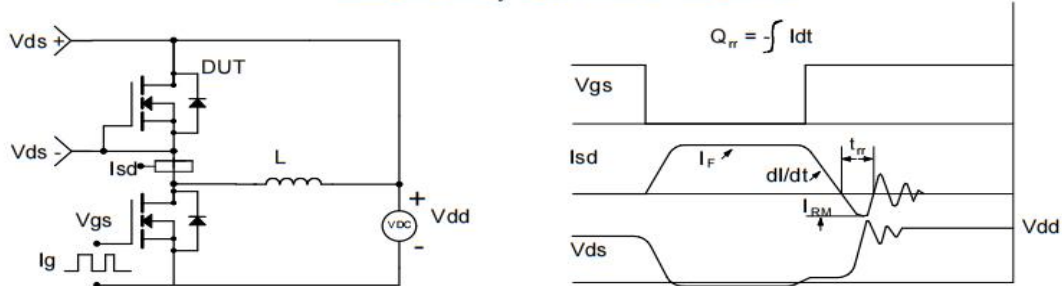
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

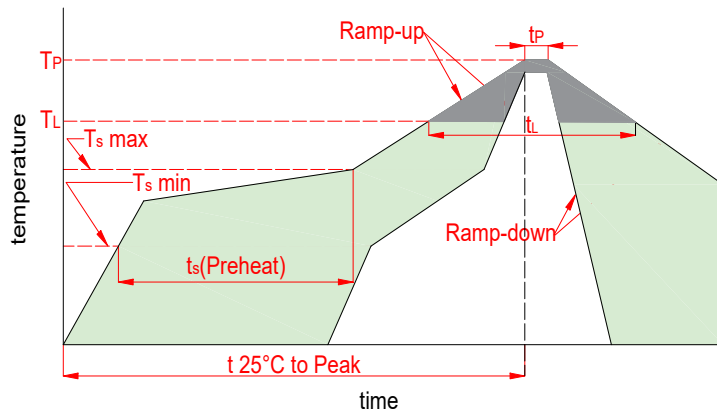


Diode Recovery Test Circuit & Waveforms



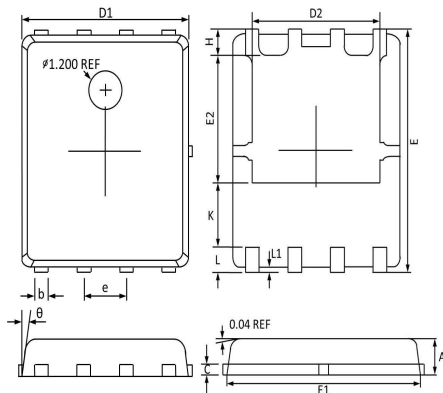


7. Soldering Parameters



Reflow Condition		Lead-free
Pre Heat	Temp. min($T_s(\text{min})$)	150°C
	Temp. max($T_s(\text{min})$)	200°C
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3°C/s max
$T_s(\text{max})$ to T_L -Ramp-up Rate		3°C/s max
Reflow	Temp. (T_L)(Liquidus)	217°C
	Temp. (t_L)(Liquidus)	60~150s
Peak Temp. (T_p)		260 ^{+0/-5} °C
Time within actual peak Temp. (t_p)		30s max
Ramp-down Rate		6°C/s max
Time 25°C to peak Tempe. (T_p)		8 minutes max
Do not exceed		260°C

8. Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.031	0.043	0.80	1.10
b	0.013	0.020	0.33	0.51
C	0.008	0.012	0.20	0.30
D1	0.189	0.201	4.80	5.10
D2	0.142	0.161	3.61	4.10
E	0.232	0.244	5.90	6.20
E1	0.224	0.232	5.70	5.90
E2	0.132	0.149	3.35	3.78
e	0.050(BSC)		1.270(BSC)	
H	0.016	0.028	0.41	0.70
K	0.043	0.059	1.10	1.50
L	0.021	0.028	0.54	0.71
L1	0.002	0.008	0.06	0.20
θ	0°	12°	0°	12°

9. Package Information

Package	Part Number	Marking Code
PDFN5*6	XNM90N03DF	90N03



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