



XNM140N04DF

40V N-Channel MOSFET

1. Features

- V_{DS} 40V
- I_D (at $V_{GS}=10V$) 140A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $1.6m\Omega$ (Typ)

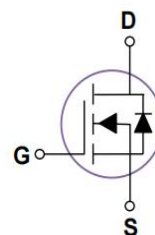
2. Mechanical Data

- Case:Molded Plastic,PDFN5*6 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking:140N04
- 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}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ C$	I_D	140	A
	$T_C = 100^\circ C$		90	
Drain Current-Pulsed ¹		I_{DM}	400	A
Power Dissipation		P_{tot}	73	W
Single pulse avalanche energy		E_{AS}	529	mJ
Thermal Resistance from Junction to Lead		$R_{\theta JL}$	1.3	$^\circ C/W$
Thermal Resistance from Junction to Ambient ²		$R_{\theta JA}$	62	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~ +150	$^\circ C$



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	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
On characteristics						
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =40A		1.6	2.2	mΩ
		V _{GS} =-4.5V, I _D =20A		2.3	3.5	mΩ
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	1	1.8	3	V
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		4000		pF
Output capacitance	C _{oss}			150		pF
Reverse transfer capacitance	C _{rss}			2.5		pF
Switching Characteristics						
Gate charge total	Q _g	V _{DS} = 20 V, I _D = 40 A, V _{GS} = 10 V		62		nC
Gate-Source Charge	Q _{gs}			12		nC
Gate-Drain Charge	Q _{gd}			10		nC
Turn-on delay time	t _{d(on)}	V _{GS} = 10 V, V _{DS} = 40V, V _{DD} = 20 V, R _{GEN} = 3 Ω		15		nS
Turn-on rise time	t _r			25		nS
Turn-off delay time	t _{d(off)}			68		nS
Turn-off fall time	t _f			26		nS
Source-Drain Diode characteristics ⁴						
Body Diode Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V		0.72	1.3	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. $V_{DD} = 25V, V_{GS} = 10V, L = 0.5mH, I_{AS} = 46A$, Starting $T_J = 25^\circ C$.
- 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

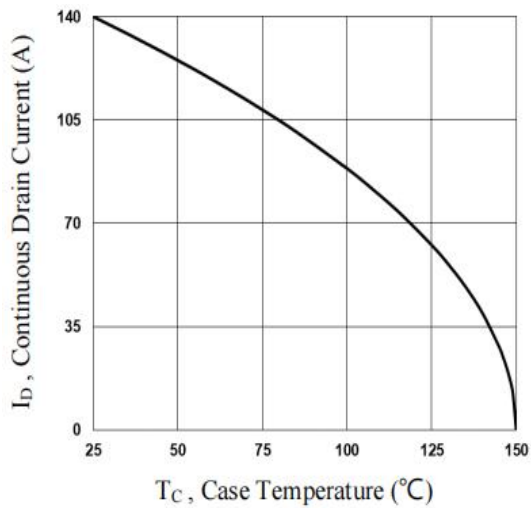


Fig2: Normalized $R_{DS(on)}$ vs. T_J

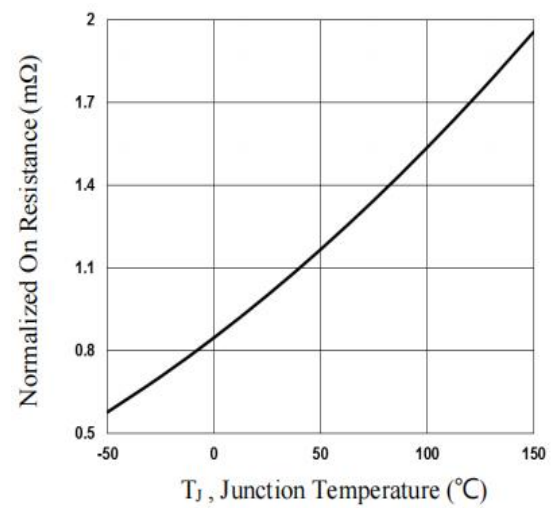


Fig.3 Normalized V_{th} vs. T_J

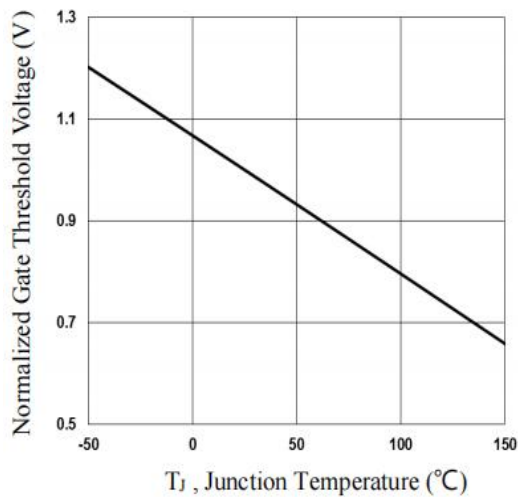


Fig.4 Gate Charge Waveform

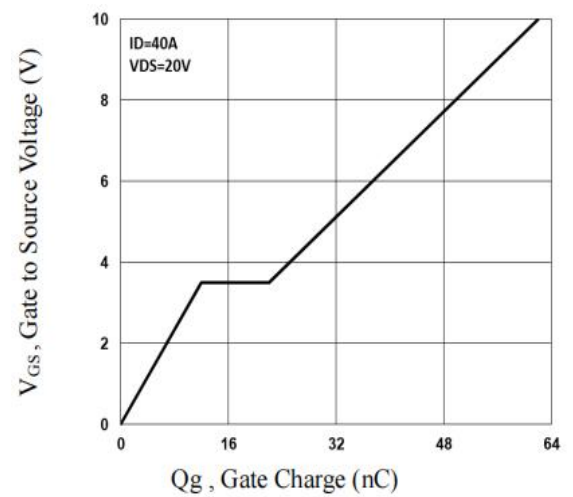


Fig.5 Normalized Transient Impedance

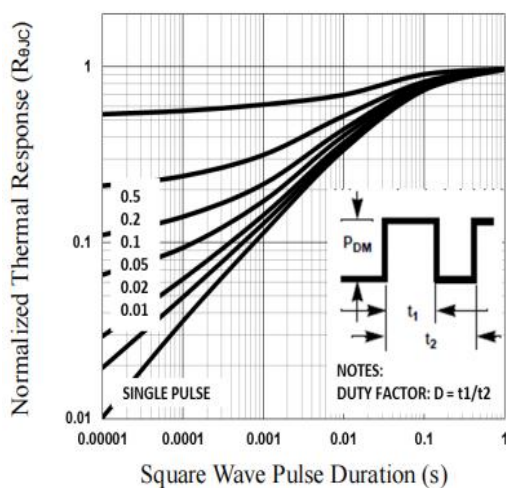


Fig.6 Maximum Safe Operation Area

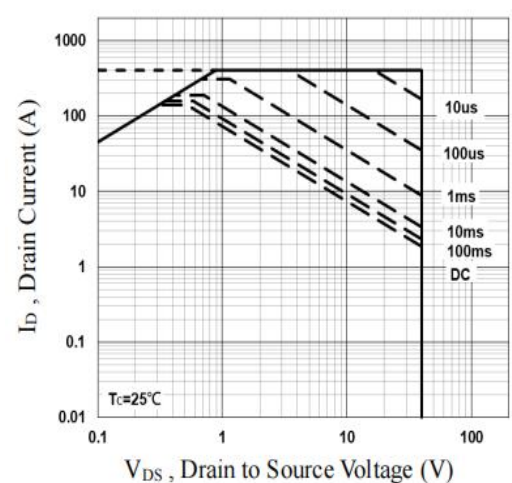




Fig.7 Switching Time Waveform

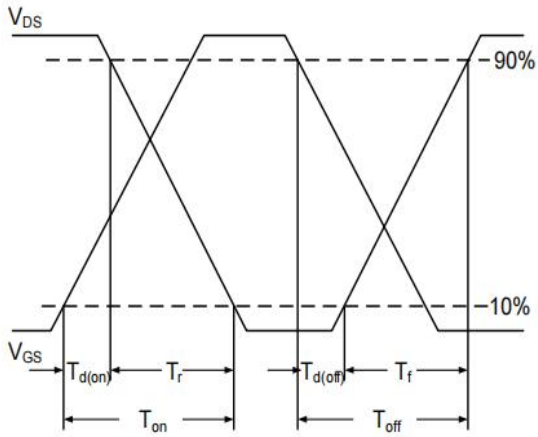
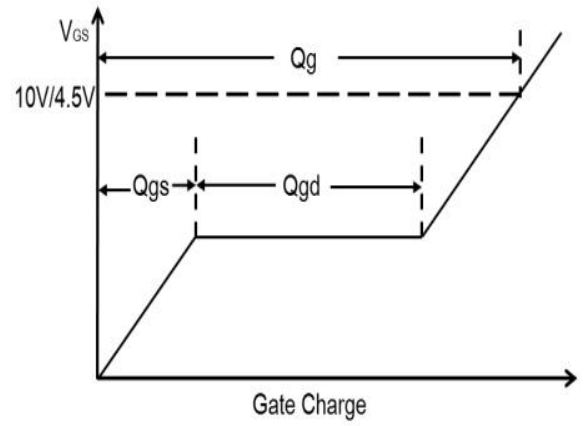
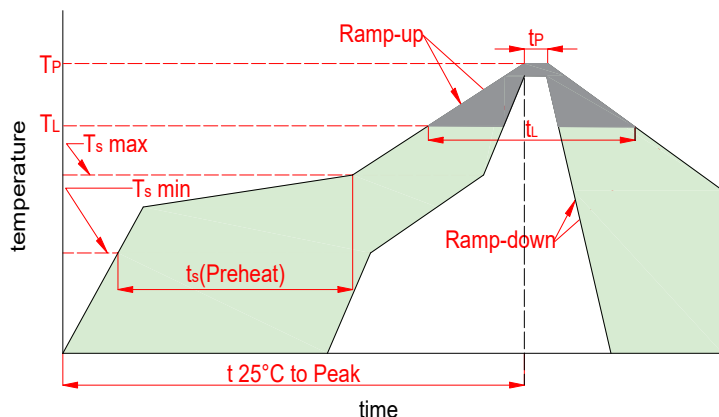


Fig.8 Gate Charge Waveform



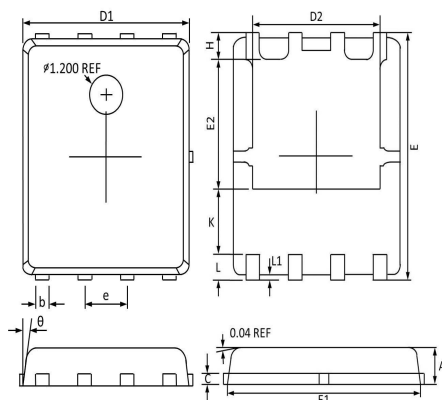


6. Soldering Parameters



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

7. 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	0.020	0.028	0.51	0.71
L1	0.002	0.008	0.06	0.20
θ	0°	12°	0°	12°

8. Package Information

Package	Part Number	Marking Code
PDFN5*6	XNM140N04DF	140N04



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