



XNM104N06DF

60V N-Channel SGT MOSFET

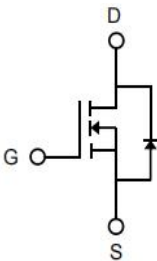
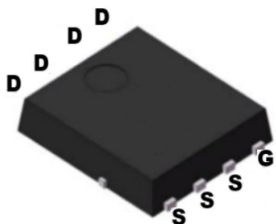
1.Features

- V_{DS} 60V
- I_D (at $V_{GS}=10V$) 104A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) 3.4m Ω (Typ)

2.Mechanical Data

- Case:Molded Plastic,PDFN5*6;
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: marked on body.
- Mounting Position : Any.

PDFN5*6



1. Gate
2. Drain
3. Source

3.Absolute Maximum Ratings

Electrical Characteristics ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_C = 25^{\circ}C$)	I_D	104	A
Drain Current-Continuous($T_C = 100^{\circ}C$)		66	
Pulsed Drain Current	I_{DM}	391	A
Power Dissipation	P_D	78	W
Single Pulsed Avalanche energy ⁽¹⁾	E_{AS}	212	mJ
Junction Temperature	T_J	-55~+150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~+150	$^{\circ}C$
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	1.6	$^{\circ}C/W$
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	46	$^{\circ}C/W$



4. Electrical Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	

Off Characteristics

Drain-source breakdown voltage	B_{VDSS}	$V_{GS} = 0V, I_D = 250\mu A$	60	-		V
Gate-source leakage current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate threshold voltage	I_{GSS}	$V_{DS} = 0V, V_{GS} = 20V$	-	-	100	nA

On Characteristics

Drain-to-Source Leakage Current	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.7	2.5	V
Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	3.4	4.1	m Ω
		$V_{GS} = 4.5V, I_D = 10A$	-	4.5	5.7	m Ω

Dynamic Parameters

Gate Resistance	R_g	$f = 1 \text{ MHz}$	-	1.5	-	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 5 \text{ V}, I_D = 20 \text{ A}$	-	30	-	S
Input Capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V$ $f = 1.0 \text{ MHz}$	-	1792	-	pF
Output Capacitance	C_{oss}		-	901	-	
Reverse Transfer Capacitance	C_{rss}		-	32	-	

Switching Parameters

Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=30V, V_{GS}=10V, I_D=20A$ $R_G=3\Omega$	-	5.5	-	nS
Turn-on Rise Time	t_r		-	9.8	-	
Turn-off Delay Time	$t_{d(off)}$		-	26	-	
Turn-off Fall Time	t_f		-	16	-	
Total Gate Charge	Q_g	$V_{DS}=30V, I_D=20, V_{GS}=10V$	-	33	-	nC
Gate-Source Charge	Q_{gs}		-	5.6	-	
Gate-Drain Charge	Q_{gd}		-	7.3	-	

Drain-Source Diode Characteristics

Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 2A$	-	0.7	1.2	V
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Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=30V, V_{GS}=10V, L=0.5mH, I_{AS}=42A.$, Starting $T_J=25^\circ C$
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature



5. Rating And Characteristic Curves

Fig. 1 On-Resistance vs. Gate-Source Voltage

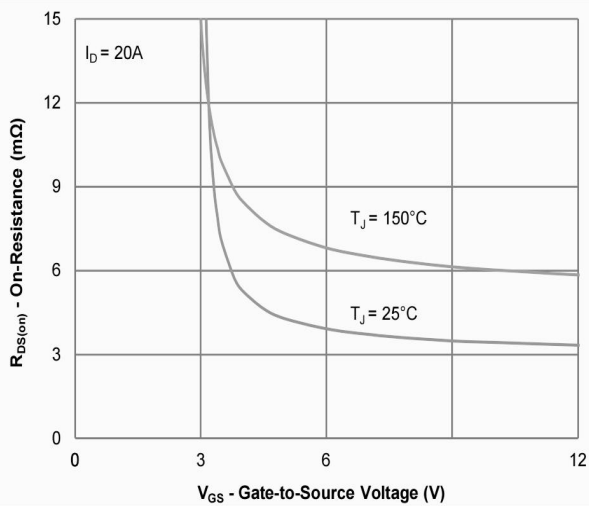


Fig 2 On-Resistance vs. Gate-Source Voltage

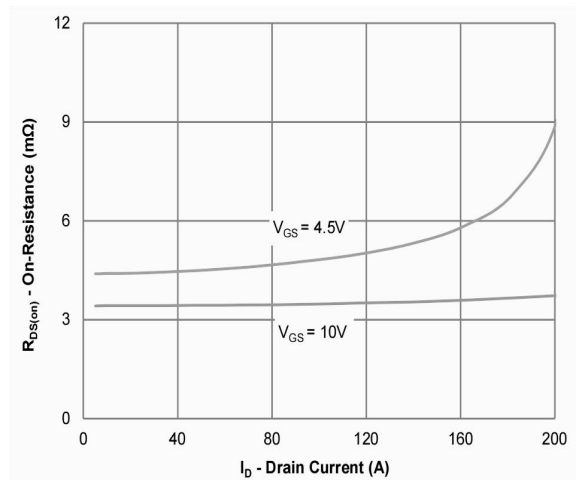


Fig.3 On-Resistance vs. Junction Temperature

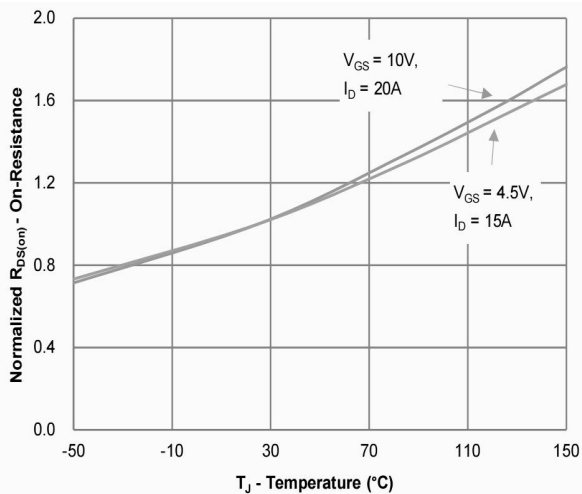


Fig.4 Source-Drain Diode Forward Voltage

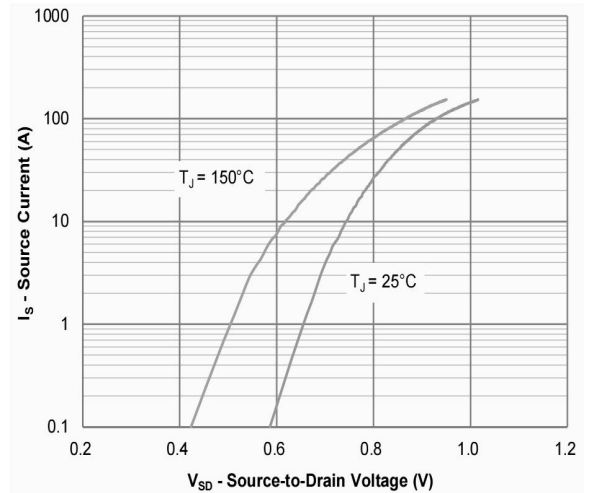


Fig.5 Gate Threshold Variation vs. Junction Temperature

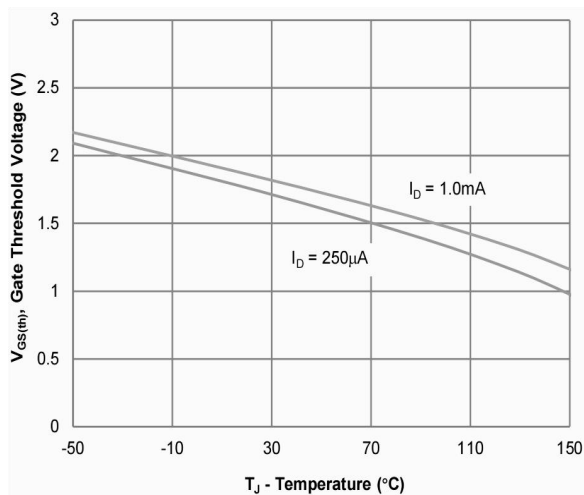


Fig.6 Gate Charge Characteristics

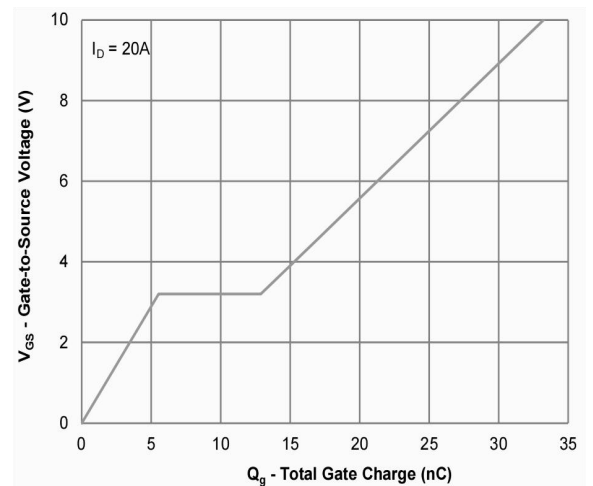




Fig. 7 Capacitance Characteristics

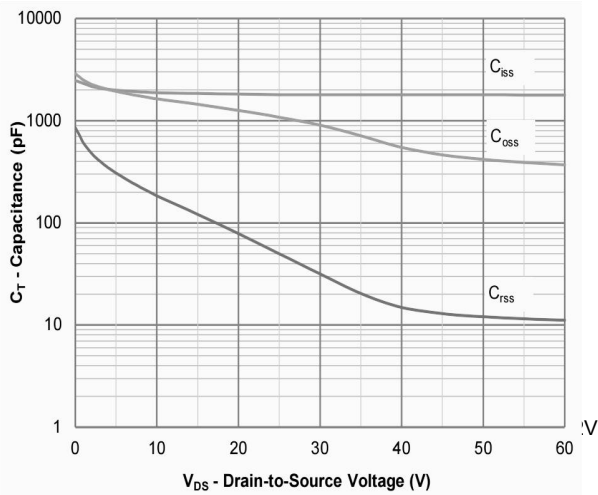


Fig 8 Power Derating

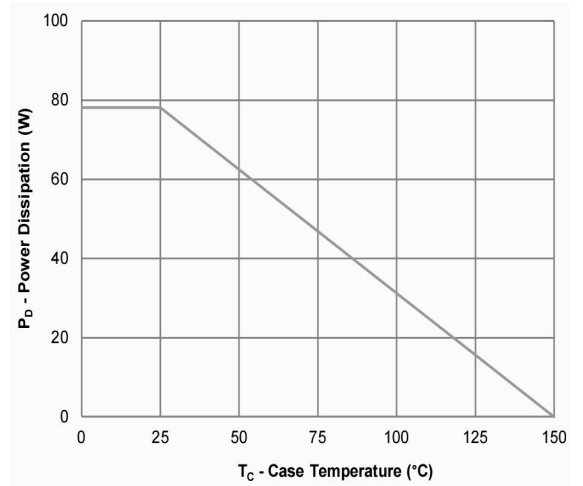


Fig.9 Current Derating

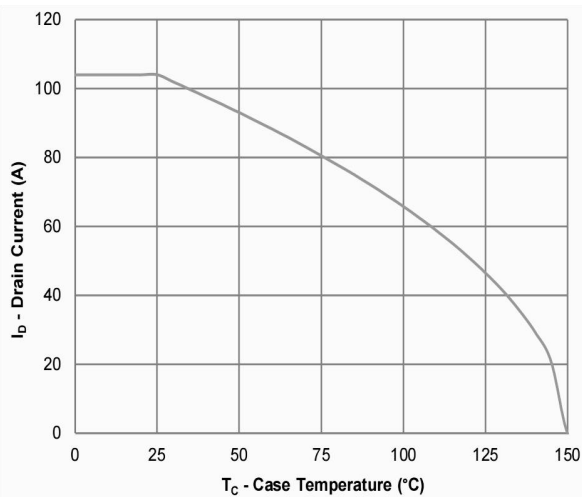


Fig.10 Safe Operating Area

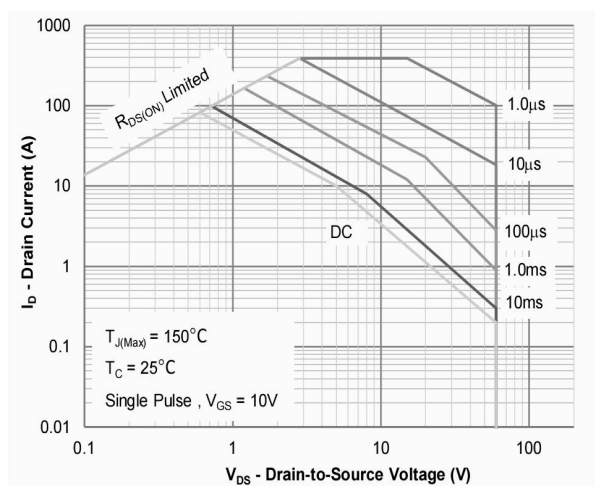
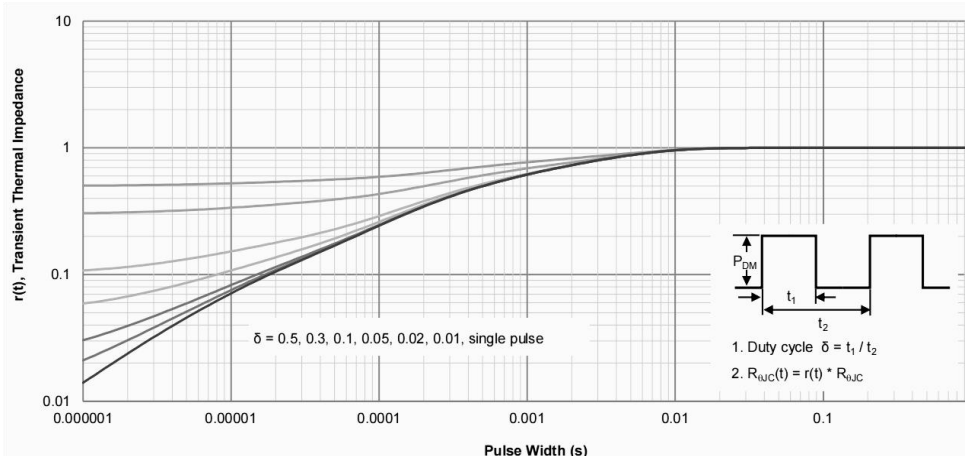
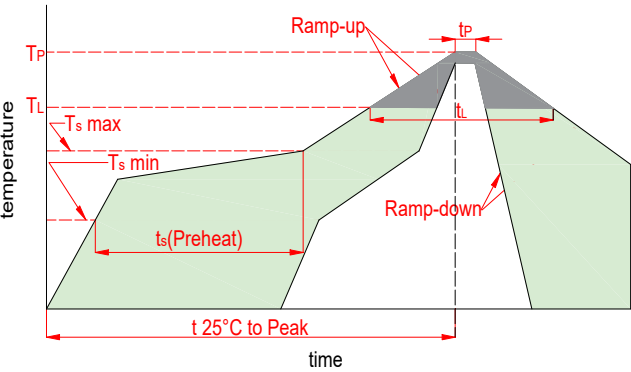


Fig.11 Normalized Maximum Transient Thermal Impedance



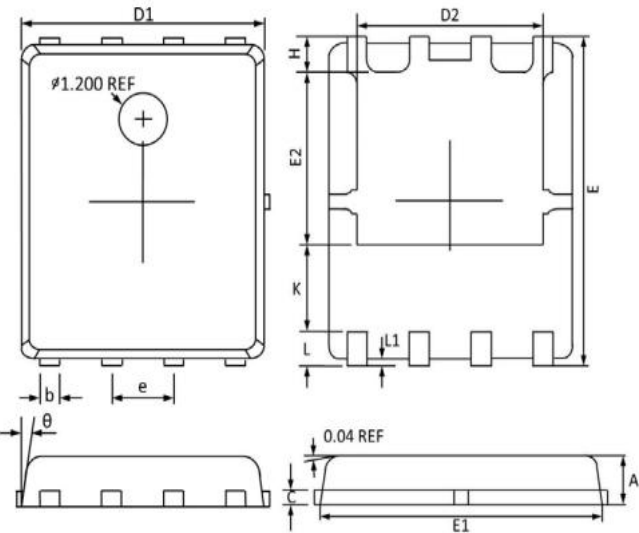


7. Soldering Parameters



Reflow Condition		Lead-free
Pre Heat	Temp. min($T_s(\text{min})$)	150℃
	Temp. max($T_s(\text{min})$)	200℃
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
$T_s(\text{max})$ 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℃

8.Package Drawing



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.031	0.043	0.8	1.1
b	0.013	0.021	0.33	0.54
C	0.008	0.012	0.2	0.3
D1	0.189	0.201	4.8	5.1
D2	0.142	0.161	3.61	4.1
E	0.232	0.244	5.9	6.2
E1	0.224	0.232	5.7	5.9
E2	0.132	0.149	3.35	3.78
e	1.27BSC		1.27BSC	
H	0.016	0.028	0.41	0.7
K	0.043	0.059	1.1	1.5
L	0.020	0.028	0.51	0.71
L1	0.002	0.008	0.06	0.2

9. Package Information

Part Number	Package	Quantity(pcs)
XNM104N06DF	PDFN5*6	5000



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