



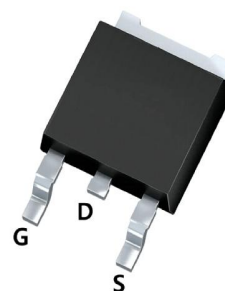
1. Features

- V_{DS} 60V
- I_D (at $V_{GS}=10V$) 30A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) 20m Ω (Typ)

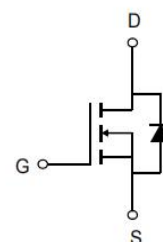
2. Mechanical Data

- Case:Molded Plastic,TO-252 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking:XNT300N06D
- Mounting Position : Any.

TO-252



- 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}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	30	A
	$T_C = 100^\circ\text{C}$		21	
Drain Current-Pulsed		I_{DM}	120	A
Power Dissipation		P_{tot}	40	W
Single pulse avalanche energy ⁽¹⁾		E_{AS}	140	mJ
Thermal Resistance from Junction to Lead		$R_{\theta JC}$	3.1	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
Gate-source leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On characteristics						
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		20	28	m Ω
		$V_{GS} = 4.5V, I_D = 10A$		24	38	m Ω
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	1	1.7	2.5	V
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$		1050		pF
Output capacitance	C_{oss}			68		pF
Reverse transfer capacitance	C_{rss}			45		pF
Switching Characteristics						
Gate charge total	Q_g	$V_{DS} = 30V, I_D = 20A, V_{GS} = 10V$		16		nC
Gate-Source Charge	Q_{gs}			2.2		nC
Gate-Drain Charge	Q_{gd}			3.8		nC
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, I_D = 1A, R_G = 6\Omega$		16		nS
Turn-on rise time	t_r			15		nS
Turn-off delay time	$t_{d(off)}$			28		nS
Turn-off fall time	t_f			7.5		nS
Source-Drain Diode characteristics						
Body Diode Voltage	V_{SD}	$I_{SD} = 10A, V_{GS} = 0V$		0.72	1.4	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. $V_{DD} = 48V, V_{GS} = 10V, L = 0.5mH, I_{AS} = 25A.$, 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

Fig1: Continuous Drain Current vs. T_C

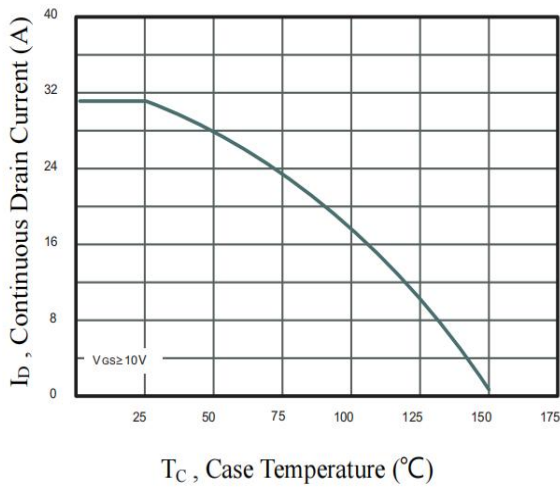


Fig2: Normalized $R_{DS(on)}$ vs. T_J

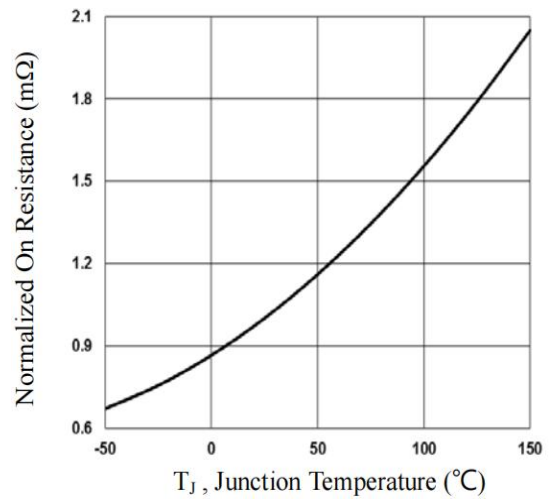


Fig.3 Normalized V_{th} vs. T_J

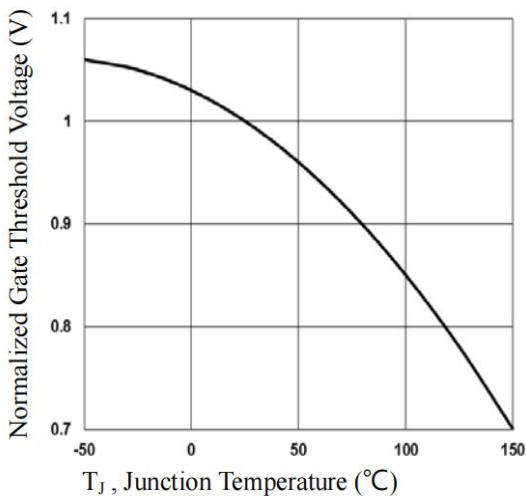


Fig.4 Gate Charge Waveform

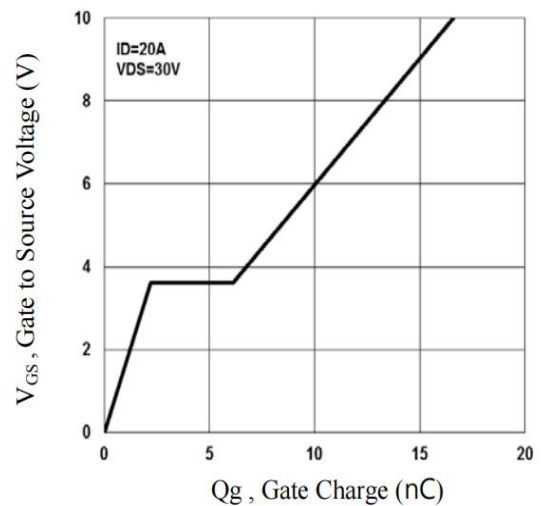


Fig.5 Normalized Transient Impedance

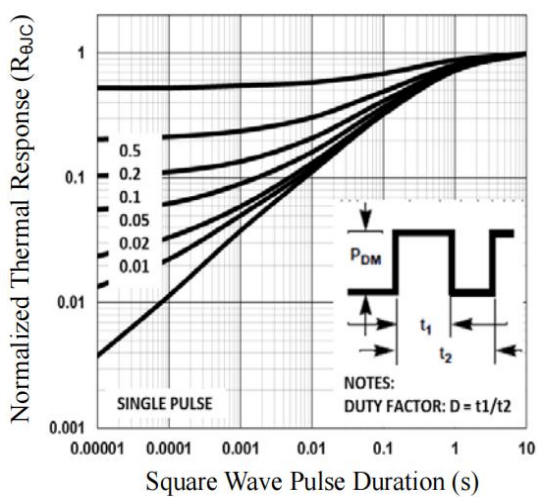
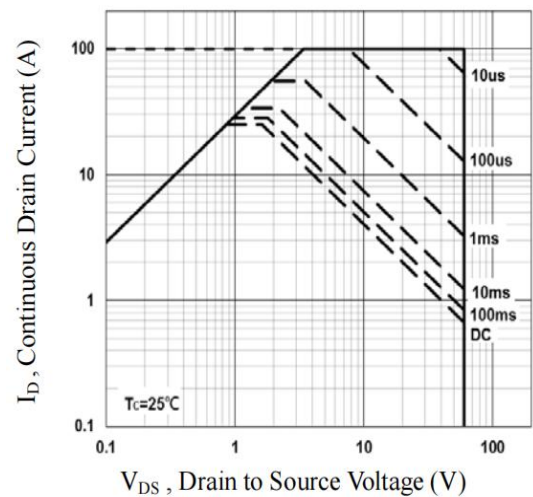


Fig.6 Maximum Safe Operation Area



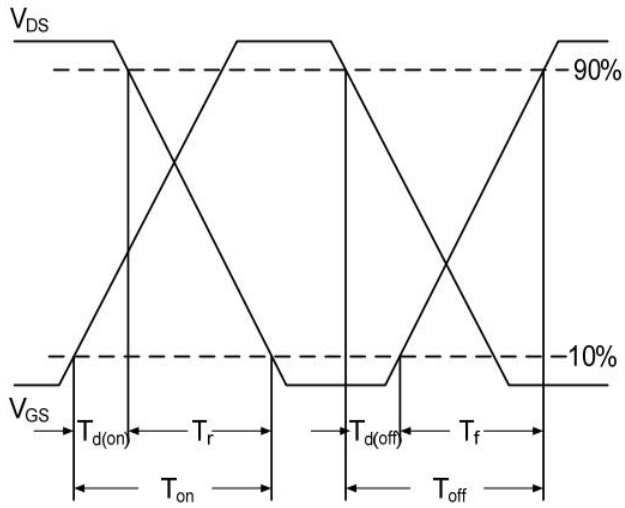


Fig.7 Switching Time Waveform

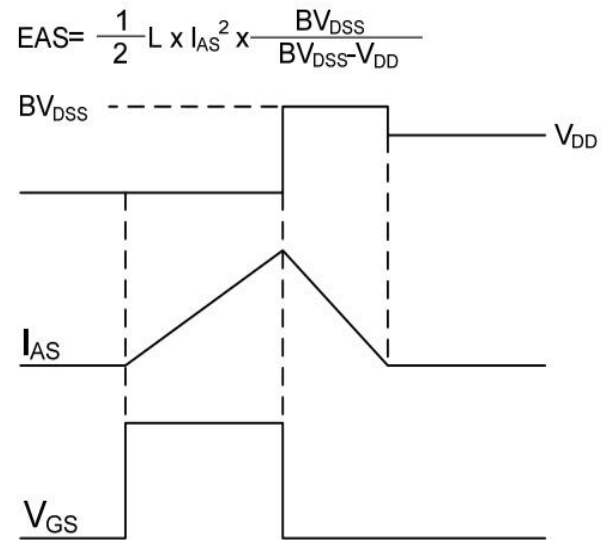
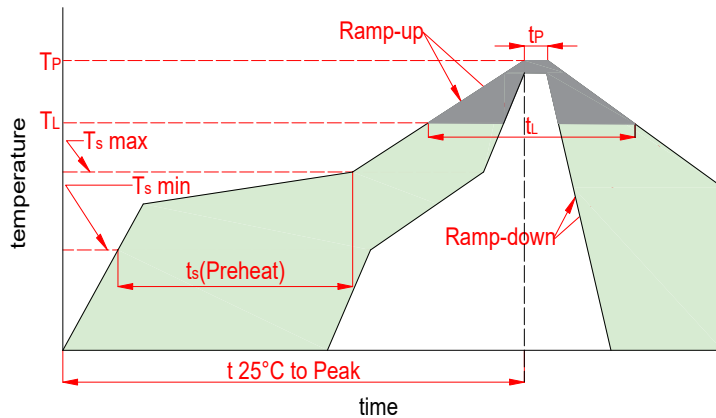


Fig.8 EAS Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

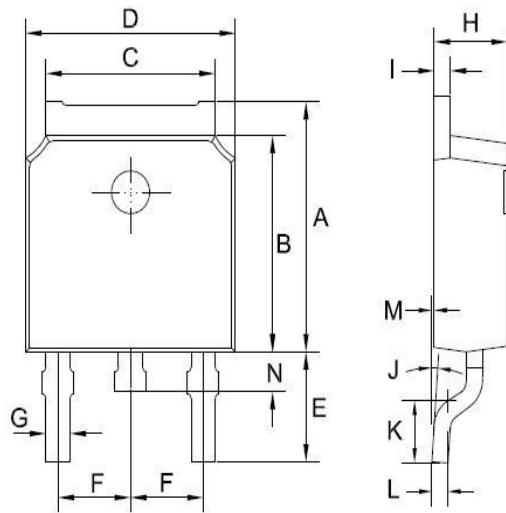


6. Soldering Parameters



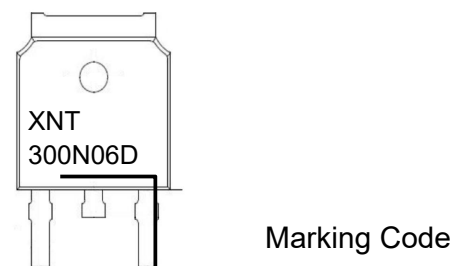
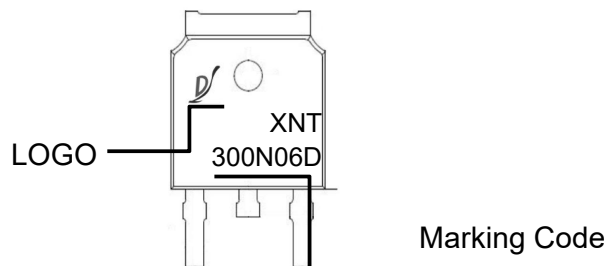
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp. (T_L)(Liquidus)	217℃
	Temp. (t_L)(Liquidus)	60~150s
Peak Temp. (T_P)		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	0.270	0.285	6.85	7.25
B	0.232	0.248	5.90	6.30
C	0.202	0.218	5.13	5.53
D	0.252	0.268	6.40	6.80
E	0.114	0.130	2.90	3.30
F	0.086	0.094	2.19	2.39
G	0.018	0.033	0.45	0.85
H	0.087	0.094	2.20	2.40
I	0.016	0.024	0.41	0.61
J	0°	8°	0°	8°
K	0.057	0.073	1.45	1.85
L	0.016	0.024	0.41	0.61
M	0.000	0.005	0.00	0.12
N	0.024	0.039	0.60	1.00

8. Part Marking System



9. Package Information

Package	Quantity(pcs)	Marking Code
TO-252	2500	XNT300N06D



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