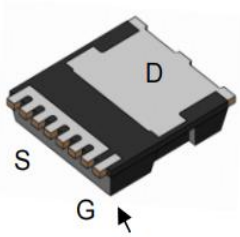
XNTL1504

150V N-Channel MOSFET TOLL

1. Features

- V_{DS} 150V
- I_D (at V_{GS}=10V) 240A
- $R_{DS(ON)}$ (at V_{GS}=10V) 3.4mΩ(Typ)

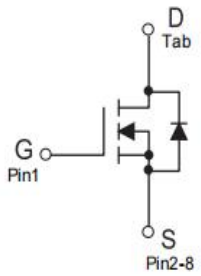
TOLL



PIN1

2. Mechanical Data

- Case:Molded Plastic,TOLL .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking:XNTL1504
- Mounting Position : Any.



3. Maximum Ratings and Electrical Characteristics

Rating at 25℃ ambient temperature unless otherwise specified.

Parameter		Symbol	Value	UNIT
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25℃	I_D	240	A
	T_C = 100℃		162	
Drain Current-Continuous(Package Limited)		I_D	781	A
Power Dissipation		P_{tot}	500	W
Avalanche Energy, Single Pulsed(1)		E_{AS}	1796	mJ
Thermal Resistance from Junction to Lead		$R_{\theta JC}$	0.3	℃/W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	25	℃/W
Junction and Storage Temperature Range		T_J,T_{STG}	-55~ +175	℃

4. Electrical Characteristics

Rating at 25℃ 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	150			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =150V， 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 =20A		3.4	4.1	mΩ
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.5	3.4	4.5	V
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS} =75V,V_{GS} =0V,f =1MHz		6235		pF
Output capacitance	C_{oss}			783		pF
Reverse transfer capacitance	C_{rss}			23		pF
Switching Characteristics						
Gate charge total	Q_g	V_{DS} = 75 V, I_D = 20 A, V_{GS} = 10 V		91		nC
Gate-Source Charge	Q_{gs}			26		nC
Gate-Drain Charge	Q_{gd}			21		nC
Turn-on delay time	td(on)	V_{DD} = 75 V, V_{GS} = 20V, R_L= 3.3Ω		20		nS
Turn-on rise time	tr			41		nS
Turn-off delay time	td(off)			58		nS
Turn-off fall time	tf			44		nS
Source-Drain Diode characteristics						
Body Diode Voltage	V_{SD}	I_{SD}=40A,V_{GS}=0V			1.2	V
Reverse Recovery Time	trr	I_F = 40A		103		ns
Reverse Recovery Charge	Qrr	d_{IF}/dt = 500A/μs		431		nC

Note：

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=75V,V_{GS}=10V,L=1.0mH, Starting TJ=25℃
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

5. Rating And Characteristic Curves

Fig1：Output Characteristics

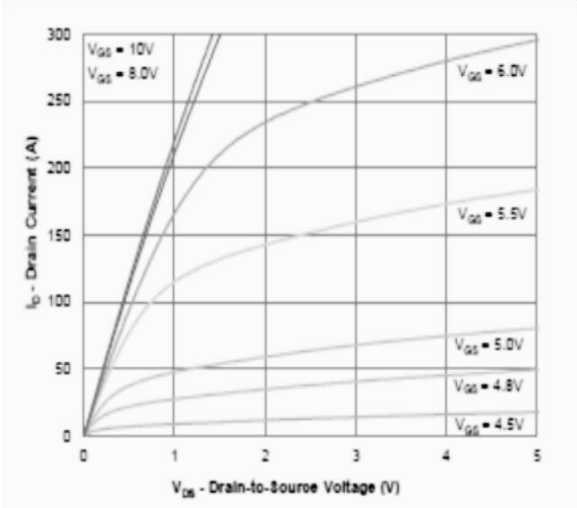


Fig2：Transfer Characteristics

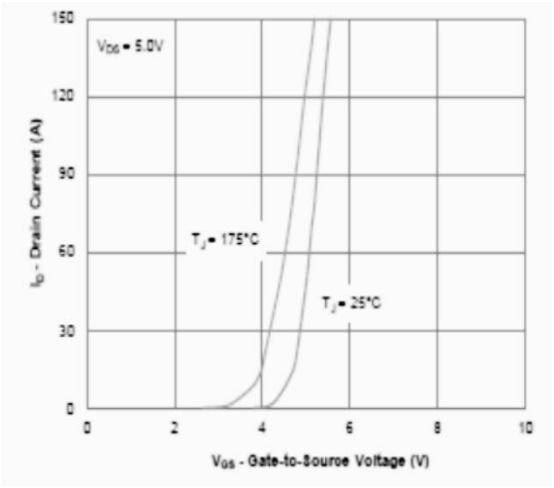


Fig.3 Rdson Vs Ids Characteristics(Tc=25°C)

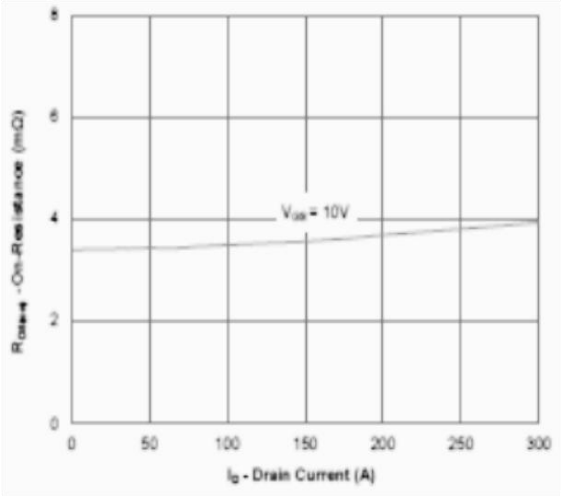


Fig.4 Rds(on) vs Gate Voltage

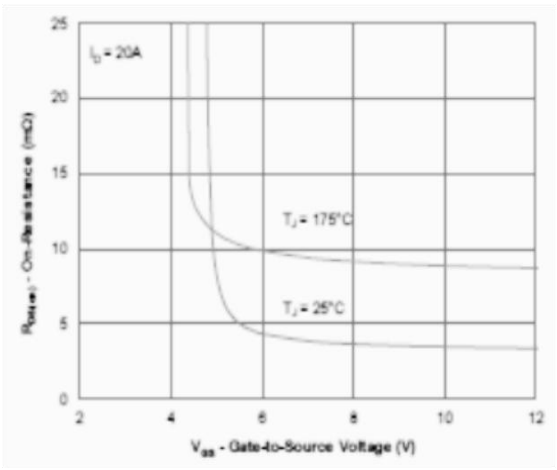


Fig.5 Rds(on) vs. Temperature

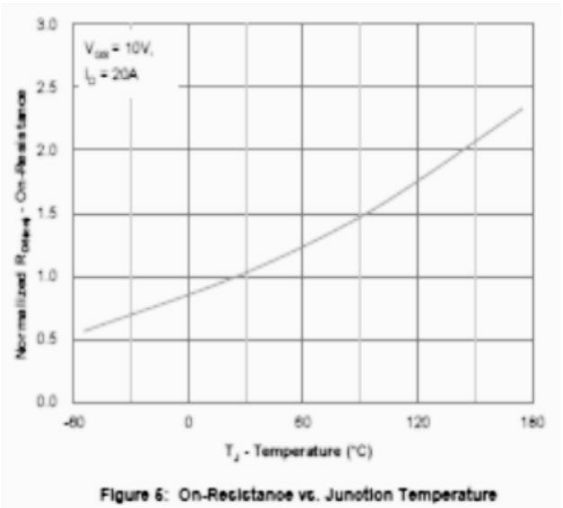


Figure 6: On-Resistance vs. Junction Temperature

Fig.6 Safe Operating Area

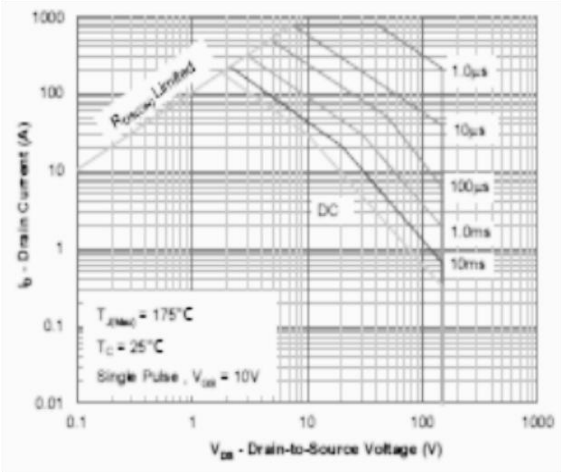


Fig.7 Gate Threahold variation vs. TJ

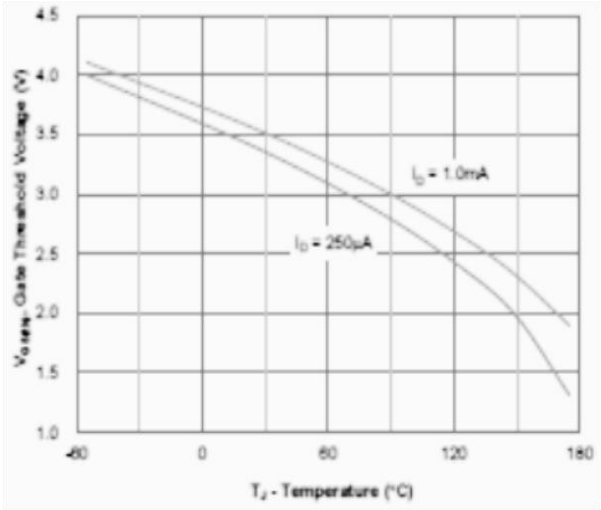


Fig.8 Capacitance Characteristics

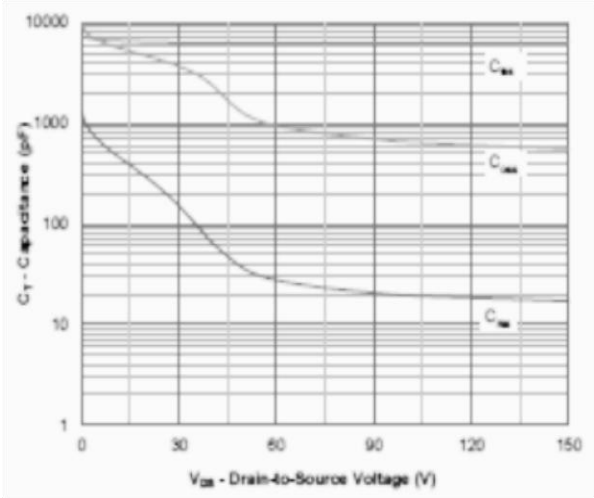


Fig.9 Gate Charge characteristics

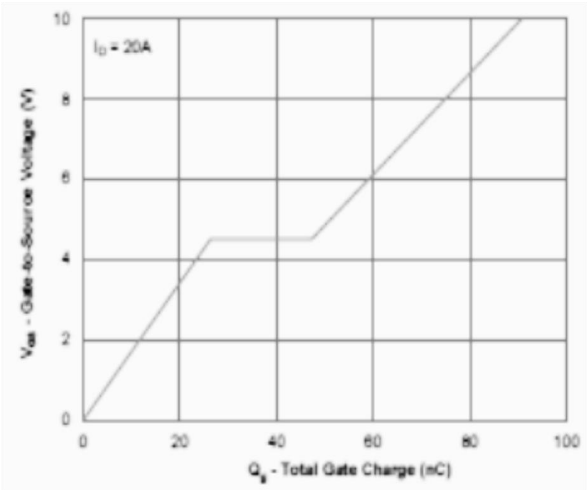


Fig.10 Capaoitance Characteristics

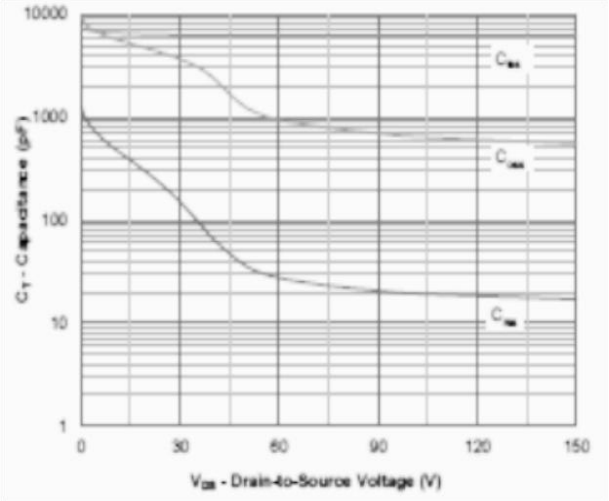


Fig.11 Power Dissipation

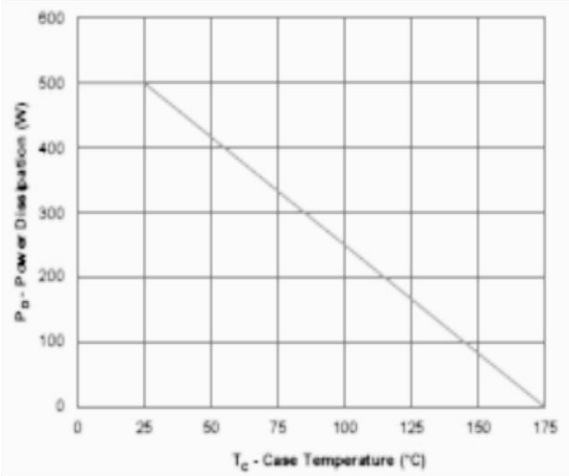


Fig.12 Drain Current Derating

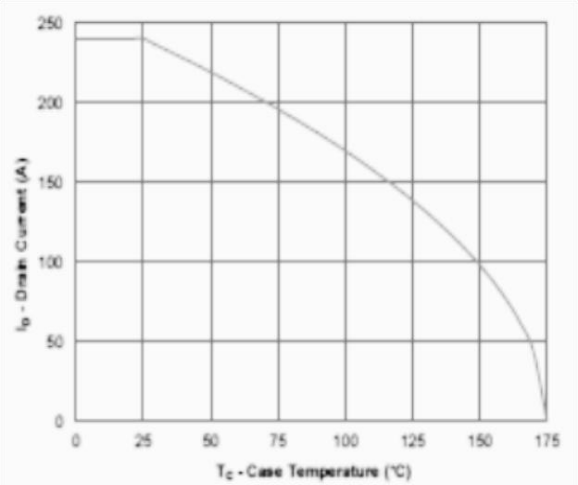
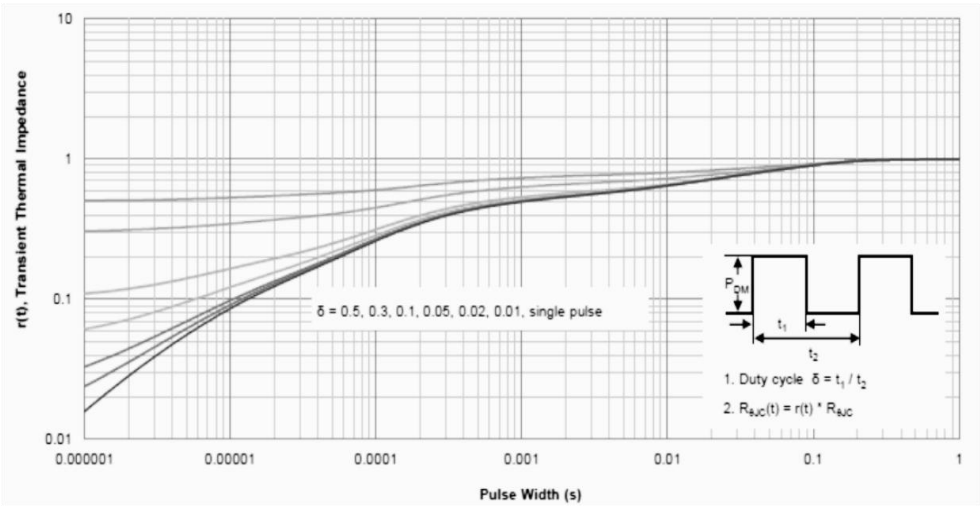
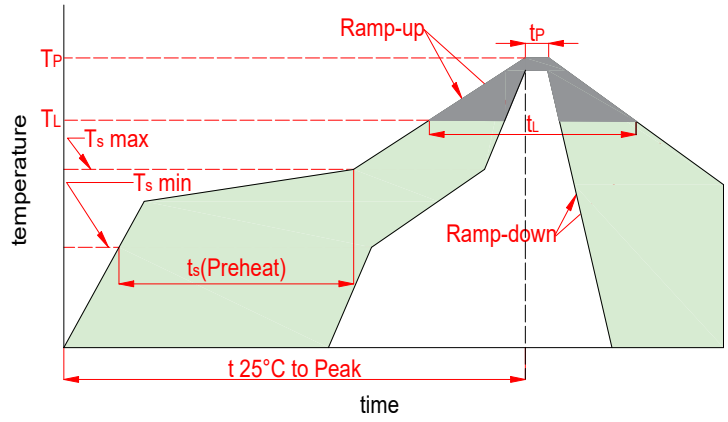


Fig.13 Normalized Maximum Transient Themmal impedance

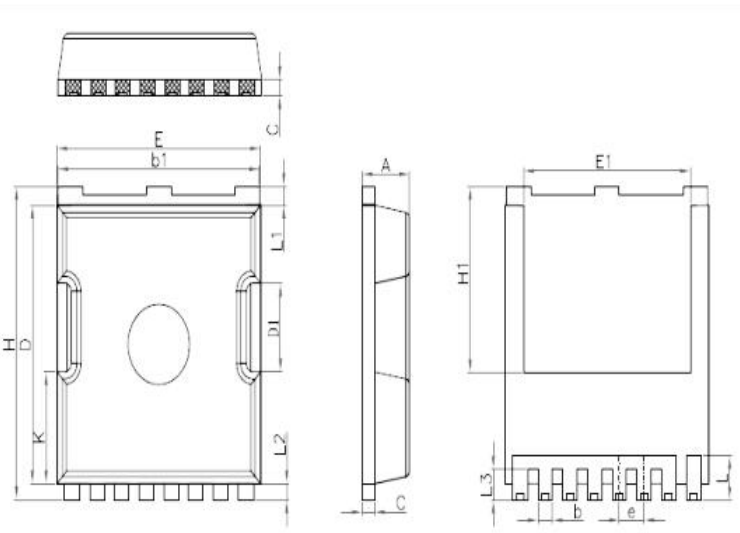


6. Soldering Parameters



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	0.087	0.094	2.20	2.40
b	0.024	0.031	0.60	0.80
b1	0.380	0.390	9.65	9.90
C	0.016	0.024	0.40	0.60
D	0.405	0.411	10.28	10.45
D1	0.126	0.134	3.20	3.40
E	0.386	0.394	9.80	10.00
e	0.043	0.051	1.10	1.30
H	0.413	0.465	10.48	11.80
L1	0.024	0.031	0.60	0.80
L2	0.020	0.028	0.50	0.70

8. Package Information

Package	Quantity(pcs)
TOLL	2000

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