

120V N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ◇ Surface-mounted package
- ◇ Advanced SGT cell design

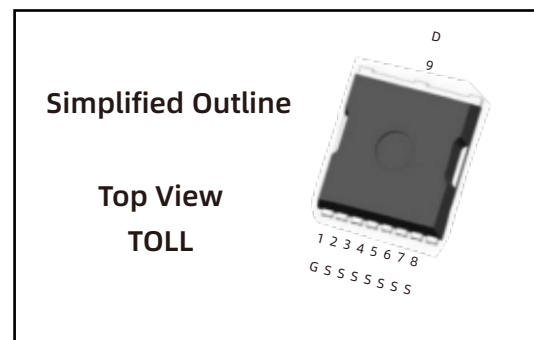
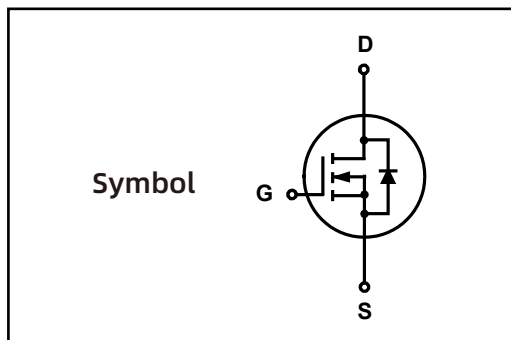
1.2 Applications

- ◇ BMS
- ◇ High power inverter system
- ◇ Drones
- ◇ Light electric vehicles

1.3 Quick reference

- ◇ $BV \cong 120\text{ V}$
- ◇ $P_{\text{tot}} \cong 428\text{ W}$
- ◇ $I_D \cong 277\text{ A}$
- ◇ $R_{\text{DS(ON)}} \cong 1.7\text{ m}\Omega @ V_{\text{GS}} = 10\text{ V}$
- ◇ $R_{\text{DS(ON)}} \cong 2.6\text{ m}\Omega @ V_{\text{GS}} = 6\text{ V}$

2. Pin Description



3. Marking Information

Product Name	Marking
LN013N120CT	LN013N120CT CYWWZZ XXXXXX

4.Limiting Values

Symbol	Parameter	Rating	Unit	
V_{DS}	Drain-Source Voltage	120	V	
V_{GS}	Gate-Source Voltage	± 20	V	
$I_{D\text{Note3}}$	Drain Current	$T_c = 25\text{ }^\circ\text{C}$	277	A
		$T_c = 100\text{ }^\circ\text{C}$	195	A
I_{DM}	Pulsed Source Current	$T_c = 25\text{ }^\circ\text{C}$	1108	A
I_s	Diode Forward Current	$T_c = 25\text{ }^\circ\text{C}$	277	A
E_{AS}	Single Pulsed Avalanche Energy	$L = 1.0\text{ mH}$	3200	mJ
P_{tot}	Total Power Dissipation	$T_c = 25\text{ }^\circ\text{C}$	428	W
$R_{\theta JA\text{Note1}}$	Thermal Resistance- Junction to Ambient		44	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance- Junction to Case		0.35	$^\circ\text{C/W}$
T_{stg}	Storage Temperature		-55~175	$^\circ\text{C}$
T_j	Junction Temperature		175	$^\circ\text{C}$

Note1 : Surface Mounted on 1 in² pad area,t ≤ 10 sec

Note2 : Pulse width ≤ 300 μs,, duty cycle ≤ 2 %

Note3 : Limited by bonding wire

5.Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
LN013N120CT	TOLL-8L	Ø330mm	12mm	2000	

Note: COMTECH defines " Green " as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight;Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C)

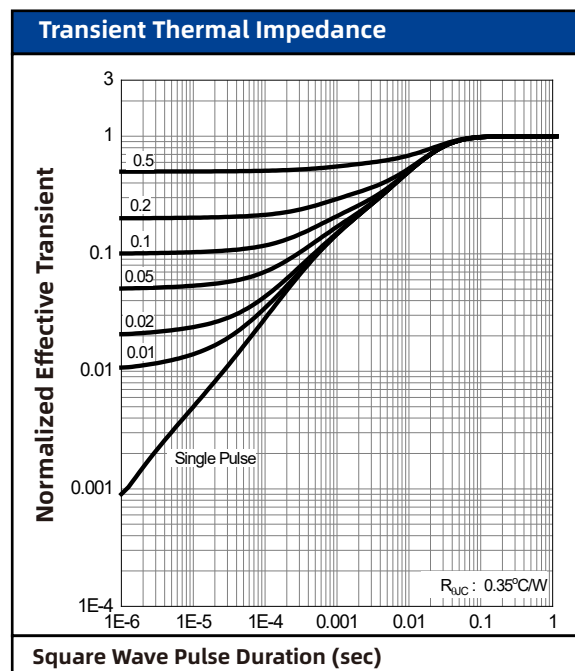
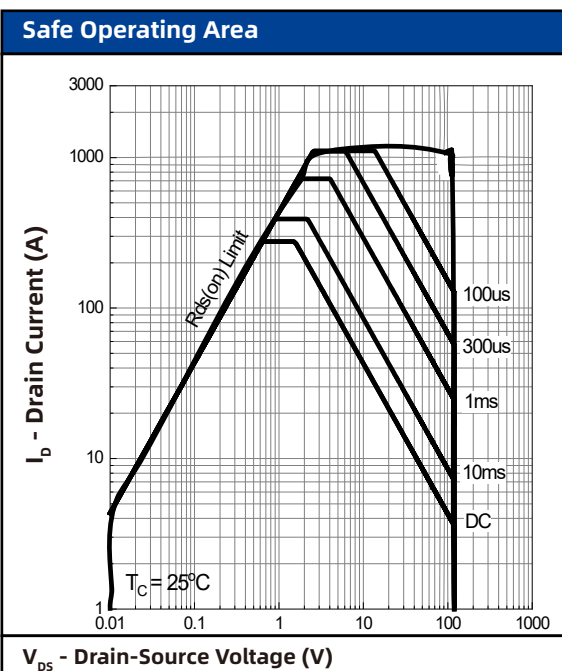
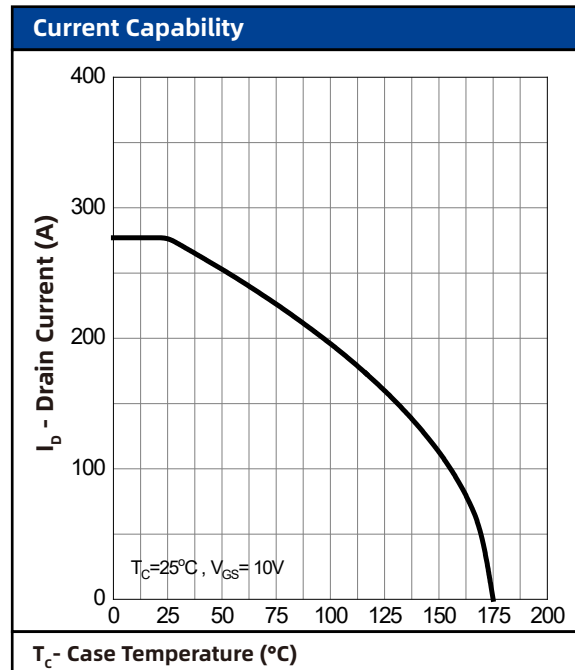
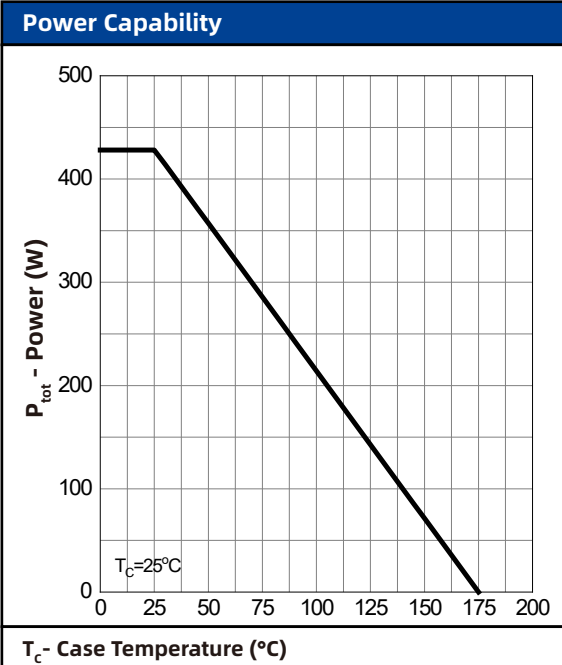
6. Electrical Characteristics ($T_A=25^\circ$ Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 250\ \mu\text{A}$	120	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$	2	-	4	V
I_{DSS}	Drain Leakage Current	$V_{DS} = 96\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
I_{GSS}	Gate Leakage Current	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
$R_{DS(on) \text{ Note1}}$	On-State Resistance	$V_{GS} = 10\text{ V}, I_{DS} = 50\text{ A}$	-	1.3	1.7	m Ω
		$V_{GS} = 6\text{ V}, I_{DS} = 30\text{ A}$	-	2.0	2.6	
Diode Characteristics						
$V_{SD \text{ Note1}}$	Diode Forward Voltage	$I_{SD} = 50\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
t_{rr}	Reverse Recovery Time	$I_{DS} = 50\text{ A}, V_{GS} = 0\text{ V}$	-	144	-	nS
Q_{rr}	Reverse Recovery Charge	$dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	502	-	nC
Dynamic Characteristics^{Note2}						
C_{ISS}	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 60\text{ V}$ Frequency = 1 MHz	-	12806	-	pF
C_{OSS}	Output Capacitance		-	1536	-	
C_{rSS}	Reverse Transfer Capacitance		-	35	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 60\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 3.9\ \Omega, R_L = 1.2\ \Omega,$ $I_{DS} = 50\text{ A}$	-	36	-	nS
t_r	Turn-on Rise Time		-	96	-	
$t_d(off)$	Turn-off Delay Time		-	138	-	
t_f	Turn-off Fall Time		-	96	-	
Gate Charge Characteristics^{Note2}						
Q_g	Total Gate Charge	$V_{DS} = 60\text{ V}, V_{GS} = 10\text{ V},$ $I_{DS} = 50\text{ A}$	-	213	-	nC
Q_{gs}	Gate-Source Charge		-	67	-	
Q_{gd}	Gate-Drain Charge		-	47	-	

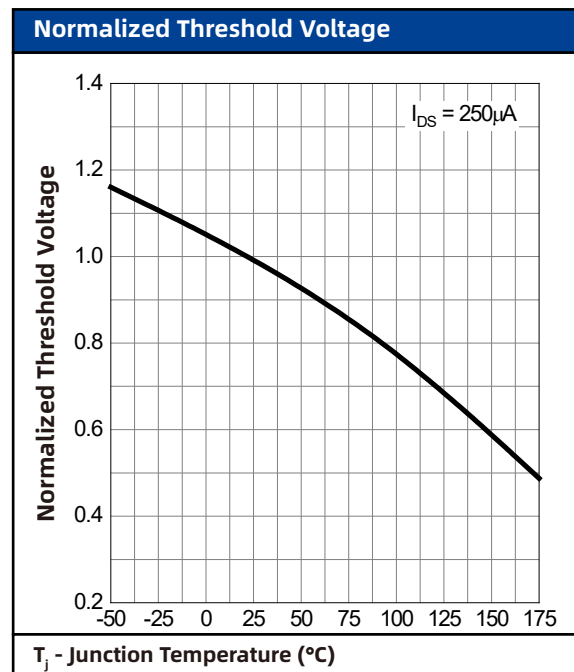
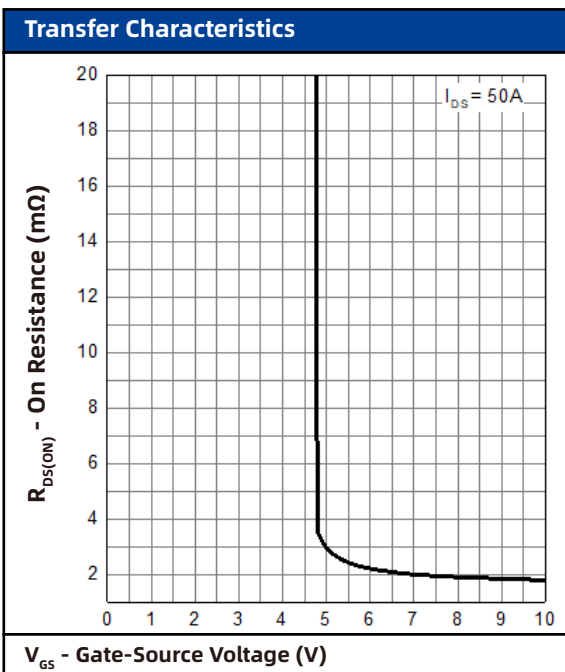
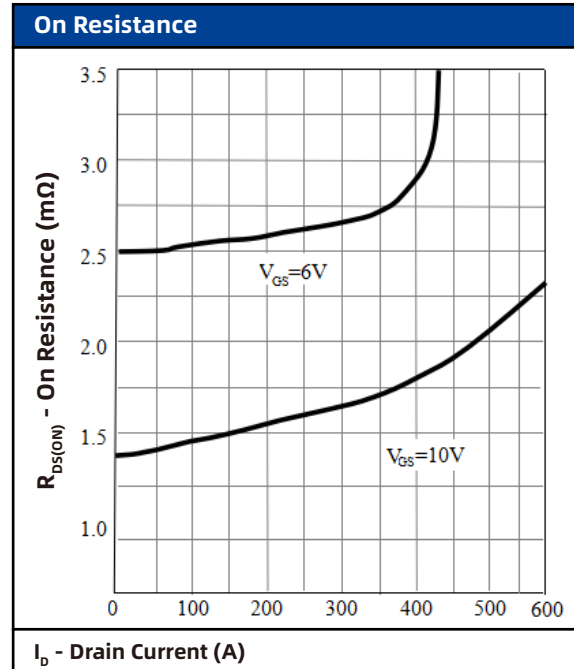
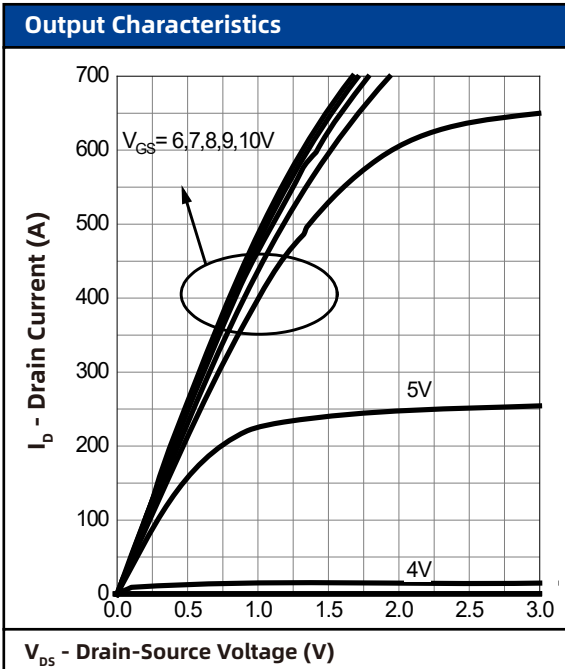
Note1: Pulse test ; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$

Note2: Guaranteed by design, not subject to production testing

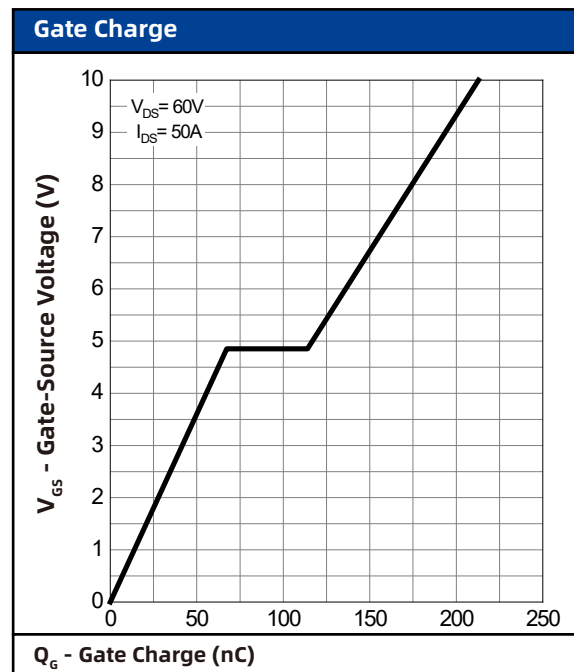
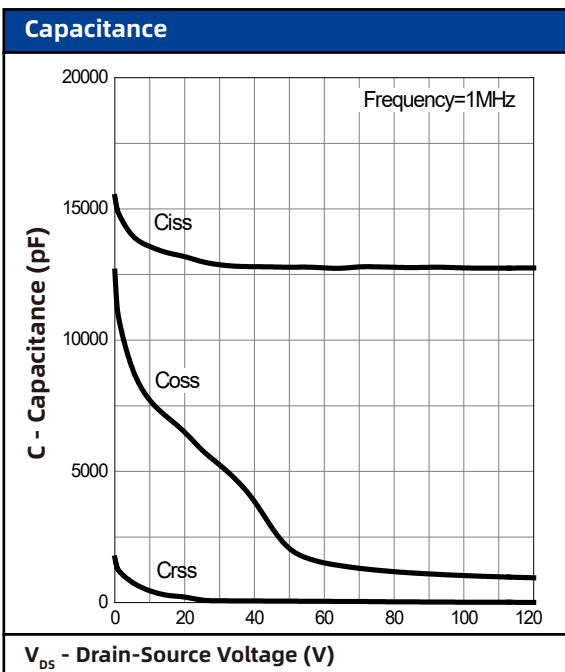
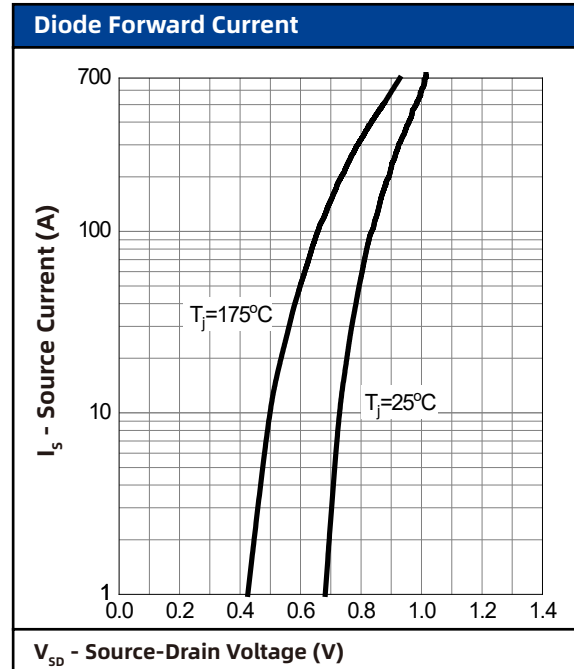
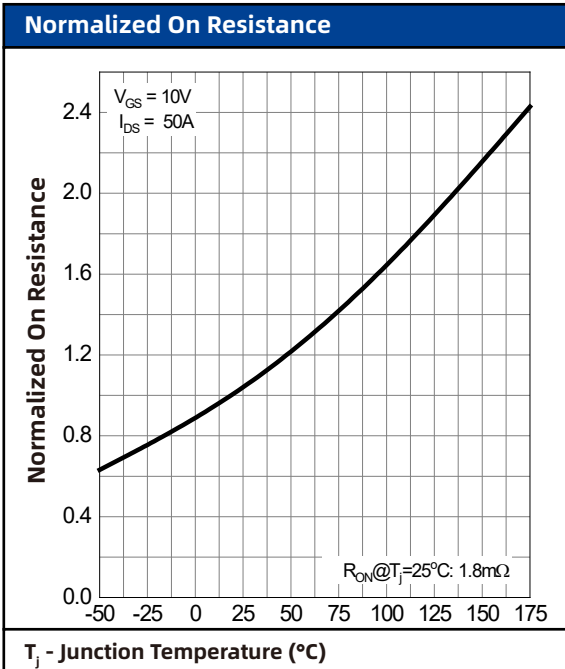
7. Typical Characteristics



7. Typical Characteristics (cont.)

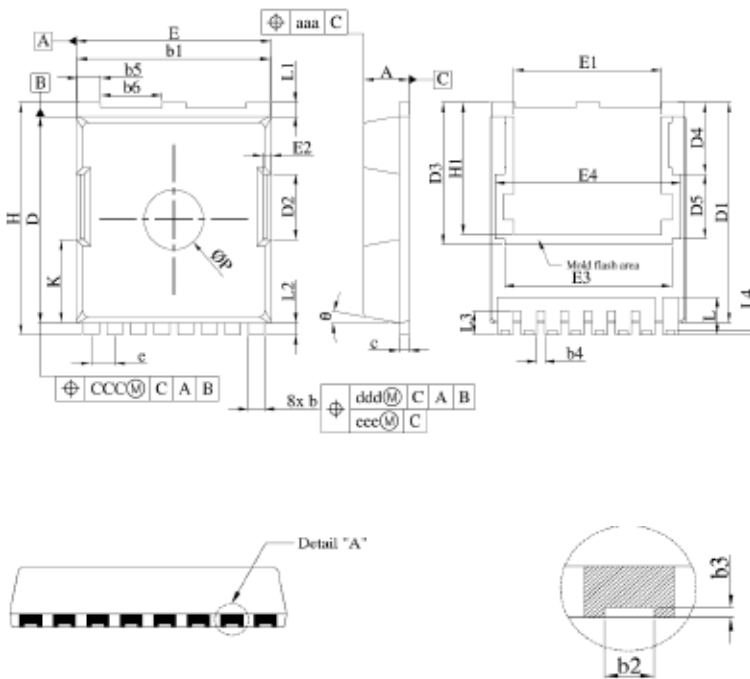


7. Typical Characteristics (cont.)



8. Package Dimensions

TOLL-8L Package



Symbol	Dimensions In Millimeters		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.36	0.45	0.55
b3	0.05	0.10	/
b4	0.30	0.40	0.50
b5	1.10	1.20	1.30
b6	3.00	3.10	3.20
c	0.40	0.50	0.60
D	10.28	10.38	10.55
D1	10.98	11.08	11.18
D2	3.20	3.30	3.40
D3	7.15		
D4	3.59		
D5	3.26		
e	1.10	1.20	1.30
E	9.80	9.90	10.00
E1	7.40	7.50	7.60
E2	0.30	0.40	0.50
E3	8.50		
E4	9.46		
H	11.50	11.68	11.85
H1	6.55	6.65	6.75
K	4.08	4.18	4.28
L	1.60	1.90	2.10
L1	0.50	0.70	0.90
L2	0.50	0.60	0.70
L3	1.00	1.20	1.30
L4	0.13	0.23	0.33
P	2.85	3.00	3.15
θ	10°REF		
aaa	0.20		
ccc	0.20		
ddd	0.25		
eee	0.20		