

General Description

The MY320N04L is the high cell density trenched N-CH MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

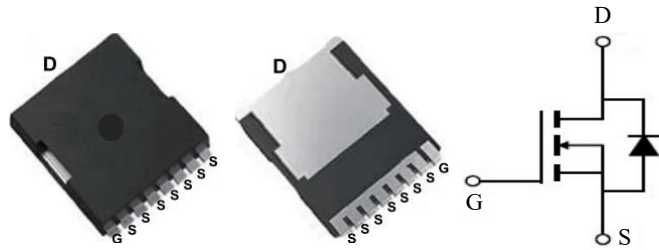


Features

V_{DSS}	40	V
I_D	320	A
$R_{DS(ON)}(at V_{GS}=10V)$	0.75	$m\Omega$
$R_{DS(ON)}(at V_{GS}=4.5V)$	1.4	$m\Omega$

Application

- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY320N04L	TOLL-8L	MY320N04L	1000

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	320	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	160	A
I_{DM}	Pulsed Drain Current ²	720	A
EAS	Single Pulse Avalanche Energy ³	450	mJ
I_{AS}	Avalanche Current	--	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	114	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.1	$^\circ\text{C/W}$

Electrical Characteristics at $T_J=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	---	---	$V/^\circ\text{C}$
$R_{DS(on)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=50A$	---	0.75	1.1	$m\Omega$
		$V_{GS}=4.5V, I_D=25A$	---	1.4	2.0	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.3	1.7	2.3	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	$mV/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=40V, V_{GS}=0V, T_J=100^\circ\text{C}$	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=20A$	---	---	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	3.5	---	Ω
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=50A$	---	87	---	nC
Q_{gs}	Gate-Source Charge		---	18	---	
Q_{gd}	Gate-Drain Charge		---	15	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{GS}=10V, V_{DD}=20V,$ $R_G=3\Omega, I_D=50A$	---	14	---	ns
T_r	Rise Time		---	15	---	
$T_{d(off)}$	Turn-Off Delay Time		---	84	---	
T_f	Fall Time		---	44	---	
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	---	5500	---	pF
C_{oss}	Output Capacitance		---	1850	---	
C_{rss}	Reverse Transfer Capacitance		---	65	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	320	A
I_{SM}	Pulsed Source Current ^{2,4}		---	---	720	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=50A, di/dt=100A/\mu s,$ $T_J=25^\circ\text{C}$	---	55	---	ns
Q_{rr}	Reverse Recovery Charge		---	53	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $T_J = 25^\circ\text{C}, V_{DD}=25V, V_{GS}=10V, L=0.5mH$,
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Performance Characteristics

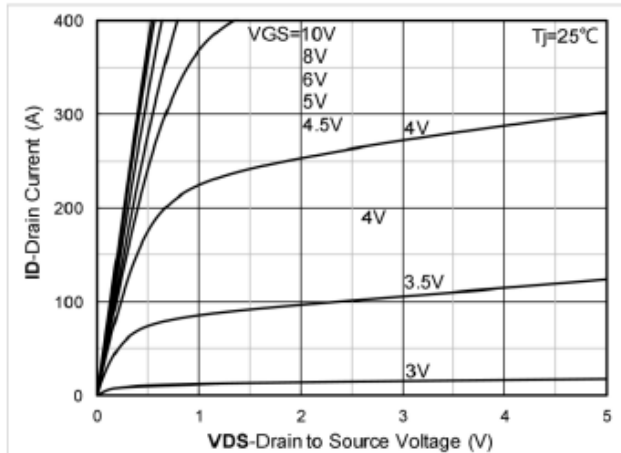


Figure 1. Output Characteristics

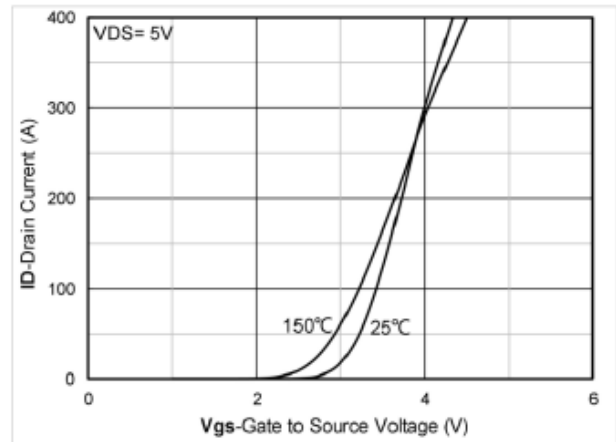


Figure 2. Transfer Characteristics

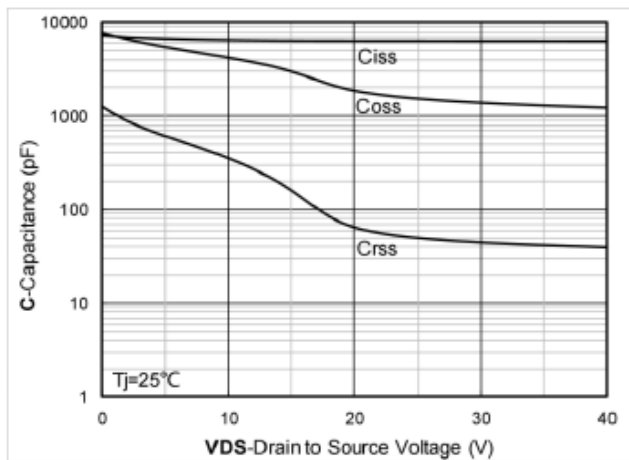


Figure 3. Capacitance Characteristics

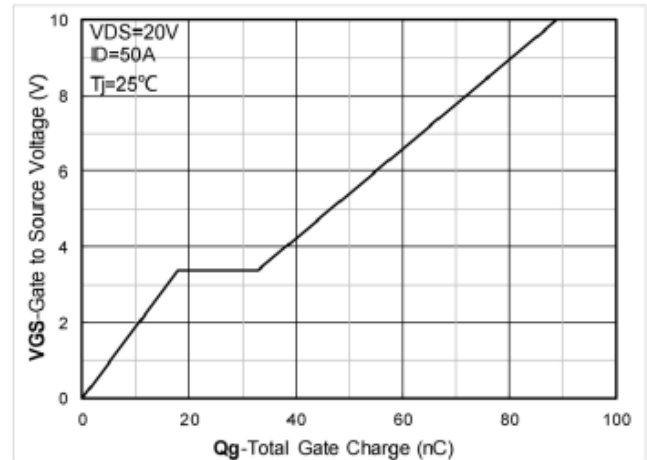
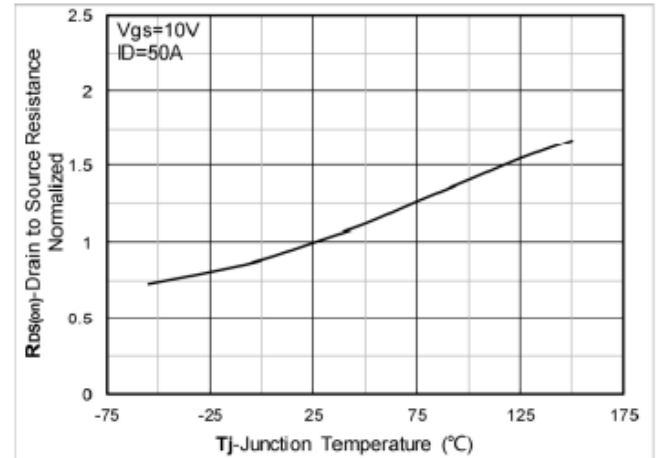
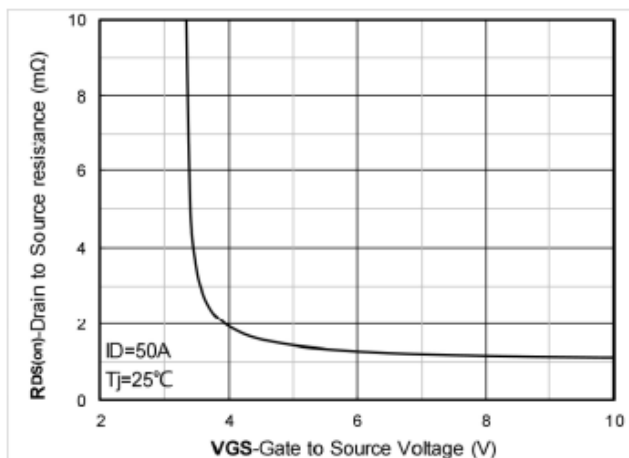


Figure 4. Gate Charge



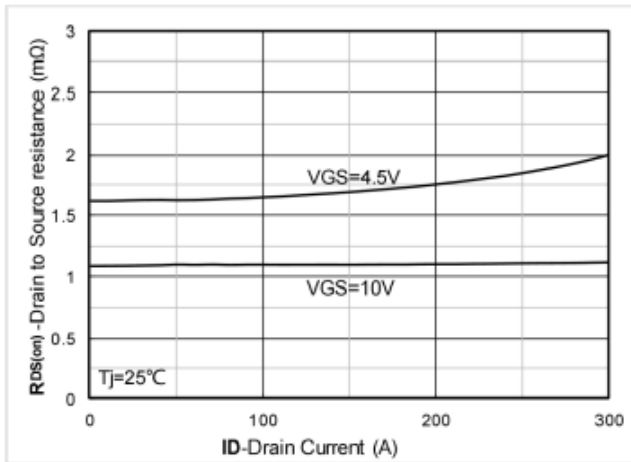


Figure 7. $R_{DS(on)}$ VS Drain Current

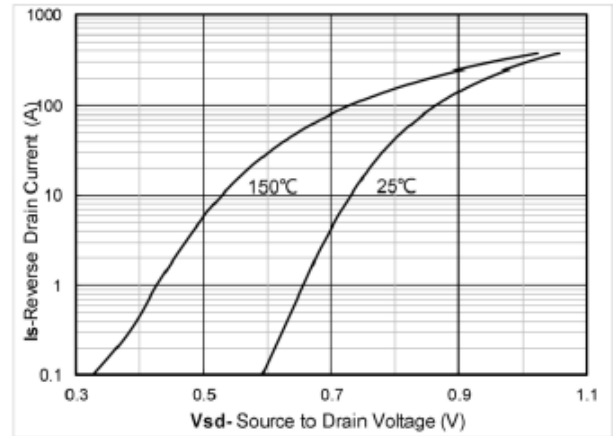


Figure 8. Forward characteristics of reverse diode

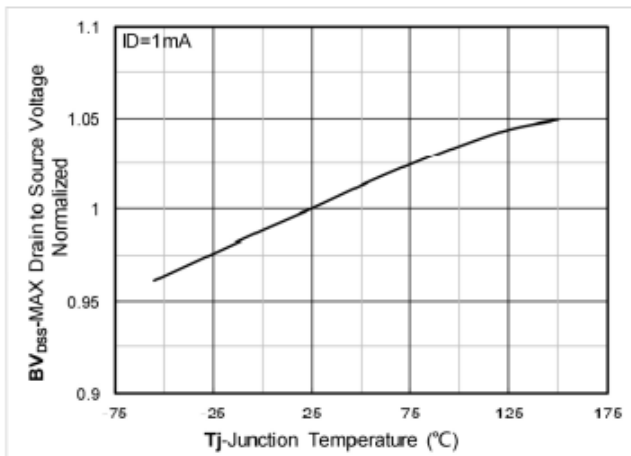


Figure 9. Normalized breakdown voltage

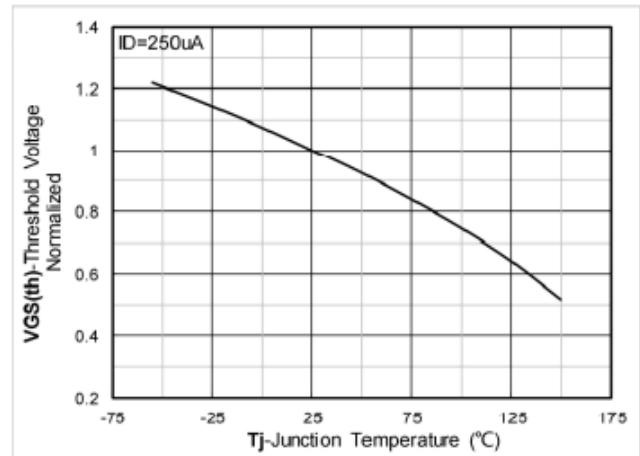


Figure 10. Normalized Threshold voltage

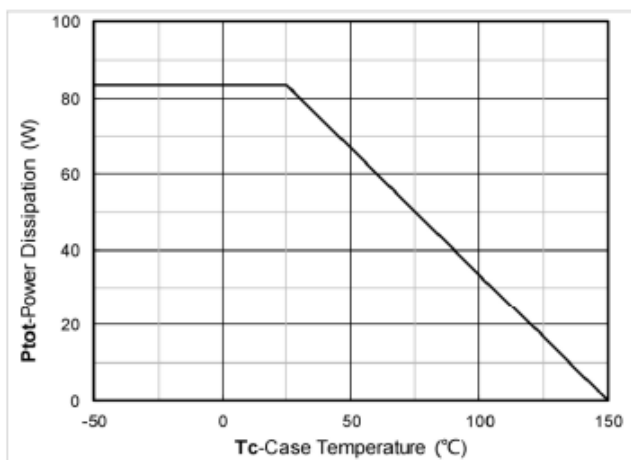
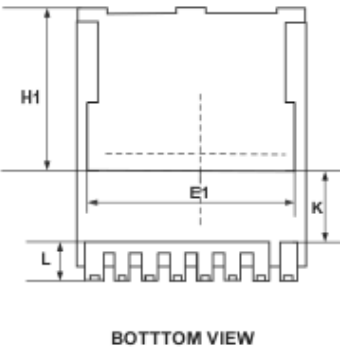
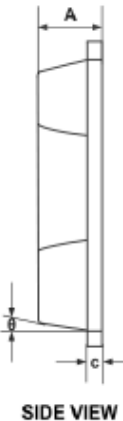
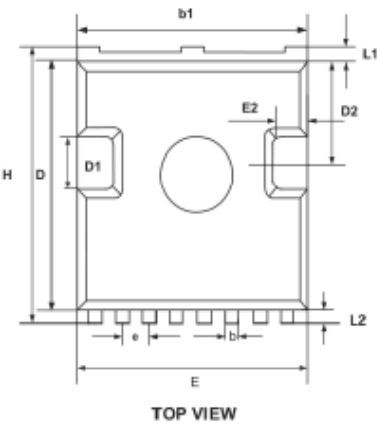


Figure 11. Power dissipation

Package Mechanical Data TOLL-8L



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	2.20	2.40
b	0.60	0.90
b1	9.70	9.90
c	0.40	0.60
D	10.20	10.60
D1	3.10	3.50
D2	4.45	4.75
E	9.70	10.10
E1	7.80BSC	
E2	0.50	0.70
e	1.200 BSC	
H	11.45	11.90
H1	6.75 BSC	
K	3.10 REF	
L	1.70	2.10
L1	0.60	0.80
L2	0.50	0.70
θ	10° REF	