

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
30V	1.5m $\Omega$ @10V	90A
	3.0m $\Omega$ @4.5V	

### Feature

- Split Gate Trench technology
- Excellent gate charge  $\times R_{DS(on)}$  product
- Excellent package for good heat dissipation

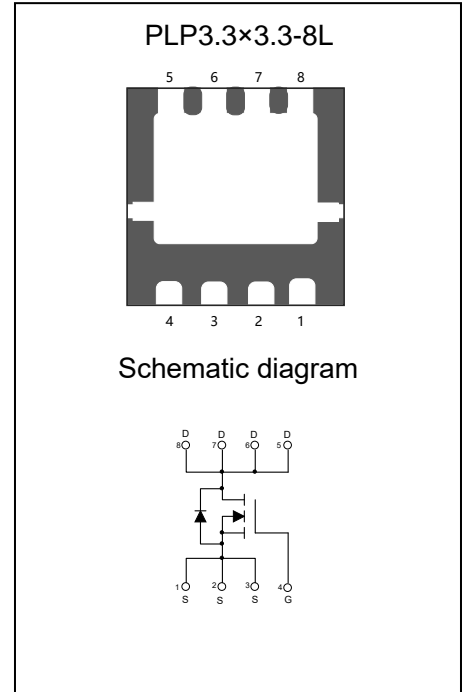
### Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### MARKING:



T022N03 = Device code  
XX = Date Code



### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>4</sup>	$I_D$	90	A
Pulsed Drain Current <sup>3</sup>	$I_{DM}$	400	A
Avalanche Current <sup>1</sup>	$I_{AS}$	27	A
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	182	mJ
Power Dissipation <sup>2</sup>	$P_D$	83	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.5	$^\circ\text{C/W}$
Steady-State			
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~+150	$^\circ\text{C}$

## MOSFET ELECTRICAL CHARACTERISTICS (T<sub>c</sub> = 25°C unless otherwise noted)

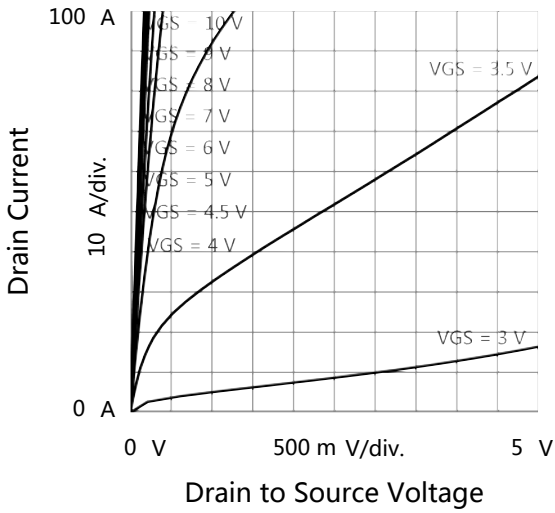
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Off Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
<b>On Characteristics<sup>5</sup></b>						
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	2	3	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A		1.5	2.2	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A		3.0	4.8	
Forward transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A				S
<b>Dynamic Characteristics</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1MHz		2190		pF
Output capacitance	C <sub>oss</sub>			1200		
Reverse transfer capacitance	C <sub>rss</sub>			153		
<b>Switching Characteristics</b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> = 35A, V <sub>GS</sub> = 10V		39.2		nC
Gate-source charge	Q <sub>gs</sub>			5.9		
Gate-drain charge	Q <sub>gd</sub>			6.3		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15V, I <sub>D</sub> = 35A, V <sub>GS</sub> = 10V, R <sub>G</sub> = 1.6Ω		4.9		ns
Turn-on rise time	t <sub>r</sub>			6.9		
Turn-off delay time	t <sub>d(off)</sub>			25		
Turn-off fall time	t <sub>f</sub>			4.8		
<b>Diode Characteristics</b>						
Diode Forward Voltage <sup>5</sup>	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A		0.76	1.2	V
Maximum Diode Continuous Current <sup>4</sup>	I <sub>SM</sub>				300	A

### Notes :

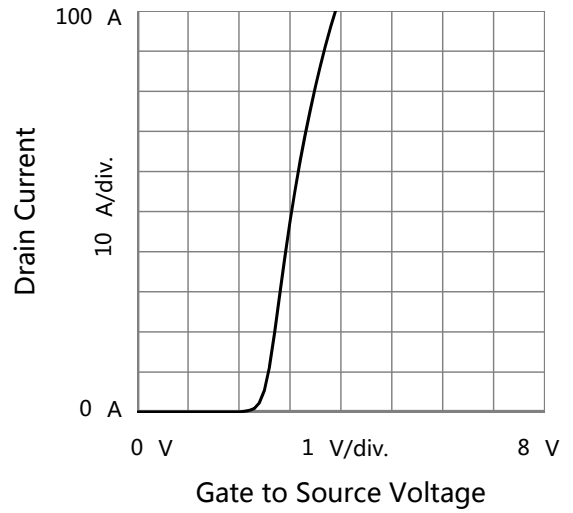
- 1.EAS condition: V<sub>DD</sub> = 15V, V<sub>GS</sub> = 10V, L = 0.5mH, R<sub>G</sub> = 25Ω Starting T<sub>J</sub> = 25°C.
- 2.The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub> = 150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
- 3.Single pulse width limited by junction temperature T<sub>J(MAX)</sub> = 150°C.
- 4.The maximum current rating is package limited.
- 5.The static characteristics are obtained using <380ms pulses, duty cycle 2% max

## Typical Electrical and Thermal Characteristics

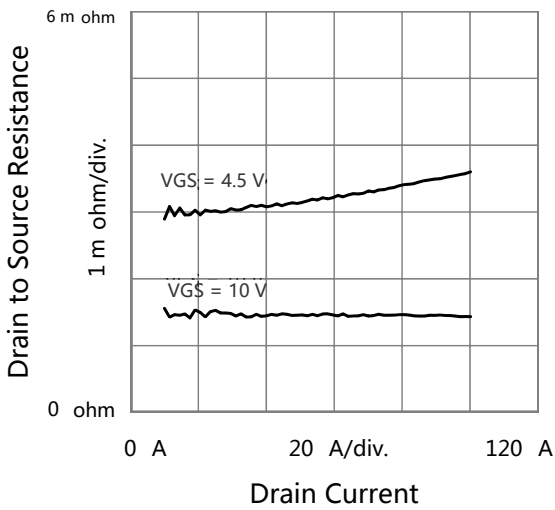
### Output Characteristics



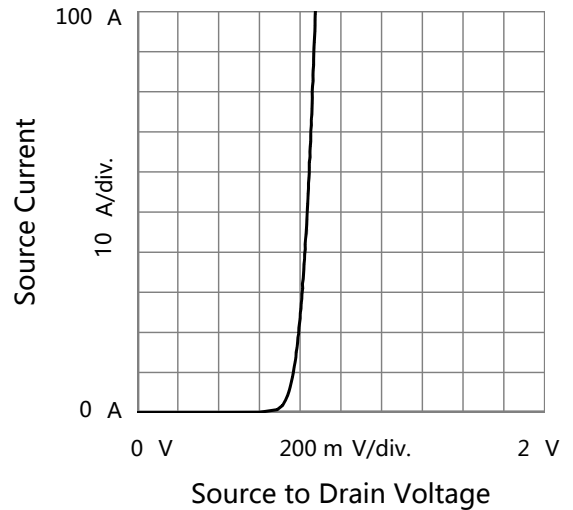
### Transfer Characteristics



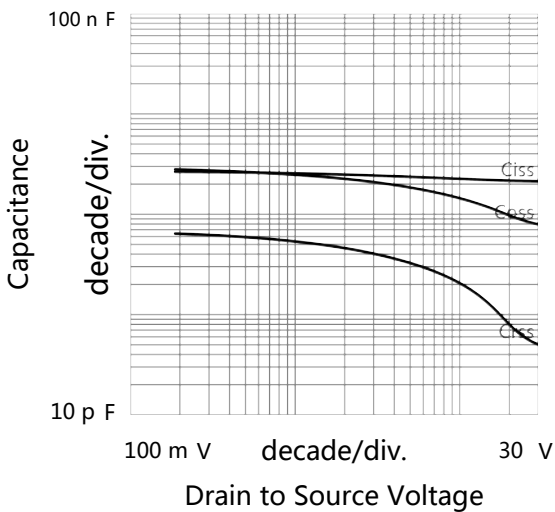
### Drain to Source Resistance vs. Drain Current



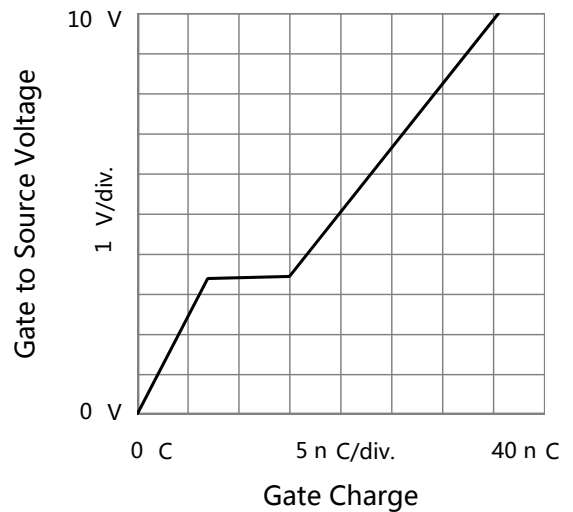
### Body Diode Forward Characteristics



### Capacitances

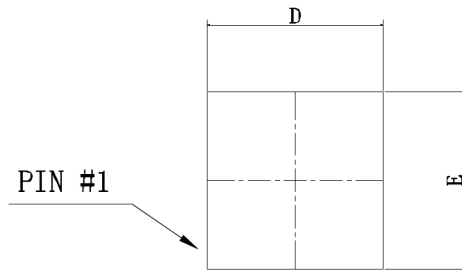


### Gate Charge

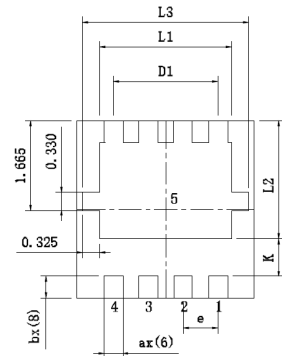


## PLP3.3×3.3-8L Package Information

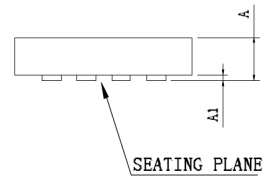
symbol	Dimension in mm		
	MIN	NOM	MAX
A	0.650	0.700	0.750
A1	0.050	0.100	0.150
D	3.200	3.300	3.400
E	3.200	3.300	3.400
D1	---	1.950	---
e	---	0.650	---
ax(6)	0.300	0.350	0.400
bx(8)	0.350	0.400	0.450
L1	2.400	2.450	2.500
L2	2.150	2.200	2.250
L3	3.050	3.100	3.150
K	0.600	0.700	0.800



Top View



Bottom View



Side View