

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	2.45mΩ@10V	170A

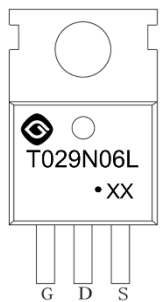
Feature

- Split Gate Trench Technology
- Low $R_{DS(on)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Application

- Power Switching Application

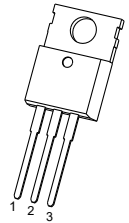
MARKING:



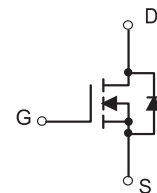
T029N06L = Device Code
XX = Date Code
Solid Dot = Green Indicator

TO-220-3L-C

1. GATE
2. DRAIN
3. SOURCE



Schematic diagram



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

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	60	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	170	A
	$T_C = 100^\circ\text{C}$	I_D	120	A
Pulsed Drain Current ²		I_{DM}	680	A
Single Pulsed Avalanche Current ³		I_{AS}	55	A
Single Pulsed Avalanche Energy ³		E_{AS}	756	mJ
Power Dissipation ⁵		P_D	278	W
$T_C = 25^\circ\text{C}$				
Thermal Resistance from Junction to Ambient ⁶		$R_{\theta JA}$	60	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.45	$^\circ\text{C/W}$
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~ +150	$^\circ\text{C}$

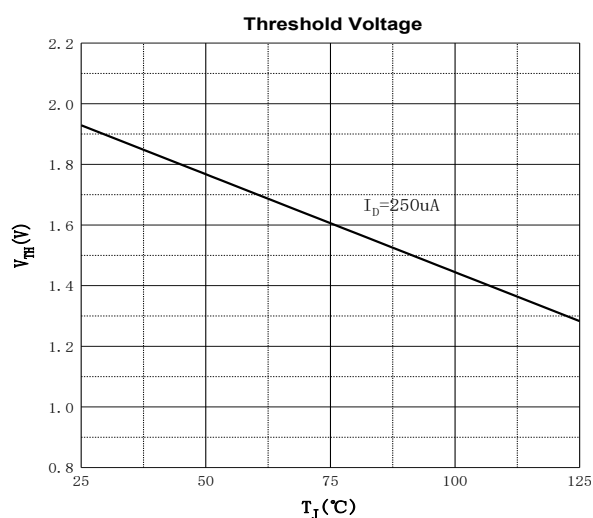
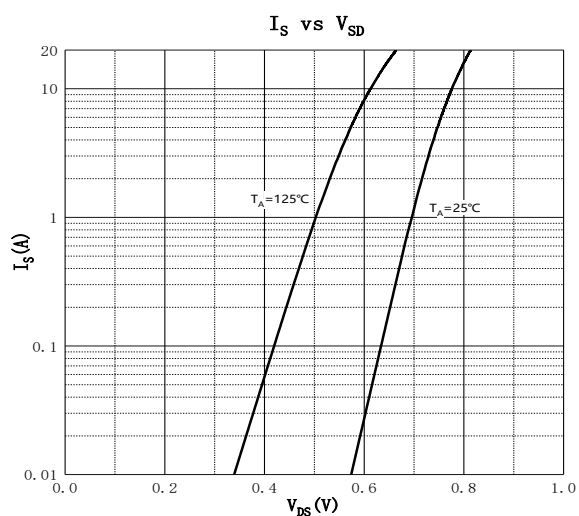
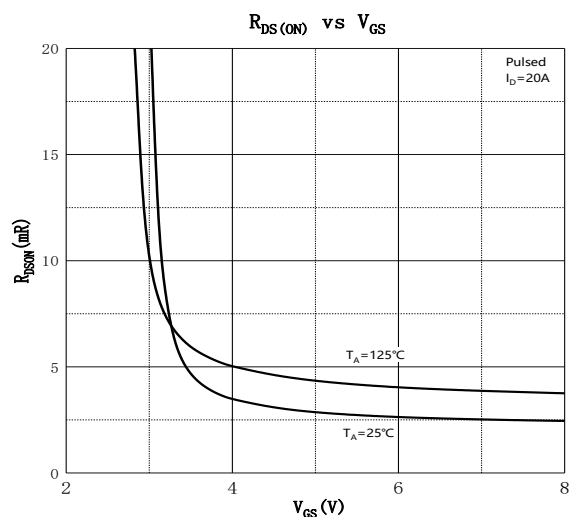
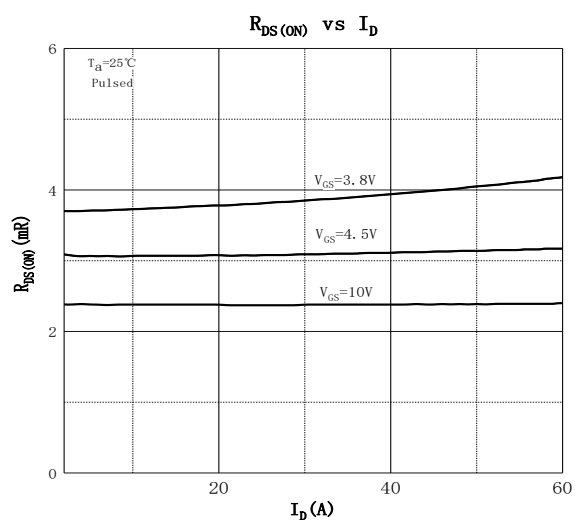
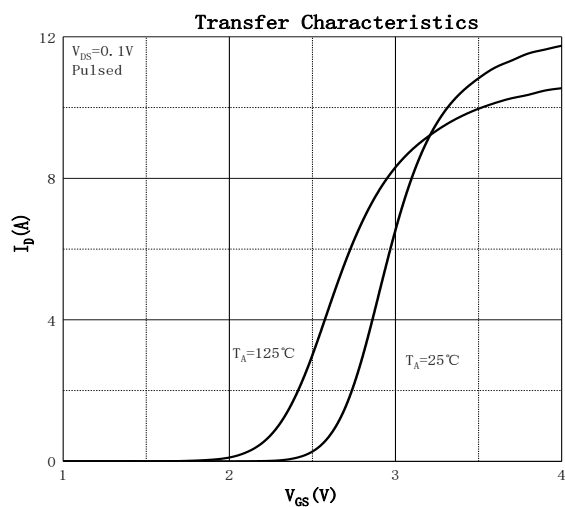
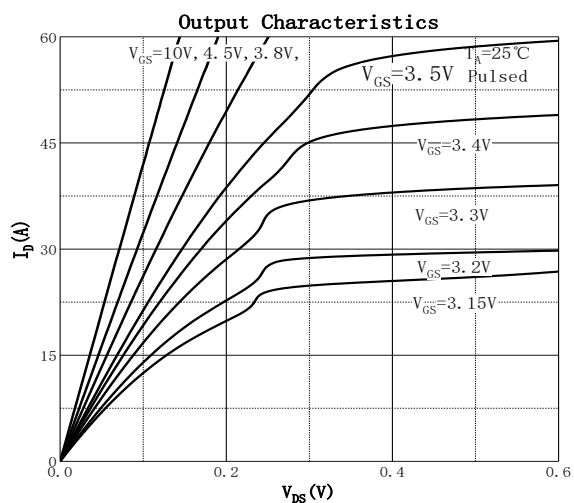
MOSFET ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

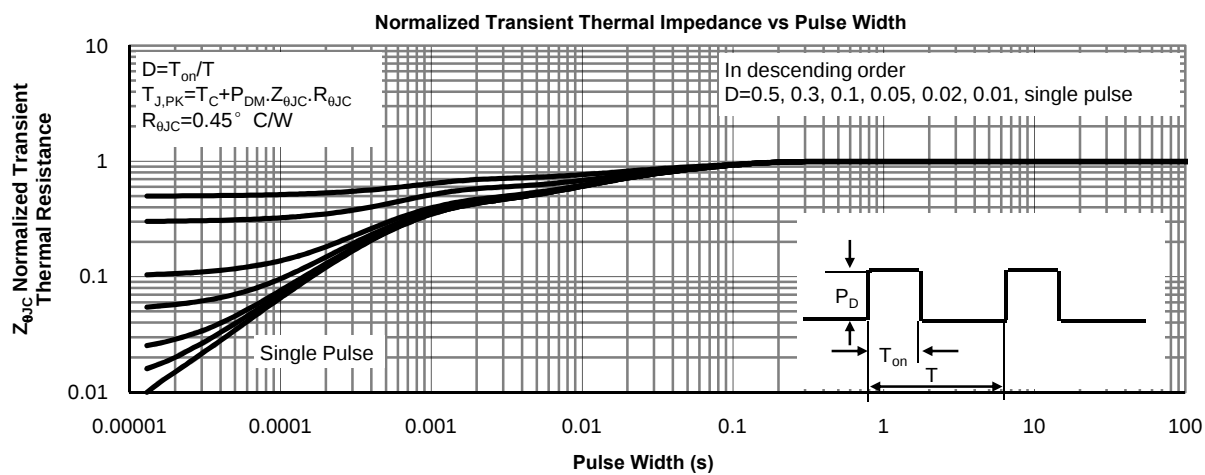
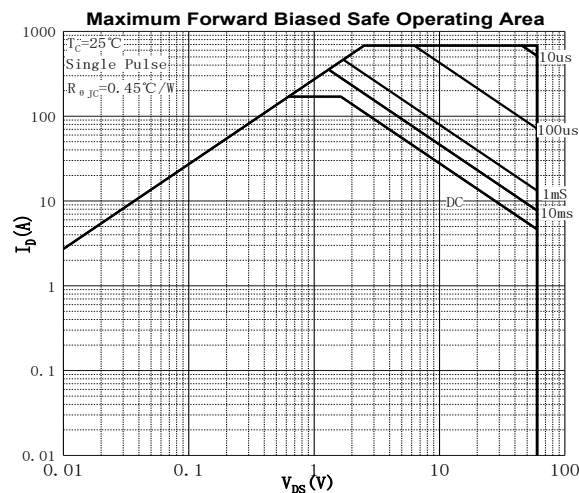
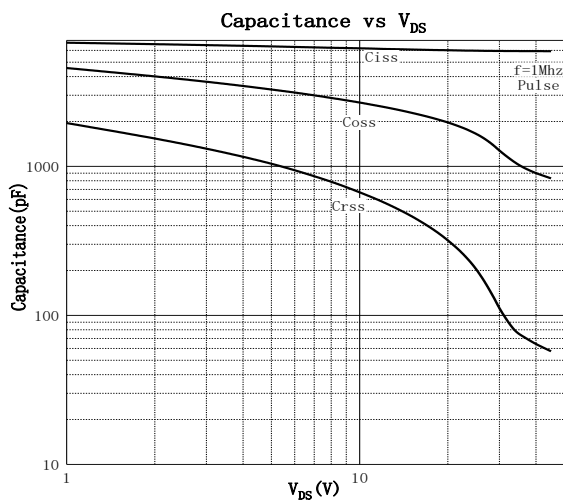
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics ⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	2	3	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		2.45	2.9	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 20A$	50			S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$		5950		pF
Output Capacitance	C_{oss}			1313		
Reverse Transfer Capacitance	C_{rss}			110		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		1.6		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 30V, V_{GS} = 10V, I_D = 20A$		111		nC
Gate-source Charge	Q_{gs}			16		
Gate-drain Charge	Q_{gd}			27.5		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, R_L = 1.5\Omega$ $R_G = 3\Omega$		8		ns
Turn-on Rise Time	t_r			13		
Turn-off Delay Ttime	$t_{d(off)}$			27		
Turn-off Fall Time	t_f			4.5		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_s = 20A$			1.2	V
Diode Continuous Forward Current ¹	I_s	$T_C = 25^\circ C$			180	A

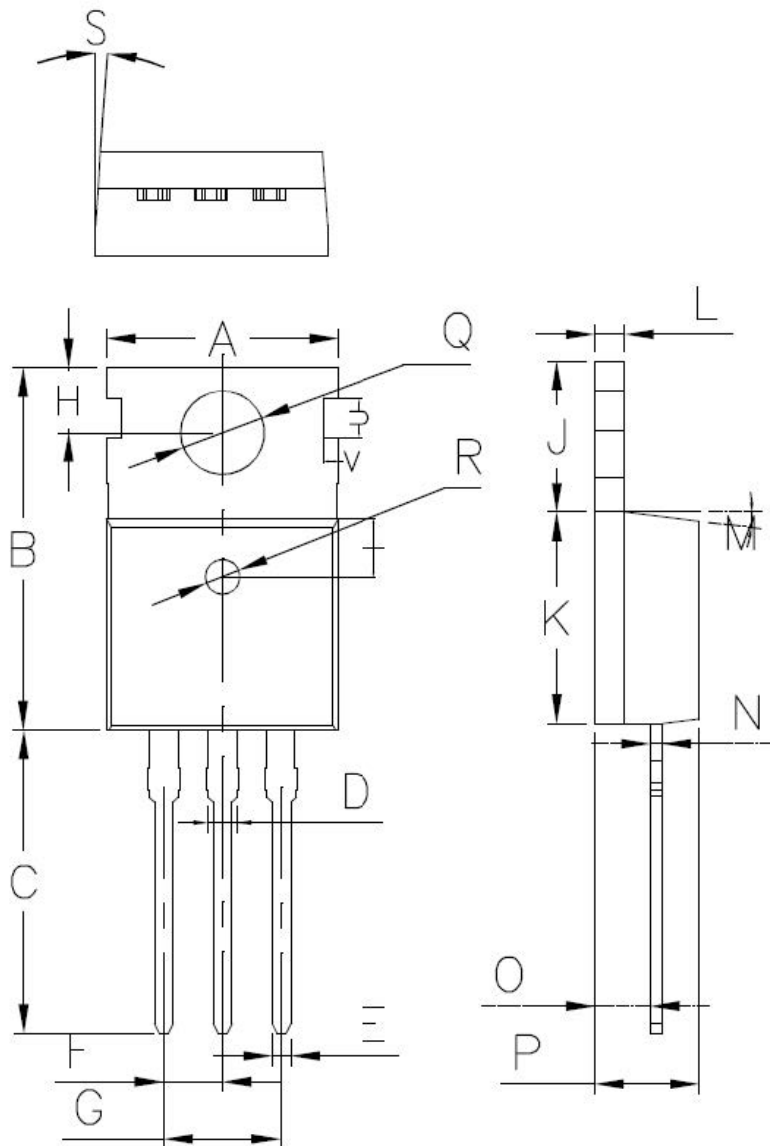
Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.And device mounted on a large heatsink
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Characteristics





TO-220-3L-C Package Information


Symbol	Min	Non	Max
A	9.80	10.00	10.20
B	15.40	15.60	15.80
C	13.02	13.37	13.72
D	1.18	1.31	1.44
E	0.70	0.80	0.90
F	2.42	2.54	2.66
G	4.84	5.08	5.32
H	2.73	2.80	2.87
I	2.40	2.50	2.60
J	6.40	6.50	6.60
K	9.00	9.10	9.20
L	1.29	1.30	1.32
M	6.5°	7.0°	7.5°
N	0.48	0.50	0.56
O	2.35	2.4	2.5
P	4.4	4.5	4.7
Q	3.5	3.6	3.7
R	1.3	1.4	1.5
S	2°	2.5°	3°
U	1.65	1.75	1.85
V	0.58	0.68	0.78