

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	1.0mΩ@10V	250A

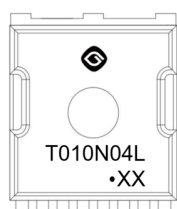
Feature

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

Application

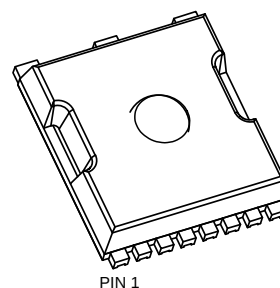
- Power Switching Application

MARKING:

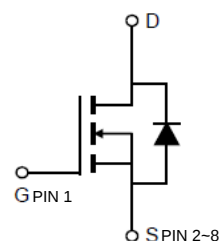


T010N04L = Device Code
 XX = Date Code
 Solid Dot = Green Indicator

TOLL



Schematic diagram



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

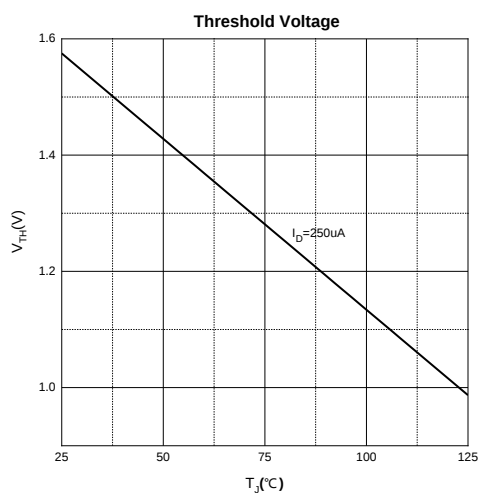
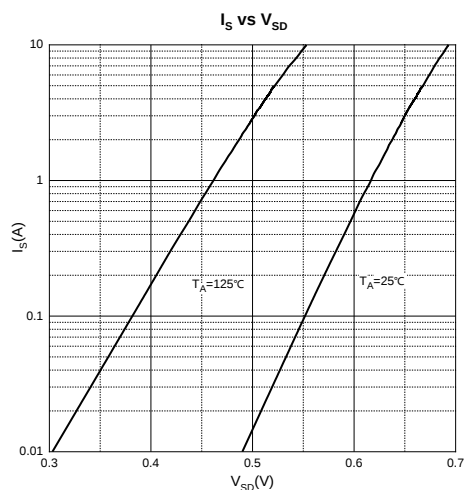
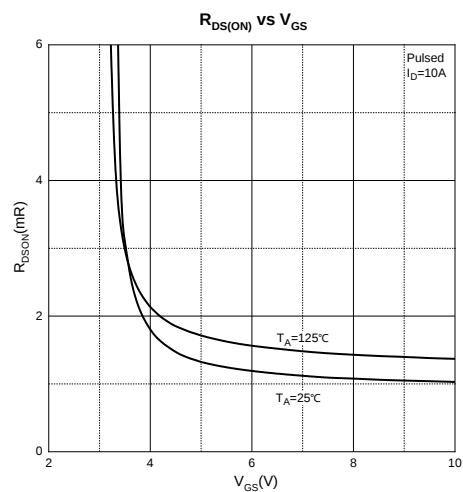
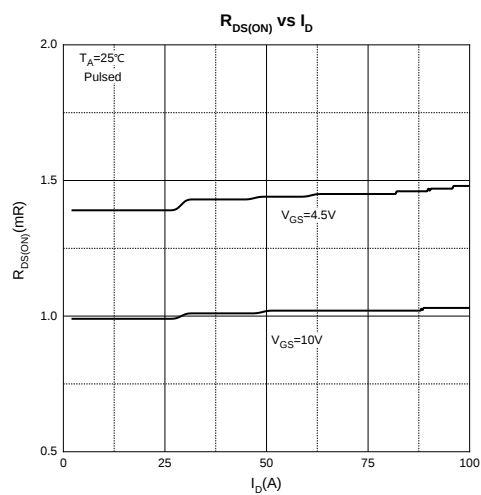
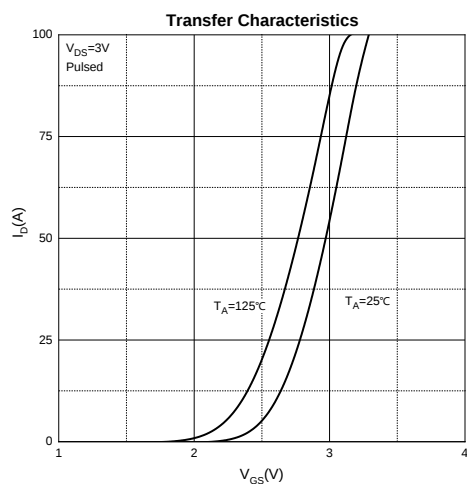
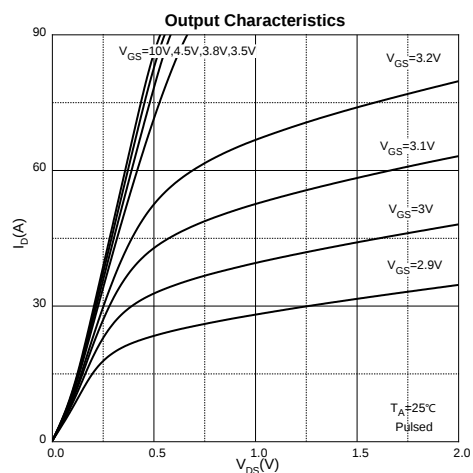
Parameter		Symbol	Value	Unit
Drain - Source Voltage		V _{DS}	40	V
Gate - Source Voltage		V _{GS}	±20	V
Continuous Drain Current ¹	T _C = 25℃	I _D	250	A
	T _C = 100℃	I _D	163	A
Pulsed Drain Current ²		I _{DM}	1000	A
Single Pulsed Avalanche Current ³		I _{AS}	49	A
Single Pulsed Avalanche Energy ³		E _{AS}	512	mJ
Power Dissipation ⁵	T _C = 25℃	P _D	250	W
Thermal Resistance from Junction to Ambient ⁶		R _{θJA}	45	℃/W
Thermal Resistance from Junction to Case		R _{θJC}	0.5	℃/W
Junction Temperature		T _J	150	℃
Storage Temperature		T _{STG}	-55~ +150	℃

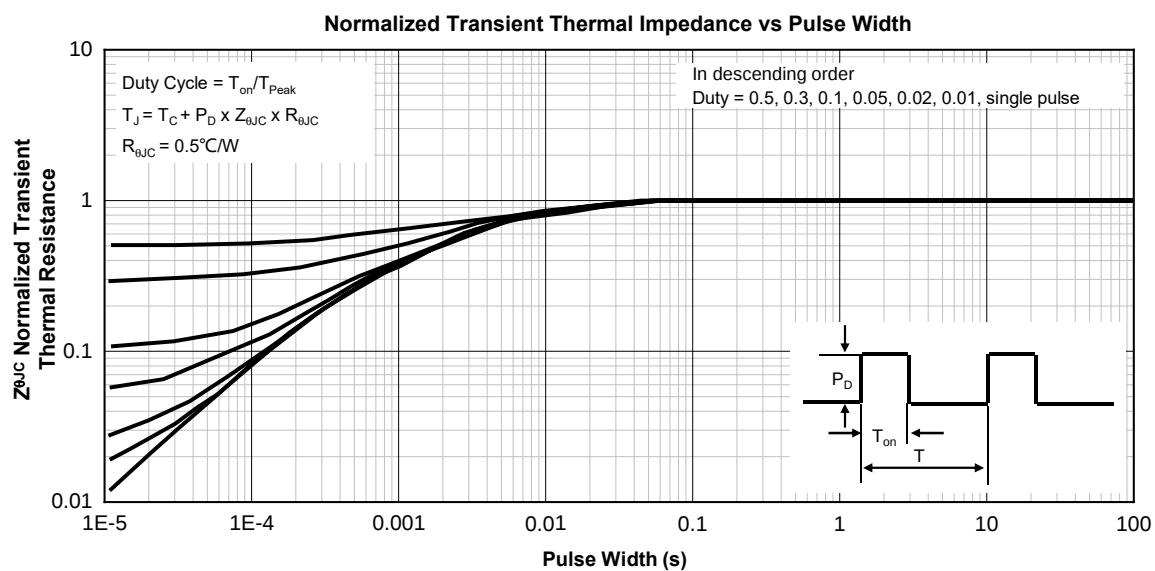
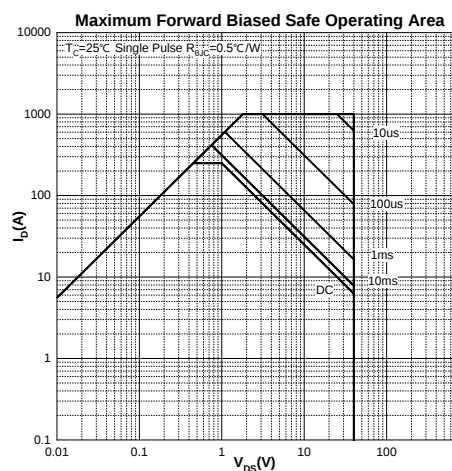
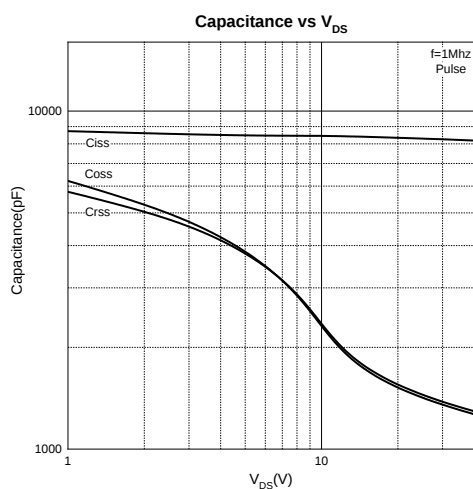
MOSFET ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

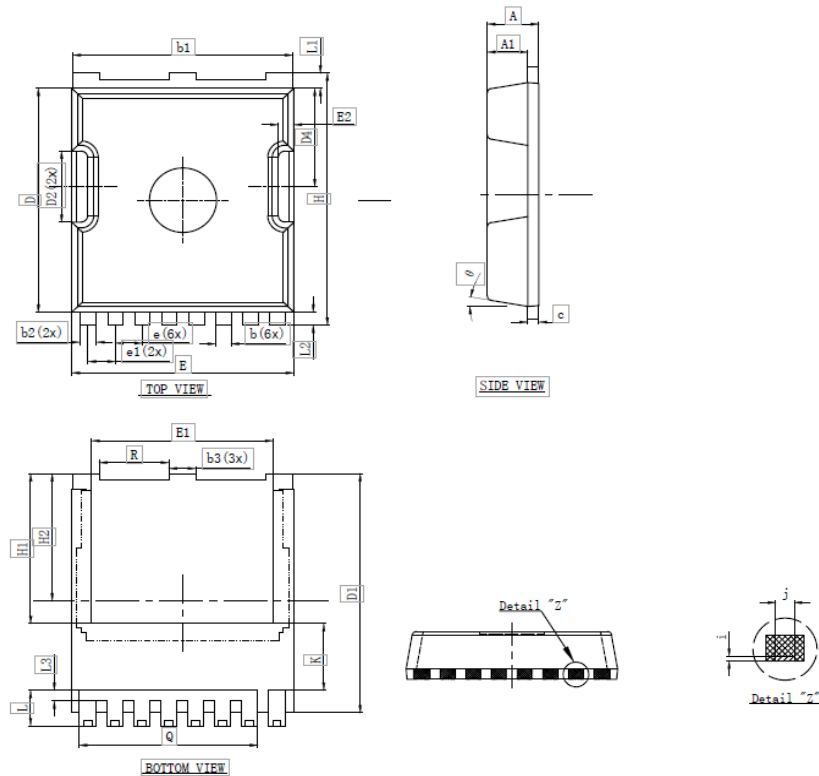
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics ⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.6	3.0	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		1.0	1.3	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$		8455		pF
Output Capacitance	C_{oss}			1503		
Reverse Transfer Capacitance	C_{rss}			1537		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		0.8		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 20V, V_{GS} = 20V, I_D = 30A$		205.4		nC
Gate-source Charge	Q_{gs}			20.6		
Gate-drain Charge	Q_{gd}			66.8		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 50A$ $R_G = 4\Omega$		15		ns
Turn-on Rise Time	t_r			8		
Turn-off Delay Time	$t_{d(off)}$			58		
Turn-off Fall Time	t_f			10		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 10A$			1.2	V

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: $V_{DD} = 20V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ 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 $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Characteristics




TOLL Package Information


SYMBOL	MILLIMETER		Dimensions In Inches	
	MIN.	MAX.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.700	1.900	0.067	0.075
b	0.600	0.800	0.024	0.031
b1	9.700	9.900	0.382	0.390
b2	0.650	0.850	0.026	0.033
b3	1.100	1.300	0.043	0.051
c	0.400	0.600	0.016	0.024
D	10.300	10.500	0.406	0.413
D1	11.000	11.200	0.433	0.441
D2	3.200	3.400	0.126	0.134
D4	4.470	4.670	0.176	0.184
E	9.800	10.000	0.386	0.394
E1	8.000	8.200	0.315	0.323
E2	0.500	0.700	0.020	0.028
e	1.200 BSC		0.047BSC	
e1	1.225 BSC		0.048BSC	
H	11.600	11.800	0.457	0.465
H1	6.950 BSC		0.247BSC	
H2	5.900 BSC		0.232BSC	
i	0.100 REF		0.004REF	
j	0.350 REF		0.014REF	
K	3.100 REF		0.122REF	
L	1.550	1.750	0.061	0.069
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	0.400	0.600	0.016	0.024
Q	7.950 REF		0.313REF	
R	3.000	3.200	0.118	0.126
θ	10°			