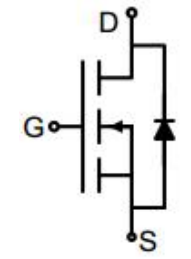
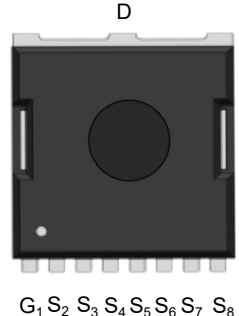


## N-Channel Enhancement Mode Power MOSFET

<p><b>Description</b></p> <p>The GT016N10TL uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge. It can be used in a wide variety of applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>• <math>V_{DS}</math> 100V</li> <li>• <math>I_D</math> (at <math>V_{GS} = 10V</math>) 362A</li> <li>• <math>R_{DS(ON)}</math> (at <math>V_{GS} = 10V</math>) &lt; 1.6m<math>\Omega</math></li> <li>• 100% Avalanche Tested</li> <li>• RoHS Compliant</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>• Power switch</li> <li>• DC/DC converters</li> </ul>	 <p>Schematic diagram</p>  <p>TOLL</p>
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### Ordering Information

Device	Package	Marking	Packaging
GT016N10TL	TOLL	GT016N10	2000pcs/Reel

### Absolute Maximum Ratings $T_C = 25^\circ C$ , unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Continuous Drain Current	$I_D$	362	A
Pulsed Drain Current (note1)	$I_{DM}$	1448	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation	$P_D$	450	W
Single pulse avalanche energy (note2)	$E_{AS}$	625	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 To 150	$^\circ C$

### Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	25	$^\circ C/W$
Maximum Junction-to-Case	$R_{thJC}$	0.28	$^\circ C/W$

Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V$	--	--	1	$\mu A$
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 20V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	3.0	4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 15A$	--	1.3	1.6	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{GS} = 5V, I_D = 15A$	--	73	--	S
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 50V,$ $f = 1.0\text{MHz}$	--	10037	--	pF
Output Capacitance	$C_{oss}$		--	3782	--	
Reverse Transfer Capacitance	$C_{rss}$		--	585	--	
Total Gate Charge	$Q_g$	$V_{DD} = 50V,$ $I_D = 15A,$ $V_{GS} = 10V$	--	165	--	nC
Gate-Source Charge	$Q_{gs}$		--	33	--	
Gate-Drain Charge	$Q_{gd}$		--	48	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50V,$ $I_D = 15A,$ $R_G = 4.5\Omega$	--	29	--	ns
Turn-on Rise Time	$t_r$		--	64	--	
Turn-off Delay Time	$t_{d(off)}$		--	120	--	
Turn-off Fall Time	$t_f$		--	106	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	362	A
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = 15A, V_{GS} = 0V$	--	--	1.2	V
Reverse Recovery Charge	$Q_{rr}$	$I_F = 15A, V_{GS} = 0V$ $di/dt = 100A/\mu s$	--	166	--	nC
Reverse Recovery Time	$T_{rr}$		--	91	--	ns

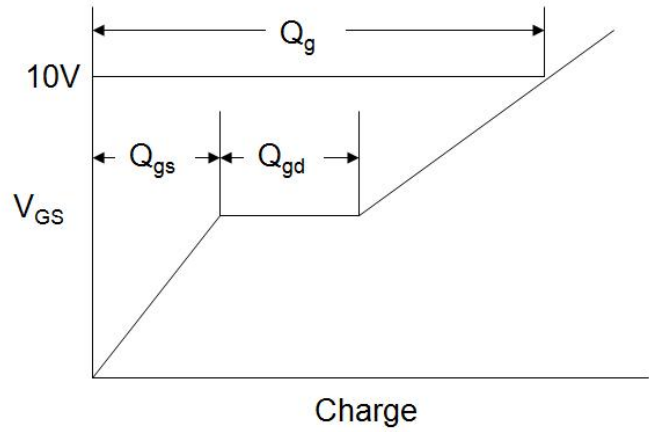
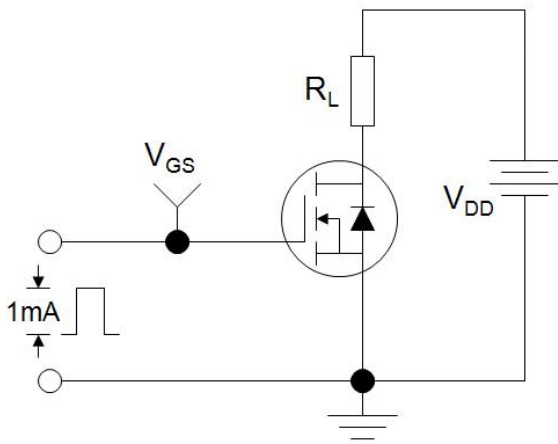
## Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition :  $T_J = 25^\circ\text{C}, V_{DD} = 50V, V_{GS} = 10V, L = 0.5\text{mH}, R_G = 25\Omega$

The table shows the minimum avalanche energy, which is 1772mJ when the device is tested until failure

3. Identical low side and high side switch with identical  $R_G$

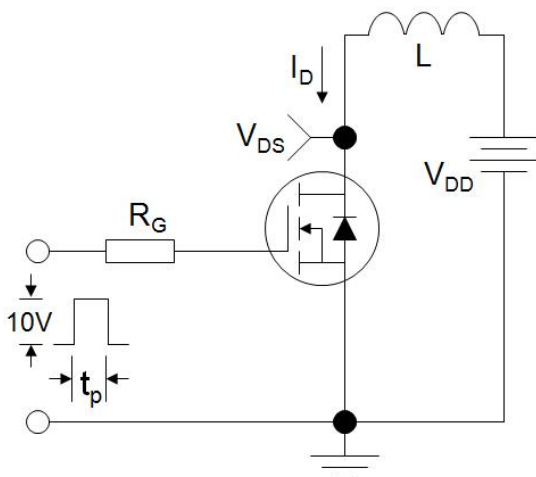
### Gate Charge Test Circuit



### Switch Time Test Circuit

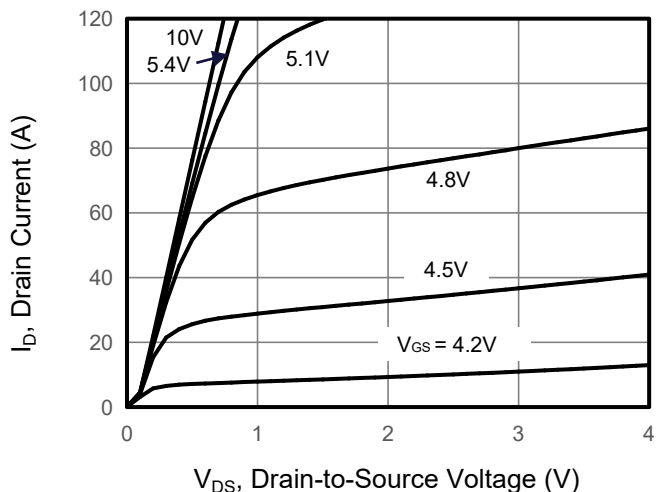


### EAS Test Circuit

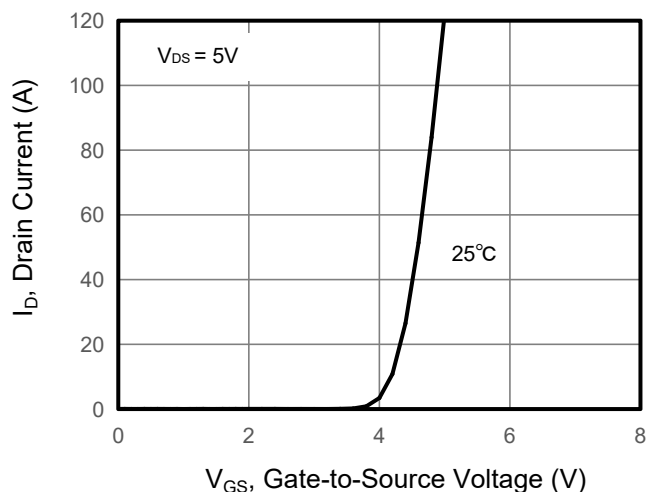


Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

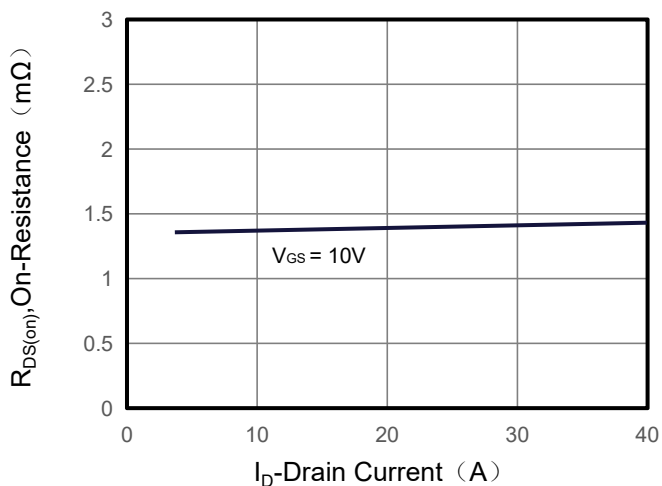
**Figure 1. Output Characteristics**



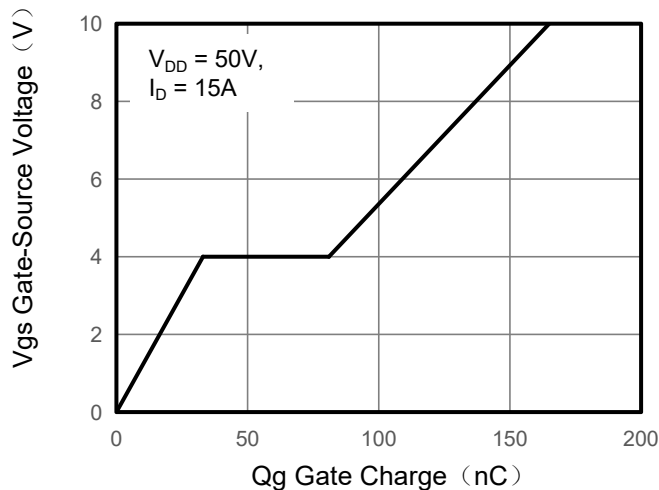
**Figure 2. Transfer Characteristics**



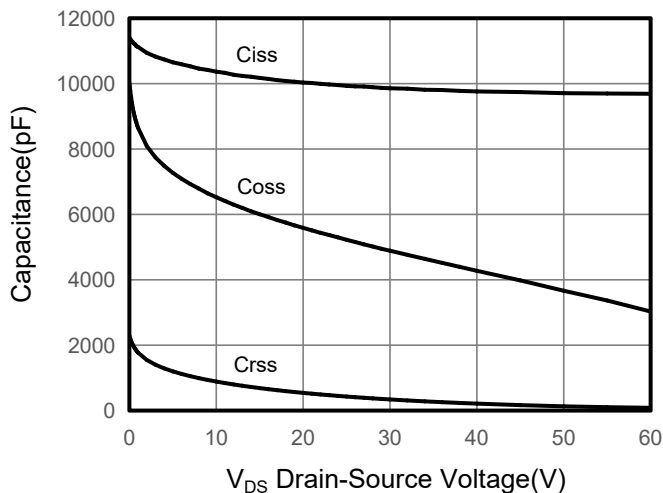
**Figure 3. Drain Source On Resistance**



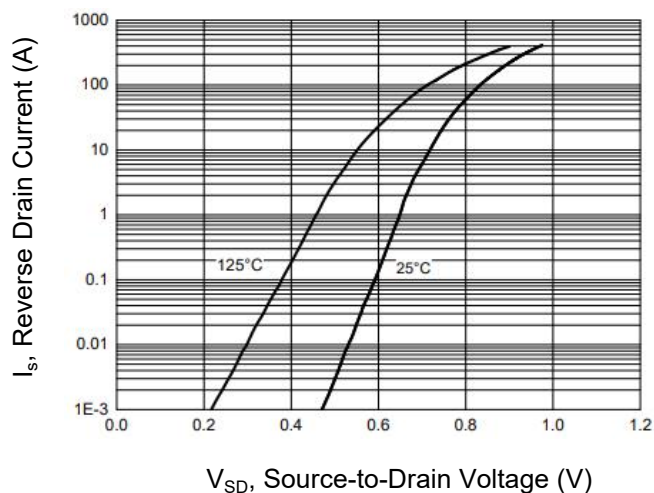
**Figure 4. Gate Charge**



**Figure 5. Capacitance**



**Figure 6. Source-Drain Diode Forward**



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. Drain-Source On-Resistance

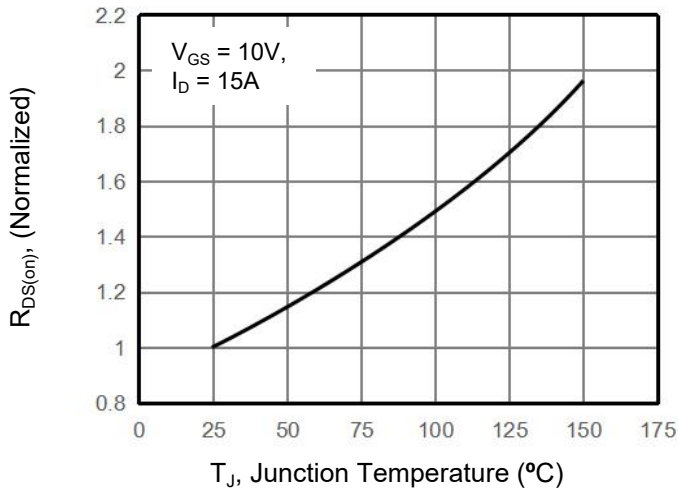


Figure 8. Safe Operation Area

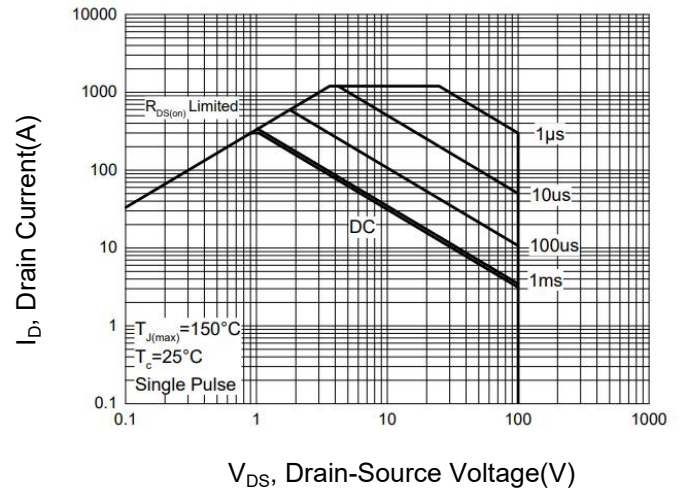
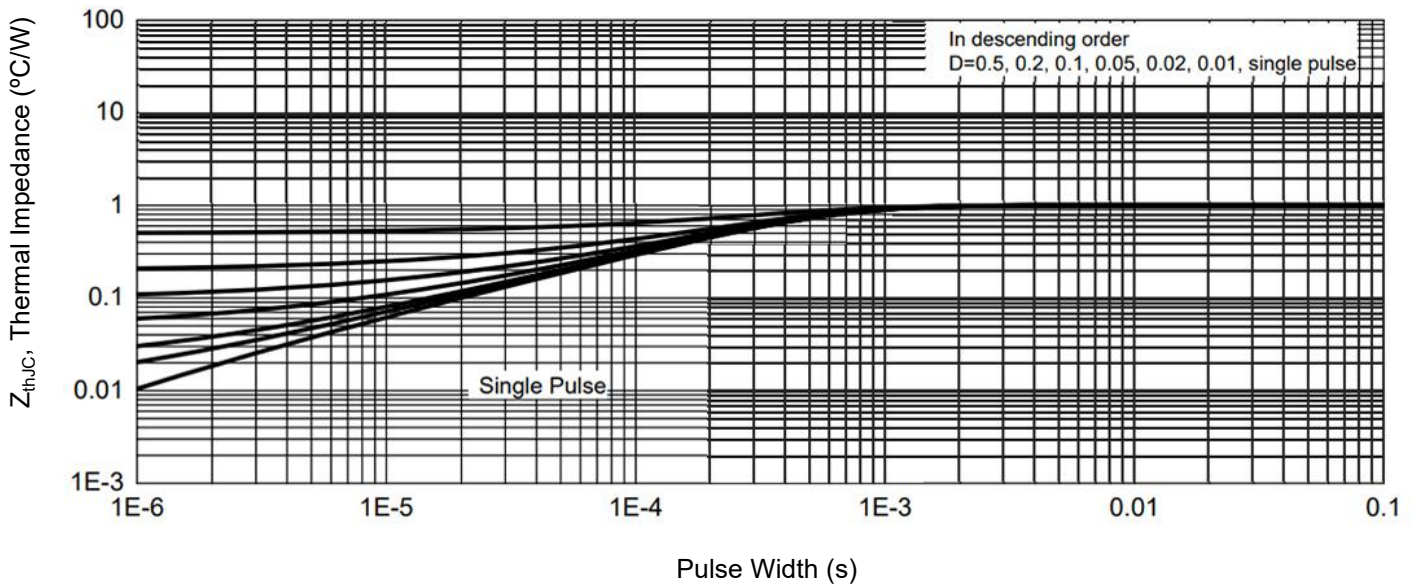
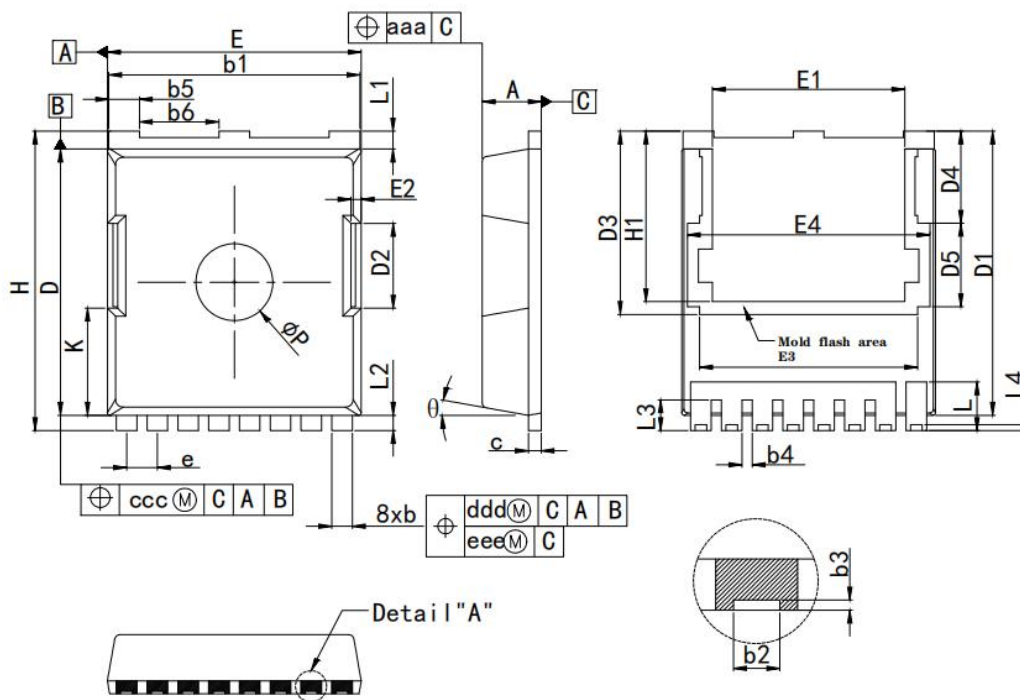


Figure 9. Normalized Maximum Transient Thermal Impedance



## TOLL Package Information



SYMBOL	COMMON		
	MILLIMETER		
	MIN	NOMINAL	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	0.100	/
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	0.55	0.65	0.75
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
$\theta$		10" REF	
aaa		0.20	
ccc		0.20	
ddd		0.25	
eee		0.20	