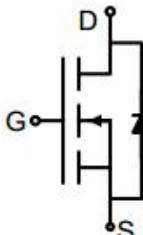
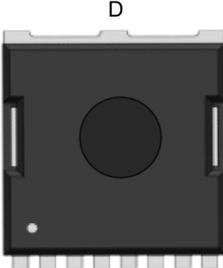


N-Channel Enhancement Mode Power MOSFET

<p>Description</p> <p>The GT020N10TL uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.</p> <p>General Features</p> <ul style="list-style-type: none"> ● V_{DS} 100V ● I_D (at $V_{GS} = 10V$) 300A ● $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 1.9mΩ ● 100% Avalanche Tested ● RoHS Compliant <p>Application</p> <ul style="list-style-type: none"> ● Power switch ● DC/DC converters 	 <p>Schematic diagram</p>  <p>TOLL-8L</p>
---	---

Ordering Information			
Device	Package	Marking	Packaging
GT020N10TL	TOLL-8L	GT020N10	2000pcs/Reel

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	300
		$T_C = 100^\circ\text{C}$	190
Pulsed Drain Current (note1)	I_{DM}	1200	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	P_D	330	W
Single pulse avalanche energy (note2)	E_{AS}	650	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	$^\circ\text{C}$

Thermal Resistance			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	40	$^\circ\text{C/W}$
Maximum Junction-to-Case	R_{thJC}	0.38	$^\circ\text{C/W}$

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
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	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.3	2.8	3.7	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 100A$	--	1.65	1.9	m Ω
Forward Transconductance	g_{FS}	$V_{GS} = 5V, I_D = 100A$	--	94	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 50V,$ $f = 0.8\text{MHz}$	--	10600	--	pF
Output Capacitance	C_{oss}		--	13700	--	
Reverse Transfer Capacitance	C_{rss}		--	370	--	
Total Gate Charge	Q_g	$V_{DD} = 50V,$ $I_D = 100A,$ $V_{GS} = 10V$	--	160	--	nC
Gate-Source Charge	Q_{gs}		--	53	--	
Gate-Drain Charge	Q_{gd}		--	60	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50V,$ $I_D = 100A,$ $R_G = 6\Omega$	--	57	--	ns
Turn-on Rise Time	t_r		--	124	--	
Turn-off Delay Time	$t_{d(off)}$		--	116	--	
Turn-off Fall Time	t_f		--	47	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	300	A
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 100A, V_{GS} = 0V$	--	--	1.2	V
Reverse Recovery Charge	Q_{rr}	$I_F = 100A, V_{GS} = 0V$ $di/dt = 100A/\mu s$	--	139	--	nC
Reverse Recovery Time	T_{rr}		--	64	--	ns

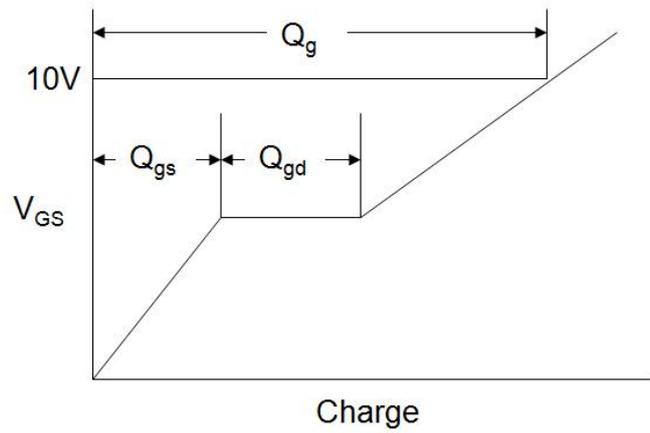
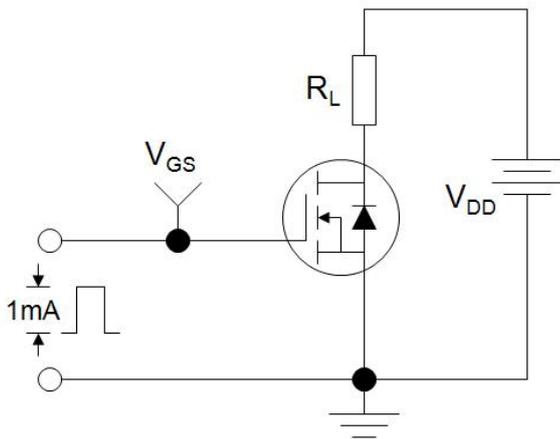
Notes

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

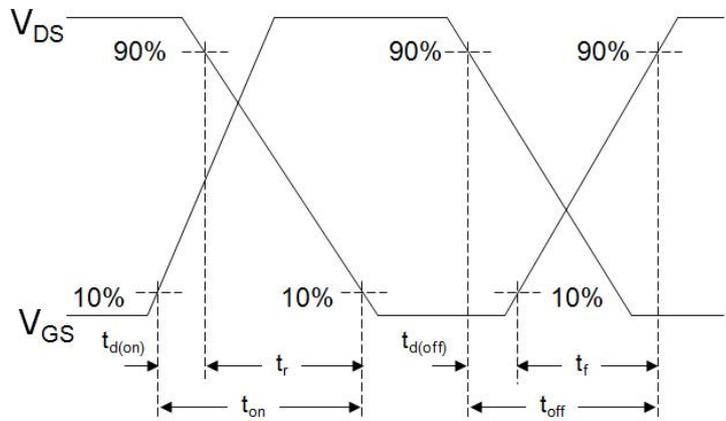
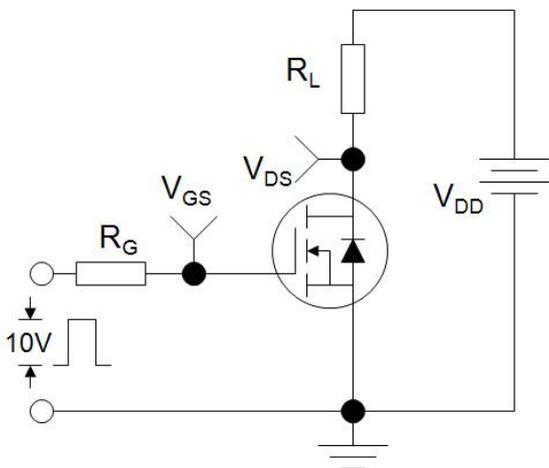
The table shows the minimum avalanche energy, which is 1806mJ when the device is tested until failure

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

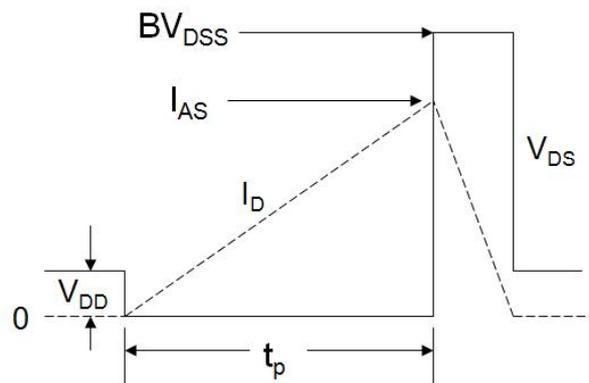
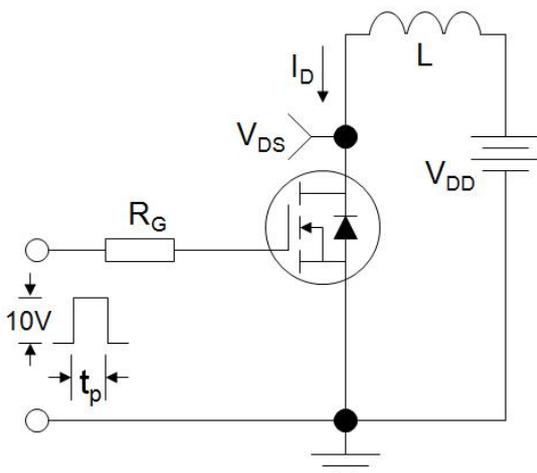
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

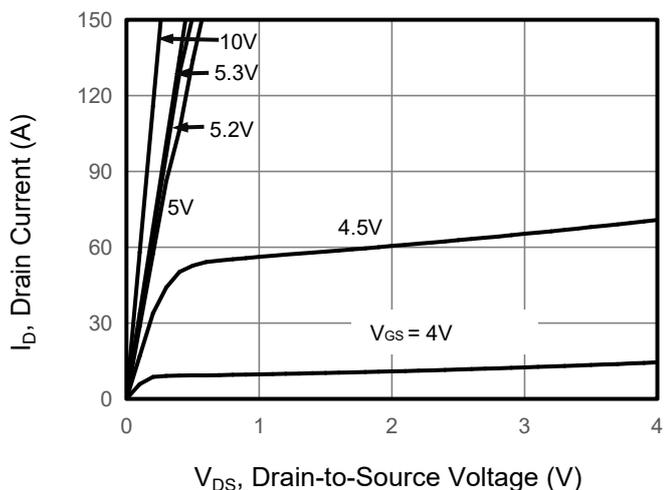


Figure 2. Transfer Characteristics

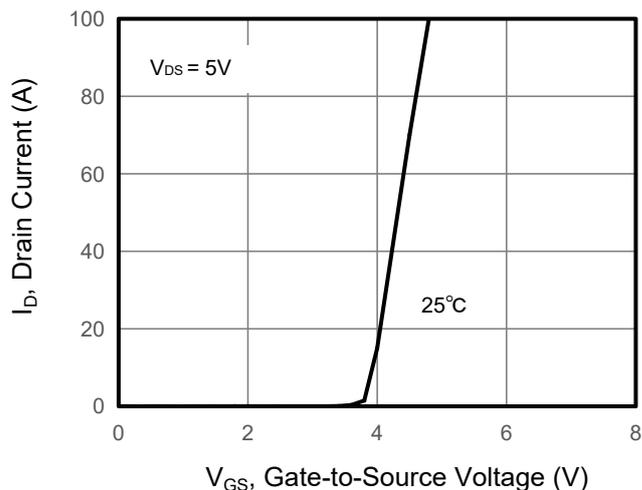


Figure 3. Drain Source On Resistance

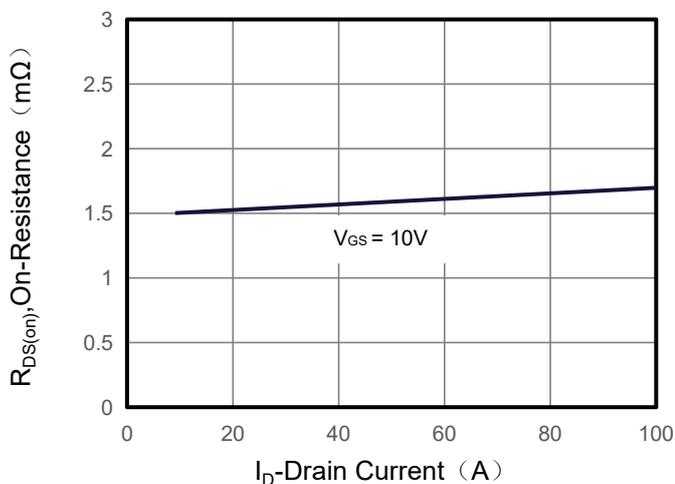


Figure 4. Gate Charge

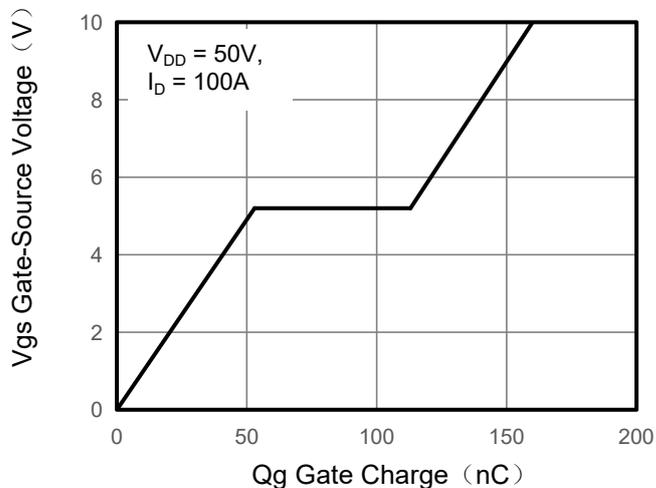


Figure 5. Capacitance

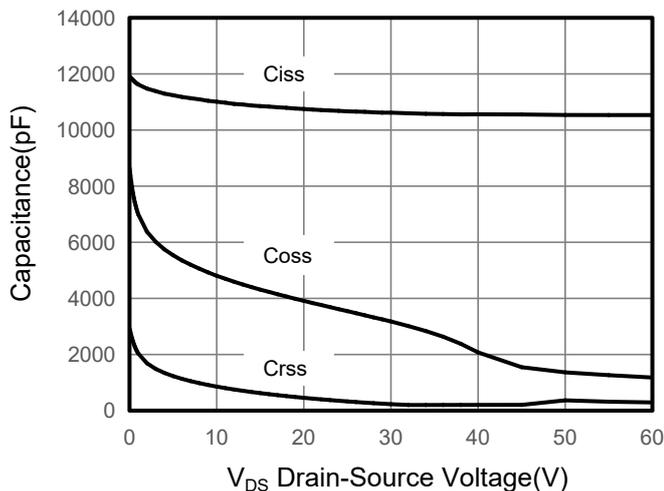
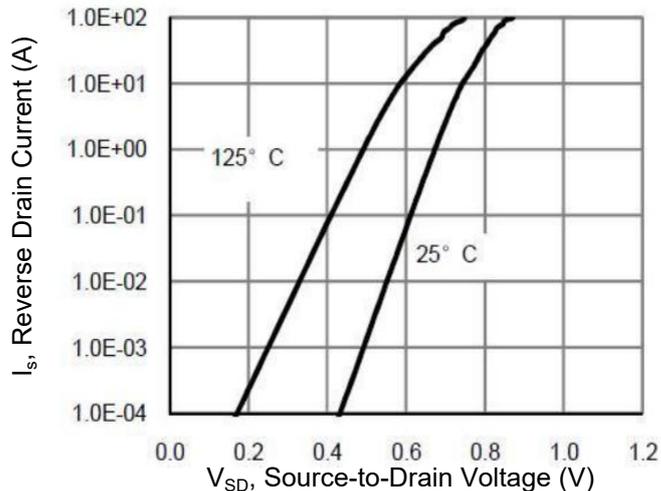


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

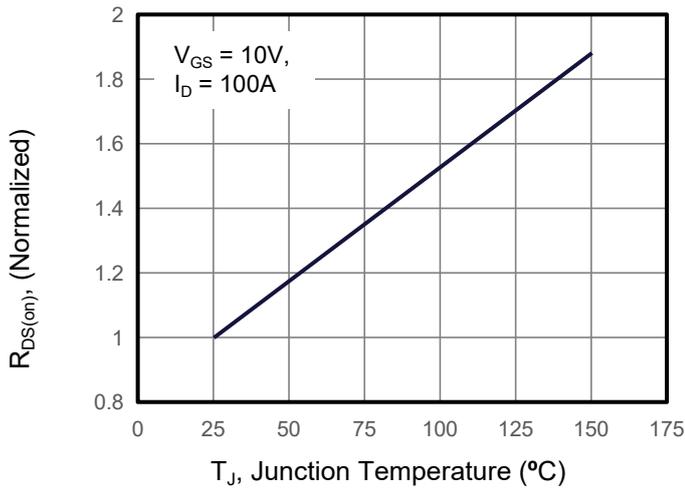


Figure 8. Safe Operation Area

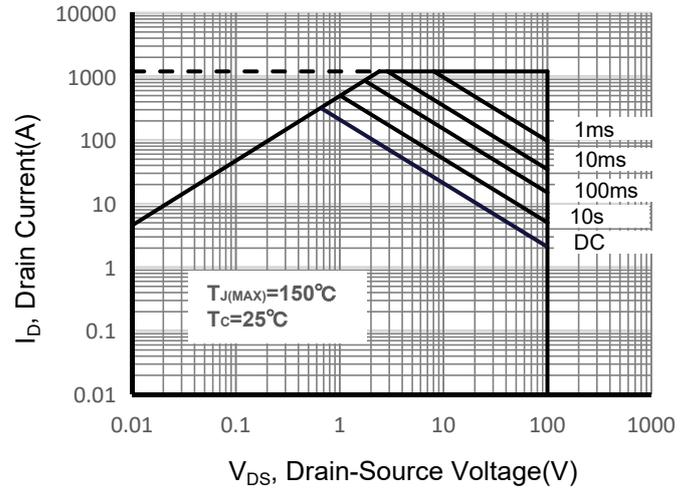


Figure 9. Maximum Continuous Drain Current vs Case Temperature

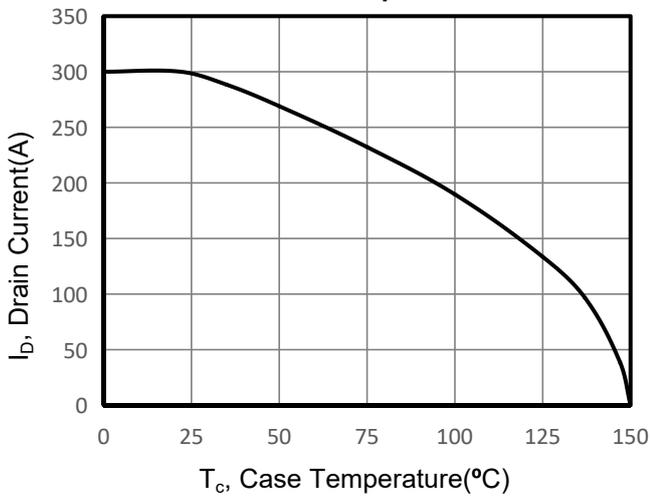
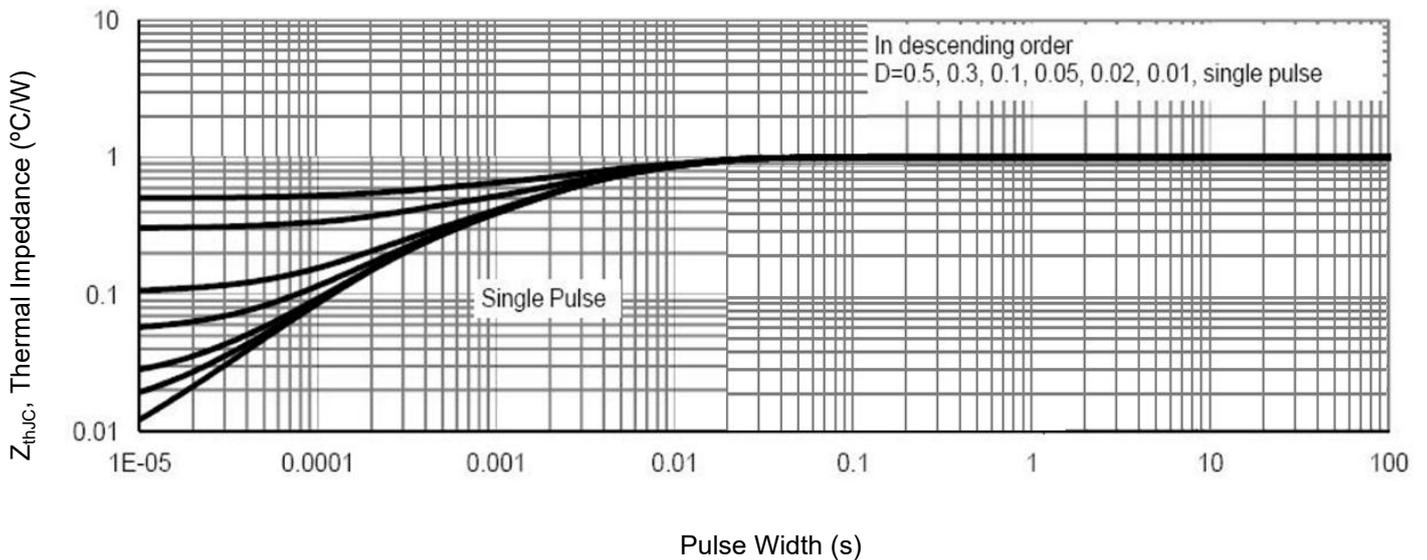
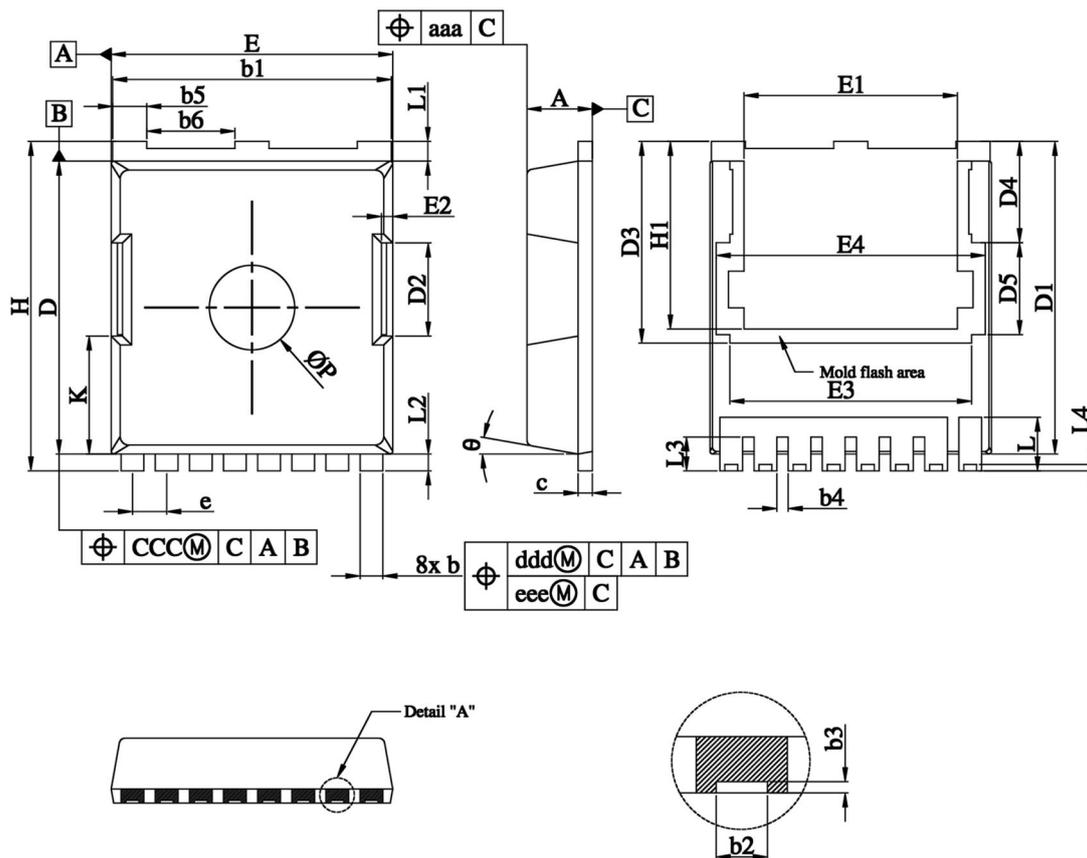


Figure 10. Normalized Maximum Transient Thermal Impedance



TOLL-8L Package Information



SYMBOL	COMMON			SYMBOL	COMMON		
	MILLIMETER				MILLIMETER		
	MIN.	NOMINAL	MAX.		MIN.	NOMINAL	MAX.
A	2.20	2.30	2.40	E2	0.30	0.40	0.50
b	0.70	0.80	0.90	E3	8.50		
b1	9.70	9.80	9.90	E4	9.46		
b2	0.36	0.45	0.55	H	11.50	11.68	11.85
b3	0.05	0.100	/	H1	6.55	6.65	6.75
b4	0.30	0.40	0.50	K	4.08	4.18	4.28
b5	1.10	1.20	1.30	L	1.60	1.90	2.10
b6	3.00	3.10	3.20	L1	0.50	0.70	0.90
c	0.40	0.50	0.60	L2	0.50	0.60	0.70
D	10.28	10.38	10.55	L3	1.00	1.20	1.30
D1	10.98	11.08	11.18	L4	0.13	0.23	0.33
D2	3.20	3.30	3.40	P	2.85	3.00	3.15
D3	7.15			θ	10° REF		
D4	3.59			aaa	0.20		
D5	3.26			ccc	0.20		
e	1.10	1.20	1.30	ddd	0.25		
E	9.80	9.90	10.00	eee	0.20		
E1	7.40	7.50	7.60				