N-Channel Enhancement Mode Power MOSFET

Description

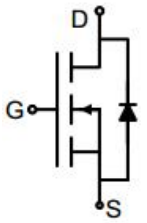
The GT100N20TT uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

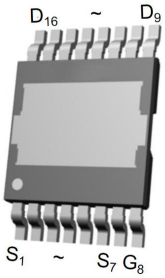
- V_{DS} 200V
- I_D (at V_{GS} = 10V) 130A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 10mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



TOLT

Ordering Information

Device	Package	Marking	Packaging
GT100N20TT	TOLT	GT100N20	2000pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Continuous Drain Current	T_C = 25ºC	I_D	130	A
	T_C = 100ºC		82	
Pulsed Drain Current (note1)		I_{DM}	520	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	280	W
Single pulse avalanche energy （note2）		E_{AS}	576	mJ
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

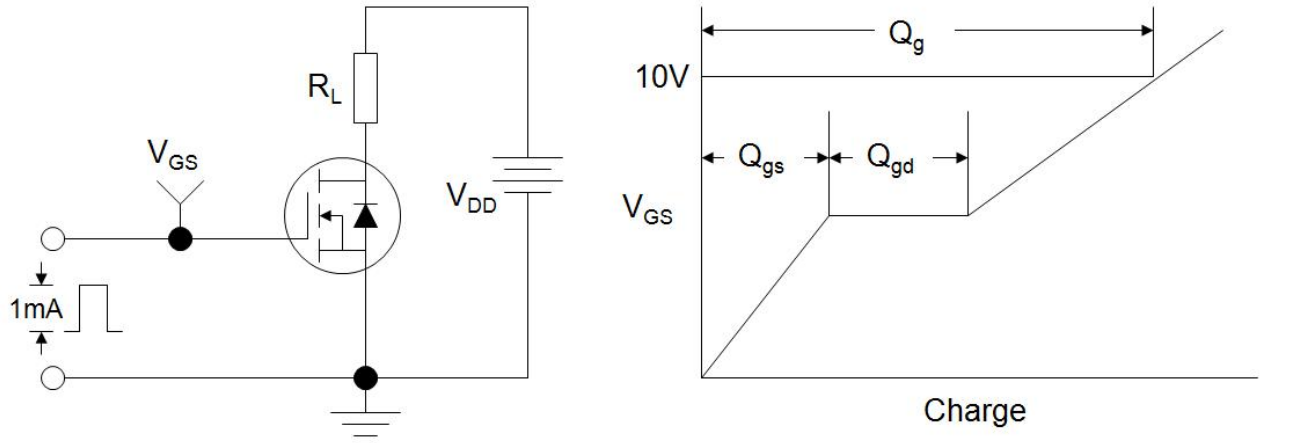
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62	ºC/W
Thermal Resistance, Junction-to-Case	R_{thJC}	0.44	ºC/W

Specifications T_J = 25ºC, 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 = 250μA	200	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 200V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 40A	--	8	10	mΩ
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 40A	--	69	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 100V, f = 0.9MHz	--	5300	--	pF
Output Capacitance	C_{oss}		--	435	--	
Reverse Transfer Capacitance	C_{rss}		--	35	--	
Total Gate Charge	Q_g	V_{DD} = 100V, I_D = 40A, V_{GS} = 10V	--	76	--	nC
Gate-Source Charge	Q_{gs}		--	28	--	
Gate-Drain Charge	Q_{gd}		--	17	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 100V, I_D = 40A, R_G = 2.7Ω	--	23	--	ns
Turn-on Rise Time	t_r		--	46	--	
Turn-off Delay Time	$t_{d(off)}$		--	63	--	
Turn-off Fall Time	t_f		--	20	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	130	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 40A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 40A, V_{GS} = 0V di/dt=100A/us	--	673	--	nC
Reverse Recovery Time	Trr		--	129	--	ns

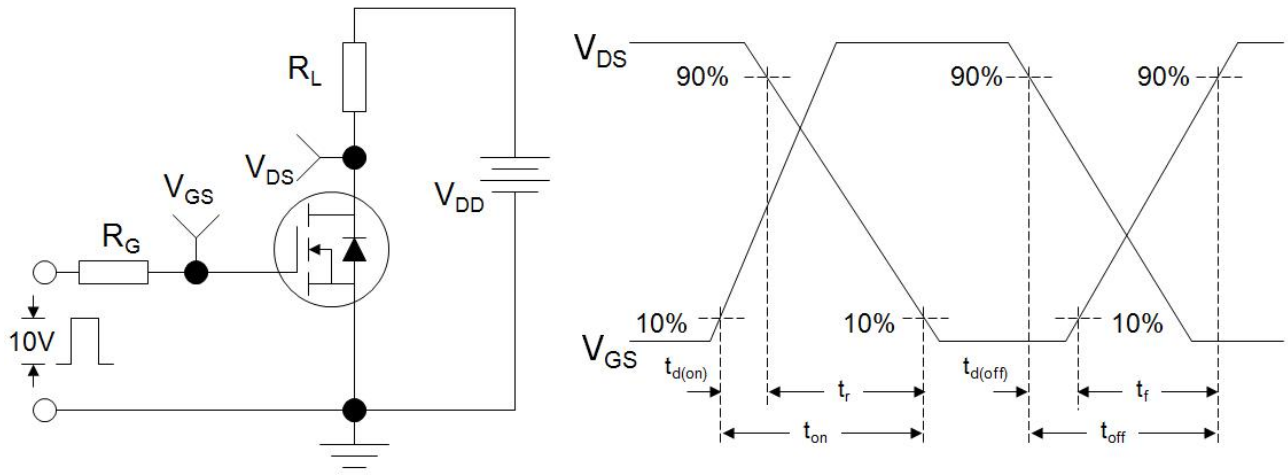
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω
   The table shows the minimum avalanche energy, which is 1600mJ when the device is tested until failure
3. Identical low side and high side switch with identical R_G

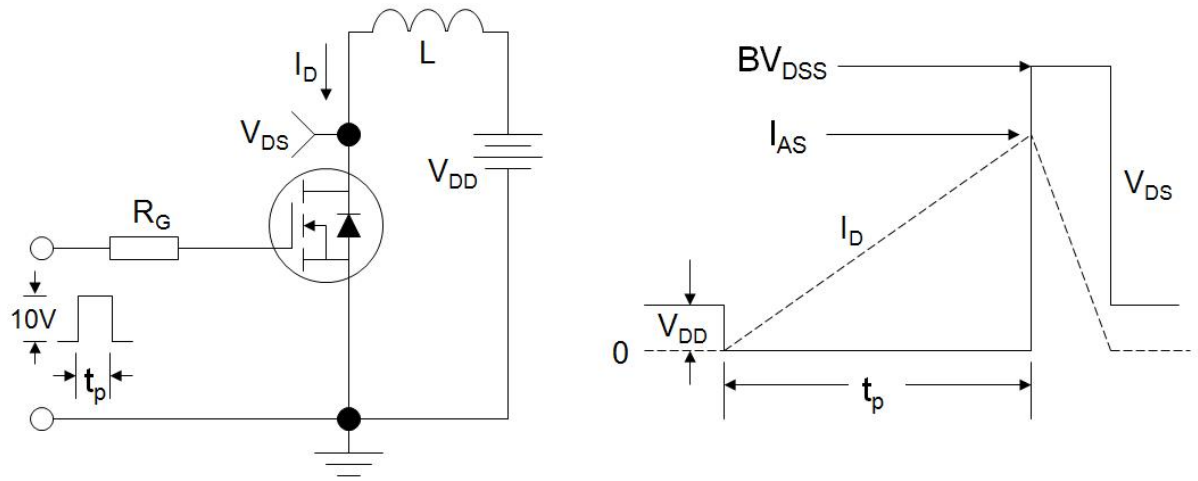
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

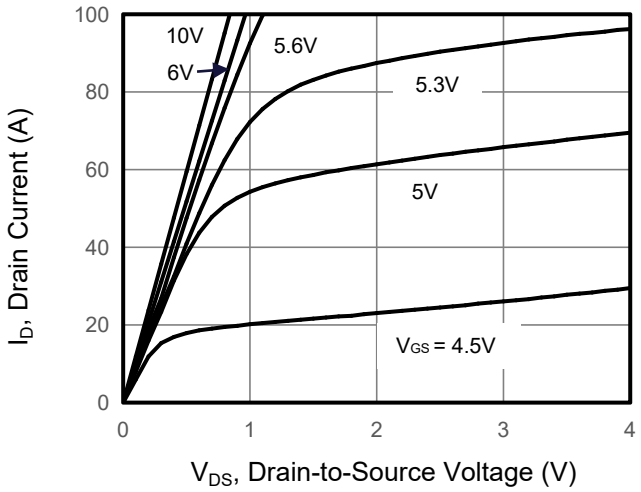


Figure 2. Transfer Characteristics

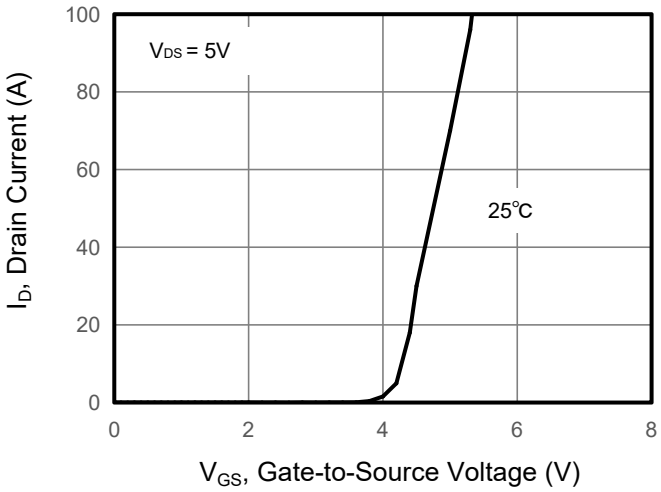


Figure 3. Drain Source On Resistance

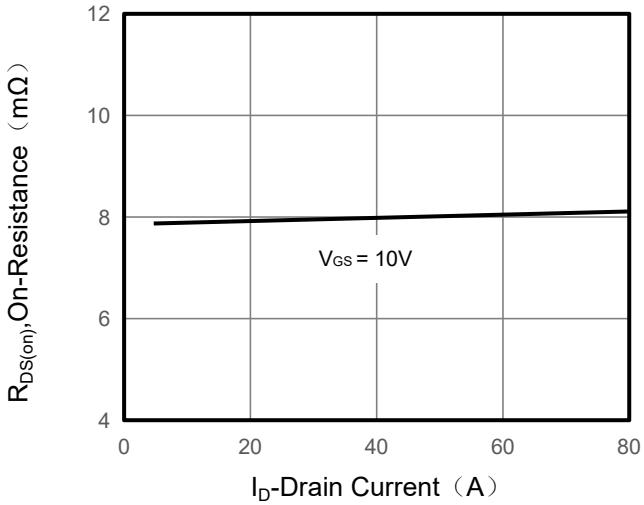


Figure 4. Gate Charge

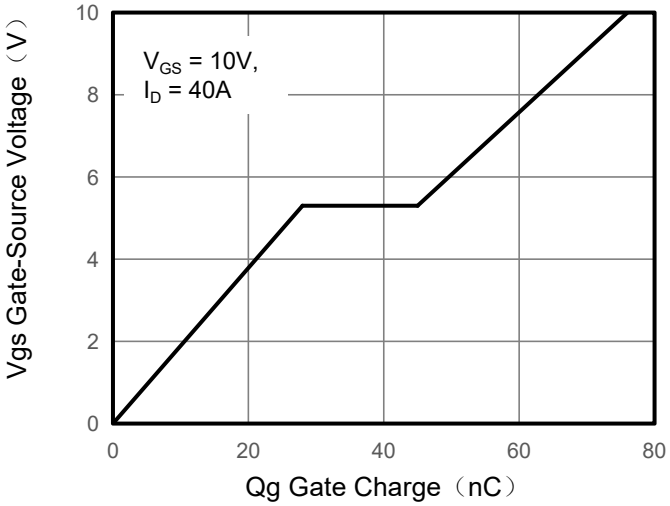


Figure 5. Capacitance

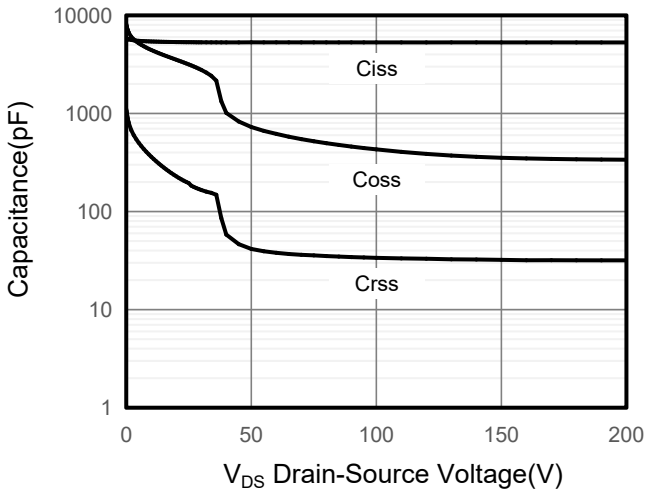
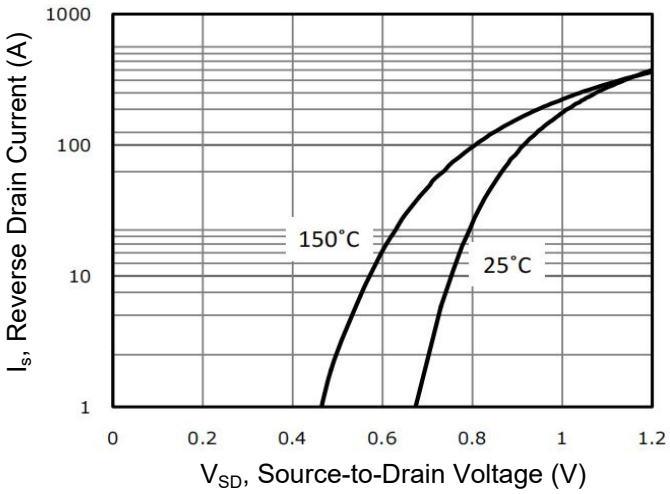


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

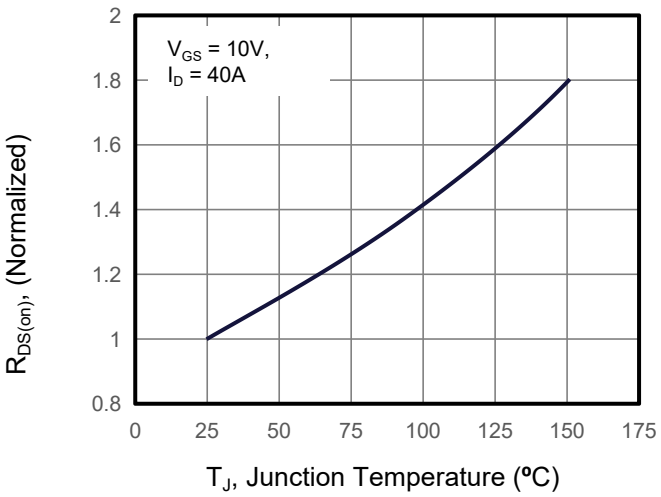


Figure 8. Safe Operation Area

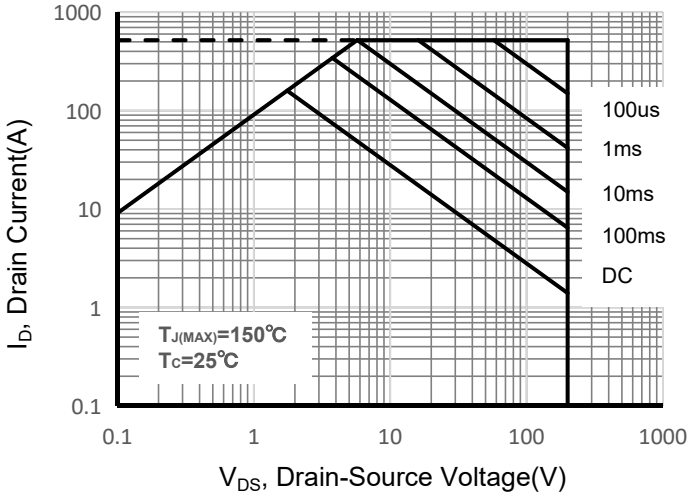


Figure 9. Maximum Continuous Drain Current vs Case Temperature

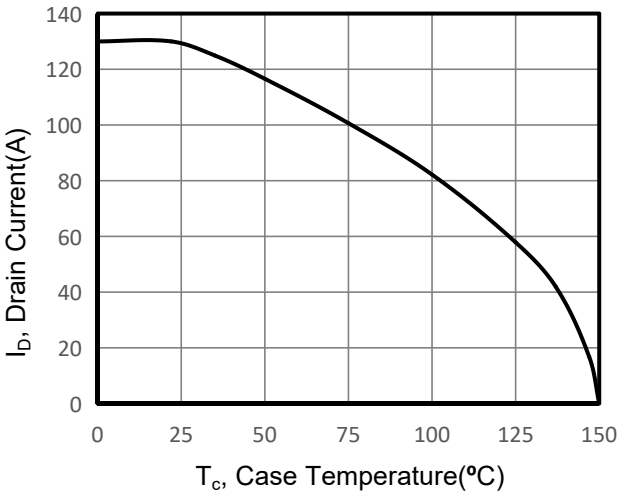
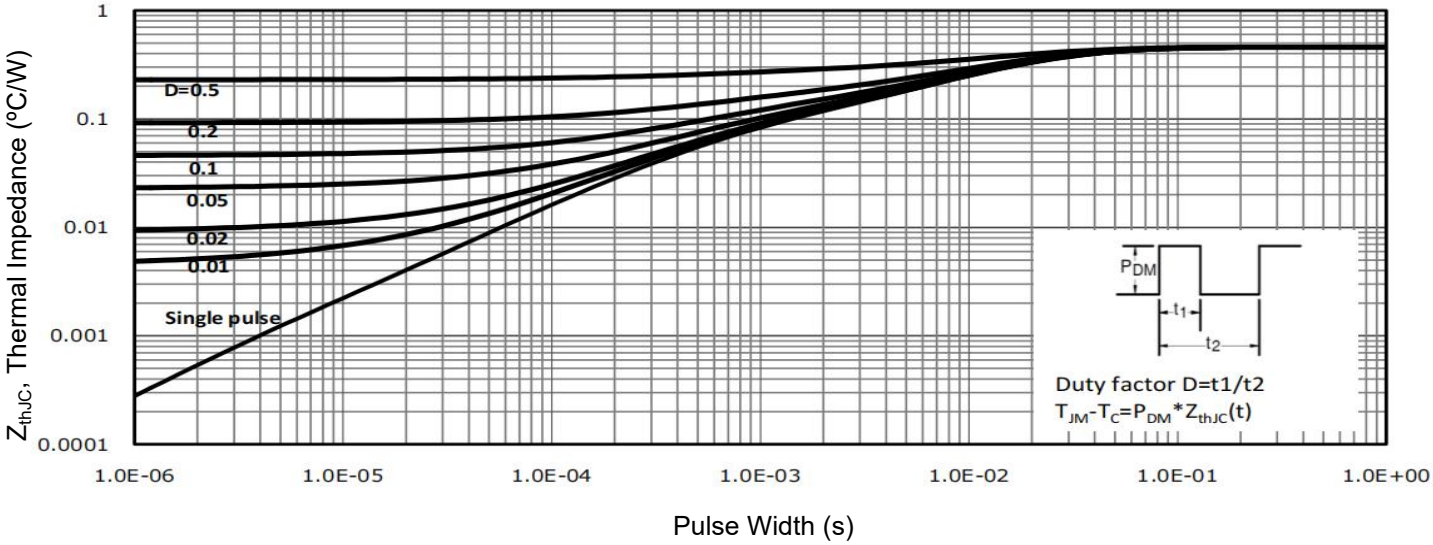
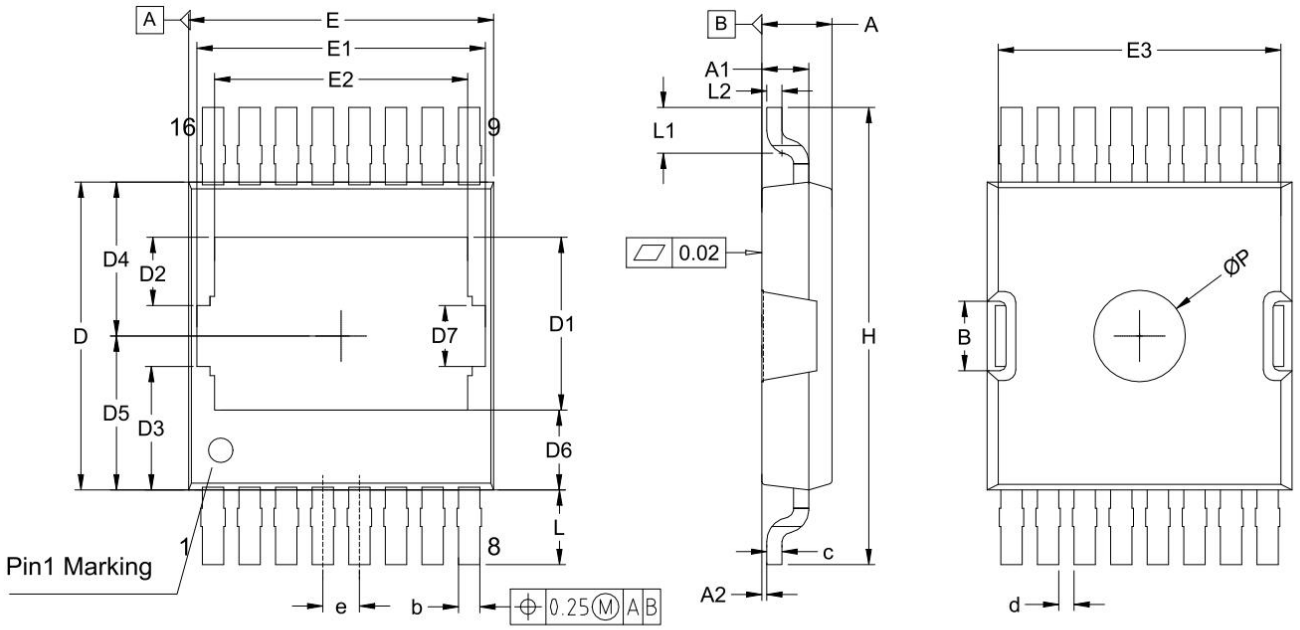


Figure 10. Normalized Maximum Transient Thermal Impedance



TOLT-8L Package Information



TOP VIEW SIDE VIEW(Right) BOTTOM VIEW

DIM / SYMBOL	MIN.	NOM.	MAX.	DIM / SYMBOL	MIN.	NOM.	MAX.
A	2.250	2.300	2.350	D6		2.620 REF.	
A1	1.440	1.540	1.640	D7		2.000 REF.	
A2	0.010	---	0.160	E	9.700	10.000	10.100
b	0.600	0.700	0.800	E1		9.460 REF.	
c	0.400	0.500	0.600	E2	8.100	8.300	8.500
d	0.400	0.500	0.600	E3	9.07	9.270	9.470
e		1.200 BSC		H	14.800	15.000	15.200
D	10.00	10.100	10.300	L	2.250	2.450	2.650
D1	5.470	5.670	5.870	L1	1.350	1.500	1.650
D2	2.040	2.240	2.440	L2		0.500 BSC	
D3		4.050 REF.		ØP	2.900	3.000	3.100
D4		5.050 REF.		B	2.180	2.280	2.380
D5		5.050 REF.					