N-Channel Enhancement Mode Power MOSFET

Description

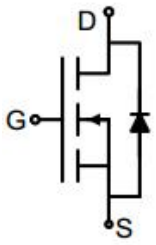
The GT010N10TT uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

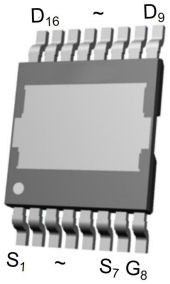
- V_{DS} 100V
- I_D (at V_{GS} = 10V) 380A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 1.3mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



TOLT

Ordering Information

Device	Package	Marking	Packaging
GT010N10TT	TOLT	GT010N10	1800pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Continuous Drain Current	T_C = 25ºC	I_D	380	A
	T_C = 100ºC		240	
Pulsed Drain Current (note1)		I_{DM}	1520	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	412	W
Single pulse avalanche energy （note2）		E_{AS}	1056	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}	50	ºC/W
Thermal Resistance, Junction-to-Case	R_{thJC}	0.3	ºC/W

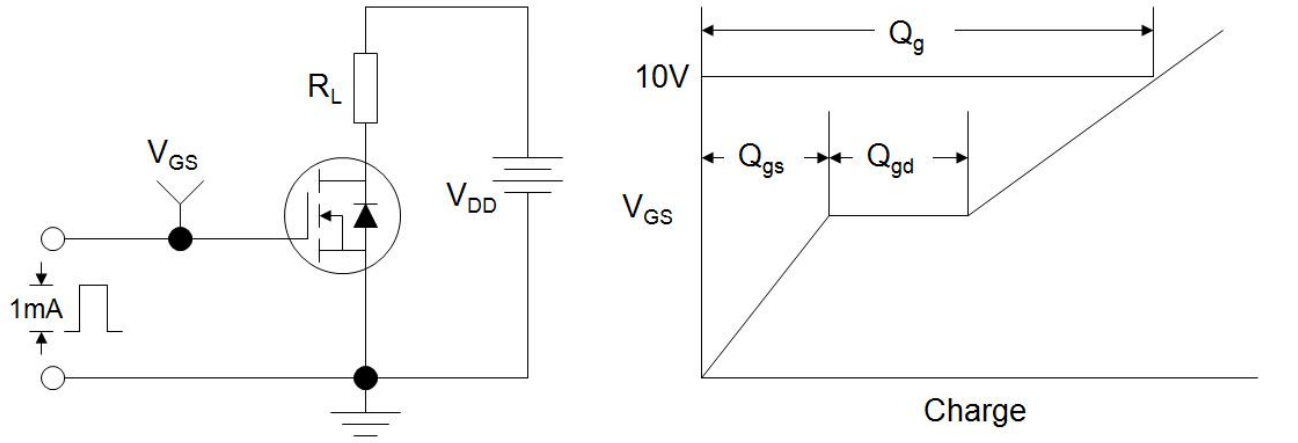
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, 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 = 50A	--	1.07	1.3	mΩ
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 50A	--	58	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 0.2MHz	--	13200	--	pF
Output Capacitance	C_{oss}		--	4220	--	
Reverse Transfer Capacitance	C_{rss}		--	55	--	
Total Gate Charge	Q_g	V_{DD} = 50V, I_D = 50A, V_{GS} = 10V	--	220	--	nC
Gate-Source Charge	Q_{gs}		--	53	--	
Gate-Drain Charge	Q_{gd}		--	54	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 50A, R_G = 1.6Ω	--	40	--	ns
Turn-on Rise Time	t_r		--	23	--	
Turn-off Delay Time	$t_{d(off)}$		--	67	--	
Turn-off Fall Time	t_f		--	22	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	380	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 50A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 50A, V_{GS} = 0V di/dt=100A/us	--	325	--	nC
Reverse Recovery Time	Trr		--	128	--	ns

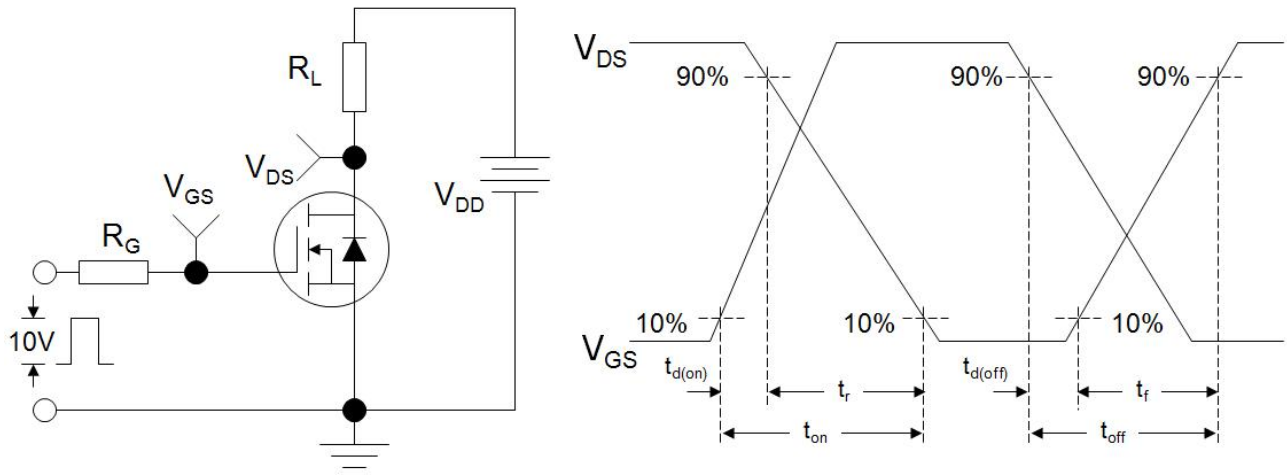
Notes

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 2916mJ when the device is tested until failure
3. Identical low side and high side switch with identical R_G

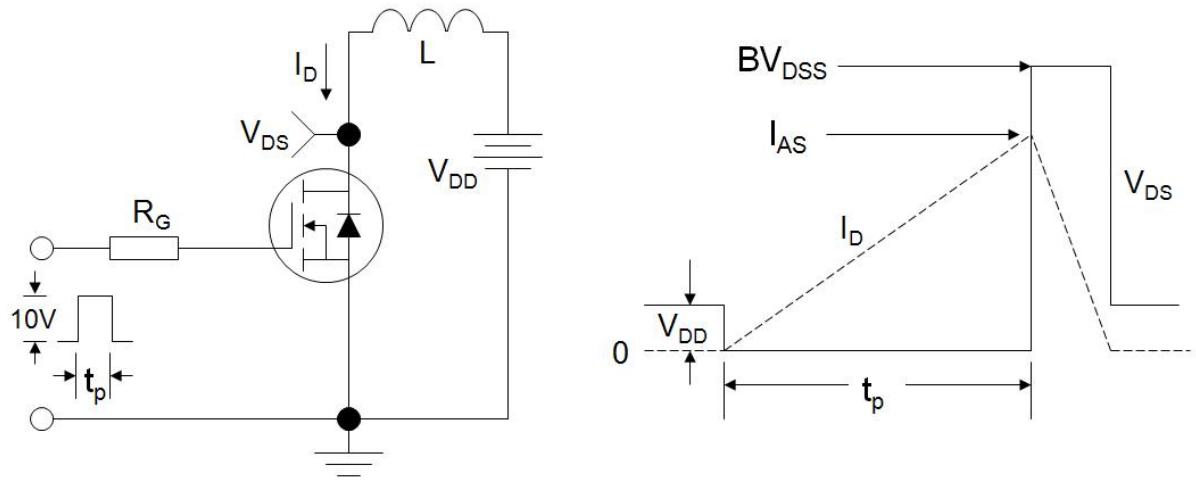
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

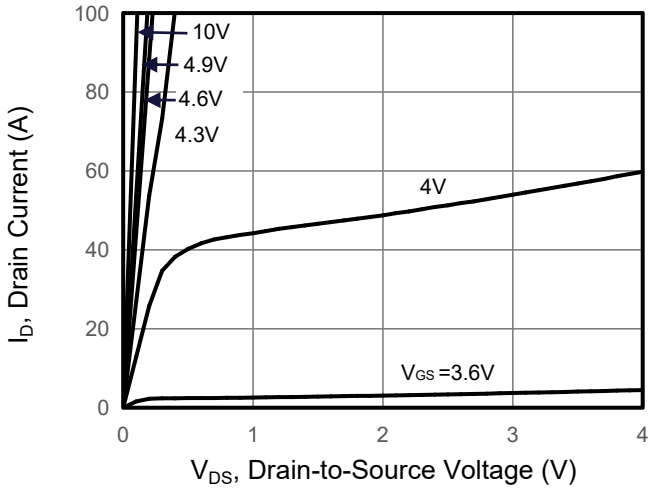


Figure 2. Transfer Characteristics

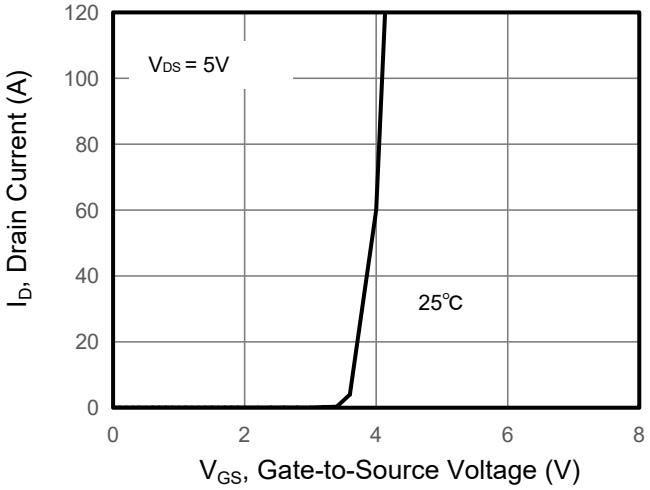


Figure 3. Drain Source On Resistance

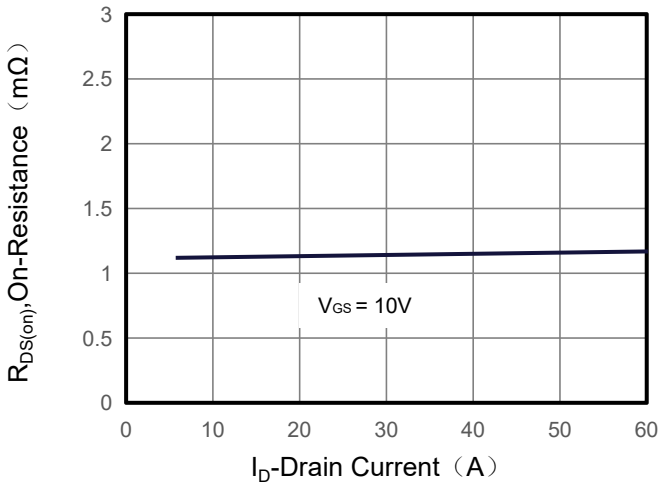


Figure 4. Gate Charge

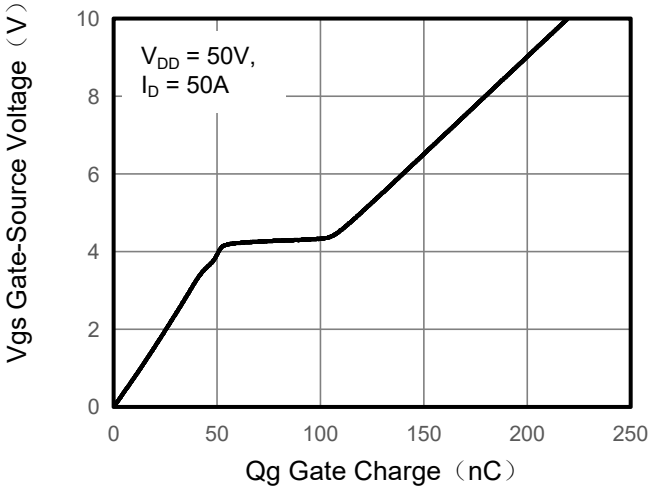


Figure 5. Capacitance

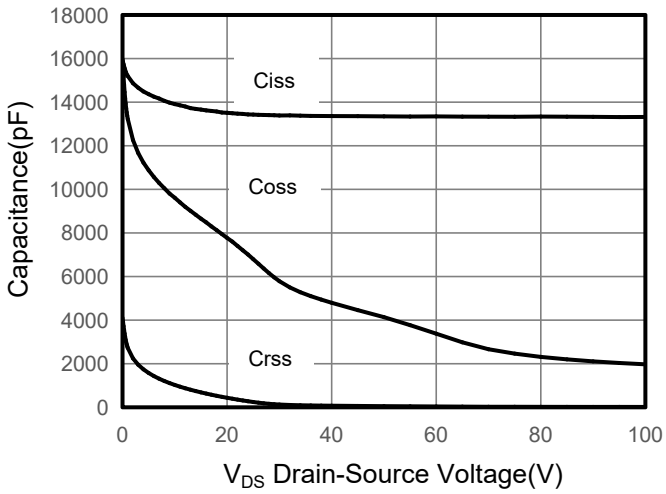
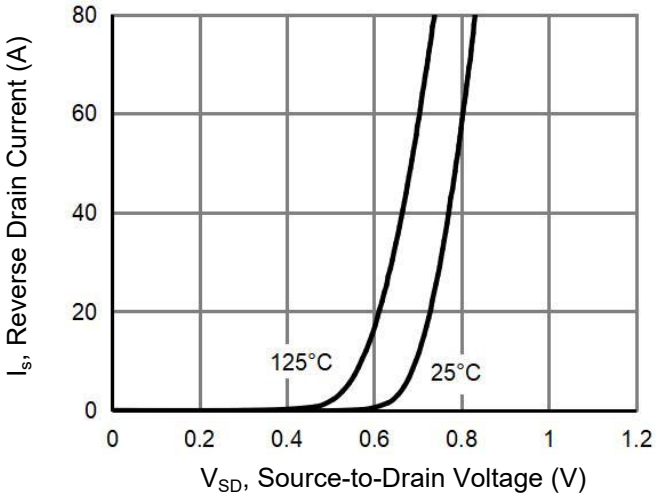


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

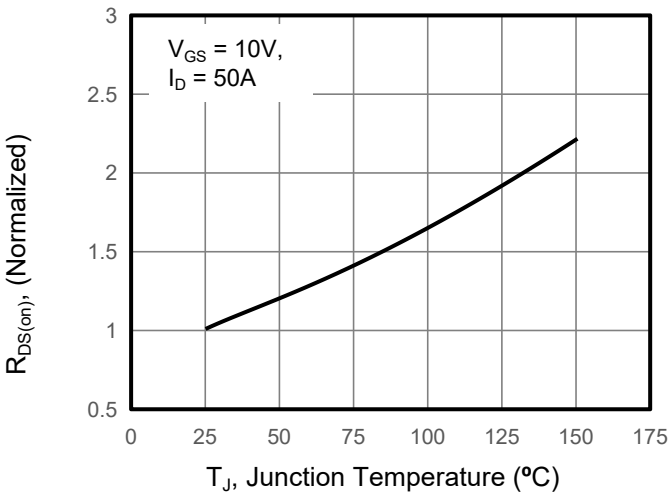


Figure 8. Safe Operation Area

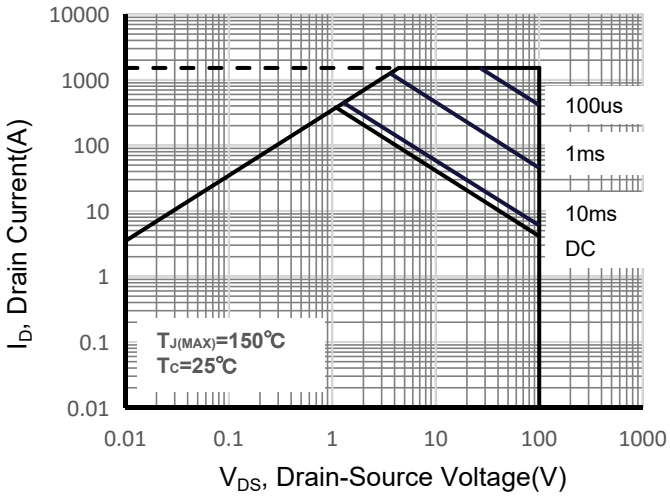


Figure 9. Maximum Continuous Drain Current vs Case Temperature

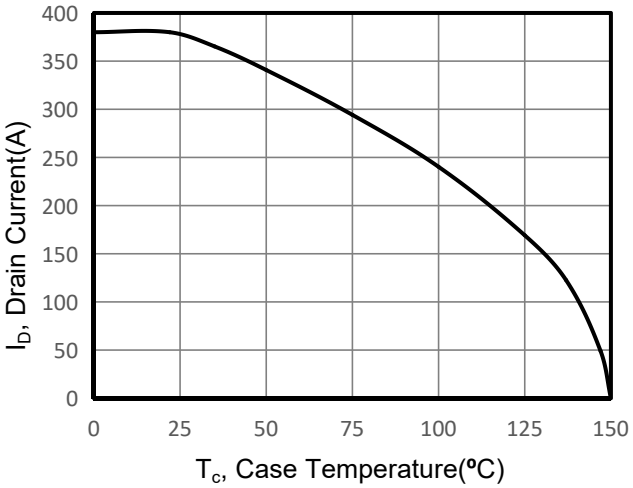
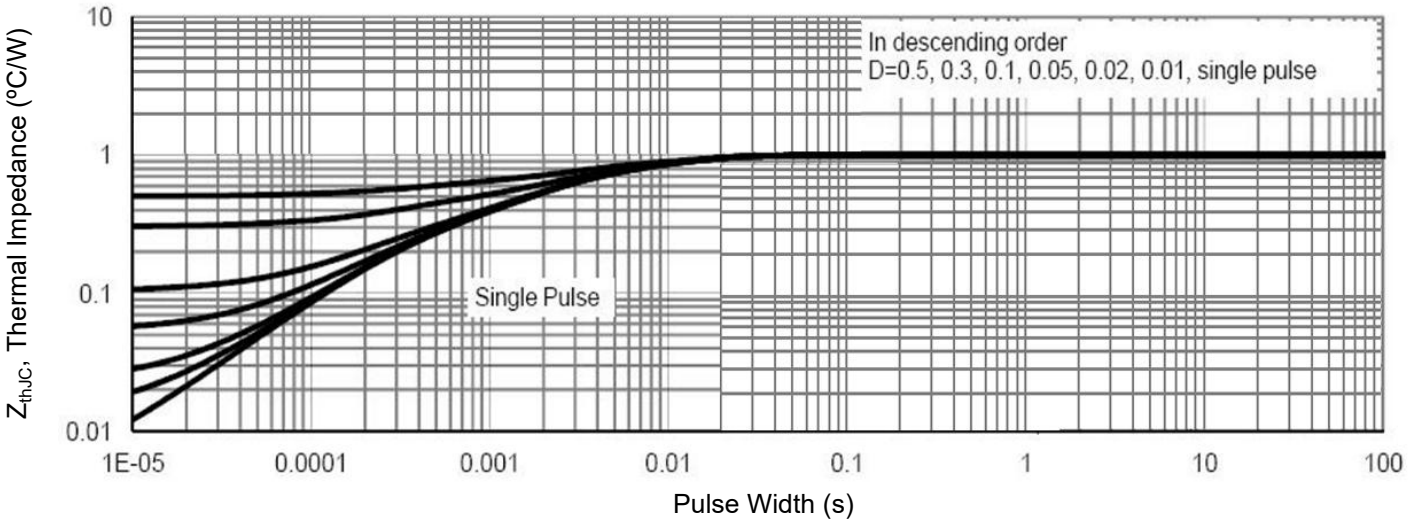
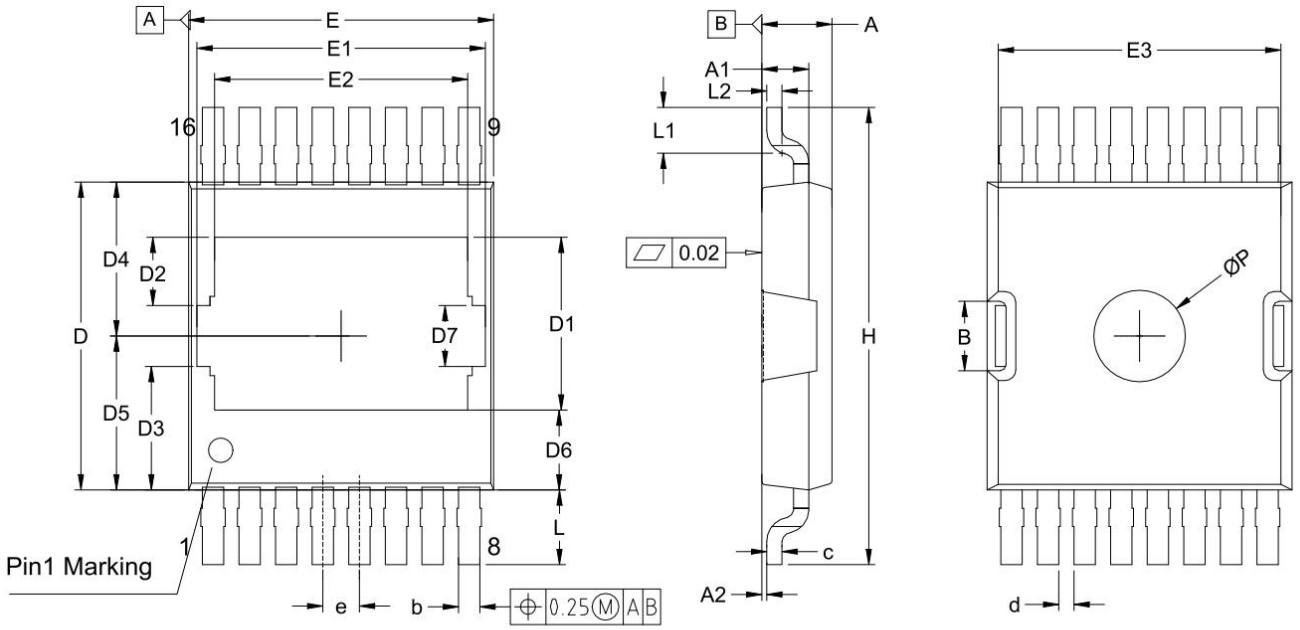


Figure 10. Normalized Maximum Transient Thermal Impedance



TOLT 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.					