

N-Channel Enhancement Mode Power MOSFET

Description

The GT045N10D5 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

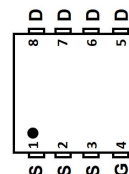
- V_{DS} 100V
- I_D (at $V_{GS} = 10V$) 120A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 4.5m Ω
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 6m Ω
- 100% Avalanche Tested
- RoHS Compliant
- Epoxy Meets UL 94 V-0 Flammability Rating

Application

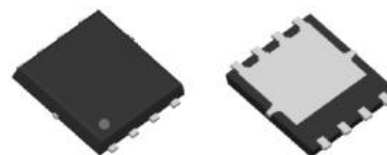
- Power switch
- DC/DC converters



Schematic diagram



pin assignment



DFN5X6-8L

Ordering Information

Device	Package	Marking	Packaging
GT045N10D5	DFN5X6-8L	GT045N10	5000pcs/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	$T_C = 25^\circ\text{C}$	120	A
	$T_C = 25^\circ\text{C}$	76	
Pulsed Drain Current (note1)	I_{DM}	480	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	P_D	180	W
Single pulse avalanche energy (note2)	E_{AS}	240	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}	60	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	R_{thJC}	0.69	$^\circ\text{C/W}$

Specifications T _J = 25°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 = 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	1.2	1.7	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	--	3.5	4.5	mΩ
		V _{GS} = 4.5V, I _D = 15A	--	4.9	6	mΩ
Forward Transconductance	g _{FS}	V _{GS} = 5V, I _D = 20A	--	42	--	S
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 50V, f = 1.0MHz	--	5800	--	pF
Output Capacitance	C _{oss}		--	700	--	
Reverse Transfer Capacitance	C _{rss}		--	52	--	
Total Gate Charge	Q _g	V _{DD} = 50V, I _D = 20A, V _{GS} = 10V	--	78	--	nC
Gate-Source Charge	Q _{gs}		--	13	--	
Gate-Drain Charge	Q _{gd}		--	14	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 50V, I _D = 20A, R _G = 1.6Ω	--	16	--	ns
Turn-on Rise Time	t _r		--	10	--	
Turn-off Delay Time	t _{d(off)}		--	38	--	
Turn-off Fall Time	t _f		--	7	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25°C	--	--	120	A
Body Diode Voltage	V _{SD}	T _J = 25°C, I _{SD} = 20A, V _{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Q _{rr}	I _F = 20A, V _{GS} = 0V di/dt=100A/us	--	104	--	nC
Reverse Recovery Time	T _{rr}		--	64	--	ns

Notes

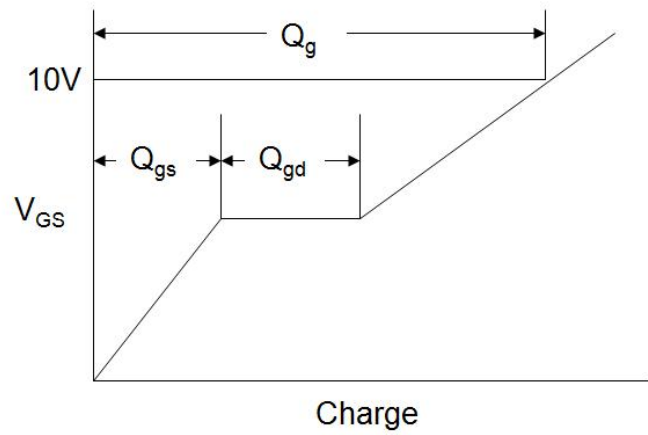
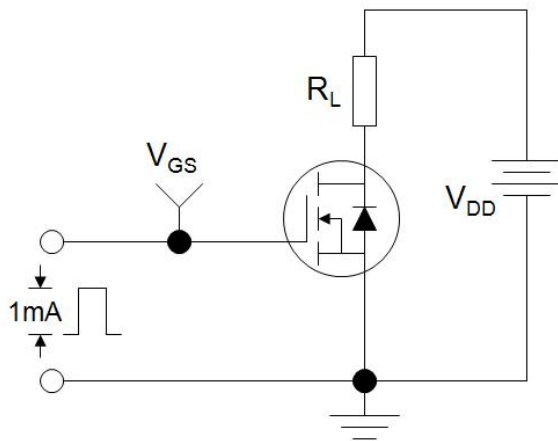
1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. EAS condition : $T_J = 25^\circ\text{C}$, $V_{DD} = 50V$, $V_{GS} = 10V$, $L = 0.5mH$, $R_G = 25\Omega$

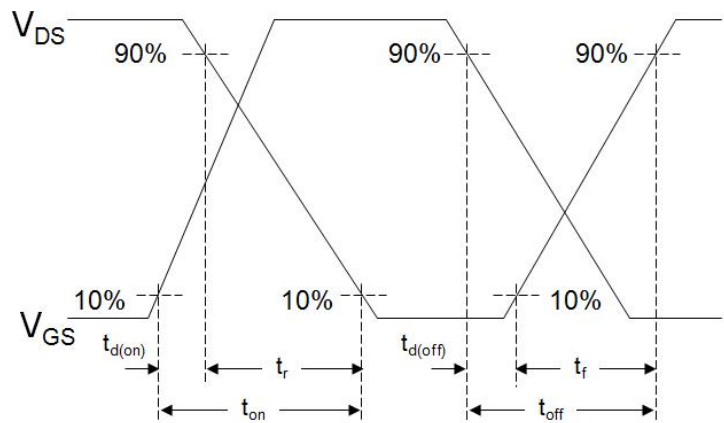
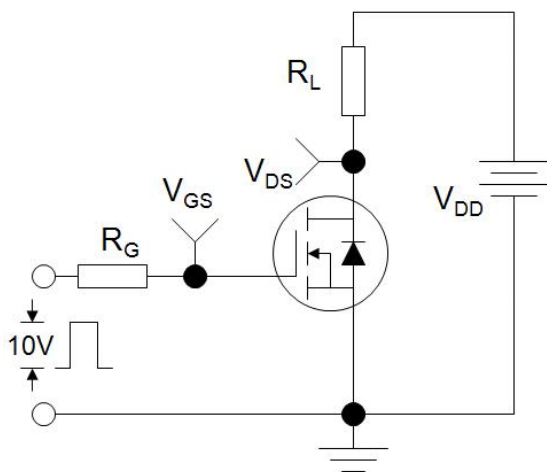
The table shows the minimum avalanche energy, which is 756mJ when the device is tested until failure

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

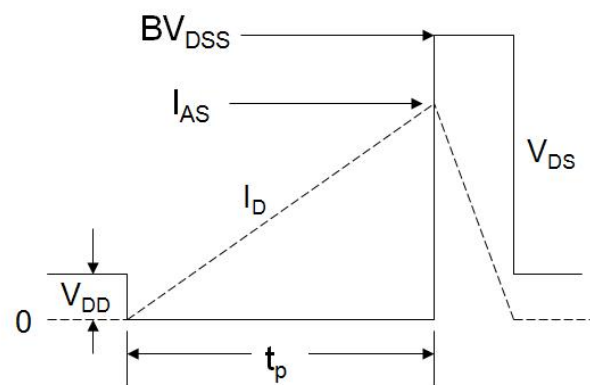
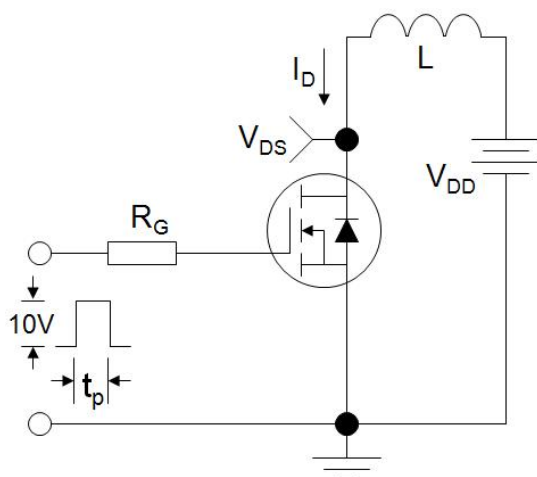
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

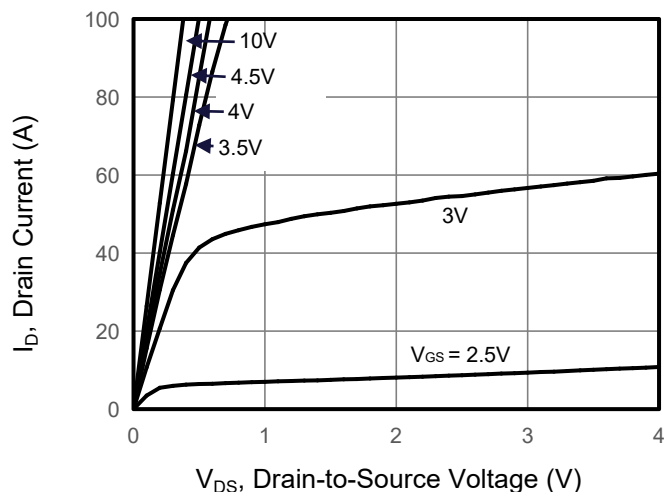


Figure 2. Transfer Characteristics

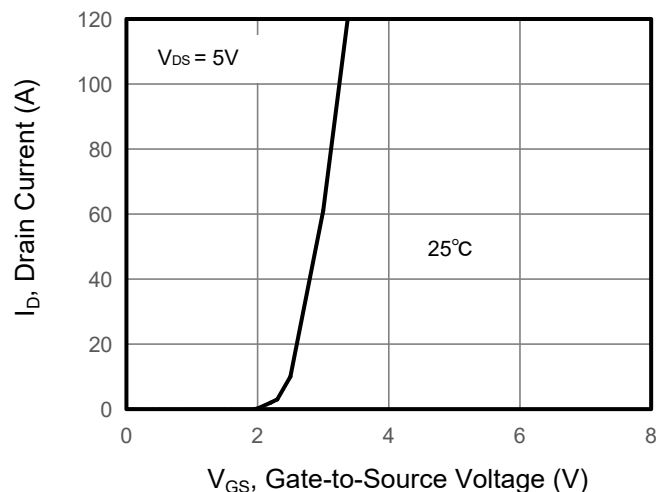


Figure 3. Drain Source On Resistance

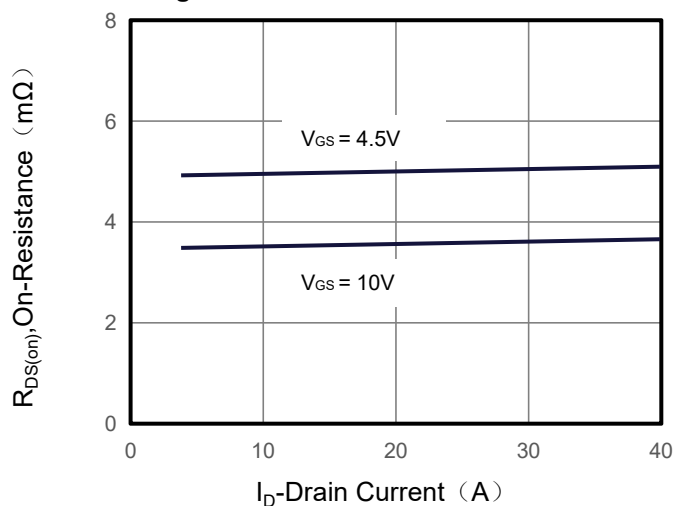


Figure 4. Gate Charge

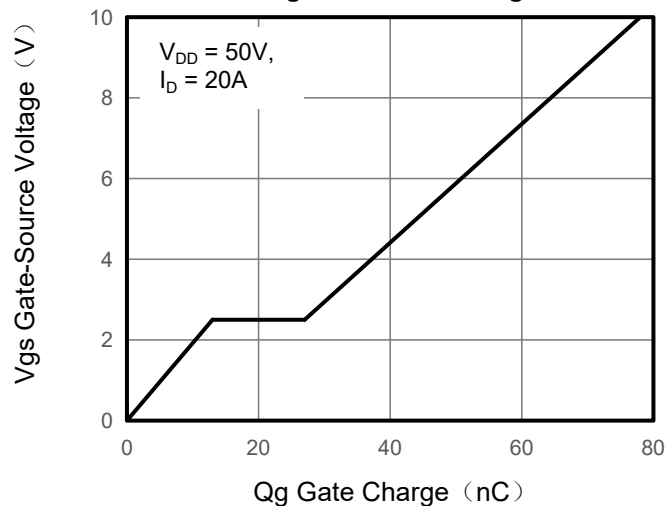


Figure 5. Capacitance

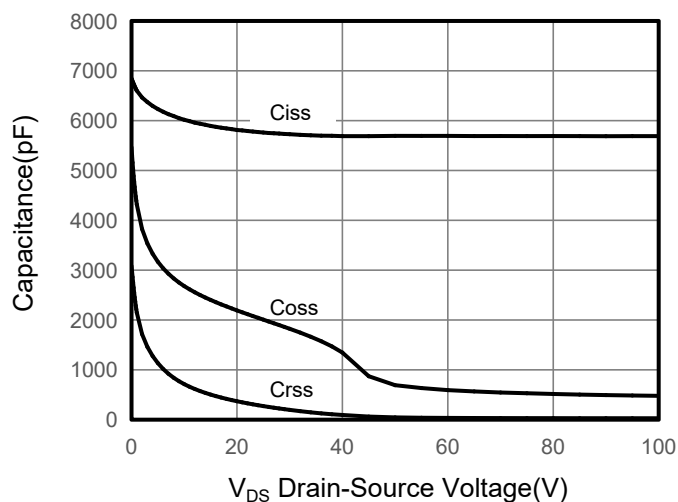
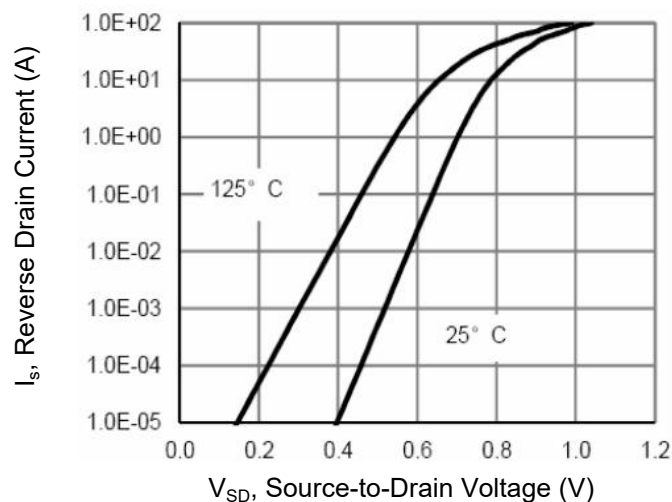


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

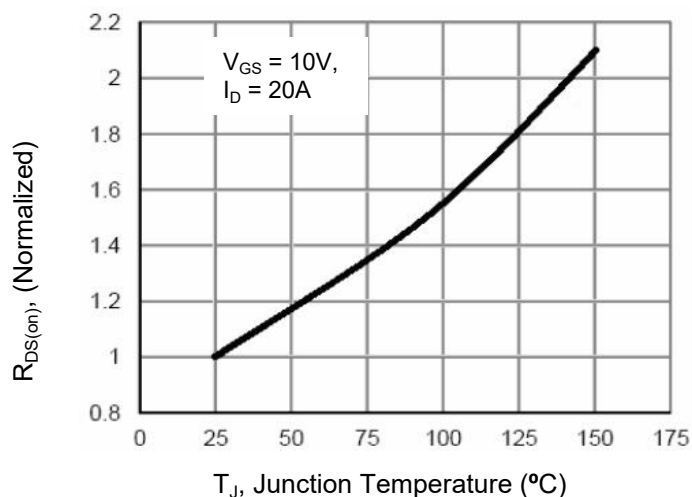


Figure 8. Safe Operation Area

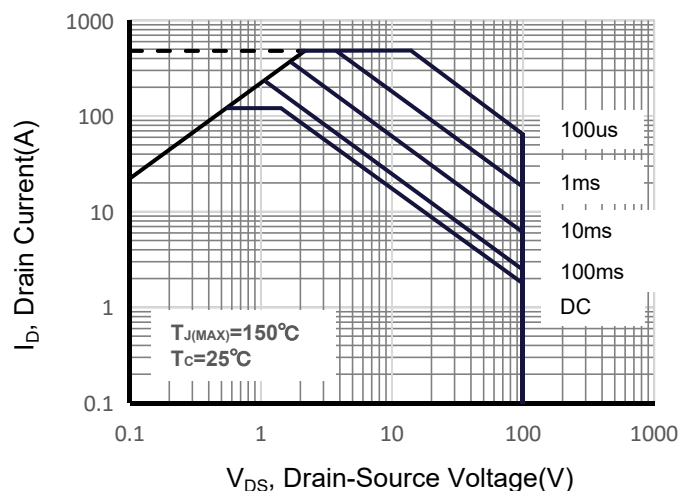


Figure 9. Maximum Continuous Drain Current vs Case Temperature

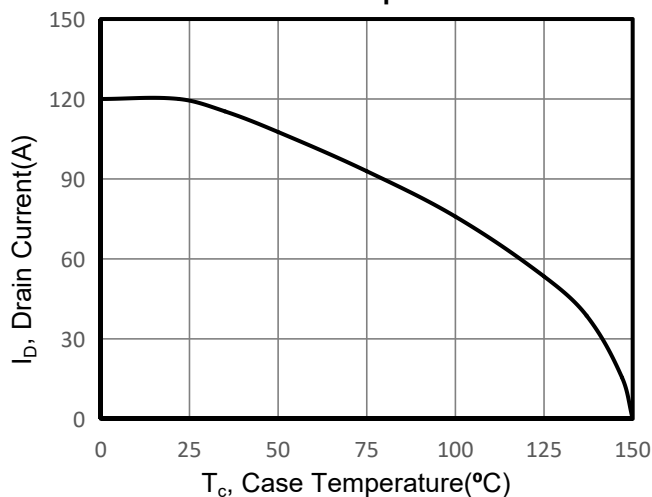
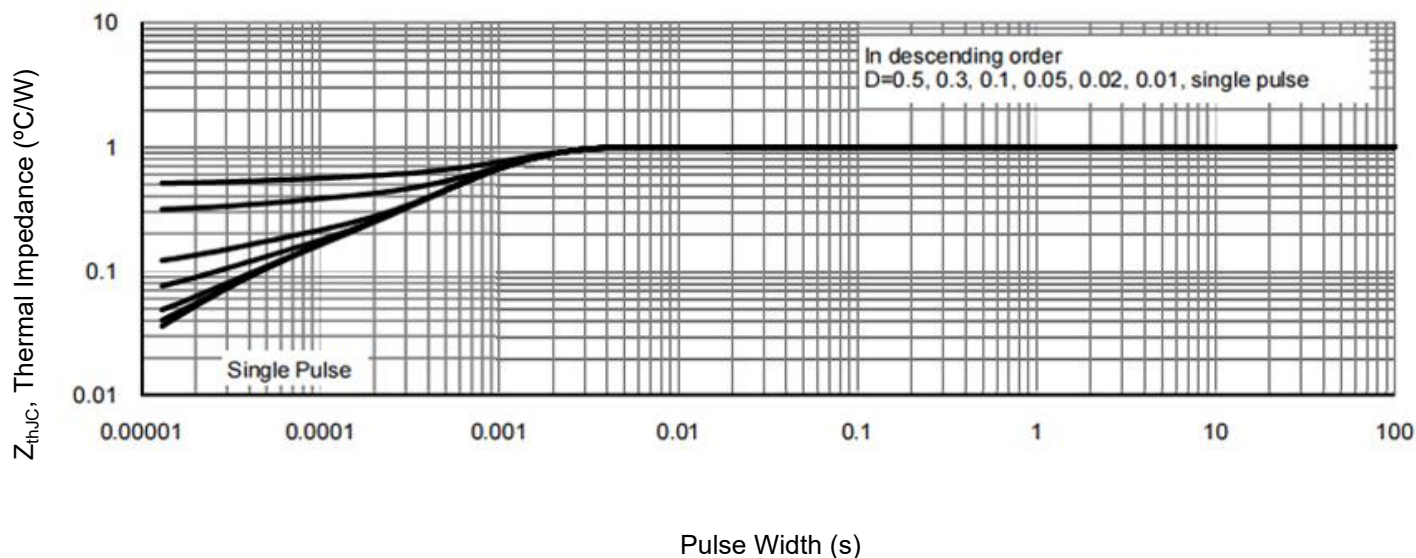
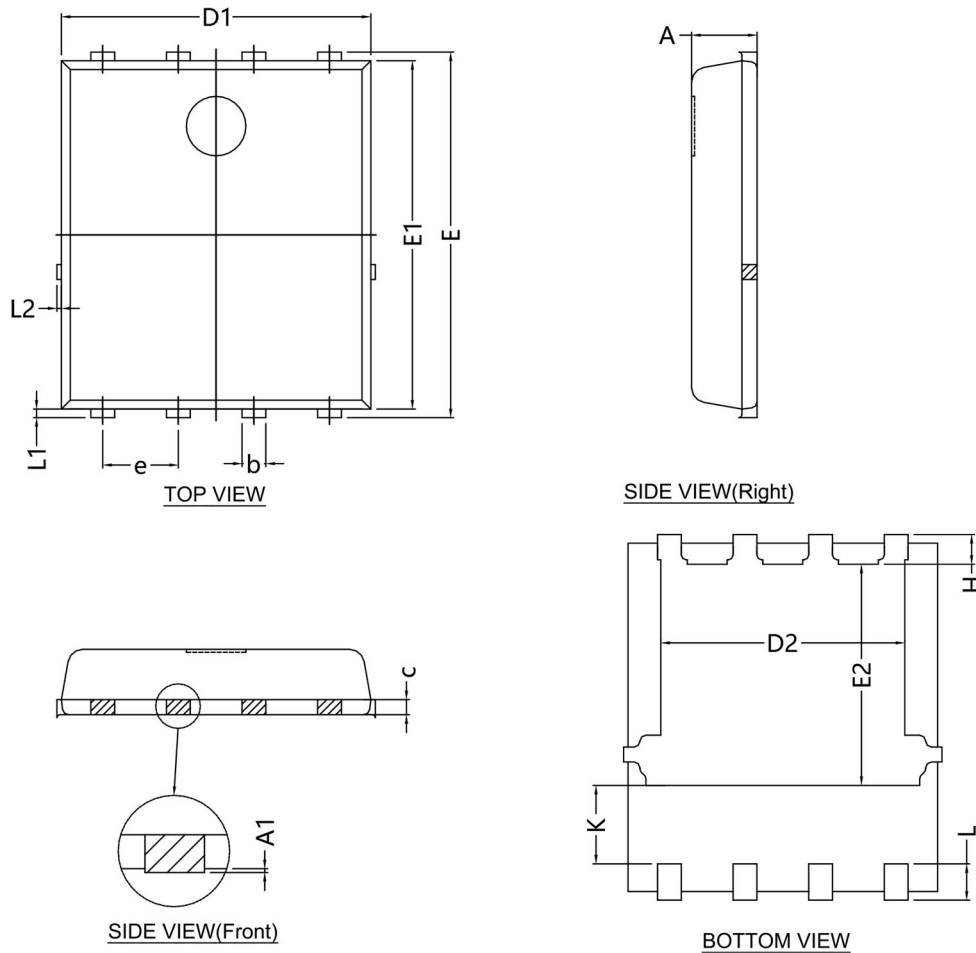


Figure 10. Normalized Maximum Transient Thermal Impedance



DFN5X6-8L Package Information



DIM. SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.00	1.10	1.20
A1	0	---	0.05
b	0.30	0.40	0.50
c	0.20	0.25	0.30
D1	5.10	5.20	5.30
D2	3.90	4.10	4.25
E	6.00	6.15	6.30
E1	5.76	5.86	5.96
E2	3.52	3.72	3.92
e	1.27 BSC		
H	0.40	0.50	0.60
L	0.50	0.61	0.71
L1	0.05	0.15	0.25
L2	0.02	0.08	0.15
K	1.10	---	---

Revision Information					
No.	Date	Version	Change Notice	Prepared	Reviewed
1	2024.10.15	V1.0	替代A1817（低VTH）	杭佳敏	周叶
2	2025.3.18	V1.0 (忘记修改了)	更新图12/电容和247的保持统一	杭佳敏	周叶/ 孙洋
3	2026.04.07	V1.1	更新SOA(参考A1998 高开的)	杭佳敏	周叶/ 孙洋