General Description

The G110N06K is N-channel MOS Field Effect Transistor designed for high current switching applications. Rugged E_{AS} capability and ultra low $R_{DS(ON)}$ is suitable for PWM, load switching applications.

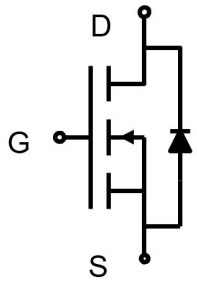
Features

V_{DSS}	$R_{DS(ON)}$ @10V(Typ)	I_D
60V	5.5 mΩ	110A

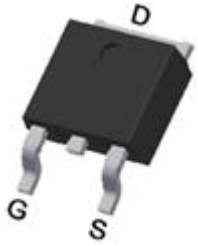
- Ultra Low On-Resistance
- High UIS and UIS 100%Test
- RoHS Compliant

Application

- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply



Schematic diagram



TO-252

Ordering Information

Part Number	Marking	Case	Packaging
G110N06K	G110N06	TO-252	2500pcs/Reel

Table 1. Absolute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	60	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	V
$I_{D\ (DC)}$	Drain Current (DC) at Tc=25℃	110	A
$I_{D\ (DC)}$	Drain Current (DC) at Tc=100℃	65	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed **(Note 1)**	368	A
dv/dt	Peak Diode Recovery Voltage	30	V/ns
P_D	Maximum Power Dissipation(Tc=25℃)	160	W
	Derating Factor	0.8	W/℃
E_{AS}	Single Pulse Avalanche Energy **(Note 2)**	484	mJ
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

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

2.E_{AS} condition:T_J=25℃,V_{DD}=33V,V_G=10V,I_D=45A

Table 2. Thermal Characteristic

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	0.78	℃/W

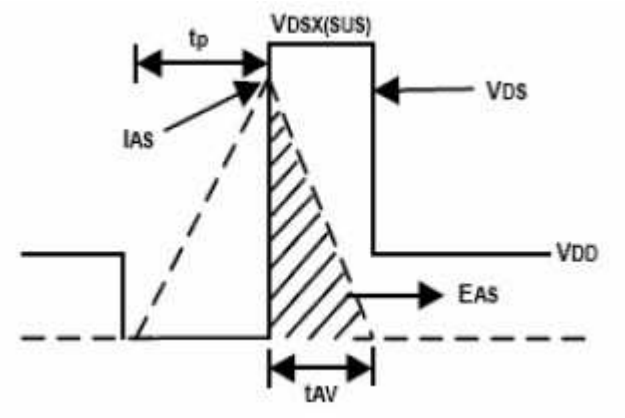
Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

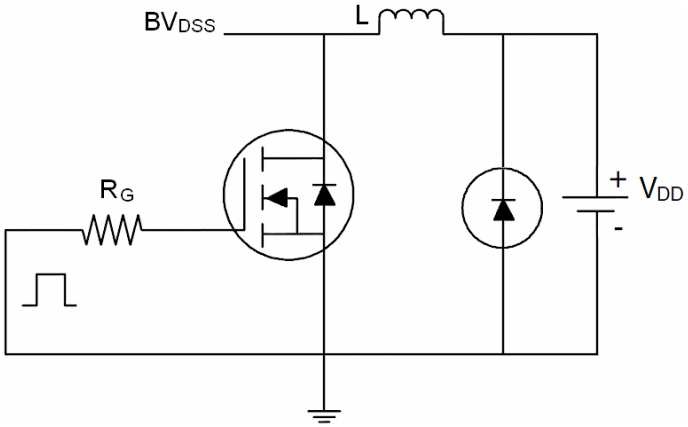
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	60			V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=60V,V_{GS}=0V			1	μA
I_{DSS}	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=60V,V_{GS}=0V			10	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=4A		5.5	6.4	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=4A		6.0	8.4	mΩ
Dynamic Characteristics						
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=15A	20			S
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1.0MHz		5538		pF
C_{oss}	Output Capacitance			380		pF
C_{rss}	Reverse Transfer Capacitance			304		pF
Q_g	Total Gate Charge	V_{DS}=50V,I_D=40A, V_{GS}=10V		113		nC
Q_{gs}	Gate-Source Charge			14		nC
Q_{gd}	Gate-Drain Charge			54		nC
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V,I_D=2A,R_L=15Ω V_{GS}=10V,R_G=2.5Ω		13		nS
t_r	Turn-on Rise Time			15		nS
$t_{d(off)}$	Turn-Off Delay Time			27		nS
t_f	Turn-Off Fall Time			32		nS
Source-Drain Diode Characteristics						
I_{SD}	Source -Drain Current (Body Diode)			110		A
I_{SDM}	Pulsed Source-Drain Current(Body Diode)			368		A
V_{SD}	Forward On Voltage **(Note 1)**	T_J=25℃,I_{SD}=20A,V_{GS}=0V		0.7	1.2	V
t_{rr}	Reverse Recovery Time **(Note 1)**	T_J=25℃,I_F=75A di/dt=100A/μs		49		nS
Q_{rr}	Reverse Recovery Charge **(Note 1)**			97		nC
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by L_S+L_D)				

Notes 1.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1.5%, R_G=25Ω, Starting T_J=25℃

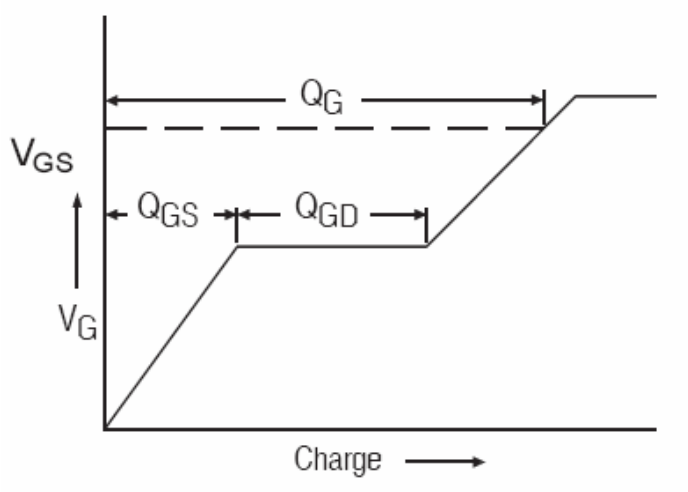
Test Circuit

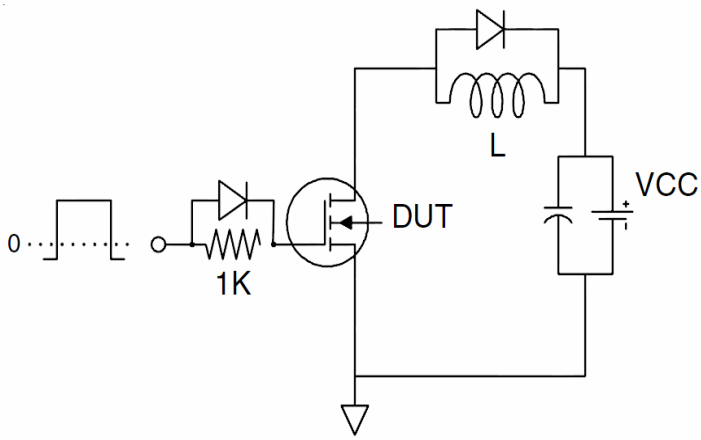
1）E_{AS} Test Circuits



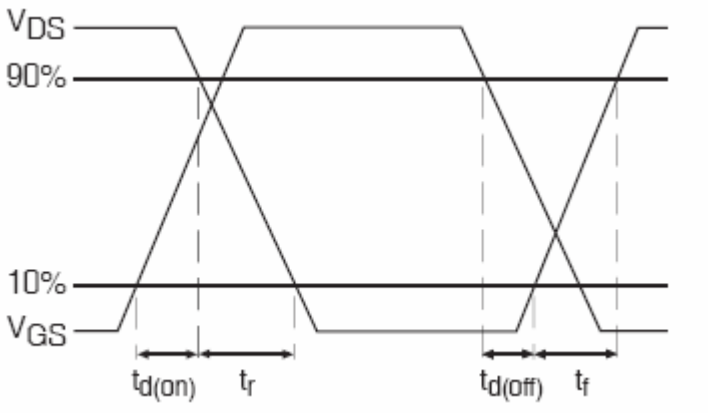


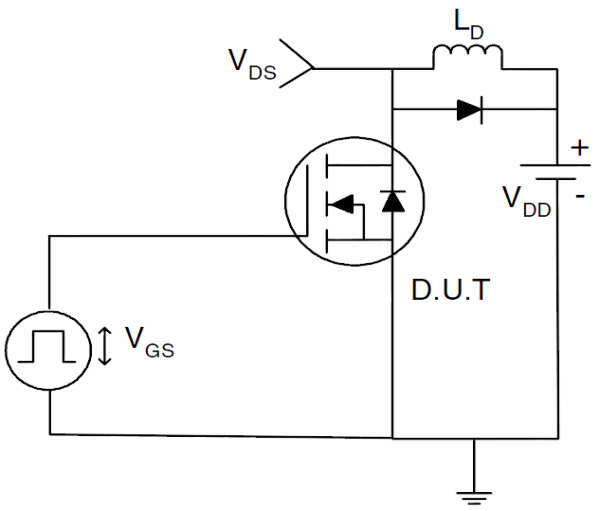
2）Gate Charge Test Circuit:





3）Switch Time Test Circuit：





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Safe Operating Area

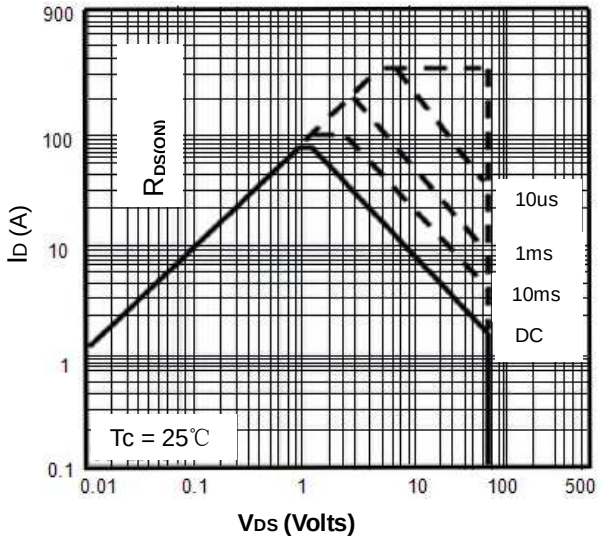


Figure2. Source-Drain Diode Forward Voltage

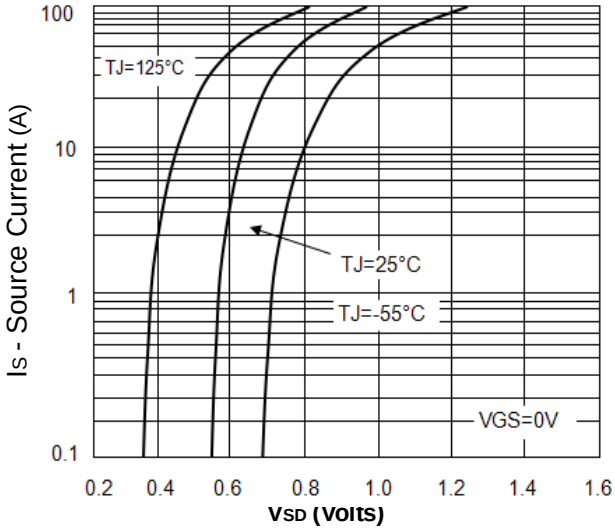


Figure3. Output Characteristics

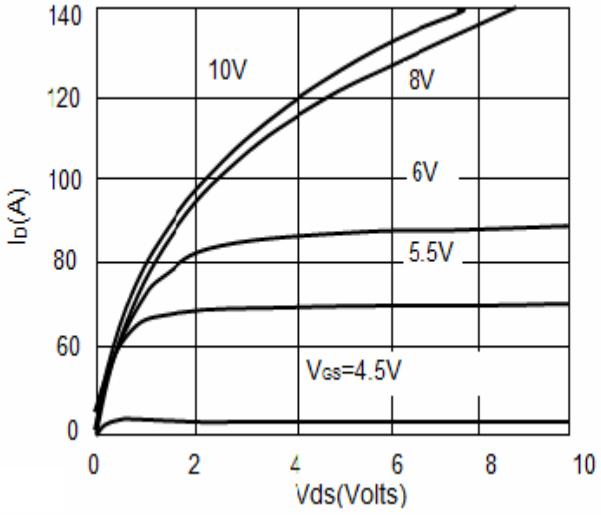


Figure4. Transfer Characteristics

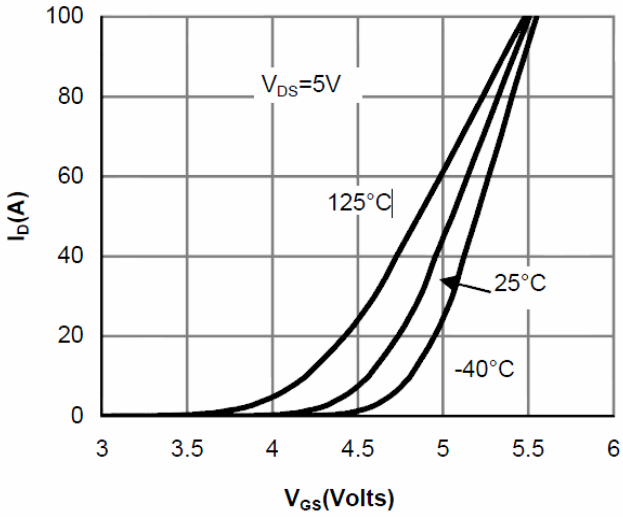


Figure5. Static Drain-Source On Resistance

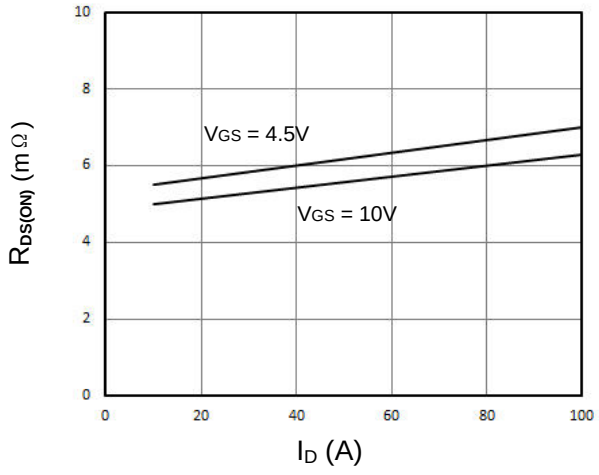


Figure6. $R_{DS(ON)}$ vs Junction Temperature

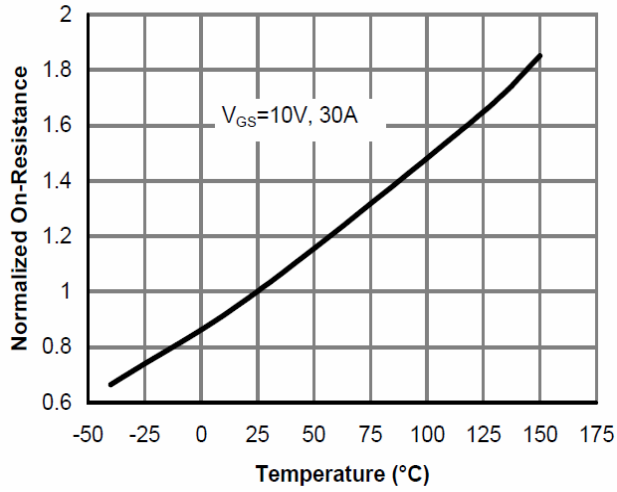
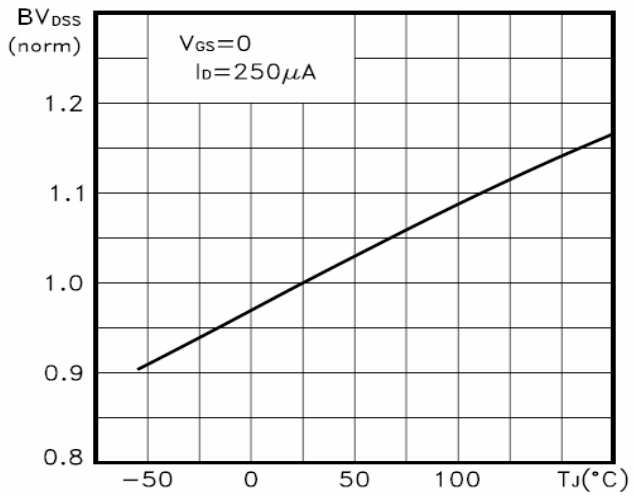
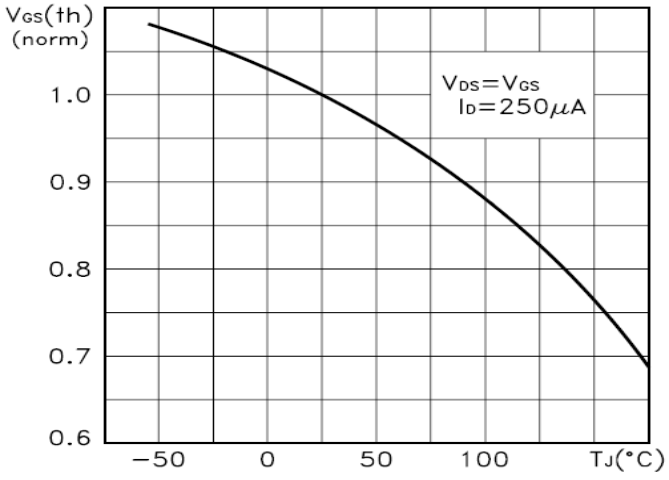


Figure7. BV_{DSS} vs Junction Temperature



Temperature（℃）

Figure8. $V_{GS(th)}$ vs Junction Temperature



Temperature（℃）

Figure9. Gate Charge Waveforms

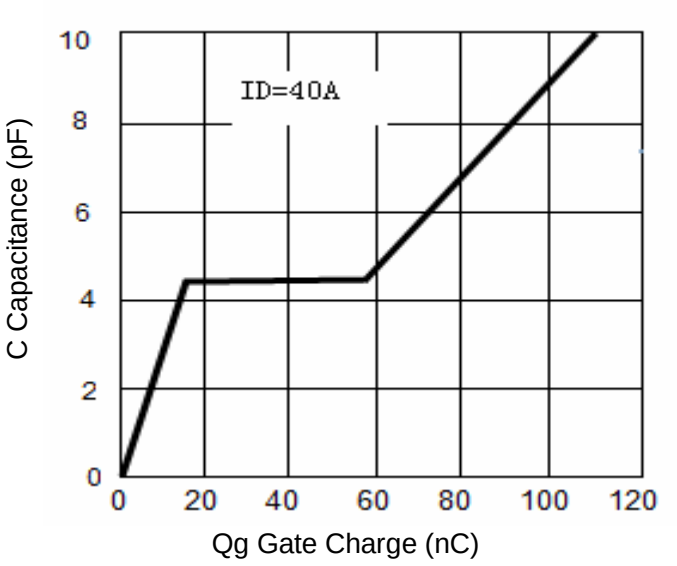


Figure10. Capacitance

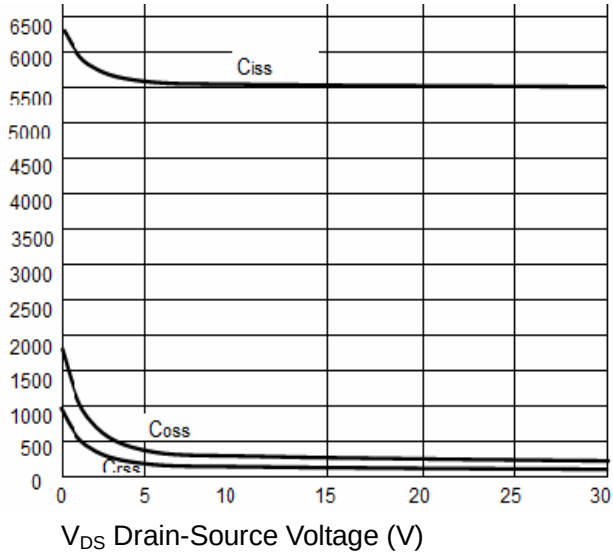
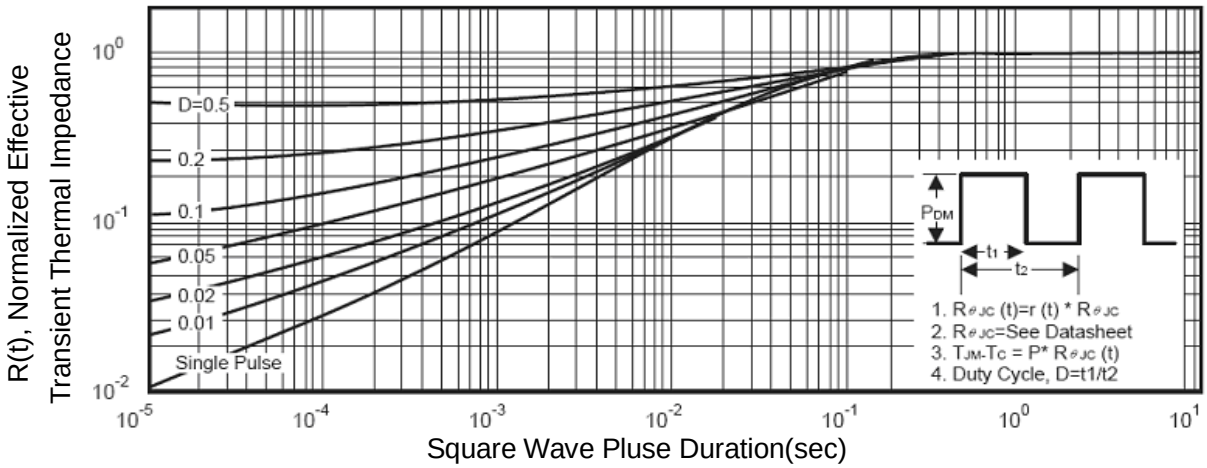
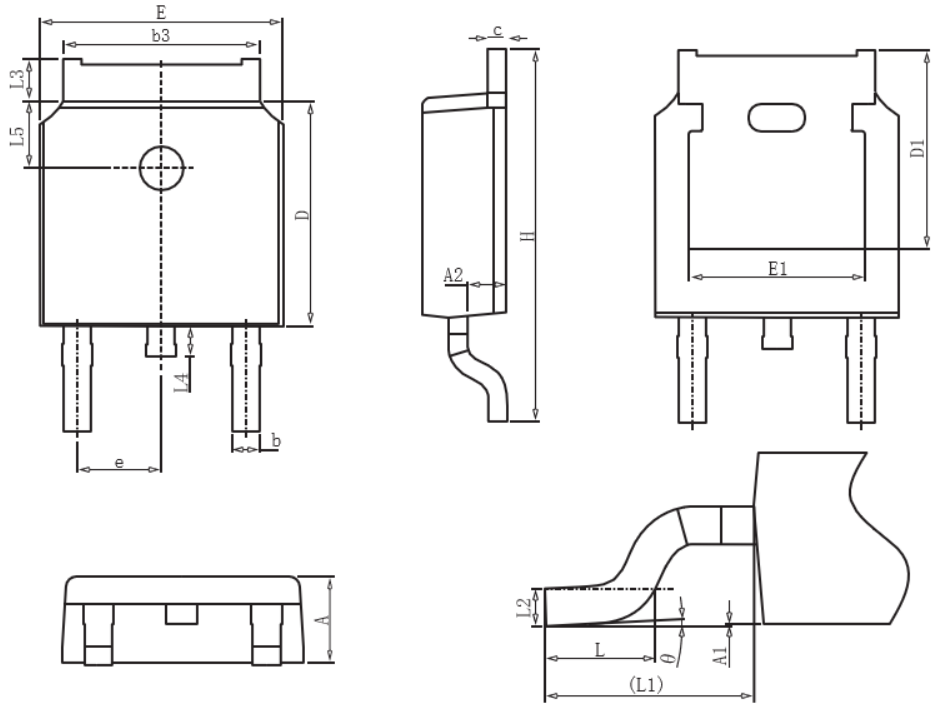


Figure11. Normalized Maximum Transient Thermal Impedance



TO-252 Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	2.2	2.3	2.4
A1	0		0.2
A2	0.97	1.07	1.17
b	0.68	0.78	0.9
b3	5.2	5.33	5.5
c	0.43	0.53	0.63
D	5.98	6.1	6.22
D1	5.30REF		
E	6.4	6.6	6.8
E1	4.63		
e	2.286BSC		
H	9.4	10.1	10.5
L	1.38	1.5	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88		1.28
L4	0.5		1
L5	1.65	1.8	1.95
θ	0°		8°