



General Description

The UV105P03 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is suitable for use in PWM, load switching and general purpose applications.

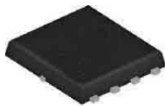
Features

- Enhancement Mode
- Enhanced Body diode dv/dt capability
- 100% Avalanche Tested

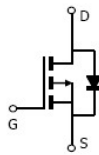
V_{DS}	-30	V
$R_{DS(on) TYP@V_{GS}=-10V}$	9.5	m Ω
$R_{DS(on) TYP@V_{GS}=-4.5V}$	14.5	m Ω
I_D	-42	A

Applications

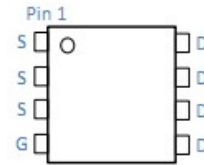
- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply



DFN3.3*3.3-8L Topview



Schematic diagram



Package Marking And Ordering Information

Part ID	Package Type	Marking	Tape and Reel information
UV105P03	DFN3.3*3.3-8L	UV105P03	5000pcs/Reel

Maximum ratings, at $T_j=25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit	
$V_{(BR)DSS}$	Drain –Source breakdown voltage	-30	V	
I_D	Continuous drain current (Silicon Limited)	$T_c=25^\circ\text{C}$	-42	A
		$T_c=100^\circ\text{C}$	-30	A
I_{DM}	Pulse drain current tested①	$T_c=25^\circ\text{C}$	-156	A
E_{AS}	Avalanche energy, single pulsed②	51.25	mJ	
P_D	Maximum power dissipation	$T_c=25^\circ\text{C}$	28	W
V_{GS}	Gate-Source voltage	± 20	V	
$T_{STG} T_J$	Storage and operating temperature range	-55 to 175	$^\circ\text{C}$	



Thermal Characteristic

Symbol	Parameter	Typical	Unit
R_{QJC}	Thermal Resistance-Junction to Case	0.8	$^{\circ}\text{C}/\text{W}$
R_{QJA}	Thermal Resistance-Junction to Ambient	40	$^{\circ}\text{C}/\text{W}$

Typical Characteristics

Symbol	Parameter	Condition	Min	Type	Max	Unit
Static Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24\text{V}, V_{GS}=0\text{V}$			1	μA
	Zero Gate Voltage Drain Current($T_j=100^{\circ}\text{C}$)	$V_{DS}=-24\text{V}, V_{GS}=0\text{V}$			50	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$			± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	-1.2	-1.8	-2.8	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ^③	$V_{GS}=-10\text{V}, I_D=-13\text{A}$		9.5	11.5	$\text{m}\Omega$
		$V_{GS}=-4.5\text{V}, I_D=-9\text{A}$		14.5	19.5	$\text{m}\Omega$
Dynamic Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise stated)						
C_{iss}	Input Capacitance	$V_{DS}=-15\text{V},$		2350		PF
C_{oss}	Output Capacitance	$V_{GS}=0\text{V},$		330		PF
C_{rss}	Reverse Transfer Capacitance	$F=1\text{MHz}$		139		PF
Q_g	Total Gate Charge	$V_{DS}=-15\text{V},$		29.8		nC
Q_{gs}	Gate-Source Charge	$I_D=-13\text{A},$		4.7		nC
Q_{gd}	Gate-Drain Charge	$V_{GS}=-10\text{V}$		10		nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay time	$V_{DD}=-15\text{V}$		11		nS
t_r	Turn-on Rise time	$I_D=-12\text{A}$		9		nS
$t_{d(off)}$	Turn-off Delay time	$R_G=1\Omega$		25		nS
t_f	Turn-off Fall time	$V_{GS}=-10\text{V}$		13		nS
Source-Drain Diode Characteristics						
V_{SD}	Forward on voltage	$I_{SD}=-3.5\text{A}, V_{GS}=0\text{V}$		-0.8	-1.2	V
t_{rr}	Reverse Recovery Time	$T_j=25^{\circ}\text{C}, I_{SD}=-13\text{A}$		39		nS
Q_{rr}	Reverse Recovery Charge	$V_{GS}=0\text{V}, di/dt=300\text{A}/\mu\text{s}$		22		nC

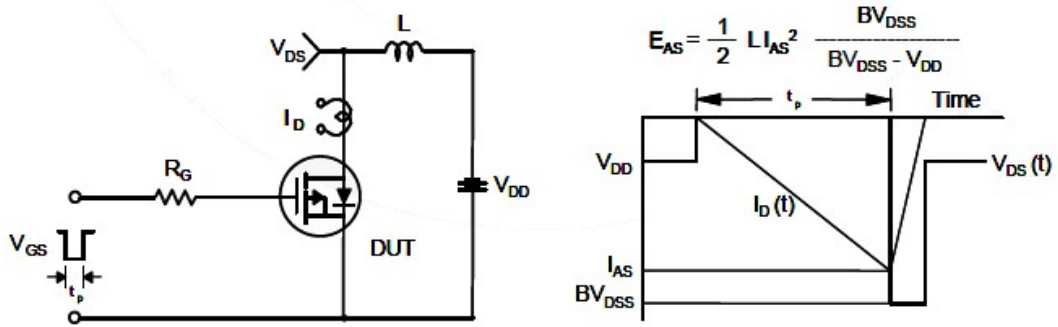
Note:

- ① Repetitive rating; pulse width limited by max, junction temperature.
- ② Limited by T_{jmax} , starting $T_j=25^{\circ}\text{C}$, $L=0.1\text{mH}$, $R_G=2\Omega$, $I_{AS}=-5\text{A}$, $V_{GS}=-10\text{V}$, Part not recommended for use above this value
- ③ Pulse width $\cong 300\mu\text{s}$; duty cycle $\cong 2\%$

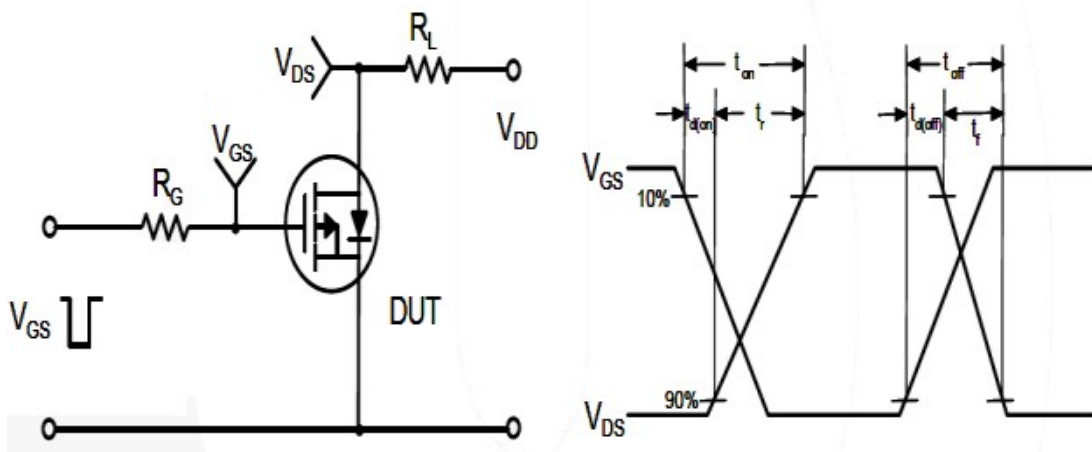


Test circuit

(1) Unclamped inductive test circuits and waveforms



(2) Switching time test circuit and waveforms



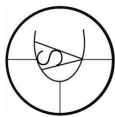


Fig 1. Typical Output Characteristics

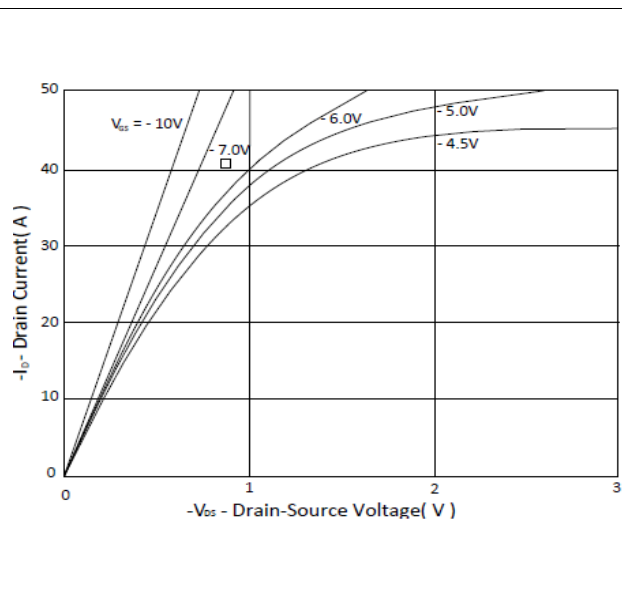


Figure 2. On-Resistance vs. Gate-Source Voltage

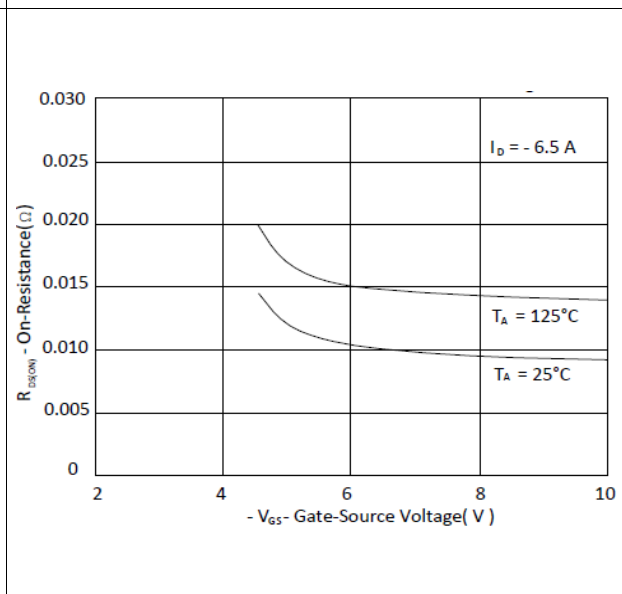


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

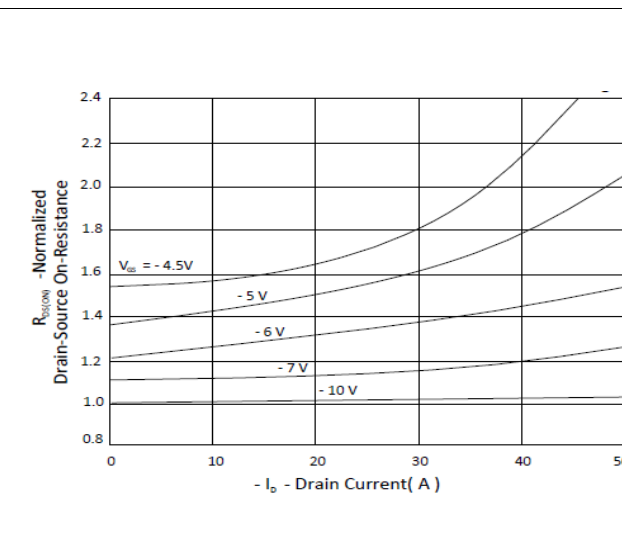


Figure 4. Normalized On-Resistance vs. Junction Temperature

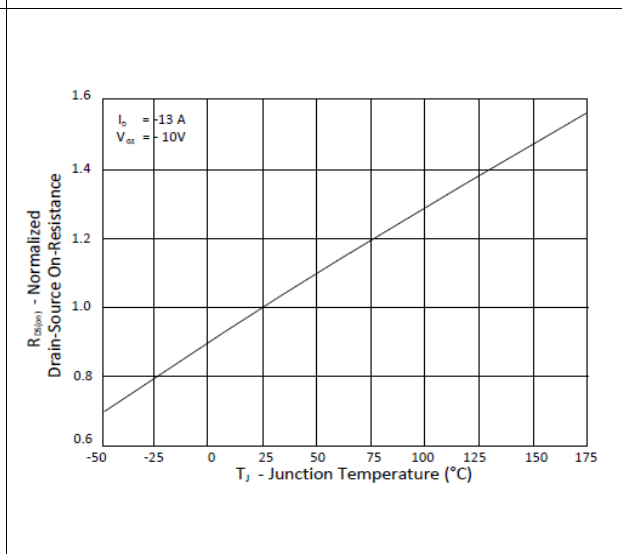


Figure 5. Typical Transfer Characteristics

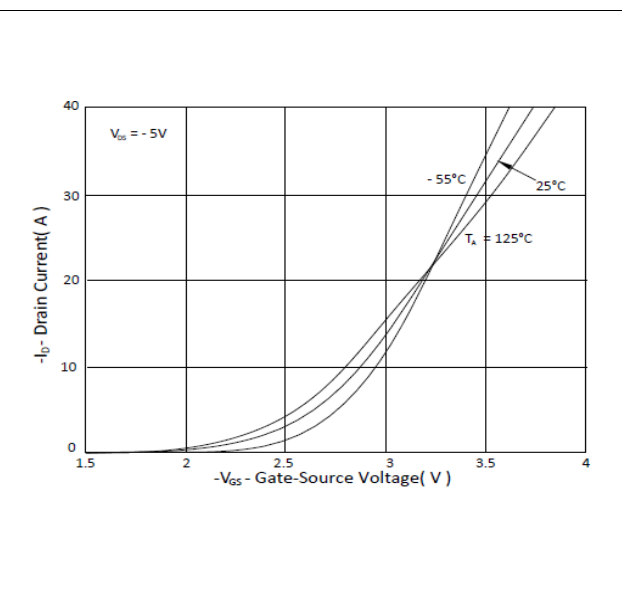
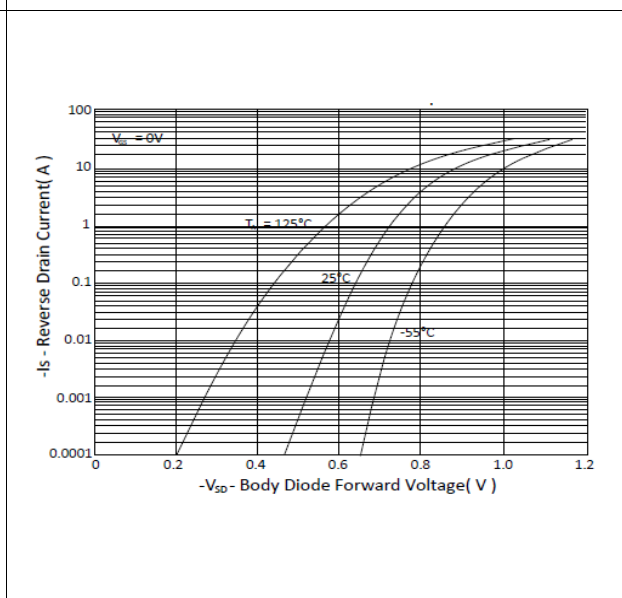


Figure 6. Typical Source-Drain Diode Forward Voltage



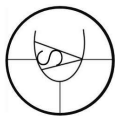


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

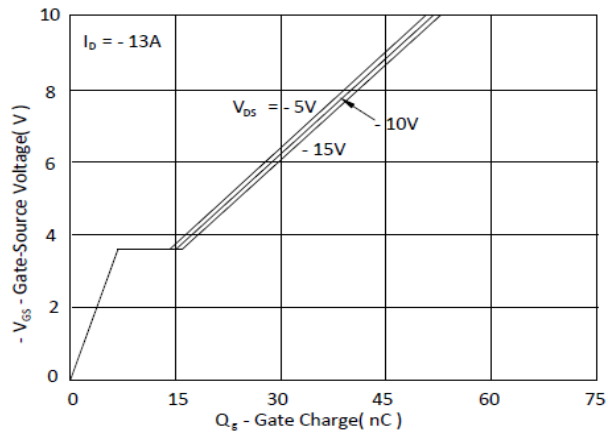


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

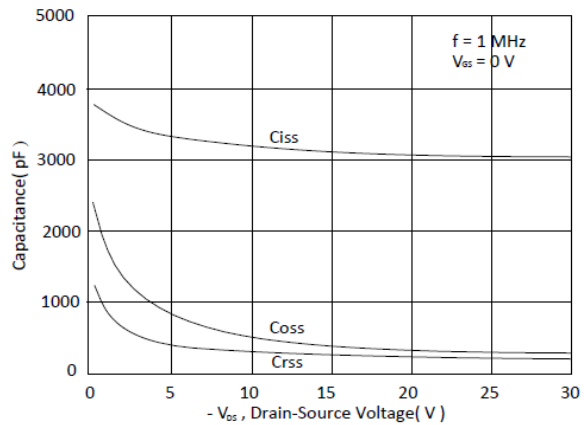


Figure 9. Maximum Safe Operating Area

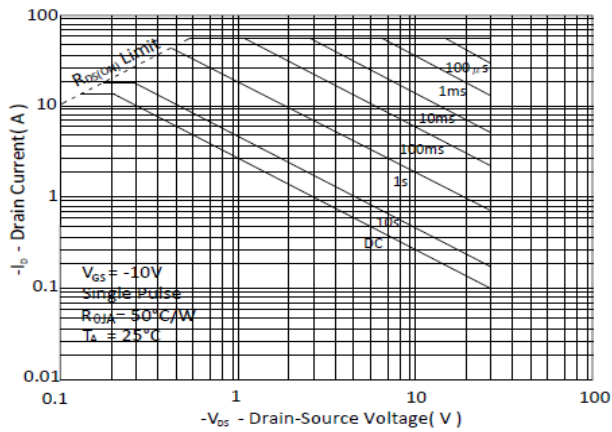


Figure 10. Single Pulse Maximum Power Dissipation

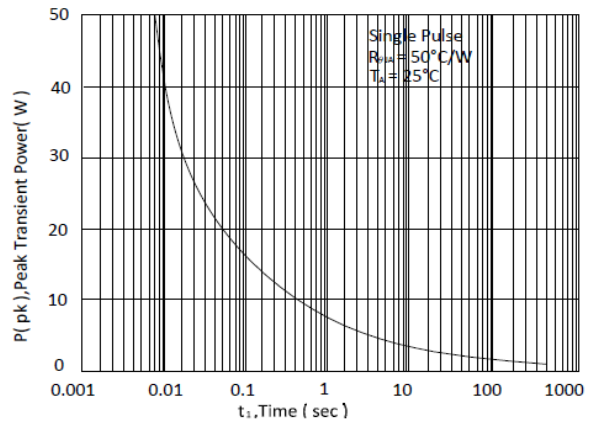
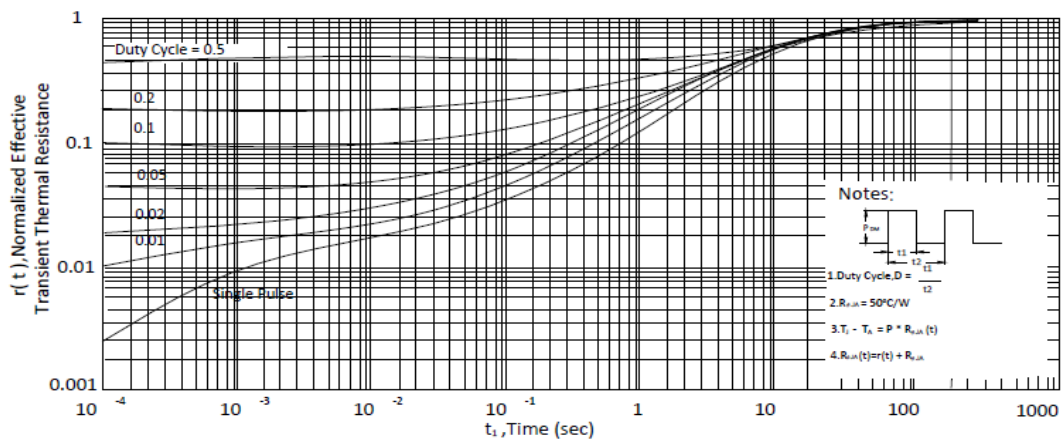
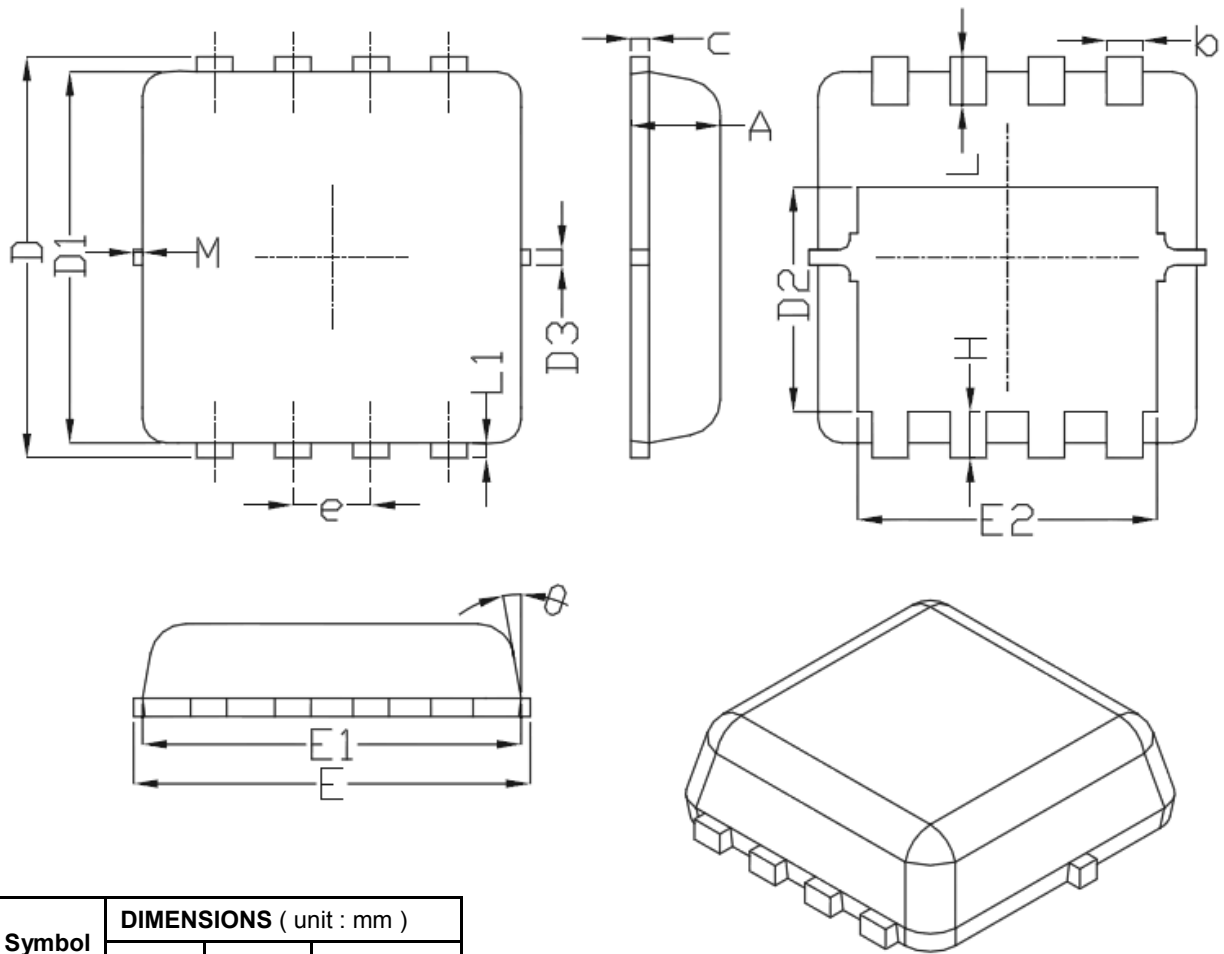


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient





PDFN3333 Package Outline Data



Symbol	DIMENSIONS (unit : mm)		
	Min	Typ	Max
A	0.7	0.75	0.8
b	0.25	0.3	0.35
C	0.1	0.15	0.25
D	3.25	3.35	3.45
D1	3	3.1	3.2
D2	1.78	1.88	1.98
D3	--	0.13	--
E	3.2	3.3	3.4
E1	3	3.15	3.2
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.3	0.39	0.5
L	0.3	0.4	0.5
L1	--	0.13	--
θ	--	10°	12°
M	*	*	0.15
* Not specified			

Notes:

1. Follow JEDEC MO-240 variation CA.
2. Dimensions "D1" and "E1" do NOT include mold flash protrusions or gate burrs.
3. Dimensions "D1" and "E1" include interterminal flash or protrusion. Interterminal flash or protrusion shall not exceed 0.25mm per side.