Prisemi®

Description

The PSMD2P100V120 uses split gate trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.
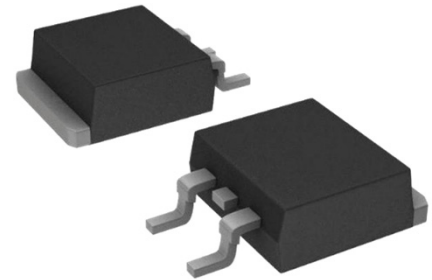
MOSFET Product Summary		
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)(Typ)$	$I_D(A)$
100	3.0@ V_{GS} = 10V	189

TO-263 (Top View)

Schematic diagram

D2P100120
YYWW

G(1) D(2) S(3)

Marking (Top View)

Feature

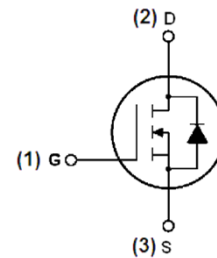➤ Low $R_{DS(ON)}$ - Ensures On-State Losses are Minimized
➤ Excellent Q_{gd} x $R_{DS(ON)}$ Product(FOM)
➤ Advanced Technology for DC-DC Converts
➤ Small Form Factor Thermally Efficient Package Enables Higher Density End Products
➤ 100% UIS (Avalanche) Rated
➤ Lead-Free Finish ; RoHS Compliant
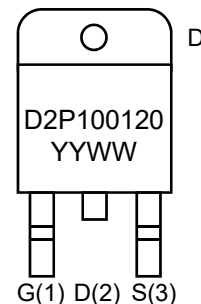➤ Halogen and Antimony Free. "Green" Device

Applications

➤ PWM applications
➤ Load switch
➤ Power management
➤ DC-DC Converters
➤ Wireless Chargers

Absolute maximum rating@25℃

Rating		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous[1]	T_C=25℃	I_D	189	A
	T_C=100℃		134	
Pulsed Drain Current[2]		I_{DM}	757	A
Single Pulse Avalanche Current @ L=0.1mH		I_{AS}	72	A
Single Pulse Avalanche Energy @ L=0.1mH		E_{AS}	259	mJ
Total Power Dissipation[4]	T_C=25℃	P_D	254	W
	T_C=100℃		127	
Thermal Resistance , Junction-to-Case[4]		$R_{\theta JC}$	0.59	℃/W
Thermal Resistance Junction-to-Ambient [3]		$R_{\theta JA}$	32	℃/W
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	℃

Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Off Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$		100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V$, $V_{GS} = 0V$	$T_J = 25℃$	-	-	1.0	μA
			$T_J = 55℃$	-	-	10	
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$		-	-	± 100	nA
On Characteristics[5]							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$		2.0	3.0	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$		-	3.0	3.5	mΩ
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 20A$		-	46	-	S
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1A$		-	0.7	1.2	V
Dynamic Characteristics[6]							
Input Capacitance	C_{Iss}	$V_{DS} = 100V, V_{GS} = 0V$, $f = 1.0MHz$		-	4799	-	pF
Output Capacitance	C_{oss}			-	1256	-	
Reverse Transfer Capacitance	C_{rss}			-	50	-	
Switching Characteristics[6]							
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 100V, V_{GS} = 10V$, $I_D = 20A, R_{GEN} = 3\Omega$		-	10	-	ns
Turn-on Rise Time	t_r			-	17	-	
Turn-Off Delay Time	$t_{d(off)}$			-	44	-	
Turn-Off Fall Time	t_f			-	23	-	
Total Gate Charge @ $V_{GS} = 10V$	Q_g	$V_{DS} = 100V, I_D = 20A$, $V_{GS} = 10V$		-	68	-	nC
Total Gate Charge @ $V_{GS} = 6V$				-	44	-	
Gate-Source Charge	Q_{gs}			-	19	-	
Gate-Drain Charge	Q_{gd}			-	15	-	
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		-	1.5	-	Ω
Drain-Source Diode Characteristics							
Reverse Recovery Time	t_{rr}	$I_F = 20A, di/dt = 100A/\mu s$		-	62	-	ns
Reverse Recovery Charge	Q_{rr}			-	130	-	nC
Diode Forward Current	I_S	-		-	-	189	A

Notes：
1. Pluse width limited by maximum junction temperature.
2. Pulse test : Pulse width ≤ 100μs, duty cycle ≤ 2%.
3. Device mounted on 1 inch FR4 PCB with 2oz.Copper.
4. Device mounted on infinite heatsink.
5. Measured under pulsed conditions. Pulse width ≤ 300μs, duty cycle ≤ 2%.
6. Guaranteed by design, not subject to production.
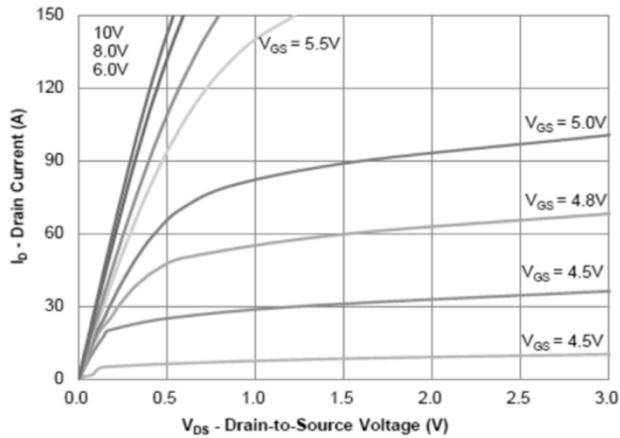
Typical Characteristics

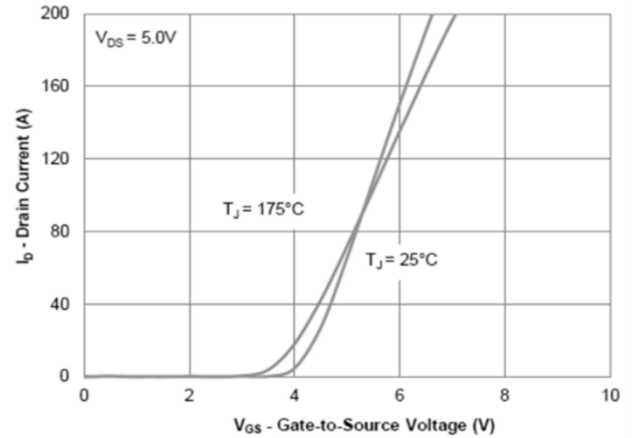Figure 1: Output Characteristics

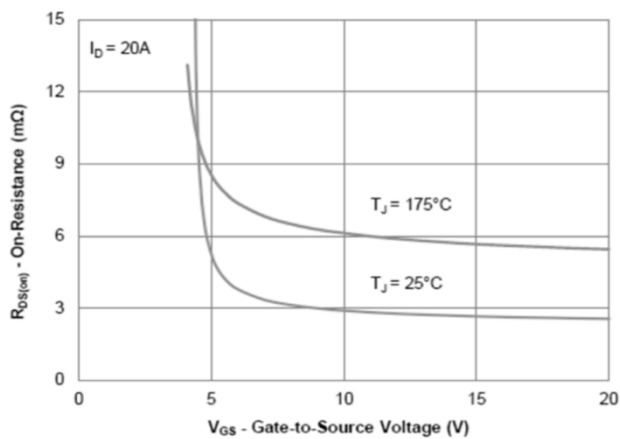Figure 2: Transfer Characteristics

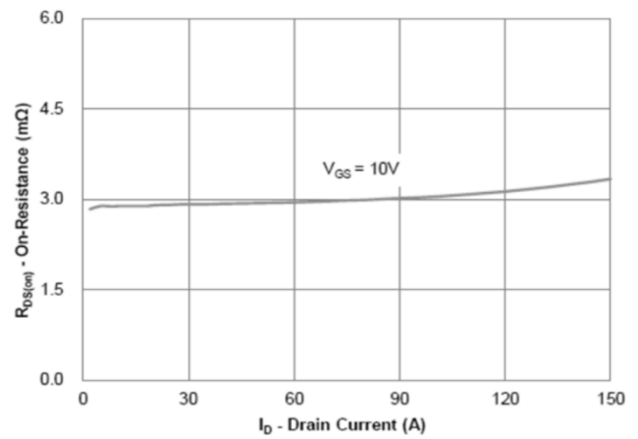

Figure 3: On-Resistance vs. Gate-Source Voltage

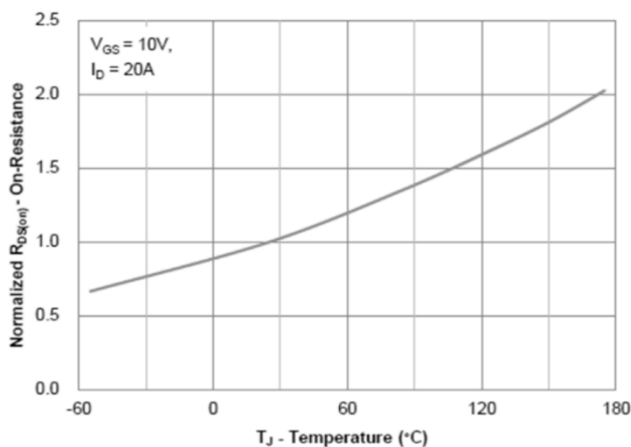Figure 4: On-Resistance vs. Gate-Source Voltage

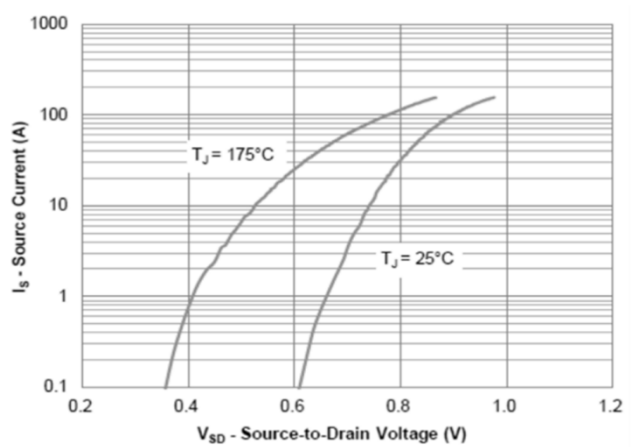Figure 5: On-Resistance vs. Junction Temperature
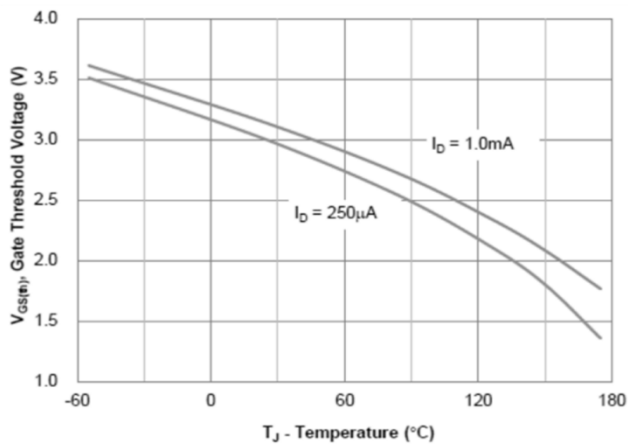

Figure 6: Source-Drain Diode Forward Voltage

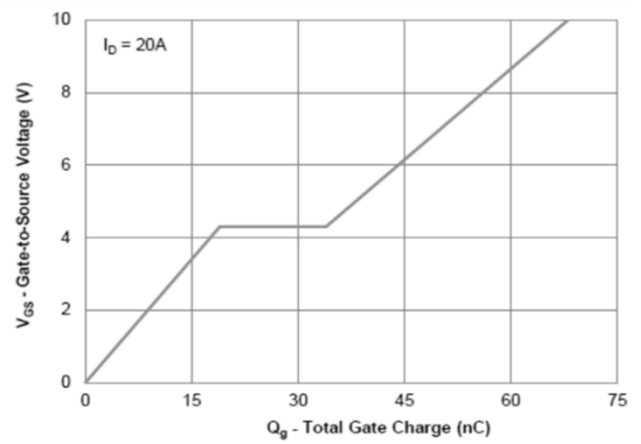Figure 7: Gate Threshold Variation vs. Junction Temperature
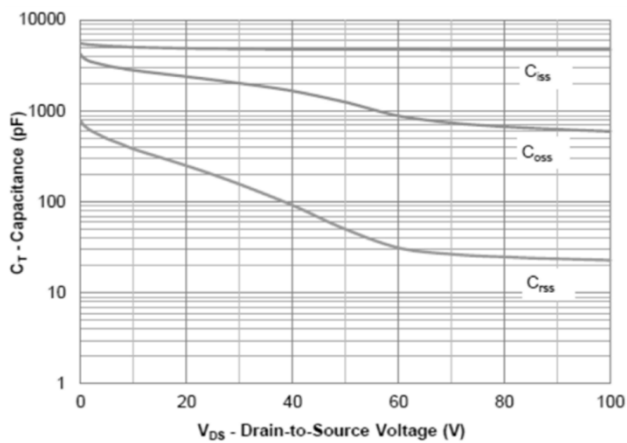
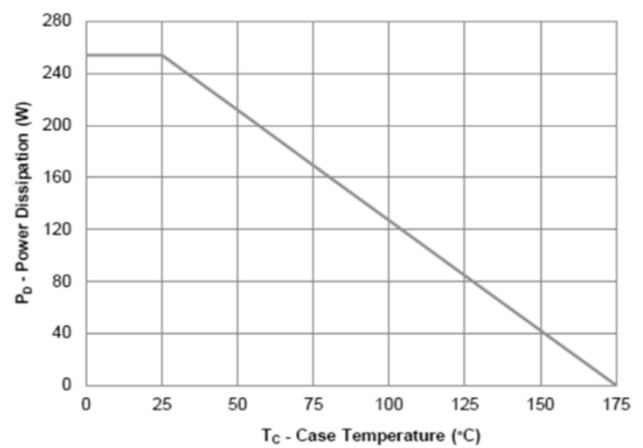Figure 8: Gate Charge Characteristics

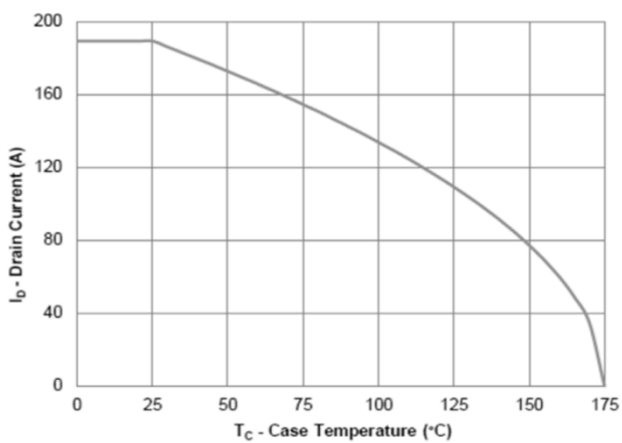Figure 9: Capacitance Characteristics

Figure 10: Power Derating
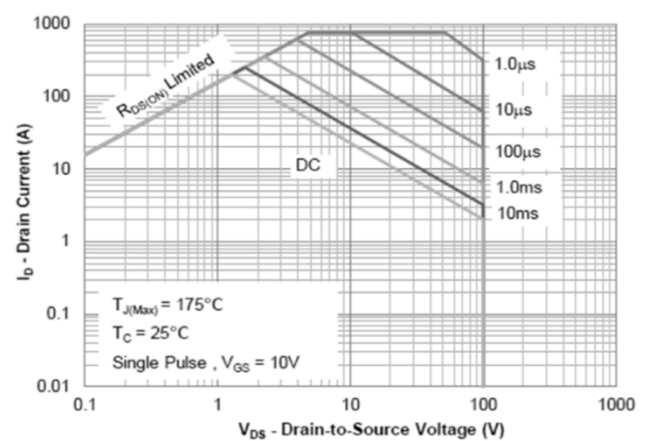
Figure 11: Current Derating
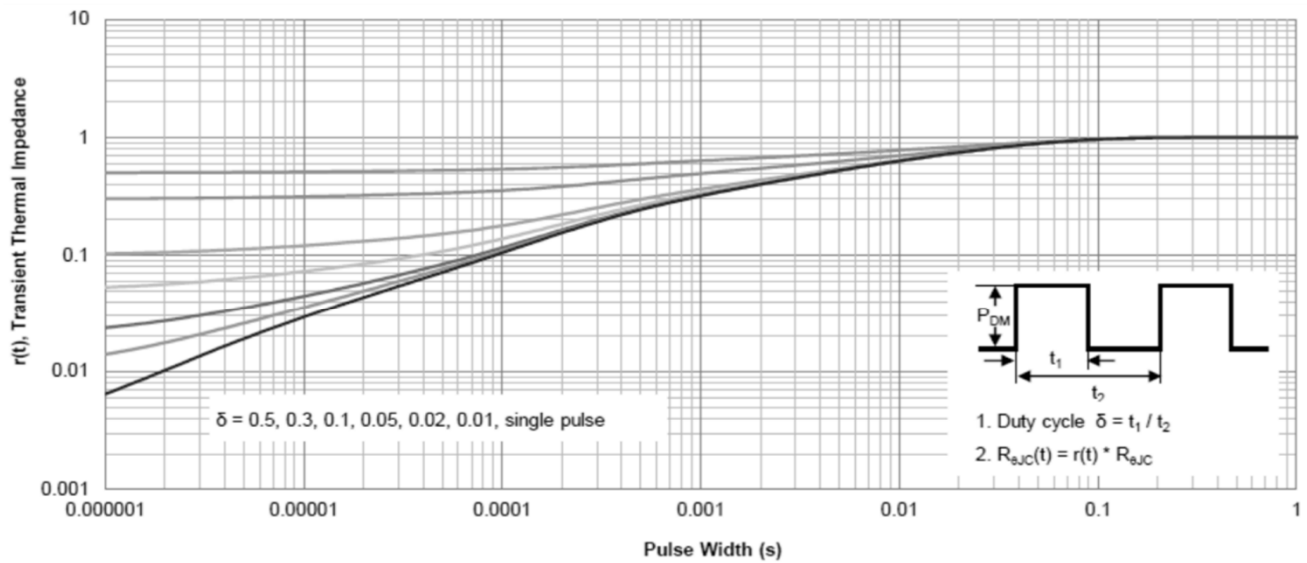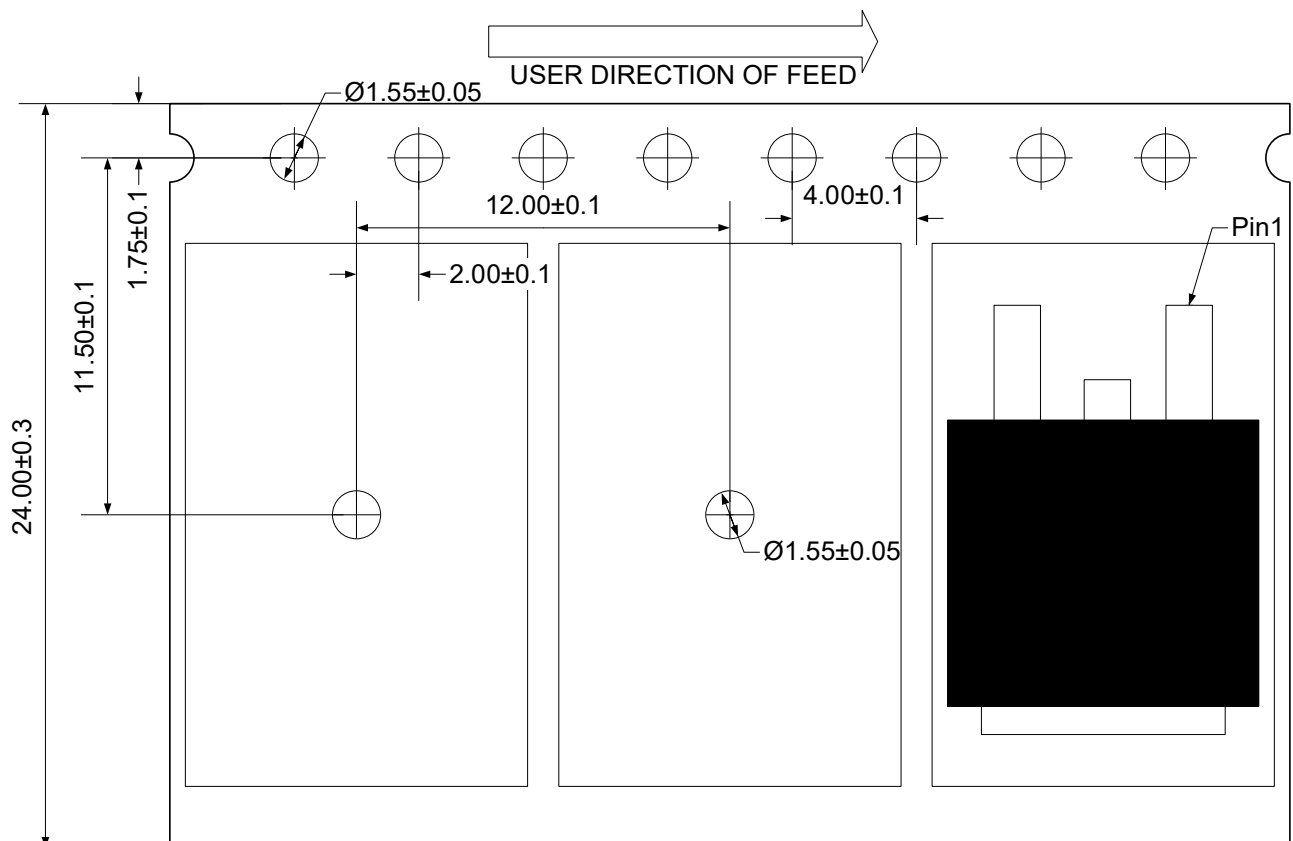
Figure 12: Safe Operating Area

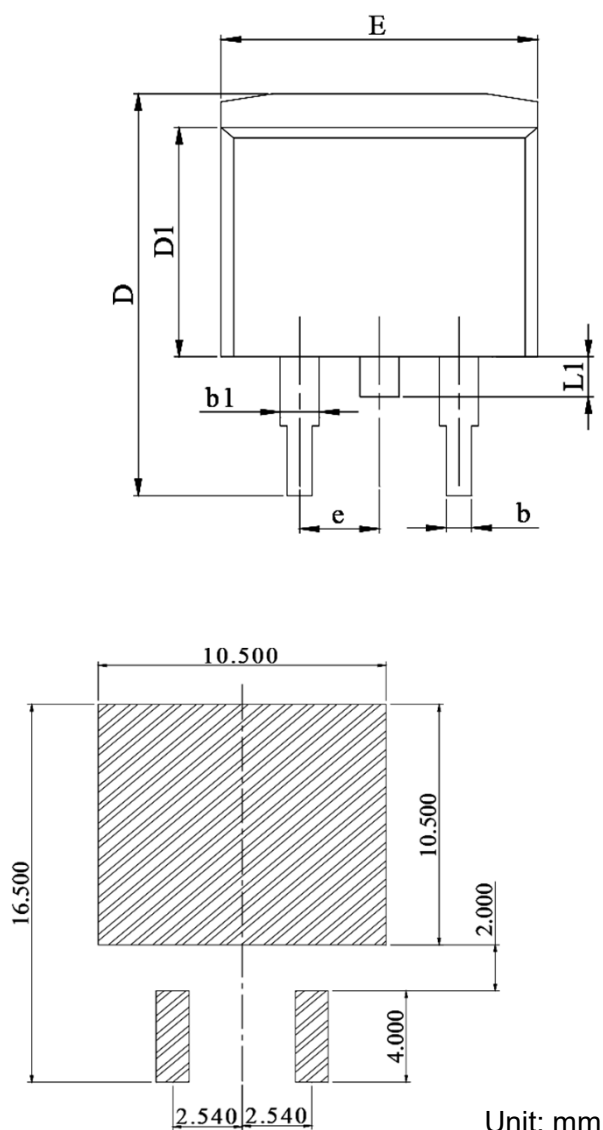Figure 13: Normalized Maximum Transient Thermal Impedance

Ordering Information

Device	Package	Reel	Shipping
PSMD2P100V120	TO-263	13"	1000 / Tape & Reel

Load With Information

Unit:mm

Product Dimension (TO-263)

Unit: mm

Suggested PCB Layout

Dim	Millimeters		Inches	
	Min	**Max**	**Min**	**Max**
A	4.24	4.77	0.167	0.188
A 1	2.30	2.89	0.091	0.114
A 2	0.00	0.25	0.000	0.010
b	0.70	0.96	0.028	0.038
b 1	1.17	1.70	0.046	0.067
C	0.30	0.60	0.012	0.024
C 1	1.15	1.42	0.045	0.056
D	14.10	15.88	0.555	0.625
D 1	8.50	9.60	0.335	0.378
E	9.78	10.36	0.385	0.408
L	1.78	2.79	0.070	0.110
L1	-	1.75	-	0.069
e	2.54 Ref.		0.100 Ref.	

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