

## Product Summary

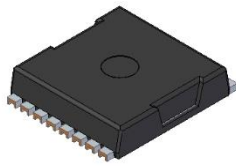
BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> T <sub>C</sub> = +25°C
100V	2.5mΩ @ V <sub>GS</sub> = 10V	215A

## Description and Applications

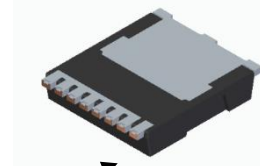
This new generation N-channel enhancement mode MOSFET is designed to minimize R<sub>DS(ON)</sub> yet maintain superior switching performance. This device is ideal for use in power management and load switch.

- Motor Control
- DC-DC Converters
- Power Management

POWERDI1012-8

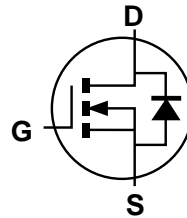


Top View

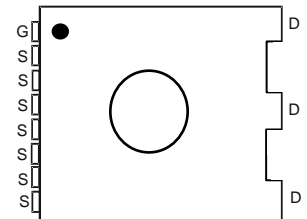


Pin1

Bottom View



Internal Schematic



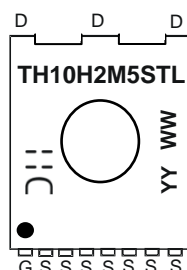
Top View  
Pin Configuration

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH10H2M5STLW-13	POWERDI1012-8	1500/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



JII = Manufacturer's Marking  
 TH10H2M5STL = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 21 = 2021)  
 WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	100	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	I <sub>D</sub>	215 152	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	860	A
Maximum Continuous Body Diode Forward Current (Note 6)	I <sub>S</sub>	215	A
Pulsed Body Diode Forward Current (10μs Pulse, Duty Cycle = 1%)	I <sub>SM</sub>	860	A
Avalanche Current, L = 0.3mH	I <sub>AS</sub>	68	A
Avalanche Energy, L = 0.3mH	E <sub>AS</sub>	701	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	5.8	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	26	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	230.8	W
Thermal Resistance, Junction to Case (Note 6)	R <sub>θJC</sub>	0.65	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 7)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 7)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	2	—	4	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	1.68	2.5	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A
Diode Forward Voltage	V <sub>SD</sub>	—	0.8	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 30A
<b>DYNAMIC CHARACTERISTICS</b> (Note 8)						
Input Capacitance	C <sub>iss</sub>	—	8450	—	pF	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	2430	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	17.7	—		
Gate Resistance	R <sub>G</sub>	—	1.0	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	—	124.4	—	nC	V <sub>DD</sub> = 50V, I <sub>D</sub> = 30A, V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	—	34	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	28.3	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	32.7	—	ns	V <sub>DD</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A, R <sub>G</sub> = 4.7Ω
Turn-On Rise Time	t <sub>r</sub>	—	47	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	91.3	—		
Turn-Off Fall Time	t <sub>f</sub>	—	53.9	—	ns	I <sub>F</sub> = 25A, di/dt = 100A/μs
Reverse Recovery Time	t <sub>rr</sub>	—	87.6	—		
Reverse Recovery Charge	Q <sub>rr</sub>	—	251.8	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
  - Thermal resistance from junction to soldering point (on the exposed drain pad).
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

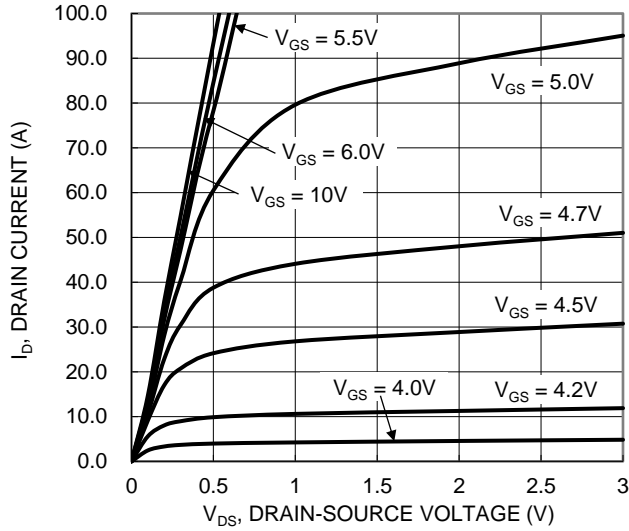


Figure 1. Typical Output Characteristic

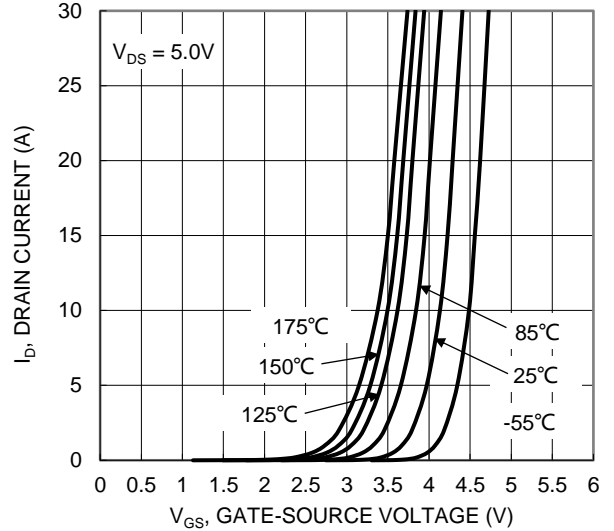


Figure 2. Typical Transfer Characteristic

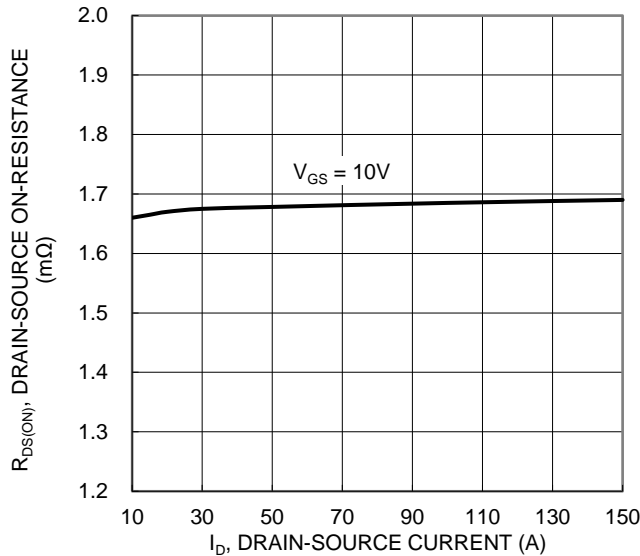


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

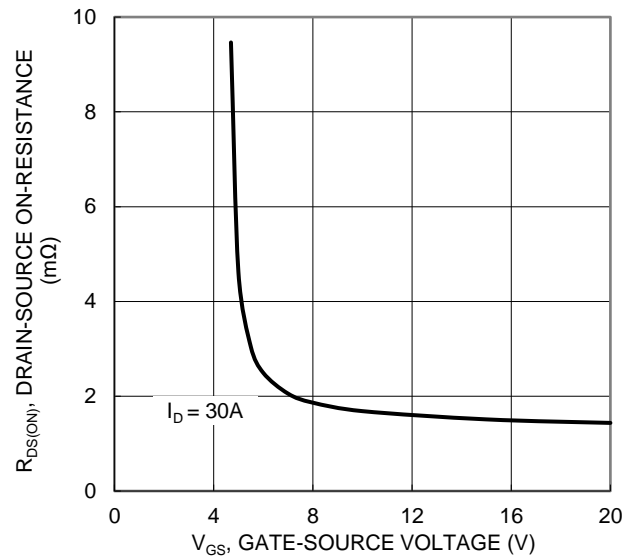


Figure 4. Typical Transfer Characteristic

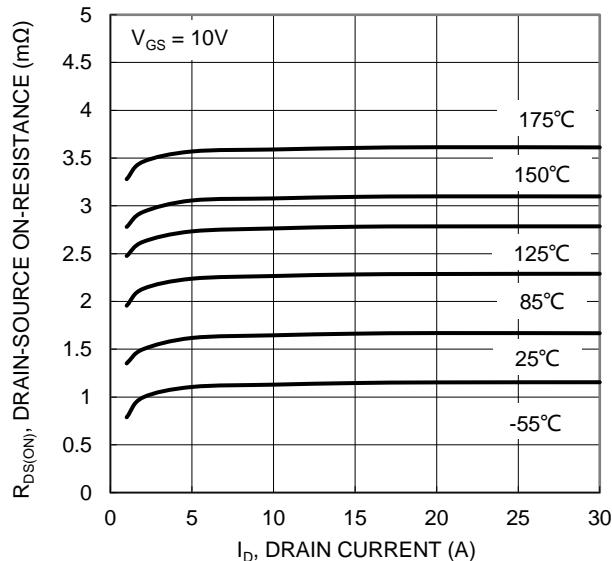


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

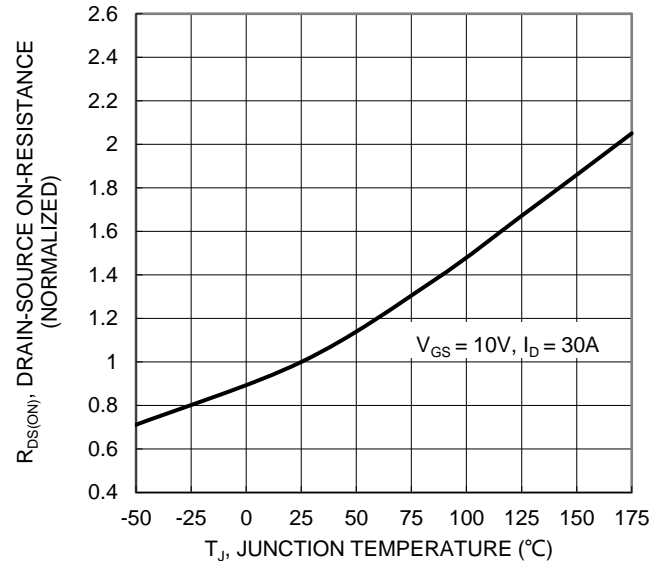
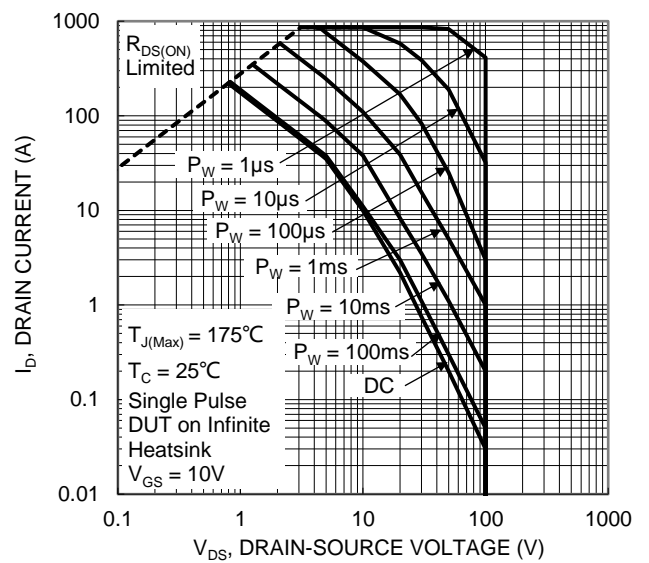
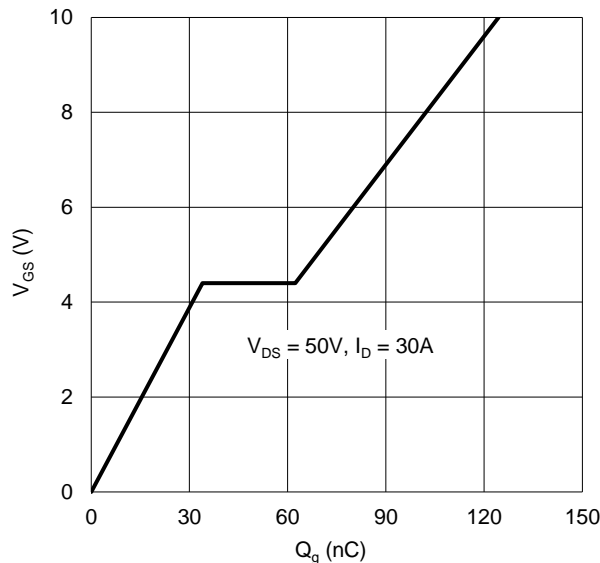
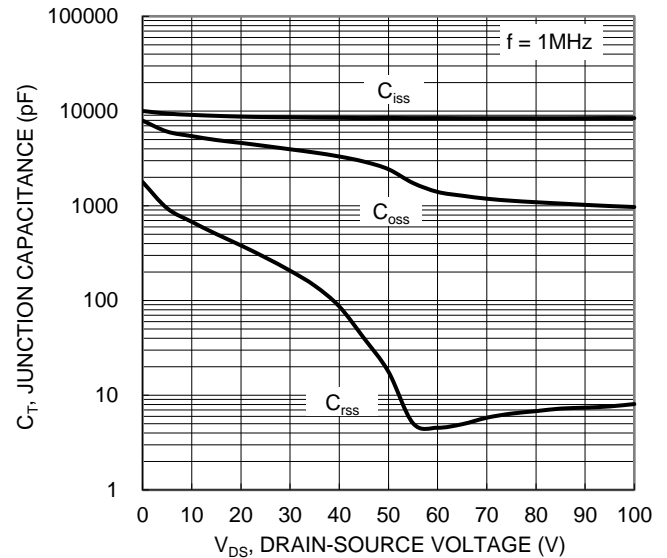
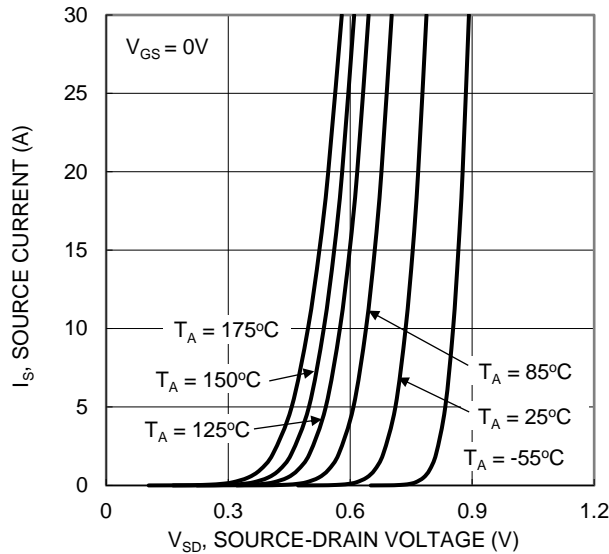
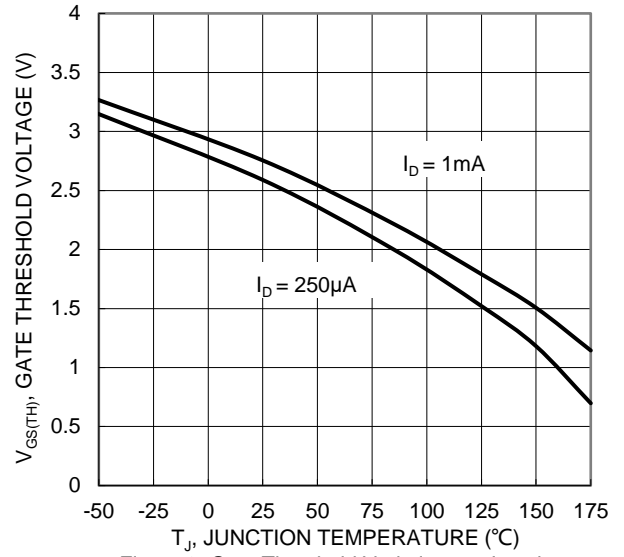
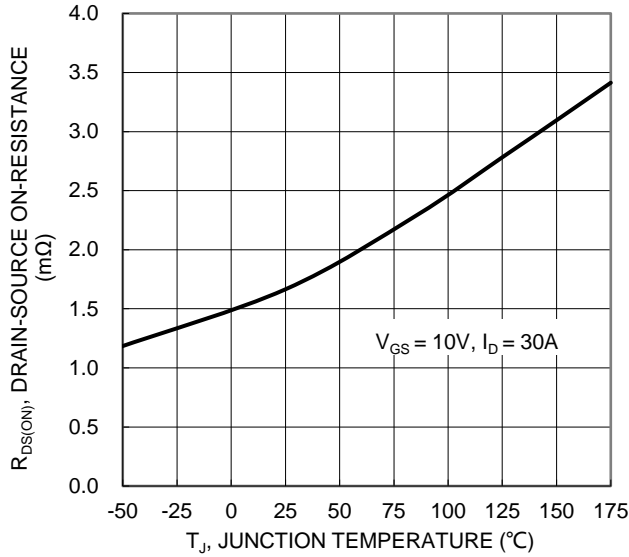


Figure 6. On-Resistance Variation with Temperature



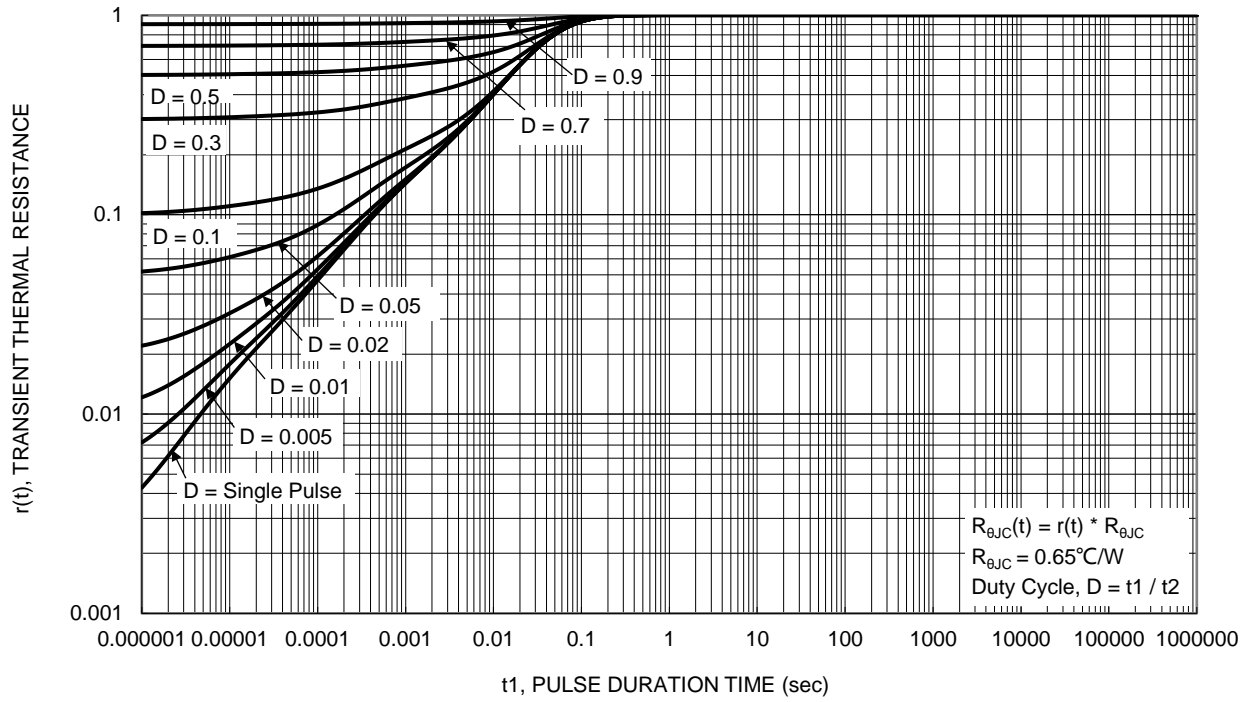
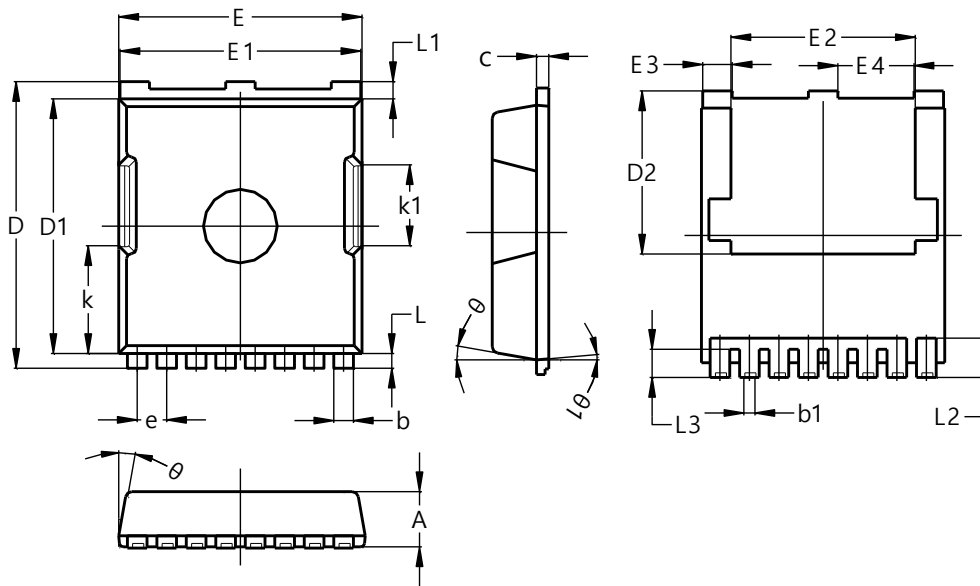


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### POWERDI1012-8

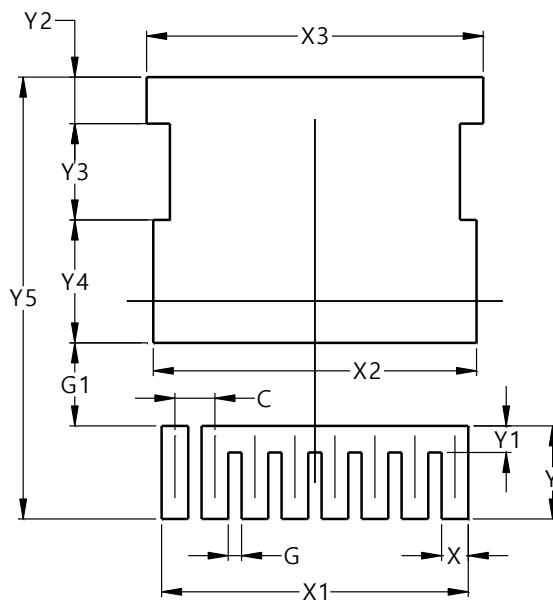


POWERDI1012-8			
Dim	Min	Max	Typ
A	2.20	2.40	2.30
b	0.70	0.90	0.80
b1	0.42	0.50	0.45
c	0.40	0.60	0.50
D	11.48	11.88	11.68
D1	10.23	10.53	10.38
D2	6.45	6.85	6.65
E	9.70	10.10	9.90
E1	9.70	9.90	9.80
E2	7.00	8.00	7.50
E3	1.10	1.30	1.20
E4	3.00	3.20	3.10
e	1.20 BSC		
k	4.39 REF		
k1	3.30 REF		
L	0.50	0.70	0.60
L1	0.50	0.90	0.70
L2	1.40	1.80	1.60
L3	1.00	1.30	1.15
θ	0°	15°	10°
θ1	0°	10°	5°
All Dimensions in mm			

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### POWERDI1012-8



Dimensions	Value (in mm)
C	1.200
G	0.400
G1	2.500
X	0.800
X1	9.200
X2	9.700
X3	10.100
Y	2.800
Y1	0.800
Y2	1.400
Y3	2.900
Y4	3.700
Y5	13.300

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