100V +175°C N-CHANNEL ENHANCEMENT MODE MOSFET
PowerDI8080-5

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D T_C = +25°C
100V	1.5mΩ @ V_{GS} = 10V	352A

Features and Benefits

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- High Conversion Efficiency
- Low $R_{DS(ON)}$ – Minimizes Power Losses
- Wettable Flank for Improved Optical Inspection
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under a separate datasheet (DMTH10H1M7SPGWQ)**

Description and Applications

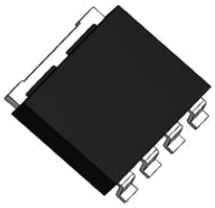
This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP, and is ideal for use in:

- Engine management systems
- Body control electronics
- DC-DC converters

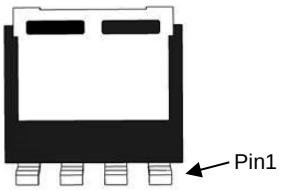
Mechanical Data

- Package: PowerDI®8080-5
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.36 grams (Approximate)

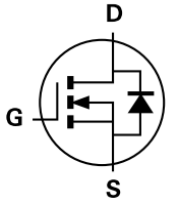
PowerDI8080-5



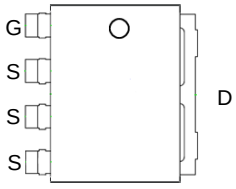
Top View



Bottom View



Internal Schematic



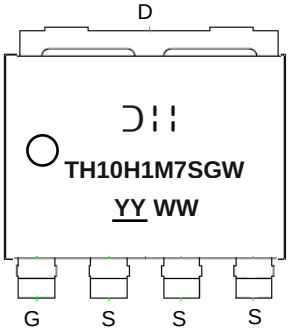
Top View
Pin Configuration

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMTH10H1M7SPGW-13	PowerDI8080-5	2,000	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



= Manufacturer's Marking
TH10H1M7SGW = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 25 = 2025)
WW = Week (01 to 53)

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Note 6)	T_C = +25°C T_C = +100°C	I_D	352 249	A
Maximum Continuous Body Diode Forward Current (Note 6)		I_S	352	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I_{DM}	1400	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)		I_{SM}	1400	A
Avalanche Current, L = 1mH		I_{AS}	53	A
Avalanche Energy, L = 1mH		E_{AS}	1404	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	5	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	30	°C/W
Total Power Dissipation (Note 6)	T_C = +25°C	P_D	405	W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	0.37	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	V_{GS} = 0, I_D = 1mA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 80V, V_{GS} = 0
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	2	—	4	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	1.13	1.5	mΩ	V_{GS} = 10V, I_D = 25A
Diode Forward Voltage	V_{SD}	—	0.75	1.2	V	V_{GS} = 0, I_S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	10881	—	pF	V_{DS} = 50V, V_{GS} = 0, f = 1MHz
Output Capacitance	C_{oss}	—	3693	—		
Reverse Transfer Capacitance	C_{rss}	—	101	—		
Gate Resistance	R_g	—	0.71	—	Ω	V_{DS} = 0, V_{GS} = 0, f = 1MHz
Total Gate Charge	Q_g	—	171	—	nC	V_{DD} = 50V, I_D = 25A, V_{GS} = 10V
Gate-Source Charge	Q_{gs}	—	51	—		
Gate-Drain Charge	Q_{gd}	—	40	—		
Turn-On Delay Time	$t_{D(ON)}$	—	28	—	ns	V_{DD} = 50V, V_{GS} = 10V, I_D = 25A, R_G = 3Ω
Turn-On Rise Time	t_R	—	43	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	71	—		
Turn-Off Fall Time	t_F	—	54	—		
Body Diode Reverse-Recovery Time	t_{RR}	—	99	—	ns	I_F = 25A, di/dt = 100A/µs
Body Diode Reverse-Recovery Charge	Q_{RR}	—	334	—	nC	

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

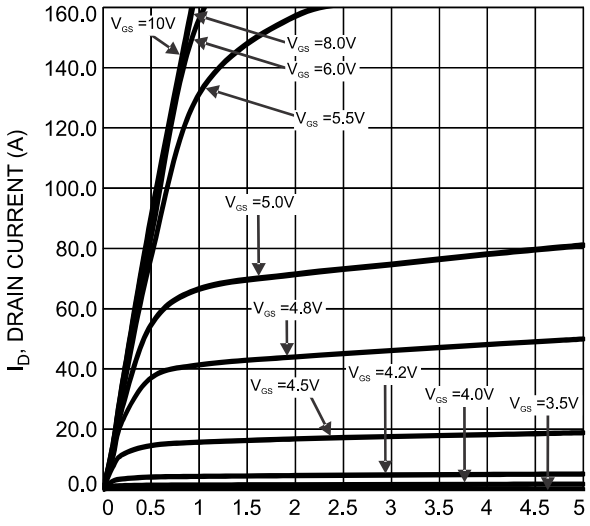


Fig. 1 Typical Output Characteristic

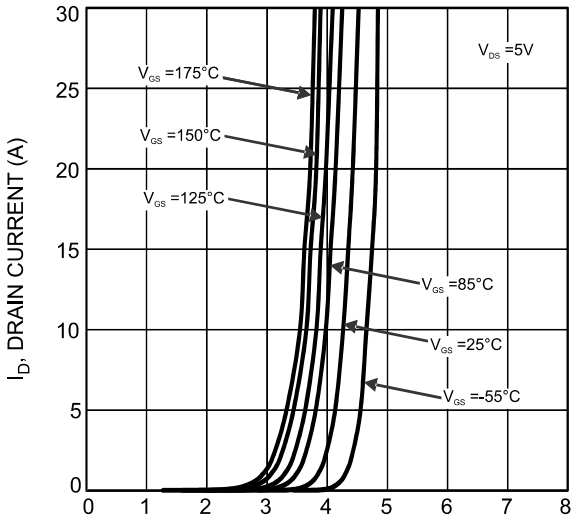


Fig. 2 Typical Transfer Characteristic

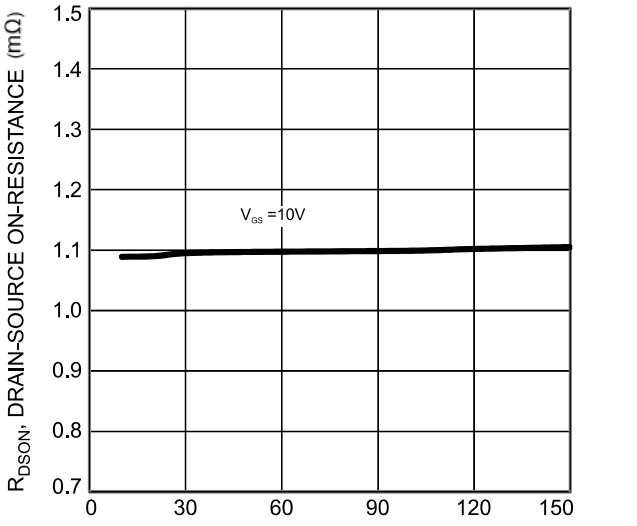


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

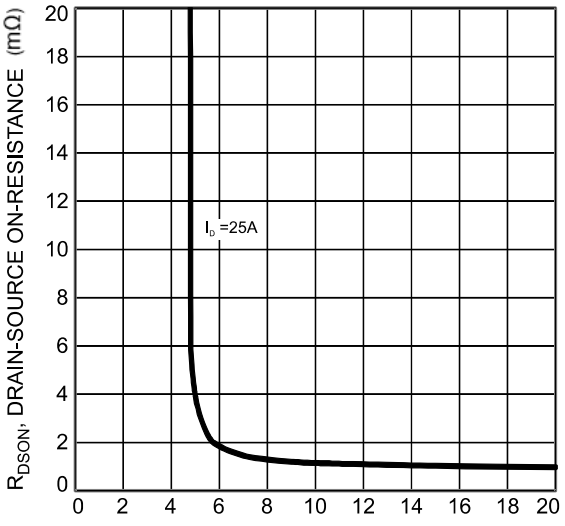


Fig. 4 Typical Transfer Characteristic

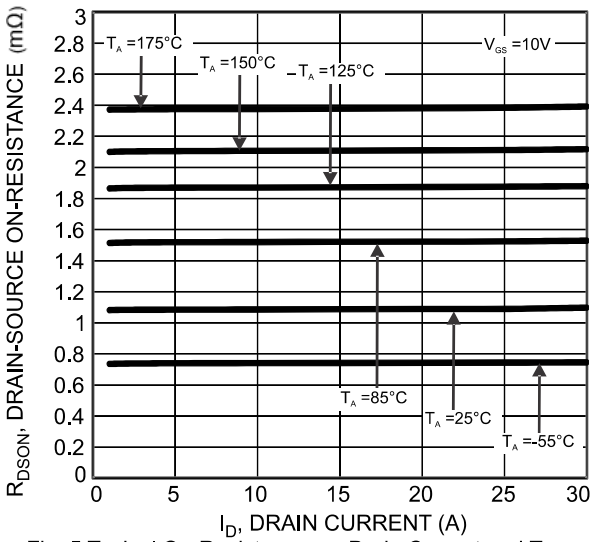


Fig. 5 Typical On-Resistance vs. Drain Current and Temperature

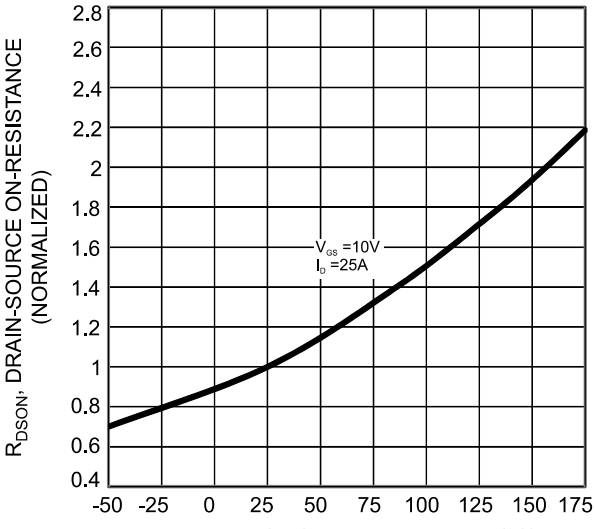


Fig. 6 On-Resistance Variation with Temperature

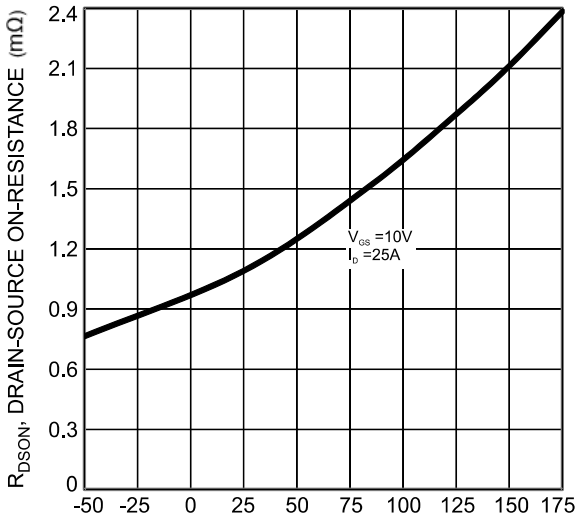


Fig. 7 On-Resistance Variation with Temperature

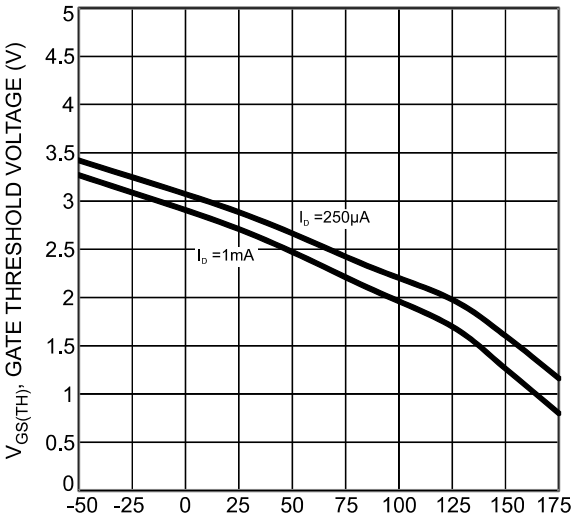


Fig. 8 Gate Threshold Variation vs Junction Temperature

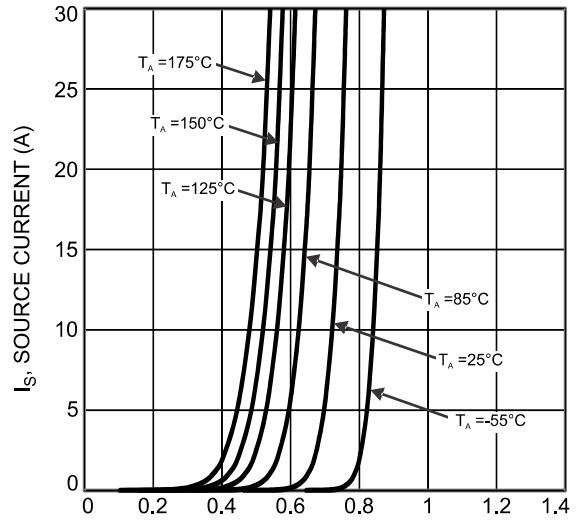


Fig. 9 Diode Forward Voltage vs. Current

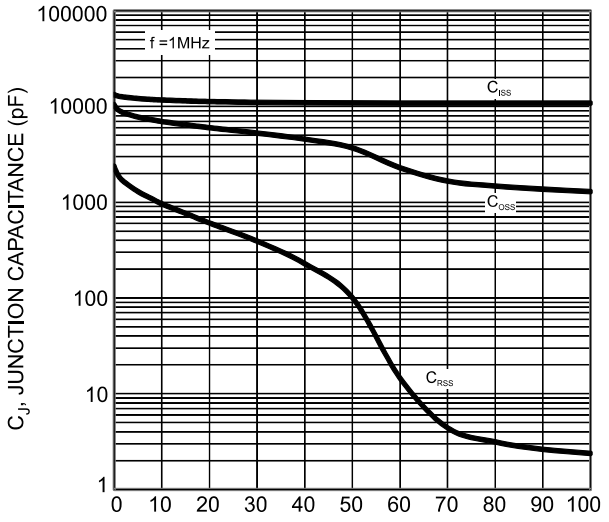


Fig. 10 Typical Junction Capacitance

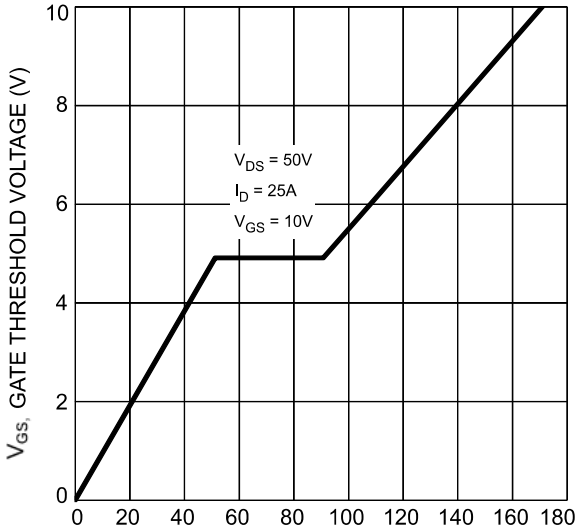


Fig. 11 Gate Charge

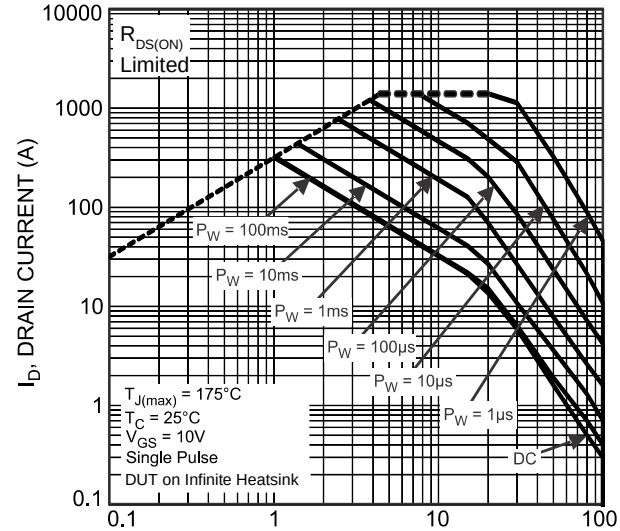


Fig. 12 SOA, Safe Operation Area

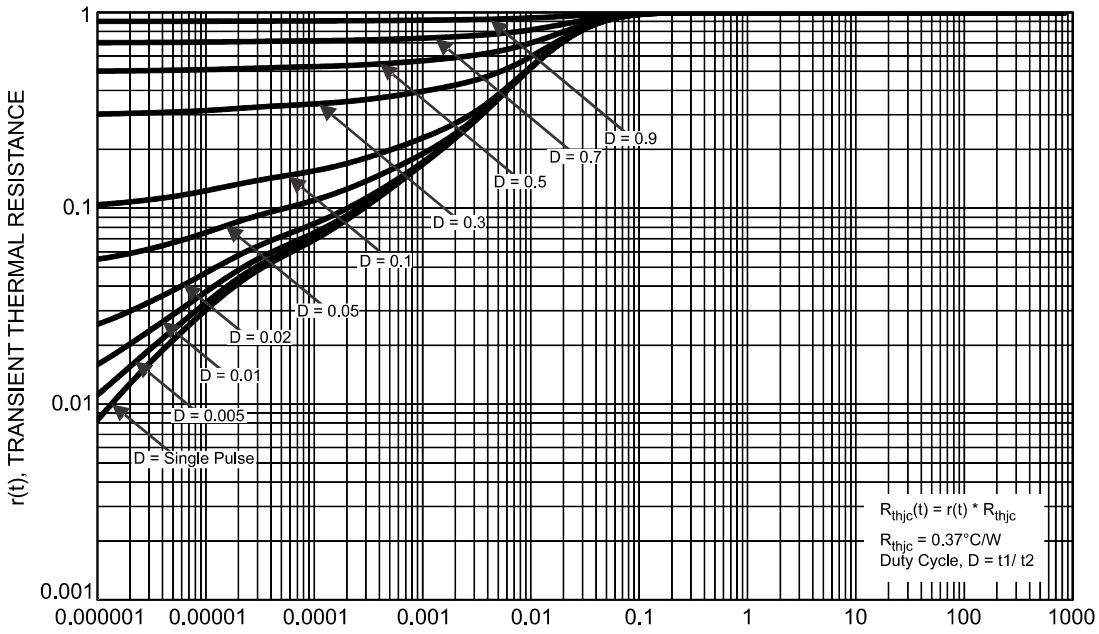
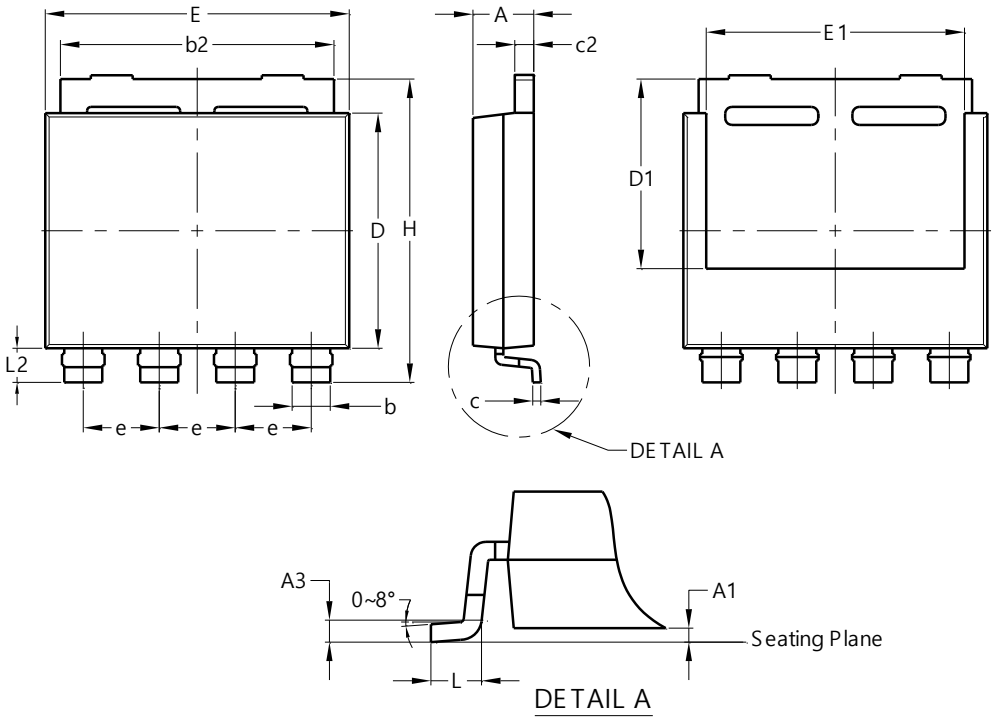


Fig. 13 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI8080-5

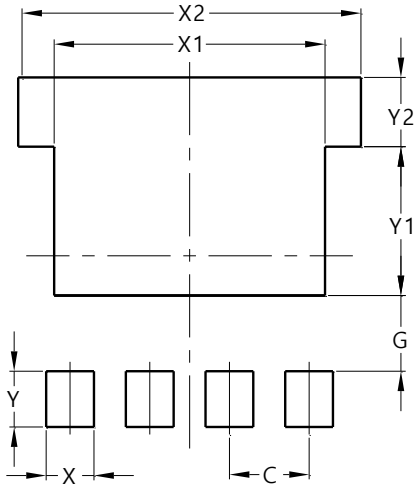


PowerDI8080-5			
Dim	**Min**	**Max**	**Typ**
A	1.50	1.70	--
A1	0.00	0.15	--
A3	--	--	0.25
b	0.90	1.10	--
b2	7.10	7.30	--
c	0.18	0.24	--
c2	0.47	0.57	--
D	6.10	6.30	--
D1	4.90	5.10	--
E	7.90	8.10	--
E1	6.70	6.90	--
e	--	--	2.00
H	7.80	8.10	--
L	0.60	0.80	--
L2	0.90	1.30	--
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI8080-5



Dimensions	Value (in mm)
C	2.00
G	1.90
X	1.20
X1	6.80
X2	8.60
Y	1.40
Y1	3.74
Y2	1.76

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