DIODES
INCORPORATED®

Product Summary

BV$_{DSS}$	R$_{DS(ON)}$	I$_D$ T$_C$ = +25°C
30V	2.0mΩ @ V$_{GS}$ = 10V	100A
	3.0mΩ @ V$_{GS}$ = 4.5V	100A

Description and Applications

This new generation MOSFET is designed to minimize R$_{DS(ON)}$ yet maintain superior switching performance. This device is ideal for use in power management and load switch.
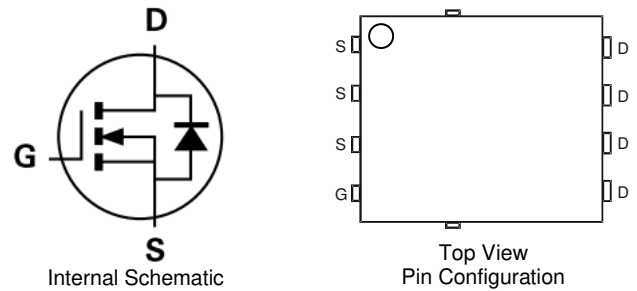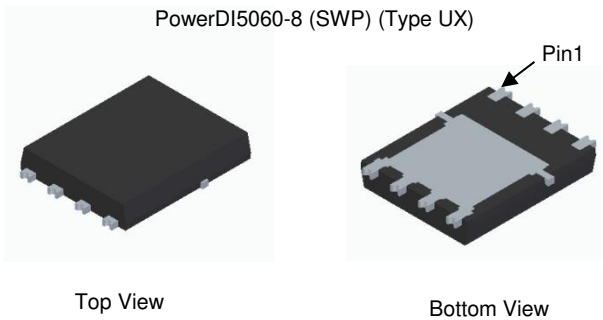
- DC-DC Converters
- Load Switch

Features

- 100% Unclamped Inductive Switch (UIS) Test in Production
- Thermally Efficient Package-Cooler Running Applications
- <1.1mm Package Profile – Ideal for Thin Applications
- High Conversion Efficiency
- Low R$_{DS(ON)}$ – Minimizes On State Losses
- Low Input Capacitance
- Fast Switching Speed
- Wettable Flank for Improved Optical Inspection
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

- Case: PowerDI®5060-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Terminals: Finish ─ Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
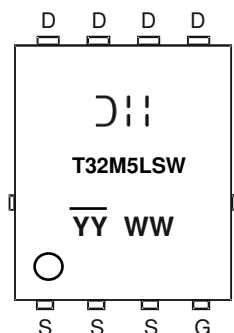- Weight: 0.097 grams (Approximate)

PowerDI5060-8 (SWP) (Type UX)

Pin1

Top View

Bottom View

Internal Schematic

Top View
Pin Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT32M5LPSW-13	PowerDI5060-8 (SWP) (Type UX)	2,500 / 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

D D D D

T32M5LSW

YY WW

S S S G

‫ɔ‖‖ = Manufacturer's Marking
T32M5LSW = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 21 = 2021)
WW = Week Code (01 to 53)

PowerDI is a registered trademark of Diodes Incorporated.

DMT32M5LPSW
Document number: DS42213 Rev. 3 - 2

1 of 7
www.diodes.com

September 2021
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Maximum Ratings (@T_C = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current, V_{GS} = 10V (Note 6)	Steady State	T_C = +25°C	I_D	100	A
		T_C = +100°C		100	
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	80	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I_{DM}	350	A
Pulsed Body Diode Forward Current (10μs Pulse, Duty Cycle = 1%)			I_{SM}	350	A
Avalanche Current, L=0.1mH			I_{AS}	50	A
Avalanche Energy, L=0.1mH			E_{AS}	140	mJ

Thermal Characteristics (@T_C = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	3.2	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{θJA}$	54	°C/W
Total Power Dissipation (Note 6)	T_C = +25°C	P_D	100	W
Thermal Resistance, Junction to Case (Note 6)		$R_{θJC}$	1.5	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	V_{GS} = 0V, I_D = 250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	V_{DS} = V_{GS}, I_D = 1mA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	1.6	2.0	mΩ	V_{GS} = 10V, I_D = 30A
		—	2.3	3.0		V_{GS} = 4.5V, I_D = 30A
Diode Forward Voltage	V_{SD}	—	0.8	1.1	V	V_{GS} = 0V, I_S = 30A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	4389	—	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	1529	—		
Reverse Transfer Capacitance	C_{rss}	—	180	—		
Gate Resistance	R_g	—	0.6	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	34	—	nC	V_{DS} = 15V, I_D = 20A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	68	—		
Gate-Source Charge	Q_{gs}	—	8	—		
Gate-Drain Charge	Q_{gd}	—	15	—		
Turn-On Delay Time	$t_{D(ON)}$	—	7.2	—	ns	V_{DD} = 15V, V_{GS} = 10V, I_D = 15A, R_G = 3Ω
Turn-On Rise Time	t_R	—	13.2	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	37.5	—		
Turn-Off Fall Time	t_F	—	23.9	—		
Body Diode Reverse Recovery Time	t_{RR}	—	28.7	—	ns	I_S = 15A, di/dt = 500A/μs
Body Diode Reverse Recovery Charge	Q_{RR}	—	45.8	—	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 production testing.

DMT32M5LPSW
Document number: DS42213 Rev. 3 - 2

2 of 7
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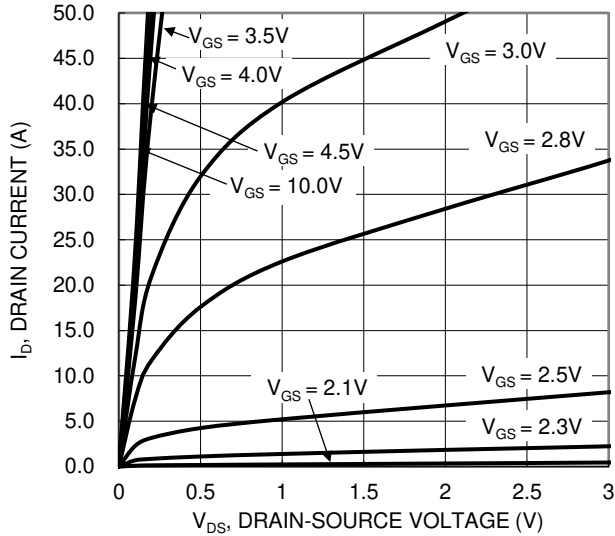September 2021
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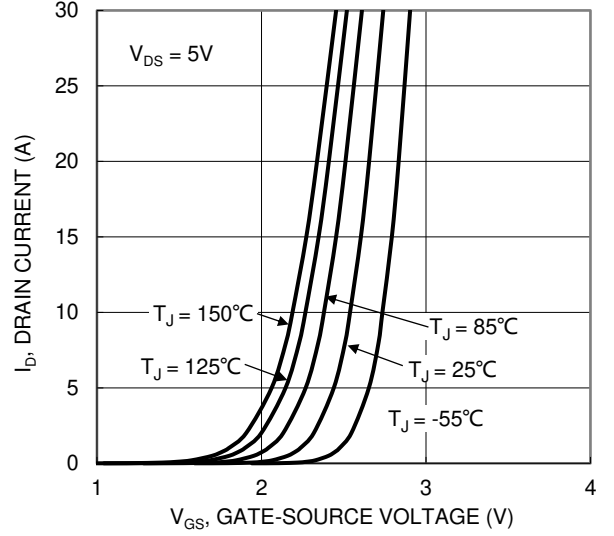
Figure 1. Typical Output Characteristic

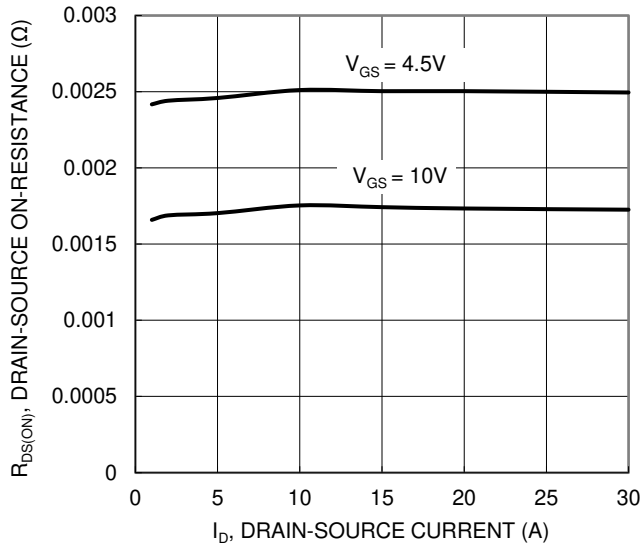Figure 2. Typical Transfer Characteristic

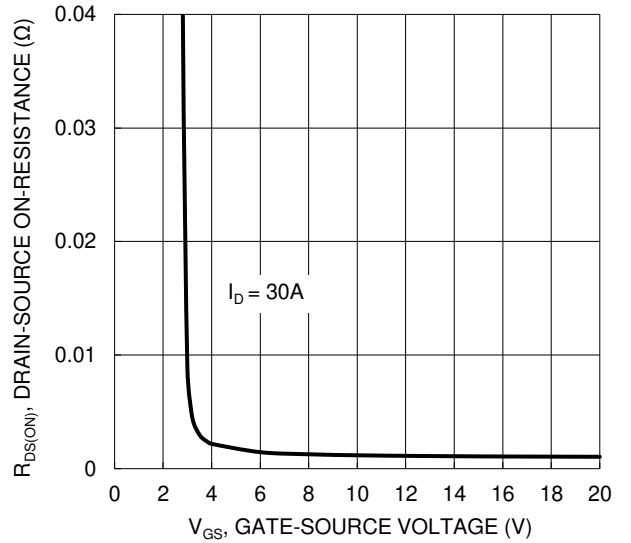Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage
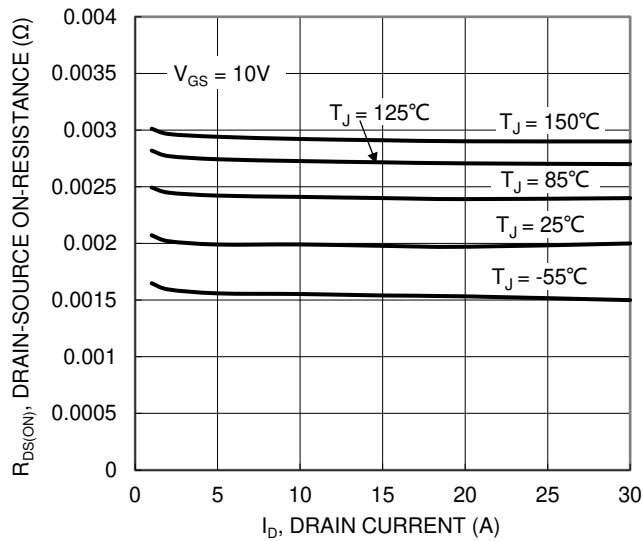

Figure 4. Typical Transfer Characteristic

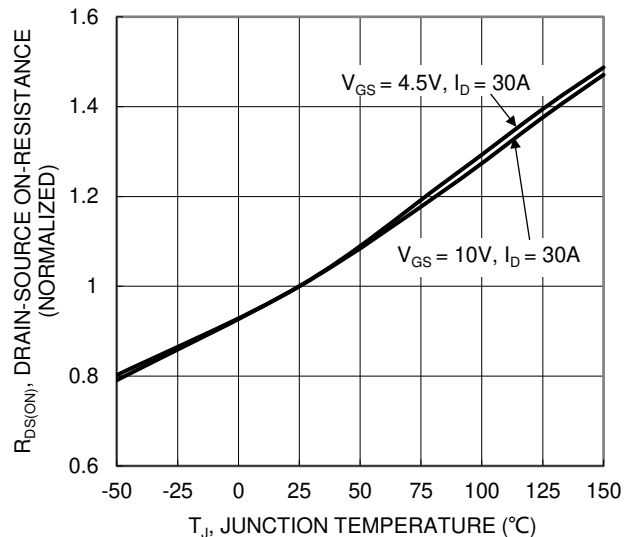Figure 5. Typical On-Resistance vs. Drain Current and Temperature
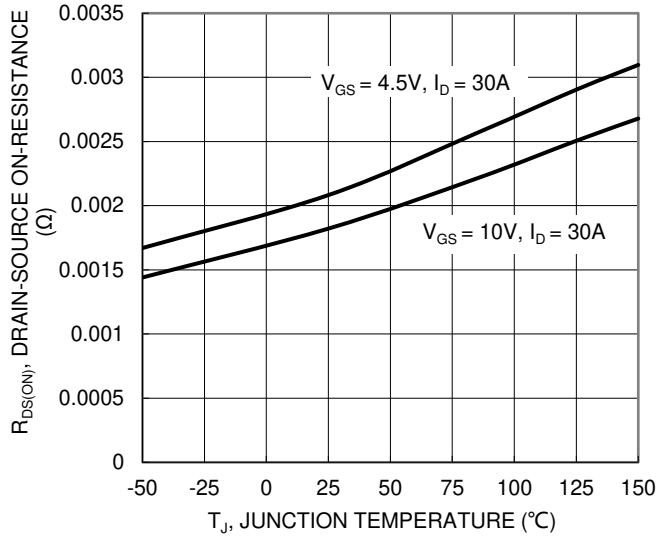

Figure 6. On-Resistance Variation with Temperature

DMT32M5LPSW
Document number: DS42213 Rev. 3 - 2

3 of 7
www.diodes.com

September 2021
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Figure 7. On-Resistance Variation with Temperature
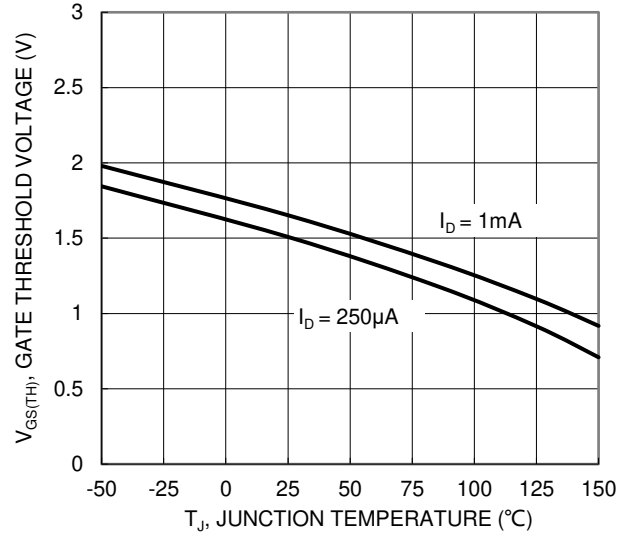
Figure 8. Gate Threshold Variation vs. Junction Temperature
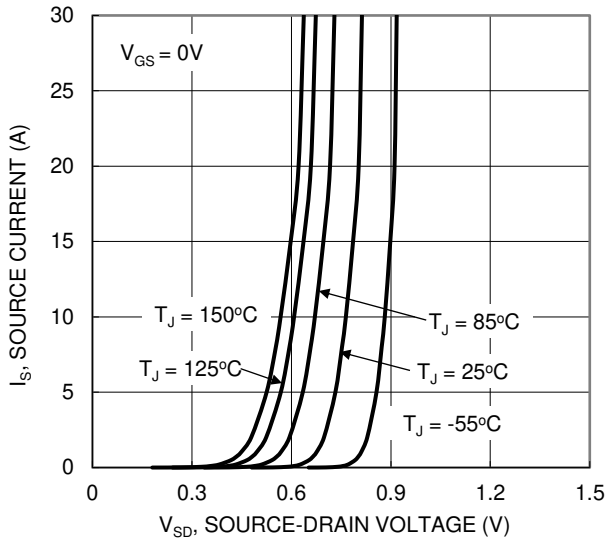
Figure 9. Diode Forward Voltage vs. Current
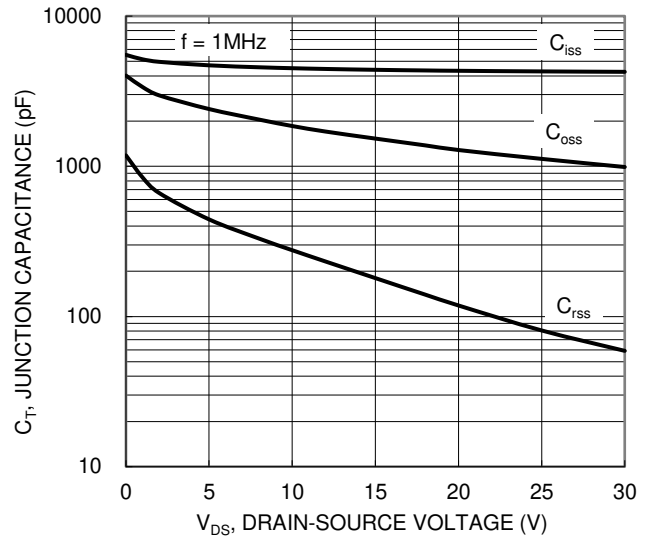
Figure 10. Typical Junction Capacitance
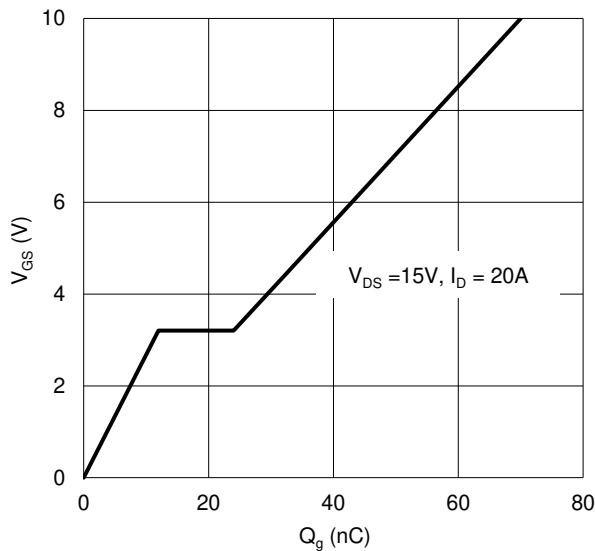
Figure 11. Gate Charge
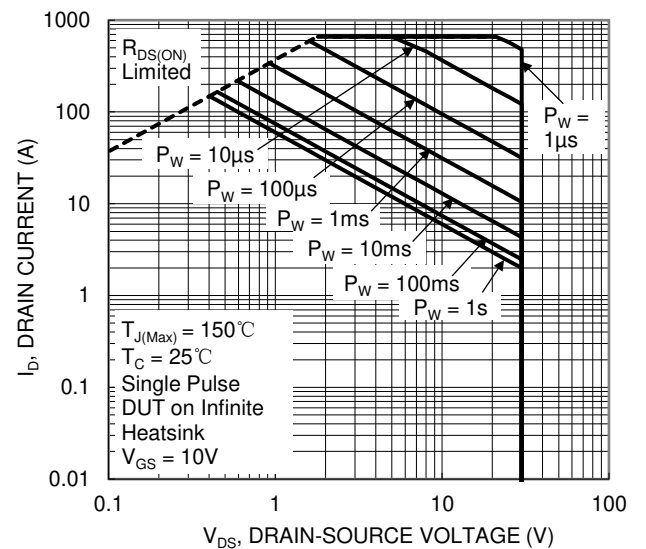
Figure 12. SOA, Safe Operation Area

DMT32M5LPSW
Document number: DS42213 Rev. 3 - 2

4 of 7
www.diodes.com

September 2021
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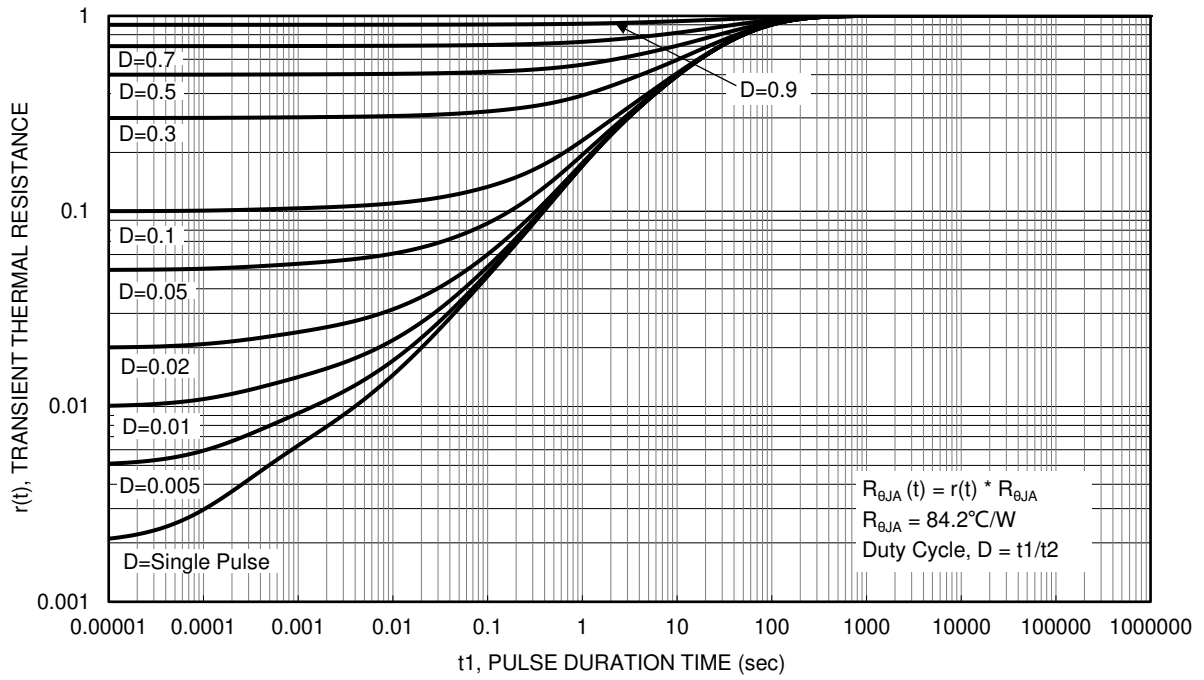
Figure 13. Transient Thermal Resistance

The graph shows r(t), TRANSIENT THERMAL RESISTANCE (y-axis, from 0.001 to 1) vs t1, PULSE DURATION TIME (sec) (x-axis, from 0.00001 to 1000000).

Curves labeled: D=0.9, D=0.7, D=0.5, D=0.3, D=0.1, D=0.05, D=0.02, D=0.01, D=0.005, D=Single Pulse

$R_{\theta JA}(t) = r(t) * R_{\theta JA}$
$R_{\theta JA} = 84.2°C/W$
Duty Cycle, D = t1/t2

DMT32M5LPSW
Document number: DS42213 Rev. 3 - 2

5 of 7
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September 2021
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Package Outline Dimensions

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

PowerDI5060-8 (SWP) (Type UX)

DETAIL A

DETAIL A
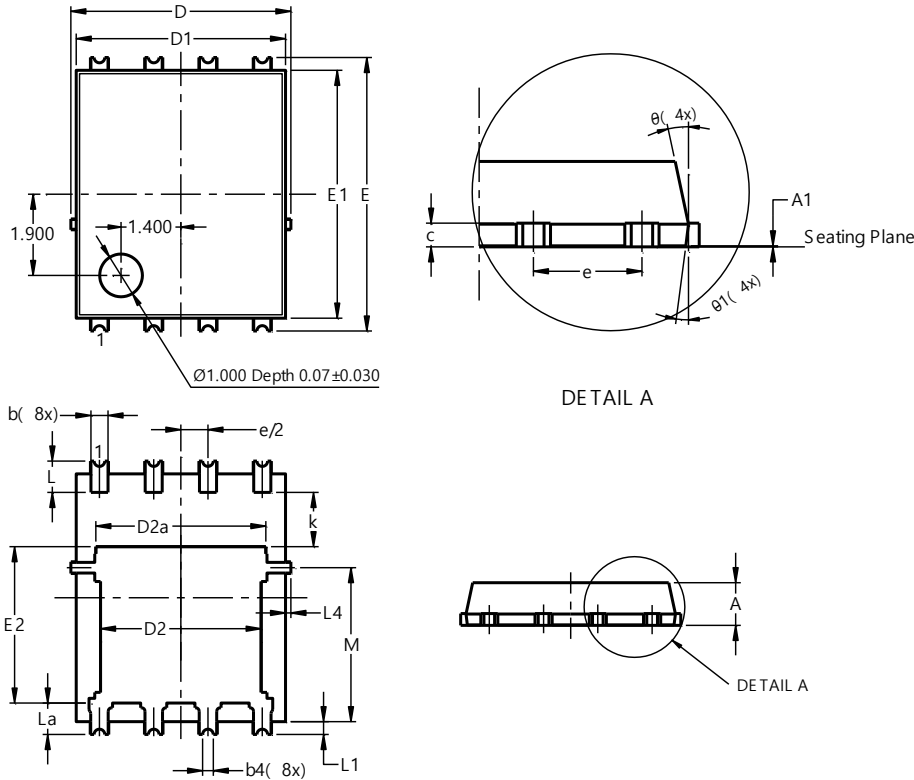
PowerDI5060-8 (SWP) (Type UX)			
Dim	**Min**	**Max**	**Typ**
A	0.90	1.10	1.00
A1	0	0.05	--
b	0.30	0.50	0.41
b2	0.20	0.35	0.25
b4	0.25REF		
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	3.56	3.96	3.76
D2a	3.78	4.18	3.98
E	6.40 BSC		
E1	5.60	6.00	5.80
E2	3.46	3.86	3.66
E2a	4.195	4.595	4.395
e	1.27BSC		
k	1.05	--	--
L	0.635	0.835	0.735
La	0.635	0.835	0.735
L1	0.200	0.400	0.300
L1a	0.050REF		
L4	0.025	0.225	0.125
M	3.205	4.005	3.605
θ	10°	12°	11°
θ1	6°	8°	7°
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI5060-8 (SWP) (Type UX)
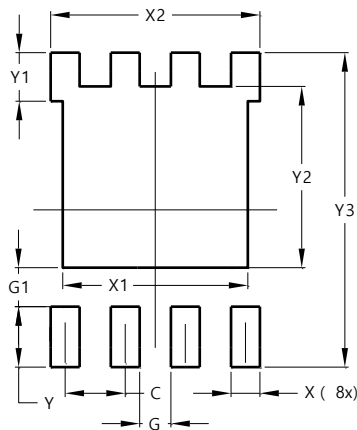
Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	4.100
X2	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

DMT32M5LPSW
Document number: DS42213 Rev. 3 - 2

6 of 7
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September 2021
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IMPORTANT NOTICE

DMT32M5LPSW
Document number: DS42213 Rev. 3 - 2

7 of 7
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