

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _C = +25°C
60V	7.9mΩ @V _{GS} = 10V	69.2A
	10.8mΩ @V _{GS} = 4.5V	59.2A

Description and Applications

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

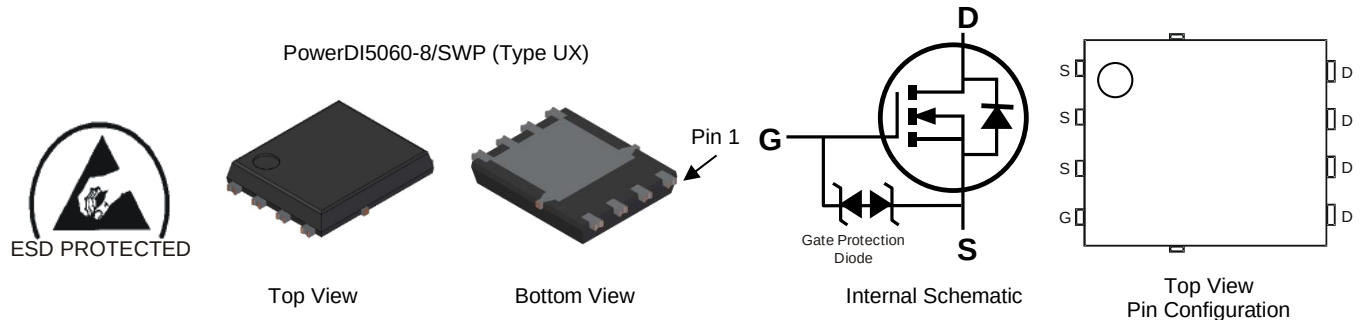
- Synchronous rectifiers
- DC-DC converters
- Power managements

Features and Benefits

- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- High Conversion Efficiency
- Low R_{DS(ON)}—Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate
- **Totally Lead-Free & Fully 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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: PowerDI[®]5060-8
- Package Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 
- Weight: 0.097 grams (Approximate)

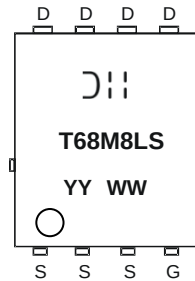


Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMT68M8LPSW-13	PowerDI5060-8/SWP (Type UX)	2500	Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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



DII = Manufacturer's Marking
 T68M8LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 24 = 2024)
 WW = Week Code (01 to 53)

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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	60	V
Gate-Source Voltage		V _{GSS}	±20	V
Continuous Drain Current (Note 5) V _{GS} = 10V	T _A = +25°C	I _D	14.1	A
	T _A = +70°C		11.2	
Continuous Drain Current (Note 6) V _{GS} = 10V	T _C = +25°C	I _D	69.2	A
	T _C = +70°C		55.4	
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)		I _{DM}	270	A
Maximum Continuous Body Diode Forward Current (Note 6)		I _S	69	A
Pulsed Body Diode Forward Current (10μs Pulse, Duty Cycle = 1%)		I _{SM}	270	A
Avalanche Current, L = 0.1mH		I _{AS}	28.1	A
Avalanche Energy, L = 0.1mH		E _{AS}	39.5	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	2.4	W
Thermal Resistance, Junction to Ambient (Note 5)		R _{θJA}	53	°C/W
Total Power Dissipation (Note 6)	T _C = +25°C	P _D	56.8	W
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	2.2	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 substrate PCB, 2oz copper, with 1inch square copper plate.
 6. Thermal resistance from junction to soldering point (on the exposed drain pad).

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}	60	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 48V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	5.9	7.9	mΩ	V _{GS} = 10V, I _D = 20A
		—	7.8	10.8		V _{GS} = 4.5V, I _D = 20A
Diode Forward Voltage	V _{SD}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	2078	—	pF	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	605	—		
Reverse Transfer Capacitance	C _{rss}	—	44	—		
Gate Resistance	R _g	—	1.71	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	14.4	—	nC	V _{DS} = 30V, I _D = 20A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	30	—		
Gate-Source Charge	Q _{gs}	—	4.1	—		
Gate-Drain Charge	Q _{gd}	—	6.7	—		
Turn-On Delay Time	t _{D(ON)}	—	5.2	—	ns	V _{DS} = 30V, V _{GS} = 10V, I _D = 20A, R _G = 3.3Ω
Turn-On Rise Time	t _R	—	9.6	—		
Turn-Off Delay Time	t _{D(OFF)}	—	20.5	—		
Turn-Off Fall Time	t _F	—	8.9	—		
Reverse-Recovery Time	t _{RR}	—	32.5	—	ns	I _F = 20A, di/dt = 100A/μs
Reverse-Recovery Charge	Q _{RR}	—	22.8	—	nC	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

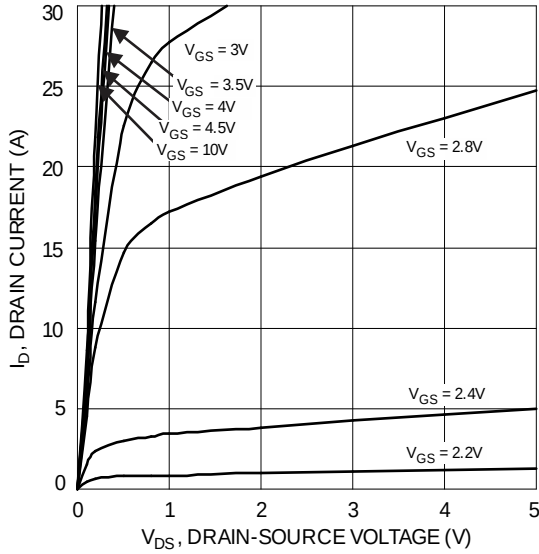


Figure 1 Typical Output Characteristic

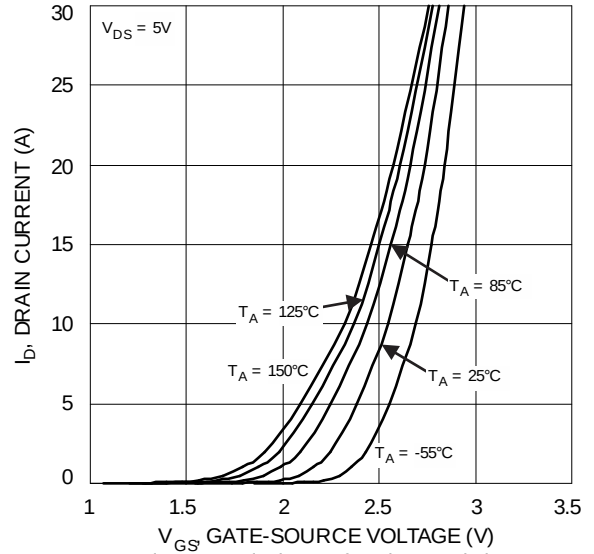


Figure 2 Typical Transfer Characteristics

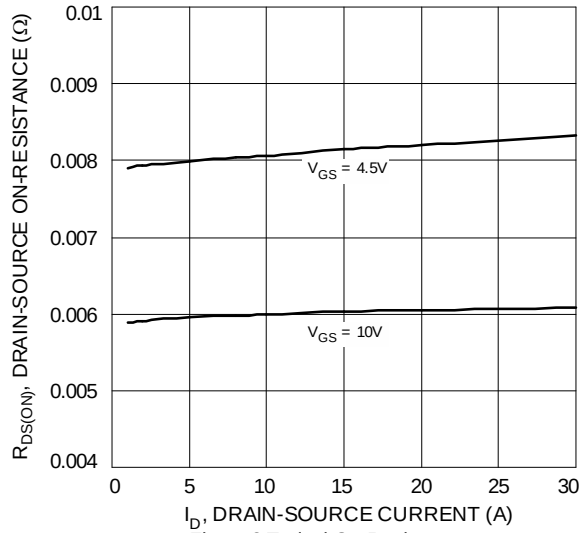


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

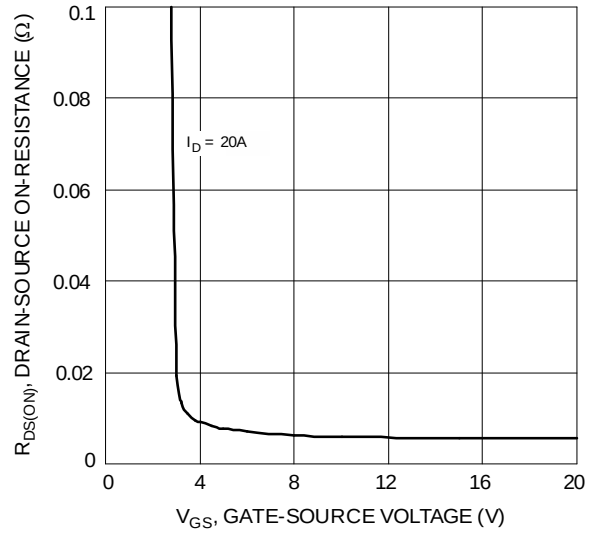


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

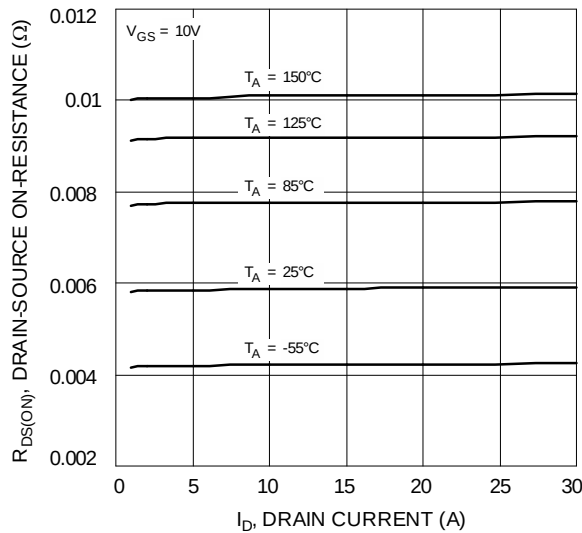


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

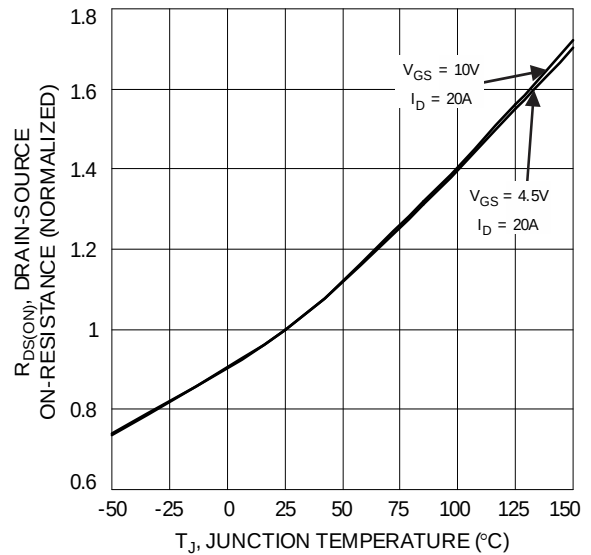
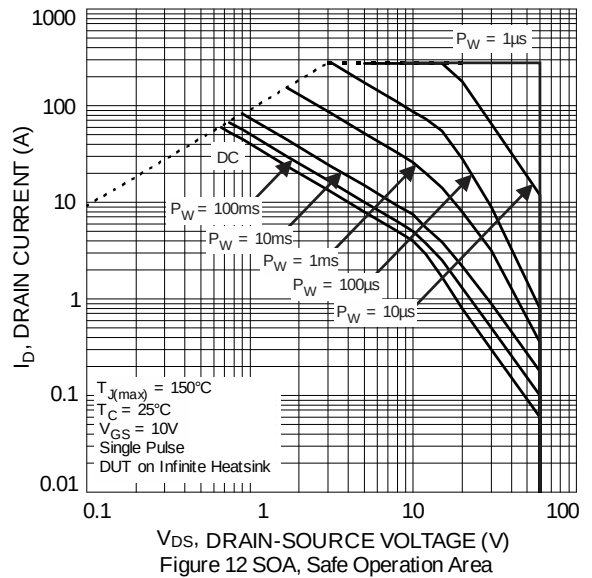
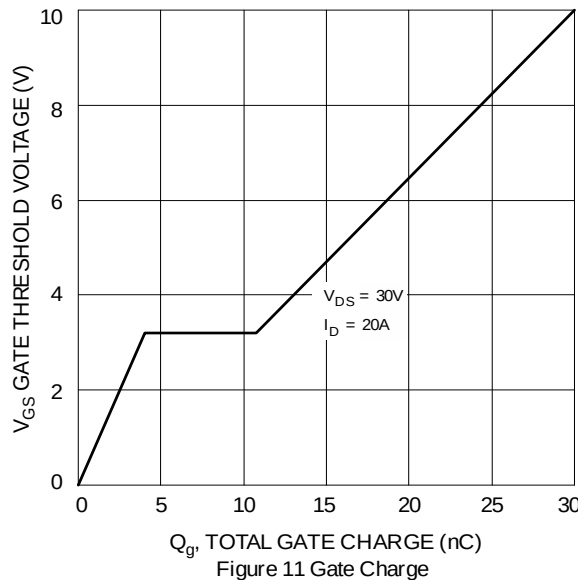
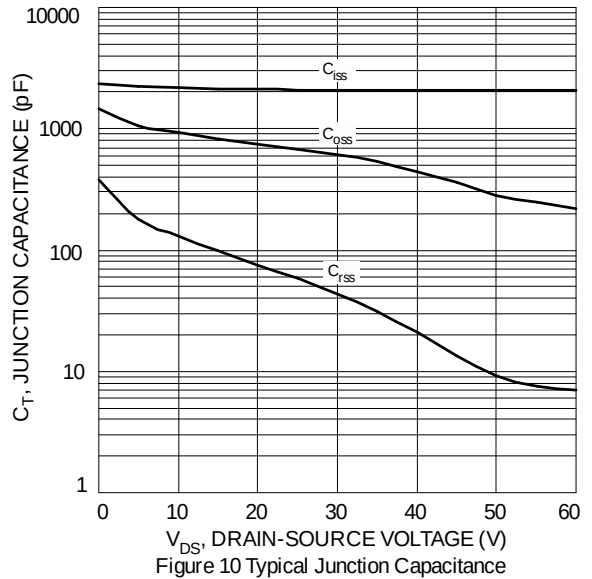
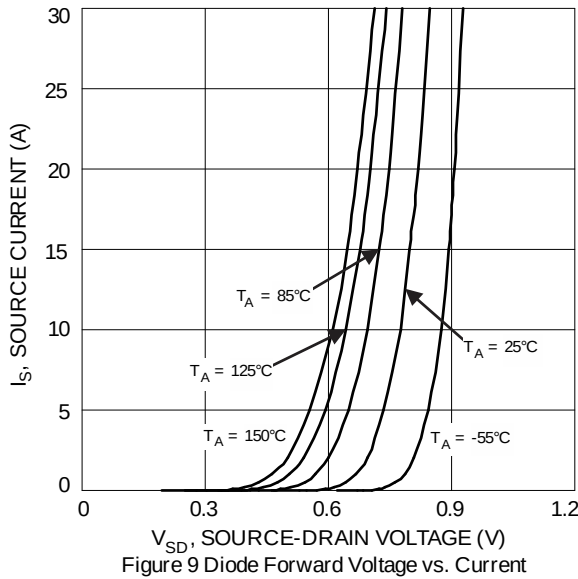
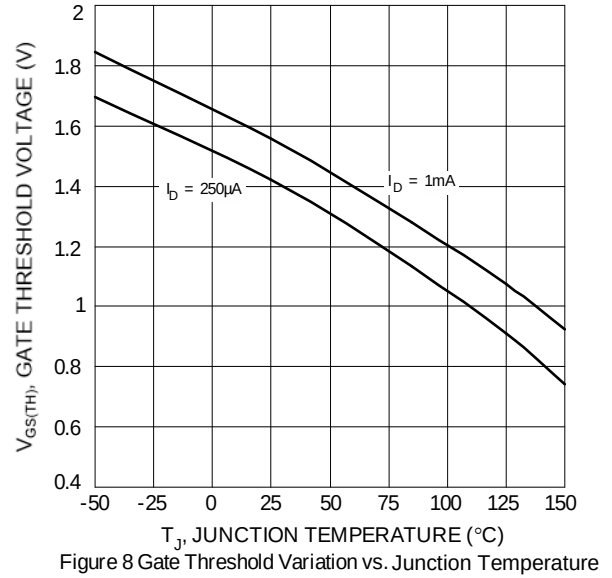
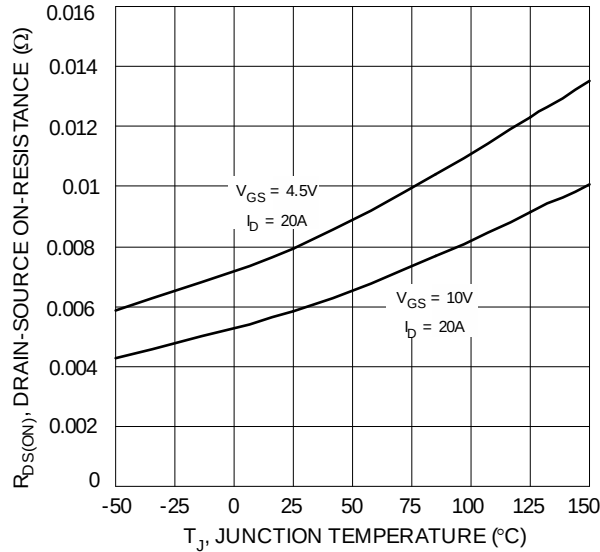
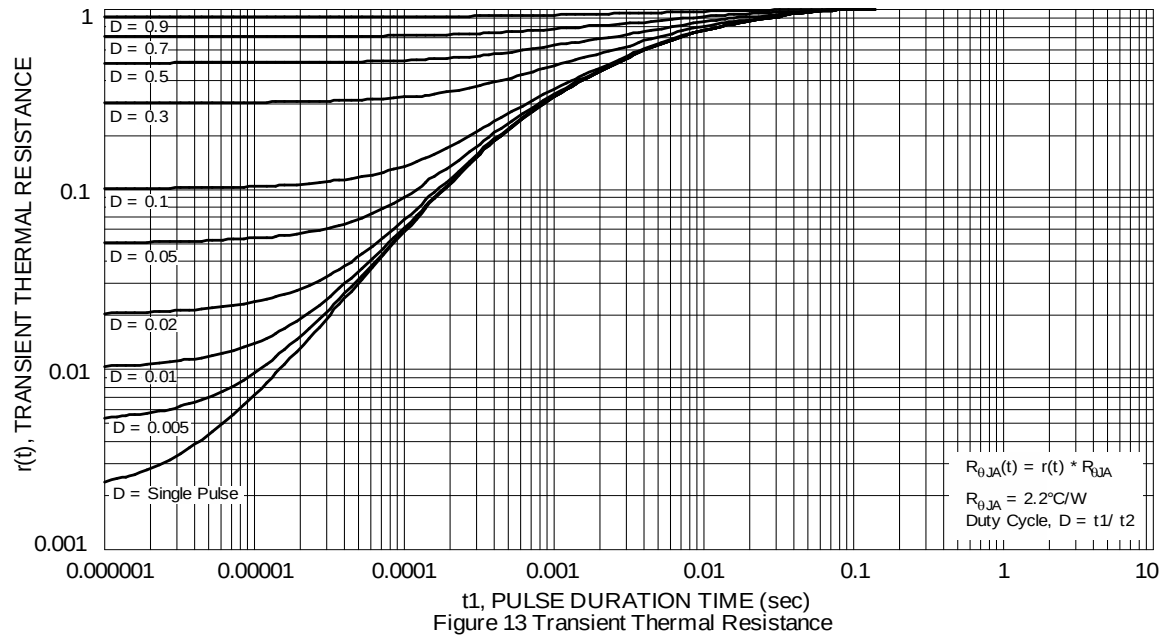


Figure 6 On-Resistance Variation with Temperature





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

Technical drawing of a rectangular metal part, showing three views: Front View, Top View, and Detail A.

Front View: Shows the rectangular body with a central hole. Dimensions include overall width D , inner width $D1$, overall height E , and inner height $E1$. A central hole has a diameter of 1.400 and a depth of 0.07 ± 0.030 . A fillet radius $R(4x)$ is indicated at the bottom corners. A section line $A-A$ is shown.

Top View: Shows the rectangular footprint. Dimensions include overall width D , inner width $D1$, overall height E , and inner height $E1$. A central hole has a diameter of 1.400 and a depth of 0.07 ± 0.030 . A fillet radius $R(4x)$ is indicated at the bottom corners. A section line $A-A$ is shown.

Detail A: Shows a cross-section of the part. Dimensions include the fillet radius $R(4x)$ and the fillet angle $\theta(4x)$. The part is labeled "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
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			

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The figure consists of two parts. The top part is a cross-sectional view of a periodic structure. It shows a central rectangular region with a width of X_1 and a height of Y_2 . This central region is surrounded by a layer of thickness Y_1 and a total width of X_3 . The total height of the structure is Y_3 . The bottom part is a top-down view of the periodic structure, showing a grid of rectangular elements. The width of each element is X , the spacing between elements is C , and the total width of the grid is G . The height of the grid is $Y(4x)$.

Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	4.100
X2	5.190
X3	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

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