Date: - 7th December, 2016

Data Sheet Issue: - 1

Water Cooled Heatsink
Type XW127EA25#

Characteristics – Double side cooling, 2 coolers + 1 Semiconductor

	PARAMETER	TYP.	TEST CONDITIONS	UNITS
$R_{th\ (C/W)}$	Cooler-input water thermal resistance	6.0	6l/m flow rate, Power – 2.5kW	K/kW
$R_{th\ (C/W)}$	Cooler-input water thermal resistance	4.6	10l/m flow rate, Power – 2.5kW	K/kW

Characteristics – Double side cooling, 3 coolers + 2 Semiconductors

	PARAMETER	TYP.	TEST CONDITIONS	UNITS
$R_{th\ (C/W)}$	Cooler-input water thermal resistance	7.5	6l/m flow rate, Power – 2.5kW	K/kW
$R_{th\ (C/W)}$	Cooler-input water thermal resistance	5.3	10l/m flow rate, Power – 2.5kW	K/kW

Physical/Electrical properties

	PARAMETER	MIN.	TYP.	MAX.	TEST CONDITIONS	UNITS
ΔP	Pressure difference between input and output water per cooler	-	72	-	6l/m	kPa
ΔP	Pressure difference between input and output water per cooler	-	170	-	10l/m	kPa
M	Mass without busbar (XW127EA25A)	-	484	-		g
M	Mass with busbar (XW127EA25B)	-	644	-		g
	Dimensions	See outline drawing				

Mechanical properties

	PARAMETER	MIN.	TYP.	MAX.	UNITS
⏥	Flatness of contact area	-	20	-	µm
Ra	Roughness of contact area	-	0.8	-	µm
	Clamping force	-	-	13	N/mm^2
	Finish of contact area	Nickel-plating 10µm bright			
	Hydraulic fitting	1/4” BSPP			

* For other busbar/mechanical configurations please consult the factory.

Notes

The graphs on the following pages are typical values at 2500W.

1.0 - Temperature reference points

Heatsink – in the cooler within 2mm of device centre
Ambient – water temperature at the assembly input.

2.0 - Multiple cooler stacks

2.1 - 2 coolers/1 semiconductor

The temperature of the water entering the last cooler pair should be taken into account. The temperature rise of cooling water along the stack with respect to the ambient input water is (ΔT)W according to the formula shown below: -

$$(\Delta T)W = \frac{14.4 * P(n-1)}{F}$$

Where P is the power (in kW) dissipated in the semiconductor
n is the number of semiconductors
F is the water flow in Litres/min.

The rise in temperature of the last cooler pair with respect to the ambient input water is then: -

$$(\Delta T)C = (\Delta T)W + P * R_{thCW}$$

Where R_{thCW} is obtained from the curve for double side cooling on page 3

2.2 - (n + 1) coolers/n semiconductors (n greater than 2)

In any series stack of coolers with n greater than two, the hottest cooler will usually be the penultimate one in the down stream direction.
The inlet water temperature rise to the last but one cooler (relative to stack inlet) may be calculated according to:

$$(\Delta T)W = \frac{14.4 * P(2n-3)}{2F}$$

The effective temperature rise of the penultimate cooler with respect to the stack input water is given by:

$$(\Delta T)C = (\Delta T)W + P * R_{thCW}$$

Where R_{thCW} is obtained from the curve for 3 coolers on page 3

Curves

Figure 1 – Steady state thermal resistance vs Water flow

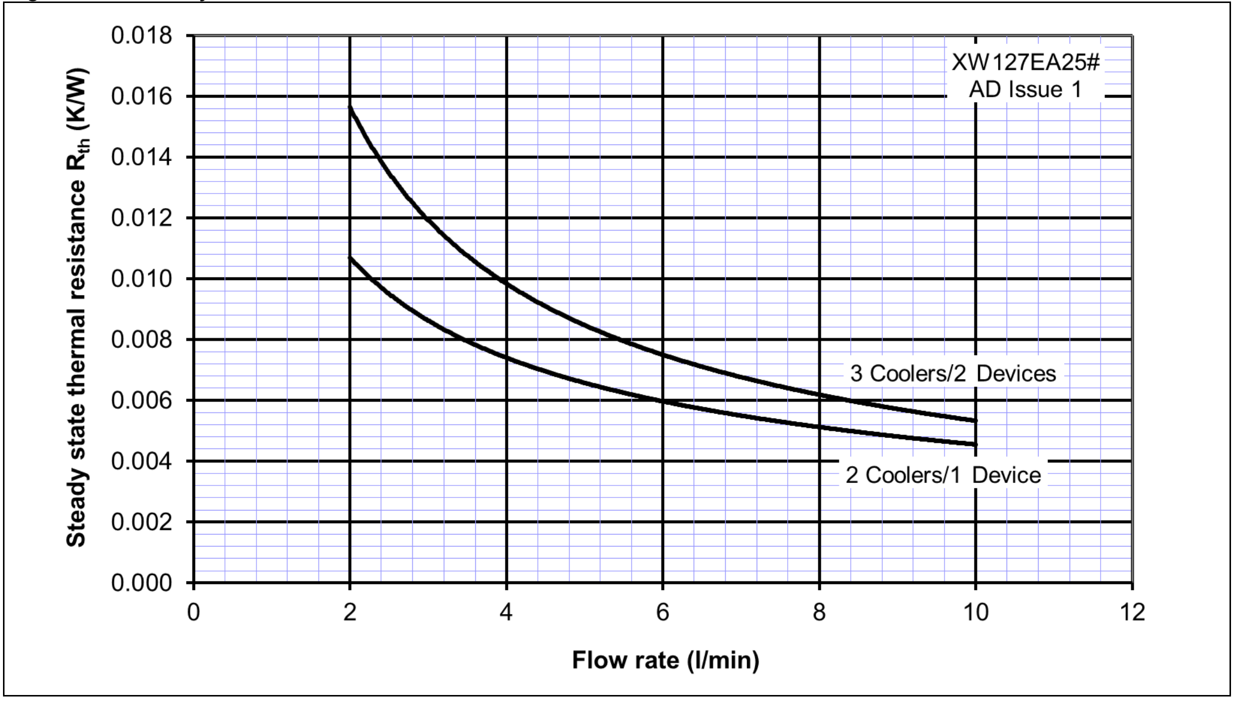


Figure 2 – Transient thermal impedance vs Time

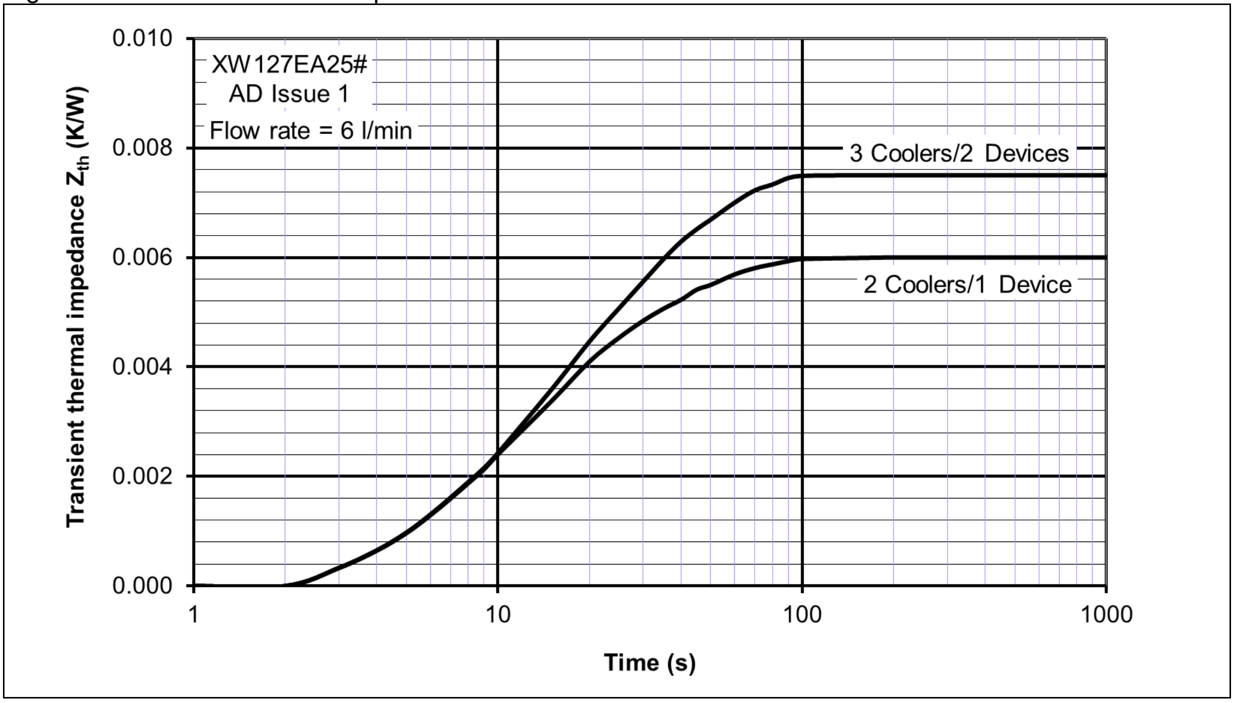
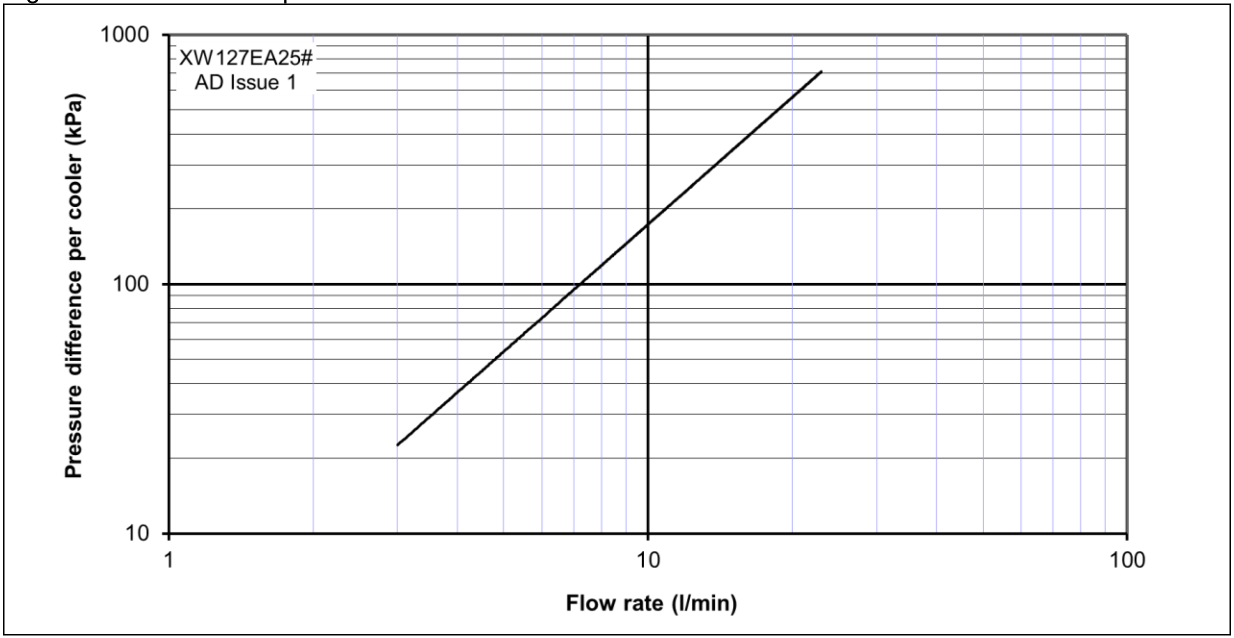
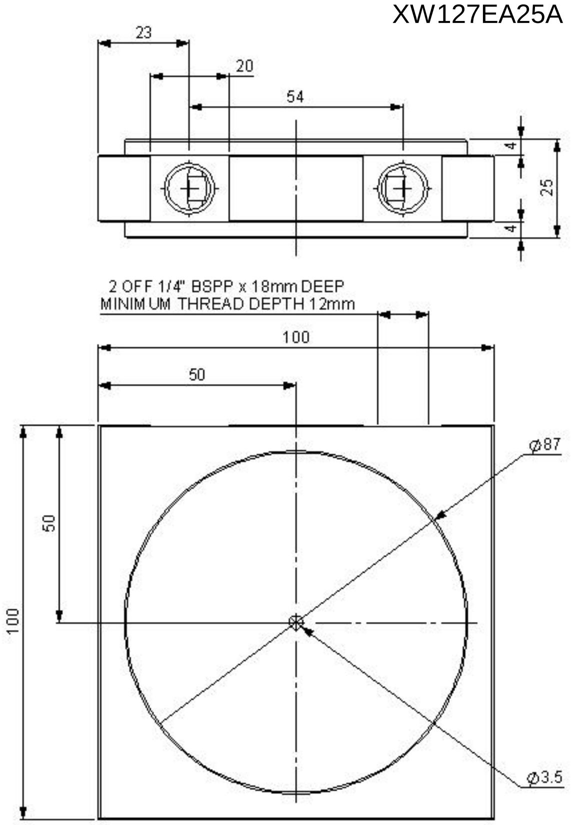


Figure 3 – Pressure drop vs Water flow

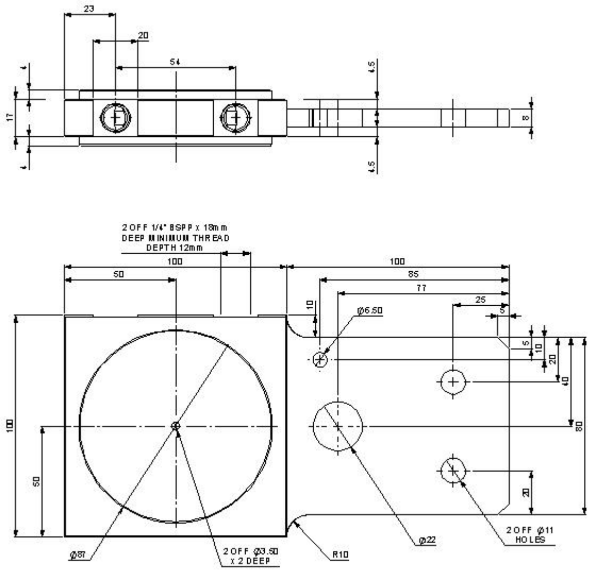


Outline Drawing & Ordering Information

XW127EA25A



XW127EA25B



ORDERING INFORMATION

(Please quote order code as below)

XW	127	E	A	25	#
Water cooler	Maximum flange diameter (mm)	Nominal poleface diameter	Material A = Aluminium	Cooler thickness (mm)	A = No busbar B = Busbar

Typical order code: XW127EA25A – Assemblies water cooler, 127mm maximum flange diameter, made from aluminium, 25mm thick with no busbar.

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