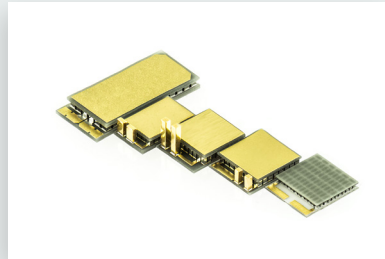


TECs for Box TOSAs

Technical Data Sheet

Phononic's high-performance TEC solutions for box TOSA (transmit optical subassembly) laser packages deliver excellent cooling for applications of 100G or higher. They work well in QSFP transceiver packages, and are perfectly suited for cooled long reach requirements that are in demand from the growth of co-located and regional data centers. Customers are also working with us on their single-wavelength 100G+ applications.



With inside-the-package differentiation and options supporting 400G, our TEC series will meet the needs of your box TOSA laser package regardless of factors like speed or distance. Leverage our expertise to plan your future product roadmap. We will not limit you to standard products; our solutions can be specifically designed and optimized to your needs.



Features

- Lower power consumption
- Higher heat pumping density
- Supports 100G-400G applications
- Suited for long reaches
- Compatible with I-temp or C-temp ranges
- Application-specific designs available

Excellent for Long-Reach and High-Speed Applications

End-Customer Applications

- CFPx MSA transceivers
- OSFP, QSFP28 and QSFP-DD (Quad Small Form Factor Pluggable) transceivers
- 100G DR1/LR1/LR4 TOSAs
- 400G DR4/FR4/LR4/ FR8/LR8 TOSAs
- 100G/200G/400G+ Coherent
- High data rate LAN-WDM and DWDM (dense wavelength division multiplexing)
- I-Temp QSFP28 TOSAs for wireless fronthaul applications

Integration Options

- Bare wire bond pads
- Wire bonding posts
- Cold side electrical connections
- High-temperature solder
- Solder pre-tinning
- Patterned cold-side metallization
- Pre-attached cold-side thermistor
- Automation-ready packaging

Benefits:



Extremely Low Power Consumption

Achieve 30% lower power consumption than typical TEC performance



High Heat Pumping Density

Realize 60% higher heat pumping density in a very thin TEC - our pico-TEC platform is perfect for data center and telecom applications

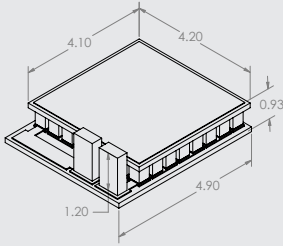
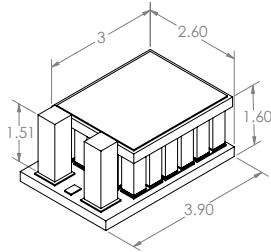
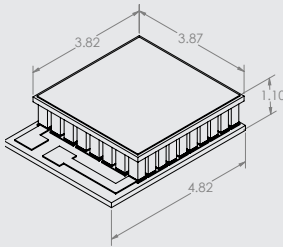
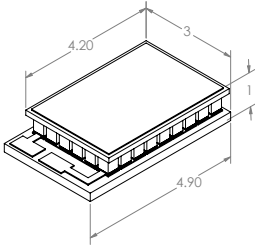
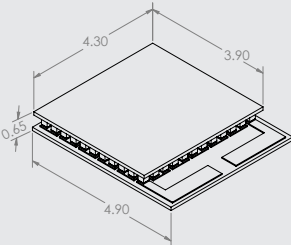


Exceptional Design Support

Benefit from our expertise: we'll consult with you, enabling faster time to market with a design done right the first time

Box TOSA Product Specifications

TEC Performance ($T_{HOT} = 75^{\circ}C$)

Part Number	TEC Dimensions	AC Resistance (Ω)	Optimum heat load (Watts)*	$Q_{C,MAX}$ [Watts]	ΔT_{MAX} [$^{\circ}C$]	V_{MAX} [Volts]	I_{MAX} [Amps]
FBM-013165		2.7	0.5 - 1.6	4.75	89	5.26	1.6
FBM-012893		2.6	0.12 - 0.4	1.2	92	2.5	0.8
FBM-012891		7.1	0.3 - 1.0	2.94	90	6.6	0.8
FBM-012894		2.3	0.4 - 1.3	4	88	4.4	1.6
FBP-009364		9.4	0.5 - 1.7	5.1	80	10.4	0.9

* Optimal heat load is the cold side heat load range under which the TEC operates at or near highest efficiency conditions. Hot side temperature is $75^{\circ}C$, cold side temperature is $45^{\circ}C$ to $55^{\circ}C$.

Version 2008B