

MICRO DC/DC

COOLPOST

The next step in DC/DC + Coil Integration!

Ultra-Compact with High Efficiency

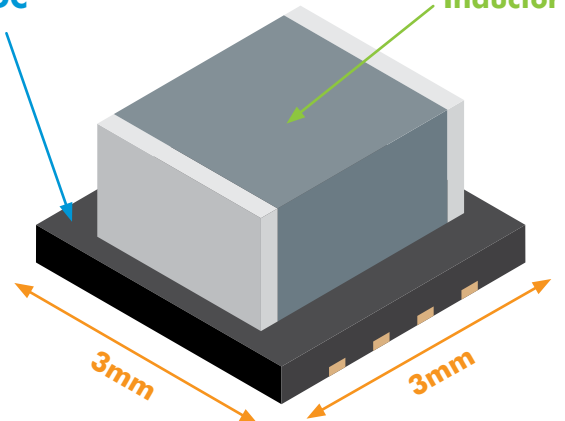
- Supports Larger Coil Dimensions
- Optimised for Mid Voltage and High Current DC/DC

More than 30% Better Heat Dissipation

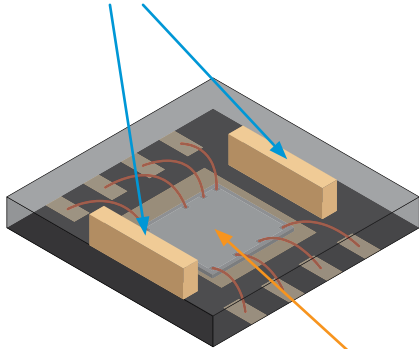
- Large Copper CoolPost Connectors
- DC/DC Directly Mounted on Thermal Pad
- Very Low Impedance

DC/DC Chip

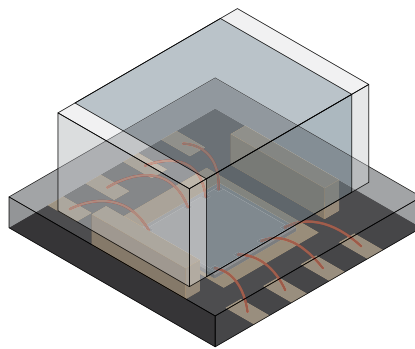
Inductor



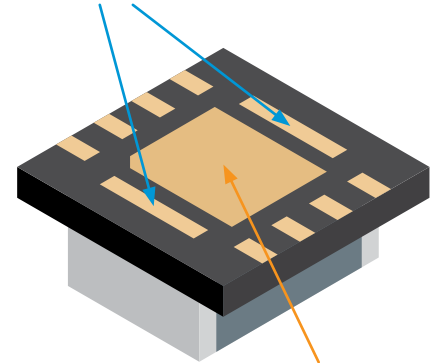
Copper CoolPosts



DC/DC IC



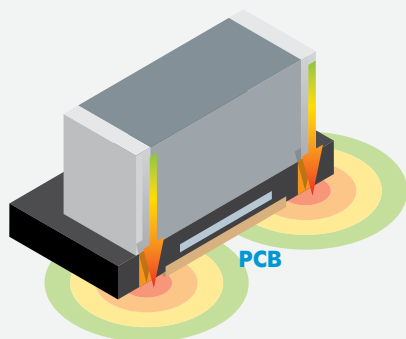
CoolPost Pads



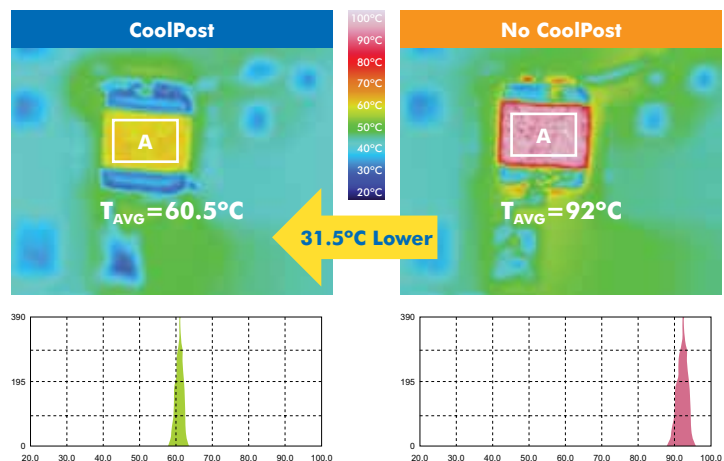
DC/DC Thermal Pad

IMPROVED THERMAL PERFORMANCE WITH COPPER COOLPOST STRUCTURE

Torex has incorporated Copper CoolPosts into the DFN3030-10B package to connect the Inductor directly to the PCB footprint through the package. In addition, the DC/DC die is mounted directly on to the large thermal pad and this significantly increases the thermal performance of the package and gives much better heat dissipation.



Improved Thermal Performance by more than 30%



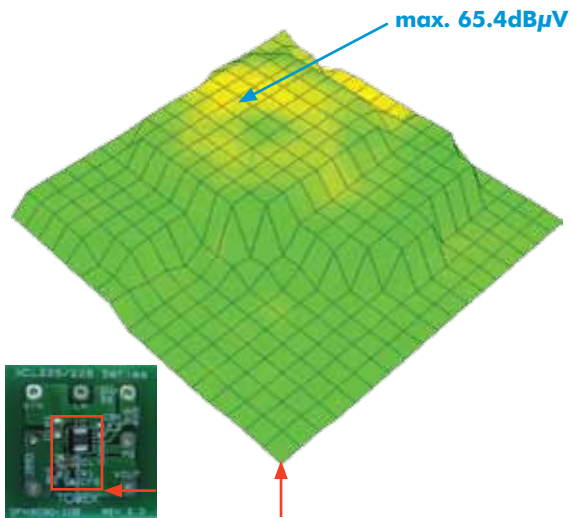
Coil Body Temperature
(1400mA coil current at TA:28°C)

LOW RADIATED NOISE

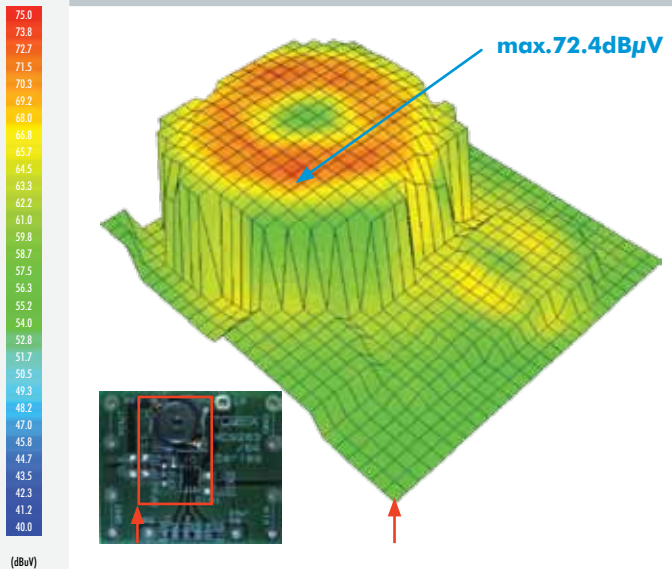
Below we compare the near magnetic field radiation generated by the XCL226B0K1H2 Micro DC/DC with CoolPost technology against the performance of our XC9264B75CER-G DC/DC with external coil.

Test conditions: $V_{IN}=12$, $V_{OUT}=3.3V$, $I_{OUT}=100mA$.

XCL226B0K1H2



XC9264B75CER-G + EXTERNAL COIL



The XCL225/26 and XCL230/31 series also pass EN55022 (CISPR 22) CLASS B with good margin

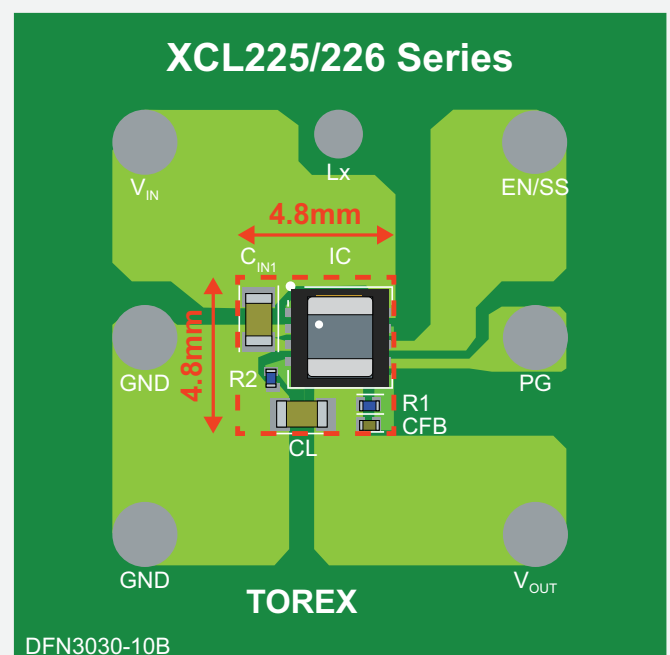
OPTIMISED FOR SPACE CONSTRAINED APPLICATIONS

- ✓ **Small PCB Area, only 23mm²**
- ✓ **Reduced Design Complexity**

The required circuit area for the CoolPost Micro DC/DC family is significantly smaller than the equivalent external coil solution.

The space saving and simplified overall design makes the XCL family ideally suited for various applications such as:

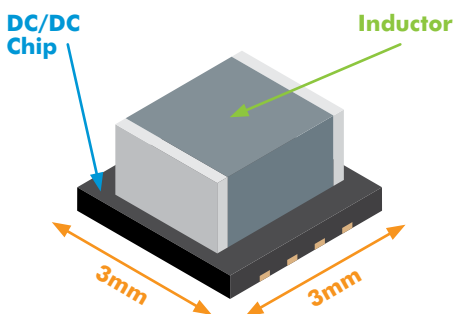
- Industrial IoT (Smart Factory)
- 4-20mA Current-Loop
- HVAC and Building Control
- Security & Home Automation
- High Voltage LDO Replacement
- Point of Load: 12V & 24V Systems



MICRO DC/DC

XCL225/26/30/31 18V/36V Step-Down DC/DC with Integrated Coil

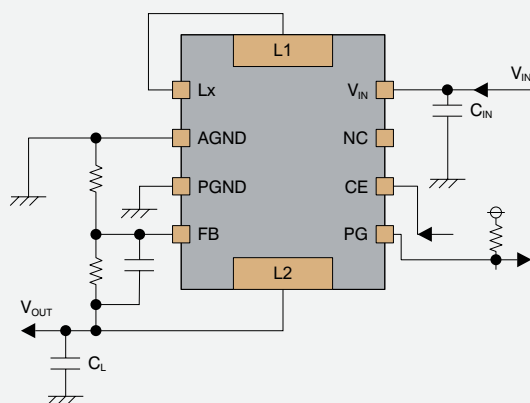
- ▶ **Wide 3V to 36V Input Range**
 - VIN Surge: 46V ($\leq 400\text{ms}$)
- ▶ **Integrated Coil Structure**
 - More than 50% Saving in PCB Area
 - Reduced Design Complexity
 - Minimized EMI Noise
- ▶ **Ultra-Low Quiescent Current**
 - 11.6 μA in Sleep Mode
 - 1.65 μA in Standby
- ▶ **Enhanced Thermal Performance**
 - CoolPost Structure
 - Exposed Thermal Pad Package
 - Ta: -40°C ~ +105°C
- ▶ **Pin-Out Compatible**



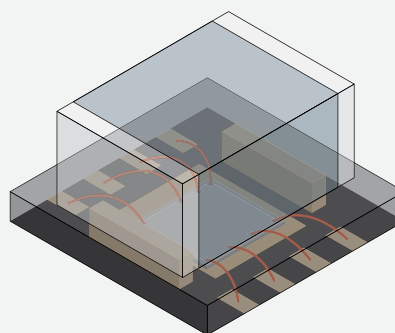
1.7mm high
0.5mm pitch

SERIES		XCL225	XCL226	XCL230	XCL231
Output Current		500mA		600mA	
ON Resistance	P-Ch	0.99 Ω (typ)		1.12 Ω (typ)	
	N-Ch	0.69 Ω (typ)		0.44 Ω (typ)	
Input Voltage Range		3.0V ~ 18V (Ab. Max 20V)		3.0V ~ 36V (Ab. Max 40V)	
VIN Surge Voltage		-		46V $\leq 400\text{ms}$	
FB Voltage		0.75V $\pm 1.5\%$		0.75V $\pm 1.5\%$	
Output Voltage Range		1.0V ~ 15.0V		1.0V ~ 5.0V	
Switching Frequency		1.2MHz		1.2MHz	
Quiescent Current (typ.)		90 μA	12.5 μA	180 μA	11.6 μA
Control Method		PWM	PWM/PFM	PWM	PWM/PFM
Max Duty Cycle		100%			
Protection Circuits		Current Limit, Short Circuit, UVLO, Thermal Shutdown			
Additional Features		Adjustable Soft-start Power Good Output			
Package		DFN3030-10B			

TYPICAL APPLICATION CIRCUIT



PACKAGE CONSTRUCTION



STANDARD EVB's READILY AVAILABLE

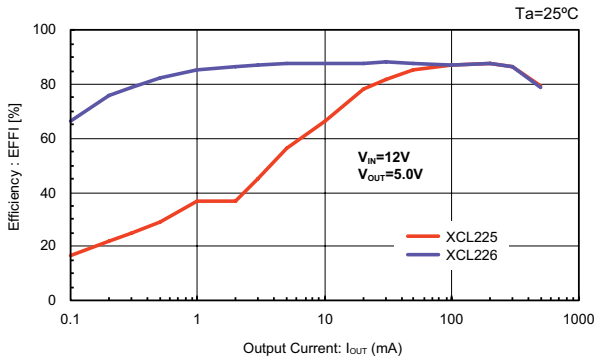


EVB Part Number	IC Part Number	Control Method	Test Specification		
			V _{IN}	V _{OUT}	I _{OUT}
XCL225B0K1H-EVB 3.3V	XCL225B0K1H2	PWM	16V, 12V, 6.0V	3.3V	500mA
XCL226B0K1H-EVB 3.3V	XCL226B0K1H2	PFM/PWM	16V, 12V, 6.0V	3.3V	500mA
XCL230B0K1H-EVB 5.0V	XCL230B0K1H2	PWM	24V, 12V	5.0V	600mA
XCL231B0K1H-EVB 5.0V*	XCL231B0K1H2	PFM/PWM	24V, 12V	5.0V	600mA

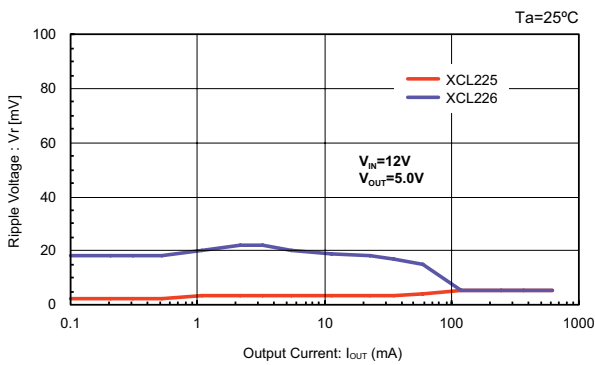
*Available from January 2019

XCL225/26

EFFICIENCY VS. OUTPUT CURRENT

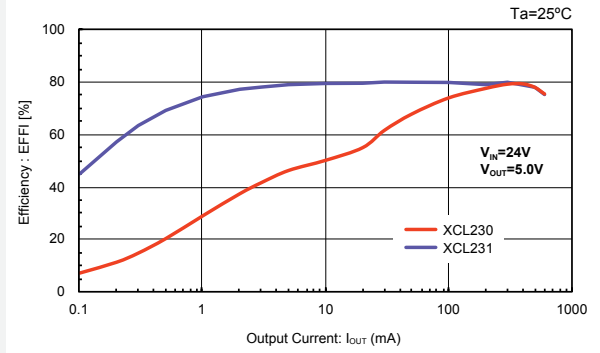


OUTPUT RIPPLE VS. OUTPUT CURRENT

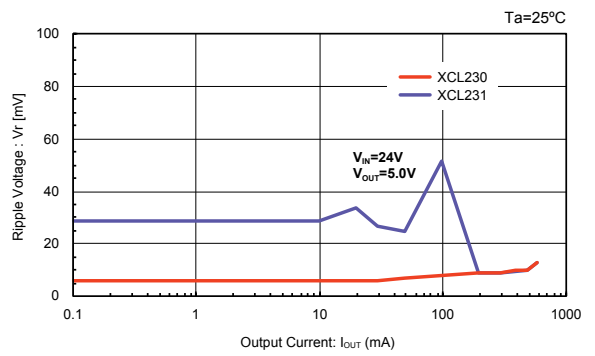


XCL230/31

EFFICIENCY VS. OUTPUT CURRENT

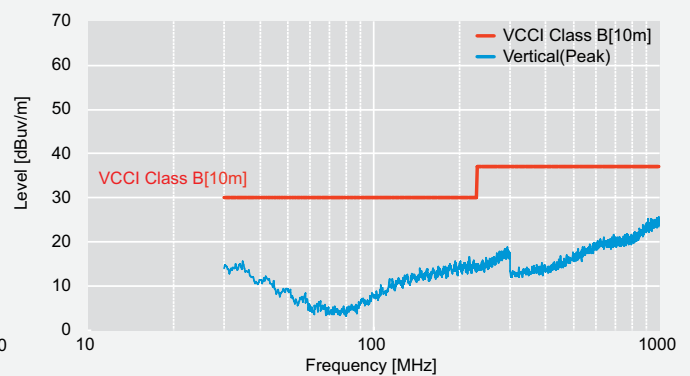
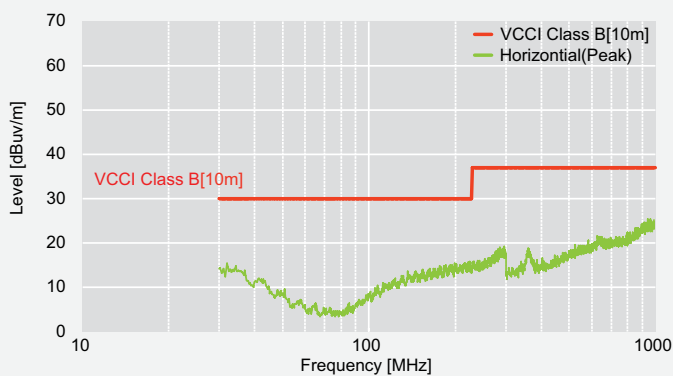


OUTPUT RIPPLE VS. OUTPUT CURRENT



LOW EMI

XCL226B0K1H2 Test Conditions: $V_{in} = 12\text{V}$, $V_{out} = 3.3\text{V}$, $I_{out} = 0.2\text{A}$



The XCL225/26 and XCL230/31 pass EN55022 (CISPR 22) Class B with good margin