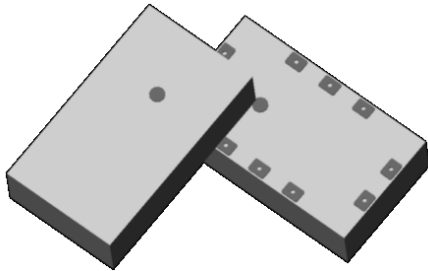


# Xinger®

## Ultra Low Profile 1608 Balun 50Ω to 200Ω Balanced



### Description

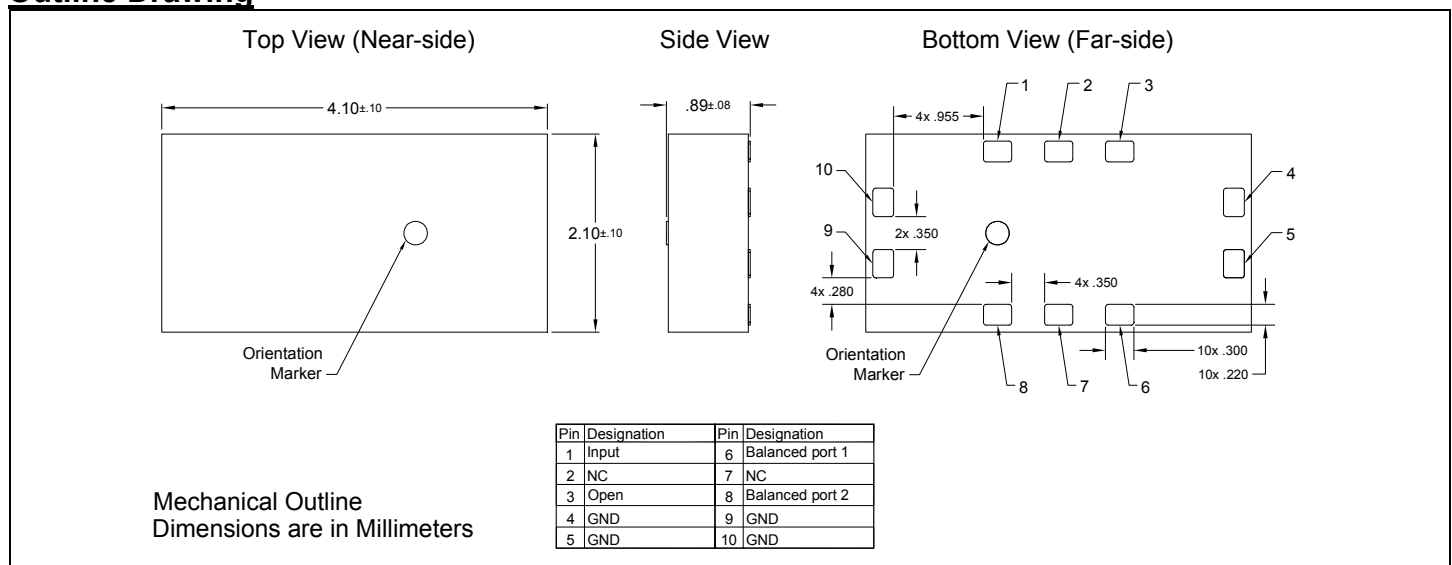
The B0205F50200AHF is a low profile sub-miniature balanced to unbalanced transformer designed for differential input locations on data conversion devices (A to D converters). In an easy to use surface mount package covering 200 MHz to 500 MHz and superior CMRR performance, this transformer is optimized to offer improved SFDR management during operation of the data converter device. The B0205F50200AHF is ideal for high volume manufacturing and is higher performance and smaller form factor than traditional wire wound transformers. The B0205F50200AHF has an unbalanced port impedance of 50Ω and a 200Ω balanced port impedance. This transformation enables single ended signals to be applied to differential ports on the data converter devices. The output ports have equal amplitude (-3dB) with 180 degree phase differential. The B0205F50200AHF is available on tape and reel for pick and place high volume manufacturing.

### Detailed Electrical Specifications: Specifications subject to change without notice.

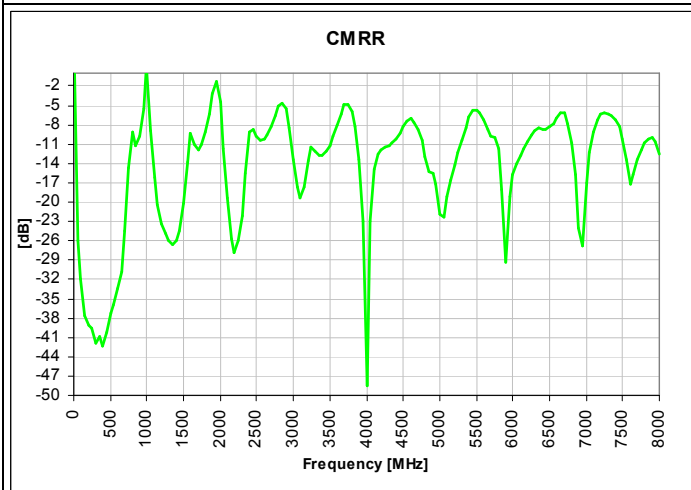
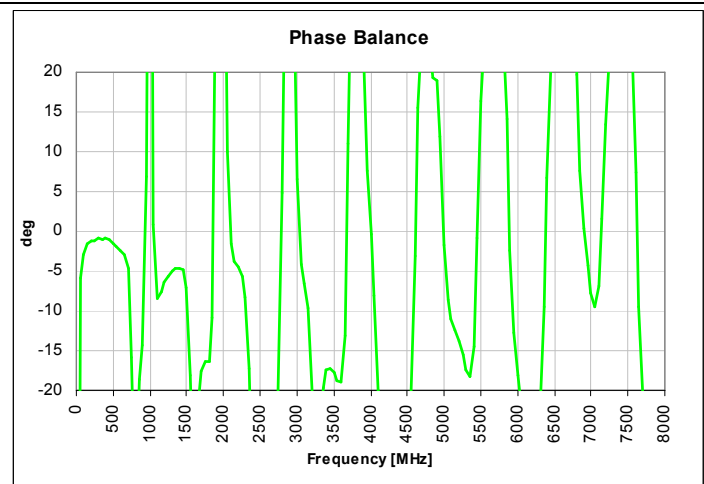
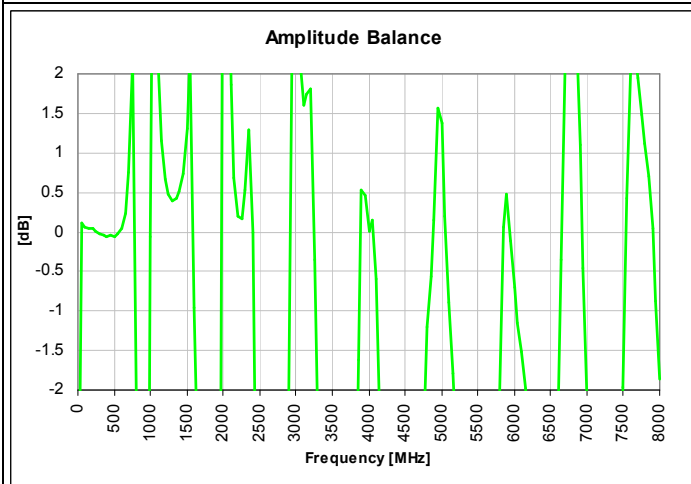
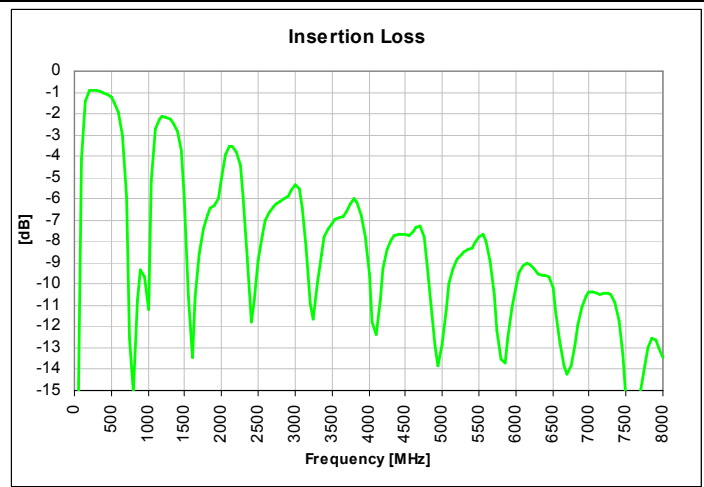
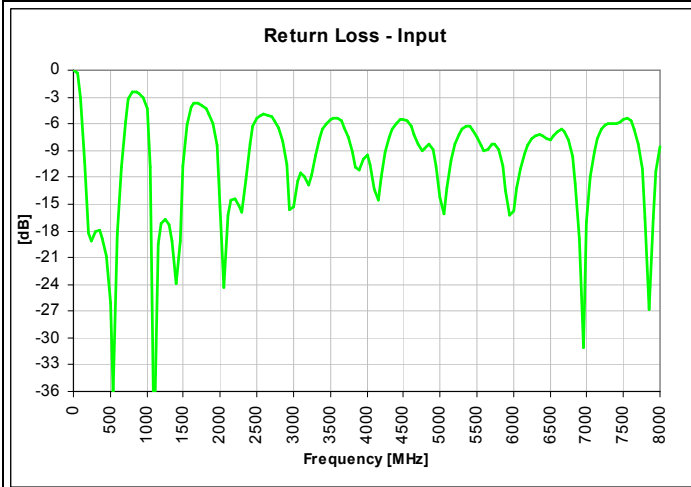
Features:	Parameter	ROOM (25°C)			Unit
		Min.	Typ.	Max	
<ul style="list-style-type: none"> <li>• 125 –700 MHz (IL 3dB BW)</li> <li>• 200 – 500 MHz (IL 1dB BW)</li> <li>• 0.83 mm Height Profile</li> <li>• 50 Ohm to 2 x 100 Ohm</li> <li>• Excellent CMRR</li> <li>• Input to Output DC Isolation</li> <li>• Surface Mountable</li> <li>• Tape &amp; Reel</li> <li>• Non-conductive Top Surface</li> <li>• RoHS Compliant</li> <li>• Halogen Free</li> </ul>	Frequency	200		500	MHz
	Unbalanced Port Impedance		50		Ω
	Balanced Port Impedance		200		Ω
	Return Loss	13.9	17.7		dB
	Insertion Loss*		1.3	1.6	dB
	Amplitude Balance		0.1	0.4	dB
	Phase Balance		1.3	3.1	Degrees
	CMRR		38.2		dB
	Power Handling			2	Watts
	Operating Temperature	-55		+85	°C

\* Insertion Loss stated at room temperature (Insertion Loss is approximately 0.1 dB higher at +85 °C)

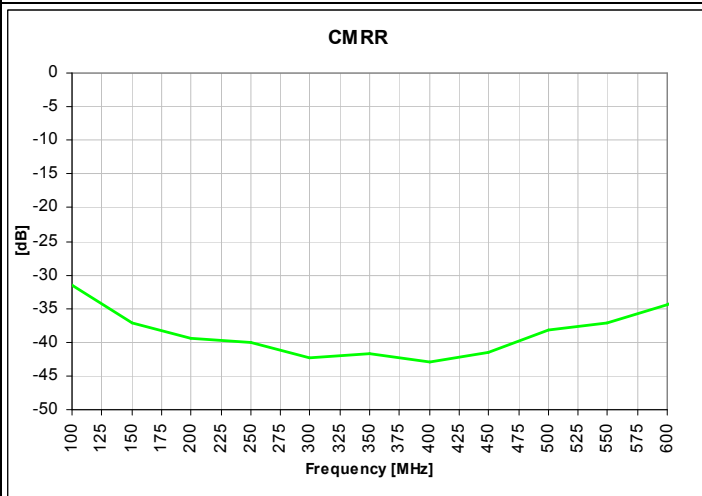
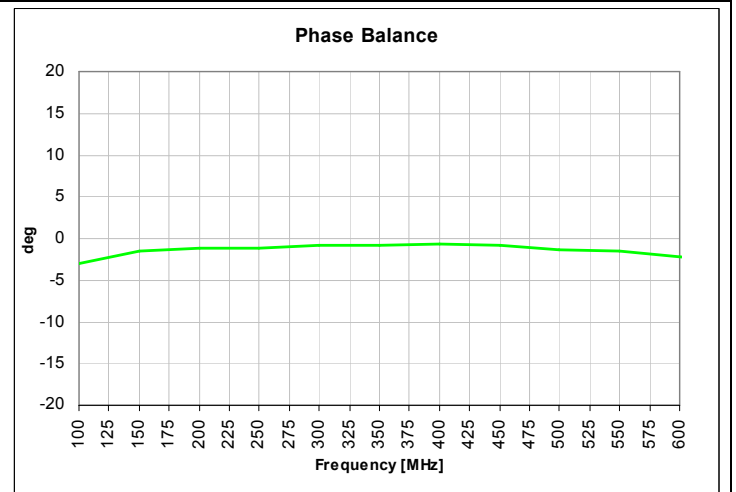
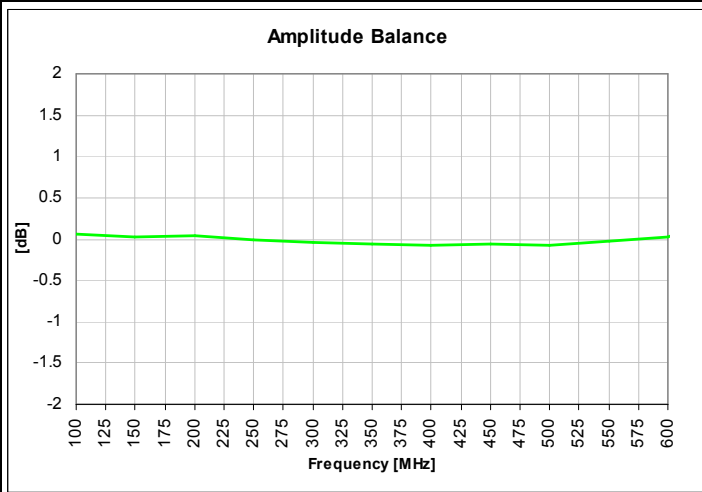
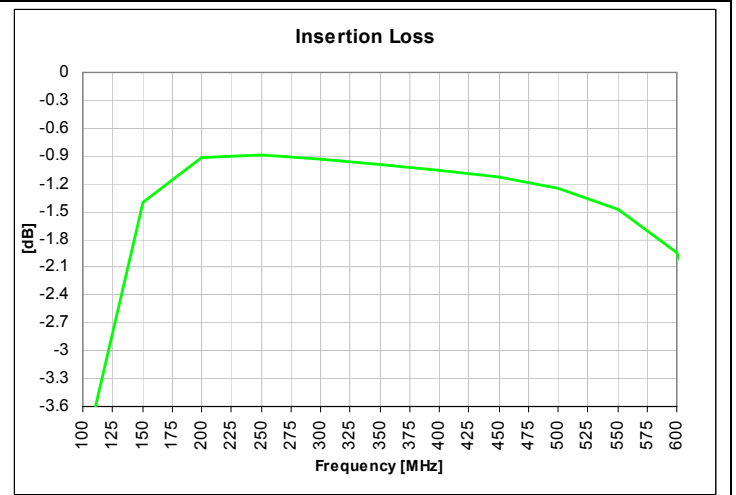
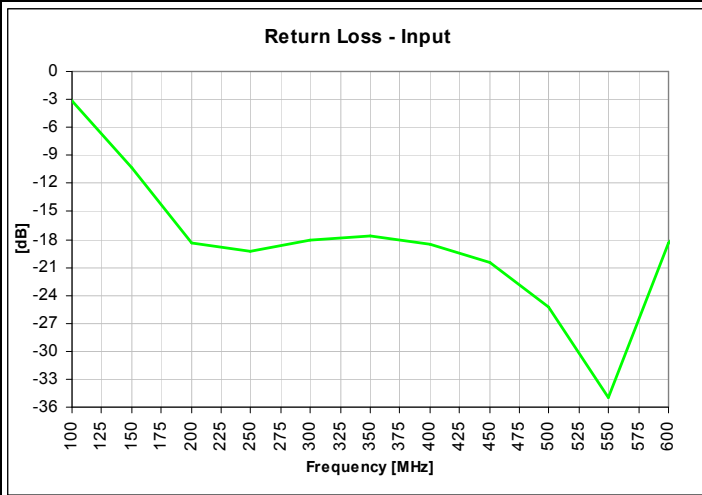
### Outline Drawing



## Typical Broadband Performance: 0 - 8.0 GHz.



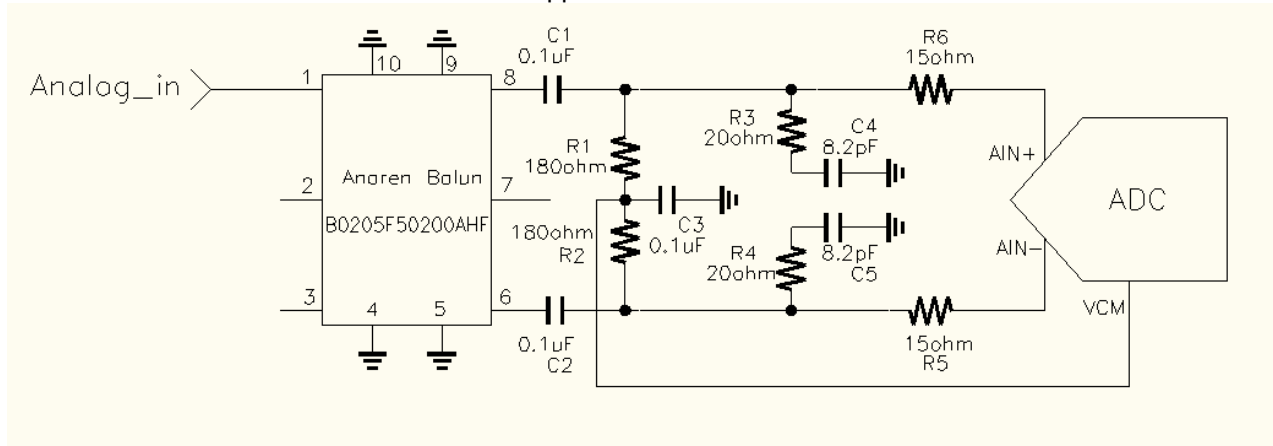
### Typical Performance: 100 MHz. to 600 MHz.



## Application in ADC Frontend:

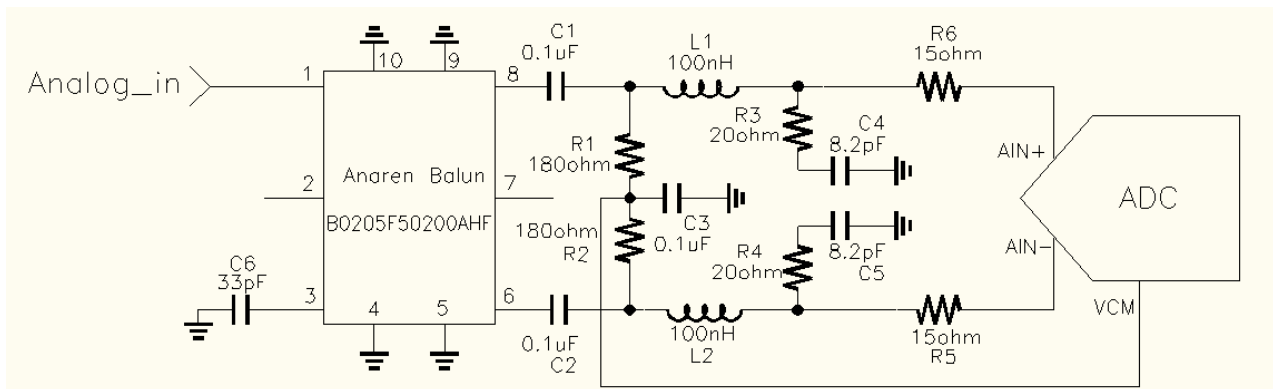
Modern Analog-to-Digital Converter (ADC) system often uses differential architecture to suppress the even-order harmonics, minimize noise interference and keep dynamic range high. The performance of ADC system is heavily influenced by amplitude and phase imbalances arising from the ADC frontend, especially in high frequency applications. Anaren's multi-layer balun B0205F50200AHF offers superb amplitude and phase balance performance over wide frequency range, translating to excellent SFDR performance of the ADC system. B0205F50200AHF is a ferrite free design eliminating related inter-modulation and other non-linear effects. B0205F50200AHF has impedance transforming ratio of 1:4 with voltage gain of 6dB higher than 1:1 balun, which reduces the input drive requirement. Anaren's highly repeatable manufacturing process results in little part to part variation, ensuring consistent performance in production.

A typical ADC front end application is shown below. In conjunction with many high speed ADC ICs, bandwidth of 100MHz to 250MHz can be obtained for -1dB ripple of gain flatness. R1 and R2, in shunt with the input impedance of ADC, supply the balun with required differential load. The series resistors, R5 and R6 are used to limit the amount of charge injection from the unbuffered ADC back into the analog input. Optional RC circuits, R3, R4, C4 and C5 further improve SDFR in many circumstances by supplying an additional current path to neutralize the charge injection. These values are also chosen to limit or extend the ADC application bandwidth.



ADC frontend schematic for IF 100 MHz to 250MHz using B0205F50200AHF

A low frequency solution can be realized by adding additional tuning components C6, L1 and L2. The -1dB ripple of gain flatness is achieved for IF band of 50MHz to 110MHz.



ADC frontend schematic for IF 50MHz to 110MHz using B0205F50200AHF

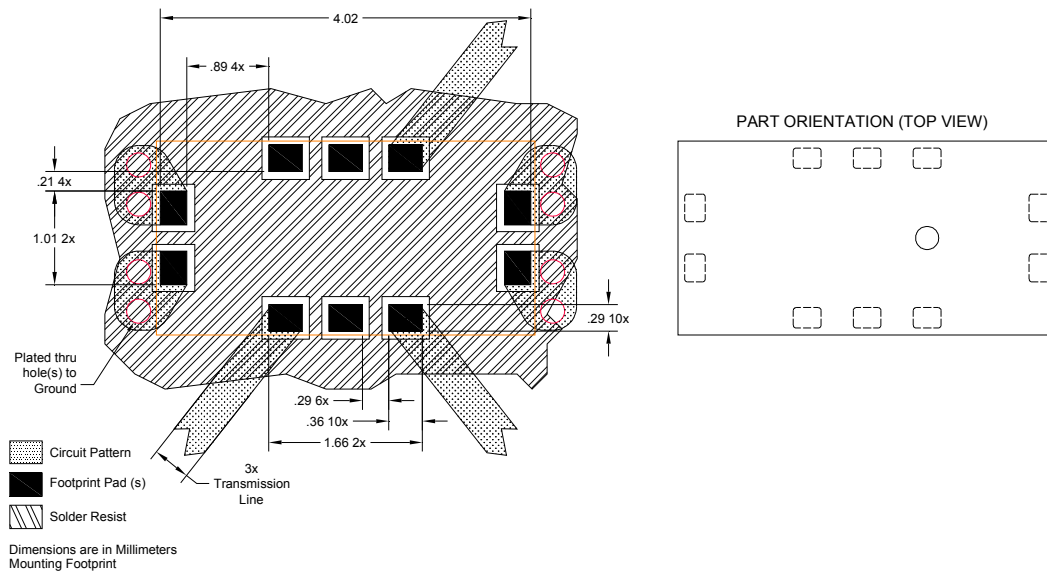
### Mounting Configuration:

In order for Xinger surface mount components to work optimally, the proper impedance transmission lines must be used to connect to the RF ports. If this condition is not satisfied, insertion loss, Isolation and VSWR may not meet published specifications.

All of the Xinger components are constructed from organic PTFE based composites which possess excellent electrical and mechanical stability. Xinger components are compliant to a variety of ROHS and Green standards and ready for Pb-free soldering processes. Pads are Gold plated with a Nickel barrier.

**To supply common mode voltage offset to the analog-to-digital converter, DC blocking capacitors are needed at the balanced port (pins 6 & 8).**

An example of the PCB footprint used in the testing of these parts is shown below. In specific designs, the transmission line widths need to be adjusted to the unique dielectric coefficients and thicknesses as well as varying pick and place equipment tolerances.



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