



Sub-18GHz Tuners

0.1-18GHz Fundamental & Harmonic Tuners



Introduction | Sub-18GHz Fundamental & Harmonic Tuners

Focus Microwaves manufactures wideband coaxial impedance tuners since 1989. For connectorized measurement applications, Focus has established a large portfolio of sub-18GHz tuners in fundamental (C) and harmonic (L for 2F0, M for 3F0) variations. All Focus coaxial tuners have between 1 and 9 wideband tuning probes, enabling the largest measurement bandwidths available on the market.

These multiple probes also offer an independent control of the amplitude and phase of the reflection factor at all three harmonic frequencies simultaneously. The robust probes (slugs) are designed for optimal tuning accuracy and are free of spurious resonances. The combination of multiple probes provides ultra-wideband coverage in a single tuner. The fundamental (C) tuners are ideal for ruggedness testing, high power applications, spur testing and wideband noise parameter extraction. The fundamental (C) series of tuners is also available in shielded format. Shielding option is used to protect the devices from exposure to unintended signals.

The Focus harmonic tuners' performance is unmatched and its capabilities make it the most popular tuner on the market today. M (3 harmonic) and L (2 harmonic) series tuners use multiple wideband probes, allowing independent control of the reflection factors at all three harmonic frequencies simultaneously. These tuners are widely used for advanced non linear device characterization to extract maximum power/efficiency for RF amplifier design. By controlling the harmonic impedances at the source and load, the user benefits from achieving higher device performance and also generate more robust and accurate non linear behaviour models and validate compact models. The harmonic tuner can be used to pre-match impedances at the fundamental and harmonic frequencies, making it ideal for hybrid active systems, reducing the power needed to drive the load of high power devices.

Focus Fundamental Tuners: 12 US Patents 🇺🇸

Focus Harmonic Tuners: 9 US Patents 🇺🇸

High Speed (Option)

The new electronics design allows the flexibility of controlling multiple motors in a tuner simultaneously. These new electronics design also integrates a high-capacity SD card with practically unlimited memory storage for calibration and tuning data. The design of the new motor controller board improved the motion of the motor providing more accurate tuner movements, which also allowed for increasing the motor speed by up to 3x compared to the older version of the electronics. As a result, this has improved the tuner calibration time by up to 25% for fundamental tuners and up to 30% for Harmonic tuners (Frequency dependant). Additionally, the measurement time for harmonic loadpull was improved by up to 50%. All Focus tuners are LAN controlled and the fundamental series include on-board impedance synthesis firmware.

Shielded (Option)

The C806 (0.6-8GHz) is also available in a shielded (s) option, when RF interference is critical in the measurement environment.



Shielded Option

Flagship Model | C806

The C806 (0.6-8GHz) is one of Focus's most popular models. Due to its ultra high VSWR $\geq 80:1$ for 90% of the band it has become a standard tuner for FR1 (5G) ruggedness testing. This tuner also comes with high-speed electronics which makes the calibration and tuner moments much faster. Engineered for performance and reliability, the new design is equipped with 3.5mm connectors on the tuner ports, enabling the transition from the central conductor down to the desired connection in one shot. This reduces the need for adapters from APC-7, eliminates unneeded loss and simplifies the measurement setup.



Flagship Model | C1804

The C1804 is an unrivalled ultra-wideband fundamental tuner, presently available in the market. With 3 probes, it enables measurements from 0.4 to 18GHz, ideal for ruggedness testing, spur testing and non-linearities at higher frequencies. Combined with our noise modules, the C1804 is perfectly suited for wideband noise parameter extraction.



Flagship Model | M1818

The M1818 is an ideal tuner for Harmonic measurements, with a small footprint that covers 1.8 to 18GHz for all 3 harmonics. This compact tuner model is ideal for harmonic source and load tuning for Scalar or Vector Load pull applications in FR1 and L, S, C bands. Its versatility and performance are simply unmatched. These tuners can be made with APC-7 or N-Type connectors, the latter being best suited for high power measurements.



Flagship Model | M1807

M1807 is a unique harmonic tuner on the market with an unmatched bandwidth of 0.7 to 18GHz with three harmonic capabilities.



Focus | Sub-18GHz Tuners | Models & Specifications

Model	f_0 , $2f_0$, $3f_0$	Frequency	VSWR	Connector type
C101	f_0	0.1 - 1 GHz	$\geq 10:1$ (typ. 40:1)	7/16, N, APC-7
C302	f_0	0.2 - 3 GHz	$\geq 10:1$ (typ. 30:1)	7/16, N, APC-7
C304	f_0	0.4 - 3 GHz	$\geq 10:1$ (typ. 40:1)	7/16, N, APC-7
C308	f_0	0.8 - 3 GHz	$\geq 10:1$ (typ. 20:1)	7/16, N, APC-7
C606	f_0	0.6 - 6 GHz	$\geq 30:1$ (typ. 40:1)	7/16, N, APC-7
C606S	f_0	0.6 - 6 GHz	$\geq 30:1$ (typ. 40:1)	7/16, N, APC-7
C804	f_0	0.4 - 8 GHz	$\geq 10:1$ (typ. 20:1)	7/16, N, APC-7
C806R	f_0	0.6 - 8 GHz	$\geq 30:1$ (typ. 35:1)	7/16, N, APC-7
C806RS	f_0	0.6 - 8 GHz	$\geq 30:1$ (typ. 35:1)	7/16, N, APC-7
C806	f_0	0.6 - 8 GHz	$> 50:1$ (typ. $> 80:1$)	3.5 mm
C806S	f_0	0.6 - 8 GHz	$> 50:1$ (typ. $> 80:1$)	3.5 mm
C807	f_0	0.7 - 8 GHz	$\geq 30:1$ (typ. 35:1)	7/16, N, APC-7
C808	f_0	0.8 - 8 GHz	$\geq 30:1$ (typ. 40:1)	7/16, N, APC-7
C1260	f_0	6.0 - 12 GHz	$\geq 40:1$ (typ. 60:1)	3.5 mm
C1804	f_0	0.4 - 18 GHz	$\geq 30:1$ (typ. 40:1)	N, APC-7
C1806	f_0	0.6 - 18 GHz	$\geq 10:1$ (typ. 20:1)	N, APC-7
C1806S	f_0	0.6 - 18 GHz	$\geq 10:1$ (typ. 20:1)	N, APC-7
C1807	f_0	0.7 - 18 GHz	$\geq 10:1$ (typ. 25:1)	N, APC-7
C1808	f_0	0.8 - 18 GHz	$\geq 10:1$ (typ. 15:1)	N, APC-7
C1818	f_0	1.8 - 18 GHz	$\geq 10:1$ (typ. 20:1)	N, APC-7
L302	f_0 , $2f_0$	0.2 - 3 GHz	10:1 ~ 100:1	N, APC-7
L804	f_0 , $2f_0$	0.4 - 8 GHz	10:1 ~ 100:1	N, APC-7
L808	f_0 , $2f_0$	0.8 - 8 GHz	10:1 ~ 100:1	N, APC-7
L1007	f_0 , $2f_0$	0.7 - 10 GHz	10:1 ~ 100:1	N, APC-7
L1208	f_0 , $2f_0$	0.8 - 12 GHz	10:1 ~ 100:1	N, APC-7
L1218	f_0 , $2f_0$	1.8 - 12 GHz	10:1 ~ 100:1	N, APC-7
L1804	f_0 , $2f_0$	0.4 - 18 GHz	10:1 ~ 100:1	N, APC-7
L1807	f_0 , $2f_0$	0.7 - 18 GHz	10:1 ~ 100:1	N, APC-7
L1808	f_0 , $2f_0$	0.8 - 18 GHz	10:1 ~ 100:1	N, APC-7
L1818	f_0 , $2f_0$	1.8 - 18 GHz	10:1 ~ 100:1	N, APC-7
M804	f_0 , $2f_0$, $3f_0$	0.4 - 8 GHz	10:1 ~ 100:1	N, APC-7
M807	f_0 , $2f_0$, $3f_0$	0.7 - 8 GHz	10:1 ~ 100:1	N, APC-7
M808	f_0 , $2f_0$, $3f_0$	0.8 - 8 GHz	10:1 ~ 100:1	N, APC-7
M1007	f_0 , $2f_0$, $3f_0$	0.7 - 10 GHz	10:1 ~ 100:1	N, APC-7
M1204	f_0 , $2f_0$, $3f_0$	0.4 - 12 GHz	10:1 ~ 100:1	N, APC-7
M1208	f_0 , $2f_0$, $3f_0$	0.8 - 12 GHz	10:1 ~ 100:1	N, APC-7
M1218	f_0 , $2f_0$, $3f_0$	1.8 - 12 GHz	10:1 ~ 100:1	N, APC-7
M1804	f_0 , $2f_0$, $3f_0$	0.4 - 18 GHz	10:1 ~ 100:1	N, APC-7
M1807	f_0 , $2f_0$, $3f_0$	0.7 - 18 GHz	10:1 ~ 100:1	N, APC-7
M1808	f_0 , $2f_0$, $3f_0$	0.8 - 18 GHz	10:1 ~ 100:1	N, APC-7
M1818	f_0 , $2f_0$, $3f_0$	1.8 - 18 GHz	10:1 ~ 100:1	N, APC-7