v01.0212

HMC897LP4E

FILTER - TUNABLE, BAND PASS SMT 9 - 19 GHz

Typical Applications

The HMC897LP4E is ideal for:

- Test & Measurement Equipment
- Military RADAR & EW/ECM
- SATCOM & Space
- Industrial & Medical Equipment

Features

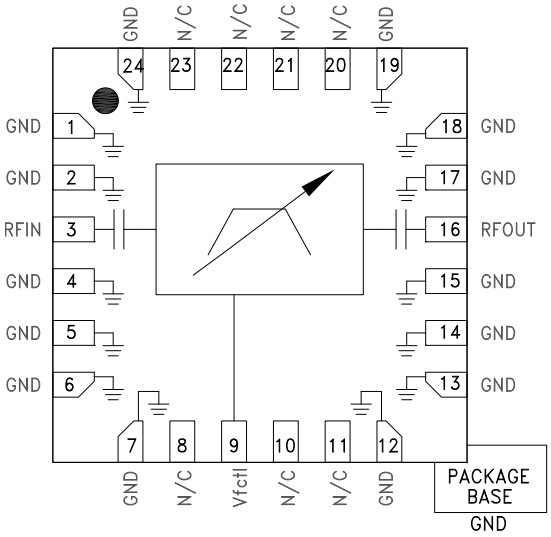
Fast Tuning Response

Excellent Wideband Rejection

Single Chip Replacement for Mechanically Tuned Designs

24 Lead 4x4 mm SMT Package

Functional Diagram



General Description

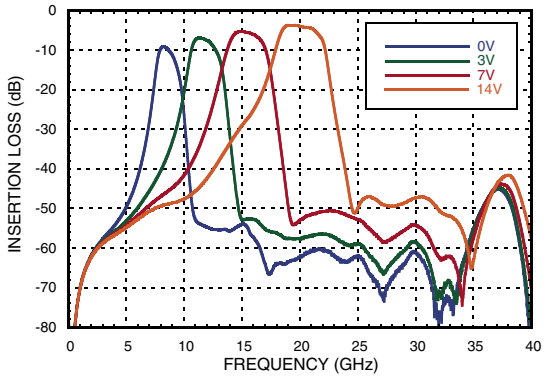
The HMC897LP4E is a MMIC band pass filter which features a user selectable passband frequency. The 3 dB filter bandwidth is approximately 18%. The 20 dB filter bandwidth is approximately 35%. The center frequency can be varied between 9 and 19 GHz by applying an analog tune voltage between 0 and 14V. This tunable filter can be used as a much smaller alternative to physically large switched filter banks and cavity tuned filters. The HMC897LP4E has excellent microphonics due to the monolithic design, and provides a dynamically adjustable solution in advanced communications applications.

Electrical Specifications, T_A = +25°C

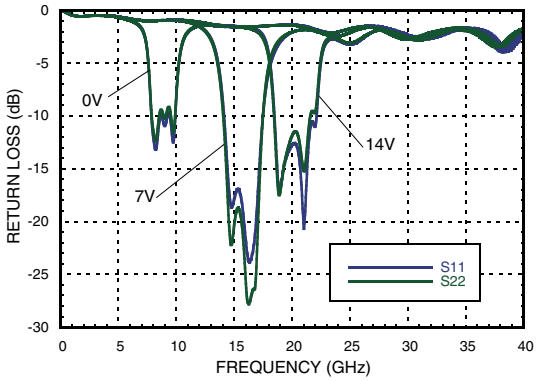
Parameter	Min.	Typ.	Max.	Units
F_{center} Tuning Range	9		19	GHz
3 dB Bandwidth		18		%
Low Side Rejection Frequency (Rejection >20 dB)		0.81 *F_{center}		GHz
High Side Rejection Frequency (Rejection >20 dB)		1.17 *F_{center}		GHz
Low Side Sub-Harmonic Rejection (Rejection >40 dB)		0.58 *F_{center}		GHz
High Side Sub-Harmonic Rejection (Rejection >40 dB)		1.23 *F_{center}		GHz
Re-entry Frequency (Rejection <30 dB)		>40		GHz
Insertion Loss		6.5		dB
Return Loss		9.5		dB
Input IP3 (Pin = 0 to +20 dBm)		30		dBm
Input Power @ 5° Shift In Insertion Phase (Vfctl = 0V)		10		dBm
Input Power @ 5° Shift In Insertion Phase (Vfctl > = 1V)		15		dBm
Frequency Control Voltage (V_{fctl})	0		14	V
Source/Sink Current (I_{fctl})			±1	mA
Residual Phase Noise [1] (100 kHz Offset)		-160		dBc/Hz
F_{center} Drift Rate		-1.65		MHz/°C
Tuning Characteristics [2] tFULLBAND (0% Vfctl to 90% RF)		200		ns

[1] Optimum residual phase noise performance requires the use of a low noise driver circuit.
[2] Tuning speed is dependent on driver circuit. Data measured with a high speed op-amp driver and includes driver slew rate delay.

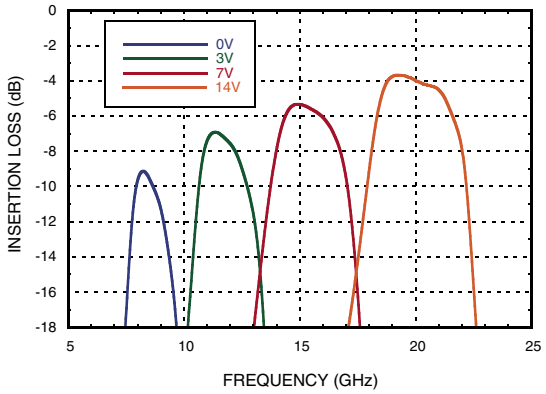
Broadband Insertion Loss vs. Vfctl



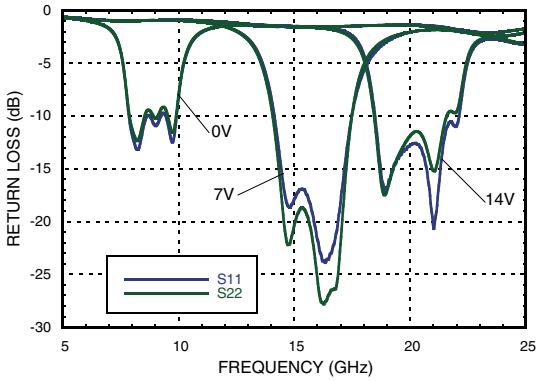
Broadband Return Loss vs. Vfctl



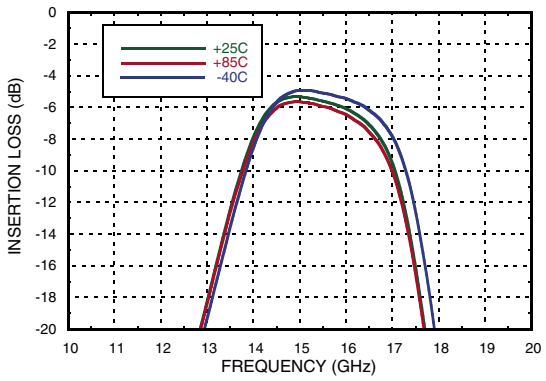
Insertion Loss vs. Vfctl



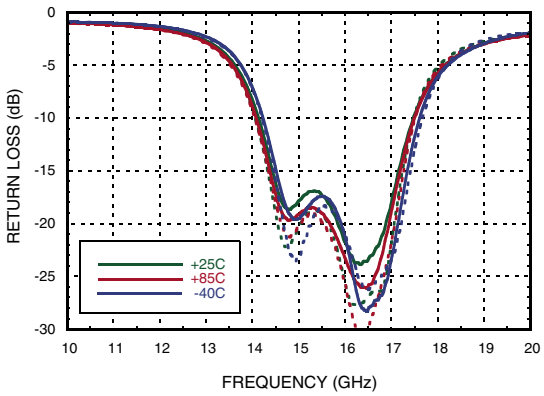
Return Loss vs. Vfctl



Insertion Loss vs. Temperature, Vfctl = 7V



Return Loss vs. Temperature, Vfctl = 7V



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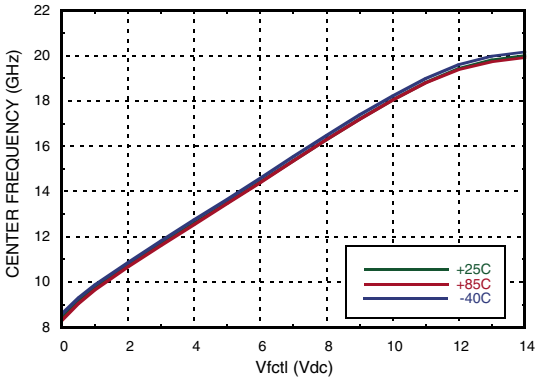
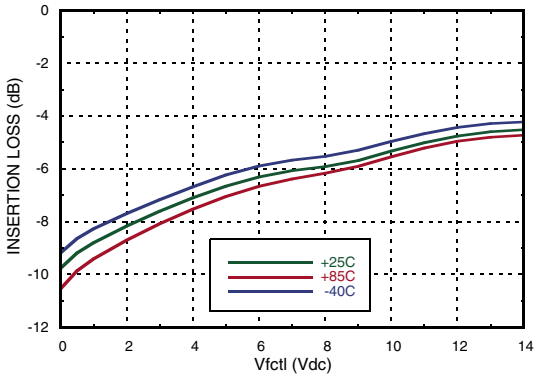
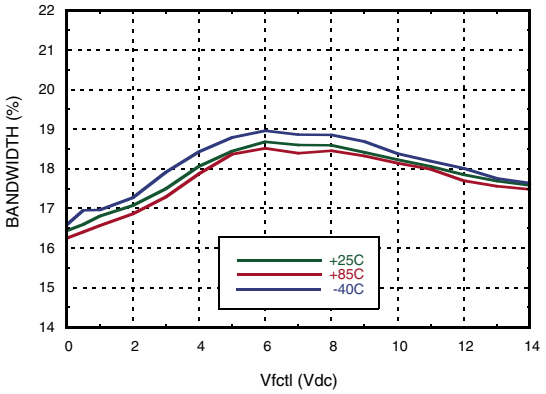
Center Frequency vs. Temperature



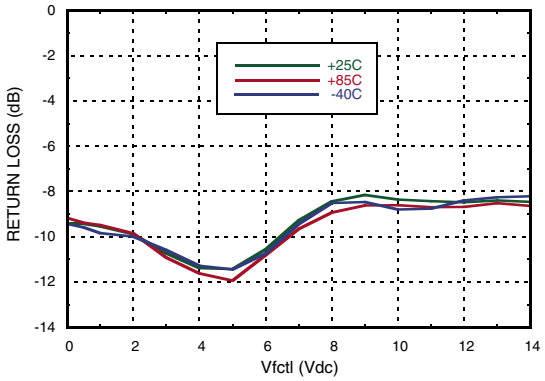
Insertion Loss vs. Temperature



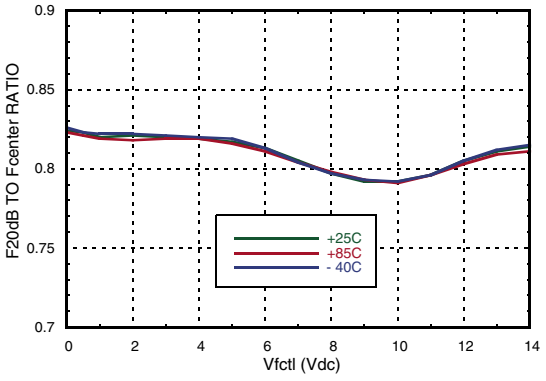
3 dB Bandwidth vs. Temperature



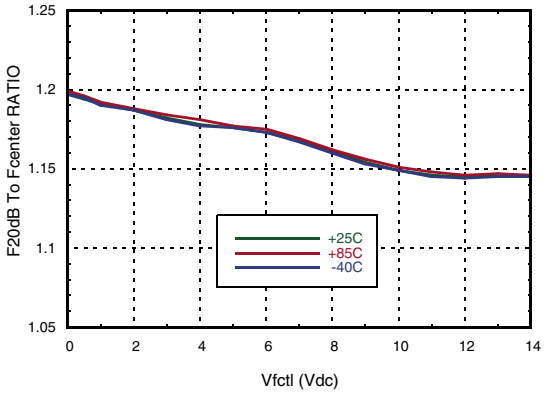
Maximum Return Loss in a 2 dB Bandwidth vs. Temperature



Low Side Rejection Ratio vs. Temperature [1]



High Side Rejection Ratio vs. Temperature [1]



[1] Rejection ratio is defined as the ratio of the frequency at which the relative insertion loss is 20 dB to *f*center