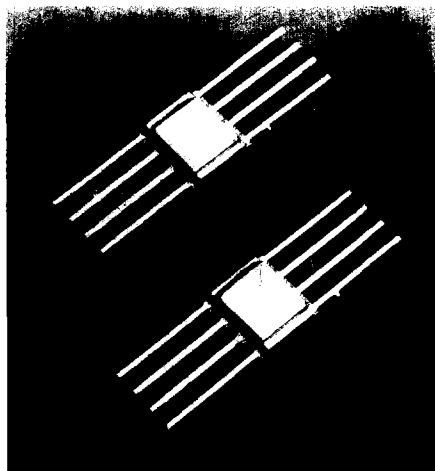


SAMPLING PHASE DETECTOR 1.0 - 20GHz

FEATURES

- ◆ Complete Phase Detector Circuit
- ◆ Low Reference Oscillator Drive Capability
- ◆ Microstrip Compatible Package
- ◆ Phase Locking to 20GHz
- ◆ Space Qualified Versions Using Diodes Certified to ESA/SCC 5010



DESCRIPTION

The ML 7799-0000 Series of Sampling Phase Detectors consists of a hybrid circuit with a fast step recovery diode, coupling capacitors and a pair of low barrier Schottky Diodes. A summing resistor network can be included internally as an option to optimise beat note output voltage and phase noise contribution.

Sampling Phase Detectors compare the phase from a stable reference oscillator and a VCO whose frequencies are harmonically related.

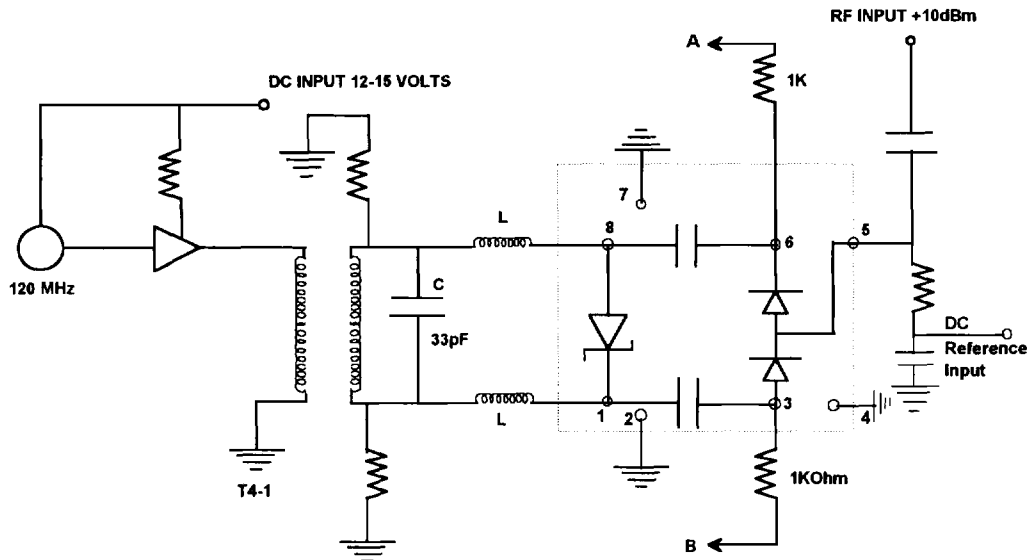
A reference oscillator rf input signal is applied to a step recovery diode which generates a harmonically rich impulse signal. This harmonic signal is applied as a local oscillator to the balanced mixer. A sample of the VCO signal is mixed with the balanced mixer, to generate an error voltage proportional in magnitude and polarity to the phase difference between these signals. The error voltage can be applied as feedback to the VCO to create a phase locked loop.

TYPICAL SPECIFICATION AT 25°C

PART NUMBER	STEP RECOVERY DIODES			COUPLING CAPACITORS	SCHOTTKY SAMPLING DIODES			FREQUENCY GHz
	C _{j-6} (pF) Typ.	T _L (ns) Typ.	T _T (ps) Typ.		C _{j0} (pF) Typ.	V _F (V) Typ.	R _s (Ohms) Typ.	
ML 7799-0002	.50	20	50	0.8 - 1.5	0.40	0.25	8	2
ML 7799-0012	.35	20	50	0.5 - 0.8	0.25	0.35	9	12
ML 7799-0020	.35	20	50	0.4 - 0.6	0.15	0.35	13	20

Maximum Operating and Storage Temperature Range -65°C to +125°C

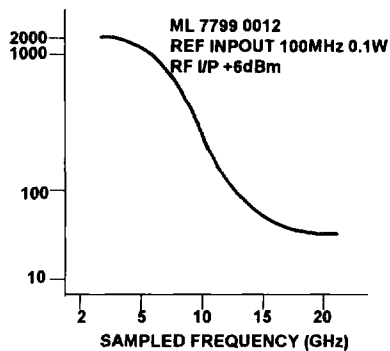
TYPICAL CIRCUIT APPLICATION



NOTE

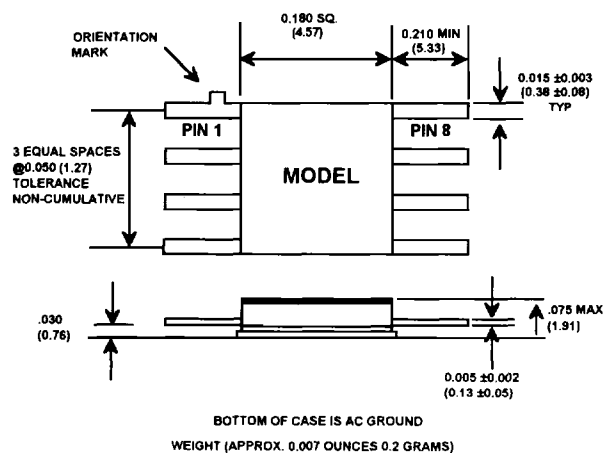
Varying the ratio of L and C in above circuit will optimise the conduction period of the sampling diode for a particular RF input frequency. Output voltages at points A & B are summed in a high impedance differential amplifier. Summing resistors can be included within the package.

TYPICAL PERFORMANCE



OUTLINE DRAWING

Package Style C



All specifications are subject to change without notice

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