



Communication Circuits

LM171/LM271 LM371 integrated rf/lf amplifier

general description

The LM171/LM271/LM371 is a monolithic RF-IF amplifier capable of emitter-coupled or cascode operation from dc to 250 MHz. The device features:

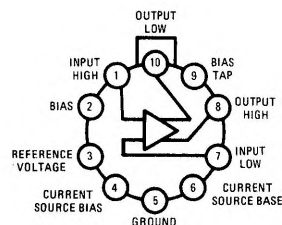
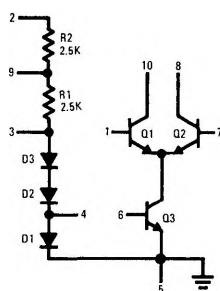
- Low internal feedback, allowing high stability-limited gain
- Versatility through user-connected configurations
- As emitter coupled amplifier, symmetrical, non-saturated limiting
- As cascode, wide AGC range with constant input admittance

- As differential DC amplifier, low input offset voltage and wide dynamic range
- As video amplifier, externally selected gain, and high gain-bandwidth product
- 100 MHz tuned power gain

(emitter coupled)	24.6 dB
(cascode)	27.5 dB

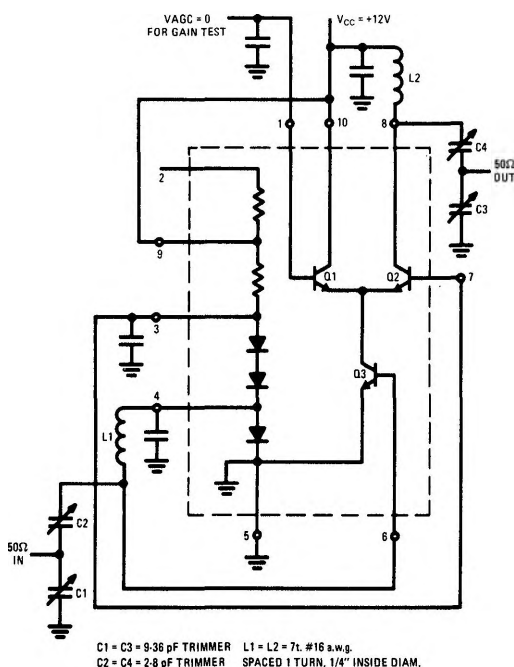
In addition to amplifier service, the circuit is useful in mixer, oscillator, detector, modulator, and numerous other applications. The LM271 is a plug-in replacement for the 911C type.

schematic and connection diagrams

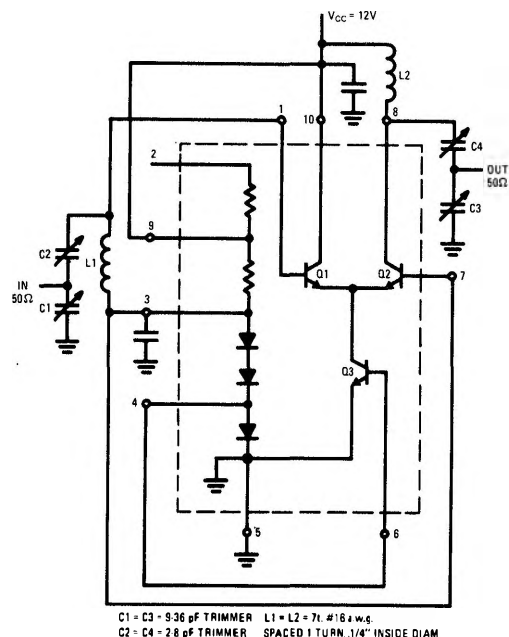


test circuits

100 MHz Cascode Test Circuit



100 MHz Emitter Coupled Test Circuit



Note: All unmarked bypass capacitors 1000 pF.

absolute maximum ratings

Storage Temperature		-65°C to +150°C
Operating Temperature	LM171	-55°C to +125°C
	LM271	-20°C to +100°C
	LM371	0°C to +70°C
Power Dissipation		230 mW

electrical characteristics (Note 1)

PARAMETER	SYMBOL	CONDITIONS	LM171			LM271			LM371			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
DC CHARACTERISTICS												
Input Offset Voltage	V _{OS}	I _B = I ₁₀ = 500 μA			3			3			10	mV
Input Bias Current	I _{B I A S}		1.30		2.65	1.3		2.65	1.3		2.65	mA
Ratio of R1/R2			.895		1.12	.895		1.12	.895		.895	
Voltage at Pin 3	V ₃	V ₂ = +12V	2.0			2.0			2.0			V
Current Through Current Source Q3	I _C	I _C = I _B + I ₁₀	2.45		5.70	2.45		5.70	2.45		5.70	mA
Current Gain	B		40			40			40			
Power Supply Current Drain	I _{P S}	I _{P S} = I _{B I A S} + I _B + I ₁₀			9.0			9.0			10.5	mA

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
EMITTER COUPLED CHARACTERISTICS (Input Signal < 10 mV rms)						
Input Conductance	G_{11}	455 kHz		.30	.40	mmhos
Output Conductance	G_{22}	455 kHz		.01	.04	mmhos
Magnitude of Forward Transadmittance	$ Y_{21} $	455 kHz	17.0	27.0		mmhos
Magnitude of Reverse Transadmittance	$ Y_{12} $	200 MHz		0.1		mmhos
Tuned Power Gain	A_P	10.7 MHz BW = 470 kHz		24.6		dB
Tuned Power Gain	A_P	100 MHz BW = 5 MHz		22.7		dB

CASCODE CHARACTERISTICS (Input Signal < 10 mV rms)						
Input Conductance	G_{11}	455 kHz		1.1	2.5	mmhos
Output Conductance	G_{22}	455 kHz Connect pin 1 to 7		.01	.04	mmhos
Magnitude of Forward Transadmittance	$ Y_{21} $	455 kHz Pin 1 ground	25.0	50.0		mmhos
Magnitude of Reverse Transadmittance	$ Y_{12} $	200 MHz		.001		mmhos
Tuned Power Gain	A_P	100 MHz Pin 1 ground BW = 5 MHz		27.5		dB
Tuned Power Gain	A_P	200 MHz Pin 1 ground BW = 6 MHz		25.0		dB

Note 1: These specifications apply for $V^+ = +12V$ and $T_A = 25^\circ C$