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NEC

VHF~UHF BROAD-BAND AMPLIFIER

THICK FILM HYBRID INTEGRATED CIRCUIT

MC-5156

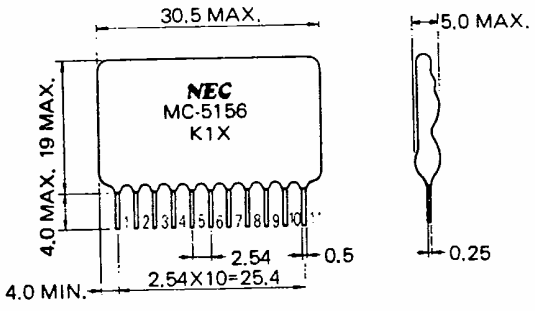
DESCRIPTION AND APPLICATIONS

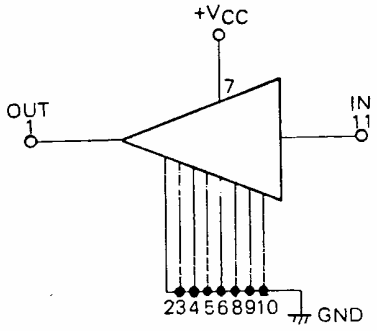
The MC-5156 is a thick film hybrid integrated circuit designed for broad-band general purpose amplifier applications in the 30 to 890 MHz band. The device is a "post amplifier" which features low noise, flat gain with a typical output of 100 to 110 dBμV/75 Ω. Since the MC-5156 is designed to serve as a VHF-UHF TV booster amplifier, the device is matched to 75 Ω. The MC-5156 offers solutions to many amplifier problems where battery operation and bandwidth is required. Reliability and performance uniformity are assured by gold metallized transistors and NEC's stringent quality-control procedures. The MC-5156 is a complete circuit which requires no additional adjustments or components. Its use offers reductions in the number of manufacturing operations, assembly time, parts control, maintenance and design complexity.

FEATURES

- Operates as a flat amplifier from 30 to 890 MHz without adjustments or external components.
- Large intersept point (+28.7 dBm TYP.)
- Input and output matching to 75 Ω.
- Low noise figure (6 dB TYP.)
- Low intermodulation distortion (IM_2=−55 dB, IM_3=−65 dB TYP.)

PACKAGE DIMENSIONS
in millimeters





ABSOLUTE MAXIMUM RATINGS (Ta=25 °C)

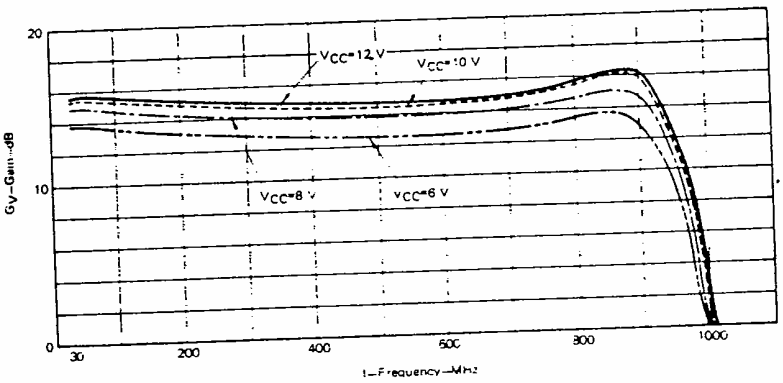
Supply Voltage	V_{CC}	15	V
Operating Current	I_{CC}	90	mA
Input Voltage	V_I	0.5	V
Total Dissipation	P_T	1.3	W
Operating Temperature	T_{opt}	−30 to +65	°C
Storage Temperature	T_{stg}	−30 to +85	°C

ELECTRICAL CHARACTERISTICS (T_a=25 °C, V_{CC}=12 V, Z_S=Z_L=75 Ω *)

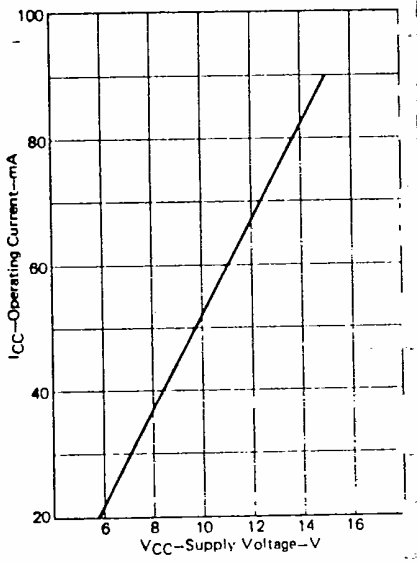
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Operating Current	I_{CC}	55	61	67	mA	
Average Gain	$G_{V(av)}$	15		16	dB	f=30~890 MHz
Gain Flatness	$\pm\Delta G_{V(av)}$		±0.8	±1.2	dB	f=30~890 MHz
Input Output VSWR	$VSWR_{I,O}$			2.5		f=30~890 MHz
Isolation	I_{SO}	25			dB	f=30~890 MHz
Noise Figure	NF		5.5	7.5	dB	f=30~300 MHz
			6	8	dB	f=300~890 MHz
2nd Order Intermodulation Distortion	IM_2		−55		dB	f_1=90 MHz, f_2=100 MHz, f_1+f_2, V_O= 105 dBμV/75 Ω
3rd Order Intermodulation Distortion	IM_3		−65		dB	f_1=200 MHz, f_2=210 MHz, $f=2f_2-f_1$, V_O=105 dBμV/75 Ω
			−50		dB	f_1=700 MHz, f_2=750 MHz, $f=2f_2-f_1$, V_O=105 dBμV/75 Ω
Output Power	P_O		13		dBm	f=500 MHz (1 dB Gain Compression)

* This device can be used in Z_O=50 Ω with some VSWR.

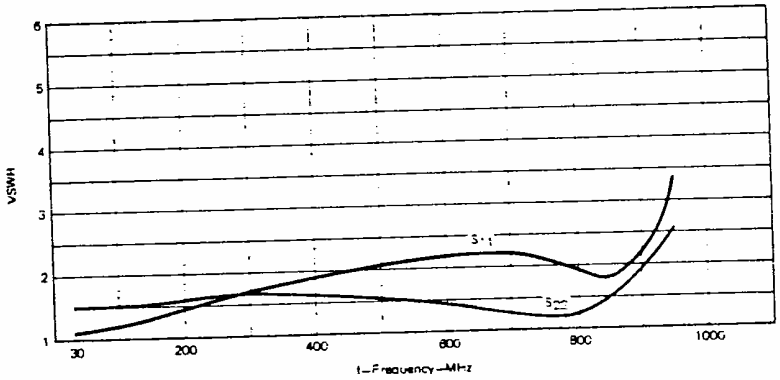
GAIN vs. FREQUENCY



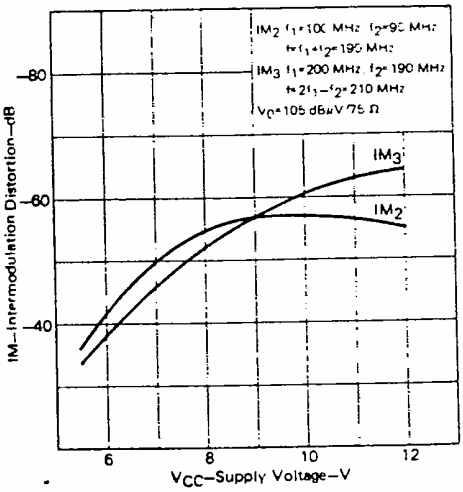
OPERATING CURRENT vs. SUPPLY VOLTAGE



VSWR vs. FREQUENCY



INTERMODULATION DISTORTION vs. SUPPLY VOLTAGE



NOISE FIGURE vs. FREQUENCY