NEC

HYBRID IC AMPLIFIER
MC5152,53

Hybrid Broadband Amplifier

FEATURES

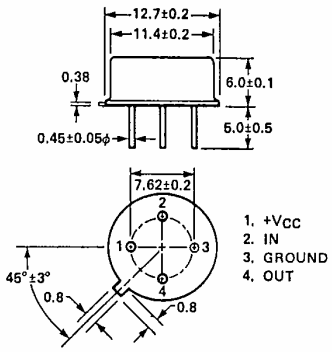
- BROADBAND PERFORMANCE
  5 TO 300MHz
- HERMETICALLY SEALED TO-8 PACKAGE
- INPUT AND OUTPUT MATCHED TO 75Ω
- HIGH RELIABILITY
- LOW INTERMODULATION DISTORTION
  IM_3 = –50dB
- LOW NOISE FIGURE

DESCRIPTION AND APPLICATIONS

The MC5152 and MC5153 are thin film hybrid integrated circuits designed for broadband general purpose or IF amplifier applications up to 300MHz. Both devices feature low noise and distortion, flat gain, and are tuned to 75Ω. Since these devices are designed to serve as broadband VHF amplifiers, they offer solutions to many amplifier problems including instruments where a broad bandwidth is requred. For narrow band applications, bandpass circuits may be used. The MC5152 and MC5153 are complete circuits which require no additional adjustments or components. Reliability and performance are assured by gold metallized transistors and NEC's stringent quality control procedures.

PHYSICAL DIMENSIONS *(Units in mm)*

PACKAGE CODE - MC3

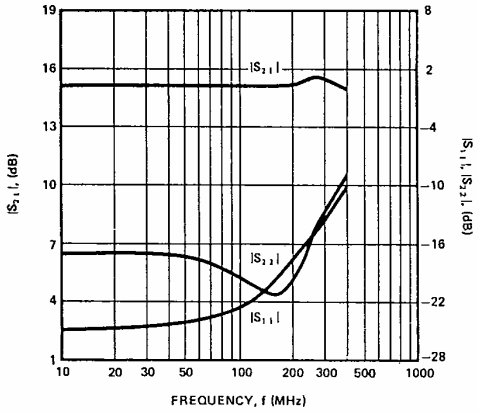


ELECTRICAL CHARACTERISTICS (T_a=25°C)

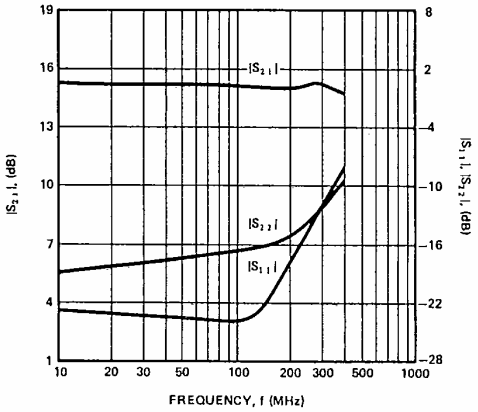
MC PART NUMBER / PACKAGE CODE			MC5152 MC3			MC5153 MC3		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX
I_{CC}	Operating current	mA	29	32	34	59	67	75
$\|S_{21}\|$	Power Gain at f = 5 ~ 300MHz	dB	14.5	15.0	15.5	14.5	15.0	15.5
$\Delta\|S_{21}\|$	Gain Flatness at f = 5 ~ 300MHz, Z_O = 75Ω	dB		±0.25	±0.5		±0.25	±0.5
$\|S_{11}\|$	Input Reflection Loss at f = 5 ~ 300MHz	dB	–10			–10		
$\|S_{22}\|$	Output Reflection Loss at f = 5 ~ 300MHz	dB	–10			–10		
$\|S_{12}\|$	Inversion Power Gain at f = 5 ~ 300MHz	dB	–15			–15		
NF	Noise Figure at f = 5 ~ 300MHz	dB		4.0	4.5		6.0	6.5
IM_3	3rd Order Intermodulation Distortion f_1 = 190MHz, f_2 = 200MHz, f = $2f_2 - f_1$	dB			–50			–66
IP_3	3rd Order Intercept Point f_1 = 190MHz, f_2 = 200MHz, f = $2f_2 - f_1$	dB	25			33		
P_{out}	Power Output at 1dB Compression, f = 200MHz, Z_O = 75Ω	dBm	9	10		18	20	

PERFORMANCE CHARACTERISTICS (T_a=25°C) (V_{CC} = 15V, Z_S = Z_L = 75Ω)

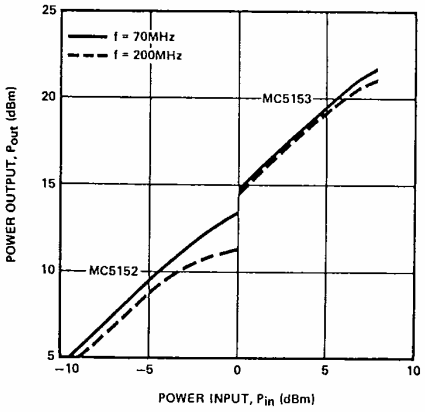
TYPICAL PERFORMANCE FOR THE MC5152



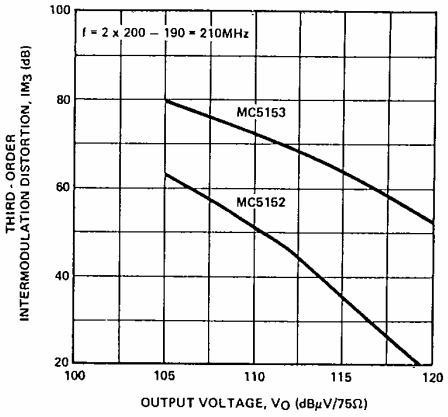
TYPICAL PERFORMANCE FOR THE MC5152



TYPICAL POWER OUTPUT VS. POWER INPUT FOR THE MC5152 AND MC5153



TYPICAL THIRD-ORDER INTERMODULATION DISTORTION CHARACTERISTICS FOR THE MC5152 AND MC5153



ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CC}	Supply Voltage	V	18
I_{CC}	Operating Current		
	MC5152	dBm	45
	MC5153	dBm	90
P_{in}	Input Power		
	MC5152	dBm	0
	MC5153	dBm	10
P_T	Total Power Dissipation		
	MC5152	mW	800
	MC5153	mW	1600
T_{opt}*	Operating Temperature		
	MC5152	°C	–40~+90
	MC5153	°C	–40~+75
T_{stg}	Storage Temperature	°C	–40~+100

*T_{opt} is the temperature at the back of the case.

TYPICAL NOISE FIGURE VS. FREQUENCY FOR THE MC5152 AND MC5153