

Hybrid Broadband Amplifier

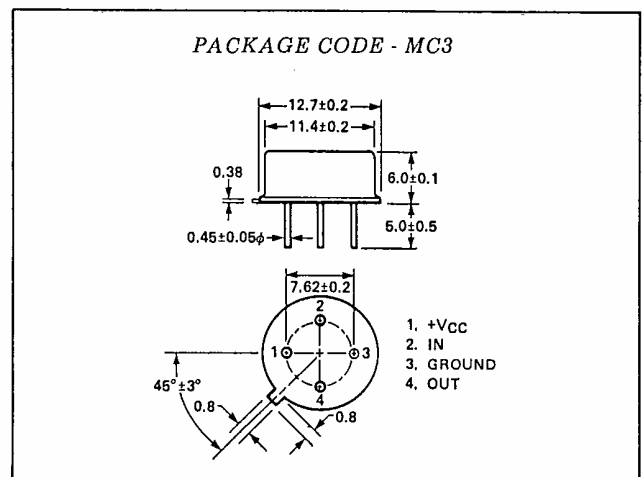
FEATURES

- 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 required. 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)



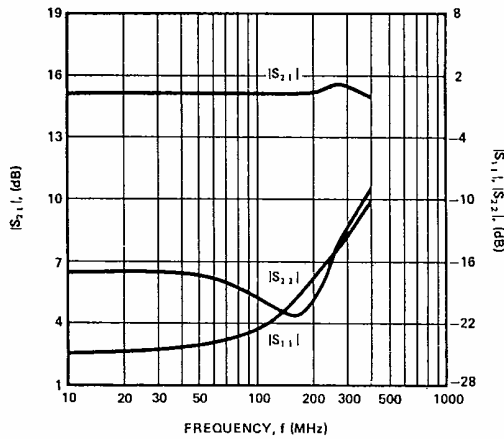
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MC5152 MC3			MC5153 MC3		
			MIN	TYP	MAX	MIN	TYP	MAX
I_{CC}	Operating current	mA	29	32	34	59	67	75
$ S_{21} $	Power Gain at $f = 5 \sim 300MHz$	dB	14.5	15.0	15.5	14.5	15.0	15.5
$\Delta S_{21} $	Gain Flatness at $f = 5 \sim 300MHz, Z_0 = 75\Omega$	dB		± 0.25	± 0.5		± 0.25	± 0.5
$ S_{11} $	Input Reflection Loss at $f = 5 \sim 300MHz$	dB	-10			-10		
$ S_{22} $	Output Reflection Loss at $f = 5 \sim 300MHz$	dB	-10			-10		
$ S_{12} $	Inversion Power Gain at $f = 5 \sim 300MHz$	dB	-15			-15		
NF	Noise Figure at $f = 5 \sim 300MHz$	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, $f = 200MHz, Z_0 = 75\Omega$	dBm	9	10		18	20	

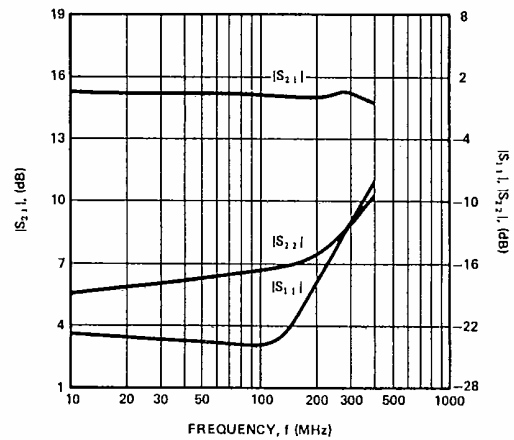
MC5152, MC5253, HYBRID BROADBAND AMPLIFIER

PERFORMANCE CHARACTERISTICS ($T_a = 25^\circ\text{C}$) ($V_{CC} = 15\text{V}$, $Z_S = Z_L = 75\Omega$)

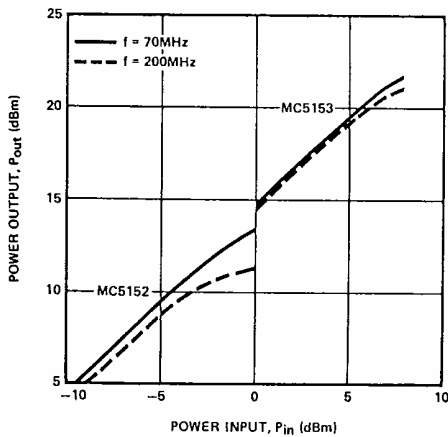
TYPICAL PERFORMANCE FOR THE MC5152



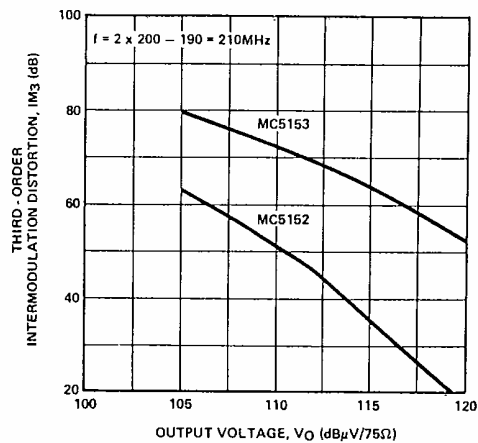
TYPICAL PERFORMANCE FOR THE MC5152



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



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

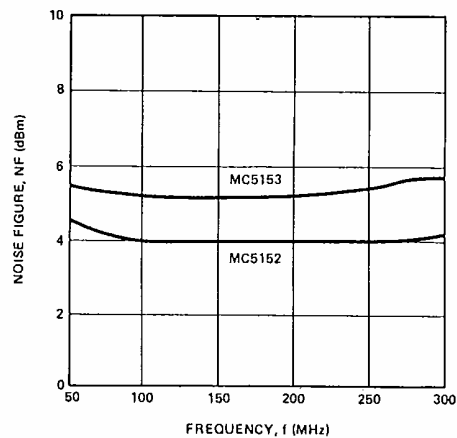


ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

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	$^\circ\text{C}$ -40~+90
		MC5153	$^\circ\text{C}$ -40~+75
T_{stg}	Storage Temperature	$^\circ\text{C}$	-40~+100

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

TYPICAL NOISE FIGURE VS. FREQUENCY FOR THE MC5152 AND MC5153



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