Ordering number : ENA0513A

SANYO Semiconductors
DATA SHEET

Monolithic Linear IC

LA8160V — AGC Amplifier and Pre Amplifier

Overview

The LA8160V is an AGC amplifier for the digital ADC and a pre amplifier for the analog SAW filter.

Features

- V_{CC} = 5V
- IF Input Frequency Range 30 to 100MHz
- AGC Amplifier Gain 30dB
- AGC Gain Reduction 40dB
- AGC Amplifier Output Amplitude 2Vp-p (differential)

- Pre Amplifier Gain 29dB
- Pre Amplifier Output Amplitude 2Vp-p

Functions

- IF AGC control
- IF AGC amplifier for AD Converter
- Pre Amplifier for SAW Filter
- Function mode switch

Notes : This device is ESD sensitive. So, the device should be treated carefully.

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Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	Pin 3, 4, 14	6.0	V
Maximum pin voltage	V max11	Pin 11	6.5	V
Circuit voltages	V max	Pin 8, 9	V_{CC}	V
Circuit current	I_6	Pin 6 sink current	2	mA
	I_7	Pin 7 sink current	2	mA
Allowable power dissipation	Pd max	Ta ≤ 85°C	430*	mW
Operating temperature	Topr		-20 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

*On the board (60 × 70 × 1.6mm^3 Double-Layers epoxy glass)

Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	Pin 3, 4, 11, 14	5.0	V
Operating supply voltage range	V_{CC} op	Pin 3, 4, 11, 14	4.5 to 5.45	V

Electrical Characteristics

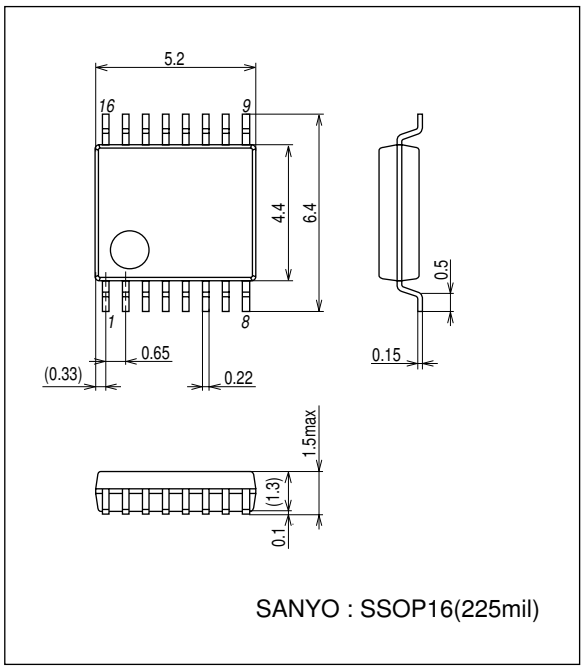
AC Characteristics at Ta = 25°C, V_{CC} = 5.0V

Parameter	Symbol	Pin No.	Conditions		Ratings min	Ratings typ	Ratings max	Unit
Input frequency range	f (in)	1, 16		*1	30		100	MHz
AGC amp section [V8 = Lo]								
AGC amp circuit current	$I_{CC}1$	3, 4	No signal	*1	29	39	48	mA
AGC amp maximum gain	G max	6/1, 16 7/1, 16	V9 = 2.5V f = 45.75MHz	*1	26	30	32	dB
AGC amp noise figure	NF1	6, 7	V9 = 2.5V, f = 45.75MHz			8		dB
Intermodulation	IM3	6/1, 16 7/1, 16	V_{IN} = 30dBmV, f = 45MHz, 50MHz Output level = 1Vp-p	*1	45	54		dB
AGC range	GR	6/1, 16 7/1, 16	Output level < ±1dB f = 45.75MHz	*1	40			dB
Output level 1	V_O6	6		*1		1.0		Vp-p
Output level 2	V_O7	7		*1		1.0		Vp-p
Maximum AGC voltage	V9 max	9	Maximum gain		2.5		V_{CC}	V
LO leakage	Lp	6, 7	Lp = 6, 7/11 AGC amp gain = max	*2		-48	-40	dBc
Pre amp section [V8 = Hi]								
Pre amp. circuit current	$I_{CC}2$	3, 11, 14	No signal	*3	50	67	79	mA
Pre amp gain	G2	11/1, 16	f = 45.75MHz	*3	25	29	31	dB
Pre amp noise figure	NF2	11	f = 45.75MHz			8		dB
920k beat level	B920	11	P/C = 15dB, P/S = 15dB Output level = 2Vp-p	*4		-78	-74	dBc
Output level	V_O11	11	V_{IN} = 27dBmV	*3	1.3	2.0	2.5	Vp-p
Function switch Section								
AGC amp active	V8L	8	I3, 4, 14 = ON, I11 = OFF				0.8	V
Pre amp active	V8H	8	I4 = OFF, I3, 11, 14 = ON		2.0			V
AGC amp active	I8L	8	V8 = 0V I3, 4, 14 = ON, I11 = OFF				5	μA
	I8H	8	V8 = 5V I4 = OFF, I3, 11, 14 = ON				200	μA

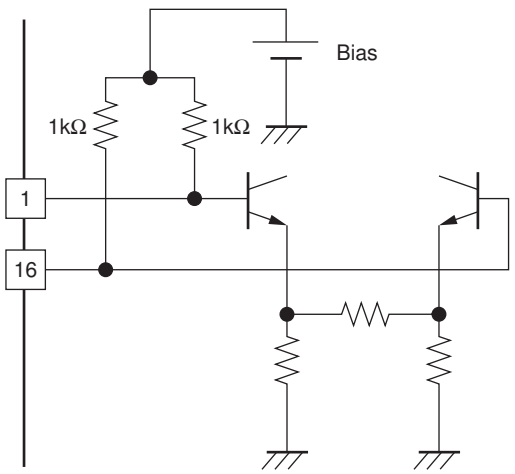
*1 : Test circuit (1), *2 : Test circuit (2), *3 : Test circuit (3), *4 : Test circuit (4)

Package Dimensions

unit : mm (typ)
3178B



Pin Description

Pin Number	Description	Equivalent circuit
1 16	IF Input	
2	AGC/Pre Amp. GND	
3	AGC/Pre Amp. V_{CC}	
4	Driver Amp. V_{CC}	
5	Driver Amp. GND	
10 12 13 15	Driver Amp. GND	
14	Driver Amp. V_{CC}	

Continued on next page.

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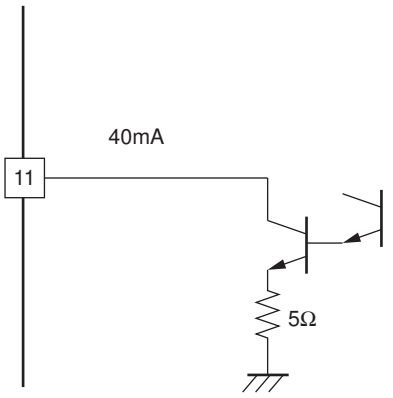
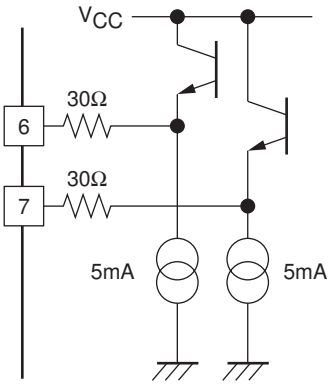
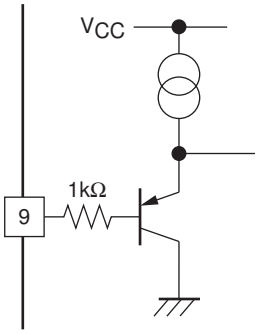
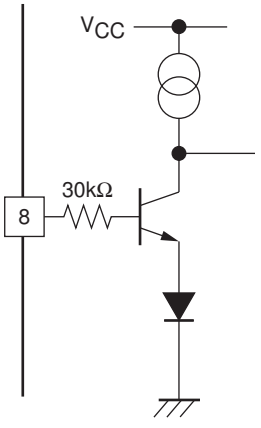
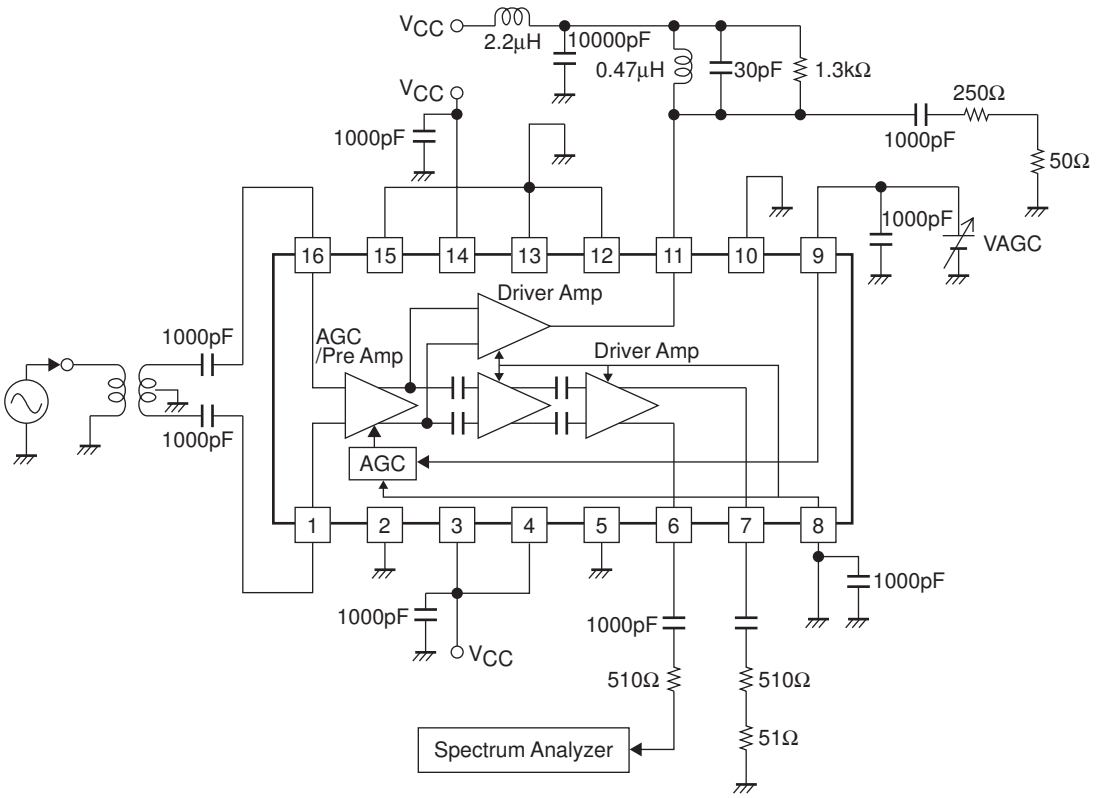
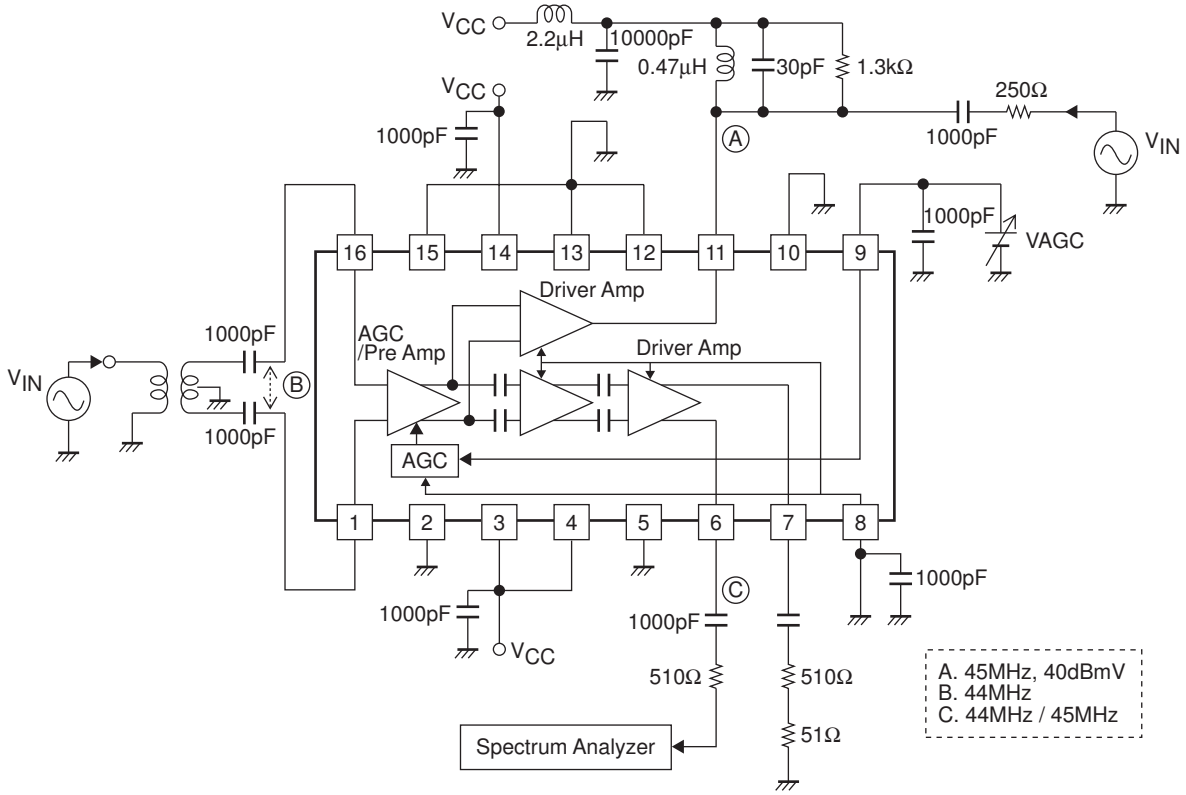
Pin Number	Description	Equivalent circuit
11	Driver Amp. Output	
6 7	Driver Amp. Output	
9	IF AGC Control	
8	Function switch	

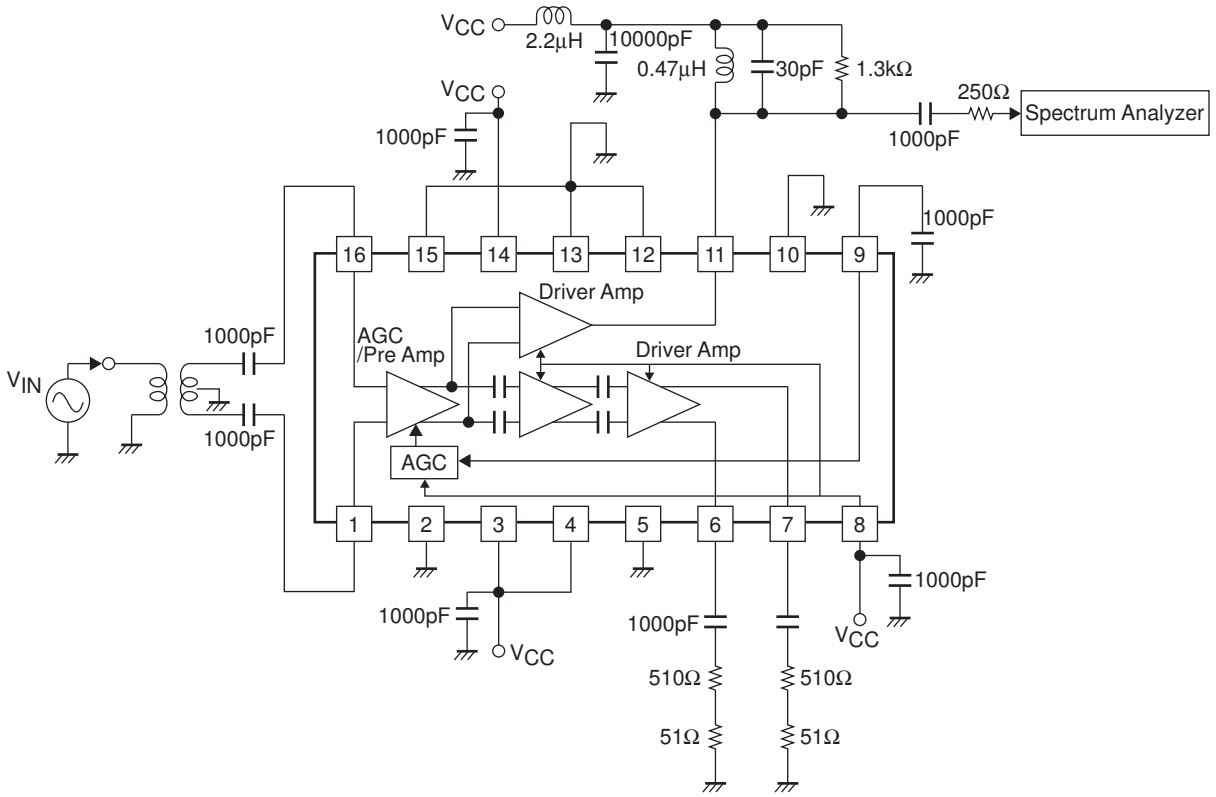
Test Circuit (1)



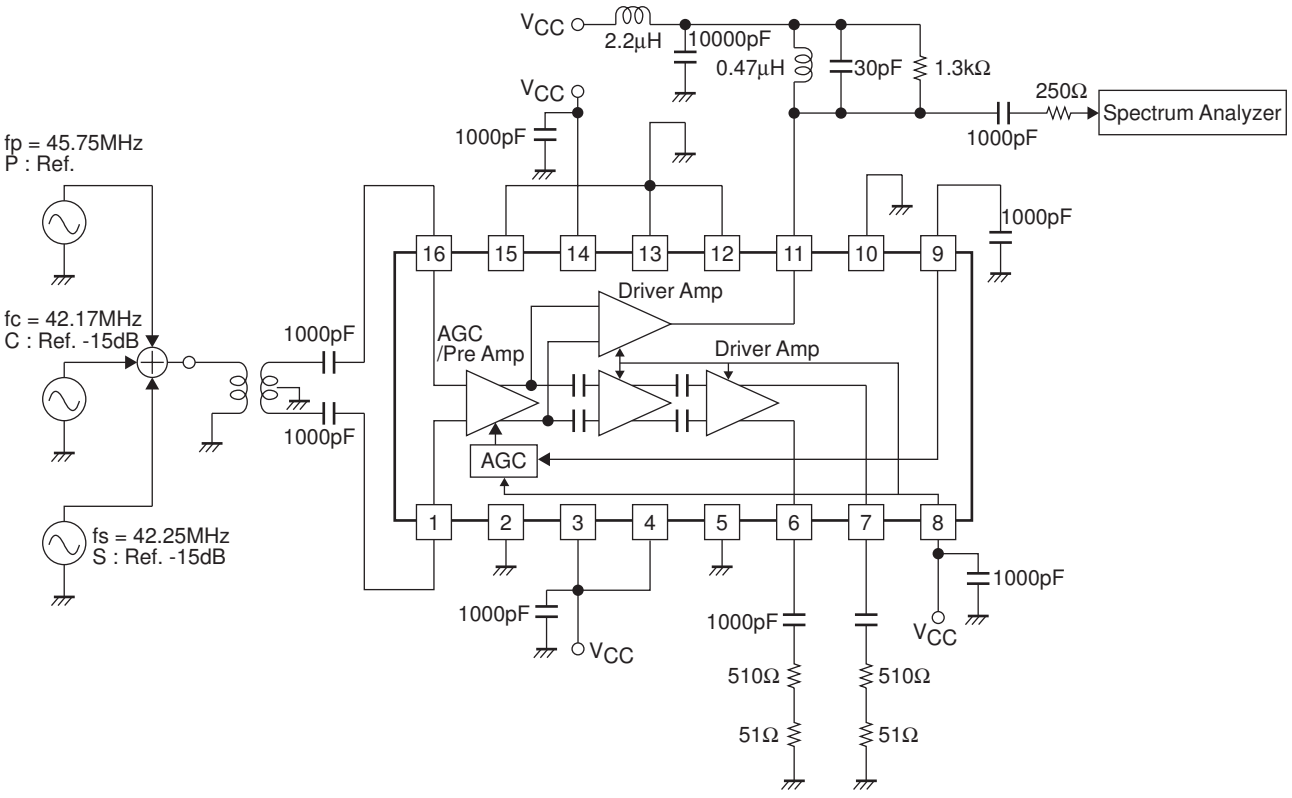
Test Circuit (2)



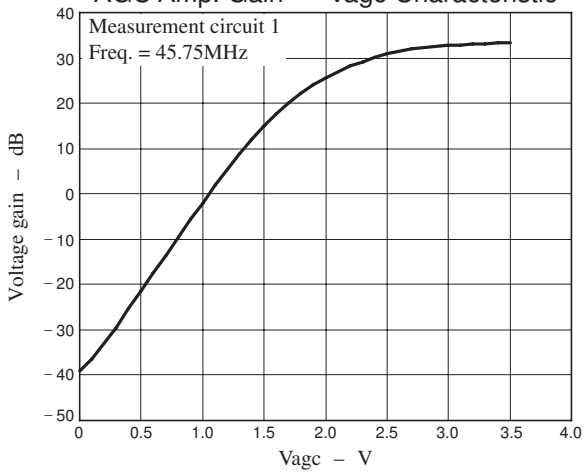
Test Circuit (3)



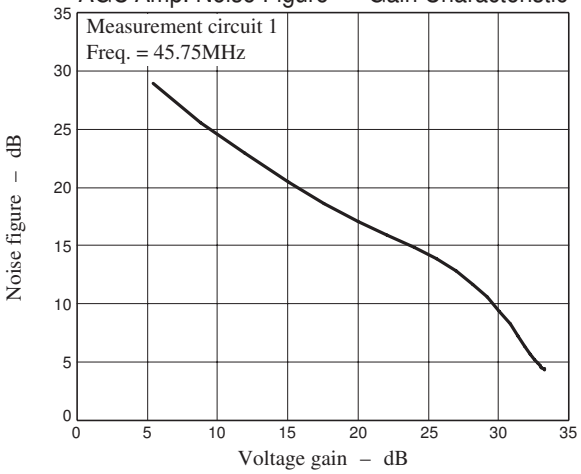
Test Circuit (4)



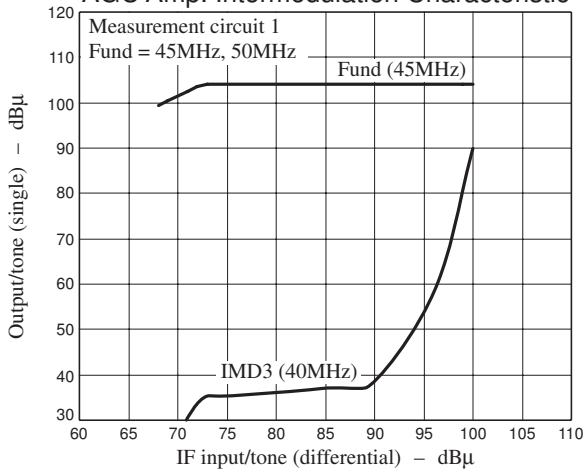
AGC Amp. Gain – Vagc Characteristic



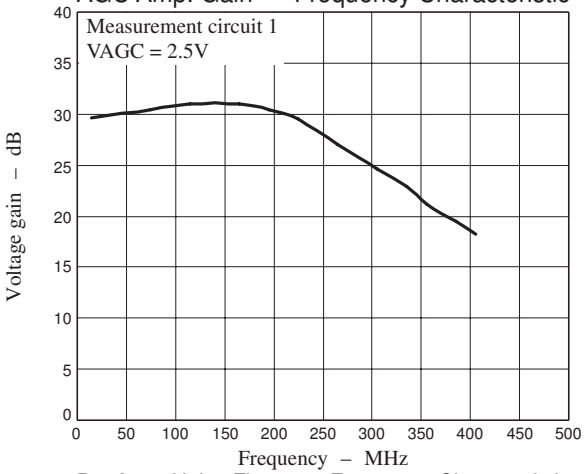
AGC Amp. Noise Figure – Gain Characteristic



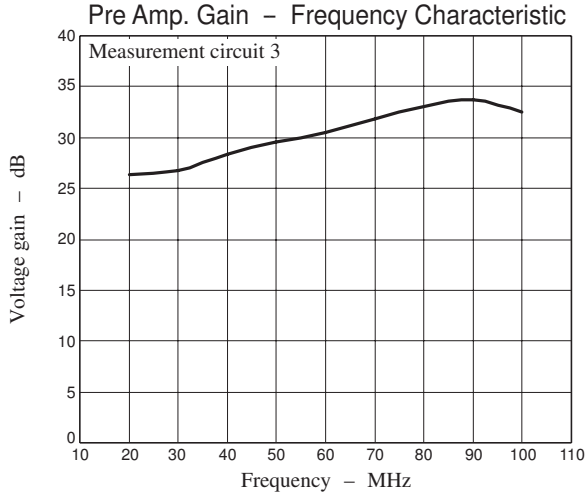
AGC Amp. Intermodulation Characteristic



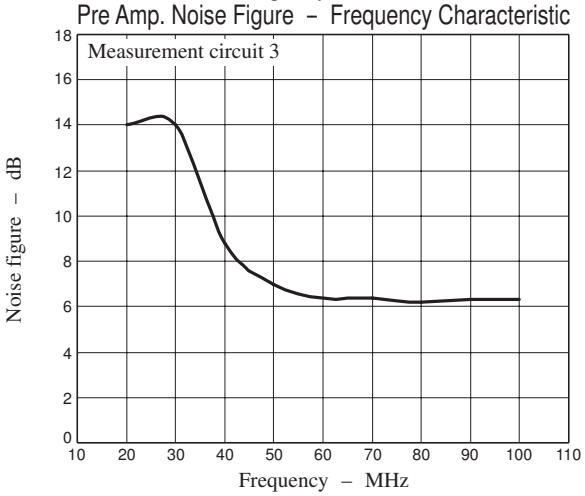
AGC Amp. Gain – Frequency Characteristic



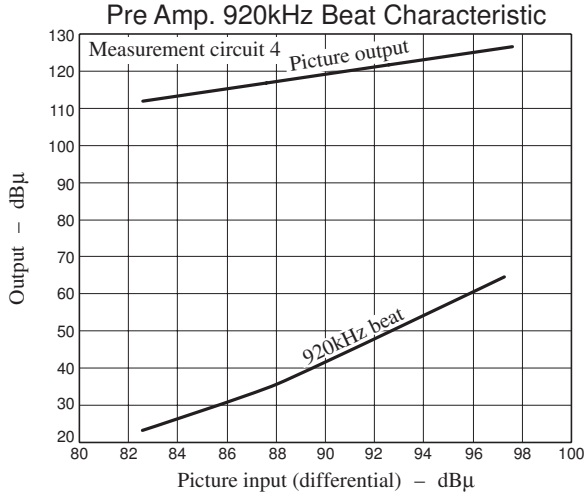
Pre Amp. Gain – Frequency Characteristic



Pre Amp. Noise Figure – Frequency Characteristic



Pre Amp. 920kHz Beat Characteristic



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