


SANYO Semiconductors

DATA SHEET

LA8160V — Monolithic Linear IC 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

- VCC = 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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LA8160V

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 × 1.6mm³ 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

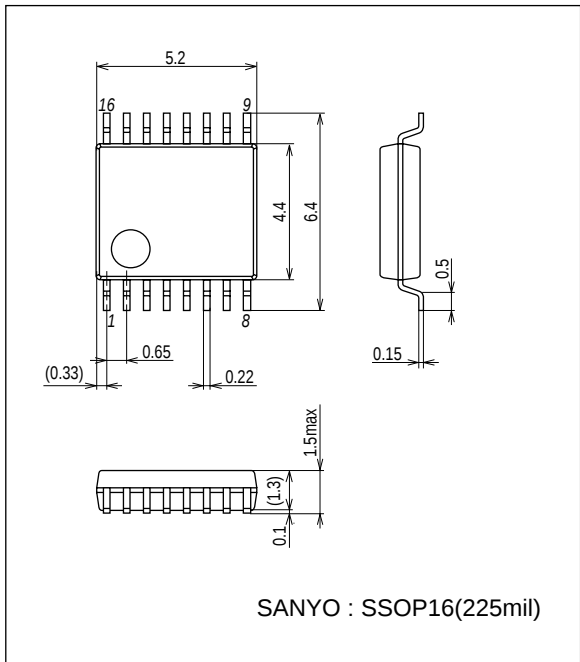
AC Characteristics at Ta = 25°C, V_{CC} = 5.0V

Parameter	Symbol	Pin No.	Conditions		Ratings			Unit
					min	typ	max	
Input frequency range	f (in)	1, 16		*1	30		100	MHz
AGC amp section [V8 = Lo]								
AGC amp circuit current	I _{CC1}	3, 4	No signal	*1	29	39	48	mA
AGC amp maximum gain	G max	6/1, 16 7/1, 16	V ₉ = 2.5V f = 45.75MHz	*1	26	30	32	dB
AGC amp noise figure	NF1	6, 7	V ₉ = 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	V ₉ 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 _{CC2}	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



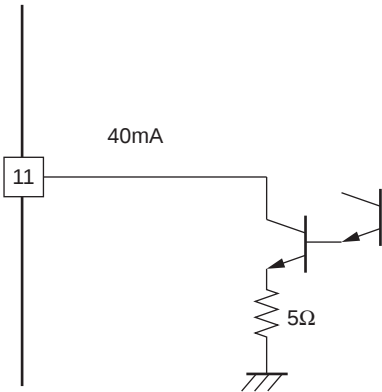
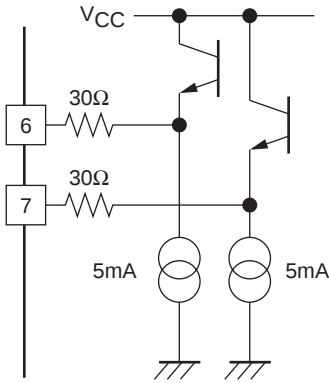
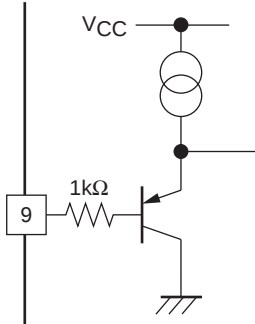
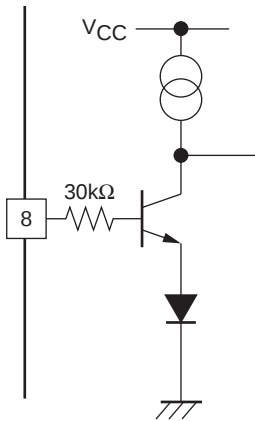
Pin Description

Pin Number	Description	Equivalent circuit
1 16	IF Input	The equivalent circuit for the IF Input pins (1 and 16) shows a differential input stage. A bias voltage is applied to the non-inverting input of a differential amplifier. The input signal is applied to the inverting input of the differential amplifier. The output of the differential amplifier is connected to the bases of two transistors. The emitters of the transistors are connected to ground. The collectors of the transistors are connected to the output of the differential amplifier.
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}	

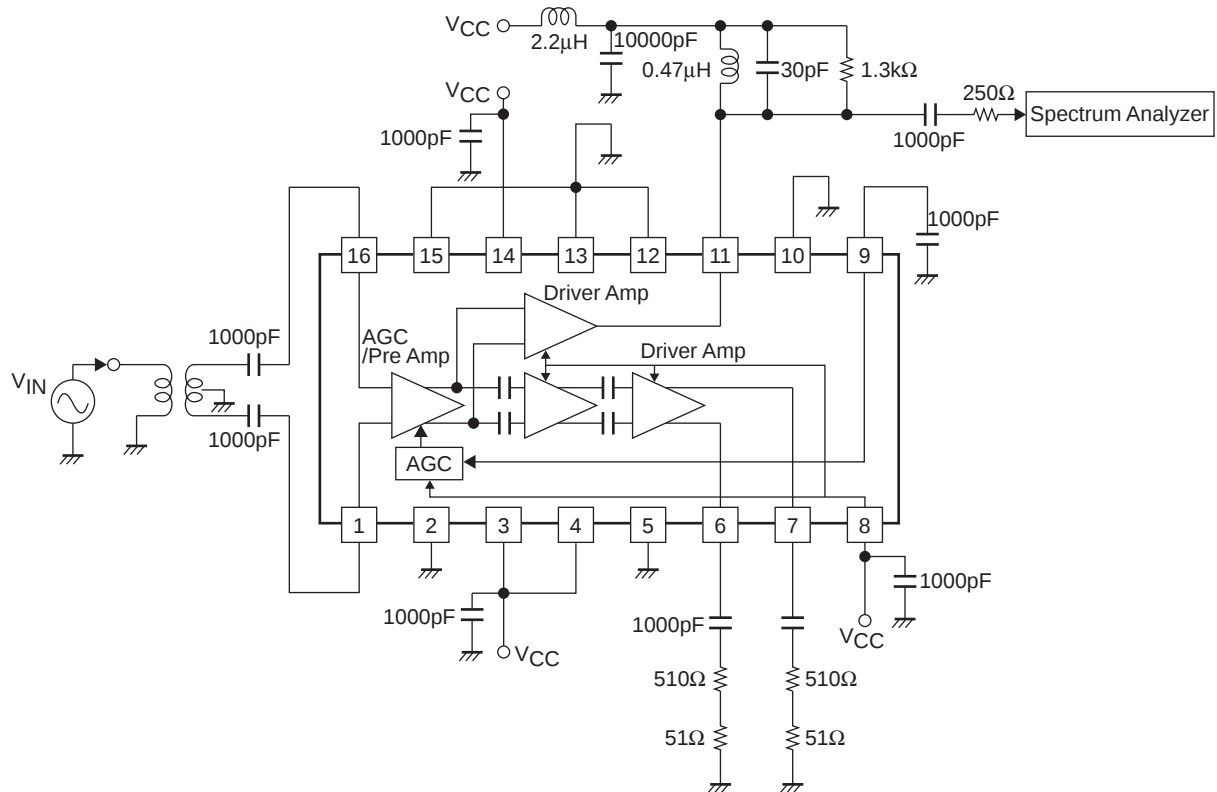
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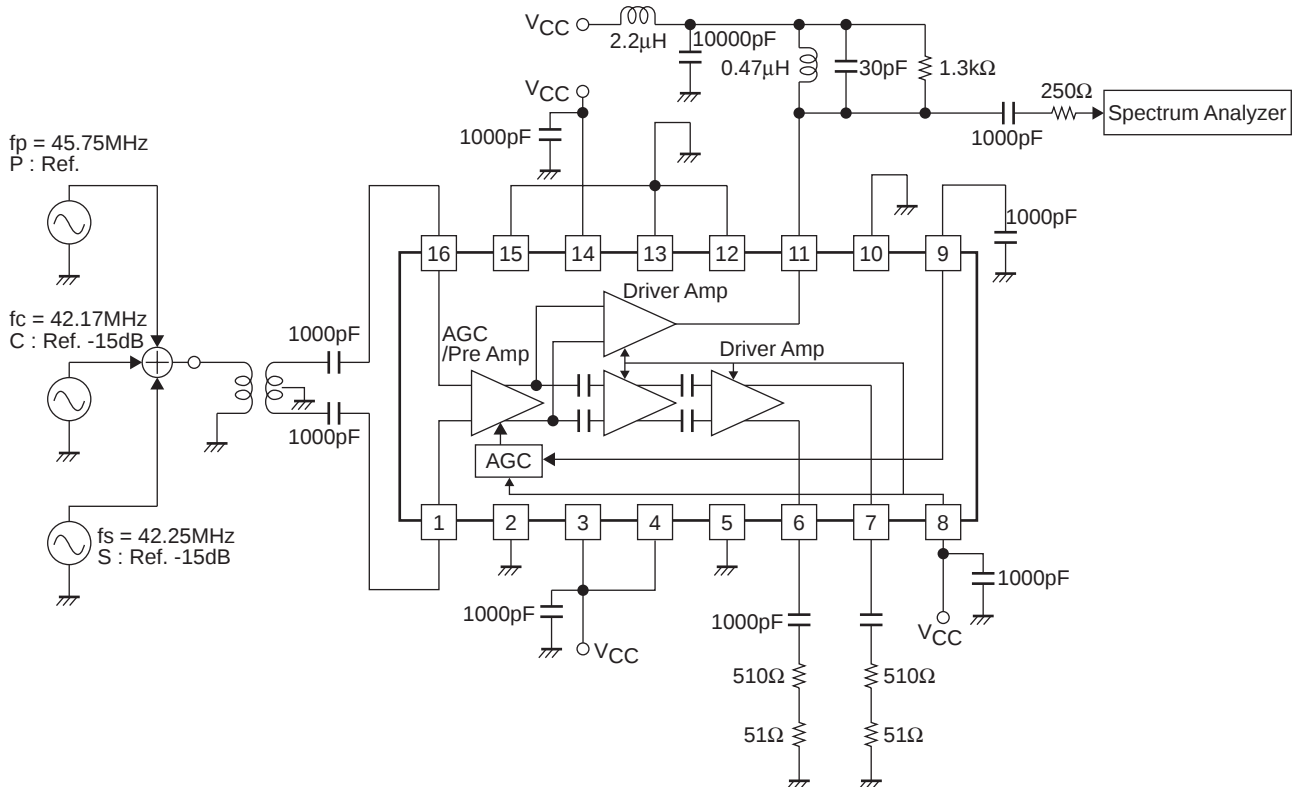
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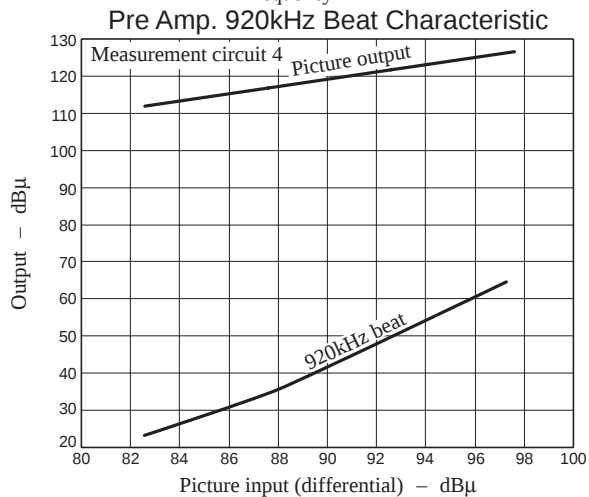
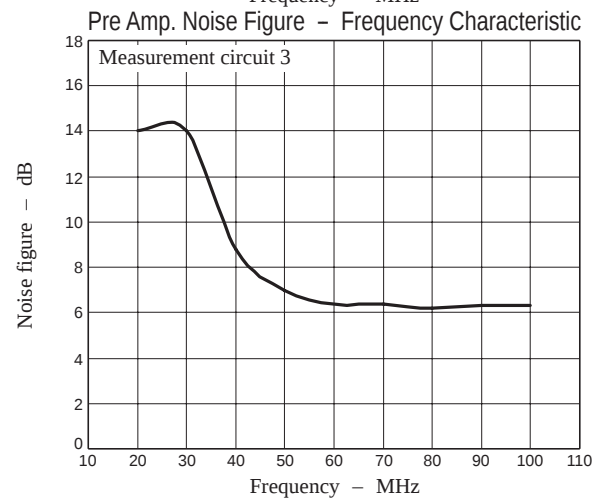
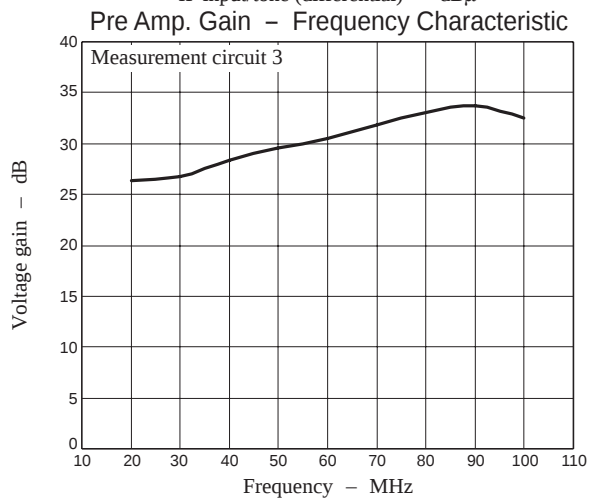
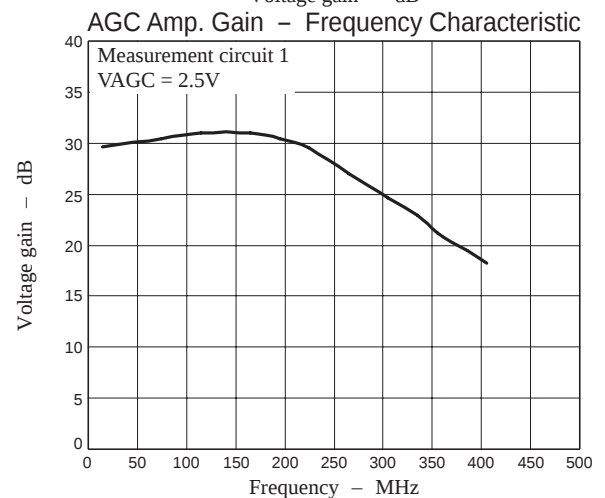
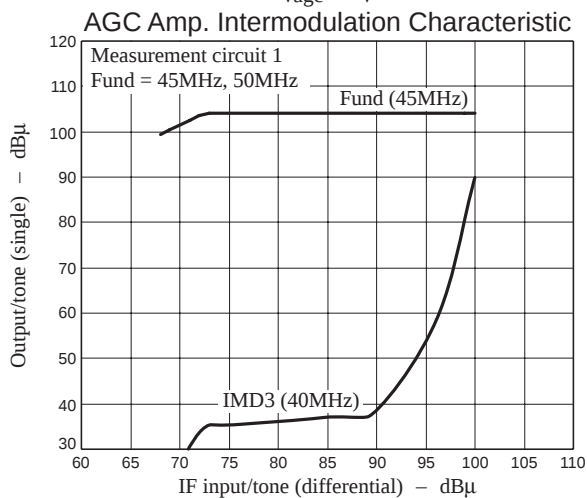
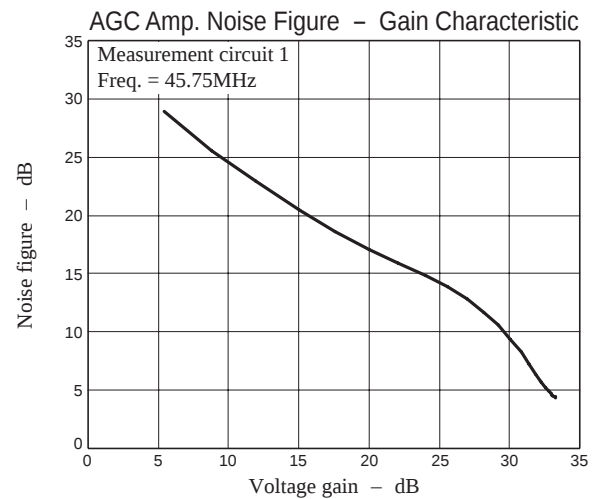
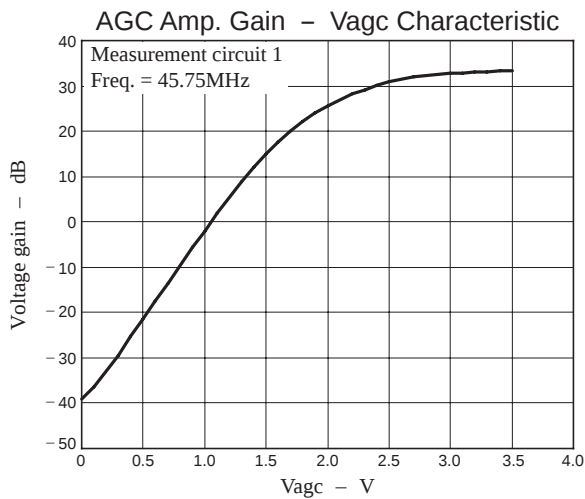
Pin Number	Description	Equivalent circuit
11	Driver Amp. Output	
6 7	Driver Amp. Output	
9	IF AGC Control	
8	Function switch	

Test Circuit (3)



Test Circuit (4)





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