



SANYO Semiconductors

# DATA SHEET

## LA7796T — Monolithic Linear IC For Digital CATV/Cable Modem Receiver AGC Amplifier

### Overview

LA7796T is an AGC amplifier. It is ideally suited for use with Digital CATV, Cable modem receiver and IP Telephony receiver.

### Functions

- IF AGC control
- IF AGC amplifier
- IF Step Gain Controlled Amplifier
- Driver amplifier

### Specifications

Maximum Ratings at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Supply Voltage	$V_{CC\ max}$	Pin 1	7.0	V
Circuit Voltages	$V\ max$	Pin 4, Pin 5	$V_{CC\ op}$	V
Circuit Current	I6	Pin 6 sink current	2	mA
	I7	Pin 7 sink current	2	mA
Allowable Power Dissipation	$P_d\ max$	$T_a \leq 85^\circ\text{C}$	220	mW
Operating Temperature Range	$T_{opr}$		-20 to 85	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$		-55 to 150	$^\circ\text{C}$

Specified board: 20.0mm × 10.0mm × 0.8mm, glass epoxy board.

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# LA7796T

## Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended Supply Voltage	V <sub>CC</sub>	Pin 1	5.0	V
Operating Supply Voltage Range	V <sub>CC op</sub>	Pin 1	4.5 to 5.5	V

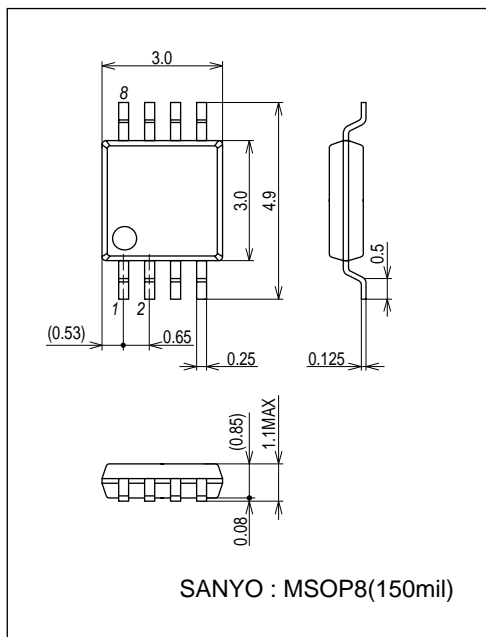
## Electrical Characteristics at Ta = 25°C, V<sub>CC</sub> = 5V

Parameter	Symbol	Pin No.	Conditions	Test circuit	Ratings			Unit	
					min	typ	max		
Circuit Current	I <sub>total</sub>	1	No Signal	1	25	30	35	mA	
IF Input Frequency Range	f(in)	2,3	f <sub>c</sub> : -3dB	1	30		100	MHz	
Noise Figure	NF	6,7	V <sub>4</sub> = 3.0V, f = 45MHz	Pin5: V <sub>CC</sub>	2		3	dB	
			V <sub>4</sub> = 3.0V, f = 45MHz	Pin5: GND	2		4	dB	
			V <sub>4</sub> = 3.0V, f = 45MHz	Pin5: OPEN	2		5	dB	
Intermodulation	IM3	6/2,3 7/2,3	V <sub>4</sub> = 3.0V, f <sub>1</sub> = 44MHz, f <sub>2</sub> = 45MHz, Output = 104dB <sub>μ</sub> each	1	50			dB	
Total Amplifier Gain	G <sub>(AGC1)</sub>	6/2,3 7/2,3	V <sub>4</sub> = 3.0V, f = 45MHz	Pin5: V <sub>CC</sub>	1	45.5	48	50.5	dB
	G <sub>(AGC2)</sub>	6/2,3 7/2,3	V <sub>4</sub> = 3.0V, f = 45MHz	Pin5: GND	1	40.5	43	45.5	dB
	G <sub>(AGC3)</sub>	6/2,3 7/2,3	V <sub>4</sub> = 3.0V, f = 45MHz	Pin5: OPEN	1	37.5	40	42.5	dB
AGC Range	GR	6/2,3 7/2,3	IF Output Level < ±1dB f = 45MHz	1	40			dB	
IF Output Level	V <sub>O(IF)1</sub>	6,7	Output Level, f = 45MHz	1		1.0		V <sub>p-p</sub>	
AGC Control Max. Voltage	V <sub>4H</sub>	4	Gain Max.	1	2.5		3	V	
AGC Control Min. Voltage	V <sub>4L</sub>	4	Gain Min.	1	0		0.5	V	
Input Impedance	Z <sub>in</sub>	2,3	V <sub>4</sub> = 0V, f = 45MHz	3		1/6.5		kΩ/pF	

## Package Dimensions

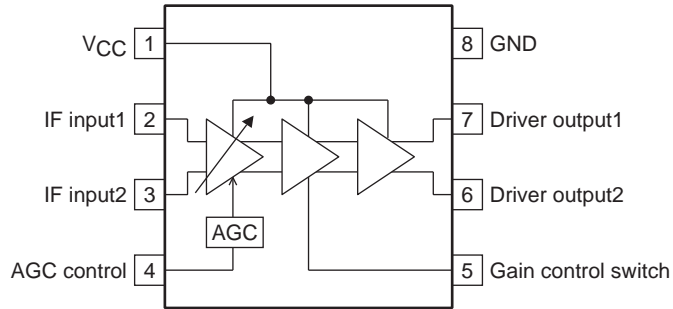
unit : mm (typ)

3245B



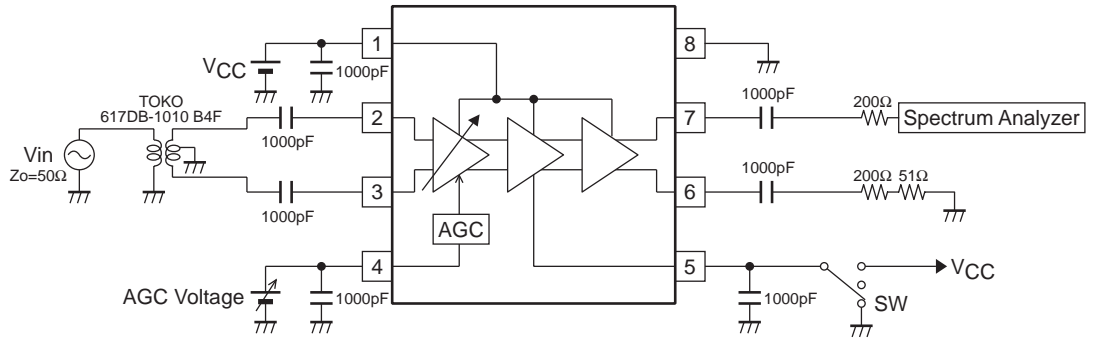
# LA7796T

## Block Diagram



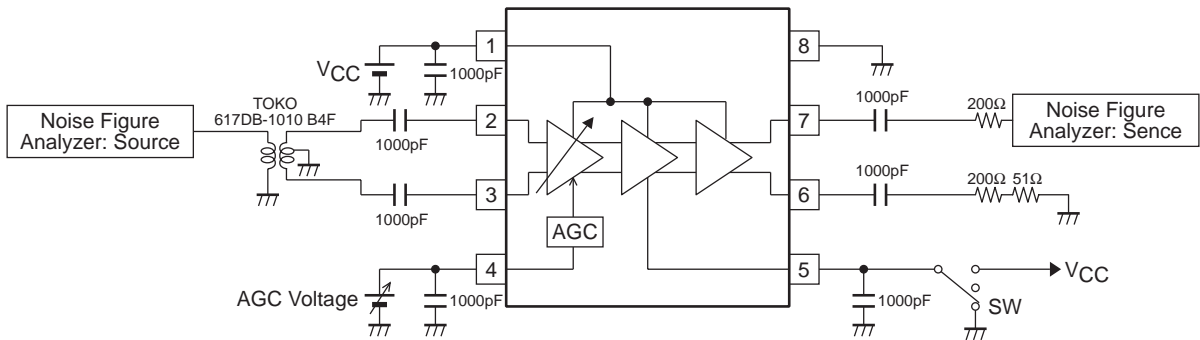
(Caution) Be sure to connect pin 5 to either V<sub>CC</sub> or GND or keep it open.

## Test Circuit1

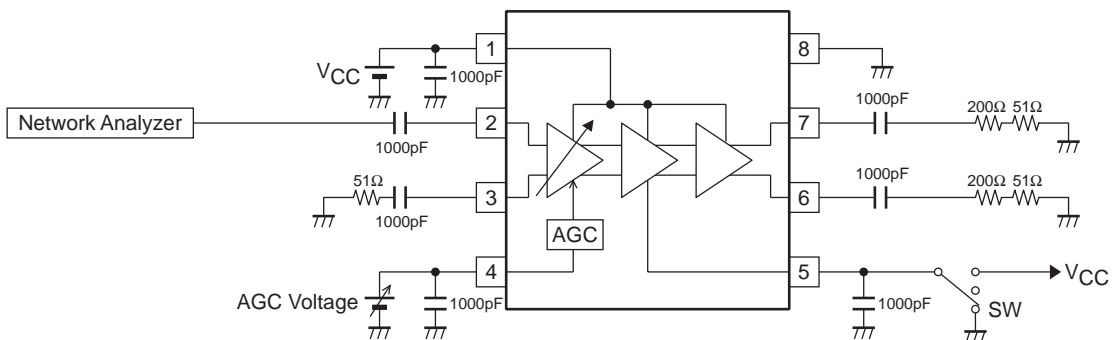


Output Voltage is divided by  $50\Omega / (200+50)\Omega$

## Test Circuit2



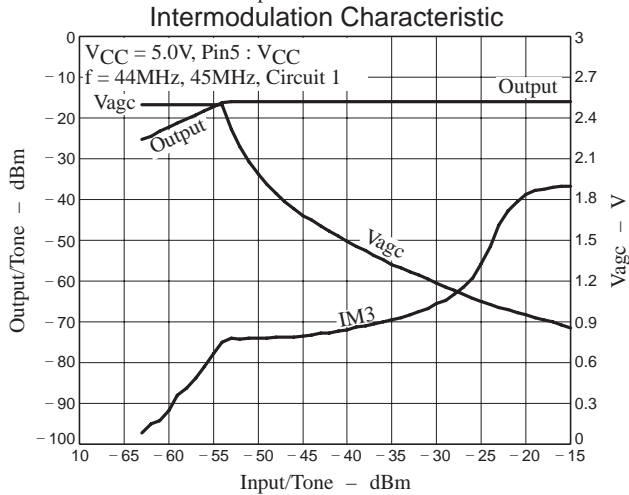
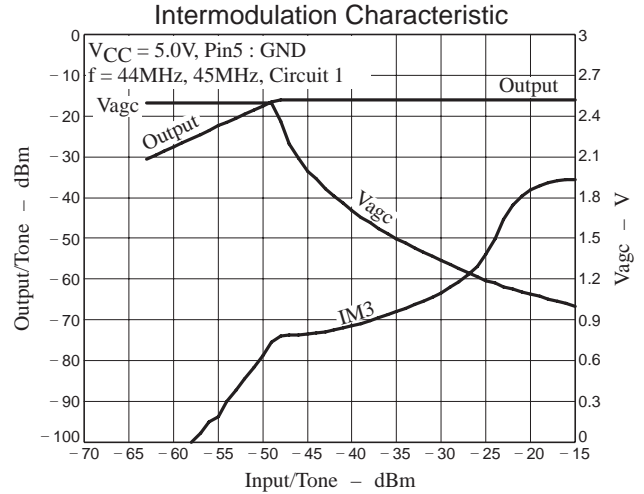
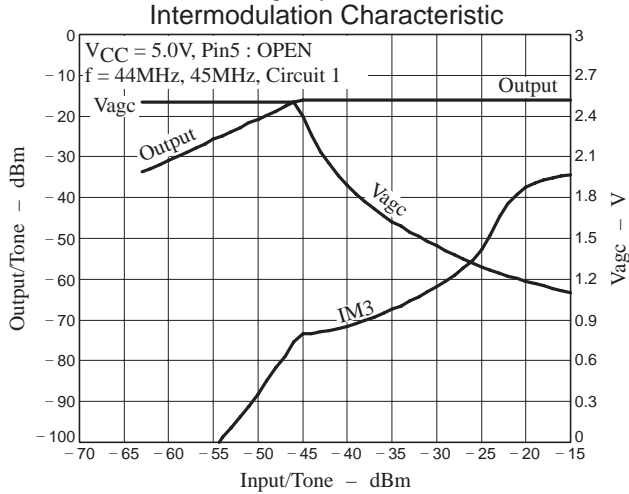
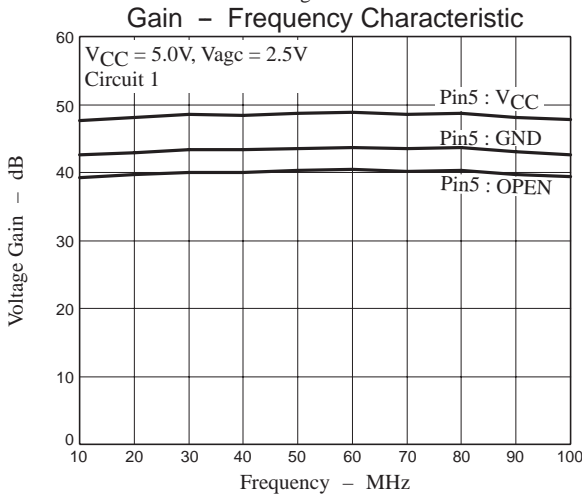
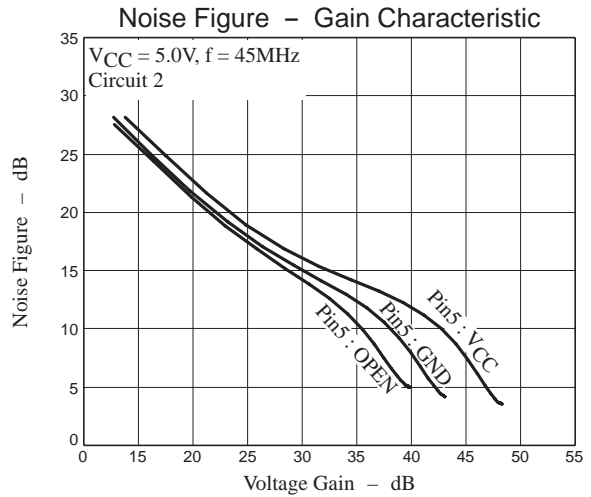
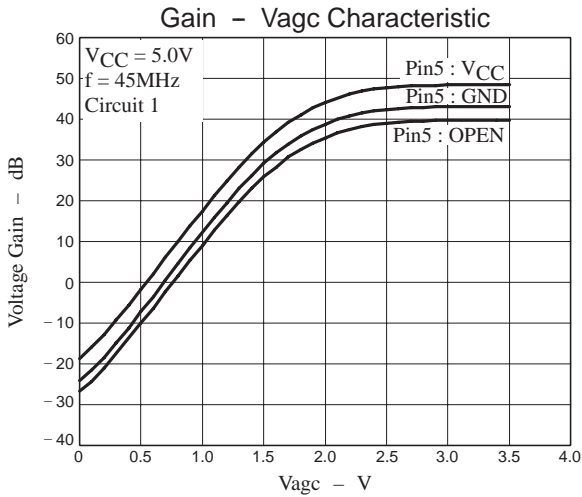
## Test Circuit3



# LA7796T

## Pin Function

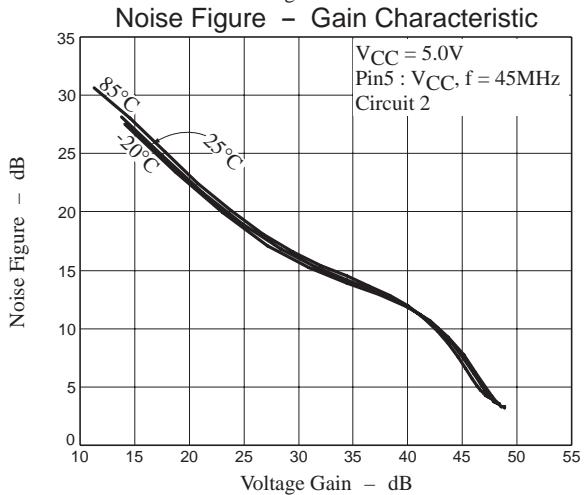
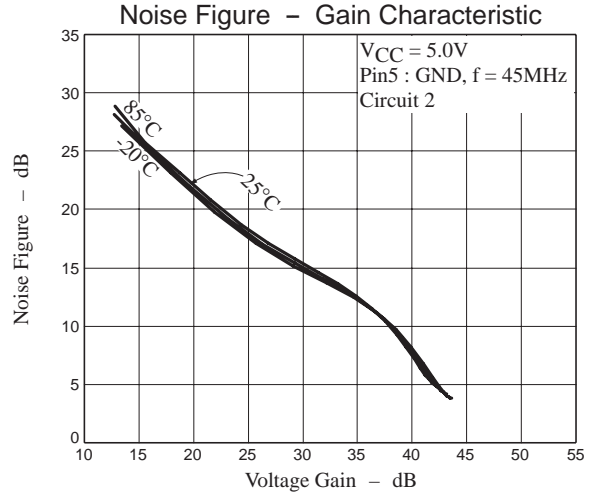
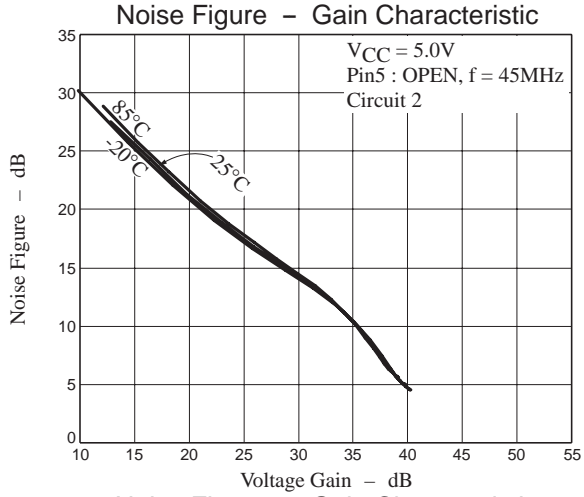
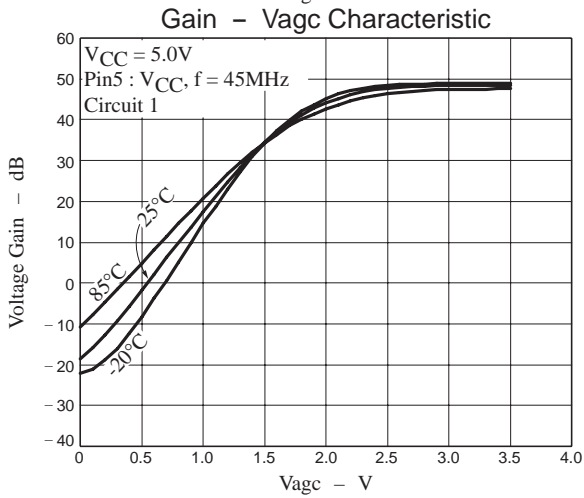
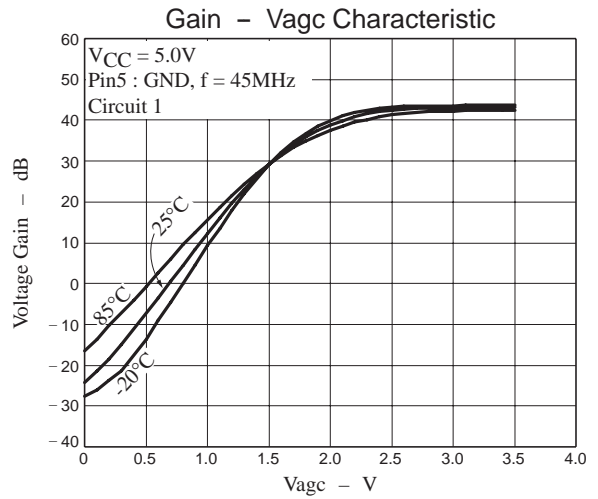
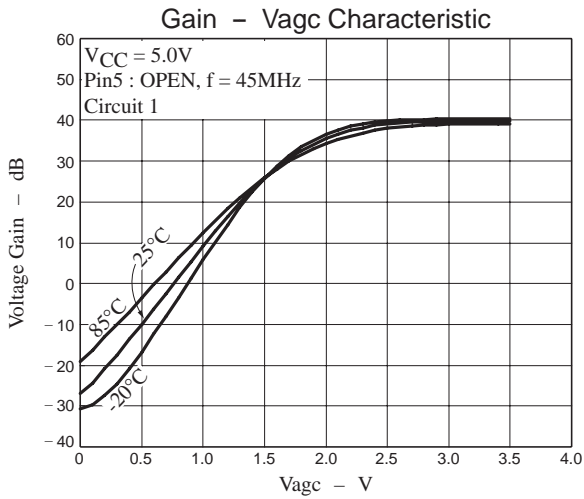
Pin No.	Function	Equivalent circuit
1	VCC	
2 3	IF input.	
4	AGC control.	
5	Gain control Switch.	
6 7	Driver output.	
8	GND	

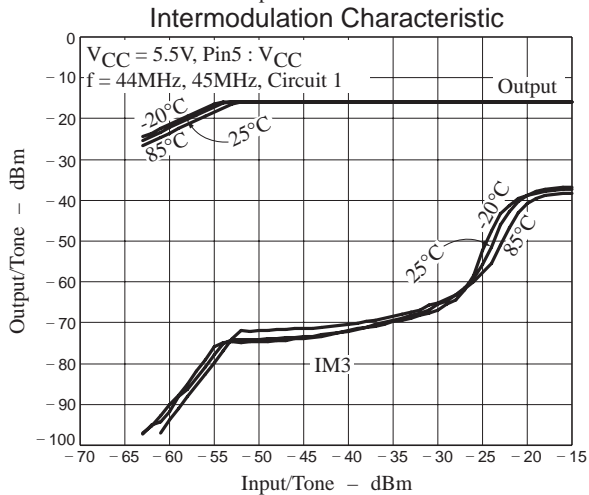
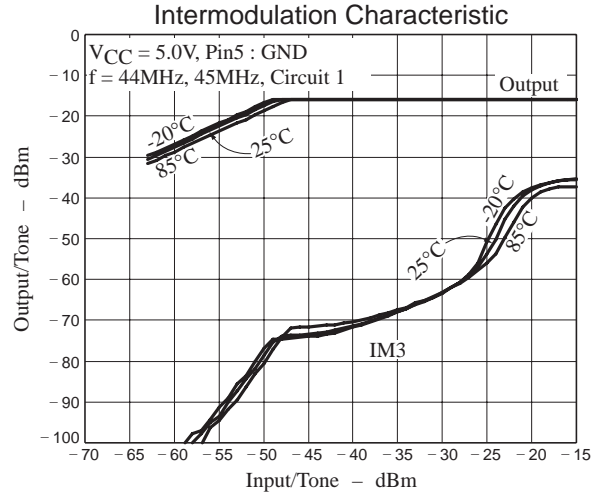
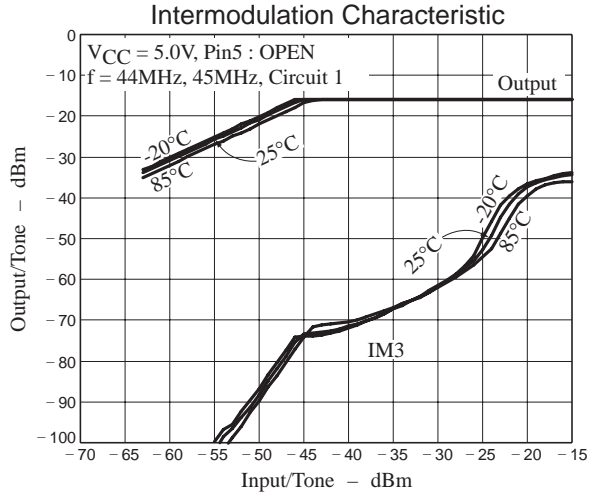
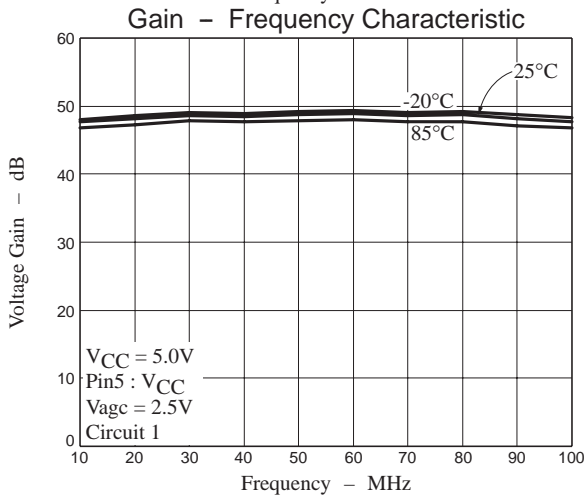
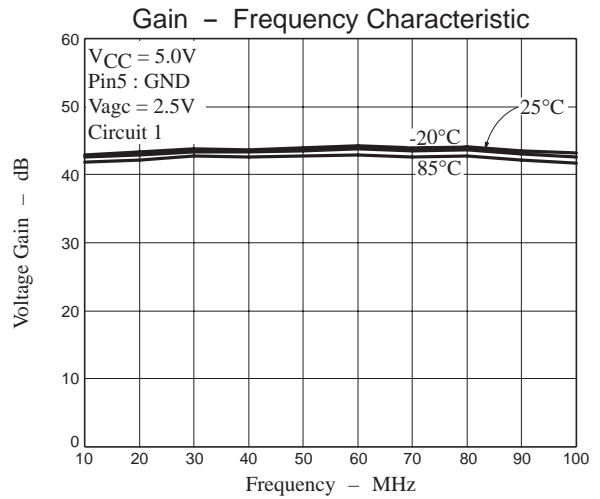
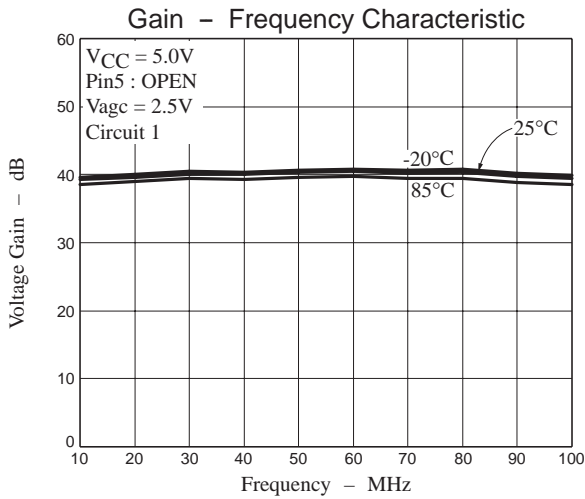


The vertical axis (Output/Tone) on this graph shows the values displayed by the spectrum analyzer for circuit 1.

The actual output power for the corresponding pins is given by the following formula.

$$\{\text{output power [dBm]}\} = \{\text{displayed value [dBm]}\} + 10 \cdot \log(250\Omega/50\Omega)$$





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