Ordering number : ENA1145A

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 Ta = 25°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	Pd max	Ta ≤ 85°C	220	mW
Operating Temperature Range	Topr		-20 to 85	°C
Storage Temperature Range	Tstg		-55 to 150	°C

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

Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended Supply Voltage	V_{CC}	Pin 1	5.0	V
Operating Supply Voltage Range	V_{CC} op	Pin 1	4.5 to 5.5	V

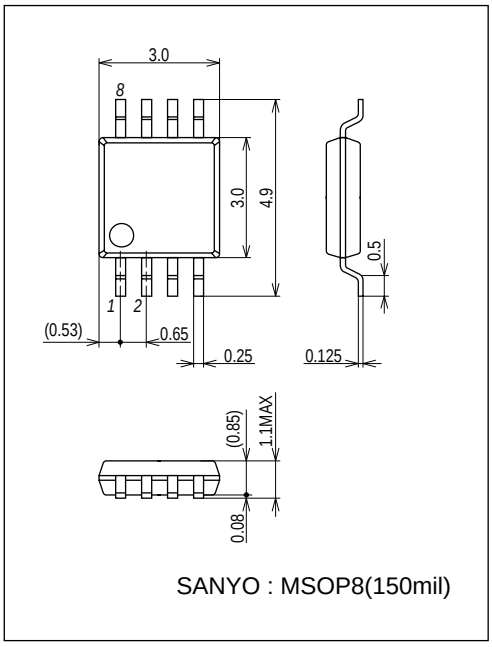
Electrical Characteristics at Ta = 25°C, V_{CC} = 5V

Parameter	Symbol	Pin No.	Conditions		Test circuit	Ratings min	Ratings typ	Ratings max	Unit
Circuit Current	I_{total}	1	No Signal		1	25	30	35	mA
IF Input Frequency Range	f(in)	2,3	fc : -3dB		1	30		100	MHz
Noise Figure	NF	6,7	V4 = 3.0V, f = 45MHz	Pin5: V_{CC}	2		3		dB
			V4 = 3.0V, f = 45MHz	Pin5: GND	2		4		dB
			V4 = 3.0V, f = 45MHz	Pin5: OPEN	2		5		dB
Intermodulation	IM3	6/2,3 7/2,3	V4 = 3.0V, f1 = 44MHz, f2 = 45MHz, Output = 104dBμ each		1	50			dB
Total Amplifier Gain	$G_{(AGC1)}$	6/2,3 7/2,3	V4 = 3.0V, f = 45MHz	Pin5: V_{CC}	1	45.5	48	50.5	dB
	$G_{(AGC2)}$	6/2,3 7/2,3	V4 = 3.0V, f = 45MHz	Pin5: GND	1	40.5	43	45.5	dB
	$G_{(AGC3)}$	6/2,3 7/2,3	V4 = 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_O(IF)1	6,7	Output Level, f = 45MHz		1		1.0		Vp-p
AGC Control Max. Voltage	V_{4H}	4	Gain Max.		1	2.5		3	V
AGC Control Min. Voltage	V_{4L}	4	Gain Min.		1	0		0.5	V
Input Impedance	Zin	2,3	V4 = 0V, f = 45MHz		3		1//6.5		kΩ//pF

Package Dimensions

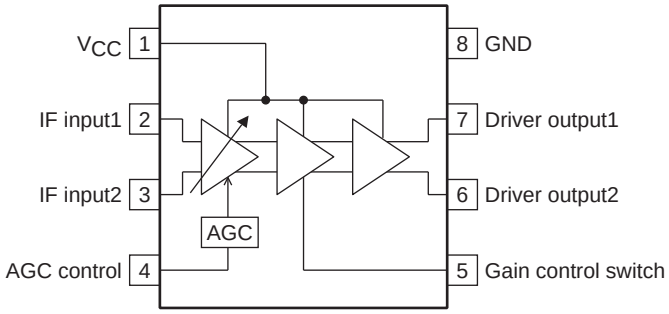
unit : mm (typ)

3245B



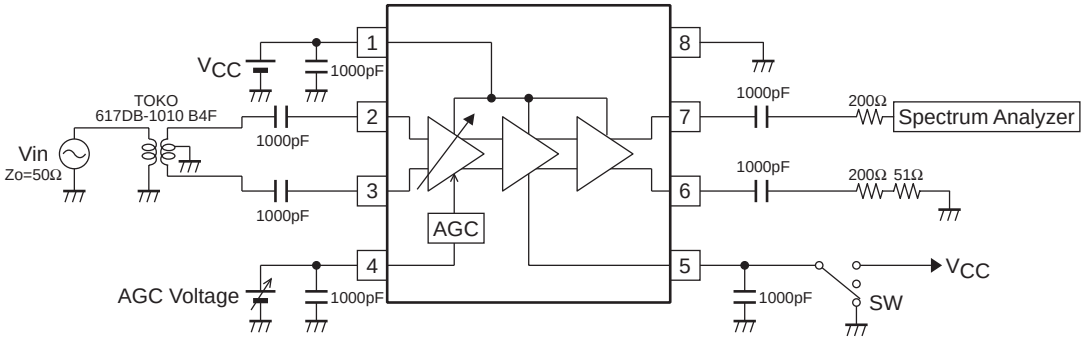
SANYO : MSOP8(150mil)

Block Diagram



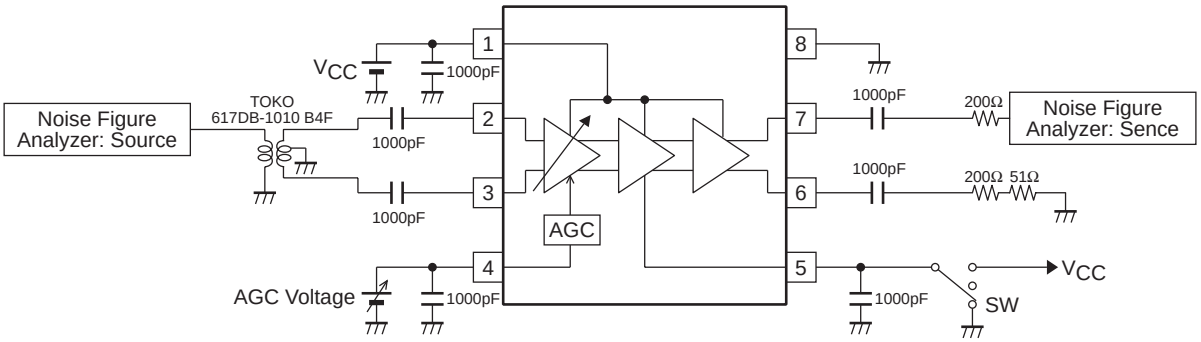
(Caution) Be sure to connect pin 5 to either V_{CC} or GND or keep it open.

Test Circuit1

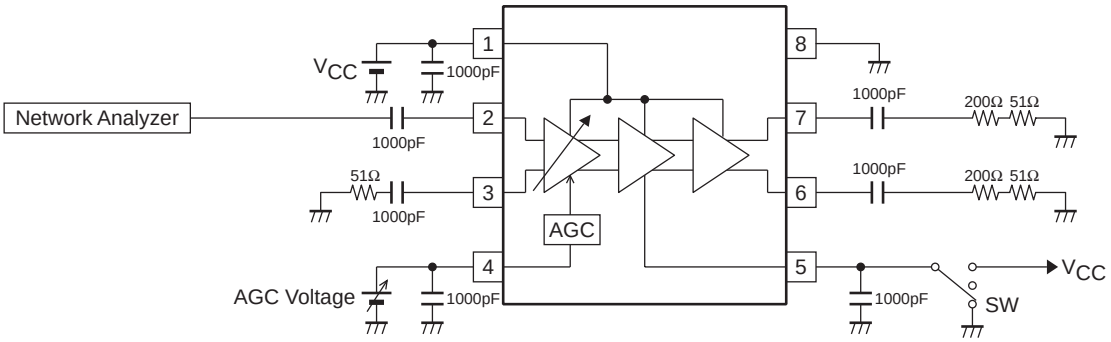


Output Voltage is divided by 50Ω / (200+50)Ω

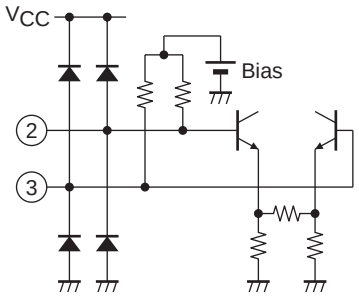
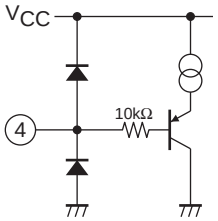
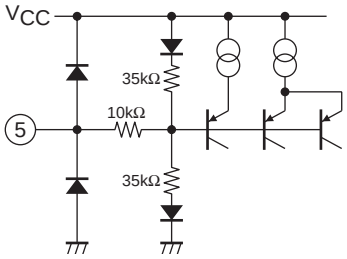
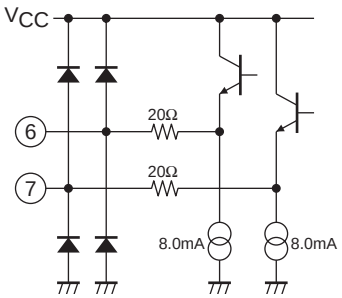
Test Circuit2



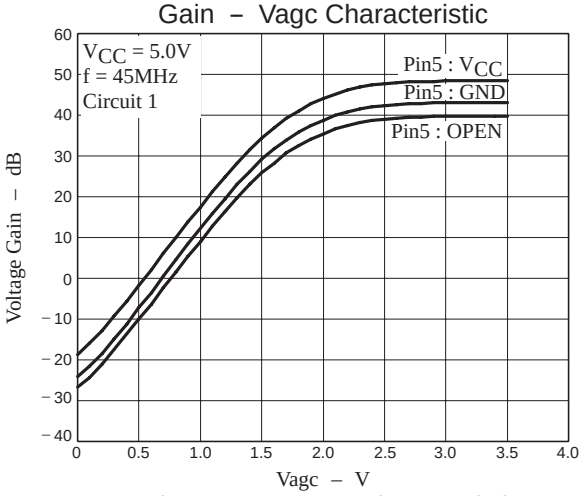
Test Circuit3



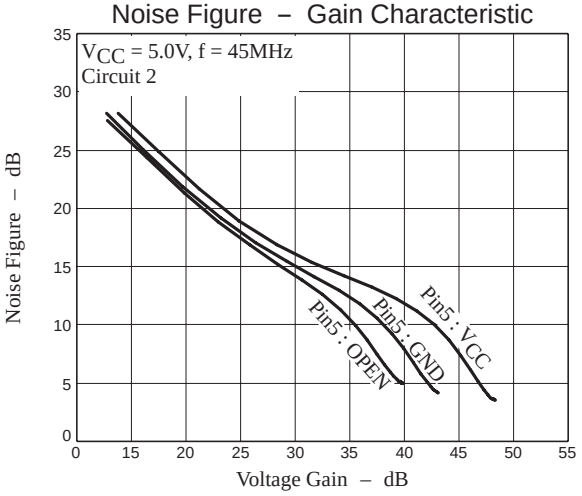
Pin Function

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

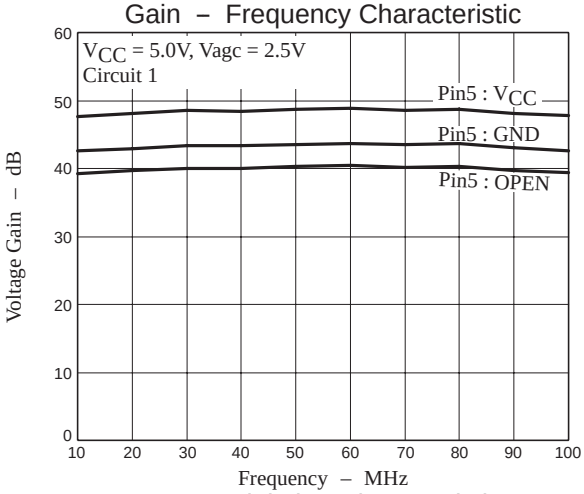
Gain – Vagc Characteristic



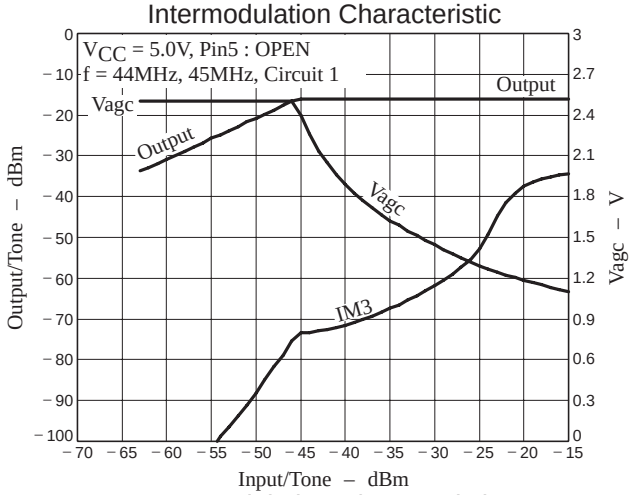
Noise Figure – Gain Characteristic



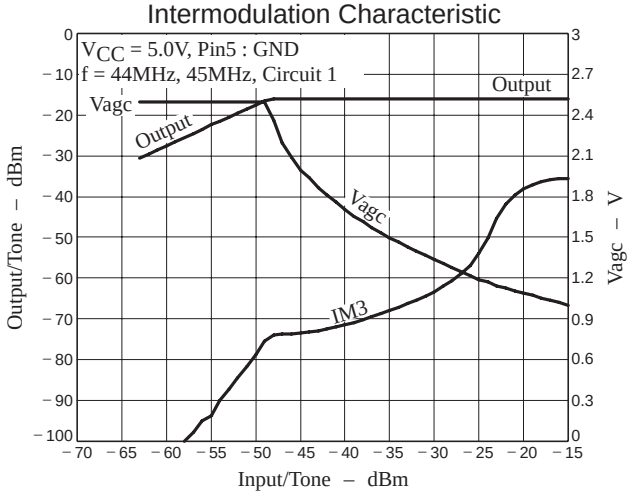
Gain – Frequency Characteristic



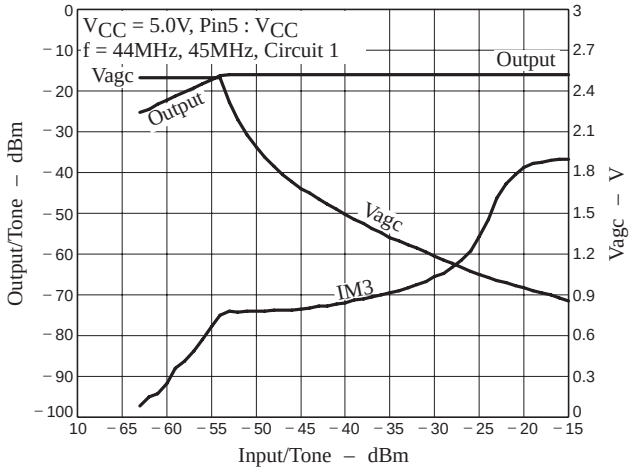
Intermodulation Characteristic



Intermodulation Characteristic



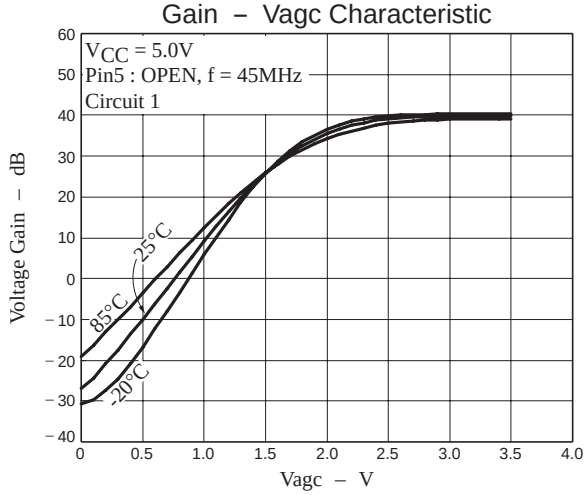
Intermodulation Characteristic



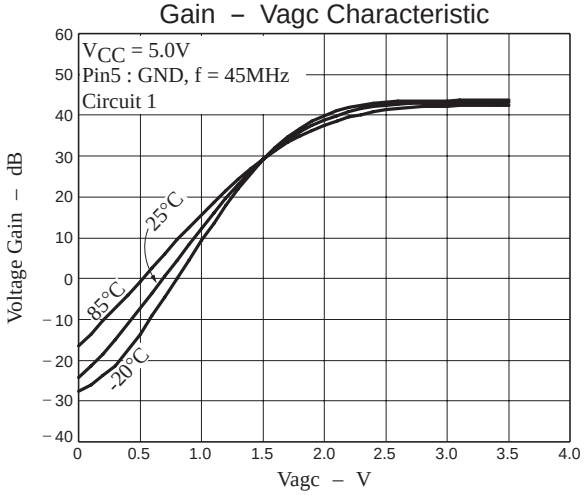
The vertical axis (Output/Tone) on this graph shows the values displayed by the spectrum analyzer for circuit 1.
The actual output power for the corresponding pins is given by the following formula.

{output power [dBm]} =
{displayed value [dBm]} + 10 · log (250Ω/50Ω)

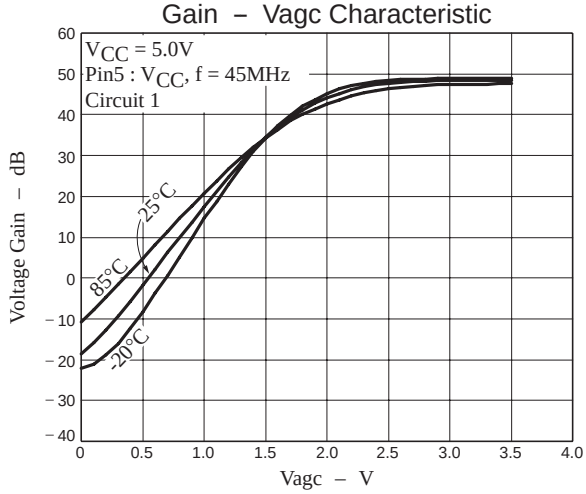
Gain – Vagc Characteristic



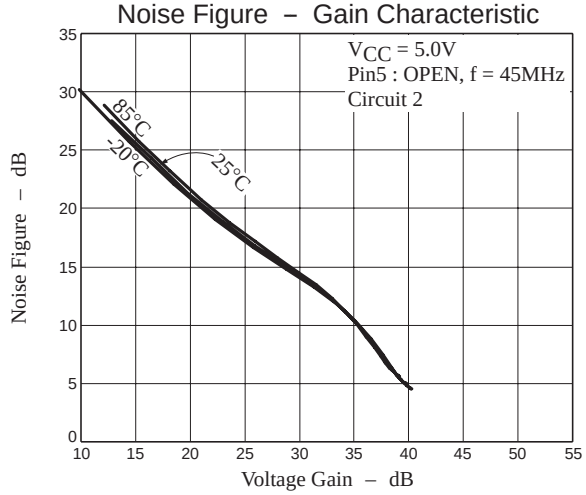
Gain – Vagc Characteristic



Gain – Vagc Characteristic



Noise Figure – Gain Characteristic



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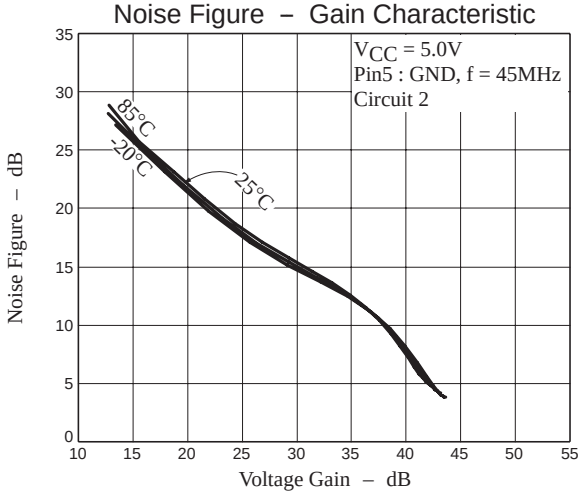

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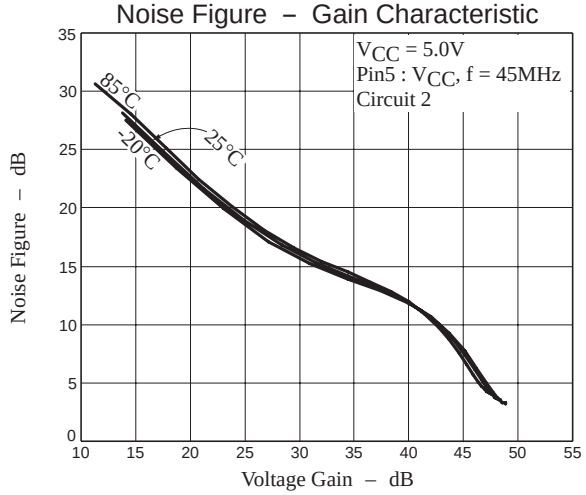
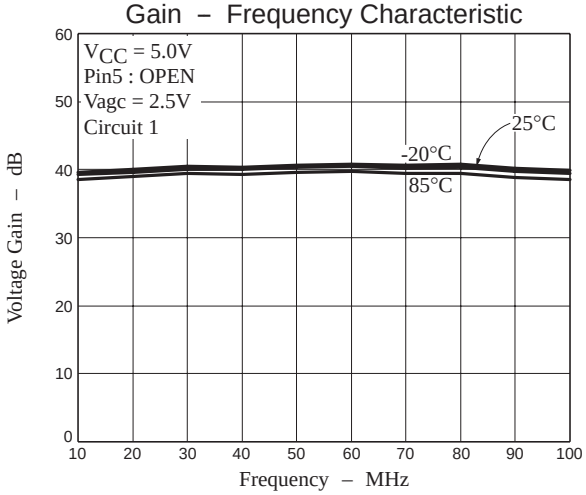
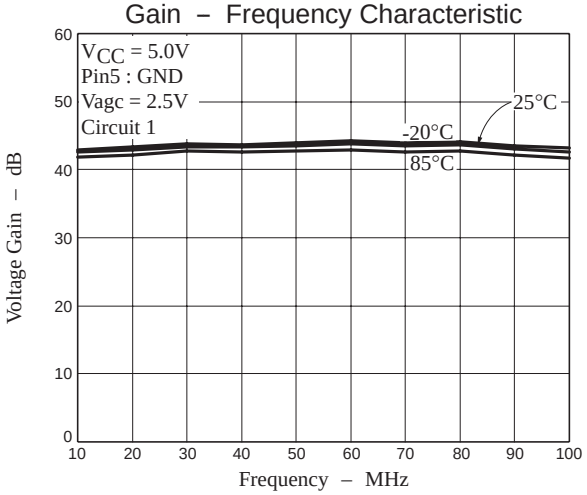


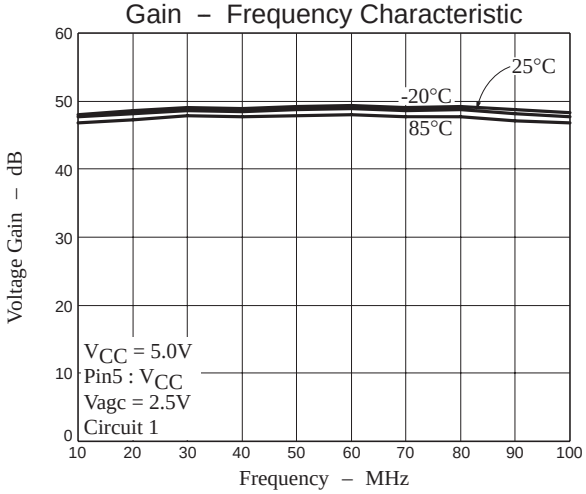
Gain – Frequency Characteristic



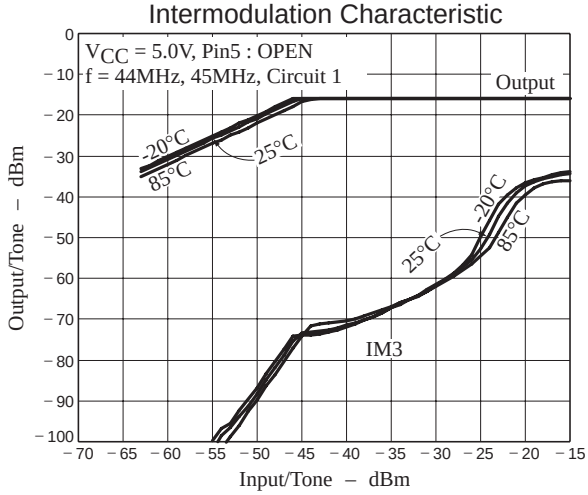
Gain – Frequency Characteristic



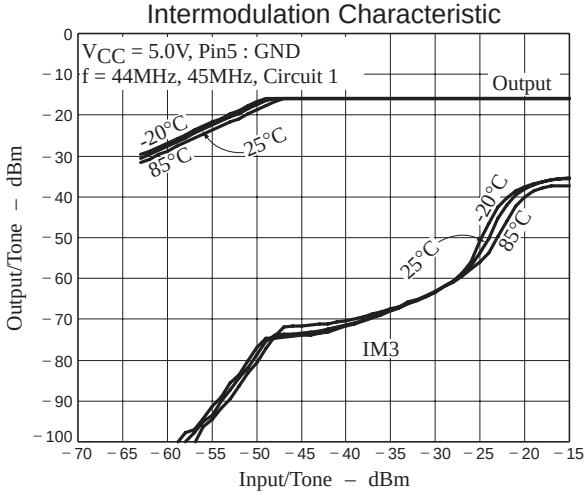
Gain – Frequency Characteristic



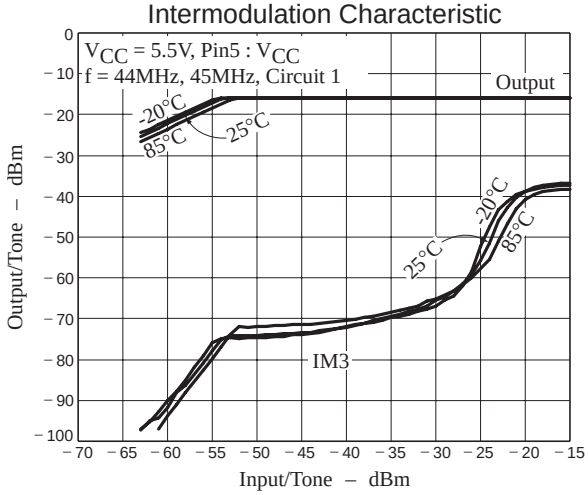
Intermodulation Characteristic



Intermodulation Characteristic



Intermodulation Characteristic



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