

SANYO	No.3516B	LA8630,8630M
	Low Voltage and Current Dissipation Compandor IC	

Applicaitons

- Cordless telephone
- FM transceiver

Functions

- Compressor (VCA circuit, full-wave rectifying circuit, adder amplifier)
- Expander (VCA circuit, full-wave rectifying circuit, adder amplifier)
- Operational amplifier (in the compressor)
- Operational amplifier with muting function (in the expander)
- Analog switch for data signal input (in the compressor)
- Regulator

Maximum Ratings at Ta=25°C

			unit
Maximum Supply Voltage	Vccmax	8	V
Allowable Power Dissipation	Pdmax	300	mW
Operating Temperature	Topr	-20 to +75	°C
Storage Temperature	Tstg	-40 to +125	°C

Operating Conditions at Ta=25°C

			unit
Recommended Supply Voltage	Vcc	3	V
Operating Voltage Range	Vcc op	2.2 to 6	V

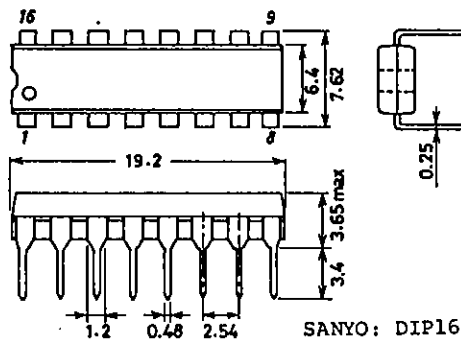
Operating Characteristics at Ta=25°C, Vcc=3.0V, f=1kHz, Vin=100mVrms (0dB)

			min	typ	max	unit
Current Dissipation	Icc	With no signal input		2.5	3.7	mA
Input Reference Voltage	Vinref			100		mVrms

Continued on next page.

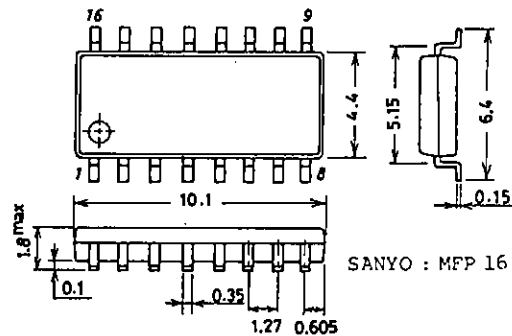
Package Dimensions
(unit: mm)
3006B

[LA8630]



Package Dimensions
(unit: mm)
3035A

[LA8630M]



LA8630,8630M

Continued from preceding page.

[Expander] (Operational amplifier gain: 0dB)			min	typ	max	unit
Output Level	Vorefe	Vin=0dB(Operational amplifier gain: -6dB)	-26.5	-24.5	-22.5	dBV
Gain Error	Vgee(1)	Vin=+5dB	-0.5	0	+0.5	dB
	Vgee(2)	Vin=-20dB	-1.0	0	+1.0	dB
	Vgee(3)	Vin=-30dB	-1.5	0	+2.0	dB
Distortion Factor	THDe	Vin=0dB	0.35	1.0	%	
Output Noise Voltage	VNOe	Vin=-∞, Rg=620Ω, f=20 to 20000Hz	12	80	μVrms	
Frequency Characteristic	f	Vin=0dB, f=200 to 3500Hz	0.0		dB	
Maximum Output Voltage	Vomax	RL=10kΩ, THD=10%	0.6	1.0	Vrms	

[Compressor] (Operational amplifier gain: 0dB)			min	typ	max	unit
Output Level	Vorefc	Vin=0dB	-23	-21	-19	dBV
Gain Error	Vgec(1)	Vin=+20dB	-0.5	0	+0.5	dB
	Vgec(2)	Vin=-20dB	-0.5	0	+0.5	dB
	Vgec(3)	Vin=-40dB	-1.0	0	+1.0	dB
Distortion Factor	THDc	Vin=0dB	0.35	1.0	%	
Output Noise Voltage	VNOc	Vin=-∞, Rg=620Ω, f=20 to 20000Hz	0.3	0.7	mVrms	
Frequency Characteristic	f	Vin=0dB, f=200 to 3500Hz	0.0		dB	

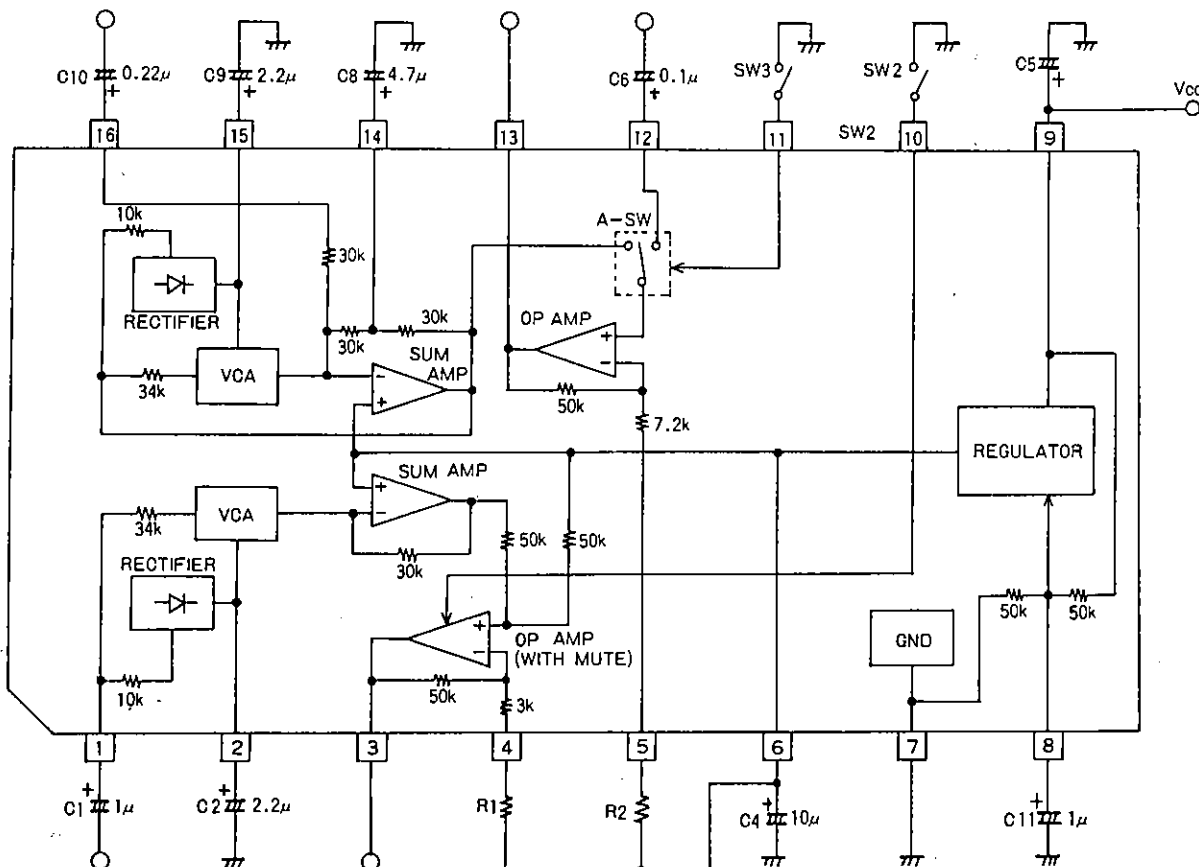
[Muting Circuit] (Operational amplifier gain: 0dB)			min	typ	max	unit
Muting Attenuation	CT(1)	Vin=0dB, f=1kHz	60	90		dB
Threshold Voltage	Vthm		1.25	1.35	1.45	V

[Analog Switch Circuit] (Operational amplifier gain: 0dB)			min	typ	max	unit
Crosstalk	CT(2)	Vin=0dB, f=1kHz	40	47		dB
Threshold Voltage	Vtha		1.25	1.35	1.45	V

*Be careful that the threshold voltage is determined by Vcc (Vth=0.45Vcc).

Equivalent Circuit Block Diagram/Sample Application Circuit

Unit (resistance: Ω, capacitance: F)

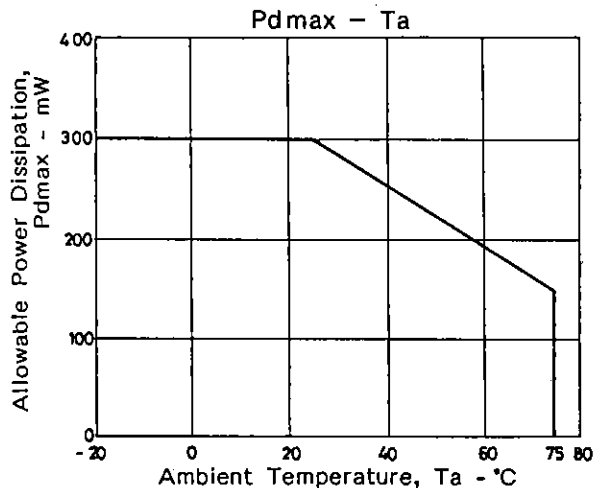


Pin Name

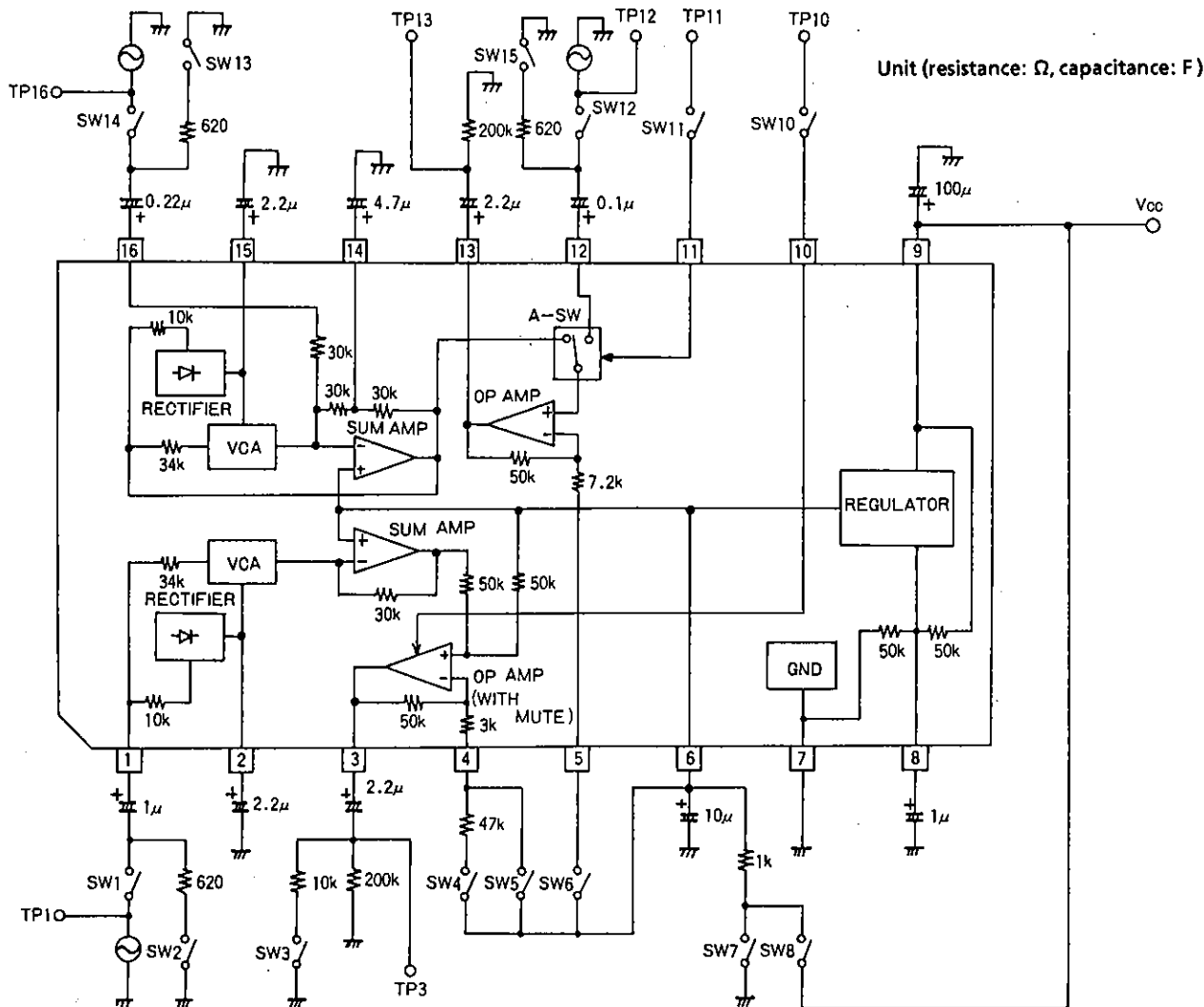
Pin No.	Name
1	EXP.VIN
2	EXP.VREC
3	EXP.VOUT
4	OP.AMP NF(EXP)
5	OP.AMP NF(COMP)
6	VREF
7	GND
8	1/2VCC
9	VCC
10	MUTE CONT.
11	DATA CONT.
12	DATA IN
13	COMP.VOUT
14	COMP.NF
15	COMP.VREC
16	COMP.VIN

Control Mode

Mode	Audio signal	Data
Pin 10	Open	Output
	[LOW]	Mute
Pin 11	Open	Output
	[LOW]	Mute

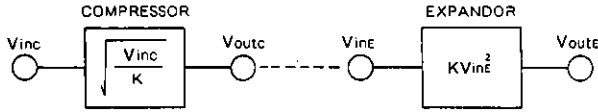


Test Circuit



Summary of Compador

(1) Operation



<for example>

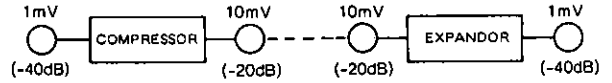
$V_{ref} = 100\text{mV}$

$K = 10$

$V_{inc} = 1\text{mV} \quad V_{outc} = \sqrt{\frac{1}{10} \times 1 \times 10^{-3}} \approx 10\text{mV} = -20\text{dB}$
 (-40dB)

$V_{ine} = 10\text{mV} \quad V_{oute} = (10 \times 10^{-3})^2 \times 10 = 1\text{mV} = -40\text{dB}$

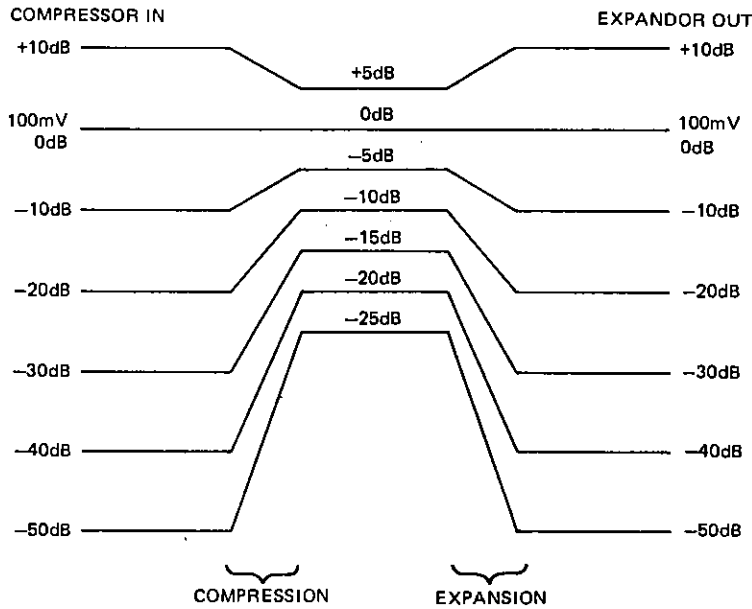
$V_{outc} = \sqrt{V_{inc}/K}$
 $V_{ine} = V_{outc}^2$
 $V_{oute} = K V_{ine}^2 = K \sqrt{\frac{V_{inc}}{K}} = V_{inc}$



at Reference level (V_{ref}) $V_{inc} = V_{outc}$, $V_{ine} = V_{oute}$

- $V_{inc} < V_{ref}$ COMPRESSOR → Amplifier
- $V_{ine} < V_{ref}$ EXPANDOR → Attenuator
- $V_{inc} > V_{ref}$ COMPRESSOR → Attenuator
- $V_{ine} > V_{ref}$ EXPANDOR → Amplifier

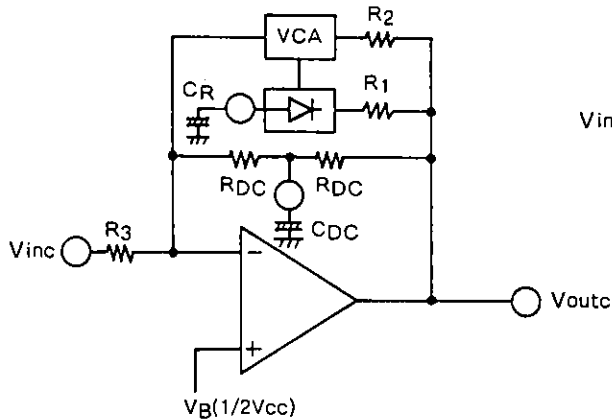
(2) Level Diagram



(3) Block Diagram
 <COMPRESSOR>

$$V_{outc} = \sqrt{\frac{R_1 R_2 I_1}{2R_3}} V_{inc}$$

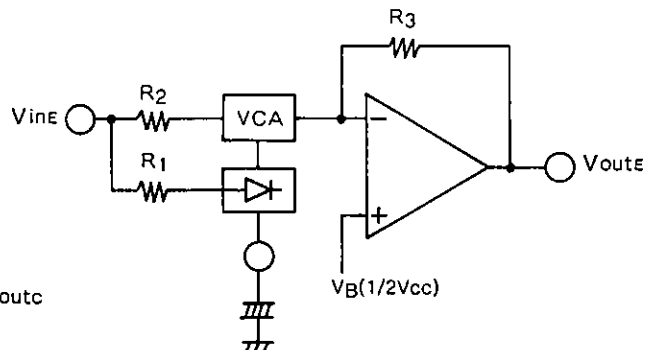
$$= \sqrt{\frac{1}{10}} V_{inc}$$

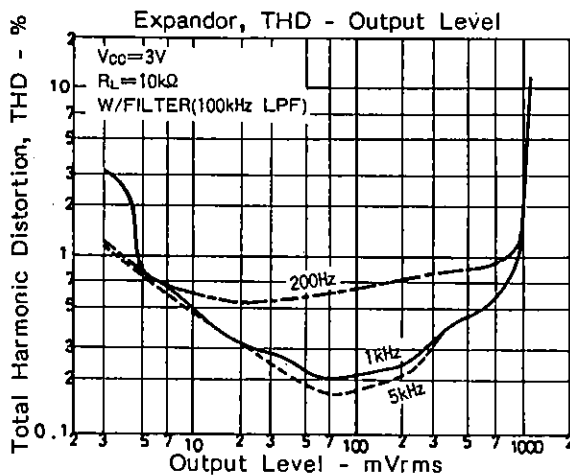
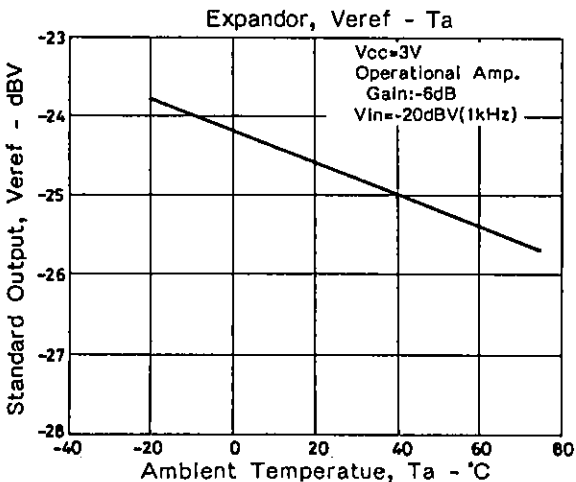
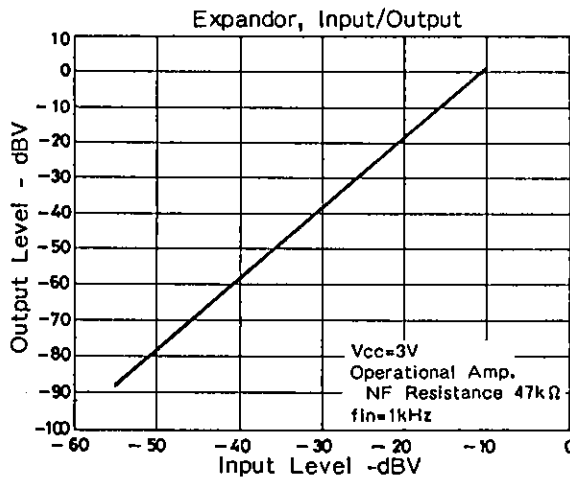
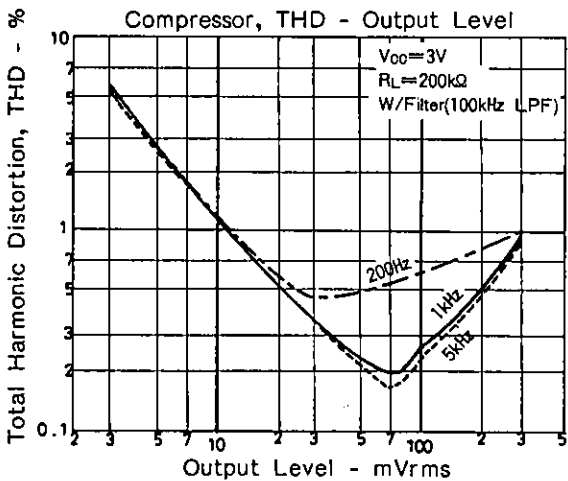
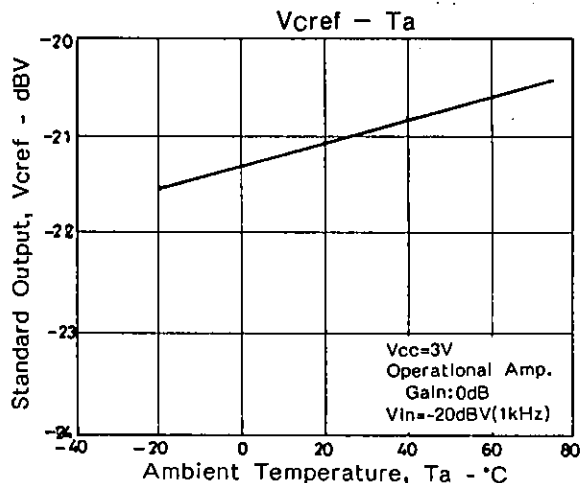
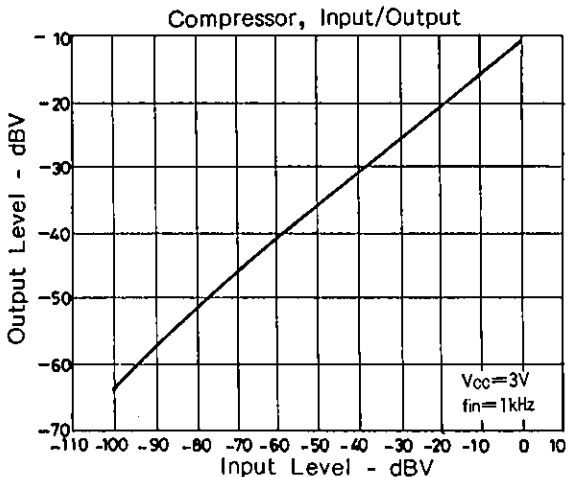
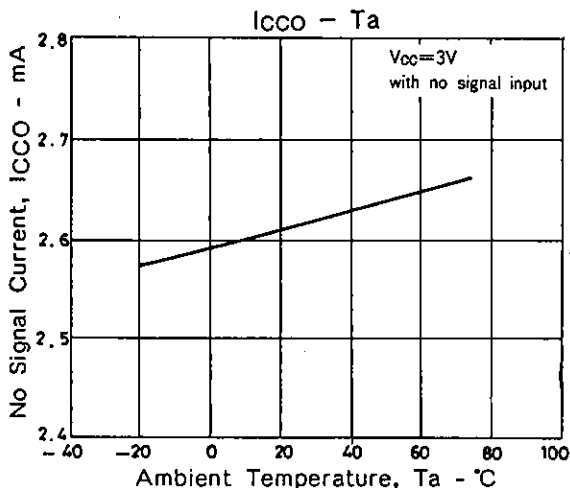
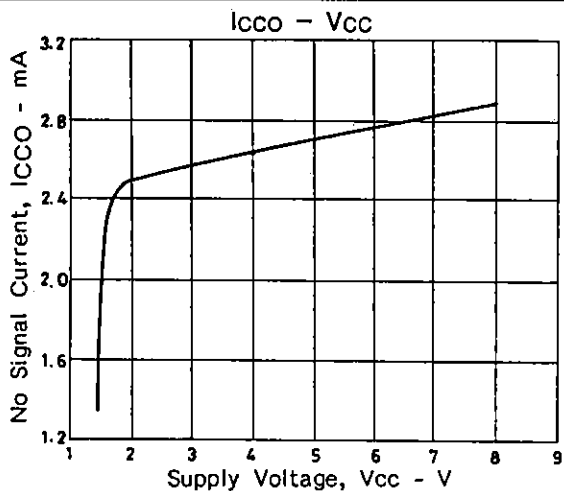


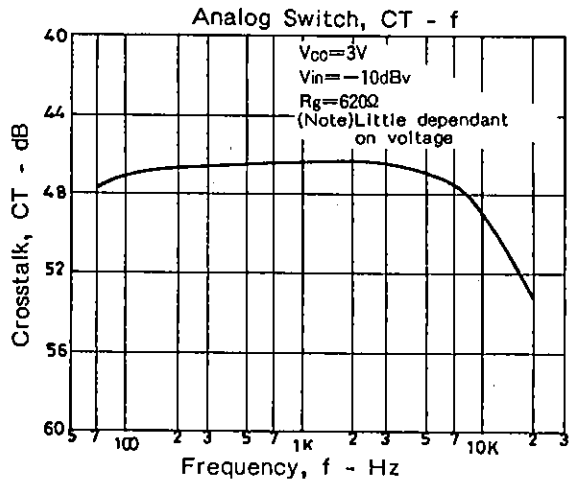
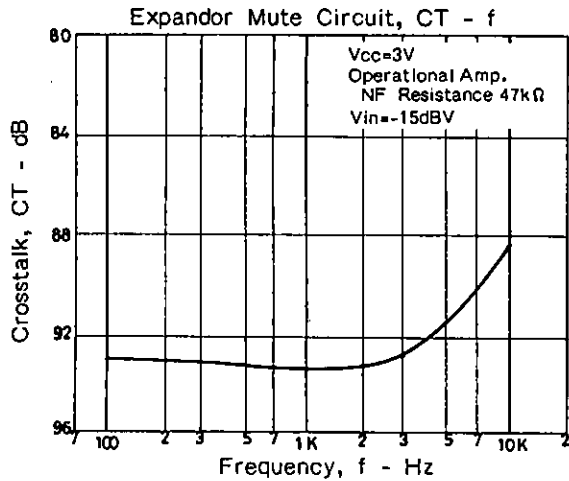
<EXPANDOR>

$$V_{oute} = \frac{2R_3}{R_1 R_2 I_1} V_{ine}^2$$

$$= 10 V_{ine}^2$$







- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
 - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use.
 - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.