SONY

CX20102

PCM-RF Signal Processing

Description

The CX20102 is a bipolar IC which has been developed for the processing of PCM audio RF signals of the 8 mm VTR, and consists of the following functions:

- Recording system : Limiter, and Area selector switch
- Playback system : Voltage follower for RF equalizer, Limiter, Tri-state TTL buffer, PLL, and D-FF

20-pin SOP (Plastic)
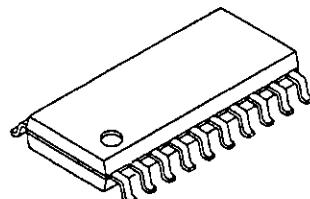
Features

- Single 5V (5.0 ± 0.25V) power supply operation.

- Low power consumption (85mW typical in a REC mode, and 110 mW typical in a PB mode)

- Built-in power saving functions

Absolute Maximum Ratings (Ta=25°C)

- Power supply voltage   Vcc   10   V
- Operating temperature   Topr   −20 to +75   °C
- Storage temperature   Tstg   −55 to +150 °C
- Allowable power dissipation P$_D$ 690   mW

Recommended Operating Condition

4.75 to 5.25   V

E95832-FP

Block Diagram
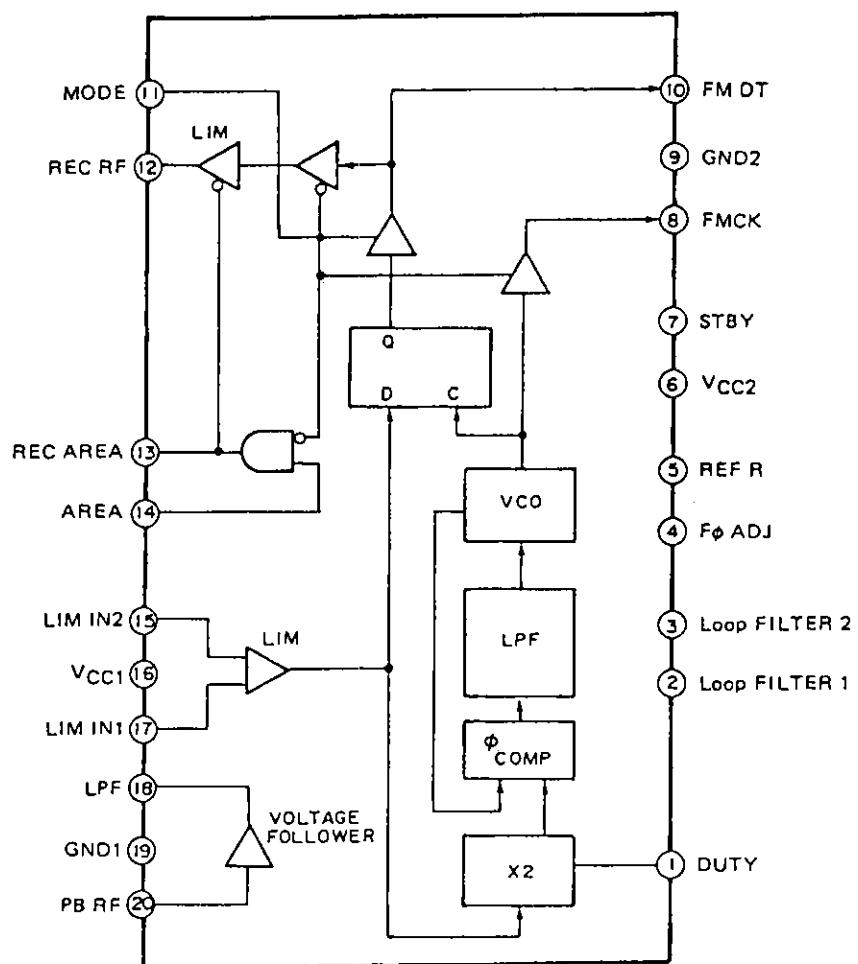
Pin Description

No.	Name	Description
1	DUTY	Fine adjustment of the input waveform sampling phase Normally open
2	Loop filter 1	Connects an external loop filter time constant
3	Loop filter 2	Connects an external loop filter time constant
4	F ϕ ADJ	Adjusting pin of the VCO free running frequency
5	REF R	R externally attached VCO current source
6	V_{CC2}	Digital Vcc
7	STBY	Power saving control pin; standby at L (CMOS level)
8	FMCK	Clock output
9	GND2	Digital GND
10	FMDT	Data input/output
11	MODE	REC/PB selector pin (CMOS level)
12	REC RF	REC mode RF output (LIM OUT)
13	REC AREA	REC AREA output (CMOS level)
14	AREA	AREA input 2 (CMOS level)
15	LIM IN2	Limiter input
16	V_{CC1}	Analog Vcc
17	LIM IN1	Limiter input 1
18	LPF	Voltage follower output
19	GND1	Analog GND
20	RBRF	Voltage follower input

Electrical Characteristics

See Measuring Circuit Diagram 2

Ta=25˚C, Vcc=5 V;

| Item	Symbol	Condition	Min.	Typ.	Max.	Unit
PB current consumption	IccPB	Pins ⑦ and ⑪ : H		19	25	mA
REC current consumption	IccREC	Pin ⑦ : H		16	20	mA
PB standby current	IccST			12	15	mA
Clock capture range	C.RCK	Pins ⑦ and ⑪ : H	11.0		12.0	MHz
Output level	VOH	1. With pin ① open, adjust the free running frequency at 11.5MHz	2.2			V
Pins ⑧ and ⑩	VOL				0.8	V
Data clock delay time *1	tpd	2. Input 50mV 11MHz and 12MHz from pin ① and perform measurement	4		35	nS
Operating input voltage	VIN		50			mVp-p
Output level Pin ⑬	VOH	Pins ⑦ and ⑭ : H	3.5			V
	VOL	Pins ⑦ : H or Pins ⑦, ⑭ and ⑪ : H or Pins ⑦ and ⑪ : H			1.5	V
Input current	IIH	Input voltage: 4V		120	200	μA
Pins ⑦ and ⑭	IIL	Input voltage: 0V	−2	0	+2	μA
Operating input voltage	VIH		3.5			V
Pins ⑦ and ⑭	VIL				1.5	V
Input current Pin ⑩	IIH	Input voltage: 5V			60	μA
	IIL	Input voltage: 0V	−2	0	2	μA
Operating input voltage	VIH		2.5			V
Pin ⑩	VIL				1.5	V
Input current Pin ⑪	IIH	Input voltage: 3.5V		130	200	
	IIL	Input voltage: 0V	−2	0	2	
Operating input voltage	VIH		2.5			V
Pin ⑪	VIL				0.8	V
Voltage follower gain	GVF	Pins ⑦ and ⑪ : H Input: Pin ⑳ 6MHz, 0.6Vp-p Output: Pin ⑱	−1.5	0	1	dB
REC RF LIM output	VLIM	Pins ⑦ and ⑭ : H Input: Pin ⑩ TTL level input Output: Pin ⑫	0.40	0.50	0.56	Vp-p

*1 For tpd measurements, see Fig. 3 Timing Chart.

Truth Table

Operation State	Pin 7	Pin 11	Pin 14
Power saving	L	X	X
PB	H	H	X
REC	H	L	H
REC standby	H	L	L

X: Don't care

Fig. 1 Operating description
PB

PB RF pin ⑳

FM DT pin ⑩

FM CK pin ⑧

Pin ⑰ input sampling point

REC. REC STBY

FM DT pin ⑩

AREA pin ⑭

REC RF pin ⑫
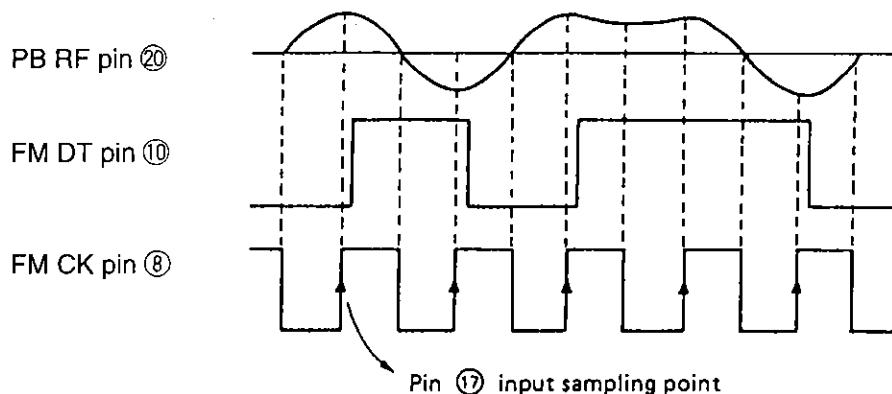
REC ——→|←—— REC STBY
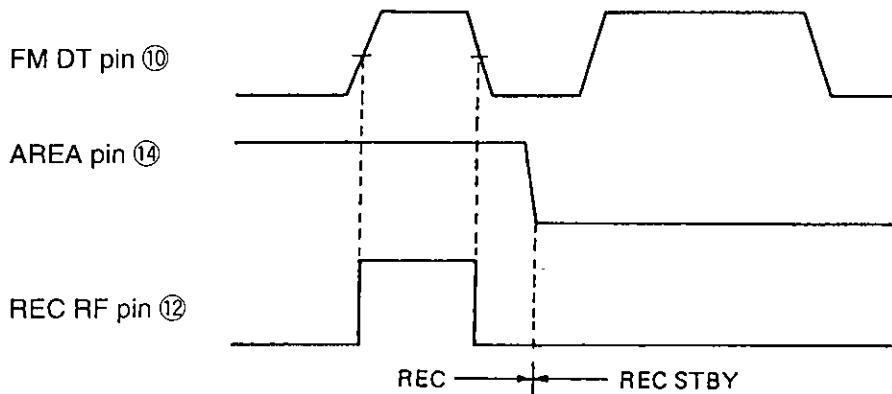
Fig. 2 Electrical characteristics measuring circuit

RF IN

AREA PCM REC REC RF MODE

Vcc: +5V

330 330 2K 3K 560 100μ 100K 100K 10K 47μ 0.01μ 0.01μ 0.01μ

DUTY ADJ

STBY FMCK FMDT

Free running adjustment

Fig. 3 tpd measurement

FM DT pin ⑩ 1.5V

FM CK pin ⑧ 1.5V

tpd1 tpd2
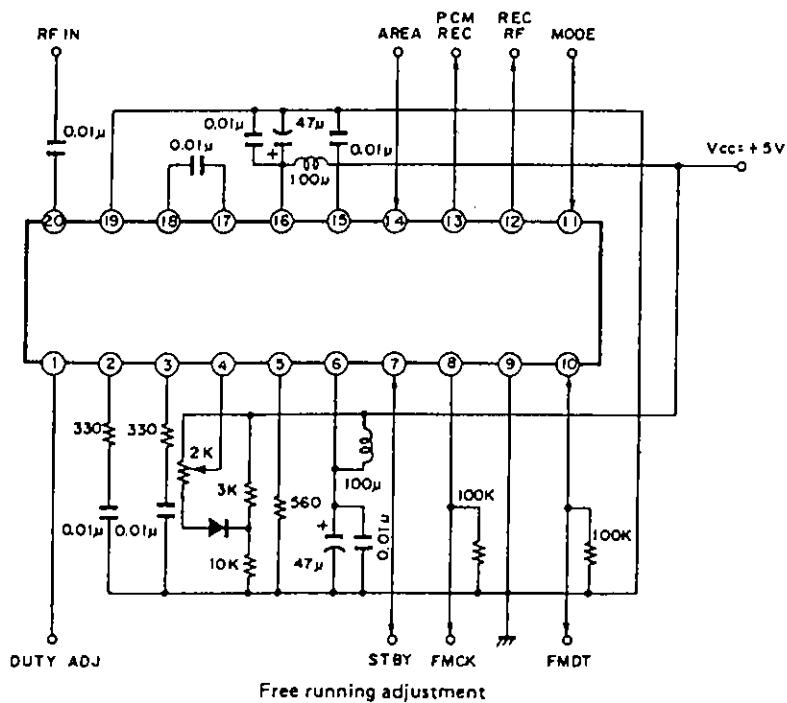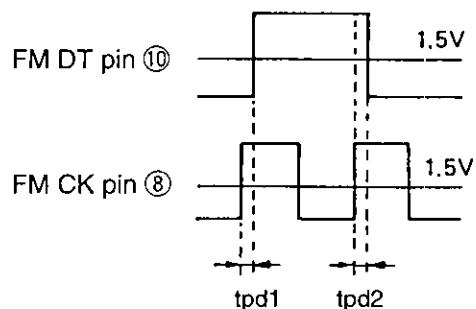
Standard Circuit Designing Data

Standard pin voltage (DC): See Fig. 2

No.	Voltage	No.	Voltage
1	3.8V	11	5*V or 0V
2	4.3V	12	3.7 to 4.2V
3	4.3V	13	0 or 4.2V
4	4.85*V	14	5*V or 0V
5	0.2V	15	2.3V
6	5.0*V (Vcc)	16	5.0*V (Vcc)
7	5*V or 0V	17	2.3V
8	Clock output	18	2.3V
9	0* (GND)	19	0*V (GND)
10	Data output	20	2.3V

*: Externally applied

During PB mode (Pins ⑦ and ⑪: H)

Fig. 4   Application circuit
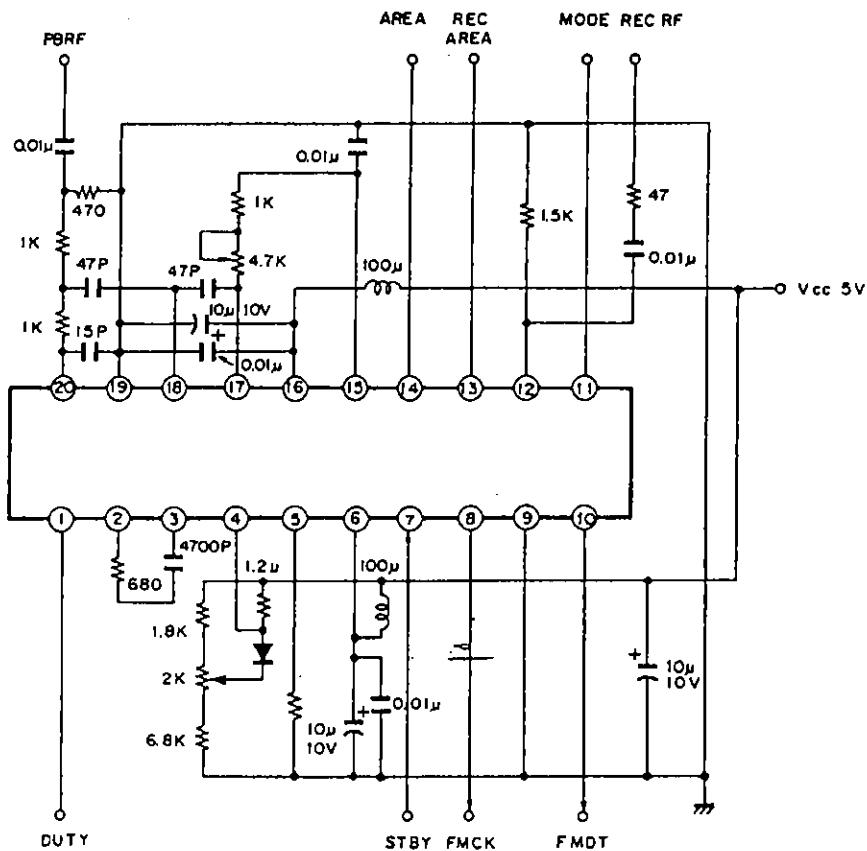
Application circuits shown are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits or for any infringement of third party patent and other right due to same.

**Fig. 5   Free running frequency vs.**
Power supply voltage

fo – Free running frequency (MHz)

12.0

11.5

11.0

4.75   5.0   5.25

Vcc – Power supply voltage (V)
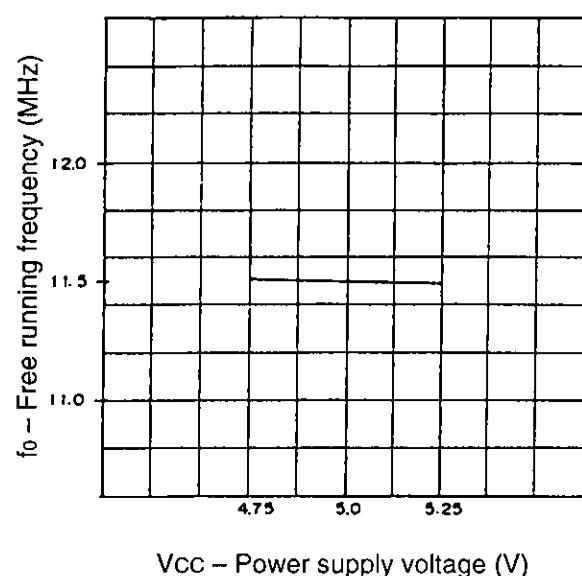
Fig. 6   Pin ⑦ current vs. Voltage

⑦: STBY

I⑦ – Pin 7 current (μA)

150

100

3   4   5

V⑦ – Pin 7 voltage (V)

Fig. 7   Pin ⑪ current vs. Voltage

⑪ MODE

I⑪ – Pin 11 current (μA)

200

150

100

3   4   5

V⑪ – Pin 11 voltage (V)

Fig. 8   Pin ⑭ current vs. Voltage

⑭ AREA

I⑭ – Pin 14 current (μA)

200

150

100

3   4   5

V ⑭ – Pin 14 voltage (V)
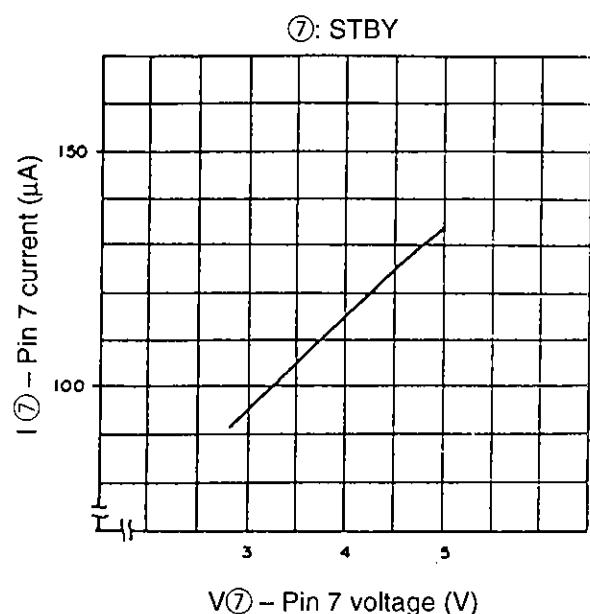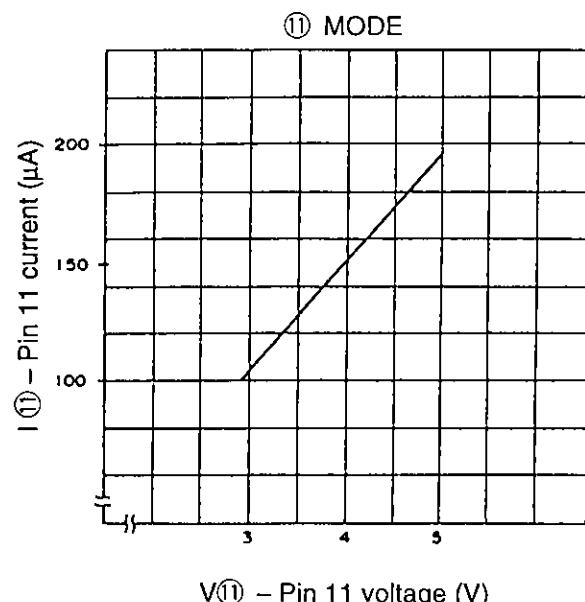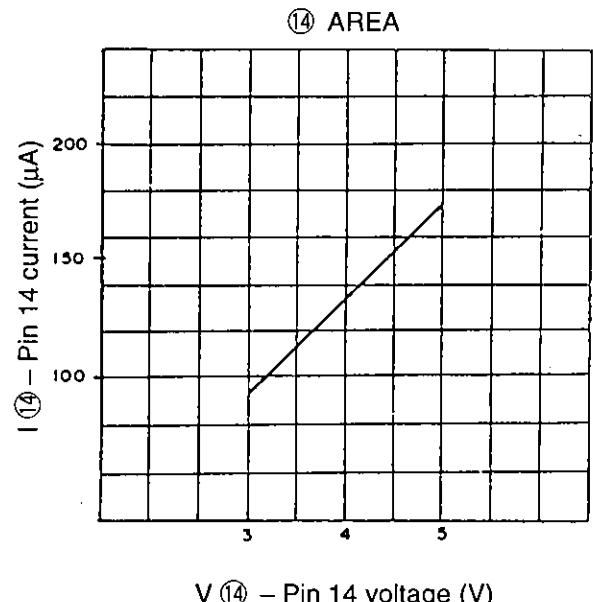
Fig. 9 Free running frequency vs.
        Pin ④ voltage


V④ – Pin 4 voltage (V)
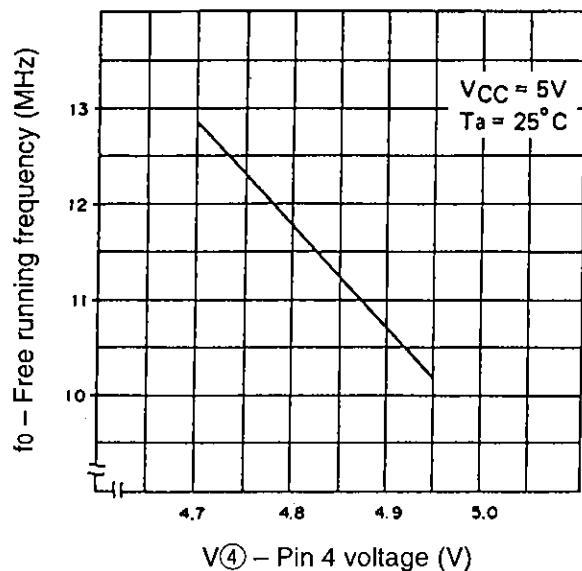
Fig. 10 Free running frequency vs.
         Ambient temperature

Ta – Ambient temperature (°C)

Fig. 11 Free running frequency vs.
         Power supply voltage
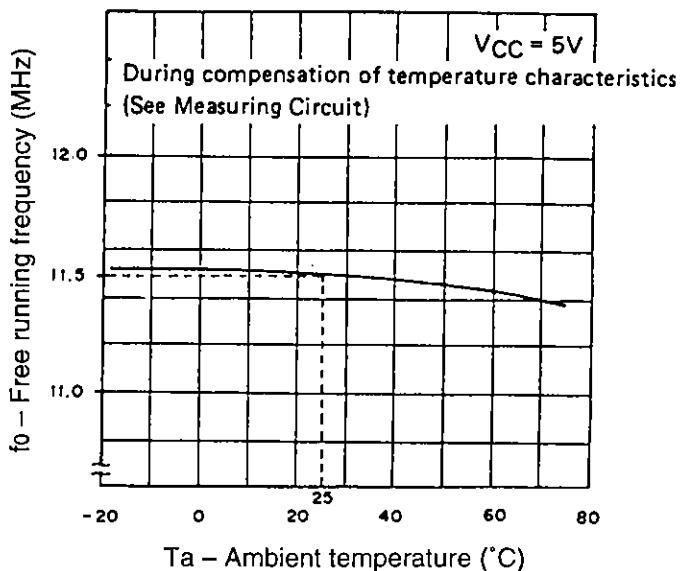

Vcc – Power supply voltage (V)
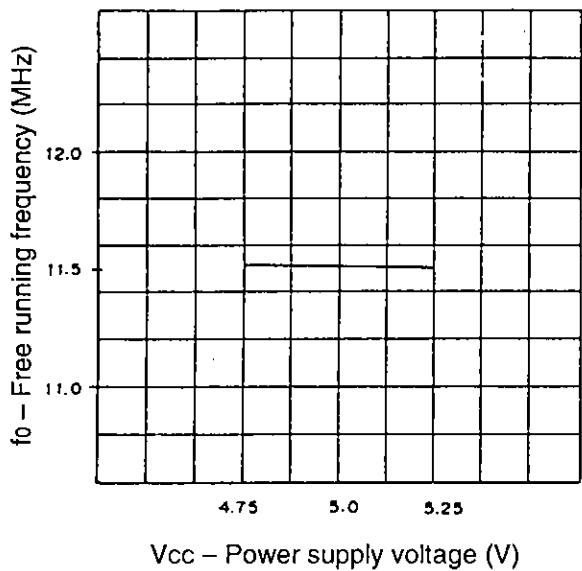
Package Outline   Unit : mm

20PIN SOP (PLASTIC) 300MIL
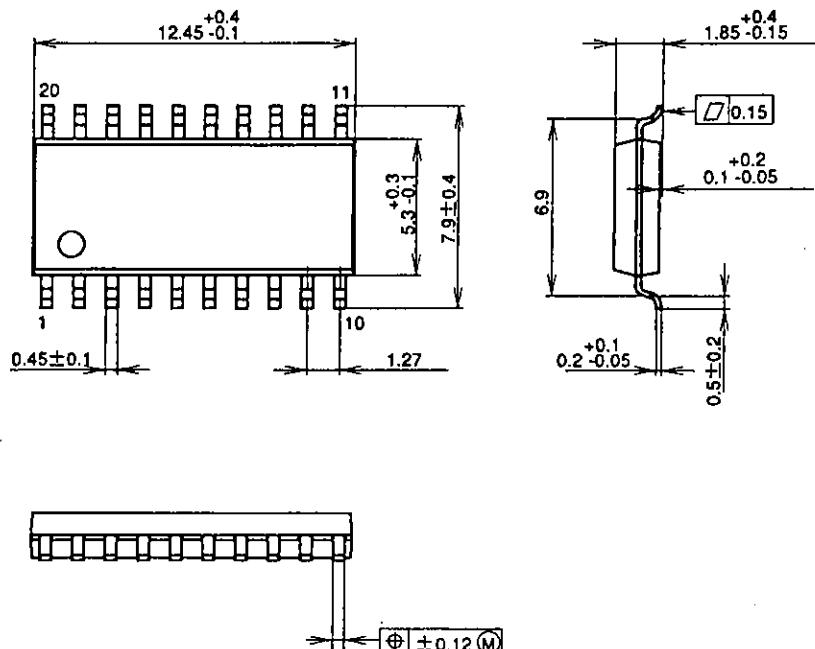
PACKAGE STRUCTURE

SONY CODE	SOP-20P-L01
EIAJ CODE	*SOP020-P-0300-A
JEDEC CODE	——

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE WEIGHT	0.3g