

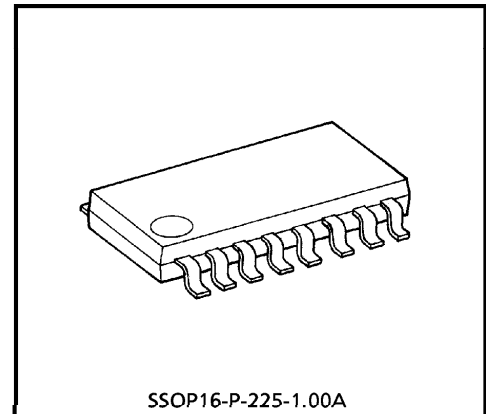
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8637BF

## VHF MODULATOR FOR VCR OR VDP

### FEATURES

- Video clamp
- White clip
- Main carrier oscillator
- Main carrier attenuator
- Video Modulator
- Sound Modulator
- Sound FM Modulator
- Channel Switch
- Low power operation
- Adjustable output level and V/A ratio with external resistance.
- Minimum number of external parts required.
- Regulator circuit is included.
- Operating voltage range : 4.5V~5.5V, Typ. 5V
- Suggested operating voltage : 4.75V~5.25V, Typ. 5V

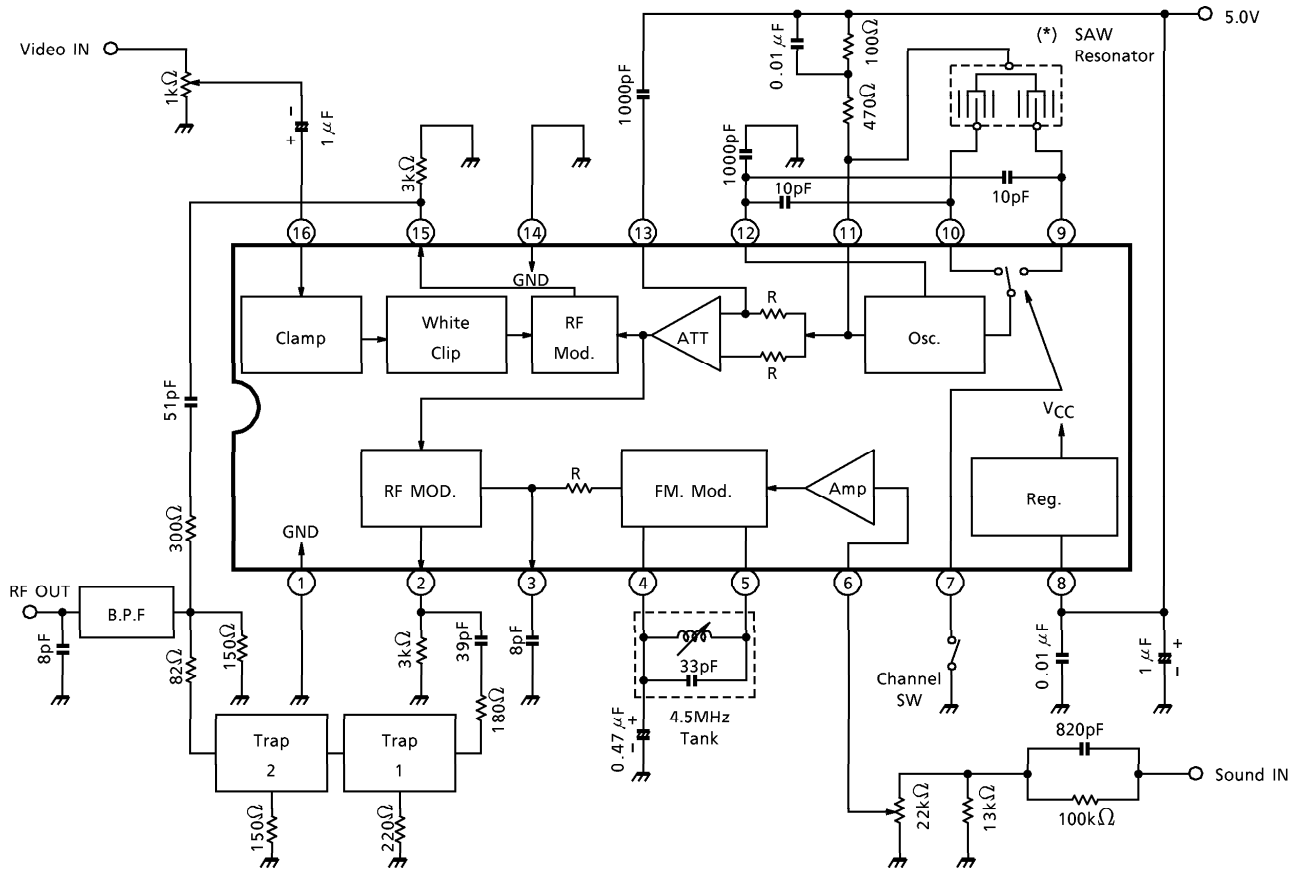


Weight : 0.14g (Typ.)

980910EBA1

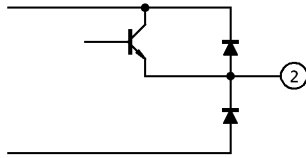
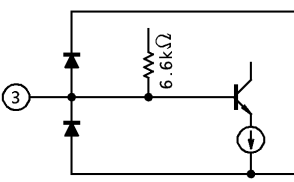
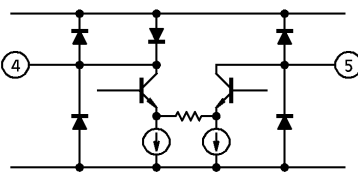
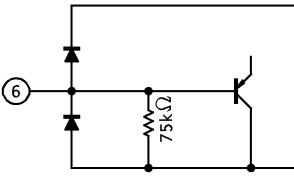
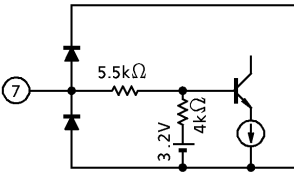
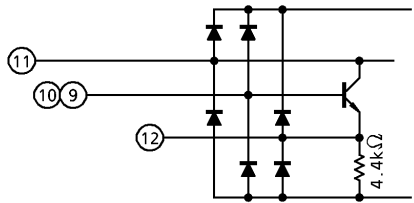
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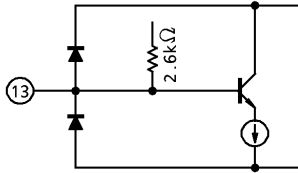
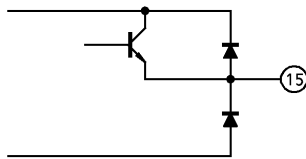
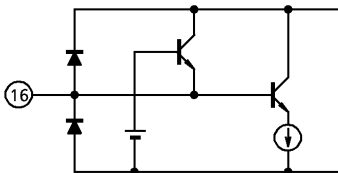
BLOCK DIAGRAM & APPLICATION CIRCUIT



(\*) See SAW Resonator Technical Data.

**TERMINAL CHARACTERISTICS**

NO.	FUNCTION	TYP. DC VOLTAGE	INTERFACE CIRCUIT	COMMENT
1	GND1	(0V)		SOUND GND
2	SOUND RF OUTPUT	3.1V		OPEN EMITTER
3	SOUND RF MODULATOR CAPACITOR	2.8V		L.P.F. OF SOUND HARMONICS SPURIOUS
4	4.5MHz	4.2V		—
5	TANK COIL			
6	SOUND INPUT	0V		—
7	CHANNEL SW	3.2V		HIGH (OPEN) : PIN 9 LOW : PIN 10
8	V <sub>CC</sub>	(5.0V)		—
9	SAW LOW CHANNEL	3.5V (2.8V)		—
10	SAW HIGH CHANNEL	3.5V (2.8V)		
11	SAW COMMON	4.6V		
12	RF OSCILLATOR CAPACITOR	2.8V		

NO.	FUNCTION	TYP. DC VOLTAGE	INTERFACE CIRCUIT	COMMON
13	VIDEO RF MODULATOR CAPACITOR	3.9V		
14	GND2	(0V)		Video & RF GND
15	VIDEO RF OUTPUT	3.0V		OPEN EMITTER
16	VIDEO INPUT	3.6V (Sync DC)		

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	7	V
Power Dissipation	P <sub>D</sub> (Note)	750	mW
Input Signal Voltage	e <sub>in</sub>	2.5	V <sub>p-p</sub>
Input Voltage at Pin 7	V <sub>in</sub>	GND - 0.3 ~ V <sub>CC</sub> + 0.3	V
Operating Temperature	T <sub>opr</sub>	- 10 ~ 70	°C
Storage Temperature	T <sub>stg</sub>	- 55 ~ 150	°C

(Note) Derated above Ta = 25°C in the proportion of 3mW/°C.

**ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 5.0V, Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Current	I <sub>CC</sub>	—	S <sub>1</sub> = 2, S <sub>2</sub> = 1, S <sub>3</sub> = 2	10	14	20	mA	
Video RF Output Level	V <sub>O</sub> (f <sub>p1</sub> )	—	S <sub>2</sub> = 1, S <sub>3</sub> = 2 (Note 1) V <sub>i1</sub> : No input signal V <sub>O1</sub> : Output level	S <sub>1</sub> = 2	90	92	94	dB <sub>μ</sub> V
	V <sub>O</sub> (f <sub>p2</sub> )	—		S <sub>1</sub> = 1				
Video RF Output Level Temperature Drift	ΔV <sub>O</sub> (f <sub>p1</sub> )	—	V <sub>O</sub> (f <sub>p1</sub> ) (Ta = -10~70°C) - V <sub>O</sub> (f <sub>p1</sub> ) (Ta = 25°C)	—	—	± 2	dB	
	ΔV <sub>O</sub> (f <sub>p2</sub> )	—		V <sub>O</sub> (f <sub>p2</sub> ) (Ta = -10~70°C) - V <sub>O</sub> (f <sub>p2</sub> ) (Ta = 25°C)				
Video Modulation Factor	m <sub>p1</sub>	1	S <sub>2</sub> = 1, S <sub>3</sub> = 2 V <sub>i1</sub> = 0.45V <sub>p-p</sub> , white	S <sub>1</sub> = 2	72	77	82	%
	m <sub>p2</sub>			S <sub>1</sub> = 1				
Video Modulation Factor Temperature Stability	Δm <sub>p1</sub>	1	m <sub>p1</sub> (Ta = -10~70°C) - m <sub>p1</sub> (Ta = 25°C)	—	—	± 3	%	
	Δm <sub>p2</sub>	1		m <sub>p2</sub> (Ta = -10~70°C) - m <sub>p2</sub> (Ta = 25°C)				
Video Modulation Factor Difference	Δm <sub>p</sub>	1	m <sub>p1</sub> - m <sub>p2</sub>	—	—	± 1.5	%	
Max. Video Modulation Factor	m <sub>p2</sub> (Max.)	1	S <sub>1</sub> = 1, S <sub>2</sub> = 1, S <sub>3</sub> = 2 V <sub>i1</sub> = 2.0V <sub>p-p</sub> , white	88	93	97	%	
Max. Video Modulation Temperature Drift	Δm <sub>p2</sub> (Max.)	1	Ta = -10~70°C m <sub>p2</sub> (Max.)	89	94	98	%	
Defferential Gain	DG <sub>1</sub>	2	S <sub>2</sub> = 1, S <sub>3</sub> = 2, V <sub>i1</sub> = 0.45V <sub>p-p</sub> , Stair case, (Note 2)	S <sub>1</sub> = 2	—	± 2	± 5	%
	DG <sub>2</sub>			S <sub>1</sub> = 1				
Defferential Phase	DP <sub>1</sub>	2	S <sub>2</sub> = 1, S <sub>3</sub> = 2, V <sub>i1</sub> = 0.45V <sub>p-p</sub> , Stair case, (Note 2)	S <sub>1</sub> = 2	—	± 2	± 5	°
	DP <sub>2</sub>			S <sub>1</sub> = 1				
Sound RF Output Level	V <sub>O</sub> (f <sub>s1</sub> )	—	S <sub>2</sub> = 1, S <sub>3</sub> = 2 (Note 1) V <sub>O3</sub> : Sound RF level	S <sub>1</sub> = 2	81	83	86	dB <sub>μ</sub> V
	V <sub>O</sub> (f <sub>s2</sub> )			S <sub>1</sub> = 1				
Sound FM Temperature Drift	Δf <sub>s</sub>	—	S <sub>1</sub> = 1, S <sub>2</sub> = 2, S <sub>3</sub> = 2 (Note 3) f <sub>s</sub> (Ta = 0~60°C) - f <sub>s</sub> (Ta = 25°C)	—	—	± 10	kHz	
Sound FM Modulation Sensitivity	β <sub>s</sub>	—	S <sub>1</sub> = 1, S <sub>2</sub> = 2, S <sub>3</sub> = 1 (Note 4)	0.36	0.43	0.52	kHz / mV	
Sound Total Harmonic Distortion	THD	—	S <sub>1</sub> = 1, S <sub>2</sub> = 2, S <sub>3</sub> = 3 V <sub>i2</sub> = 1kHz (Note 5)	—	0.2	1.0	%	

- (Note 1) Measure RF level by spectrum analyzer (Input impedance = 50) and calculate measurement data  $V_O$  (dBm) by  

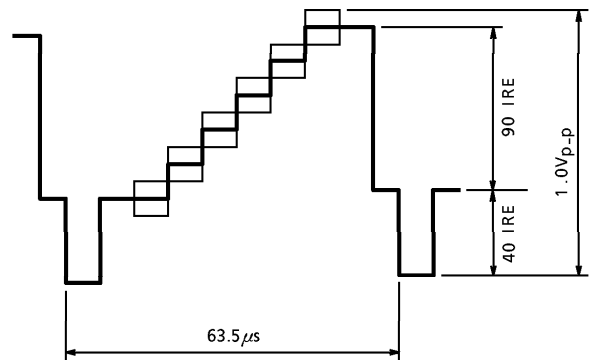
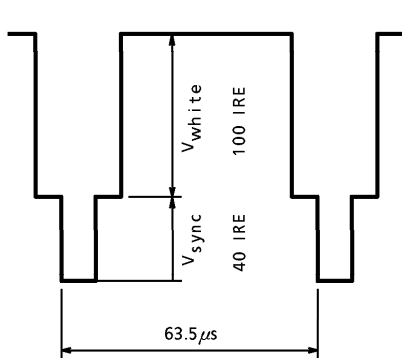
$$\text{Output Level (dB}\mu\text{V)} = V_O + 107 + 16 \text{ (dB}\mu\text{V)}$$
- (Note 2) Measure after that demodulated by the standard demodulator (For example Tektronix 1450).
- (Note 3) Adjust a sound FM center frequency to 4.500MHz at  $T_a = 25^\circ\text{C}$ , then measure a frequency drift at  $T_a = 0\sim 60^\circ\text{C}$  for at  $T_a = 25^\circ\text{C}$ .  
 This spec ( $\Delta f_s$ ) does not include TANK temperature coefficienty.
- (Note 4) Connect  $V_a + 0.2$  (V) and  $V_a - 0.2$  (V) to  $V_1$  ( $V_a$  ; #6 terminals open voltage) then measure each frequency and calculate by

$$\beta_s = \frac{\text{Frequency difference between } V_1 = V_a + 0.2 \text{ and } V_2 = V_a - 0.2}{0.4}$$

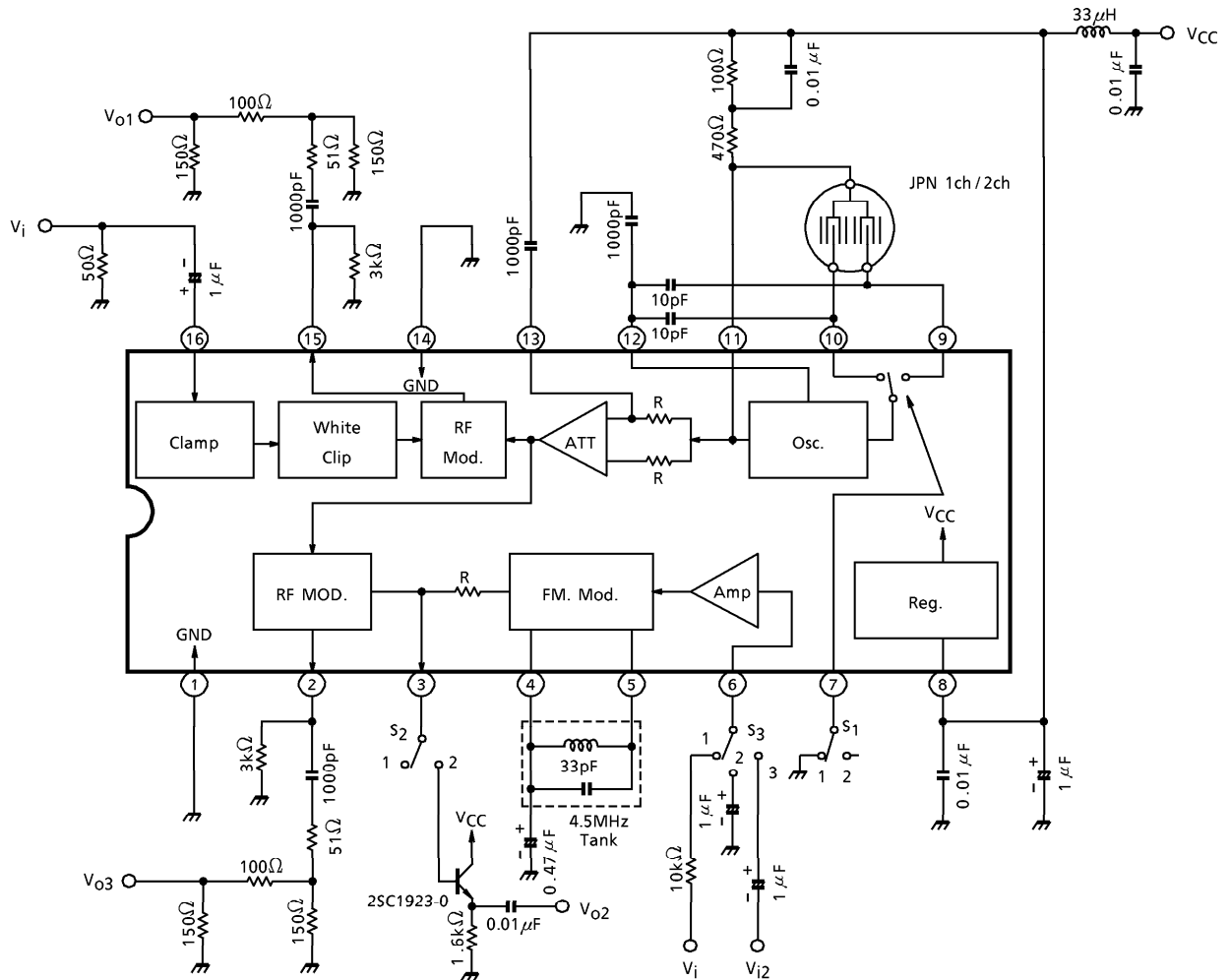
- (Note 5) Adjust  $V_{i2}$  level so that FM deviation become  $\pm 20\text{kHz}$ , then measure THD after that demodulate by standard demodulator (for example tektronix 1450)

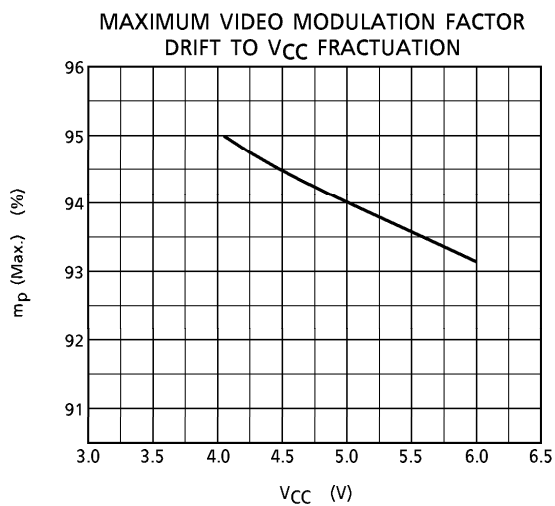
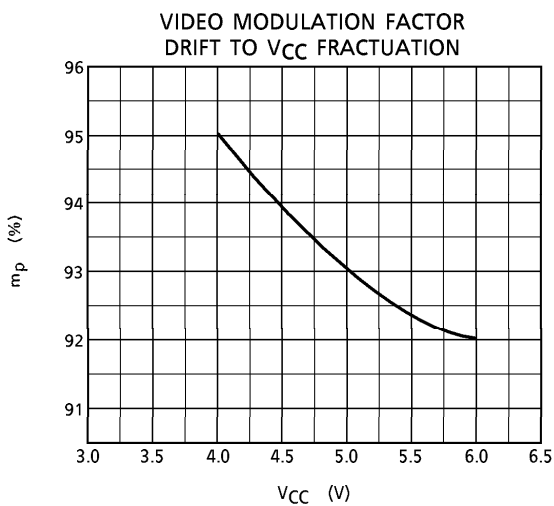
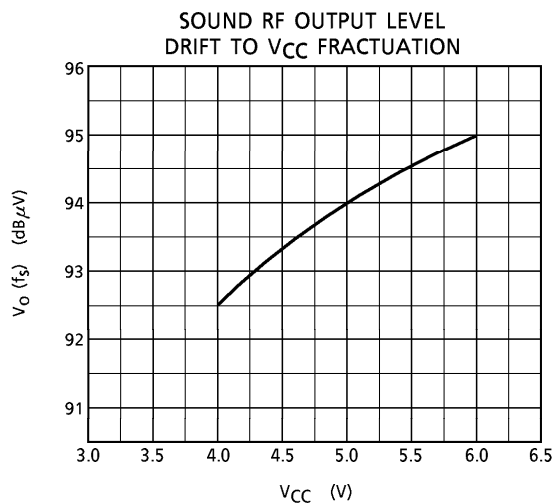
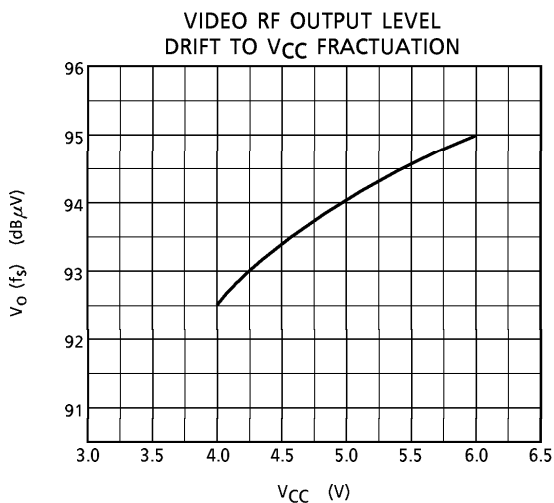
Input wave form  
 White signal

Stair case signal  
 APL 50% sub carrier 20 IRE



TEST CIRCUIT



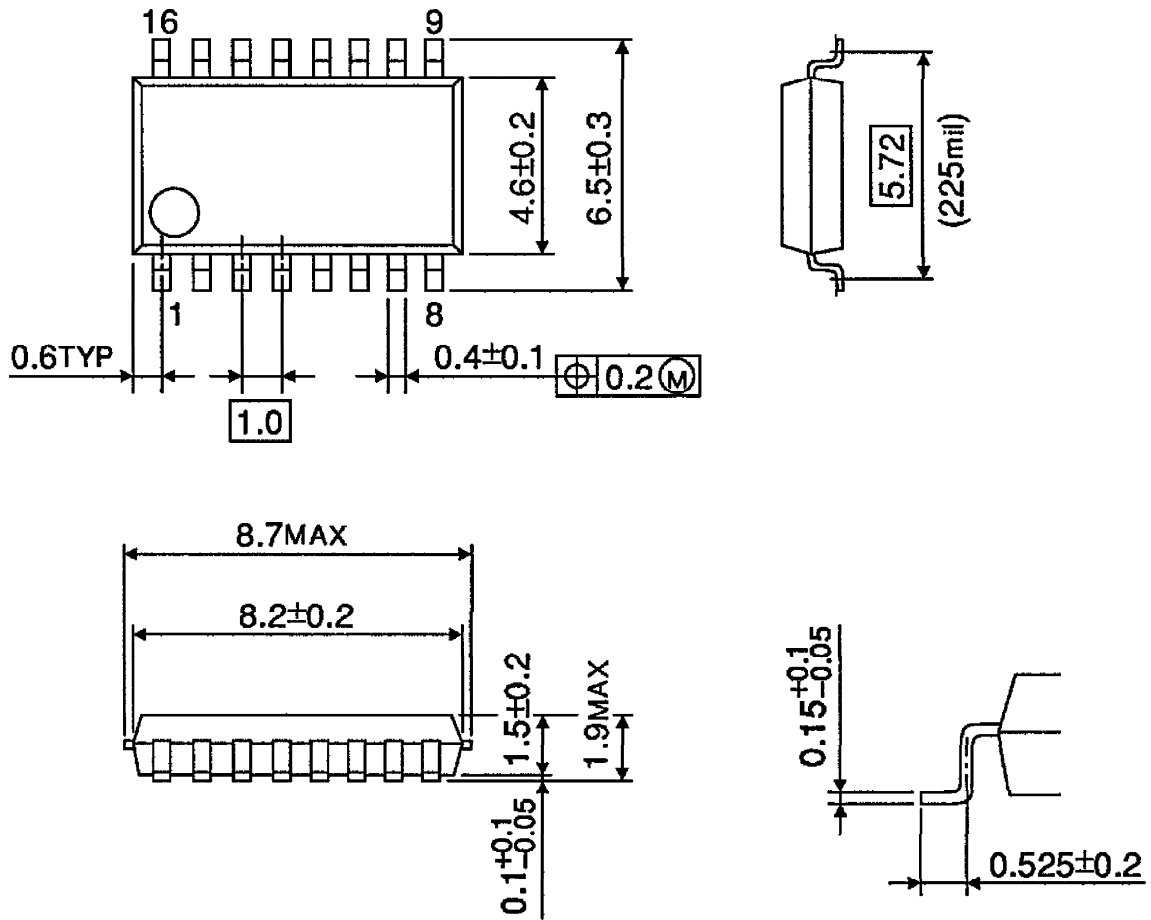


(Note) TA8637BF does not divide the sound FM modulation sensitivity and video modulation rank classification.



**OUTLINE DRAWING**  
SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)