

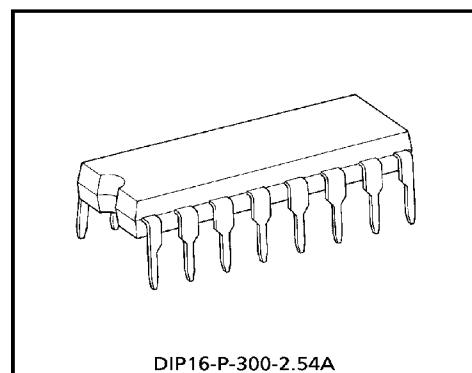
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8637BP

## 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



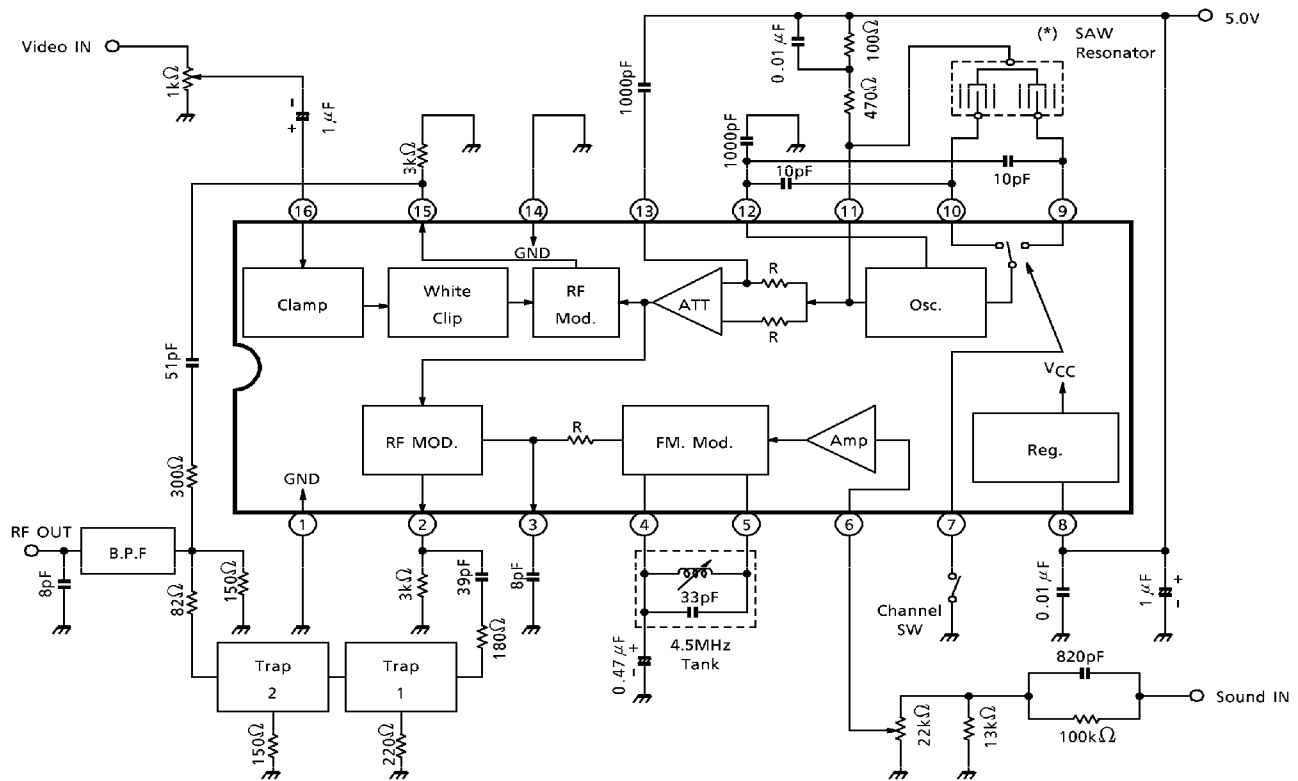
Weight : 1.11g (Typ.)

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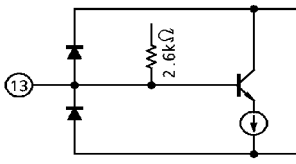
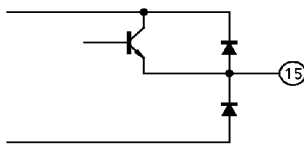
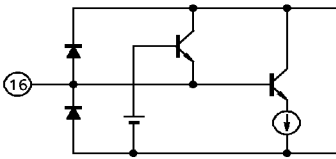
## BLOCK DIAGRAM &amp; APPLICATION CIRCUIT



(\*) 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 5	4.5MHz TANK COIL	4.2V		—
6	SOUND INPUT	0V		—
7	CHANNEL SW	3.2V		HIGH (OPEN) : PIN9 LOW : PIN10
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 6mW/°C.

ELECTRICAL CHARACTERISTICS ( $V_{CC} = 5.0V$ ,  $T_a = 25^\circ C$ )

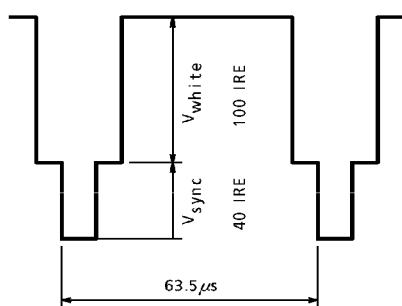
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	$I_{CC}$	—	$S_1 = 2, S_2 = 1, S_3 = 2$	10	14	20	mA
Video RF Output Level	$V_O(f_{p1})$	—	$S_2 = 1, S_3 = 2$ (Note 1) $V_{i1}$ : No input signal $V_{O1}$ : Output level	90	92	94	dB $\mu$ V
	$V_O(f_{p2})$	—					
Video RF Output Level Temperature Drift	$\Delta V_O(f_{p1})$	—	$V_O(f_{p1})$ ( $T_a = -10 \sim 70^\circ C$ ) — $V_O(f_{p1})$ ( $T_a = 25^\circ C$ )	—	—	$\pm 2$	dB
	$\Delta V_O(f_{p2})$	—	$V_O(f_{p2})$ ( $T_a = -10 \sim 70^\circ C$ ) — $V_O(f_{p2})$ ( $T_a = 25^\circ C$ )				
Video Modulation Factor	$m_{p1}$	1	$S_2 = 1, S_3 = 2$ $V_{i1} = 0.45V_{p-p}$ , white	72	77	82	%
	$m_{p2}$						
Video Modulation Factor Temperature Stability	$\Delta m_{p1}$	1	$m_{p1}$ ( $T_a = -10 \sim 70^\circ C$ ) — $m_{p1}$ ( $T_a = 25^\circ C$ )	—	—	$\pm 3$	%
	$\Delta m_{p2}$	1	$m_{p2}$ ( $T_a = -10 \sim 70^\circ C$ ) — $m_{p2}$ ( $T_a = 25^\circ C$ )				
Video Modulation Factor Difference	$\Delta m_p$	1	$m_{p1} - m_{p2}$	—	—	$\pm 1$	%
Max. Video Modulation Factor	$m_{p2}(\text{Max.})$	1	$S_1 = 1, S_2 = 1, S_3 = 2$ $V_{i1} = 2.0V_{p-p}$ , white	89	94	98	%
Max. Video Modulation Temperature Drift	$\Delta m_{p2}(\text{Max.})$	1	$T_a = -10 \sim 70^\circ C$ $m_{p2}(\text{Max.})$	89	94	98	%
Defferential Gain	DG <sub>1</sub>	2	$S_2 = 1, S_3 = 2$ , $V_{i1} = 0.45V_{p-p}$ , Stair case, (Note 2)	—	$\pm 2$	$\pm 5$	%
	DG <sub>2</sub>						
Defferential Phase	DP <sub>1</sub>	2	$S_2 = 1, S_3 = 2$ , $V_{i1} = 0.45V_{p-p}$ , Stair case, (Note 2)	—	$\pm 2$	$\pm 5$	°
	DP <sub>2</sub>						
Sound RF Output Level	$V_O(f_{s1})$	—	$S_2 = 1, S_3 = 2$ (Note 1) $V_{O3}$ : Sound RF level	81	83	86	dB $\mu$ V
	$V_O(f_{s2})$						
Sound FM Temperature Drift	$\Delta f_s$	—	$S_1 = 1, S_2 = 2, S_3 = 2$ (Note 3) $f_s$ ( $T_a = 0 \sim 60^\circ C$ ) — $f_s$ ( $T_a = 25^\circ C$ )	—	—	$\pm 10$	kHz
Sound FM Modulation Sensitivity	$\beta_s$	—	$S_1 = 1, S_2 = 2, S_3 = 1$ (Note 4)	0.36	0.43	0.52	kHz / mV
Sound Total Harmonic Distortion	THD	—	$S_1 = 1, S_2 = 2, S_3 = 3$ $V_{i2} = 1\text{kHz}$ (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  
 Output Level (dB $\mu$ V) =  $V_O + 107 + 16$  (dB $\mu$ 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

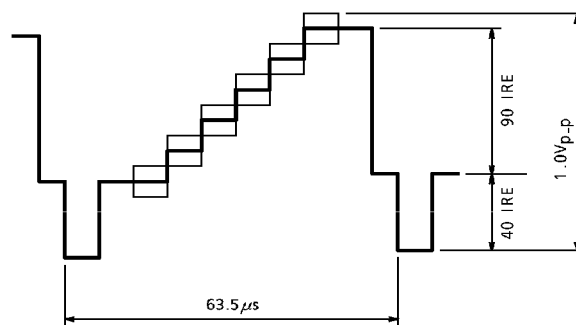
$$\beta_s = \frac{\text{Frequency difference between } V_1 = V_a + 0.2 \text{ and } V_2 = V_a - 0.2}{0.4}$$

- (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)

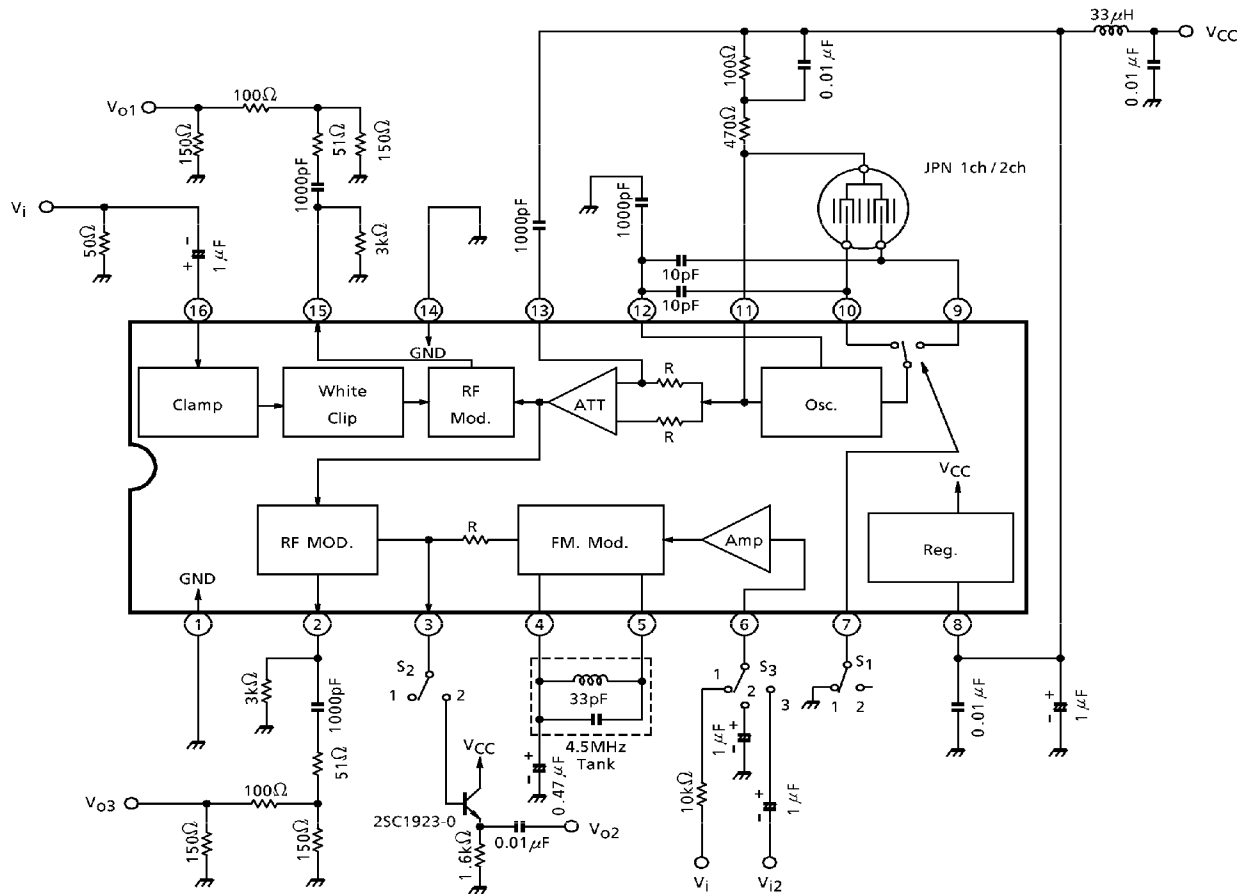
Input wave form  
 White signal

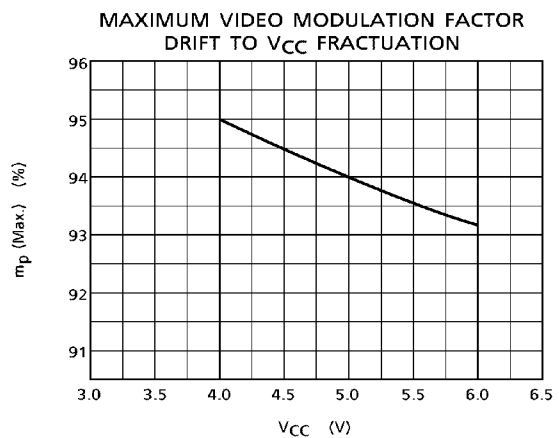
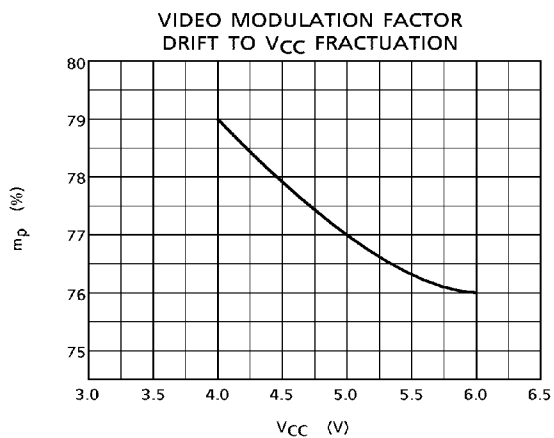
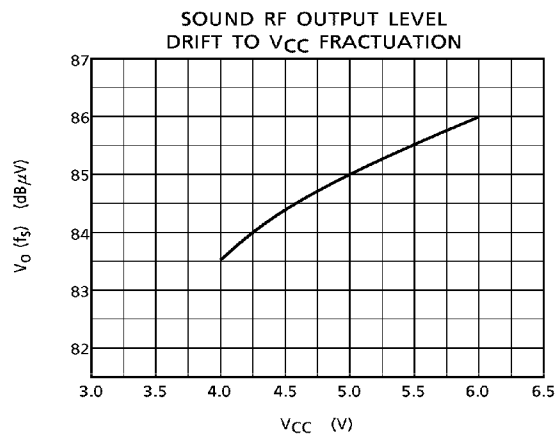
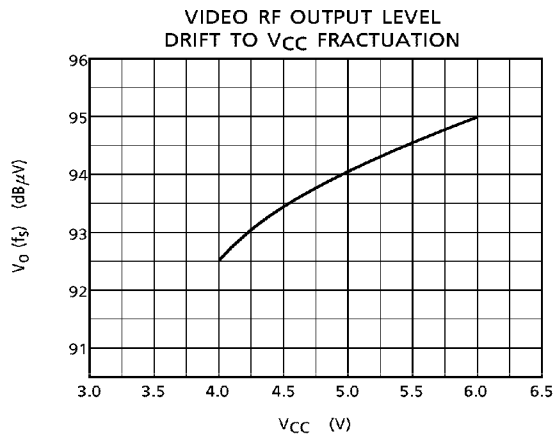


Stair case signal  
 APL 50% sub carrier 20 IRE



## TEST CIRCUIT





#### SOUND, VIDEO MODULATION RANK CLASSIFICATION

RANK	SOUND FM MODULATION SENSITIVITY				VIDEO MODULATION FACT				MARK
	MIN	TYP.	MAX	UNIT	MIN	TYP.	MAX	UNIT	
1	0.36	0.39	0.42	kHz / mV	72	75	78	%	Green
2	0.39	0.43	0.46		72	75	78		Yellow
3	0.44	0.48	0.52		72	75	78		Red
4	0.36	0.39	0.42		76	79	82		Blue
5	0.39	0.43	0.46		76	79	82		Orange
6	0.44	0.48	0.52		76	79	82		Purple

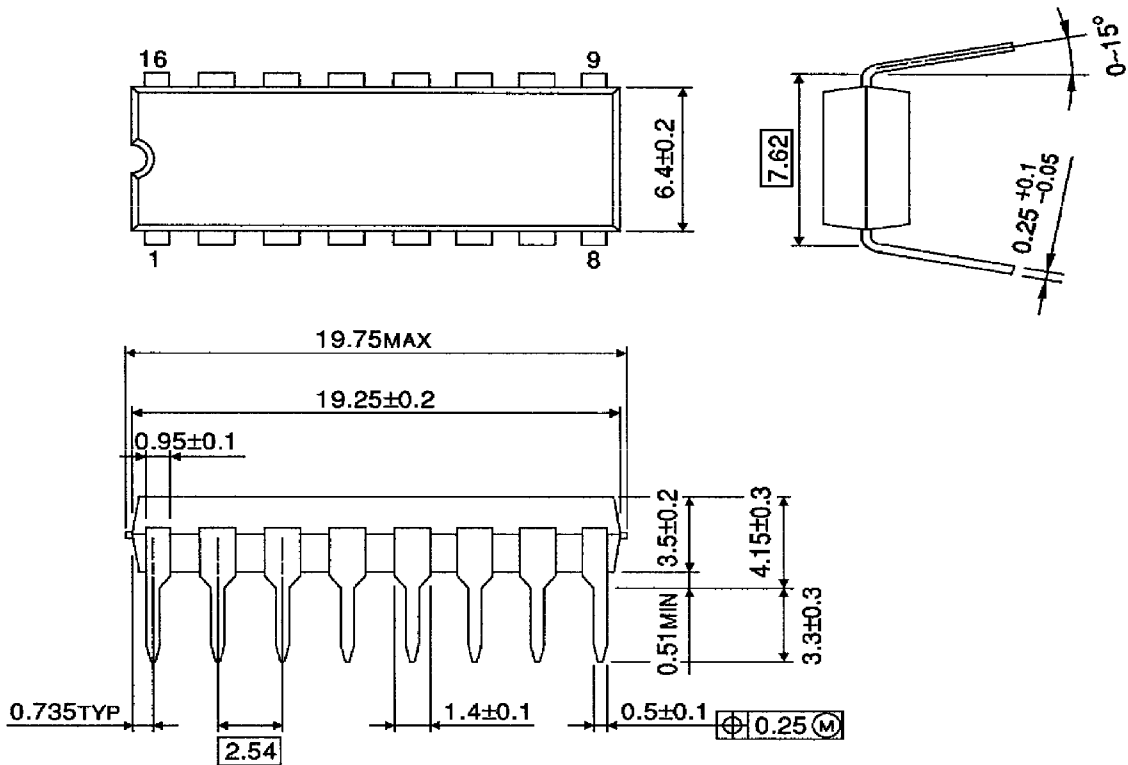
(Note) TA8637BP does not receive the rank classification specification when ordering.



## OUTLINE DRAWING

DIP16-P-300-2.54A

Unit : mm



Weight : 1.11g (Typ.)