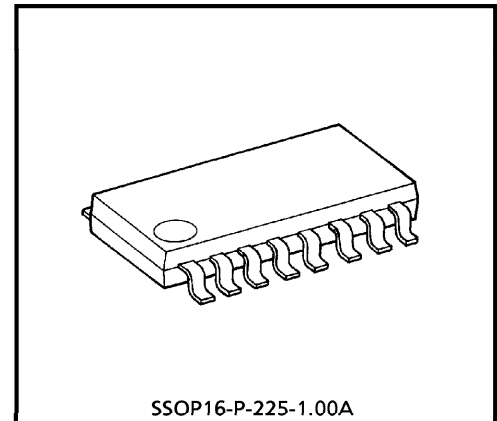


TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

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

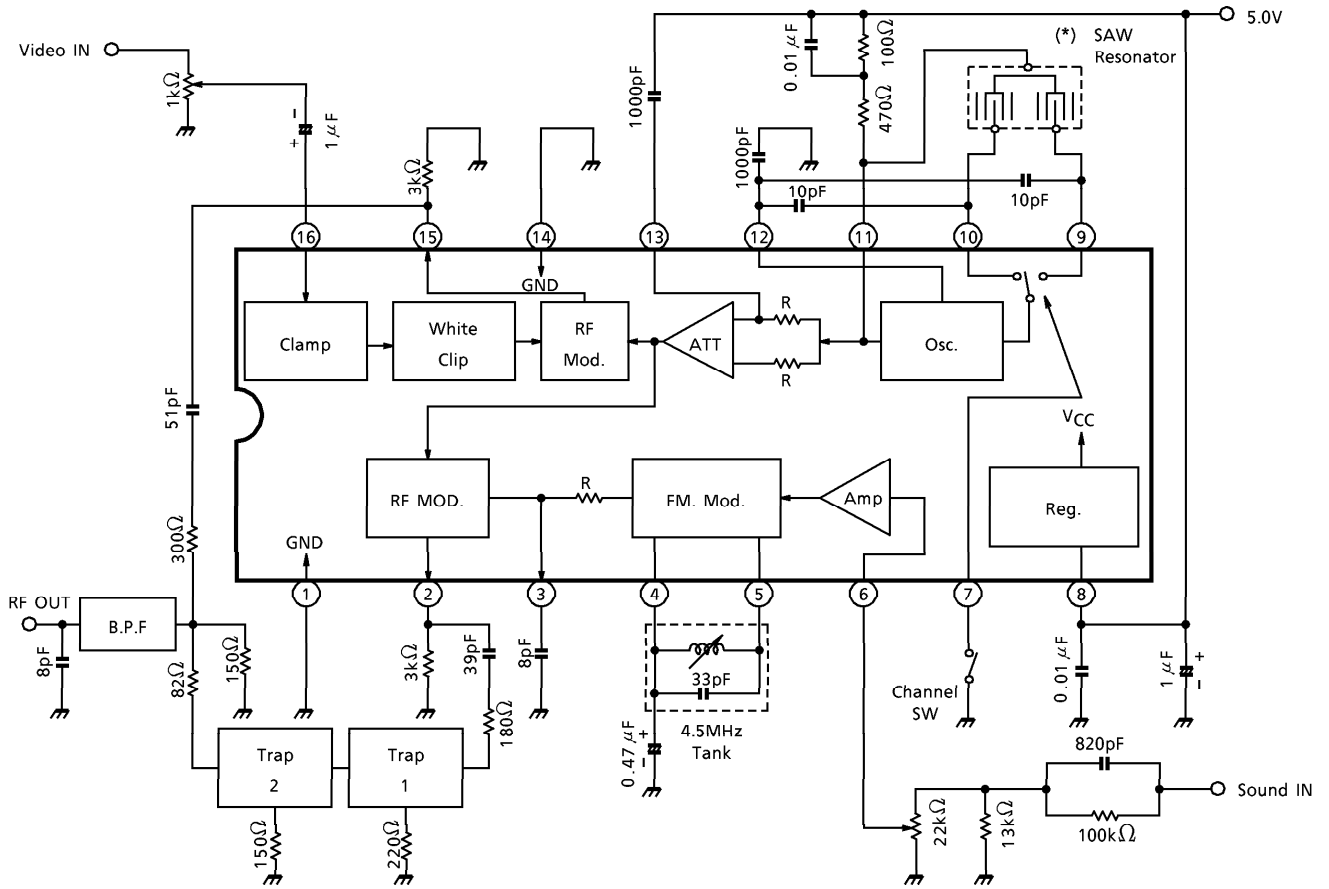


Weight : 0.14g (Typ.)

000707EBA1

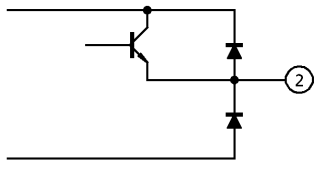
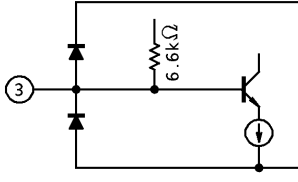
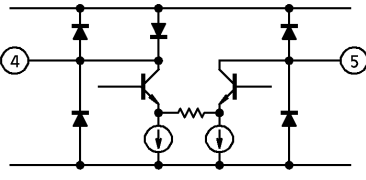
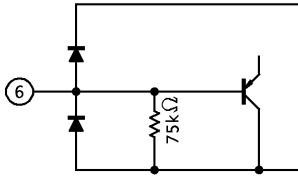
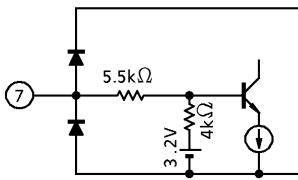
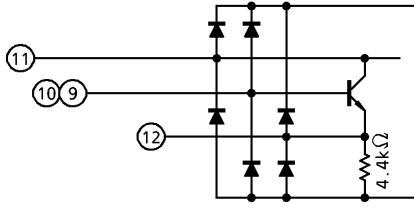
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

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	VCC	(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 _{CC}	7	V
Power Dissipation	P _D (Note)	750	mA
Input Signal Voltage	e _{in}	2.5	V _{p-p}
Input Voltage at Pin 7	V _{in}	GND - 0.3~V _{CC} + 0.3	V
Operating Temperature	T _{opr}	- 10~70	°C
Storage Temperature	T _{stg}	- 55~150	°C

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

ELECTRICAL CHARACTERISTICS (V_{CC} = 5.0V, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	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 _μ V
	V _O (f _{p2})	—					
Video RF Output Level Temperature Drift	ΔV _O (f _{p1})	—	V _O (f _{p1}) (Ta = -10~70°C) - V _O (f _{p1}) (Ta = 25°C)	—	—	± 2	dB
	ΔV _O (f _{p2})	—	V _O (f _{p2}) (Ta = -10~70°C) - V _O (f _{p2}) (Ta = 25°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	Δm _{p1}	1	m _{p1} (Ta = -10~70°C) - m _{p1} (Ta = 25°C)	—	—	± 3	%
	Δm _{p2}	1	m _{p2} (Ta = -10~70°C) - m _{p2} (Ta = 25°C)				
Video Modulation Factor Difference	Δm _p	1	m _{p1} - m _{p2}	—	—	± 1.5	%
Max. Video Modulation Factor	m _{p2} (Max.)	1	S ₁ = 1, S ₂ = 1, S ₃ = 2 V _{i1} = 2.0V _{p-p} , white	88	93	97	%
Max. Video Modulation Temperature Drift	Δm _{p2} (Max.)	1	Ta = -10~70°C m _{p2} (Max.)	89	94	98	%
Defferential Gain	DG ₁	2	S ₂ = 1, S ₃ = 2, V _{i1} = 0.45V _{p-p} , Stair case, (Note 2)	—	± 2	± 5	%
	DG ₂						
Defferential Phase	DP ₁	2	S ₂ = 1, S ₃ = 2, V _{i1} = 0.45V _{p-p} , Stair case, (Note 2)	—	± 2	± 5	°
	DP ₂						
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 _μ V
	V _O (f _{s2})						
Sound FM Temperature Drift	Δf _s	—	S ₁ = 1, S ₂ = 2, S ₃ = 2 (Note 3) f _s (Ta = 0~60°C) - f _s (Ta = 25°C)	—	—	± 10	kHz
Sound FM Modulation Sensitivity	β _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} = 1kHz (Note 5)	—	0.2	1.0	%

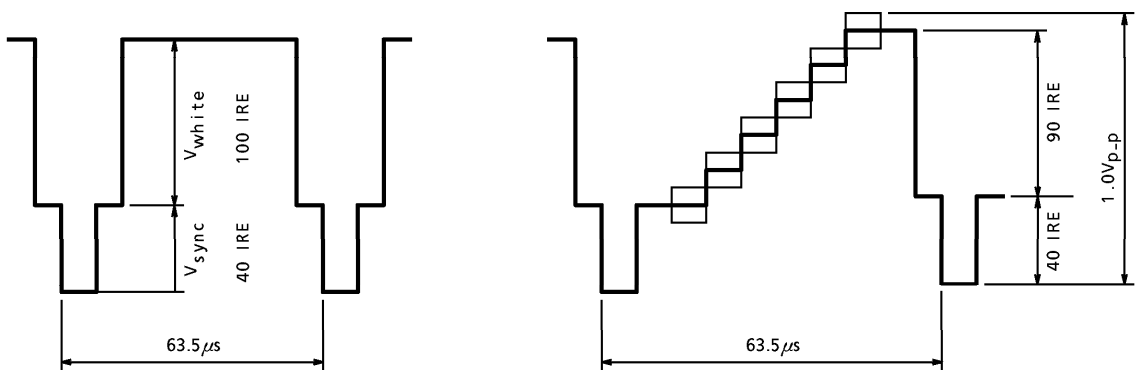
- (Note 1) Measure RF level by spectrum analyzer (Input impedance = 50) and calculate measurement data V_O (dBm) by
 Output Level (dB μ V) = $V_O + 107 + 16$ (dB μ V)
- (Note 2) Measure after that demodulated by the standard demodulator (For example Tektronix 1450).
- (Note 3) Adjust a sound FM center 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 (Δf_s) does not include TANK temperature coefficiency.
- (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

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

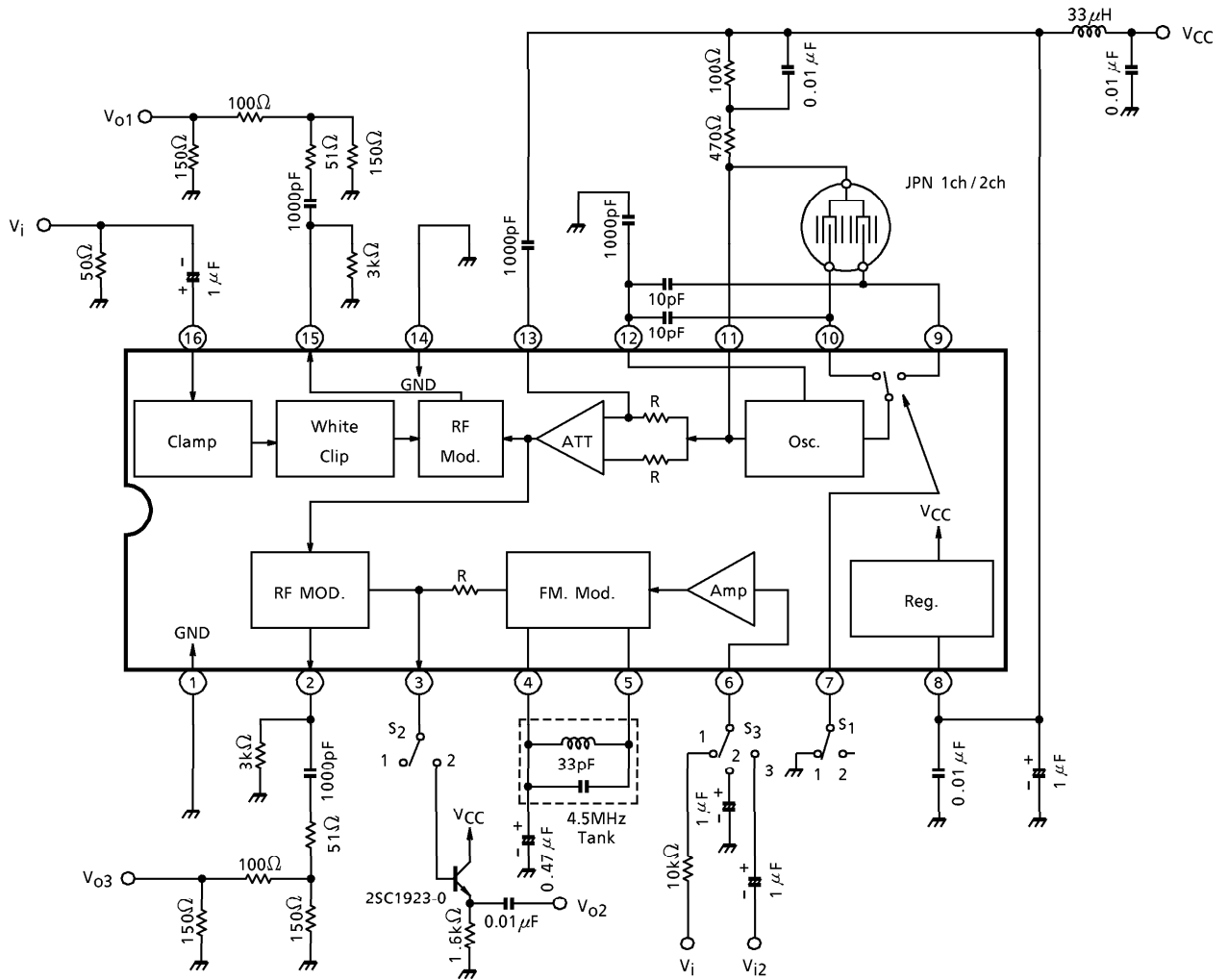
- (Note 5) Adjust V_{i2} level so that FM deviation become $\pm 20\text{kHz}$, then measure THD after that demodulate by standard demodulator (for example tektronix 1450)

Input wave form
 White signal

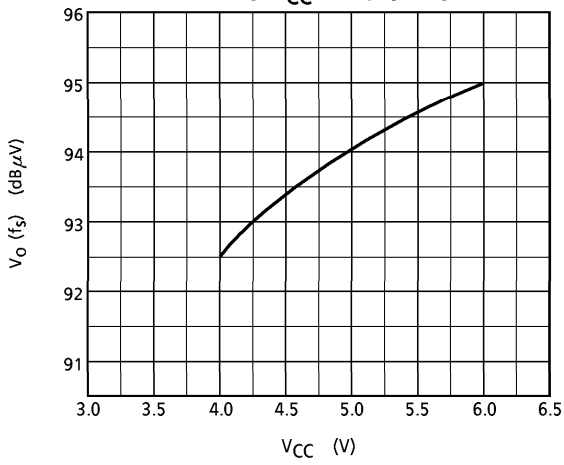
Stair case signal
 APL 50% sub carrier 20 IRE



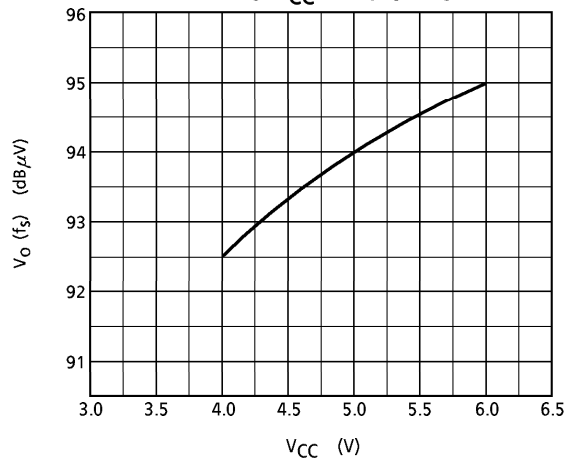
TEST CIRCUIT



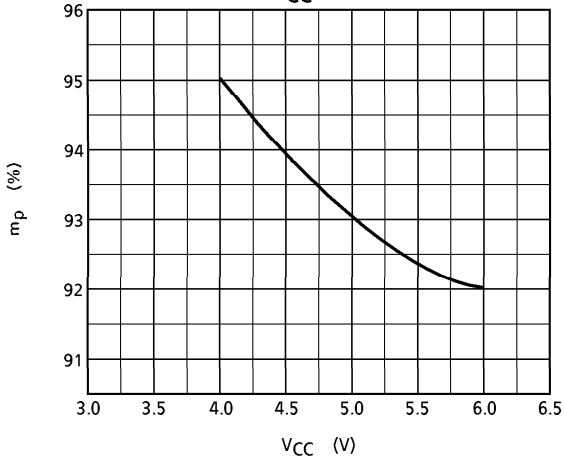
VIDEO RF OUTPUT LEVEL
DRIFT TO V_{CC} FRACTUATION



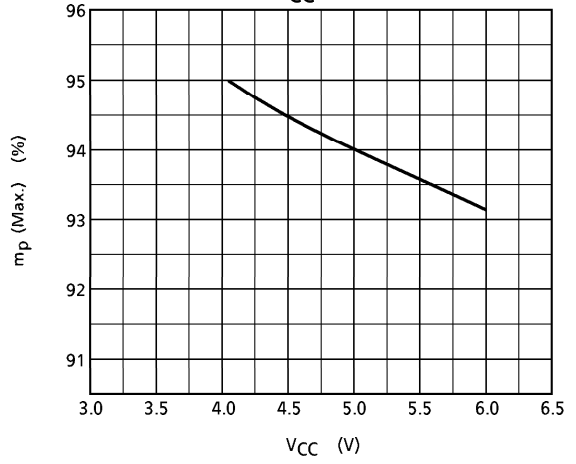
SOUND RF OUTPUT LEVEL
DRIFT TO V_{CC} FRACTUATION



VIDEO MODULATION FACTOR
DRIFT TO V_{CC} FRACTUATION



MAXIMUM VIDEO MODULATION FACTOR
DRIFT TO V_{CC} FRACTUATION



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

HANDLING PRECAUTIONS

1. The device should not be inserted into or removed from the test jig while the voltage is being applied: otherwise the device may be degraded or break down.

Do not abruptly increase or decrease the power supply to the device either.

Overshoot or chattering of the power supply may cause the IC to be degraded.

To avoid this filters should be incorporated on the power supply line.

2. The application circuits described in this datasheet are given only as system examples for evaluating the device's performance. Toshiba Intend neither to recommend the configuration or related values of the peripheral circuits nor to manufacture such application system in large quantities.

Please note that high-frequency characteristics of the device may vary depending on the external components, mounting method and other factors relating to the application design.

Therefore, the characteristics of application circuits must be evaluated at the responsibility of the users incorporating the device into their design.

Toshiba only guarantee the quality and characteristics of the device as described in this detasheet and do not assume any responsibility for the customers application design.

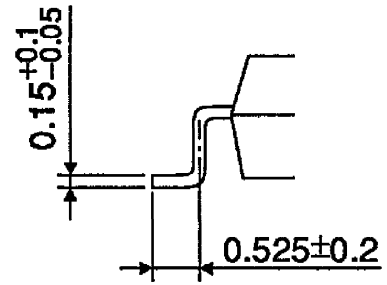
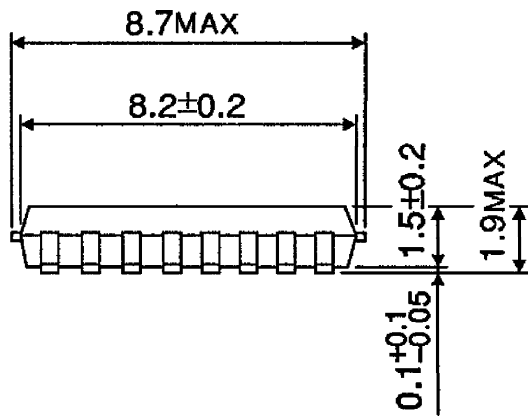
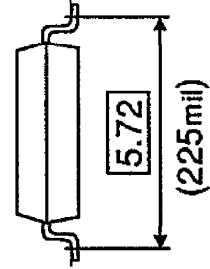
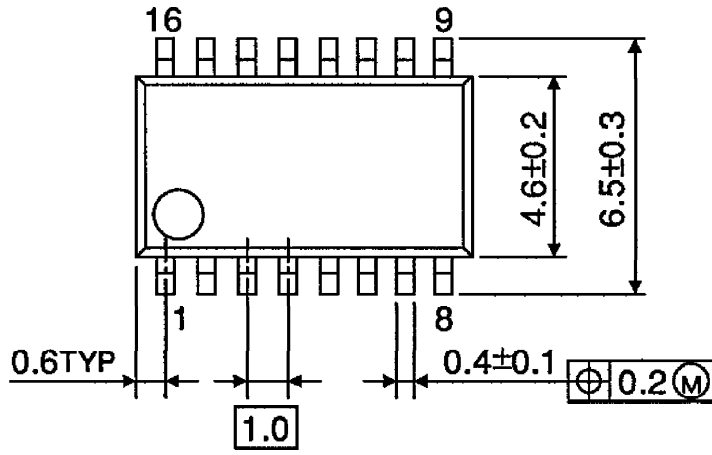
3. In order to better understand the quality and reliability of Toshiba semiconductor products and to incorporate them into design in an appropriate manner, please refer to the latest Semiconductor Reliability Handbook (Integrated Circuit) published by Toshiba Semiconductor Company.

The handbook can also be viewed online at

<http://www.semicon.toshiba.co.jp/noseek/us/sinrai/sinraifm.htm>

PACKAGE DIMENSIONS
SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)