

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

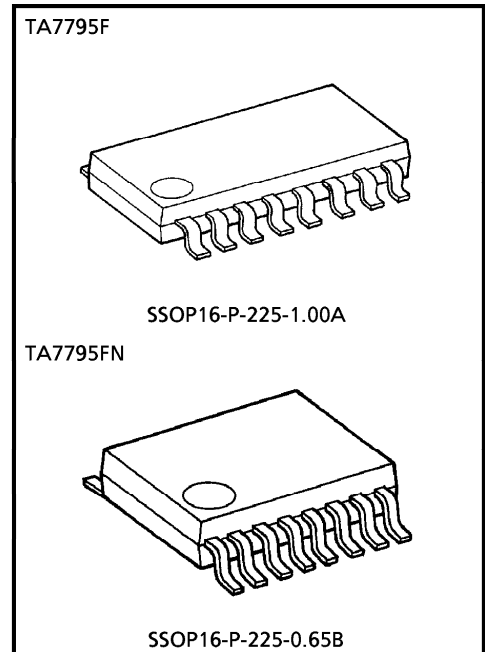
# TA7795F, TA7795FN

## DUAL PREAMPLIFIERS FOR AUTO-REVERSE SYSTEM (1.5V USE)

The TA7795F, TA7795FN are Dual preamplifiers ICs, which are designed for low voltage operation (1.5V, 3V). They are especially suitable for a stereo headphone cassette player and for that of auto-reverse type.

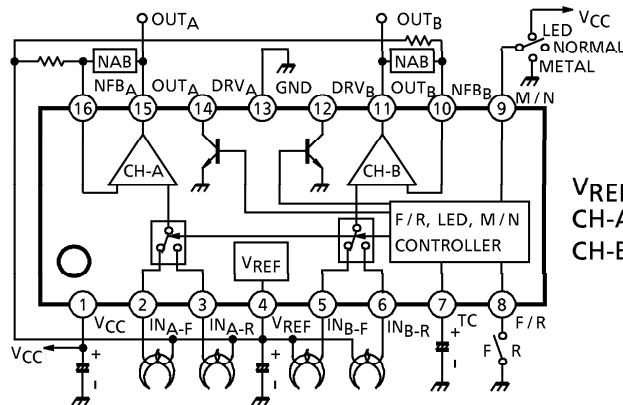
### FEATURES

- Switchover between F/R directional mode is possible with only one-make switch.
- Built-in M/N equalizer drivers, switchover between M/N equalizer mode is possible with only one-make switch. Those drivers are applicable to LED driver for F/R display, too ( $V_{LED} \geq 2.5V$ ).
- Low noise (Equivalent input noise).  
 $V_{ni} = 1.3\mu V_{rms}$  (Typ.)  
 $(V_{CC} = 1.5V, R_g = 2.2k\Omega, BPF = 20 \sim 20kHz)$
- Low supply current.  
 $I_{CC} = 1.6mA$  (Typ.) ( $V_{CC} = 1.5V, T_a = 25^\circ C$ )
- Operating supply voltage range.  
 $V_{CC(opr)} = 0.9 \sim 4.5V$  ( $T_a = 25^\circ C$ )  
 (Note 1) F/R : Direction (FORWARD / REVERSE)  
 (Note 2) M/N : Equalizer (METAL / NORMAL)



Weight  
 SSOP16-P-225-1.00A : 0.14g (Typ.)  
 SSOP16-P-225-0.65B : 0.09g (Typ.)

### BLOCK DIAGRAM



VREF : Reference voltage  
 CH-A : Channel A preamplifier  
 CH-B : Channel B preamplifier

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**PIN FUNCTION**

Terminal voltage : Typical terminal voltage at no signal with test circuit ( $V_{CC} = 1.5V$ ,  $T_a = 25^\circ C$ )

PIN No.	PIN NAME	CONTENTS	EQUIVALENT	TERMINAL VOLTAGE (V)
1	$V_{CC}$	—	—	1.5
2	$IN_{A-F}$	Input for Forward mode		1.1
5	$IN_{B-F}$	Input impedance $R_{in} = 100k\Omega$ (Typ.)		1.1
3	$IN_{A-R}$	Input for Reverse mode		1.1
6	$IN_{B-R}$	Input impedance $R_{in} = 100k\Omega$ (Typ.)		1.1
10	$NFB_A$	NFB		1.1
16	$NFB_B$			1.1
4	$V_{REF}$	Reference voltage		1.1
7	TC	Smoothing Reducing pop noise, at switchover between F/R mode.		0.7
8	F/R	Switch for F/E mode Off : Forward mode On : Reverse mode		0.7
9	M/N	Switch for M/N LED To $V_{CC}$ : LED mode Open : Normal mode To GND : Metal mode		—
11	$OUT_B$	Output		0.75
15	$OUT_A$			
12	$DRV_B$	CH-B·Metal Driver (LED driver for Reverse mode)		—
14	$DRV_A$	CH-A·Metal Driver (LED driver for Forward mode)		
13	GND	—	—	0

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APPLICATION NOTE

1. Function of built-in driver (Equalizer SW / LED driver)

The built-in driver is set to the mode shown in the table below by the voltage applied to Pin⑨ and ⑧.

FUNCTION		PIN⑨	PIN⑧	Q1 (PIN⑭)	Q2 (PIN⑫)
Equalizer Switchover	Normal	OPEN	—	OFF	OFF
	Metal	GND	—	ON	ON
LED Driver	FWD	V <sub>CC</sub>	OPEN	ON	OFF
	REV		GND	OFF	ON

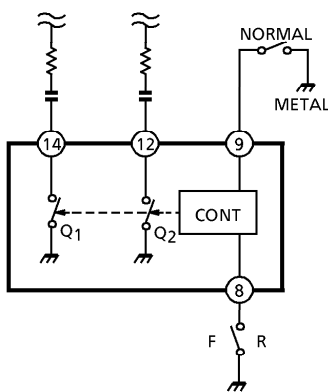


Fig. 1 Equalizer switchover function

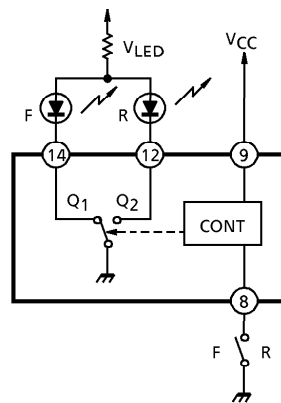


Fig. 2 LED driver function

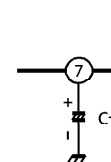


Fig. 3 Smoothing function

2. Smoothing function

The Pin⑦ is the smoothing terminal for reducing the pop noise produced at F/R switchover by using the external capacitor C<sub>T</sub>. (Fig.3)

3. NFB terminal

The resistance of 18kΩ is advisable to be connected between NFB terminal (Pin⑯ and ⑩) and V<sub>REF</sub> for using this IC. That is because NFB terminal is designed to have the off-set voltage (ΔV = 36mV) against each terminal (Pin ②, ③, ⑤ and ⑥). Therefore, the DC potential of the output terminals (Pin⑮ and ⑪) can be set at about V<sub>CC</sub>/2 with the current produced by this off-set potential. (Fig.4)

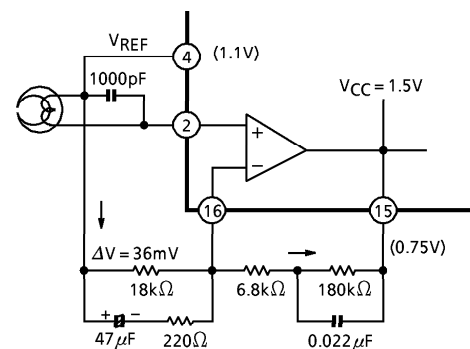


Fig. 4 NFB terminal

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	5	V
LED Supply Voltage	V <sub>L</sub>	6	V
LED Driver Current	I <sub>L</sub>	5	mA
Power Dissipation	TA7795F	P <sub>D</sub> (Note)	350
	TA7795FN		
Operating Temperature	T <sub>opr</sub>	-25~75	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

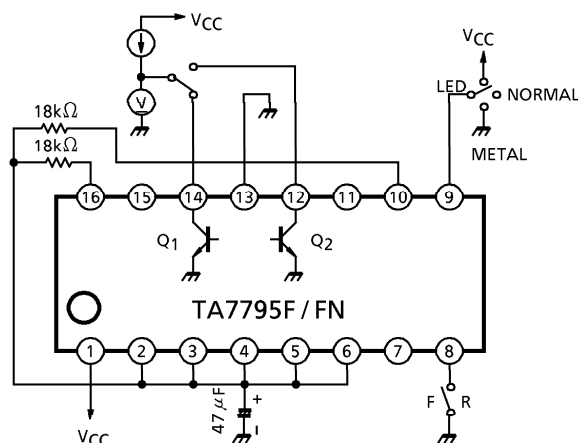
(Note) Derated above Ta = 25°C in the proportion of 2.8mW/°C for TA7795F, and of 3.2mW/°C for TA7795FN.

**ELECTRICAL CHARACTERISTICS**

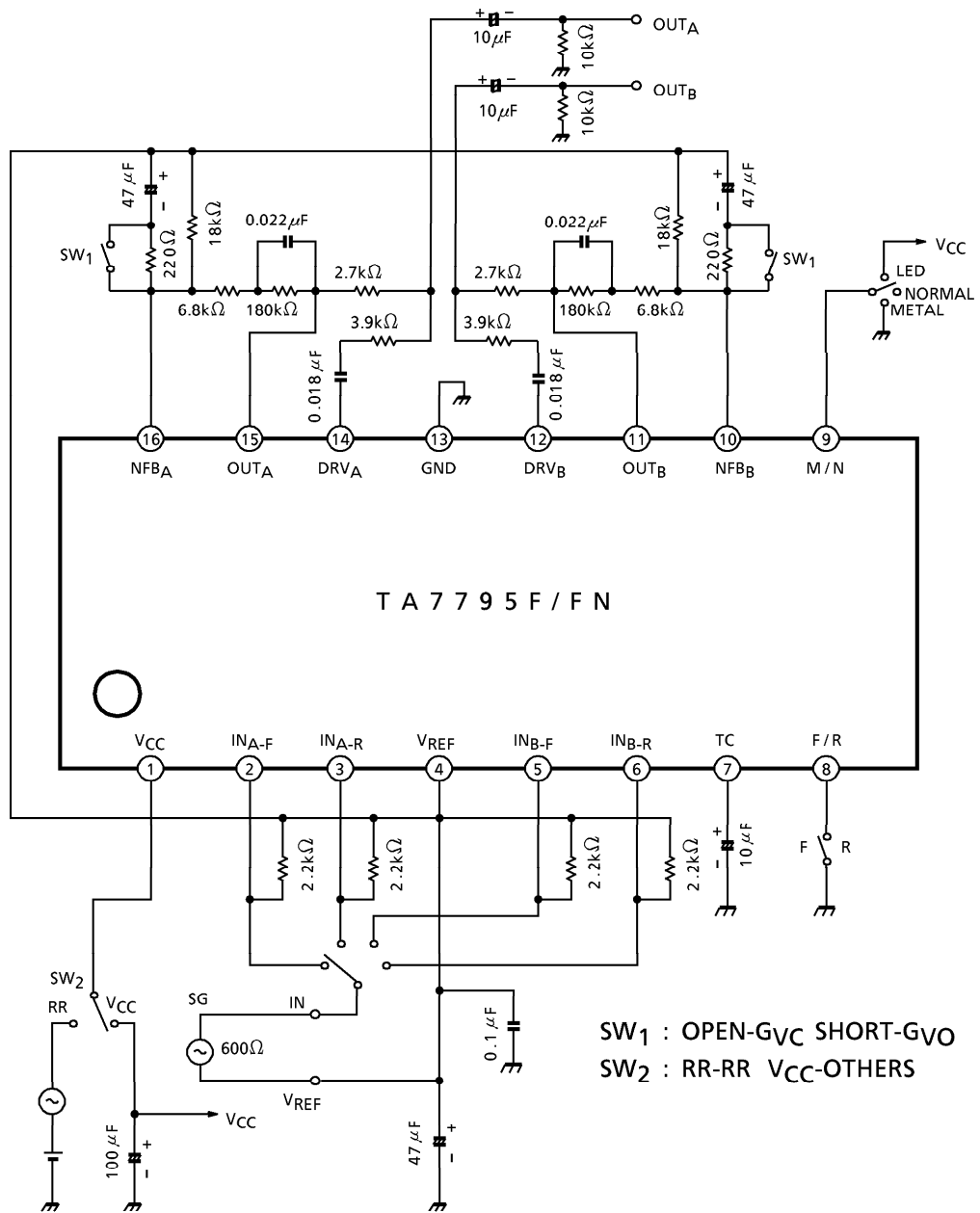
Unless otherwise specified, (Ta = 25°C, V<sub>CC</sub> = 1.5V, R<sub>g</sub> = 2.2kΩ, f = 1kHz, Normal EQ)

CHARACTERISTIC	SYM-BOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I <sub>CC</sub>	1	V <sub>in</sub> = 0	—	1.6	2.5	mA
Reference Voltage	V <sub>REF</sub>	2		1.0	1.1	1.2	V
Open Loop Voltage Gain	G <sub>VO</sub>	2	V <sub>in</sub> = 32μV <sub>rms</sub>	60	66	—	dB
Closed Loop Voltage Gain	G <sub>VC</sub>	2	V <sub>in</sub> = 320μV <sub>rms</sub>	—	31	—	dB
Maximum Output Voltage	V <sub>om</sub>	2	THD = 0.5%	270	350	—	mV <sub>rms</sub>
Total Harmonic Distortion	THD	2	V <sub>O</sub> = 100mV <sub>rms</sub>	—	0.03	0.1	%
Equivalent Input Noise Voltage	V <sub>ni</sub>	2	R <sub>g</sub> = 2.2kΩ, BPF = 20Hz~20kHz NAB (G <sub>V</sub> = 31dB, f = 1kHz)	—	1.3	3.0	μV <sub>rms</sub>
Ripple Rejection Ratio	RR	2	V <sub>r</sub> = 32mV <sub>rms</sub> , f <sub>r</sub> = 1kHz	—	48	—	dB
Cross Talk (CH-A / CH-B)	CT1	2	V <sub>O</sub> = 100mV <sub>rms</sub>	—	67	—	dB
Cross Talk (F / R)	CT2	2	V <sub>O</sub> = 100mV <sub>rms</sub>	—	70	—	dB
Saturation Voltage Of LED Driver	V <sub>on</sub>	1	I <sub>L</sub> = 3mA, LED Mode	—	80	—	mV
On-Resistance Of Metal Driver	R <sub>on</sub>	1	I <sub>L</sub> = 100μA, Metal Mode	—	100	—	Ω

**TEST CIRCUIT 1**

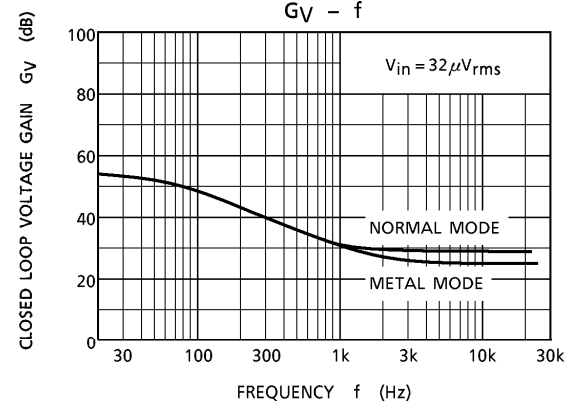
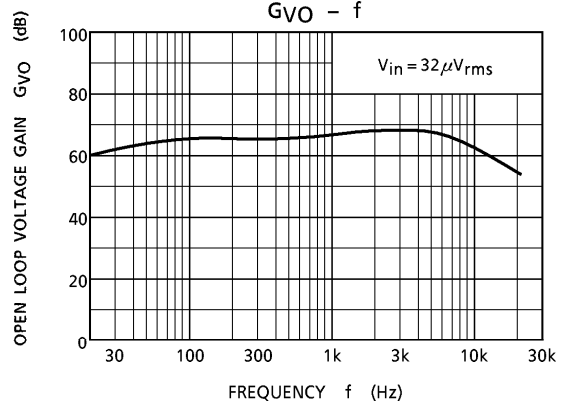
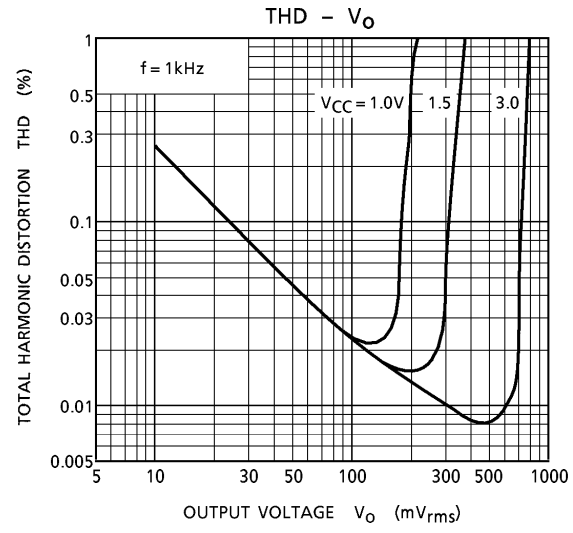
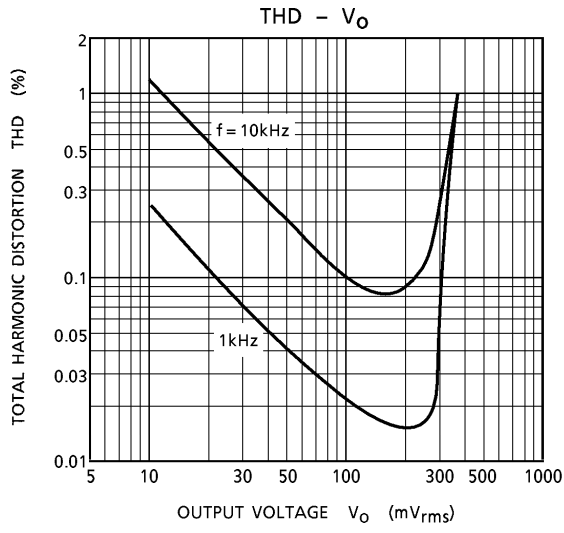
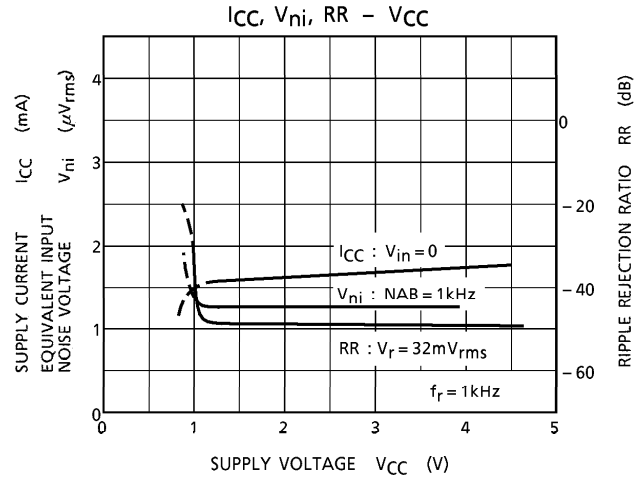
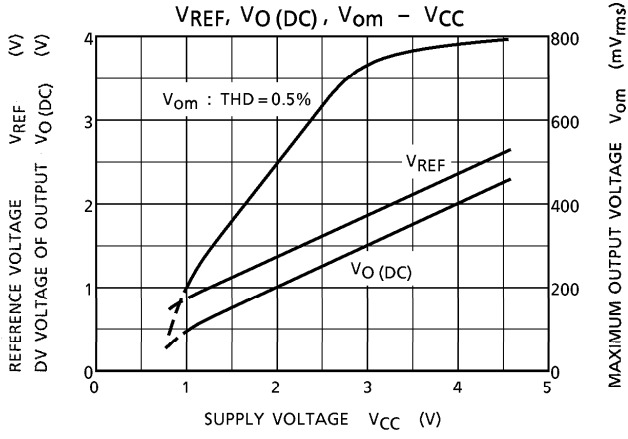


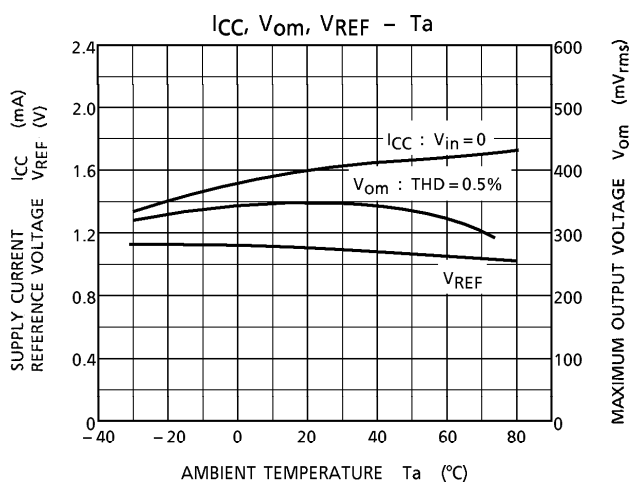
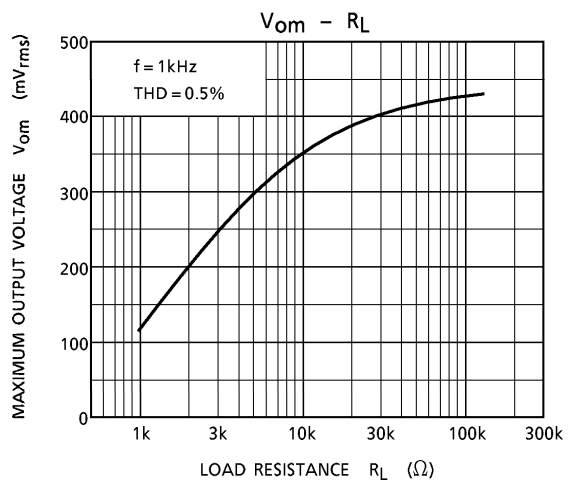
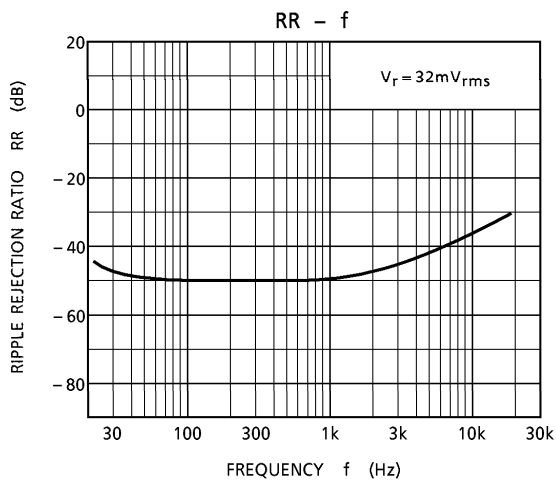
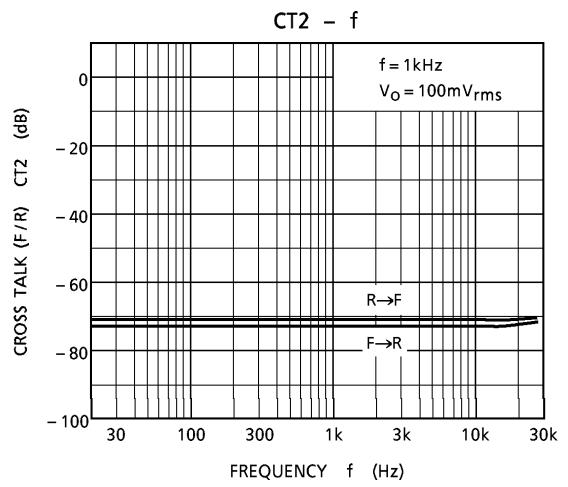
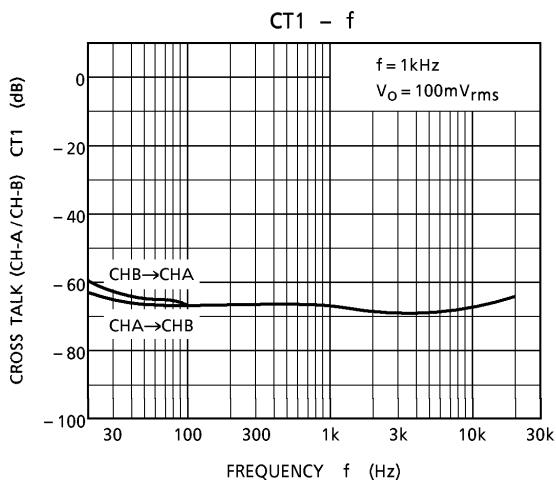
TEST CIRCUIT 2



**CHARACTERISTICS CURVES**

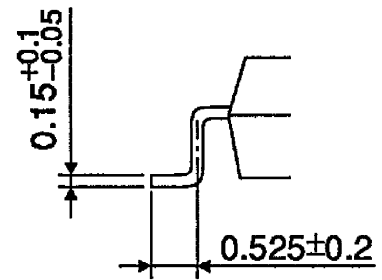
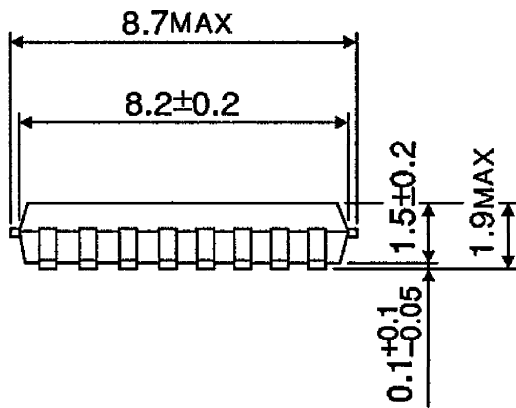
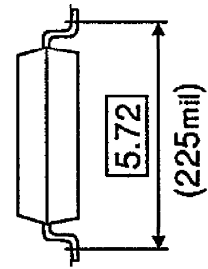
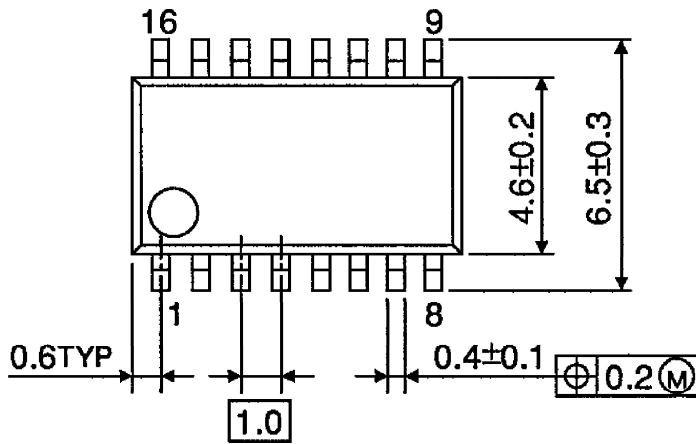
Unless otherwise specified,  $V_{CC} = 1.5V$ ,  $T_a = 25^\circ C$ ,  $f = 1kHz$ , Normal Mode





OUTLINE DRAWING  
SSOP16-P-225-1.00A

Unit : mm

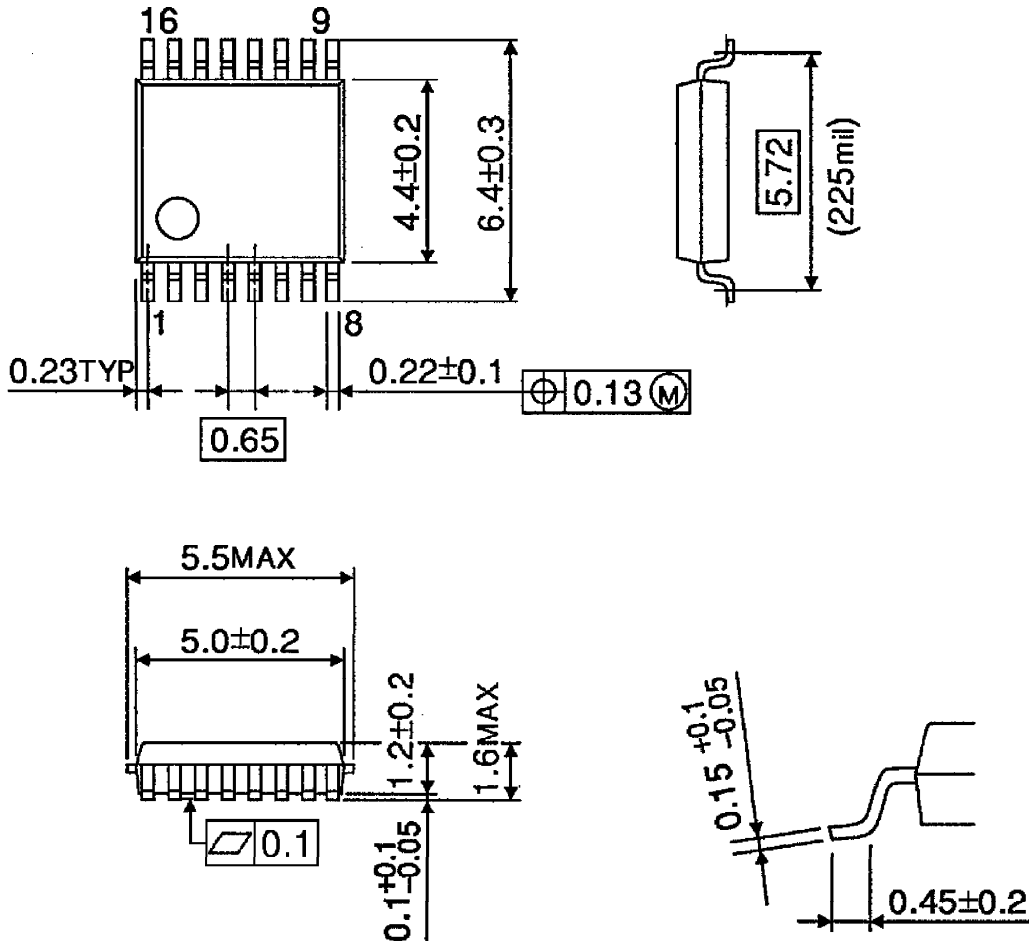


Weight : 0.14g (Typ.)



**OUTLINE DRAWING**  
SSOP16-P-225-0.65B

Unit : mm



Weight : 0.09g (Typ.)