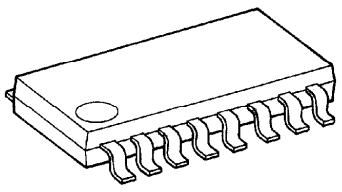
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7795F, TA7795FN

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

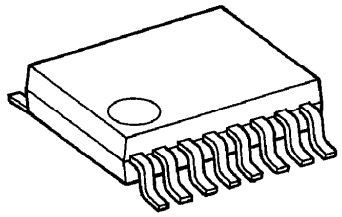
The TA7795F, TA7795FN are Dual preamplifiers ICs, which are designed for low voltage operation (1.5V, 3V). They are especially suitable for a stereo headphone cassette player and for that of auto-reverse type.

TA7795F



SSOP16-P-225-1.00A

TA7795FN



SSOP16-P-225-0.65B

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

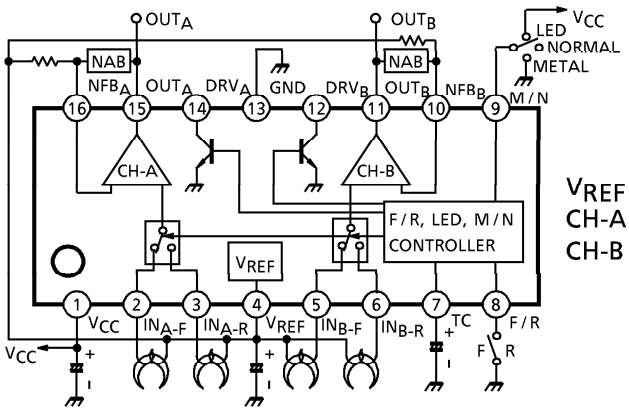
FEATURES

- 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 ($V_{LED} \geqq 2.5V$).
- Low noise (Equivalent input noise).
  $V_{ni} = 1.3 \mu V_{rms}$ (Typ.)
  ($V_{CC} = 1.5V$, $R_g = 2.2k\Omega$, BPF = 20~20kHz)
- Low supply current.
  $I_{CC} = 1.6mA$ (Typ.) ($V_{CC} = 1.5V$, Ta = 25°C)
- Operating supply voltage range.
  $V_{CC\,(opr)} = 0.9 \sim 4.5V$ (Ta = 25°C)

(Note 1) F / R : Direction (FORWARD / REVERSE)

(Note 2) M / N : Equalizer (METAL / NORMAL)

BLOCK DIAGRAM

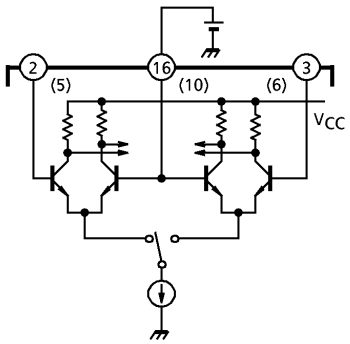
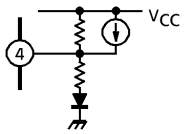
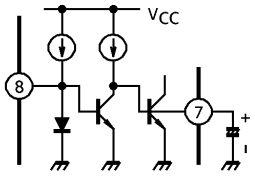
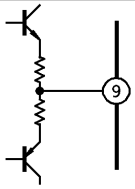
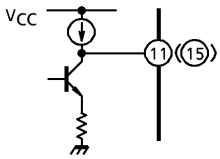
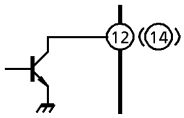


V_{REF} : Reference voltage
CH-A : Channel A preamplifier
CH-B : Channel B preamplifier

961001EBA2

PIN FUNCTION

Terminal voltage : Typical terminal voltage at no signal with test circuit (V_{CC} = 1.5V, Ta = 25°C)

PIN No.	PIN NAME	CONTENTS	EQUIVALENT	TERMINAL VOLTAGE (V)
1	V_{CC}	—	—	1.5
2	IN_{A-F}	Input for Forward mode Input impedance R_{in} = 100kΩ (Typ.)		1.1
5	IN_{B-F}			
3	IN_{A-R}	Input for Reverse mode Input impedance R_{in} = 100kΩ (Typ.)		1.1
6	IN_{B-R}			
10	NFB_A	NFB		1.1
16	NFB_B			
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

961001EBA2'

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_{CC}	OPEN	ON	OFF
	REV		GND	OFF	ON

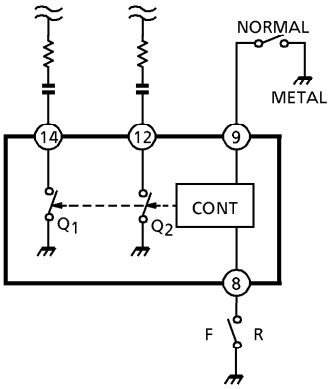


Fig.1 Equalizer switchover function

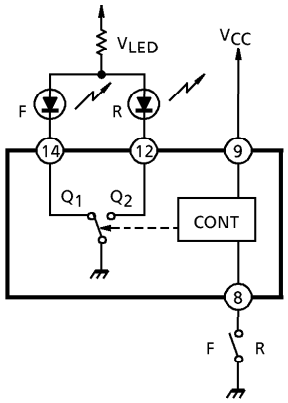


Fig.2 LED driver function

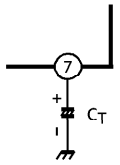


Fig.3 Smoothing function

2. Smoothing function

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

3. NFB terminal

The resistance of 18kΩ is advisable to be connected between NFB terminal (Pin⑯ and ⑩) and V_{REF} for using this IC. That is because NFB terminal is designed to have the off-set voltage ($\Delta V = 36mV$) 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 $V_{CC}/2$ with the current produced by this off-set potential. (Fig.4)

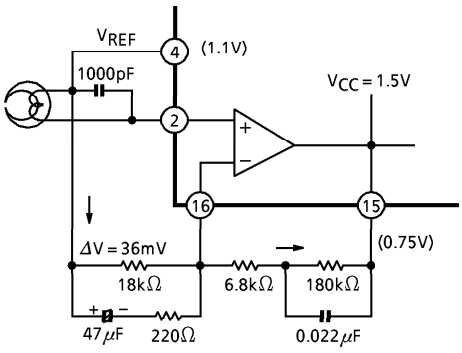


Fig.4 NFB terminal

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	5	V
LED Supply Voltage		V_L	6	V
LED Driver Current		I_L	5	mA
Power Dissipation	TA7795F	P_D (Note)	350	mW
	TA7795FN		400	
Operating Temperature		T_{opr}	−25~75	°C
Storage Temperature		T_{stg}	−55~150	°C

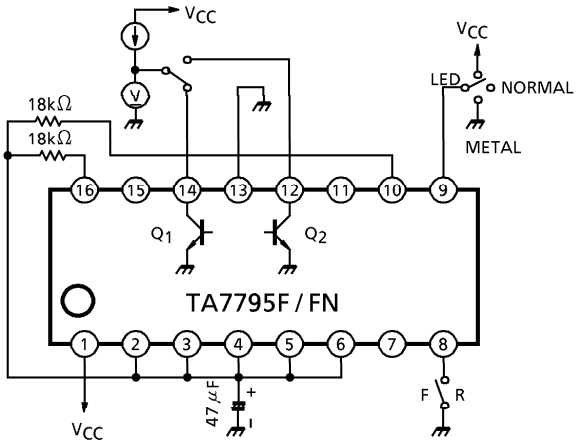
(Note) Derated above Ta = 25°C in the proportion of 2.8mW / °C for TA7795F, and of 3.2mW / °C for TA7795FN.

ELECTRICAL CHARACTERISTICS

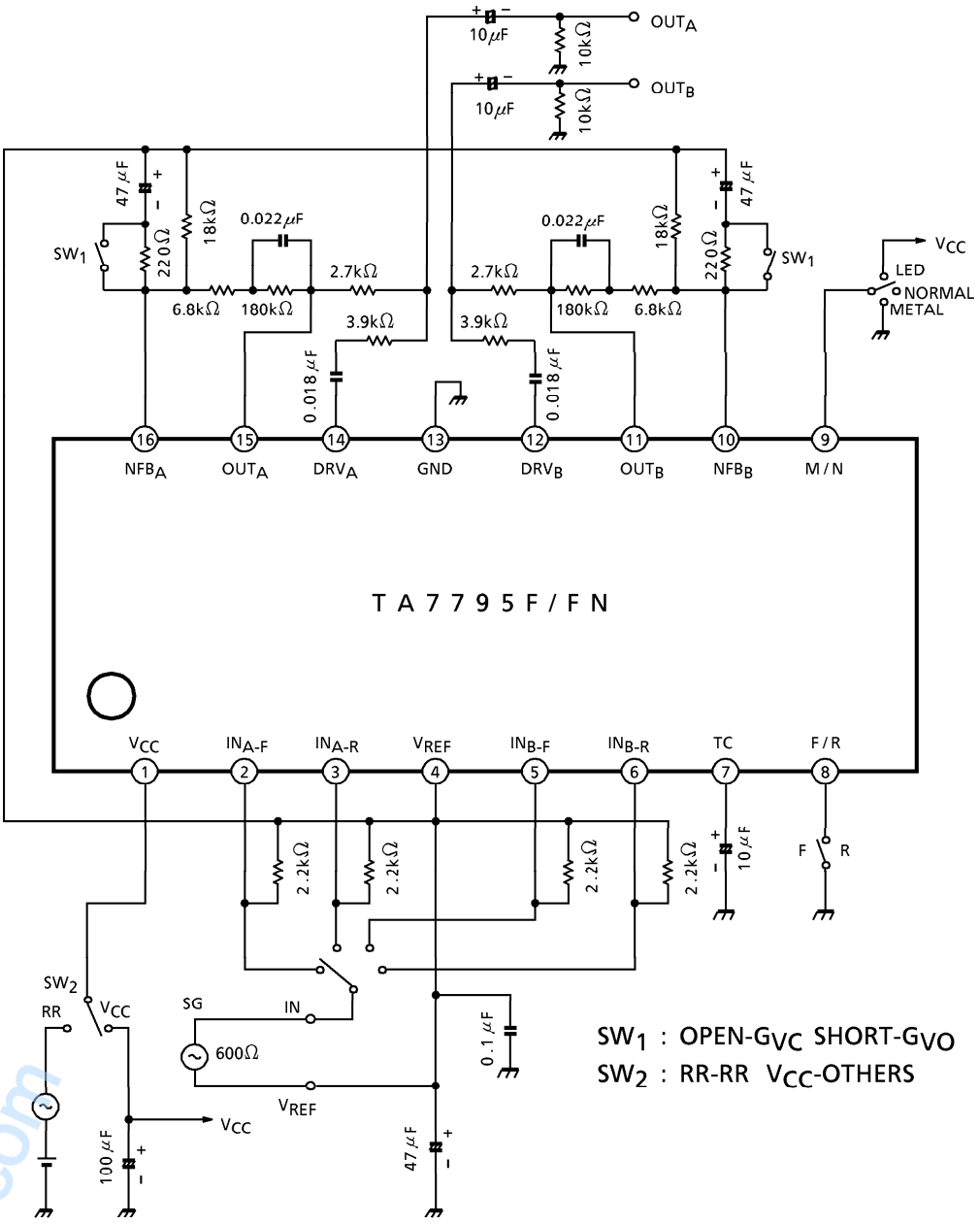
Unless otherwise specified, (Ta = 25°C, V_{CC} = 1.5V, R_g = 2.2kΩ, f = 1kHz, Normal EQ)

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

TEST CIRCUIT 1



TEST CIRCUIT 2

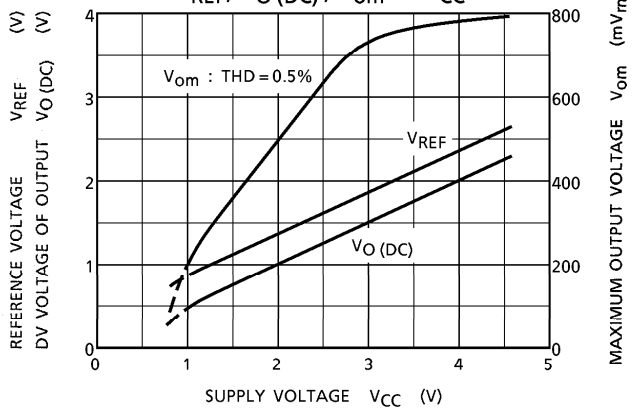


SW_1 : OPEN-G_{VC} SHORT-G_{VO}
SW_2 : RR-RR V_{CC}-OTHERS

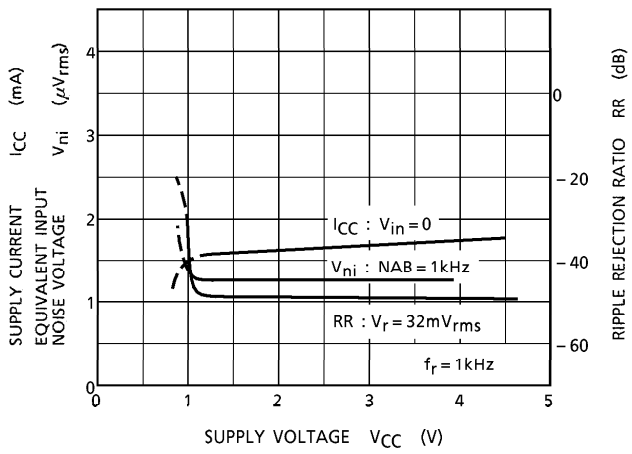
CHARACTERISTICS CURVES

Unless otherwise specified, V_{CC} = 1.5V, Ta = 25°C, f = 1kHz, Normal Mode

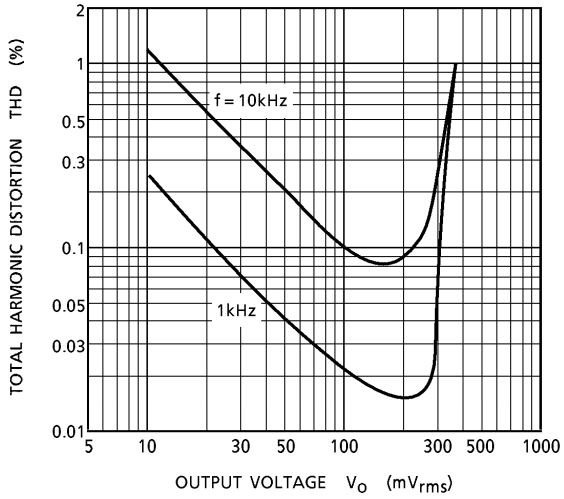
V_{REF}, $V_{O(DC)}$, V_{om} – V_{CC}



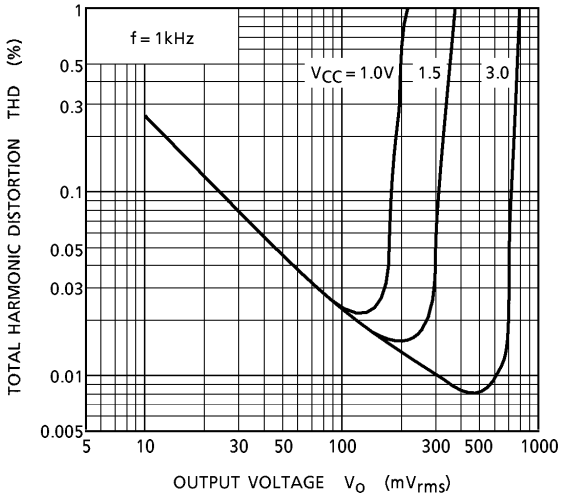
I_{CC}, V_{ni}, RR – V_{CC}



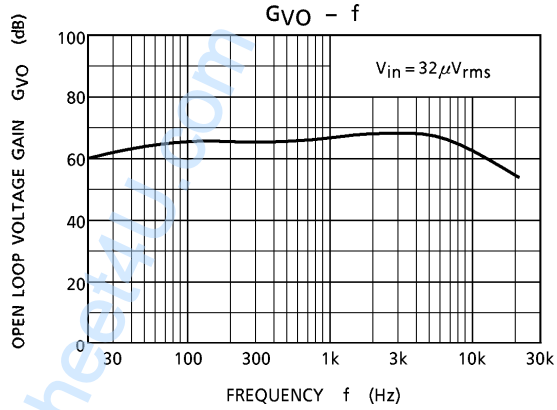
THD – V_o



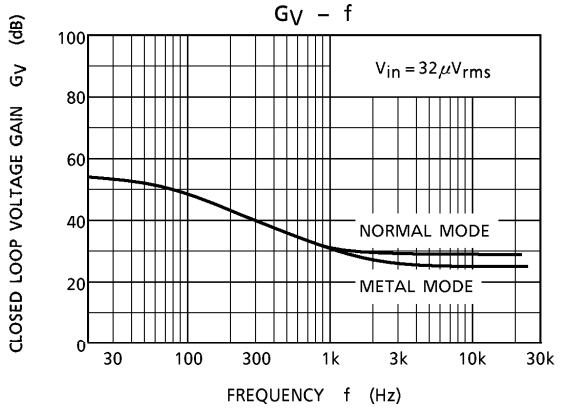
THD – V_o



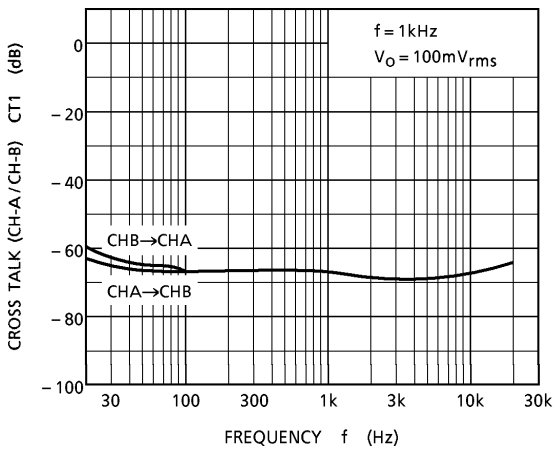
G_{VO} – f



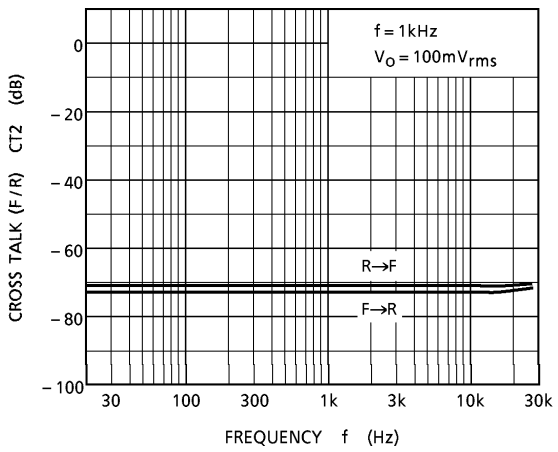
G_V – f



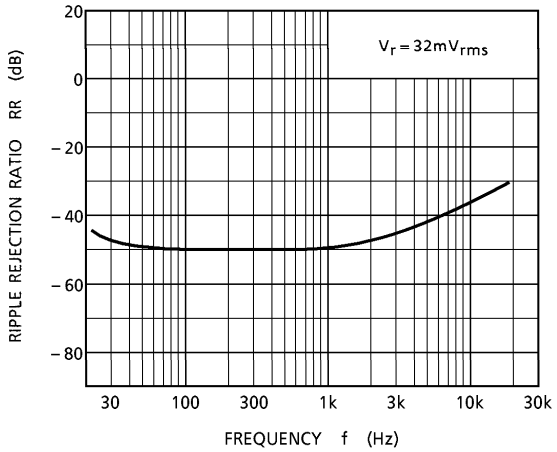
CT1 – f



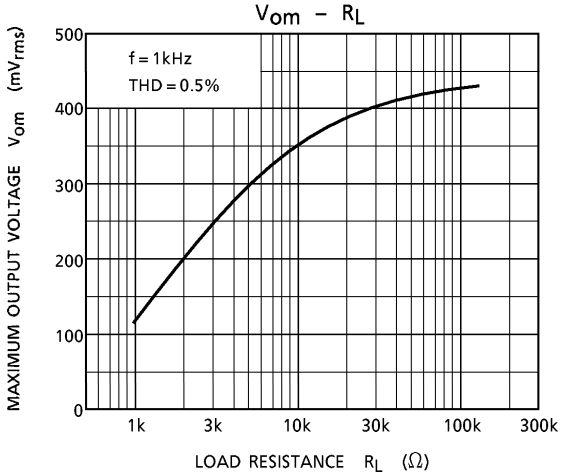
CT2 – f



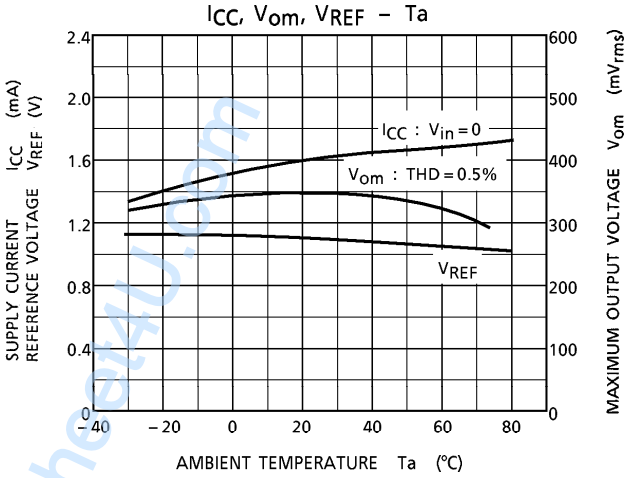
RR – f



V_{om} – R_L



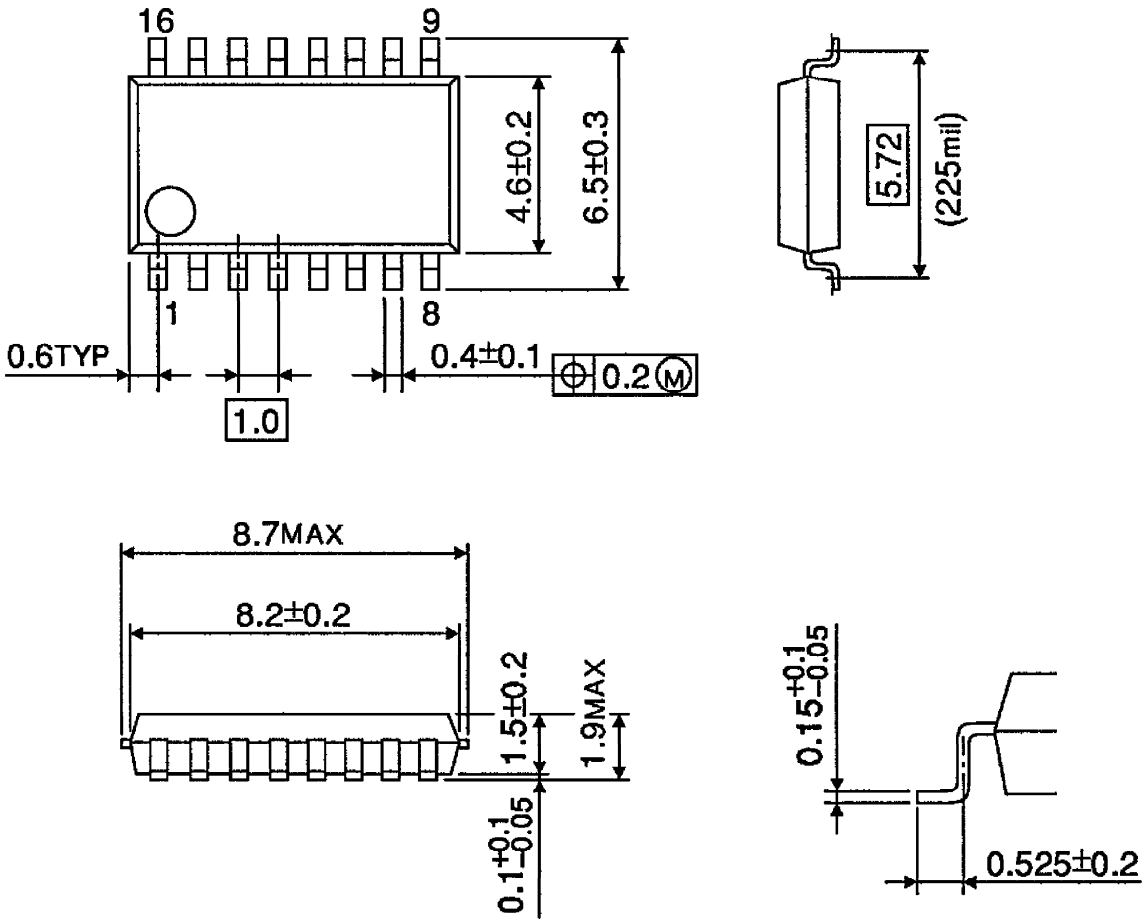
I_{CC}, V_{om}, V_{REF} – Ta



OUTLINE DRAWING

SSOP16-P-225-1.00A

Unit : mm

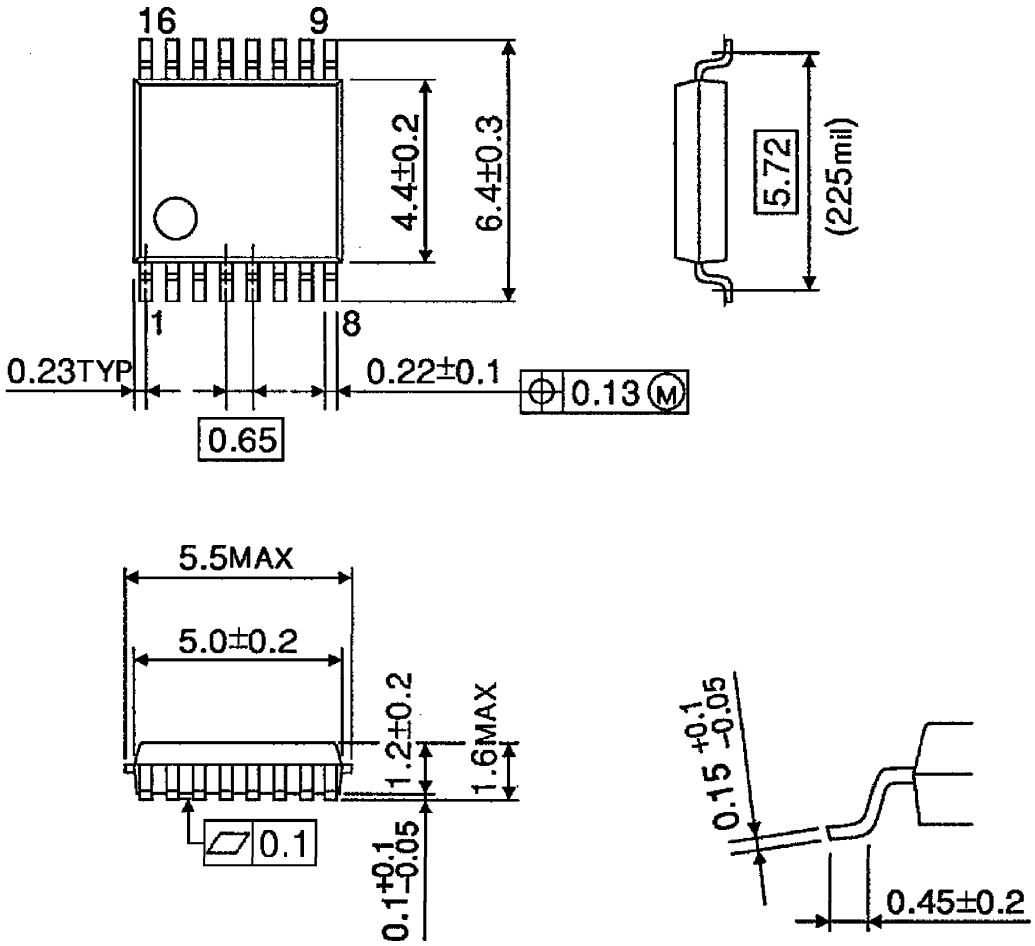


Weight : 0.14g (Typ.)

OUTLINE DRAWING

SSOP16-P-225-0.65B

Unit : mm



Weight : 0.09g (Typ.)