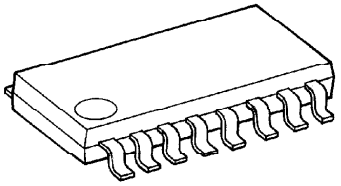
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA2063F

FILTER IC FOR Σ-Δ MODULATION SYSTEM DA CONVERTER

The TA2063F is an analog filter IC for Σ-Δ modulation system DA converter.
Using the TA2063F in combination the TC9268/78/76 (the Σ-Δ modulation system DA converter with a built-in digital filter), it is possible to construct a DA conversion system with less external parts.



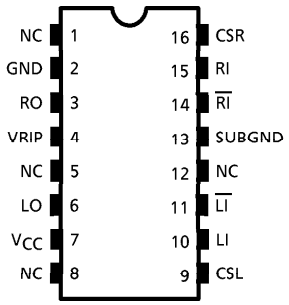
SSOP16-P-225-1.00A

Weight : 0.14g (Typ.)

FEATURES

- Built-in CR for LPFs and output (differential) amplifiers for the left and right channel.
- Single power supply operation.
- Noise distortion factor and S/N ratio are as follows (when operating at +5V single power supply) :
  Noise distortion factor : −90dB (Typ.)
  S/N : 100dB (Typ.)
- Compatible TA2009F.

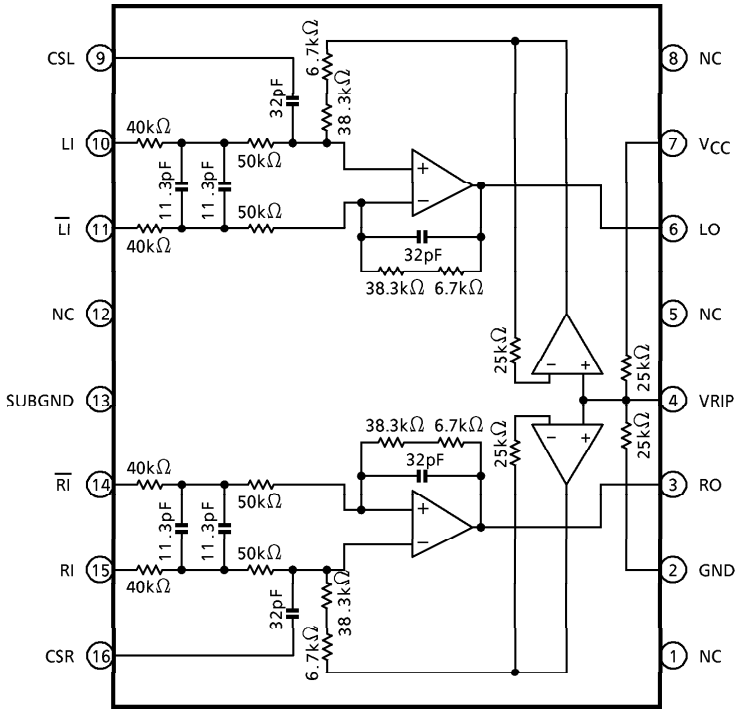
PIN CONNECTION (TOP VIEW)



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BLOCK DIAGRAM



PIN FUNCTION

PIN No.	SYMBOL	I/O	FUNCTION & OPERATION	REMARK
1	NC	—	Non-connecting terminal.	—
2	GND	—	Ground terminal.	—
3	RO	O	R channel analog output terminal.	—
4	VRIP	—	Reference voltage terminal. (V_{CC}/2)	See the block diagram.
5	NC	—	Non-connecting terminal.	—
6	LO	O	L channel analog output terminal.	—
7	V_{CC}	—	Supply voltage terminal.	—
8	NC	—	Non-connecting terminal.	—
9	CSL	—	Ground terminal for L channel reverse input side filter.	—
10	LI	I	L channel forward input terminal.	Connect to LO of TC9268/78/76.
11	$\overline{LI}$	I	L channel reverse input terminal.	Connect to $\overline{LO}$ of TC9268/78/76.
12	NC	—	Non-connecting terminal.	—
13	SUBGND	—	Ground terminal.	—
14	$\overline{RI}$	I	R channel reverse input terminal.	Connect to $\overline{RO}$ of TC9268/78/76.
15	RI	I	R channel forward input terminal.	Connect to RO of TC9268/78/76.
16	CSR	—	Ground terminal for R channel reverse input side filter.	—

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	6	V
Power Dissipation	P_D	350 (*)	mW
Operating Temperature	T_{opr}	−40~85	°C
Storage Temperature	T_{stg}	−55~150	°C

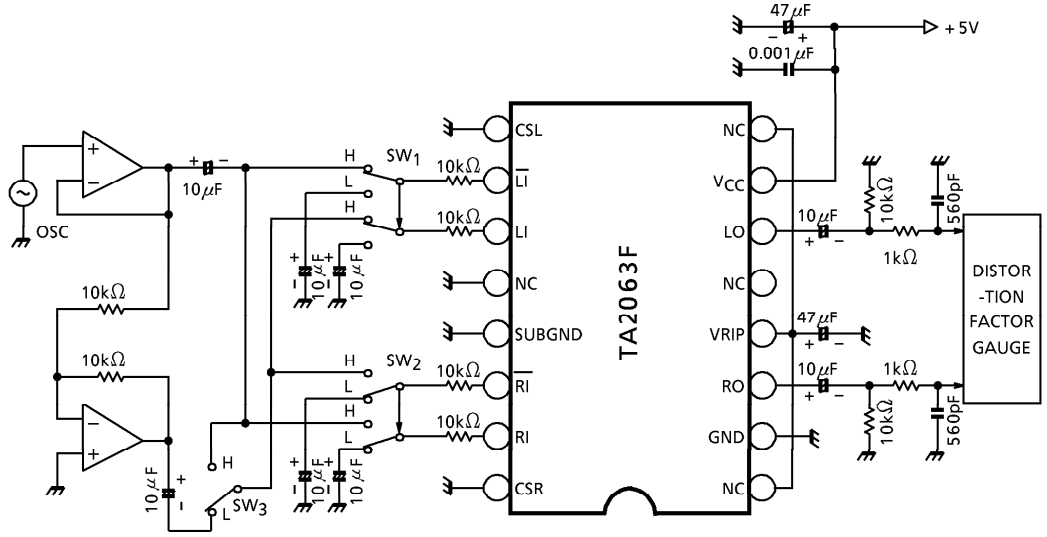
(*) Reduce 2.8mW / °C at above 25°C.

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V_{CC} = 5.0V, Ta = 25°C, R_L = 10kΩ)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Supply Voltage	V_{CC}	—	Ta = −40~85°C	3.0	5.0	5.5	V
Operating Supply Current	I_{CCQ}	—	V_{in} = 0	5.0	7.0	10	mA
Reference Voltage	VRIP	—	—	—	2.5	—	V
Noise Distortion Factor	THD (1)	—	1kHz, V_i = 1.40V_{rms} (*)	—	−90	−85	dB
	THD (2)		10kHz, V_i = 1.40V_{rms} (*)	—	−81	−79	
	THD (3)		1kHz, V_i = 140mV_{rms} (*)	—	−80	−77	
	S / N	—	1kHz, V_i = 1.40V_{rms} (*)	—	−100	−96	dB
Cross Talk	C.T.	—	1kHz, V_i = 1.40V_{rms} (*)	—	−100	−95	dB
Attenuation	ATT (1)	—	20kHz	0.03	0.2	0.5	dB
	ATT (2)		80kHz	1.2	3.0	7.0	
Max. Output Level	V_{out}	—	1kHz, V_i = 1.40V_{rms} (*)	1.2	1.26	1.3	V_{rms}

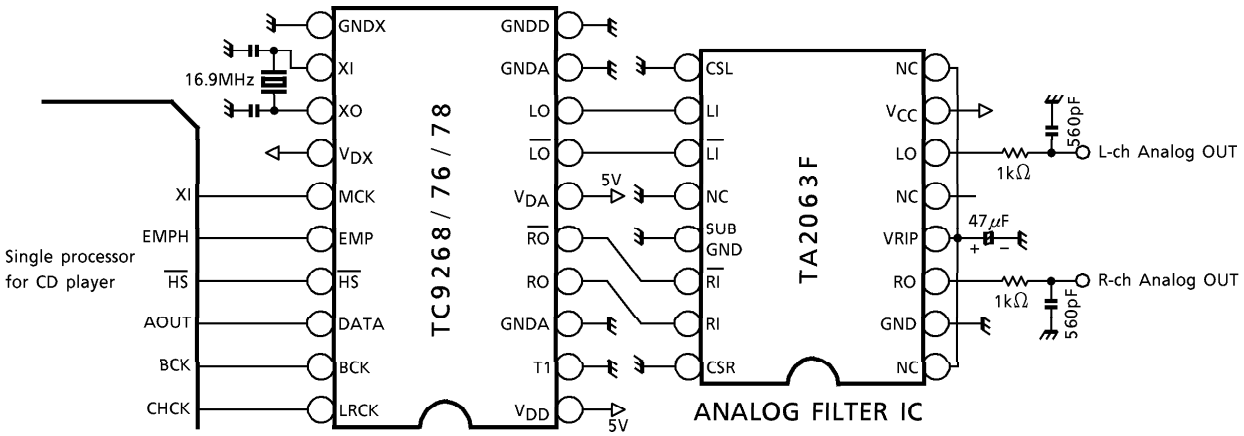
(Note) When the TC9268 / 78 / 76 and +5V single power supply are operated
: Full scale = 1.1V_{rms} (Typ.)
(*) B.W. = 400Hz~30kHz

TEST CIRCUIT



SW_1	SW_2	SW_3	MEASURING ITEM
L	L	—	Operating supply voltage, Reference voltage
L	H	L	Cross talk (R→L)
H	L	L	Cross talk (L→R)
H	H	L	Noise distortion factor, Attenuation, Maximum output level, LR output difference.
H	H	H	Difference balance

APPLICATION CIRCUIT



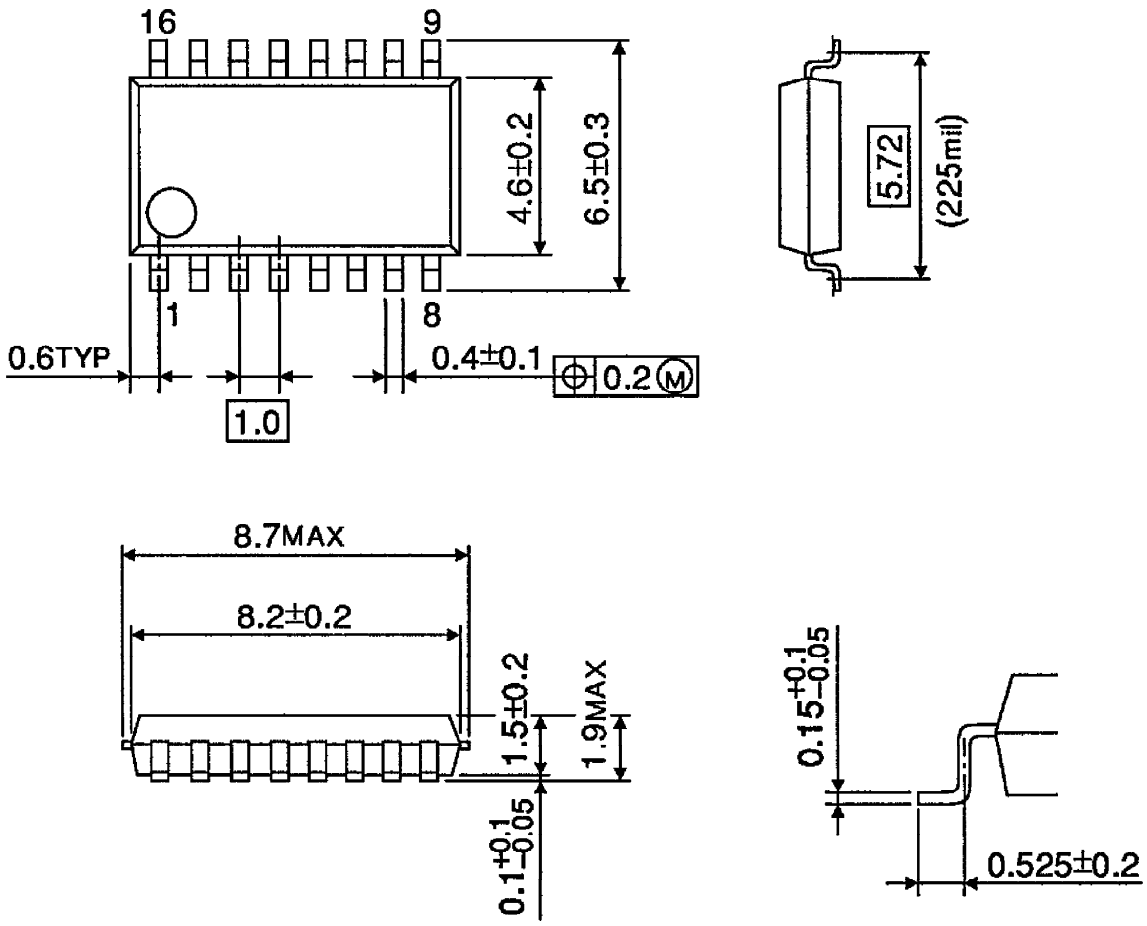
(Cautions)

- Quality of crystal oscillation waveform largely effects S / N ratio.
  Further, this is also true when system clock is input externally through the XI terminal of pin ⑫.
- Suppress glitch of input signals (LRCK, BCK, DATA) as could as possible.
- The wiring between the TC9268 / 76 / 78 output and the analogue filter amplifier input must be made the shortest.
- The capacitor between V_{DA} and GNDA shall be connected as close to the pin as possible.

OUTLINE DRAWING

SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)