DIGITAL AUDIO

2-Channel 4-times Oversampling Digital Filter

YM3404B CDDF

■ OUTLINE

The YM3404B (CDDF) is a super-high performance 4-times oversampling digital filter for use with the digital audio systems developed by Yamaha.

It is connectable directly to LSI, DIT, DIR, etc. for digital audio systems, and can exhibit its excellent performance through simple procedures.

■ FEATURES

- **4-times oversampling in two channels**
- **Linear phase FIR type filters connected in two vertical stages**
  - **1'st filter: 225-order FIR filter**
  - **2'nd filter: 41-order FIR filter**
- **19 × 18 bits multiplier built in**
- **Floating point multiplier and accumlater having a coefficient of 18 bits**
- **Overflow limiter built in**
- **Filter characteristics (fs=44.1 kHz)**
  - **Pass band ripple: Within ±0.0001 dB at 0 to 20 kHz**
    (Within quantization error in 16 bits)
  - **Stop band attenuation: At least 100 dB at 24.1 to 64.1 kHz**
    At least 99 dB at 64.1 kHz and higher
- **High precision oscillator specially designed for use with the filter**
- **Clock providing 8.6426 MHz output**
- **C-MOS type process**
- **Single 5 V power supply**
- **16-pin type DIP package**

■ ELECTRICAL CHARACTERISTICS

■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Minimum	Maximum	Unit
Power supply voltage	Vdd	−0.3	+7.0	V
Input voltage	VI	−0.3	Vdd+0.5	V
Working temperature	Top	−20	+75	°C
Storage temperature	Tstg	−50	+125	°C

■ RECOMMENDED OPERATING CONDITIONS

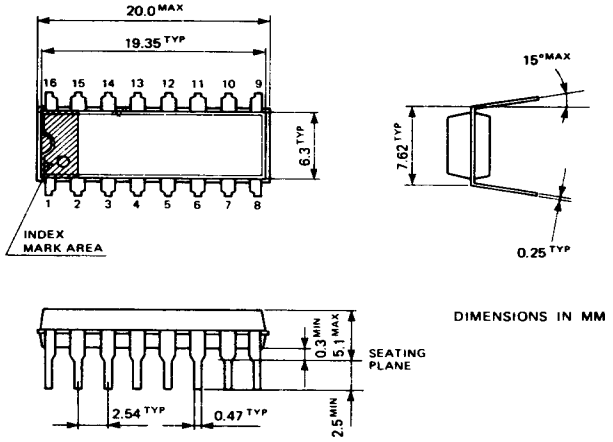
Item	Symbol	Minimum	Typical	Maximum	Unit
Power supply voltage	VDD	4.75	5.0	5.25	V
Clock frequency	XIN	12.2	16.93	18.5	MHz
Working temperature	Top	0	25	70	°C

■ ELECTRICAL CHARACTERISTICS (Ta=25°C, V_{DD}=5±0.25V)

Item	Symbol	Condition	Minimum	Typical	Maximum	Unit
Power consumption	W	Vdd=+5V		200	270	mW
Input voltage H level (XI, FEN, ST) (BCI, SDSY, SDI)	VIH		 3.5 2.7		 Vdd Vdd	 V V
Input voltage L level	VIL		0		0.8	V
Output voltage H level	VOH		2.4		Vdd	V
Output voltage L level	VOL		0		0.4	V
Output delay (delay from BCO)			5		35	nsec
Input data setup time (Rise of BCI)			50			nsec
Input data hold time (Rise of BCI)			20			nsec
XI ON/OFF time (Duty)				50		%
BCI ON/OFF time (Duty)				50		%

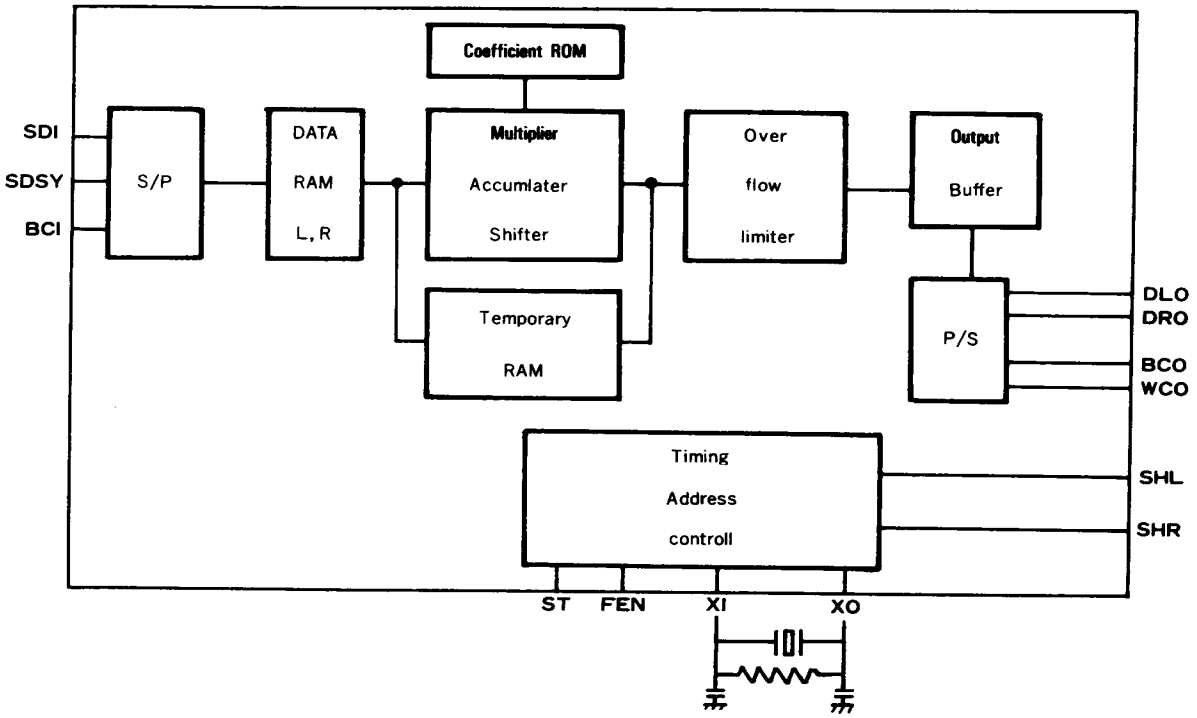
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■ OUTLINE DIMENSIONS



DIMENSIONS IN MM

■ BLOCK DIAGRAM



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