# Melody Sound Source LSI for Cellular Phone
# BU8788KN

● Description

BU8788KN is a melody sound source LSI for cellular phones. This LSI generates 32 polyphonic tones simultaneously and is capable of generating user's own sounds by an ADPCM decoder. A total of 207 tones(128tones+47drums +32effect sounds) can be generated. FIFO and Sequencer for playing are incorporated. The sequencer itself can control the timing and play the music by sending the melody data to FIFO.

● Dimension (Unit : mm)
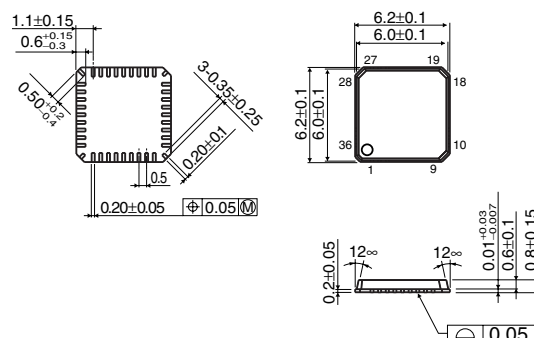


QFN36V

● Features

1) PCM sound source
2) 32 harmonies generator available at the same time
   128 sounds+drum set 47 sounds generation
3) ADPCM decode functions are mounted, and mixing with sounds is possible.
4) FIFO buffer and sequencer are used to reduce CPU load
5) PitchBend and vibrato available
6) Integrated stereo sound DAC
7) CPU control through serial and parallel I/F

● Applications

Sound source for cellular phones and portable appliances

● Absolute Maximum Ratings  (Ta=25˚C)

| Parameter | Symbol | Limits | | Unit |
|---|---|---|---|---|
| Supply voltage range | $V_{DD}$ | −0.3 ~ | +4.5 | V |
| Power dissipation | Pd | 450 ∗ | | mW |
| Operating temperature range | Topr | −40 ~ | +85 | ˚C |
| Storage temperature range | Tstg | −50 ~ | +125 | ˚C |

∗Derating : 4.5mW/˚C for operation above Ta=25˚C

## ● Recommended Operating Conditions  (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Supply voltage range | $V_{DD}$ | 2.7 | 3.0 | 3.6 | V |

## ● Electrical characteristics  (Unless otherwise noted; Ta=25°C, Vcc=3.0V)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Clock input frequency | $F_{MCLK}$ | 12 | — | 20 | MHz | Scale precision is within 0.2% |
| ANOUT pin load resistance | $Z_{AN}$ | 50 | — | — | kΩ | After DC Coupling |
| VREF pin rise time | $T_{RVR}$ | — | 70 | 100 | ms | After releasing RESET when CVREF=1μF |
| PLL pin rise time | $T_{RPLL}$ | — | — | 10 | ms | After releasing RESET or STANDBY mode (When C=4.7nF between PLL-FILTER pin and GND) |
| ANOUT amplitude | $V_{MAX}$ | — | $0.667V_{DD}$ | — | $V_{P-P}$ | Theoretical value of dynamic range |
| Analog operating current consumption | $I_{DDA}$ | — | 1 | 2 | mA | Playing mode |
| Digital operating current consumption | $I_{DDD}$ | — | 33 | 50 | mA | Playing mode |
| Analog static current | $I_{stA}$ | — | — | 5 | μA | Standby mode |
| Digital static current | $I_{stD}$ | — | — | 5 | μA | Standby mode |

## ● Block Diagram
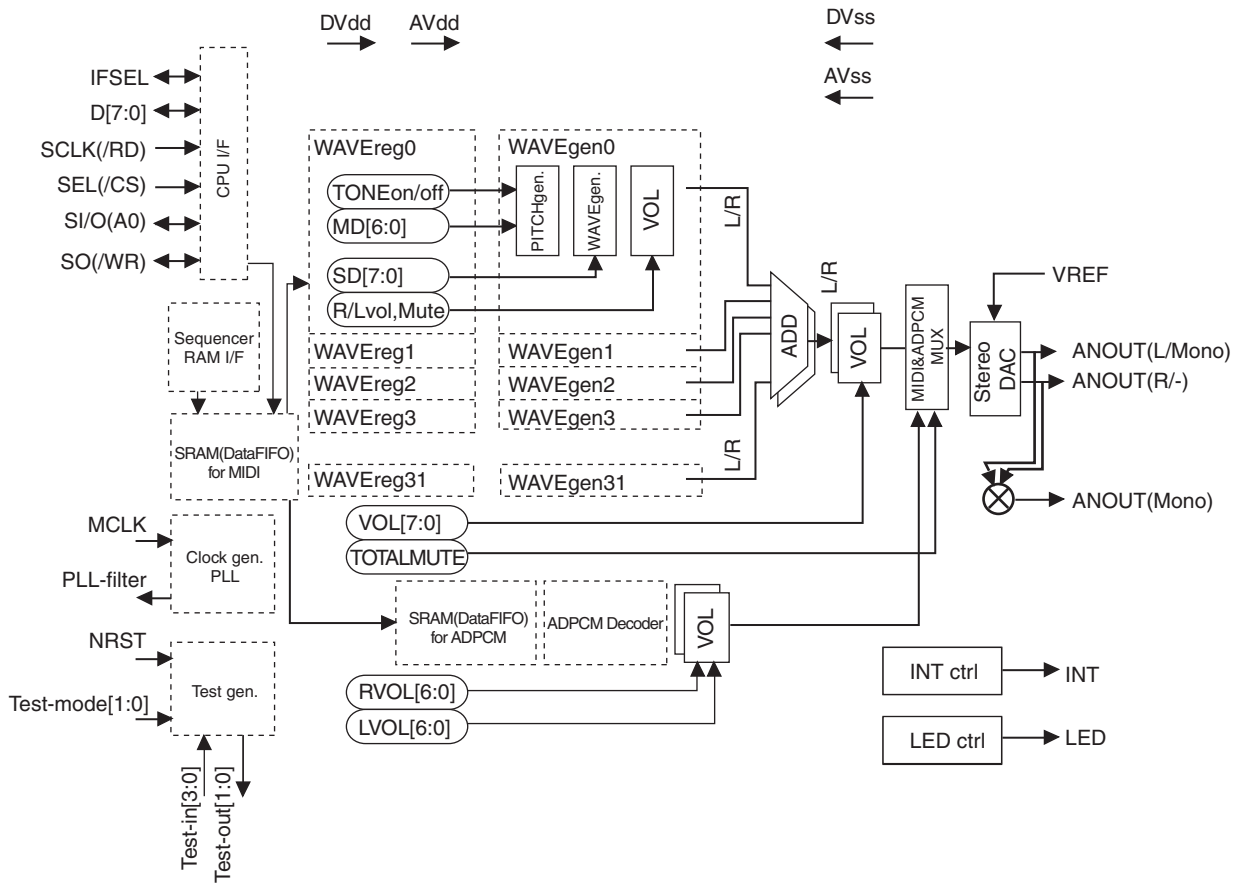
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