MOTOROLA

MC145554
MC145557
MC145564
MC145567

Advance Information

PCM Codec-Filter

The MC145554, MC145557, MC145564, and MC145567 are all per channel PCM codec-filters. These devices perform the voice digitization and reconstruction as well as the band limiting and smoothing required for PCM systems. They are designed to operate in both synchronous and asynchronous applications and contain an on-chip precision voltage reference. The MC145554 (Mu-Law) and MC145557 (A-Law) are general purpose devices that are offered in 16-pin packages. The MC145564 (Mu-Law) and MC145567 (A-Law), offered in 20-pin packages, add the capability of analog loop-back and push-pull power amplifiers with adjustable gain.

These devices have an input operational amplifier whose output is the input to the encoder section. The encoder section immediately low-pass filters the analog signal with an active R-C filter to eliminate very-high-frequency noise from being modulated down to the pass band by the switched capacitor filter. From the active R-C filter, the analog signal is converted to a differential signal. From this point, all analog signal processing is done differentially. This allows processing of an analog signal that is twice the amplitude allowed by a single-ended design, which reduces the significance of noise to both the inverted and noninverted signal paths. Another advantage of this differential design is that noise injected via the power supplies is a common-mode signal that is cancelled when the inverted and noninverted signals are recombined. This dramatically improves the power supply rejection ratio.

After the differential converter, a differential switched capacitor filter band passes the analog signal from 200 Hz to 3400 Hz before the signal is digitized by the differential compressing A/D converter.

The decoder accepts PCM data and expands it using a differential D/A converter. The output of the D/A is low-pass filtered at 3400 Hz and sinX/X compensated by a differential switched capacitor filter. The signal is then filtered by an active R-C filter to eliminate the out of band energy of the switched capacitor filter.

These PCM codec-filters accept both industry standard clock formats. They also maintain compatibility with Motorola's family of TSACs and MC3419/MC34120 SLIC products.

The MC145554/57/64/67 family of PCM codec-filters utilizes CMOS due to its reliable low-power performance and proven capability for complex analog/digital VLSI functions.

MC145554/57 (16-Pin Package)

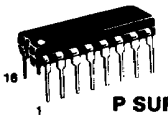
- Fully Differential Analog Circuit Design for Lowest Noise
- Performance Specified for Extended Temperature Range of −40 to +85°C
- Transmit Band-Pass and Receive Low-Pass Filters On-Chip
- Active R-C Pre-Filtering and Post-Filtering
- Mu-Law Companding MC145554
- A-Law Companding MC145557
- On-Chip Precision Voltage Reference (2.5 V)
- Typical Power Dissipation of 40 mW, Power Down of 1.0 mW at ±5 V

MC145564/67 (20-Pin Package)

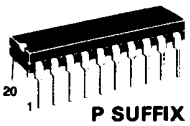
All of the Features of the MC145554/57 Plus:

- Mu-Law Companding MC145564
- A-Law Companding MC145567
- Push-Pull Power Drivers with External Gain Adjust
- Analog Loop-Back

MC145554, 57 | **MC145564, 67**

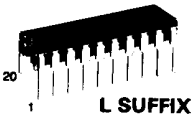


P SUFFIX PLASTIC CASE 648



P SUFFIX PLASTIC CASE 738

L SUFFIX CERAMIC CASE 620



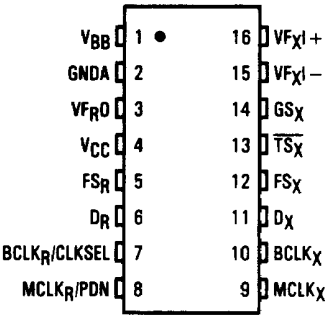
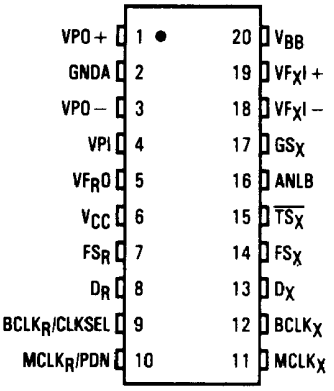
L SUFFIX CERAMIC CASE 732

DW SUFFIX SO CASE 751G

DW SUFFIX SO CASE 751D

PIN ASSIGNMENT

MC145554, MC145557



MC145564, MC145567