TLE2027, TLE2037, TLE2027A, TLE2037A, TLE2027Y, TLE2037Y EXCALIBUR LOW-NOISE HIGH-SPEED PRECISION OPERATIONAL AMPLIFIERS

SLOS192A - FEBRUARY 1997 REVISED MARCH 2002

 Outstanding Combination of dc Precision and AC Performance:

Unity-Gain Bandwidth . . . 15 MHz Typ V_n 3.3 nV/ \sqrt{Hz} at f = 10 Hz Typ,

2.5 nV/ $\sqrt{\text{Hz}}$ at f = 1 kHz Typ

V_{IO}.... 25 μV Max

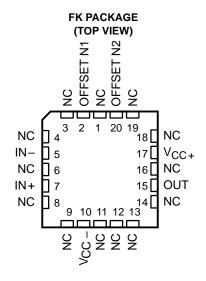
A_{VD} ... 45 V/ μ V Typ With R_L = 2 kΩ, 19 V/ μ V Typ With R_L = 600 Ω

- Available in Standard-Pinout Small-Outline Package
- Output Features Saturation Recovery Circuitry
- Macromodels and Statistical information

description

The TLE20x7 and TLE20x7A contain innovative circuit design expertise and high-quality process control techniques to produce a level of ac performance and dc precision previously unavailable in single operational amplifiers. Manufactured using Texas Instruments state-of-the-art Excalibur process, these devices allow upgrades to systems that use lower-precision devices.

In the area of dc precision, the TLE20x7 and TLE20x7A offer maximum offset voltages of 100 μ V and 25 μ V, respectively, common-mode rejection ratio of 131 dB (typ), supply voltage rejection ratio of 144 dB (typ), and dc gain of 45 V/ μ V (typ).



AVAILABLE OPTIONS

| | | | OUID | | | | |
|----------------|--------------------------------|--------------------------|----------------------------|----------------------------|--------------------------|----------------------------------|--|
| TA | V _{IO} max AT 25°C | SMALL OUTLINE† (D) | CHIP CARRIER (FK) | CERAMIC DIP (JG) | PLASTIC DIP (P) | CHIP FORM [‡] (Y) | |
| 0°C to 70°C | 25 μV | TLE2027ACD TLE2037ACD | | | TLE2027ACP TLE2037ACP | TLE2027Y TLE2037Y | |
| | 100 μV | TLE2027CD TLE2037CD | | _ _ | TLE2027CP TLE2037CP | TLE2027Y TLE2037Y | |
| -40°C to 105°C | 25 μV | TLE2027AID TLE2037AID | | | TLE2027AIP TLE2037AIP | _ | |
| | 100 μV | TLE2027ID TLE2037ID | | _ | TLE2027IP TLE2037IP | _ | |
| –55°C to 125°C | 25 μV | TLE2027AMD TLE2037AMD | TLE2027AMFK TLE2037AMFK | TLE2027AMJG TLE2037AMJG | TLE2027AMP TLE2037AMP | _ | |
| | 100 μV | TLE2027MD TLE2037MD | TLE2027MFK TLE2037MFK | TLE2027MJG TLE2037MJG | TLE2027MP TLE2037MP | _ | |

The D packages are available taped and reeled. Add R suffix to device type (e.g., TLE2027ACDR).

[‡] Chip forms are tested at 25°C only.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.





PACKAGING INFORMATION

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | e Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|-----------------|--------------------|------|----------------|---------------------------|------------------|------------------------------|
| 5962-9089601M2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | Level-NC-NC-NC |
| 5962-9089601MPA | ACTIVE | CDIP | JG | 8 | 1 | TBD | A42 SNPB | Level-NC-NC-NC |
| 5962-9089602MPA | OBSOLETE | CDIP | JG | 8 | | TBD | Call TI | Call TI |
| 5962-9089603Q2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | Level-NC-NC-NC |
| 5962-9089603QPA | ACTIVE | CDIP | JG | 8 | 1 | TBD | A42 SNPB | Level-NC-NC-NC |
| TLE2027ACD | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI |
| TLE2027ACP | OBSOLETE | PDIP | Р | 8 | | Pb-Free (RoHS) | CU NIPDAU | Level-NC-NC-NC |
| TLE2027AID | OBSOLETE | SOIC | D | 8 | | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2027AIP | OBSOLETE | PDIP | Р | 8 | | Pb-Free (RoHS) | CU NIPDAU | Level-NC-NC-NC |
| TLE2027AMD | ACTIVE | SOIC | D | 8 | 75 | TBD | CU NIPDAU | Level-1-220C-UNLIM |
| TLE2027AMFKB | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | Level-NC-NC-NC |
| TLE2027AMJG | ACTIVE | CDIP | JG | 8 | 1 | TBD | A42 SNPB | Level-NC-NC-NC |
| TLE2027AMJGB | ACTIVE | CDIP | JG | 8 | 1 | TBD | A42 SNPB | Level-NC-NC-NC |
| TLE2027CD | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2027CDG4 | ACTIVE | SOIC | D | 8 | 75 | TBD | Call TI | Call TI |
| TLE2027CDR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2027CP | OBSOLETE | PDIP | Р | 8 | | TBD | Call TI | Call TI |
| TLE2027ID | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2027IDR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2027IDRG4 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI |
| TLE2027IP | OBSOLETE | PDIP | Р | 8 | | TBD | Call TI | Call TI |
| TLE2027MD | ACTIVE | SOIC | D | 8 | 75 | TBD | CU NIPDAU | Level-1-220C-UNLIM |
| TLE2027MFKB | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | Level-NC-NC-NC |
| TLE2027MJG | ACTIVE | CDIP | JG | 8 | 1 | TBD | A42 SNPB | Level-NC-NC-NC |
| TLE2027MJGB | ACTIVE | CDIP | JG | 8 | 1 | TBD | A42 SNPB | Level-NC-NC-NC |
| TLE2037ACD | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI |
| TLE2037ACP | OBSOLETE | PDIP | Р | 8 | | TBD | Call TI | Call TI |
| TLE2037AID | OBSOLETE | SOIC | D | 8 | | TBD | Call TI | Call TI |
| TLE2037AIP | OBSOLETE | PDIP | Р | 8 | | Pb-Free (RoHS) | CU NIPDAU | Level-NC-NC-NC |
| TLE2037AMD | ACTIVE | SOIC | D | 8 | 75 | TBD | CU NIPDAU | Level-1-220C-UNLIM |
| TLE2037AMJGB | OBSOLETE | CDIP | JG | 8 | | TBD | Call TI | Call TI |
| TLE2037CD | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2037CDR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2037CDRG4 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI |
| TLE2037CP | OBSOLETE | PDIP | Р | 8 | | TBD | Call TI | Call TI |



PACKAGE OPTION ADDENDUM

12-May-2005

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | e Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp (3) |
|------------------|-----------------------|-----------------|--------------------|------|----------------|---------------------------|------------------|--------------------|
| TLE2037ID | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2037IDR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| TLE2037IP | OBSOLETE | PDIP | Р | 8 | | TBD | Call TI | Call TI |
| TLE2037MD | ACTIVE | SOIC | D | 8 | 75 | TBD | CU NIPDAU | Level-1-220C-UNLIM |
| TLE2037MFKB | OBSOLETE | LCCC | FK | 20 | | TBD | Call TI | Call TI |
| TLE2037MJGB | OBSOLETE | CDIP | JG | 8 | • | TBD | Call TI | Call TI |

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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