

UNISONIC TECHNOLOGIES CO., LTD

LV712 CMOS IC

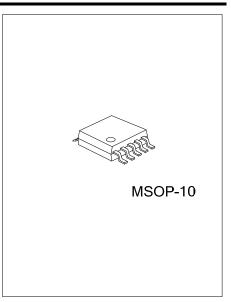
RAIL-TO-RAIL, DUAL RRIO OPERATIONAL WITH INDEPENDENT SHUTDOWN

DESCRIPTION

The UTC LV712 duals are high performance BiCMOS operational amplifiers intended for applications requiring Rail-to-Rail inputs combined with speed and low noise. They offer a bandwidth of 4MHz and a slew rate of 4.5 V/µs.

The UTC LV712 is guaranteed to operate from 2.7V to 5.5V and offers two independent shutdown pins. This feature allows disabling of each device separately and reduces the supply current to less than 0.8µA (typ.). The output voltage rapidly ramps up smoothly with no glitch as the amplifier comes out of the shutdown mode.

The UTC LV712 offered in 10-Pin MSOP package. The package are designed to meet the demands of small size, low power, and low cost required by cellular phones and similar battery operated portable electronics.

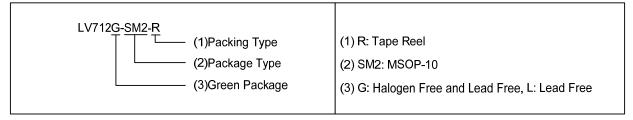


FEATURES

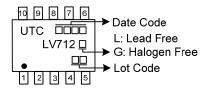
- * Supply Voltage: 2.7~5V
- * Supply current 1.3mA/ amplifier (Typ.)
- * Shutdown Current: 0.8µA (Typ.)
- * Input Offset Voltage: 3mV (Max.)
- * Rail-to-Rail inputs and outputs
- * Slew Rate 4.5V/µs(Typ.)

ORDERING INFORMATION

| Ordering Number | | Deekees | De alcie e | |
|-----------------|--------------|---------|------------|--|
| Lead Free | Halogen Free | Package | Packing | |
| LV712L-SM2-R | LV712G-SM2-R | MSOP-10 | Tape Reel | |

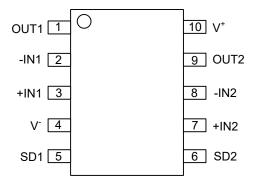


MARKING



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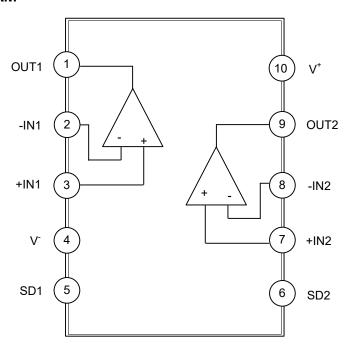
■ PIN CONFIGURATION



■ PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION |
|---------|----------------|----------------------------------|
| 1 | OUT1 | Output of A AMP |
| 2 | -IN1 | Inverting Input of 1 AMP |
| 3 | +IN1 | Non-inverting input of 1 AMP |
| 4 | V- | Negative power supply |
| 5 | SD1 | Active low enable input of 1 AMP |
| 6 | SD2 | Active low enable input of 2 AMP |
| 7 | +IN2 | Non-inverting input of 2 AMP |
| 8 | -IN2 | Inverting input of 2 AMP |
| 9 | OUT2 | Output of 2 AMP |
| 10 | V ⁺ | Positive power supply |

■ BLOCK DIAGRAM



LV712

■ **ABSOLUTE MAXIMUM RATING** (T_A=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-----------------------------|---------------------------------|-------------------------------|------|
| Supply Voltage | V ⁺ - V ⁻ | 6.0 | V |
| Differential Input Voltage | | ±Supply Voltage | |
| Voltage at Input/Output Pin | | V^{+} - 0.4 ~ V^{-} + 0.4 | V |
| Current at Input Pin | | ±10 | mA |
| Current at Output Pin | | ±50 | mA |
| Storage Temperature | T _{STG} | -65 ~ +150 | °C |
| Junction Temperature | TJ | +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|--------|---------|------|
| Junction to Ambient | θја | 258 | °C/W |

■ RECOMMENDED OPWRAING CONDITIONS

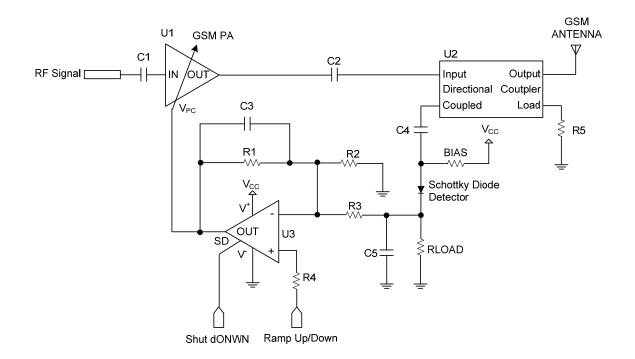
| PARAMETER | SYMBOL | RATING | UNIT |
|--------------------------------|---------|------------|------|
| Supply Voltage | V+ - V- | 2.7 ~ 5.5 | V |
| Operating Free-Air Temperature | Topr | -40 ~ +125 | °C |

■ ELECTRICAL CHARACTERISTICS

(V⁺ = +2.7 \sim +5.0V, V⁻ = 0V, V_{CM} = V⁺/2 and R_L > 1M Ω , T_A=25 $^{\circ}$ C, unless otherwise specified)

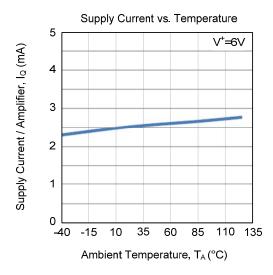
| PARAMETER | SYMBOL | | | MIN | TYP | MAX | UNIT |
|------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------|-------|--------|---------|
| TANAMETER | STWIDOL | TEST CONDITIONS | | IVIIIN | | 1.7 | |
| Supply Current/Amplifier | IQ | On Mode Shutdown Mode | | | 1.3 | | mA |
| | | | | 70 | 0.8 | 1.5 | uA |
| Power Supply Rejection Ratio | PSRR | | ≤5V, V _{CM} = 0.85V | 70 70 | 90 | | dB |
| Innut Offert Velters | | 2.7V ≤ V ⁺ ≤5V, V _{CM} = 1.85V V _{CM} = 0.85V and V _{CM} = 1.85V | | 70 | 90 | _ | dB |
| Input Offset Voltage | Vos | V _{CM} = 0.85 | v and v _{CM} = 1.85v | | 0.1 | 3 | mV |
| Input Bias Current | I _B | 1 | | 0.0 | 5.5 | V++0.2 | pA V |
| Common-mode Voltage Range | V _{CM} | 0) / 4) / | 0.717 | -0.2 | 7.5 | V*+0.2 | - |
| Common-Mode Rejection Ratio | CMRR | 0V ≤V _{CM} ≤ | 2.7V | 50 | 75 | | dB |
| Large Signal Voltage Gain | Av | Sourcing R_L = 10k Ω , V_O = 1.35V to 2.3V | | 80 | 115 | | dB |
| | | Sinking R_L = 10k Ω , V_O = 0.4V to 1.35V | | 80 | 115 | | dB |
| | | Sourcing $R_L = 600\Omega$, $V_O = 1.35V$ to 2.2V | | 80 | 95 | | dB |
| | | Sinking R _L = 600Ω | Vo= 0.5V to 1.35V | 80 | 95 | | dB |
| Output Voltage | Vo | | $R_{L=}$ 10kΩ to 1.35V, V_{OH} | 2.62 | 2.64 | | V |
| | | V+ = 2.7V | $R_{L=}$ 10k Ω to 1.35V, V_{OL} | | 0.01 | 0.12 | V |
| | | V+ = 5.0V | R_L = 600Ω to 1.35V, V_{OH} | 2.52 | 2.55 | | V |
| | | | R _L = 600Ω to 1.35 V, V _{OL} | | 0.05 | 0.23 | V |
| | | | R _{L=} 10kΩ to 2.5V, V _{OH} | 4.9 | 4.92 | | V |
| | | | $R_{L=}$ 10k Ω to 2.5V, V_{OL} | | 0.01 | 0.12 | V |
| | | | R _L = 600Ω to $2.5V$, V _{OH} | 4.8 | 4.83 | | V |
| | | | $R_{L=}$ 10k Ω to 2.5V, V_{OL} | | 0.0.5 | 0.23 | V |
| Output Voltage in Shutdown | Vo(SD) | 1 | 1 | | 50 | 200 | mV |
| | lsc | \/+ = 2 7\/ | Sourcing V ₀ = 0V Sinking V ₀ = 2.7V | 15 | 60 | | mA |
| Short-Circuit Current | | v - Z.1 V | Sinking V ₀ = 2.7V | 25 | 55 | | mA |
| | | V+ = 5.0V | Sourcing V ₀ = 0V | 20 | 75 | | mA |
| | | v – J.UV | Sinking V ₀ = 5.0V | 25 | 70 | | mA |
| Slew Rate | SR | | | | 4.5 | | V/µs |
| Gain-Bandwidth Product | GBW | | | | 4 | | MHz |
| Phase Margin | ΦМ | | | | 50 | | Deg |
| Input Referred Voltage Noise | en | f = 1kHz | | | 20 | | nV/ √Hz |
| Shutdown Pin Voltage Range | V _{SD} | On Mode | | V+-0.5 | | | V |
| Character in voltage Nange | | Shutdown Mode | | | | 8.0 | V |
| Turn-On Time from Shutdown | T_ON | | | | 2.2 | 4.6 | μs |
| Turn-On Time from Shutdown | · UN | micro SMD | | 6 | | | μs |

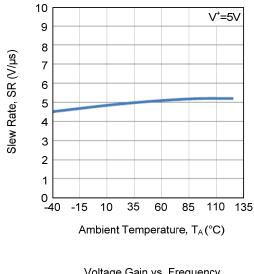
■ TYPICAL APPLICATION CIRCUIT



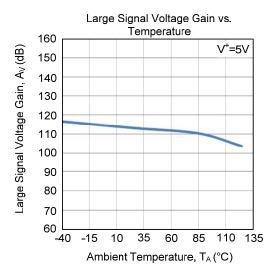
LV712 cmos ic

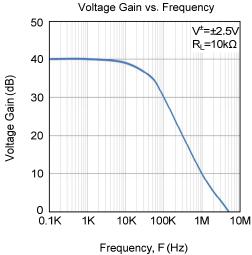
■ TYPICAL CHARACTERISTICS

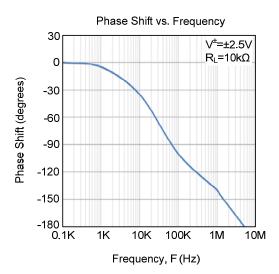




Slew Rate vs. Temperature







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