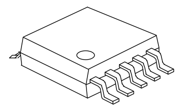
RAIL-TO-RAIL, DUAL RRIO OPERATIONAL WITH INDEPENDENT SHUTDOWN



MSOP-10

■ 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

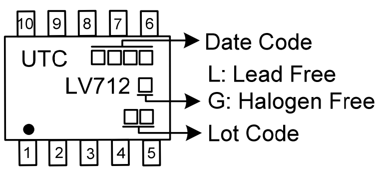
* Supply Voltage: 2.7~5V
* Supply current 1.3mA/ amplifier (Typ.)
* Shutdown Current: 0.8μA (Typ.)
* Input Offset Voltage: 3mV (Max.)
* Rail-to-Rail inputs and outputs
* Slew Rate 4.5V/μs(Typ.)

■ ORDERING INFORMATION

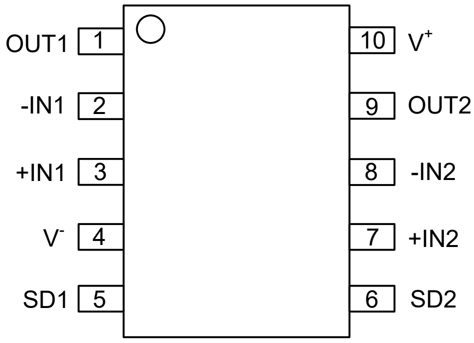
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LV712L-SM2-R	LV712G-SM2-R	MSOP-10	Tape Reel

LV712G-SM2-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) SM2: MSOP-10 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



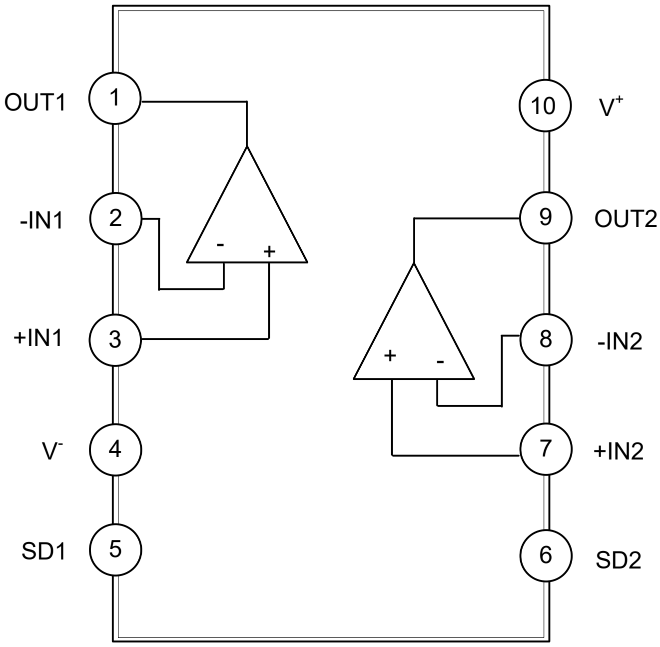
■ PIN CONFIGURATION



■ 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



■ 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		$V^+ - 0.4 \sim V^- + 0.4$	V
Current at Input Pin		±10	mA
Current at Output Pin		±50	mA
Storage Temperature	T_{STG}	-65 ~ +150	°C
Junction Temperature	T_J	+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	θ_{JA}	258	°C/W

■ RECOMMENDED OPWRAING CONDITIONS

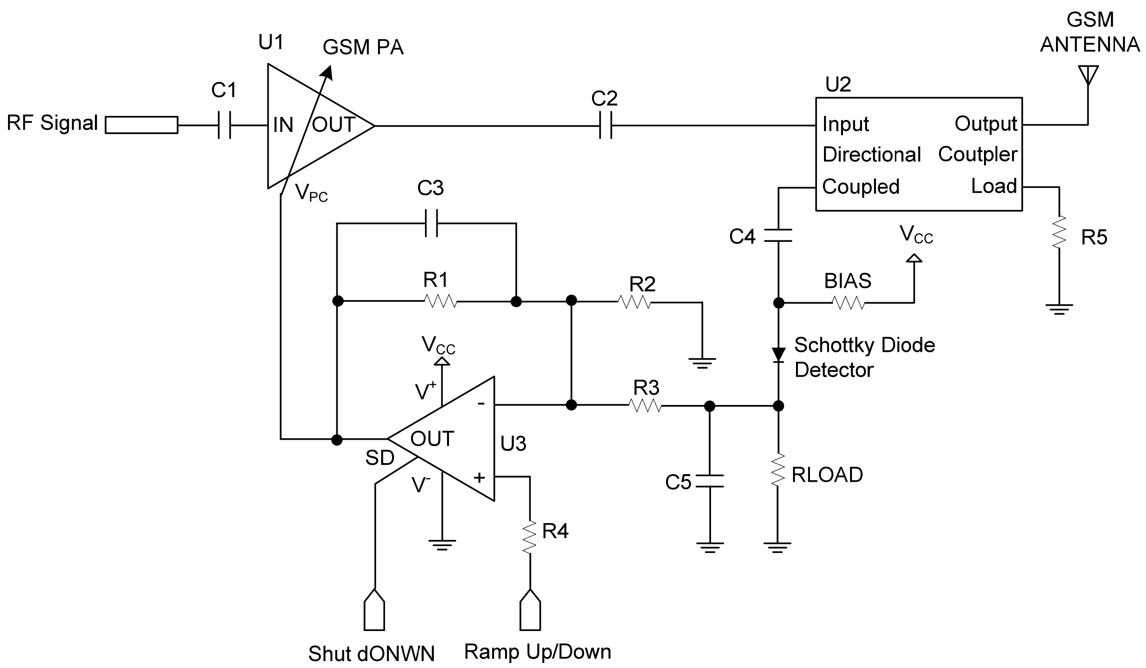
PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	$V^+ - V^-$	2.7 ~ 5.5	V
Operating Free-Air Temperature	T_{OPR}	-40 ~ +125	°C

■ ELECTRICAL CHARACTERISTICS

(V^+ = +2.7 ~ +5.0V, V^- = 0V, V_{CM} = V^+/2 and R_L > 1MΩ, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Supply Current/Amplifier	IQ	On Mode			1.3	1.7	mA
		Shutdown Mode			0.8	1.5	uA
Power Supply Rejection Ratio	PSRR	2.7V ≤ V^+ ≤5V, V_{CM}= 0.85V		70	90		dB
		2.7V ≤ V^+ ≤5V, V_{CM}= 1.85V		70	90		dB
Input Offset Voltage	V_{OS}	V_{CM}= 0.85V and V_{CM}= 1.85V			0.1	3	mV
Input Bias Current	I_B				5.5		pA
Common-mode Voltage Range	V_{CM}			-0.2		V^++0.2	V
Common-Mode Rejection Ratio	CMRR	0V ≤V_{CM} ≤2.7V		50	75		dB
Large Signal Voltage Gain	A_V	Sourcing R_L= 10kΩ, V_O= 1.35V to 2.3V		80	115		dB
		Sinking R_L= 10kΩ, V_O= 0.4V to 1.35V		80	115		dB
		Sourcing R_L= 600Ω, V_O= 1.35V to 2.2V		80	95		dB
		Sinking R_L= 600Ω, V_O= 0.5V to 1.35V		80	95		dB
Output Voltage	V_O	V^+ = 2.7V	R_L= 10kΩ to 1.35V, V_{OH}	2.62	2.64		V
			R_L= 10kΩ to 1.35V, V_{OL}		0.01	0.12	V
			R_L= 600Ω to 1.35V, V_{OH}	2.52	2.55		V
			R_L= 600Ω to 1.35V, V_{OL}		0.05	0.23	V
		V^+ = 5.0V	R_L= 10kΩ to 2.5V, V_{OH}	4.9	4.92		V
			R_L= 10kΩ 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= 10kΩ to 2.5V, V_{OL}		0.0.5	0.23	V
Output Voltage in Shutdown	V_O(SD)				50	200	mV
Short-Circuit Current	I_{SC}	V^+ = 2.7V	Sourcing V_O= 0V	15	60		mA
			Sinking V_O= 2.7V	25	55		mA
		V^+ = 5.0V	Sourcing V_O= 0V	20	75		mA
			Sinking V_O= 5.0V	25	70		mA
Slew Rate	SR				4.5		V/μs
Gain-Bandwidth Product	GBW				4		MHz
Phase Margin	ΦM				50		Deg
Input Referred Voltage Noise	e_n	f = 1kHz			20		nV/$\sqrt{Hz}$
Shutdown Pin Voltage Range	V_{SD}	On Mode		V^+-0.5			V
		Shutdown Mode				0.8	V
Turn-On Time from Shutdown	T_{ON}				2.2	4.6	μs
Turn-On Time from Shutdown		micro SMD		6			μs

■ TYPICAL APPLICATION CIRCUIT



■ TYPICAL CHARACTERISTICS