

SERIAL DATA CONTROL DUAL ELECTRONIC VOLUME

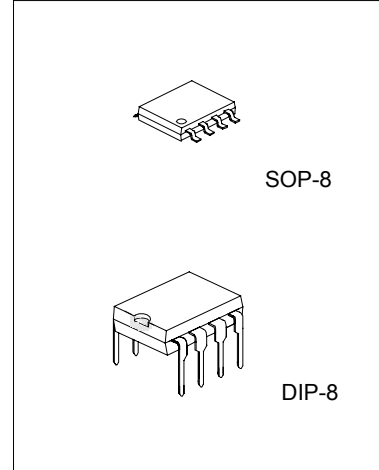
DESCRIPTION

The UTC U2429 is a dual channel electronic volume controlled with 2-wire serial data.

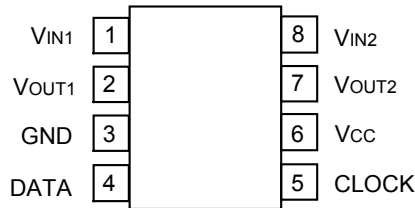
The built-in reference circuit can compose of an electronic volume with less external parts.

FEATURES

- * Built-in reference circuit
- * Control with serial data
Volume 0 ~ -83dB (1dB/step), $-\infty$
(Independent control is allowed in each channel)
- * Low noise and low distortion
VNO = $5\mu\text{Vrms}$ (ATT = $-\infty$)
THD = 0.01% Typ. (V0 = 0.5Vrms)



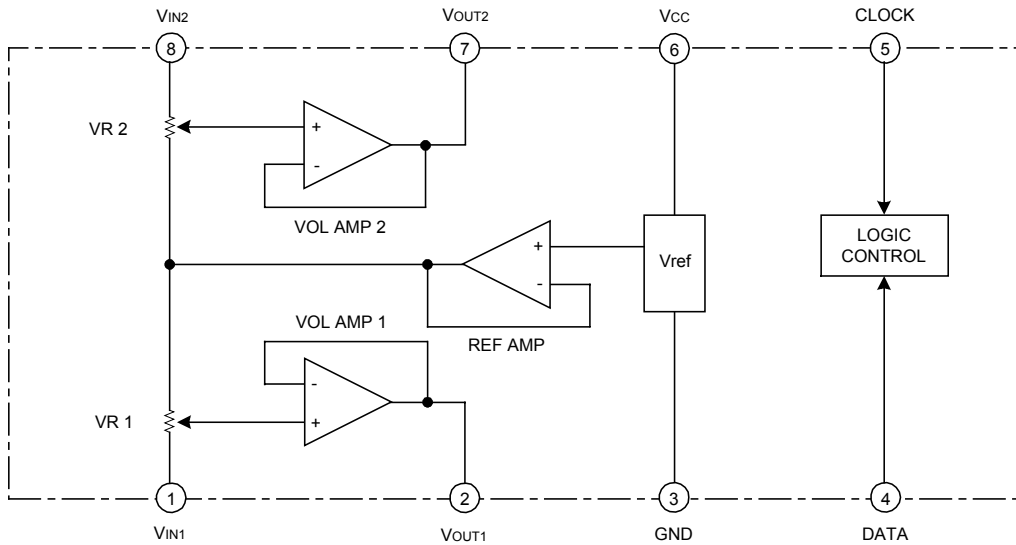
PIN CONFIGURATION



PIN DESCRIPTION

PIN No.	PIN NAME	FUNCTION
1	VIN 1	1-ch input pin
2	VOUT1	1-ch output pin
3	GND	Ground pin
4	DATA	Control data input pin. Inputs data in synchronization with clock.
5	CLOCK	Clock input pin for transferring serial data.
6	VCC	Power supply pin. Stabilize the pin with decoupling capacitor.
7	VOUT2	2-ch output pin
8	VIN2	1-ch input pin

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC} , V _{DD}	6.0	V
Power Dissipation	DIP-8 SOP-8	P _D	625
			440
Operating Temperature	T _{opr}	-20 ~ +75	°C
Storage Temperature	T _{stg}	-55 ~ +125	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply voltage range	V _{CC}	4.5 ~ 5.5	V
Rated supply voltage	V _{CC}	5	V

ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, T_a = 25°C, unless otherwise noted.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Circuit current	I _{CC}			8	16	mA
Maximum attenuation	ATT	ATT=-∞		-90	-80	dB
Attenuation error	ATT	ATT=0	-2.0	0	2.0	dB
Maximum input voltage	V _{IM}	THD=1%, ATT=-6dB	1.5	1.7		V _{rms}
Maximum output voltage	V _{OM}	THD=1%	0.8	1.3		V _{rms}
Output noise voltage	V _{NO1}	ATT=0, R _g =0		4	10	μV _{rms}
	V _{NO2}	ATT=-∞, R _g =0		5	10	μV _{rms}
Total harmonic distortion	THD	f=1kHz, V _o =0.5V _{rms} , ATT=0		0.01	0.05	%
Channel separation	CS	f=1kHz		-80	-70	dB

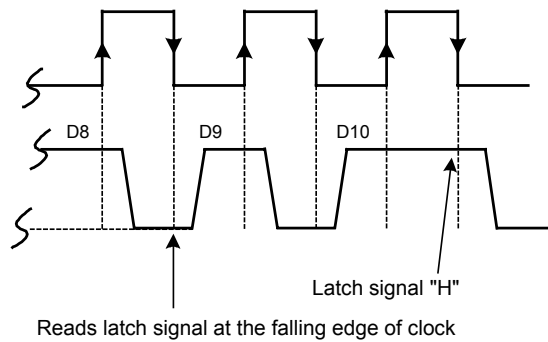
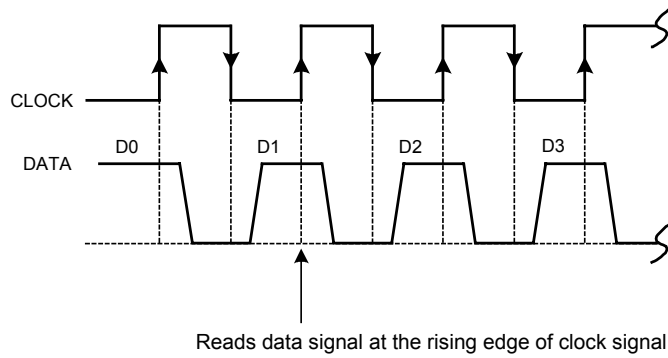
DC CHARACTERISTICS OF DIGITAL BLOCK

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
"L" level input voltage	V_{IL}	Data, clock pin		0	~	$0.2V_{CC}$	V
"H" level input voltage	V_{IH}			$0.8V_{CC}$	~	V_{CC}	V
"L" level input current	I_{IL}	$V_I=0$	Data, clock pin	-10		10	μA
"H" level input current	I_{IH}	$V_I=5V$				10	μA

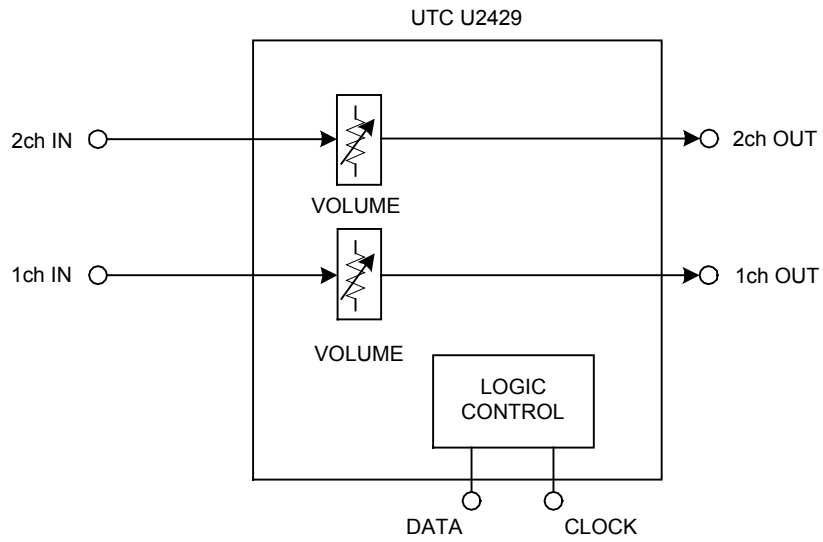
AC CHARACTERISTICS OF DIGITAL BLOCK

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Cycle time of clock	t_{cr}	$V_{DD}=5V$	4			μS
Pulse width of clock ("H" level)	t_{WHC}	$V_{DD}=5V$	1.6			μS
Pulse width of clock ("L" level)	t_{WLc}	$V_{DD}=5V$	1.6			μS
Clock rising time	t_r	$V_{DD}=5V$			0.4	μS
Clock falling time	t_f	$V_{DD}=5V$			0.4	μS
Data setup time	t_{SD}	$V_{DD}=5V$	0.8			μS
Data hold time	t_{HD}	$V_{DD}=5V$	0.8			μS

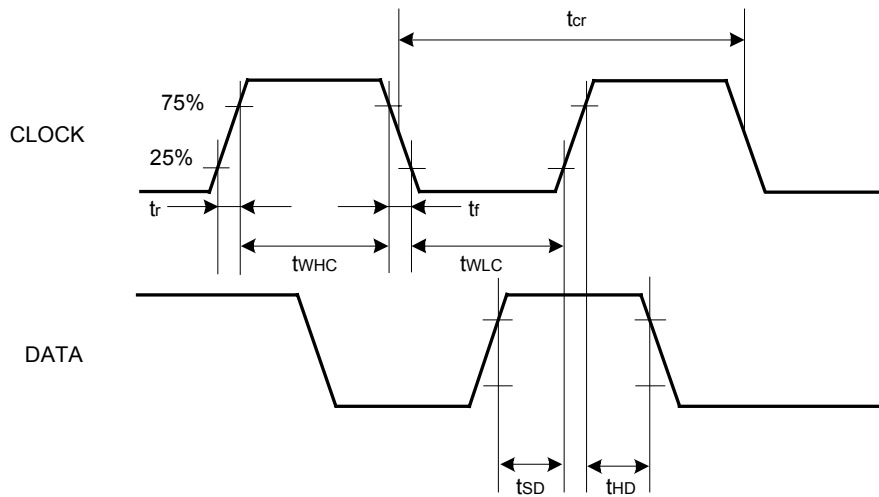
RELATIONSHIP BETWEEN DATA AND CLOCK



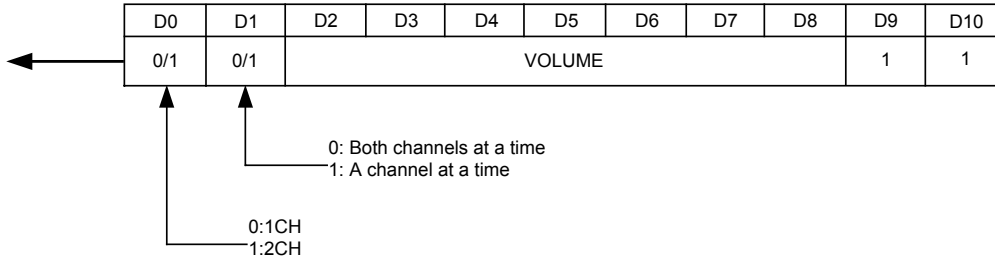
SYSTEM CONFIGURATION



CLOCK AND DATA TIMING



DATA INPUT FORMAT



VOLUME CODE

ATT1	D2	D3	D4	D5	D6
0dB	H	L	H	L	H
-4dB	L	L	H	L	H
-8dB	H	H	L	L	H
-12dB	L	H	L	L	H
-16dB	H	L	L	L	H
-20dB	L	L	L	L	H
-24dB	H	H	H	H	L
-28dB	L	H	H	H	L
-32dB	H	L	H	H	L
-36dB	L	L	H	H	L
-40dB	H	H	L	H	L
-44dB	L	H	L	H	L
-48dB	H	L	L	H	L
-52dB	L	L	L	H	L
-56dB	H	H	H	L	L
-60dB	L	H	H	L	L
-64dB	H	L	H	L	L
-68dB	L	L	H	L	L
-72dB	H	H	L	L	L
-76dB	L	H	L	L	L
-80dB	H	L	L	L	L
	L	L	L	L	L

ATT2	D7	D8
0dB	H	H
-1dB	L	H
-2dB	H	L
-3dB	L	L

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