



No. 1890

LC7520

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C MOS IC
**GRAPHIC EQUALIZER VOLUME CONTROLLER
 FOR HOME STEREO, MUSIC CENTER USE**

The 3-chip configuration consisting of the LC7520, a controller (LC7060 or general-purpose microcomputer LC6502), and a display LSI (LC7560 LCD, LC7565 FLT, LED) provides an electronic graphic equalizer system having the following features.

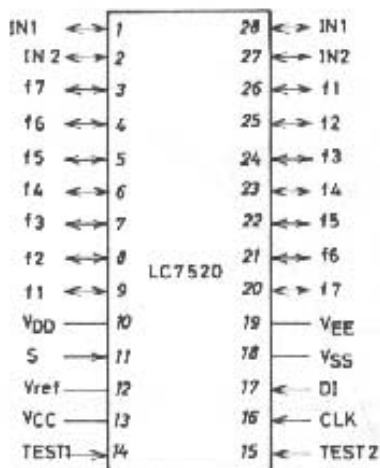
Functions

- . On-chip electronic volume control for graphic equalizer with 7 bands each of right/left.
- . 2dB/step variable in each band.
- . Maximum boost of +10dB, maximum cut of -10dB, and 11 positions in each band.
- . Setting can be made separately for right/left band.
- . Band setting is made by serial data input. There are 2 control lines.
- . Wide dynamic range.
- . CMOS LSI of 40V breakdown voltage.

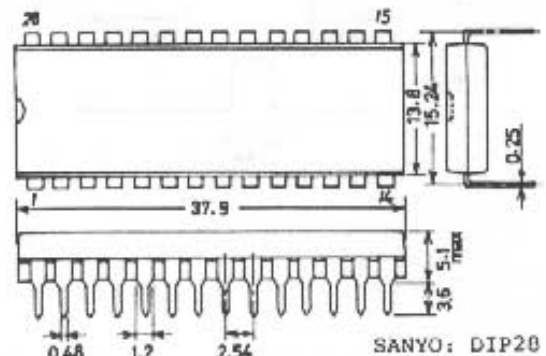
Features

- . The gain in each band can be increased/decreased with one touch.
- . Since the preset memory contents can be called with one touch, your desired frequency characteristic to the music can be selected.
 (Example) User option 2 modes + Maker option 3 modes + Last channel memory
- . '0dB in each band (flat function)', 'The frequency characteristic in each band is reversed with respect to 0dB (reverse function).' - These functions can be software-controlled with one touch.
- . Spectrum analyzing display facilitates recording equalization.
- . Since 2 control lines can be also used for a display LSI, wiring between microcomputer and LSI is facilitated.

Pin Assignment



Case Outline 3012A-D28IC
 (unit:mm)



Absolute Maximum Ratings at Ta=25°C, V_{SS}=0V

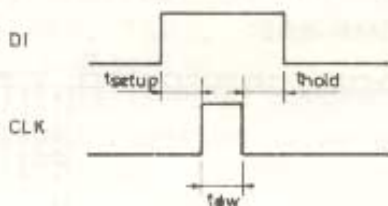
				unit	
Maximum Supply Voltage	V _{DD} max	V _{DD}	V _{EE} ≤ V _{SS}	V _{DD} -V _{EE} ≤ 40	V
	V _{EE} max	V _{EE}	V _{EE} ≤ V _{SS}	V _{DD} -V _{EE} ≤ 40	V
	V _{ref}	V _{ref}	V _{SS} ≤ V _{ref}	V _{DD} -V _{ref} ≤ 11	V
	V _{CC} max	V _{CC}		V _{SS} to V _{SS} +7	V
Maximum Input Voltage	V _{I1} max	CLK, DI		V _{SS} -0.3 to V _{CC} +0.3	V
	V _{I2} max	f1 to f7, IN1,2		V _{EE} -0.3 to V _{DD} +0.3	V
	V _{I3} max	S, TEST1,2		V _{ref} -0.3 to V _{DD} +0.3	V
Allowable Power Dissipation	Pdmax	Ta ≤ 75°C		150	mW
Operating Temperature	Topg			-30 to +75	°C
Storage Temperature	Tstg			-40 to +125	°C

Allowable Operating Conditions at Ta=25°C, V_{SS}=0V

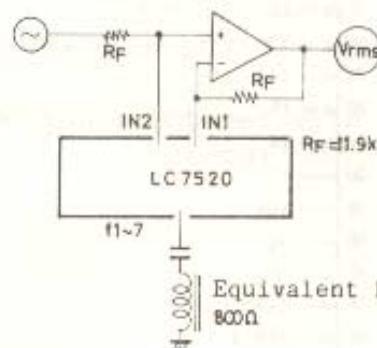
				unit	
Supply Voltage	V _{DD}	V _{DD}	V _{EE} ≤ V _{SS}	8 ≤ V _{DD} -V _{EE} ≤ 37	V
	V _{EE}	V _{EE}	V _{CC} ≤ V _{DD}		
	V _{ref}	V _{ref}	V _{DD} -V _{ref} ≤ 10	0 to V _{DD} -4.5	V
	V _{CC}	V _{CC}		4.5 to (5.0typ) to 5.5	V
Input "H"-Level Voltage	V _{IH1}	CLK, DI		0.8V _{CC} to V _{CC}	V
	V _{IH2}	S		V _{ref} +0.9(V _{DD} -V _{ref}) to V _{DD}	V
Input "L"-Level Voltage	V _{IL1}	CLK, DI		V _{SS} to 0.2V _{CC}	V
	V _{IL2}	S		V _{ref} to V _{ref} +0.1(V _{DD} -V _{ref})	V
Input Pulse Width	t _{pw}	CLK		1 min.	us
Setup Time	t _{setup}	DI		1 min.	us
Hold Time	t _{hold}	DI		1 min.	us

Electrical Characteristics at Ta=25°C, V_{SS}=0V

			min	typ	max	unit	
Total Harmonic Distortion THD1	IN1,2:All bands flat,	f=20kHz, output 1V			0.005	%	
			THD2	IN1,2:Boost, f=20kHz, Output 1V	0.05	%	
Crosstalk	CT	f=1kHz	60			dB	
Setting Error	ΔB	Other band flat	±10dB	±9	±10 ±11.5	dB	
			Test Circuit 1	±8dB	±6.6	±7.6 ±9.0	dB
			(No reversion occurs.)	±6dB	±4.9	±5.9 ±7.2	dB
				±4dB	±3.0	±3.8 ±4.9	dB
			±2dB	±1.0	±1.9 ±3.0	dB	
Analog SW OFF Leak	I _{OFF}	IN1, IN2, f1-f7			10	uA	
Pull-down Resistance	R _{PD}	S : V _{DD} =13V, S		100		kohm	
Current Dissipation	I _{DD}				1	mA	
	I _{CC}				0.5	mA	



Test Circuit 1



Equivalent LC resonance impedance 800Ω