

PRELIMINARY
 Notice ; This is not a final specification.
 some parametric limits are subject to change.

MITSUBISHI SOUND PROCESSORS

M62419FP

SOUND CONTROLLER FOR CAR STEREO

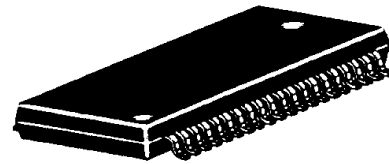
FEATURES

- 4-channel source selector with gain setting buffer amplifier by the external resistances
- Volume (balance),loudness,tone (bass and treble) and fader control by serial data from MCU
- Input maximum voltage level ; 2.8Vrms

APPLICATION

Car audio , Mini stereo,etc

PACKAGE

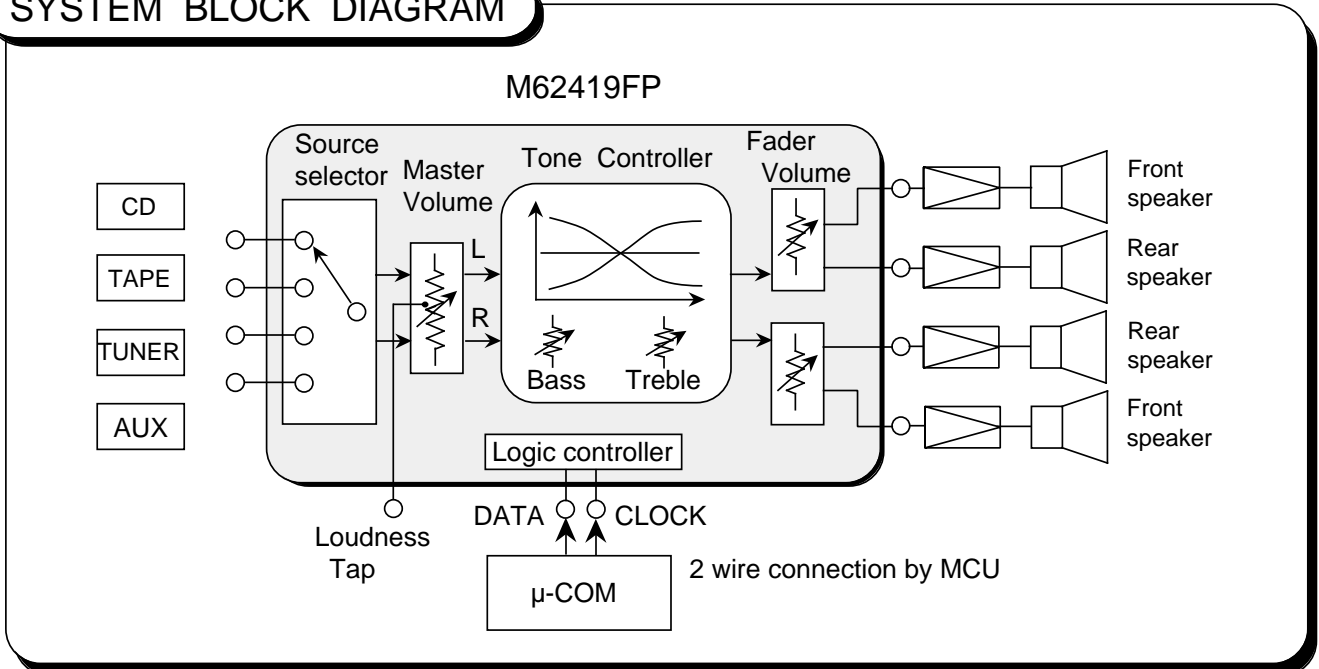


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RECOMMENED OPERATING CONDITIONS

Supply voltage range.....Vcc=6~9V Rated voltage.....Vcc=8V
 Vdd=4~6V Vdd=5V

SYSTEM BLOCK DIAGRAM



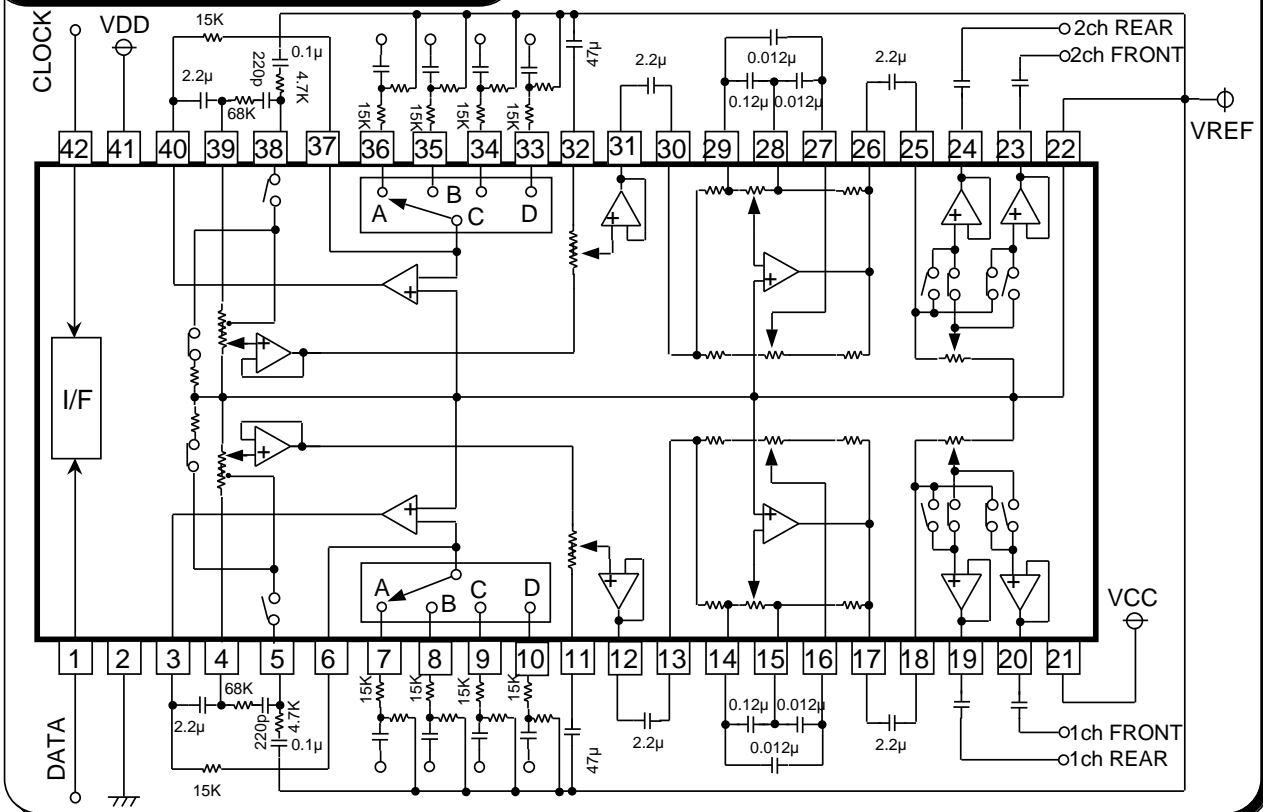
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
Vcc,Vdd	Supply voltage		10 , 7	V
Pd	Power dissipation		990	mW
Topr	Operating temperature		-30~+85	°C
Tstg	Storage temperature		-40~+125	°C

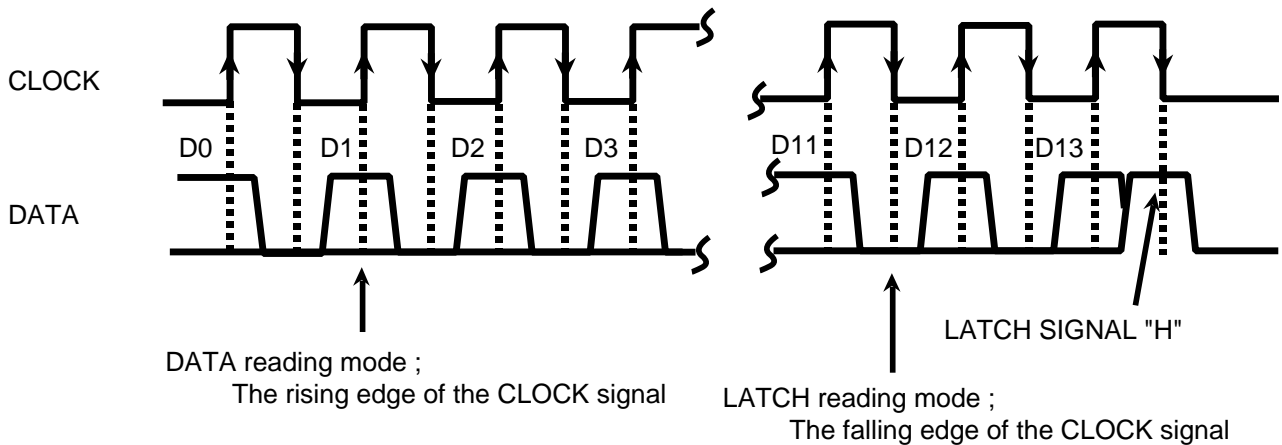
ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Limits			Unit
			Min	typ	Max	
Icc	Circuit current			22	40	mA
A _{TT} (VOL)	Att maximum	A _{TT} (VOL) = -	—	-90	-80	dB
A _{TT} (VOL)	Att error	A _{TT} (VOL) = 0	-2.0	0	2.0	dB
V _{IM}	Maximum input voltage	THD=1%	2.0	2.8	—	Vrms
G(Bass)B	Bass boost	f=100Hz	9	12	15	dB
G(Bass)C	Bass cut	f=100Hz	-15	-12	-9	dB
G(Tre)B	Treble boost	f=10KHz	9	12	15	dB
G(Tre)C	Treble cut	f=10KHz	-15	-12	-9	dB
A _{TT} (FED)	Att maximum	A _{TT} (FED) = -	—	-80	-74	dB
V _{OM}	Maximum output voltage	THD=1%	1.8	2.2	—	Vrms
V _{NO 1}	Output noise voltage	A _{TT} (VOL)=0,A _{TT} (FED)=0 Rg=0,DIN-AUDIO	—	9	18	μVrms
V _{NO 2}		A _{TT} (VOL)= ,A _{TT} (FED)= Rg=0,DIN-AUDIO	—	5.5	11	
THD	Total harmonic distortion	f=1KHz,Vo=0.5Vrms,Loud= OFF,A _{TT} (VOL)=0,A _{TT} (FED)=0	—	0.003	0.05	%
CS	Channel separation	f=1KHz	—	-90	-80	dB

APPLICATION EXAMPLE



RELATIONSHIP BETWEEN DATA AND CLOCK



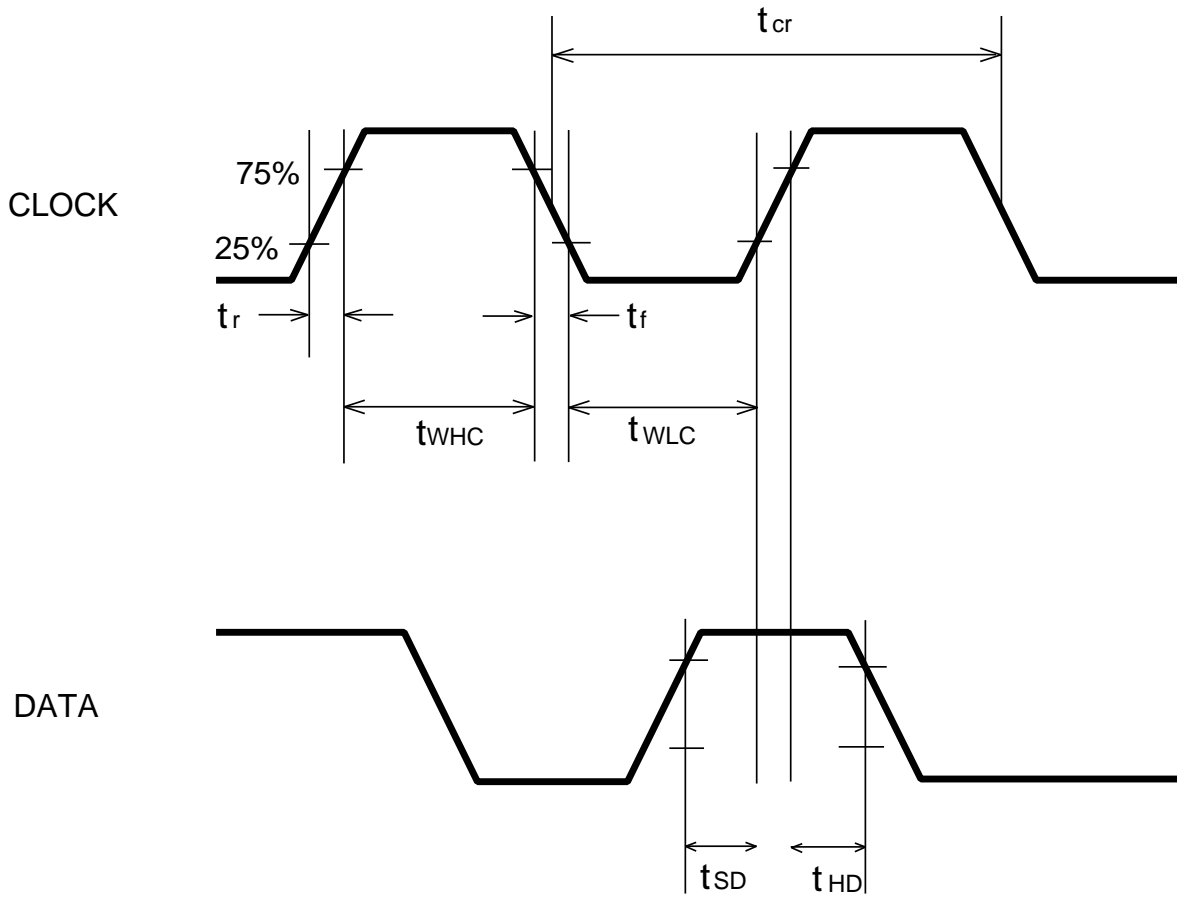
DIGITAL CIRCUIT DC CHARACTERISTICS

Symbol	Parameter	Test conditions	Limits			Unit	
			Min	typ	Max		
V_{IL}	"L" level input voltage	DATA,CLOCK pins	0	~	$0.2V_{DD}$	V	
V_{IH}	"H" level input voltage		$0.8V_{DD}$	~	V_{DD}		
I_{IL}	"L" level input current	$V_I=0$	DATA,CLOCK pins	-10	-	10	μA
I_{IH}	"H" level input current	$V_I=V_{DD}$		-	-	10	

DIGITAL CIRCUIT AC CHARACTERISTICS

Symbol	Parameter	Limits			Unit
		Min	typ	Max	
t_{cr}	CLOCK Cycle time	4	-	-	μS
t_{WHC}	CLOCK pulse width("H" level)	1.6	-	-	
t_{WLC}	CLOCK pulse width("L" level)	1.6	-	-	
t_r	CLOCK rise time	-	-	0.4	
t_f	CLOCK fall time	-	-	0.4	
t_{SD}	DATA setup time	0.8	-	-	
t_{HD}	DATA hold time	0.8	-	-	

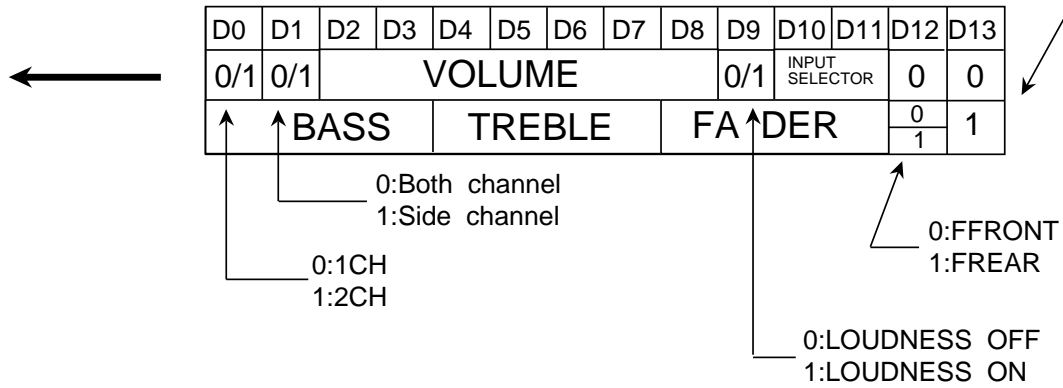
CLOCK DATA TIMING



DATA FORMAT

DATA SELECT

0:VOLUME / LOUDNESS / INPUT SELECTOR
 1:BASS / TREBLE / FADER



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

TONE CODE

BASS	D0	D1	D2	D3
TREBLE	D4	D5	D6	D7
12dB	H	H	H	H
10dB	L	H	H	H
8dB	H	L	H	H
6dB	L	L	H	H
4dB	H	H	L	H
2dB	L	H	L	H
0dB	H	L	L	H
-2dB	L	L	L	H
-4dB	H	H	H	L
-6dB	L	H	H	L
-8dB	H	L	H	L
-10dB	L	L	H	L
-12dB	H	H	L	L

FADER CODE

FADER	D8	D9	D10	D11
0dB	H	H	H	H
-1dB	L	H	H	H
-2dB	H	L	H	H
-3dB	L	L	H	H
-4dB	H	H	L	H
-6dB	L	H	L	H
-8dB	H	L	L	H
-10dB	L	L	L	H
-12dB	H	H	H	L
-14dB	L	H	H	L
-16dB	H	L	H	L
-20dB	L	L	H	L
-30dB	H	H	L	L
-45dB	L	H	L	L
-60dB	H	L	L	L
-	L	L	L	L

INPUT SELECTOR CODE

INPUT SELECTOR	D10	D11
A CH	H	H
B CH	L	H
C CH	H	L
D CH	L	L