

# M62419FP

## Sound Controller for Car Stereo

REJ03F0207-0200  
 Rev.2.00  
 Sep 14, 2006

### 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; 2.8 Vrms

### Application

Car audio, Mini stereo, etc

### Recommended Operating Conditions

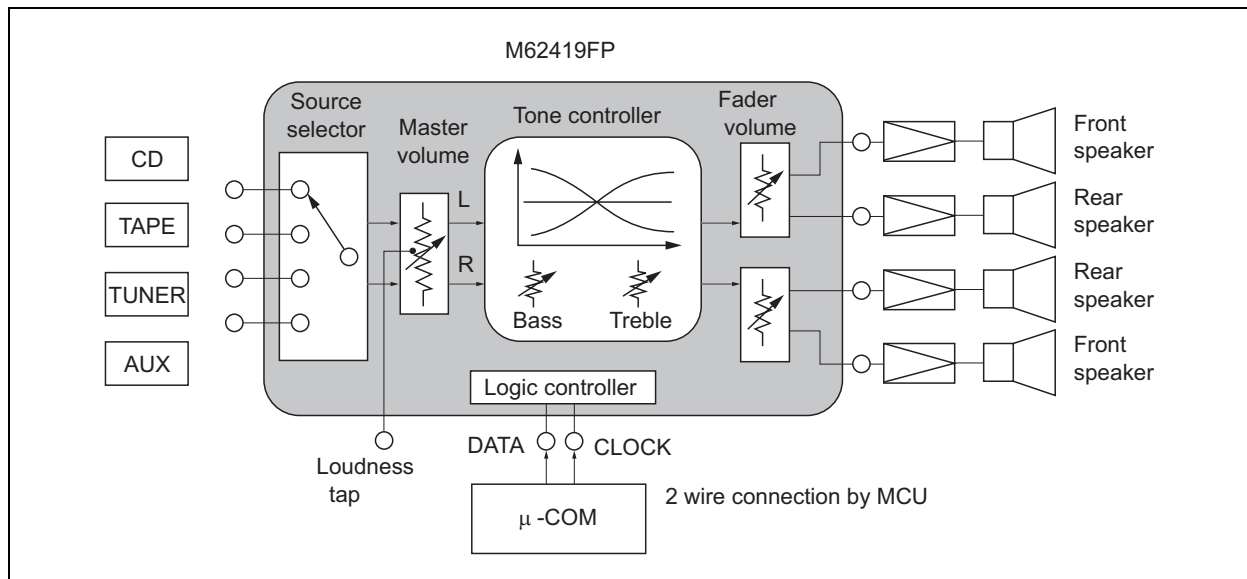
Supply voltage range:  $V_{CC} = 6$  to  $9$  V

$V_{DD} = 4$  to  $6$  V

Rated supply voltage:  $V_{CC} = 8$  V

$V_{DD} = 5$  V

### System Block Diagram



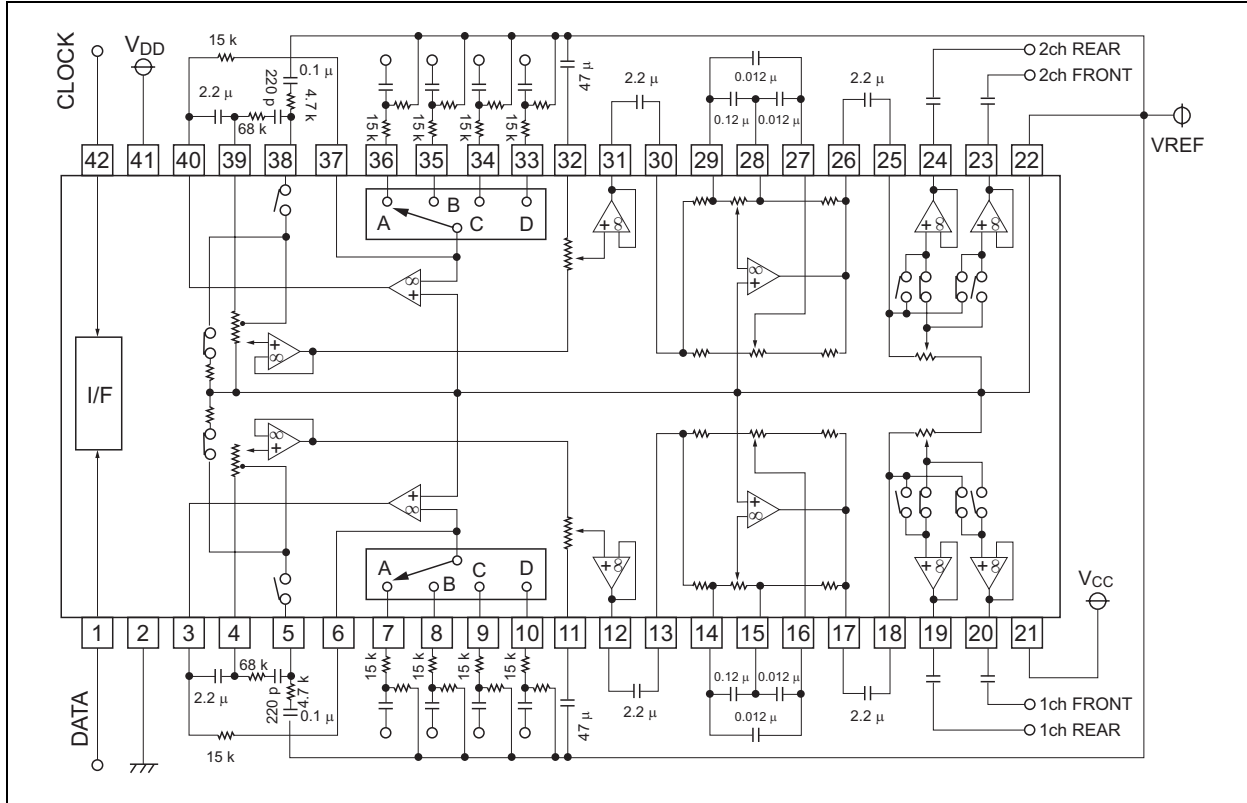
## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	$V_{CC}, V_{DD}$	10, 7	V
Power dissipation	$P_d$	990	mW
Operating temperature	$T_{opr}$	-30 to +85	°C
Storage temperature	$T_{stg}$	-40 to +125	°C

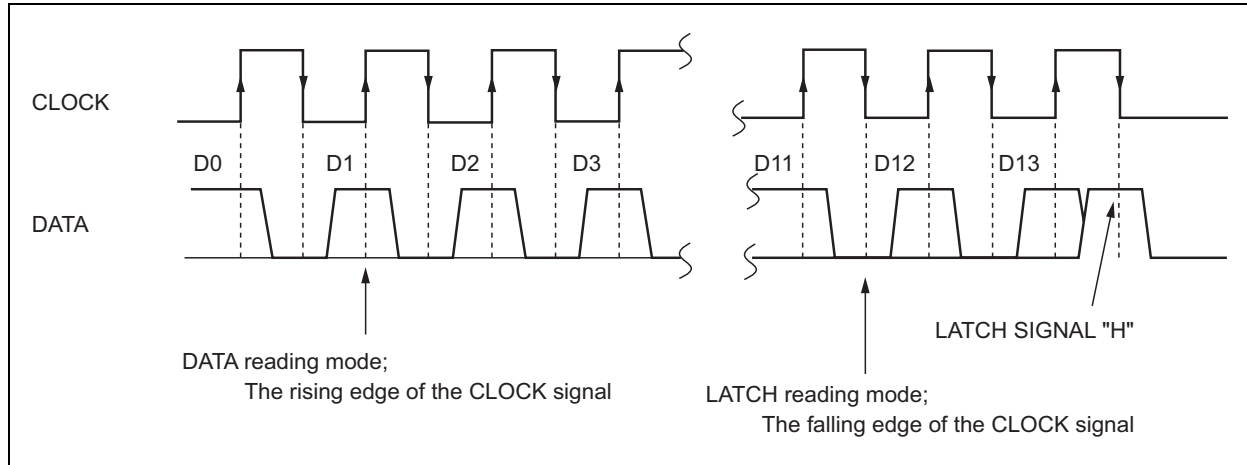
## Electrical Characteristics

Item	Symbol	Limits			Unit	Conditions
		Min	Typ	Max		
Circuit current	$I_{CC}$	—	22	40	mA	
Att maximum	$A_{TT} (VOL)$	—	-90	-80	dB	$A_{TT} (VOL) = -\infty$
Att error	$\Delta A_{TT} (VOL)$	-2.0	0	2.0	dB	$A_{TT} (VOL) = 0$
Maximum input voltage	$V_{IM}$	2.0	2.8	—	V <sub>rms</sub>	THD = 1 %
Bass boost	G (Bass) B	9	12	15	dB	f = 100 Hz
Bass cut	G (Bass) C	-15	-12	-9	dB	f = 100 Hz
Treble boost	G (Tre) B	9	12	15	dB	f = 10 kHz
Treble cut	G (Tre) C	-15	-12	-9	dB	f = 10 kHz
Att maximum	$A_{TT} (FED)$	—	-80	-74	dB	$A_{TT} (FED) = -\infty$
Maximum output voltage	$V_{OM}$	1.8	2.2	—	V <sub>rms</sub>	THD = 1 %
Output noise voltage	$V_{No1}$	—	9	18	$\mu V_{rms}$	$A_{TT} (VOL) = 0, A_{TT} (FED) = 0$ Rg = 0, DIN-AUDIO
	$V_{No2}$	—	5.5	11		$A_{TT} (VOL) = -\infty, A_{TT} (FED) = -\infty$ Rg = 0, DIN-AUDIO
Total harmonic distortion	THD	—	0.003	0.05	%	f = 1 kHz, $V_o = 0.5 V_{rms}$ , Loud = OFF, $A_{TT} (VOL) = 0, A_{TT} (FED) = 0$
Channel separation	CS	—	-90	-80	dB	f = 1 kHz

Application Example



## Relationship between Data and Clock



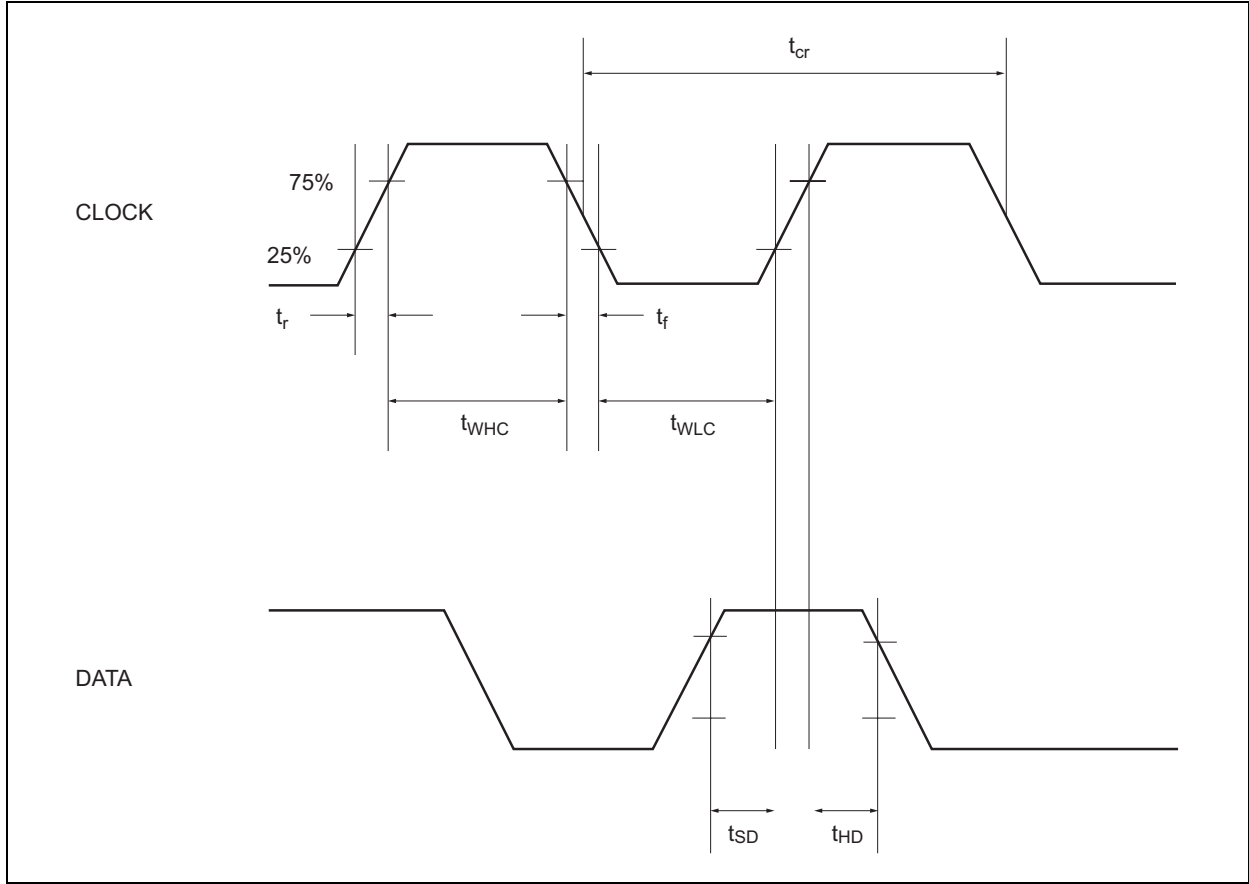
## Digital Circuit DC Characteristics

Item	Symbol	Limits			Unit	Test Conditions	
		Min	Typ	Max			
"L" level input voltage	$V_{IL}$	0	~	$0.2 V_{DD}$	V	DATA, CLOCK pins	
"H" level input voltage	$V_{IH}$	$0.8 V_{DD}$	~	$V_{DD}$			
"L" level input current	$I_{IL}$	-10	—	10	$\mu A$	DATA, CLOCK pins	
"H" level input current	$I_{IH}$	—	—	10			

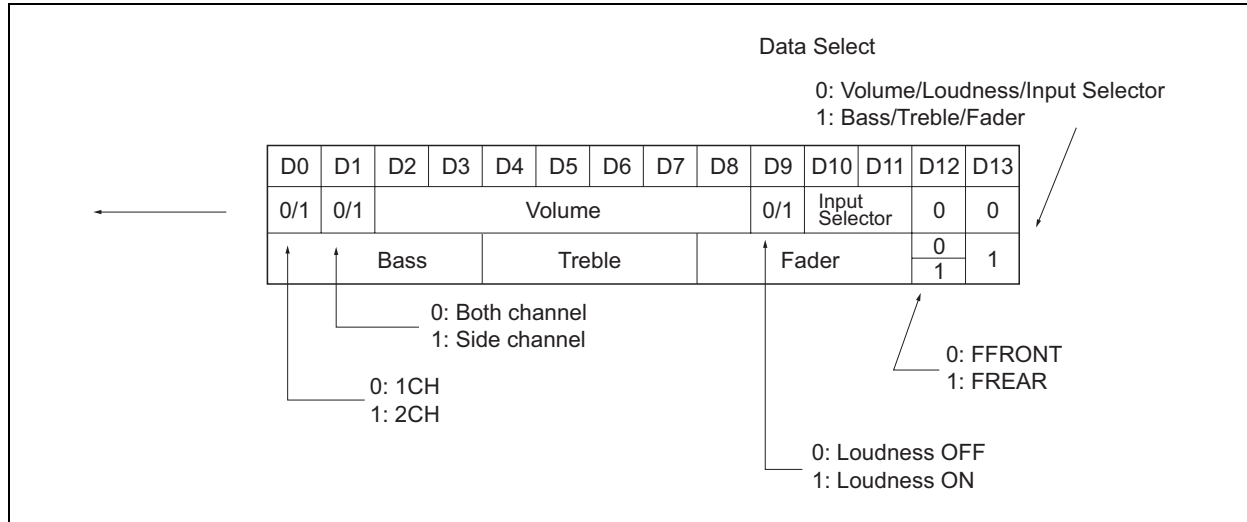
## Digital Circuit AC Characteristics

Item	Symbol	Limits			Unit
		Min	Typ	Max	
CLOCK cycle time	$t_{cr}$	4	—	—	$\mu S$
CLOCK pulse width ("H" level)	$t_{WHC}$	1.6	—	—	
CLOCK pulse width ("L" level)	$t_{WLC}$	1.6	—	—	
CLOCK rise time	$t_r$	—	—	0.4	
CLOCK fall time	$t_f$	—	—	0.4	
DATA setup time	$t_{SD}$	0.8	—	—	
DATA hold time	$t_{HD}$	0.8	—	—	

### Clock Data Timing



## Data Format



## Volume Code

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

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

### Tone Code

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

### Fader Code

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

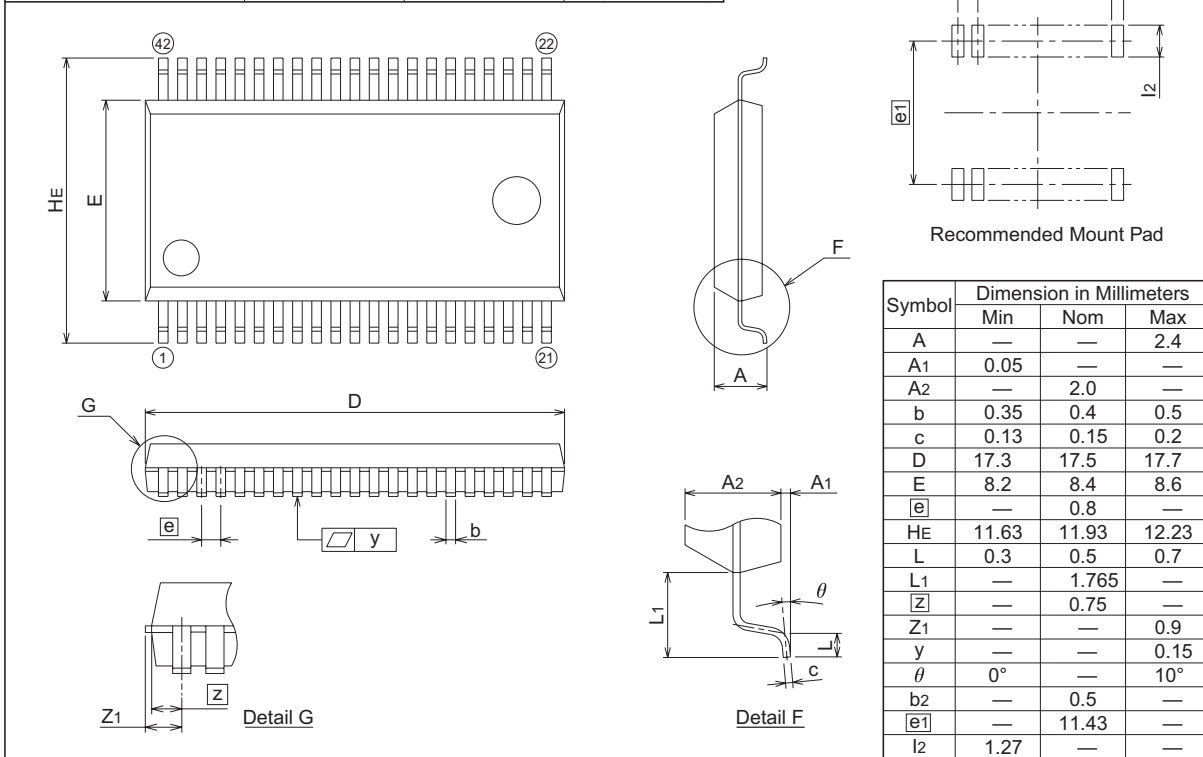
Package Dimensions

42P2R-A

(MMP)

Plastic 42pin 450mil SSOP

EIAJ Package Code	JEDEC Code	Weight(g)	Lead Material
SSOP42-P-450-0.80	—	0.63	Alloy 42/Cu Alloy





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