

# M62415P/FP

## 2CH 4 MODE PRESET EQUALIZER

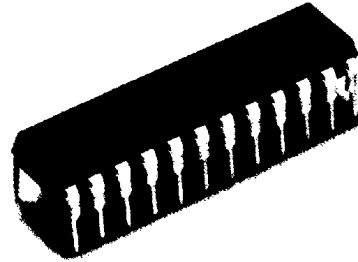
### DESCRIPTION

The M62415 is preset equalizer IC's developed for stereo set, radio cassette, and audio equipment.

Output character of 4 modes, "Normal, Rock, Pops and Classic". The selection one can be choiced via 4 control terminals.

### FEATURES

- Sound controller of preset typ for 3-element graphic equalizer.
- It can be controlled by 4-easy control switches.
- Equiped with output ports for drive in LED.
- These function housed in 24-pin dual inline package (300mil DIP)
- Low noise  $V_{no} (flot) = 4.5\mu V_{rms} (typ)$
- Low distortion  $THD = 0.005\% (typ)$



Outline 24P4D(P)

2.54mm pitch 300mil DIP  
(6.3mm×29.2mm×3.3mm)

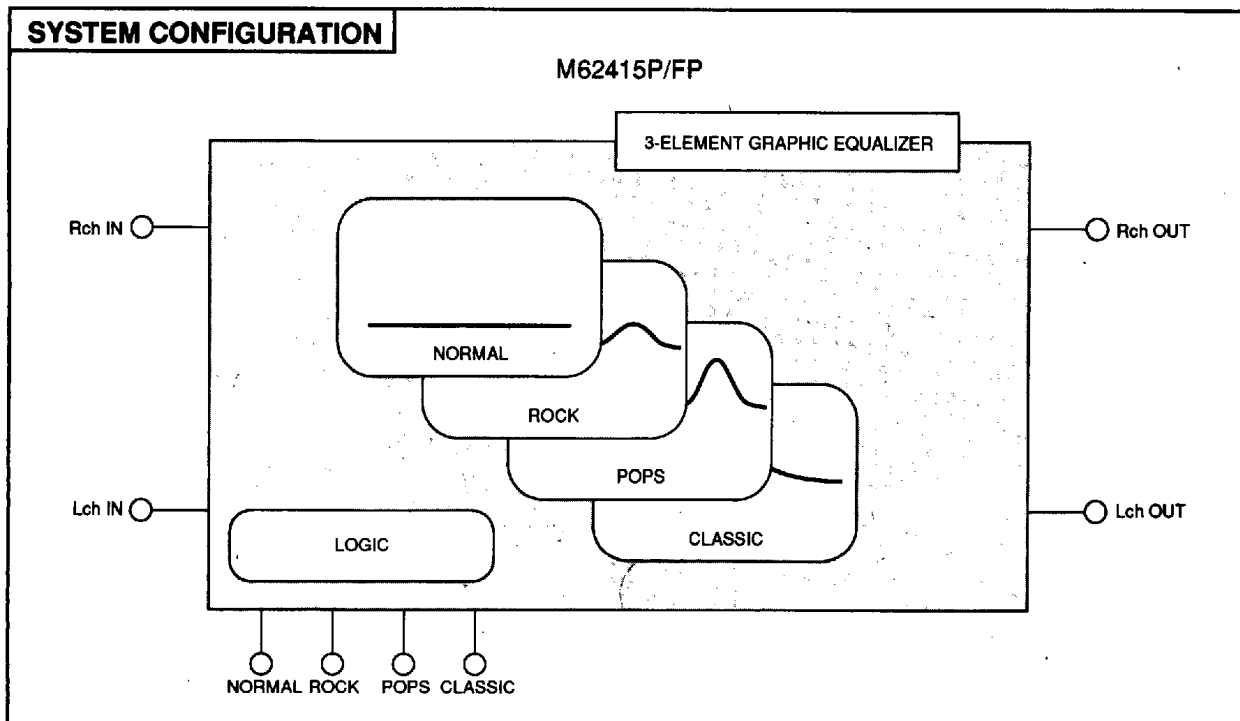


Outline 24P2Q-A(FP)

0.8mm pitch 300mil SSOP  
(5.3mm×10.1mm×1.8mm)

### RECOMMENDED OPERATING CONDITIONS

Supply voltage range .....  $V_{cc} = 6.0$  to  $13.0$  V  
Rated supply voltage .....  $V_{cc} = 9.0$  V



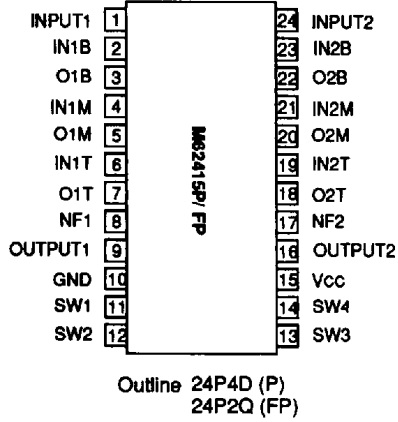
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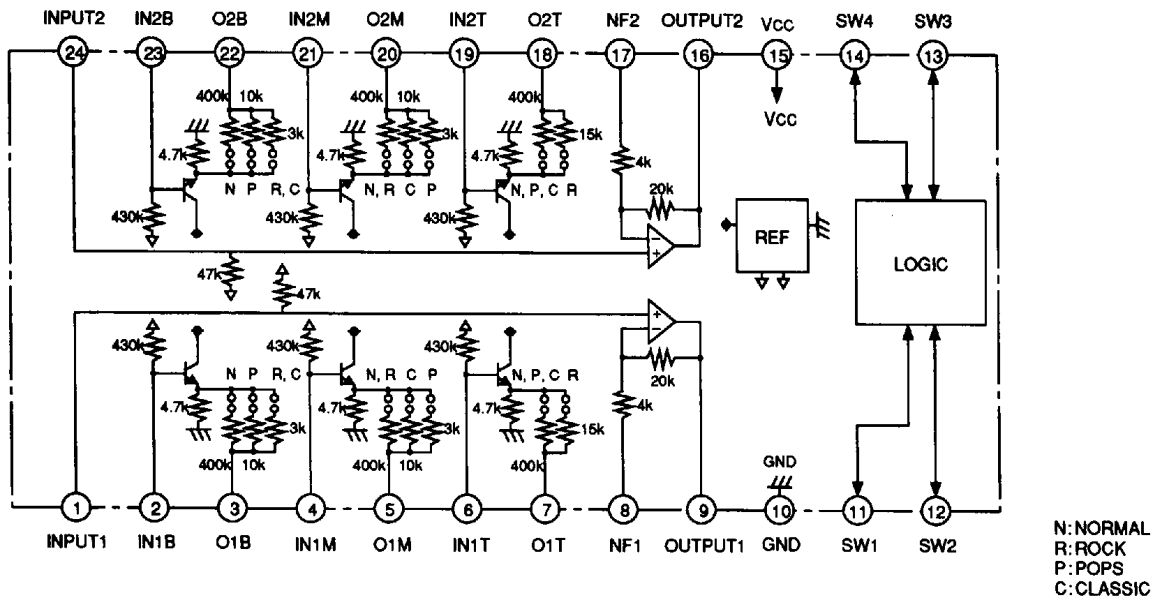
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### PIN CONFIGURATION (TOP VIEW)



### IC INTERNAL BLOCK DIAGRAM



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**ABSOLUTE MAXIMUM RATINGS** (Ta = 25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Unit
Vcc	Supply voltage	14	V
Kθ	Thermal derating Ta ≥ 25°C	11.5	mW/°C
Pd	Power dissipation	1150	mW
Topr	Operage temperature range	-20 to +75	°C
Tstg	Storage temperature	-40 to +125	°C

**ELECTRICAL CHARACTERISTICS** (Vcc = 9 V, Ta = 25°C, unless otherwise noted)

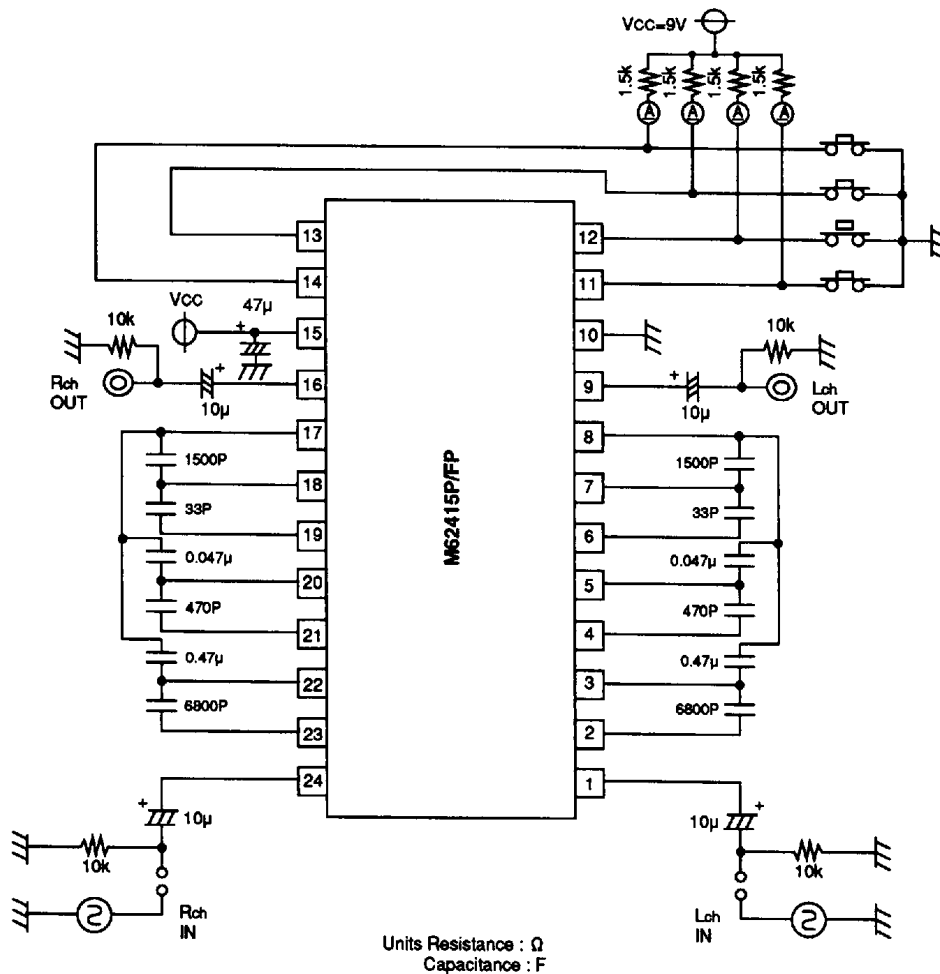
Symbol	Parameter		Test conditions	Limits			Unit
				Min	Typ	Max	
IDD	Circuit current		Vcc = 9V	14	23	32	mA
G(Normal)B	Normal	BASS	f = 80Hz	-2	1	4	dB
G(Normal)M		MID	f = 1kHz	-2	1	4	dB
G(Normal)T		TREBLE	f = 10kHz	-2	1	4	dB
G(ROCK)B	ROCK	BASS	f = 80Hz	8	11	14	dB
G(ROCK)M		MID	f = 1kHz	-1	2	5	dB
G(ROCK)T		TREBLE	f = 10kHz	3	6	9	dB
G(POPS)B	POPS	BASS	f = 80Hz	3	6	9	dB
G(POPS)M		MID	f = 1kHz	8	11	14	dB
G(POPS)T		TREBLE	f = 10kHz	0	3	6	dB
G(CLASSIC)B	CLASSIC	BASS	f = 80Hz	8	11	14	dB
G(CLASSIC)M		MID	f = 1kHz	4	7	10	dB
G(CLASSIC)T		TREBLE	f = 10kHz	-1	2	5	dB
VOM	Maximum output voltage		THD = 1%, f = 1kHz, Normal mode	2	2.5	-	Vrms
THD	Total harmonic distortion		f = 1kHz, Vo = 0.5Vrms Normal mode	-	0.005	0.05	%
VNO	Output noise voltage		Rg = 10kΩ, BW : 1HF-A Normal mode	-	4.5	10.0	μVrms
CSep	Channel separation		f = 1kHz, Rg = 10kΩ, Normal mode BW : DIN AUDIO	-	-80	-65	dB
ILED	Maximum LED drive current		Seted switches, Rp = 1.5kΩ	4.5	5.6	-	mA

Note. These are forbid that switches operate at the same time.

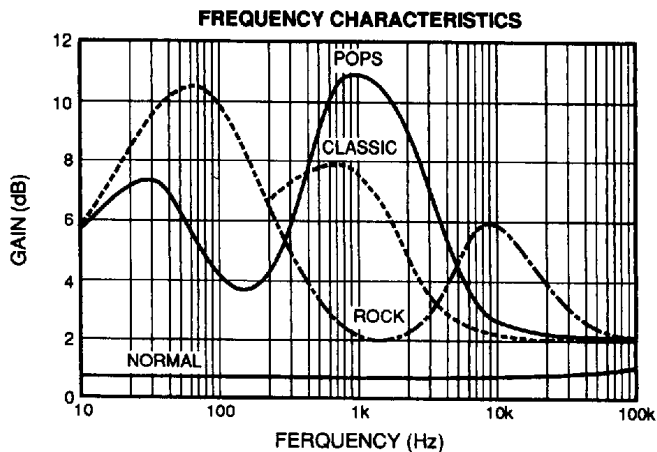
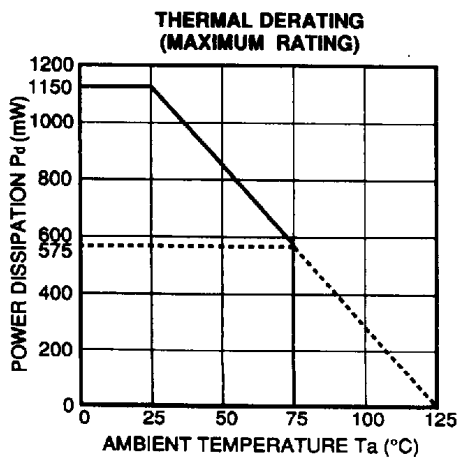
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### TEST CIRCUIT



### TYPICAL CHARACTERISTICS

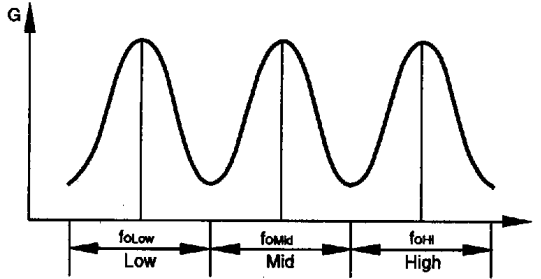


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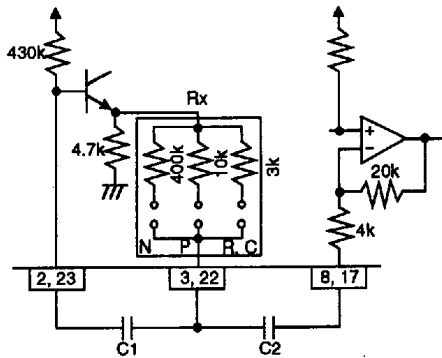
APPLICATION NOTE

Frequency characteristics



N: NORMAL  
 R: ROCK  
 C: CLASSIC  
 P: POPS

(1) Low band

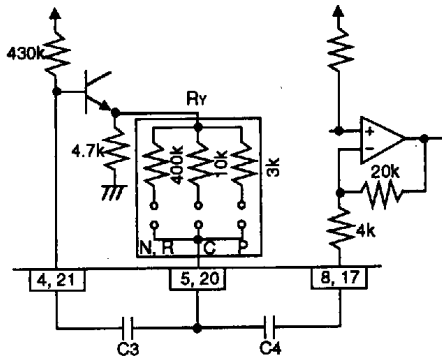


$$f_{0Low} = \frac{1}{2\pi\sqrt{C1 \cdot C2 \cdot Rx \cdot 430k}} \text{ [Hz]}$$

$$Q_{Low} = \sqrt{\frac{C1 \cdot Rx \cdot 430k}{C2 (Rx + 4k)^2}}$$

$$G_{Rock} = 20 \log \frac{20k + 4k + Rx}{4k + Rx} \text{ [dB]}$$

(2) Mid band

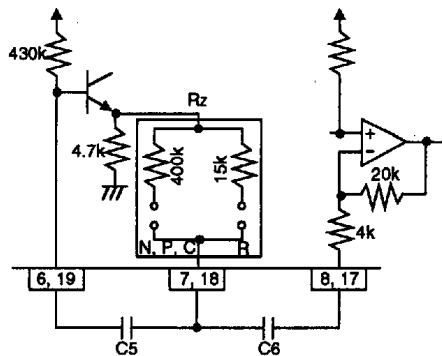


$$f_{0Mid} = \frac{1}{2\pi\sqrt{C3 \cdot C4 \cdot Ry \cdot 430k}} \text{ [Hz]}$$

$$Q_{Mid} = \sqrt{\frac{C3 \cdot Ry \cdot 430k}{C4 (Ry + 4k)^2}}$$

$$G_{Mid} = 20 \log \frac{20k + 4k + Ry}{4k + Ry} \text{ [dB]}$$

(3) HI band



$$f_{0Hi} = \frac{1}{2\pi\sqrt{C5 \cdot C6 \cdot Rz \cdot 430k}} \text{ [Hz]}$$

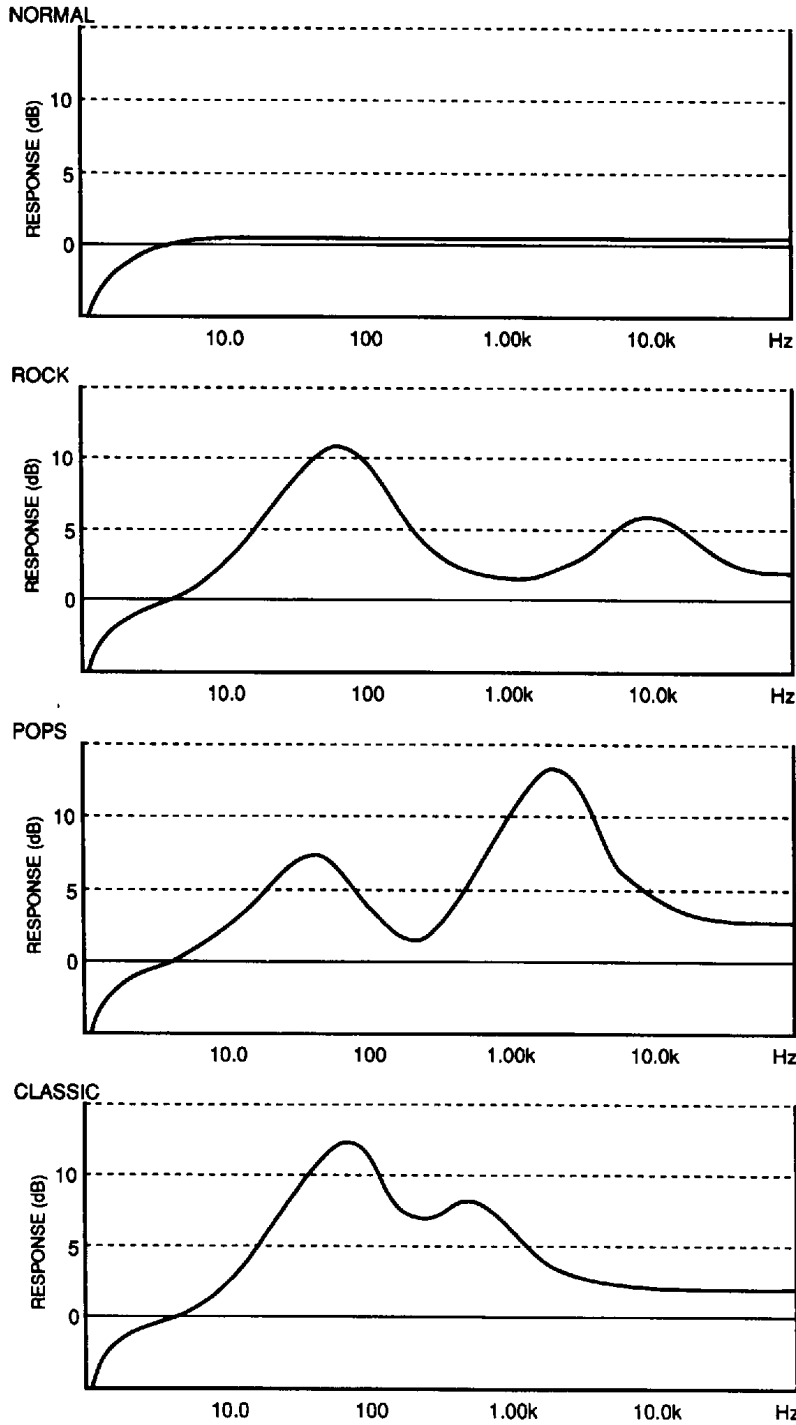
$$Q_{Hi} = \sqrt{\frac{C5 \cdot Rz \cdot 430k}{C6 (Rz + 4k)^2}}$$

$$G_{Hi} = 20 \log \frac{20k + 4k + Rz}{4k + Rz} \text{ [dB]}$$

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SOUND CONTROL SPECK



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### APPLICATION EXAMPLE

