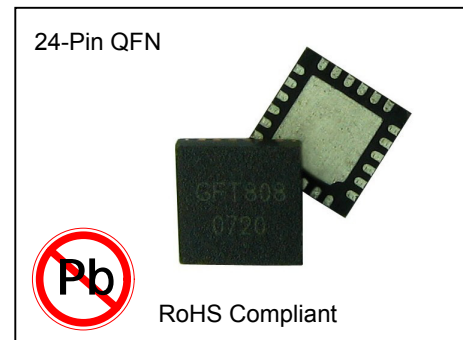


## DESCRIPTION

The GFT808 is a high performance FM transmitter designed for portable multimedia systems. It includes stereo modulator and FM transmitter incorporated with oscillator circuits. This device employs sophisticated stereo modulation circuitry to ensure quality audio characteristics. The GFT808 is fabricated using advanced CMOS process and available as 24-pin QFN package.

## FEATURES

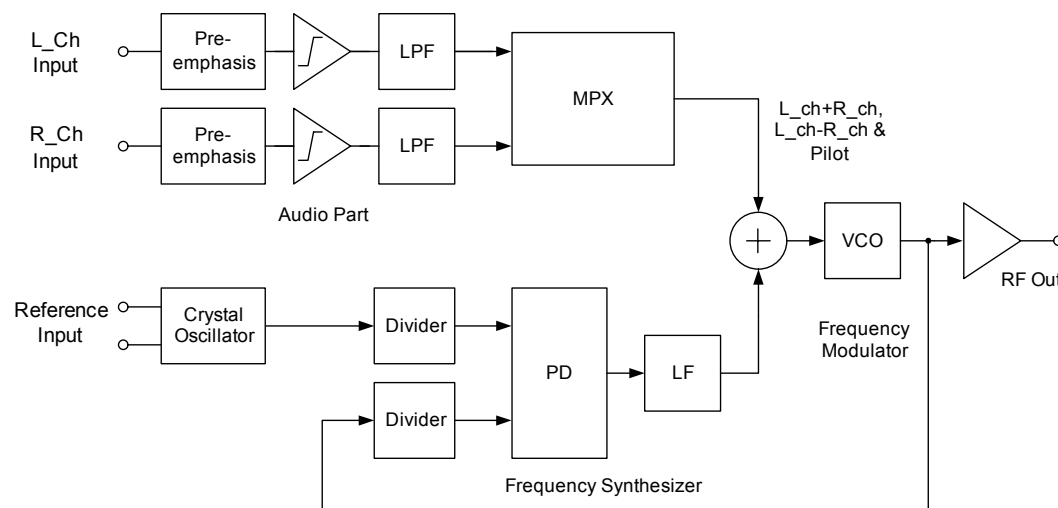
- 2.7V to 3.7V operation
- Low current consumption  
9mA @ 3.0V (Typical)
- Serial programmable interface
- Chip scale package (body size, 4mm x 4mm)



## APPLICATIONS

- MP3P, MP3 phone, GPS, CD changer, notebook PC, car TV, electronic dictionary, portable DVD and portable multimedia players(PMP), etc.,

## BLOCK DIAGRAM



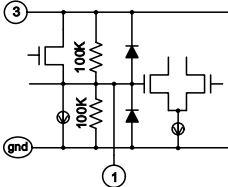
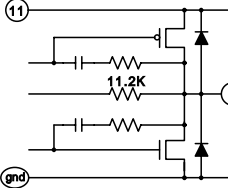
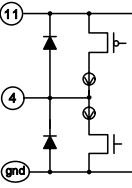
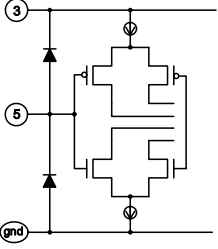
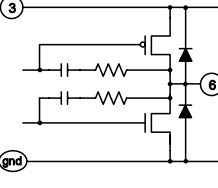
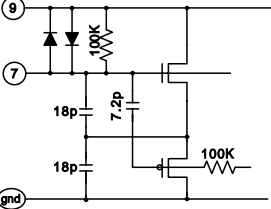
**ELECTRICAL CHARACTERISTICS**

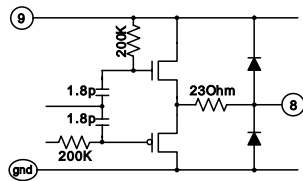
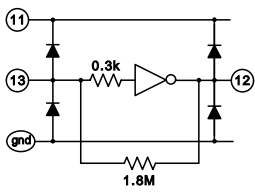
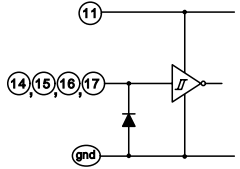
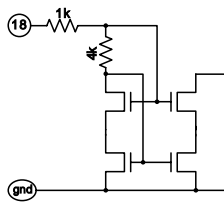
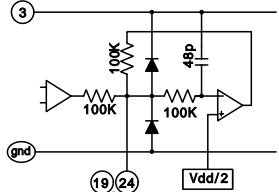
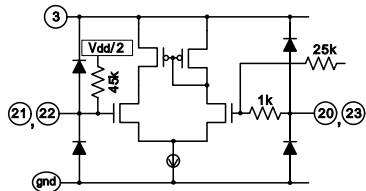
Parameter	Symbol	Test condition	Min.	Typ.	Max.	Units
Power supply voltage	V <sub>CC</sub>		2.7	3.0	3.7	V
Operating current	I <sub>CC</sub>	V <sub>CC</sub> =3.0V	7	9	11	mA
Total harmonic distortion	THD	V <sub>in</sub> =-20dBV	-	0.1	0.3	%
Audio input level	Lin-A		-	-	-10	dBV
Pre-emphasis time constant	T <sub>PRE</sub>	V <sub>in</sub> =-20dBV, L+R	40	50	60	μsec
Limiter input level	Lin-LIM	Output level at 1dB compression	-14	-12	-10	dBV
LPF cut off frequency	F <sub>cut</sub>	V <sub>O</sub> =-3dB	14	15	16	kHz
Mute attenuation	AM	V <sub>in</sub> =-20dBV, L+R	50	60	-	dB
Pilot modulation rate	MP	V <sub>in</sub> =-20dBV, L+R	10	13	16	%
Input output gain	GN	V <sub>in</sub> =-20dBV, L+R	-1	0	1	dB
Sub-carrier rejection ratio	SCR	V <sub>in</sub> =-20dBV, L+R	25	35	-	dB
Channel balance	BAL	V <sub>in</sub> =-20dBV, L+R	-1	0	1	dB
Channel separation	SEP	V <sub>in</sub> =-20dBV	30	40	-	dB
RF power	PRF	F <sub>TX</sub> =100MHz	96	100	102	dBμV

**ABSOLUTE MAXIMUM RATINGS**

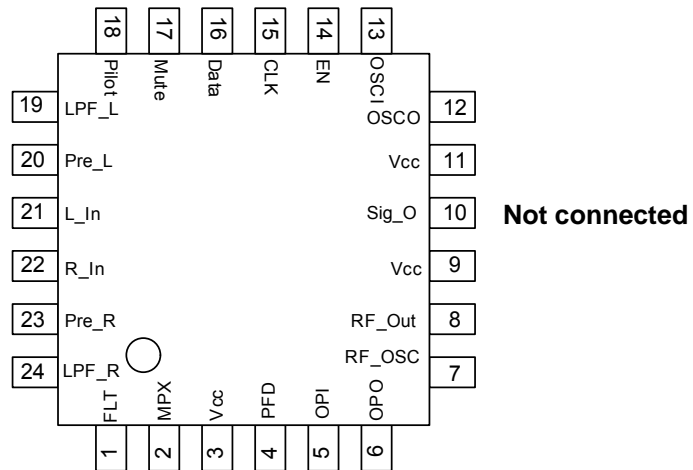
Parameters	Symbol	Value	Units
Power supply voltage	V <sub>CC</sub>	4.0	V
Operating temperature	T <sub>OPR</sub>	-30 to +85	°C
Transmission frequency	F <sub>TX</sub>	70 to 120	MHz
Storage temperature	T <sub>STG</sub>	-35 to +150	°C
ESD (Human Body model)		2000	V

**PIN DESCRIPTIONS**

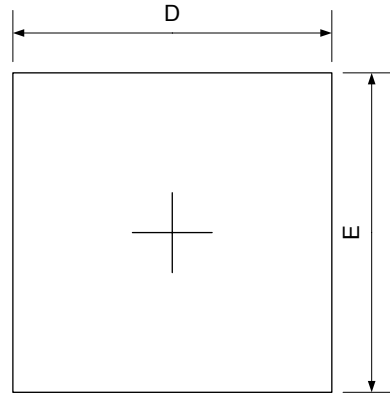
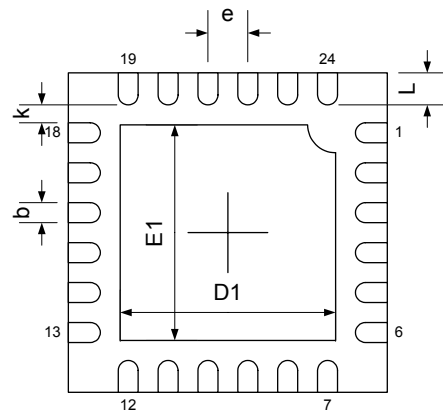
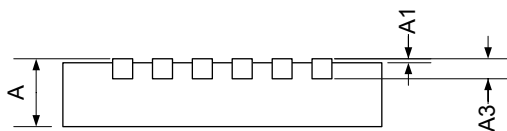
Pin No.	Symbol	Description	Equivalent circuit
1	FLT	Filter	
2	MPX	MPX signal out	
3	Vcc	Vcc, analog	-
4	PFD	Phase frequency detector	
5	OPI	OP amp in	
6	OPO	OP amp out	
7	RF_OSC	RF Oscillator	

Pin No.	Symbol	Description	Equivalent circuit
8	RF_Out	RF signal out	
9	Vcc	Vcc, RF	-
10	Sig_O	Signal out (not connected)	-
11	Vcc	Vcc, digital	-
12	OSCO	Crystal oscillator out	
13	OSCI	Crystal oscillator in	
14	EN	Enable signal input	
15	CLK	Clock input	
16	Data	Serial data input	
17	Mute	Audio mute	
18	Pilot	Pilot tone adjustment	
19	LPF_L	Low pass filter, left	
24	LPF_R	Low pass filter, right	
20	Pre_L	Pre-emphasis, left	
23	Pre_R	Pre-emphasis, right	
21	L_In	Audio input, left channel	
22	R_In	Audio input, right channel	

**CONNECTION DIAGRAM**



Note: The exposed pad on the bottom side must be connected to the ground.

**24-PIN QFN Package (4mm x 4mm)**

**Top View**

**Bottom View**

**Side View**

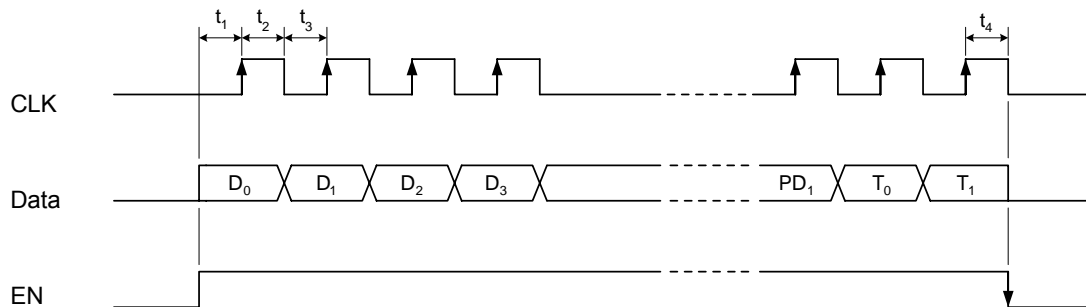
Symbol	Dimensions in Millimeter		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF		0.008REF	
D	3.924	4.076	0.154	0.160
E	3.924	4.076	0.154	0.160
D1	2.600	2.800	0.102	0.110
E1	2.600	2.800	0.102	0.110
k	0.200MIN		0.008MIN	
b			0.800	0.012
e	0.500TYP		0.020TYP	
L	0.324	0.476	0.013	0.019

## PROGRAMMING

- Serial data input

The serial data is clocked in on the rising edge of clock and transferred into the shift register. At the falling edge of EN, stored data is latched.

$t_1, t_2, t_3, \text{ \& } t_4 \geq 0.2\mu\text{sec}$



### Serial data

D <sub>0</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>	D <sub>9</sub>	D <sub>10</sub>	Mono	PD <sub>0</sub>	PD <sub>1</sub>	T <sub>0</sub>	T <sub>1</sub>
(LSB)										(MSB)	MPX	Phase Detector		Test mode	

- Counter

Divide ratio is controlled by the programmable counter. Transmission frequency is determined. For instance, in case of 100MHz oscillation frequency, 1000[=100MHz/100kHz( $f_{ref}$ )] is entered in such a way of (LSB) 00010111110 (MSB).

- Multiplexer (MPX)

This selects a stereo or monaural mode which can be set by "1" and "0", respectively.

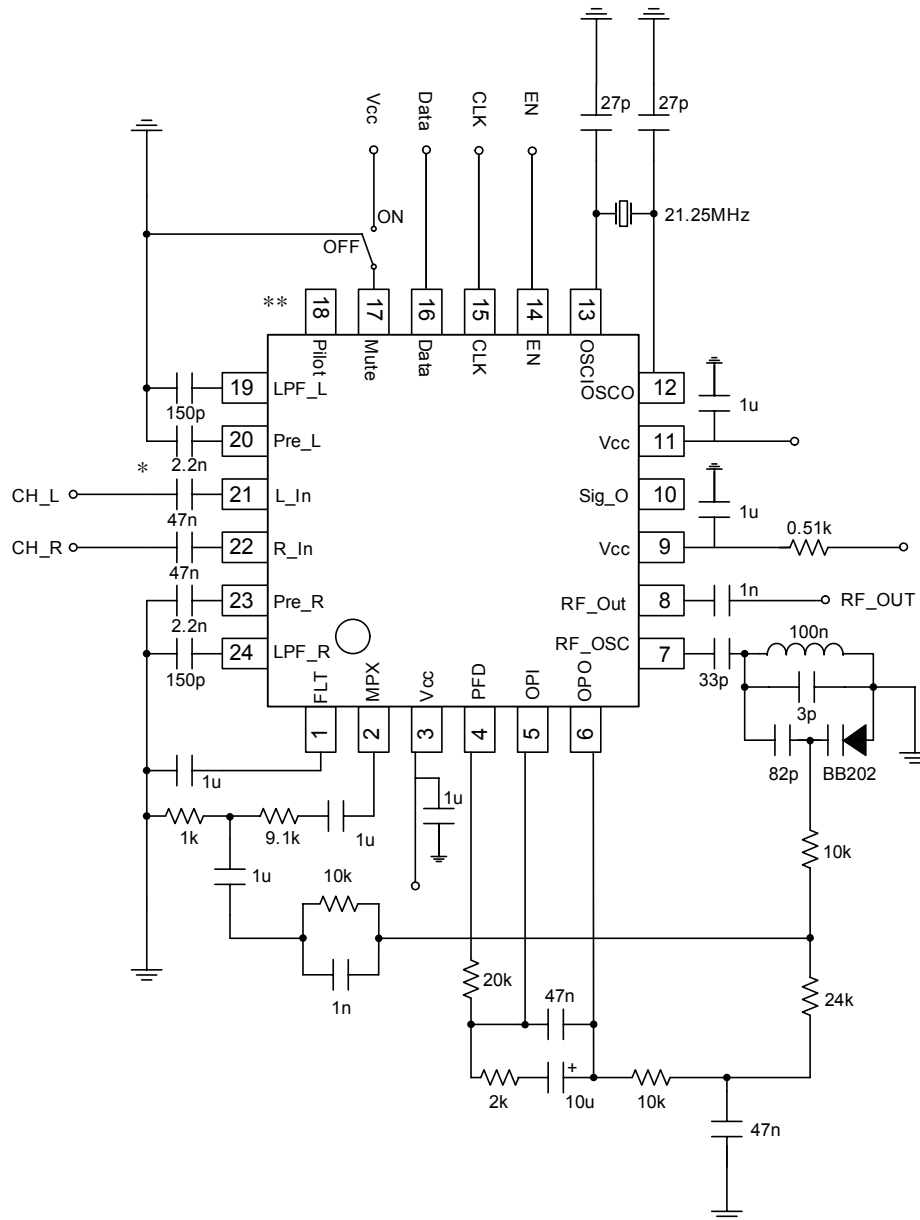
- Phase detector

Charge pump output is controlled. A normal operation is defined by a combination of "0" "0". Forced by Low and by High can be determined via "0" "1" and "1" "0", respectively. "1" "1" represents high impedance.

- Test mode

Input mode of "1" "0" specifies normal operation with positive charge pump polarity. Mode of "0" "0" represents normal operation with negative charge pump polarity.

**APPLICATION CIRCUIT**



\* Capacitors of 2.2nF and 3.3nF are used for the pre-emphasis time constant of 50 $\mu$ sec and 75 $\mu$ sec, respectively.

\*\* Pin # 18, pilot level control, can be normally open.