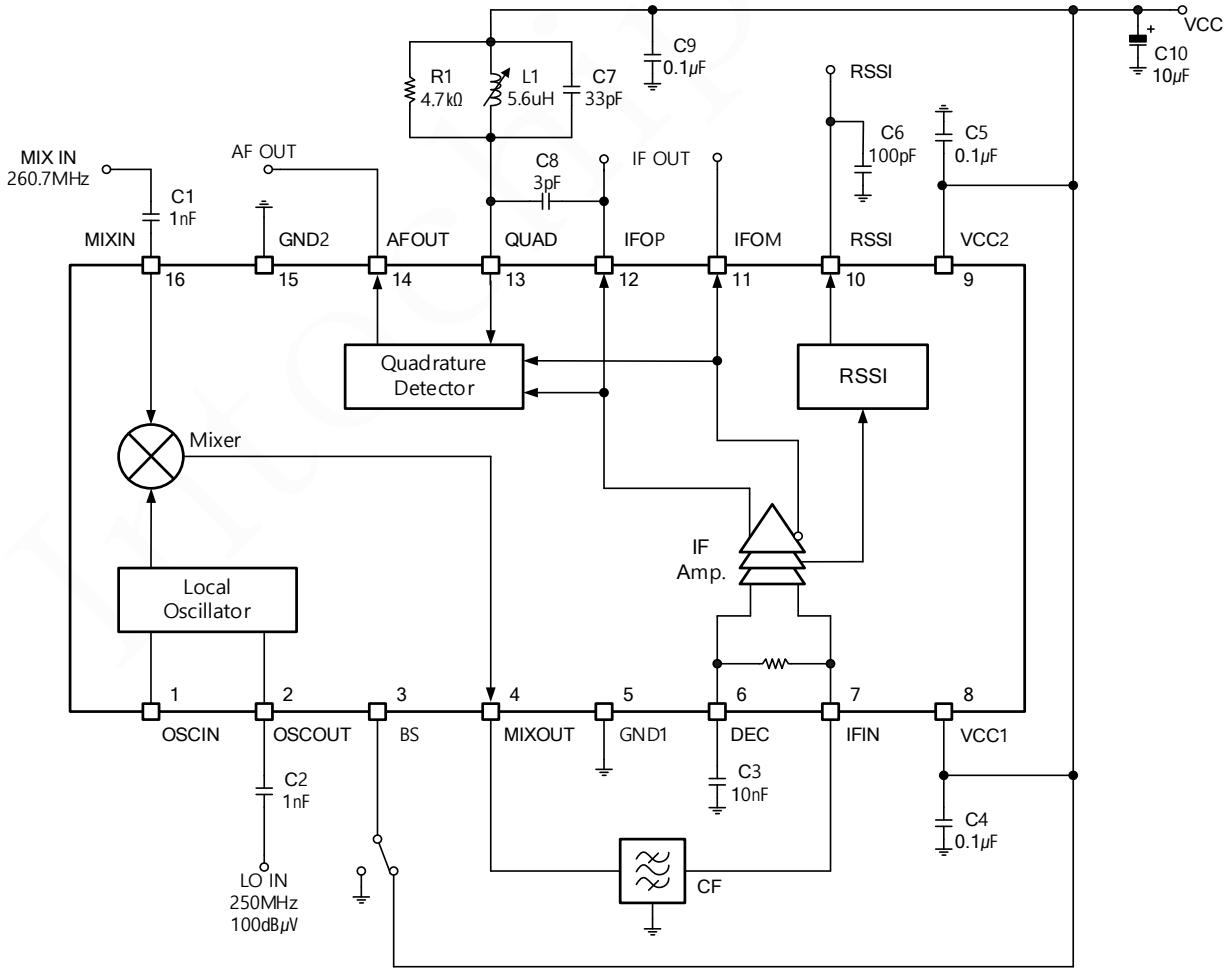
The DHF810 is a wide-band IF detector IC that can be operating at 10.7MHz. It consists of high-speed mixer, IF amplifier, RSSI circuit and quadrature detector. It is available in a 16-pin TSSOP plastic package.

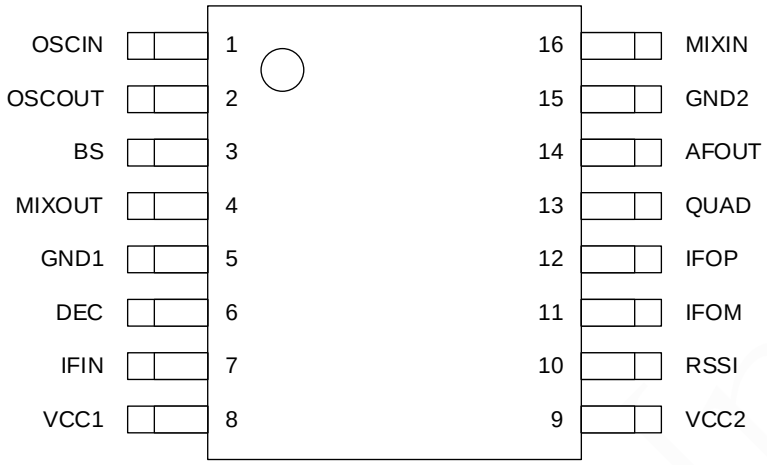
Features

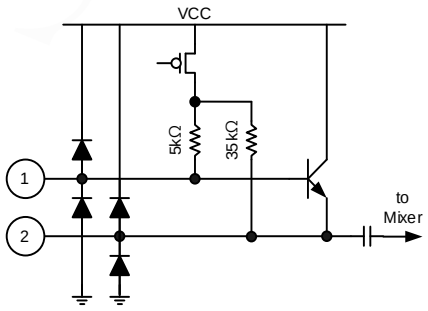
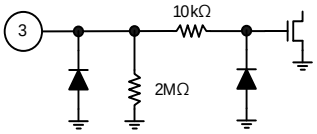
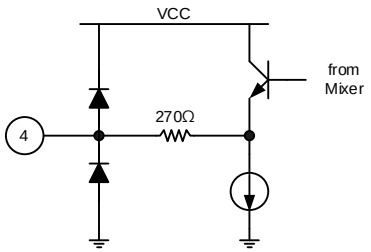
- Low operating voltage (2.3V ~ 5.5V)
- Wide mixer operating frequency (20MHz to 300MHz)
- Excellent temperature characteristics
- High sensitivity
- RSSI function
- Battery save function
- TSSOP16 package (Pb-free and RoHS compliant)

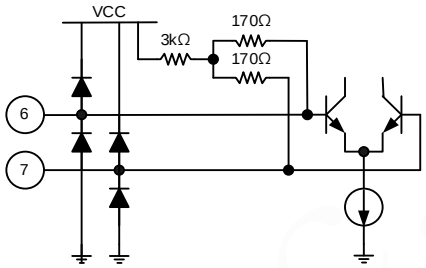
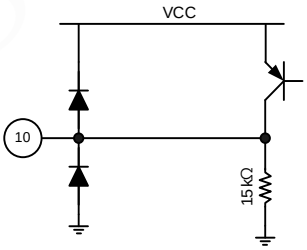
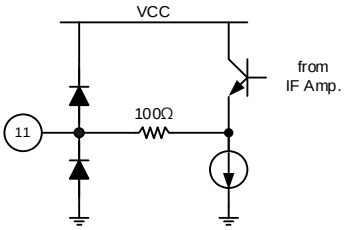
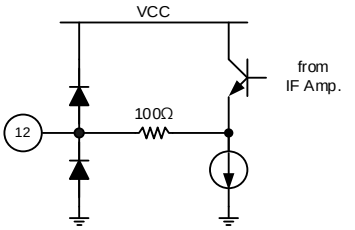
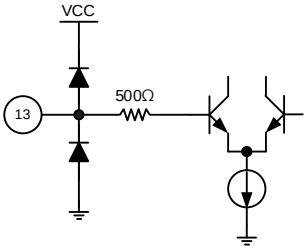
Block Diagram & Application Circuit Example

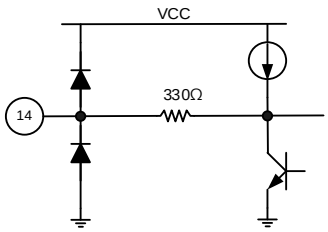
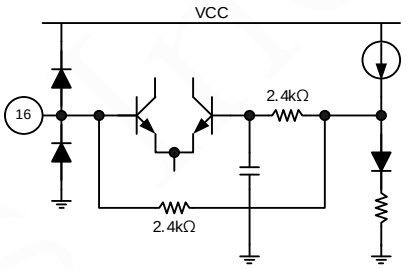


Pin Description



Pin No.	Mnemonic	Description	Internal Equivalent Circuit
1	OSCIN	Local oscillator input.	
2	OSCOUT	Local oscillator output.	
3	BS	Battery save input. Normal operation state : High Battery save state : Low	
4	MIXOUT	Mixer output. (Output impedance is around 330Ω)	
5	GND1	Ground.	

Pin No.	Mnemonic	Description	Internal Equivalent Circuit
6	DEC	Decoupling input for bias	
7	IFIN	IF amplifier input (Input impedance is around 1.8kΩ)	
8	VCC1	Power supply	
9	VCC2	Power supply	
10	RSSI	RSSI output.	
11	IFOM	IF Amplifier output. IFOP and IFOM are in opposite phases.	
12	IFOP		
13	QUAD	Phase shift signal input of quadrature detector.	

Pin No.	Mnemonic	Description	Internal Equivalent Circuit
14	AFOUT	Demodulated signal output (Output impedance is around 360Ω)	
15	GND2	Ground.	
16	MIXIN	Mixer input.	

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	-0.3 to 7.0	V
Operating Temperature Range	T_{OP}	-40 to +85	°C
Storage Temperature Range	T_{ST}	-50 to +150	°C

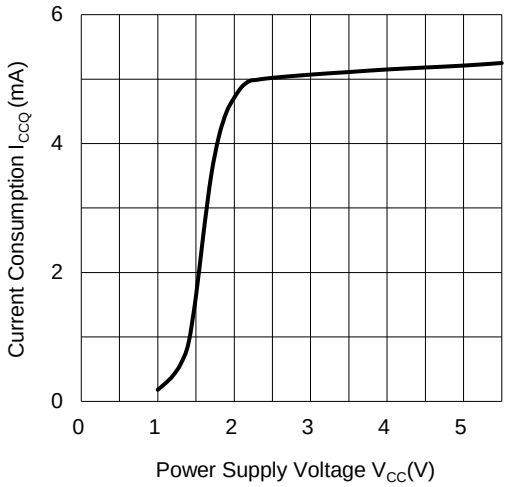
Electrical Characteristics

(V_{CC}=3V, $f_{IN(MIX)}$ = 260.7MHz, $f_{IN(LO)}$ = 250MHz, $f_{IN(IF)}$ = 10.7MHz, Δf = ±100kHz, f_{MOD} = 1kHz, Ta=25°C)

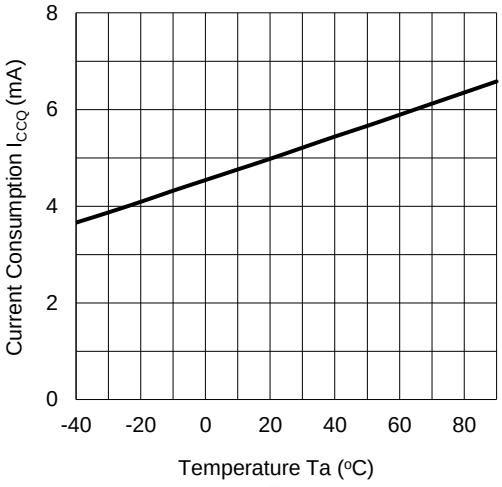
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power Supply Voltage	V_{CC}	-	2.3	3	5.5	V
Power Supply Current	I_{CCQ}	-	4.1	5.1	6.1	mA
Battery Save Current	$I_{CCQ\ (BS)}$	BS = 0V	-	-	10	uA
BS High Level Input Voltage	V_H	Battery Save Input	2	-	5.5	V
BS Low Level Input Voltage	V_L	Battery Save Input	0	-	0.4	V
Mixer Operating Frequency	f_{MIX}	-	20	-	300	MHz
Mixer Conversion Gain	G_{VC}	$V_{IN(MIX)}$ = 60dBuV	15	19	23	dB
Mixer Intercept Point	P_{IM}	-	-	95	-	dBuV
Mixer Output Resistance	$R_{O\ (MIX)}$	-	-	330	-	Ω
Mixer 1dB Compression Level	$D_{R\ (MIX)}$	Mixer Input Level at G_{VC} 1dB down	-	82	-	dBuV
LO Operating Frequency	f_{LO}	-	20	-	120	MHz
LO Input Level	V_{LO}	-	-	100	-	dBuV
IF AMP. Operating Frequency	f_{IF}	-	4	-	15	MHz
IF AMP. Gain	G_V	-	-	73	-	dB
IF AMP. Input Resistance	$R_{IN\ (IF)}$	-	-	330	--	Ω
IF AMP. Output Level	$V_{O\ (IF)}$	-	0.4	0.5	0.6	V_{P-P}
RSSI Output Voltage 1	V_{RSSI1}	No Input	-	0.15	0.4	V
RSSI Output Voltage 2	V_{RSSI2}	$V_{IN\ (IF)}$ = 70dBuV	1.0	1.2	1.4	V
RSSI Output Voltage 3	V_{RSSI3}	$V_{IN\ (IF)}$ = 100dBuV	1.8	2.0	2.2	V
RSSI Dynamic Range	$V_{D\ (RSSI)}$	-	-	70	-	dB
RSSI Output Resistance	$R_{O\ (RSSI)}$	-	12	15	18	kΩ
Demodulation Output Level	V_{OD}	$V_{IN(IF)}$ = 80dBuV	50	70	90	mV_{RMS}
Demodulation Frequency	f_{DET}	-	-	100	-	KHz
12dB Sensitivity	12dB SN	-	-	14	-	dBuV
SN Ratio	SN	$V_{IN(IF)}$ = 80dBuV	-	65	-	dB
AM Rejection Ratio	AMR	$V_{IN(IF)}$ = 80dBuV, AM = 30%	-	40	-	dB

Typical Performance Characteristics

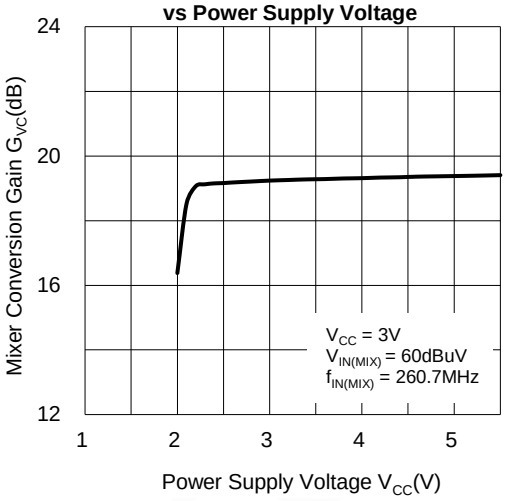
Current Consumption



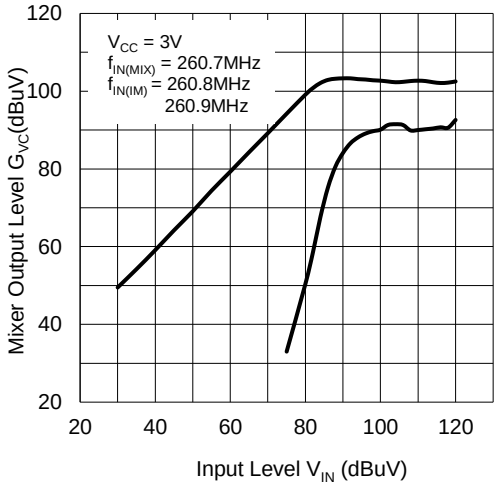
Current Consumption vs Temperature



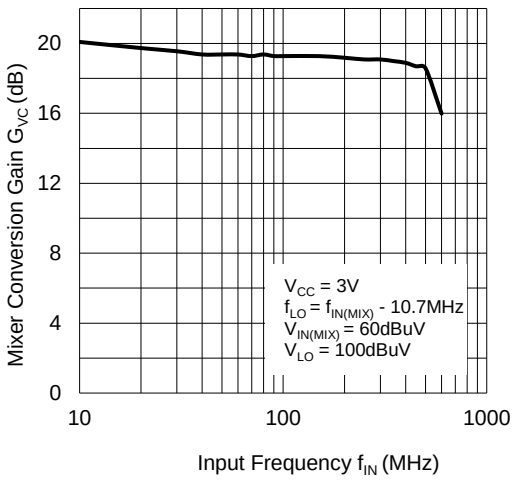
Mixer Conversion Gain vs Power Supply Voltage



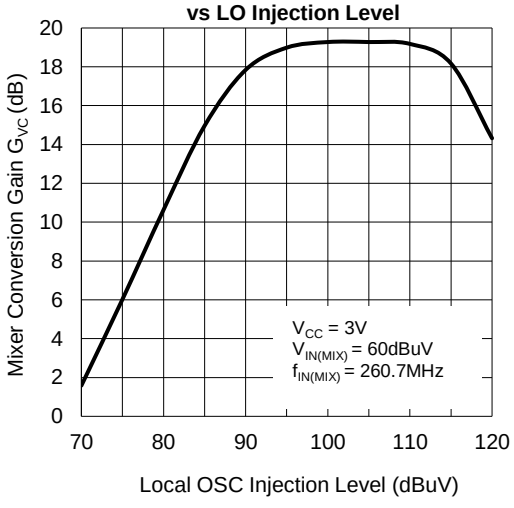
Mixer Intercept Point



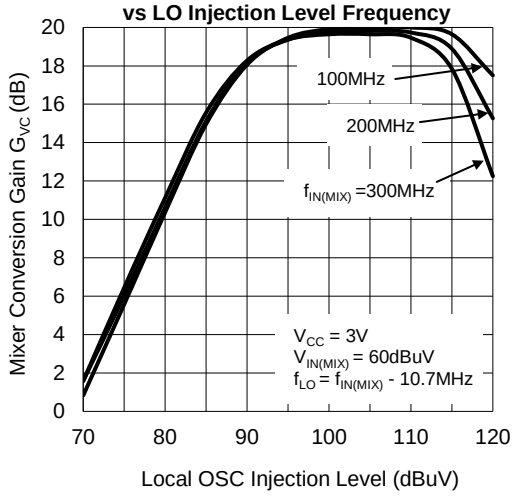
Mixer Frequency Characteristics



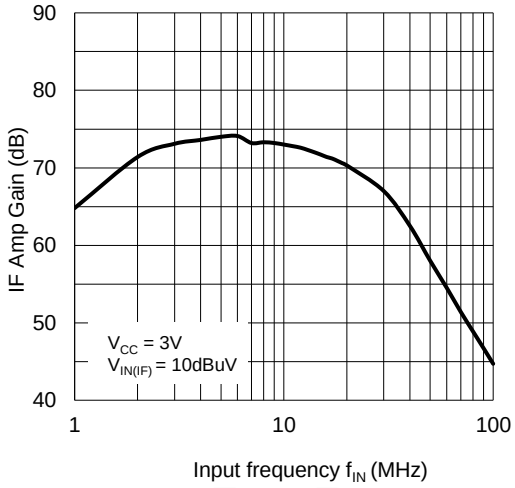
Mixer Conversion Gain vs LO Injection Level



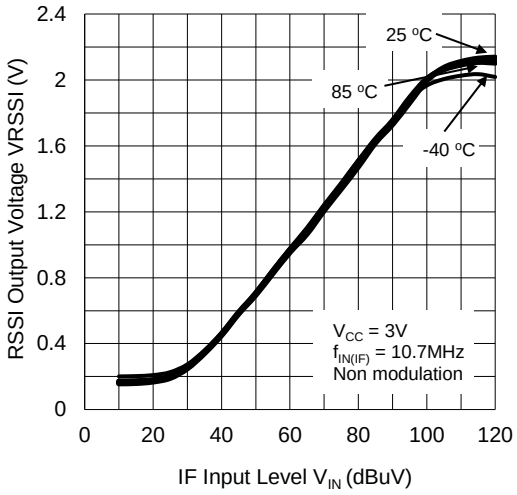
Mixer Conversion Gain vs LO Injection Level Frequency



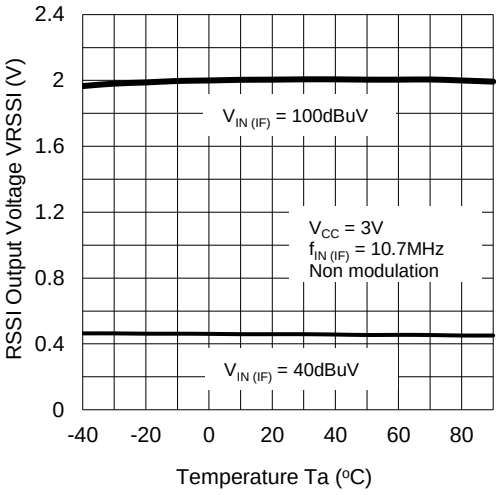
IF Amp Gain vs Frequency



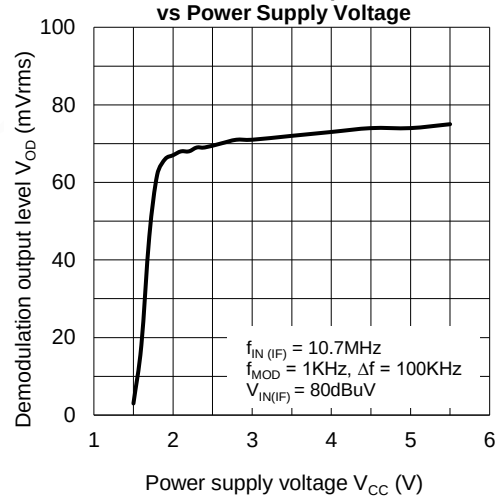
RSSI vs IF Input Temperature



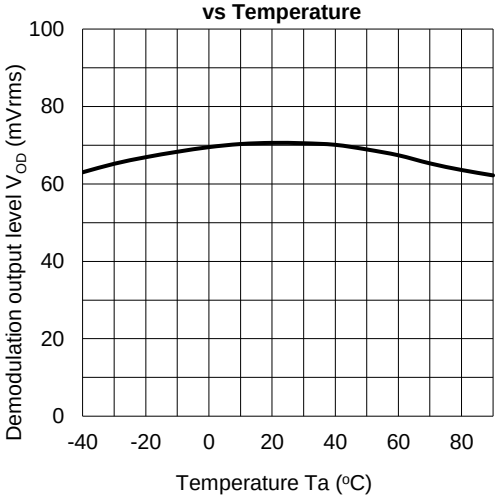
RSSI vs Temperature



Demodulation Output Level vs Power Supply Voltage



Demodulation Output Level vs Temperature



Package Dimensions