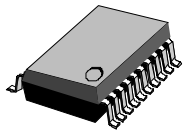
INTRODUCTION

The S1T8514B is designed for FM IF detection on the pager set. It includes a voltage regulator, low battery detection circuit, mixer, oscillator, FSK comparator and limiting IF Amplifier. Also S1T8514B provides the RSSI function for RF level monitoring.

20–SSOP–225



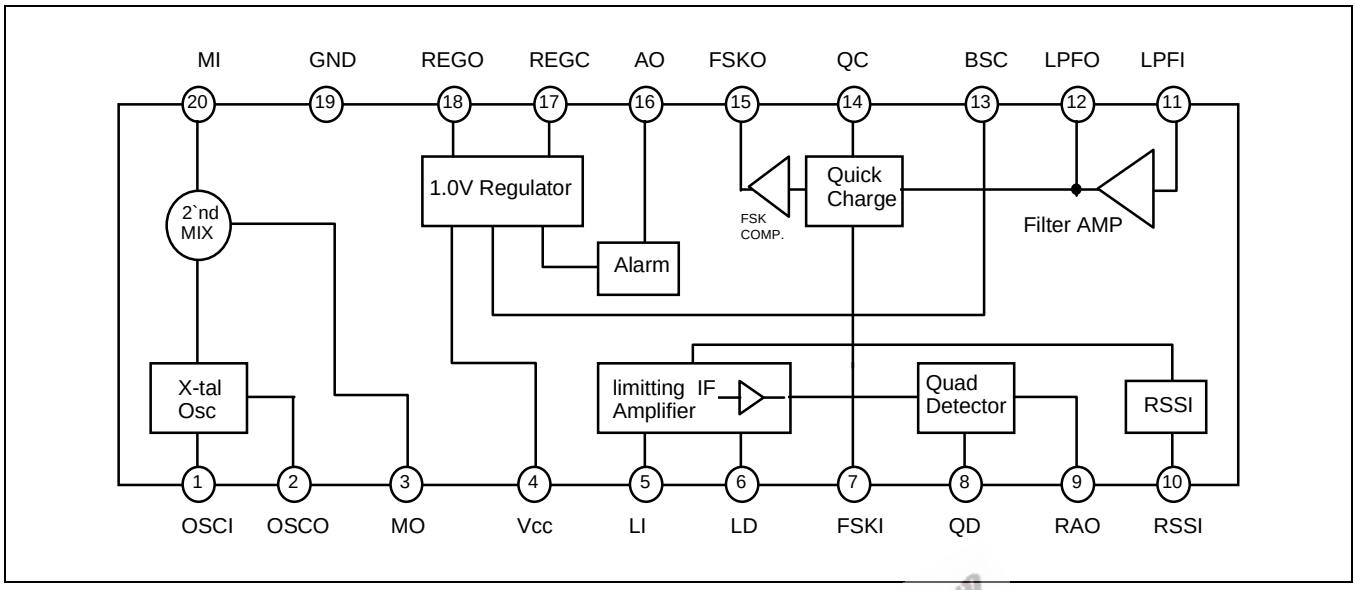
FEATURES

- Built-in RSSI function
- Operating voltage range: V_{CC} = 1.1 to 4.0V
- Low current consumption: I_{CC} = 1.5mA
- Low battery detection circuit (alarm function): 1.05V
- Voltage regulator: Vreg = 1.0V (Typ.)
- Mixer operating frequency: 10 to 50MHz
- High transmitting rate: 1200 / 2400bps
- FSK Data reception
- Package type: 20-SSOP (0.65mm)

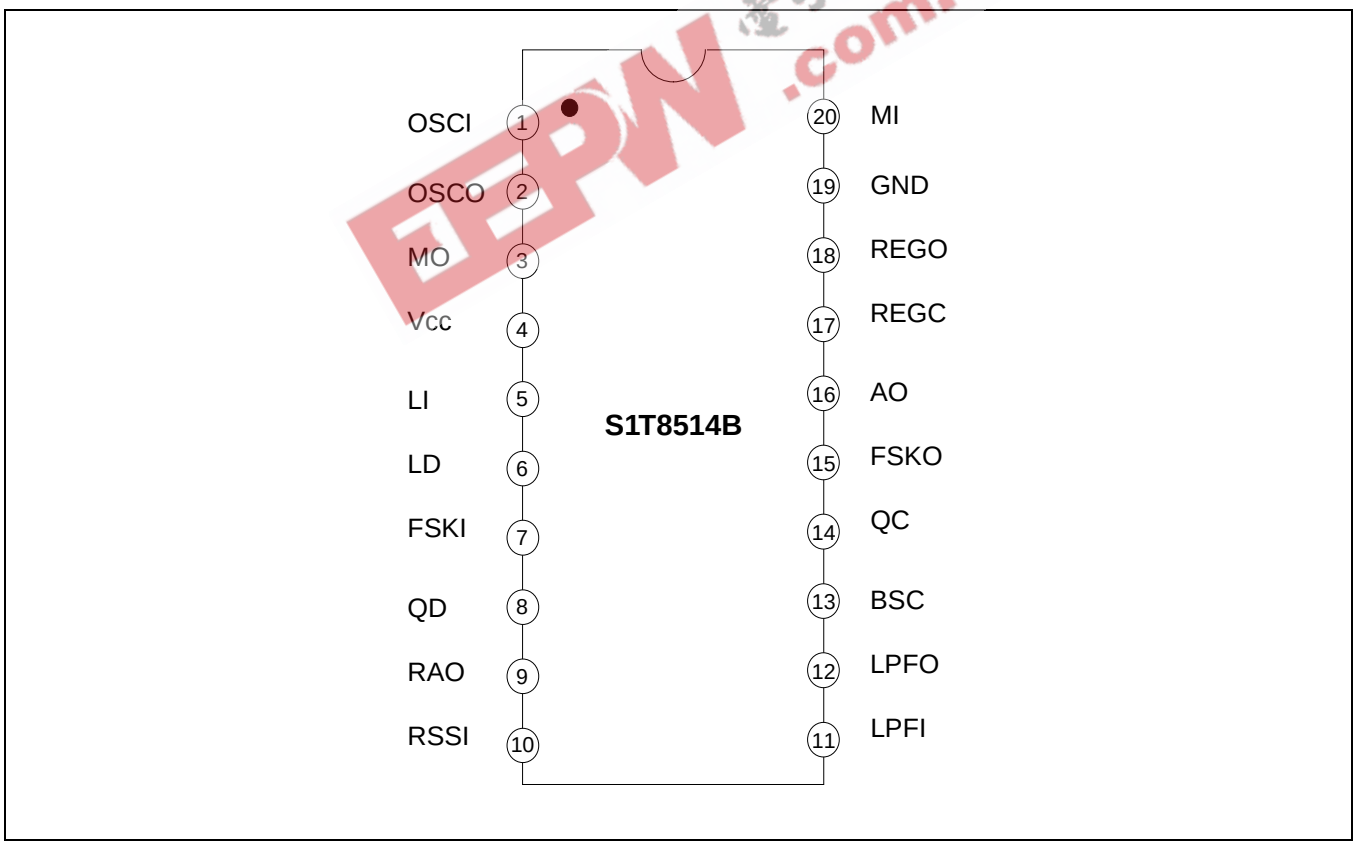
ORDERING INFORMATION

Device	Package	Operating Temperature
S1T8514B01-V0B0	20–SSOP–225	–20°C to +70°C

BLOCK DIAGRAM



PIN CONFIGURATION



PIN DESCRIPTION

Pin No	Symbol	Description
1	OSCI	Oscillator input (Base). The oscillator is an internally biased colpitts type.
2	OSCO	Oscillator output.
3	MO	Mixer output (Output impedance ≈ 2kΩ) Connect a 455kHz filter between this pin and the LI.
4	V_{CC}	V_{CC} pin.
5	LI	IF limiter amplifier input (Input impedance ≈ 2kΩ)
6	LD	Bypass capacitor connect pin for the IF limiter amplifier.
7	FSKI	Differential Amp Reference input on the FSK comparator.
8	QD	Quadrature detection, phase shifter input.
9	RAO	Recovered audio signal output.
10	RSSI	Output pin for RSSI. This pin detects RF level by monitoring the limiter amplifier.
11	LPFI	Low pass filter a amplifier input. Bias is supplied from pin 9.
12	LPFO	Low pass filter amplifier output.
13	BSC	Battery saving control pin. High: Battery saving off. Low: Battery saving on.
14	QC	Quick charge control pin. High: Quick charge-discharge on. Low: Quick charge-discharge off.
15	FSKO	FSK signal output pin.
16	AO	Alarm output. This pin becomes High when VCC drops belows 1.05V.
17	REGC	S1T8514B has an internal PNP transistor. But, it also can support an external PNP transistor to control the power.
18	REGO	Regulated Voltage output.
19	GND	Ground.
20	MI	Mixer input impedance ≈ 5kΩ.

ABSOLUTE MAXIMUM RATINGS

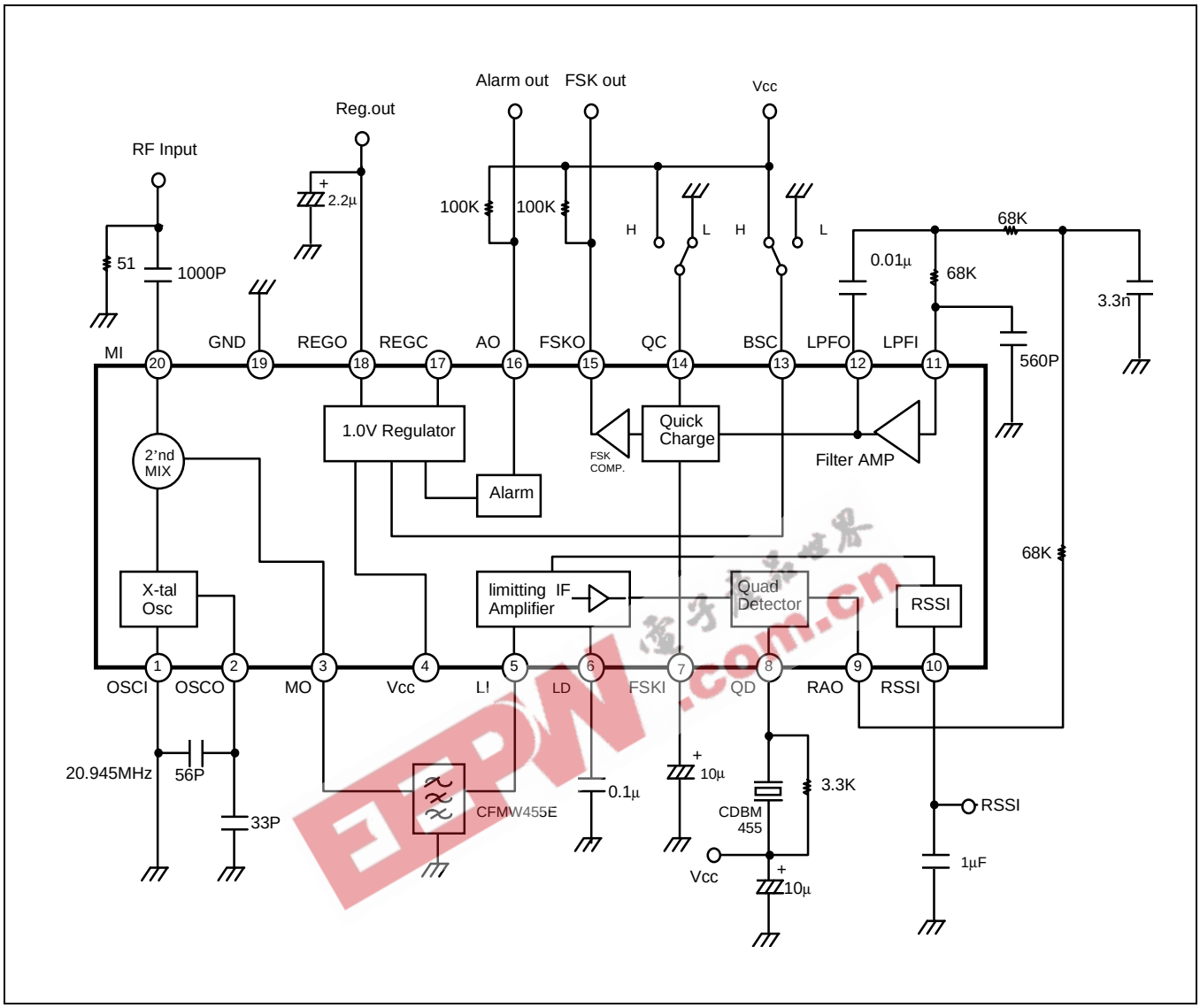
Characteristic	Symbol	Value	Unit
Max. Supply Voltage	$V_{CC\ (MAX)}$	4	V
Power Dissipation	P_D	800	mW
Operating Temperature	T_{OPR}	–20 to +70	°C
Storage Temperature	T_{STG}	–55 to +125	°C

ELECTRICAL CHARACTERISTICS

(V_{CC} = 1.4V ±5%, $f_{IN\ (2MIX)}$ = 21.4MHz, f_{DEV} = ±4.8kHz, f_{MOD} = 600Hz, Ta = 25°C, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Operating current	I_{CCN}	No Input Signal	–	1.2	1.7	mA
	I_{CCS}	Battery Saving	–	0	10	µA
Alarm detection voltage	V_{AD}	–	1.0	1.05	1.1	V
Alarm low level output voltage	$V_{O\ (AL)}$	I = 100µA	–	–	0.4	V
Alarm high level leakage current	$I_{LKG\ (AL)}$	–	–	–	2	µA
FSK low level output voltage	$V_{L\ (FSK)}$	–	–	–	0.4	V
FSK high level leakage current	$I_{LKG\ (FSK)}$	I = 100µA	–	–	2	µA
Regulator output voltage	V_{OREG}	–	0.95	1.0	1.05	V
Quick charge current	I_C	–	56	70	–	µA
Input for –3dB sensitivity	V_{LIM}	Mixer Input	–	2.5	7.5	µVrms
Input for –12dB SINAD sensitivity	$V_{I\ (SEN)}$	FM Input	–	6.0	18.0	µVrms
Recovered audio output voltage	$V_{O\ (RAO)}$	$V_{IN\ (2MIX)}$ = 500µVrms	33	55	77	mVrms
Mixer conversion voltage gain	$\Delta G_{V\ (M)}$	Ceramic Filter loss = –1dB	8	12	16	dB
Signal to noise ratio	S/N	–	38	55	–	dB
Total Harmonic Distortion	THD	–	–	2.0	3.5	%
Mixer 3rd order intercept point	3RD	–	–	–10	–	dBm
Mixer input resistance	$R_{I\ (MIX)}$	–	3.5	5	6.5	kΩ
Limiting amp input resistance	$R_{I\ (LA)}$	–	1.4	2	2.6	kΩ
AM rejection ratio	AMR	$V_{IN\ (2MIX)}$ = 5µVrms (AM = 300%)	25	40	–	dB
Data shaping output duty	DR	$V_{IN\ (2MIX)}$ = 500µVrms	40	50	60	%
RSSI output voltage	V_{RSSI}	$V_{IN\ (2MIX)}$ = 1m µVrms (AM = 300%)	0.49	0.7	0.91	V
RSSI output resistance	R_{RSSI}	–	80	100	120	kΩ

APPLICATION CIRCUIT



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