

# KA8514

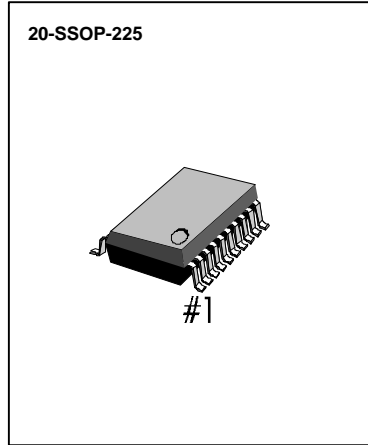
# Preliminary FM IF RECEIVER WITH RSSI

## INTRODUCTION

The KA8514 is designed for FM IF detection on the pager set. It includes voltage regulator, low battery detection circuit, Mixer, Oscillator FSK comprator and limiting IF Amplifier. Also KA8514 provides the RSSI function for RF level monitoring.

## FEATURES

- Built-in RSSI function
- Low Supply Voltage :  $V_{cc} = 1.1 \sim 4.0V$
- Low Consumption Current :  $I_{cc} = 1.2mA$  (typ)
- Low Battery Detection Circuit ( alarm function ) : 1.05V
- Voltage Regulator :  $V_{reg} = 1.0V$  (typ)
- Mixer Operating Frequency : 10 ~ 50MHz
- High Transmitting Rate : 1200bps
- FSK Data Reception
- Package Type : 20 ssop (0.65mm)

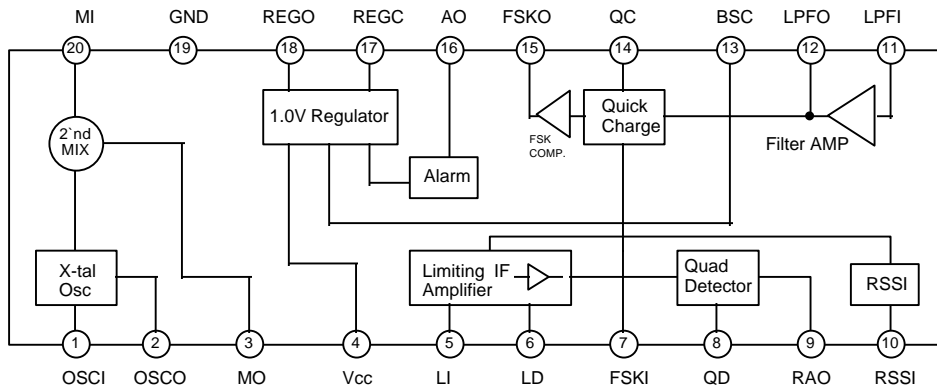


## ORDERING INFORMATION

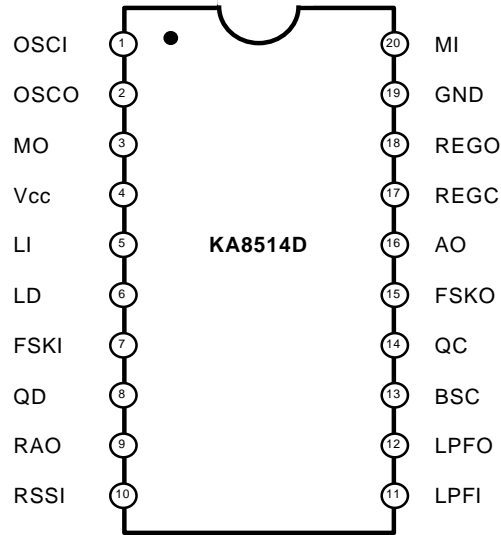
Device	Package	Operating Temperature
† KA8514D	20-SSOP-225	-20 ~ +70°C

† New Product

## BLOCK DIGRAM



**PIN CONFIGURATION**



**PIN DESCRIPTION**

Pin No.	Symbol	Description
1	OSCI	Oscillator input The oscillator is an internally biased colpitts type
2	OSCO	Oscillator output
3	MO	Mixer output pin Output impedance $\approx 2K\Omega$ Connect a 455KHz filter between this pin and the IFI
4	V <sub>cc</sub>	V <sub>cc</sub> pin
5	LI	If limiter amplifier input Input impedance $\approx 2K\Omega$
6	LD	Bypass capacitor connect pin for the IF limiter amplifier

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**FM IF RECEIVER WITH RSSI**

Pin No.	Symbol	Description
7	FSKI	Differential Amp Reference input on the FSK comparator.
8	QD	Quadrature detection phase shifter pin.
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 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 become ' High' when V <sub>CC</sub> drops belows 1.05V.
17	REGC	External Transtor control pin. Connect the PNP External Transistor.
18	REGO	Regulated Voltage output
19	GND	Ground
20	MI	Mixer input impedance = 5K $\Omega$

**ABSOLUTE MAXIMUM RATINGS**

Characteristic	Symbol	Value	Unit
Max. Supply Voltage	V <sub>CC</sub> (Max)	4	V
Power Dissipation	P <sub>D</sub>	800	mW
Operating Temperature	T <sub>OPR</sub>	- 20 ~ + 70	°C
Storage Temperature	T <sub>STG</sub>	- 55 ~ 125	°C

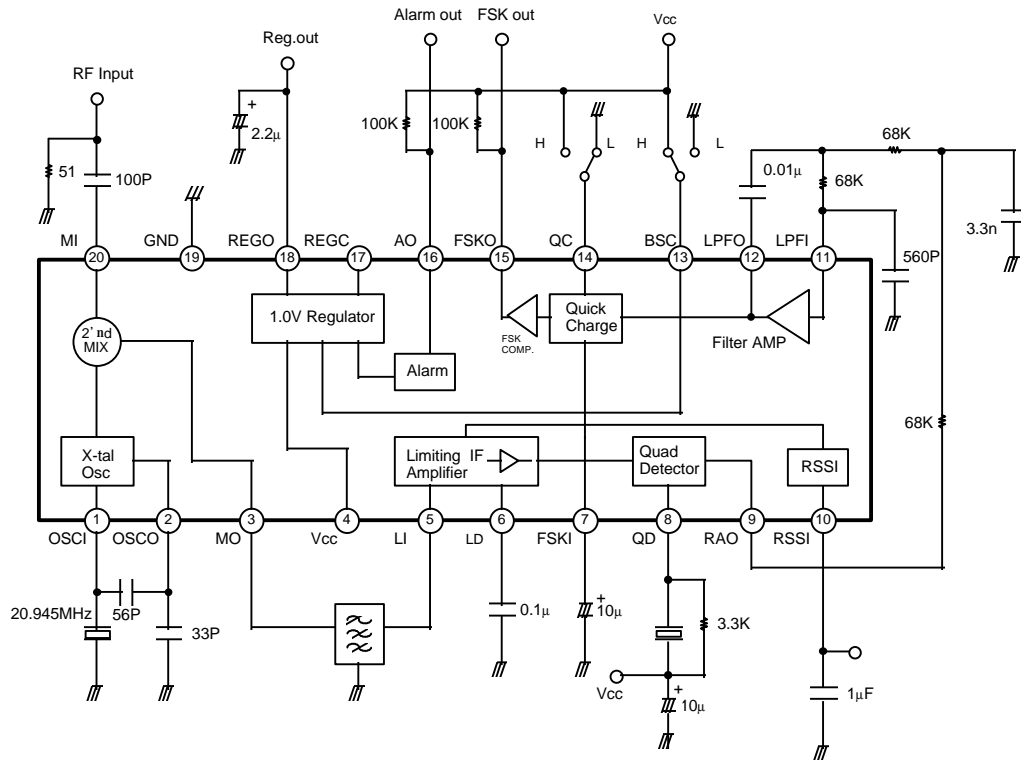


**ELECTRICAL CHARACTERISTICS**

( $V_{CC} = 1.4V \pm 5\%$ ,  $f_{IN(2MIX)} = 21.4MHz$ ,  $f_{DEV} = \pm 4KHz$ ,  $f_{MOD} = 600Hz$ ,  $T_a = 25^\circ C$ , Unless otherwise specified )

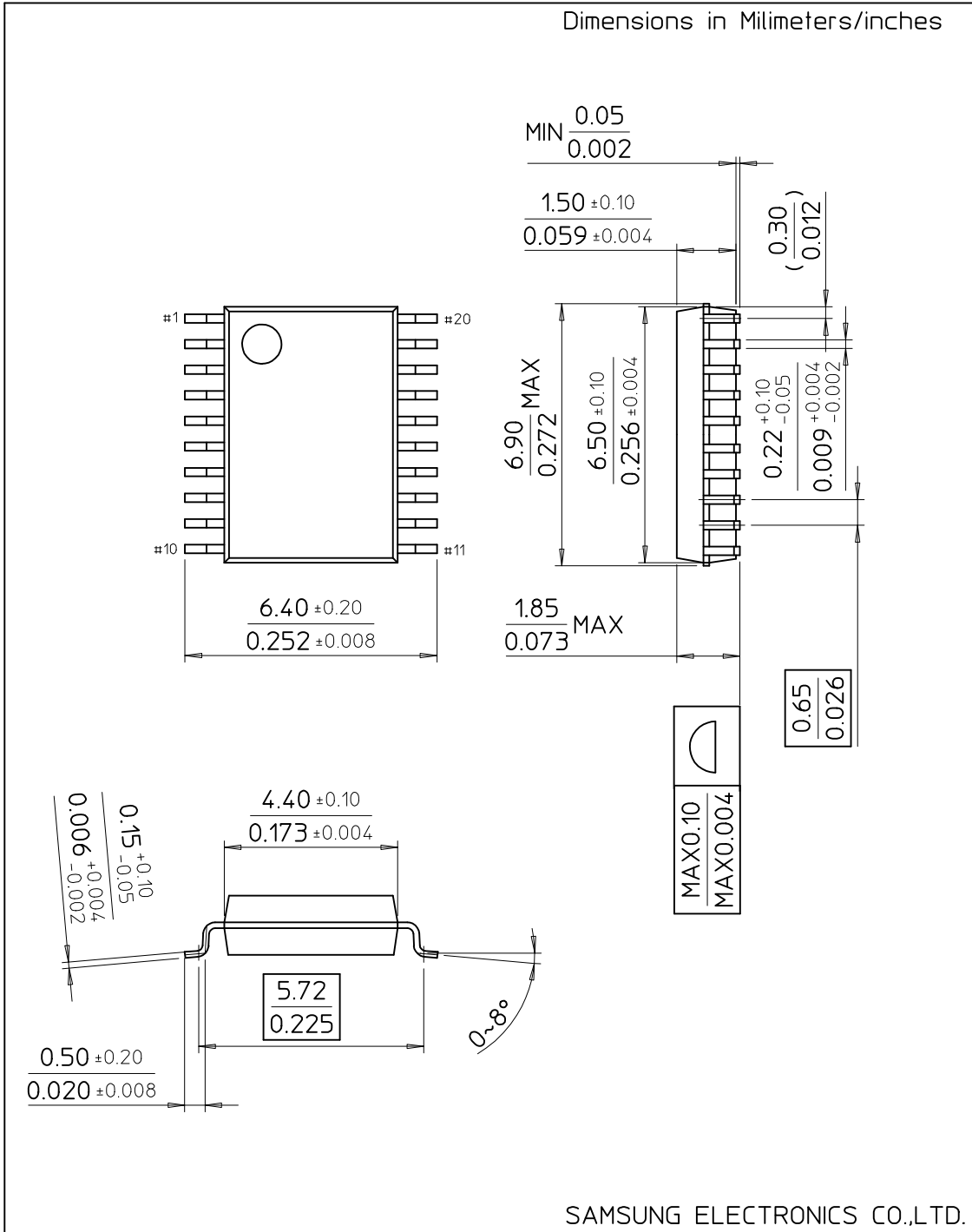
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating current	$I_{CCN}$	No Input Signal	-	1.2	1.7	mA
	$I_{CCS}$	Battery Saving	-	0	10	$\mu A$
Alarm detection voltage	$V_{AD}$	-	1.0	1.05	1.1	V
Alarm low level output voltage	$V_{O(AL)}$	$I = 100\mu A$	-	-	0.4	V
Alarm high level leakage current	$I_{LKG(AL)}$	-	-	-	2	$\mu A$
FSK low level output voltage	$V_{L(FSK)}$	-	-	-	0.4	V
FSK high level leakage current	$I_{LKG(FSK)}$	$I = 100\mu A$	-	-	2	$\mu A$
Regulator output voltage	$V_{OREG}$	-	0.95	1.0	1.05	V
Quick charge current	$I_C$	-	56	70	-	$\mu A$
Input for -3dB sensitivity	$V_{LIM}$	Mixer Input	-	2.5	7.5	$\mu V_{rms}$
Input for -12dB SINAD sensitivity	$V_{I(SEN)}$	IF Input	-	6.0	18.0	$\mu V_{rms}$
Recovered audio output voltage	$V_{O(RAD)}$	$V_{IN(2MIX)} = 500 \mu V_{rms}$	33	55	77	$\mu V_{rms}$
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	$K\Omega$
Limiting amplifier input resistance	$R_{I(LA)}$	-	1.4	2	2.6	$K\Omega$
AM rejection ratio	AMR	$V_{IN(2MIX)} = 5\mu V_{rms}$ (AM = 30%)	25	40	-	dB
Data shapping output duty ratio	DR	$V_{IN(2MIX)} = 500\mu V_{rms}$	40	50	60	%
RSSI output voltage	$V_{RSSI}$	$V_{IN(2MIX)} = 1m \mu V_{rms}$ (AM = 30%)	0.49	0.7	0.91	V
RSSI output resistance	$R_{RSSI}$	-	80	100	120	$K\Omega$

APPLICATION CIRCUIT



# 20-SSOP-225

Dimensions in Millimeters/inches



SAMSUNG ELECTRONICS CO.,LTD.