

DATA SHEET

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MIKA7088T • FM RECEIVER CIRCUIT FOR BATTERY SUPPLY



REPLACEMENT
of TDA7088T

MIKA7088T

FM Receiver Circuit for Battery Supply

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GENERAL DESCRIPTION

The MIKA7088T is a bipolar integrated circuit for use in mono portable and pocket radios. It is used when a minimum of peripheral components (of small dimensions and low costs) is important. The circuit contains a Frequency-Locked-Loop (FLL) system with an Intermediate Frequency (IF) of about 70 kHz. Selectivity is achieved by active RC-filters. De-tuning related to the IF and too weak input signals are suppressed by the mute circuit.

APPLICATIONS

- Mechanical tuning; this is possible with or without integrating AFC circuit.
- Electrical tuning; this is realized by one directional (band-up) search tuning facility, including RESET to the lower-band limit.

FEATURES

- Equipped with all stages of a mono receiver from antenna to audio output
- Mute circuit
- Search tuning with a single varicap diode
- Mechanical tuning with integrating AFC
- AM application supported
- Power supply polarity protection
- Power supply voltage down to 1.8 V

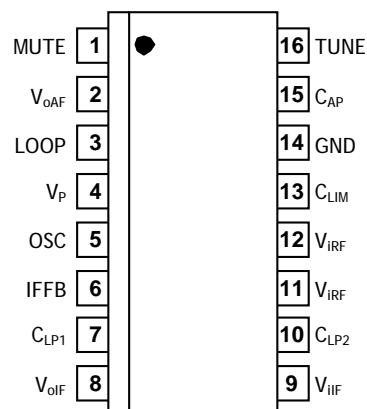
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_P	Supply voltage		1.8	3.0	5.0	V
I_P	Supply current		4.2	5.2	6.6	mA
f_{IRF}	Radio input frequency		0.5	—	110.0	MHz
$V_{i(rms)}$	RF sensitivity input voltage (RMS value)	$V_{oAF} = -3dB$; $V_{oAF} = 0dB$ at $V_i = -1mV$; Mute OFF	—	3	6.0	μV
	Signal handling	$\Delta f = \pm 75 kHz$; $THD < 10\%$	100	200	—	mV
$V_{o(rms)}$	Audio output signal (RMS value)	$R_L = 22k\Omega$	60	85	120	mV
T_{amb}	Operating ambient temperature		-10	—	+70	$^{\circ}C$

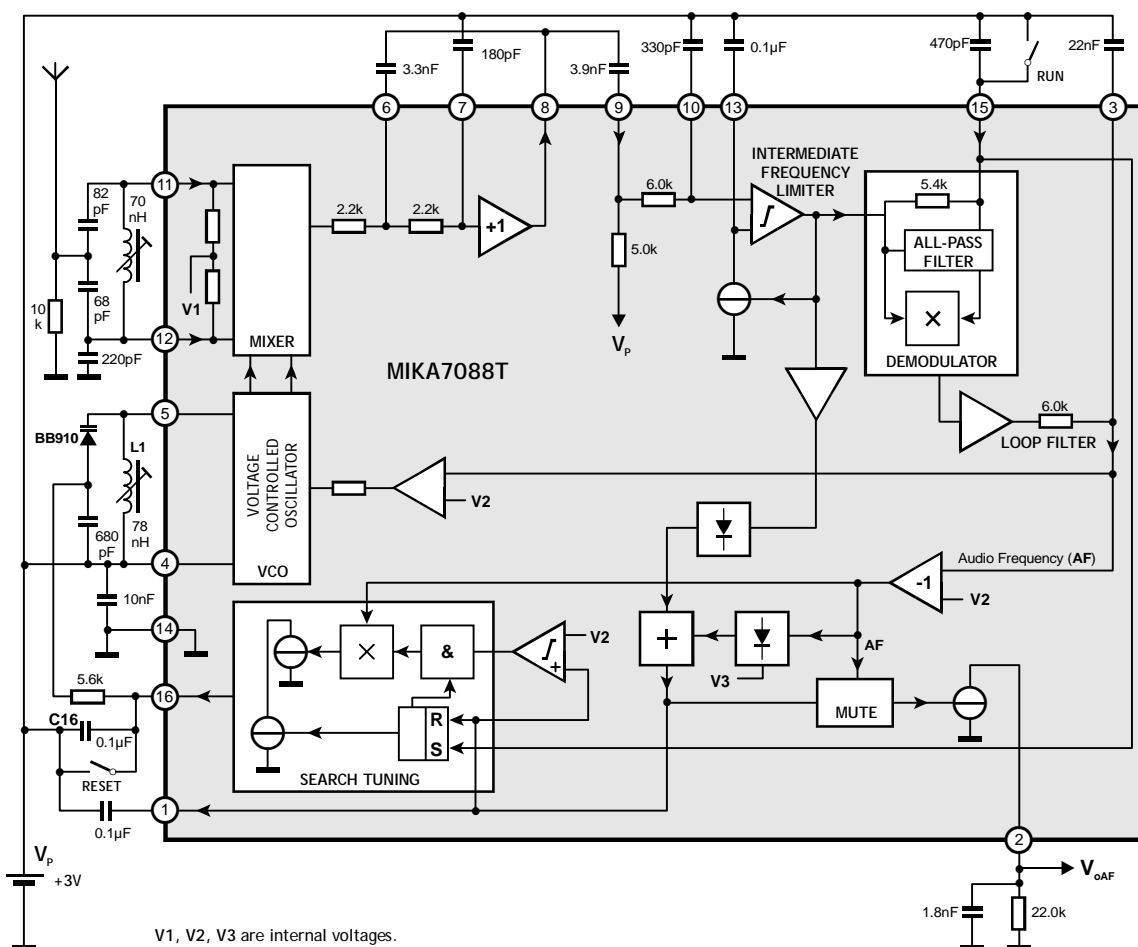


PIN DESCRIPTION & CONFIGURATION

PIN	SYMBOL	DESCRIPTION
1	MUTE	Mute output
2	V _{oAF}	Audio frequency output signal
3	LOOP	AF loop filter
4	V _P	+3 V supply voltage
5	OSC	Oscillator resonant circuit
6	IFFB	IF feedback
7	C _{LP1}	Low-pass capacitor of 1 db amplifier
8	V _{oIF}	IF output to external coupling capacitor (high-pass)
9	V _{IIF}	IF input to limiter amplifier
10	C _{LP2}	Low-pass capacitor of IF limiter amplifier
11	V _{IRF}	Radio frequency input
12	V _{IRF}	Radio frequency input
13	C _{LIM}	Limiter offset voltage capacitor
14	GND	Ground (0 V)
15	C _{AP}	All-pass filter capacitor / input for search tuning
16	TUNE	Electrical tuning / AFC output

SOP-16  MIKA7088T

BLOCK DIAGRAM & APPLICATION CIRCUIT FOR SEARCH TUNING





LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN	MAX	UNIT
V_P	Supply voltage	0	5	V
T_{stg}	Storage temperature	-55	+150	°C
T_{amb}	Operating ambient temperature	-10	+70	°C
V_{es}	Electrostatic handling; see Note 1	—	—	—

Note 1: There is no special ESD protection circuit built-in; ESD data on request.

DC CHARACTERISTICS

$V_P = 3V$; $T_{amb} = 25^\circ C$; unless otherwise specified.

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
V_P	Supply voltage (pin 4)	1.80	3.00	5.00	V
I_P	Supply current (pin 4)	4.00	4.80	6.00	mA
V_1	DC voltage on pin 1	2.50	2.55	2.60	V
V_3	DC voltage on pin 3	2.64	2.69	2.74	V
$V_{6,7}$	DC voltage on pins 6 and 7	2.40	2.60	2.80	V
V_8	DC voltage on pin 8	1.60	1.84	2.03	V
$V_{9,10,13}$	DC voltage on pins 9, 10 and 13	2.23	2.32	2.50	V
$V_{11,12}$	DC voltage on pins 11 and 12	0.88	0.94	0.98	V
V_{15}	DC voltage on pin 15	2.06	2.12	2.18	V
I_2	AF output current on pin 2	45.00	60.00	80.00	μA
I_5	Oscillator current on pin 5	275.00	375.00	500.00	μA

AC CHARACTERISTICS

$V_P=3V$; $T_{amb}=25^\circ C$; $f_{IRF}=96MHz$ modulated with $f_{mod}=1kHz$ and $\pm 22.5kHz$ deviation; $V_i=400\mu V$ (measured as EMF; $R_S=75\Omega$) and measurements taken in Fig.4 unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$V_{i(rms)}$	RF sensitivity input voltage (RMS value)	$V_{oAF} = -3dB$; $V_{oAF} = 0dB$ at $V_i = 1mV$; see Fig.3 Mute OFF Mute ON	— 3	3.0 6.0	6.0 12.0	μV μV
		$(S + N)/N = 26dB$	—	5.0	10.0	μV
	Signal handling	$\Delta f = \pm 75kHz$; $THD < 10\%$	100	200.0	—	mV
$(S + N)/N$	Signal plus noise-to-noise ratio	See Fig.3	52	56.0	—	dB
THD	Total harmonic distortion	$\Delta f = \pm 22.5kHz$;	—	1.0	1.4	%
		$\Delta f = \pm 75kHz$;	—	2.4	3.3	%
α_{AM}	AM suppression	FM: 1kHz; $\pm 75kHz$; AM: 1kHz; $m=0.8$	47	52.0	—	dB
RR_{1000}	Ripple rejection	100 mV RMS ripple on V_P ; $f = 1kHz$	7	10.0	—	dB
$V_{o(rms)}$	Audio output signal (RMS value)	$R_L = 22k\Omega$	60	85.0	120.0	mV
Search tuning (with BB910 and $C_{16} = 0.1\mu F$) see Fig.1						
V_{16}	Minimum output voltage on pin 16	Limiting point	—	$V_P - 1.85$	—	V
$\Delta V/\Delta t$	Tuning steepness	Voltage at pin 16	95.00	210.00	420.0	mV/s
$\Delta f_{osc}/\Delta t$	Oscillator steepness		1.25	2.83	5.6	MHz/s
$\Delta I_{AFC}/\Delta V_3$	AFC steepness	Voltage at pin 3	4.75	9.50	19.0	μA/V



INPUT SENSITIVITY DIAGRAM

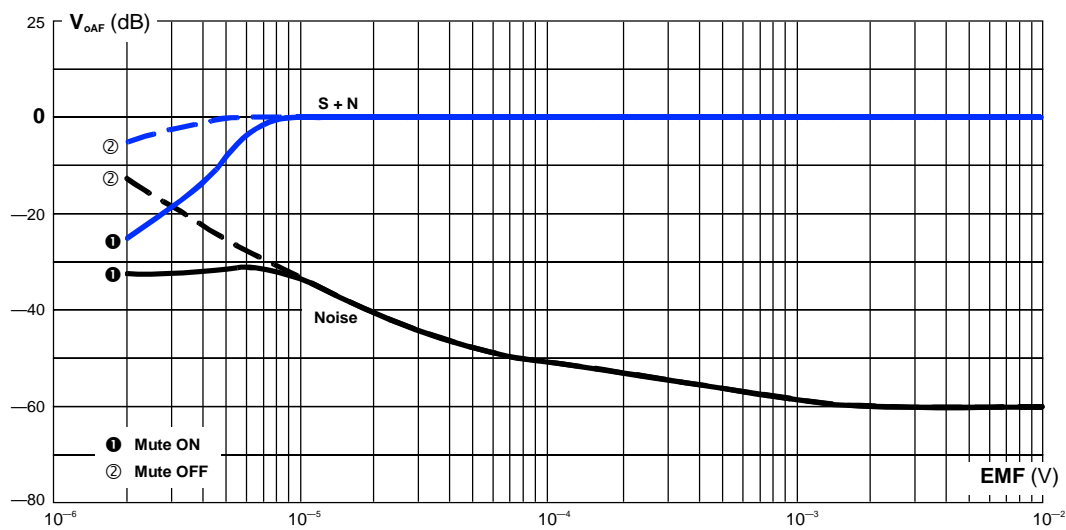


Fig. 3

TEST AND APPLICATION INFORMATION

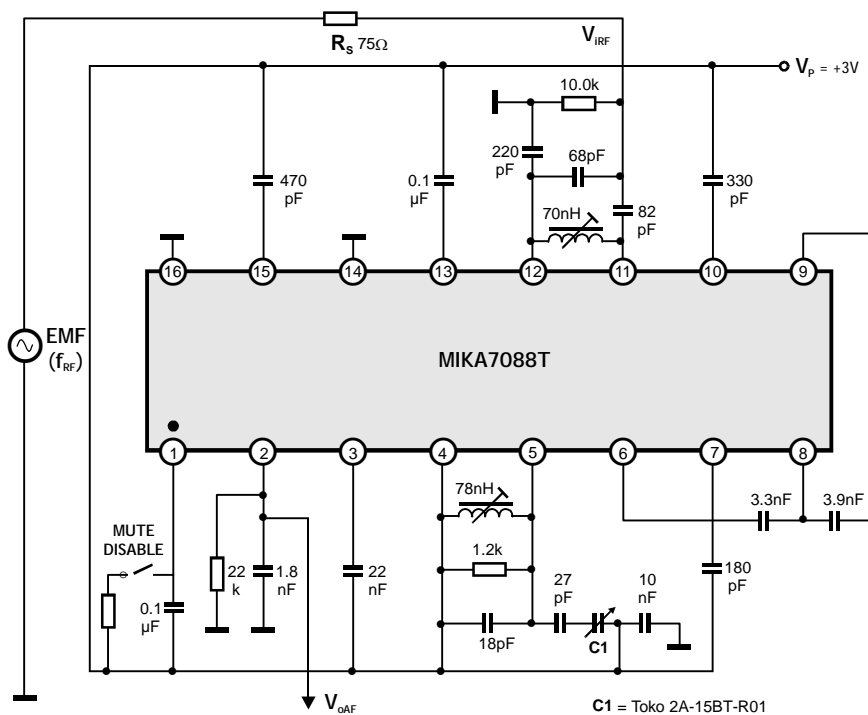
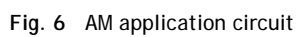
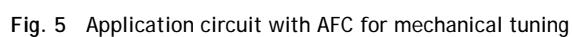


Fig. 4 Test circuit and application for mechanical tuning

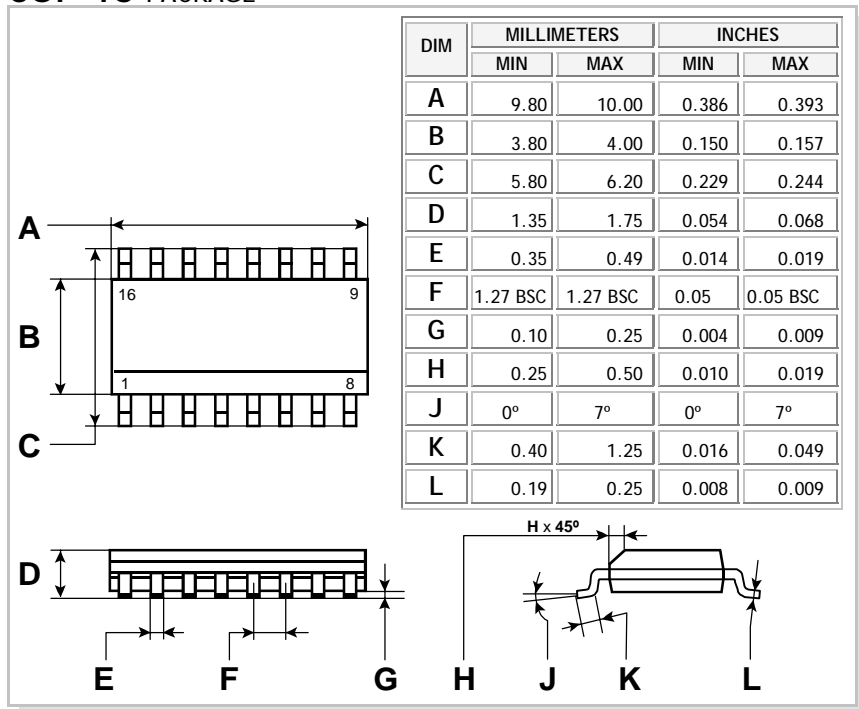
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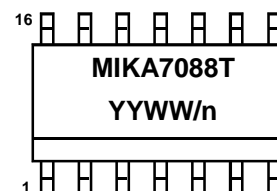
PHYSICAL DIMENSIONS & MARKING DIAGRAM

SOP-16 PACKAGE



SOP-16

MARKING DIAGRAM



ABBREVIATION	ABBREVIATION EXPANSION
YY	Year
WW	Work Week
n	Assembly Location

ORDERING INFORMATION

DEVICE	PACKAGE	OPERATING TEMPERATURE	SHIPPING
MIKA7088T	SOP-16	-10°C to +70°C	Tube/Rail and Tape/Reel

NOTE: THE FORM OF PACKING IS STIPULATED IN THE CONTRACT.

The information presented in this Data sheet is believed to be accurate and reliable. Application circuits shown are typical examples illustrating the operation of the device.
In the interest of product improvement, MIKRON reserves the right to change

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