

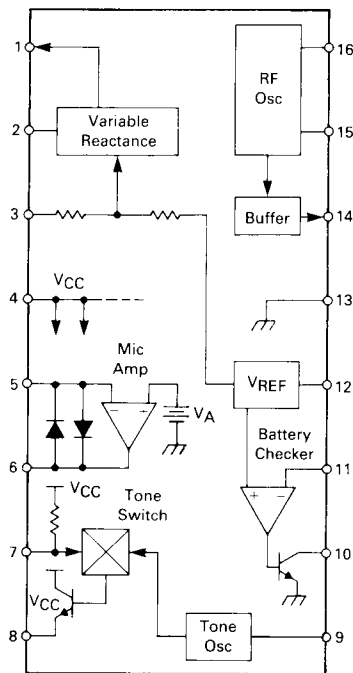
MOTOROLA SEMICONDUCTOR TECHNICAL DATA

LOW POWER FM TRANSMITTER SYSTEM

The MC2831A is a one-chip FM transmitter subsystem designed for cordless telephone and FM communication equipment. It includes a Microphone Amplifier, Pilot Tone Oscillator, Voltage Controlled Oscillator and Battery Monitor.

- Wide Range of Operating Supply Voltage (3.0 V–8.0 V)
- Low Drain Current (4.0 mA Typ Full Operation at $V_{CC} = 4.0$ V)
- Battery Checker (290 μ A Typ at $V_{CC} = 4.0$ V)
- Low Number of External Parts Required
- Users Must Comply with Local Regulations on R.F. Transmission (FCC, DOT, P.T.T., etc)

FUNCTIONAL BLOCK DIAGRAM



MC2831A

LOW POWER FM TRANSMITTER SYSTEM

SILICON MONOLITHIC INTEGRATED CIRCUIT

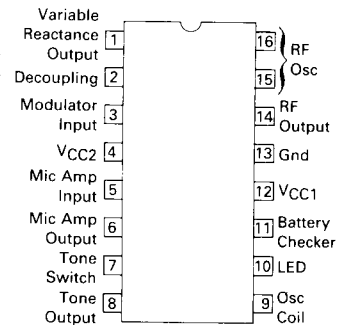


P SUFFIX
PLASTIC PACKAGE
CASE 648



D SUFFIX
PLASTIC PACKAGE
CASE 751B
(SO-16)

PIN ASSIGNMENTS



ORDERING INFORMATION

Device	Temperature Range	Package
MC2831AD	-30°C to +75°C	SO-16
MC2831AP		Plastic DIP

MC2831A

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Rating	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	10	Vdc
Operating Supply Voltage Range	V_{CC}	3.0 to 8.0	Vdc
Battery Checker Output Sink Current	I_{LED}	25	mA
Junction Temperature	T_J	+150	$^\circ\text{C}$
Operating Ambient Temperature Range	T_A	-30 to +75	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($V_{CC1} = 4.0\text{ Vdc}$, $V_{CC2} = 4.0\text{ Vdc}$, $T_A = 25^\circ\text{C}$, unless otherwise noted)

Characteristic	Symbol	Pin	Min	Typ	Max	Unit
Drain Current	I_{CC1}	12	150	290	420	μA
Drain Current	I_{CC2}	4	2.2	3.6	6.5	mA

BATTERY CHECKER

Threshold Voltage (LED Off $\rightarrow$ On)	V_{TB}	11	1.0	1.2	1.4	Vdc
Output Saturation Voltage (Pin 11 = 0 V, Pin 10 Sink Current = 5.0 mA)	V_{OSAT}	10	—	0.15	0.5	Vdc

MIC AMPLIFIER

Voltage Gain, Closed Loop ($V_{in} = 1.0\text{ mV}_{rms}$, $f_{in} = 1.0\text{ kHz}$)	A_V	5, 6	27	30	33	dB
Output DC Voltage	V_{Odc}	6	1.1	1.4	1.7	Vdc
Output Swing ($V_{in} = 30\text{ mV}_{rms}$, $f_{in} = 1.0\text{ kHz}$)	V_{OP-P}	6	0.8	1.2	1.6	Vp-p
Total Harmonic Distortion ($V_O = 31\text{ mV}_{rms}$, $f_{in} = 1.0\text{ kHz}$)	THD	6	—	0.7	—	%

PILOT TONE OSCILLATOR (250 Ω LOADING)

Output AF Voltage ($f_O = 5.0\text{ kHz}$)	V_{AFO}	8	—	50	—	mV_{rms}
Output DC Voltage	V_{Odc}	8	—	1.4	—	Vdc
Total Harmonic Distortion ($f_O = 5.0\text{ kHz}$, $V_{AF} = 150\text{ mV}_{rms}$)	THD	8	—	1.8	5.0	%
Tone Switch Threshold	—	7	1.1	1.4	1.7	Vdc

FM MODULATOR (120 Ω LOADING)

Output RF Voltage ($f_O = 16.6\text{ MHz}$)	V_{RFO}	14	—	40	—	mV_{rms}
Output DC Voltage	V_{Odc}	14	—	1.3	—	Vdc
Modulation Sensitivity (Note 1) ($V_{in} = 1.0\text{ V} \pm 0.2\text{ V}$)	SEN	3, 14	6.0	10	18	Hz mVdc
Maximum Deviation (Note 1) ($V_{in} = 0\text{ V to } +2.0\text{ V}$)	F_{dev}	3, 14	± 2.5	± 5.0	± 12.5	kHz
RF Frequency Range	—	14	—	—	60	MHz

Note 1. Modulation sensitivity and maximum deviation are measured at 49.815 MHz, which is the third harmonic of the crystal frequency.

MC2831A

FIGURE 1 — TEST CIRCUIT

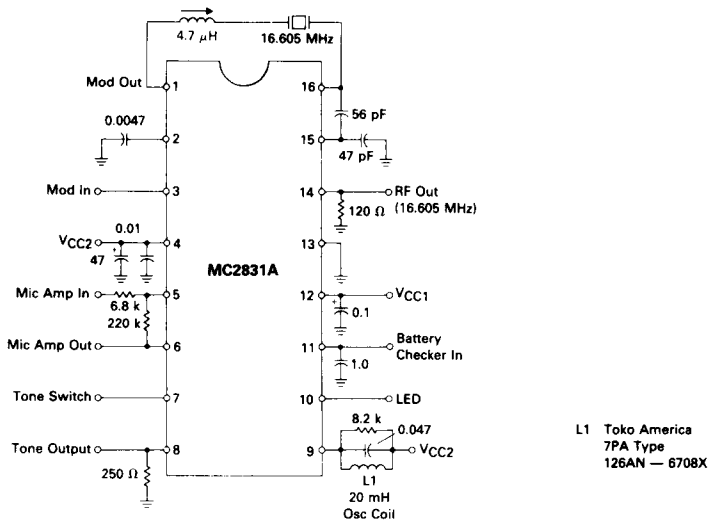
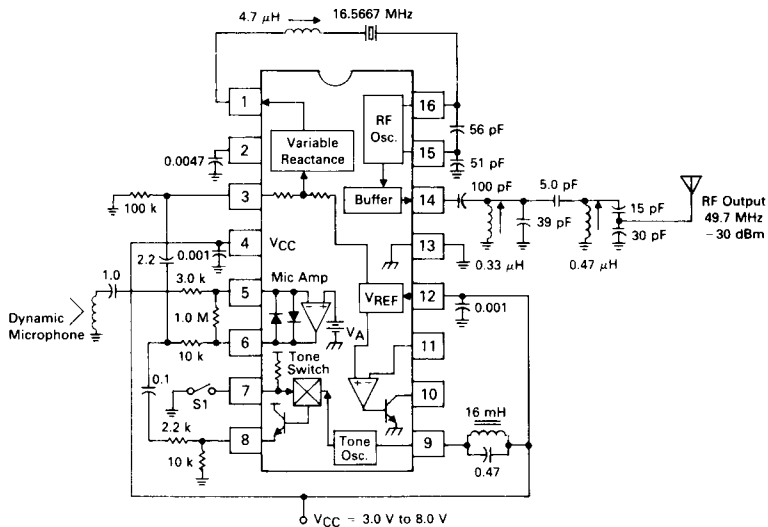


FIGURE 2 — SINGLE CHIP FM VHF TRANSMITTER AT 49.7 MHz



NOTES:

S1 is a normally closed push button type switch.

Battery checker circuit (Pins 10, 11) is not used in this application.

The crystal used is fundamental mode, calibrated for parallel resonance with a 32 pF load. The 49.7 MHz output is generated in the output buffer, which generates useful harmonics to 60 MHz.

All capacitors in microfarads, inductors in Henries and resistors in Ohms, unless otherwise specified.

The network on the output at Pin 14 provides output tuning and impedance matching to 50 Ω at 49.7 MHz. Harmonics are suppressed by more than 25 dB.