



LINEAR INTEGRATED CIRCUITS DATA

AN217

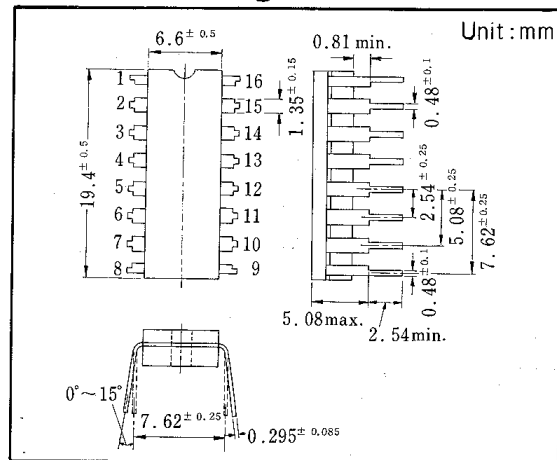
AM-RF AMPLIFIER, MIXER, OSCILLATOR and FM/AM-IF AMPLIFIER CIRCUIT

The AN217 is a monolithic integrated circuit designed for FM/AM radio receiver applications. In this device, FM and AM circuits are separated from each other. The AM section consists of an AM-RF amplifier, a frequency convertor and an IF amplifier circuit. The FM section consists of an IF amplifier circuit. The device is particularly suitable for home radio receivers, auto-radio receivers and stereo applications.

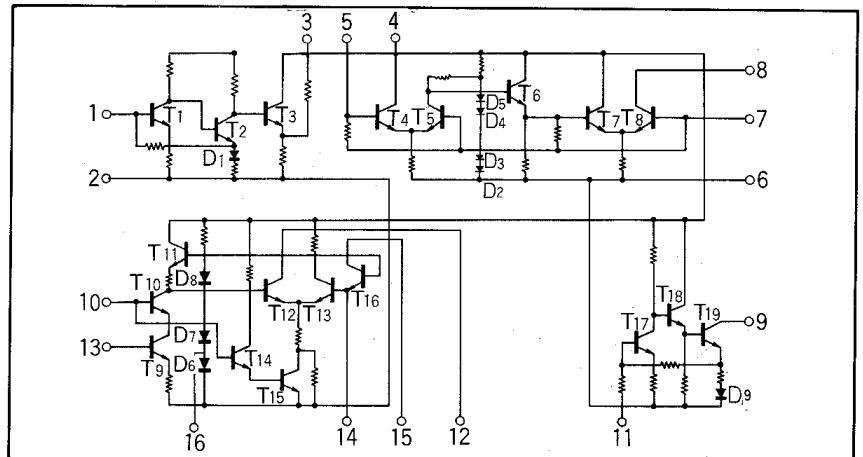
Features:

- * Improved stability can be obtained, since the FM and AM sections are separated from each other.
- * Both FM and AM circuits can be connected to ceramic filters, enabling adjustment-free operation.
- * A high performance RF amplifier is included in the AM section.

Outline Drawing



Equivalent Circuit



Quick Reference Data

Item	Symbol	Value	Unit	Note
Supply Voltage	Vcc	4~9.5	V	
Voltage Gain	Gv	Typ. 80	dB	
Detection Output	Vo	Typ. 250	mV	
Maximum Sensitivity	Max Sens.	30	$\mu\text{V}/\text{m}$	AF AMP GV=56dB
Maximum Input	Max Input	3	V/m	

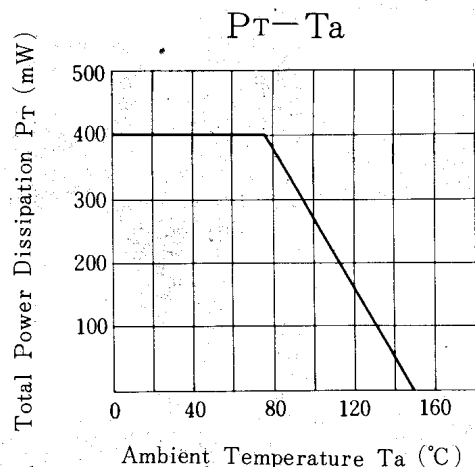
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Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

Item	Symbol	Rating	Unit
Operating Ambient Temperature Range	T_{opr}	$-20 \sim +75$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-65 \sim +150$	$^\circ\text{C}$
Collector Breakdown Voltage (T8, T16)	V_{CEX}	16	V
Supply Voltage	V_{cc}	9.5	V
Total Current Consumption	I_{tot}	40	mA
Total Power Dissipation	P_T	400	mW

Electrical Characteristics ($T_a=25^\circ\text{C}$)

Item	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Circuit Voltage	V_{3-2}	Test Circuit 1. $V_{cc}=6\text{V}$	1.05		5.5	V
	V_{4-8}	Test Circuit 2. $V_{cc}=6\text{V}$, $R=100\Omega$	35	150	250	mV
	V_{7-6}	Test Circuit 2. $V_{cc}=6\text{V}$	0.8	1.18	1.45	V
	V_{4-9}	Test Circuit 3. $V_{cc}=6\text{V}$, $R=100\Omega$	25	150	320	mV
Total Current Consumption	I_{tot}	Test Circuit 4. $V_{cc}=6\text{V}$	6	20	40	mA
Bias Reference Voltage	V_{16-2}	Test Circuit 1. $V_{cc}=6\text{V}$	0.6		0.9	V
Circuit Voltage	V_{4-12}	Test Circuit 5. $V_{cc}=6\text{V}$, $R=100\Omega$		60	165	mV
	V_{4-12}	Test Circuit 6. $V_{cc}=6\text{V}$, $R=100\Omega$			25	mV
	V_{4-15}	Test Circuit 7. $V_{cc}=6\text{V}$, $R=120\Omega$	45	130	220	mV
FM-IF Detection Output Voltage	$V_o(\text{FM})$	Test Circuit 8. $V_{cc}=-6\text{V}$	17		76	mV
AM-IF Detection Output Voltage	$V_o(\text{AM})$	Test Circuit 8. $V_{cc}=-6\text{V}$	14.5		42	mV



Function of Transistors

- T1~T3: FM-IF Direct-Coupled Amplifier
- T4, T5: FM-IF First Limiter
- T6: Emitter Follower
- T7, T8: FM-IF Second Limiter
- T9: AM-RF Amplifier
- T10, T14, T15: AM-AGC
- T11: Bias Stabilizing
- T12: Mixer
- T13: Tuning
- T16: Oscillation
- T17~T19: AM-IF Direct-Coupled Amplifier