

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1265G

ONE CHIP FM TUNER

DESCRIPTION

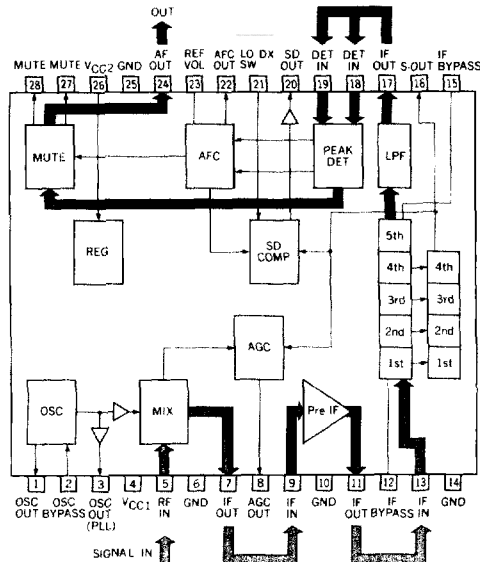
The μ PC1265G is a monolithic integrated circuit used in FM tuner for car radio or car stereo.

The system consists of a mixer, an oscillator, an oscillator buffer, a pre amplifier, a five-stage differential amplifier and a differential peak detector, including AGC for RF, muting circuit, signal meter circuit, AFC for local OSC, and stop function (stations detector) for digital tuning system (DTS) as additional circuits.

FEATURES

- One chip FM tuner (FM front-end + IF system).
- High sensitivity.
- Built in double balanced mixer (D.B.M).
- Built in differential peak detector.
- Few external parts.
- Occupation of minimum area in P.W. board.

BLOCK DIAGRAM (Top View)



ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

DC Supply Voltage	V _{CC}	12	V
Input Voltage	V _I	3	V _{p-p}
Package Dissipation	P _D	470 (T _a = +75 °C)	mW
Operating Temperature	T _{opt}	-30 to +75	°C
Storage Temperature	T _{stg}	-40 to +125	°C

RECOMMENDED OPERATING CONDITION (T_a = 25 °C)

DC Supply Voltage Range	V _{CC}	7.5 to 10 V
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ELECTRICAL CHARACTERISTICS

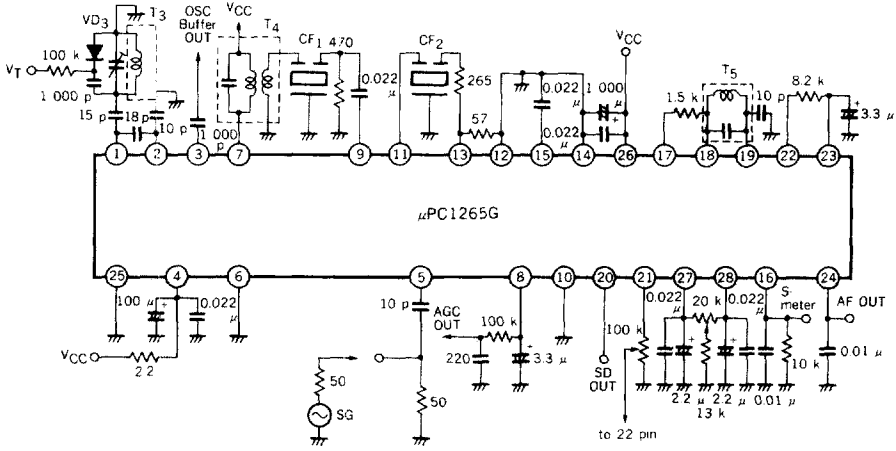
(T_a = 25 °C, V_{CC} = 8.5 V, f = 83 MHz, f_{mod} = 400 Hz, Δf = ±22.5 kHz)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Circuit Current	I _{CC}		31	42	mA	No Signal
Limiting Sensitivity	V _{i(limit)}	33	43	53	dBμV	V _o = V _{OAF} - 3 dB
Signal-to-Noise Ratio	S/N ₁	25	30		dB	V _i = 45 dBμV
	S/N ₂	58	65		dB	V _i = 100 dBμV
Detector Output Voltage	V _{OAF}	90	140	185	mV _{r.m.s.}	V _i = 100 dBμV
Harmonic Distortion	THD		0.2	1.2	%	V _i = 100 dBμV
AM Rejection	AMR	28	40		dB	V _i = 100 dBμV, AM: 400 Hz, 30 %
Signal Meter Output Voltage	V _{S1}		0.1	0.5	V	V _i = 40 dBμV
	V _{S2}	0.5	2.5	4.2	V	V _i = 70 dBμV
	V _{S3}	2.8	5.0	6.5	V	V _i = 100 dBμV
AGC Output Voltage	V _{AGC1}	7.5			V	V _i = 50 dBμV
	V _{AGC2}			0.5	V	V _i = 120 dBμV
SD Output Voltage	V _{SD1}	6.5			V	V _i = 0 dBμV
	V _{SD2}			0.5	V	V _i = 100 dBμV
Stop Signal Band-width	BW _{SD}	50	85	130	kHz	V _i = 100 dBμV

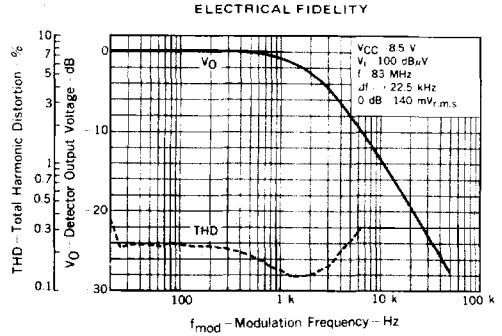
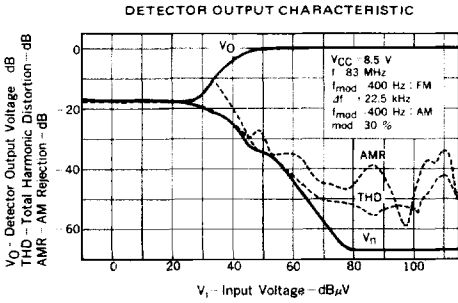
TEST CIRCUIT

T₃ : E525HNS-100084 (TOKO) T₄ : 119AC-13695A (TOKO) T₅ : 119ACS-14891Z (TOKO)
CF₁, CF₂ : SFE10.7MS2 (MURATA)

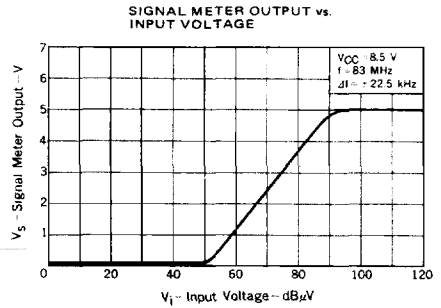
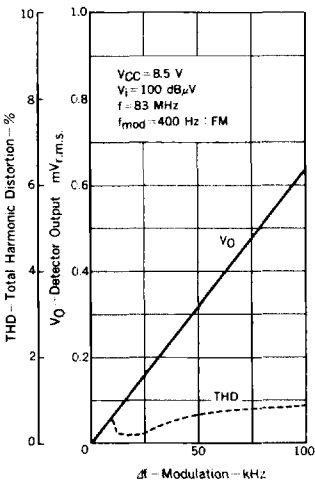
Unit Resistor : Ω
Capacitor : F



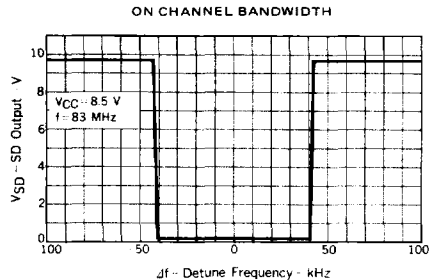
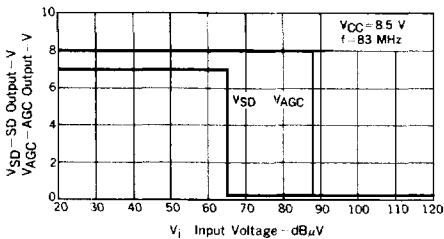
TYPICAL CHARACTERISTICS (T_a = 25 °C)



DETECTOR OUTPUT AND TOTAL HARMONIC DISTORTION vs. MODULATION

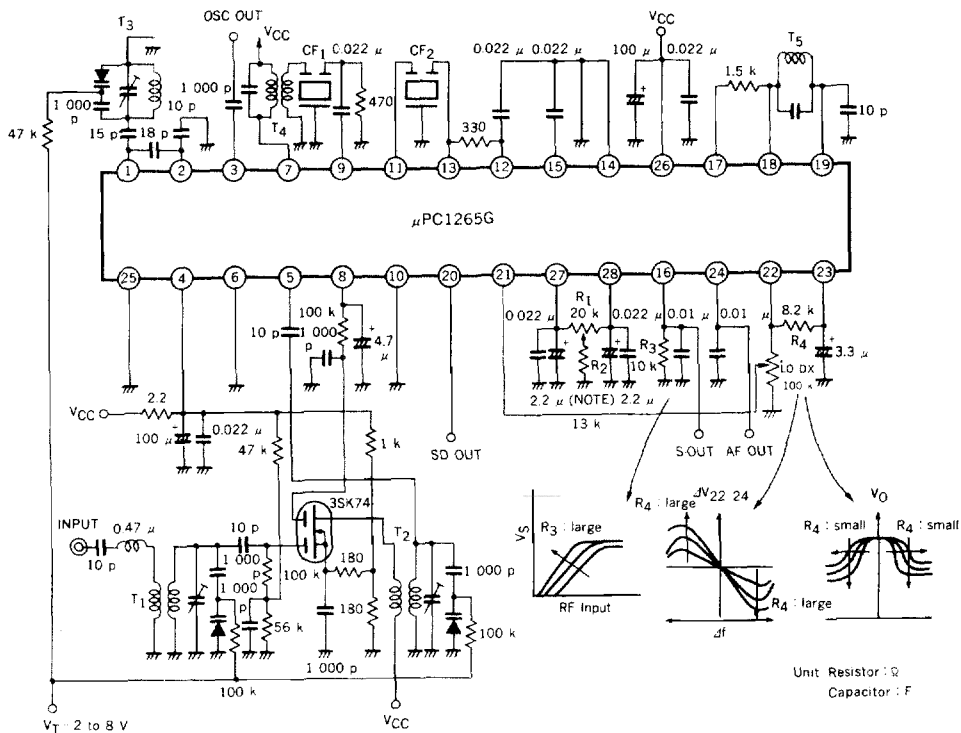


AGC OUTPUT AND SD OUTPUT vs. INPUT VOLTAGE



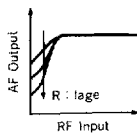
μPC1265G ADDITIONAL FUNCTION CHARACTERISTICS

T₁, T₂ : E525HNS-200076 (TOKO) CF₁, CF₂ : SFE10 7MS2 (MURATA)
 T₃ : E525HNS-100084 (TOKO)
 T₄ : 119AC-13695A (TOKO)
 T₅ : 119ACS-14891Z (TOKO)

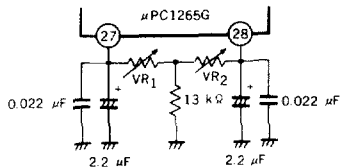
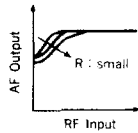


(NOTE) Limiting Characteristics

(1) VR₁ : Limiting Attenuation Setting

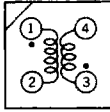


(2) VR₂ : Limiting Sensitivity Setting



COIL DATA (TOKO INC.)

T₁, T₂ : RF Coil



MC-119

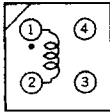
E525HNS-200076

①-② ③-④

3 1/4 T 1 1/4 T

L ≈ 80 nH, Q_U > 110 (f = 100 MHz)

T₃ : OSC Coil



MC-119

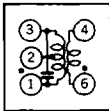
E525HNS-100084

①-②

4 1/4 T

L ≈ 120 nH, Q_U > 110 (f = 100 MHz)

T₄ : IFT Coil



119AC-13695A

①-③ ①-② ②-③ ⑥-④

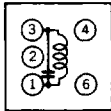
14T 3T 11T 2T

f_T = 10.7 MHz

Q_U > 77

C_T = 47 pF

T₅ : DET Coil



119ACS-14891Z

①-③

21T

C_T = 22 pF

Q_U > 90

CERAMIC FILTER (MURATA)

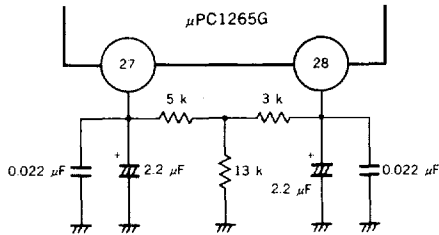
CF₁, CF₂ : SFE10.7MS2

OVERALL CHARACTERISTICS

($T_a = 25\text{ }^\circ\text{C}$, $V_{CC} = 10\text{ V}$, $f = 83\text{ MHz}$, $f_{mod} = 400\text{ Hz}$, $\Delta f = \pm 22.5\text{ kHz}$)

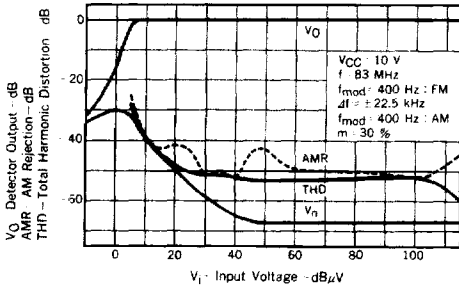
CHARACTERISTIC	SYMBOL	VALUE	UNIT	TEST CONDITION
Limiting Sensitivity	$V_{i(\text{limit})}$	4	$\text{dB}\mu\text{V}$	$V_o = V_{OAF} - 3\text{ dB}$
Usable Sensitivity	US	5	$\text{dB}\mu\text{V}$	$S/N = 30\text{ dB}$
Det. Output Voltage	V_{OAF}	140	$\text{mV}_{r.m.s.}$	$V_i = 55\text{ dB}\mu\text{V}$
Signal-to-Noise Ratio	S/N	67	dB	$V_i = 55\text{ dB}\mu\text{V}$
Total Harmonic Distortion	THD ₁	0.23	%	$V_i = 55\text{ dB}\mu\text{V}$
	THD ₂	0.65	%	$V_i = 55\text{ dB}\mu\text{V}$, $\Delta f = \pm 75\text{ kHz}$
	THD ₃	0.13	%	$V_i = 120\text{ dB}\mu\text{V}$
AM Rejection	AMR	47	dB	$V_i = 55\text{ dB}\mu\text{V}$, AM: 400 Hz, 30 %
Signal Meter Output	V_{S1}	0.5	V	$V_i = 0\text{ dB}\mu\text{V}$
	V_{S2}	2.9	V	$V_i = 20\text{ dB}\mu\text{V}$
	V_{S3}	5	V	$V_i = 100\text{ dB}\mu\text{V}$
AGC Sensitivity	S_{AGC}	50	$\text{dB}\mu\text{V}$	$V_{AGC} = 0.5 V_{CC}$
SD Sensitivity	SS	15	$\text{dB}\mu\text{V}$	
SD Bandwidth	BW_{SD}	85	kHz	$V_i = 55\text{ dB}\mu\text{V}$
AFC Voltage	V_{AFC}	5.23	V	
AFC Sensitivity	S_{AFC}	7.9	mV/kHz	
OSC Buffer Output	$V_{osc-out}$	200	mV_{p-p}	
IF Rejection	IFR	> 127	dB	$f = 76\text{ MHz}$
Image Rejection	IMR	44	dB	$f = 90\text{ MHz}$

Limiting Sensitivity Setting Condition

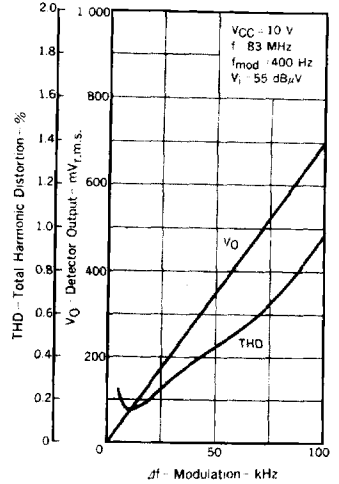


TYPICAL ALLOVER CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

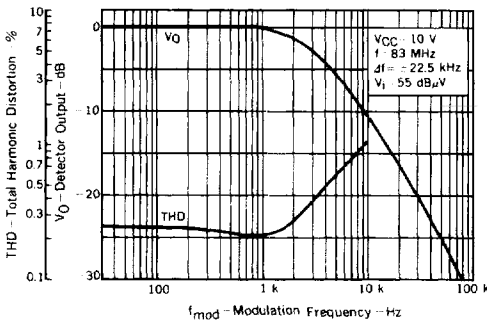
DETECTOR OUTPUT CHARACTERISTIC



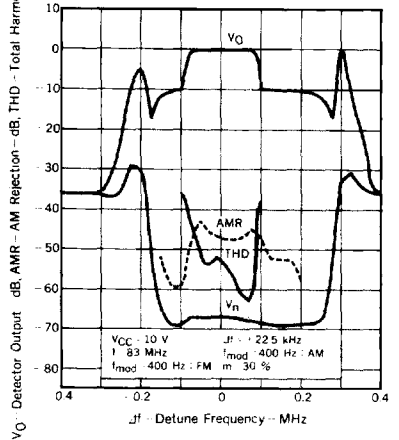
DETECTOR OUTPUT AND TOTAL HARMONIC DISTORTION vs. MODULATION



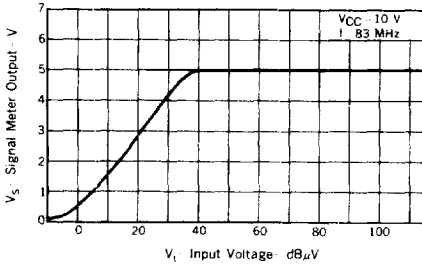
ELECTRICAL FIDELITY



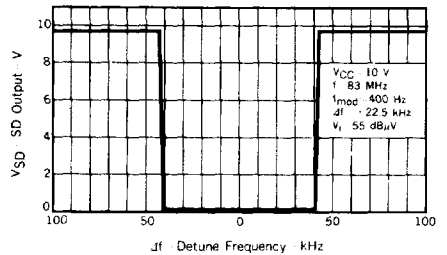
DETUNE FREQUENCY CHARACTERISTIC



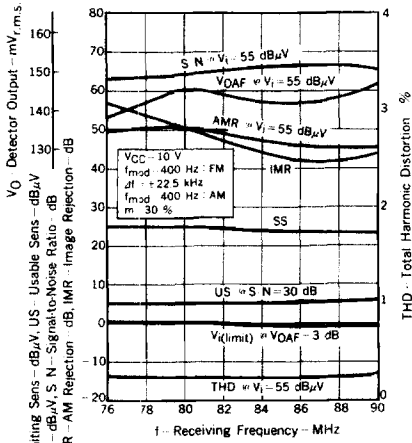
SIGNAL METER OUTPUT vs. INPUT VOLTAGE



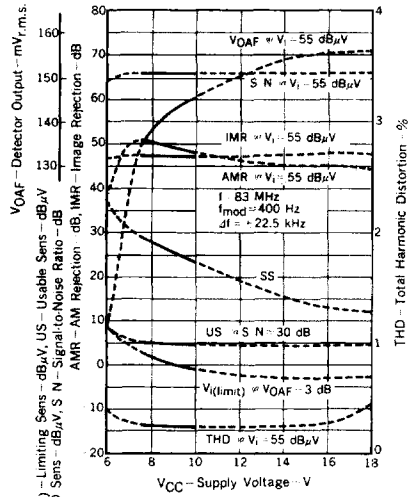
ON CHANNEL BANDWIDTH



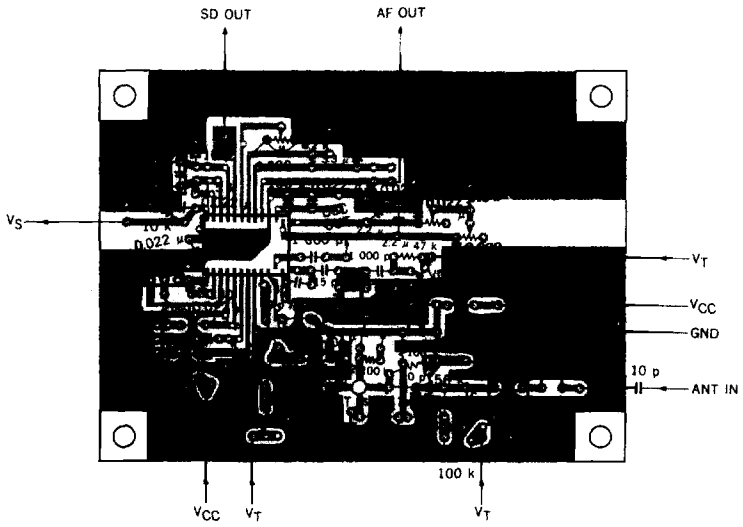
RECEIVING FREQUENCY CHARACTERISTICS



SUPPLY VOLTAGE CHARACTERISTICS

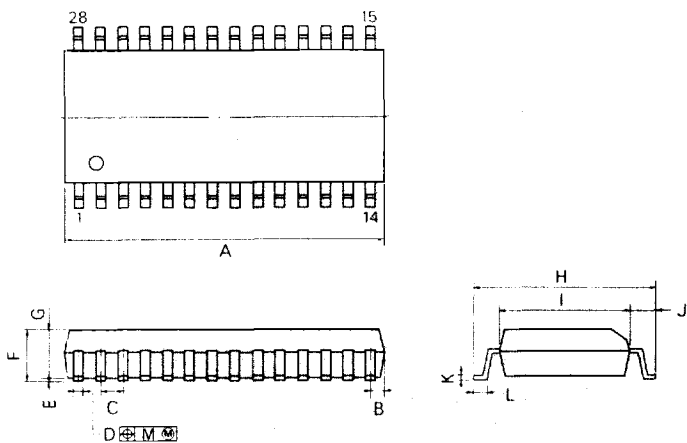


PRINTED-CIRCUIT BOARD (Copper side)



T_1, T_2 : E525HNS-200076 (TOKO)
 T_3 : E525HNS-100084 (TOKO)
 T_4 : 119AC-13695A (TOKO)
 T_5 : 119ACS-14891Z (TOKO)
 CF_1, CF_2 : SFE10.7MS2 (MURATA)

28PIN PLASTIC SOP (375 mil)



P28GM-50-375B

NOTE

Each lead centerline is located within 0.12 mm (0.005 inch) of its true position (T.P.) at maximum material condition.

ITEM	MILLIMETERS	INCHES
A	18.07 MAX.	0.712 MAX.
B	0.78 MAX.	0.031 MAX.
C	1.27 (T.P.)	0.050 (T.P.)
D	0.40 ^{+0.10} / _{0.05}	0.016 ^{+0.004} / _{0.003}
E	0.1 ^{+0.1}	0.004 ^{+0.004}
F	2.9 MAX.	0.115 MAX.
G	2.50	0.098
H	10.3 ^{+0.3}	0.406 ^{+0.013} / _{0.013}
I	7.2	0.283
J	1.6	0.063
K	0.15 ^{+0.05} / _{0.05}	0.006 ^{+0.002} / _{0.002}
L	0.8 ^{+0.2}	0.031 ^{+0.008} / _{0.008}
M	0.12	0.005