

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1265G

ONE CHIP FM TUNER

DESCRIPTION

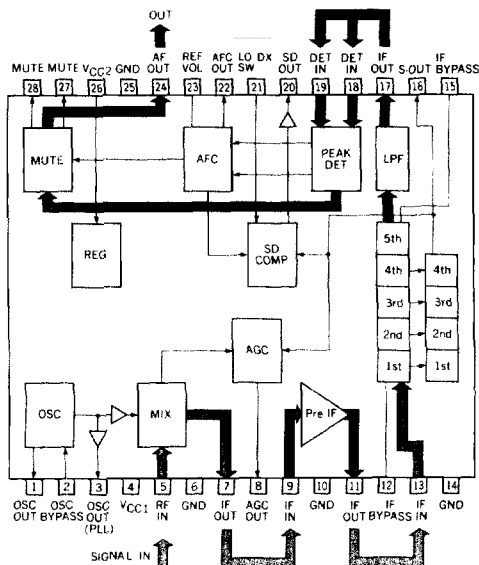
The μ PC1265G is a monolithic integrated circuit used in FM tuner for car radio or car stereo.

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

DC Supply Voltage	V_{CC}	12	V
Input Voltage	V_I	3	V_{p-p}
Package Dissipation	P_D	470 ($T_a = +75^\circ\text{C}$)	mW
Operating Temperature	T_{opT}	-30 to +75	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITION ($T_a = 25^\circ\text{C}$)

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

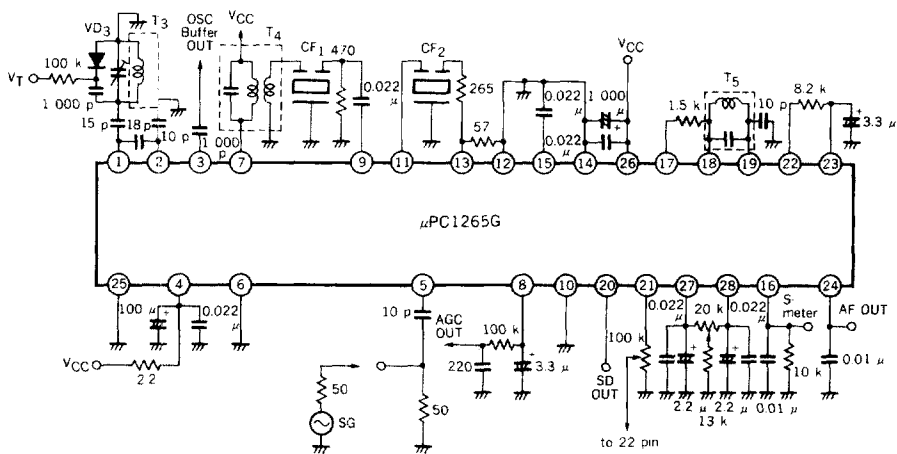
($T_a = 25^\circ\text{C}$, $V_{CC} = 8.5\text{ V}$, $f = 83\text{ MHz}$, $f_{mod} = 400\text{ Hz}$, $\Delta f = \pm 22.5\text{ kHz}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Circuit Current	I_{CC}		31	42	mA	No Signal
Limiting Sensitivity	$V_{i(limit)}$	33	43	53	dB μ V	$V_o = V_{OAF} - 3\text{ dB}$
Signal-to-Noise Ratio	S/N_1	25	30		dB	$V_i = 45\text{ dB}\mu\text{V}$
	S/N_2	58	65		dB	$V_i = 100\text{ dB}\mu\text{V}$
Detector Output Voltage	V_{OAF}	90	140	185	mV _{r.m.s.}	$V_i = 100\text{ dB}\mu\text{V}$
Harmonic Distortion	THD		0.2	1.2	%	$V_i = 100\text{ dB}\mu\text{V}$
AM Rejection	AMR	28	40		dB	$V_i = 100\text{ dB}\mu\text{V}$, AM: 400 Hz, 30 %
Signal Meter Output Voltage	V_{S1}		0.1	0.5	V	$V_i = 40\text{ dB}\mu\text{V}$
	V_{S2}	0.5	2.5	4.2	V	$V_i = 70\text{ dB}\mu\text{V}$
	V_{S3}	2.8	5.0	6.5	V	$V_i = 100\text{ dB}\mu\text{V}$
AGC Output Voltage	V_{AGC1}	7.5			V	$V_i = 50\text{ dB}\mu\text{V}$
	V_{AGC2}			0.5	V	$V_i = 120\text{ dB}\mu\text{V}$
SD Output Voltage	V_{SD1}	6.5			V	$V_i = 0\text{ dB}\mu\text{V}$
	V_{SD2}			0.5	V	$V_i = 100\text{ dB}\mu\text{V}$
Stop Signal Band-width	BW_{SD}	50	85	130	kHz	$V_i = 100\text{ dB}\mu\text{V}$

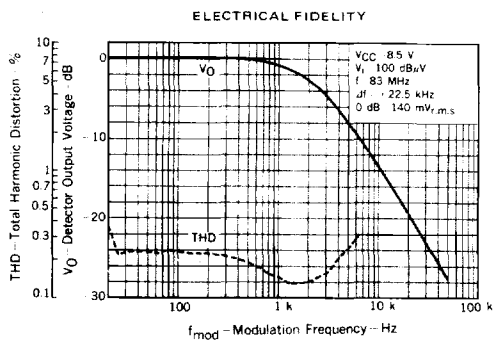
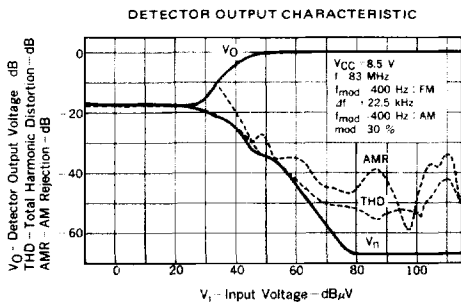
TEST CIRCUIT

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

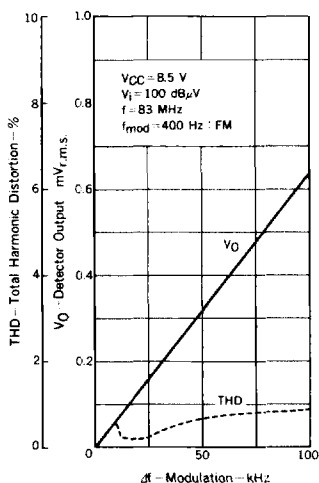
Unit Resistor : Ω
 Capacitor : F



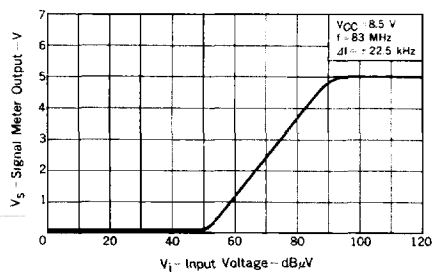
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



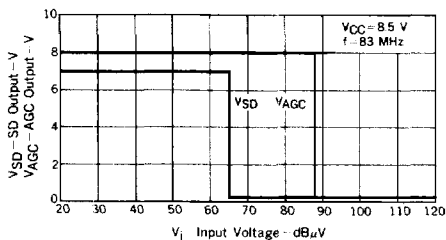
DETECTOR OUTPUT AND TOTAL HARMONIC DISTORTION vs. MODULATION



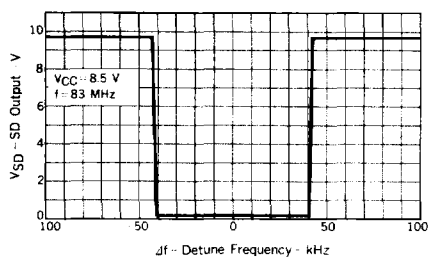
SIGNAL METER OUTPUT vs. INPUT VOLTAGE



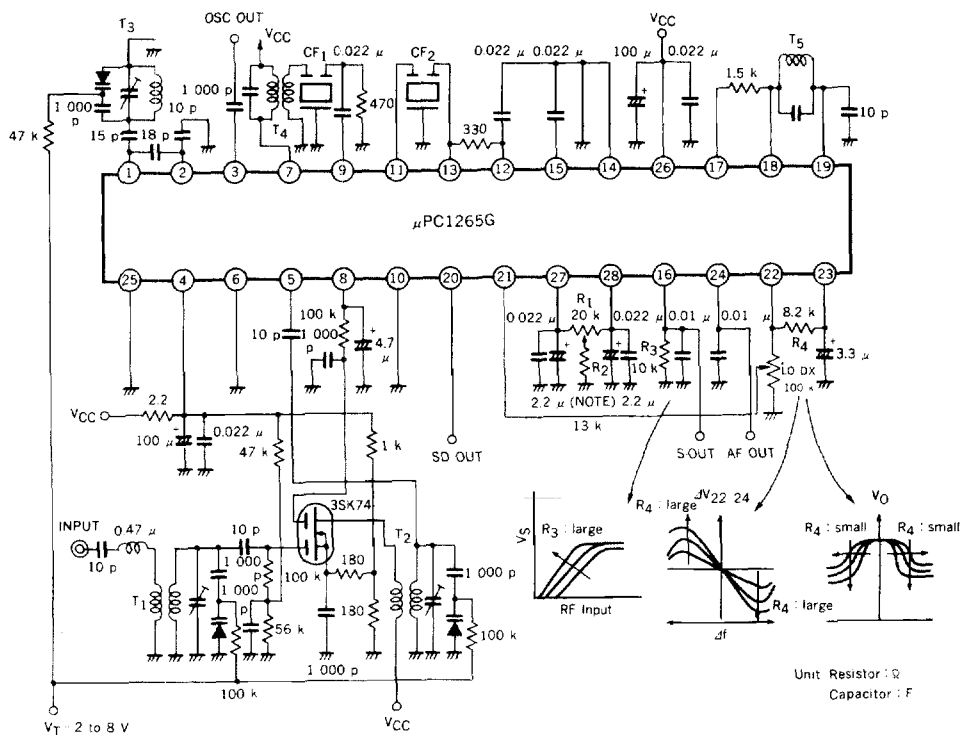
AGC OUTPUT AND SD OUTPUT vs. INPUT VOLTAGE



ON CHANNEL BANDWIDTH

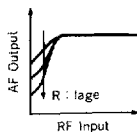


T₁, T₂ : E525HNS-200076 (TOKO) CF₁, CF₂ : SFE10 7MS2 (MURATA)
T₃ : E525HNS-100084 (TOKO)
T₄ : 119AC-13695A (TOKO)
T₅ : 119ACS-14891Z (TOKO)

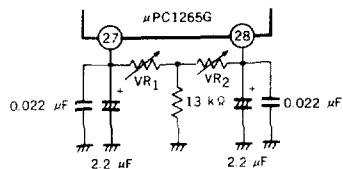
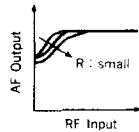


(NOTE) Limiting Characteristics

(1) VR_1 : Limiting Attenuation Setting

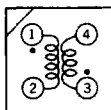


(2) VR_2 : Limiting Sensitivity Setting



COIL DATA (TOKO INC.)

T₁, T₂ : RF Coil



MC-119

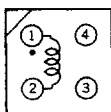
E525HNS-200076

①-② ③-④

3 1/4 T 1 1/4 T

$L \approx 80$ nH, $Q_u > 110$ ($f = 100$ MHz)

T₃ : OSC Coil



MC-119

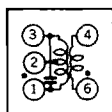
E525HNS-100084

①-②

4 1/4 T

$L \approx 120$ nH, $Q_u > 110$ ($f = 100$ MHz)

T₄ : IFT Coil



119AC-13695A

①-③ ①-② ②-③ ⑥-④

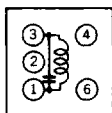
14T 3T 11T 2T

$f_T = 10.7$ 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)

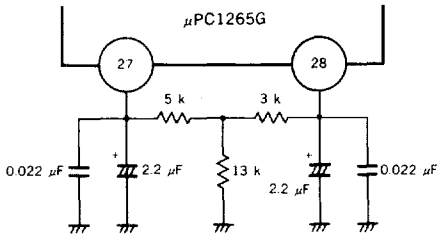
CF₁, CF₂ : SFE10.7MS2

OVERALL CHARACTERISTICS

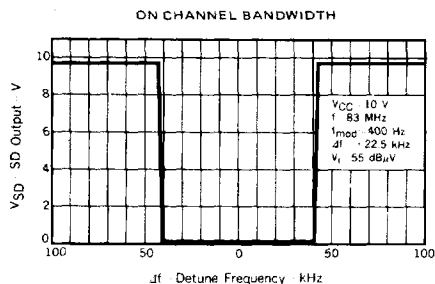
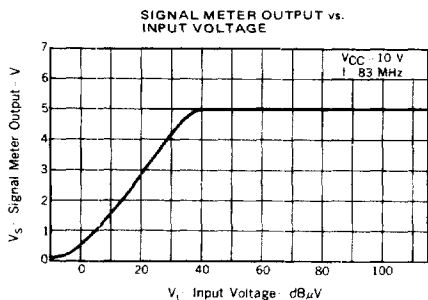
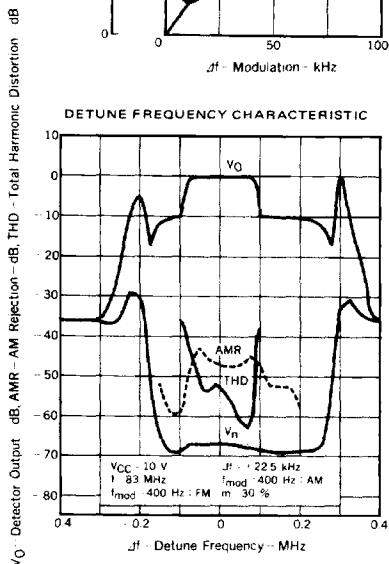
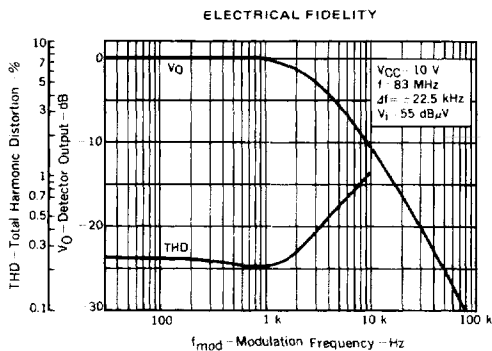
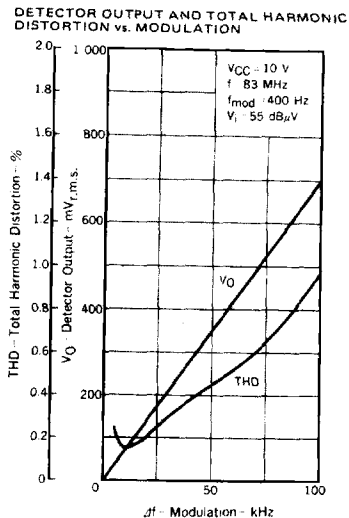
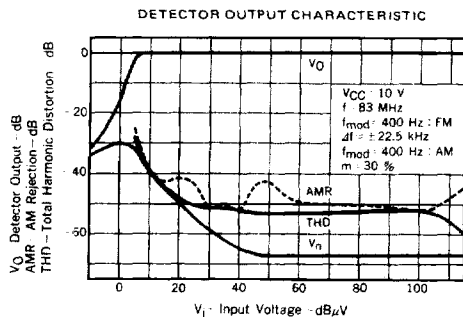
(T_a = 25 °C, V_{CC} = 10 V, f = 83 MHz, f_{mod} = 400 Hz, Δf = ±22.5 kHz)

CHARACTERISTIC	SYMBOL	VALUE	UNIT	TEST CONDITION
Limiting Sensitivity	V _{i(limit)}	4	dBμV	V _O = V _{OAF} - 3 dB
Usable Sensitivity	US	5	dBμV	S/N = 30 dB
Det. Output Voltage	V _{OAF}	140	mV _{r.m.s.}	V _i = 55 dBμV
Signal-to-Noise Ratio	S/N	67	dB	V _i = 55 dBμV
Total Harmonic Distortion	THD ₁	0.23	%	V _i = 55 dBμV
	THD ₂	0.65	%	V _i = 55 dBμV, Δf = ±75 kHz
	THD ₃	0.13	%	V _i = 120 dBμV
AM Rejection	AMR	47	dB	V _i = 55 dBμV, AM: 400 Hz, 30 %
Signal Meter Output	V _{S1}	0.5	V	V _i = 0 dBμV
	V _{S2}	2.9	V	V _i = 20 dBμV
	V _{S3}	5	V	V _i = 100 dBμV
AGC Sensitivity	S _{AGC}	50	dBμV	V _{AGC} = 0.5 V _{CC}
SD Sensitivity	SS	15	dBμV	
SD Bandwidth	BW _{SD}	85	kHz	V _i = 55 dBμV
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 MHz
Image Rejection	IMR	44	dB	f = 90 MHz

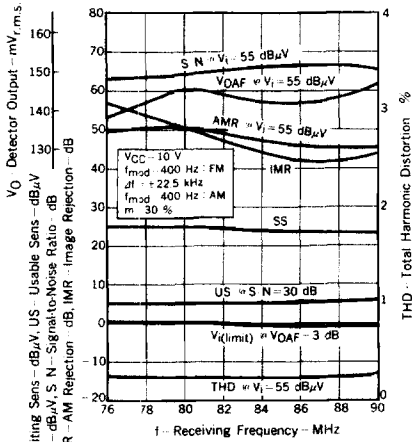
Limiting Sensitivity Setting Condition



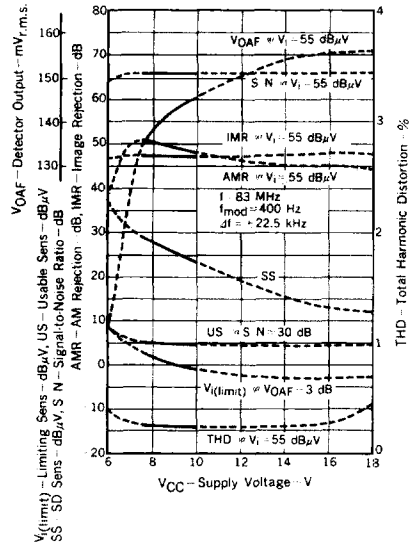
TYPICAL ALLOVER CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



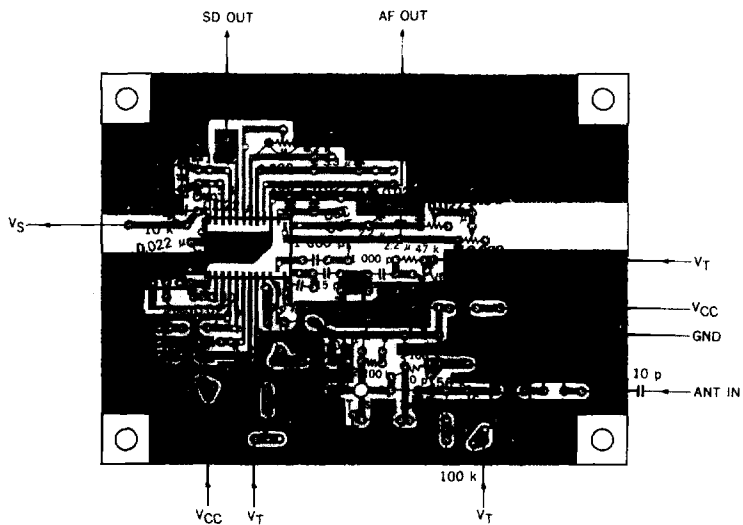
RECEIVING FREQUENCY CHARACTERISTICS



SUPPLY VOLTAGE CHARACTERISTICS

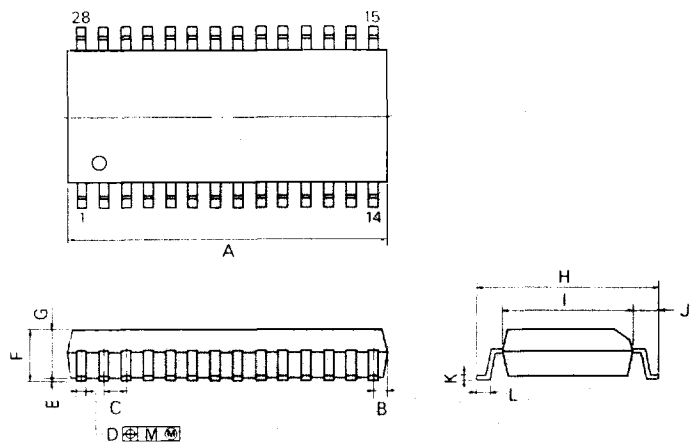


PRINTED-CIRCUIT BOARD (Copper side)



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} _{-0.08}	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 ^{+0.012} _{-0.013}
I	7.2	0.283
J	1.6	0.063
K	0.15 ^{+0.08} _{-0.05}	0.006 ^{+0.004} _{-0.002}
L	0.8 ^{+0.2}	0.031 ^{+0.009} _{-0.008}
M	0.12	0.005