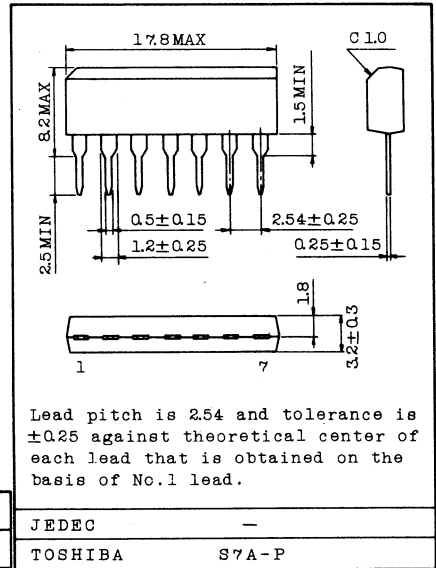


TA7130P

FOR FM IF AMPLIFIER AMPLIFIER AND DETECTOR

Unit in mm

- 3 Stage Differential IF Amplifier.
- Differential Peak Detector.
- Excellent AM Rejection : AMR=50dB(Typ.)
- High Sensitivity : $V_{IN(1im)}=50dB\mu V$ (Typ.)
- Operating Supply Voltage Range : $V_{CC}=8\sim 15V$.
- Low Distortion : THD=0.2%(Typ.)
- High Recovered Output Voltage : $V_{OD}=430mV$ (Typ.)
at $\Delta F=\pm 75kHz$ dev.
- Simplified Single Coil Tuning.
- Very Few External Parts.

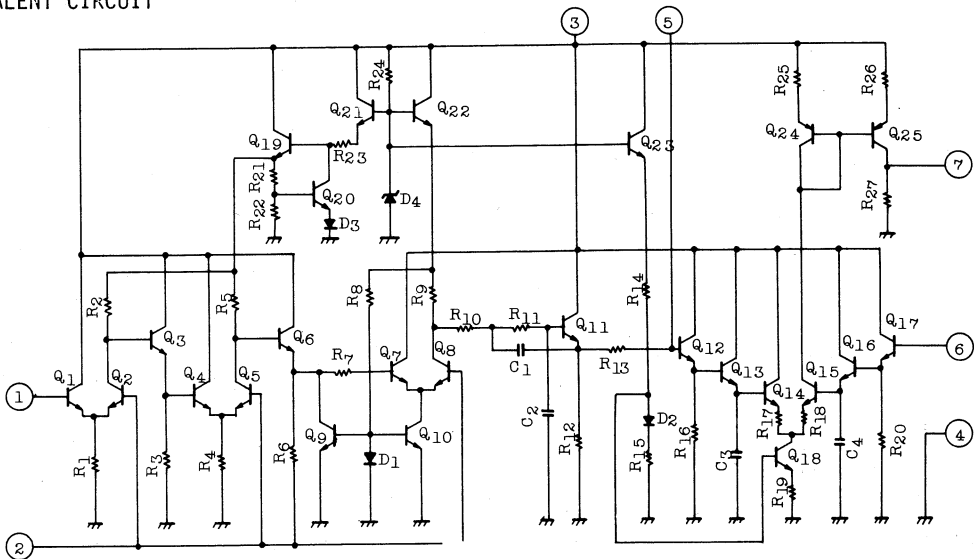


MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC}(V_3)$	15	V
Input Voltage	$V_{IN}(V_1)$	0.7	V_{rms}
Power Dissipation (Note)	P_D	400	mW
Operating Temperature	T_{opr}	-25 ~ 75	°C
Storage Temperature	T_{stg}	-55 ~ 125	°C

Note : Derated above $T_a=25^\circ C$ in the proportion of $4mW/^\circ C$.

EQUIVALENT CIRCUIT



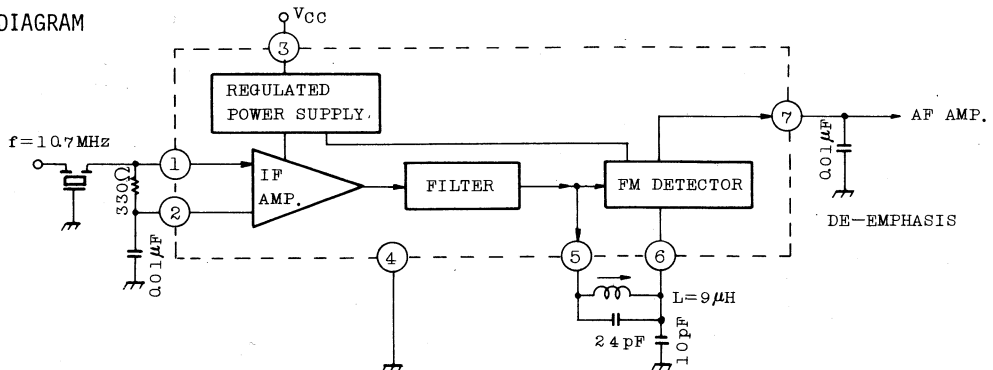
TA7130P

ELECTRICAL CHARACTERISTICS ($V_{CC}=12V$, $T_a=25^\circ$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I_{CC}	1	$V_{IN}=0$	8	11	15	mA
Output Terminal DC Voltage (Pin 7)		V_7	-	$V_{IN}=0, 5, 6$ pin short	4.0	4.8	5.5	V
Recovered Output Voltage (Note)		V_{OD}	1	$f=10.7\text{MHz}$, $f_M=400\text{Hz}$ $\Delta F=\pm 75\text{kHz}$ dev $V_{IN}=80\text{dB}\mu\text{V}$	300	500	700	mV_{rms}
Input Limiting Voltage		$V_{IN}(1\text{im})$	1	$f=10.7\text{MHz}$, $f_M=400\text{Hz}$ $\Delta F=\pm 22.5\text{kHz}$ dev. -3dB Limiting	-	50	55	$\text{dB}\mu\text{V}$
Total Harmonic Distortion		THD	1	$f=10.7\text{MHz}$, $f_M=400\text{Hz}$ $\Delta F=\pm 22.5\text{kHz}$ dev. $V_{IN}=80\text{dB}\mu\text{V}$	-	0.2	-	%
Signal to Noise Ratio		S/N	-	$f=10.7\text{MHz}$, $f_M=400\text{Hz}$ $\Delta F=\pm 22.5\text{kHz} \rightarrow 0\text{kHz}$, $V_{IN}=80\text{dB}\mu\text{V}$	-	60	-	dB
AM Rejection Ratio		AMR	1	$f=10.7\text{MHz}$, $f_M=400\text{Hz}$ $V_{IN}=80\text{dB}\mu\text{V}$ FM: 75kHz dev. AM: 30% MOD	-	50	-	dB
Output Resistance		R_O	-	$f=400\text{Hz}$, 7pin-GND	6.2	7.7	9.5	$\text{k}\Omega$
Input Impedance	Parallel Input Resistance	r_{ip}	-	$f=10.7\text{MHz}$, 1 pin-GND	-	5	-	$\text{k}\Omega$
	Parallel Input Capacitance	c_{ip}	-		-	4.5	-	pF
Output Impedance	Parallel Output Resistance	r_{op}	-	$f=10.7\text{MHz}$, 5 pin-GND	-	1.3	-	$\text{k}\Omega$
	Parallel Output Capacitance	c_{op}	-		-	4	-	pF

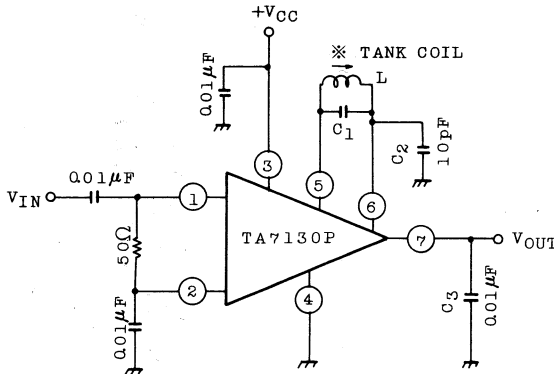
(Note) V_{OD} RANK ($\Delta f=\pm 22.5\text{kHz}$): B RANK 90~140 mV_{rms} , C RANK 130~200 mV_{rms}

BLOCK DIAGRAM



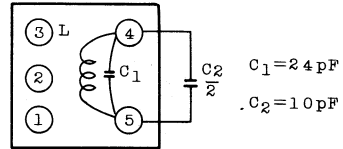
TA7130P

TEST CIRCUIT 1



※ TANK COIL

WIRE 2 UEW 0.08mm ϕ
 TURNS 21
 Qu 130 \pm 15%



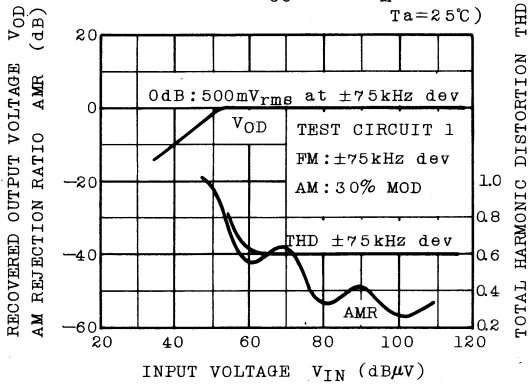
COVERED RESONANT FREQUENCY :

10.7MHz \pm 250kHz

※ Tuning coil is adjusted to make recovered output voltage maximum at $f=10.7$ MHz.

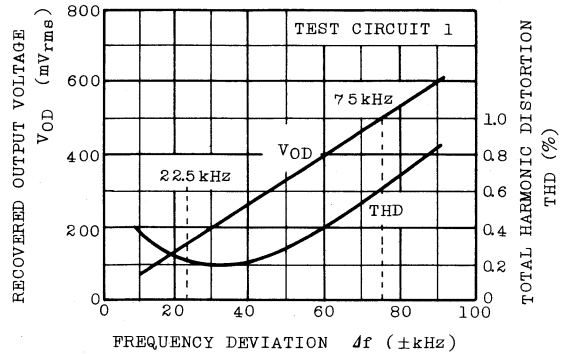
$V_{OD}, THD, AMR - V_{IN}$

($f=10.7$ MHz, $V_{CC}=12$ V, $f_M=400$ Hz, $T_a=25^\circ$ C)



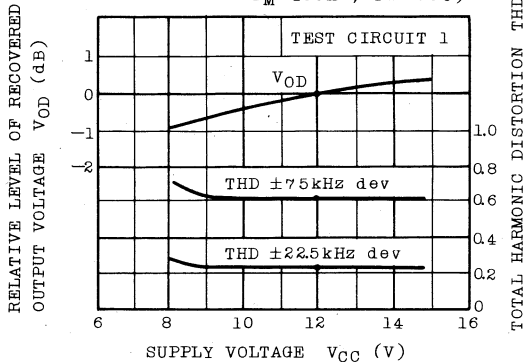
$V_{OD}, THD - \Delta f$

($f=10.7$ MHz, $V_{CC}=12$ V, $V_{IN}=80$ dB μ V, $T_a=25^\circ$ C)



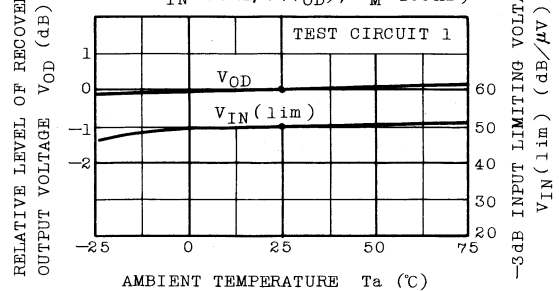
$V_{OD}, THD - V_{CC}$

($f_0=10.7$ MHz, $V_{IN}=80$ dB μ V, $f_M=400$ Hz, $T_a=25^\circ$ C)



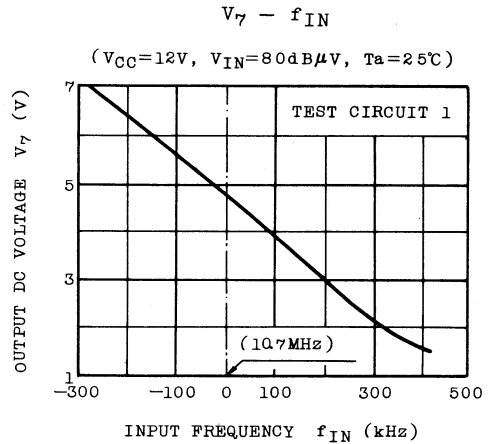
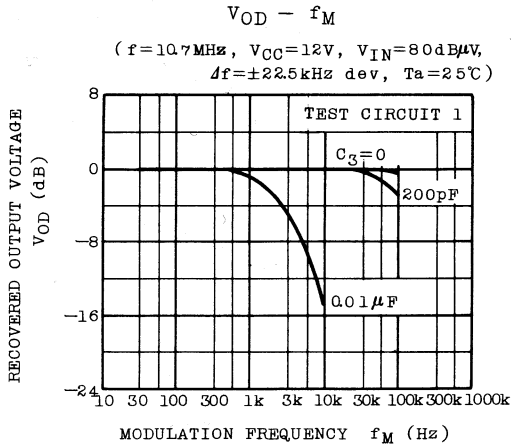
$V_{OD}, V_{IN}(\text{lim}) - T_a$

($f_0=10.7$ MHz, $V_{CC}=12$ V, $V_{IN}=80$ dB μ V (V_{OD}), $f_M=400$ Hz)

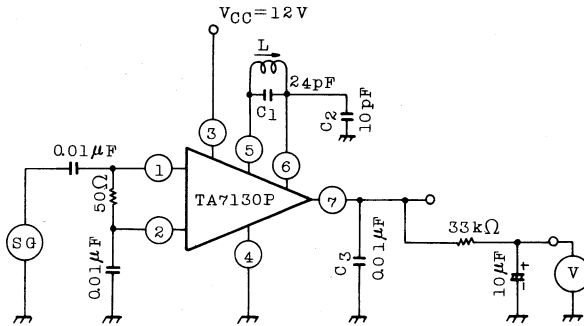


Note: Not includes temperature variation of external components.

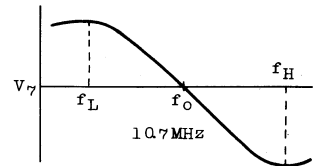
TA7130P



TEST CIRCUIT 2



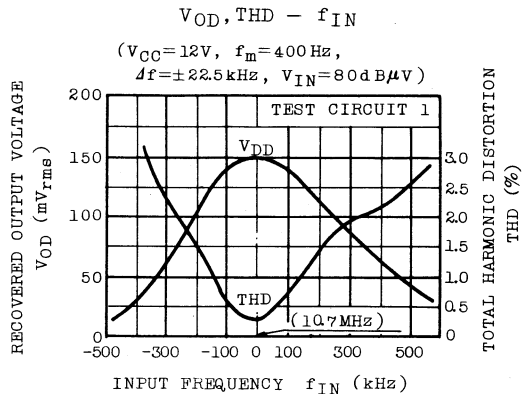
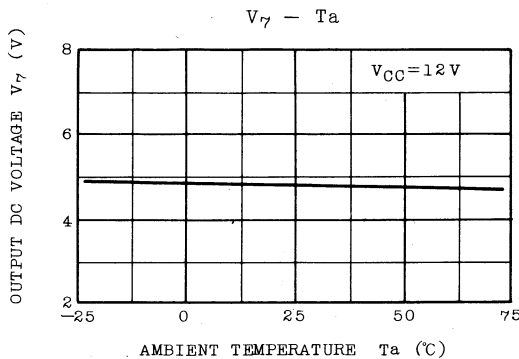
Output DC voltage (V_7) Can be utilized as control voltage for AFC.



$$f_L = \frac{1}{2\pi\sqrt{L(C_1 + C_2)}}$$

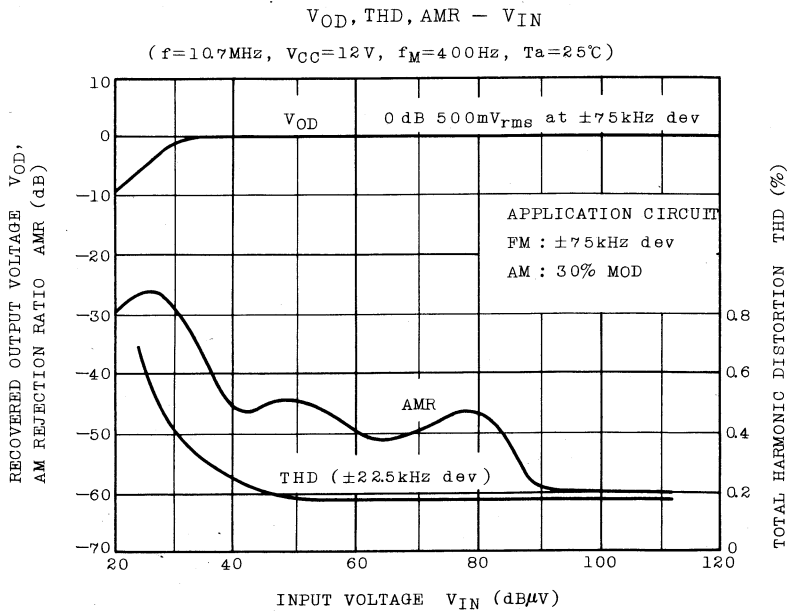
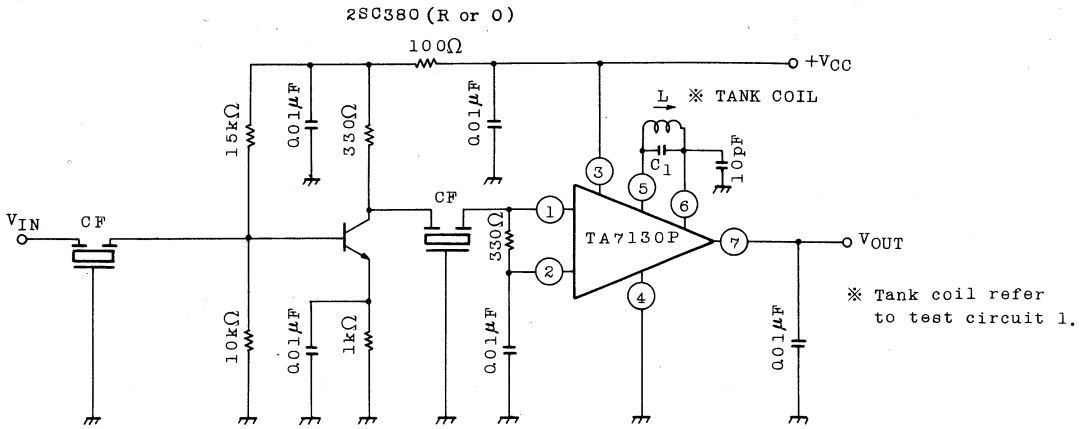
$$f_0 = \frac{1}{2\pi\sqrt{L(C_1 + \frac{C_2}{2})}}$$

$$f_H = \frac{1}{2\pi\sqrt{LC_1}}$$



TA7130P

APPLICATION CIRCUIT



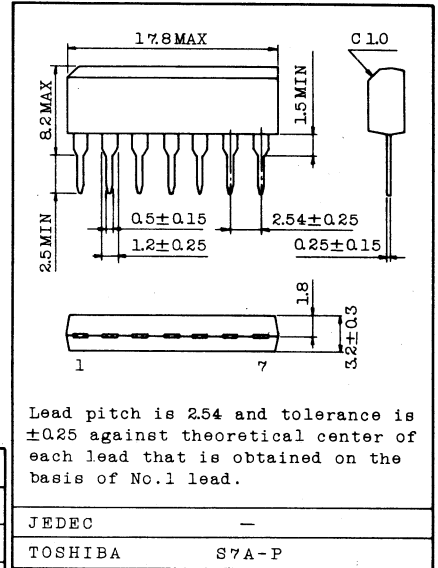
TA7133P

GENERAL PURPOSE PLL

CD-4 SUB-CHANNEL DEMODULATION

- Wide Operating Supply Voltage Range: $V_{CC}=8\sim 15V$
- High Stability of VCO : 200ppm/ $^{\circ}C$ (Typ.)
at $T_a=-25\sim 75^{\circ}C$, $V_{CC}=12V$
- High Stability of VCO for Wide Power Supply
Voltage Range : 200ppm/% (Typ.) at $V_{CC}=8\sim 15V$
- High Linearity of Demodulated Output : 0.2% (Typ.)

Unit in mm

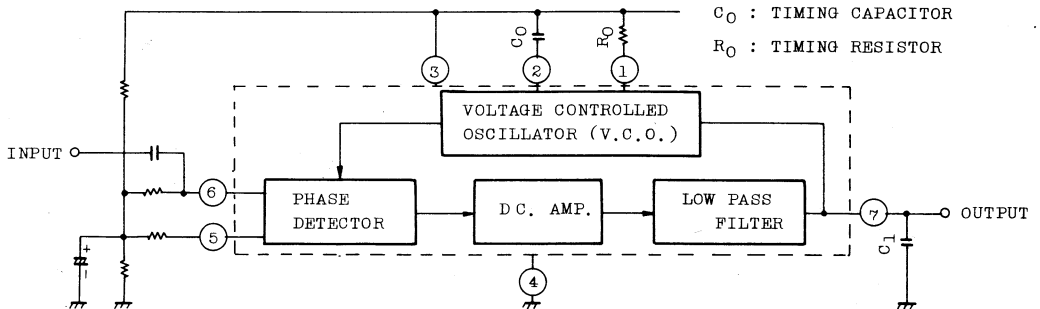


MAXIMUM RATINGS ($T_a=25^{\circ}C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	15	V
Input Voltage	V_{IN}	±1	V
Power Dissipation (Note)	P_D	400	mW
Operating Temperature	T_{opr}	-25 ~ 75	$^{\circ}C$
Storage Temperature	T_{stg}	-55 ~ 125	$^{\circ}C$

Note: Derated above $T_a=25^{\circ}C$ in the proportion of 4mW/ $^{\circ}C$.

BLOCK DIAGRAM



APPLICATION NOTE

FREE RUNNING FREQUENCY (f_0)

$$f_0 = \frac{1.2}{4R_0 C_0} \quad (\text{Hz})$$

LOCK RANGE (f_L)

$$f_L = \pm \frac{8f_0}{V_{CC}} \quad (\text{Hz})$$

CAPTURE RANGE (f_C)

$$f_C = \pm \frac{1}{2\pi} \sqrt{\frac{2\pi f_L}{\tau}} \quad (\text{Hz})$$

$$\tau = 30k\Omega \times C_1$$

LOOP GAIN $K_0 K_D$

$$K_0 K_D = \frac{336 f_0}{V_{CC}} \quad (1/\text{sec})$$

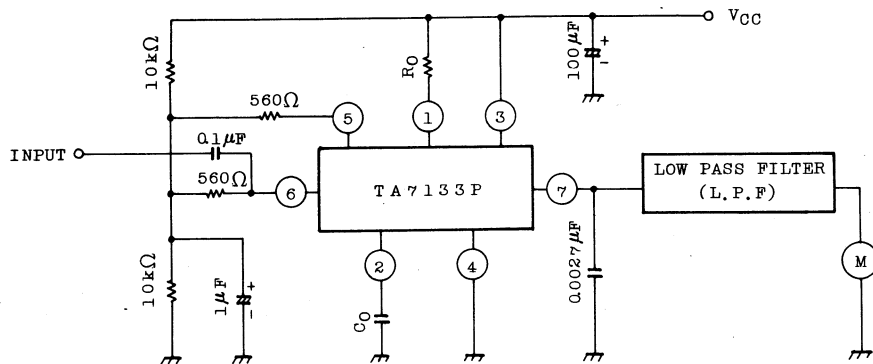
TA7133P

ELECTRICAL CHARACTERISTICS

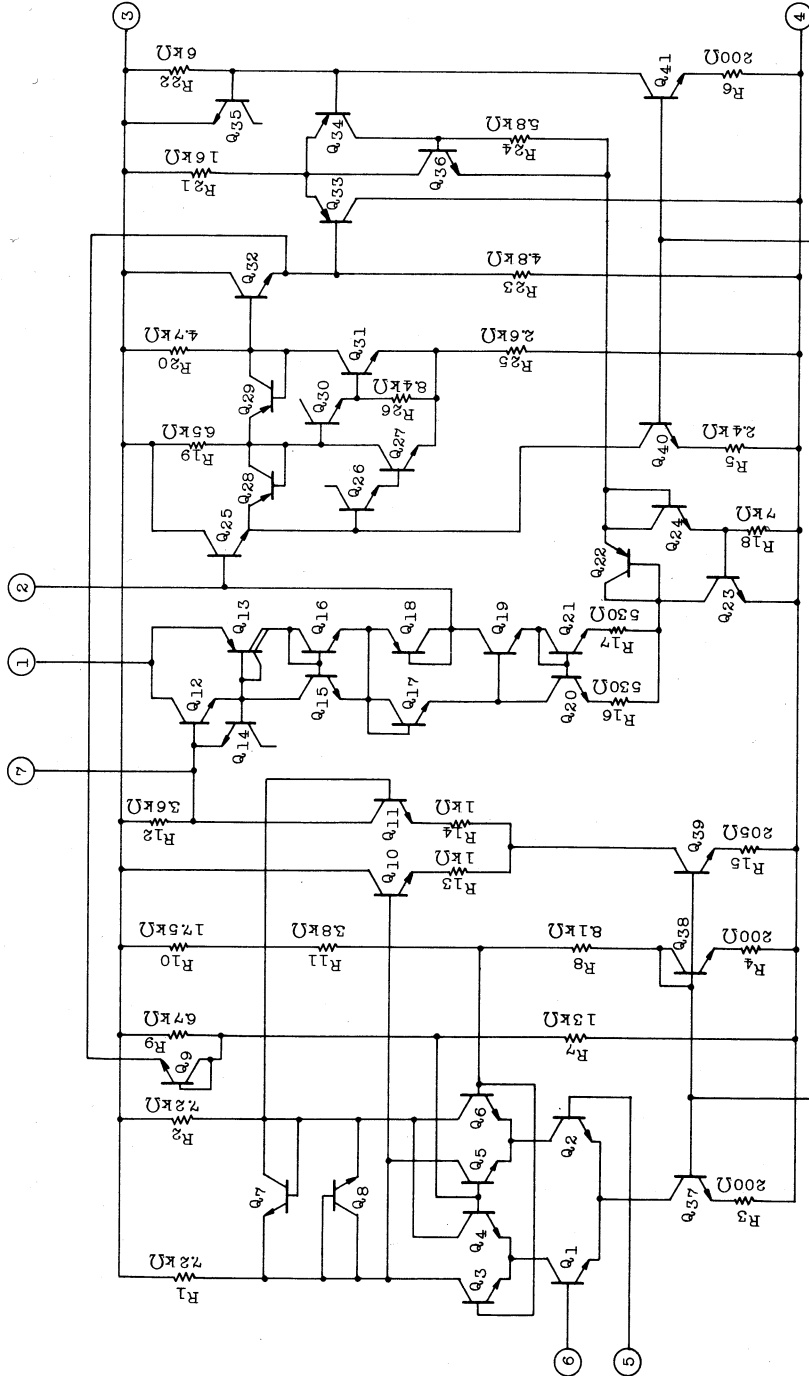
(Unless otherwise specified, $V_{CC}=12V$, $f_0=30kHz$, $C_0=0.0027\mu F$, $T_a=25^\circ C$)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I_{CC}	-	$R_0=3k\Omega$	-	8.0	10.0	mA
Input Resistance	R_{IN}	-	$2V < V_5 = V_6 < 6V$	-	5	-	$k\Omega$
VCO Maximum Operating Frequency	$f_{OSC\ MAX}$	-	$C_0=2.7pF$	-	500	-	kHz
VCO Temperature Coefficient	$f\Delta T$	-	-	-	200	-	ppm/ $^\circ C$
VCO Drift with Supply Voltage	$f\Delta V$	-	-	-	200	-	ppm/%
Triangle Wave Output Voltage	$f\Delta_{p-p}$	-	-	1.8	2.2	-	V_{p-p}
Triangle Wave Output Linearity	$f\Delta_{lin}$	-	-	-	0.5	-	%
VCO Conversion Gain	K_0	-	$f_0=10kHz$	-	6600	-	Hz/V
Demodulated Output Voltage	V_{OD}	-	$f_0=30kHz$, $\Delta f=\pm 3kHz$	75	-	120	mV_{rms}
Total Harmonic Distortion	THD	-	$f_0=30kHz$, $\Delta f=\pm 3kHz$	-	-	1.0	%
	THD	-	$f_0=31.5kHz$, $\Delta f=\pm 10kHz$	-	-	10	
Output Resistance	R_{OUT}	-	7 pin	-	3.5	-	$k\Omega$
D.C. Level	V_7	-	7 pin	-	10.5	-	V
AM Rejection Ratio	AMR	-	-	-	40	-	dB
Phase Detector Conversion Gain	K_d	-	-	-	0.68	-	V/ radian

TEST CIRCUIT

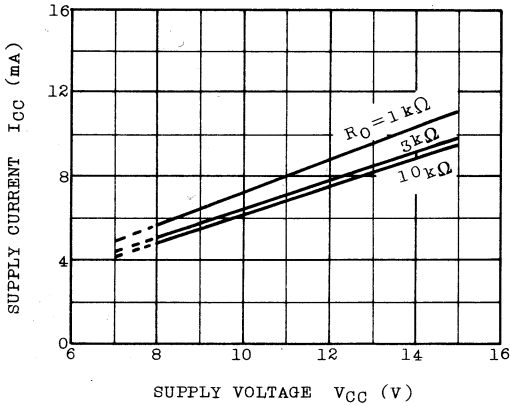


EQUIVALENT CIRCUIT

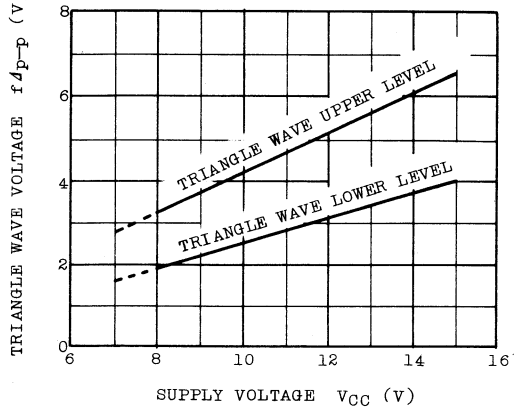


TA7133P

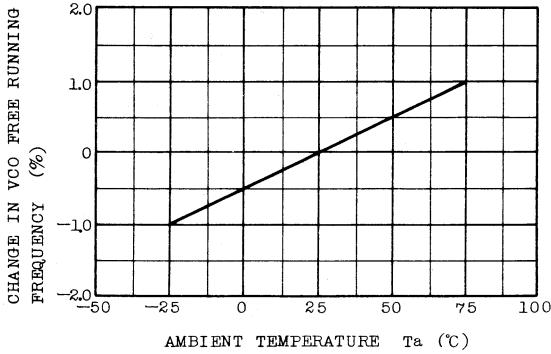
$I_{CC} - V_{CC}$



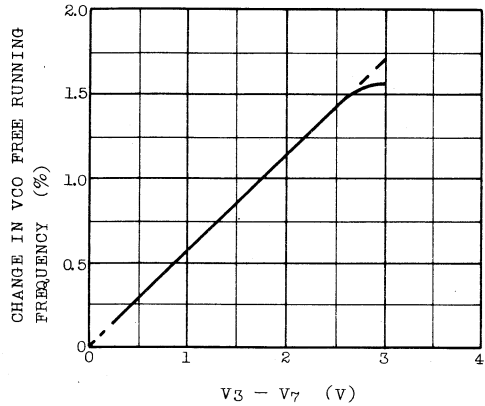
$f_{dP-P} - V_{CC}$



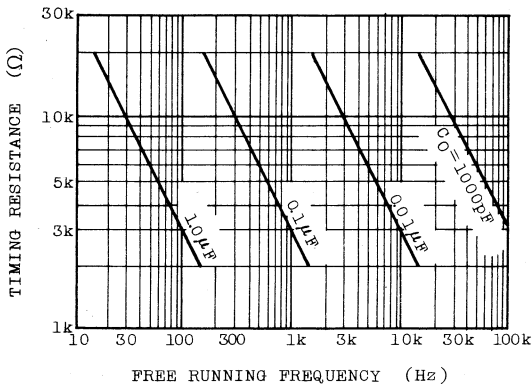
FREE RUNNING FREQUENCY - AMBIENT TEMPERATURE CHARACTERISTICS



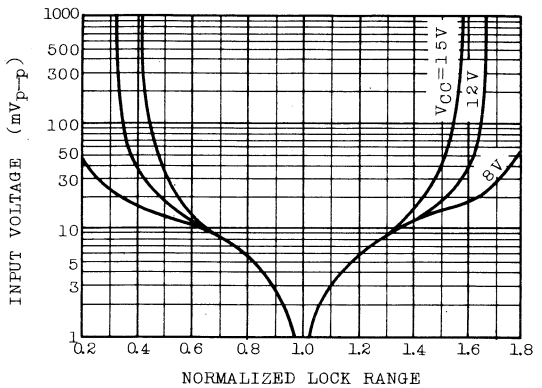
FREE RUNNING FREQUENCY - ($V_3 - V_7$) CHARACTERISTICS (V_{CO} CONVERSION GAIN)



V_{CO} FREE RUNNING FREQUENCY

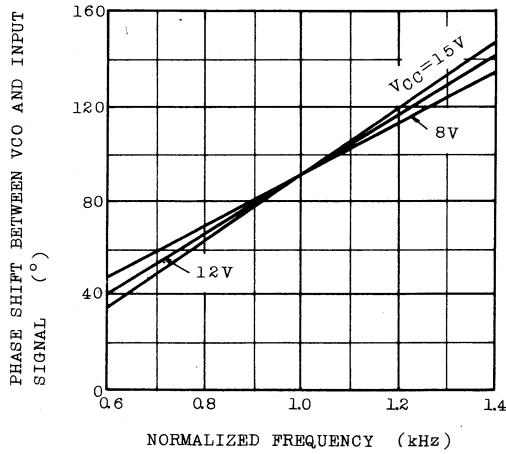


LOCK RANGE - INPUT VOLTAGE CHARACTERISTICS

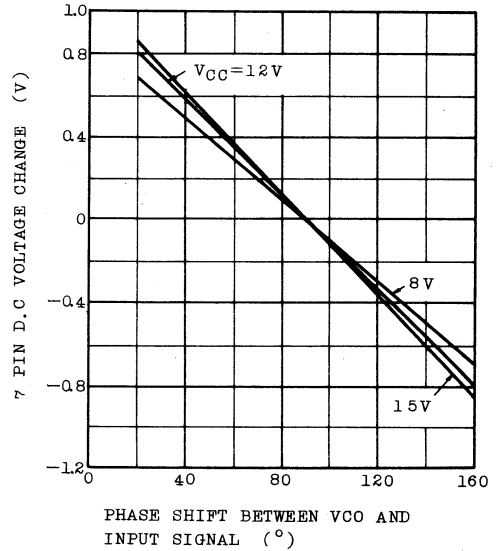


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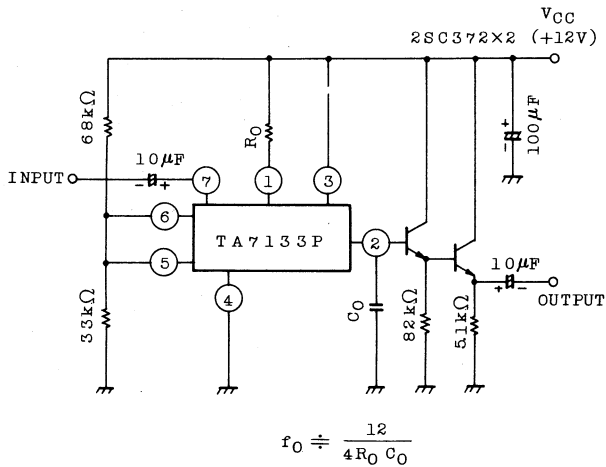
PHASE SHIFT - FREQUENCY CHARACTERISTICS



7 PIN D.C. VOLTAGE - PHASE SHIFT CHARACTERISTICS



APPLICATION CIRCUIT (FM MODULATION)



MAXIMUM FREQUENCY DEVIATION - SINUSOIDAL INPUT VOLTAGE CHARACTERISTICS

