

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

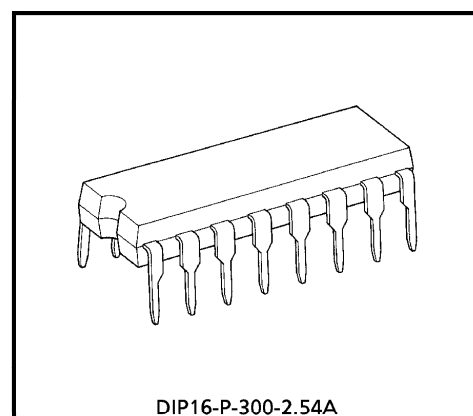
TA8186P**AM / FM IF + MPX**

TA8186P is the AM / FM IF + MPX system IC, which is designed for radio cassette recorders and music centers.

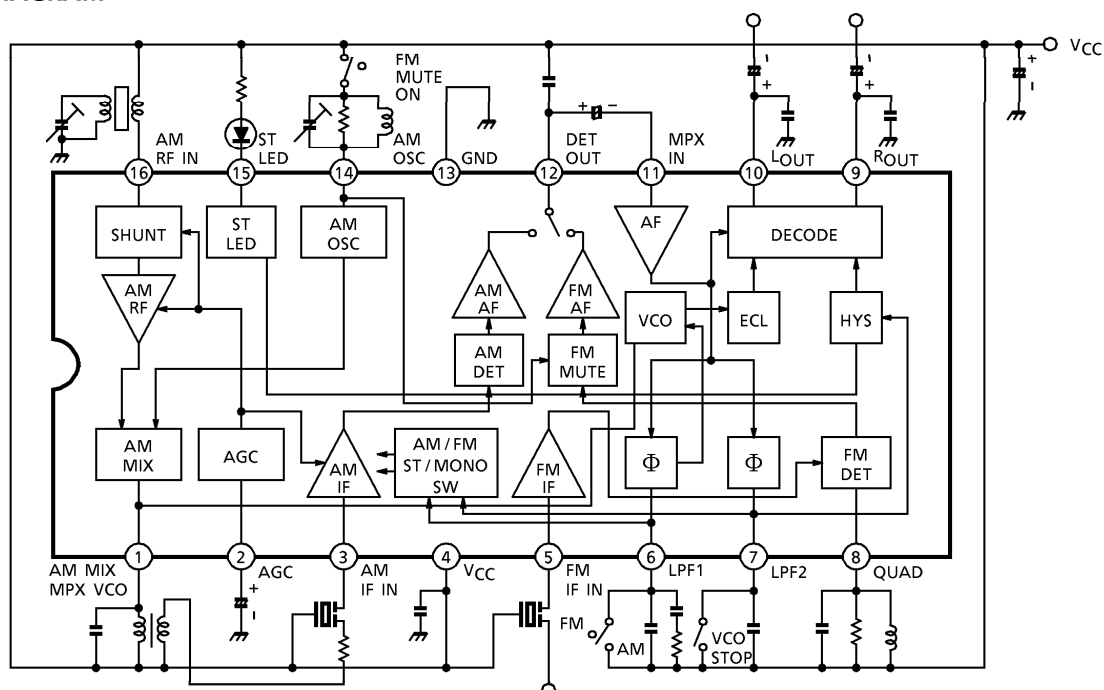
FEATURES

- Compact package (DIP16), and small number of external parts.
- AM IFT is also used for VCO resonator.
- Built-in FM soft muting circuit.
- Operating supply voltage range :
 $V_{CC}(\text{opr}) = 3.5 \sim 13\text{V}$ ($T_a = 25^\circ\text{C}$)
 At FM soft mute using :
 $V_{CC}(\text{opr}) = 3.5 \sim 9\text{V}$ ($T_a = 25^\circ\text{C}$)

※ Handle with care to prevent devices from deteriorations by static electricity.



Weight : 1.00g (Typ.)

BLOCK DIAGRAM

961001EBA2

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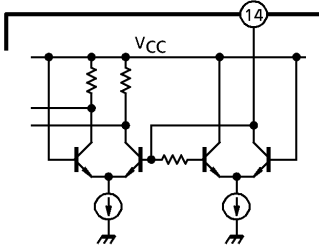
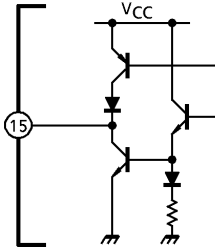
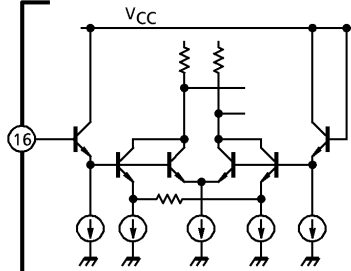
TERMINAL EXPLANATION (Terminal voltage shows the typical value at $T_a = 25^\circ\text{C}$, $V_{CC} = 6\text{V}$, and non-signal test circuit)

PIN No.	TERMINAL NAME	CONTENTS	INTERNAL CIRCUIT	TERMINAL VOLTAGE (V)	
				FM	AM
1	AM MIX MPX VCO	- AM mixer output terminal - AM IFT is also used for VCO resonator		6.0	6.0
2	AGC	AM AGC terminal It is necessary to connect external capacitance		0.4	0.3
3	AM IF IN	AM IF Amp input terminal		6.0	6.0
4	V_{CC}	Power supply	—	6.0	6.0
5	FM IF IN	FM IF Amp input terminal		6.0	6.0
6	LPF1	- LPF terminal for phase detector - Bias terminal for AM/FM switch circuit $V_6 = V_{CC} \rightarrow \text{AM}$ $V_6 = \text{Open} \rightarrow \text{FM}$		4.3 (At VCO STOP) 5.6	6.0

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PIN No.	TERMINAL NAME	CONTENTS	INTERNAL CIRCUIT	TERMINAL VOLTAGE (V)	
				FM	AM
7	LPF2	• LPF terminal for synchronous detector • VCO stop terminal $V_7 = V_{CC} \rightarrow \text{VCO Stop}$		4.3	6.0
8	QUAD	FM QUAD detector terminal FM QUAD coil is connected.		6.0	6.0
9	R _{out}	MPX audio output terminal		3.5	3.5
10	L _{out}			3.5	3.5
11	MPX IN	MPX input terminal		3.3	3.3
12	DET OUT	FM / AM detector output terminal		1.3	1.3
13	GND	GND terminal	—	0	0

PIN No.	TERMINAL NAME	CONTENTS	INTERNAL CIRCUIT	TERMINAL VOLTAGE (V)	
				FM	AM
14	AM OSC	- AM OSC terminal - Bias terminal for FM soft mute switch circuit $V_{14} = \text{Open} \rightarrow \text{FM MUTE ON}$		6.0 (At FM MUTE ON) 5.4	6.0
15	ST LED	- Stereo LED terminal - VCO monitor terminal		5.4	5.4
16	AM RF IN	AM RF Amp input terminal ($R_{in} = 1M\Omega$, at $f_{in} = 1\text{MHz}$)		6.0	6.0

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	15	V
LED Current	I_{LED}	10	mA
LED Voltage	V_{LED}	15	V
Power Dissipation	P_D (Note)	750	mW
Operating Temperature	T_{opr}	$-25 \sim 75$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

(Note) Derated above $T_a = 25^\circ\text{C}$ in the proportion of $6\text{mW}/^\circ\text{C}$.

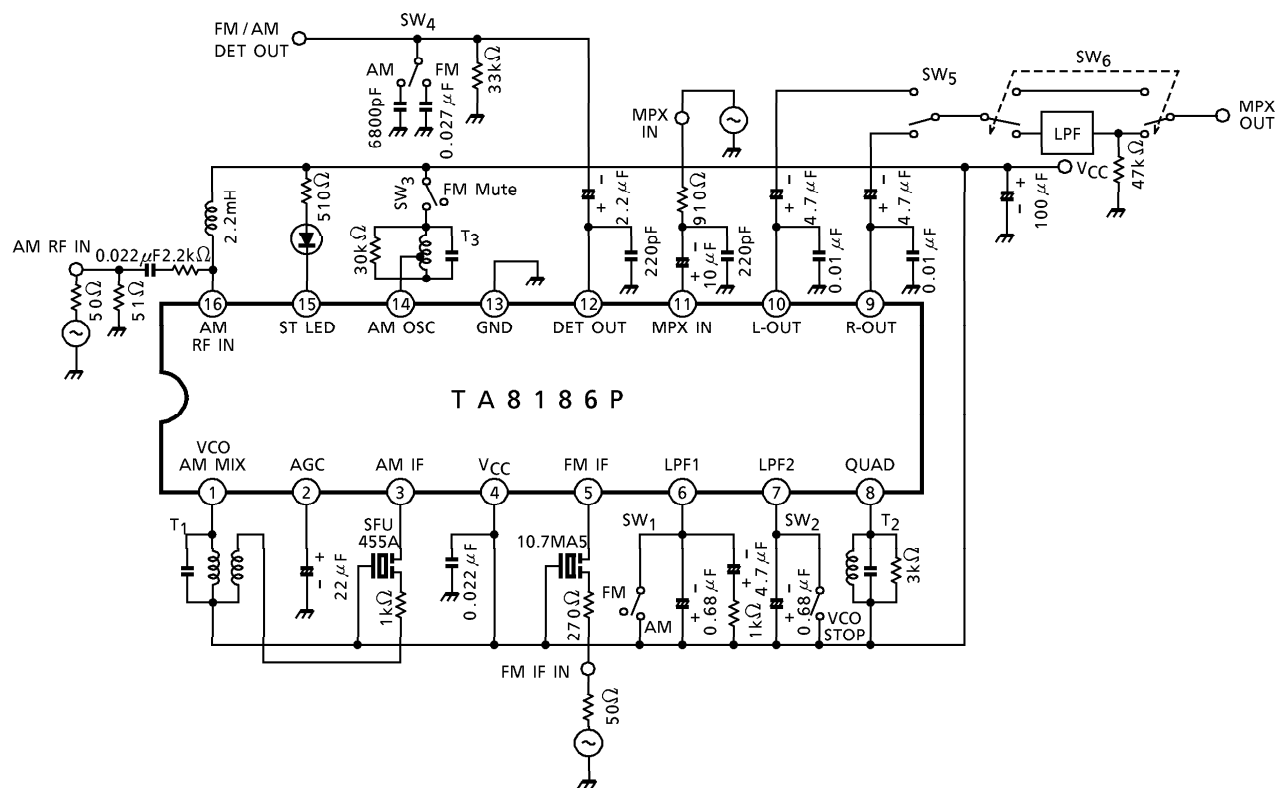
ELECTRICAL CHARACTERISTICS

Unless otherwise specified, $T_a = 25^\circ\text{C}$, $V_{CC} = 6\text{V}$,FM IF : $f = 10.7\text{MHz}$, $\Delta f = \pm 22.5\text{kHz}$, $f_m = 1\text{kHz}$ AM : $f = 1\text{MHz}$, $\text{MOD} = 30\%$, $f_m = 1\text{kHz}$ MPX : $f_m = 1\text{kHz}$

CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT		
Supply Current		I _{CC} (FM)	1	FM Mode, V _{in} = 0	—	17.0	25.0	mA		
		I _{CC} (AM)	1	AM Mode, V _{in} = 0	—	15.0	22.0			
FM IF	Input Limiting Voltage	V _{in} (lim)	1	− 3dB limiting point	38	43	48	dBμV EMF		
	Recovered Output Voltage	V _{OD}	1	V _{in} = 80dBμV EMF	55	80	110	mV _{rms}		
	Signal To Noise Ratio	S / N	1	V _{in} = 80dBμV EMF	—	70	—	dB		
	Total Harmonic Distortion	THD	1	V _{in} = 80dBμV EMF	—	0.1	—	%		
	AM Rejection Ratio	AMR	1	V _{in} = 80dBμV EMF	—	45	—	dB		
AM	Gain	G _V	1	V _{in} = 26dBμV EMF	20	35	50	mV _{rms}		
	Recovered Output Voltage	V _{OD}	1	V _{in} = 60dBμV EMF	55	80	110	mV _{rms}		
	Signal To Noise Ratio	S / N	1	V _{in} = 60dBμV EMF	—	42	—	dB		
	Total Harmonic Distortion	THD	1	V _{in} = 60dBμV EMF	—	1.0	—	%		
Pin ⑫ Output Resistance		R ₁₂	1	FM Mode	—	1.5	—	kΩ		
				AM Mode	—	10	—			
MPX	Input Resistance		R _{IN}	1	—		—	33	—	kΩ
	Output Resistance		R _{OUT}	1	—		—	5	—	
	Max. Composite Signal Input Voltage		V _{in} MAX (Stereo)	1	L + R = 90%, P = 10% THD = 3%, SW→LPF : ON		—	800	—	mV _{rms}
	Separator		Sep	1	L + R = 180mV _{rms} P = 20mV _{rms} SW→LPF : ON	f _m = 100Hz	—	43	—	dB
						f _m = 1kHz	35	43	—	
						f _m = 10kHz	—	43	—	
	Total Harmonic Distortion	Monaural	THD (Monaural)	1	V _{in} = 200mV _{rms} (Mono)		—	0.2	—	%
		Stereo	THD (Stereo)		L + R = 180mV _{rms} P = 20mV _{rms} SW→LPF : ON		—	0.2	—	
	Voltage Gain		G _V (MPX)	1	V _{in} = 200mV _{rms} (Mono)		− 2	0	2	dB
Channel Balance		C.B.	1	V _{in} = 200mV _{rms} (Mono)		− 2	0	2	dB	

CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
MPX	Stereo LED Sensitivity	ON	V_L (ON)	1	Pilot input	—	10	16	mV_{rms}
		OFF	V_L (OFF)			2	6	—	
	Stereo LED Hysteresis		V_H	1	To LED turn off from LED turn on	—	4	—	mV_{rms}
	Capture Range		C.R.	1	$P = 20mV_{rms}$	—	± 4	—	%
	Signal To Noise Ratio		S / N	1	$V_{in} = 200mV_{rms}$ (Mono)	—	78	—	dB

TEST CIRCUIT

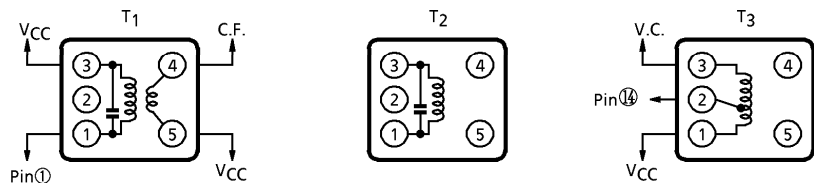


COIL DATA

COIL No.	f	L (μH)	C ₀ (pF)	Q ₀	TURN				WIRE (mmφ)	REF
					1-2	2-3	1-3	4-6		
T ₁ AM IFT	455kHz	—	180	120	—	—	180	15	0.06 UEW	⑤2150-2162-165
		—	180	50 ↑	—	—	158	14	0.07 φ2 UEW	①A7LCS-11432X
T ₂ FM DET	10.7MHz	—	82	110	—	—	13	—	0.12 UEW	⑤4152-4095-015
		—	82	80 ↑	—	—	11	—	0.1 φ2 UEW	①A119ACS-19118Z
T ₃ AM OSC	796kHz	288	—	115	13	73	—	—	0.08 UEW	⑤4147-1356-038
		288	—	105 ↑	16	88	—	—	0.07 φ2 UEW	①7TRS-11433Y

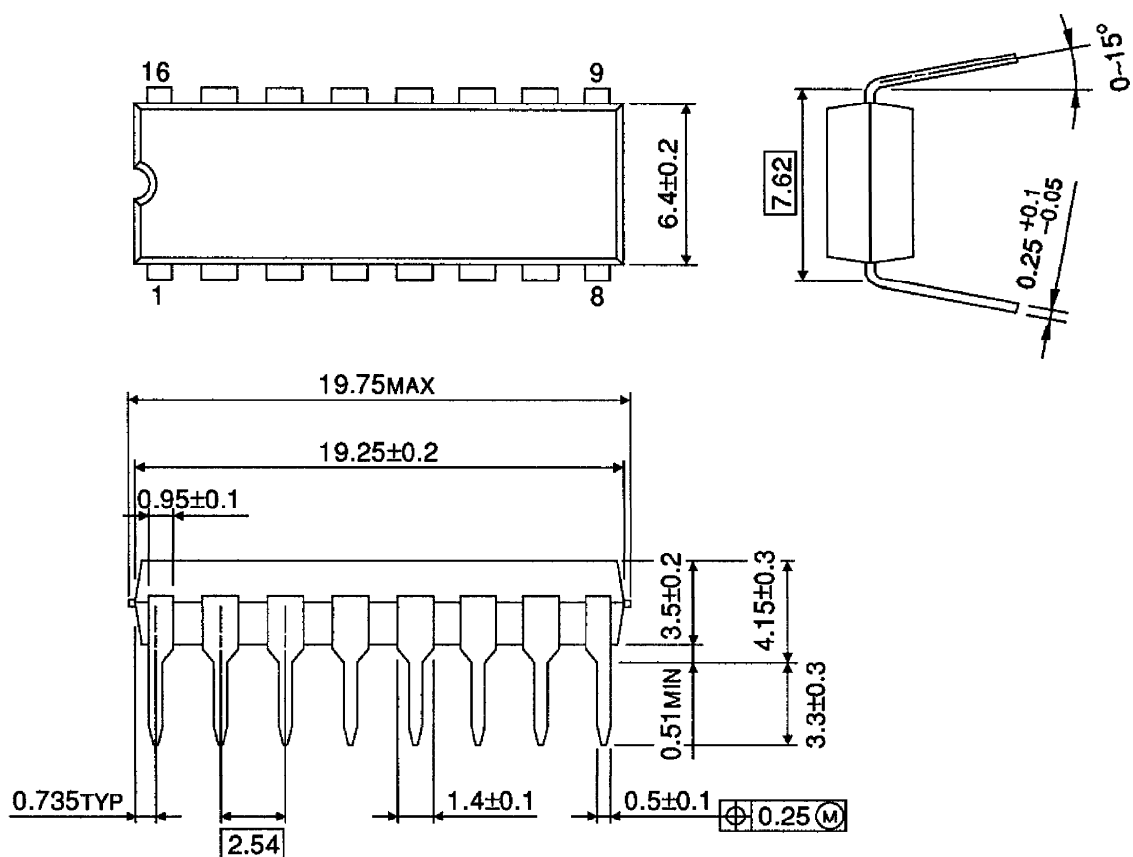
⑤ : SUMIDA ELECTRIC Co., Ltd.

① : TOKO Co., Ltd.



OUTLINE DRAWING
DIP16-P-300-2.54A

Unit : mm



Weight : 1.00g (Typ.)

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