

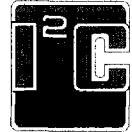
## ICE car radio

## TEA6821T

## FEATURES

## General

- FM mixer for conversion from FM  $IF_1 = 72.2$  MHz to FM  $IF_2 = 10.7$  MHz
- AM mixer for conversion from AM  $IF_1 = 10.7$  MHz to AM  $IF_2 = 450$  kHz
- FM IF gain stage
- Crystal oscillator providing mixer frequencies and references for IF count and stereo decoder
- FM quadrature demodulator with automatic centre frequency adjust and THD compensation
- Level and multipath and noise detectors
- Soft mute
- Stereo noise cancelling and variable de-emphasis
- PLL stereo decoder
- Noise blanker
- AM IF amplifier and demodulator
- I<sup>2</sup>C-bus transceiver
- IF count for AM and FM
- Reference frequency generation for PLL synthesizer
- Reduced external components
- SW applicable.



## Stereo decoder

- Adjustment-free PLL-VCO
- Pilot depending mono/stereo switching
- Analog control of mono/stereo blend
- Adjacent channel noise suppression (114 kHz)
- Pilot canceller
- Analog control of de-emphasis
- Integrated low-pass filters for 190 kHz adjacent channel interferences and signal delay for interference absorption circuit.

## GENERAL DESCRIPTION

The TEA6821T together with the TEA6810T / TEA6811T forms an AM/FM electronic tuned car radio in a double conversion receiver concept for European, American and Japanese frequency range.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{s1}$	supply voltage 1 (pins 56 and 28)	note 1	7	8.5	10	V
$V_{s1}$	operating range		8.1	8.5	8.9	V
$I_{s1}$	supply current 1 FM		–	28	–	mA
$I_{s1}$	supply current 1 AM		–	24	–	mA
$V_{s2}$	supply voltage 2 (pin 5)	note 1	4.5	5.0	5.5	V
$V_{s2}$	operating range		4.75	5.0	5.25	V
$I_{s2}$	supply current 2 FM		–	31	–	mA
$I_{s2}$	supply current 2 AM		–	28	–	mA
S+N/N	signal-to-noise AM	$m = 0.3$	–	57	–	dB
THD	distortion AM		–	1	2	%
S+N/N	signal-to-noise FM	$\Delta f = 22.5$ kHz at pins 43 and 47	66	72	–	dB
THD	distortion FM	$\Delta f = 75$ kHz	–	0.1	0.35	%
$\alpha$	channel separation (adjusted)		40	–	–	dB
$T_{amb}$	operating ambient temperature		–40	–	+85	°C

## Note to the quick reference data

1. IC is functional, specified parameters may deviate from limits which are valid for operating range.

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**ORDERING INFORMATION**

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TEA6821T	VSO56	plastic very small outline package; 56 leads	SOT190-1

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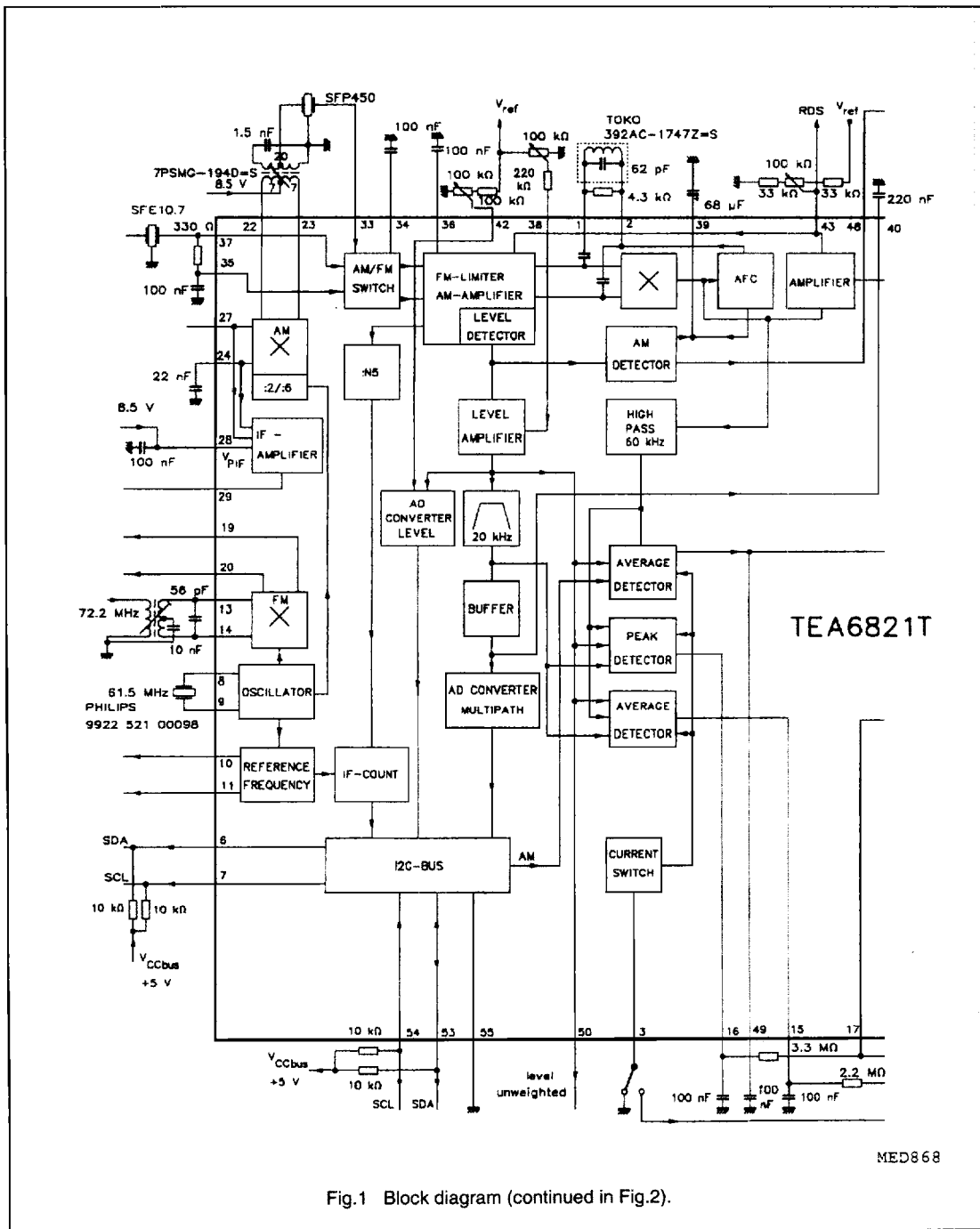


Fig.1 Block diagram (continued in Fig.2).

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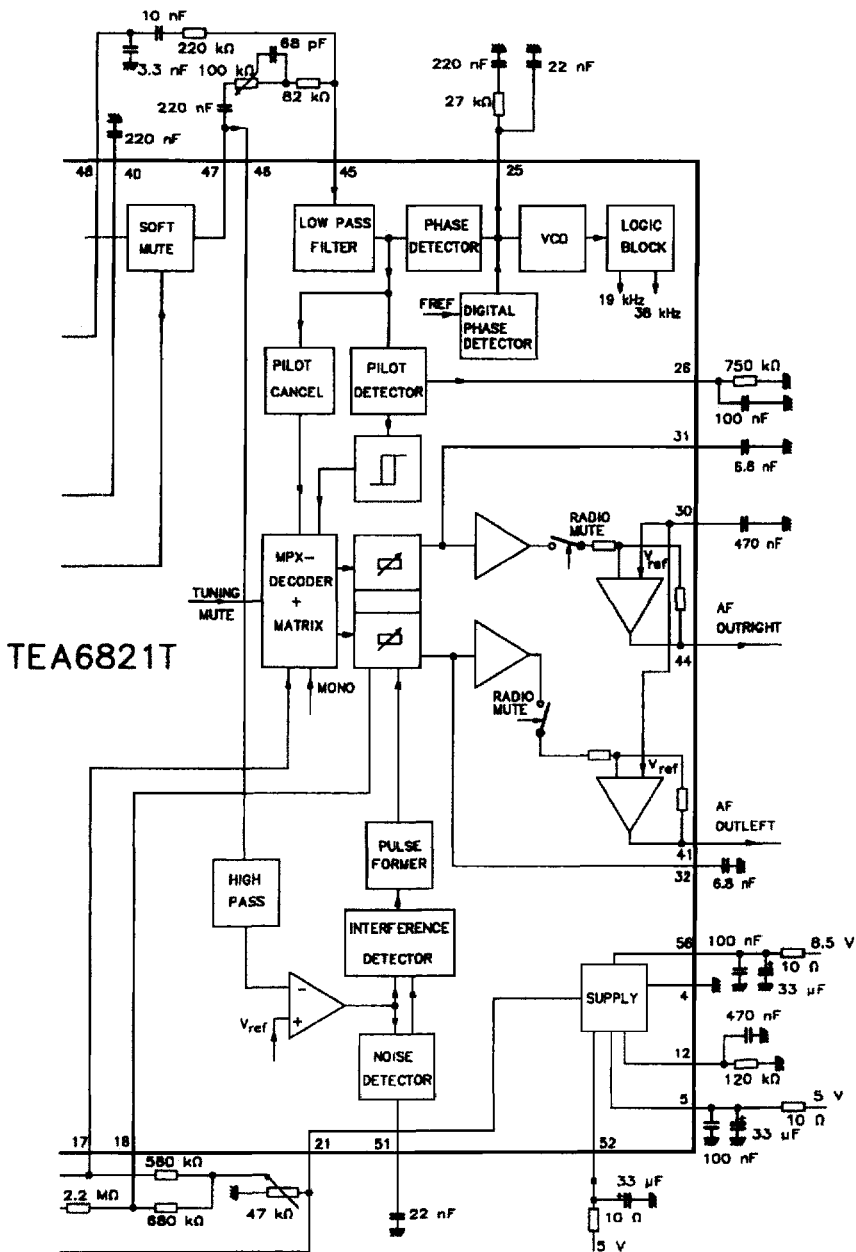
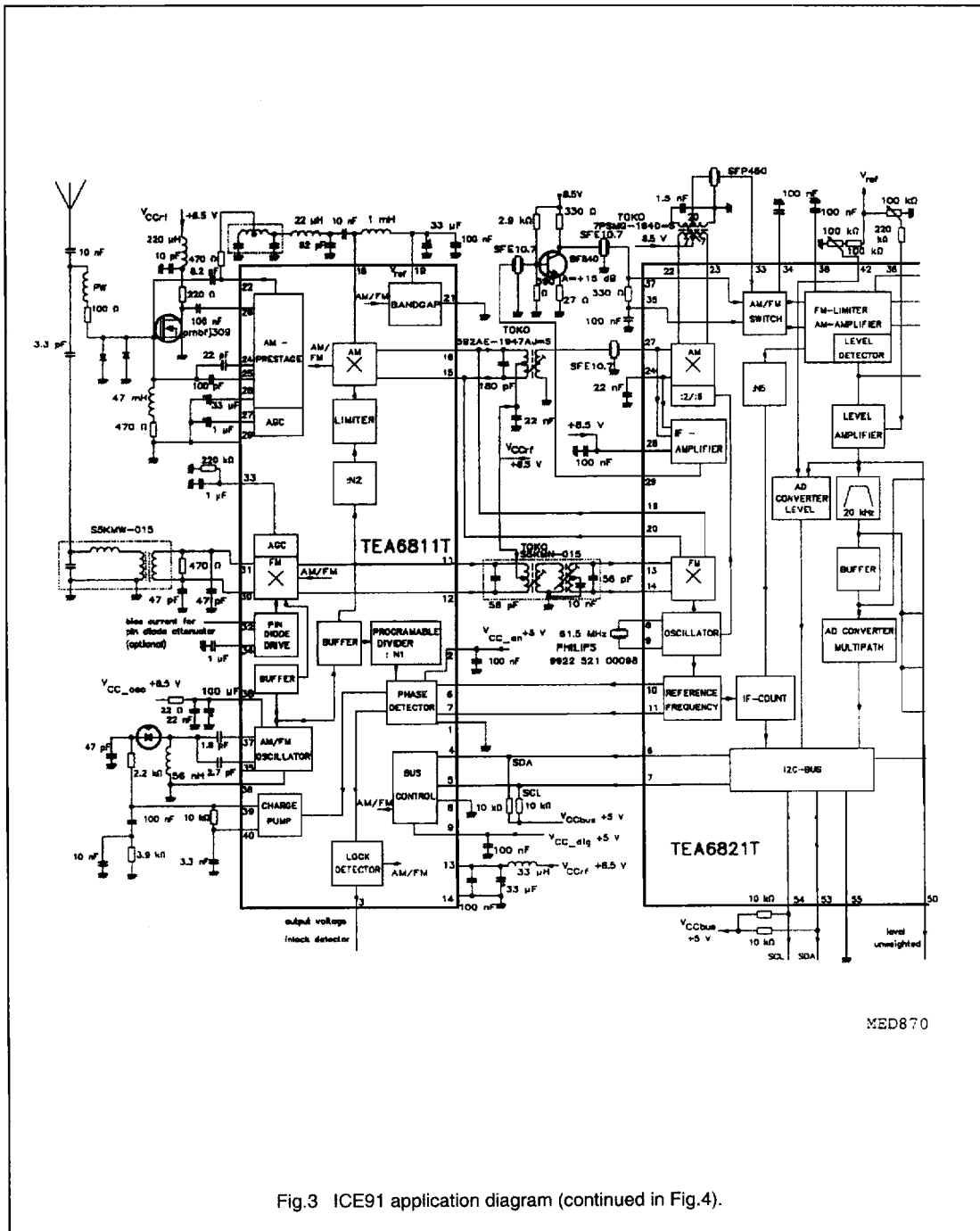


Fig.2 Block diagram (continued from Fig.1).

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MED870

Fig.3 ICE91 application diagram (continued in Fig.4).

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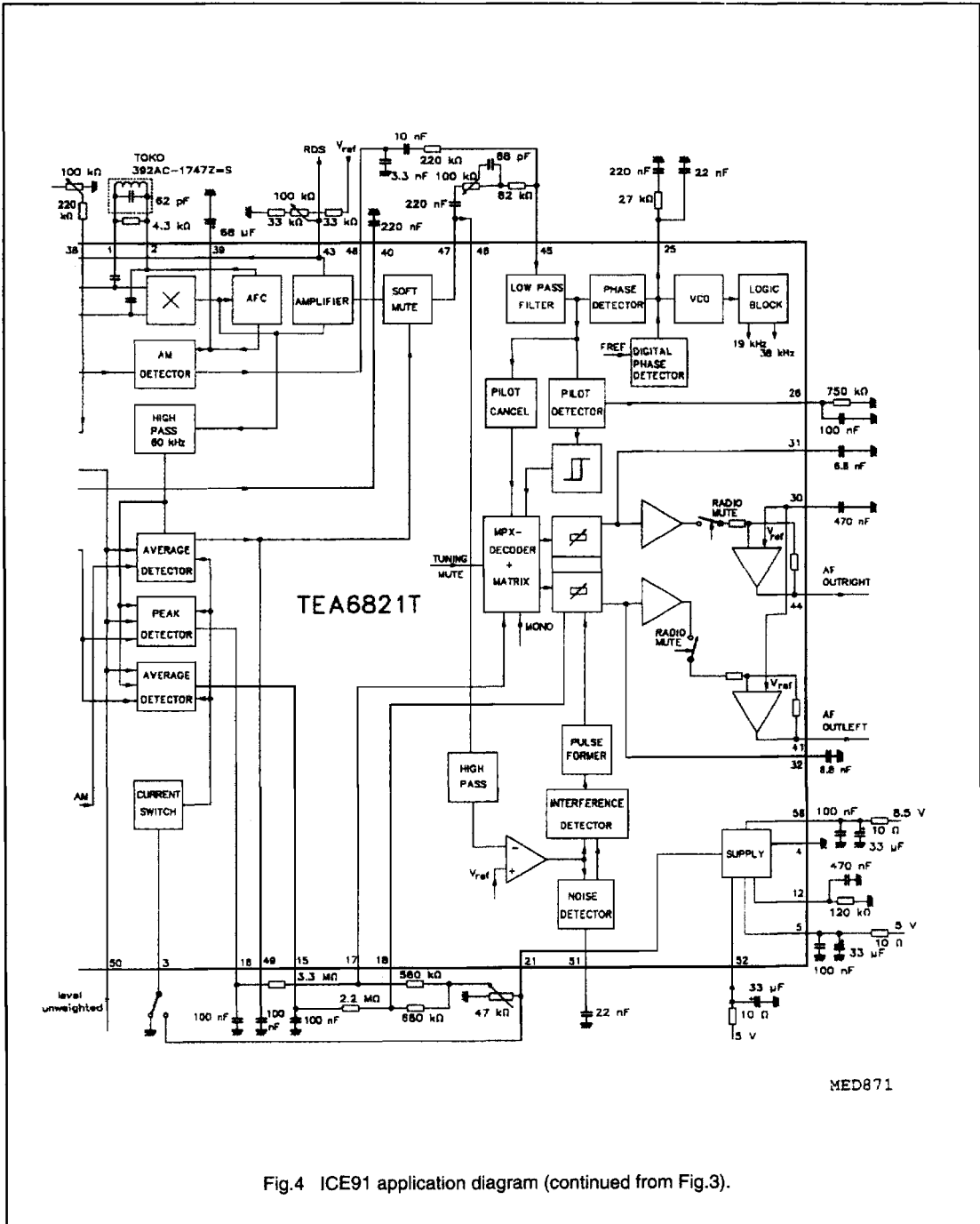


Fig.4 ICE91 application diagram (continued from Fig.3).

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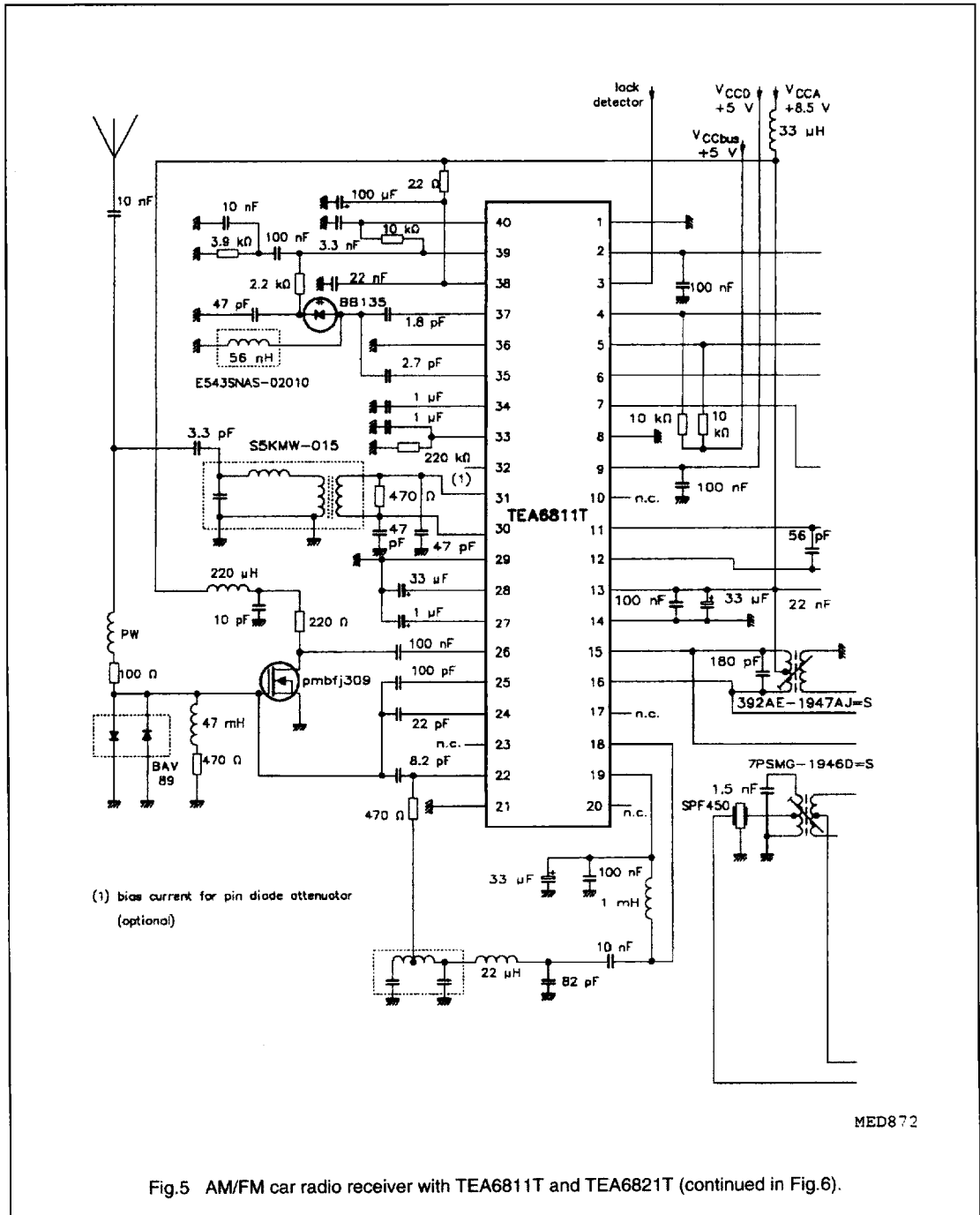


Fig.5 AM/FM car radio receiver with TEA6811T and TEA6821T (continued in Fig.6).

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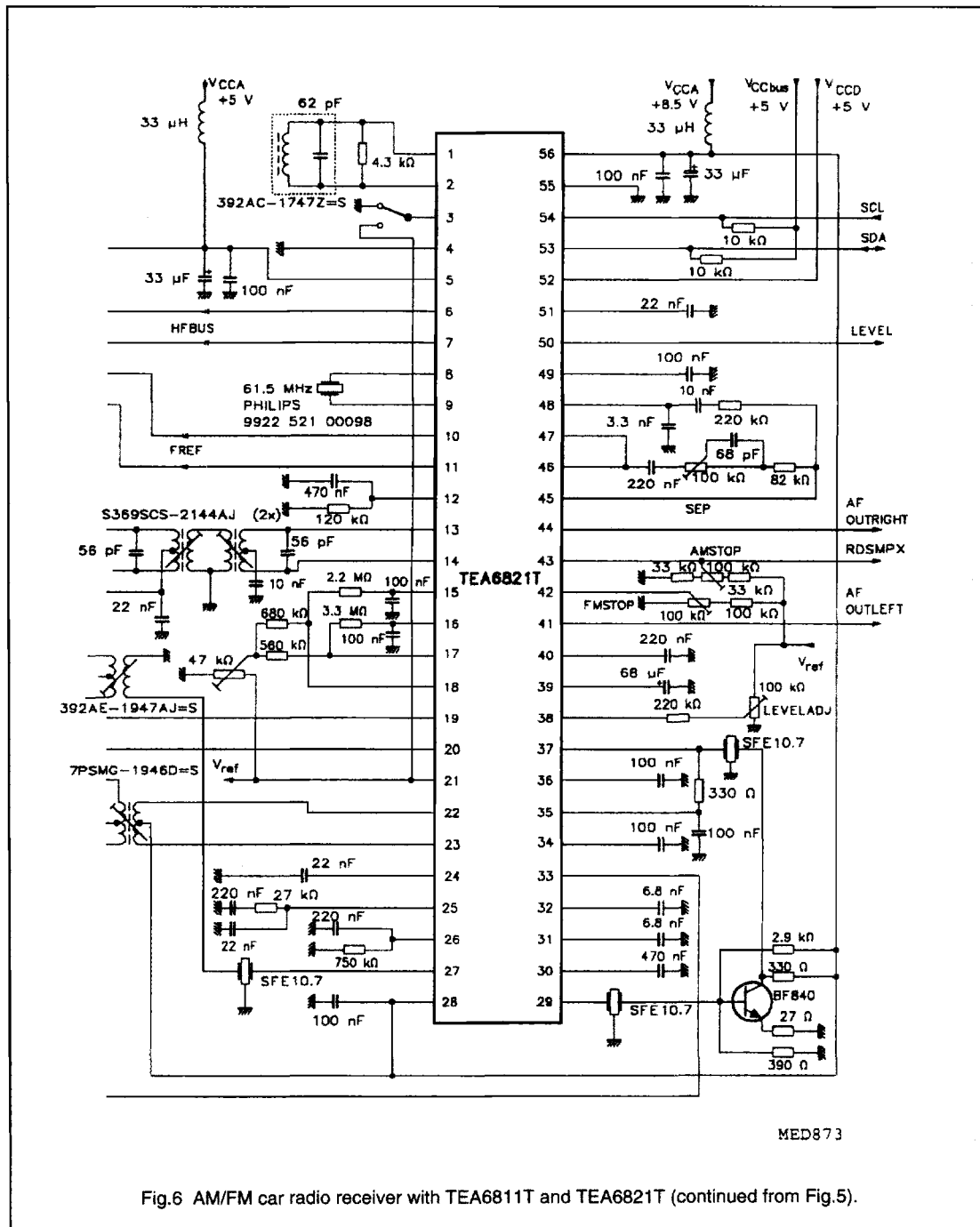


Fig.6 AM/FM car radio receiver with TEA6811T and TEA6821T (continued from Fig.5).



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## PINNING

SYMBOL	PIN	DESCRIPTION
QDET1	1	demodulator tank
QDET2	2	demodulator tank
TSWITCH	3	time switch
GND	4	analog ground
V <sub>P5</sub>	5	5 V supply voltage
HFBUS1	6	HF bus, pull-up to 5 V
HFBUS2	7	HF bus, pull-up to 5 V
XTAL1	8	crystal oscillator
XTAL2	9	crystal oscillator
F <sub>REFP</sub>	10	PLL reference frequency
F <sub>REFN</sub>	11	PLL reference frequency
I <sub>REF</sub>	12	reference current
FMIF1IN1	13	70 MHz FM-IF input
FMIF1IN2	14	70 MHz FM-IF input
TSDR	15	time constant for SDR
TSDS	16	time constant for SDS
V <sub>SDS</sub>	17	SDS control voltage
V <sub>SDR</sub>	18	SDR control voltage
FMIF2OUT1	19	FM mixer output
FMIF2OUT2	20	FM mixer output
V <sub>REF</sub>	21	reference voltage
AMIF2OUT1	22	AM mixer output
AMIF2OUT2	23	AM mixer output
FMAMDEC	24	FM/AM 10.7 MHz decoupling
PHASEDET	25	phase detector
PILDET	26	pilot detector
FMAM10.7	27	FM/AM 10.7 MHz input
V <sub>PIF</sub>	28	V <sub>P</sub> IF amplifier

SYMBOL	PIN	DESCRIPTION
FMIFAMP <sub>OUT</sub>	29	FM-IF amplifier output
AFGND	30	AF ground
DEEMPH <sub>R</sub>	31	de-emphasis capacitor right
DEEMPH <sub>L</sub>	32	de-emphasis capacitor left
AMIF2IN1	33	AM IF2 input 1
AMIF2IN2	34	AM IF2 input 2
FMIN2	35	FM limiter input
DCFEED	36	DC feed FM limiter
FMIN1	37	FM limiter input
LEVELADJ	38	level adjust
C <sub>AFC</sub>	39	AFC capacitor
MPBUF	40	multipath buffer time constant
OUTLEFT	41	AF output left
FMSTOP	42	FMSTOP adjust
RDS/AMSTOP	43	MPX for RDS/AMSTOP adjust
OUTRIGHT	44	AF output right
MPXIN	45	stereo decoder MPX input
IAC <sub>IN</sub>	46	IAC input
MPXOUT	47	FM demodulator MPX output
AMAFOUT	48	AM demodulator AF output
V <sub>MUTAML</sub>	49	mute voltage / AM level
LEVELUNWEIG	50	level unweighted
I <sub>ACCONTR</sub>	51	IAC control voltage
V <sub>PDIG</sub>	52	V <sub>P</sub> digital
SDA	53	SDA, pull-up to 5 V
SCL	54	SCL, pull-up to 5 V
BUSGND	55	bus ground
V <sub>P8.5</sub>	56	V <sub>P</sub> 8.5 V

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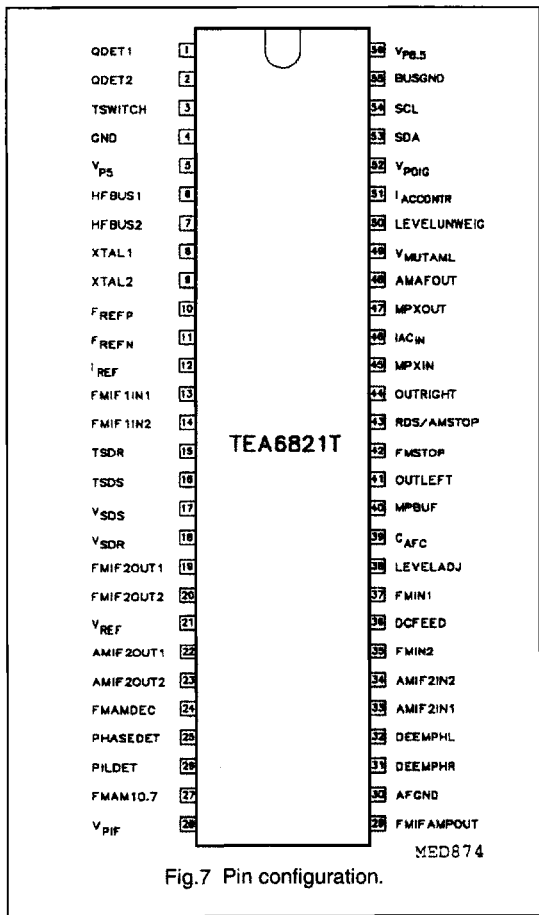


Fig.7 Pin configuration.