

TELEPHONE ANALOG FRONT END

PRODUCT PREVIEW

FEATURES:

SPEECH

- DC LINE CURRENT RANGE FROM 6 TO 110mA
- Tx AND Rx GAIN EXTERNALLY ADJUSTABLE
- AGC IN Tx AND Rx EXTERNALLY PROGRAMMABLE
- AGC DISABLEABLE THROUGH MICROCONTROLLER BUS
- SINGLE/DOUBLE SIDETONE NETWORK SOFTWARE PROGRAMMABLE
- SOFTCLIPPING ON Tx CHANNEL
- SQUELCH TO REDUCE Tx NOISE ENVIRONMENT AND TO IMPROVE HOWLING IMMUNITY IN LOUDHEARING MODE
- RECEIVING AMPLIFIER FOR PIEZO OR ELECTRODYNAMIC TRANSDUCERS
- +6dB MODE ON Rx CHANNEL (SELECTABLE THROUGH MICROCONTROLLER BUS)
- -6dB MODE ON Tx CHANNEL (SELECTABLE THROUGH MICROCONTROLLER BUS)
- FREQUENCY GENERATOR FOR WAITING MELODY
- ERROR BEEP GENERATOR
- HOLD LINE CURRENT DETECTOR FOR TRANSFER/AUTO RELEASE

GROUP LISTENING / ON-HOOK DIALING

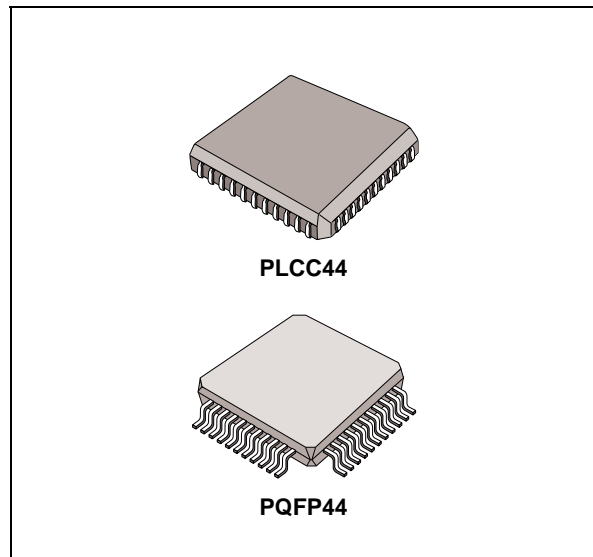
- ANTI HOWLING WITH ACOUSTIC FEEDBACK SYSTEM COUPLED WITH SQUELCH
- DIGITAL VOLUME CONTROL (8 STEPS OF 4dB EACH) THROUGH MICROCONTROLLER BUS
- ANTILARSEN ATTENUATION (4 DIFFERENT LEVELS) PROGRAMMABLE THROUGH MICROCONTROLLER BUS

HANDSFREE INTERFACE

- PIN AND SOFTWARE FACILITY FOR EASY INTERCONNECTION WITH HANDSFREE CONTROLLER IC.

RING ON LOUDSPEAKER

- EMBEDDED SWITCH MODE POWER SUP-



PLY TO FEED THE LOUDSPEAKER AMPLIFIER DURING RING MODE

- DIGITAL VOLUME CONTROL (8 STEPS OF 4dB EACH) THROUGH MICROCONTROLLER BUS
- RING FREQUENCY GENERATOR PROGRAMMED THROUGH MICROCONTROLLER BUS

DIALLING

- DTMF GENERATOR (CONTROLLED BY MCU BUS)
- DC MASK VALUE DURING MAKE PERIOD PROGRAMMABLE THROUGH MICROCONTROLLER BUS

MICROCONTROLLER INTERFACE

- STABILIZED VOLTAGE FOR MICROCONTROLLER
- 2 WIRE SERIAL BUS
- RING INDICATOR
- POWER-ON SIGNAL
- RESET SIGNAL
- LINE CURRENT VARIATION INDICATOR

SELF BIASED LOUDSPEAKER AMPLIFIER FOR ANSWERING MACHINE

TEA7091

DESCRIPTION

The TEA7091 is a Telephone set Analog Front End (TAFE) interface intended for use in conjunction with a microcontroller.

In this configuration the TEA7091 provides a worldwide mid-range telephone set with loudhearing on board and melody ringer on loudspeaker. Repertory dialer (memory on MCU) and various features (HOLD, Tone/Pulse, Flash, MUTE, adjustable Ringer and Loudhearing levels..) are programmable by MCU.

Also high-range telephone set can be built around TEA7091 by adding Handsfree controller (TEA7540), Electronic Hook Switch and upgraded

MCU (ST family) with LCD driver.

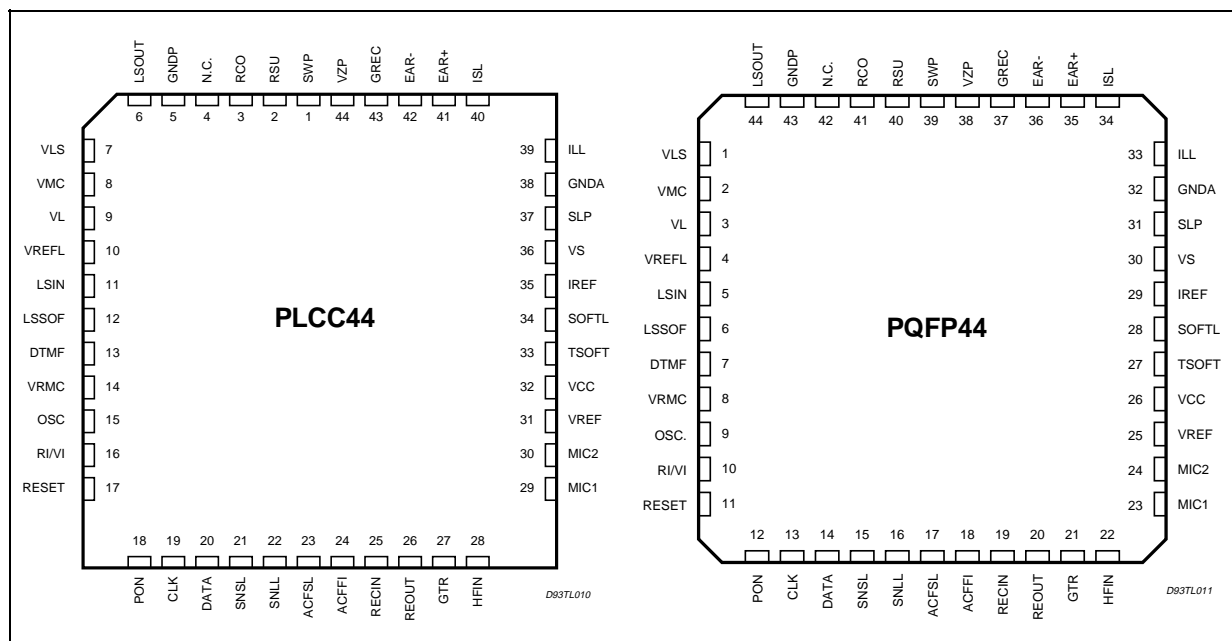
The concept using TAFE + Microcontroller is called BICHIP approach.

The benefits of this concept are:

- Saving of external components.
- Easy upgrade of the features (extra memories, LCD driver, Answering machine or Cordless interface..) through microcontroller.
- Replacement of configuration switches (PABX /Public, Tone/Pulse...) by EEPROM settings.

This also induces reliability and cost improvement.

PINS CONNECTION (Top views)



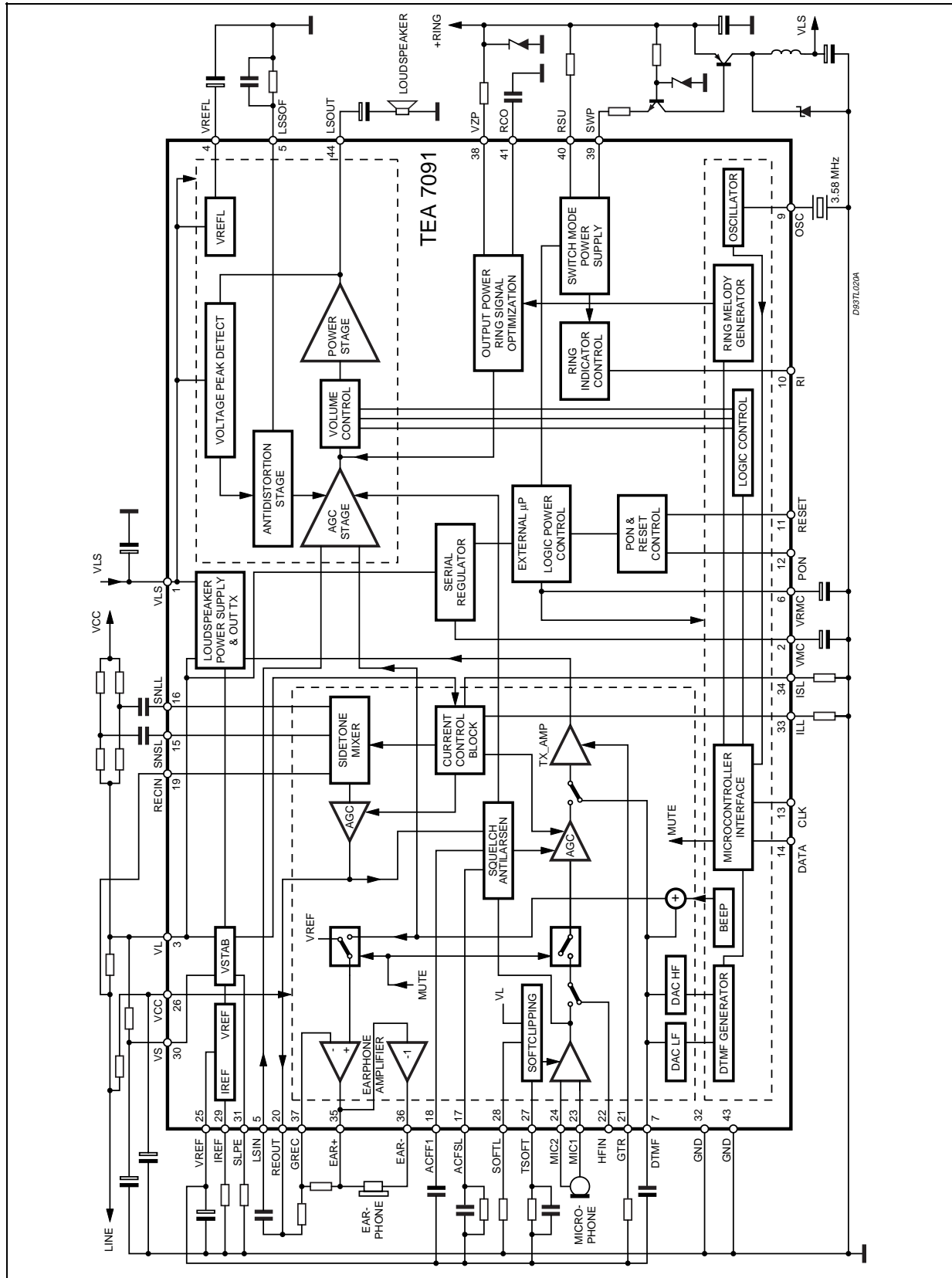
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
T_{op}	Operating Temperature	– 25 to +70	°C
T_{stg}	Storage Temperature	– 55 to +150	°C
V_{LM}	Supply Voltage (pin 3)	12	V
I_{LM}	Supply Current	150	mA
V_{REGM}	CMOS part supply (Pin 8)	6	V
T_j	Junction Temperature	– 25 to +150	°C

PIN DESCRIPTIONS

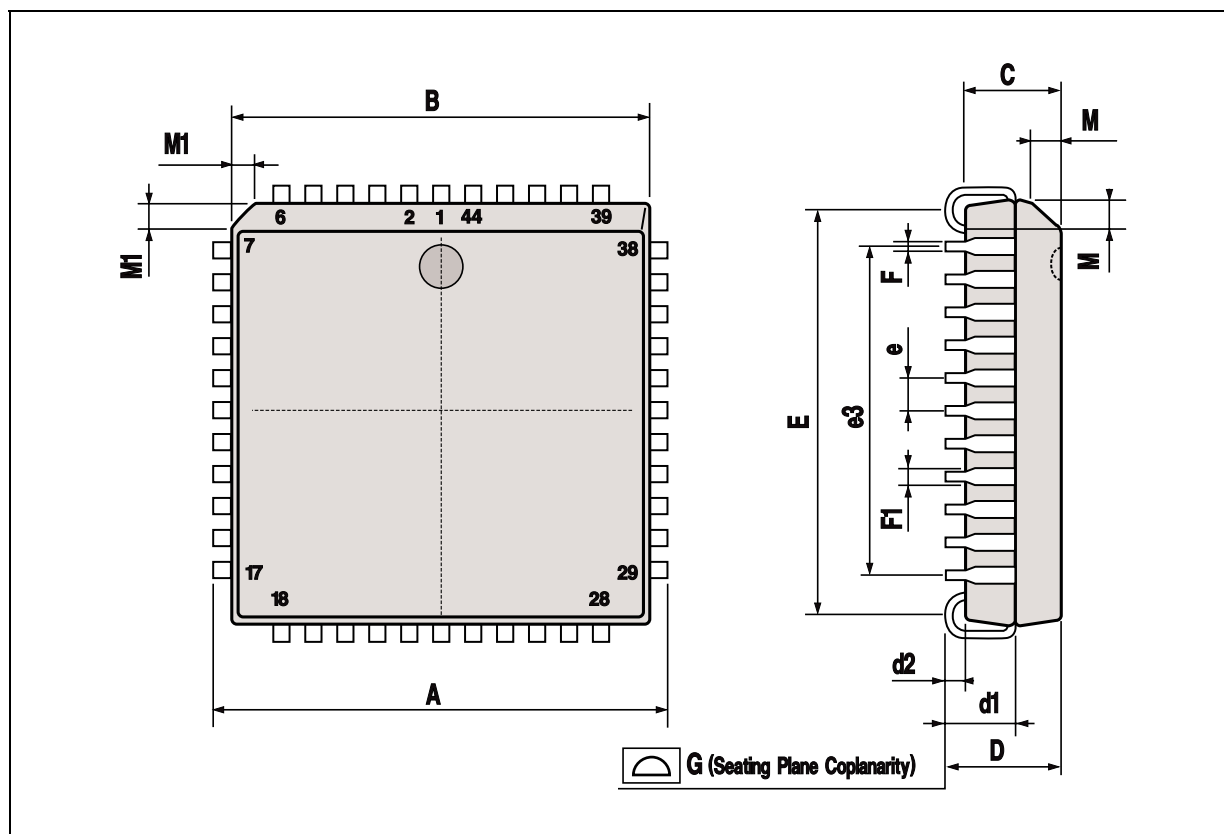
PQFP44 N° Pins	PLCC44 N° Pins	Names	Functions
1	7	VLS	Loudspeaker power supply.
2	8	VMC	Unregulated microcontroller supply.
3	9	VL	Line voltage.
4	10	VREFL	Loudspeaker reference voltage.
5	11	LSIN	Loudspeaker input.
6	12	LSSOF	Loudspeaker softclipping time constant.
7	13	DTMF	DTMF filter.
8	14	VRMC	Stabilized microcontroller supply.
9	15	OSC	Oscillator input.
10	16	RI/VI	Ring indicator / Line current variation indicator.
11	17	RESET	Microcontroller reset.
12	18	PON	Power on output.
13	19	CLK	Clock data input.
14	20	DATA	Data Input.
15	21	SNSL	Short line sidetone input.
16	22	SNLL	Long line sidetone input.
17	23	ACFSL	Anti-acoustic feedback and squelch peak voltage.
18	24	ACFFI	Anti-acoustic feedback and squelch filter.
19	25	RECIN	Receiving Input.
20	26	REOUT	Receive output.
21	27	GTR	Transmit gain adjustment.
22	28	HFIN	Handsfree microphone input.
23	29	MIC1	Microphone input.
24	30	MIC2	Microphone input.
25	31	VREF	Transmit and receive reference voltage (VCC/2).
26	32	VCC	Transmit and receive power supply.
27	33	TSOFT	Transmit soft-clipping time constant.
28	34	SOFTL	Maximum AC signal (Softclipping threshold).
29	35	IREF	Internal reference current.
30	36	VS	Shunt regulator capacitor.
31	37	SLP	DC mask slope.
32	38	GNDA	Analog Ground (signal).
33	39	ILL	Line current regulation start up.
34	40	ISL	Line current regulation stop.
35	41	EAR+	Positive earphone output.
36	42	EAR-	Negative earphone output.
37	43	GREC	Receive gain adjustment.
38	44	VZP	Switch mode power supply internal zener.
39	1	SWP	Switch mode power supply output.
40	2	RSU	Ring start up level.
41	3	RCO	Ring capacitor optimization (output power).
42	4	N.C.	Not Connected.
43	5	GNDP	Power Ground.
44	6	LSOUT	Loudspeaker Output.

Figure 1: Block Diagram.



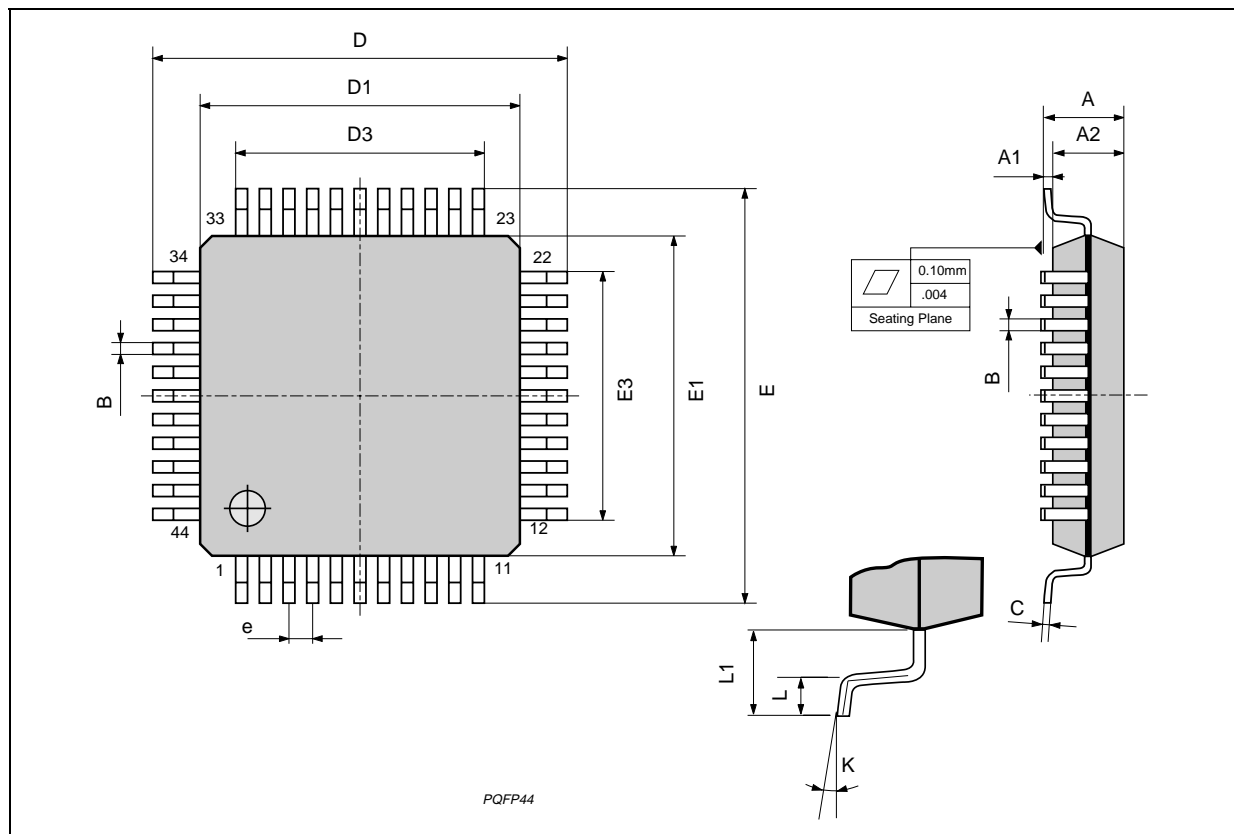
PLCC44 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	17.4		17.65	0.685		0.695
B	16.51		16.65	0.650		0.656
C	3.65		3.7	0.144		0.146
D	4.2		4.57	0.165		0.180
d1	2.59		2.74	0.102		0.108
d2		0.68			0.027	
E	14.99		16	0.590		0.630
e		1.27			0.050	
e3		12.7			0.500	
F		0.46			0.018	
F1		0.71			0.028	
G			0.101			0.004
M		1.16			0.046	
M1		1.14			0.045	



PQFP44 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			3.40			0.134
A1	0.25			0.0098		
A2	2.55	2.80	3.05	0.100	0.110	0.120
B	0.35		0.50	0.0138		0.0197
C	0.13		0.23	0.005		0.009
D	16.95	17.20	17.45	0.667	0.677	0.687
D1	13.90	14.00	14.10	0.547	0.551	0.555
D3		10.00			0.394	
e		1.00			0.039	
E	16.95	17.20	17.45	0.667	0.677	0.687
E1	13.90	14.00	14.10	0.547	0.551	0.555
E3		10.00			0.394	
L	0.65	0.80	0.95	0.025	0.0315	0.0374
L1		1.60			0.063	
K	0°(min.), 7°(max.)					



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