

Features

- Data mode capabilities:
 - ITU-T V.90
 - ITU-T V.92 (Upgradeable)
 - ITU-T V.34
 - ITU-T V.32bis, V.32
 - ITU-T V.22bis, V.22
 - ITU-T V.23, V.21
 - Bell 212
 - Bell 103
- FAX mode capabilities:
 - ITU-T V.17, V.29, V.27ter, and V.21 Ch 2
 - TIA/EIA 578 class 1 FAX
- Enhanced voice features:
 - Telephone answering machine (TAM)
 - Real Audio, 8 bits PCM
 - Speakerphone (Option)
- Caller identification (caller ID)
- V.42 error correction (LAPM and MNP)
- V.42bis and MNP class 5 data compression
- V.44 data compression
- World wide call progress tone detection
- ITU V.24, RS-232C serial interface
- Operating system support: DOS, Windows 95, Windows 98, Windows NT, Windows ME and Windows 2000
- IS-101 AT+V commands with extensions
- TIA/EIA 602 standard for AT command set
- DTE speed up to 115200
- I/O port for homologation and specific application
- Support power down mode
- Fully software upgradeable (need external flash memory)

General Description

The Modem Chip IP568x is a highly integrated, low-cost, high performance, low-power, a full-function modem solution. IP568x implements V.90/V.92 to achieve Internet connection rates up to 56Kbps, supporting existing V.34 data mode, video-ready interface, Class 1 FAX, TAM (Telephone Answer Machine) and Speakerphone functions. IP568x's I/O pins allow designer to easily control DAA or design modem for special application. IP568x is a μ DSP-based chip designed specifically for modem application, and it performs high MIPS operations such as V.90/V.92, V.34 and V.32 modulation. IP568x provides a serial interface for connecting to codec. IP568x uses high quality design to optimize modem configuration for line condition and provide reliable connection with connection rate ranging from 300bps up to 56Kbps. IP568x is the best choice for designing a modem.

Application

- Standalone modem
- Embedded modem module
- Network computer
- Set-top box
- Video phone

System Block Diagram

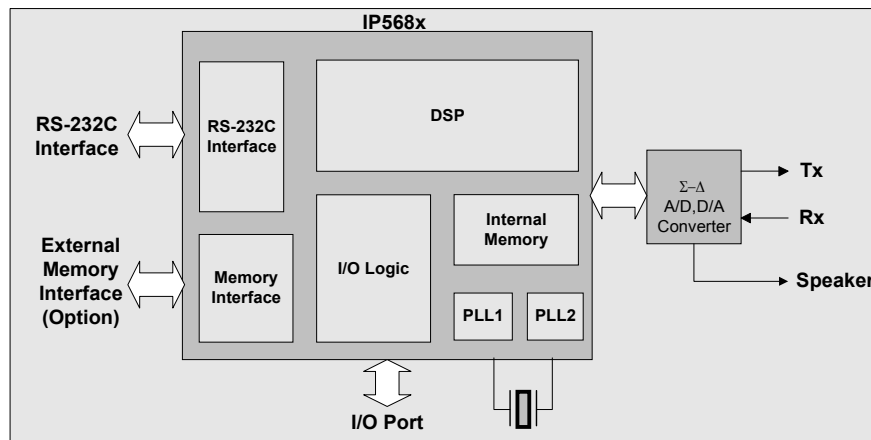


Figure 1. Block Diagram



PIN Assignments

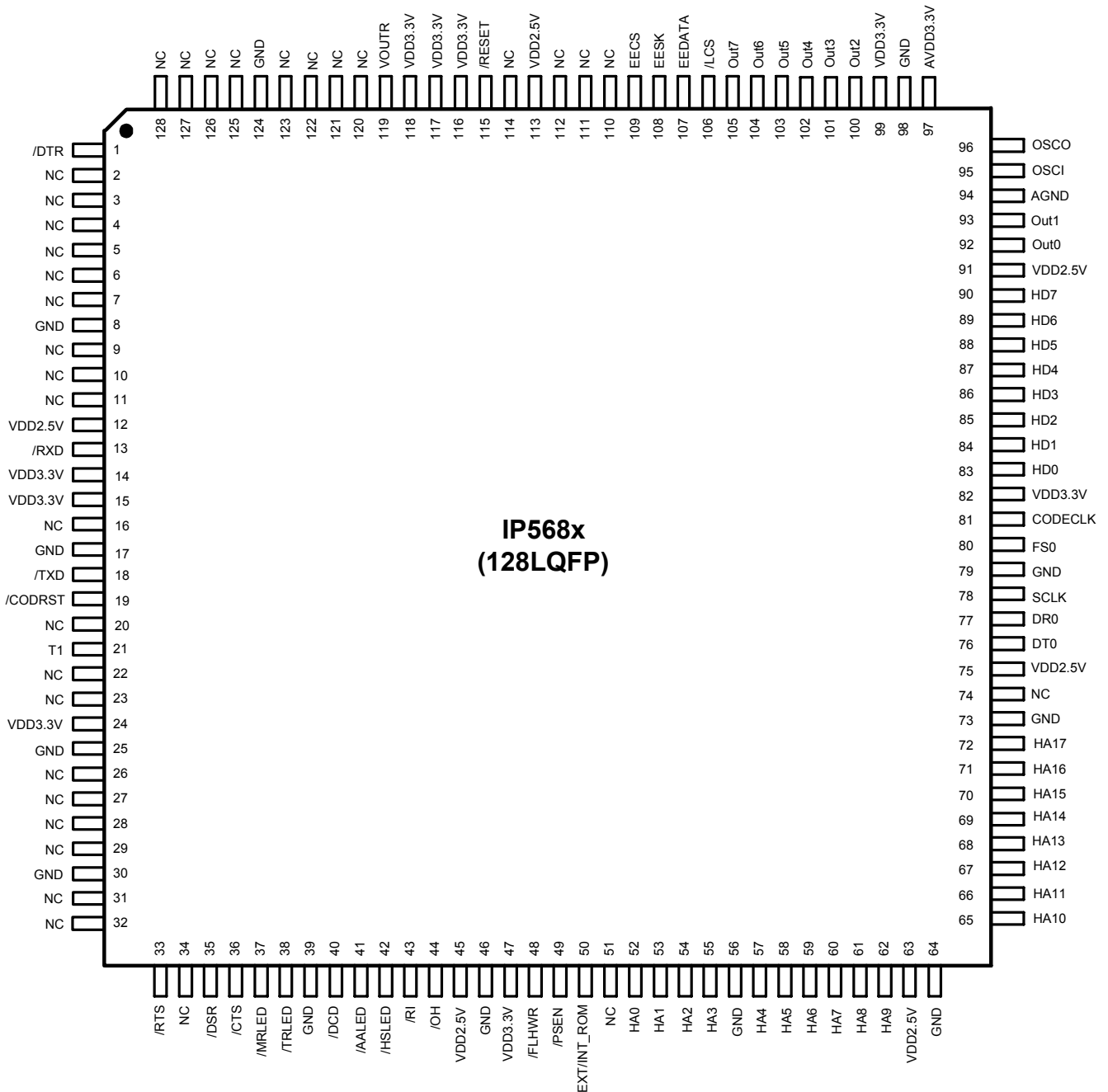


Figure 2. PIN Assignments



PIN Description

Pin No.	Symbol	I/O	Description
1	/DTR	I	RS232 DTR signal
13	/RXD	I	RS232 data input and TD LED
18	/TXD	O	Data output to RS232 and RD LED
19	/CODRST	O	Codec reset
21	T1	I	Connect with pin 15
33	/RTS	I	RS232 RTS Signal
35	/DSR	O	RS232 DSR signal
36	/CTS	O	RS232 CTS signal
37	/MRLED	O	MR LED pin
38	/TRLED	O	DTR LED pin
40	/DCD	O	DCD
41	/AALED	O	AA LED pin
42	/HSLED	O	HS LED pin
43	/RI	I	Telephone interface ring input
44	/OH	O	Hook relay control (P1.2)
48	/FLHWR	O	IP568x flash memory write enable If program memory is not flash memory, this pin is an NC pin
49	/PSEN	O	IP568x program strobe enable
50	EXT/INT_ROM	I	For external ROM or internal ROM selection
52-55,57-62,65-72	HA0-HA17	O	Host Address bus of IP568x
76	DT0	O	SP1 Transmit data output pin
77	DR0	I	SP1 Receive data input pin
80	FS0	I	SP1 Frame signal
78	SCLK	I	Reference clock for SP1 and SP2
81	CODECLK	O	Codec clock
83-90	HD0-HD7	I/O	Host data bus of IP568x
92-93,100-105	OUT[7:0]	O	Output port 0 – 7
95	OSCI	I	Oscillator input. It accepts either a crystal or an external TTL driver
96	OSCO	O	Oscillator output
106	/LCS	I	Line loop current detection Input port (address:bit0 of F400H)
107	EEDATA	I/O	NVRAM serial data port
108	EESK	O	NVRAM clock input
109	EECS	O	NVRAM chip select
115	/RESET	I	Reset pin, 3.3V input only
119	VOUTr	O	Regulator control output
94	AGND	P	For PLL and oscillator
97	AVDD3.3V	P	For PLL and oscillator (3.3V)
12,45,63,75,91,113	VDD2.5V	P	+2.5V power supply
8,17,25,30,39,46, 56,64,73,79,98, 124	GND	P	Digital ground



PIN Description (continued)

Pin No.	Symbol	I/O	Description
14,15,24,47,82,99, 116,117,118	VDD3.3V	P	+3.3V power supply
2-7,9-11,16, 20,22,23,26-29, 31,32,34,51,74, 110-112,114, 120-123,125-128	NC	-	These pins are for testing and must be floated in application.

Table 1. PIN Description

System Configuration

a. Power Down Mode

Host can instruct modem system to enter power down mode by "AT*P" command. There are two ways to wake μ DSP.

- (1) Power off then power on modem
- (2) Negative pulse is occurred at input pins "RI" of IP568x

b. Re-flash Program Memory (Download New code)

By setting C0H.0 (reset state: 0), system can switch program and data memory. If system uses FLASH memory as program memory, we can use this function to replace program code by loading download program to data memory then swapping external data memory and external program memory.

For example,

```
SETB  C0H,0
LJMP  0000H
```

In this modem system, modem provides a AT command for download function. When users get new code and want to upgrade current program code, the following procedure can be used:

- ATxxxx (Issue Download command)
- Ready (Modem response "Ready")
- Send ASCII File (Choose send ASCII file in communication software & send new code to modem)
- Wait moment (download program)
- .
- .
- .
- OK (When download procedure is complete, modem will response OK.)

Note: When modem is in download mode, don't turn off power.

c. DAA (Data Access Arrangement) & NCU (network Control Unit)

The modem chip provides standard serial interface for Codec. IP568x can support traditional code plus transformer-based NCU circuit and advance silicon DAA. For further information, please contact technical supporting engineer.

d. AT command

IP568x modem supports Data, Fax and Voice function. All functions are controlled by AT command.

IC PLUS will provide source code of AT command part for customer modification. Please refer to the document " User's Manual & AT command set".



e. V.92 & V.44

V.92

- Quick Connect
Reducing the modem handshake time
- Modem-On-Hold
Allows the user to stay connected to the internet while taking an incoming voice call.
- PCM Upstream
Increases capability of upstream data rate from 24Kbps to 48Kbps maximum.

V.44

New compression scheme that compresses HTML text for faster web downloads.

IP568x has already combined the V.44 function into its internal ROM. That means, IP568x don't need to add any extra components for this advance function.

IP568x can be upgrade to V.92 capability by using external flash memory. The size of memory is 256K x 8 bits.

Electrical Characteristic

Absolute Maximum Rating

Power supply voltage	-0.5V to 7.0V
Operating temperature under bias	0°C to 70°C
Storage temperature	-65°C to 150°C
Applied voltage on any pin	$-0.5V \leq V_{IN} \leq V_{DD} + 0.5V$

Table 2. Absolute Maximum Rating

DC Electrical Characteristics

(AVDD3.3V=3.3V±5%, VDD3.3V=3.3V±5%, VDD2.5V=2.5V±5%, GND=0V, TA=0°C to 70°C)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
VDD3.3V	Operation Voltage	3.3-5%	3.3	3.3+5%	V	
VDD2.5V	Operation Voltage	2.5-5%	2.5	2.5+5%	V	
AVDD3.3V	Operation Voltage	3.3-5%	3.3	3.3+5%	V	
IDD	Operation Current		TBD		mA	
VIH	Input High Voltage	2.0			V	
VIL	Input Low Voltage			+0.8	V	
ILI	Input Leakage	-10		10	uA	VIN =0, 3.3V + 5%
VOH	Output High Voltage	2.4			V	IOH=-0.5mA
VOL	Output Low Voltage			+0.4	V	IOL=1.5mA
CIN	Input Capacitance		10.0		pF	
VILRESET	Reset Schmitt VIL			1.3	V	
VIHRESET	Reset Schmitt VIH	2.0			V	

Table 3. DC electrical characteristics



Order Information

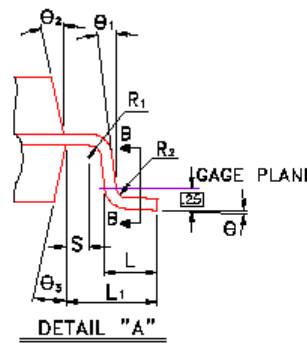
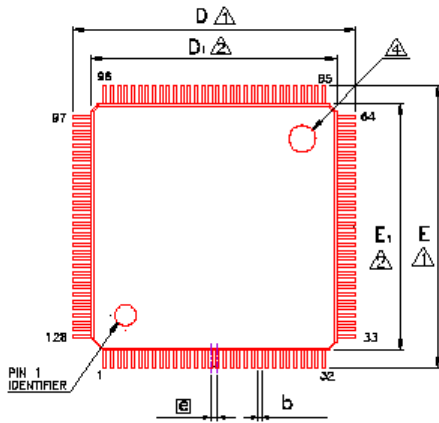
Part No.	PIN	Notice
IP568x	128 PIN LQFP	External Modem

Table 4. Order Information

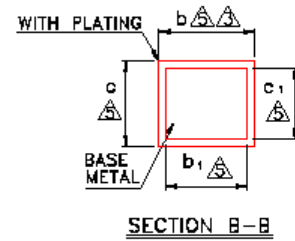


Package Detail
(LQFP 128L Outline Dimensions)

Unit: Inches/mm



Symbol	Dimension in mm			Dimension in inch		
	Min	Nom	Max	Min	Nom	Max
A	—	—	1.60	—	—	0.063
A ₁	0.05	—	—	0.002	—	—
A ₂	1.35	1.40	1.45	0.053	0.055	0.057
b	0.13	0.18	0.23	0.005	0.007	0.009
b ₁	0.13	0.16	0.19	0.005	0.006	0.007
c	0.09	—	0.20	0.004	—	0.008
c ₁	0.09	—	0.16	0.004	—	0.006
D	15.85	16.00	16.15	0.624	0.630	0.636
D ₁	13.90	14.00	14.10	0.547	0.551	0.555
E	15.85	16.00	16.15	0.624	0.630	0.636
E ₁	13.90	14.00	14.10	0.547	0.551	0.555
⌀	0.40 BSC			0.016 BSC		
L	0.45	0.60	0.75	0.018	0.024	0.030
L ₁	1.00 REF			0.039 REF		
R ₁	0.08	—	—	0.003	—	—
R ₂	0.08	—	0.20	0.003	—	0.008
S	0.20	—	—	0.008	—	—
θ	0°	3.5°	7°	0°	3.5°	7°
θ ₁	0°	—	—	0°	—	—
θ ₂	12°TYP			12°TYP		
θ ₃	12°TYP			12°TYP		



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