



## **iChip™ CO2128SEC** **IP Communication Controller**

### **General Description**

iChip™ CO2128SEC is a full-featured programmable Internet Protocol (IP) Communication Controller chip that acts as a coprocessor to offload security and IP network connectivity tasks from any host processor. The IP Controller™ is ideal for enabling devices to achieve secure, high-speed throughput and access to IP networks via 10/100BaseT or 802.11b/g wireless LANs, cellular or dial-up modems. Typically, only one man-month is needed for hardware engineering and adding IP connectivity commands to the application.

The CO2128SEC's firmware supports up to 10 simultaneous active TCP/UDP, two listening sockets, and a secure SSL3/TLS1 socket.

Security features include a true hardware random number generator, SHA-1/256 secure hash accelerator, AES-128/192/256 encryption accelerator, 3DES, SSL3/TLS1, WEP, WPA and WPA2 WiFi encryption.

The CO2128SEC can be configured to route IP packets between a LAN/WiFi and dial-up/cellular platform when in iRouter mode. Multiple iChips can create an ad-hoc network that does not require an Access Point.

The CO2128SEC stores its Internet protocol stack and configuration parameters in the host's memory. The firmware can run from external flash or it can be loaded locally via RS-232, two-wire, SPI or USB interfaces. Firmware can be updated remotely via sockets, FTP, or HTTP.

The chip includes a 32-bit ARM7TDMI RISC processor, 256KB SRAM, and a bus to access external memory or communication devices. The integrated boot loader enables the host to load the firmware via any of the interfaces provided.

The chip's peripheral set includes a 10/100BaseT Ethernet MAC with RMI; two USARTs; two SPI, two-wire, HPI and EBI high-speed parallel interfaces.

CO2128SEC features several Power Save modes for energy savings, and can shut down blocks not in use. It comes in a 128-pin LQFP RoHS-compliant package, has an internal 1.2V LDO power supply, and operates in the industrial temperature range.

### **Key Features**

- Complete Internet Protocol stack
- 3DES, SHA-1/256, AES-128/192/256, SSL3/TLS1 encryption accelerated in hardware.
- 10/100BaseT Ethernet MAC
- Multiple communication interfaces

### **Protocols**

- Internet Protocols: IP, UDP, TCP, PING, DNS, NTP, SMTP, POP3, MIME, FTP, HTTP, Telnet
- Security Protocols: SSL3/TLS1, FTPS, HTTPS, AES-128/256, SHA-128/192/256, 3DES, WEP, WPA, WPA2
- Modem Protocols: PPP, LCP, IPCP, PAP, CHAP, or script authentication
- LAN Protocols: ARP, ICMP, and DHCP
- Web/WAP server with two websites

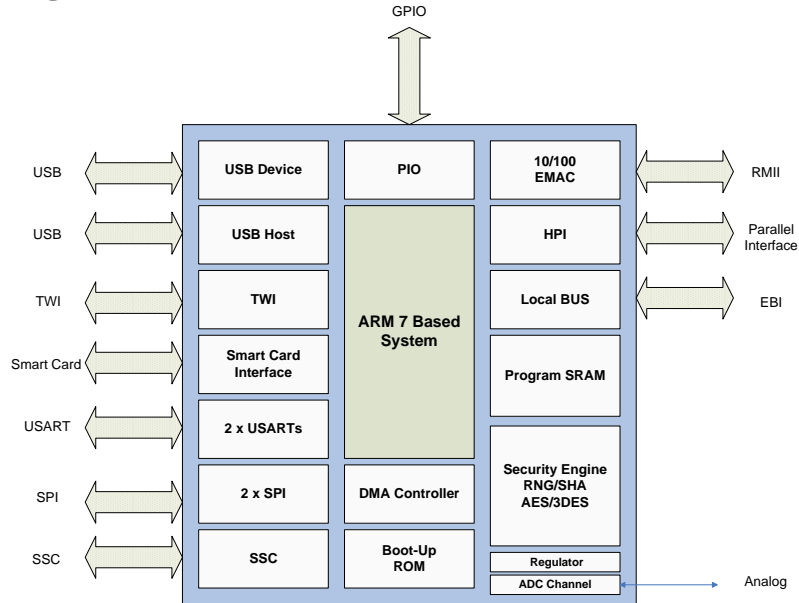
### **Application Program Interface**

Connect One's AT+i™ protocol eliminates the need for Internet programming and minimizes changes to the host application, while the SerialNET™ serial-to-IP bridging mode eliminates the need for any change to the host application. AT+i commands are intercepted by iChip, which puts the host device into Internet mode. AT commands pass transparently from the host processor to the communication peripheral without any intervention by iChip.

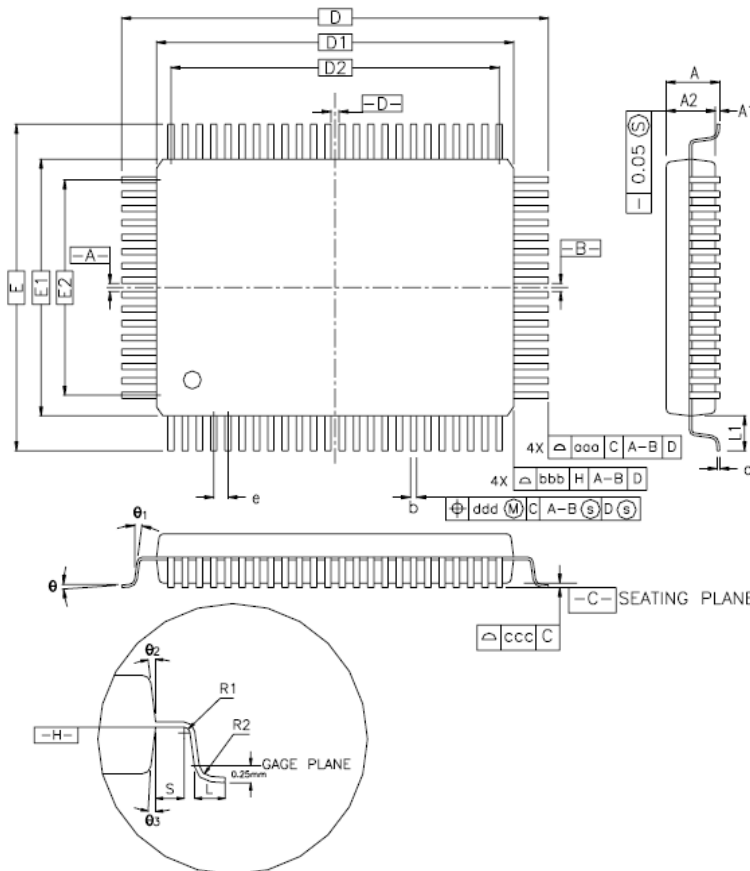
### **Hardware Description**

- Package: 128-pin LQFP, RoHS-compliant
- Dimensions: 14x20x1.4mm, 0.5mm pitch
- Core CPU: 32-bit RISC ARM7TDMI, 0.13 micron, low-leakage
- I/O Operating Range: 3.3V+/-10%
- Core Operating Range: 1.2V+/-10%
- Operating Frequency: Up to 48MHz
- Operating Humidity: 90% max. (non-condensing)
- Operating Temperature Range: -40° to 85°C (-40° to 185°F)
- Power Consumption with external VDD Core @1.2V: 200mW (typical)
- Sleep mode current: <2mA
- Interfaces: Two USARTs, USB Host and Device, two SPI, TWI, HPI, EBI, RMI

## Block Diagram



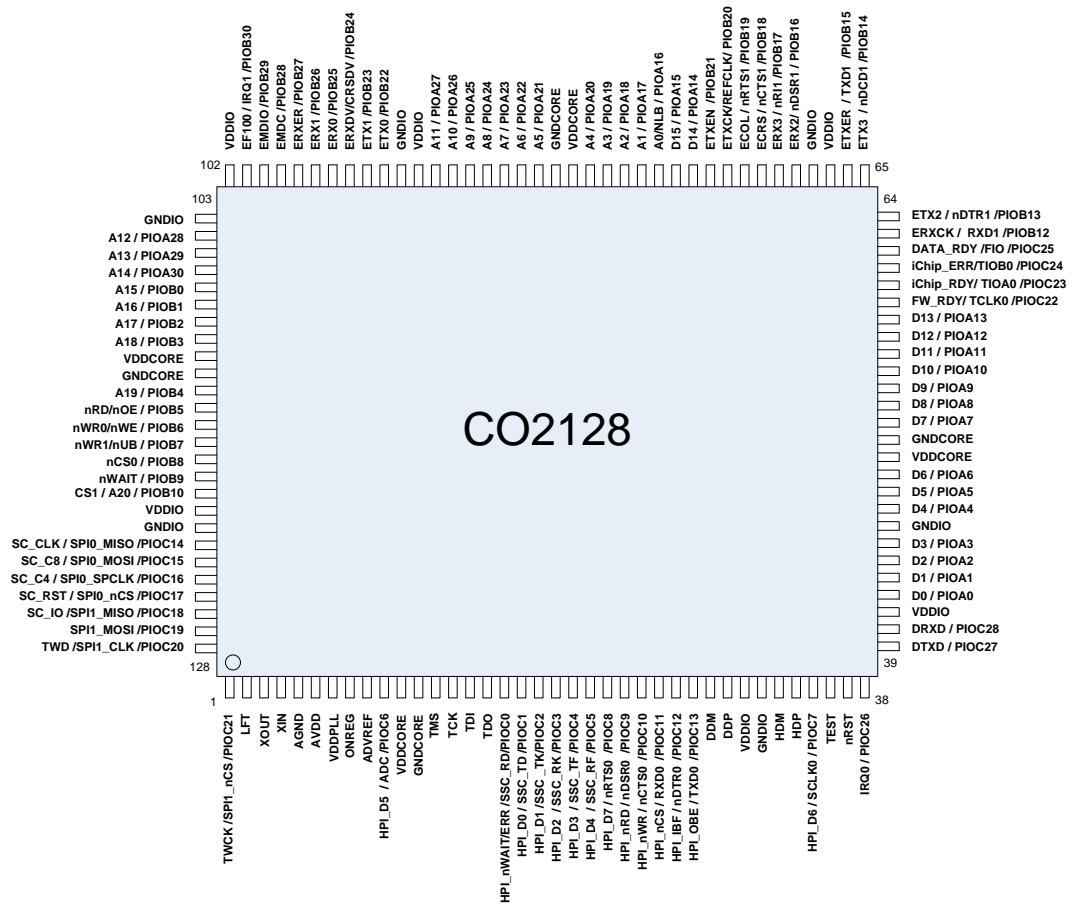
## Mechanical Views



COTROL DIMENSIONS ARE IN MILLIMETERS.

SYMBOL	MILLIMETER			INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	—	—	1.60	—	—	0.063
A1	0.05	—	0.15	0.002	—	0.006
A2	1.35	1.40	1.45	0.053	0.055	0.057
D	22.00 BSC.			0.866 BSC.		
D1	20.00 BSC.			0.787 BSC.		
E	16.00 BSC.			0.630 BSC.		
E1	14.00 BSC.			0.551 BSC.		
R2	0.08	—	0.20	0.003	—	0.008
R1	0.08	—	—	0.003	—	—
θ	0°	3.5°	7°	0°	3.5°	7°
θ <sub>1</sub>	0°	—	—	0°	—	—
θ <sub>2</sub>	11°	12°	13°	11°	12°	13°
θ <sub>a</sub>	11°	12°	13°	11°	12°	13°
c	0.09	—	0.20	0.004	—	0.008
L	0.45	0.60	0.75	0.018	0.024	0.030
L <sub>1</sub>	1.00 REF			0.039 REF		
S	0.20	—	—	0.008	—	—
b	0.17	0.20	0.27	0.007	0.008	0.011
e	0.50 BSC.			0.020 BSC.		
D2	18.50			0.728		
E2	12.50			0.492		
TOLERANCES OF FORM AND POSITION						
aaa	0.20			0.008		
bbb	0.20			0.008		
ccc	0.08			0.003		
ddd	0.08			0.003		

## Pin Out



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