1. General Description

DA128PC-N8D is specific IC for 'Anti-copy system'. This IC protects Main SoC system from illegal replications.

It can be used as the way of checking authenticity.

It enhances the protection of Intellectual Property Rights.

2. Features

Strong Security

- Copy Protection Security IC
- Hardware System Lock
- Unique Encryption-decryption Algorithm
- Using 128 byte Key for advanced security
- Unique 128 byte Key provided to Each Customer (One Customer One Key)

Operating

- 3.3 Volt Operation
- 27MHz Operation
- Communicate with Main Chip using I2C Interface
- 8-SOP Small Size

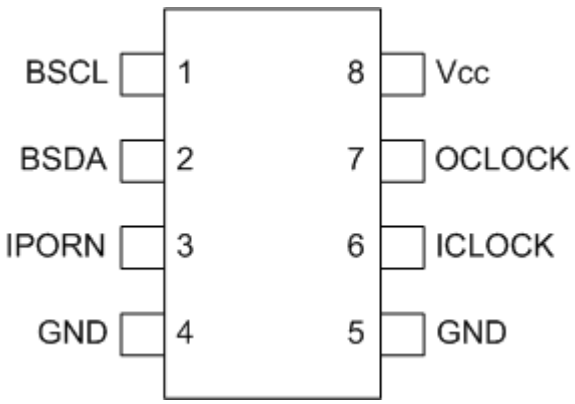
Customer Support

- Firmware Library will be provided

3. Applications

- STB / DVR / DVDP / DMB / MP3 / PMP
  - Module Authorization
  - Authenticity check
  - Limitation of Production

4. Pin Diagram (Top View)



5. Pin Description

No	Name	I/O Type	Function
1	BSCL[1)]	INPUT	I2C INTERFACE CLOCK
2	BSDA[2)]	INPUT / OUTPUT	I2C INTERFACE DATA
3	IPORN[3)]	INPUT	RESET
4	GND	SUPPLY	GROUND
5	GND	SUPPLY	GROUND
6	ICLOCK[4)]	INPUT	MASTER CLOCK
7	OCLOCK[5)]	OUPUT	MASTER CLOCK
8	VCC	SUPPLY	3.3V POWER SUPPLY

NOTE.

1) BSCL : I2C CLOCK INPUT.

2) BSDA :I2C CLOCK DATA INPUT/OUTPUT (Bidirectional). When BSCL is positive edge, data is valid.

3) IPORN : reset by 3.3 Volt.

4) ICLOCK : Main Clock of this IC. 27MHz.

5) OCLOCK : This is output of ICLOCK.

6. Electrical Specifications (will be added after Elec-Test)

A. Electrical Characteristics and Operating Conditions

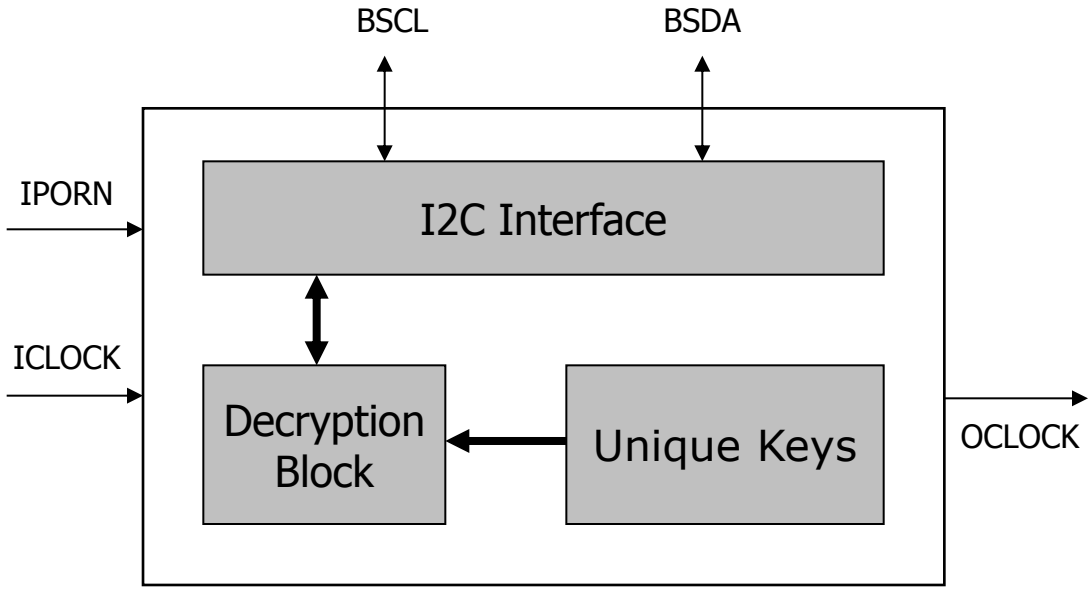
(V_{CC} = 3.3 ± 0.3V : T_A = Ambient = 25℃)

Parameter	Condition	Min	Typ	Max	Unit
Core Digital Voltage (V_{CC})		3.0	3.3	3.6	V
I/O Digital Voltage (V_{CCQ})		3.0	3.3	3.6	V
Operating Temperature	Measured at junction	-40		125	℃

B. I/O Parameters

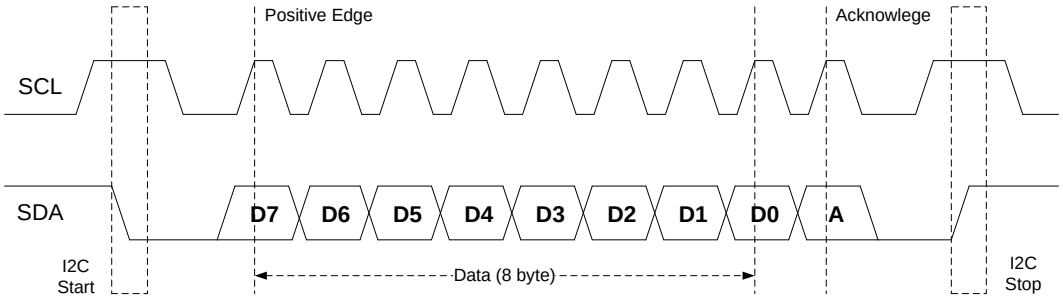
Pin	Parameter	Definition	Condition	Min	Typ	Max	Unit
All Outputs	V_{OH}	Output High Voltage	2.7 V	2.4			V
	V_{OL}	Output Low Voltage	2.7 V			0.4	V
	I_{OH}	Output High Current			400		uA
	I_{OL}	Output Low Current			-400		uA
All Inputs	V_{IH}	Input High Voltage	2.7V to 3.6V	2		4.1	V
	V_{IL}	Input Low Voltage	2.7V to 3.6V	-0.5		0.8	V
CLKIN	CLK27	Master Clock	Absolute minimum	1	27		MHz

7. Functional Diagram



8. I2C Protocol Format

I2C Format Diagram



Write Process

S	Device ID (7 bit)	W	A	$0x00_{(16)}$ (8 bit)	A	Data 0 (8 bit)	A	…	Data 7 (8 bit)	A	P

Read Process

S	Device ID (7 bit)	R	A	Data 0 (8 bit)	A	…	Data 7 (8 bit)	NA	P

NOTE.

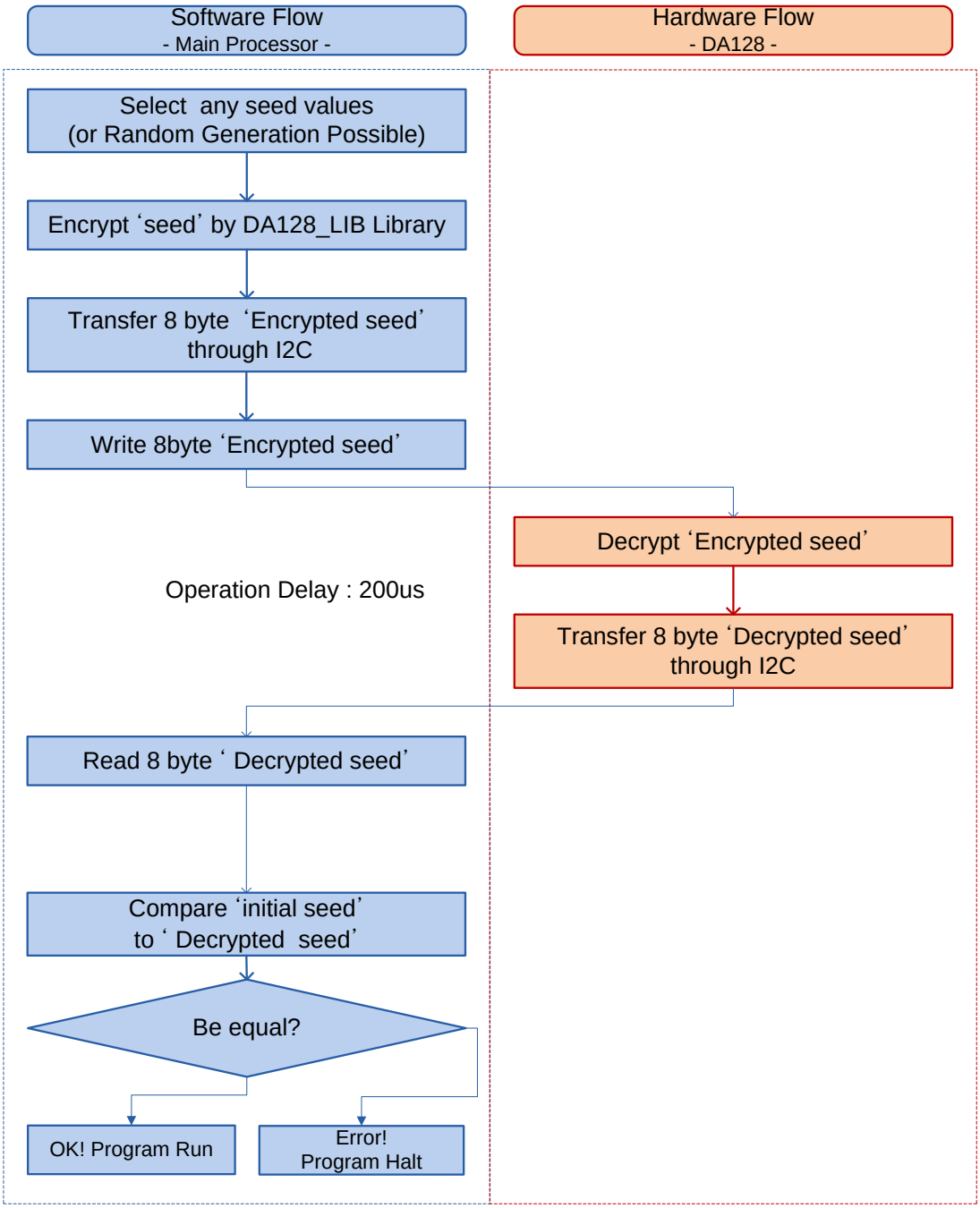
Start/Stop Condition Master to Slave Slave to Master

S : Start, P : Stop

W : Write (bit = 0), R : Read (bit = 1)

A : Acknowledge signal (SDA = Low), NA : No Acknowledge (SDA = High)

9. Operation Flow Chart



10. How to drive Firmware Library

1. Prepare Bootloader Source for using DA128PC-N8D.

2. Make I2C handling code [1)] for communication between DA128PC-N8D and MASTER device.

3. Encrypt temporary Seed data(Original Seed) using Encryption Function [2)] of Library.

4. Transmit encrypted Seed data to DA128PC-N8D.

5. Wait for 200us.

6. Receive decrypted Seed data from DA128PC-N8D after delay time.

7. If Seed data decrypted is equal to Original Seed, boot the program. Else quit the program.

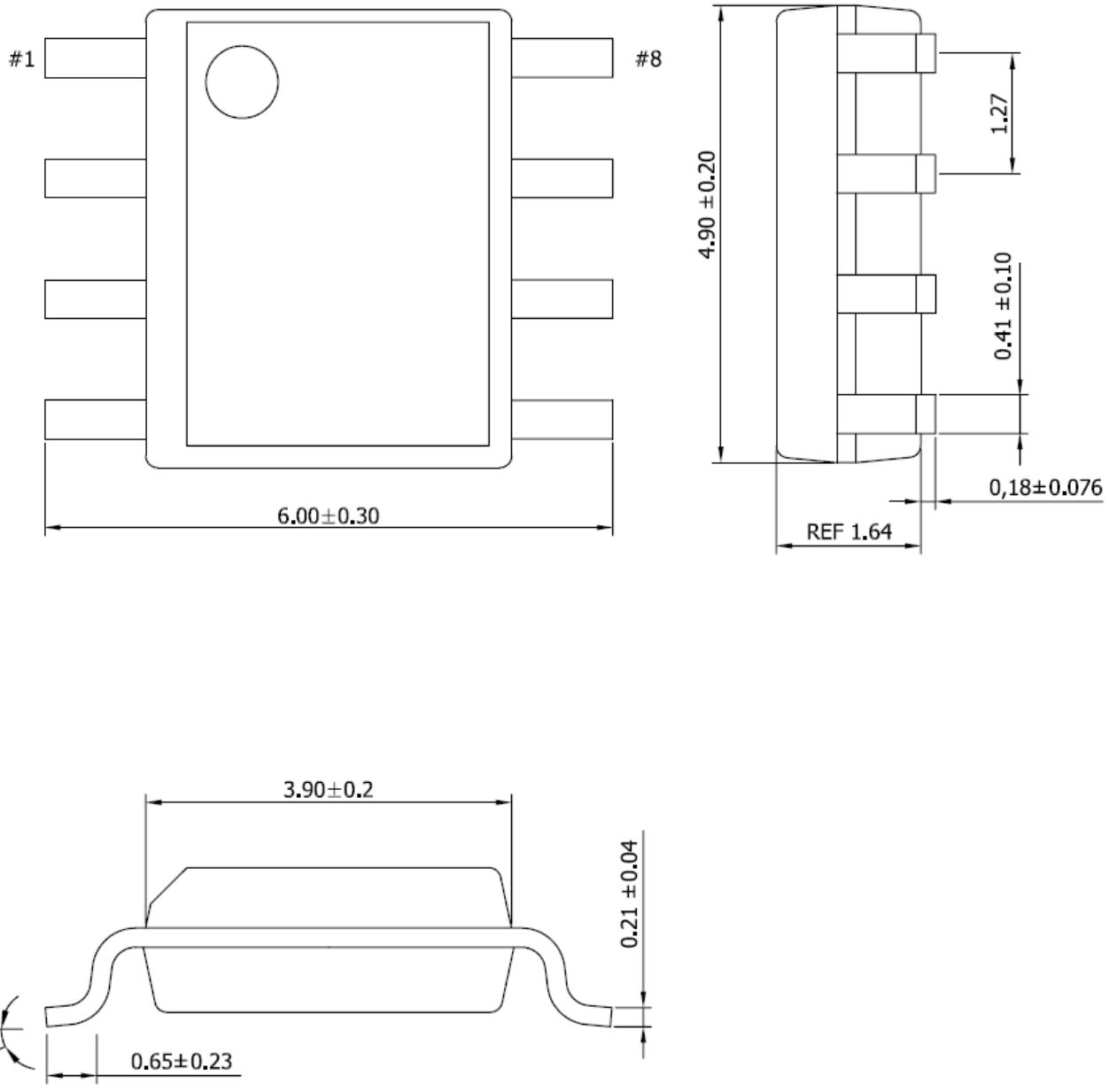
NOTE.

1) I2C Handling Code: Refer to I2C Protocol Format(Page.5)

2) Encryption Function : void crp_enc(char *seed_data_buffer);

11. Package

dimensions in millimeters



12. Application Circuit