ADVANTECH

PCA-TPM
Trusted Platform Module TCG 2.0
Startup Manual

Packing List

Before you begin installing your card, please make sure that the following items have been shipped:

1.	PCA-TPM 2.0 trusted platform module x1	
2.	2-year quality warranty card x 1	P/N: 2190000902
3.	Startup manual x 1	P/N: 20010TPM00
4.	Screw x 1	P/N: 1930005258

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

Specifications

Standard Functions

- Trusted platform module compliant with TCG 2.0 specification and TSS 2.0 via LPC connector on CPU card.
- Adopting Infineon SLB9665TT2.0FW5.51 solution with common criteria security certification EAL level 4+.
- Hardware-based data protection solution for high security businesses such as banks, governments, insurance and confidential facilities in factories or power plants. Once the module disconnects with the SBC, the encrypted data can not be decrypted, even when password is provided.
- System support list

SBC
PCE-5129 (BIOS V2.0 or later)
PCE-5029 (BIOS V2.0 or later)
PCE-7129 (BIOS V2.0 or later)
PCE-4129 (BIOS V2.0 or later)
PCE-3029 (BIOS V2.0 or later)

For more information on this and other Advantech products, please visit our website at:

http://www.advantech.com

For technical support and service, please visit our support website at:

http://support.advantech.com

This manual is for the PCA-TPM Series.

Part No. 20010TPM00
Print in China
1st Edition
February 2017

Specifications(Cont.)

AIMB
AIMB-785 (BIOS V2.0 or later)
AIMB-705 (BIOS V2.0 or later)
Module IPC
MIC-7700 (BIOS V1.0 or later)
MIC-7500 (BIOS V1.13 or later)
AIMC-3202 (BIOS V2.0 or later)
AIMC-3422 (BIOS V2.0 or later)
AIIS-3400 (BIOS V2.0 or later)
AIIS-3410 (BIOS V2.0 or later)
ASMB
ASMB-585 (BIOS V1.13 or later)
ASMB-785 (BIOS V1.14 or later)
ASMB-813 (BIOS V2.01 or later)
ASMB-823 (BIOS V3.02 or later)
ASMB-913 (BIOS V2.01 or later)
ASMB-923 (BIOS V3.01 or later)

Build-in AP support OS List (TPM.msc)
Windows 7 SP1 x64 (Need to update hotfix — Fix459309)
Windows Server 2008 R2 SP1 x64 (Need to update hotfix — Fix459309)
Windows 8 x86 and x64
Windows 8.1 x86 and x64
Windows Server 2012 x64
Windows Server 2012 R2

Mechanical

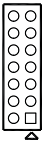
- **Dimensions:** 31.5 mm x 30.5 mm
- **Power supply type:** 3.3 V, 5 V, 5 VSB
- **Power requirements:** 3.3 V @ 5 mA, 3.3 VSB @ 25 mA (Operation time)
- **Operating temperature:** 0 ~ 60° C
- **Operating humidity:** 40° C @ 85% RH, Non-Condensing
- **Storage temperature:** -40 ~ 85° C
- **Storage humidity:** 60° C @ 95% RH, Non-Condensing
- **Weight:** 0.12 kg

Jumpers and Connectors

There is one connector on the module to connect with SBC. The below table lists the functions of this connector.

Jumpers and connectors

Connectors	
Label	**Function**
LPC1	Low pin count connector

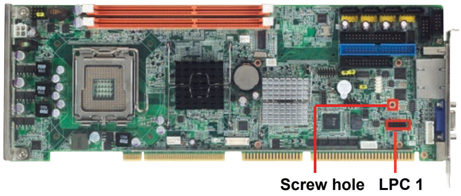


Pin	Signal	Pin	Signal
1	LPC_AD1	2	CLK_TPM
3	LPC_AD0	4	#PLTRST
5	VCC3	6	#LFRAME
7	GND	8	LPC_AD3
9	N/A	10	LPC_AD2
11	N/A	12	LPC_SERIRQ
13	VCC	14	VCC5SB

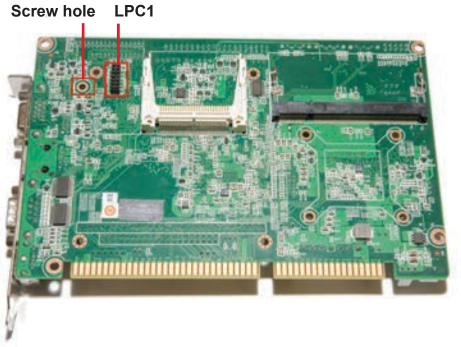
Installation Guide

1. Please connect TPM module to the SBC LPC1 connector using the following steps.

   1). Locate LPC1 and the screw hole on your SBC. If your SBC is either PCA-6010/6011, PCE-5125, or PCA-6782, you will find two screw holes around LPC1. Please choose the screw on the inside of the SBC for those full-size products (please refer to picture 1), and the screw further from LPC1 for PCA-6782 (please refer to picture 2).

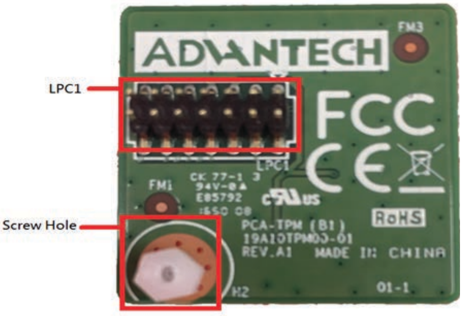


Picture 1



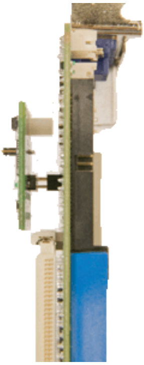
Picture 2

   2). Locate LPC1 and the screw hole on PCA-TPM.

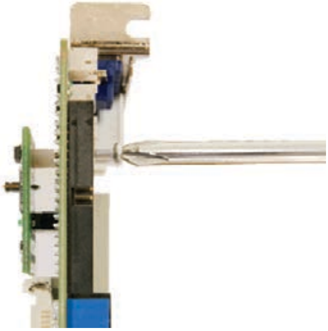


Installation Guide(Cont.)

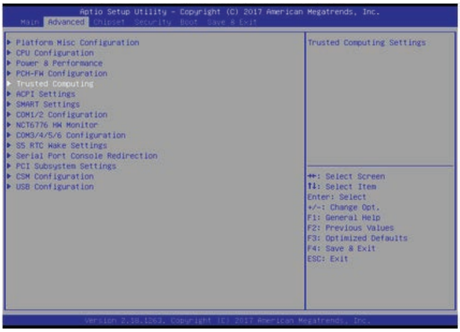
3). Connect PCA-TPM and SBC with LPC1 connector.



4). Align the screw holes, and fix securely with the screw.



Enter the BIOS setup manual and select “Advanced” label.



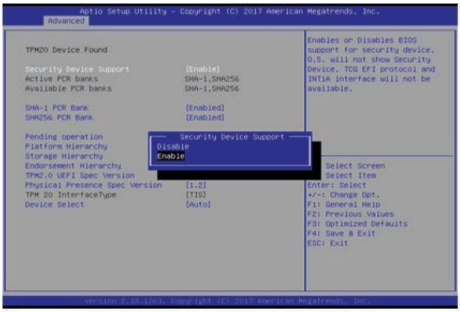
```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit

▶ Platform Misc Configuration                          Trusted Computing Settings
▶ CPU Configuration
▶ Power & Performance
▶ PCH-FW Configuration
▶ Trusted Computing
▶ ACPI Settings
▶ SMART Settings
▶ COM1/2 Configuration
▶ NCT6776 HW Monitor
▶ COM3/4/5/6 Configuration
▶ S5 RTC Wake Settings
▶ Serial Port Console Redirection
▶ PCI Subsystem Settings
▶ CSM Configuration                                    ↔: Select Screen
▶ USB Configuration                                    ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

             Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

Installation Guide(Cont.)

Enable the “Security Device Support”.



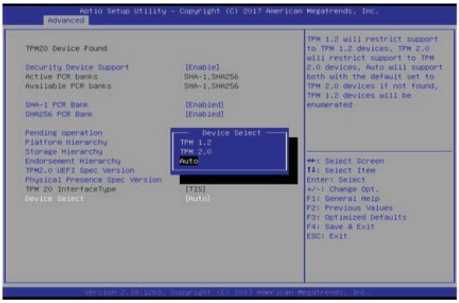
```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
      Advanced

   TPM20 Device Found                                  Enables or Disables BIOS
                                                       support for security device.
   Security Device Support          [Enable]           O.S. will not show Security
   Active PCR banks                 SHA-1,SHA256       Device. TCG EFI protocol and
   Available PCR banks              SHA-1,SHA256       INT1A interface will not be
                                                       available.
   SHA-1 PCR Bank                   [Enabled]
   SHA256 PCR Bank                  [Enabled]

   Pending operation         ── Security Device Support ──
   Platform Hierarchy          Disable
   Storage Hierarchy           Enable
   Endorsement Hierarchy                                  Select Screen
   TPM2.0 UEFI Spec Version                               Select Item
   Physical Presence Spec Version   [1.2]              Enter: Select
   TPM 20 InterfaceType             [TIS]              +/-: Change Opt.
   Device Select                    [Auto]             F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

             Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

Select TPM 2.0 in Device Select.



```
           Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
      Advanced

   TPM20 Device Found                                  TPM 1.2 will restrict support
                                                       to TPM 1.2 devices, TPM 2.0
   Security Device Support          [Enable]           will restrict support to TPM
   Active PCR banks                 SHA-1,SHA256       2.0 devices, Auto will support
   Available PCR banks              SHA-1,SHA256       both with the default set to
                                                       TPM 2.0 devices if not found,
   SHA-1 PCR Bank                   [Enabled]          TPM 1.2 devices will be
   SHA256 PCR Bank                  [Enabled]          enumerated

   Pending operation                ── Device Select ──
   Platform Hierarchy                 TPM 1.2
   Storage Hierarchy                  TPM 2.0
   Endorsement Hierarchy              Auto             ↔: Select Screen
   TPM2.0 UEFI Spec Version                            ↑↓: Select Item
   Physical Presence Spec Version                      Enter: Select
   TPM 20 InterfaceType             [TIS]              +/-: Change Opt.
   Device Select                    [Auto]             F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

             Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

2. For software installation, please refer to the appendix.

Board Layout

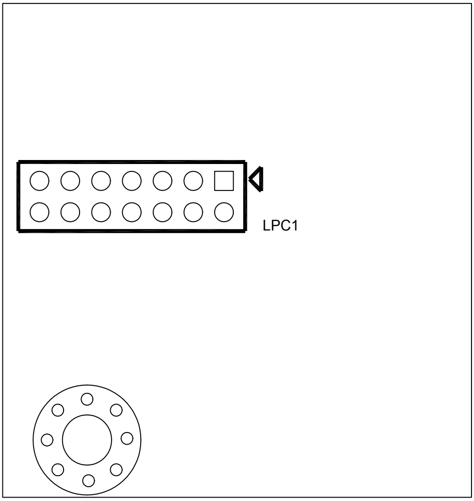


Figure 1: PCA-TPM Board Layout

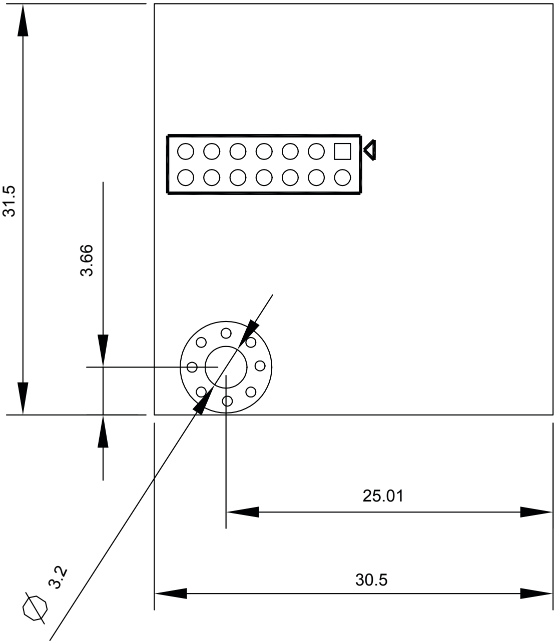
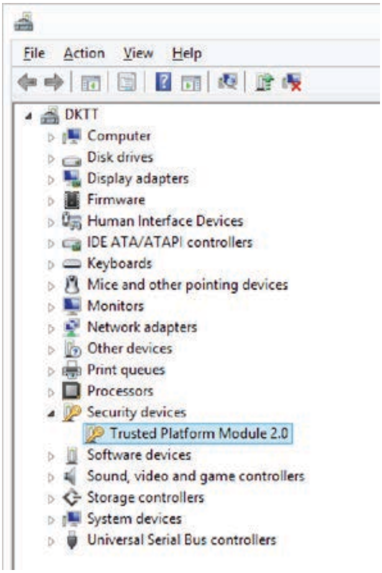


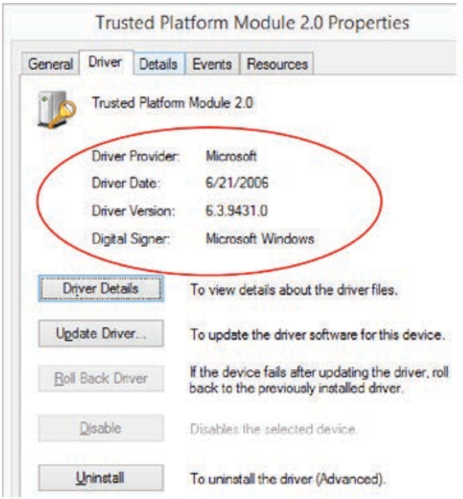
Figure 3: PCA-TPM Board Dimensions

TPM setup under Windows OS

Enter the Device manager to check the TPM is work or not.



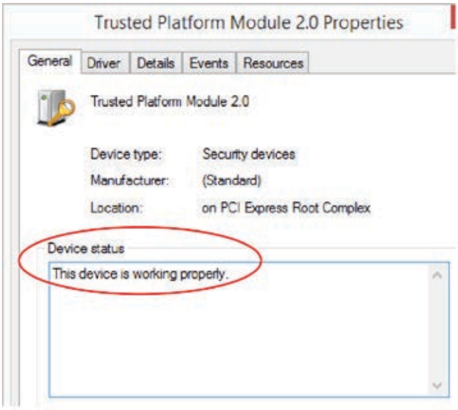
DKTT
- Computer
- Disk drives
- Display adapters
- Firmware
- Human Interface Devices
- IDE ATA/ATAPI controllers
- Keyboards
- Mice and other pointing devices
- Monitors
- Network adapters
- Other devices
- Print queues
- Processors
- Security devices
  - Trusted Platform Module 2.0
- Software devices
- Sound, video and game controllers
- Storage controllers
- System devices
- Universal Serial Bus controllers



Trusted Platform Module 2.0

Driver Provider:	Microsoft
Driver Date:	6/21/2006
Driver Version:	6.3.9431.0
Digital Signer:	Microsoft Windows

Driver Details	To view details about the driver files.
Update Driver...	To update the driver software for this device.
Roll Back Driver	If the device fails after updating the driver, roll back to the previously installed driver.
Disable	Disables the selected device.
Uninstall	To uninstall the driver (Advanced).

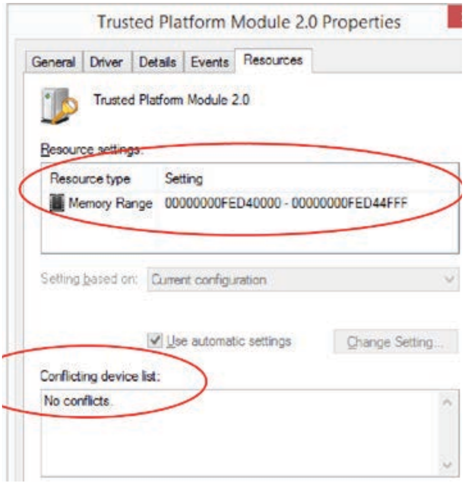


Trusted Platform Module 2.0

Device type:	Security devices
Manufacturer:	(Standard)
Location:	on PCI Express Root Complex

Device status

This device is working properly.



Trusted Platform Module 2.0

Resource settings:

Resource type	Setting
Memory Range	00000000FED40000 - 00000000FED44FFF

Setting based on: Current configuration

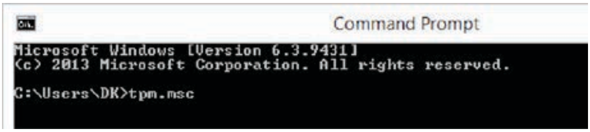
☑ Use automatic settings

Conflicting device list:

No conflicts.

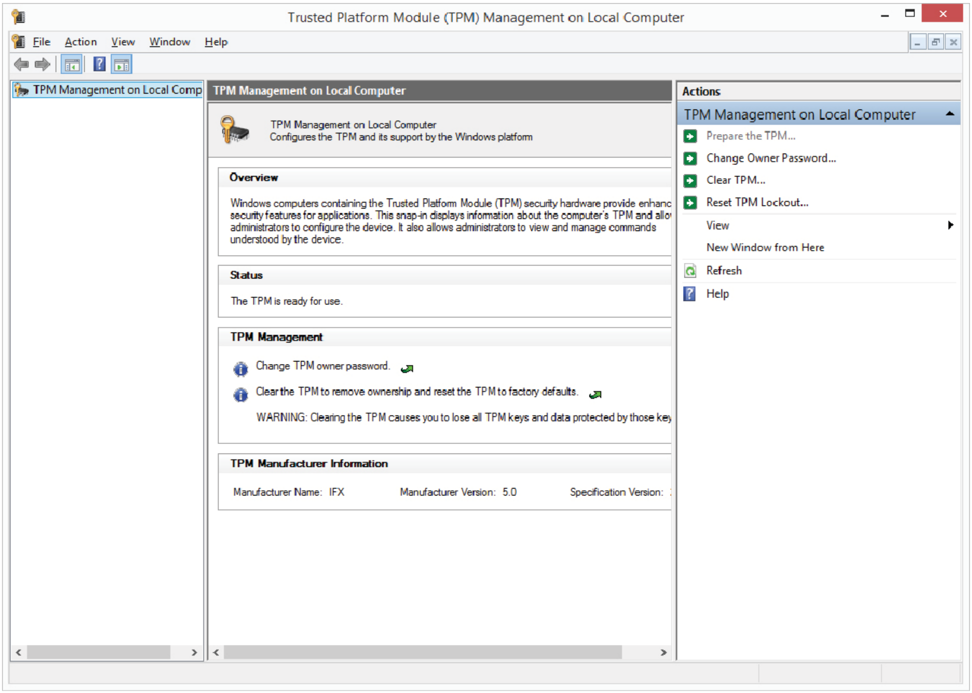
Appendix(Cont.)

Enter “tpm.msc” under command mode and start to setup the TPM.



```
Microsoft Windows [Version 6.3.9431]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\DK>tpm.msc
```


Trusted Platform Module (TPM) Management on Local Computer
File
Action
View
Window
Help
TPM Management on Local Comp
TPM Management on Local Computer
Actions
TPM Management on Local Computer
Prepare the TPM...
Change Owner Password...
Clear TPM...
Reset TPM Lockout...
View
New Window from Here
Refresh
Help

TPM Management on Local Computer
Configures the TPM and its support by the Windows platform

Overview

Windows computers containing the Trusted Platform Module (TPM) security hardware provide enhanc security features for applications. This snap-in displays information about the computer's TPM and allo administrators to configure the device. It also allows administrators to view and manage commands understood by the device.

Status

The TPM is ready for use.

TPM Management

Change TPM owner password.

Clear the TPM to remove ownership and reset the TPM to factory defaults.

WARNING: Clearing the TPM causes you to lose all TPM keys and data protected by those key

TPM Manufacturer Information

Manufacturer Name: IFX Manufacturer Version: 5.0 Specification Version: