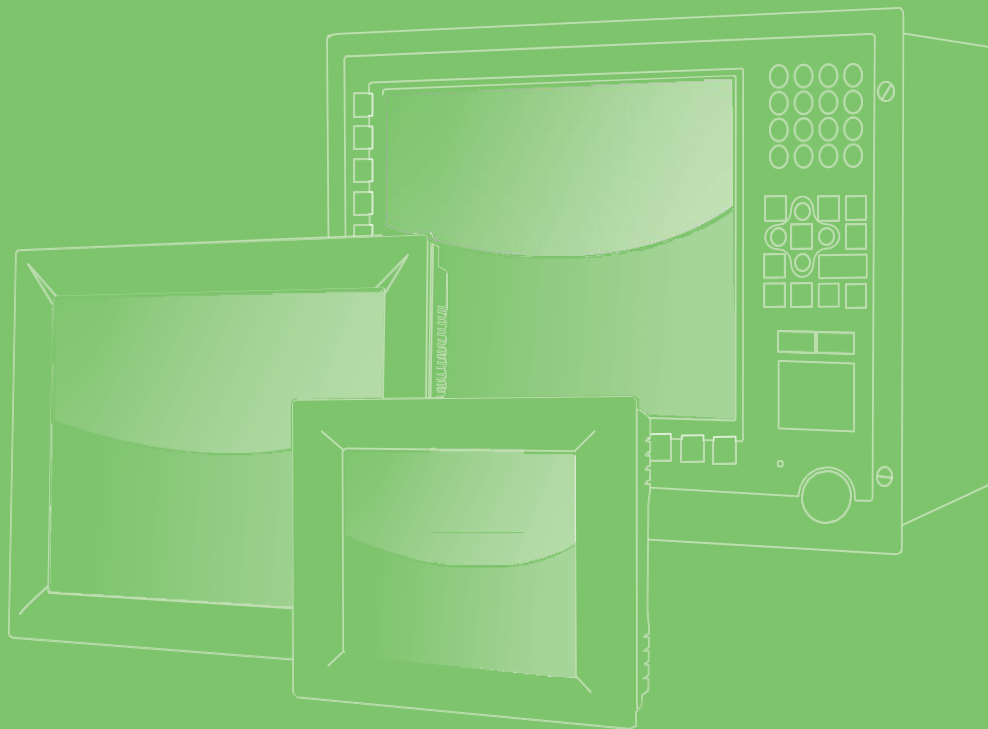


User Manual



TPC-B520L

Computing Box Module with Intel® Core™ i3 Processor N-series

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This Manual Covers the Following Models:

TPC-B520L series

- TPC-B520L-C30A
- TPCB520LC30A2401-T, TPCB520LC30A2402-T, TPCB520LC30A2403-T, TPCB520LC30A2404-T, TPCB520LC30A2405-T, TPCB520LC30A2406-T, TPCB520LC30A2501-T, TPCB520LC30A2502-T, TPCB520LC30A2503-T, TPCB520LC30A2504-T, TPCB520LC30A2505-T, TPCB520LC30A2506-T, TPCB520LC30A2601-T, TPCB520LC30A2602-T, TPCB520LC30A2603-T, TPCB520LC30A2604-T, TPCB520LC30A2605-T, TPCB520LC30A2606-T, TPCB520LC30A2701-T, TPCB520LC30A2702-T, TPCB520LC30A2703-T, TPCB520LC30A2704-T, TPCB520LC30A2705-T, TPCB520LC30A2706-T, TPCB520LC30A2801-T, TPCB520LC30A2802-T, TPCB520LC30A2803-T, TPCB520LC30A2804-T, TPCB520LC30A2805-T, TPCB520LC30A2806-T, TPCB520LC30A2901-T, TPCB520LC30A2902-T, TPCB520LC30A2903-T, TPCB520LC30A2904-T, TPCB520LC30A2905-T, TPCB520LC30A2906-T, TPCB520LC30A3001-T, TPCB520LC30A3002-T, TPCB520LC30A3003-T, TPCB520LC30A3004-T, TPCB520LC30A3005-T, TPCB520LC30A3006-T

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

A 级产品

警告：在居住环境中，运行此设备可能会造成无线电干扰。

甲類警語

甲類設備為其他符合甲類設備限制值之資訊技術設備，而非符合乙類資訊技術設備的限制值；雖然不可限制此類設備之行銷，但使用場所必須被限制，不得進行居住的環境中，且應於其機器本體及使用說明書中含有下列警語：

警告使用者

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻干擾，在此種情況下，使用者會被要求採取某些適當的對策。

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*



Les avertissements indiquent des conditions qui, si elles ne sont pas respectées, peuvent provoquer des blessures !

Caution!



Cautions are included to help you avoid damaging hardware or losing data. e.g. There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Des précautions sont incluses pour vous aider à éviter d'endommager le matériel ou de perdre des données. par exemple. Il existe un risque d'explosion d'une nouvelle batterie si elle n'est pas correctement installée. N'essayez pas de recharger, d'ouvrir de force ou de chauffer la batterie. Remplacez la batterie uniquement par une pile identique ou équivalente recommandée par le fabricant. Jetez les piles usagées conformément aux instructions du fabricant.

Note! *Notes provide optional additional information.*



Safety Instructions

1. Read these safety instructions carefully.
Lisez attentivement ces consignes de sécurité.
2. Keep this User Manual for later reference.
Conservez ce manuel d'utilisation pour référence ultérieure.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth.
Do not use liquid or spray detergents for cleaning.
Débranchez cet équipement de toute prise secteur avant de le nettoyer. Utilisez un chiffon humide. N'utilisez pas de détergents liquides ou en spray pour le nettoyage.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
Pour les équipements enfichables, la prise de courant doit être située à proximité de l'équipement et doit être facilement accessible.
5. Keep this equipment away from humidity.
Gardez cet équipement à l'abri de l'humidité.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
Placez cet équipement sur une surface fiable lors de l'installation. Le laisser tomber ou le laisser tomber peut causer des dommages.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
Les ouvertures sur le boîtier sont destinées à la convection de l'air. Protégez l'équipement de la surchauffe. **NE COUVREZ PAS LES OUVERTURES.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à la prise de courant.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
Placez le cordon d'alimentation de manière à ce que personne ne puisse marcher dessus. Ne placez rien sur le cordon d'alimentation.
10. All cautions and warnings on the equipment should be noted.
Toutes les mises en garde et avertissements figurant sur l'équipement doivent être notés.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
Si l'équipement n'est pas utilisé pendant une longue période, débranchez-le de la source d'alimentation pour éviter tout dommage dû à une surtension transitoire.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
Si l'équipement n'est pas utilisé pendant une longue période, débranchez-le de la source d'alimentation pour éviter tout dommage dû à une surtension transitoire.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
N'ouvrez jamais l'équipement. Pour des raisons de sécurité, l'équipement ne doit être ouvert que par un personnel de service qualifié.
14. If one of the following situations arises, get the equipment checked by service personnel:
Si l'une des situations suivantes se produit, faites vérifier l'équipement par le personnel de service :
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.

- The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
 - Le cordon d'alimentation ou la fiche est endommagé.
 - Du liquide a pénétré dans l'équipement.
 - L'équipement a été exposé à l'humidité.
 - L'équipement ne fonctionne pas bien ou vous ne parvenez pas à le faire fonctionner conformément au manuel d'utilisation.
 - L'équipement est tombé et a été endommagé.
 - L'équipement présente des signes évidents de casse.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20°C (-4°F) OR ABOVE 60°C (140°F) THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
- NE LAISSEZ PAS CET ÉQUIPEMENT DANS UN ENVIRONNEMENT OÙ LA TEMPÉRATURE DE STOCKAGE PEUT DESCENDRE EN DESSOUS DE -20°C (-4°F) OU AU-DESSUS DE 60°C (140°F), CELA POURRAIT ENDOMMAGER L'ÉQUIPEMENT. L'ÉQUIPEMENT DOIT ÊTRE DANS UN ENVIRONNEMENT CONTRÔLÉ.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
- ATTENTION : RISQUE D'EXPLOSION SI LA BATTERIE EST MAL REMPLACÉE. REMPLACER UNIQUEMENT PAR LE MÊME TYPE OU ÉQUIVALENT RECOMMANDÉ PAR LE FABRICANT, JETER LES BATTERIES USÉES SELON LES INSTRUCTIONS DU FABRICANT.
17. In accordance with the IEC 704-1:1982 specifications, the sound pressure level at the operator position does not exceed 70 dB (A).
- Conformément aux spécifications CEI 704-1:1982, le niveau de pression acoustique au poste de l'opérateur ne dépasse pas 70 dB (A).
18. DISCLAIMER: These instructions are provided according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.
- AVIS DE NON-RESPONSABILITÉ : Ces instructions sont fournies conformément à la norme CEI 704-1. Advantech décline toute responsabilité quant à l'exactitude des déclarations contenues dans le présent document.
19. This product is not intended for use by children (this product is not a toy).
- Ce produit n'est pas destiné à être utilisé par des enfants (ce produit n'est pas un jouet).
20. This equipment is not suitable for use in locations where children are likely to be present.
- Cet équipement ne convient pas à une utilisation dans des endroits où des enfants sont susceptibles d'être présents.
21. This product is intended to be supplied by a UL listed (Certificate) power supply with a mating connector, output rated 19-24Vdc, 7.89-6.25A, Tma 60 degree C minimum and altitude 2000m. If need further assistance, please contact manufacture or UL File owner or brand owner for additional information.
- Ce produit est destiné à être alimenté par une alimentation homologuée UL (certificat) avec un connecteur homologue, sortie nominale 19-24 Vdc, 7,89-6,25 A, Tma 60 degrés C minimum et altitude 2 000 m. Si vous avez besoin d'aide supplémentaire, veuillez contacter le fabricant, le propriétaire du fichier UL ou le propriétaire de la marque pour plus d'informations.
22. The equipment power supply cord shall be connected to a socket-outlet with

earthing connection.

Le cordon d'alimentation de l'équipement doit être connecté à une prise de courant avec connexion à la terre.

安全指示

23. 請仔細閱讀此安全操作說明。
24. 請妥善保存此用戶手冊供日後參考。
25. 用濕抹布清洗設備前，請從插座拔下電源線。請不要使用液體或去汙噴霧劑清洗設備。
26. 對於使用電源線的設備，設備周圍必須有容易接觸到的電源插座。
27. 請不要在潮濕環境中使用設備。
28. 請在安裝前確保設備放置在可靠的平面上，意外跌落可能會導致設備損壞。
29. 設備外殼的開口是用於空氣對流，從而防止設備過熱。請不要覆蓋這些開口。
30. 當您連接設備到電源插座上前，請確認電源插座的電壓是否符合要求。
31. 請將電源線佈置在人們不易絆到的位置，並不要在電源線上覆蓋任何雜物。
32. 請注意設備上的所有警告和注意標示。
33. 如果長時間不使用設備，請將其同電源插座斷開，避免設備被超標的電壓波動損壞。
34. 請不要讓任何液體流入通風口，以免引起火災或者短路。
35. 請不要自行打開設備。為了確保您的安全，請由經過認證的工程師來打開設備。
36. 如遇下列情況，請由專業人員來維修：
 - 電源線或者插頭損壞；
 - 設備內部有液體流入；
 - 設備曾暴露在過於潮濕的環境中使用；
 - 設備無法正常工作，或您無法通過用戶手冊來使其正常工作；
 - 設備跌落或者損壞；
 - 設備有明顯的外觀破損。
37. 請不要把設備保存在超出我們建議的溫度範圍的環境，即不要低於 -20°C (-4°F) 或高於 60°C (140°F)，否則可能會損壞設備。
38. 注意：如果電池放置不正確，將有爆炸的危險。因此，只可以使用製造商推薦的同一種或者同等型號的電池進行替換。請按照製造商的指示處理舊電池。
39. 根據 IEC 704-1:1982 的規定，操作員所在位置的音量不可高於 70dB(A)。
40. 限制區域：請勿將設備安裝於限制區域使用。
41. 免責聲明：該安全指示符合 IEC 704-1 的要求。研華公司對其內容的準確性不承擔任何法律責任。
42. 使用過度恐傷害視力。
43. 使用 30 分鐘請休息 10 分鐘。
44. 未滿 2 歲幼兒不看螢幕，2 歲以上每天看螢幕不要超過 1 小時。
45. 本產品為國內裝置使用時，其電源僅限使用架構電源模組所提供電源直流輸入，不得使交流電源及附加其他電源轉換裝置提供電源這者，其電源輸入電壓及電流請依說明書規定使用。
46. 本產品由帶有對接連接器的 UL 認證電源供電，額定輸出為 24Vdc, 2.5A, Tma 最低溫度為攝氏 60 度，海拔高度為 2000m。如果需要進一步協助，請聯絡製造商或 UL 文件所有者或品牌所有者以獲取更多資訊。

Safety Precaution - Static Electricity

For Skilled person follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

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Chapter 1

General Information

1.1 Introduction

The TPC-B520L series is a computing box module equipped with 13th Generation Intel Core processor.

- Powered by Alder Lake-N Core™ i3-N305 octo-core processor
- Single DDR5 memory slot supports up to 16GB
- Support expansion via three M.2 slots (NVMe, Wi-Fi, 5G)
- LAN, PoE, isolated serial port and isolated digital I/O via iDoor technology
- Support Type C connector with USB 3.2, DP 1.4a, 15W power delivery
- Support fieldbus protocols/GPS/GPRS/Wi-Fi capabilities via iDoor technology
- Modular front panel modules ranging from 12.1" to 23.8" with P-CAP multi-touch in selection (12.1", 15", 15.6", 21.5" with high brightness panel option)
- Performance, fanless embedded system with chassis grounding protection

1.2 Specifications

1.2.1 General

- **BIOS:** AMI UEFI
- **Cooling System:** Fanless design
- **Dimensions (W x H x D):** 269 x 203 x 50 mm (10.59 x 7.99 x 1.96 inch)
- **Enclosure:**
Back housing: Die cast aluminum alloy
- **Mounting:** VESA mount (100 x 100), desktop, wall or panel mount
- **OS Support:** Windows 11, Windows 10, Linux
- **Security:** TPM 2.0 (built-in)
- **Watchdog Timer:** 15-255 sec (system)
- **Weight (Net):** 2.65 kg (5.9 lb)

1.2.2 System Hardware

- **CPU:**
Alder Lake-N Core™ i3-N305 octo-core processor
- **Memory:**
Single DDR5 4800 SO-DIMM, up to 16 GB
- **LAN Port:** 2 x 2.5GbE with Intel® I226
- **Storage:**
1 x M.2 M key 2280 for NVMe (PCIe x1 / SATA)
(Optional) 1 x SATA for 2.5" SSD/HDD
- **Expansion Slots:**
1 x M.2 B key 3042, 3052, 3080 for iDoor (PCIe/USB2.0)
1 x M.2 E key 2230 for Wi-Fi (PCIe/USB2.0)
1 x M.2 B key 3052 for 5G LTE (USB3.2/USB2.0)
1 x SIM card slot
- **I/O Ports:**
1 x DisplayPort 1.4a (video output)
1 x Type C (USB 3.2 Gen 2, DP 1.4a, 5V w/ 3A max)

2 x USB 3.2 Gen 1
4 x USB 2.0
2 x RS-232/422/485
(Optional) 2 x 4Ω speaker for audio out

1.2.3 Certification and Environment

Certification

- BSMI
- CCC
- CE
- FCC Class A
- CB/UL
- IP66-rated front panel

Environment

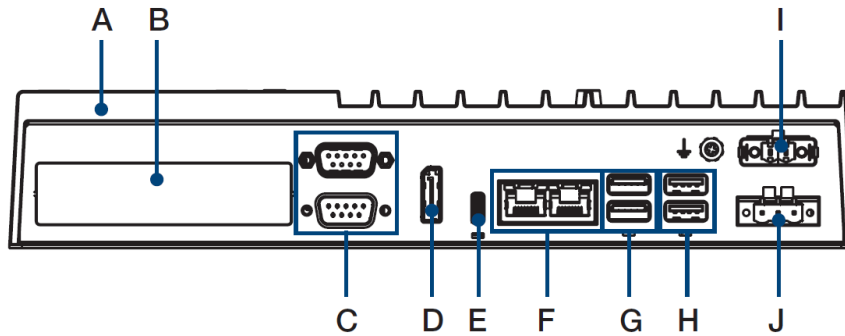
- **Operating Temperature:**
-10~60 °C (14~140 °F)
- **Storage Temperature:** -30 ~ 70 °C (-22 ~ 158 °F)
- **Humidity:** 95% RH @ 40 °C, non-condensing
- **Vibration Protection:** 1 Grms random vibration (5 ~ 500 Hz) during operation (with SSD)

1.2.4 Power

- **Input Voltage:** 19 – 24V_{DC} ± 15%
- **Power Consumption:** Typ. 29W; Max. 65W

1.3 External I/O

The arrangement of I/O ports is shown below.



A. Default sku for iDoor installation
(optional 2.5" SSD / 2 x speakers)

B. iDoor slot

C. 2 x RS-232/422/485

D. DisplayPort

E. USB Type-C

F. 2.5GbE LAN ports

G. 2 x USB 3.2

H. 2 x USB 2.0

I. Remote button connector

J. DC input terminal block

1.4 LCD & Touch Specification

Table 1.1: Specifications

Part Number for Cost Effective Version	FPM-D12T- CE	FPM-D15T- CE	FPM-D17T- CE	FPM-D19T- CE		
LCD Panel	Display Size	12"	15"	17"	19"	
	Display Type	XGA TFT LED LCD	XGA TFT LED LCD	SXGA TFT LED LCD	SXGA TFT LED LCD	
		Aspect Ratio	4:3		5:4	
	Max. Resolution	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024	
	Max. Color	16.2M	16.7M	16.7M	16.7M	
	Luminance	600 cd/m ²	300 cd/m ²	350 cd/m ²	350 cd/m ²	
	Viewing Angle (H/V)	178°/178°	176°/176°	160°/140°	170°/160°	
	Backlight Life	50,000 hr	70,000 hr	50,000 hr	50,000hr	
	Contrast Ratio	1000:1	2000:1	800:1	1000:1	
	Touchscreen	Type	PCAP	PCAP	PCAP	PCAP
Light Transmis- sion		Above 88%	Above 88%	Above 88%	Above 88%	
Anti-Glare Treatment		Yes	Yes	Yes	Yes	
Built-In iKey		N/A	N/A	N/A	N/A	
Expandability	NFC Support on Front Panel	N/A	N/A	N/A	N/A	
Environment	Operating Temperature	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	
	Storage Temperature	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	
	Ingress Protection	Font IP66	Font IP66	Font IP66	Font IP66	
	Housing Color	Panel Frame and Back Cover	Pantone 432C	Pantone 432C	Pantone 432C	Pantone 432C

Table 1.2: Specifications

Part Number for Cost Effective Version	FPM-D15W- FCE	FPM-D18W- FCE	FPM-D21W- CE	FPM-D24W- CE		
LCD Panel	Display Size	15.6"	18"	21.5"	23.8"	
	Display Type	FHD TFT LED LCD	FHD TFT LED LCD	FHD TFT LED LCD	FHD TFT LED LCD	
	Aspect Ratio	16:9				
	Max. Resolution	1920 x 1080	1920 x 1080	1920 x 1080	1920 x 1080	
	Max. Color	16.7M	16.7M	16.7M	16.7M	
	Luminance	450 cd/m ²	350 cd/m ²	250 cd/m ²	350 cd/m ²	
	Viewing Angle (H/V)	170°/170	178°/178°	178°/178°	178°/178°	
	Backlight Life	50,000 hr	50,000 hr	50,000 hr	30,000hr	
	Contrast Ratio	800:1	1000:1	1000:1	1000:1	
	Touchscreen	Type	PCAP	PCAP	PCAP	PCAP
Light Transmis- sion		Above 88%	Above 85%	Above 88%	90%±3%	
Anti-Glare Treatment		Yes	Yes	Yes	Yes	
Built-In iKey		N/A	N/A	N/A	N/A	
Expandability	NFC Support on Front Panel	N/A	N/A	N/A	N/A	
Environment	Operating Temperature	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	0~55 °C (32~131 °F)	0~55 °C (32~131 °F)	
	Storage Temperature	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	
	Ingress Protection	Font IP66	Font IP66	Font IP66	Font IP66	
	Housing Color	Panel Frame and Back Cover	Pantone 432C	Pantone 432C	Pantone 432C	Pantone 432C

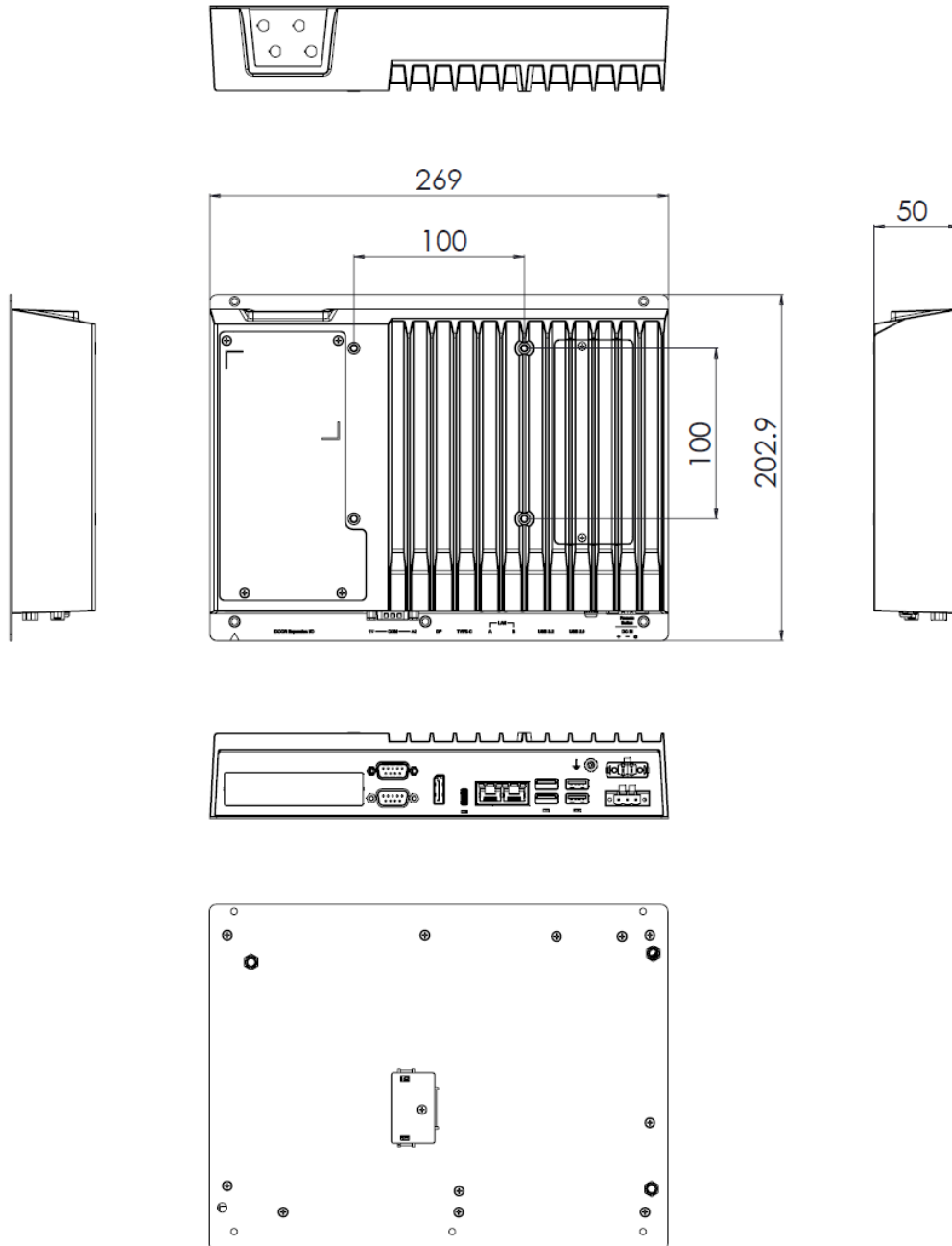
Table 1.3: Specifications

Part Number for Cost Effective Version	FPM-D12T- HE	FPM-D15T- HE	FPM-D15W- FHE	FPM-D21W- HE		
LCD Panel	Display Size	12"	15.6"	15.6"	21.5"	
	Display Type	XGA TFT LED	FHD TFT LED	FHD TFT LED	FHD TFT LED	
		LCD	LCD	LCD	LCD	
	Aspect Ratio	4:3		16:9		
	Max. Resolution	1024 x 768	1024 x 768	1920 x 1080	1920 x 1080	
	Max. Color	16.7M	16.2M	16.7M	16.7M	
	Luminance	1000 cd/m ²	1,800 cd/m ²	1,200 cd/m ²	1,400 cd/m ²	
	Viewing Angle (H/V)	178°/174°	160°/150°	178°/178°	178°/178°	
	Backlight Life	50,000 hr	50,000 hr	50,000 hr	50,000hr	
	Contrast Ratio	1000:1	800:1	800:1	1000:1	
Touchscreen	Type	PCAP	PCAP	PCAP	PCAP	
	Light Transmis- sion	Above 88%	Above 85%	Above 88%	Above 88%	
	Anti-Glare Treatment	Yes	Yes	Yes	Yes	
	Built-In iKey	N/A	N/A	N/A	N/A	
Expandability	NFC Support on Front Panel	N/A	N/A	N/A	N/A	
Environment	Operating Temperature	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	
	Storage Temperature	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	-20~60 °C (-4~140 °F)	
	Ingress Protection	Font IP66	Font IP66	Font IP66	Font IP66	
	Housing Color	Panel Frame and Back Cover	Pantone 432C	Pantone 432C	Pantone 432C	Pantone 432C

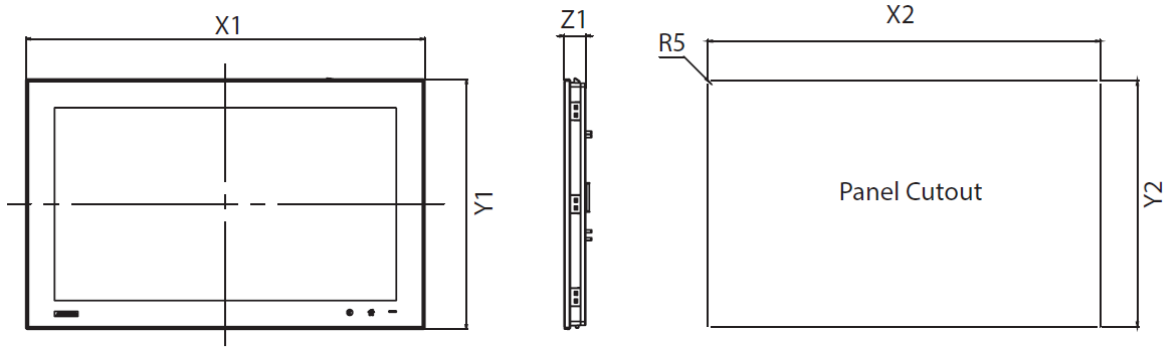
1.5 Dimensions

TPC-B520L Computing Box

- Dimensions (W x H x D): 269 x 202.9 x 50 mm (10.59 x 7.99 x 1.96 inch)

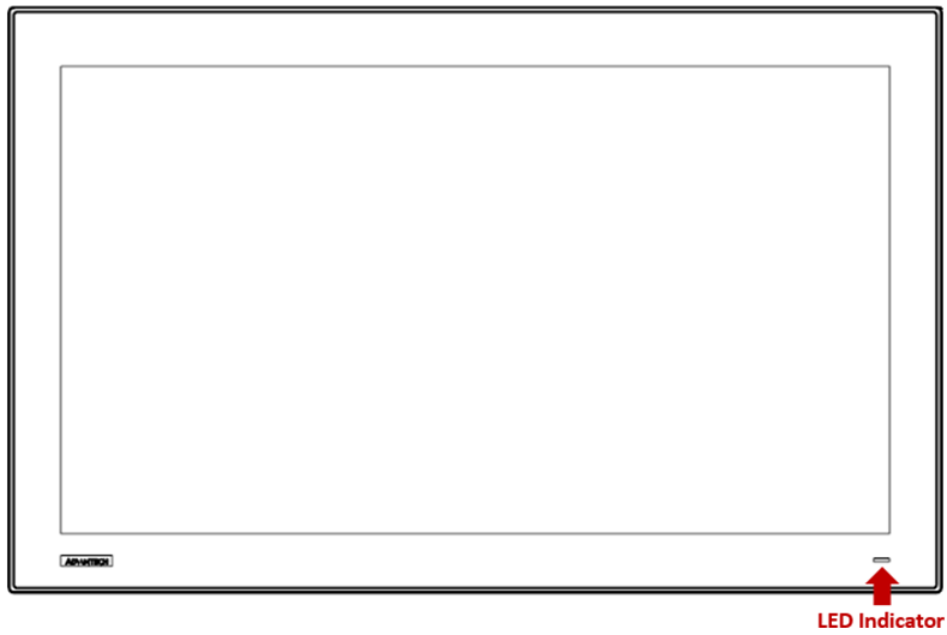


FPM Display Module



Display Type	System Dimensions			Panel Mount	
	X1	Y1	Z1	X2	Y2
12" (XGA)	311.8	238	27.1	303	229
15" (XGA)	383.2	307.3	27.5	374.5	298.5
15.6" (HD)	419.7	269	30.	412.4	261.7
15.6" (FHD)	419.7	269	30.	412.4	261.7
17" (SXGA)	410.4	343.4	28.3	401.3	334.8
18.5" (HD / FHD)	488	309	30.3	479.3	300.3
19" (SXGA)	454	379.8	51.5	443.5	369.3
21.5" (FHD)	558.4	349.8	30.3	550.3	341.8
23.8" (FHD)	595.9	374.1	30.3	587	365.3

1.6 LED Indicators on Optional FPM-Display



Indicator	Default Status (ErP Enable)	Status 2 (ErP Disable)
Green	Normal Powered-On State	Normal Powered-On State
Orange	Sleep (S3) / Hibernate (S4)	Sleep (S3) / Hibernate (S4) / Shutdown(S5)
No Light	Shutdown(S5)/Power Off	Power Off

Chapter 2

System Setup

2.1 Transport and Unpacking

2.1.1 Transport

When accepting a delivery, please check the packaging for visible transport damage and check the delivery for completeness by comparing it with your order. If you notice any shipping damage or inconsistencies between the contents and your order, please inform the responsible delivery service immediately.

During transportation, the TPC should be protected from excessive mechanical stress. If the TPC is transported or stored without packaging, shocks, vibrations, pressure and moisture may impact the unprotected unit. A damaged packaging indicates that ambient conditions have already had a massive impact on the device. Therefore, please use the original packaging during transportation and storage.

If the TPC is transported in cold weather or is exposed to extreme variations in temperature, make sure that moisture (condensation) does not build up on or inside the HMI device. Moisture can result in short-circuits in electrical circuits and damage the device. To avoid that, please store the TPC in a dry place and bring the TPC to room temperature before starting it up. If condensation occurs, a delay time of approximately 12 hours must be allowed to make sure the TPC is completely dry before the TPC is switched on.

2.1.2 System Setup

Follow these steps to setup the TPC-B520L device:

1. Unbox the TPC-B520L device.
2. **Install a memory module:** Detach the bottom cover from the chassis by removing the 11 screws. Locate the memory slot and insert the DDR5 memory module into the slot. Reattach the bottom cover after installation.

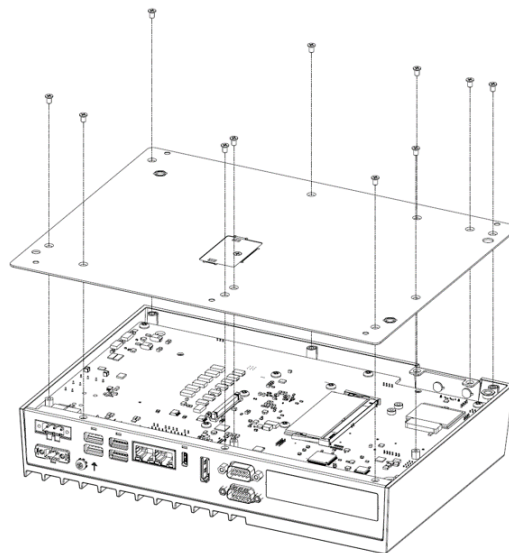


Figure 2.1 Bottom Panel Removal

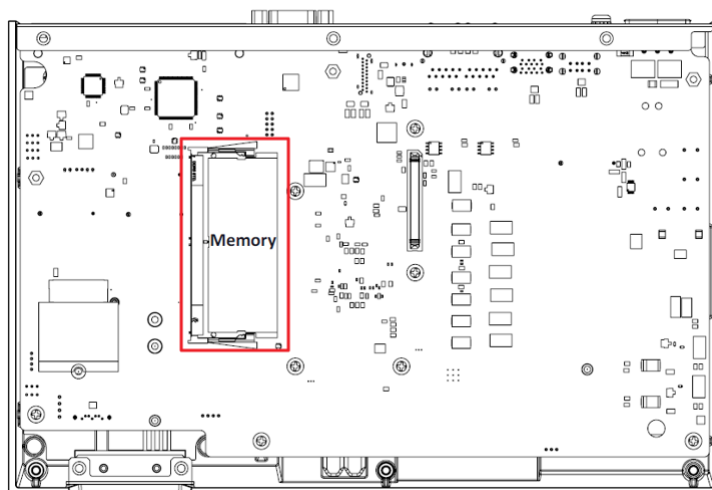


Figure 2.2 Memory Module Installation

3. **Install the M.2 SSD:** Unscrew and remove the M.2 SSD slot cover. Insert the M.2 SSD into the slot. Secure it in place using the M3x4L screw.

Warning! *If your M.2 SSD comes with a heatsink, please remove it before installation. The TPC-B520L already includes a heatsink. Failure to remove the heatsink may lead to improper fit and cooling issues.*



i votre SSD M.2 est livré avec un dissipateur thermique, veuillez le retirer avant l'installation. Le TPC-B520L comprend déjà un dissipateur thermique. Ne pas retirer le dissipateur thermique peut entraîner un mauvais ajustement et des problèmes de refroidissement.

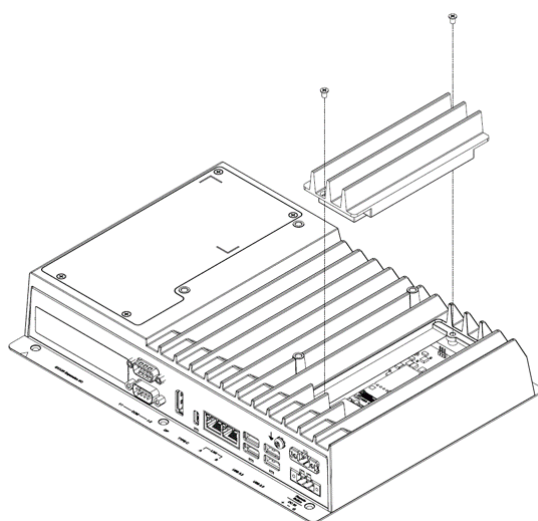


Figure 2.3 M.2 SSD Slot Cover Removal

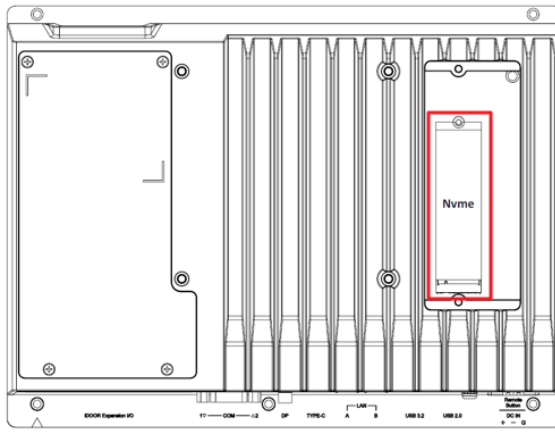


Figure 2.4 M.2 SSD Installation

5. Attach the TPC computing box module to the FPM display module via the board-to-board connector. Use the five screws of 1930000881 to secure the computing box with the display module.

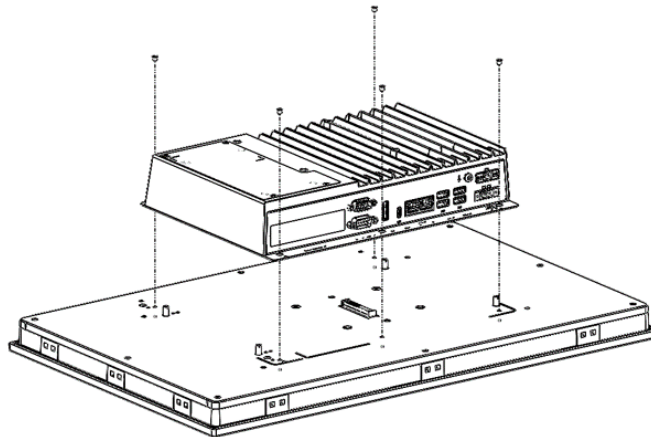


Figure 2.5 Attaching the TPC to the FPM Display

6. Connect the power connector to the 24 VDC power lines of a power adapter or in-house power source.

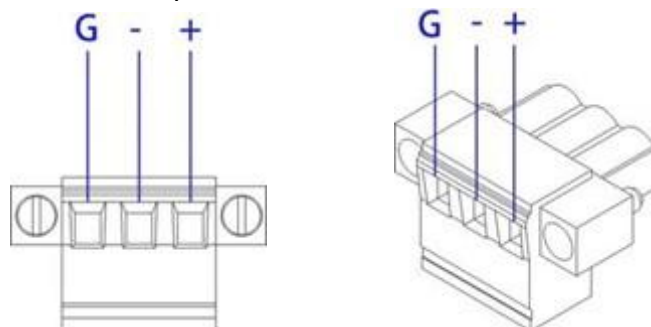


Figure 2.6 Power Connector and Pin Assignment

Warning! *The system may get damaged when the power is turned on and the power source is not connected to the correct pins.
Le système peut être endommagé lorsque l'alimentation est allumée et que la source d'alimentation n'est pas connectée aux broches appropriées.*



7. Connect the power lines to the system power receptor using the terminal block suitable for 12-24 AWG. Apply a torque value of 3 lb-in. Ensure the use of copper conductors only, and the installation must be performed by a skilled person.

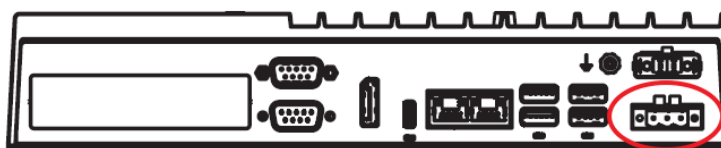


Figure 2.7 Power Connector

8. Power on the system. The power LED on the display module turns to green.
9. Calibrate the touchscreen.

2.2 Driver Installation

2.2.1 Chipset, Graphics, ME, and LAN Driver Installation

Relevant drivers must be installed for full functionality. Install the chipset, graphics, ME, and LAN drivers individually. The drivers can be downloaded from the TPC-B520L product page of the Advantech website.

2.2.2 Watchdog Driver Installation

If the Advantech watchdog driver is not pre-installed on the TPC system, users will need to install the driver.

Follow the steps outlined below to install the Advantech watchdog driver.

1. Verify that the computer meets the hardware and software requirements to run the Advantech watchdog driver.
2. If you do not already have the installer for the Advantech watchdog driver, download it from the Advantech website.
3. From the Control Panel, remove any existing installation of the Advantech watchdog driver from the computer.
4. With administrator-level privileges, run the installer for the Advantech watchdog driver.

Below is an example of the Advantech watchdog driver setup. To stop the setup process at any time, click the “Cancel” button on the pop-up screen. The setup program will stop the procedure automatically.

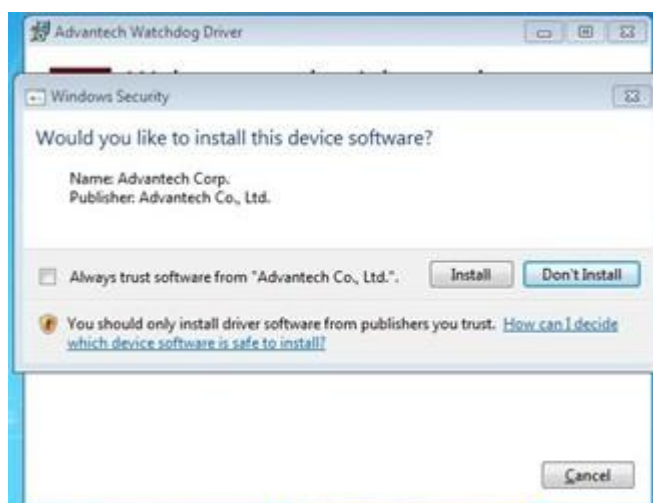
1. Open the setup program. When the setup program is running, click the **Next** button on the Advantech Watchdog Driver Setup Wizard pop-up screen.



2. Wait until the Advantech Watchdog Driver Setup Wizard has completed the installation.



3. Click the **Install** button to continue the installation of the Advantech watchdog driver software.



- Click the **Restart** or **Close** button on the Advantech Watchdog Driver Setup Wizard pop-up screen to complete the setup.



2.3 Cabinet Installation and Earth Grounding Setup

Follow these steps to set up the TPC-B520L system, ensuring that the Ground pin of the TPC-B520L system is properly connected to the earth ground. This connection is crucial for optimizing the performance of the TPC-B520L system, including enhanced EMI immunity, ESD immunity, surge immunity. If the TPC-B520L system is embedded in a cabinet, make sure to connect the TPC-B520L system's ground, the cabinet's ground, and the earth ground together.

2.3.1 Installing TPC into Cabinet.

- Connect the cabinet to earth ground.
- Embed null TPC-B520L system into the cabinet without any I/O cable and power.

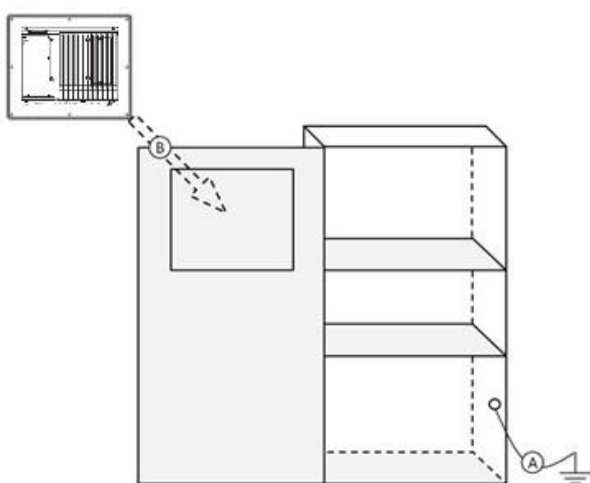


Figure 2.8 Cabinet Installation

2.3.2 System Wiring

1. Ground the cabinet to earth.
2. Ensure proper grounding for all cabinets.
3. Connect the power supply ground to the cabinet.
4. Connect the TPC-B520L system's ground pin to the cabinet.
5. If necessary, connect I/O to the controller.
6. Connect the power supply's V+ and V- to the TPC-B520L system.
7. Proceed step by step through steps 1 to 6, then power on the TPC-B520L system.

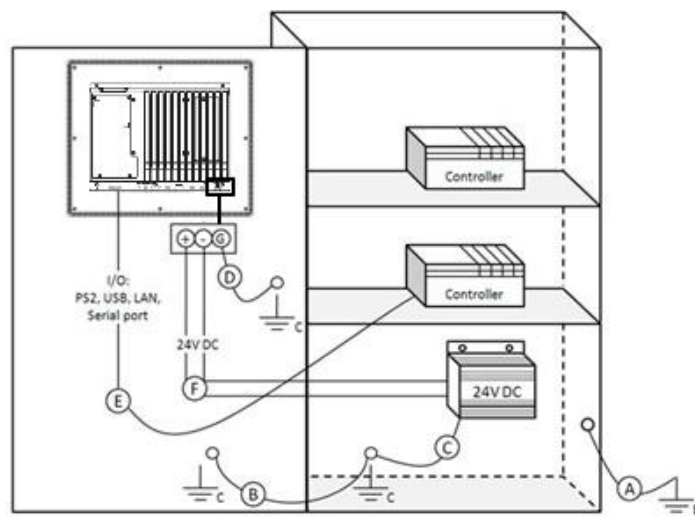


Figure 2.9 System Wiring

NOTE! Make sure all wires follow the installation guidelines to avoid performance issues.



2.4 Panel Mounting

1. There is an adhesive waterproof gasket on the front bezel of the FPM display module. Make sure the waterproof gasket is in position before installing TPC into the panel opening.
2. Install the TPC into the panel opening. The suggested mounting panel thickness is less than 6 mm (0.236 in).



Figure 2.10 Panel Mounting (1)

3. Retrieve the clamps and long screws from the accessory pack. Hook the clamp into the holes around the four sides of the bezel.

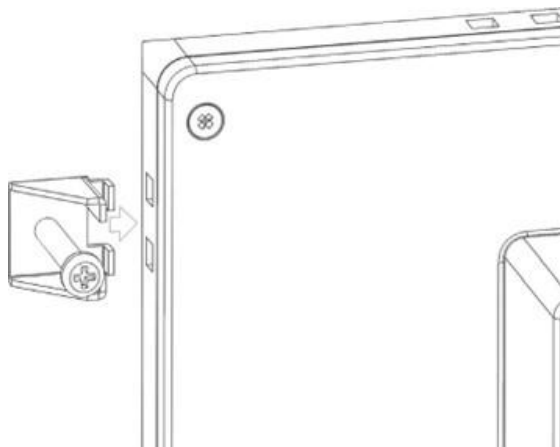


Figure 2.11 Panel Mounting (2)

4. Fasten the screws with a torque of 2 kgf-cm. These screws will push the mounting panel, ensuring a secure and stable unit.

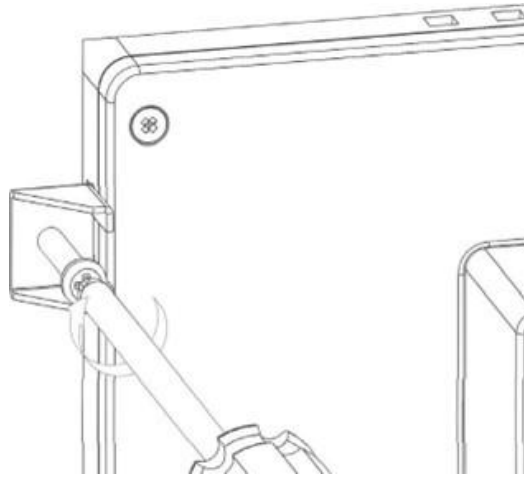
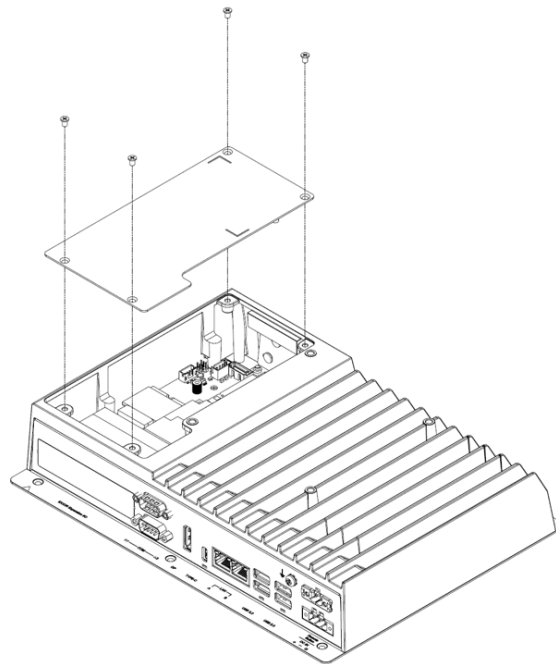


Figure 2.12 Panel Mounting (3)

2.5 Expansion Module Installation

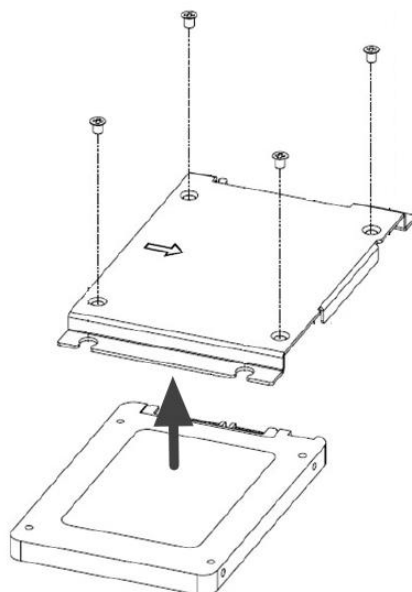
2.5.1 Expansion Cover Removal

To install SATA SSD or expansion modules, the expansion cover of the system must be removed. It is attached with 4 screws, as illustrated below. After removing all screws, carefully lift the rear bracket and set it aside, taking care not to cause any damage to the system or the cover in the process.

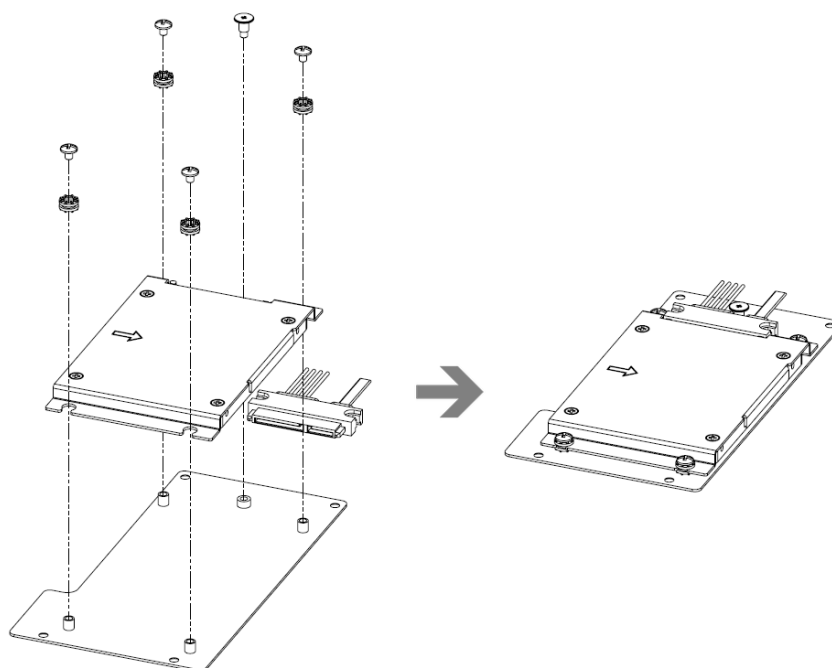


2.5.2 Installation of 2.5" SATA SSD

1. Secure the SSD onto the bracket using four M3x4L screws.



2. Remove the expansion cover and flip it over.
3. Install the SSD and its bracket onto the expansion cover removed in the previous step.



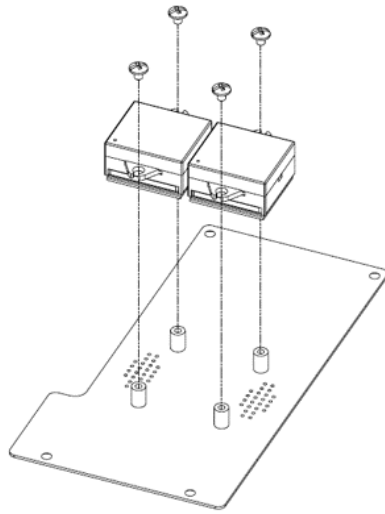
4. Attach the cover to the chassis using the previously removed screw.

NOTE! A SATA expansion kit (98R1B520000) is required for 2.5" SATA SSD installation.



2.5.3 Installation of Speaker Module

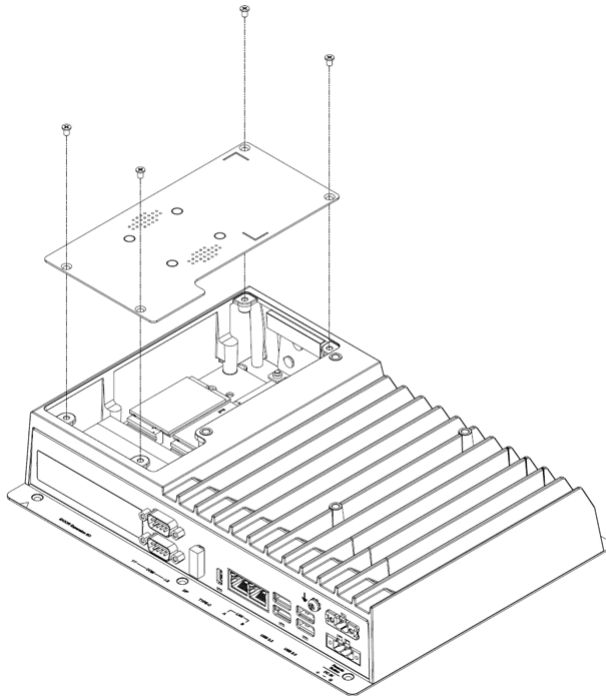
1. Remove the expansion cover.
2. Retrieve the cover plate from the speaker kit.
3. Install the speakers onto the cover.



NOTE! A speaker expansion kit (98R1B520001) is required for speaker installation.

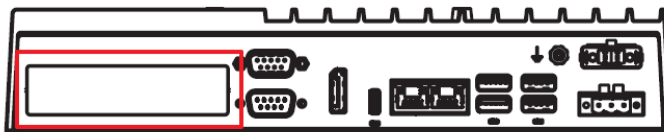


4. Attach the cover to the chassis using the previously removed screw.

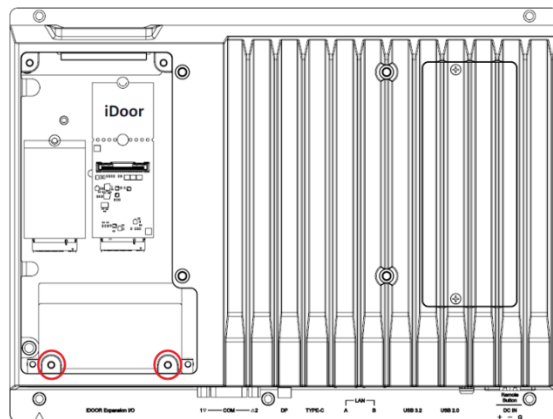


2.5.4 Installation of iDoor Module

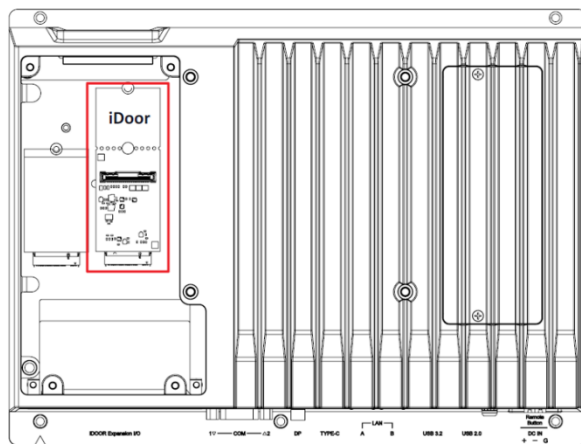
1. Remove the expansion cover.
2. Remove the blank slot cover for iDoor.



3. Insert an iDoor module.
4. Tighten the two screws to secure the module in place.



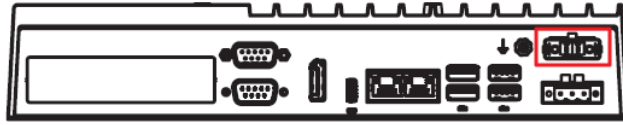
5. Install the iDoor M.2 module and plug in the cable to the connector on the iDoor M.2 module.



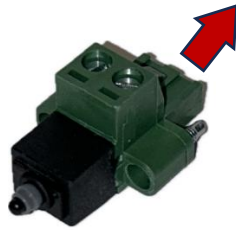
6. Attach the cover to the chassis using the previously removed screw.

2.5.5 Installation of Remote Button

1. Locate the remote button connector on the rear panel.



2. Take the remote button kit and insert it into the connector.



3. Use a screwdriver to tighten the two side screws on the remote button kit.

NOTE! A remote button kit (98R1B520002) is required for remote button installation.

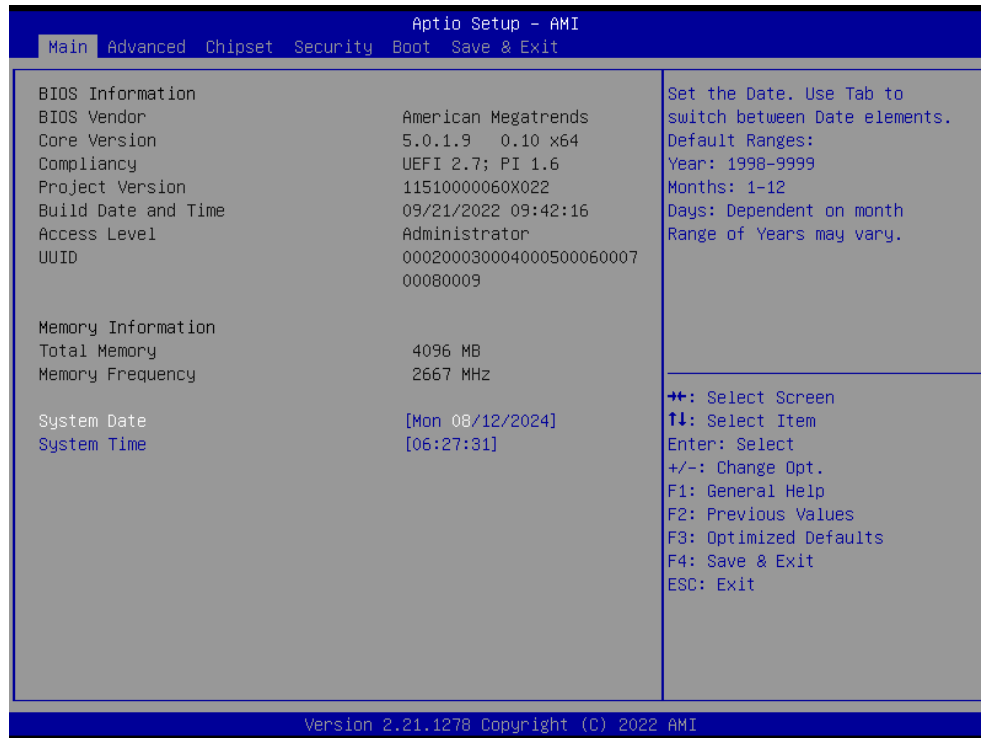


Chapter 3

BIOS Setup

3.1 BIOS Setup

With the AMI BIOS Setup program, users can modify the BIOS settings and control various system features. This chapter describes the basic navigation of the BIOS Setup Utility.



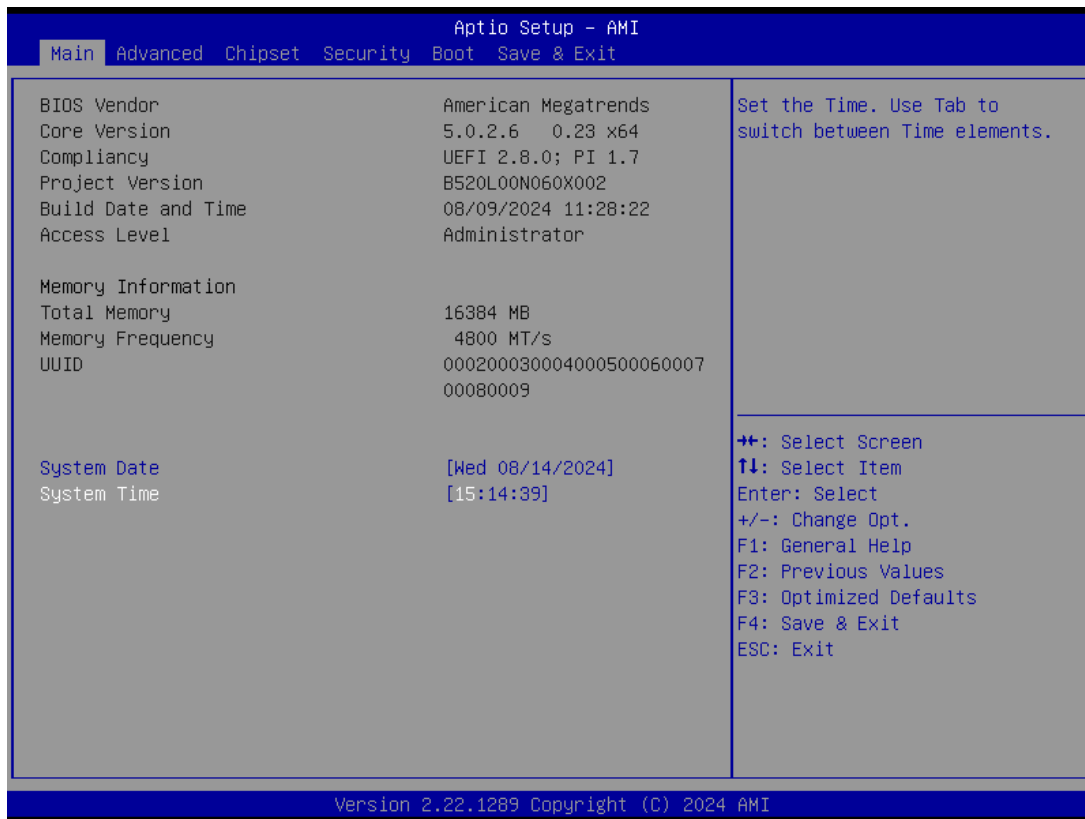
AMI's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. The setup information is stored in flash ROM to ensure it is retained when the system is powered off.

3.2 Entering Setup

Turn on the computer and check for the patch code. If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, contact an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that the CPU status is valid. After ensuring that you have a number assigned to the patch code, press to access the BIOS Setup Utility.

3.2.1 Main Setup

Upon entering the BIOS Setup Utility, users will be on the Main setup screen. At any point during the configuration, users can return to the Main setup screen by selecting the Main tab. There are two Main setup options, which are described in this section. The Main setup screen is shown below.



The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured, options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

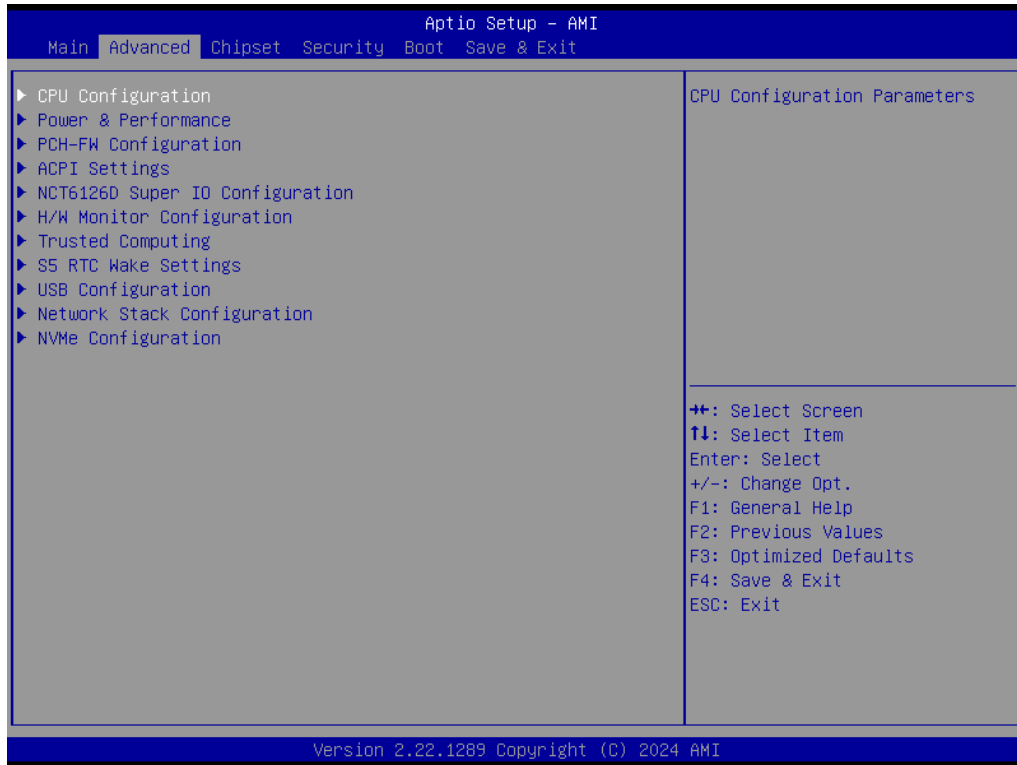
■ System Time/System Date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields.

The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the TPC-B520L setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as ACPI Settings and hit <enter> to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



3.2.2.1 CPU Configuration



- **Intel (VMX) Virtualization Technology**

When this item is disabled, Virtual Machine Extensions function will be no longer supported.

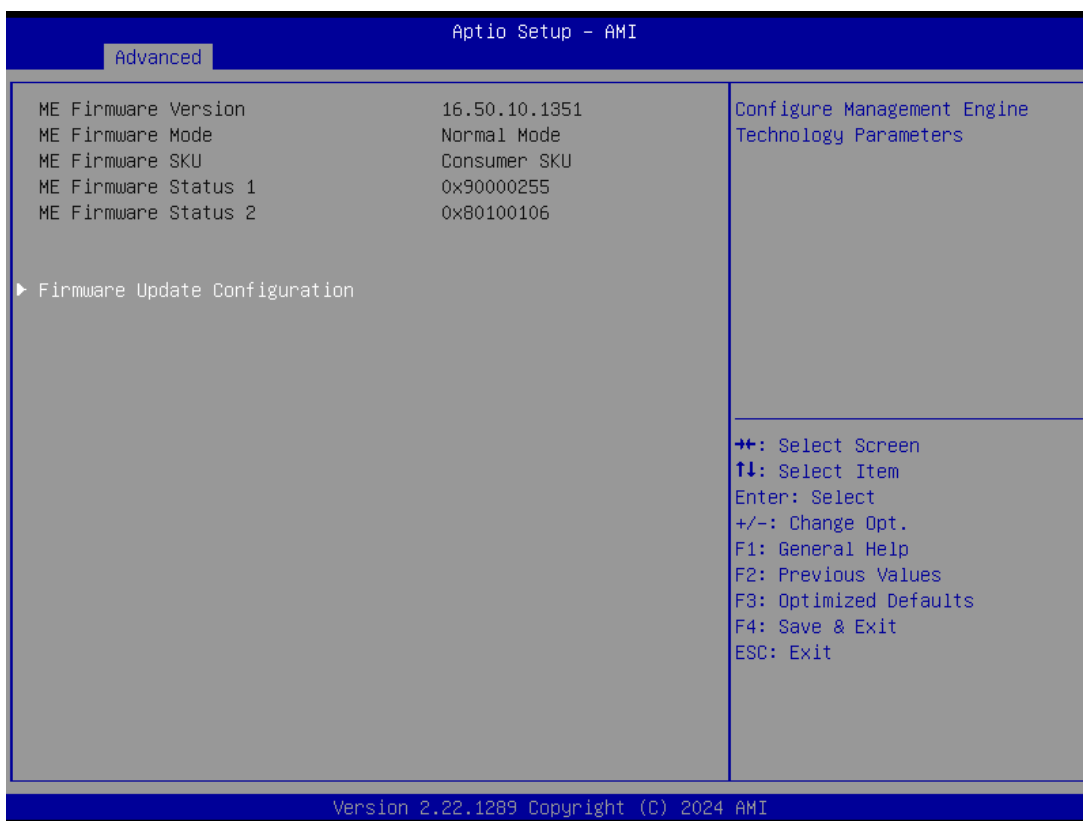
- **Active Efficient-cores**

This item allows users to configure Efficient-cores quantity ◦

3.2.2.2 Power & Performance



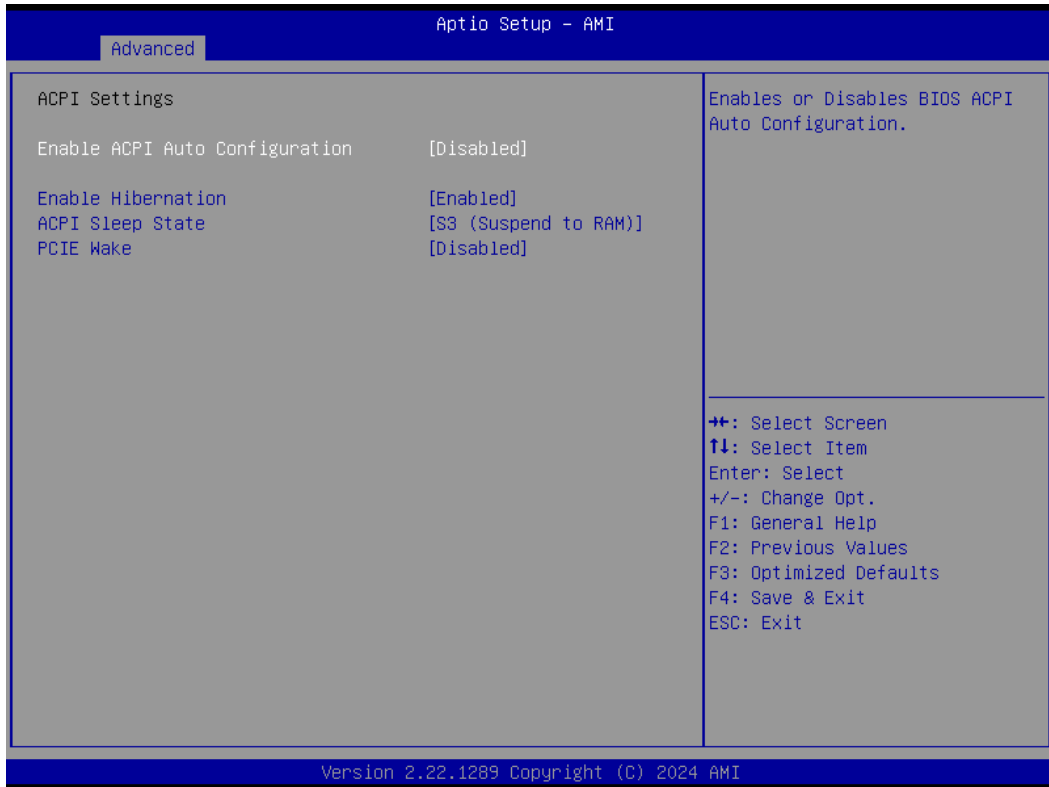
3.2.2.3 PCH-FW Configuration



■ Firmware Update Configuration

This item allows users to configure the management engine technology parameters.

3.2.2.4 ACPI Settings



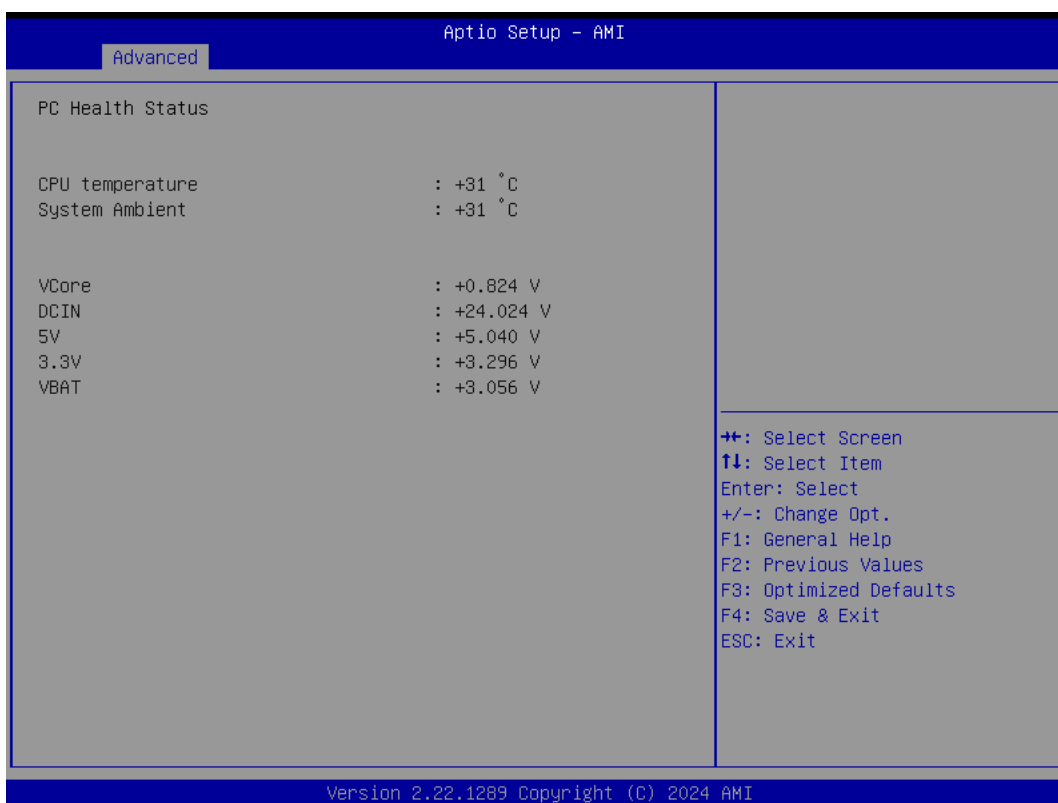
- **Enable ACPI Auto Configuration**
This item allows users to enable or disable “ACPI Auto Configuration”.
- **Enable Hibernation**
This item allows users to enable or disable System ability to hibernate (OS/S4 sleep state). This option may be not effective with some OS.
- **ACPI Sleep State**
This item allows users to select the highest ACPI sleep state. The system will enter when the SUSPEND button is pressed.

3.2.2.5 NCT6126D Super I/O Configuration



- **Serial Port 1 Configuration**
Set Parameters of Serial Port 1 (COMA).
- **Serial Port 2 Configuration**
Set Parameters of Serial Port 2 (COMB).

3.2.2.6 Hardware Monitor Configuration



3.2.2.7 Trusted Computing



■ TPM Device Selection

This item allows users to select TPM device: fTPM or dTPM.

fTPM: Enables fTPM.

dTPM: Disables fTPM and enable dTPM.

Warning! fTPM/dTPM will be disabled and all data saved on it will be lost.

Avertissement! fTPM/dTPM sera désactivé et toutes les données enregistrées dessus seront perdues.

■ Security Device Support

This item allows users to enable/disable BIOS support for security devices. The OS will not show the security devices. The TCG EFI protocol and INT1A interface will not be available.

■ SHA-1 PCR Bank

This item allows users to enable/disable SHA-1 PCR bank.

■ SHA256 PCR Bank

This item allows users to enable/disable SHA256 PCR bank.

■ SHA384 PCR Bank

This item allows users to enable/disable SHA384 PCR bank.

■ Pending Operation

This item allows users to schedule an operation for the security device.

Note: The computer must be restarted to change the security device state.

■ Platform Hierarchy

This item allows users to enable/disable platform hierarchy.

■ Storage Hierarchy

This item allows users to enable/disable storage hierarchy.

■ Endorsement Hierarchy

This item allows users to enable/disable endorsement hierarchy.

- **Physical Presence Spec Version**

This item allows users to enable support for PPI spec version 1.2 or 1.3.
Note: Some HCK tests may not support version 1.3.

- **Device Select**

TPM 1.2: select this to restrict support to TPM 1.2 devices.

TPM 2.0: select this to restrict support to TPM 2.0 devices

Auto: select this to support both; TPM 2.0 devices by default; if not found, TPM 1.2 devices will be enumerated

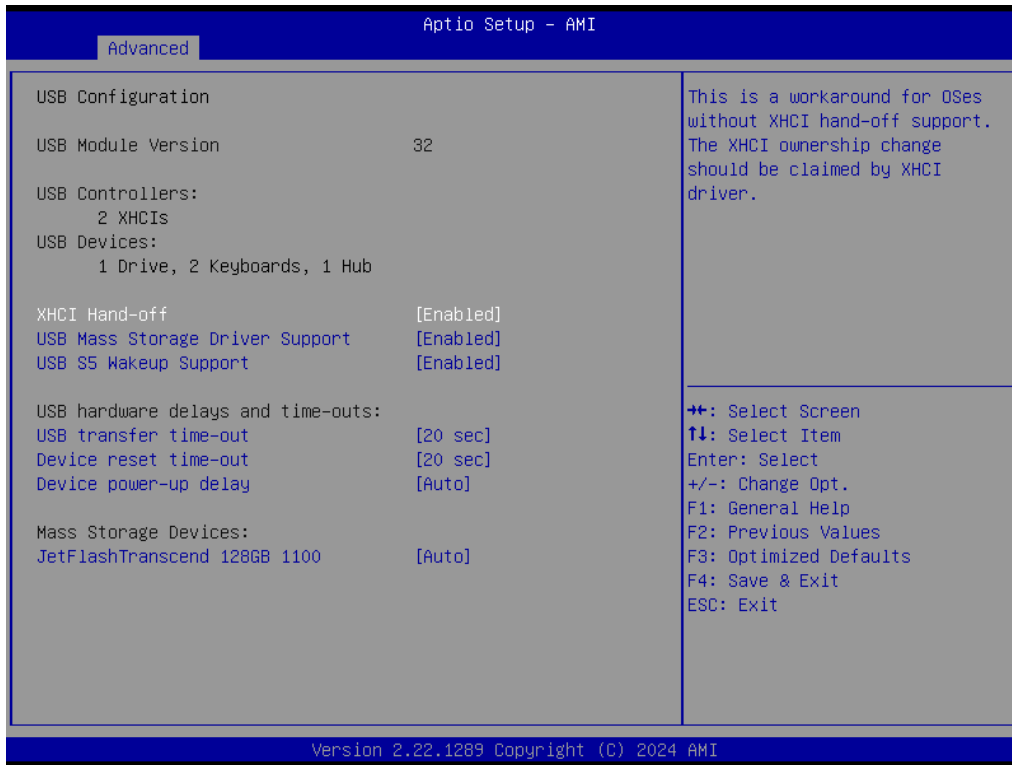
3.2.2.8 S5 RTC Wake Settings



- **Wake System from S5**

This item allows users to enable or disable system wake on alarm event. Select FixedTime, the system will wake on the hr:min:sec specified. Select DynamicTime, the system will wake on the current time + increased minute(s).

3.2.2.9 USB Configuration



■ Legacy USB Support

Enables Legacy USB support. The AUTO option disables legacy support if no USB devices are connected. The DISABLE option will keep USB devices available only for EFI applications.

■ XHCI Hand-off

This is a workaround of 0 Secs without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

■ USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

■ USB S5 Wakeup Support

This item allows users to enable/disable USB S5 wakeup support.

■ USB Transfer Time-Out

This item allows users to set the time-out value for control, bulk, and Interrupt USB mass storage device transfers.

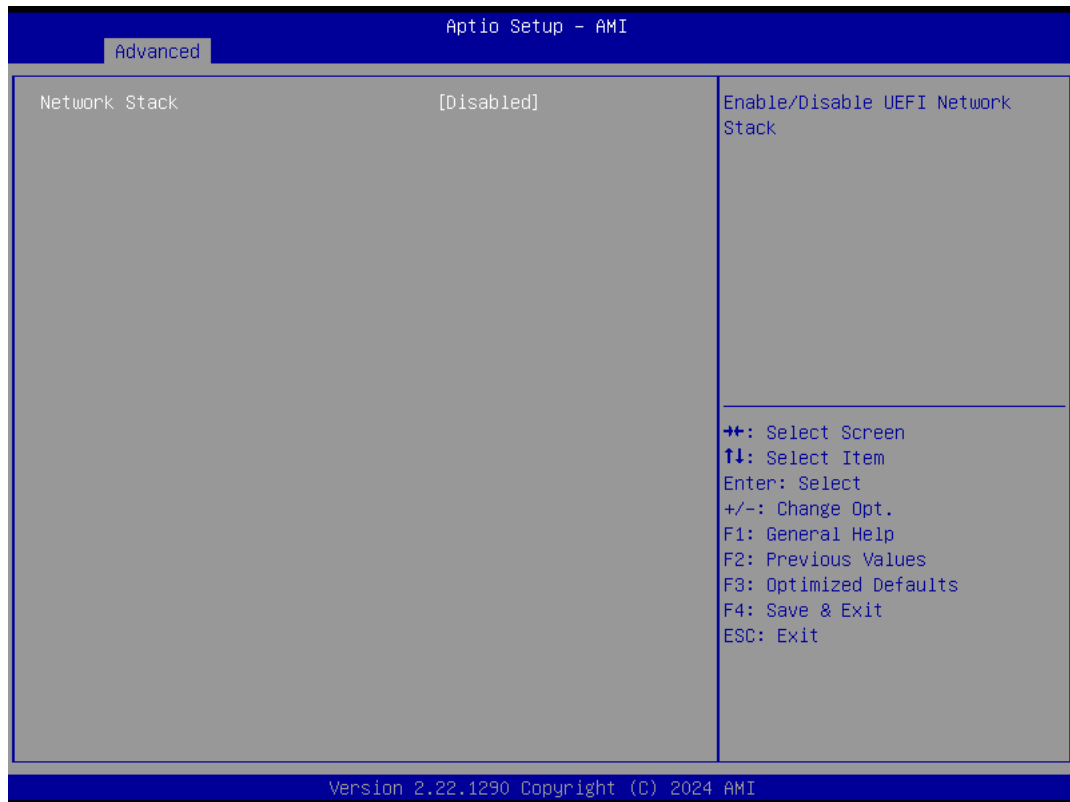
■ Device Reset Time-Out

This item allows users to set the device reset command time-out.

■ Device Power-Up Delay

This item allows users to Set the maximum time the device will take before reporting itself to the Host Controller. The Auto option uses the default value, which is 100 ms for a Root port. For a Hub port, the delay time is obtained from the Hub descriptor.

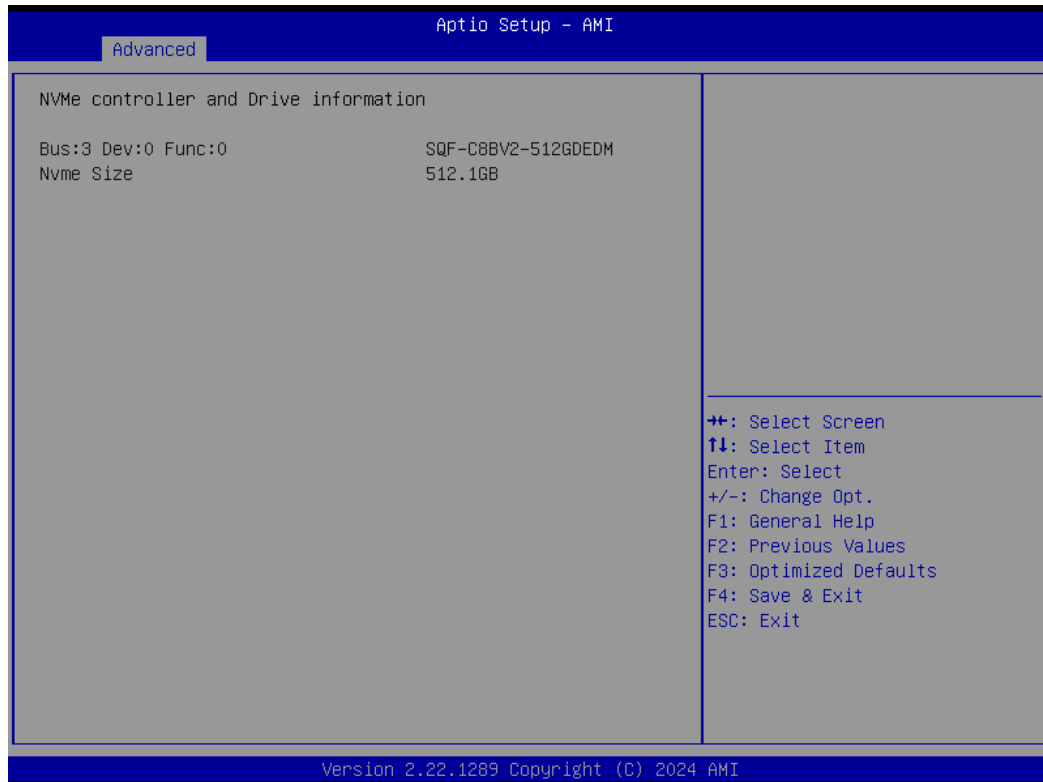
3.2.2.10 Network Stack Configuration



- **Network Stack**

This item allows users to enable or disable the UEFI network stack.

3.2.2.11 NVMe Configuration



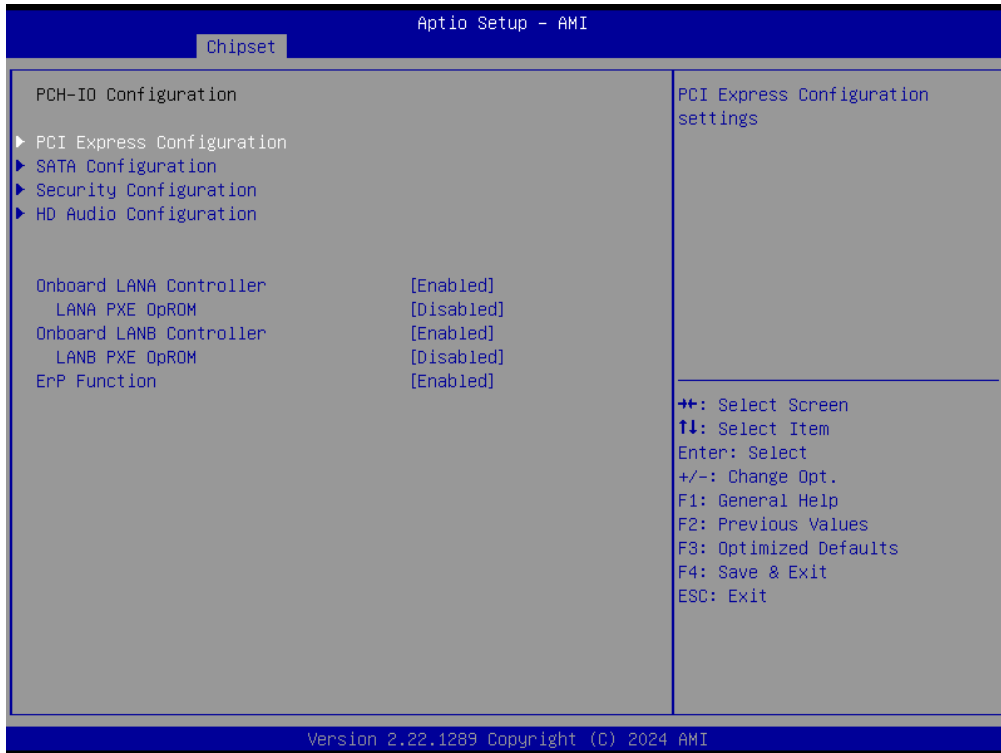
3.2.3 Chipset Configuration

3.2.3.1 System Agent (SA) Configuration



- **Memory Configuration**
This submenu allows users to view the memory parameters.
- **DMI/OPI Configuration**
This submenu allows users to set DMI/OPI configuration parameters
- **VT-d**
This item allows users to enable or disable VT-d capability

3.2.3.2 PCH-IO Configuration



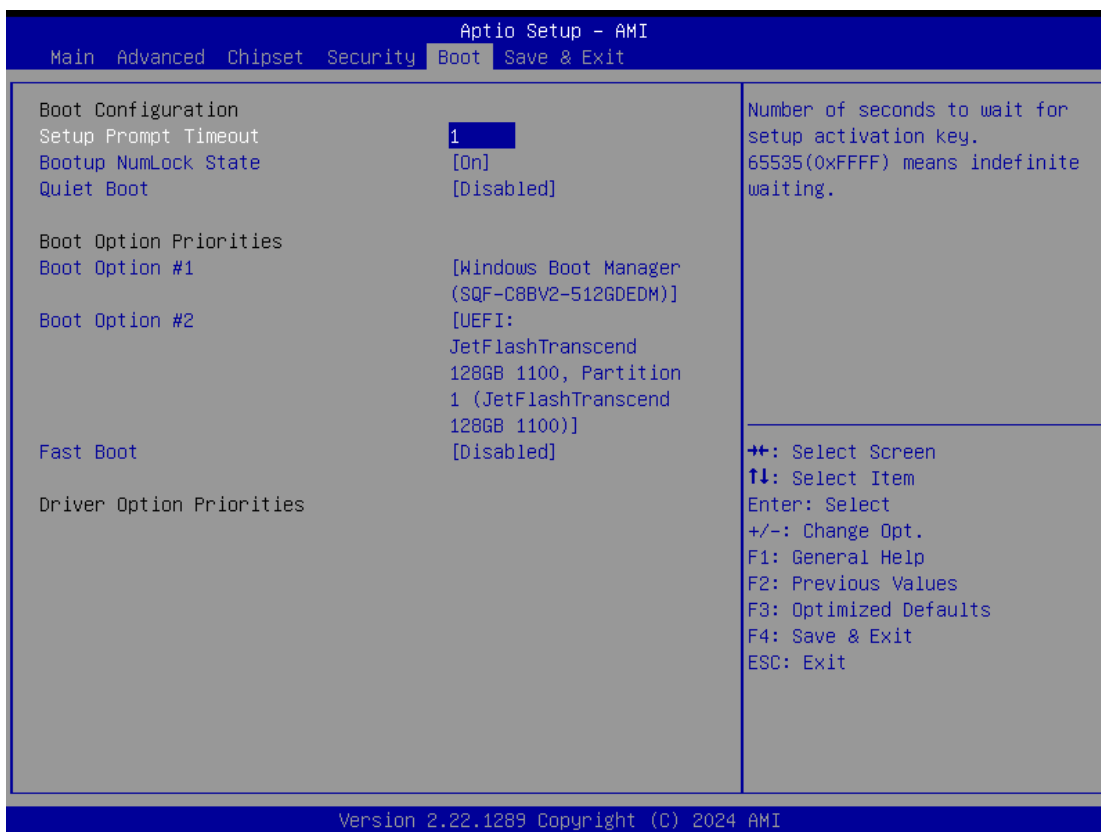
- **PCI Express Configuration**
This submenu allows users to set the PCI Express settings.
- **SATA Configuration**
This submenu allows users to set the SATA device settings.
- **Security Configuration**
This submenu allows users to set the security configuration settings.
- **Onboard LAN A Controller**
This item allows users to enable or disable the onboard LAN A controller.
- **LAN A PXE OpROM**
This item allows users to enable or disable the boot option ROM for the LAN A controller.
- **Onboard LAN B Controller**
This item allows users to enable or disable the onboard LAN B controller.
- **LAN B PXE OpROM**
This item allows users to enable or disable the boot option ROM for the LAN B controller.
- **ErP Function**
When this option is disabled, the wake on function can be selected.

3.2.4 Security



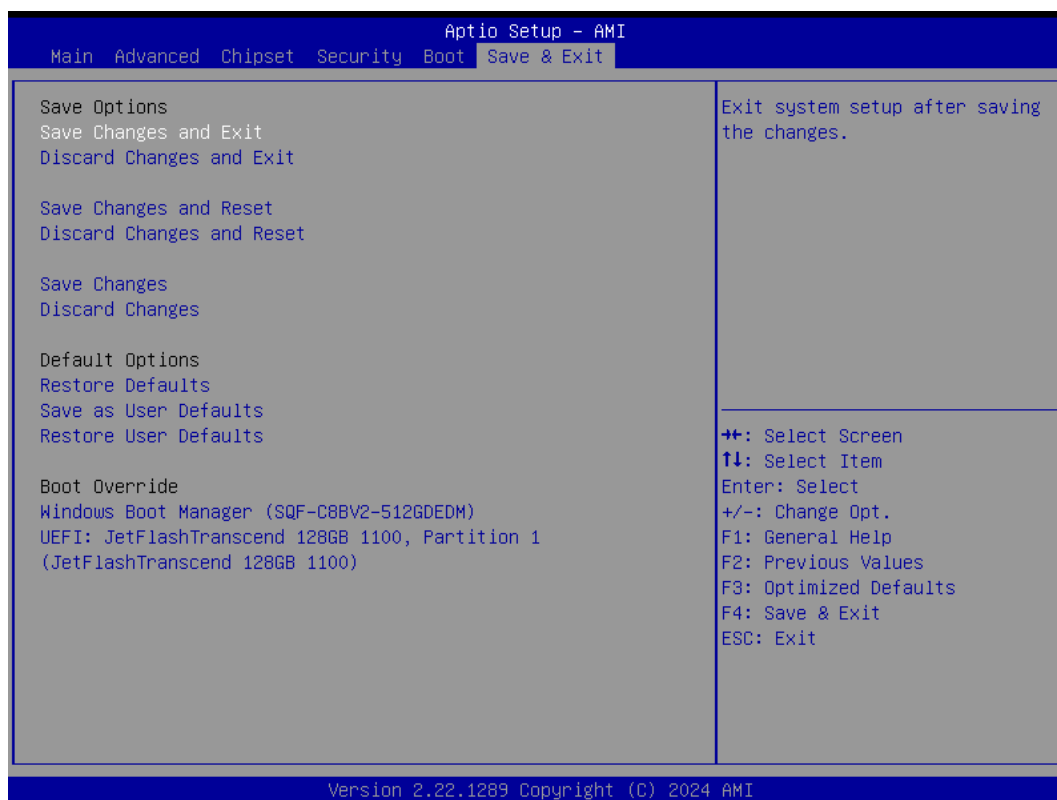
- **Administrator Password**
Set Administrator Password
- **Secure Boot**
This item allows users to access a submenu to configure secure boot settings.

3.2.5 Boot



- **Setup Prompt Timeout**
This item allows users to set the number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
- **Bootup NumLock State**
This item allows users to select the keyboard NumLock state.
- **Quiet Boot**
This item allows users to enable/disable quiet boot option.
- **Fast Boot**
This item allows users to enable/disable boot with initialization of a minimal set of devices required to launch active boot option. It has no effect for BBS boot options.

3.2.6 Save & Exit



- **Save Charges and Exit**
This item allows you to exit system setup after saving the changes.
- **Discard Changes and Exit**
This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**
This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**
This item allows you to reset system setup without saving any changes.
- **Save Changes**
This item allows you to save changes done so far to any of the options.
- **Discard Changes**
This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**
This item allows you to restore/load default values for all the options.
- **Save as User Defaults**
This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**
This item allows you to restore the user defaults to all the options.

Appendix **A**

Connectors

A.1 Jumper and Connector Location

A.1.1 Board Layout

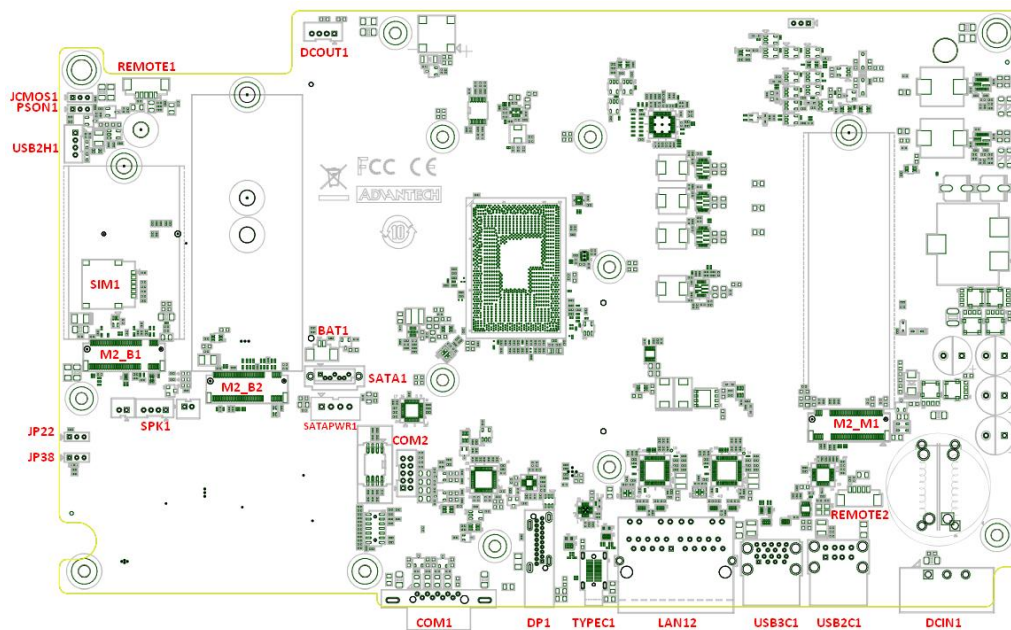


Figure A.1 Board Layout - Top View

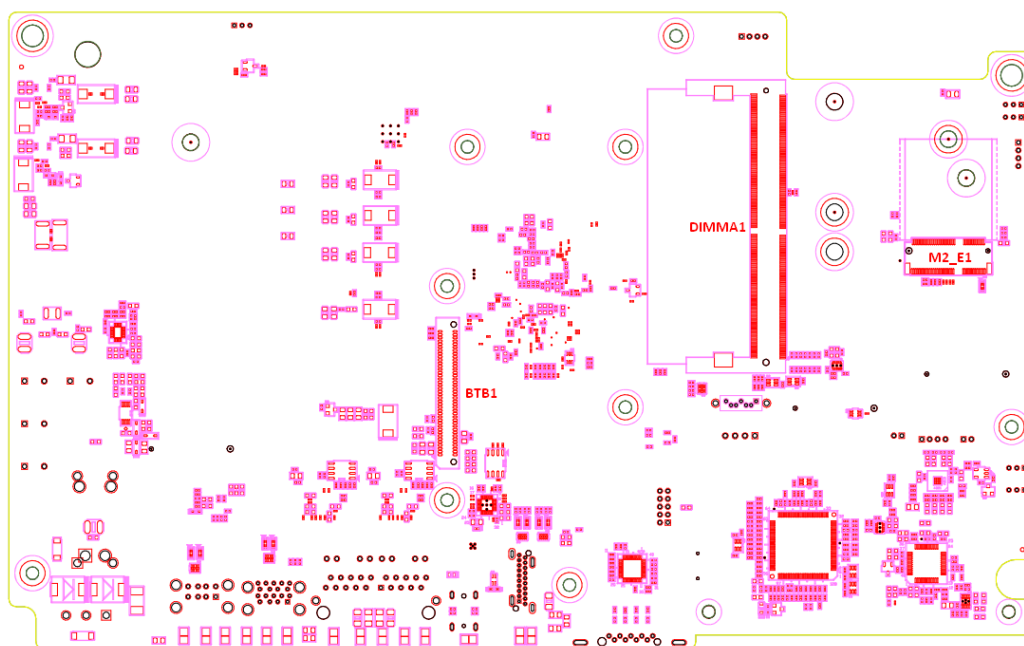


Figure A.2 Board Layout - Bottom View

Table A.1: Board Placement

Place	Function
JCMOS1	Clear CMOS jumper
PSON1	AT/ATX jumper
JP22,JP38	5G module jumper
DCIN1	Power input connector

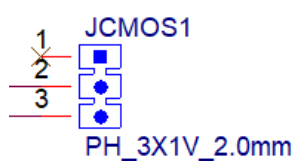
DCOUT1	iDoor power connector
USB2C1	USB 2.0 connector
USB3C1	USB 3.0 connector
LAN12	LAN RJ45 connectors
TYPEC1	Type-C connector
DP1	DisplayPort connector
COM1	COM1 RS-232/422/485 connector
COM2	Internal COM2 RS-232/422/485 connector
USB2H1	Internal USB connector
REMOTE1	Remote button connector
REMOTE2	Remote button connector
BAT1	RTC battery connector
M2M1	M.2 M-key slot
M2B1	M.2 B-key slot
M2B2	M.2 B-key slot for iDoor
M2E1	M.2 E-key slot
BTB1	Front panel module connector
DIMMA1	Memory slot
SIM1	SIM card slot
SPK1	Speaker connector
SATA1	SATA SSD connector
SATAPWR1	SATA power connector

A.2 Jumper Settings and Descriptions

A.2.1 CMOS Clear Function (JCMOS1)

Table A.2: CMOS Clear Function

Description	This jumper is used to select CMOS clear
Default	(1-2)
(1-2)	Normal (Default)
(2-3)	Clear CMOS



(1-2) Normal, default

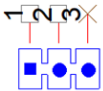




(2-3) Clear CMOS

A.2.1 AT/ATX Select (PSON1)

Table A.3: AT/ATX Select

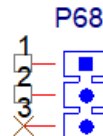


Description	This jumper is used to select power on mode
Default	(1-2)
(1-2)	AT (Default)
(2-3)	ATX

 PSON1 PH_3x1V_2.00mm	 (1-2) AT power
	 (2-3) ATX power

A.2.2 5G Module Mode Select (JP22,JP38)

Table A.4: 5G Module Mode Select

Description	This switch is used to select 5G module mode
Default	(2-3)
(1-2)	High_1.8V
(2-3)	Normal (Default)

 P68 PH_3X1V_2.0mm <Characteristic>	 (1-2) High_1.8V (Pull high 1.8V)
	 (2-3) Normal, default (Floating non-power)

JP22 for M.2 pin 22 power selection. Define by 5G module vendor.

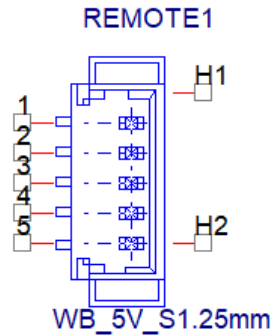
JP38 for M.2 pin 38 power selection. Define by 5G module vendor.

A.3 Connector Pin Definition

A.3.1 Remote Button Connector (REMOTE1)

Table A.5: Remote Button Connector (REMOTE1)

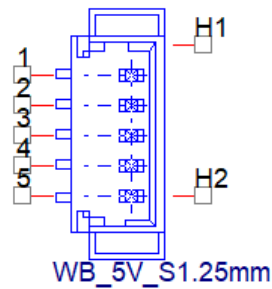
Pin	Signal
1	ATX_PWRBTN#
5	GND



A.3.2 Remote Button Connector (REMOTE2)

Table A.6: Remote Button Connector (REMOTE2)

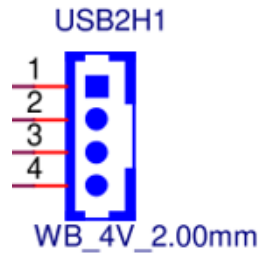
Pin	Signal
1	ATX_PWRBTN#
5	GND



A.3.3 Internal USB Connector (USB2H1)

Table A.6: Internal USB Connector (USB2H1)

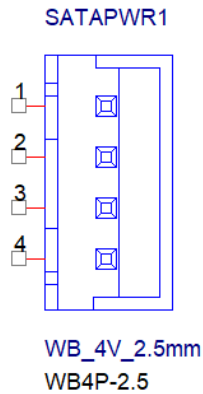
Pin	Signal
1	+V5
2	D-
3	D+
4	GND



A.3.4 SATA Power Connector (SATAPWR1)

Table A.7: SATA Power Connector (SATAPWR1)

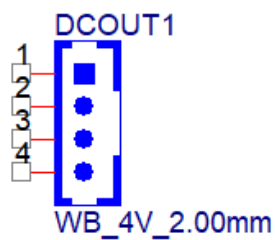
Pin	Signal
1	+V5
2	GND
3	GND
4	+V12



A.3.5 iDoor Power Connector (DCOUT1)

Table A.8: iDoor Power Connector (DCOUT1)

Pin	Signal
1	DCOUT*
2	DCOUT*
3	GND
4	GND



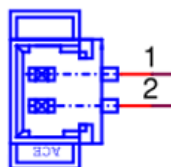
*DCOUT voltage comes directly from power input.

A.3.6 RTC Battery Connector (BAT1)

Table A.9: RTC Battery Connector (BAT1)

Pin	Signal
1	+VBAT
2	GND

BAT1

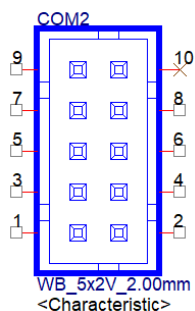


WB_2V_S1.25mm

A.3.7 Internal RS-232/422/485 Connector (COM2)

Table A.10: Internal COM Port Connector (COM2)

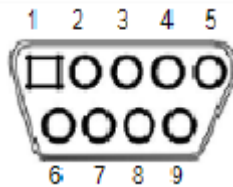
Pin	Signal
1	DCD#
2	RX
3	TX
4	DTR#
5	GND
6	DSR
7	RTS#
8	CTS#
9	RI#
10	NA



A.3.8 COM1&2 RS-232/422/485 Connector (COM1&2)

Table A.11: COM1&2 RS-232/422/485 Connector (COM1)

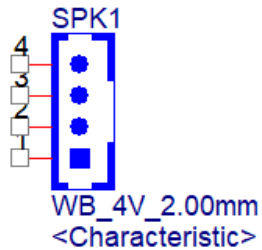
Pin	RS232	RS422	RS485
1	DCD	TX-	Data-
2	RX	TX+	Data+
3	TX	RX+	
4	DTR	RX-	
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		



A.3.9 Speaker Connector (SPK1)

Table A.12: Speaker Connector (SPK1)

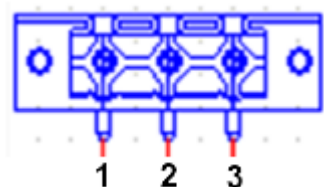
Pin	Signal
1	R+
2	R-
3	L-
4	L+



A.3.10 Power Input Connector (DCIN1)

Table A.13: Power Input Connector (DCIN1)

Pin	Signal
1	Power In V+
2	Power In V- (GND)
3	GND_EARTH

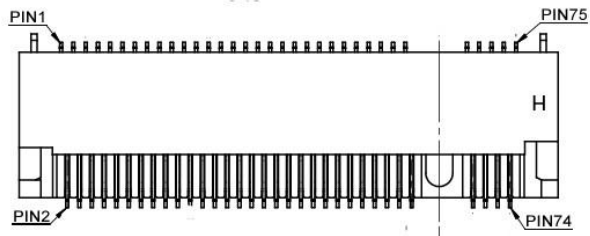


A.3.11 M.2 M-Key Connector (M2M1)

Table A.14: M.2 M-Key Connector (M2M1)

Pin	Signal	Pin	Signal
74	3.3V	75	GND
72	3.3V	73	GND
70	3.3V	71	GND
68	SUSCLK	69	PEDET(NC-PCIe/GND-SATA)
58	NC	67	NC
56	NC	57	GND
54	PEWAKE0#	55	REFCLKp
52	CLKREQ0#	53	REFCLKn
50	PERST0#	51	GND
48	NC	49	PETp0 / SATA-A+
46	NC	47	PETn0 / SATA-A-
44	NC	45	GND
42	NC	43	PERp0 / SATA-B-
40	NC	41	PERn0 / SATA-B+
38	DEVSLP	39	GND
36	NC	37	PETp1
34	NC	35	PETn1
32	NC	33	GND
30	NC	31	PERp1
28	NC	29	PERn1
26	NC	27	GND
24	NC	25	PETp2

22	NC	23	PETn2
20	NC	21	GND
18	3.3V	19	PERp2
16	3.3V	17	PERn2
14	3.3V	15	GND
12	3.3V	13	PETp3
10	NC	11	PETn3
8	NC	9	GND
6	NC	7	PERp3
4	3.3V	5	PERn3
2	3.3V	3	GND
		1	GND

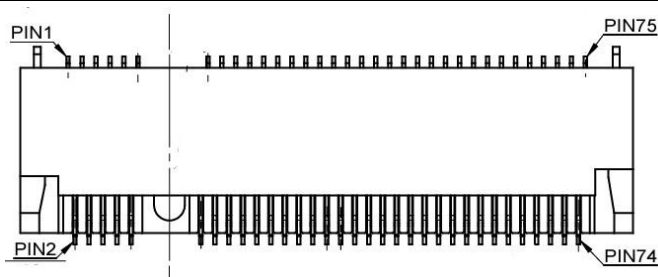


A.3.12 M.2 E-Key Connector (M2E1)

Table A.15: M.2 E-Key Connector (M2E1)

Pin	Signal	Pin	Signal
74	3.3V	75	GND
72	3.3V	73	NC
70	NC	71	NC
68	NC	69	GND
66	NC	67	NC
64	NC	65	NC
62	NC	63	GND
60	NC	61	NC
58	NC	59	NC
56	W_DISABLE1#	57	GND
54	W_DISABLE2#	55	PEWAKE0#
52	PERST0#	53	CLKREQ0#
50	SUSCLK	51	GND
48	NC	49	REFCLKn
46	NC	47	REFCLKp
44	NC	45	GND
42	NC	43	PERn0

40	NC	41	PERp0
38	NC	39	GND
36	NC	37	PETn0
34	NC	35	PETp0
32	NC	33	GND
22	NC	23	NC
20	NC	21	NC
18	GND	19	NC
16	NC	17	NC
14	NC	15	NC
12	NC	13	NC
10	NC	11	NC
8	NC	9	NC
6	NC	7	GND
4	3.3V	5	USB_D-
2	3.3V	3	USB_D+
		1	GND

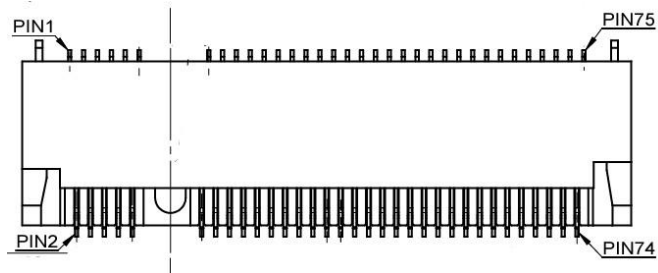


A.3.13 M.2 B-Key Connector (M2B1)

Table A.16: M.2 B-Key Connector (M2B1)

Pin	Signal	Pin	Signal
74	3.3V	75	CONFIG_2
72	3.3V	73	GND
70	3.3V	71	GND
68	NC	69	CONFIG_1
66	NC	67	RESET#
64	NC	65	NC
62	NC	63	NC
60	NC	61	NC
58	NC	59	NC
56	NC	57	GND
54	PEWAKE0#	55	REFCLKp

52	CLKREQ0#	53	REFCLKn
50	PERST0#	51	GND
48	NC	49	PETp0
46	NC	47	PETn0
44	NC	45	GND
42	NC	43	PERp0
40	NC	41	PERn0
38	NC	39	GND
36	UIM_PWR	37	USB3.1-Tx+
34	UIM_DATA	35	USB3.1-Tx-
32	UIM_CLK	33	GND
30	UIM_RESET	31	USB3.1-Rx+
28	NC	29	USB3.1-Rx-
26	NC	27	GND
24	NC	25	NC
22	NC	23	NC
20	NC	21	CONFIG_0
10	3.3V	11	GND
8	W_DISABLE1#	9	USB_D-
6	FULL_CARD_POWER_OFF#	7	USB_D+
4	3.3V	5	GND
2	3.3V	3	GND
		1	CONFIG_3

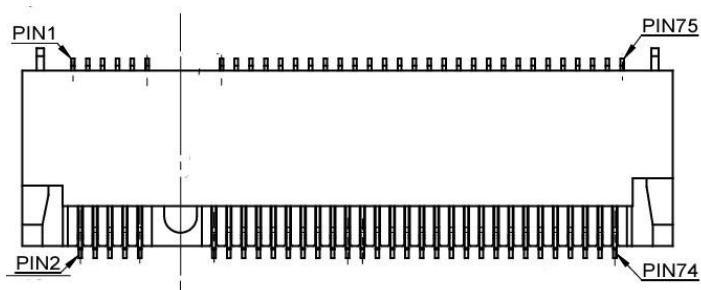


A.3.14 M.2 B-Key Connector (M2B2)

Table A.17: M.2 B-Key Connector (M2B2)

Pin	Signal	Pin	Signal
74	3.3V	75	NC
72	3.3V	73	GND
70	3.3V	71	GND
68	NC	69	NC
66	NC	67	RESET#
64	NC	65	NC

62	NC	63	NC
60	NC	61	NC
58	NC	59	NC
56	NC	57	GND
54	PEWAKE0#	55	REFCLKp
52	CLKREQ0#	53	REFCLKn
50	PERST0#	51	GND
48	NC	49	PETp0
46	NC	47	PETn0
44	NC	45	GND
42	NC	43	PERp0
40	NC	41	PERn0
38	NC	39	GND
36	NC	37	PETp1
34	NC	35	PETn1
32	NC	33	GND
30	NC	31	PERp1
28	NC	29	PERn1
26	NC	27	GND
24	NC	25	NC
22	NC	23	NC
20	NC	21	NC
10	3.3V	11	GND
8	NC	9	USB_D-
6	FULL_CARD_POWER_OFF#	7	USB_D+
4	3.3V	5	GND
2	3.3V	3	GND
		1	NC



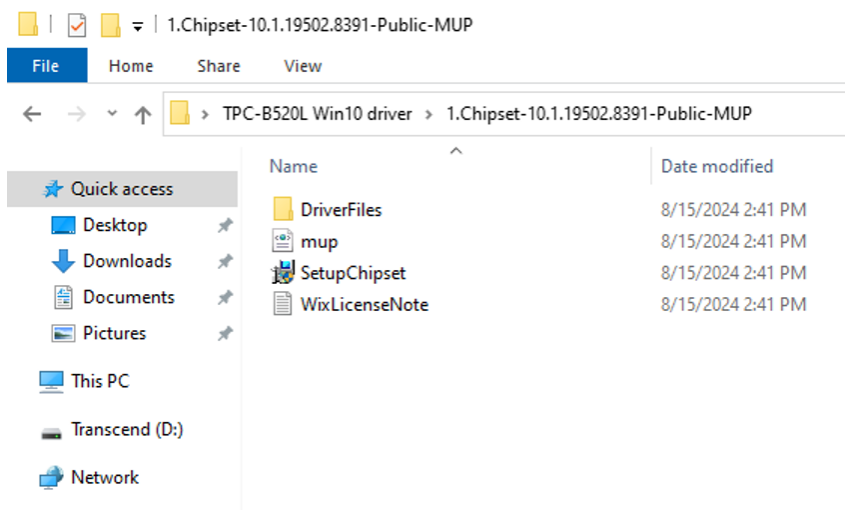
Appendix **B**

Driver Installation

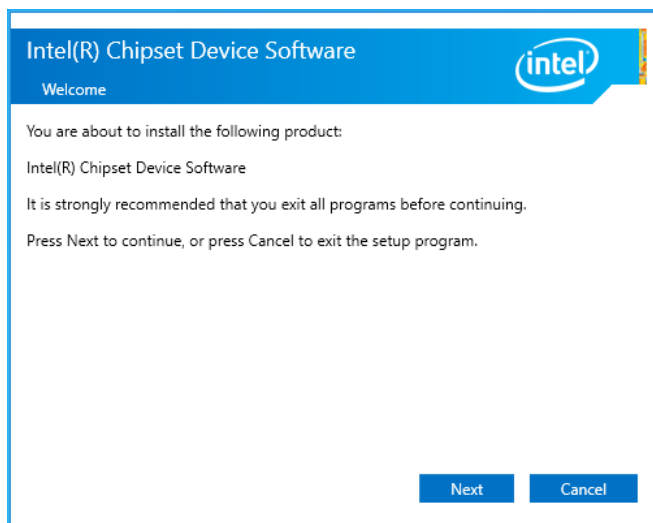
B.1 Intel Chipset Device Software Installation

Follow the steps below to install the Intel Chipset Device Software:

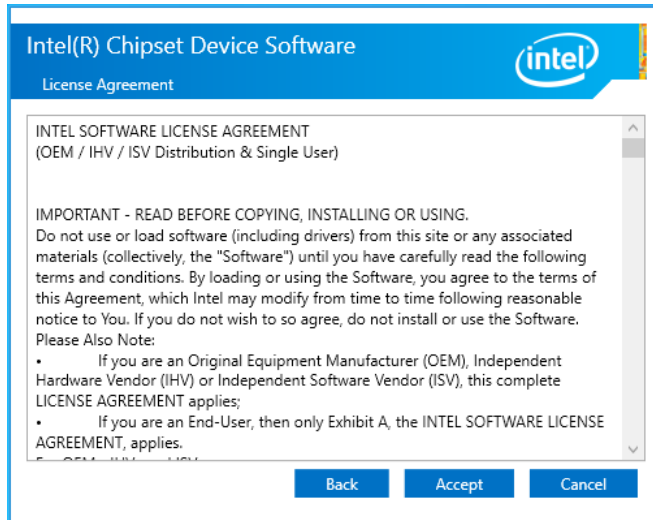
1. Launch <Driver Root Path>\1.Chipset-10.1.19502.8391-Public-MUP
2. Install **SetupChipset.exe**



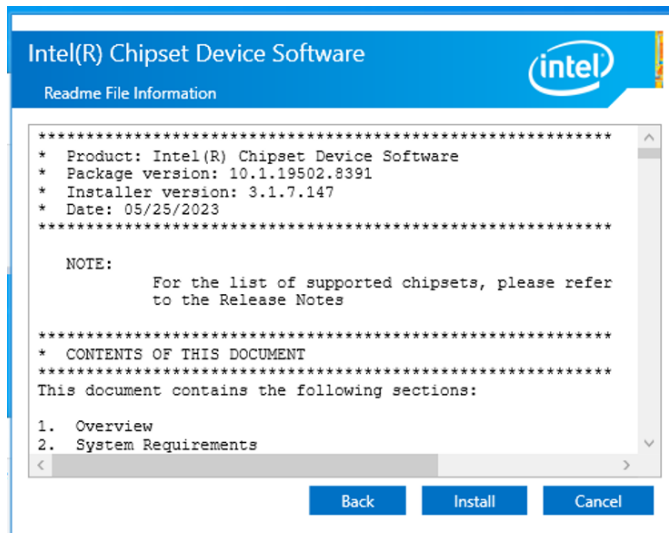
3. Click **Next**.



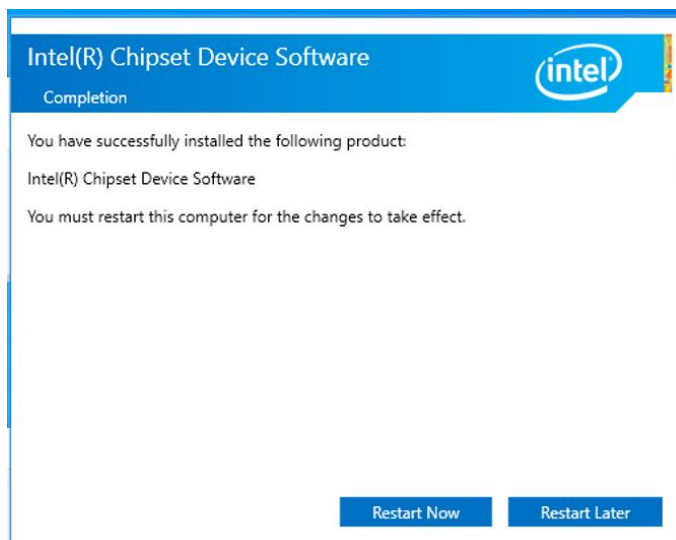
4. Click **Accept**.



5. Click **Install**.



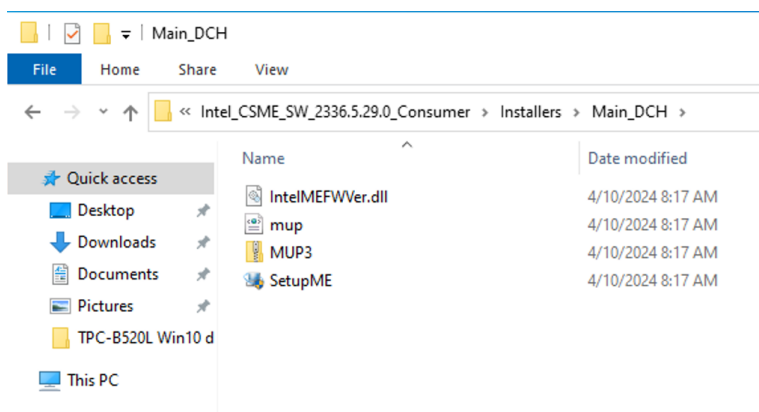
6. Click **Restart Now**.



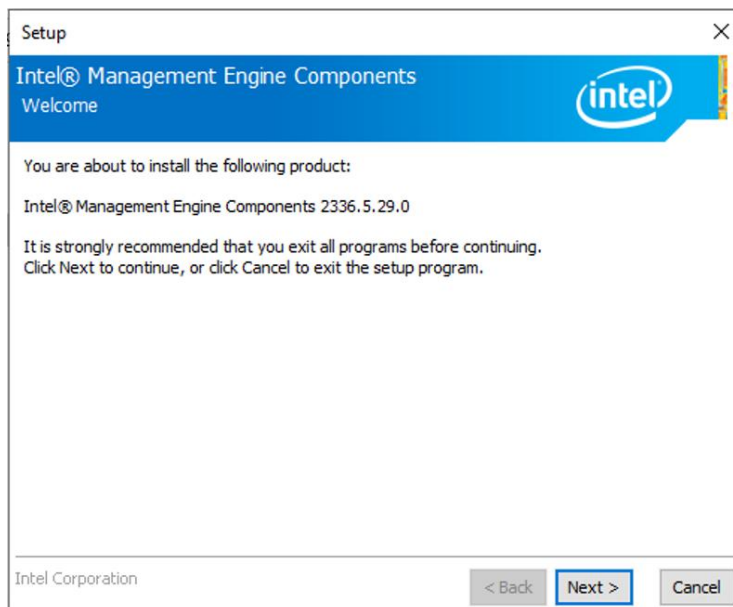
B.2 Intel Management Engine Components Installation

Follow the steps below to install the Intel Management Engine Components:

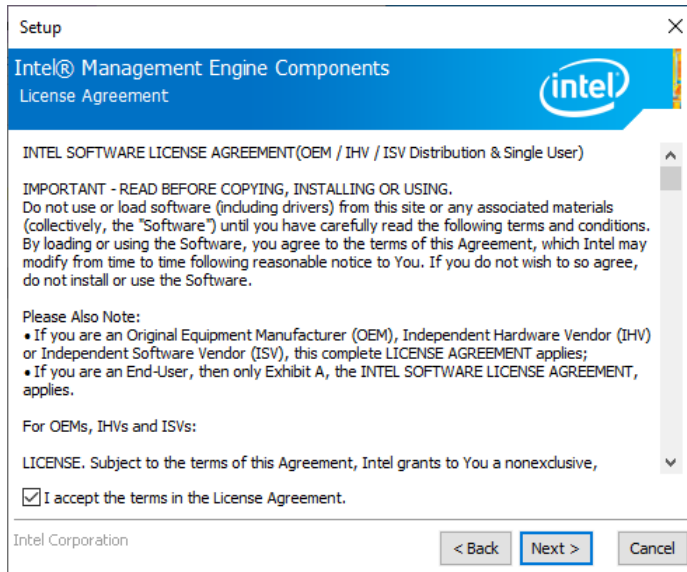
1. Launch <Driver Root Path>\2.ME Driver_Win10(64bit)\ME Driver_Win10(64bit)\Intel_CSME_SW_2336.5.29.0_Consumer\Installers\Main_DCH
2. Install **SetupMe.exe**



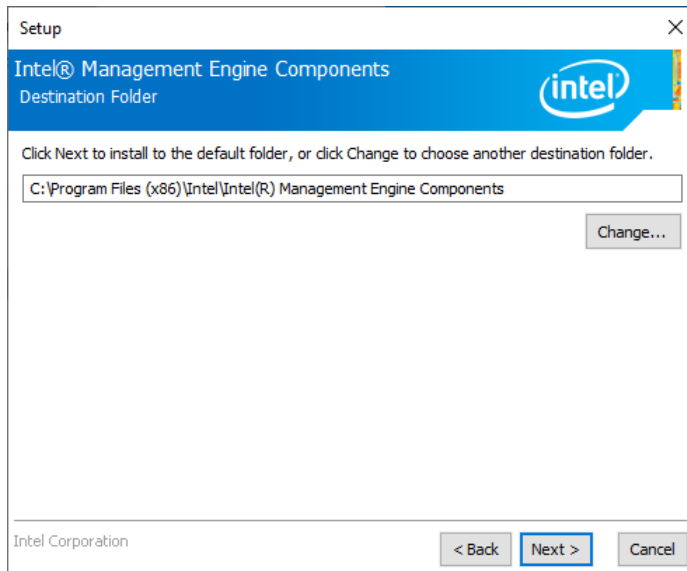
3. Click **Next**.



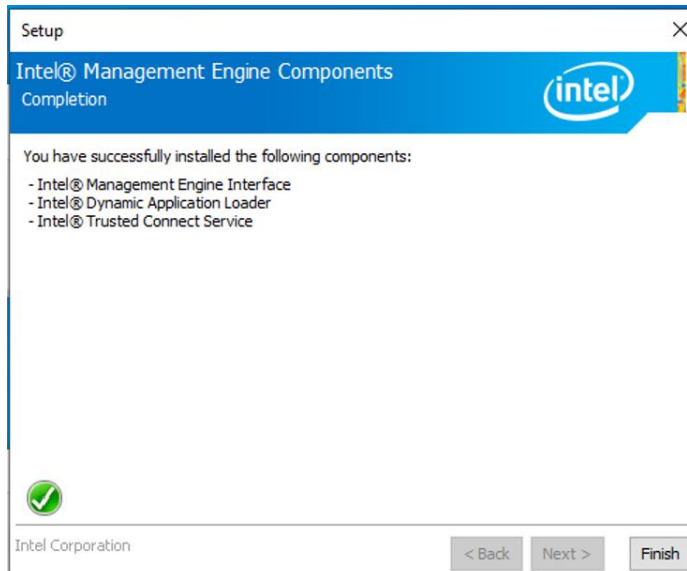
4. Check "I accept the terms in the License Agreement". Click **Next**.



5. Click **Next**.



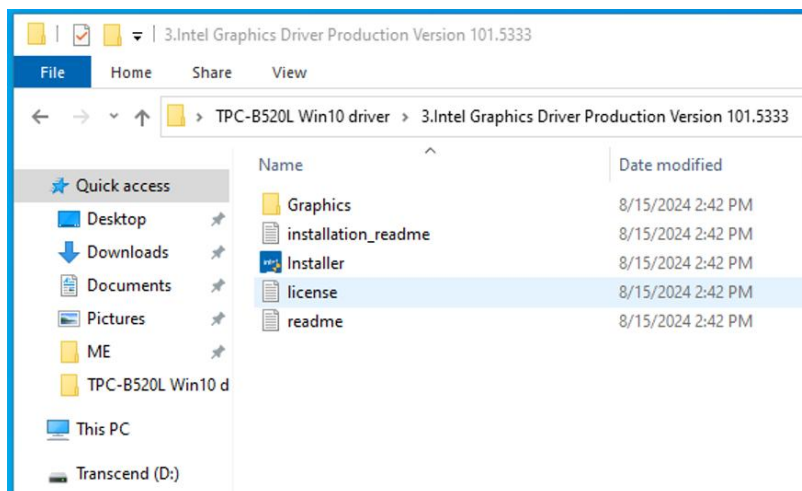
6. Click **Finish**.



B.3 Intel Graphics Driver Installation

Follow the steps below to install the Intel Graphics Driver:

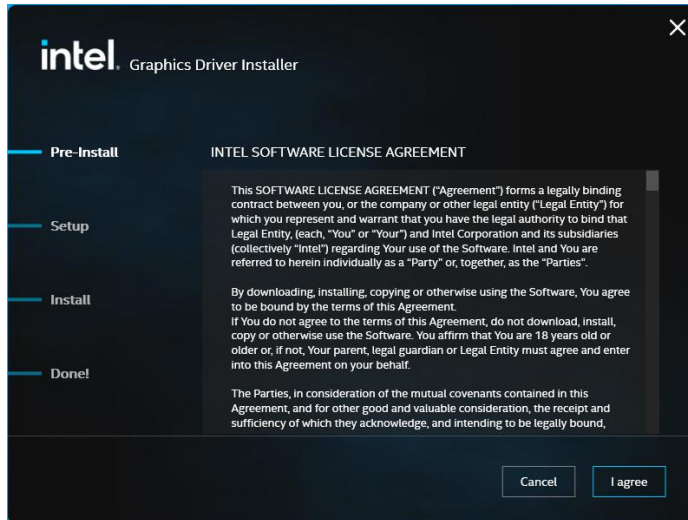
1. Launch <Driver Root Path>\3.Intel Graphics Driver Production Version 101.5333
2. Install **Installer.exe**



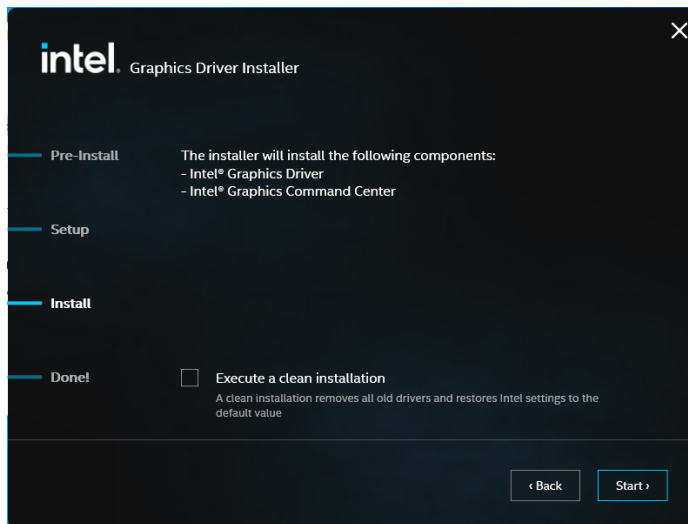
3. Click **Begin Installation.**



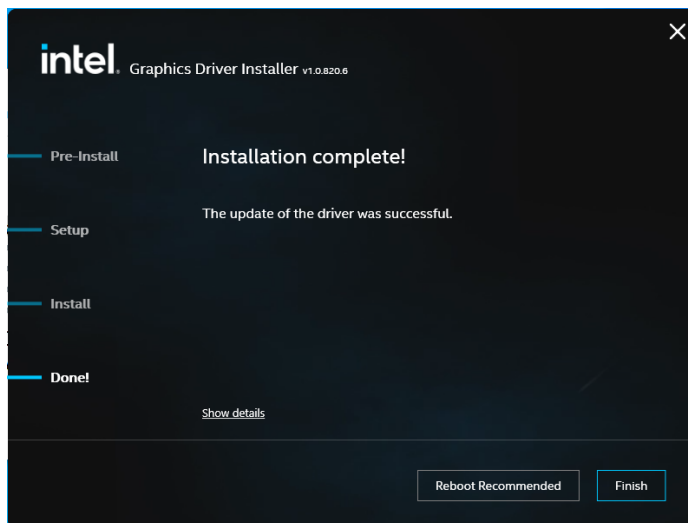
4. Click **I agree**.



5. Click **Start**.



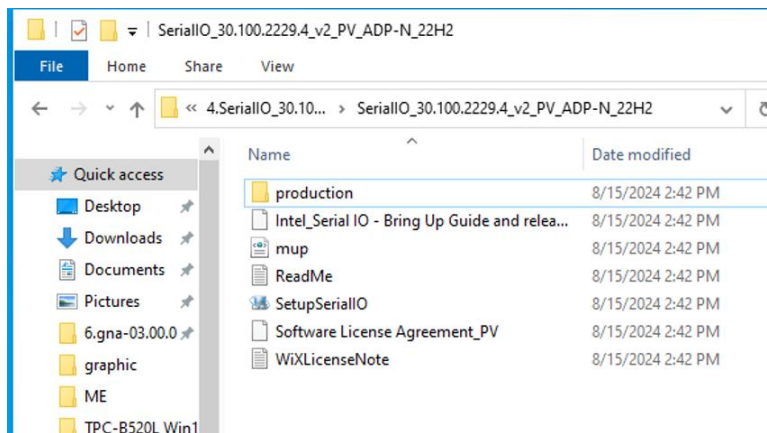
6. Click **Finish**.



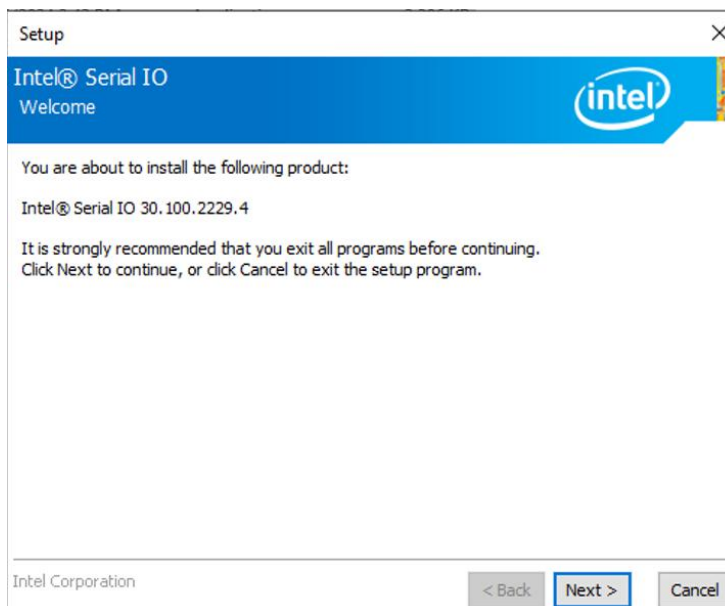
B.4 Intel Serial IO Driver Installation

Follow the steps below to install the Intel Serial IO driver:

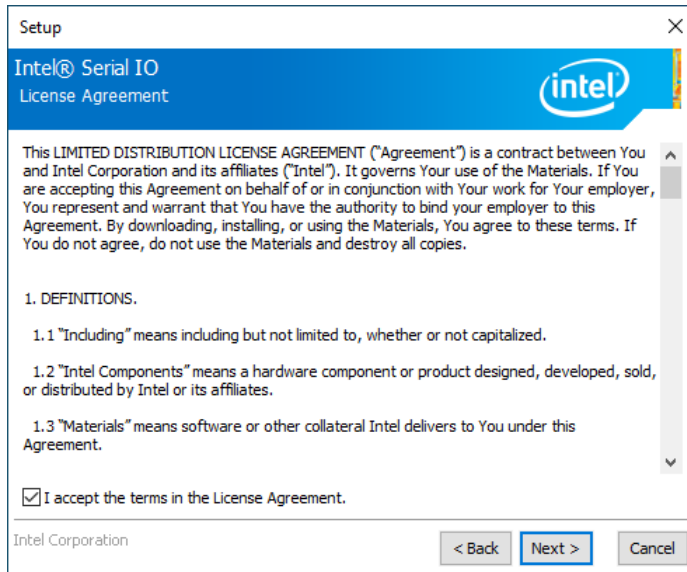
1. Launch <Driver Root Path>\4.SerialIO_30.100.2229.4_v2_PV_ADP-N_22H2\SerialIO_30.100.2229.4_v2_PV_ADP-N_22H2
2. Install **SetupSerialIO.exe**



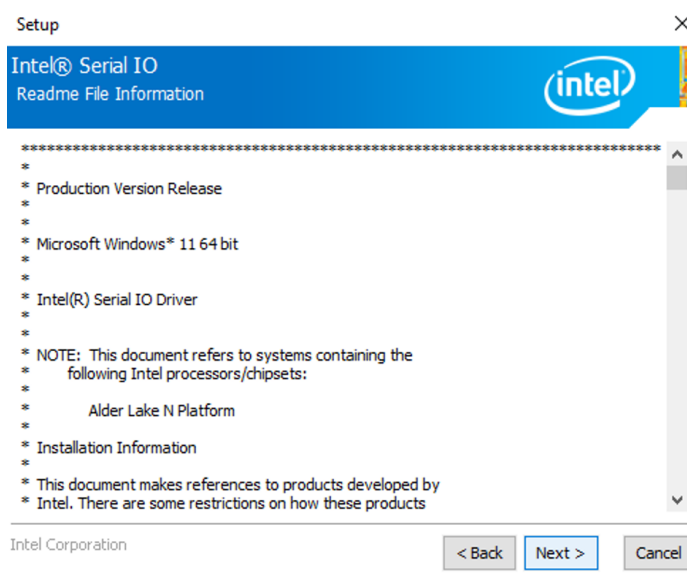
3. Click **Next**.



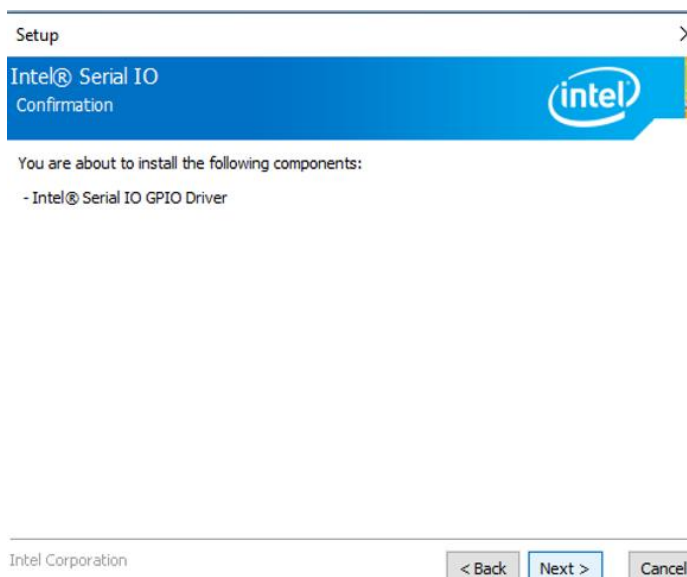
4. Check "I accept the terms in the License Agreement". Click **Next**.



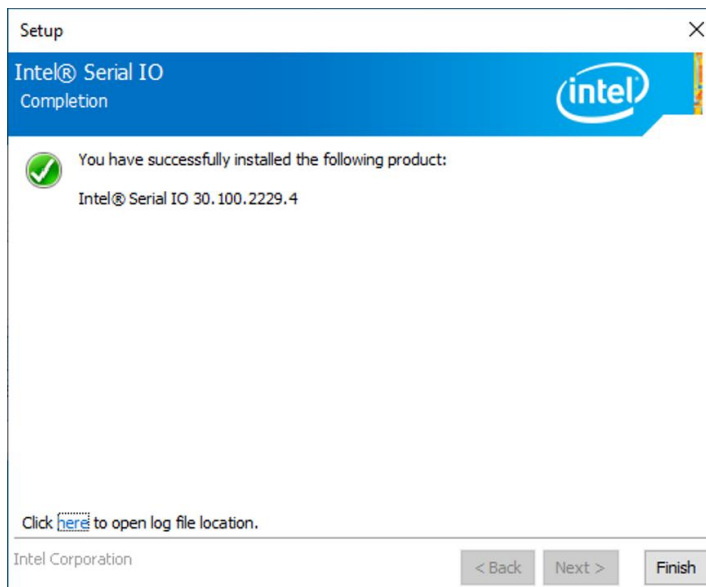
5. Click **Next**.



6. Click **Next**.



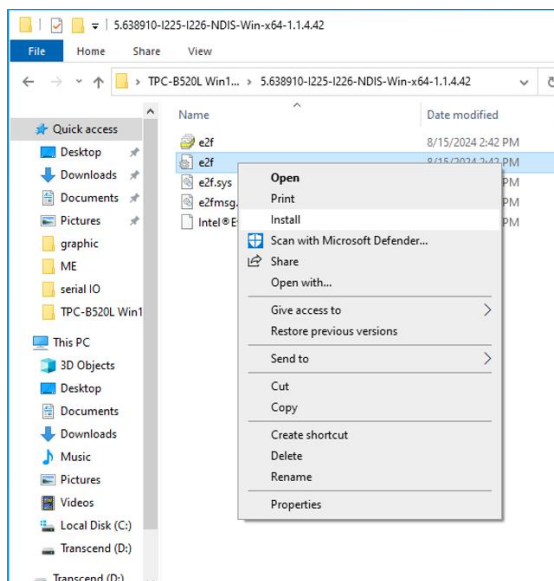
- Click **Finish**.



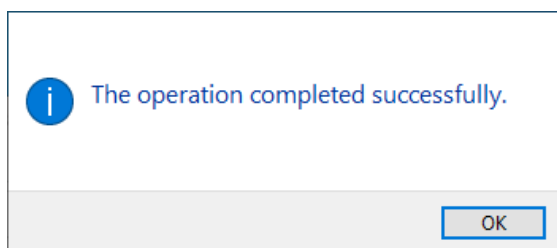
B.5 Intel LAN Driver Installation

Follow the steps below to install the Intel LAN driver:

- Launch <Driver Root Path>\ 5. 638910-I225-I226-NDIS-Win-x64-1.1.4.42
- Select and right click **e2f.inf**. Click **Install** from the menu.



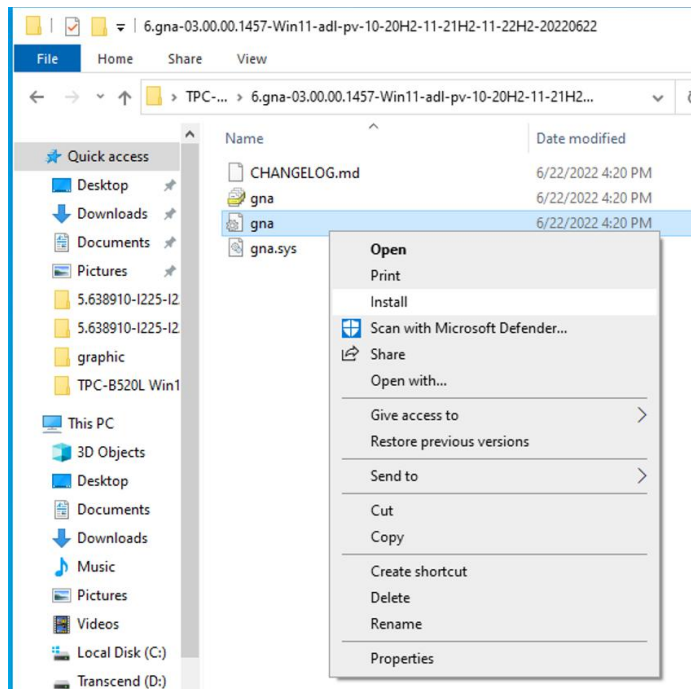
- After installation, the following screen appears. Click **OK**.



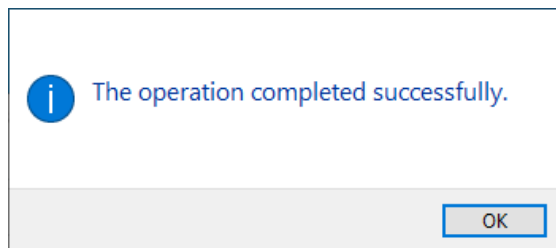
B.6 Intel GNA Driver Installation

Follow the steps below to install the Intel GNA driver:

1. Launch <Driver Root Path>\6.gna-03.00.00.1457-Win11-adl-pv-10-20H2-11-21H2-11-22H2-20220622
2. Select and right click **gna.inf**. Click **Install** from the menu.



3. After installation, the following screen appears. Click **OK**.



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