

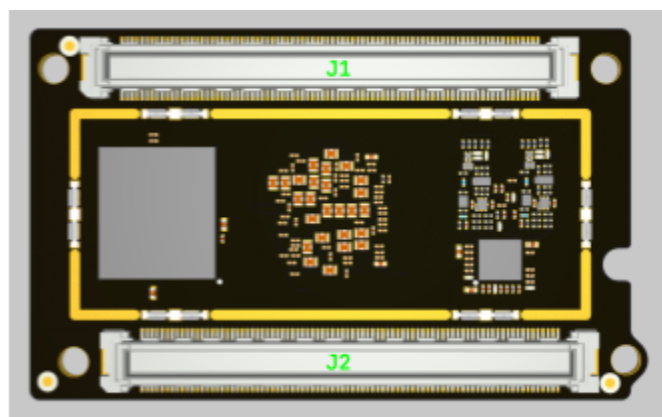
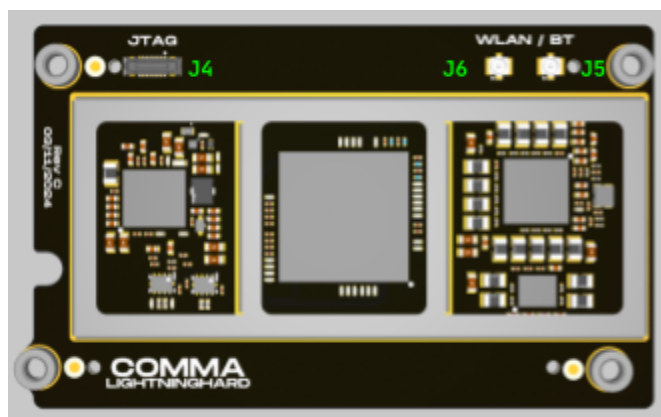
LIGHTNINGHARD: USER AND INTEGRATION MANUAL

High performance embedded System-On-Module (SOM) based around the Qualcomm SDx845 SoC

Specifications

- Qualcomm SDx845 SoC, including:
 - 4x Kryo Gold CPU
 - 4x Kryo Silver CPU
 - Hexagon v65 DSP
 - ISP280
- 4GB LPDDR4X RAM
- 128GB UFS2.1 flash storage
- 2x2 MIMO 802.11ac WLAN. Bluetooth is disabled in firmware.
- Dimensions: 62x37x6.5mm

Connectors



- J1: General purpose #1: Hirose FX10A-168P-SV(71)
- J2: General purpose #2: Hirose FX10A-168P-SV(71)
- J4: In-circuit debugging: Hirose BM28B0.6-16DS/2-0.35V(51)
- J5: Chain 0 WLAN antenna: UMCC MHF-4
- J6: Chain 1 WLAN antenna: UMCC MHF-4

Connector pinouts

Available on request

Power supply

VBAT: 3.6 - 4.8V DC

CURRENT: 0-4A

Integration limitations (English)

- The module is to be integrated with a host device intended for indoor use, to reduce the potential harmful interference with channel mobile satellite systems in band 5150-5250MHz.
- The maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit
- The maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate
- This radio transmitter (IC ID 32232-LIGHTNINGH) has been submitted for approval to operate with the antenna types listed below, with the maximum permissible gain indicated. Antennas that have a gain greater than the maximum gain indicated are strictly prohibited for use with this device:

Antenna description	Antenna type	Maximum antenna gain
WiFi antenna	PCB antenna (50 Ohm impedance)	2.4GHz WiFi: 1.5dBi 5GHz WiFi: 5.7dBi

Limitations d'intégration (Français)

- Le module doit être intégré à un dispositif hôte destiné à une utilisation en intérieur, afin de réduire les interférences potentiellement nuisibles avec les systèmes satellites mobiles de bande 5150-5250MHz.
- Le gain d'antenne maximal autorisé pour les dispositifs dans les bandes 5250-5350 MHz et 5470-5725 MHz doit être tel que l'équipement soit toujours conforme à la limite de p.i.r.e.
- Le gain d'antenne maximal autorisé pour les dispositifs dans la bande 5725-5850 MHz doit être tel que l'équipement soit toujours conforme aux limites de p.i.r.e. appropriées.
- Ce transmetteur radio (IC ID 32232-LIGHTNINGH) a été soumis pour approbation afin de fonctionner avec les types d'antennes listés ci-dessous, avec le gain maximal permis indiqué. Les antennes ayant un gain supérieur au gain maximal indiqué sont strictement interdites d'utilisation avec cet appareil:

Description de l'antenne	Type d'antenne	Gain maximal de l'antenne
Antenne WiFi	Antenne PCB (impédance de 50 Ohms)	WiFi 2.4GHz: 1.5dBi WiFi 5GHz: 5.7dBi

FCC compliance statement

CAUTION:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

ISED compliance statement (English)

CAUTION

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference, and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

IMPORTANT NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to the Innovation, Science and Economic Development Canada's ICES-003. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Déclaration de conformité d'ISED (Français):

ATTENTION:

Toute modification ou changement non expressément approuvé par la partie responsable de la conformité pourrait annuler l'autorité de l'utilisateur à utiliser l'équipement. Cet appareil est conforme aux normes sans licence d'Innovation, Sciences et Développement économique Canada (ISED). Son fonctionnement est soumis aux deux conditions suivantes :

- (1) cet appareil ne doit pas provoquer d'interférences, et
- (2) cet appareil doit accepter toute interférence, y compris celles pouvant causer un fonctionnement indésirable.

NOTE IMPORTANTE:

Cet équipement a été testé et est conforme aux limites pour un appareil numérique de classe B, conformément à la norme ICES-003 d'Innovation, Sciences et Développement économique Canada. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Cet équipement génère, utilise et peut émettre de l'énergie de fréquence radio. S'il n'est pas installé et utilisé conformément aux instructions, il peut causer des interférences nuisibles aux communications radio. Cependant, il n'y a aucune garantie que des interférences ne se produiront pas dans une installation particulière. Si cet équipement cause des interférences nuisibles à la réception radio ou télévisée, ce qui peut être déterminé en éteignant et en rallumant l'équipement, l'utilisateur est encouragé à essayer de corriger les interférences par une ou plusieurs des mesures suivantes:

- Réorienter ou déplacer l'antenne réceptrice.
- Augmenter la séparation entre l'équipement et le récepteur.
- Brancher l'équipement sur une prise d'un circuit différent de celui auquel le récepteur est connecté.
- Consulter le revendeur ou un technicien radio/TV expérimenté pour obtenir de l'aide.

Déclaration d'exposition aux radiations d'ISED:

Cet équipement est conforme aux limites d'exposition aux radiations d'ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

Integration instructions according to KDB996369 D03 OEM manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C/E has been investigated. It is applicable to the module.

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturers have to consult with the module manufacturer for the installation method in the end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with a minimum distance of 20cm from your body.

2.7 Antennas

This radio transmitter has been submitted for approval to operate with the antenna types listed below, with the maximum permissible gain indicated. Antennas that have a gain greater than the maximum gain indicated are strictly prohibited for use with this device.

Antenna description	Antenna type	Maximum antenna gain
WiFi antenna	PCB antenna	2.4GHz WiFi: 1.5dBi 5GHz WiFi: 5.7dBi

2.8 Label and compliance information

The final end product is labeled in a visible area with the approved FCC/IC ID according to the labeling document submitted to the FCC/ISED. The final product is required to show the FCC ID/IC per the relevant FCC/ISED regulations.

2.9 Information on test modes and additional testing requirements

Host manufacturers are strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15B