

FEATURES

- +20dBm (100mW) Nominal Transmit Power
- Superior Sensitivity -110dBm typical
- Dual Antenna Ports for Indoor Applications
- Small QSFP+ 45mm x22.3mm x 3.7mm form factor
- Long range-up to >1000 meters LoS
- MKW22D512V 50MHz 32 bit ARM® Cortex™ M4 MCU
- Freescale Thread, BeeStack™ Pro, SynkroRF or SMAC
- MMCX, u.fl, SMA or Chip Antenna RF connection
- 15 Selectable IEEE 802.15.4 RF channels
- Extensive low power modes
- 64K SRAM, 512K FLASH
- AES 128 bit Encryption
- USB 2.0 communication to mangOH™
- 1.8v mangOH™ compliant SPI and UART I/O
- -40C to +105C Operation
- RoHS Compliant
- FCC/IC/CE Certified

APPLICATIONS

- Thread / ZigBee™ SE2.0
- Smart Energy
- IoT
- Automatic Meter Reading
- Medical (MBAN) Networks
- Residential Automation
- HVAC Control
- Lighting Control
- Asset Tracking



DESCRIPTION

The mangOH™ IoT Connector is an open interface standard from Sierra Wireless to simplify product development with a single interface for connectivity and sensor module technology. Just as the minicard standard simplified development for the laptop, tablet, and networking industry, so the IoT connector brings plug'n'play hardware solutions offering electrical and feature compatibility across various IoT technologies. Talon has numerous RF IoT connector devices available or under development.

The Talon "OVAL" RF module on mangOH™ form factor is an ultra-low power extremely high performance IEEE 802.15.4 compliant, FCC/IC/CE certified 2.4GHz RF Module with a 100mW PA/LNA for extended range operations. The micro form factor module includes a dual antenna design to support receiver diversity systems to maximize indoor RF performance. The OVAL is based on the Freescale MKW22D512V fourth-generation Thread/ZigBee Pro/IP platform which incorporates a low power 2.4GHz IEEE 802.15.4 compliant radio frequency transceiver combined with a powerful Kinetis mixed signal ARM® Cortex™ M4 MCU, hardware acceleration for both the IEEE 802.15.4 MAC and AES security, and a full set of Microcontroller Unit (MCU) peripherals.

The Talon OVAL IoT Module brings out 3 different communication and 1 programming interface for maximum usability and flexibility including:

- 1 x UART
- 1 x SPI bus
- 1 x USB2.0
- 1 x JTAG

TALON OVAL IoT MODULE PINOUT 1/3

| MODULE PIN # | MKW22D512 PIN # | IoT PIN NAME | TYPICAL FEATURE | DESCRIPTION |
|--------------|-----------------|--------------|-----------------|--|
| P01 | NC | VCC_5V0 | POWER | NC |
| P02 | 21 | USB0_D+ | USB0 | USB+ 2.0 I/O |
| P03 | 22 | USB0_D- | USB0 | USB- 2.0 I/O |
| P04 | GND | GND | POWER | GND |
| P05 | NC | SDIO_CLK | SDIO | NC |
| P06 | NC | SDIO_CMD | SDIO | NC |
| P07 | NC | SDIO_DAT3/CD | SDIO | NC |
| P08 | NC | SDIO_DAT2 | SDIO | NC |
| P09 | NC | SDIO_DAT1 | SDIO | NC |
| P10 | NC | SDIO_DAT0 | SDIO | NC |
| P11 | NC | 1.8v | POWER | 1.8v Input from Host for 1.8v to 3.3v translator |
| P12 | PTD7/P14 | UART_TXD | UART | Output to Host |
| P13 | PTD6/P13 | UART_RXD | UART | Input from Host |
| P14 | NC | UART_CTS | UART | NC |
| P15 | NC | UART_RTS | UART | NC |
| P16 | PTC5/P5 | SPI SCLK | SPI | Input from Host |
| P17 | PTC6/P6 | SPI MISO | SPI | Output to Host |

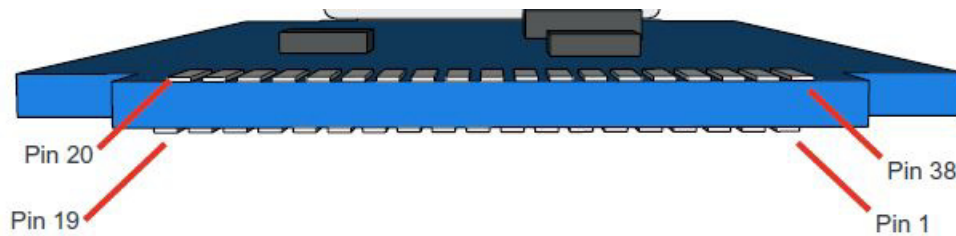
TALON OVAL IoT MODULE PINOUT 2/3

| MODULE PIN # | MKW22D512 PIN # | IoT PIN NAME | TYPE | DESCRIPTION |
|--------------|-----------------|---------------|----------------|-----------------------|
| P18 | PTC7/P7 | SPI MOSI | SPI | Input from Host |
| P19 | PTC4/P4 | SPI CS | SPI | Output to Host |
| P20 | NC | ADC0 | ADC | NC |
| P21 | GND | GND | POWER | GND |
| P22 | NC | I2C_SDA | I2C | NC |
| P23 | NC | I2C_SCL | I2C | NC |
| P24 | NC | GPIO_1 | GPIO | NC |
| P25 | NC | GPIO_2 | GPIO | NC |
| P26 | NC | GPIO_3 | GPIO | NC |
| P27 | NC | GPIO_4 | GPIO | NC |
| P28 | +3.3v | VCC_3V3 | POWER | +3.3V Input from Host |
| P29 | +3.3v | VCC_3V3 | POWER | +3.3V Input from Host |
| P30 | GND | GND | POWER | GND |
| P31 | NC | n_CARD_DETECT | SYSTEM CONTROL | IoT IDENTIFY |
| P32 | RESET_b | n_RESET | SYSTEM CONTROL | MCU RESET |

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TALON OVAL IoT MODULE PINOUT 3/3

| MODULE PIN # | MKW22D512 PIN # | IoT PIN NAME | TYPE | DESCRIPTION |
|--------------|-----------------|-----------------|---------------|-------------|
| P33 | NC | PCM/I2S IN | AUDIO | NC |
| P34 | NC | PCM/I2S OUT | AUDIO | NC |
| P35 | NC | PCM_SYNC/I2S_WS | AUDIO | NC |
| P36 | NC | PCM/I2S CLK | AUDIO | NC |
| P37 | NC | PPS | STRATUM CLOCK | NC |
| P38 | GND | GND | POWER | GND |



mangOH™ PCB physical pinout

TALON OVAL IoT ORDERING INFORMATION

| MODULE | RF CONNECTORS |
|--------------------|----------------------------|
| OVAL-24SW-CHIP-SMA | Chip Antenna (1) + SMA (1) |
| OVAL-24SW-CHIP | Chip Antenna (1) |
| OVAL-24SW-SMA | SMA (1) |

FCC OPERATING NOTES

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

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.

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.

FCC RF Radiation Exposure Statement Caution: To maintain compliance with the FCC's RF exposure guidelines, place the product at least 20cm from nearby persons.

IC OPERATING NOTES

a. This device complies with Industry Canada license-exempt RSS standard(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.

b. This radio transmitter (IC: 10593A-24ZBPA100) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

c. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and person's body.

a. Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). Son fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas causer interférences , et (2) ce dispositif doit accepter toute interférence , y compris les interférences qui peuvent entraîner un mauvais fonctionnement de l'appareil.

b . Cet émetteur radio (IC : 10593A - 24ZBPA100) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous avec le gain maximal admissible indiqué . Les types d'antennes ne figurant pas dans cette liste , ayant un gain supérieur au gain maximum indiqué pour ce type , sont strictement interdits pour une utilisation avec cet appareil .

c . Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et le corps de la personne .

European OPERATING NOTES

CE0979

“Hereby, Talon Communications, Inc., declares that this radio module is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Restricted Use

Talon Communications, Inc. (TCI) does not assume any responsibility for the use of the described radio module (“the Module(s)”). TCI makes no representation with respect to the adequacy of the module in low-power wireless data communications applications or systems. Any Products using the Module must be designed so that a loss of communications due to radio interference or otherwise will not endanger either people or property, and will not cause the loss of valuable data. TCI assumes no liability for the performance of products which are designed or created using the Modules.

The Modules are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Module could create a situation where personal injury or death may occur. If you use the Modules for such unintended and unauthorized applications, you do so at your own risk and you shall indemnify and hold TCI and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that TCI was negligent regarding the design or manufacture of the Product.