

## 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

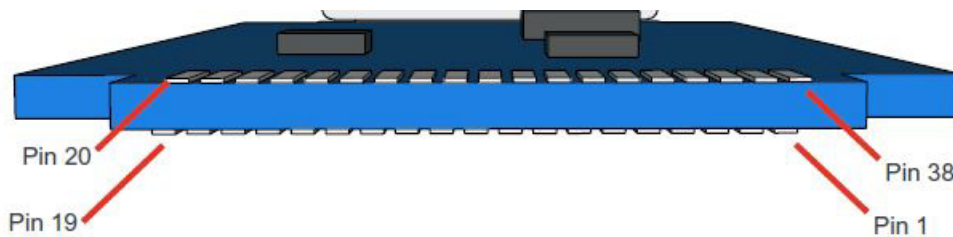
<b>MODULE PIN #</b>	<b>MKW22D512 PIN #</b>	<b>IoT PIN NAME</b>	<b>TYPICAL FEATURE</b>	<b>DESCRIPTION</b>
P01	NC	VCC_5V0	POWER	NC
P02	21	USB0_D+	USB0	USB+ 2.0 I/O
P03	22	USB0_D-	USB0	USB- 2.0 I/O
P04	GND	GND	POWER	GND
P05	NC	SDIO_CLK	SDIO	NC
P06	NC	SDIO_CMD	SDIO	NC
P07	NC	SDIO_DAT3/CD	SDIO	NC
P08	NC	SDIO_DAT2	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	NC	n_RESET	SYSTEM CONTROL	NC

## 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 OVAL-24SW-CHIP	Chip Antenna (1) + SMA (1) 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.**