FREESTAR PRO SERIES TRANSCEIVER MODULES

ZFSM-201-1

Integrated Transceiver Modules for ZigBee / IEEE 802.15.4

Evaluation Kit available: ZFSM-201-KIT-1

DESCRIPTION

CEL's FreeStar Pro module provides a high performance and cost effective RF transceiver solution for 2.4 GHz IEEE 802.15.4, ZigBee, and Zigbee PRO wireless networks.

The FreeStar Pro module is based on the Freescale™ MC13224V transceiver platform. It combines Freescale's transceiver IC with an onboard 100mW Power Amplifier. Ideal for remote sensing, AMR/AMI, home and building automation, industrial control, and security applications, FreeStar Pro combines extensive processing capability with high output power and low power consumption.

The processing power of the MC13224V enables the FreeStar Pro to provide a level of integration unprecedented in a ZigBee module. The 32-bit ARM7TDMI processor and expansive on-chip memory enable designers to eliminate the peripheral host processors often required by 8- and 16-bit transceiver solutions. This high level of integration reduces component count, lower power consumption and overall system costs.

FREESTAR PRO
ZFSM-201-1

- Transmit Power: 100 mW
- Receive Sensitivity: -94 dBm
- Freescale MC13224V platform
- 128 kB Serial Flash Memory
- 96 kB SRAM
- 80 kB ROM
- 32-bit ARM7TDMI-based MCU
- 46 GPIO Pins
- 12-bit ADC

APPLICATIONS

Automated Meter Reading
- In meter applications
- Thermostats
- In-home display units

Home & Building Automation
- Security
- HVAC control
- Lighting control
- Thermostats

Industrial Controls
- Food processing controls
- Traffic Management
- Sensor Networks
- Asset Management
- Barcode reader
- Patient Monitoring
- Glucose monitor

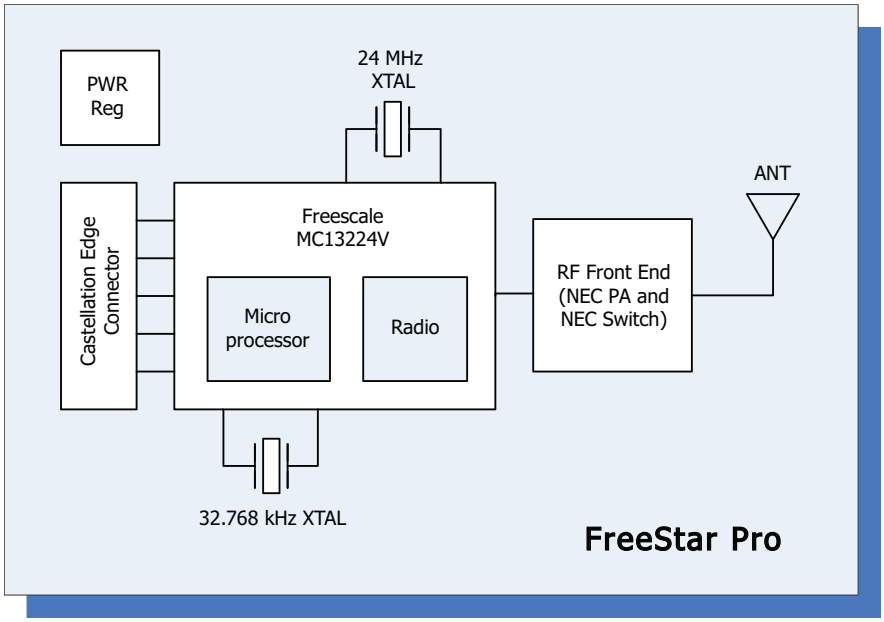
FEATURES

- Powerful 32-bit ARM7TDMI based microprocessor
- Extensive on-board memory resources
- Up to 100 mW output power
- Miniature footprint: 1" x 1.4" (25.4 mm x 36.5 mm)
- Integrated PCB trace antenna
- 16 RF channels
- Over 4000 feet of range
- AES 128-bit encryption
- Low power consumption
- FCC, CE and IC certifications pending
- RoHS compliant

ORDERING INFORMATION

Part Number	Order Number	Supplying Form
ZFSM-201 Series FREESTAR PRO	**ZFSM-201-1**	100 mW Output power, PCB Trace Antenna
	ZFSM-201-1C	100 mW Output power, MMCX connector for external antenna
	ZFSM-201-KIT-1	Engineering Evaluation Kit

FREESTAR PRO MODULE BLOCK DIAGRAM



EVALUATION KIT

The FreeStar Pro Kits assists users in both evaluation and development. As a stand alone radio system, the kit allows users to place the modules into the target environment and evaluate performance. The FreeStar Pro kit also serves as an invaluable aid in application development. Through the many headers on the interface board, the user has access to all pins on the ZFSM-201-1 enabling easy connection to the target system for application development.

The FreeStar Pro module contains the Freescale™ MC13224V transceiver IC, an NEC high gain Power Amplifier, XTALs, Power Regulator, and an integrated PCB antenna.

The interface board features a serial communication interface, a power management module, peripherals such as potentiometer LEDs, and GPIO headers. The Evaluation Kit also contains four AA batteries and two USB cables.

For more detailed information regarding FreeStar Pro Evaluation Kit, refer to the FreeStar Pro Evaluation Kit User Guide document. (Available at CEL's website http://www.cel.com)

Kit Contents:

- **Three Evaluation Boards with ZFSM-201-1 Modules**
- **Two USB A/B Cables**
- **Ten Jumpers (Spares)**
- **Four AA Batteries**
- **Software & Technical Information CD**

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MICROPROCESSOR

The primary component of the FreeStar Pro module is Freescale's third generation ZigBee platform. It incorporates a complete, low power, 2.4 GHz radio frequency transceiver, 32-bit ARM7TDMI-based microprocessor, hardware acceleration for both IEEE 802.15.4 MAC and AES security plus a full suite of processor peripherals.

The MC13224V architecture offers superior processing power for ZigBee applications. The core operates up to 26 MHz. An 80 kByte ROM is utilized for the low level IEEE 802.15.4 MAC and PHYsical layer commands. This off loads the Flash memory, leaving more space for the end user application. The MC13224V supports 128 kBytes of Flash memory. The program code is mirrored in 96 kBytes of RAM for faster execution by the processor core. A full set of peripherals and Direct Memory Access (DMA) capability for transceiver packet data are also included.

In addition, the MC13224V provides extensive power savings options. options, including low current sleep modes allowing for maximum operating life when battery-powered.

ANTENNA

FreeStar Pro modules include an integrated PCB trace antenna. An optional MMCX connector can be specified, enabling connection to a 50-ohm external antenna of the user's choice. See Ordering Information on page 1.

The PCB antenna employs an F-Antenna topology that is compact and supports an omni-directional radiation pattern. To maximize antenna efficiency, an adequate ground plane must be provided on the host PCB. Correctly positioned, the ground plane on the host board under the module will contribute significantly to antenna performance.

The position of the module on the host board and overall design of the product enclosure contribute to antenna performance. Poor design affects radiation patterns and can result in reflection, diffraction, and/or scattering of the transmitted signal.

Here are some design guidelines to help ensure antenna performance:

- Never place the ground plane or route copper traces directly underneath the antenna portion of the module.
- Never place the antenna close to metallic objects.
- In the overall design, ensure that wiring and other components are not placed near the antenna.
- Do not place the antenna in a metallic or metallized plastic enclosure.
- Keep plastic enclosures 1cm or more from the antenna in any direction.

MODES OF OPERATION

FreeStar Pro power management is controlled through the Freescale MC13224V's Clock and Reset Module (CRM). The CRM is a dedicated module to handle clock, reset, and power management functions including control of the power regulators. All these functions have direct impact on attaining the lowest power.

The FreeStar Pro module supports three modes of operation: Active, Doze and Hibernation. The latter two modes are the low-power sleep modes.

Active Mode

In this mode all functions / features are operating normally.

Doze Mode

Doze mode provides significant reduction in power consumption while still maintaining a high degree of sleep timing accuracy. In Doze mode, the reference oscillator of the processor continues to operate normally.

Hibernation Mode

Hibernation mode provides the greatest reduction in power consumption however the sleep timing accuracy is not as precise as in Doze mode.

The CRM manages the recovery from the low-power modes, similar to power-up from reset, providing regulator and clock management.

The module can be awoken from the low-power modes in 3 ways, wake-up can occur:

- On external interrupts through any of the 4 Keyboard Interface inputs
- From internal interrupts
- On the Real Time (wake-up) timer interrupt

For more detail information on modes of operation refer to Freescale's MC13224V datasheet available at Freescale's website (**www.freescale.com**)

POWER AMPLIFIER

The FreeStar Pro module incorporates a high performance Power Amplifier from NEC Electronics.

Power Amplifier Control Line

FreeStar Pro modules include a separate 1.8V regulator supplying a bias that enables consistent module output performance over the wide operating range. To prevent excessive sleep current draw, this regulator should be disabled when the module is placed into sleep mode.The voltage regulator is controlled by GPIO42 (ANT1), setting GPIO42 high enables the regulator while setting GPIO42 low disables the regulator. See the table below for the Turn on Time requirements for the voltage regulator.

SPECIFICATIONS — GPIO42

Parameter	Min	Typ	Max	Unit
Regulator enable voltage		0.95		V
Regulator disable voltage		0.40		V
Turn on Time for V_{OUT}=1.8V (Default)		105	200	μsec

For the TX_ON and RX_ON pins, the function table is as follows:

Parameter	TX Mode	RX Mode
TX_ON	High	Low
RX_ON	Low	High

Other Notes:

- The GPIO43 (ANT2) pin is not used and is left unconnected.
- Due to the long turn on time (105μs) of the regulator, the regulator is enabled or ON all the time with the execption of sleep mode.
- The RF switch uses both the TX_ON and RX_ON outputs as control inputs.
- The PA uses the TX_ON line as the control input.

RF Output Power Setting

In order to comply with emissions requirements, the Freestar PRO module must operate at reduced power settings on channels 11,12, and 26. The firmware provided with the modules limits users to Test Tool power step 4 maximum on channels 11 & 12 and power step 1 on channel 26. The resulting maximum RF output power using these power setting is 10dBm on channels 11 & 12, and -1dBm on channel 26.

In addition to restricting power, the firmware also limits the maximum data payload to 106 bytes for any transmitted packet.

INTERFACE

The FreeStar Pro module has all major pins routed to the castellation connectors, this includes, but is not limited, to the pins for JTAG, serial communication, A/D, etc.

HOST PROTOCOL INTERFACE COMMANDS

CEL provides the Host Serial and RF Protocols document which details the protocols and commands between the Host processor (i.e. an external microprocessor, a PC, etc.) and the FreeStar Pro module. An example of the commands, but not limited to, included in the host protocol interface are as follows:

- Query Version (MAC version, SMAC version, etc)
- Set RF Channel
- Set RF Power
- Transmit Packet Error Test

For more detail refer to Host Serial and RF Protocols document listed on our website at http://www.cel.com (FreeStar Pro Host & RF Protocol)

ABSOLUTE MAXIMUM RATINGS

Description	Min	Max	Unit
Power Supply Voltage	-0.3	3.6	VDC
Voltage on Any Digital Pin	-0.3	VCC + 0.2	VDC
RF Input Power		10	dBm
Storage Temperature Range	-45	125	°C
Reflow Soldering Temperature		260	°C

Note: Exceeding the maximum ratings may cause permanent damage to the module.

RECOMMENDED OPERATING CONDITIONS

Description	Min	Typ	Max	Unit
Power Supply Voltage (VCC)	2.1		3.6	VDC
Ambient Temperature Range	-40	25	85	°C
Crystal Reference Oscillator		24		MHz

DC CHARACTERISTICS *(@ 25°C, VCC = 3.3V unless otherwise noted)*

Description	Typ	Max	Unit
Transmit Mode Current (at +20 dBm Output Power)	193		mA
Receive Mode Current	30		mA
Hibernate or Doze Mode Current	5		µA

RF CHARACTERISTICS *(@ 25°C, VCC = 3.3V unless otherwise noted)*

Parameter	Min	Typ	Max	Unit
General Charcteristics				
RF Frequency Range	2400		2483.5	MHz
RF Data Rate		250		kbps
Transmitter				
Nominal Output Power		20		dBm
Programmable Output Power Range		18		dB
Error Vector Magnitude		8	35	%
Receiver				
Receiver Sensitivity (1% PER)	-92	-94		dBm
Saturation (Maximum Input Level) (1% PER)	0			dBm
802.15.4 Adjacent Channel Rejection (±5 MHz)	35	40		dB
802.15.4 Alternate Channel Rejection *(±10 MHz)*		50		dB

PIN SIGNALS I/O PORT CONFIGURATION

The FreeStar Pro module has 60 edge I/O interfaces for connection to the user's host board. Figure 1 shows the layout of the 60 edge castellations.

FREESTAR PRO I/O PIN ASSIGNMENTS

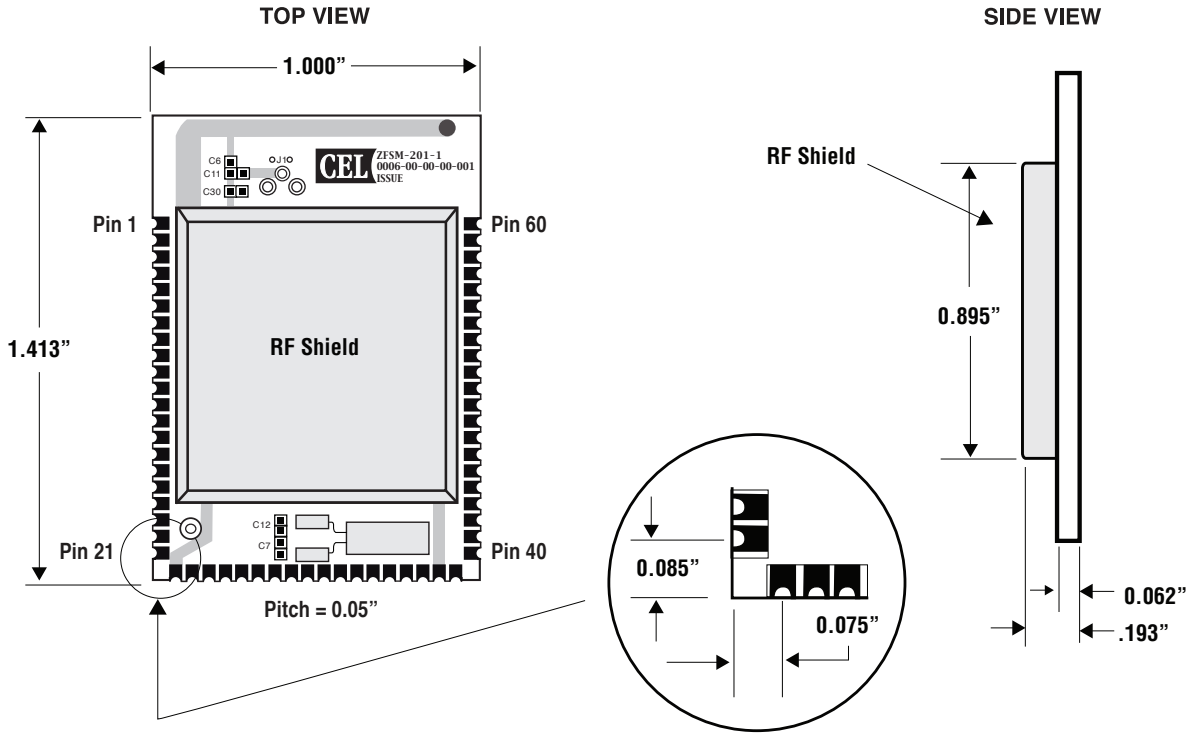
Pin #	Name	Type	Description	IC Pin #
1	GND	GND	GND	85
2	GND	GND	GND	84
3	GND	GND	GND	75
4	ADC2_VREFL	Analog Input or Digital I/O	GPIO39 Alternate function: Low reference voltage for ADC2	61
5	ADC1_VREFL	Analog Input or Digital I/O	GPIO41 Alternate function: Low reference voltage for ADC1	62
6	ADC1_VREFH	Analog Input or Digital I/O	GPIO40 Alternate function: High reference voltage for ADC1	63
7	ADC2_VREFH	Analog Input or Digital I/O	GPIO38 Alternate function: Low reference voltage for ADC2	64
8	ADC0	Analog Input or Digital I/O	GPIO30 Alternate function: ADC analog input Channel 0	1
9	ADC1	Analog Input or Digital I/O	GPIO31 Alternate function: ADC analog input Channel 1	2
10	ADC2	Analog Input or Digital I/O	GPIO32 Alternate function: ADC analog input Channel 2	3
11	ADC3	Analog Input or Digital I/O	GPIO33 Alternate function: ADC analog input Channel 3	4
12	VCC	Power Input	High side supply voltage to buck regulator switching MOSFET & IO buffers	45
13	ADC4	Analog Input or Digital I/O	GPIO34 Alternate function: ADC analog input Channel 4	5
14	ADC5	Analog Input or Digital I/O	GPI035 Alternate function: ADC analog input Channel 5	6
15	ADC6	Analog Input or Digital I/O	GPIO036 Alternate function: ADC analog input Channel 6	7
16	ADC7_RTCK	Analog Input or Digital I/O	GPI037 Alternate function: ADC analog input Channel 7 / Return ClocK	8
17	TDO	Digital I/O	GPI049 Alternate function: JTAG Test Data Output	9
18	TDI	Digital I/O	GPI048 Alternate function: JTAG Test Data Input	10
19	TCK	Digital I/O	GPIO47 Alternate function: JTAG Test Clock Input	11
20	TMS	Digital I/O	GPIO46 Alternate function: JTAG Test Mode Select Input	12
21	UART2_RTS	Digital I/O	GPIO21 Alternate function: UART2 Request to Send input	13
22	GND	GND	GND	76
23	UART2_CTS	Digital I/O	GPI020 Alternate function: UART2 Clear to Send output	14
24	UART2_RX	Digital I/O	GPIO19 Alternate function: UART2 RX data input	15
25	UART2_TX	Digital I/O	GPIO18 Alternate function: GPIO18UART2 TX data output	16
26	UART1_RTS	Digital I/O	GPI017 Alternate function: UART1 Request to Send input	17
27	UART1_CTS	Digital I/O	GIO016 Alternate function: UART1 Clear to Send output	18
28	I2C_SDA	Digital I/O	GPIO13 Alternate function: I2C Bus data	21
29	I2C_SCL	Digital I/O	GPIO12 Alternate function: I2C Bus clock	22
30	TMR3	Digital I/O	GPIO11 Alternate function: Timer 3 IO signal	23

FREESTAR PRO I/O PIN ASSIGNMENTS *(Continued)*

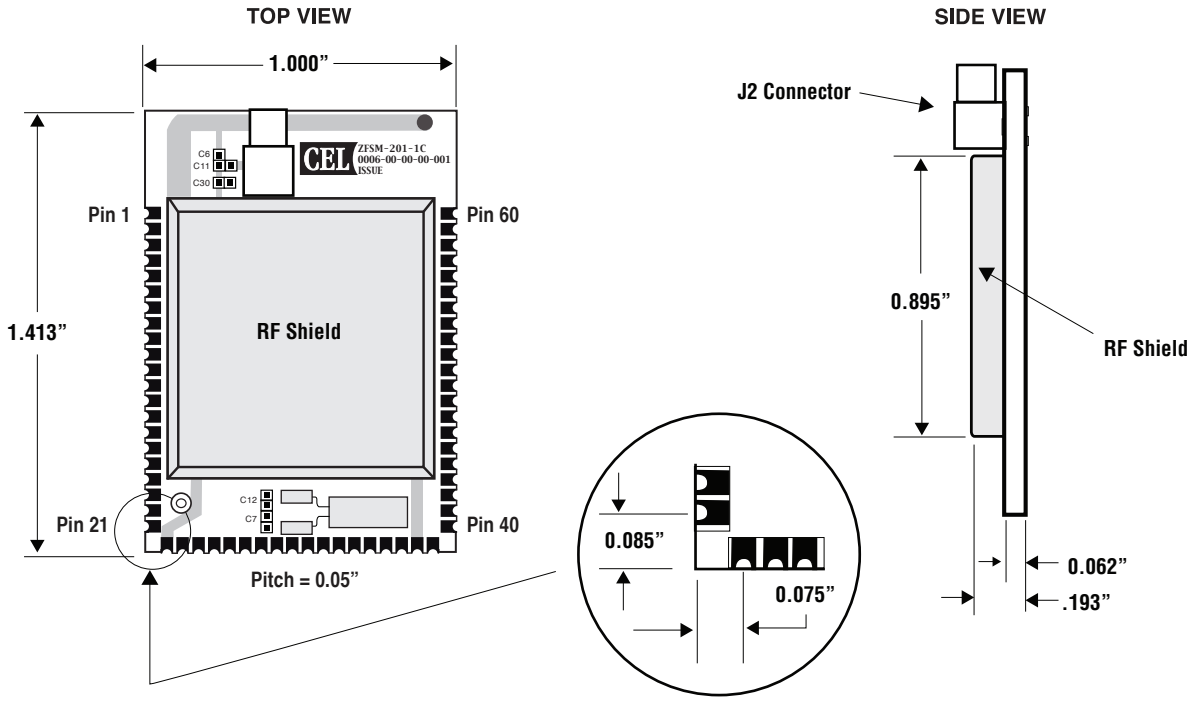
Pin #	Name	Type	Description	IC Pin #
31	VCC	Power Input	High side supply voltage to buck regulator switching MOSFET & IO buffers	45
32	TMR2	Digital I/O	GPIO10 Alternate function: Timer 2 IO signal	24
33	TMR1	Digital I/O	GPIO9 Alternate function: Timer 1 IO signal	25
34	TMR0	Digital I/O	GPIO8 Alternate function: Timer 0 IO signal	26
35	SPI_SCK	Digital I/O	GPIO7 Alternate function: SPI Port clock	27
36	UART1_TX	Digital I/O	GPIO14 Alternate function: UART1 TX data output	20
37	UART1_RX	Digital I/O	GPIO15 Alternate function: UART1 RX data input	19
38	GND	GND	GND	77
39	SPI_MOSI	Digital I/O	GPIO6 Alternate function: SPI Port MOSI	28
40	SPI_MISO	Digital I/O	GPIO5 Alternate function: SPI Port MISO	29
41	SPI_SS	Digital I/O	GPIO4 Alternate function: SPI Port SS	30
42	SSI_BITCK	Digital I/O	GPIO3 Alternate function: SSI Bit Clock	31
43	SSI_FSYN	Digital I/O	GPIO2 Alternate function: SSI Frame Sync	32
44	SSI_RX	Digital I/O	GPIO1 Alternate function: SSI RX data input	33
45	SSI_TX	Digital I/O	SSI TX data output / GPIO0	34
46	KBI_7	Digital I/O	GPIO29 Alternate function: Keyboard Interface Bit 7	35
47	COIL_BK	Power Switch Output	Buck Converter coil drive output	43
48	KBI_6	Digital I/O	GPIO28 Alternate function: Keyboard Interface Bit 6	36
49	RESETB	Digital Input	System reset input	51
50	LREG_BK_FB	Power Input	Voltage input to onboard regulators, buck regulator feedback voltage	44
51	GND	GND	GND	78
52	KBI_5	Digital I/O	GPIO27 Alternate function: Keyboard Interface Bit 5	37
53	KBI_4	Digital I/O	GPIO26 Alternate function: Keyboard Interface Bit 4	38
54	KBI_3	Digital I/O	GPIO25 Alternate function: Keyboard Interface Bit 3	39
55	KBI_2	Digital I/O	GPIO24 Alternate function: Keyboard Interface Bit 2	40
56	KBI_1	Digital I/O	GPIO23 Alternate function: Keyboard Interface Bit 1	41
57	KBI_0_HST_WK	Digital I/O	GPIO22 Alternate function: Keyboard Interface Bit 0 / Host Walk-up output	42
58	GND	GND	GND	79
59	GND	GND	GND	86
60	GND	GND	GND	87

MODULE DIMENSIONS *Dimensions in inches. Tolerances = +/-0.005" unless otherwise noted.*

FreeStar PRO ZFSM-201-1



FreeStar PRO ZFSM-201-1C



For layout recommendation for optimum antenna performance, refer to Antenna section in this document.

MODULE LAND FOOTPRINT

NOTE: *Dimensions in inches. Tolerances = +/-0.005" unless otherwise noted.*

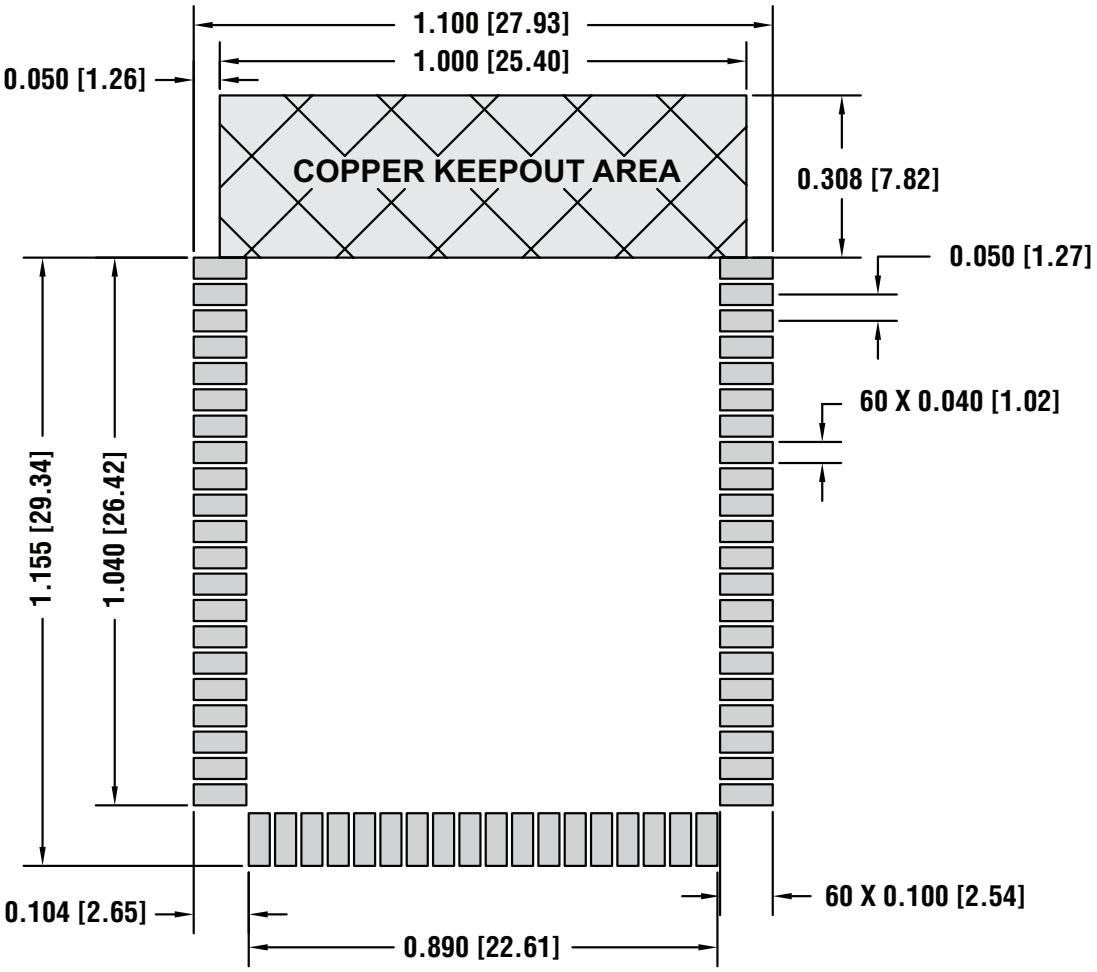


Figure 2

PROCESSING

Recommended Reflow Profile

Parameters Values

Ramp up rate (from Tsoakmax to Tpeak) 3º/sec max
Minimum Soak Temperature 150ºC
Maximum Soak Temperature 200ºC
Soak Time 60-120 sec
TLiquidus 217ºC
Time above TL 60-150 sec
Tpeak 260 + 0ºC
Time within 5º of Tpeak 20-30 sec
Time from 25º to Tpeak 8 min max
Ramp down rate 6ºC/sec max

Achieve the brightest possible solder fillets with a good shape and low contact angle.

Pb-Free Soldering Paste

Use of "No Clean" soldering paste is strongly recommended, as it does not require cleaning after the soldering process.

Note: The quality of solder joints on the castellations ('half vias') where they contact the host board should meet the appropriate IPC Specification. See **IPC-A-610-D** Acceptability of Electronic Assemblies, section 8.2.4 Castellated Terminations."

Cleaning

In general, cleaning the populated modules is strongly discouraged. Residuals under the module cannot be easily removed with any cleaning process.

- Cleaning with water can lead to capillary effects where water is absorbed into the gap between the host board and the module. The combination of soldering flux residuals and encapsulated water could lead to short circuits between neighboring pads. Water could also damage any stickers or labels.
- Cleaning with alcohol or a similar organic solvent will likely flood soldering flux residuals into the two housings, which is not accessible for post-washing inspection. The solvent could also damage any stickers or labels.
- Ultrasonic cleaning could damage the module permanently.

The best approach is to consider using a "no clean" soldering paste and eliminate the post-soldering cleaning step.

Optical Inspection

After soldering the Module to the host board, consider optical inspection to check the following:

- Proper alignment and centering of the module over the pads.
- Proper solder joints on all pads.
- Excessive solder or contacts to neighboring pads, or vias.

Repeating Reflow Soldering

Only a single reflow soldering process is encouraged for host boards.

PROCESSING *(Continued)*

Wave Soldering

If a wave soldering process is required on the host boards due to the presence of leaded components, only a single wave soldering process is encouraged.

Hand Soldering

Hand soldering is possible. Use a soldering iron temperature setting equivalent to 350°C, follow IPC recommendations/ reference document IPC-7711.

Rework

The FreeStar Pro Module can be unsoldered from the host board. Use of a hot air rework tool and hot plate for pre-heating from underneath is recommended. Avoid overheating.

!Warning Never attempt a rework on the module itself, e.g. replacing individual components. Such actions will terminate warranty coverage.

Additional Grounding

Attempts to improve module or system grounding by soldering braids, wires, or cables onto the module RF shield cover is done at the customers own risk. The numerous ground pins at the module perimeter should be sufficient for optimum immunity to external RF interference.

AGENCY CERTIFICATIONS

FCC Compliance Statement (Part 15.19) Section 7.15 of RSS-GEN

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by CEL could void the user's authority to operate the equipment.

20 cm Separation Distance

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM Responsibility to the FCC Rules and Regulations

The FreeStar Pro Module has been certified per FCC Part 15 rules for integration into products without further testing or certification. To fulfill the FCC certification requirements, the OEM using the FreeStar Pro Module must ensure that the information provided on the FreeStar Pro Label is placed on the outside of the final product. The FreeStar Pro Module is labeled with its own FCC ID Number. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: W7Z-FSTARPRO" or "Contains FCC ID: W7Z-FSTARPRO"

The OEM using the FreeStar Pro Module must only use the approved antenna, (PCB Trace Antenna) that has been certified with this module. The OEM using the FreeStar Pro Module must test their final product configuration to comply with Unintentional Radiator Limits before declaring FCC compliance per Part 15 of the FCC rules.

AGENCY CERTIFICATIONS *(Continued)*

IC Certification — Industry Canada Statement

The term "IC" before the certification / registration number only signifies that the Industry Canada technical specifications were met.

Section 14 of RSS-210

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population. Consult Safety Code 6, obtainable from Health Canada's website: http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/99ehd-dhm237/index-eng.php

CE Certification — Europe

The FreeStar Pro RF module has been tested and certified for use in the European Union.

OEM Responsibility to the European Union Compliance Rules

If the FreeStar Pro module is to be incorporated into a product, the OEM must verify compliance of the final product to the European Harmonized EMC and Low-Voltage / Safety Standards. A Declaration of Conformity must be issued for each of these standards and kept on file as described in Annex II of the R&TTE Directive.

The manufacturer must maintain the user's guide and adhere to the settings described in the manual for maintaining European Union Compliance. If any of the specifications are exceeded in the final product, the OEM is required to make a submission to the notified body for compliance testing.

OEM Labeling Requirements

The `CE' mark must be placed on the OEM product in a visible location.
The CE mark shall consist of the initials “CE” with the following form:

- If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be adhered to.
- The CE mark must be a minimum of 5mm in height
- The CE marking must be affixed visibly, legibly, and indelibly Since the 2400 - 2483.5 MHz band is not harmonized by a few countries throughout Europe, the Restriction sign must be placed to the right of the `CE' marking as shown in the picture

SHIPMENT, HANDLING, AND STORAGE

Shipment

The FreeStar Pro Modules are delivered in trays of TBD.

Handling

The FreeStar Pro Modules are designed and packaged to be processed in an automated assembly line.

!Warning The FreeStar Pro Modules contain a highly sensitive electronic circuitry. Handling without proper ESD protection may destroy or damage the module permanently.

!Warning According to JEDEC ISP, the FreeStar Pro Modules are moisture sensitive devices. Appropriate handling instructions and precautions are summarized in Section 2.1. Read carefully to prevent permanent damage due to moisture intake.

Moisture Sensitivity Level (MSL)

MSL 3, per J-STD-033

Storage

Storage/shelf life in sealed bags is 12 months at <40°C and <90% relative humidity.

REFERENCES & REVISION HISTORY

References

Reference Documents
FreeStar Pro Module Evaluation Kit User Guide
FreeScale MC13224V Datasheet
Freescale Semiconductor MC1322x Reference Manual MC1322xRM
Freescale Semiconductor BeeKit™ Quick Start Guide BKWCTKQUG
Freescale Semiconductor BeeKit™ User Guide BKWCTKUG
Freescale Semiconductor Software Driver Reference Manual 22XDRVRRM
Freescale Semiconductor MC1322x Simple Media Access Controller (SMAC) Reference Manual 22xSMACRM
Freescale Semiconductor Simple Media Access Controller (SMAC) User's Guide SMACRM
IAR J-Link and IAR J-Trace user Guide J-Link_J-TraceARM-1
ARM® IAR Embedded Workbench® IDE User Guide UARM-13

Revision History

Previous Versions	Changes to Current Version	Page
0006-00-07-00-000 (Preliminary) October 28, 2008	Initial advance datasheet.	N/A
0006-00-07-00-000 (Preliminary) May 20, 2009	Updated to current revisions to the Freescale Silicon IC	N/A
0006-00-07-00-000 (Preliminary) June 11, 2009	Updated FCC and IC Agency Statements	14-15

Disclaimer

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