



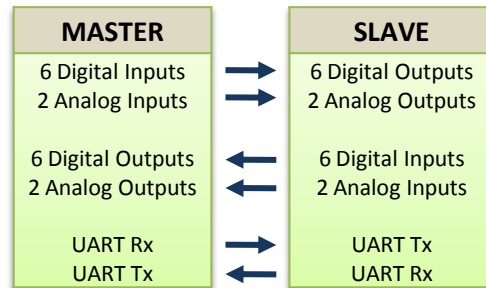
DataBridge™

Wireless I/O Transceiver Modules for Digital, Analog, and UART Data.

DataBridge is a wireless I/O transceiver module used for point-to-point bridging of analog, digital, and UART data. Two modules automatically link together and function as a wireless cable, bridging both sides through a low-latency, full-duplex wireless RF link.

Features:

- Easy Point-to-Point Wireless
- Analog, Digital, and Serial Bridge
- 6 Digital Inputs, 6 Digital Outputs
- 2 Analog Inputs, 2 Analog Outputs
- UART Data Transmit and Receive
- 200 Samples per Second
- Extremely Low Latency (5mS)
- Full-duplex Communication
- 2.4Ghz Frequency Hopping
- Reliable Data Delivery
- Up to 16 Device Pairs
- 1mW or 100mW
- Up to 4km Range
- Internal or External Antenna
- 2.7V – 3.6V Operation
- Small Form Factor
- Power Saving Sleep Mode
- RSSI and Link Indication
- Temperature and Voltage Monitor
- FCC, Canadian, and ETSI Certified



Signals are sampled and repeated at 200hz with a latency of only 5 milliseconds. DataBridge offers the lowest latency on the market, while maintaining low power and long range. Reliable data delivery is ensured by avoiding interference through frequency hopping, and data integrity is maintained using checksums and acknowledgments.

Using simple jumpers, each DataBridge device can be configured as a master or slave, and up to 16 device pairs can operate in the same area by setting a Network ID. UART baud rates are also configurable without software, and can display all I/O and status information for additional control.

No software configuration or programming is required.

Applications:

- Wireless Cable Replacement
- Remote Data Measurement
- Remote Analog or Digital Control
- Low Latency Wireless Control

Models

Model	Power	Range	Antenna	FCC ID	I/O
SE1200A	1mW	1km	Internal Ceramic	TYOJN5139M0	Each Module: 6 Digital Inputs 6 Digital Outputs 2 Analog Inputs 2 Analog Outputs 1 UART Tx 1 UART Rx
SE1200B	1mW	1km	SMA Connector	N/A	
SE1200C	1mW	1km	UFL Connector	TYOJN5139M3	
SE1200D	100mW	4km	SMA Connector	N/A	
SE1200E	100mW	4km	UFL Connector	TYOJN5139M4	

*Devices can be mixed and matched.

RF Specifications

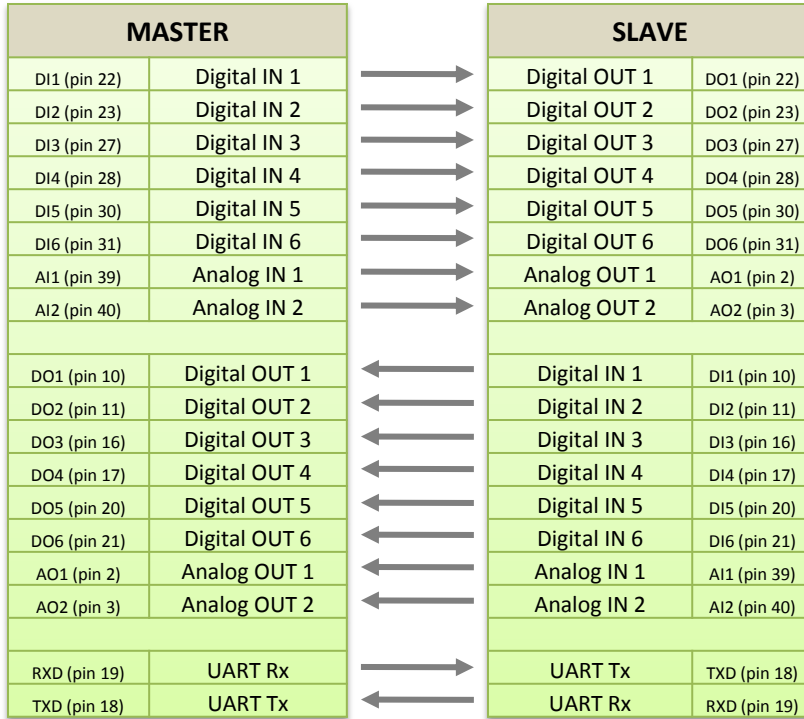
RF Characteristics		
	SE1200 (A, B, C)	SE1200 (D, E)
Receiver Sensitivity	-96 dBm	-102 dBm
Transmit Power	2.5dBm (1mW)	19dBm (100mW)
Range (Line of Sight)	1km (0.625mi)	4km (2.5mi)
RF Data Rate	40kbps	
Latency	5mS	
Frequency	2.400Ghz – 2.485Ghz	
Hopping Channels	16	
Dwell Time	5mS	
Modulation	QPSK/DSSS	
RF Port Impedance (2.4 – 2.5Ghz)	50 ohm	
Max VSWR (2.4 – 2.5Ghz)	2:1	

*Latency and Data Rate are under good RF conditions.

Device Specifications

Device Characteristics			
		SE1200 (A, B, C)	SE1200 (D, E)
Operating Voltage (VDD)		2.7V – 3.6V	
Operating Current		37mA	82.5mA
Peak Current		37mA	120mA
Startup Time		80mS	
Number of Network Pairs		16	
I/O Sampling Rate		200hz	
Analog	ADC Resolution	12 bits	
	ADC Reference	2.4V	
	DAC Resolution	11 bits	
	DAC Reference	2.4V	
Digital	Logic Level High	VDD x 0.8	
	Logic Level Low	0.4V	
	Sink/Source Current	4mA	
	Pull-Ups	40kΩ nominal	
UART	Baud Rates (bps)	1200, 2400, 9600, 19200, 38400, 57600, 115200	
	Data Format	8 data bits, no parity, 1 stop bit, no flow control	

Inputs and Outputs



Power and Configuration

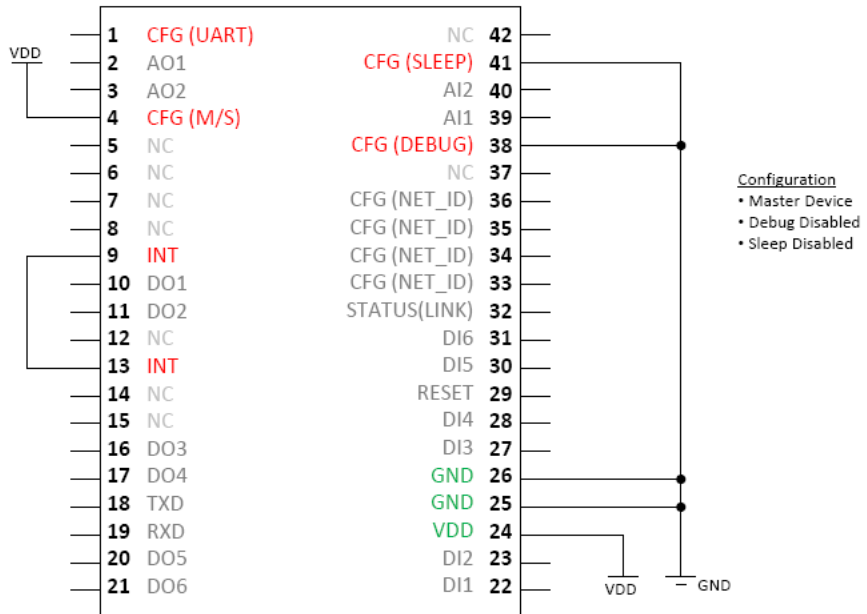
Device Power		
(pin 24)	VDD	Power (2.7 to 3.6V)
(pin 25)	GND	Ground
(pin 26)	GND	Ground

Device Configuration																		
(pin 4)	CFG (M/S)	Digital Input. Connect to Vdd to configure as Master, connect to GND to configure as Slave.																
(pin 33-36)	CFG (NET_ID)	Digital Inputs. These 4 bits represent a binary value with 16 combinations (0000 to 1111). Up to 16 device pairs can be used by configuring these optional inputs. Both Master and Slave devices must have the same configuration for them to communicate.																
(pin 38)	CFG (DEBUG)	Digital Input. Connect to Vdd to enable, GND to disable. If enabled, I/O information will be placed on the UART. See Page 7 for more information.																
(pin 41)	CFG (SLEEP)	<p>Digital Input. Connect to Vdd to enable, GND to disable.</p> <p>For master devices, the device will go to sleep when enabled, and wake when disabled.</p> <p>For slave devices, the device will sleep if no data is received for 1 second. It will check for data every 5 seconds. If data is received, the device will wake.</p> <p>Upon waking, the wireless pair may take up to 5 seconds to reconnect.</p>																
(pin 1)	CFG (UART)	<p>Analog Input. This input is used to configure the UART baud rate by reading an analog voltage. The following voltage ranges will determine the setting:</p> <table border="1"> <tbody> <tr> <td>1200 bps</td> <td>0.00V – 0.30V</td> </tr> <tr> <td>2400 bps</td> <td>0.31V – 0.60V</td> </tr> <tr> <td>4800 bps</td> <td>0.61V – 0.90V</td> </tr> <tr> <td>9600 bps</td> <td>0.91V – 1.20V</td> </tr> <tr> <td>19200 bps</td> <td>1.21V – 1.50V</td> </tr> <tr> <td>38400 bps</td> <td>1.51V – 1.80V</td> </tr> <tr> <td>57600 bps</td> <td>1.81V – 2.10V</td> </tr> <tr> <td>115200 bps</td> <td>2.11V – 3.60V</td> </tr> </tbody> </table>	1200 bps	0.00V – 0.30V	2400 bps	0.31V – 0.60V	4800 bps	0.61V – 0.90V	9600 bps	0.91V – 1.20V	19200 bps	1.21V – 1.50V	38400 bps	1.51V – 1.80V	57600 bps	1.81V – 2.10V	115200 bps	2.11V – 3.60V
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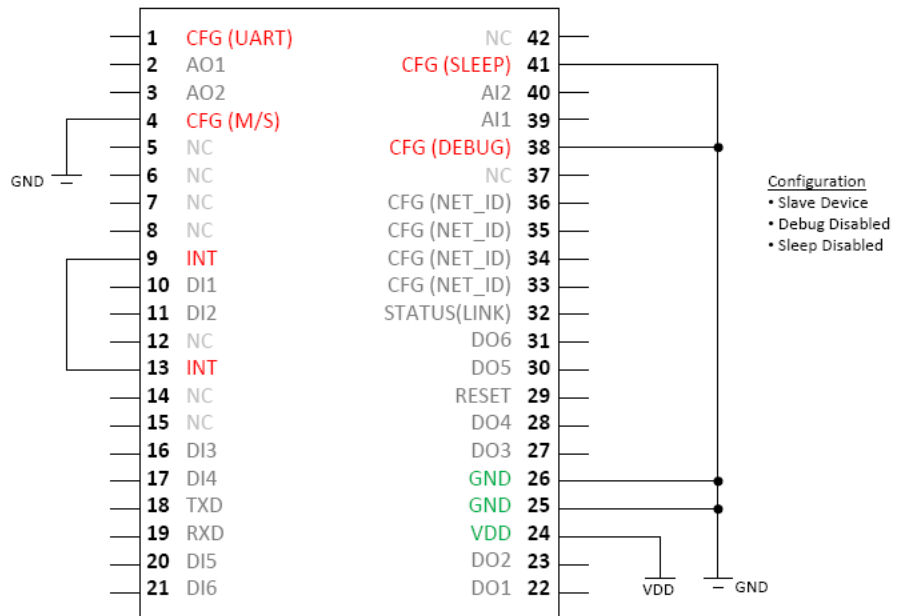
DataBridge™

Minimum Configuration

(Configured as Master)

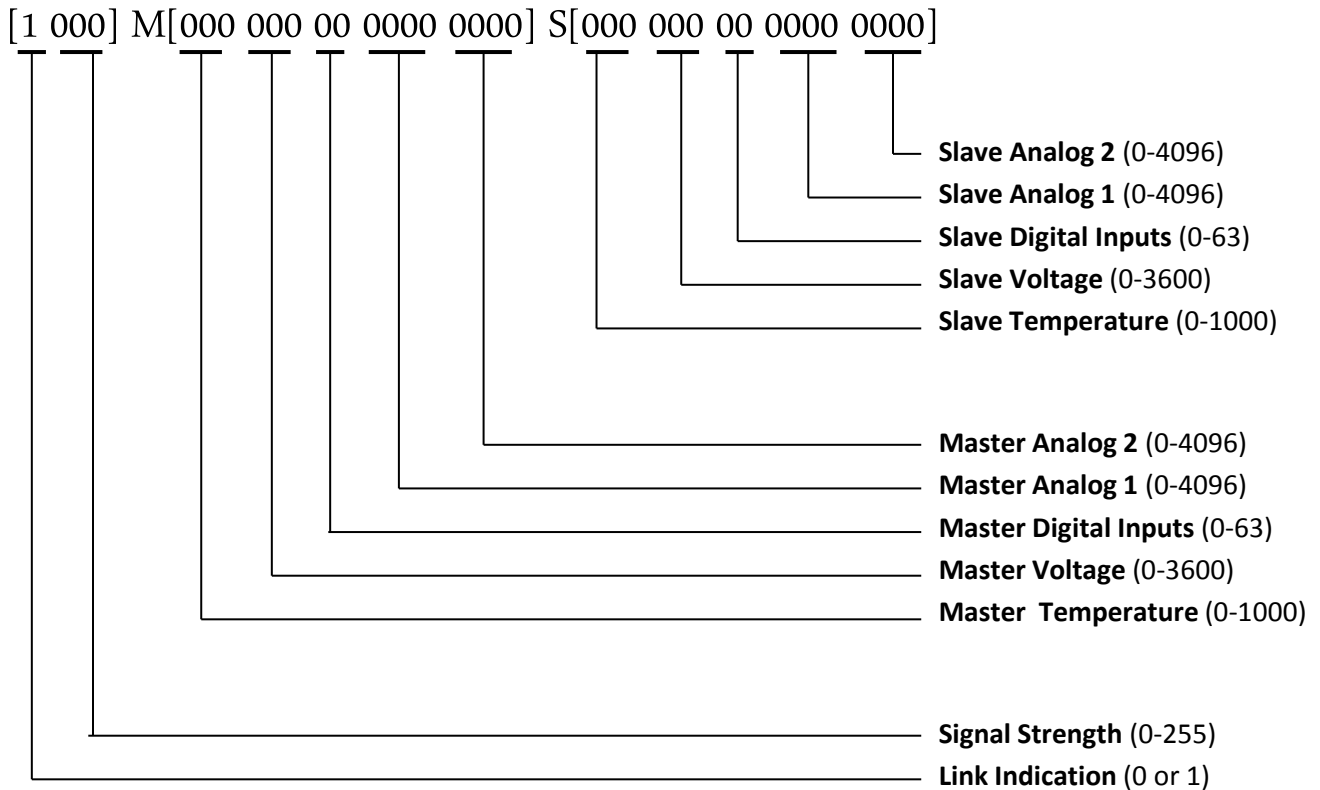


(Configured as Slave)



CFG (Debug) Setting

- If CFG(Debug) is enabled, both Master and Slave devices can output I/O and status information to the UART in the following format:

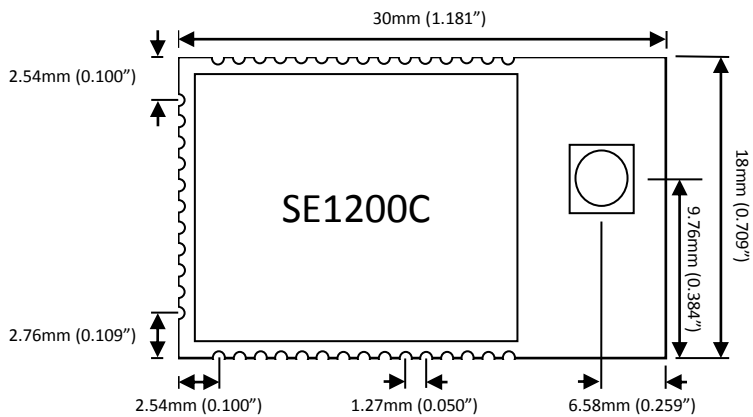
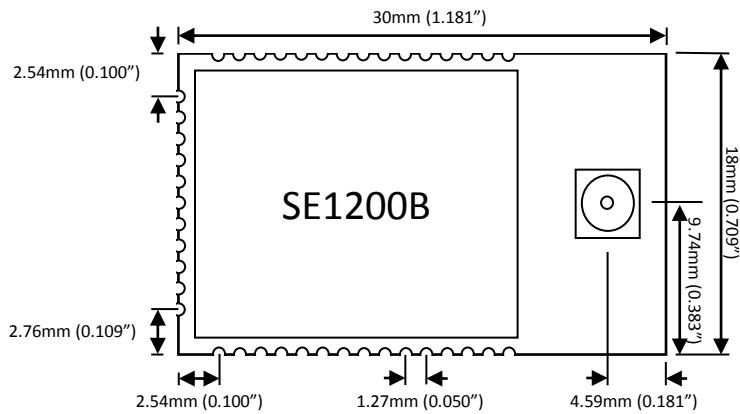
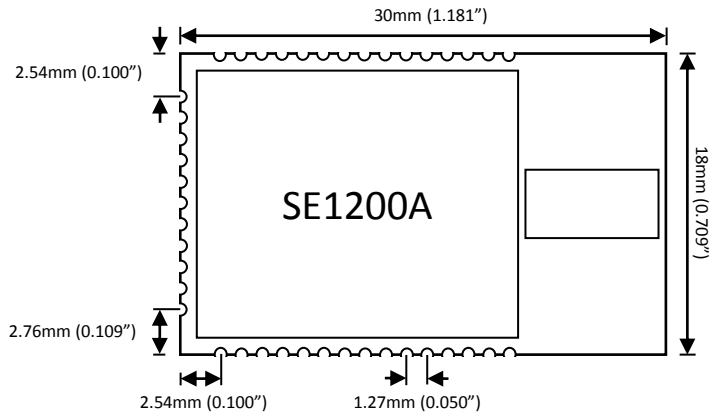


Pin Diagram (All DIP Packages)

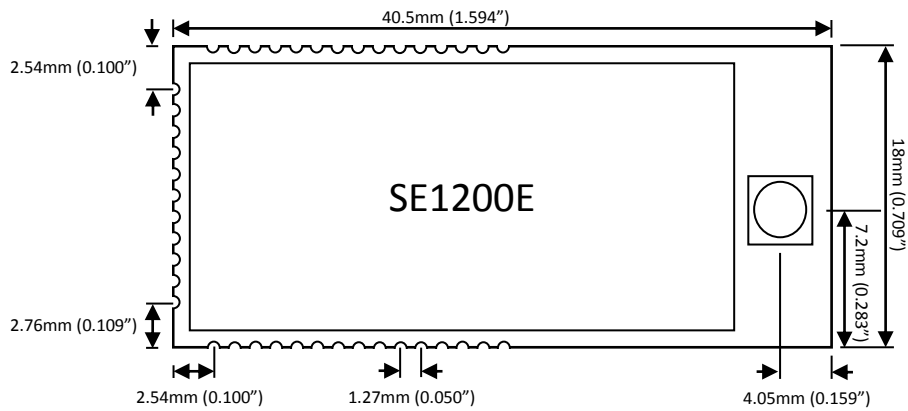
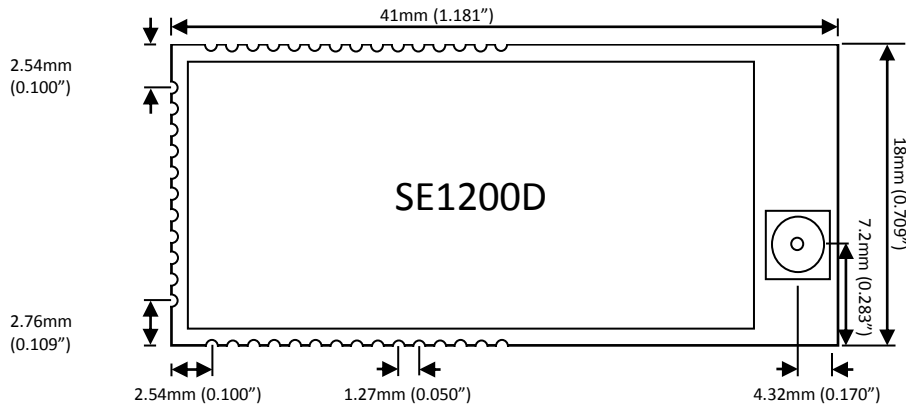
CFG (UART)	1		42	NC
AO1	2		41	CFG (SLEEP)
AO2	3		40	AI2
CFG (M/S)	4		39	AI1
NC	5		38	CFG (DEBUG)
NC	6		37	NC
NC	7		36	CFG (NET_ID)
NC	8		35	CFG (NET_ID)
INT	9		34	CFG (NET_ID)
DO1	10	MASTER	33	CFG (NET_ID)
DO2	11		32	STATUS(LINK)
NC	12		31	DI6
INT	13		30	DI5
NC	14		29	RESET
NC	15		28	DI4
DO3	16		27	DI3
DO4	17		26	GND
TXD	18		25	GND
RXD	19		24	VDD
DO5	20		23	DI2
DO6	21		22	DI1

CFG (UART)	1		42	NC
AO1	2		41	CFG (SLEEP)
AO2	3		40	AI2
CFG (M/S)	4		39	AI1
NC	5		38	CFG (DEBUG)
NC	6		37	NC
NC	7		36	CFG (NET_ID)
NC	8		35	CFG (NET_ID)
INT	9		34	CFG (NET_ID)
DI1	10	SLAVE	33	CFG (NET_ID)
DI2	11		32	STATUS (LINK)
NC	12		31	DO6
INT	13		30	DO5
NC	14		29	RESET
NC	15		28	DO4
DI3	16		27	DO3
DI4	17		26	GND
TXD	18		25	GND
RXD	19		24	VDD
DI5	20		23	DO2
DI6	21		22	DO1

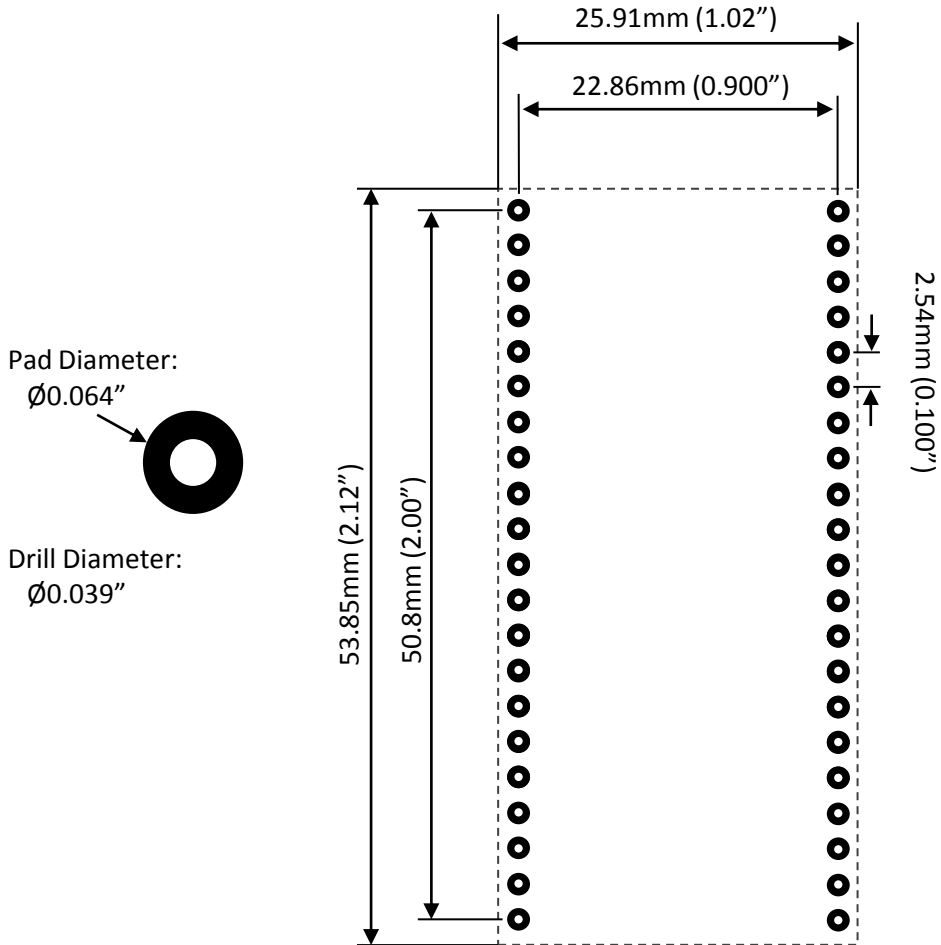
Mechanical A, B, C Models (SMD Packages)



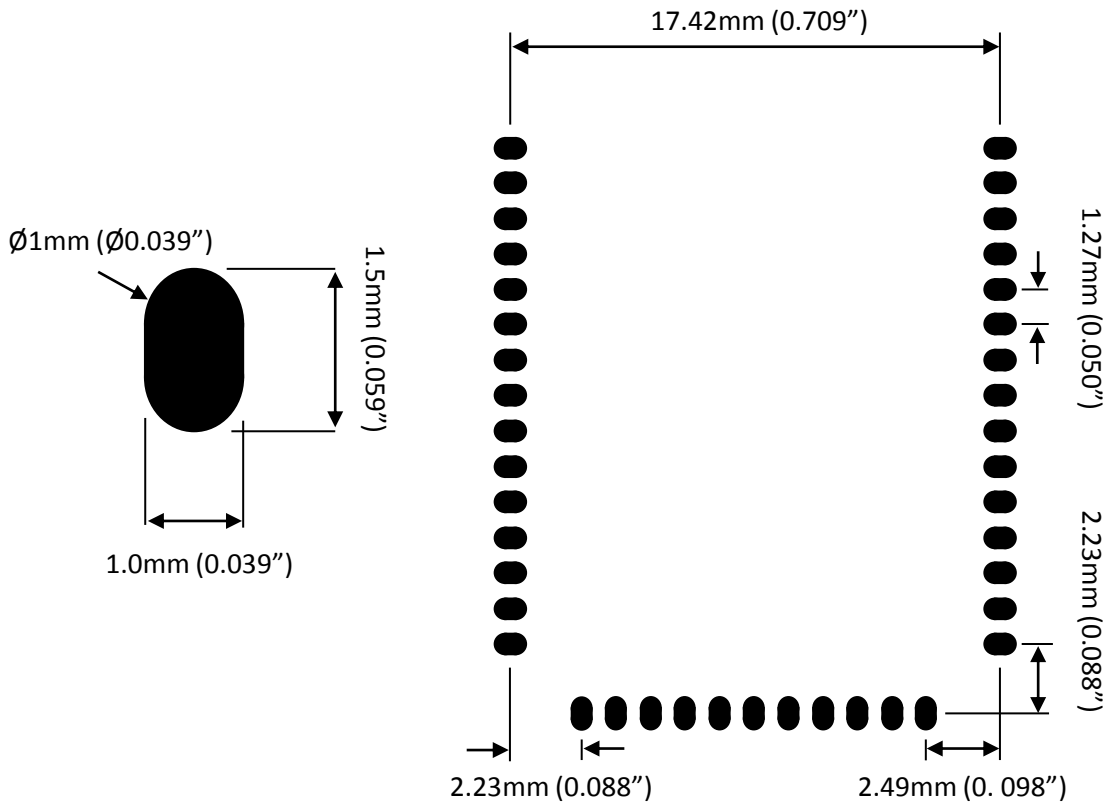
Mechanical D, E Models (SMD Packages)



PCB Footprint (All DIP Packages)



PCB Footprint (All SMD Packages)

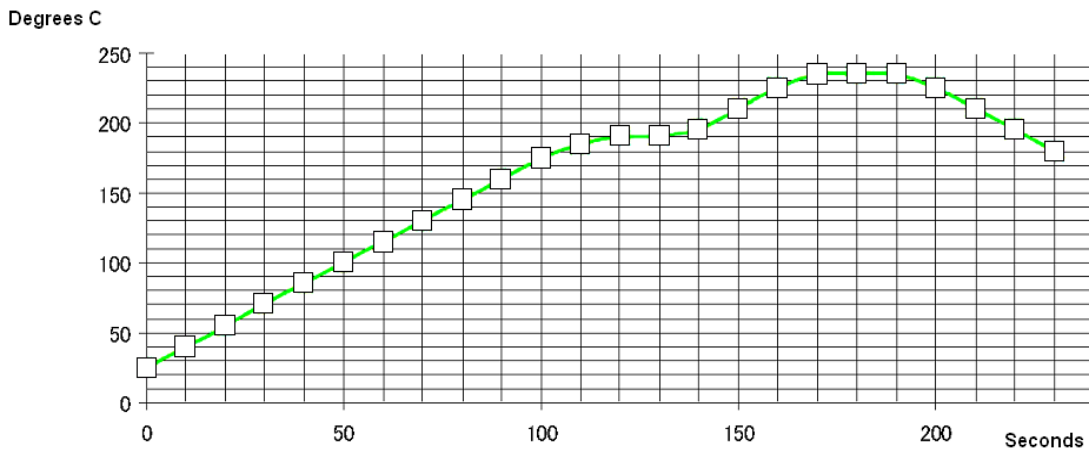


* Note for Model SE1200A-SMD modules: Do not place components, traces, or planes within 20mm ($0.787''$) of the three free sides of the internal ceramic antenna.

Maximum Ratings

Parameter	Minimum	Maximum
VDD	-0.3V	3.6V
Analog Inputs	-0.3V	VDD + 0.3V
Digital Inputs	-0.3V	VDD + 2.0V
Storage Temperature	-40°C	150°C
Ambient Operating Temperature	-20°C	70°C
Reflow soldering temperature according to IPC/JEDEC J-STD-020C		260°C

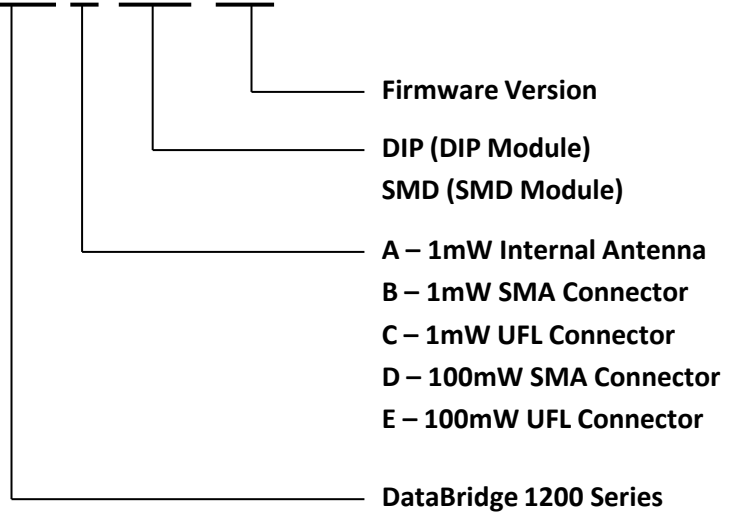
Reflow Profile



Temperature	25°C - 160°C	160°C - 190°C	>220°C	230°C Peak	Peak Temp (235°C)
Target Time (sec)	90-130	30-60	20-50	10-15	160-270

Ordering Information

Part Number: **SE1200X-XXX-X.X**



Datasheet Revisions

Revision	Date	Notes
1.0	10-Jan-2010	Initial Release

Federal Communication Commission Interference Statement

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 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 FCC Regulations. 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 Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

WARNING!

FCC Radiation Exposure Statement:

This portable equipment with its antenna complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment. To maintain compliance follow the instructions below;

1. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. Avoid direct contact to the antenna, or keep it to a minimum while using this equipment.

This transmitter module is authorized to be used in other devices only by OEM integrators under the following condition:

The transmitter module must not be co-located with any other antenna or transmitter.

Disclaimer

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Sales and Support Information

Starman Electric
Po Box 13511
San Luis Obispo, CA 93406
United States of America

Phone: (805) 699-5312

Website: <http://www.starmanelectric.com>

Support: support@starmanelectric.com

Sales: sales@starmanelectric.com