DIGI

900 MHZ RF MODULES FOR OEMS

DIGI XBEE® SX MODULES

900 MHz OEM RF modules pack maximum power, security and flexibility into the Digi XBee SMT footprint for mission-critical wireless designs

Digi XBee SX 900 MHz RF modules are the "muscle modules" of the Digi XBee ecosystem, providing a combination of reliability and redundancy for OEMs building low-power, mission-critical wireless devices. They utilize the DigiMesh® networking protocol, featuring redundant mesh network operation and support for low-power sleeping nodes. Customers that don't require mesh network architecture can configure the Digi XBee SX to operate in simple point to multipoint mode.

With RF line-of-sight ranges up to 65 miles* and strong interference blocking, these modules are ideal for applications requiring the combination of range, data redundancy and data reliability. The Digi XBee SX modules can be configured easily using Digi's free XCTU software or via Digi's simplified AT or API command sets. They are pre-certified for use in multiple countries and include integrated antennas, removing the burden of RF development/support costs and enabling fast time to market for OEM designs. The modules provide secure, reliable delivery of critical data between devices with 256-bit AES encryption, and the small Digi XBee surface-mount form factor saves valuable board space.

THE REAL PROPERTY OF

BENEFITS

- Family includes powerful 1-Watt 900 MHz Digi XBee-PRO SX and battery-optimized 20 mW Digi XBee SX modules for mission-critical OEM designs
- DigiMesh networking topology for redundancy and reliability
- 256-bit AES encryption for secure data communications
- Digi XBee SMT form factor saves valuable PCB space
- Fully certified for use in unlicensed 900 MHz band



RELATED PRODUCTS

Modules

Development Kits

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Digi Remote

APPLICATION EXAMPLE

SPECIFICATIONS

Digi XBee[®] SX Module

Digi XBee-PRO[®] SX Module

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GorTware SELECTWEE Up to allow Up to allow CHANNELS 50 hopping sequences share 50 frequencies 10 hopping sequences share 50 frequencies FE DATA RATE Eve dwart area: 10 kb/p; High data rate: 300 kb/p; High data rate: 300 kb/p; MAXIMADIA TAT THROUGHY High data rate: 100 kb/p; High data rate: 300 kb/p; Now and midde data rate: 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate: 300 kb/p; Now and midde data rate: 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate: 300 kb/p; Now and midde data rate: 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate: 300 kb/p; Now and midde data rate: 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate; 300 kb/p; Now and midde data rate; 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate; 300 kb/p; Now and midde data rate; 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate; 300 kb/p; Now and midde data rate; 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate; 300 kb/p; Now 300 kb/p; RECEIVER SERVETVE Eve dwart area: 100 kb/p; High data rate; 300 kb/p; Now 300 kb/p; RECEIVER SERVETVE Eve dwart are	FREQUENCY RANGE		ISM 902 to 928 MHz	ISM 902 to 928 MHz	
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NMLRE CYANNEL FREQUENCIES Low and middle data rate: 101** High data rate: 30 dBm RECEIVER SENSTIVITY Low data rate: 132 dBm, Middle data rate: 100 dBm, High data rate: 300 dBm RECEIVER IS SELESTIVITY Low data rate: 172 20 Hz dB dBm, Middle data rate: 140 dBm, High dBm,	RF DATA RATE		Low data rate: 10 kb/s; Middle data rate: 110 kb/s; High data rate: 250 kb/s		
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RECEIVENT FIGURATION High data rate, 4, 900 MH2 and data rate, 4, 000 MH2 and 200 MH2 re S00 MH2 re S0	RECEIVER SENSITIVITY		Low data rate: -113 dBm; Middle data rate: -106 dBm; High data rate: -103 dBm		
RURAL RANGE LURE OF SIGHT***Low data rate: Up to 14.5 km (9 m)****Low data rate: Up to 13.5 km (1.5 m)****URBAN RANGE LURE OF SIGHT***Low data rate: Up to 12.5 km (1.5 m)****Low data rate: Up to 3.5 km (1.5 m)****INDOR RANGE****Vex data rate: Up to 10 m (330 fedt)Low data rate: Up to 3.5 km (1.5 m)****RETWINKING AND SETTING TO 12.5 km (1.5 m)****Gausdan Frequency Shift KeyingMODULATIONSeries Ander Series Market Siles Preduced Series Market Series Market Siles Preduced Series Market Series Marke	RECEIVER IF SELECTIVITY		Middle data rate, +/- 250 kHz: 30 dB; Middle data rate, +/- 500 kHz: 40 dB		
NRANGE LINE UP SIGHT ***kow data rate: Up to 26 km (15 m)****kow data rate: Up to 30 m (1,000 fet)INDOOR RANGE****kow data rate: Up to 300 m (300 fet)kow data rate: Up to 300 m (1,000 fet)NRUMENTARYGaussian Frequency Shift KeyingGaussian Frequency Shift KeyingSPREADING TECHNOWFrequency Hopping Spread Spectrum (FHSS)Frequency Hopping Spread Spectrum (FHSS)SPREADING TECHNOWFrequency Hopping Spread Spectrum (FHSS)Frequency Hopping Spread Spectrum (FHSS)SUPCRTENPercho-percimater/slave relationship not required), point-to-put/hop-ing Spread Spectrum (FHSS)SUPCRTENOptional 256-bit AES CBC encryption. Encryption is enabled with: Kommand.GOVERNSa 221 x 12 or (1,13x 0,87 x 0,12 in)318 x 221 x 12 or (1,3x 0,87 x 0,12 in)SUPCRTENSa 20 compliantSa 20 compliantMOULT FERFACE CONCETORSa 20 compliantGoupliantMANUFACTURINGSa 20 compliantSo 3001.2000 registered standardsMANUFACTURINGSo 3001.2000 registered standardsSo 3001.2000 registered standardsMATENNA CONNECTOR UPT TOVice ABF PadCatable AMT PadSANTENNA CONNECTOR UPT SIGoubma unbalancedSo 3001.2000 registered standardsMATENNA PORTVice ABF PadGaussiant Catable AMT PadSANTENNA PORTSo 40 co 85°CGoubma unbalancedMATENNA PORTVice ABF PadGaussiant Catable AMT PadSMATENNA PORTVice ABF PadGaussiant Catable AMT PadSSUPPLY VOLTAGESo 40 so 30 compliant Sim Ad 0 domREGURENTVice ABF Sim Ad 10 dbm; AS m Ad 0 dbm; Gau Ca	RECEIVER RF SELECTI	VITY	Below 900 MHz and above 930 MHz; > 50 dB	Below 900 MHz and above 930 MHz; > 50 dB	
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ANTENNA CONNECTV U.F.or RF pad U.F.or RF pad ANTENNA IMPEDANCE 50 ohms unbalanced 50 ohms unbalanced MAXIMUNDUT RFVERETV 6dBm 6dBm OPERATING TEMPERTV 40° C to 85° C 40° C to 85° C OPERATING TEMPERTV 24 to 3.6 VDC, 3.3 Vt pical 2.6 to 3.6 VDC, 3.3 Vt pical SUPPLY VOLTAGE 2.4 to 3.6 VDC, 3.3 Vt pical 40 mA RECEIVE CURRENT VCC = 3.3 V 40 mA 40 mA SUPER VOLTAGE VCC = 3.3 V 5 mA@ 13 dBm; 45 mA@ 10 dBm; 35 mA@ 0 dBm 900 mA@ 30 dBm; 640 mA@ 27 dBm; 330 mA@ 20 dBm SLEEP CURRENT VCC = 3.3 V 5 suA@ 13 dBm; 45 mA@ 10 dBm; 35 mA@ 0 dBm 90 mA@ 30 dBm; 640 mA@ 27 dBm; 330 mA@ 20 dBm SLEEP CURRENT VCC = 3.3 V 5 suA@ 13 dBm; 45 mA@ 10 dBm; 35 mA@ 0 dBm 90 mA@ 30 dBm; 640 mA@ 27 dBm; 330 mA@ 20 dBm SLEEP CURRENT VCC = 3.3 V 5 suA@ 13 dBm; 45 mA@ 10 dBm; 35 mA@ 0 dBm 90 mA@ 30 dBm; 640 mA@ 27 dBm; 330 mA@ 20 dBm SLEEP CURRENT VCC = 3.3 V 5 suA@ 13 dBm; 45 mA@ 10 dBm; 35 mA@ 0 dBm 10 suA@ 10 suB SLEEP CURRENT VCC = 3.3 V 5 suA@ 13 dBm; 45 mA@ 10 dBm; 35 mA@ 0 dBm 10 suB SLEEP CURRENT VCC = 3.3 V 10 suB 10 suB SLEEP CURRENT VCC = 3.3 V 10 suB 10 suB SLEEP CURRENT VCC = 3.3 V 10	MANUFACTURING		ISO 9001:2000 registered standards	ISO 9001:2000 registered standards	
ANTENNA IMPEDANCE 50 ohms unbalanced 50 ohms unbalanced MAXIMUM INPUT RF LEL AT 6 dBm 6 dBm OPERATING TEMPERTE 6 dBm -40° C to 85° C OPERATING TEMPERTE 40° C to 85° C -40° C to 85° C SUPPLY VOLTAGE 2.4 to 3.6 VDC, 3.3 V typical 2.6 to 3.6 VDC, 3.3 V typical RECEIVE CURRENT VCC = 3.3 V 40 mA 40 mA TRANSMIT VCC = 3.3 V 5 sn A 0.1 dBm; 45 mA 0.1 dBm; 35 mA 0.0 dBm; 640 mA 0.27 dBm; 330 mA 0.2 dBm; 640 mA 0.2 mA 0.2 mBm; 640 mBm; 640 mA 0.2 mBm;	HOST INTERFACE CONNECTOR		37 castellated SMT pads	37 castellated SMT pads	
MAXIMUM INPUT RF LEVEL AT ANTENNA PORT6 dBm6 dBmOPERATING TEMPERET40° cto 85° C-40° cto 85° CPOWER REQUIREMENTS40° cto 85° C-40° cto 85° CSUPPLY VOLTAGE2.4 to 3.6 VDC, 3.3 V typical2.6 to 3.6 VDC, 3.3 V typicalRECEIVE CURRENTVCC = 3.3 V40 mA40 mAVCC = 3.3 V55 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm900 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBmSLEEP CURRENTVCC = 3.3 V5.5 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm5.5 mA @ 20 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBmSLEEP CURRENTVCC = 3.3 V5.5 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm5.5 mA @ 20 mA @ 20 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBmSLEEP CURRENTVCC = 3.3 V5.5 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm5.5 mA @ 20 mA @ 20 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBmSLEEP CURRENTVCC = 3.4 V5.5 mA @ 20	ANTENNA CONNECTOR OPTIONS		U.FL or RF pad	U.FL or RF pad	
ANTENNA PORT6 dBm6 dBmOPERATING TEMPER-URE-40° Cto 85° C-40° Cto 85° CPOWER REQUIREMENTS2.4 to 3.6 VDC, 3.3 V typical2.6 to 3.6 VDC, 3.3 V typicalSUPPLY VOLTAGEVCC = 3.3 V40 mA40 mARECEIVE CURRENTVCC = 3.3 V55 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm900 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBmSLEEP CURRENTVCC = 3.3 V55 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm2.5 uASLEEP CURRENTVCC = 3.3 V55 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm2.5 uASLEEP CURRENTVCC = 3.3 V15 ta A2.5 uASLEEP CURRENTVCC = 3.3 V15 ta A15 ta ASLEEP CURRENTVCC = 3.3 V15 ta A15 ta ASLEEP CURRENTVCC = 3.3 V15 ta A15 ta ASLEEP CURRENTVCC = 3.4 V15 ta A15 ta ASLEEP CURRENTVCC = 3.4 V15 ta A15 ta ASLEEP CURRENTVCC = 3.4 V15 ta A<	ANTENNA IMPEDANCE		50 ohms unbalanced	50 ohms unbalanced	
POWER REQUIREMENTS 2.4 to 3.6 VDC, 3.3 V typical 2.6 to 3.6 VDC, 3.3 V typical SUPPLY VOLTAGE VCC = 3.3 V 40 mA 40 mA RECEIVE CURRENT VCC = 3.3 V 5 5m A @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm 900 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBm SLEEP CURRENT VCC = 3.3 V 5 5m A @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm 2.5 uA SLEEP CURRENT VCC = 3.3 V 5 5m A @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm 2.5 uA SLEEP CURRENT VCC = 3.3 V 5 5m A @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm 2.5 uA SLEEP CURRENT VCC = 3.3 V 5 5m A @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm 2.5 uA SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA NUTED STATES VCC = 3.3 V 2.5 uA 2.5 uA UNITED STATES FCC ID: MCQ-XBSX FCC ID: MCQ-XBSX FCC ID: MCQ-XBSX CANADA IC: 1846A-XBSX IC: 1846A-XBSX IC: 1846A-XBSX AUSTRALIA RCM RCM ACM NEW ZEALAND RSM AUSTRALIA -			6 dBm	6 dBm	
SUPPLY VOLTAGE 2.4 to 3.6 VDC, 3.3 V tpical 2.6 to 3.6 VDC, 3.3 V tpical RECEIVE CURRENT VCC = 3.3 V 40 mA 40 mA TRANSMIT CURRENT VCC = 3.3 V 5 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm 90 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBm SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA 2.5 uA SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA 2.5 uA SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA 2.5 uA SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA 2.5 uA VILTED STATES VCC = 3.3 V 2.5 uA 2.5 uA 2.5 uA VILTED STATES FCI DI: MCQ-XBSX FCI DI: MCQ-XBSX FCI DI: MCQ-XBSX CANADA VILTEAS FCI DI: MCQ-XBSX FCI DI: MCQ-XBSX AUSTRALIA VILTEAS FCM FCM NEW ZEALAND KCM RCM FCM	OPERATING TEMPERATURE		-40° C to 85° C	-40° C to 85° C	
RECEIVE CURRENT VCC = 3.3 V 40 mA 40 mA TRANSMIT CURRENT VCC = 3.3 V 55 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm 900 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBm SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA ISLEEP CURRENT FCC ID: MCQ-XBSX 5.5 uA 5.5 uA INITED STATES FCC ID: MCQ-XBSX FCC ID: MCQ-XBSX FCC ID: MCQ-XBSX INITED STATES FCC ID: MCQ-XBSX FCC ID: MCQ-XBSX FCC ID: MCQ-XBSX AUSTRALIA IC: 1846A-XBSX IC: 1846A-XBPSX IC: 1846A-XBPSX NEW ZEALAND RSM AUSTRALIA -	POWER REQUIREMENTS				
TRANSMIT CURRENT VCC = 3.3 V 55 mA@13 dBm;45 mA@10 dBm;35 mA@0 dBm 900 mA@30 dBm;640 mA@27 dBm;330 mA@20 dBm SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA REGULATORY APPROVALS VCC = 3.3 V 2.5 uA 2.5 uA VITED STATES FCC ID: MCQ-XBSX FCC ID: MCQ-XBPSX CANADA FCC ID: MCQ-XBSX FCC ID: MCQ-XBPSX AUSTRALIA IC: 1846A-XBSX IC: 1846A-XBPSX NEW ZEALAND RSM AMS	SUPPLY VOLTAGE		2.4 to 3.6 VDC, 3.3 V typical	2.6 to 3.6 VDC, 3.3 V typical	
CURRENT VCC = 3.3 V SS mA @ 13 dBm; 4S mA @ 10 dBm; 3S mA @ 0 dBm 900 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBm SLEEP CURRENT VCC = 3.3 V 2.5 uA 2.5 uA 2.5 uA REGULATORY APPROVALS FCC ID: MCQ-XBSX FCC ID: MCQ-XBSX FCC ID: MCQ-XBPSX UNITED STATES FCC ID: MCQ-XBSX FCC ID: MCQ-XBPSX FCC ID: MCQ-XBPSX CANADA IC: 1846A-XBSX IC: 1846A-XBPSX IC: 1846A-XBPSX AUSTRALIA RCM RCM RCM PC	RECEIVE CURRENT	VCC = 3.3 V	40 mA	40 mA	
REGULATORY APPROVALS UNITED STATES FCC ID: MCQ-XBSX CANADA FCC ID: MCQ-XBSX AUSTRALIA RCM RSM FCM		VCC = 3.3 V	55 mA @ 13 dBm; 45 mA @ 10 dBm; 35 mA @ 0 dBm	900 mA @ 30 dBm; 640 mA @ 27 dBm; 330 mA @ 20 dBm	
UNITED STATES FCC ID: MCQ-XBSX FCC ID: MCQ-XBPSX CANADA IC: 1846A-XBSX IC: 1846A-XBPSX AUSTRALIA RCM RCM NEW ZEALAND RSM -	SLEEP CURRENT	VCC = 3.3 V	2.5 uA	2.5 uA	
CANADA IC: 1846A-XBSX IC: 1846A-XBPSX AUSTRALIA RCM RCM NEW ZEALAND RSM -	REGULATORY APPROVALS				
AUSTRALIA RCM RCM NEW ZEALAND RSM -	UNITED STATES		FCC ID: MCQ-XBSX	FCC ID: MCQ-XBPSX	
NEW ZEALAND RSM -	CANADA		IC: 1846A-XBSX	IC: 1846A-XBPSX	
	AUSTRALIA		RCM	RCM	
BRAZIL Anatel –	NEW ZEALAND		RSM	-	
	BRAZIL		Anatel	-	

*30 dBm typical at 3.3 V and above. Maximum power will decrease at lower voltages.

**The device hops on 50 channels selected, using the CM command, from 101 available frequencies.

 *** We estimate rural ranges based on a 14.5 km (9 mi) range test with dipole antennas.

****Range estimated assuming that the urban noise floor is approximately 15 dB higher than rural. The actual range depends on the setup and level of interference in your location.

******Range figure estimates are based on free-air terrain with limited sources of interference. Actual range will vary based on transmitting power, orientation of transmitter and receiver, height of transmitting antenna, height of receiving antenna, weather conditions, interference sources in the area, and terrain between receiver and transmitter, including indoor and outdoor structures such as walls, trees, buildings, hills, and mountains.



PART NUMBERS

ESCRIPTION

VITC				
KII3	KITS			
XK9X-DMS-0	Digi XBee SX RF Module Dev Kit, US/CA			
XK9X-DMS-1	Digi XBee SX RF Module Dev Kit, Brazil			
XK9X-DMS-2	Digi XBee SX RF Module Dev Kit, Australia			
Digi XBee-PRO SX Modules (1-Watt)				
XBP9X-DMRS-001	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, RF Pad, North America			
XBP9X-DMUS-001	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, U.FL, North America			
XBP9X-DMRS-021	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, RF Pad, Australia			
XBP9X-DMUS-021	Digi XBee-PRO SX, 1W, DigiMesh/Point to Multipoint, SMT, U.FL, Australia			
XBP9X-DMRS-011	Digi XBee-PRO SX, 1W, DigiMesh, SMT, RF Pad, Brazil			
XBP9X-DMUS-011	Digi XBee-PRO SX, 1W, DigiMesh, SMT, U.FL, Brazil			
Digi XBee SX Modules (20 mW)				
XB9X-DMRS-001	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, RF Pad, North America			
XB9X-DMUS-001	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, U.FL, North America			
XB9X-DMRS-021	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, RF Pad, Australia			
XB9X-DMUS-021	Digi XBee SX, 20 mW, DigiMesh/Point to Multipoint, SMT, U.FL, Australia			
XB9X-DMRS-031	Digi XBee SX, 20mW, DigiMesh, Point to Multipoint, SMT, RFPAD, New Zealand			
XB9X-DMUS-031	Digi XBee SX, 20mW, DigiMesh, Point to Multipoint, SMT, U.FL, New Zealand			
XB9X-DMRS-011	Digi XBee SX, 20 mW, DigiMesh, SMT, RF Pad, Brazil			
XB9X-DMUS-011	Digi XBee SX, 20 mW, DigiMesh, SMT, U.FL, Brazil			

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