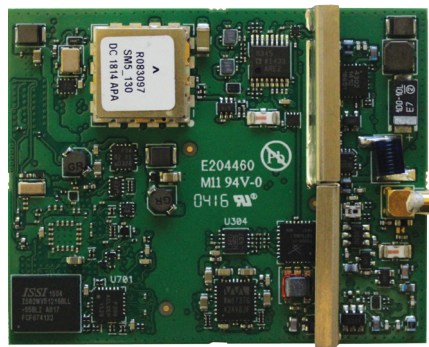




HPT401S



Actual size

DSP based OEM Radio Modem with Built-in wireless link Monitoring and Management Tools:

- Both Licensed and Unlicensed operation modes
- 8 miles Maximum Distance Range
- Data Speed over the air 38400 bps at 25 kHz and 19200 bps at 12.5 kHz
- Programmable Output Power (30 mW to 1 W)
- Advanced Forward Error Correction (FEC)
- UART serial interface with RTS/CTS flow control support
- Data Speed over the serial port 9600 to 115200 bps
- Testing, monitoring and control of the unit over the air
- AlphaWave SuperScan® - automatic search and select for best frequency/channel

The HPT401S radio transceiver provides a high-speed Point-to-Point and Point-to-Multipoint wireless data transfer at up to 38.4 kbps. HPT401S supports user selectable modulation techniques (GMSK, 4FSK, DBPSK, DQPSK, D8PSK, or D16QAM), which allows the user to achieve the highest data speed for a given range (up to 8 miles). It also includes a selectable error correction, which improves the functioning of the radio modem under interference.

The unmatched features of HPT401S include data scrambling, frequency hopping, user selectable transmit output power level, low power consumption sleep modes, autoscanning for base and plug-and-play installation for remote terminals.

HPT401S supports two separate Application Data and Maintenance modes of single UART serial port.

The built-in software tools provide the wireless link testing, units' status and error statistics monitoring as well as units' settings change over the air. The software of the HPT401S radio transceiver resides in a flash memory. The updating of the radio transceiver programs is entirely software-based. The flash memory is re-programmable through an UART interface or over the air.

HPT401S

Pinout HPT401S

Pin #	Signal name	I/O*	Description
1	EMU [^]	O	Do not connect
2	TMS	I	Do not connect
3	VDDIO	Power	Do not connect
4	TCK	I	Do not connect
5	TDI	I	Do not connect
6	TRST [^]	I	Do not connect
7	TDO	O	Do not connect
8	GND	-	Signal and Chassis Ground
9	PF12	I/O	General-Purpose I/O
10	SP0_RX_DPRI	I	SPI Master Receive line
11	PF13	I/O	General-Purpose I/O
12	SP0_TX_DPRI	O	SPI Master Transmit line
13	PF14	I/O	General-Purpose I/O
14	SP0_FS	O	SPI Chip Select
15	PF15	I/O	General-Purpose I/O
16	SP0_CLK	O	SPI Master Clock
17..18	Reserved	-	Do not connect
19	GND	-	Signal and Chassis Ground
20	12.288MHZ	O	TCXO Clock Output signal
21..22	Reserved	-	Do not connect
23	I2C_SCL_EXT	O	I2C Serial Clock. An internal 4.7K pull-up
24	I2C_SDA_EXT	I/O	I2C Serial Data. An internal 4.7K pull-up
25..26	Reserved	-	Do not connect
27	UART0_TX-OUT	O	Serial Data Output
28	UART0_RX-IN	I	Serial Data Input
29	UART0_RTS-OUT	O	Request to Send.
30	UART0_DSR-IN	I	Data Set Ready. Control line can be used as a backup method for entering Command mode: (0V) – Maintenance Mode; (3.0V) – Data Mode An internal 47K pull-up enables Data Mode if this signal is left unconnected. Maintenance Mode is also accessible by transmitting an escape sequence.
31	UART0_DTR-OUT	O	Data Terminal Ready
32	UART0_CTS-IN	I	Clear to Send. An internal 47K pull-down enables data receive if this signal is left unconnected.
33	UART0_DCD-OUT	O	Data Carrier Detect.
34	TTL I-2	I	Input line. An internal 47K pull-up resistor is applied. Reserved for future use
35	TTL O-1	O	Output Line 1. Reserved for future use
36	TTL O-2	O	Output Line 2. Reserved for future use
37	SLEEP-BOOT	I	consuming less than 0.2mA. An internal 15K pull-down wakes up the radio if this signal is left unconnected. At wake up, any user programmed configuration settings are refreshed from flash memory, clearing any temporary settings that may have been set: (3.0V) – Sleep Radio; (0V) – Wake Radio
38	RES_CONT	I	Reset the radio by shortening this pin to the ground.
39..54	GND	-	Signal and Chassis Ground
55..70	4V2	Power	Positive 3.6V...4.4V DC from ext. Power Supply.
71..74	GND	-	Signal and Chassis Ground

* I/O Voltage Level = 3V

General Specification

- Input Voltage: 4-4.4 VDC
- Current (max): 1.6 A
- Power Consumption (average):
 - 3 W – transmit with 50% duty cycle (1 W TPO)
 - 1 W – receive mode
- Operation Temperature: -40° C ... +60° C
- Storage Temperature: -40° C ... +80° C
- Dimensions: L: 56.5 mm x W: 45.5 mm x H: 7.4 mm
- Weight: 24.4 g

Features

- DSP-Modem
- Multi-Modulation Technologies
- Zero-IF Technologies
- Embedded Firmware Compensation for Operation and Extremely Low at High Temperatures
- Compact Design

External Connectors

- RF Connector (J500): MMCX RIGHT ANGLE PCB JACK.
Emerson Johnson p/n 135-3701-311 (285210)
- Main Connector (J101): 2x35, 0.4 mm, vertical, plug connector
Molex p/n 55909-0774 (285375)
- Mating part: 2x35, 0.4 mm, vertical, receptable connector
p/n 500913-0702 (285374)

Radio Transmitter Specifications

- Transmitter Output Power: +15... +30 dBm in 1 dB step / 50 Ω
- Carrier Power Stability: +1 dB / -2 dB

Radio Transceiver Specifications

- Frequency Range: 406 - 470 MHz
- Channel Spacing: 25/20/12.5/6.25 kHz
- Carrier Frequency Stability: ± 1 ppm
- Modulation: GMSK/4FSK/DBPSK/DQPSK/D8PSK/D16QAM
- Communication Mode: Half duplex, simplex

Radio Receiver Specifications

- Receiver Sensitivity for DBPSK (BER 1×10^{-4}):
 - 113 dBm for 25 kHz Channel Spacing
 - 113 dBm for 20 kHz Channel Spacing
 - 114 dBm for 12.5 kHz Channel Spacing
 - 114 dBm for 6.25 kHz Channel Spacing
- Receiver Sensitivity for DQPSK (BER 1×10^{-4}):
 - 110 dBm for 25 kHz Channel Spacing
 - 110 dBm for 20 kHz Channel Spacing
 - 111 dBm for 12.5 kHz Channel Spacing
 - 111 dBm for 6.25 kHz Channel Spacing
- Receiver Dynamic Range: -119 to -10 dBm

Modem Specification

- Interface DSP: UART (serial port)
- Data Speed of Serial Interface: 9600 - 115200 bps
- Data Rate of Radio Interface (25 kHz Channel Spacing):
 - 9600 bps – DBPSK/GMSK
 - 19200 bps – DQPSK
 - 28800 bps – D8PSK
 - 38400 bps – D16QAM
- Data Rate Radio Interface (20 kHz Channel Spacing):
 - 7500 bps – DBPSK/GMSK
 - 15000 bps – DQPSK
 - 22500 bps – D8PSK
 - 30000 bps – D16QAM
- Data Rate Radio Interface (12.5 kHz Channel Spacing):
 - 4800 bps – DBPSK/GMSK
 - 9600 bps – DQPSK
 - 14400 bps – D8PSK
 - 19200 bps – D16QAM
- Data Rate Radio Interface (6.25 kHz Channel Spacing):
 - 2400 bps – DBPSK
 - 4800 bps – DQPSK
 - 7200 bps – D8PSK
 - 9600 bps – D16QAM
- Forward Error Correction (FEC): Reed-Solomon Error Correction
- Data scrambling: Yes

