

May 2012

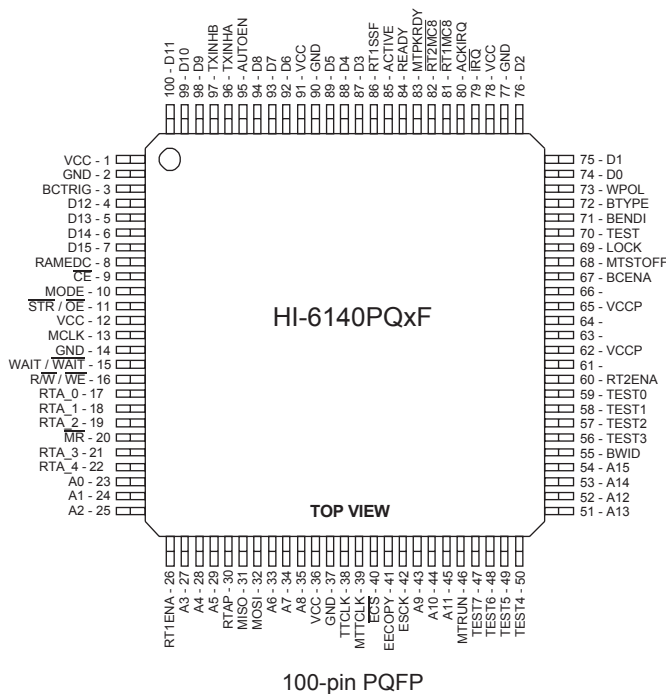
**GENERAL DESCRIPTION**

The HI-6140 is a 10 MBit/sec version of Holt's HI-6130 integrated BC/MT/RT solution. The part is designed for MIL-STD-1553 or MIL-STD-1760 applications using a 10Mbps bit rate, such as Miniature Munitions Stores Interface (MMSI) or EBR-1553.

The part is available in Industrial -40°C to +85°C, or Extended -55°C to +125°C temperature ranges. Optional burn-in is available on the extended temperature range.

Refer to the HI-6130 datasheet for full functional description and operation.

**PIN CONFIGURATION (TOP)**



**FEATURES**

- 10 Mbps bit rate complies with MMSI / EBR-1553 and SAE AS5652 10Mbps network protocol
- DO-254 certifiable
- Single terminal or concurrent multi-terminal operation (BC, MT, or RT)
- 16-bit parallel host bus interface
- 64K bytes on-chip RAM with error detection/correction option
- Autonomous terminal operation requires minimal host intervention
- Fully programmable Bus Controller uses 28 op code instruction set
- Simple Monitor Terminal (SMT) Mode records commands and data separately, with 16-bit or 48-bit time tagging
- IRIG Monitor Terminal (IMT) Mode supports IRIG-106 Chapter 10 packet format. Complete IRIG-106 data packets including full packet headers and trailers can optionally be generated
- Independent time-tag counters for all terminals with 32-bit option for Bus Controller and 48-bit option for Monitor Terminal
- 64-Word Interrupt Log Buffer queues the most recent 32 interrupts. Hardware-assisted interrupt decoding quickly identifies interrupt sources
- Built-in self-test for protocol logic, digital signal paths and internal RAM
- Optional self-initialization at reset uses external serial EEPROM
- Two temperature ranges: -40°C to +85°C, or -55°C to +125°C

**BLOCK DIAGRAM**

**HI-6140 10MBit / Sec 1553 Terminal (RS-485) with Host Parallel Bus Interface**

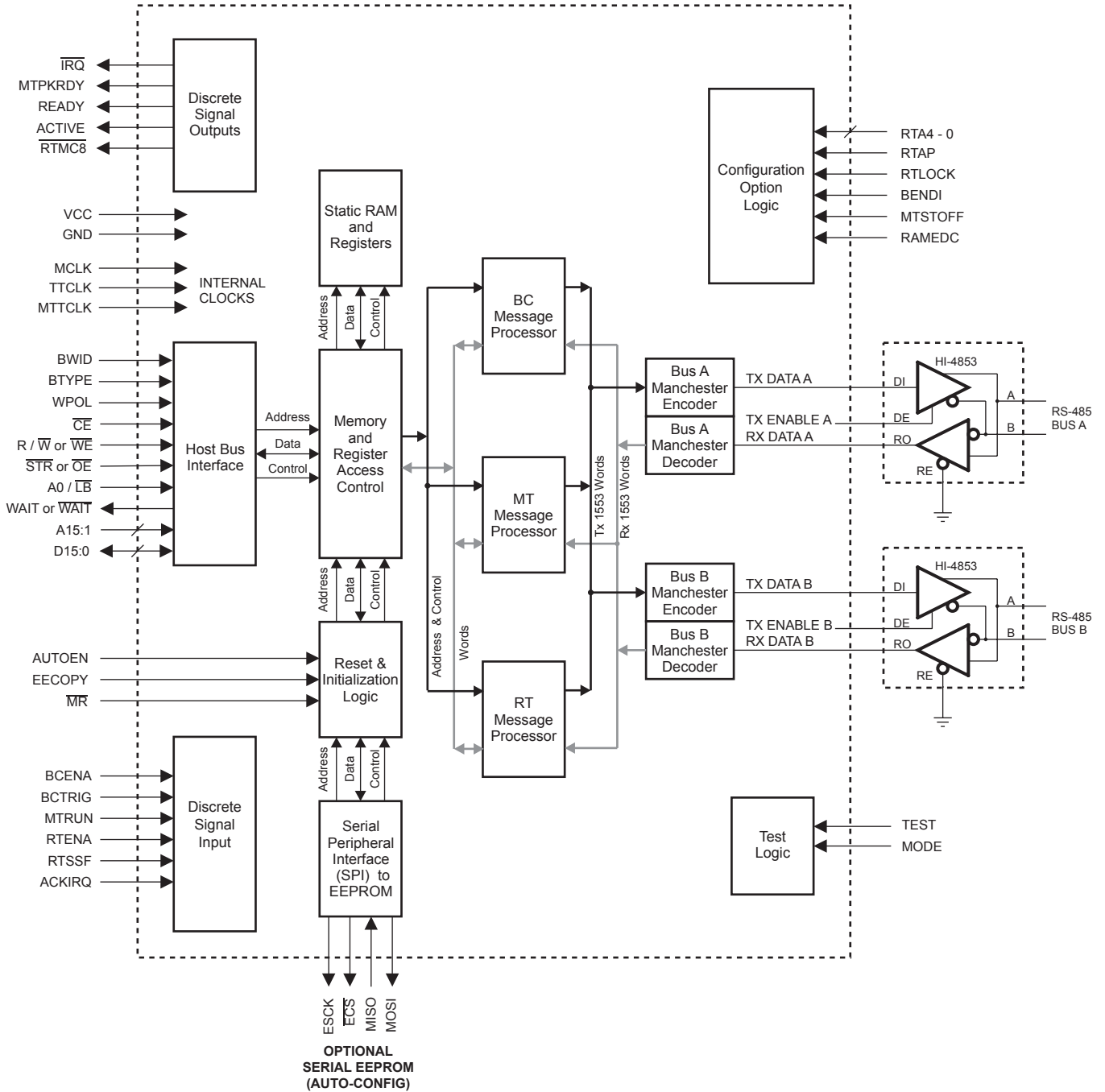


Figure 1. HI-6140 Block Diagram

## PIN DESCRIPTIONS

See HI-6130 datasheet for full Pin Descriptions.

Table 1. Pins that apply to HI-6140 only

Pin	Function	Description
TX DATA A	Output 50KΩ pull-up	MIL-STD-1553 Manchester II bi-phase data output, BUS A. Connect this pin to the Driver Input (DI) pin of external RS-485 transceiver (Holt 20Mbps transceiver, HI-4853).
RX DATA A	Input 50KΩ pull-up	MIL-STD-1553 Manchester decoder data input, BUS A. Connect this pin to the Receiver Output (RO) pin of external RS-485 transceiver (Holt 20Mbps transceiver, HI-4853).
TX DATA B	Output 50KΩ pull-up	MIL-STD-1553 Manchester II bi-phase data output, BUS B. Connect this pin to the Driver Input (DI) pin of external RS-485 transceiver (Holt 20Mbps transceiver, HI-4853).
RX DATA B	Input 50KΩ pull-up	MIL-STD-1553 Manchester decoder data input, BUS B. Connect this pin to the Receiver Output (RO) pin of external RS-485 transceiver (Holt 20Mbps transceiver, HI-4853).

**Note:** The HI-6140 may function as a single remote terminal (RT), whereas HI-613x devices can function as two independent RTs. The pin assignments for dual RT operation in HI-613x (e.g. RT1A4-0, RT2A4-0, RT1AP, RT2AP, etc.) are replaced with pin assignments for a single RT in HI-6140 (e.g. RTA4-0, RTAP, etc.). Descriptions and functionality remain the same.

## OPERATION

Refer to the HI-6130 datasheet for detailed operation and register description.

### Operational and Protocol Considerations for 10Mbps

The HI-6140 is designed for use in MIL-STD-1553B 10Mbps applications, such as Miniature Munitions Stores Interface (MMSI) or EBR-1553. The device produces dual redundant Manchester II bi-phase encoded data for transmission on dual RS-485 busses. External, half-duplex, 20Mbps slew rate controlled RS-485 transceivers (HI-4853) are recommended for connection to the RS-485 busses (see “Figure 1. HI-6140 Block Diagram” on page 2 and “Pin Descriptions” on page 3).

#### Timing differences compared to MIL-STD-1553B (measured mid-parity to mid-sync):

- Minimum intermessage Gap =  $1\mu\text{s}$  (vs  $4\mu\text{s}$  for MIL-STD-1553B)
- Minimum No Response Timeout =  $8\mu\text{s}$  (vs  $12\mu\text{s}$  for MIL-STD-1553B)
- RT response time must begin in range 400ns to  $4\mu\text{s}$

### System Architecture

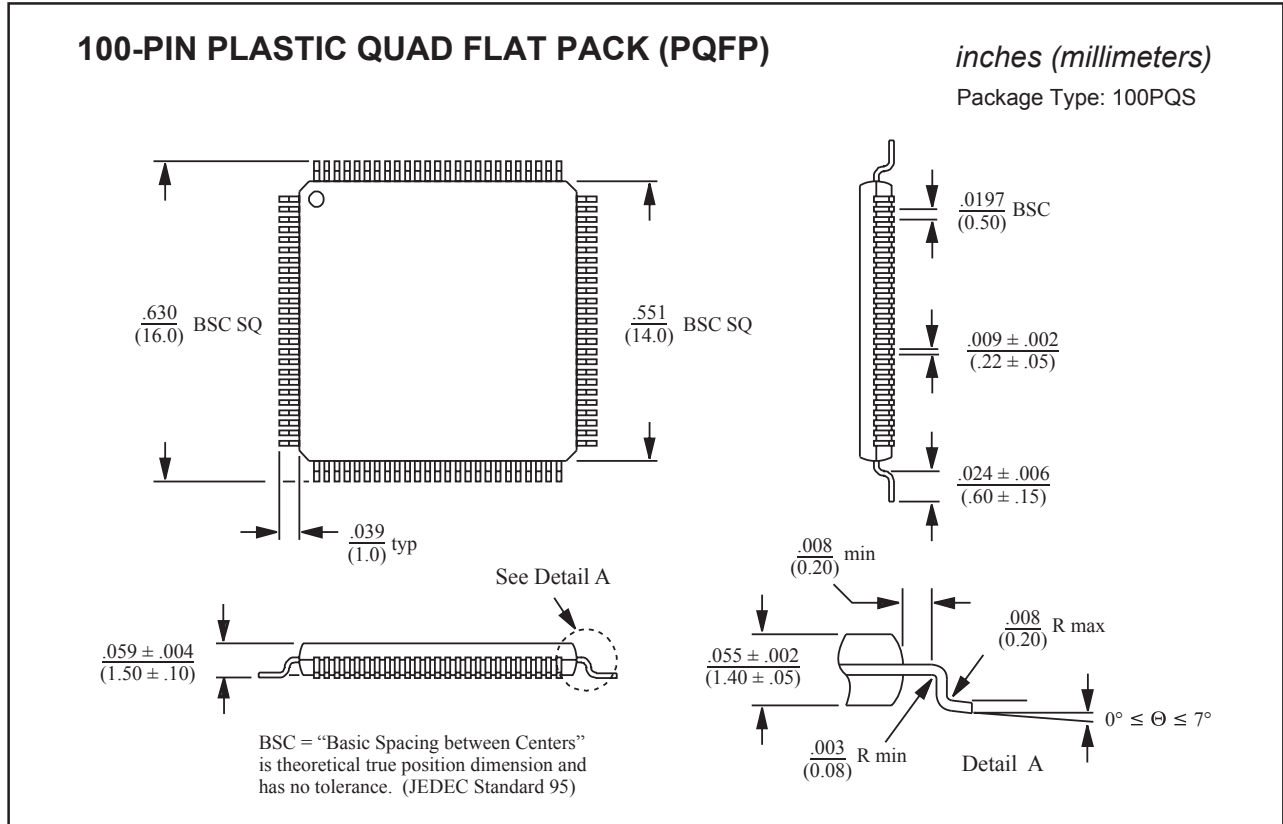
SAE AS5652 uses a BC logical hub (star) architecture. A separate cable connects each RT to the BC via a hub controller. All data transfer occurs between BC and RT, hence there are no RT-to-RT messages. The HI-6140 will work as an RT in a SAE AS5652 network.

In contrast to SAE AS5652, the HI-6140 may be used in a multi-drop RS-485 bus configuration. In a properly terminated bus situation with terminal stubs of proper length, the HI-6140 can execute RT-RT messages.

### Protocol Considerations

In SAE AS5652, transmit mode codes 0,4 and 5 are reserved, not used. Receive mode codes 20-21 are reserved, not used. These mode commands correspond to “Dynamic Bus Control”, and two variants each of “Bus Shutdown” and “Override Bus Shutdown” mode commands.

PACKAGE DIMENSIONS



# HI-6140

## ORDERING INFORMATION

HI - 6140 PQ x F

PART NUMBER	LEAD FINISH
F	100% Matte Tin (Pb-free, RoHS compliant)

PART NUMBER	TEMPERATURE RANGE	FLOW	BURN IN
I	-40°C to +85°C	I	No
T	-55°C to +125°C	T	No
M	-55°C to +125°C	M	Yes

PART NUMBER	PACKAGE DESCRIPTION
PQ	100 PIN PLASTIC QUAD FLAT PACK, PQFP (100PQS)

# HI-6140

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## REVISION HISTORY

Revision	Date	Description of Change
DS6140, Rev. New	05/02/12	Initial Release