Advance Information
MC68QH302 Quad HDLC Integrated Multiprotocol Processor
Technical Summary

The MC68QH302, quad HDLC integrated multiprotocol processor, is based on the three-SCC MC68302 family of chips with the addition of the QH protocol and two extra serial DMA channels. The QH302 supports a total of four independent communications channels, handling two HDLC or transparent channels on SCC1; see Figure 1 for a block diagram.

In non-QH mode, the QH302 can be used in standard 302 applications as well.

To locate any published errata or updates for this document, refer to the website at http://www.mot.com/netcomm.
The MC68QH302 supports a full ISDN basic rate interface with one serial channel left over to communicate with the DTE as shown in Figure 2. The dual-channel SCC1 is used to support the two B channels.

Note: *SCC1 = Dual channel SCC, each channel used for a B channel
1.1 FEATURES

The main features of the MC68QH302 are as follows (new features indicated in bold):

- MC68000/MC68008 microprocessor core (may be disabled to use the IMP as a peripheral)
- Serial interface block including:
  - Independent direct memory access (IDMA) controller
  - Interrupt controller with two modes of operation
  - Parallel I/O ports, some with interrupt capability
  - On-chip 1152 bytes of dual-ported RAM
  - Three timers, including a software watchdog timer
  - Four programmable chip-select lines with wait-state logic
  - Programmable address mapping of dual-ported RAM and IMP registers
  - On-chip clock generator with an output clock signal
  - System control
    - System control register
    - Bus arbitration logic with low-interrupt latency support
    - Hardware watchdog for monitoring bus activity
    - Low power (standby) modes
    - Disable CPU logic (M68000)
    - Freeze control for debugging selected on-chip peripherals
    - DRAM refresh controller
- CP including:
  - Main controller (RISC processor)
  - Three physical full-duplex serial communication controllers (SCCs) with the following protocols:
    - HDLC/SDLC
    - UART
    - Totally transparent
    - V.110
  - SCC1 can support two logical HDLC or transparent channels running QH protocol
  - Eight serial DMA channels dedicated to the four serial channels
  - Capability to send/receive up to eight buffers/frames without M68000 core intervention
  - Flexible physical interface accessible by SCCs for interchip digital link (IDL), general circuit interface (GCI, also called IOM2), pulse code modulation (PCM), and nonmultiplexed serial interface (NMSI) operation
  - Serial communication port (SCP) for synchronous communication
  - Serial management controllers (SMCs) for IDL and GCI channels
- Application development system available with M68302FADS.
1.2 MC68QH302 Ordering Information

Table 1 identifies operating frequencies available for the MC68QH302.

Table 1. MC68QH302 Package/Frequency Availability

<table>
<thead>
<tr>
<th>Package Type</th>
<th>Operating Voltage</th>
<th>Frequency (MHz)</th>
<th>Temperature</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>144-pin thin quad flat pack (PV suffix)</td>
<td>5 V</td>
<td>16.67</td>
<td>0°C to 70°C</td>
<td>MC68QH302PV16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td></td>
<td>MC68QH302PV20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
<td></td>
<td>MC68QH302PV25</td>
</tr>
</tbody>
</table>

The documents listed in Table 2 contain detailed information on the MC68QH302. These documents can be obtained from the Literature Distribution Centers at the addresses listed on the back page. Visit the website at http://www.mot.com/netcomm/ for more information.

Table 2. Documentation

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Order Number</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC68302 User's Manual</td>
<td>MC68302UM/AD</td>
<td>Detailed information for design</td>
</tr>
<tr>
<td>M68000 Family Programmer's Reference Manual</td>
<td>M68000PM/AD</td>
<td>M68000 family instruction set</td>
</tr>
<tr>
<td>The 68K Source</td>
<td>BR729/D</td>
<td>Independent vendor listing supporting software and development tools</td>
</tr>
<tr>
<td>The MC68QH302 Supplement to MC68302 User's Manual</td>
<td>MC68QH302SUPL/AD</td>
<td>Highlights implementation-specific features of the MC68QH302, and discusses how they differ from the MC68302.</td>
</tr>
</tbody>
</table>
RoHS-compliant and/or Pb-free versions of Freescale products have the functionality and electrical characteristics of their non-RoHS-compliant and/or non-Pb-free counterparts. For further information, see http://www.freescale.com or contact your Freescale sales representative.

For information on Freescale’s Environmental Products program, go to http://www.freescale.com/epp.

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