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GENERAL DESCRIPTION

The XRT72L50, single Channel DS3/E3 Framer IC is designed to accept user data from the Terminal Equipment and insert this data into the payload bit-fields within an outbound DS3/E3 Data Stream. Further, the Framer IC is also designed to receive an inbound DS3/E3 Data Stream from the Remote Terminal Equipment and extract out the user data.

The XRT72L50 DS3/E3 Framer device is designed to support full-duplex data flow between Terminal Equipment and an LIU (Line Interface Unit) IC. The Framer Device will transmit, receive and process data in the DS3-C-bit Parity, DS3-M13, E3-ITU-T G.751 and E3-ITU-T G.832 Framing Formats.

The XRT72L50 DS3/E3 Framer IC consists of a Transmit section, Receiver section, Performance Monitor Section and a Microprocessor interface.

The Transmit Section includes a Transmit Payload Data Input Interface, a Transmit Overhead data Input Interface Section, a Transmit HDLC Controller, a Transmit DS3/E3 Framer block and a Transmit LIU Interface Block which permits the Terminal Equipment to transmit data to a remote terminal.

The Receive Section consists of a Receive LIU Interface, a Receive DS3/E3 Framer, a Receive HDLC Controller, a Receive Payload Data Output Interface, and a Receive Overhead Data Interface which allows

the local terminal equipment to receive data from remote terminal equipment.

The Microprocessor Interface is used to configure the Framer IC in different operating modes and monitor the performance of the Framer.

The Performance Monitor Sections consist of a large number of Reset-upon-Read and Read-Only registers that contain cumulative and one-second statistics that reflect the performance/health of the Framer IC/ system.

FEATURES

- Transmits, Receives and Processes data in the DS3-C-bit Parity, DS3-M13, E3-ITU-T G.751 and E3-ITU-T G.832 Framing Formats.
- 1 Channel HDLC Controller - Tx and Rx
- Interfaces to all Popular Microprocessors
- Integrated Framer Performance Monitor
- Available in a 100 Pin PQFP package
- 3.3V Power Supply with 5V Tolerant I/O
- Operating Temperature -40°C to +85°C

APPLICATIONS

- Network Interface Units
- CSU/DSU Equipment.
- PCM Test Equipment
- Fiber Optic Terminals
- DS3/E3 Frame Relay Equipment

FIGURE 1. BLOCK DIAGRAM OF THE XRT72L50

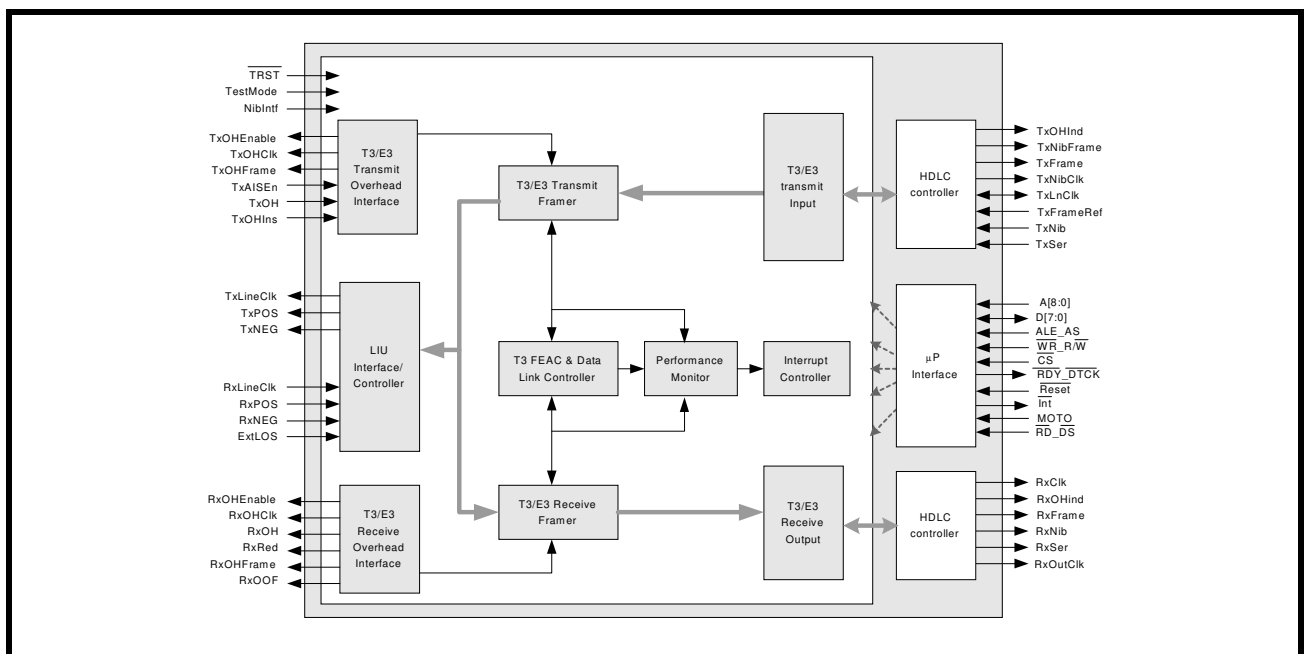
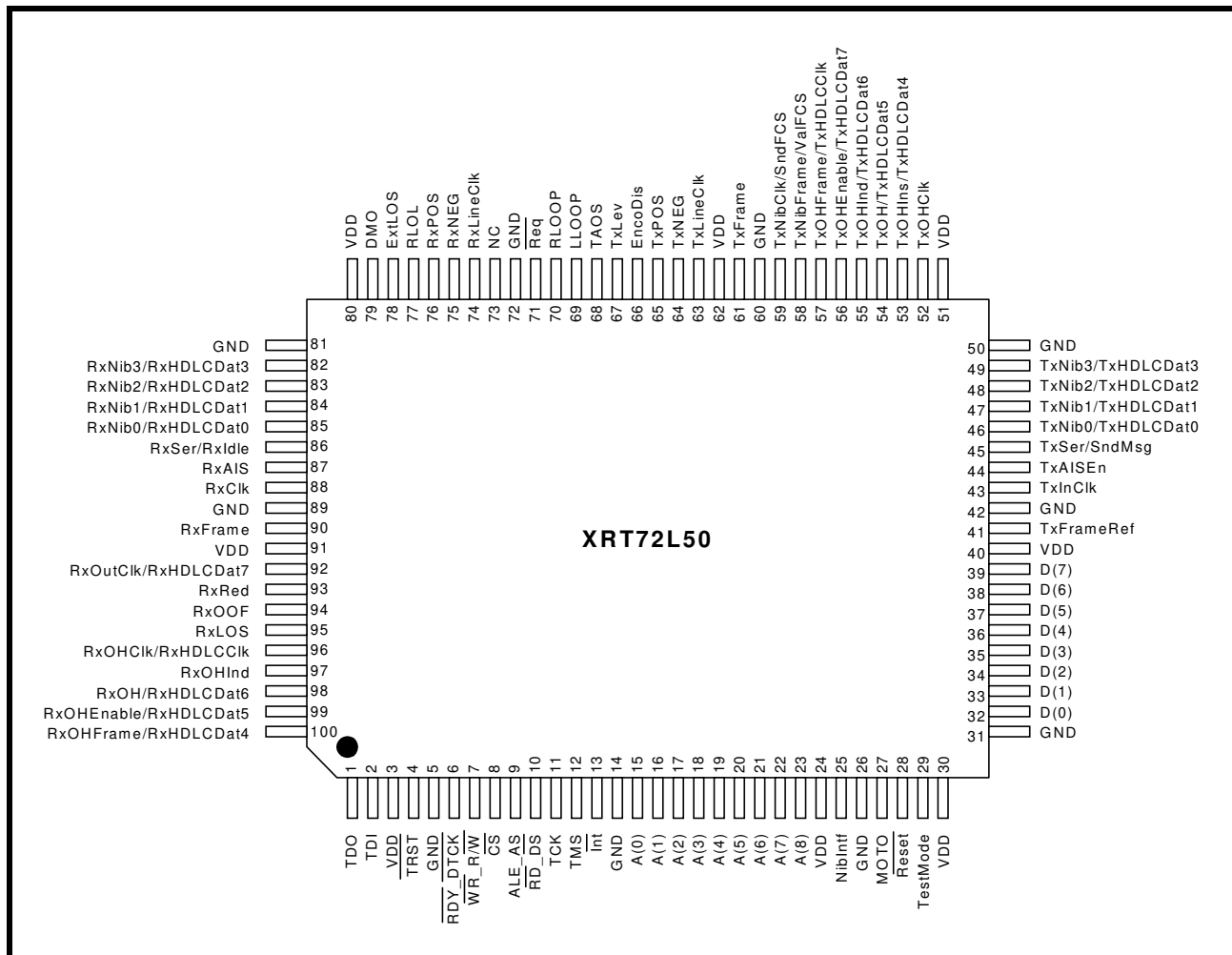


FIGURE 2. PIN OUT OF THE XRT72L50



ORDERING INFORMATION

PART NUMBER	PACKAGE TYPE	OPERATING TEMPERATURE RANGE
XRT72L50IQ	14x20mm, 100 Lead Plastic QFP	-40°C to +85°C

TABLE OF CONTENTS

GENERAL DESCRIPTION	1
FEATURES	1
APPLICATIONS	1
Figure 1. Block Diagram of the XRT72L50	1
Figure 2. Pin Out of the XRT72L50	2
ORDERING INFORMATION	2
TABLE OF CONTENTS	1
PIN DESCRIPTIONS	3
ELECTRICAL CHARACTERISTICS	20
ABSOLUTE MAXIMUMS	20
DC ELECTRICAL CHARACTERISTICS	20
AC ELECTRICAL CHARACTERISTICS	20
AC ELECTRICAL CHARACTERISTICS (CONT.)	22
1.0 Timing Diagrams	26
Figure 3. Timing Diagram for Transmit Payload Input Interface, when the XRT72L50 Device is operating in both the DS3 and Loop-Timing Modes	26
Figure 4. Timing Diagram for the Transmit Payload Input Interface, when the XRT72L50 Device is operating in both the DS3 and Local-Timing Modes	26
Figure 5. Timing Diagram for the Transmit Payload Data Input Interface, when the XRT72L50 Device is operating in both the DS3/Nibble and Looped-Timing Modes	27
Figure 6. Timing Diagram for the Transmit Payload Data Input Interface, when the XRT72L50 Device is operating in the DS3/Nibble and Local-Timing Modes	27
Figure 7. Timing Diagram for the Transmit Overhead Data Input Interface (Method 1 Access)	28
Figure 8. Timing Diagram for the Transmit Overhead Data Input Interface (Method 2 Access)	28
Figure 9. Transmit LIU Interface Timing - TxPOS and TxNEG are updated on the rising edge of TxLineClk	29
Figure 10. Transmit LIU Interface Timing - TxPOS and TxNEG are updated on the falling edge of TxLineClk	29
Figure 11. Receive LIU Interface timing - RxPOS and RxNEG are sampled on rising edge of RxLineClk	30
Figure 12. Receive LIU Interface timing - RxPOS and RxNEG are sampled on falling edge of RxLineClk	30
Figure 13. Receive Payload Data Output Interface Timing	31
Figure 14. Receive Payload Data Output Interface Timing (Nibble Mode Operation)	31
Figure 15. Receive Overhead Data Output Interface Timing (Method 1 - Using RxOHClk)	32
Figure 16. Receive Overhead Data Output Interface Timing (Method 2 - Using RxOHEnable)	32
Figure 17. Microprocessor Interface Timing - Intel-type Programmed I/O Read Operation	33
Figure 18. Microprocessor Interface Timing - Intel-type Programmed I/O Write Operation	33
Figure 19. Microprocessor Interface Timing - Motorola-type Programmed I/O Read Operation	34
Figure 20. Microprocessor Interface Timing - Motorola-type Programmed I/O Write Operation	34
Figure 21. Microprocessor Interface Timing - Reset Pulse Width	34
2.0 The Microprocessor Interface Block	35
2.1 THE MICROPROCESSOR INTERFACE BLOCK SIGNALS	35
Figure 22. Block Diagram of the Microprocessor Interface Block	35
TABLE 1: DESCRIPTION OF MICROPROCESSOR INTERFACE SIGNALS THAT EXHIBIT CONSTANT ROLES IN BOTH THE INTEL AND MOTOROLA MODES	36
TABLE 2: DESCRIPTION OF MICROPROCESSOR INTERFACE SIGNALS - OPERATING IN THE INTEL MODE	36
2.2 INTERFACING THE XRT72L50 DS3/E3 FRAMER TO THE LOCAL μC/μP VIA THE MICROPROCESSOR INTERFACE BLOCK	37
2.2.1 Interfacing the XRT72L50 DS3/E3 Framer to the Microprocessor over an 8 bit wide bi-directional Data Bus	37
TABLE 3: DESCRIPTION OF THE MICROPROCESSOR INTERFACE SIGNALS - OPERATING IN THE MOTOROLA MODE	37
2.2.2 Data Access Modes	38
2.2.2.1 Data Access using Programmed I/O	38
Figure 23. Microprocessor Interface Timing - Intel-type Programmed I/O Read Operation	39
Figure 24. Microprocessor Interface Timing - Intel-type Programmed I/O Write Operation	40
Figure 25. Microprocessor Interface Timing - Motorola-type Programmed I/O Read Operation	41
2.3 ON-CHIP REGISTER ORGANIZATION	42
2.3.1 Framer Register Addressing	42
Figure 26. Microprocessor Interface Timing - Motorola-type Programmed I/O Write Operation	42
TABLE 4: REGISTER ADDRESSING OF THE FRAMER PROGRAMMER REGISTERS	42
2.3.2 Framer Register Description	46

2.3.2.1	Operating Mode Register	46
2.3.2.2	I/O Control Register	48
2.3.2.3	Part Number Register	50
2.3.2.4	Version Number Register	50
2.3.2.5	Block Interrupt Enable Register	50
2.3.2.6	Block Interrupt Status Register	51
2.3.2.7	Test Register	52
2.3.2.8	Receive DS3 Configuration & Status Register	53
2.3.2.9	Receive DS3 Status Register	54
2.3.2.10	Receive DS3 Interrupt Enable Register	55
2.3.2.11	Receive DS3 Interrupt Status Register	56
2.3.2.12	Receive DS3 Sync Detect Enable Register	58
2.3.2.13	Receive DS3 FEAC Register	58
2.3.2.14	Receive DS3 FEAC Interrupt Enable/Status Register	58
2.3.2.15	Receive DS3 LAPD Control Register	59
2.3.2.16	Receive DS3 LAPD Status Register	60
2.3.3	Receive E3 Framer Configuration Registers (ITU-T G.832)	61
2.3.3.1	Receive E3 Configuration & Status Register 1 (E3, ITU-T G.832)	61
2.3.3.2	Receive E3 Configuration & Status Register 2 (E3, ITU-T G.832)	62
2.3.3.3	Receive E3 Interrupt Enable Register 1 (E3, ITU-T G.832)	63
2.3.3.4	Receive E3 Interrupt Enable Register 2 (E3, ITU-T G.832)	64
2.3.3.5	Receive E3 Interrupt Status Register 1 (E3, ITU-T G.832)	65
2.3.3.6	Receive E3 Interrupt Status Register 2 (E3, ITU-T G.832)	66
2.3.3.7	Receive E3 LAPD Control Register (E3, ITU-T G.832)	68
2.3.3.8	Receive E3 LAPD Status Register (E3, ITU-T G.832)	68
2.3.3.9	Receive E3 NR Byte Register (E3, ITU-T G.832)	69
2.3.3.10	Receive E3 GC Byte Register (E3, ITU-T G.832)	70
2.3.3.11	Receive E3 TTB-0 Register (E3, ITU-T G.832)	70
2.3.3.12	Receive E3 TTB-1 Register (E3, ITU-T G.832)	70
2.3.3.13	Receive E3 TTB-2 Register (E3, ITU-T G.832)	71
2.3.3.14	Receive E3 TTB-3 Register (E3, ITU-T G.832)	71
2.3.3.15	Receive E3 TTB-4 Register (E3, ITU-T G.832)	71
2.3.3.16	Receive E3 TTB-5 Register (E3, ITU-T G.832)	72
2.3.3.17	Receive E3 TTB-6 Register (E3, ITU-T G.832)	72
2.3.3.18	Receive E3 TTB-7 Register (E3, ITU-T G.832)	72
2.3.3.19	Receive E3 TTB-8 Register (E3, ITU-T G.832)	73
2.3.3.20	Receive E3 TTB-9 Register (E3, ITU-T G.832)	73
2.3.3.21	Receive E3 TTB-10 Register (E3, ITU-T G.832)	73
2.3.3.22	Receive E3 TTB-11 Register (E3, ITU-T G.832)	74
2.3.3.23	Receive E3 TTB-12 Register (E3, ITU-T G.832)	74
2.3.3.24	Receive E3 TTB-13 Register (E3, ITU-T G.832)	74
2.3.3.25	Receive E3 TTB-14 Register (E3, ITU-T G.832)	75
2.3.3.26	Receive E3 TTB-15 Register (E3, ITU-T G.832)	75
2.3.3.27	Receive E3 Framer SSM Register (E3, ITU-T G.832)	75
2.3.4	Receive E3 Framer Configuration Registers (ITU-T G.751)	76
2.3.4.1	Receive E3 Configuration & Status Register 1 (E3, ITU-T G.751)	76
2.3.4.2	Receive E3 Configuration & Status Register 2 (E3, ITU-T G.751)	76
2.3.4.3	Receive E3 Framer Interrupt Enable Register 1 (E3, ITU-T G.751)	78
2.3.4.4	Receive E3 Interrupt Enable Register 2 (E3, ITU-T G.751)	78
2.3.4.5	Receive E3 Interrupt Status Register 1 (E3, ITU-T G.751)	79
2.3.4.6	Receive E3 Interrupt Status Register 2 (E3, ITU-T G.751)	80
2.3.4.7	Receive E3 LAPD Control Register (E3, ITU-T G.751)	81
2.3.4.8	Receive E3 LAPD Status Register (E3, ITU-T G.751)	81
2.3.4.9	Receive E3 Service Bits Register (E3, ITU-T G.751)	83
2.3.5	Transmit DS3 Configuration Registers	83
2.3.5.1	Transmit DS3 Configuration Register	83
2.3.5.2	Transmit DS3 FEAC Configuration & Status Register	85
2.3.5.3	Transmit DS3 FEAC Register	86
2.3.5.4	Transmit DS3 LAPD Configuration Register	86

2.3.5.5 Transmit DS3 LAPD Status and Interrupt Register	87
2.3.5.6 Transmit DS3 M-Bit Mask Register	88
2.3.5.7 Transmit DS3 F-Bit Mask Register 1	89
2.3.5.8 Transmit DS3 F-Bit Mask Register 2	89
2.3.5.9 Transmit F-Bit Mask Register 3	89
2.3.5.10 Transmit F-Bit Mask Register 4	90
2.3.6 Transmit E3 (ITU-T G.832) Configuration Registers	90
2.3.6.1 Transmit E3 Configuration Register (E3, ITU-T G.832)	90
2.3.6.2 Transmit E3 LAPD Configuration Register (E3, ITU-T G.832)	91
2.3.6.3 Transmit E3 LAPD Status and Interrupt Register (E3, ITU-T G.832)	92
2.3.6.4 Transmit E3 GC Byte Register (E3, ITU-T G.832)	93
2.3.6.5 Transmit E3 MA Byte Register (E3, ITU-T G.832)	93
2.3.6.6 Transmit E3 NR Byte Register (E3, ITU-T G.832)	94
2.3.6.7 Transmit E3 TTB-0 Register (E3, ITU-T G.832)	94
2.3.6.8 Transmit E3 TTB-1 Register (E3, ITU-T G.832)	95
2.3.6.9 Transmit E3 TTB-2 Register (E3, ITU-T G.832)	95
2.3.6.10 Transmit E3 TTB-3 Register (E3, ITU-T G.832)	96
2.3.6.11 Transmit E3 TTB-4 Register (E3, ITU-T G.832)	96
2.3.6.12 Transmit E3 TTB-5 Register (E3, ITU-T G.832)	96
2.3.6.13 Transmit E3 TTB-6 Register (E3, ITU-T G.832)	97
2.3.6.14 Transmit E3 TTB-7 Register (E3, ITU-T G.832)	97
2.3.6.15 Transmit E3 TTB-8 Register (E3, ITU-T G.832)	98
2.3.6.16 Transmit E3 TTB-9 Register (E3, ITU-T G.832)	98
2.3.6.17 Transmit E3 TTB-10 Register (E3, ITU-T G.832)	98
2.3.6.18 Transmit E3 TTB-11 Register (E3, ITU-T G.832)	99
2.3.6.19 Transmit E3 TTB-12 Register (E3, ITU-T G.832)	99
2.3.6.20 Transmit E3 TTB-13 Register (E3, ITU-T G.832)	100
2.3.6.21 Transmit E3 TTB-14 Register (E3, ITU-T G.832)	100
2.3.6.22 Transmit E3 TTB-15 Register (E3, ITU-T G.832)	100
2.3.6.23 Transmit E3 FA1 Byte Error Mask Register (E3, ITU-T G.832)	101
2.3.6.24 Transmit E3 FA2 Byte Error Mask Register (E3, ITU-T G.832)	101
2.3.6.25 Transmit E3 BIP-8 Error Mask Register (E3, ITU-T G.832)	101
2.3.6.26 Tx E3 SSM Register - G.832	102
2.3.7 Transmit E3 Framer Configuration Registers (ITU-T G.751)	102
2.3.7.1 Transmit E3 Configuration Register (ITU-T G.751)	102
2.3.7.2 Transmit E3 LAPD Configuration Register (ITU-T G.751)	104
2.3.7.3 Transmit E3 LAPD Status and Interrupt Register (ITU-T G.751)	104
2.3.7.4 Transmit E3 Service Bits Register (ITU-T G.751)	105
2.3.7.5 Transmit E3 FAS Mask Register - 0 (ITU-T G.751)	106
2.3.7.6 Transmit E3 FAS Error Mask Register - 1 (ITU-T G.751)	106
2.3.7.7 Transmit E3 BIP-4 Error Mask Register (ITU-T G.751)	106
2.3.8 Performance Monitor Registers	107
2.3.8.1 PMON Line Code Violation Count Register - MSB	107
2.3.8.2 PMON Line Code Violation Count Register - LSB	107
2.3.8.3 PMON Framing Bit/Byte Error Count Register - MSB	107
2.3.8.4 PMON Framing Bit/Byte Error Count Register - LSB	108
2.3.8.5 PMON Parity Error Count Register - MSB	108
2.3.8.6 PMON Parity Error Count Register - LSB	108
2.3.8.7 PMON FEBE Event Count Register - MSB	109
2.3.8.8 PMON FEBE Event Count Register - LSB	109
2.3.8.9 PMON CP-Bit Error Event Count Register - MSB	109
2.3.8.10 PMON CP-Bit Error Event Count Register - LSB	110
2.3.8.11 PRBS Error Count Register - MSB	110
2.3.8.12 PRBS Error Count Register - LSB	110
2.3.8.13 PMON Holding Register	111
2.3.8.14 One-Second Error Status Register	111
2.3.8.15 One-Second Line Code Violation Accumulator Register - MSB	111
2.3.8.16 One-Second Line Code Violation Accumulator Register - LSB	112
2.3.8.17 One-Second Frame Parity Error Accumulator Register - MSB	112

2.3.8.18 One-Second Frame Parity Error Accumulator Register - LSB	112
2.3.8.19 One-Second Frame CP-Bit Error Accumulator Register - MSB	113
2.3.8.20 One-Second Frame CP-Bit Error Accumulator Register - LSB	113
2.3.8.21 Line Interface Drive Register	113
2.3.8.22 Line Interface Scan Register	116
2.3.8.23 HDLC Control Register	117
2.4 THE LOSS OF CLOCK ENABLE FEATURE	117
2.5 USING THE PMON HOLDING REGISTER	118
2.6 THE INTERRUPT STRUCTURE WITHIN THE FRAMER MICROPROCESSOR INTERFACE SECTION	118
TABLE 5: LIST OF ALL OF THE POSSIBLE CONDITIONS THAT CAN GENERATE INTERRUPTS WITHIN EACH CHANNEL OF THE XRT72L50 FRAMER	119
TABLE 6: A LISTING OF THE XRT72L50 FRAMER INTERRUPT BLOCK REGISTERS (FOR DS3 APPLICATIONS)	119
TABLE 7: A LISTING OF THE XRT72L50 FRAMER INTERRUPT BLOCK REGISTERS (FOR E3, ITU-T G.832 APPLICATIONS) ..	120
TABLE 8: A LISTING OF THE XRT72L50 FRAMER INTERRUPT BLOCK REGISTER (FOR E3, ITU-T G.751 APPLICATIONS) ...	120
2.6.1 Automatic Reset of Interrupt Enable Bits	122
TABLE 9: INTERRUPT SERVICE ROUTINE GUIDE (FOR DS3 APPLICATIONS)	122
TABLE 10: INTERRUPT SERVICE ROUTINE GUIDE (FOR E3, ITU-T G.832 APPLICATIONS)	122
TABLE 11: INTERRUPT SERVICE ROUTINE GUIDE (FOR E3, ITU-T G.751 APPLICATIONS)	122
2.6.2 One-Second Interrupts	123
3.0 The Line Interface and scan section	124
3.1 BIT-FIELDS WITHIN THE LINE INTERFACE DRIVE REGISTER	124
Figure 27. XRT72L50 DS3/E3 Framer Interfaced to the XRT73L0x DS3/E3/STS-1 LIU	124
TABLE 12: THE RELATIONSHIP BETWEEN THE STATES OF RLOOP, LLOOP AND THE RESULTING LOOP-BACK MODE WITH THE XRT73L0x	126
3.2 BIT-FIELDS WITHIN THE LINE INTERFACE SCAN REGISTER	127
4.0 DS3 Operation of the XRT72L50	129
4.1 DESCRIPTION OF THE DS3 FRAMES AND ASSOCIATED OVERHEAD BITS	129
Figure 28. DS3 Frame Format for C-bit Parity	129
Figure 29. DS3 Frame Format for M13	130
TABLE 13: BIT 2 SETTING WITHIN THE FRAMER OPERATING MODE REGISTER AND THE RESULTING DS3 FRAMING FORMAT	130
4.1.1 Frame Synchronization Bits (Applies to both M13 and C-bit Parity Framing Formats)	131
4.1.2 Performance Monitoring/Error Detection Bits (Parity)	131
TABLE 14: C-BIT FUNCTIONS FOR THE C-BIT PARITY DS3 FRAME FORMAT	131
4.1.3 Alarm and Signaling-Related Overhead Bits	132
4.1.4 The Data Link Related Overhead Bits	133
4.2 THE TRANSMIT SECTION OF THE XRT72L50 (DS3 MODE OPERATION)	133
Figure 30. The XRT72L50 Transmit Section configured to operate in the DS3 Mode	134
4.2.1 The Transmit Payload Data Input Interface Block	135
Figure 31. The Transmit Payload Data Input Interface Block	135
TABLE 15: DESCRIPTIONS FOR THE PINS ASSOCIATED WITH THE TRANSMIT PAYLOAD DATA INPUT INTERFACE	135
4.2.1.1 Mode 1 - Serial/Loop-Timing Mode Behavior of the XRT72L50	136
Figure 32. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 1 (Serial/Loop-Timed) Operation	137
Figure 33. Behavior of the Terminal Interface signals between the Transmit Payload Data Input Interface block of the XRT72L50 and the Terminal Equipment (Mode 1 Operation)	138
4.2.1.2 Mode 2 - The Serial/Local-Timed/Frame-Slave Mode Behavior of the XRT72L50	139
Figure 34. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 2 (Serial/Local-Timed/Frame-Slave) Operation	140
4.2.1.3 Mode 3 - The Serial/Local-Timed/Frame-Master Mode Behavior of the XRT72L50	141
Figure 35. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (Mode 2 Operation)	141
Figure 36. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 3 (Serial/Local-Timed/Frame-Master) Operation	142
4.2.1.4 Mode 4 - The Nibble-Parallel/Loop-Timed Mode Behavior of the XRT72L50	143
Figure 37. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (DS3 Mode 3 Operation)	143
Figure 38. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 4 (Nibble-Parallel/Loop-Timed) Operation	144
Figure 39. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (Mode 4 Operation)	145
4.2.1.5 Mode 5 - The Nibble-Parallel/Local-Timed/Frame-Slave Interface Mode Behavior of the XRT72L50	146

Figure 40. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 5 (Nibble-Parallel/Local-Timed/Frame-Slave) Operation	147
4.2.1.6 Mode 6 - The Nibble-Parallel/TxInClk/Frame-Master Interface Mode Behavior of the XRT72L50	148
Figure 41. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (DS3 Mode 5 Operation)	148
Figure 42. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 6 (Nibble-Parallel/Local-Timed/Frame-Master) Operation	149
Figure 43. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (DS3 Mode 6 Operation)	150
4.2.2 The Transmit Overhead Data Input Interface	151
Figure 44. The Transmit Overhead Data Input Interface block	151
4.2.2.1 Method 1 - Using the TxOHClk Clock Signal	152
TABLE 16: OVERHEAD BITS WITHIN THE DS3 FRAME AND THEIR POTENTIAL SOURCES WITHIN THE XRT72L50 IC	152
TABLE 17: DESCRIPTION OF METHOD 1 TRANSMIT OVERHEAD INPUT INTERFACE SIGNALS	153
Figure 45. The Terminal Equipment being interfaced to the Transmit Overhead Data Input Interface (Method 1)	154
TABLE 18: THE RELATIONSHIP BETWEEN THE NUMBER OF RISING CLOCK EDGES IN TXOHCLK SINCE TXOHFRAME WAS LAST SAMPLED "HIGH" TO THE DS3 OVERHEAD BIT THAT IS BEING PROCESSED	154
Figure 46. Illustration of the signal that must occur between the Terminal Equipment and the XRT72L50, in order to configure the XRT72L50 to transmit a Yellow Alarm to the remote terminal equipment	157
4.2.2.2 Method 2 - Using the TxInClk and TxOHEnable Signals	158
TABLE 19: DESCRIPTION OF METHOD 2 TRANSMIT OVERHEAD INPUT INTERFACE SIGNALS	158
Figure 47. The Terminal Equipment being interfaced to the Transmit Overhead Data Input Interface (Method 2)	159
TABLE 20: THE RELATIONSHIP BETWEEN THE NUMBER OF TXOHENABLE PULSES SINCE THE LAST OCCURRENCE OF THE TXOHFRAME PULSE, TO THE DS3 OVERHEAD BIT THAT IS BEING PROCESSED BY THE XRT72L50	159
4.2.3 The Transmit DS3 HDLC Controller	162
4.2.3.1 Bit-Oriented Signaling (or FEAC Message) processing via the Transmit DS3 HDLC Controller.	162
Figure 48. Behavior of Transmit Overhead Data Input Interface signals between the XRT72L50 and the Terminal Equipment (for Method 2)	162
4.2.3.2 Message-Oriented Signaling (e.g., LAP-D) processing via the Transmit DS3 HDLC Controller	164
Figure 49. A Flow Chart depicting how to transmit a FEAC Message via the FEAC Transmitter	164
Figure 50. LAPD Message Frame Format	165
TABLE 21: THE LAPD MESSAGE TYPE AND THE CORRESPONDING VALUE OF THE FIRST BYTE WITHIN THE INFORMATION PAYLOAD	166
TABLE 22: RELATIONSHIP BETWEEN TxLAPD MSG LENGTH AND THE LAPD MESSAGE SIZE	166
TABLE 23: RELATIONSHIP BETWEEN TxLAPD MSG LENGTH AND THE LAPD MESSAGE SIZE	167
Figure 51. Flow Chart depict how to use the LAPD Transmitter	169
4.2.4 The Transmit DS3 Framer Block	170
4.2.4.1 Brief Description of the Transmit DS3 Framer	170
4.2.4.2 Detailed Functional Description of the Transmit DS3 Framer Block	171
Figure 52. The Transmit DS3 Framer Block and the associated paths to other Functional Blocks	172
TABLE 24: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 7 (TX YELLOW ALARM) WITHIN THE TX DS3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT DS3 FRAMER BLOCK'S ACTION	173
TABLE 25: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 6 (TX X-BITS) WITHIN THE TX DS3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT DS3 FRAMER BLOCK'S ACTION	173
TABLE 26: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 5 (TX IDLE) WITHIN THE TX DS3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT DS3 FRAMER ACTION	174
TABLE 27: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 4 (TX AIS PATTERN) WITHIN THE TX DS3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT DS3 FRAMER BLOCK'S ACTION	174
TABLE 28: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 3 (TX LOS) WITHIN THE TX DS3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT DS3 FRAMER BLOCK'S ACTION	175
4.2.5 The Transmit DS3 Line Interface Block	177
Figure 53. Interfacing the XRT72L50 Framer IC to the XRT73L00 DS3/E3/STS-1 LIU	178
Figure 54. The Transmit DS3 LIU Interface block	178
4.2.5.1 Selecting the various Line Codes	179
Figure 55. The Behavior of TxPOS and TxNEG signals during data transmission while the Transmit DS3 LIU Interface is operating in the Unipolar Mode	179
TABLE 29: THE RELATIONSHIP BETWEEN THE CONTENT OF BIT 3 (UNIPOLAR/BIPOLAR) WITHIN THE UNI I/O CONTROL REGISTER AND THE TRANSMIT DS3 FRAMER LINE INTERFACE OUTPUT MODE	180
Figure 56. Illustration of AMI Line Code	180
4.2.5.2 TxLineClk Clock Edge Selection	181
Figure 57. Illustration of two examples of B3ZS Encoding	181
TABLE 30: THE RELATIONSHIP BETWEEN BIT 4 (AMI/B3ZS*) WITHIN THE I/O CONTROL REGISTER AND THE BIPOLAR LINE CODE THAT IS OUTPUT BY THE TRANSMIT DS3 LIU INTERFACE BLOCK	181
TABLE 31: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 2 (TxLINECLK INV) WITHIN THE I/O CONTROL REGISTER AND THE	

	<i>TXLINECLK</i> CLOCK EDGE THAT <i>TxPOS</i> AND <i>TxNEG</i> ARE UPDATED ON	182
	Figure 58. Waveform/Timing Relationship between <i>TxLineClk</i> , <i>TxPOS</i> and <i>TxNEG</i> - <i>TxPOS</i> and <i>TxNEG</i> are configured to be updated on the rising edge of <i>TxLineClk</i>	182
4.2.6	Transmit Section Interrupt Processing	183
4.2.6.1	Enabling Transmit Section Interrupts	183
	Figure 59. Waveform/Timing Relationship between <i>TxLineClk</i> , <i>TxPOS</i> and <i>TxNEG</i> - <i>TxPOS</i> and <i>TxNEG</i> are configured to be updated on the falling edge of <i>TxLineClk</i>	183
4.3	THE RECEIVE SECTION OF THE XRT72L50 (DS3 MODE OPERATION)	186
	Figure 60. The XRT72L50 Receive Section configured to operate in the DS3 Mode	186
4.3.1	The Receive DS3 LIU Interface Block	187
4.3.1.1	Unipolar Decoding	187
	Figure 61. The Receive DS3 LIU Interface Block	187
4.3.1.2	Bipolar Decoding	188
	Figure 62. Behavior of the <i>RxPOS</i> , <i>RxNEG</i> and <i>RxLineClk</i> signals during data reception of Unipolar Data	188
	TABLE 32: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 3 (UNIPOLAR/BIPOLAR) WITHIN THE I/O CONTROL REGISTER AND THE <i>TXLINECLK</i> CLOCK EDGE THAT <i>TxPOS</i> AND <i>TxNEG</i> ARE UPDATED ON	188
	Figure 63. Interfacing the XRT72L50 Framer IC to the XRT73L00 DS3/E3/STS-1 LIU	189
	Figure 64. AMI Line Code	189
	Figure 65. Illustration of two examples of B3ZS Decoding	190
	TABLE 33: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 1 (<i>RXLINECLK INV</i>) OF THE I/O CONTROL REGISTER, AND THE SAMPLING EDGE OF THE <i>RXLINECLK</i> SIGNAL	191
	Figure 66. Waveform/Timing Relationship between <i>RxLineClk</i> , <i>RxPOS</i> and <i>RxNEG</i> - When <i>RxPOS</i> and <i>RxNEG</i> are to be sampled on the rising edge of <i>RxLineClk</i>	191
4.3.2	The Receive DS3 Framer Block	192
	Figure 67. Waveform/Timing Relationship between <i>RxLineClk</i> , <i>RxPOS</i> and <i>RxNEG</i> - When <i>RxPOS</i> and <i>RxNEG</i> are to be sampled on the falling edge of <i>RxLineClk</i>	192
	Figure 68. The Receive DS3 Framer Block and the Associated Paths to Other Functional Blocks	192
4.3.2.1	Frame Acquisition Mode Operation	193
	Figure 69. The State Machine Diagram for the Receive DS3 Framer block's Frame Acquisition/Maintenance Algorithm .	193
4.3.2.2	Frame Maintenance Mode Operation	194
	TABLE 34: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 2 (FRAMING ON PARITY) WITHIN THE <i>Rx DS3 CONFIGURATION AND STATUS REGISTER</i> , AND THE RESULTING FRAMING ACQUISITION CRITERIA	194
	TABLE 35: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 1 (F-SYNC ALGO) WITHIN THE <i>Rx DS3 CONFIGURATION AND STATUS REGISTER</i> , AND THE RESULTING F-BIT OOF DECLARATION CRITERIA USED BY THE RECEIVE DS3 FRAMER BLOCK	195
	TABLE 36: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 0 (M-SYNC ALGO) WITHIN THE <i>Rx DS3 CONFIGURATION AND STATUS REGISTER</i> , AND THE RESULTING M-BIT OOF DECLARATION CRITERIA USED BY THE RECEIVE DS3 FRAMER BLOCK	195
4.3.2.3	Forcing a Reframe via Software Command	196
4.3.2.4	Performance Monitoring of the Receive DS3 Framer block	196
4.3.2.5	DS3 Receive Alarms	197
4.3.2.6	Performance Monitoring of the DS3 Transport Medium	201
	Figure 70. A Simple Illustration of the Locations of the Source, Mid-Network and Sink Terminal Equipment (for CP-Bit Processing)	203
4.3.3	The Receive HDLC Controller Block	204
	Figure 71. Illustration of the Presumed Configuration of the Mid-Network Terminal Equipment	204
4.3.3.1	Bit-Oriented Signaling (or FEAC) Processing via the Receive DS3 HDLC Controller.	205
4.3.3.2	The Message Oriented Signaling (e.g., LAP-D) Processing via the Receive DS3 HDLC Controller block	207
	Figure 72. Flow Diagram depicting how the Receive FEAC Processor Functions	207
	Figure 73. LAPD Message Frame Format	208
	TABLE 37: THE RELATIONSHIP BETWEEN <i>RXLAPDTYPE[1:0]</i> AND THE RESULTING LAPD MESSAGE TYPE AND SIZE	209
4.3.4	The Receive Overhead Data Output Interface	211
	Figure 74. Flow Chart depicting the Functionality of the LAPD Receiver	211
4.3.4.1	Method 1 - Using the <i>RxOHClk</i> Clock signal	212
	Figure 75. The Receive Overhead Output Interface block	212
	TABLE 38: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE OVERHEAD DATA OUTPUT INTERFACE BLOCK	213
	Figure 76. The Terminal Equipment being interfaced to the Receive Overhead Data Output Interface Block (Method 1)	213
	TABLE 39: THE RELATIONSHIP BETWEEN THE NUMBER OF RISING CLOCK EDGES IN <i>RxOHCLK</i> , (SINCE <i>RxOHFRAME</i> WAS LAST SAMPLED "HIGH") TO THE DS3 OVERHEAD BIT, THAT IS BEING OUTPUT VIA THE <i>RxOH</i> OUTPUT PIN	214
	Figure 77. Illustration of the signals that are output via the Receive Overhead Output Interface (for Method 1).	216

TABLE 40: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE OVERHEAD DATA OUTPUT INTERFACE BLOCK (METHOD 2)	216
Figure 78. The Terminal Equipment being interfaced to the Receive Overhead Data Output Interface (Method 2) ...	217
TABLE 41: THE RELATIONSHIP BETWEEN THE NUMBER OF RXOHENABLE OUTPUT PULSES ((SINCE RXOHFRAME WAS LAST SAMPLED "HIGH") TO THE DS3 OVERHEAD BIT, THAT IS BEING OUTPUT VIA THE RXOH OUTPUT PIN	218
4.3.5 The Receive Payload Data Output Interface	220
Figure 79. Illustration of the signals that are output via the Receive Overhead Data Output Interface block (for Method 2). 220	
Figure 80. The Receive Payload Data Output Interface block	220
TABLE 42: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE PAYLOAD DATA OUTPUT INTERFACE BLOCK 221	
4.3.5.1 Serial Mode Operation	222
Figure 81. The XRT72L50 DS3/E3 Framer IC being interfaced to the Receive Terminal Equipment (Serial Mode Operation) 222	
4.3.5.2 Nibble-Parallel Mode Operation	223
Figure 82. An Illustration of the behavior of the signals between the Receive Payload Data Output Interface block of the XRT72L50 and the Terminal Equipment (Serial Mode Operation)	223
Figure 83. The XRT72L50 DS3/E3 Framer IC being interfaced to the Receive Section of the Terminal Equipment (Nibble-Parallel Mode Operation)	224
4.3.6 Receive Section Interrupt Processing	225
4.3.6.1 Enabling Receive Section Interrupts	225
Figure 84. An Illustration of the Behavior of the signals between the Receive Payload Data Output Interface Block of the XRT72L50 and the Terminal Equipment (Nibble-Mode Operation).	225
4.3.6.2 Enabling/Disabling and Servicing Receive Section Interrupts	226
5.0 E3/ITU-T G.751 Operation of the XRT72L50	239
5.1 DESCRIPTION OF THE E3, ITU-T G.751 FRAMES AND ASSOCIATED OVERHEAD BITS	239
5.1.1 Definition of the Overhead Bits	239
5.1.1.1 The A (Alarm) Bit	239
Figure 85. Illustration of the E3, ITU-T G.751 Framing Format.	239
5.1.1.2 The N Bit	240
5.2 THE TRANSMIT SECTION OF THE XRT72L50 (E3, ITU-T G.751 MODE OPERATION)	240
5.2.1 The Transmit Payload Data Input Interface Block	241
Figure 86. The XRT72L50 Transmit Section configured to operate in the E3 Mode	241
Figure 87. The Transmit Payload Data Input Interface Block	241
TABLE 43: LISTING AND DESCRIPTION OF THE PINS ASSOCIATED WITH THE TRANSMIT PAYLOAD DATA INPUT INTERFACE ...	242
5.2.1.1 Mode 1 - The Serial/Loop-Timing Mode The Behavior of the XRT72L50	243
Figure 88. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 1 (Serial/Loop-Timed) Operation	244
Figure 89. Behavior of the Terminal Interface signals between the XRT72L50 Transmit Payload Data Input Interface block and the Terminal Equipment (for Mode 1 Operation)	246
5.2.1.2 Mode 2 - The Serial/Local-Timed/Frame-Slave Mode Behavior of the XRT72L50	247
Figure 90. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 2 (Serial/Local-Timed/Frame-Slave) Operation	247
Figure 91. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (Mode 2 Operation)	248
5.2.1.3 Mode 3 - The Serial/Local-Timed/Frame-Master Mode Behavior of the XRT72L50	249
Figure 92. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 3 (Serial/Local-Timed/Frame-Master) Operation	250
5.2.1.4 Mode 4 - The Nibble-Parallel/Loop-Timed Mode Behavior of the XRT72L50	251
Figure 93. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (E3 Mode 3 Operation)	251
Figure 94. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 4 (Nibble-Parallel/Loop-Timed) Operation	252
Figure 95. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (Mode 4 Operation)	253
5.2.1.5 Mode 5 - The Nibble-Parallel/Local-Timed/Frame-Slave Interface Mode Behavior of the XRT72L50 254	
Figure 96. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 5 (Nibble-Parallel/Local-Timed/Frame-Slave) Operation	255
5.2.1.6 4.2.1.6 Mode 6 - The Nibble-Parallel/Local-Timed/Frame-Master Interface Mode Behavior of the XRT72L50	256
Figure 97. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (E3, Mode 5 Operation)	256

Figure 98. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 6 (Nibble-Parallel/Local-Timed/Frame-Master) Operation	257
Figure 99. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (E3 Mode 6 Operation)	258
5.2.2 The Transmit Overhead Data Input Interface	259
Figure 100. The Transmit Overhead Data Input Interface block	259
5.2.2.1 Method 1 - Using the TxOHClk Clock Signal	260
TABLE 44: A LISTING OF THE OVERHEAD BITS WITHIN THE E3 FRAME, AND THEIR POTENTIAL SOURCES, WITHIN THE XRT72L50 IC	260
TABLE 45: DESCRIPTION OF METHOD 1 TRANSMIT OVERHEAD INPUT INTERFACE SIGNALS	261
Figure 101. The Terminal Equipment being interfaced to the Transmit Overhead Data Input Interface (Method 1) ...	262
TABLE 46: THE RELATIONSHIP BETWEEN THE NUMBER OF RISING CLOCK EDGES IN TXOHCLK, (SINCE TXOHFRAME WAS LAST SAMPLED "HIGH") TO THE E3 OVERHEAD BIT, THAT IS BEING PROCESSED	263
Figure 102. Illustration of the signal that must occur between the Terminal Equipment and the XRT72L50 in order to configure the XRT72L50 to transmit a Yellow Alarm to the remote terminal equipment	264
5.2.2.2 Method 2 - Using the TxInClk and TxOHEnable Signals	265
TABLE 47: DESCRIPTION OF METHOD 2 TRANSMIT OVERHEAD INPUT INTERFACE SIGNALS	265
Figure 103. The Terminal Equipment being interfaced to the Transmit Overhead Data Input Interface (Method 2) ...	266
TABLE 48: THE RELATIONSHIP BETWEEN THE NUMBER OF TXOHENABLE PULSES (SINCE THE LAST OCCURRENCE OF THE TXOHFRAME PULSE) TO THE E3 OVERHEAD BIT, THAT IS BEING PROCESSED BY THE XRT72L50	267
5.2.3 The Transmit E3 HDLC Controller	268
5.2.3.1 Message-Oriented Signaling (e.g., LAP-D) processing via the Transmit E3 HDLC Controller ...	268
Figure 104. Behavior of Transmit Overhead Data Input Interface signals between the XRT72L50 and the Terminal Equipment (for Method 2)	268
Figure 105. LAPD Message Frame Format	269
TABLE 49: THE LAPD MESSAGE TYPE AND THE CORRESPONDING VALUE OF THE FIRST BYTE, WITHIN THE INFORMATION PAYLOAD	270
TABLE 50: RELATIONSHIP BETWEEN TxLAPD MSG LENGTH AND THE LAPD MESSAGE SIZE	271
Figure 106. Flow Chart Depicting how to use the LAPD Transmitter	274
5.2.4 The Transmit E3 Framer Block	275
5.2.4.1 Brief Description of the Transmit E3 Framer	275
5.2.4.2 Detailed Functional Description of the Transmit E3 Framer Block	276
Figure 107. The Transmit E3 Framer Block and the associated paths to other Functional Blocks	277
TABLE 51: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 2 (TX AIS ENABLE) WITHIN THE TX E3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT E3 FRAMER BLOCK'S ACTION	278
TABLE 52: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 1 (TX LOS) WITHIN THE TX E3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT E3 FRAMER BLOCK'S ACTION	278
5.2.5 The Transmit E3 Line Interface Block	281
Figure 108. Interfacing the XRT72L50 Framer IC to the XRT73L00 DS3/E3/STS-1 LIU	282
Figure 109. The Transmit E3 LIU Interface block	282
5.2.5.1 Selecting the various Line Codes	283
Figure 110. The Behavior of TxPOS and TxNEG signals during data transmission while the Transmit E3 LIU Interface is operating in the Unipolar Mode	283
TABLE 53: THE RELATIONSHIP BETWEEN THE CONTENT OF BIT 3 (UNIPOLAR/BIPOLAR) WITHIN THE UNI I/O CONTROL REGISTER AND THE TRANSMIT E3 FRAMER LINE INTERFACE OUTPUT MODE	284
Figure 111. Illustration of AMI Line Code	284
5.2.5.2 TxLineClk Clock Edge Selection	285
Figure 112. Illustration of two examples of HDB3 Encoding	285
TABLE 54: THE RELATIONSHIP BETWEEN BIT 4 (AMI/HDB3*) WITHIN THE I/O CONTROL REGISTER AND THE BIPOLAR LINE CODE THAT IS OUTPUT BY THE TRANSMIT E3 LIU INTERFACE BLOCK	285
TABLE 55: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 2 (TxLINECLK INV) WITHIN THE I/O CONTROL REGISTER AND THE TxLINECLK CLOCK EDGE THAT TxPOS AND TxNEG ARE UPDATED ON	286
Figure 113. Waveform/Timing Relationship between TxLineClk, TxPOS and TxNEG - TxPOS and TxNEG are configured to be updated on the rising edge of TxLineClk	286
5.2.6 Transmit Section Interrupt Processing	287
5.2.6.1 Enabling Transmit Section Interrupts	287
Figure 114. Waveform/Timing Relationship between TxLineClk, TxPOS and TxNEG - TxPOS and TxNEG are configured to be updated on the falling edge of TxLineClk	287
5.3 THE RECEIVE SECTION OF THE XRT72L50 (E3 MODE OPERATION)	289
Figure 115. The XRT72L50 Receive Section configured to operate in the E3 Mode	289
5.3.1 The Receive E3 LIU Interface Block	290
5.3.1.1 Unipolar Decoding	290
Figure 116. The Receive E3 LIU Interface Block	290
5.3.1.2 Bipolar Decoding	291

Figure 117. Behavior of the RxPOS, RxNEG and RxLineClk signals during data reception of Unipolar Data	291
TABLE 56: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 2 (TXLINECLK INV) WITHIN THE I/O CONTROL REGISTER AND THE TXLINECLK CLOCK EDGE THAT TxPOS AND TxNEG ARE UPDATED ON	291
Figure 118. Interfacing the XRT72L50 Framer IC to the XRT73L00 DS3/E3/STS-1 LIU	292
Figure 119. Illustration of AMI Line Code	292
Figure 120. Illustration of two examples of HDB3 Decoding	293
TABLE 57: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 1 (RXLINECLK INV) OF THE I/O CONTROL REGISTER, AND THE SAMPLING EDGE OF THE RXLINECLK SIGNAL	294
Figure 121. Waveform/Timing Relationship between RxLineClk, RxPOS and RxNEG - When RxPOS and RxNEG are to be sampled on the rising edge of RxLineClk	294
5.3.2 The Receive E3 Framer Block	295
Figure 122. Waveform/Timing Relationship between RxLineClk, RxPOS and RxNEG - When RxPOS and RxNEG are to be sampled on the falling edge of RxLineClk	295
Figure 123. The Receive E3 Framer Block and the Associated Paths to Other Functional Blocks	295
5.3.2.1 The Framing Acquisition Mode	296
Figure 124. The State Machine Diagram for the Receive E3 Framer E3 Frame Acquisition/Maintenance Algorithm	297
Figure 125. Illustration of the E3, ITU-T G.751 Framing Format	297
5.3.2.2 The Framing Maintenance Mode	299
5.3.2.3 Forcing a Reframe via Software Command	300
5.3.2.4 Performance Monitoring of the Frame Synchronization Section, within the Receive E3 Framer block	301
5.3.2.5 The RxOOF and RxLOF output pin.	301
TABLE 58: THE RELATIONSHIP BETWEEN THE LOGIC STATE OF THE RxOOF AND RxLOF OUTPUT PINS, AND THE FRAMING STATE OF THE RECEIVE E3 FRAMER BLOCK	301
5.3.2.6 E3 Receive Alarms	302
5.3.2.7 The Loss of Signal (LOS) Alarm	302
5.3.2.8 The AIS (Alarm Indication Status) Condition	303
5.3.2.9 The Far-End-Receive Failure (FERF) Condition	304
5.3.2.10 Error Checking of the Incoming E3 Frames	305
Figure 126. Illustration of the Local Receive E3 Framer block, receiving an E3 Frame (from the Remote Terminal) with a correct BIP-4 Value.	306
Figure 127. Illustration of the Local Receive E3 Framer block, transmitting an E3 Frame (to the Remote Terminal) with the A bit set to "0"	307
Figure 128. Illustration of the Local Receive E3 Framer block, receiving an E3 Frame (from the Remote Terminal) with an incorrect BIP-4 value.	308
Figure 129. Illustration of the Local Receive E3 Framer block, transmitting an E3 Frame (to the Remote Terminal) with the A bit-field set to "1"	308
5.3.3 The Receive HDLC Controller Block	310
Figure 130. LAPD Message Frame Format	311
TABLE 59: THE RELATIONSHIP BETWEEN THE CONTENTS OF RXLAPDTYPE[1:0] BIT-FIELDS AND THE PMDL MESSAGE TYPE/SIZE	314
5.3.4 The Receive Overhead Data Output Interface	316
Figure 131. Flow Chart depicting the Functionality of the LAPD Receiver	316
5.3.4.1 Method 1 - Using the RxOHClk Clock signal	317
Figure 132. The Receive Overhead Output Interface block	317
Figure 133. The Terminal Equipment being interfaced to the Receive Overhead Data Output Interface (Method 1) .	318
TABLE 60: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE OVERHEAD DATA OUTPUT INTERFACE BLOCK (FOR METHOD 1)	318
TABLE 61: THE RELATIONSHIP BETWEEN THE NUMBER OF RISING CLOCK EDGES IN RxOHCLK, (SINCE RxOHFRAME WAS LAST SAMPLED "HIGH") TO THE E3 OVERHEAD BIT, THAT IS BEING OUTPUT VIA THE RxOH OUTPUT PIN	319
Figure 134. Illustration of the signals that are output via the Receive Overhead Output Interface (for Method 1).	319
TABLE 62: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE OVERHEAD DATA OUTPUT INTERFACE BLOCK (METHOD 2)	320
Figure 135. The Terminal Equipment being interfaced to the Receive Overhead Data Output Interface (Method 2) .	321
TABLE 63: THE RELATIONSHIP BETWEEN THE NUMBER OF RxOHENABLE OUTPUT PULSES (SINCE RxOHFRAME WAS LAST SAMPLED "HIGH") TO THE E3 OVERHEAD BIT, THAT IS BEING OUTPUT VIA THE RxOH OUTPUT PIN	321
5.3.5 The Receive Payload Data Output Interface	322
Figure 136. Illustration of the signals that are output via the Receive Overhead Data Output Interface block (for Method 2).	322
Figure 137. The Receive Payload Data Output Interface block	322
TABLE 64: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE PAYLOAD DATA OUTPUT INTERFACE BLOCK	323
5.3.5.1 Serial Mode Operation Behavior of the XRT72L50	324
Figure 138. The Terminal Equipment being interfaced to the Receive Payload Data Input Interface Block (Serial Mode	

Operation)	324
5.3.5.2 Nibble-Parallel Mode Operation Behavior of the XRT72L50	325
Figure 139. An Illustration of the behavior of the signals between the Receive Payload Data Output Interface block of the XRT72L50 and the Terminal Equipment	325
Figure 140. The XRT72L50 DS3/E3 Framer IC being interfaced to the Receive Section of the Terminal Equipment (Nibble-Parallel Mode Operation)	326
5.3.6 Receive Section Interrupt Processing	327
5.3.6.1 Enabling Receive Section Interrupts	327
Figure 141. Illustration of the signals that are output via the Receive Payload Data Output Interface block (for Nibble-Parallel Mode Operation).	327
5.3.6.2 Enabling/Disabling and Servicing Interrupts	328
6.0 E3/ITU-T G.832 Operation of the XRT72L50	339
6.1 DESCRIPTION OF THE E3, ITU-T G.832 FRAMES AND ASSOCIATED OVERHEAD BYTES	339
6.1.1 Definition of the Overhead Bytes	339
Figure 142. Illustration of the E3, ITU-T G.832 Framing Format.	339
6.1.1.1 Frame Alignment (FA1 and FA2) Bytes	340
6.1.1.2 Error Monitor (EM) Byte	340
6.1.1.3 The Trail-Trace Buffer (TTB) Byte	340
6.1.1.4 Maintenance and Adaptation (MA) Byte	341
TABLE 65: DEFINITION OF THE TRAIL TRACE BUFFER BYTES, WITHIN THE E3, ITU-T G.832 FRAMING FORMAT	341
6.1.1.5 The Network Operator (NR) Byte	342
6.1.1.6 The General Purpose Communications Channel (GC) Byte	342
6.2 THE TRANSMIT SECTION OF THE XRT72L50 (E3 MODE OPERATION)	342
TABLE 66: A LISTING OF THE VARIOUS PAYLOAD TYPE VALUES AND THEIR CORRESPONDING MEANING	342
6.2.1 The Transmit Payload Data Input Interface Block	343
Figure 143. The Transmit Section configured to operate in the E3 Mode	343
Figure 144. The Transmit Payload Data Input Interface Block	344
TABLE 67: LISTING AND DESCRIPTION OF THE PINS ASSOCIATED WITH THE TRANSMIT PAYLOAD DATA INPUT INTERFACE ...	344
6.2.1.1 Mode 1 - The Serial/Loop-Timing Mode	346
Figure 145. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 1 (Serial/Loop-Timed) Operation	346
Figure 146. Behavior of the Terminal Interface signals between the Transmit Payload Data Input Interface block of the XRT72L50 and the Terminal Equipment (for Mode 1 Operation)	347
6.2.1.2 Mode 2 - The Serial/Local-Timed/Frame-Slave Mode Behavior of the XRT72L50	348
Figure 147. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 2 (Serial/Local-Timed/Frame-Slave) Operation	349
6.2.1.3 Mode 3 - The Serial/Local-Timed/Frame-Master Mode Behavior of the XRT72L50	350
Figure 148. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (Mode 2 Operation)	350
Figure 149. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 3 (Serial/Local-Timed/Frame-Master) Operation	351
6.2.1.4 Mode 4 - The Nibble-Parallel/Loop-Timed Mode Behavior of the XRT72L50	352
Figure 150. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (E3 Mode 3 Operation)	352
Figure 151. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 4 (Nibble-Parallel/Loop-Timed) Operation	353
Figure 152. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (Mode 4 Operation)	354
6.2.1.5 Mode 5 - The Nibble-Parallel/Local-Time/Frame-Slave Interface Mode Behavior of the XRT72L50 .	355
Figure 153. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 5 (Nibble-Parallel/Local-Timed/Frame-Slave) Operation	356
6.2.1.6 Mode 6 - The Nibble-Parallel/Local-Timed/Frame-Master Interface Mode Behavior of the XRT72L50	357
Figure 154. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (E3 Mode 5 Operation)	357
Figure 155. The Terminal Equipment being interfaced to the Transmit Payload Data Input Interface block for Mode 6 (Nibble-Parallel/Local-Timed/Frame-Master) Operation	358
6.2.2 The Transmit Overhead Data Input Interface	359
Figure 156. Behavior of the Terminal Interface signals between the XRT72L50 and the Terminal Equipment (E3 Mode 6 Operation)	359
Figure 157. The Transmit Overhead Data Input Interface block	360
TABLE 68: A LISTING OF THE OVERHEAD BITS WITHIN THE E3 FRAME, AND THEIR POTENTIAL SOURCES, WITHIN THE XRT72L50 IC	

361	
6.2.2.1	Method 1 - Using the TxOHClk Clock Signal 363
	TABLE 69: DESCRIPTION OF METHOD 1 TRANSMIT OVERHEAD INPUT INTERFACE SIGNALS 363
	Figure 158. The Terminal Equipment being interfaced to the Transmit Overhead Data Input Interface (Method 1) ... 364
	TABLE 70: THE RELATIONSHIP BETWEEN THE NUMBER OF RISING CLOCK EDGES IN TXOHCLK, (SINCE "TXOHFRAME" WAS LAST SAMPLED "HIGH") TO THE E3 OVERHEAD BIT, THAT IS BEING PROCESSED 365
	Figure 159. Illustration of the signal that must occur between the Terminal Equipment and the XRT72L50, in order to configure the XRT72L50 to transmit a Yellow Alarm to the remote terminal equipment 367
6.2.2.2	Method 2 - Using the TxInClk and TxOHEnable Signals 368
	TABLE 71: DESCRIPTION OF METHOD 1 TRANSMIT OVERHEAD INPUT INTERFACE SIGNALS 368
	Figure 160. The Terminal Equipment being interfaced to the Transmit Overhead Data Input Interface (Method 2) ... 369
	TABLE 72: THE RELATIONSHIP BETWEEN THE NUMBER OF TXOHENABLE PULSES (SINCE THE LAST OCCURRENCE OF THE TXOHFRAME PULSE) TO THE E3 OVERHEAD BIT, THAT IS BEING PROCESSED BY THE XRT72L50 369
6.2.3	The Transmit E3 HDLC Controller 372
6.2.3.1	Message-Oriented Signaling (e.g., LAP-D) processing via the Transmit E3 HDLC Controller ... 372
	Figure 161. Behavior of Transmit Overhead Data Input Interface signals between the XRT72L50 and the Terminal Equipment (for Method 2) 372
	Figure 162. LAPD Message Frame Format 373
	TABLE 73: THE LAPD MESSAGE TYPE AND THE CORRESPONDING VALUE OF THE FIRST BYTE, WITHIN THE INFORMATION PAYLOAD 374
	TABLE 74: RELATIONSHIP BETWEEN TxLAPD MSG LENGTH AND THE LAPD MESSAGE SIZE 375
	Figure 163. Flow Chart depicting how to use the LAPD Transmitter (LAPD Transmitter is configured to re-transmit the LAPD Message frame repeatedly at One-Second intervals) 379
	Figure 164. Flow Chart depicting how to use the LAPD Transmitter (LAPD Transmitter is configured to transmit a LAPD Message frame only once). 380
6.2.4	The Transmit E3 Framer Block 381
6.2.4.1	Brief Description of the Transmit E3 Framer 381
6.2.4.2	Detailed Functional Description of the Transmit E3 Framer Block 382
	Figure 165. The Transmit E3 Framer Block and the associated paths to other Functional Blocks 382
	TABLE 75: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 2 (TX AIS ENABLE) WITHIN THE TX E3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT E3 FRAMER BLOCK'S ACTION 384
	TABLE 76: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 1 (TX LOS) WITHIN THE TX E3 CONFIGURATION REGISTER, AND THE RESULTING TRANSMIT E3 FRAMER BLOCK'S ACTION 384
6.2.5	The Transmit E3 Line Interface Block 386
	Figure 166. Interfacing the XRT72L50 Framer IC to the XRT73L00 DS3/E3/STS-1 LIU 386
	Figure 167. The Transmit E3 LIU Interface block 387
	Figure 168. The Behavior of TxPOS and TxNEG signals during data transmission while the Transmit E3 LIU Interface is operating in the Unipolar Mode 387
6.2.5.1	Selecting the various Line Codes 388
	TABLE 77: THE RELATIONSHIP BETWEEN THE CONTENT OF BIT 3 (UNIPOLAR/BIPOLAR) WITHIN THE UNI I/O CONTROL REGISTER AND THE TRANSMIT E3 FRAMER LINE INTERFACE OUTPUT MODE 388
	Figure 169. Illustration of AMI Line Code 389
	Figure 170. Illustration of two examples of HDB3 Encoding 389
6.2.5.2	TxLineClk Clock Edge Selection 390
	TABLE 78: THE RELATIONSHIP BETWEEN BIT 4 (AMI/HDB3*) WITHIN THE I/O CONTROL REGISTER AND THE BIPOLAR LINE CODE THAT IS OUTPUT BY THE TRANSMIT E3 LIU INTERFACE BLOCK 390
	TABLE 79: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 2 (TxLINECLK INV) WITHIN THE I/O CONTROL REGISTER AND THE TxLINECLK CLOCK EDGE THAT TxPOS AND TxNEG ARE UPDATED ON 390
6.2.6	Transmit Section Interrupt Processing 391
6.2.6.1	Enabling Transmit Section Interrupts 391
	Figure 171. Waveform/Timing Relationship between TxLineClk, TxPOS and TxNEG - TxPOS and TxNEG are configured to be updated on the rising edge of TxLineClk 391
	Figure 172. Waveform/Timing Relationship between TxLineClk, TxPOS and TxNEG - TxPOS and TxNEG are configured to be updated on the falling edge of TxLineClk 391
6.3	THE RECEIVE SECTION OF THE XRT72L50 (E3 MODE OPERATION) 393
6.3.1	The Receive E3 LIU Interface Block 394
	Figure 173. The XRT72L50 Receive Section configured to operate in the E3 Mode 394
6.3.1.1	Unipolar Decoding 395
	Figure 174. The Receive E3 LIU Interface Block 395
	Figure 175. Behavior of the RxPOS, RxNEG and RxLineClk signals during data reception of Unipolar Data 395
6.3.1.2	Bipolar Decoding 396
	TABLE 80: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 3 (UNIPOLAR/BIPOLAR) WITHIN THE I/O CONTROL REGISTER 396

Figure 176. Interfacing the XRT72L50 Framer IC to the XRT73L00 DS3/E3/STS-1 LIU	396
Figure 177. Illustration of AMI Line Code	397
Figure 178. Illustration of two examples of HDB3 Decoding	398
TABLE 81: THE RELATIONSHIP BETWEEN THE CONTENTS OF BIT 1 (RXLINECLK INV) OF THE I/O CONTROL REGISTER, AND THE SAMPLING EDGE OF THE RXLINECLK SIGNAL	399
Figure 179. Waveform/Timing Relationship between RxLineClk, RxPOS and RxNEG - When RxPOS and RxNEG are to be sampled on the rising edge of RxLineClk	399
Figure 180. Waveform/Timing Relationship between RxLineClk, RxPOS and RxNEG - When RxPOS and RxNEG are to be sampled on the falling edge of RxLineClk	399
6.3.2 The Receive E3 Framer Block	400
6.3.2.1 The Framing Acquisition Mode	400
Figure 181. The Receive E3 Framer Block and the Associated Paths to Other Functional Blocks	400
Figure 182. The State Machine Diagram for the Receive E3 Framer E3 Frame Acquisition/Maintenance Algorithm ..	401
Figure 183. Illustration of the E3, ITU-T G.832 Framing Format	402
6.3.2.2 The Framing Maintenance Mode	404
6.3.2.3 Forcing a Reframe via Software Command	405
6.3.2.4 Performance Monitoring of the Frame Synchronization Section, within the Receive E3 Framer block	406
6.3.2.5 The RxOOF and RxLOF output pin.	406
6.3.2.6 E3 Receive Alarms	406
TABLE 82: THE RELATIONSHIP BETWEEN THE LOGIC STATE OF THE RXOOF AND RXLOF OUTPUT PINS, AND THE FRAMING STATE OF THE RECEIVE E3 FRAMER BLOCK	406
6.3.2.7 Error Checking of the Incoming E3 Frames	410
Figure 184. Illustration of the Local Receive E3 Framer block, receiving an E3 Frame (from the Remote Terminal) with a correct EM Byte.	411
Figure 185. Illustration of the Local Receive E3 Framer block, transmitting an E3 Frame (to the Remote Terminal) with the FEBE bit (within the MA byte-field) set to "0"	411
Figure 186. Illustration of the Local Receive E3 Framer block, receiving an E3 Frame (from the Remote Terminal) with an incorrect EM Byte.	412
Figure 187. Illustration of the Local Receive E3 Framer block, transmitting an E3 Frame (to the Remote Terminal) with the FEBE bit (within the MA byte-field) set to "1"	413
6.3.2.8 Processing of the Far-End-Block Error (FEBE) Bit-fields	414
6.3.2.9 Receiving the Trail Trace Buffer Messages	415
6.3.3 The Receive HDLC Controller Block	415
Figure 188. LAPD Message Frame Format	416
TABLE 83: THE RELATIONSHIP BETWEEN THE CONTENTS OF RXLAPDTYPE[1:0] BIT-FIELDS AND THE PMDL MESSAGE TYPE/SIZE	420
6.3.4 The Receive Overhead Data Output Interface	422
Figure 189. Flow Chart depicting the Functionality of the LAPD Receiver	422
6.3.4.1 Method 1 - Using the RxOHClk Clock signal	423
Figure 190. The Receive Overhead Output Interface block	423
Figure 191. The Terminal Equipment being interfaced to the Receive Overhead Data Output Interface (Method 1) .	424
TABLE 84: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE OVERHEAD DATA OUTPUT INTERFACE BLOCK	424
TABLE 85: THE RELATIONSHIP BETWEEN THE NUMBER OF RISING CLOCK EDGES IN RxOHCLK, (SINCE RxOHFRAME WAS LAST SAMPLED "HIGH") TO THE E3 OVERHEAD BIT, THAT IS BEING OUTPUT VIA THE RxOH OUTPUT PIN	425
6.3.4.2 Method 2 - Using RxOutClk and the RxOHEnable signals	427
Figure 192. Illustration of the signals that are output via the Receive Overhead Output Interface (for Method 1).	427
TABLE 86: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE OVERHEAD DATA OUTPUT INTERFACE BLOCK (METHOD 2)	428
Figure 193. The Terminal Equipment being interfaced to the Receive Overhead Data Output Interface (Method 2) .	428
TABLE 87: THE RELATIONSHIP BETWEEN THE NUMBER OF RxOHENABLE OUTPUT PULSES (SINCE RxOHFRAME WAS LAST SAMPLED "HIGH") TO THE E3 OVERHEAD BIT, THAT IS BEING OUTPUT VIA THE RxOH OUTPUT PIN	429
6.3.5 The Receive Payload Data Output Interface	431
Figure 194. Illustration of the signals that are output via the Receive Overhead Data Output Interface block (for Method 2).	431
Figure 195. The Receive Payload Data Output Interface block	431
TABLE 88: LISTING AND DESCRIPTION OF THE PIN ASSOCIATED WITH THE RECEIVE PAYLOAD DATA OUTPUT INTERFACE BLOCK	432
6.3.5.1 Serial Mode Operation Behavior of the XRT72L50	433
Figure 196. The Terminal Equipment being interfaced to the Receive Payload Data Input Interface Block (Serial Mode Operation)	433
6.3.5.2 Nibble-Parallel Mode OperationBehavior of the XRT72L50	434
Figure 197. An Illustration of the behavior of the signals between the Receive Payload Data Output Interface block of the	

<i>XRT72L50 and the Terminal Equipment</i>	434
<i>Figure 198. The XRT72L50 DS3/E3 Framer IC being interfaced to the Receive Section of the Terminal Equipment (Nibble-Parallel Mode Operation)</i>	435
6.3.6 Receive Section Interrupt Processing	436
<i>Figure 199. Illustration of the signals that are output via the Receive Overhead Data Output Interface block (for Method 2).</i> 436	
6.3.6.1 Enabling Receive Section Interrupts	437
6.3.6.2 Enabling/Disabling and Servicing Interrupts	437
7.0 diagnostic operation of the xrt72L50 framer ic	450
<i>Figure 200. The Framer Local Loop-back Path within the XRT72L50 DS3/E3 Framer IC</i>	450
8.0 High Speed HDLC Controller Mode of Operation	451
8.1 CONFIGURING THE XRT72L50 TO OPERATE IN THE HIGH SPEED HDLC CONTROLLER MODE	451
8.2 OPERATING THE HIGH SPEED HDLC CONTROLLER	452
8.2.1 Operating the Transmit HDLC Controller Block	452
TABLE 89: DESCRIPTION OF EACH OF THE TRANSMIT HDLC CONTROLLER PIN	452
<i>Figure 201. TxHDLC timing for CRC16</i>	453
<i>Figure 202. TxHDLC timing for CRC32</i>	454
<i>Figure 203. An Outbound HDLC Frame when CRC-32 is selected.</i>	454
<i>Figure 204. An Outbound HDLC Frame when CRC-16 is selected</i>	454
8.2.2 Operating the Receive HDLC Controller Block	455
8.2.2.1 Receive Payload HDLC Processor	455
TABLE 90: DESCRIPTION OF EACH OF THE RECEIVE HDLC CONTROLLER PINS	455
<i>Figure 205. Timing Diagram for RxHDLC Operation</i>	456
ORDERING INFORMATION	457
PACKAGE DIMENSIONS	457
REVISION HISTORY	458

PIN DESCRIPTIONS

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
1	TDO	O	Test Data Out: Boundary Scan test data output.
2	TDI	I	Test Data In: Boundary Scan Test data input.
3	VDD	****	Power Supply 3.3V ± 5%
4	TRST	I	JTAG Reset Pin: Resets Boundary Scan Logic.
5	GND	****	Ground
6	RDY_DTCK	O	<p>READY or DTACK: This active-low output pin will function as the READY output, when the microprocessor interface is running in the Intel Mode; and will function as the DTACK output, when the microprocessor interface is running in the Motorola Mode.</p> <p>Intel Mode - READY Output: When the Framer negates this output pin (e.g., toggles it "Low"), it indicates (to the μP) that the current READ or WRITE cycle is completed.</p> <p>Motorola Mode - DTACK (Data Transfer Acknowledge) Output: The Framer device will assert this pin in order to inform the local microprocessor that the present READ or WRITE cycle is nearly complete. If the Framer device requires that the current READ or WRITE cycle be extended, then the Framer will delay its assertion of this signal. The 68000 family of μPs requires this signal from its peripheral devices, in order to quickly and properly complete a READ or WRITE cycle.</p>
7	WR $\overline{R\overline{W}}$	I	<p>Write Data Strobe (Intel Mode): If the microprocessor interface is operating in the Intel Mode, then this active-low input pin functions as the WR (Write Strobe) input signal from the μP. Once this active-low signal is asserted, then the Framer will latch the contents of the μP Data Bus, into the addressed register (or RAM location) within the Framer IC. In the Intel Mode, data gets latched on the rising edge of WR</p> <p>R/W Input Pin (Motorola Mode): When the Microprocessor Interface is operating in the Motorola Mode, this pin is functionally equivalent to the R\overline{W} pin. In the Motorola Mode, a READ operation occurs if this pin is at a logic "1". Similarly, a WRITE operation occurs if this pin is at a logic "0".</p>
8	\overline{CS}	I	<p>Chip Select Input: This active-low input signal selects the Microprocessor Interface Section of the Framer device and enables READ/WRITE operations between the Local Microprocessor and the Framer on-chip registers and RAM locations.</p>
9	ALE_AS	I	<p>Address Latch Enable/Address Strobe: This input is used to latch the address (present at the Microprocessor Interface Address Bus, A(8:0)) into the Framer Microprocessor Interface circuitry and to indicate the start of a READ/WRITE cycle. This input is active-high in the Intel Mode (MOTO = "Low") and active-low in the Motorola Mode (MOTO = "High").</p>

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
10	$\overline{RD_DS}$	I	<p>Read Data Strobe (Intel Mode): If the microprocessor interface is operating in the Intel Mode, then this input will function as the RD (READ STROBE) input signal from the local μP. Once this active-low signal is asserted, then the Framer will place the contents of the addressed registers (within the Framer) on the Microprocessor Data Bus (D(7:0)). When this signal is negated, the Data Bus will be tri-stated.</p> <p>Data Strobe (Motorola Mode): If the microprocessor interface is operating in the Motorola mode, then this pin will function as the active-low Data Strobe signal.</p>
11	TCK	I	Test Clock: Boundary Scan clock input.
12	TMS	I	Test Mode Select: Boundary Scan Mode Select input.
13	\overline{Int}	O	<p>Interrupt Request Output: This open-drain, active-low output signal will be asserted when the Framer device is requesting interrupt service from the local microprocessor. This output pin should typically be connected to the Interrupt Request input of the local microprocessor.</p>
14	GND	****	Ground
15	A(0)	I	<p>Address Bus Input (Microprocessor Interface) - LSB (Least Significant Bit): (Please see description for A(8) pin 23)</p>
16	A(1)	I	<p>Address Bus Input (Microprocessor Interface) - Bit 7 See description of pin 23</p>
17	A(2)	I	<p>Address Bus Input (Microprocessor Interface) - Bit 7 See description of pin 23</p>
18	A(3)	I	<p>Address Bus Input (Microprocessor Interface) - Bit 7 See description of pin 23</p>
19	A(4)	I	<p>Address Bus Input (Microprocessor Interface) - Bit 7 See description of pin 23</p>
20	A(5)	I	<p>Address Bus Input (Microprocessor Interface) - Bit 7 See description of pin 23</p>
21	A(6)	I	<p>Address Bus Input (Microprocessor Interface) - Bit 7 See description of pin 23</p>
22	A(7)	I	<p>Address Bus Input (Microprocessor Interface) - Bit 7 See description of pin 23</p>
23	A(8)	I	<p>Address Bus Input (Microprocessor Interface) - MSB (Most Significant Bit): This input pin, along with inputs A0 - A7 are used to select the on-chip Framer register and RAM space for READ/WRITE operations with the local microprocessor.</p>
24	VDD	****	Power Supply 3.3V \pm 5%

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
25	NibIntf	I	<p>Nibble Interface Select Input Pin:</p> <p>This input pin allows the user to configure the Transmit Payload Data Input Interface and the Receive Payload Data Output Interface to operate in either the Serial-Mode or the Nibble/Parallel-Mode.</p> <p>Setting this input pin "High" configures the Transmit and Receive Terminal Interfaces to operate in the Nibble/Parallel-Mode. In this mode, the Transmit Payload Data Input Interface block will accept the outbound payload data (from the Terminal Equipment) in a nibble-parallel manner via the TxNib[3:0] input pins. Further, the Receive Payload Data Output Interface block will output the inbound payload data (to the Terminal Equipment) in a nibble-parallel manner via the RxNib[3:0] output pin. HDLC mode of operation requires Nibble/Parallel mode setup.</p> <p>Setting this input pin "Low" configures the Transmit and Receive Terminal Interfaces to operate in the Serial Mode. In this mode, the Transmit Payload Data Input Interface block will accept the outbound payload data (from the Terminal Equipment) in a serial manner via the TxSer input pin. Further, the Receive Payload Data Output Interface block will output the inbound payload data (to the Terminal Equipment) in a serial manner via the RxSer output pin.</p>
26	GND	****	Ground
27	MOTO	I	<p>Motorola/Intel Processor Interface Select Mode:</p> <p>This input pin allows the user to configure the Microprocessor Interface to interface with either a Motorola-type or Intel-type microprocessor/microcontroller. Tying this input pin to VCC, configures the microprocessor interface to operate in the Motorola mode (e.g., the Framer device can be readily interfaced to a Motorola type local microprocessor). Tying this input pin to GND configures the Microprocessor Interface to operate in the Intel Mode (e.g., the Framer device can be readily interfaced to a Intel type local microprocessor).</p>
28	<u>Reset</u>	I	<p>Reset Input:</p> <p>When this active-low signal is asserted, the Framer device will be asynchronously reset. Additionally, all outputs will be tri-stated, and all on-chip registers will be reset to their default values.</p>
29	TestMode	***	<p>Factory Test Pin:</p> <p>The user should tie this pin to Ground.</p>
30	VDD	****	Power Supply 3.3V ± 5%
31	GND	****	Ground
32	D(0)	I/O	<p>Bit 0 of Bi-Directional Data Bus (Microprocessor Interface Section):</p> <p>See description of pin 39 D(7)</p>
33	D(1)	I/O	<p>Bit 1 of Bi-Directional Data Bus (Microprocessor Interface Section):</p> <p>See description of pin 39 D(7)</p>
34	D(2)	I/O	<p>Bit 2 of Bi-Directional Data Bus (Microprocessor Interface Section):</p> <p>See description of pin 39 D(7)</p>
35	D(3)	I/O	<p>Bit 3 of Bi-Directional Data Bus (Microprocessor Interface Section):</p> <p>See description of pin 39 D(7)</p>
36	D(4)	I/O	<p>Bit 4 of Bi-Directional Data Bus (Microprocessor Interface Section):</p> <p>See description of pin 39 D(7)</p>

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
37	D(5)	I/O	Bit 5 of Bi-Directional Data Bus (Microprocessor Interface Section): See description of pin 39 D(7)
38	D(6)	I/O	Bit 6 of Bi-Directional Data Bus (Microprocessor Interface Section): See description of pin 39 D(7)
39	D(7)	I/O	MSB of Bi-Directional Data Bus (Microprocessor Interface Section): This pin, along with pins D0 - D6, function as the Microprocessor Interface bi-directional data bus, and is intended to be interfaced to the local microprocessor.
40	VDD	****	Power Supply 3.3V ± 5%
41	TxFramRef	I	Transmit Framer Reference Input: This input pin functions as the Transmit Frame Generation reference signal, if the XRT72L50 has been configured to operate in the Local-Time/Frame Slave Mode. If the XRT72L50 has been configured to operate in the Local-Time/Frame-Slave Mode, then the user's terminal equipment is expected to apply a pulse (to this input pin) once every 106.4 microseconds (for DS3 applications); once every 125 microseconds (for E3, ITU-T G.832 applications) or once every 44.7 microseconds (for E3, ITU-T G.751 applications). In the Local-Time/Frame-Slave Mode, the Transmit Section of the XRT72L50 Framers IC will initiate its generation of a new outbound DS3 or E3 frame, upon the rising edge of this signal. NOTE: The user can configure the XRT72L50 Framers IC to operate in the Local Time/Frame Slave Mode by writing xxxx xx01 into the Framers Operating Mode Register (Address = 0x00).
42	GND	****	Ground
43	TxInClk	I	Transmit Framers Reference Clock Input: This input pin functions as the Timing Reference for the Transmit Section of the XRT72L50 Framers IC; if the device has been configured to operate in the Local-Time Mode. Further, if the XRT72L50 Framers IC has been configured to operate in the Local-Time Mode, the Transmit Payload Data Input Interface will sample the data at the TxSer input pin, upon the rising edge of TxInClk. For E3 applications, the user should apply a 34.368MHz clock signal. For DS3 applications, the user should apply a 44.736MHz clock signal. The user can configure the XRT72L50 Framers IC to operate in the Local-Time mode by writing xxxx xx01 or xxxx xx1x into the Framers Operating Mode register (Address = 0x00)
44	TxAISEn	I	Transmit AIS Command Input: Setting this input pin "High" configures the Transmit Section to generate and transmit an AIS Pattern. Setting this input pin "Low" configures the Transmit Section to generate E3 or DS3 traffic in a normal manner.

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
45	TxSer/ SndMsg	I	<p>Transmit Serial Payload Data Input Pin: The Terminal Equipment is expected to input data, that is intended to be transmitted to the remote terminal, over an E3 or DS3 transport medium. The Framers IC will take data, applied to this pin, and insert it into an outbound E3 or DS3 frame.</p> <p>If the XRT72L50 Framers IC has been configured to operate in the Local Time Mode, then it will sample the data (on this pin) upon the rising edge of TxInClk. If the XRT72L50 Framers IC has been configured to operate in the Loop-Time Mode, then it will sample the data (on this pin) upon the rising edge of RxOutClk.</p> <p>NOTE: <i>This input pin is active only if the Serial Mode has been selected.</i></p> <p>Send Message: This input is to remain "High" during the entire duration of the HDLC packet (including FCS bytes) to be transmitted, when the HDLC controller is turned on.</p>
46	TxNib0/ TxHDLCData0	I	<p>Transmit Nibble-Parallel Payload Data Input -0: The Terminal Equipment is expected to input data, that is intended to be transmitted to the remote terminal, over an E3 or DS3 transport medium. The Framers IC will take data, applied to this pin (along with TxNib1, TxNib2, and TxNib3), and insert it into an outbound E3 or DS3 frame. The XRT72L50 will sample the data that is at these input pins, upon the rising edge of the TxNibClk signal.</p> <p>NOTE: <i>This input pin is active only if the Nibble-Parallel Mode has been selected.</i></p> <p>Transmit HDLC Data Input - 0: This pin accepts bit 0 TxHDLC data when the HDLC controller is turned on.</p>
47	TxNib1/ TxHDLCData1	I	<p>Transmit Nibble-Parallel Payload Data Input -1: The Terminal Equipment is expected to input data, that is intended to be transmitted to the remote terminal, over an E3 or DS3 transport medium. The Framers IC will take data, applied to this pin, and insert it into an outbound E3 or DS3 frame. The XRT72L50 will sample the data that is at these input pins, upon the rising edge of the TxNibClk signal.</p> <p>NOTE: <i>This input pin is active only if the Nibble-Parallel Mode has been selected.</i></p> <p>Transmit HDLC Data Input - 1: This pin accepts bit 1 TxHDLC data when the HDLC controller is turned on.</p>
48	TxNib2/ TxHDLCData2	I	<p>Transmit Nibble-Parallel Payload Data Input -2: The Terminal Equipment is expected to input data, that is intended to be transmitted to the remote terminal, over an E3 or DS3 transport medium. The Framers IC will take data, applied to this pin, and insert it into an outbound E3 or DS3 frame. The XRT72L50 will sample the data that is at these input pins, upon the rising edge of the TxNibClk signal.</p> <p>NOTE: <i>This input pin is active only if the Nibble-Parallel Mode has been selected.</i></p> <p>Transmit HDLC Data Input - 2: This pin accepts bit 2 TxHDLC data when the HDLC controller is turned on.</p>

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
49	TxNib3/ TxHDLCDat3	I	<p>Transmit Nibble-Parallel Payload Data Input -3: The Terminal Equipment is expected to input data, that is intended to be transmitted to the remote terminal, over an E3 or DS3 transport medium. The Framer IC will take data, applied to this pin (along with TxNib1, TxNib2, and TxNib3), and insert it into an outbound E3 or DS3 frame. The XRT72L50 will sample the data that is at these input pins, upon the rising edge of the TxNib-Clk signal.</p> <p><i>NOTE: This input pin is active only if the Nibble-Parallel Mode has been selected.</i></p> <p>Transmit HDLC Data Input - 3: This pin accepts bit 3 TxHDLCDat3 data when the HDLC controller is turned on.</p>
50	GND	****	Ground
51	VDD	****	Power Supply 3.3V ± 5%
52	TxOHCik	O	<p>Transmit Overhead Clock: This output signal serves two purposes:</p> <ol style="list-style-type: none"> 1. The Transmit Overhead Data Input Interface block will provide a rising clock edge on this signal, one bit-period prior to the start to the instant that the Transmit Overhead Data Input Interface block is processing an overhead bit. 2. The Transmit Overhead Data Input Interface will sample the data at the TxOH input pin, on the falling edge of this clock signal (provided that the TxOHIns input pin is "High"). <p><i>NOTE: The Transmit Overhead Data Input Interface block will supply a clock edge for all overhead bits within the DS3 or E3 frame (via the TxOHCik output signal). This includes those overhead bits that the Transmit Overhead Data Input Interface will not accept from the Terminal Equipment.</i></p>
53	TxOHIns/ TxHDLCDat4	I	<p>Transmit Overhead Data Insert Input: Asserting this input signal (e.g., setting it "High") enables the Transmit Overhead Data Input Interface to accept overhead data from the Terminal Equipment. In other words, while this input pin is "High", the Transmit Overhead Data Input Interface will sample the data at the TxOH input pin, on the falling edge of the TxOHCik output signal.</p> <p>Conversely, setting this pin "Low" configures the Transmit Overhead Data Input Interface to NOT sample (e.g., ignore) the data at the TxOH input pin, on the falling edge of the TxOHCik output signal.</p> <p><i>NOTE: If the Terminal Equipment attempts to insert an overhead bit that cannot be accepted by the Transmit Overhead Data Input Interface (e.g., if the Terminal Equipment asserts the TxOHIns signal, at a time when one of these non-insertable overhead bits are being processed); that particular insertion effort will be ignored.</i></p> <p>Transmit HDLC Data Input - 4: This pin accepts bit 4 TxHDLCDat4 data when the HDLC controller is turned on.</p>

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
54	TxOH/ TxHDLCdat5	I	<p>Transmit Overhead Input Pin: The Transmit Overhead Data Input Interface accepts the overhead data via this input pin, and inserts into the overhead bit position within the very next outbound DS3 or E3 frame. If the TxOHIns pin is pulled "High", the Transmit Overhead Data Input Interface will sample the data at this input pin (TxOH), on the falling edge of the TxOHClk output pin. Conversely, if the TxOHIns pin is pulled "Low", then the Transmit Overhead Data Input Interface will NOT sample the data at this input pin (TxOH). Consequently, this data will be ignored.</p> <p>Transmit HDLC Data Input - 5: This pin accepts bit 5 TxHDLC data when the HDLC controller is turned on.</p>
55	TxOHInd/ TxHDLCdat6	O I	<p>Transmit Overhead Data Indicator: This output pin will pulse "High" one-bit period prior to the time that the Transmit Section of the XRT72L50 will be processing an Overhead bit. The purpose of this output pin is to warn the Terminal Equipment that, during the very next bit-period, the XRT72L50 is going to be processing an Overhead bit and will be ignoring any data that is applied to the TxSer input pin.</p> <p><i>NOTE: For DS3 applications, this output pin is only active if the XRT72L50 is operating in the Serial Mode. This output pin will be pulled "Low" if the device is operating in the Nibble-Parallel Mode.</i></p> <p>Transmit HDLC Data Input - 6: This pin accepts bit 6 TxHDLC data when the HDLC controller is turned on.</p>
56	TxOHEnable/ TxHDLCdat7	O I	<p>Transmit Overhead Input Enable: The XRT72L50 will assert this signal, for one TxInClk period, just prior to the instant that the Transmit Overhead Data Input Interface will be sampling and processing an overhead bit.</p> <p>If the Terminal Equipment intends to insert its own value for an overhead bit, into the outbound DS3 or E3 frame, it is expected to sample the state of this signal, upon the falling edge of TxInClk. Upon sampling the TxOHEnable "High", the Terminal Equipment should (1) place the desired value of the overhead bit, onto the TxOH input pin and (2) assert the TxOHIns input pin. The "Transmit Overhead Data Input Interface" block will sample and latch the data on the TxOH signal, upon the rising edge of the very next TxInClk input signal.</p> <p>Transmit HDLC Data Input - 7: This pin accepts bit 7 TxHDLC data when the HDLC controller is turned on.</p>
57	TxOHFrame/ TxHDLCclk	O	<p>Transmit Overhead Framing Pulse: This output pin pulses "High" when the Transmit Overhead Data Input Interface block is expecting the first Overhead bit, within a DS3 or E3 frame to be applied to the TxOH input pin.</p> <p>This pin is "High" for one clock period of TxOHClk.</p> <p>Transmit HDLC Output Clock: When the HDLC controller is on, TxHDLCdat is updated by the 72L53 by this clock signal.</p>

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
58	TxNibFrame/ ValFCS	O	<p>Transmit Frame Boundary Indicator - Nibble/Parallel Interface: This output pin pulses "High" when the last nibble of a given DS3 or E3 frame is expected at the TxNib[3:0] input pins. The purpose of this output pin is to alert the Terminal Equipment that it needs to begin transmission of a new DS3 or E3 frame to the XRT72L50.</p> <p>Valid Frame Check Sequence: When the HDLC is on, this pin will go "High" at the end of a valid Frame Check Sequence.</p>
59	TxNibClk/ SndFCS	O I	<p>Transmit Nibble Clock Signal: If the user opts to operate the XRT72L50 in the Nibble-Parallel mode, then the XRT72L50 will derive this clock signal from either the TxInClk or the RxLineClk signal (depending upon which signal is selected as the timing reference). The user is advised to configure the Terminal Equipment to output the outbound payload data (to the XRT72L50 Framer IC) onto the Tx-Nib[3:0] input pins, upon the rising edge of this clock signal.</p> <p>NOTES:</p> <ol style="list-style-type: none"> 1. For DS3 applications, the XRT72L50 Framer IC will output 1176 clock edges (to the Terminal Equipment) for each outbound DS3 frame. 2. For E3, ITU-T G.832 applications, the XRT72L50 Framer IC will output 1074 clock edges (to the Terminal Equipment) for each outbound E3 frame. 3. For E3, ITU-T G.751 applications, the XRT72L50 Framer IC will output 384 clock edges (to the Terminal Equipment) for each outbound E3 frame. <p>Send Frame Check Sequence: When the HDLC controller is turned on, this pin is driven "High" during the time when FCS bytes are being sent after a valid HDLC message.</p>
60	GND	****	Ground
61	TxFrame	O	<p>Transmit End of DS3 or E3 Frame Indicator: The Transmit Section of the XRT72L50 will pulse this output pin "High" (for one bit-period), when the Transmit Payload Data Input Interface is processing the last bit of a given DS3 or E3 frame. The purpose of this output pin is to alert the Terminal Equipment that it needs to begin transmission of a new DS3 or E3 frame to the XRT72L50 (e.g., to permit the XRT72L50 to maintain Transmit DS3/E3 framing alignment control over the Terminal Equipment).</p>
62	VDD	****	Power Supply 3.3V ± 5%
63	TxLineClk	O	<p>Transmit Line Interface Clock: This clock signal is output to the Line Interface Framer, along with the TxPOS and TxNEG signals. The purpose of this output clock signal is to provide the LIU with timing information that it can use to generate the AMI pulses and deliver them over the transmission medium to the Far-End Receiver. The user can configure the source of this clock to be either the RxLineClk (from the Receiver portion of the Framer) or the TxInClk input. The nominal frequency of this clock signal is 34.368 MHz.</p>

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
64	TxNEG	O	<p>Transmit Negative Polarity Pulse: The exact role of this output pin depends upon whether the Framer is operating in the Unipolar or Bipolar Mode.</p> <p>Unipolar Mode: This output signal pulses "High" for one bit period, at the end of each outbound DS3 or E3 frame. This output signal is at a logic "Low" for all of the remaining bit-periods of the outbound DS3 or E3 frames</p> <p>Bipolar Mode: This output pin functions as one of the two dual-rail output signals that commands the sequence of pulses to be driven on the line. TxPOS is the other output pin. This input is typically connected to the TNDATA input of the external DS3/E3 Line Interface Unit IC. When this output is asserted, it will command the LIU to generate a negative polarity pulse on the line.</p>
65	TxPOS	O	<p>Transmit Positive Polarity Pulse: The exact role of this output pin depends upon whether the Framer is operating in the Unipolar or Bipolar Mode.</p> <p>Unipolar Mode: This output pin functions as the Single-Rail output signal for the outbound DS3 or E3 data stream. The signal, at this output pin, will be updated on the user-selected edge of the TxLineClk signal.</p> <p>Bipolar Mode: This output pin functions as one of the two dual rail output signals that commands the sequence of pulses to be driven on the line. TxNEG is the other output pin. This input is typically connected to the TPDATA input of the external DS3 or E3 Line Interface Unit IC. When this output is asserted, it will command the LIU to generate a positive polarity pulse on the line</p>
66	ENCODIS	O	<p>Encoder (HDB3) Disable Output pin (intended to be connected to the XRT73L00 DS3/E3 Line Interface Unit IC): This output pin is intended to be connected to the ENDECDIS input pin of the XRT73L00 DS3/E3 Line Interface Unit IC when the device is being used in Hardware mode. The user can control the state of this output pin by writing a "0" or "1" to Bit 3 (Encodis) within the Line Interface Driver Register (Address = 0x80). If the user commands this signal to toggle "High" then it will disable the B3ZS/HDB3 encoder circuitry within the XRT73L00 IC. Conversely, if the user commands this output signal to toggle "Low", then the B3ZS/HDB3 Encoder circuitry, within the XRT73L00 IC will be enabled.</p> <p>The user is advised to disable the B3ZS/HDB3 encoder (within the XRT73L00 IC) if the XRT72L50 Framer IC has been configured to operate in the B3ZS/HDB3 line code.</p> <p>NOTE: <i>If the customer is not using the XRT73L00 DS3/E3 Line Interface Unit IC, then this output pin may be used for other purposes.</i></p>

PIN DESCRIPTION

PIN #	PIN NAME	TYPE	DESCRIPTION
67	TxLEV	O	<p>Transmit Line Build-Out Enable/Disable Select Output (to be connected to the XRT73L00 DS3/E3 Line Interface Unit IC):</p> <p>This output pin is intended to be connected to the TxLev input pin of the XRT73L00 DS3/E3 Line Interface Unit IC. The user can control the state of this output pin by writing a "0" or a "1" to Bit 2 (TxLev) within the Line Interface Driver Register (Address = 0x80).</p> <p>For DS3 Application:</p> <p>If the user commands this signal to toggle "High" then the Transmit Line Build-Out circuit (within the XRT73L00) will be disabled. In this mode, the XRT73L00 will output unshaped (e.g., square) pulses onto the line (via the TTIP and TRING output pins).</p> <p>Conversely, if the user commands this signal to toggle "Low" then the Transmit Line Build-Out circuit (within the XRT73L00) will be disabled. In this mode, the XRT73L00 will output shaped (e.g., more rounded) pulses onto the line (via the TTIP and TRING output pins).</p> <p>In order to comply with the DSX-3 Isolated Pulse Template Requirement (per Bellcore GR-499-CORE), the user is advised to command this output pin to be "High" if the cable length (between the transmit output of the XRT73L00 and the DSX-3 Cross-Connect System) is greater than 225 feet. Conversely, the user is advised to command this output pin to be "Low" if the cable length (between the transmit output of the XRT73L00 and the DSX-3 Cross Connect System) is less than 225 feet.</p> <p>For E3 Applications:</p> <p>This pin can be used as a General Purpose Output pin. The Transmit Line Build-Out circuitry (within the XRT73L00) is not active for E3 applications.</p> <p>NOTE: If the customer is not using the XRT73L00 DS3/E3 Line Interface Unit IC, then this output pin may be used for other purposes.</p>
68	TAOS	O	<p>Transmit All Ones Signal (TAOS) Command (for the XRT73L00 Line Interface Unit IC):</p> <p>This output pin is intended to be connected to the TAOS input pin of the XRT73L00 DS3/E3 Line Interface Unit IC. The user can control the state of this output pin by writing a '0' or '1' to Bit 4 (TAOS) of the Line Interface Drive Register (Address = 0x80). If the user commands this signal to toggle "High" then it will force the XRT73L00 Line Interface Unit IC to transmit an "All Ones" pattern onto the line. Conversely, if the user commands this output signal to toggle "Low" then the XRT73L00 DS3/E3 Line Interface Unit IC will proceed to transmit data based upon the pattern that it receives via the TxPOS and TxNEG output pins.</p> <p>NOTE: If the customer is not using the XRT73L00 DS3/E3 Line Interface Unit IC, then this output pin may be used for other purposes.</p>
69	LLOOP	O	<p>Local Loopback Output Pin (to the XRT73L00 DS3/E3 Line Interface Unit IC):</p> <p>This output pin is intended to be connected to the LLOOP input pin of the XRT73L00 LIU IC. The user can command this signal to toggle "High" and, in turn, force the LIU into the Local Loop-back mode. (For a detailed description of the XRT73L00 DS3/E3 Line Interface Unit IC's operation during Local Loopback, please see the XRT73L00 DS3/STS-1/E3 Line Interface Unit IC's Data Sheet).</p> <p>NOTE: If the customer is not using the XRT73L00 DS3/E3 Line Interface Unit IC, then this output pin may be used for other purposes.</p>