THREE-CHANNEL E3/DS3/STS-1 LINE INTERFACE UNIT WITH JITTER ATTENUATOR

JUNE 2001 *REV. P1.0.4*

GENERAL DESCRIPTION

The XRT75L03 is a Three-Channel fully integrated Line Interface Unit (LIU) and Jitter Attenuator for E3/DS3/STS-1 applications. It incorporates three independent Receivers, Transmitters and Jitter Attenuators in a single 128-Lead TQFP package.

The XRT75L03 transmits shaped waveforms meeting the G.703, T1.102 and Bellcore GR-499 and GR-253 specifications. Each channel has an independent programmable pulse shaper that can be set to meet or exceed the cross connect pulse mask requirement for up to 450 feet cable length.Each transmitter can be turned off for saving power and redundancy support.

The XRT75L03's differential receiver provides high noise interference margin and is able to receive the data over 1000 feet of cable, or with cable attenuation of up to 12 dB.

The XRT75L03 incorporates an advanced Crystal-Less jitter attenuator in each channel, that can be selected in the transmit or receive path. The Jitter Attenuator performance meets the ETSI TBR-24 and Bellcore GR-499 specifications. Also, the Jitter Attenuator can be used for clock smoothing in SONET STS-1 to DS3 mapping.

The XRT75L03 provides both Serial Microprocessor Interface as well as a Hardware mode for programming and control.

FEATURES

RECEIVER

- Integrated Adaptive Receive Equalizer
- On-Chip Clock and Data Recovery Circuit for High Input Jitter Tolerance
- Detects and Clears LOS per G.755
- Receiver Monitor Mode handles up to 20dB flat loss with 6dB cable attenuation
- Compliant with Jitter Transfer Template outlined in ITU G.751, G.752, G.755 and GR-499 CORE, 1995 Standards
- Meets ETSI TBR-24 Jitter Transfer Requirements
- On-Chip B3ZS/HDB3 Encoder and Decoder which can be Enabled or Disabled

TRANSMITTER

- Compliant with Bellcore GR-499, GR-253 and ANSI T1.102 Specification for transmit pulse
- Tri-State Transmit Output Capability for Redundancy Applications
- Individual Transmitters can be independently turned on or off

JITTER ATTENUATOR

- On-Chip Advanced Crystal-less Jitter Attenuator for each channel
- Jitter Attenuator selectable in Receive or Transmit Paths
- Selectable FIFO Size for 16 or 32 Bits
- Meets the Jitter and Wander specifications described in T1.105.03b, ETSI TBR-24, Bellcore GR-253 and GR-499 standards
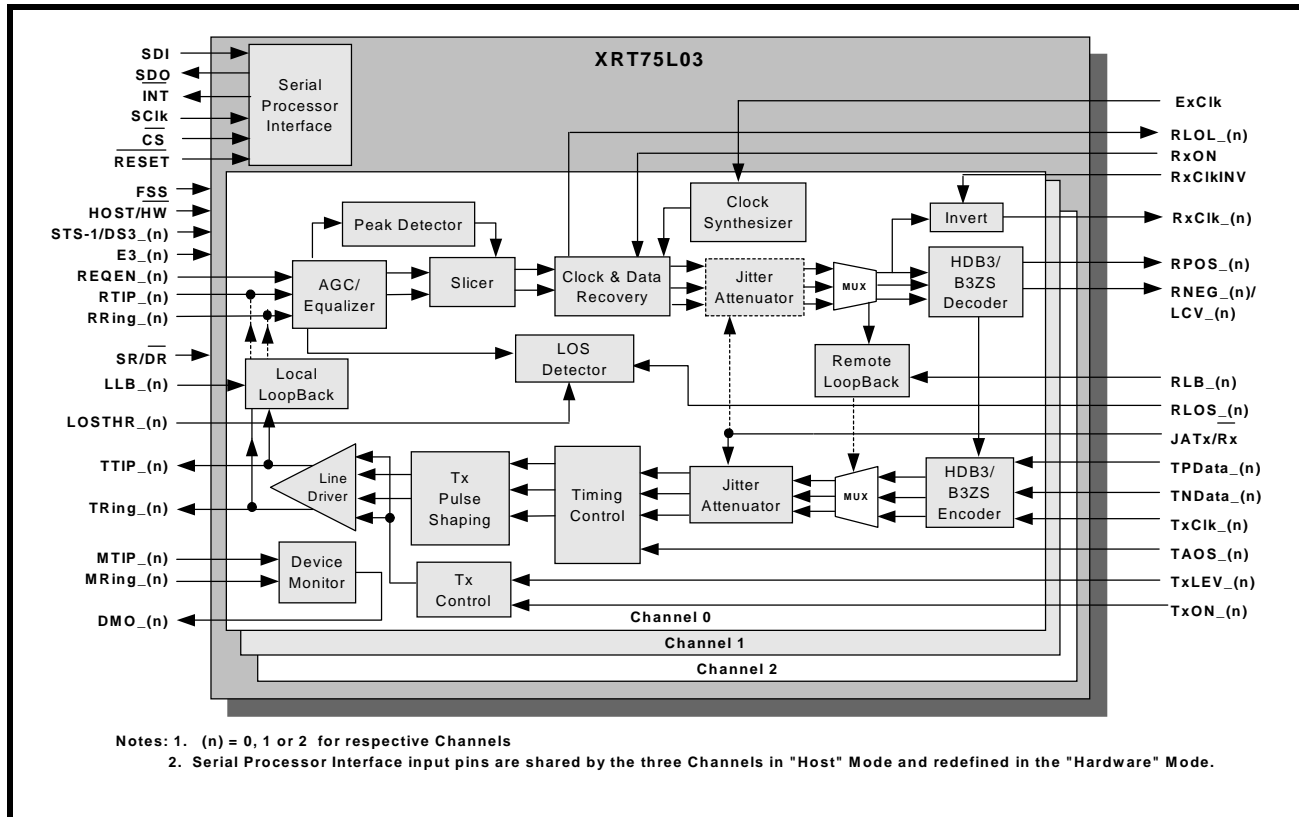- Jitter Attenuator can be Disabled

CONTROL AND DIAGNOSTICS

- Five wire Serial Microprocessor Interface for Control and Configuration
- Hardware Mode for Control and Configuration
- Each Channel Supports Local, Remote and Digital Loop-Backs
- Jitter attenuator can be disabled
- Single 3.3V ± 5% power supply
- 5V Tolerant I/O
- Available in a 128-Lead TQFP
- -40°C to 85°C Industrial Temperature Range

APPLICATIONS

- E3/DS3 Access Equipment
- STS-SPE to DS3 Mapper
- DSLAMs
- Digital Cross Connect Systems
- CSU/DSU Equipment
- Routers
- Fiber Optic Terminals

FIGURE 1. BLOCK DIAGRAM OF THE XRT75L03

Notes: 1. (n) = 0, 1 or 2 for respective Channels
2. Serial Processor Interface input pins are shared by the three Channels in "Host" Mode and redefined in the "Hardware" Mode.

TRANSMIT INTERFACE CHARACTERISTICS

- Accepts either Single-Rail or Dual-Rail data from Terminal Equipment and generates a bipolar signal from the line

- Integrated Pulse Shaping Circuit

- Built-in B3ZS/HDB3 Encoder (which can be disabled)

- Accepts Transmit Clock with duty cycle of 30% - 70%

- Generates pulses that comply with the ITU-T G.703 pulse template for E3 applications

- Generates pulses that comply with the DSX-3 pulse template, as specified in Bellcore GR-499 CORE and ANSI T1.102_1993

- Generates pulses that comply with the STSX-1 pulse template, as specified in Bellcore GR-253 CORE

- Transmitter can be turned off in order to support redundancy designs

RECEIVE INTERFACE CHARACTERISTICS

- Integrated Adaptive Receive Equalization (optional) and Timing Recovery

- Meets Jitter Tolerance Requirements, as specified in ITU-T G.823_1993 for E3 applications

- Meets Jitter Tolerance Requirements, as specified in Bellcore GR-499-CORE for DS3 applications

- Declares Loss of Signal (LOS) and Loss of Lock (LOL) Alarms

- Declares and Clears the LOS defect per ITU-T G.775 requirements for E3 and DS3 applications

- Built-in B3ZS/HDB3 Decoder (which can be disabled)

- Recovered Data can be muted while the LOS Condition is declared

- Outputs either Single-Rail or Dual-Rail data to the Terminal Equipment

JITTER ATTENUATORS

Each channel of the XRT75L03 includes a Jitter Attenuator that meets the Jitter requirements specified in the ETSI TBR-24, Bellcore GR-499 and GR-253 standards. In addition, the Jitter Attenuators also meet the Jitter and Wander specifications described in the ANSI T1.105.03b 1997, Bellcore GR-253 and GR-499 standards.

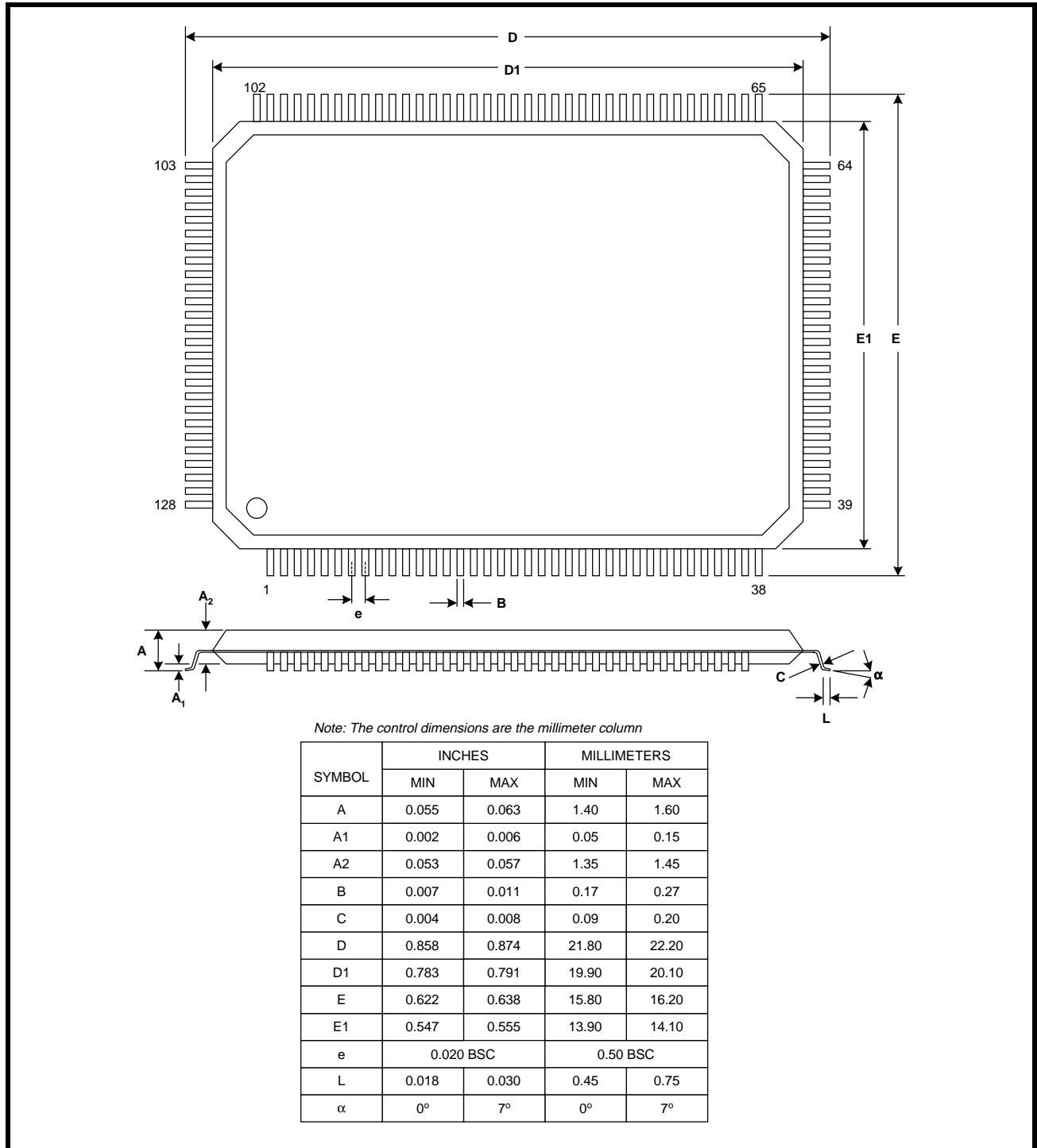### FIGURE 2. PIN OUT OF THE XRT75L03
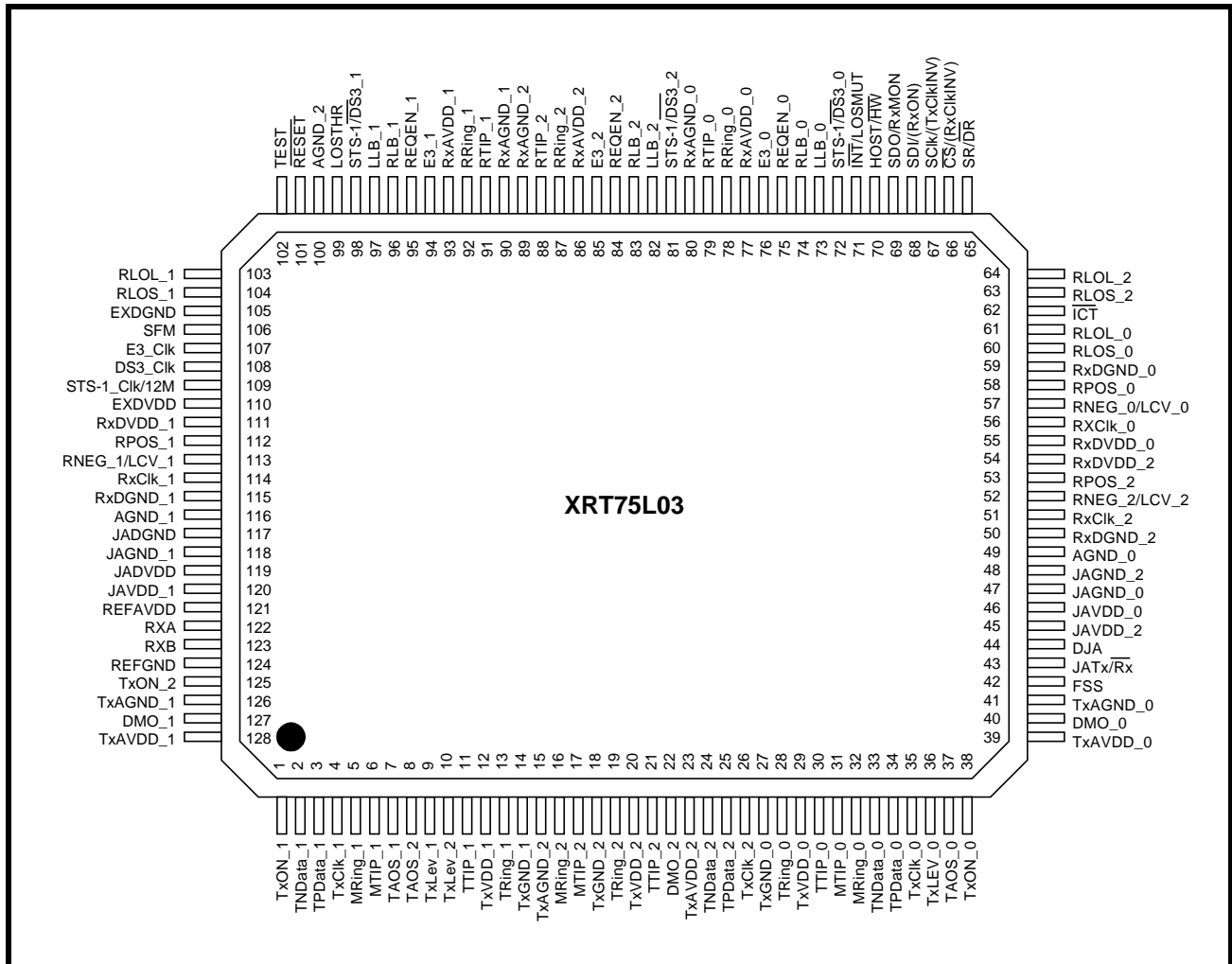
ORDERING INFORMATION

PART NUMBER	PACKAGE	OPERATING TEMPERATURE RANGE
XRT75L03IV	128 Pin TQFP	-40°C to +85°C

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XRT75L03	128 Pin TQFP	-40°C to +85°C

PACKAGE DIMENSIONS - 14X20 MM, 128 PIN PACKAGE

Note: The control dimensions are the millimeter column

SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.055	0.063	1.40	1.60
A1	0.002	0.006	0.05	0.15
A2	0.053	0.057	1.35	1.45
B	0.007	0.011	0.17	0.27
C	0.004	0.008	0.09	0.20
D	0.858	0.874	21.80	22.20
D1	0.783	0.791	19.90	20.10
E	0.622	0.638	15.80	16.20
E1	0.547	0.555	13.90	14.10
e	0.020 BSC		0.50 BSC	
L	0.018	0.030	0.45	0.75
α	0°	7°	0°	7°

REVISIONS

Revised pin listing by function

Rev. P1.0.4 Added pin 106 SFM, Single Frequency Mode

NOTICE