

ICs for Communications

Extended Line Card Interface Controller
ELIC®

PEB 20550

PEF 20550

Versions 1.3

User's Manual 01.96

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PEB 20550**PEF 20550****Revision History:****User's Manual 01.96****Previous Release:****Technical Manual 9.93**

Page (in Previous Release)	Page (in User's Manual)	Subjects (major changes since last revision)
–	13	PEF 20550 (ext. temperature range; new)
–	38	System Integration and Application (DECT added)
29	46	Boundary scan number 22 = 110 (correction)
29	46	Boundary scan number 9: ID code for V1.3 added
31	49	Boundary scan ID code for V1.3 added
–	57	DMA-transfers, figure 31 (new)
–	60	Support of the HDLC protocol by SACCO, figure 35 (new)
51	76	SACCO clock mode 2 description (extended)
53	80	Extensions for V1.3
55	82	Arbiter state machine description (extended)
58	85	Table 14: Control channel delay examples (extended)
65	95	Internal reference clock RCL replaced by CFI reference clock CRCL
–	101	Interrupt driven transmission sequence example, figure 50 (new)
82	114	Internal reference clock RCL replaced by CFI reference clock CRCL
85	118	Register address arrangement (extended)
–	129	EMOD: ECMD2 restriction 5 (new)
93	130	PMOD: PMD1..0 description (data rate stepping corrected)
101	140	CMD2: CXF, CRR description (corrected)
104	144	MACR description (extended)
114	154	TIMR: SSR (correction)
121	162	VNSR: VN3..0 = V1.2 (correction)
124	167	EXIR: XMR description (extended)
128	172	CCR1: ODS description (extended for V1.3)
132	177	SACCO RSTA: C/R description (new)
140	185	VSTR: VN3..0 value for V1.3 added
142	187	SCV: SCV7..0 description (extended)
–	191	Application Hints (new)
148	380	$t_{\text{ALOZ min}} = 8 \text{ ns}$, $t_{\text{DEPR min}} = 65 \text{ ns}$, $t_{\text{HOL min}} = 0 \text{ ns}$ (correction)
–	395	Package outlines (new)
–	396	Appendix (new)

Table of Contents		Page
1	Overview	11
1.1	Features	13
1.2	Pin Configuration (top view)	15
1.3	Pin Definitions and Functions	16
1.4	Logic Symbol	23
1.5	Functional Block Diagram	24
1.6	System Integration and Application	25
1.6.1	Digital Line Card	25
1.6.1.1	Switching, Layer-1 Control, Group Controller Signaling	25
1.6.1.2	Decentralized D-Channel Processing, Multiplexed HDLC-Controller	27
1.6.1.3	Decentralized D-Channel Processing, Dedicated HDLC-Controller per Subscriber	31
1.6.1.4	Decentralized D-Channel Processing, Multiplexed plus Dedicated HDLC-Control	31
1.6.1.5	Central D-Channel Processing	33
1.6.1.6	Mixed D-Channel Processing, Signaling Decentralized, Packet Data Centralized	34
1.6.2	Key Systems	36
1.6.3	Analog Line Card	37
1.6.4	DECT Applications	38
1.6.4.1	Adaptation of a DECT System to an Existing PBX	38
1.6.4.2	DECT Line Card Design for an Existing PBX	40
2	Functional Description	41
2.1	General Functions and Device Architecture	41
2.2	Functional Blocks	41
2.2.1	Bus Interface	41
2.2.2	Parallel Ports	42
2.2.3	Watchdog Timer	43
2.2.4	Reset Logic	43
2.2.5	Boundary Scan Support	45
2.2.5.1	Boundary Scan	45
2.2.5.2	TAP-Controller	48
2.2.6	EPIC®-1	49
2.2.6.1	PCM-Interface	49
2.2.6.2	Configurable Interface	50
2.2.6.3	Memory Structure and Switching	50
2.2.6.4	Pre-processed Channels, Layer-1 Support	51
2.2.6.5	Special Functions	52
2.2.7	SACCO	52
2.2.7.1	Block Diagram	52
2.2.7.2	Parallel Interface	53
2.2.7.3	FIFO-Structure	57

Table of Contents		Page
2.2.7.4	Protocol Support	60
2.2.7.5	Special Functions	75
2.2.7.6	Serial Interface	76
2.2.7.7	Serial Port Configuration	79
2.2.7.8	Test Mode	80
2.2.8	D-Channel Arbiter	81
2.2.8.1	Upstream Direction	82
2.2.8.2	Downstream Direction	86
2.2.8.3	Control Channel Delay	87
2.2.8.4	D-Channel Arbiter Co-operating with QUAT-S Circuits	88
3	Operational Description	89
3.1	Microprocessor Interface Operation	89
3.2	Interrupt Structure and Logic	90
3.3	Clocking	91
3.4	Reset	92
3.5	EPIC®-1 Operation	92
3.5.1	PCM-Interface	93
3.5.2	Configurable Interface	94
3.5.3	Switching Functions	95
3.5.4	Special Functions	99
3.6	SACCO-A/B	99
3.6.1	Data Transmission in Interrupt Mode	99
3.6.2	Data Transmission in DMA-Mode	101
3.6.3	Data Reception in Interrupt Mode	102
3.6.4	Data Reception in DMA-Mode	103
3.7	D-Channel Arbiter	104
3.7.1	SACCO-A Transmission	104
3.7.2	SACCO-A Reception	105
3.8	Initialization Procedure	106
3.8.1	Hardware Reset	106
3.8.2	EPIC®-1 Initialization	106
3.8.2.1	Register Initialization	106
3.8.2.2	Control Memory Reset	106
3.8.2.3	Initialization of Pre-processed Channels	107
3.8.2.4	Initialization of the Upstream Data Memory (DM) Tristate Field	109
3.8.3	SACCO-Initialization	109
3.8.4	Initialization of D-Channel Arbiter	111
3.8.5	Activation of the PCM- and CFI-Interfaces	112
3.8.6	Initialization Example	113
3.8.6.1	EPIC®-1 Initialization Example	114
3.8.6.2	SACCO-A Initialization Example	116
3.8.6.3	D-Channel Arbiter Initialization Example	116

Table of Contents	Page
3.8.6.4 PCM- and CFI-Interface Activation Example	117
3.8.6.5 SACCO-B Initialization Example	117
4 Detailed Register Description	118
4.1 Register Address Arrangement	118
4.2 Interrupt Top Level	124
4.2.1 Interrupt Status Register (ISTA)	124
4.2.2 Mask Register (MASK)	125
4.3 Parallel Ports	126
4.3.1 PORT0 Data Register (PORT0)	126
4.3.2 PORT1 Data Register (PORT1)	126
4.3.3 Port1 Configuration Register (PCON1)	127
4.4 Watchdog Timer	127
4.4.1 Watchdog Control Register (WTC)	127
4.5 ELIC® Mode Register / Version Number Register (EMOD)	128
4.6 EPIC®-1	130
4.6.1 PCM-Mode Register (PMOD)	130
4.6.2 Bit Number per PCM-Frame (PBNR)	132
4.6.3 PCM-Offset Downstream Register (POFD)	132
4.6.4 PCM-Offset Upstream Register (POFU)	133
4.6.5 PCM-Clock Shift Register (PCSR)	134
4.6.6 PCM-Input Comparison Mismatch (PICM)	135
4.6.7 Configurable Interface Mode Register 1 (CMD1)	136
4.6.8 Configurable Interface Mode Register 2 (CMD2)	138
4.6.9 Configurable Interface Bit Number Register (CBNR)	141
4.6.10 Configurable Interface Time Slot Adjustment Register (CTAR)	141
4.6.11 Configurable Interface Bit Shift Register (CBSR)	142
4.6.12 Configurable Interface Subchannel Register (CSCR)	143
4.6.13 Memory Access Control Register (MACR)	144
4.6.14 Memory Access Address Register (MAAR)	147
4.6.15 Memory Access Data Register (MADR)	148
4.6.16 Synchronous Transfer Data Register (STDA)	148
4.6.17 Synchronous Transfer Data Register B (STDB)	149
4.6.18 Synchronous Transfer Receive Address Register A (SARA)	149
4.6.19 Synchronous Transfer Receive Address Register B (SARB)	150
4.6.20 Synchronous Transfer Transmit Address Register A (SAXA)	150
4.6.21 Synchronous Transfer Transmit Address Register B (SAXB)	151
4.6.22 Synchronous Transfer Control Register (STCR)	151
4.6.23 MF-Channel Active Indication Register (MFAIR)	152
4.6.24 MF-Channel Subscriber Address Register (MFSAR)	153
4.6.25 Monitor/Feature Control Channel FIFO (MFFIFO)	153
4.6.26 Signaling FIFO (CIFIFO)	154
4.6.27 Timer Register (TIMR)	154

Table of Contents	Page
4.6.28 Status Register EPIC®-1 (STAR_E)	155
4.6.29 Command Register EPIC®-1 (CMDR_E)	156
4.6.30 Interrupt Status Register EPIC®-1 (ISTA_E)	158
4.6.31 Mask Register EPIC®-1 (MASK_E)	159
4.6.32 Operation Mode Register (OMDR)	160
4.6.33 Version Number Status Register (VNSR)	162
4.7 SACCO	163
4.7.1 Receive FIFO (RFIFO)	163
4.7.2 Transmit FIFO (XFIFO)	164
4.7.3 Interrupt Status Register (ISTA_A/B)	165
4.7.4 Mask Register (MASK_A/B)	166
4.7.5 Extended Interrupt Register (EXIR_A/B)	166
4.7.6 Command Register (CMDR)	168
4.7.7 Mode Register (MODE)	170
4.7.8 Channel Configuration Register 1 (CCR1)	171
4.7.9 Channel Configuration Register 2 (CCR2)	173
4.7.10 Receive Length Check Register (RLCR)	174
4.7.11 Status Register (STAR)	175
4.7.12 Receive Status Register (RSTA)	176
4.7.13 Receive HDLC-Control Register (RHCR)	178
4.7.14 Transmit Address Byte 1 (XAD1)	178
4.7.15 Transmit Address Byte 2 (XAD2)	179
4.7.16 Receive Address Byte Low Register 1 (RAL1)	179
4.7.17 Receive Address Byte Low Register 2 (RAL2)	180
4.7.18 Receive Address Byte High Register 1 (RAH1)	180
4.7.19 Receive Address Byte High Register 2 (RAH2)	181
4.7.20 Receive Byte Count Low (RBCL)	181
4.7.21 Receive Byte Count High (RBCH)	182
4.7.22 Transmit Byte Count Low (XBCL)	182
4.7.23 Transmit Byte Count High (XBCH)	183
4.7.24 Time Slot Assignment Register Transmit (TSAX)	183
4.7.25 Time Slot Assignment Register Receive (TSAR)	184
4.7.26 Transmit Channel Capacity Register (XCCR)	184
4.7.27 Receive Channel Capacity Register (RCCR)	185
4.7.28 Version Status Register (VSTR)	185
4.8 D-Channel Arbiter	186
4.8.1 Arbiter Mode Register (AMO)	186
4.8.2 Arbiter State Register (ASTATE)	187
4.8.3 Suspend Counter Value Register (SCV)	187
4.8.4 D-Channel Enable Register IOM-Port 0 (DCE0)	188
4.8.5 D-Channel Enable Register IOM-Port 1 (DCE1)	188
4.8.6 D-Channel Enable Register IOM-Port 2 (DCE2)	188

Table of Contents	Page
4.8.7 D-Channel Enable Register IOM-Port 3 (DCE3)	189
4.8.8 Transmit D-Channel Address Register (XDC)	189
4.8.9 Broadcast Group IOM-port 0 (BCG0)	190
4.8.10 Broadcast Group IOM-port 1 (BCG1)	190
4.8.11 Broadcast Group IOM-port 2 (BCG2)	190
4.8.12 Broadcast Group IOM-port 3 (BCG3)	190
5 Application Hints	191
5.1 Introduction	191
5.1.1 IOM [®] and SLD Functions	191
5.2 Configuration of Interfaces	198
5.2.1 PCM Interface Configuration	198
5.2.1.1 PCM Interface Signals	198
5.2.1.2 PCM Interface Registers	198
5.2.1.3 PCM Interface Characteristics	199
5.2.2 Configurable Interface Configuration	211
5.2.2.1 CFI Interface Signals	211
5.2.2.2 CFI Registers	211
5.2.2.3 CFI Characteristics	213
5.3 Data and Control Memories	239
5.3.1 Memory Structure	239
5.3.2 Indirect Register Access	240
5.3.3 Memory Access Commands	244
5.3.3.1 Access to the Data Memory Data Field	244
5.3.3.2 Access to the Data Memory Code (Tristate) Field	248
5.3.3.3 Access to the Control Memory Data Field	251
5.3.3.4 Access to the Control Memory Code Field	253
5.4 Switched Channels	260
5.4.1 CFI - PCM Timeslot Assignment	261
5.4.2 Subchannel Switching	265
5.4.3 Loops	270
5.4.3.1 CFI - CFI Loops	270
5.4.3.2 PCM - PCM Loops	273
5.4.4 Switching Delays	275
5.4.4.1 Internal Procedures at the Serial Interfaces	276
5.4.4.2 How to Determine the Delay	279
5.4.4.3 Example: Switching of Wide Band ISDN Channels with the ELIC [®]	281
5.5 Preprocessed Channels	284
5.5.1 Initialization of Preprocessed Channels	285
5.5.2 Control/Signaling (CS) Handler	298
5.5.2.1 Registers used in Conjunction with the CS Handler	299
5.5.2.2 Access to Downstream C/I and SIG Channels	301
5.5.2.3 Access to the Upstream C/I and SIG Channels	302

Table of Contents	Page
5.5.3 Monitor/Feature Control (MF) Handler	304
5.5.3.1 Registers used in Conjunction with the MF Handler	306
5.5.3.2 Description of the MF Channel Commands	311
5.6 μ P Channels	319
5.7 Synchronous Transfer Utility	323
5.7.1 Registers Used in Conjunction with the Synchronous Transfer Utility ..	326
5.8 Supervision Functions	331
5.8.1 Hardware Timer	331
5.8.2 PCM Input Comparison	333
5.8.3 PCM Framing Supervision	336
5.8.4 Power and Clock Supply Supervision/Chip Version	338
5.9 Applications	339
5.9.1 Analog IOM [®] -2 Line Card with SICOFI [®] -4 as Codec/Filter Device ..	339
5.9.2 IOM [®] -2 Trunk Line Applications	343
5.9.2.1 PBX With Multiple ISDN Trunk Lines	344
5.9.2.2 Small PBX	349
5.9.3 Miscellaneous	351
5.9.3.1 Interfacing the ELIC [®] to a MUSAC [™]	351
5.9.3.2 Space and Time Switch for 16 kBit/s Channels	353
6 Application Notes	355
6.1 Example of ELIC [®] Operation in a Digital PBX	355
6.1.1 Introduction	355
6.1.2 Basic Initialization	356
6.1.2.1 EPIC [®] Interface Initialization	357
6.1.2.2 SACCO-A Initialization	357
6.1.2.3 Basic D-Channel Arbiter Initialization	358
6.1.2.4 SACCO-B Initialization	358
6.1.3 ELIC [®] CM and OCTAT-P Initialization	359
6.1.3.1 Resetting the CM	360
6.1.3.2 Initializing the CM	360
6.1.3.3 CFI Activation	361
6.1.3.4 PCM Interface Activation	361
6.1.3.5 Deactivating the OCTAT-P	361
6.1.4 Line Activation by Subscriber A	362
6.1.4.1 Handling of C/I Interrupt	362
6.1.4.2 Confirmation of Line Activation	363
6.1.4.3 Enabling the Arbiter	363
6.1.4.4 Build-up of Layer 2	363
6.1.4.5 Build-up of Layer 3	364
6.1.5 Dialling the Desired Link	364
6.1.5.1 Reception of Dialed Numbers at SACCO-A	364
6.1.5.2 Preparing to Loop Data from Terminal A to Terminal B	365

Table of Contents	Page
6.1.6 Calling up Subscriber B	365
6.1.6.1 Activating the Line to Subscriber B	365
6.1.6.2 Enabling the Arbiter	366
6.1.6.3 Build-up of Layer 2	366
6.1.6.4 Build-up of Layer 3	367
6.1.7 Completing the Call	367
6.1.7.1 Receiving the Hook-off Information at the ELIC®	367
6.1.7.2 Closing the Data Loop	368
6.1.7.3 Giving both Terminals the 'Go-Ahead' to Transceive Data	368
6.2 D-Channel Delay Due to Arbitration	369
6.3 Behaviour of the SACCO-A when a RFIFO Overflow Occurs	375
7 Electrical Characteristics	377
8 Package Outlines	395
9 Appendix	396
9.1 Differences between EPIC®-1 (PEB 2055) and the ELIC®-EPIC® ...	396
9.2 Working Sheets	396
9.2.1 Register Summary for EPIC® Initialization	397
9.2.2 Switching of PCM Time Slots to the CFI Interface (data downstream) ..	401
9.2.3 Switching of CFI Time Slots to the PCM Interface (data upstream) ...	402
9.2.4 Preparing EPIC®s C/I Channels	403
9.2.5 Receiving and Transmitting IOM®-2 C/I-Codes	404
9.3 Development Tools	405
9.3.1 SIPB 5000 Mainboard	405
9.3.2 SIPB 5122 IOM®-2 Line Card Module (ELIC®)	406
10 Lists	407
10.1 Glossary	407

IOM®, IOM®-1, IOM®-2, SICOFI®, SICOFI®-2, SICOFI®-4, SICOFI®-4_{μC}, SUCOFI®, ARCOFI®, ARCOFI®-BA, ARCOFI®-SP, EPIC®-1, EPIC®-S, ELIC®, IPAT®-2, ITAC®, ISAC®-S, ISAC®-S TE, ISAC®-P, ISAC®-P TE, IDEC®, SICAT®, OCTAT®-P, QUAT®-S are registered trademarks of Siemens AG.

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1 Overview

The PEB 20550 (Extended Line Card Controller) is a highly integrated controller circuit optimized for line card and key system applications. It combines all functional blocks necessary to manage up to 32 digital (ISDN or proprietary) or 64 analog subscribers.

The switching and layer-1 control capability of the EPIC-1 (PEB 2055) constitutes a major functional block of the ELIC.

For layer-2 support, two independent Special Application Communication Controllers (SACCO) are available. One typically handles the communication with the group controller, the other is used to serve the subscriber terminals. A D-channel arbiter is employed to multiplex the HDLC controller between multiple subscribers while maintaining full duplex signaling protocols (e.g. LAPD).

Additionally, typical line card glue logic functions such as a power-up reset generator, a watchdog timer and two parallel ports are integrated.

The ELIC is implemented in a Siemens advanced 1.0- μ m CMOS-technology and manufactured in a P-MQFP-80-1 package.

The ELIC is a member of a new chip family supporting D-channel multiplexing on the line card and in the subscriber terminal. This concept allows an highly economical implementation of digital subscriber lines.

Chip Family

Line Cards:

PEB 20550	Extended Line Card Controller	(ELIC)
PEB 2096	Octal U_{PM} Transceiver	(OCTAT-P)
PEB 2095	ISDN Burst Transceiver Circuit	(IBC)
PEB 2084	QUAD S_0 Transceiver	(QUAT-S)
PEB 2465	QUAD DSP based Codec Filter	(SICOFI-4)
PEB 2075	ISDN D-Channel Exchange Controller	(IDEC)

Terminals:

PSB 2196	Digital Subscriber Access Controller for U_{PM} Interface	(ISAC-P TE)
PEB 2081 (V3.2)	S/T-Bus Interface Circuit Extended	(SBCX)

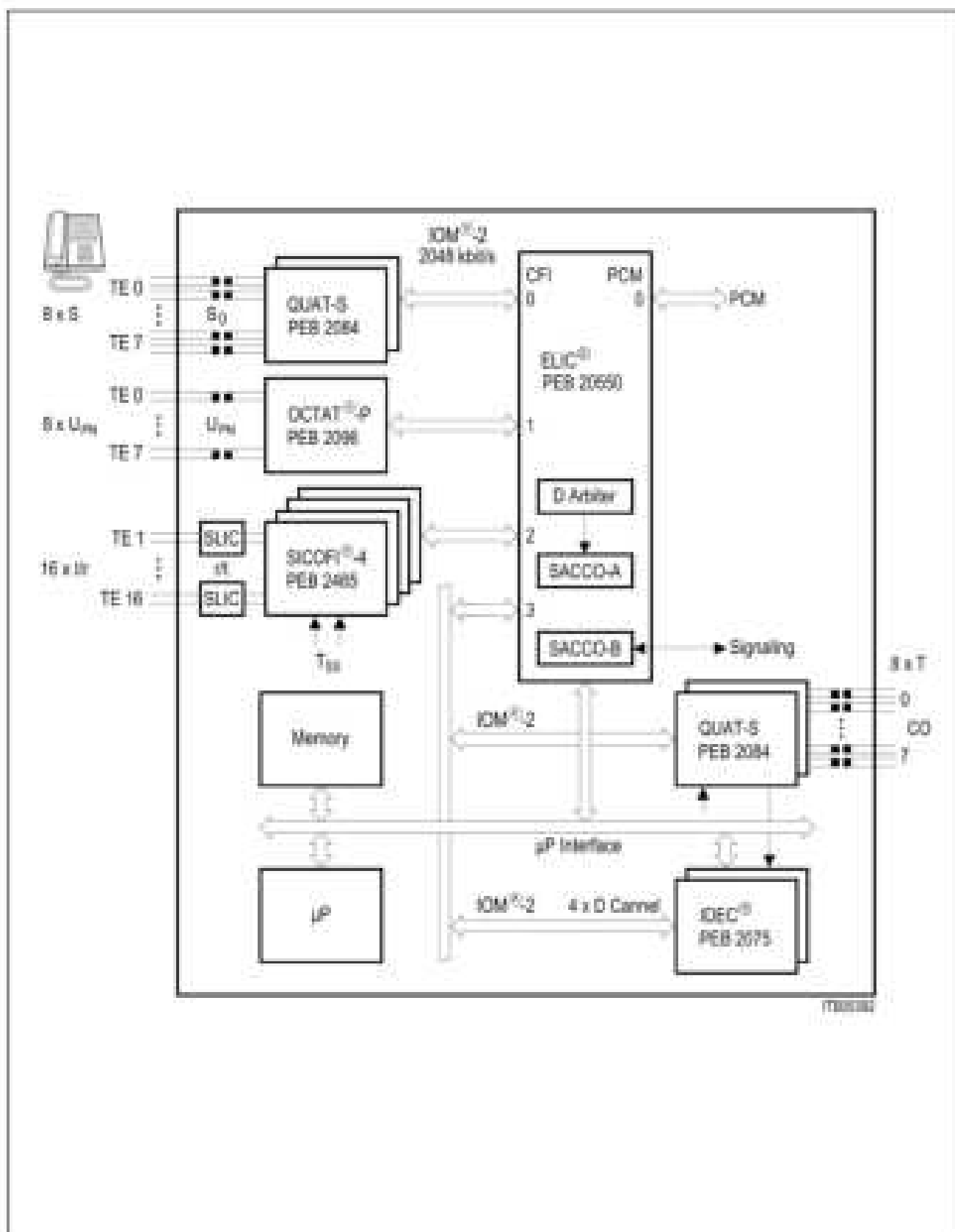


Figure 1
Example for an Integrated Analog / Digital PBX

Extended Line Card Interface Controller ELIC®

PEB 20550
PEF 20550

Versions 1.3

CMOS

1.1 Features

Switching (EPIC®-1)

- Non-blocking switch for 32 digital (e.g. ISDN) or 64 voice subscribers
 - Bandwidth 16, 32, or 64 kbit/s
 - Two consecutive 64-bit/s channels can be switched as a single 128-kbit/s channel
- Freely programmable time slot assignment for all subscribers
- Synchronous μ P-access to two selected channels
- Two types of serial interfaces independently programmable over a wide data range (128 - 8192 kbit/s)
 - PCM-interface
 - Tristate control signals for external drivers
 - Programmable clock shift
 - Single or double data clock
 - Configurable interface
 - Configurable for IOM-, SLD- and PCM-applications
 - High degree of flexibility for datastream adaption
 - Programmable clockshift
 - Single or double data clock



P-MQFP-80-1

Type	Ordering Code	Package
PEB 20550	Q67101-H6484	P-MQFP-80-1 (SMD)
PEF 20550	Q67101-H6605	P-MQFP-80-1 (SMD)

Handling of Layer-1 Functions (EPIC®-1)

- Change detection for C/I-channel (IOM-configuration) or feature control (SLD-configuration)
- Additional last-look logic for feature control (SLD-configuration)
- Buffered monitor (IOM-configuration) or signaling channel (SLD-configuration)

Handling of Layer-2 Functions (SACCO)

- Two independent full duplex HDLC-channels
 - Serial interface
 - Data rate up to 4 Mbit/s
 - Independent time slot assignment for each channel with programmable time slot length (1-256 bits)
 - Support of bus configuration with collision resolution
 - Continuous transmission of 1 to 32 bytes possible
 - Protocol support
 - Auto-mode, fully compatible to PEB 2050 (PBC) protocol
 - Non-auto mode, address recognition capability
 - Transparent mode, HDLC-framing only
 - Extended transparent mode, fully transparent without HDLC-framing
 - 64-bytes FIFO's per HDLC-channel and direction

D-channel Multiplexing (D-channel arbiter)

- Serving of multiple subscribers with one HDLC-controller
- Full duplex signaling protocols (e.g. LAPD or proprietary) supported
- Programmable priority scheme
- Broadcast transmission

Line Card Glue Logic

- Power-up reset generator
- Watchdog timer
- Parallel ports (8-bit input, 4-bit I/O)

Boundary Scan Support

- Fully IEEE 1149.1 compatible
- 32-bit device identification register

Bus Interface

- Siemens/Intel or Motorola type μ P-interface
- 8-bit demultiplexed bus interface
- FIFO-access interrupt or DMA controlled

1.2 Pin Configuration
(top view)

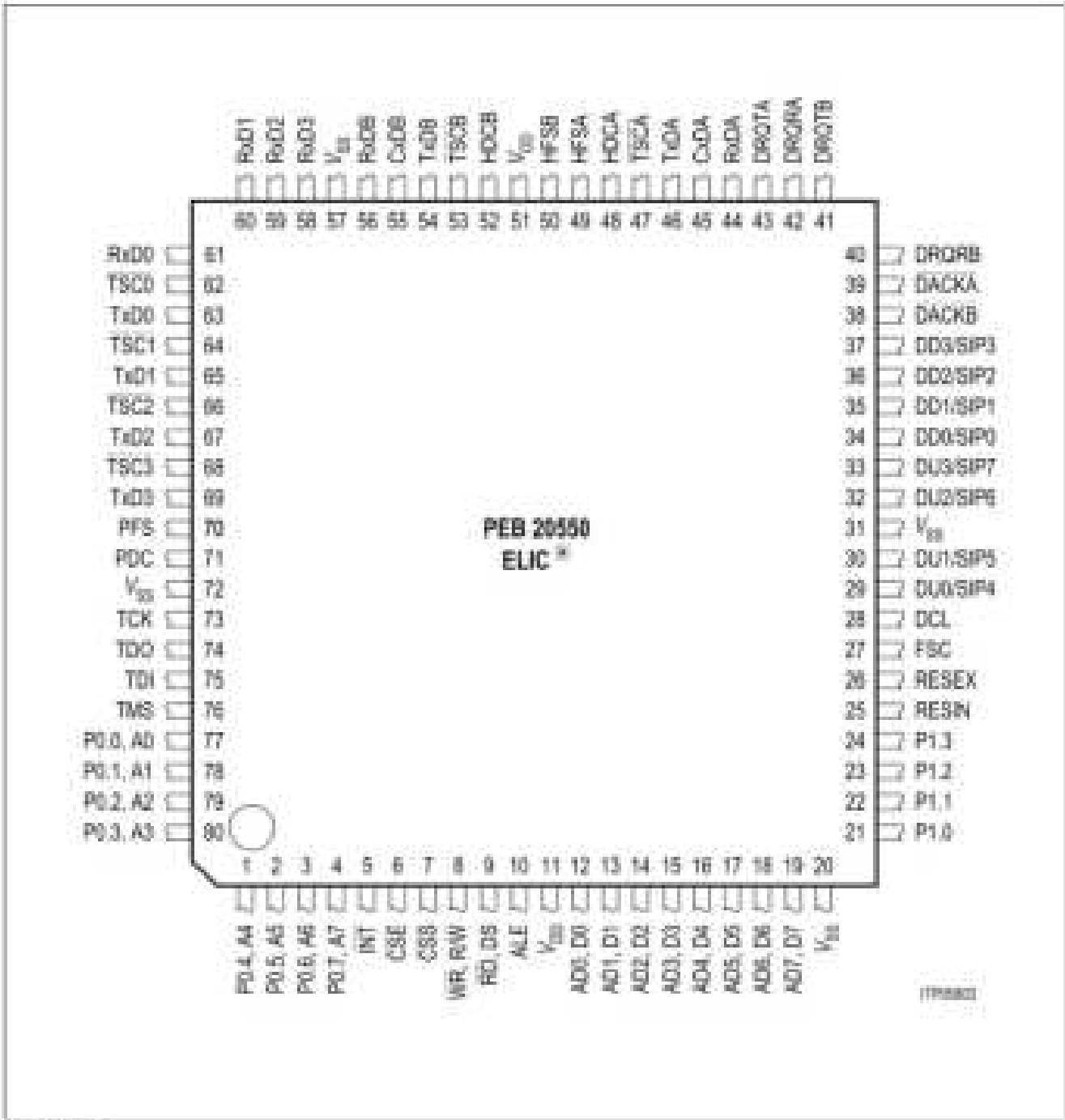


Figure 2