SMSC® SUCCESS BY DESIGN

LAN8187/LAN8187i

flexPWR®

±15kV ESD Protected MII/RMII 10/100 Ethernet Transceiver with HP Auto-MDIX & flexPWR® Technology

PRODUCT FEATURES

Data Brief

- Single-Chip Ethernet Physical Layer Transceiver (PHY)
- ESD Protection levels of ±8kV HBM without external protection devices
- ESD protection levels of EN61000-4-2, ±8kV contact mode, and ±15kV for air discharge mode per independent test facility
- Comprehensive flexPWR® Technology
  - Flexible Power Management Architecture
- LVCMOS Variable I/O voltage range: +1.6V to +3.6V
- Integrated 3.3V to 1.8V regulator for optional single supply operation.
  - Regulator can be disabled if 1.8V system supply is available.
- Performs HP Auto-MDIX in accordance with IEEE 802.3ab specification
- Automatic Polarity Correction
- Latch-Up Performance Exceeds 150mA per EIA/JESD 78, Class II
- Energy Detect power-down mode
- Low Current consumption power down mode
- Low operating current consumption:
  - 39mA typical in 10BASE-T and
  - 79mA typical in 100BASE-TX mode
- Supports Auto-negotiation and Parallel Detection
- Supports the Media Independent Interface (MII) and Reduced Media Independent Interface (RMII)
- Compliant with IEEE 802.3-2005 standards
  - MII Pins tolerant to 3.6V
- IEEE 802.3-2005 compliant register functions
- Integrated DSP with Adaptive Equalizer
- Baseline Wander (BLW) Correction
- Vendor Specific register functions
- Low profile 64-pin TQFP lead-free RoHS compliant package (10 x 10 x 1.4mm)
- 4 LED status indicators
- Commercial Operating Temperature 0° C to 70° C
- Industrial Operating Temperature -40° C to 85° C version available (LAN8187i)

Applications

- Set Top Boxes
- Network Printers and Servers
- LAN on Motherboard
- 10/100 PCMCIA/CardBus Applications
- Embedded Telecom Applications
- Video Record/Playback Systems
- Cable Modems/Routers
- DSL Modems/Routers
- Digital Video Recorders
- Personal Video Recorders
- IP and Video Phones
- Wireless Access Points
- Digital Televisions
- Digital Media Adaptors/Servers
- POS Terminals
- Automotive Networking
- Gaming Consoles
- Security Systems
- Access Control

PRODUCT PREVIEW

Order Numbers:

LAN8187-JT for 64-pin, TQFP lead-free RoHS compliant package

LAN8187i-JT for (Industrial Temp) 64-pin, TQFP lead-free RoHS compliant package

This product meets the halogen maximum concentration values per IEC61249-2-21

For RoHS compliance and environmental information, please visit www.smsc.com/rohs

80 ARKAY DRIVE, HAUPPAUGE, NY 11788 (631) 435-6000, FAX (631) 273-3123

General Description

The SMSC LAN8187/LAN8187i is a low-power, industrial temperature (LAN8187i), variable I/O voltage, analog interface IC with HP Auto-MDIX for high-performance embedded Ethernet applications. The LAN8187/LAN8187i can be configured to operate on a single 3.3V supply utilizing an integrated 3.3V to 1.8V linear regulator. An option is available to disable the linear regulator to optimize system designs that have a 1.8V power plane available.

Architectural Overview

The LAN8187/LAN8187i consists of an encoder/decoder, scrambler/descrambler, wave-shaping transmitter, output driver, twisted-pair receiver with adaptive equalizer and baseline wander (BLW) correction, and clock and data recovery functions. The LAN8187/LAN8187i can be configured to support either the Media Independent Interface (MII) or the Reduced Media Independent Interface (RMII).

The LAN8187/LAN8187i is compliant with IEEE 802.3-2005 standards (MII Pins tolerant to 3.6V) and supports both IEEE 802.3-2005 -compliant and vendor-specific register functions. It contains a full-duplex 10-BASE-T/100BASE-TX transceiver and supports 10-Mbps (10BASE-T) operation on Category 3 and Category 5 unshielded twisted-pair cable, and 100-Mbps (100BASE-TX) operation on Category 5 unshielded twisted-pair cable.

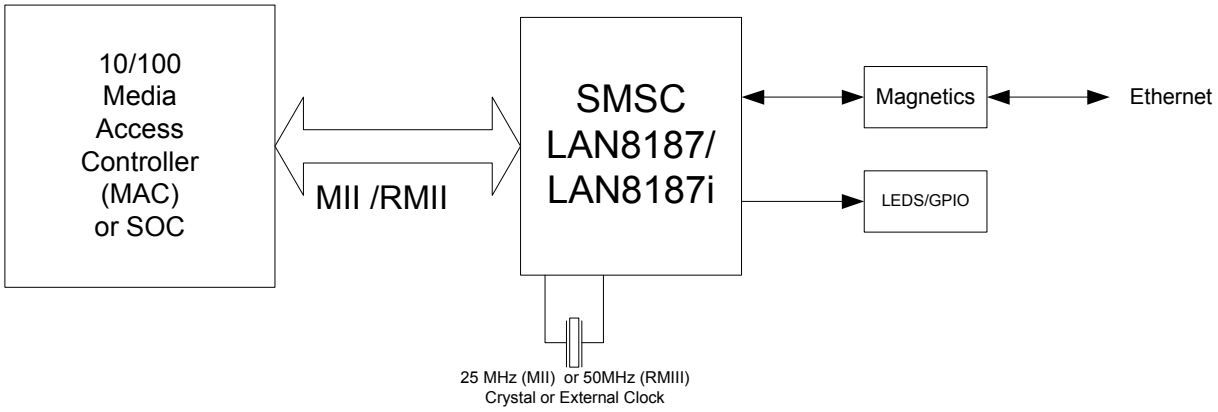

Figure 1 LAN8187/LAN8187i System Block Diagram

Hubs and switches with multiple integrated MACs and external PHYs can have a large pin count due to the high number of pins needed for each MII interface. An increasing pin count causes increasing cost.

The RMII interface is intended for use on Switch based ASICs or other embedded solutions requiring minimal pincount for ethernet connectivity. RMII requires only 6 pins for each MAC to PHY interface plus one common reference clock. The MII requires 16 pins for each MAC to PHY interface.

The SMSC LAN8187/LAN8187i is capable of running in RMII mode. Please contact your SMSC sales representative for the latest RMII specification.

The LAN8187/LAN8187i referenced throughout this document applies to both the commercial temperature and industrial temperature components. The LAN8187i refers to only the industrial temperature component.

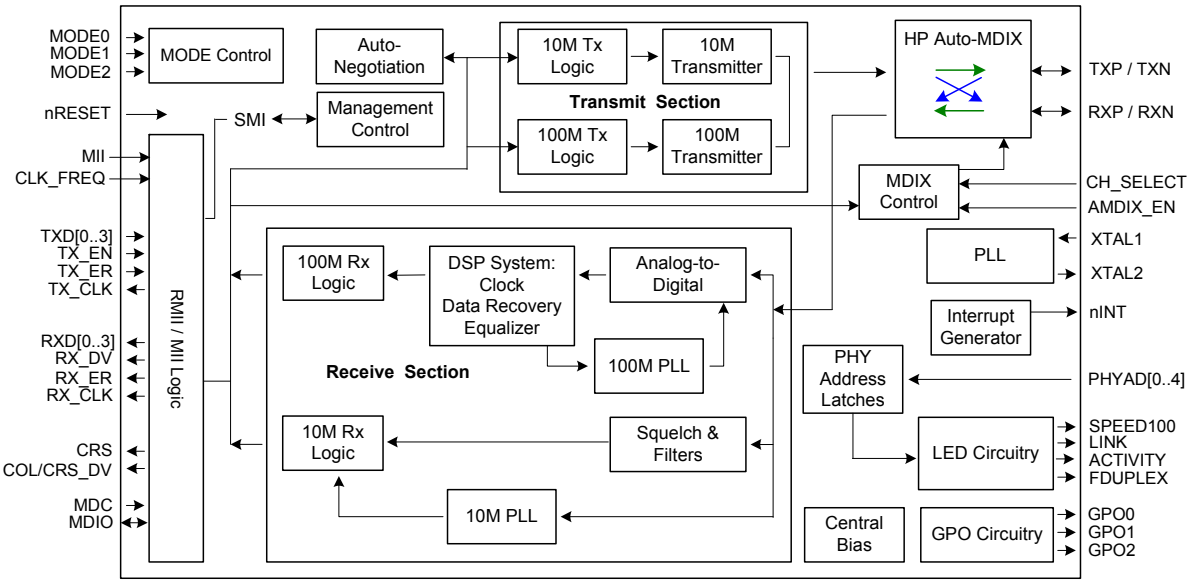

Figure 2 LAN8187/LAN8187i Architectural Overview

Package Outline

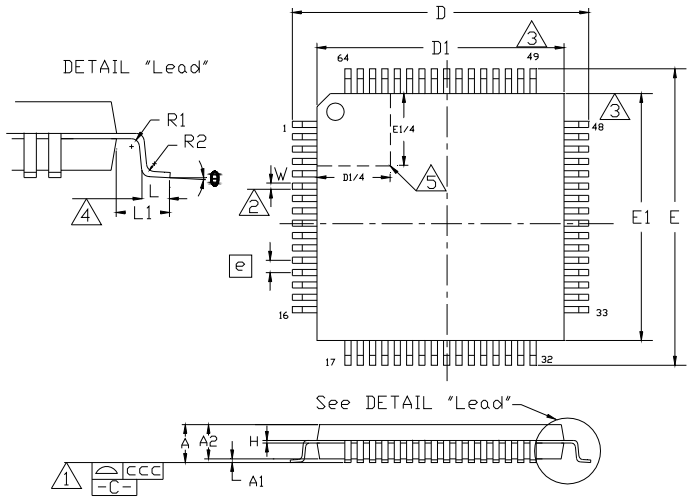

Figure 3 64 Pin TQFP Package Outline, 10X10X1.4 Body, 12x12 mm Footprint

Table 1 64 Pin TQFP Package Parameters

	MIN	NOMINAL	MAX	REMARKS
A	~	~	1.60	Overall Package Height
A1	0.05	~	0.15	Standoff
A2	1.35	~	1.45	Body Thickness
D	11.80	~	12.20	X Span
D1	9.80	~	10.20	X body Size
E	11.80	~	12.20	Y Span
E1	9.80	~	10.20	Y body Size
H	0.09	~	0.20	Lead Frame Thickness
L	0.45	0.60	0.75	Lead Foot Length
L1	~	1.00	~	Lead Length
e	0.50 Basic			Lead Pitch
θ	0^o	~	7^o	Lead Foot Angle
W	0.17	0.22	0.27	Lead Width
R	0.08	~	~	Lead Shoulder Radius
R2	0.08	~	0.20	Lead Foot Radius
ccc	~	~	0.08	Coplanarity

Notes:

1. Controlling Unit: millimeter.
2. Tolerance on the true position of the leads is ± 0.04 mm maximum.
3. Package body dimensions D1 and E1 do not include the mold protrusion. Maximum mold protrusion is 0.25 mm per side.
4. Dimension for foot length L measured at the gauge plane 0.25 mm above the seating plane.
5. Details of pin 1 identifier are optional but must be located within the zone indicated.