LUM900D   PCI Express Mini Card

User Manual

1.   Production Overview

LG Electrics LUM900D and HSPA   PCI Express Mini Card are high-speed packet access (HSPA) Mobile Broadband Modules.
The modules support data services through HSPA, UMTS, EDGE, GPRS, and data message service.

1.1   Production Feature

- Powered by ICERA E300™ chipset
- Theoretical peak downlink rate of 14.4 Mbps (S/W upgradable to 21Mbps)[1]
- Theoretical peak uplink rate of 5.75 Mbps
- Tri-band HSPA and Rx Diversity

- Quad-band GSM/GPRS/EDGE

    850/900/1800/1900 MHz (**LUM900D**)

- Support Receive Equalization and Type i
    – improves performance in noisy & highly mobile environ
- System interface : USB 2.0

Some Statements

a. When this module is installed in the host system and the FCC ID label of module is not visitable at the time of purchase, a separate label shall be affixed on the host system with "contains TX FCC ID:BEJLUM900D" statement.

b. This module has been approved as transmitter module with requirement to maintain at least 20 cm separation distance from the antenna to the body of user.
This transmitter cannot be co-located with any other transmitter(s) which is capable of transmitting simultaneously with this module. Additional RF exposure evaluation is required to address co-located transmitters which may result additional equipment authorization approval if applicable.

c. This module is certified with max. antenna gain of -1.03 dBi for cellular and PCS band operation in term of RF exposure compliance. Any antenna gain which is greater than -1.03 dBi shall be evaluated per FCC RF Exposure requirement.

d. This module is certified to be installed by the OEM/ODM system integrator and end user installation is not allowed. The host manual shall not contain any instruction to the user on how to remove and / or install the module

2.2   Pin Descriptions

Pin	Name	Type	Description
1	NC		Not Connect
2	3.3 Vaux	PWR	+3.3V Power Supply
3	NC		Not Connect
4	GND	PWR	Ground
5	NC		Not Connect
6	NC		Not Connect
7	NC		Not Connect
8	UIM PWR	O	USIM Interface, USIM VCC Supply
9	GND	PWR	Ground
10	UIM_DATA	I/O	USIM Interface, USIM IO
11	NC		Not Connect
12	UIM_CLK	O	USIM Interface, USIM Clock
13	NC		Not Connect
14	UIM_RESET	O	USIM Interface, USIM Reset
15	GND	GND	Ground
16	NC		Not Connect
17	NC		Not Connect
18	GND	PWR	Ground
19	NC		Not Connect
20	W_DISABLE#	I/PU	Wireless Disable , Internal Pull-up
21	GND	PWR	Ground
22	PERST#	I	System Reset
23	NC		Not Connect
24	3.3Vaux	PWR	+3.3V Power Supply
25	NC		Not Connect
26	GND	PWR	Ground
27	GND	PWR	Ground

Pin	Name	Type	Description
28	NC		Not Connect
29	GND	PWR	Ground
30	NC		Not Connect
31	NC		Not Connect
32	NC		Not Connect
33	NC		Not Connect
34	GND	PWR	Ground
35	GND	PWR	Ground
36	USB_D-	I/O	USB Data Negative
37	GND	PWR	Ground
38	USB_D+	I/O	USB Data Positive
39	3.3Vaux	PWR	+3.3V Power Supply
40	GND	PWR	Not Connect
41	3.3Vaux	PWR	+3.3V Power Supply
42	LED_WWAN#	O	LED Driver, Max 9mA
43	GND	PWR	Not Connect
44	NC		Not Connect
45	NC		Not Connect
46	NC		Not Connect
47	NC		Not Connect
48	NC		Not Connect
49	NC		Not Connect
50	GND	PWR	Ground
52	NC		Not Connect
52	3.3Vaux	PWR	+3.3V Power Supply

2.3 Signal Descriptions

2.3.1 Power Supply

Power is provided to the LUM850T / LUM900T through Power pins that range from 3.0V to 3.6V.

Power Rail	Voltage Tolerance	Normal (max)	Peak (max)
3.3Vaux	±9%	TBD [1]	2,750 [1]

(1) In case of the VCC is +3.3V

Definitions:
Peak – The highest averaged current value over any 100-microsecond period
Normal – The highest averaged current value over any 1-second period
Note: For Peak, the value of "100-microsecond period" was derived as follows:
The period of time that the current is to be measured and averaged over must be less than a single
GPRS slot time. This enables measurement of the average peak current within a single GPRS slot.
There are 4.6 milliseconds/GPRS frame and eight slots per GPRS frame = 575 microseconds/slot.
The 100-microsecond period < 575-microsecond period.

2.3.2 USB Interface

The USB interface is compliant with the High Speed USB 2.0 specifications.
The USB interface is powered directly from host interface 3.3Vaux supply.

2.3.3　Control Signal Interface

Power is provided to the LUM850T / LUM900T through Power pins that range from 3.0V to 3.6V.

Symbol	Parameter	Conditions	Min	Max	Units	Notes
+3.3Vaux	Supply Voltage		3.3-9%		V	2
V_{IH}	Input High Voltage		2.0	3.6	V	1
V_{IL}	Input Low Voltage		-0.5	0.8	V	1
I_{IN}	Input Leakage Current	0V to 3.3V	-10	+10	µA	1
I_{LKG}	Output Leakage Current	0V to 3.3V	-50	+50	µA	1

Notes:
1. Applies to PERST# and W_DISABLE#.
2. As measured at the card connector pad.

2.3.4　USIM Interface

The USIM interface pins provide the connections necessary to interface to a USIM socket located on host system.
Voltage levels over this interface comply with 3GPP standards.

2.3.5　Antenna Interface

The modem has two connecters for antenna interface. The one is for Main antenna and the other is for Diversity antenna(AUX).
The connector type is UF.L and the path is assumed to be 50 ohms.

3.   RF Specifications

3.1   UMTS Technical Data

Power Class	Class 3 (+24dBm)			
Frequency Band	Band V(850)	BAND IV (900)	BAND II (1900)	BAND I (2100)
Frequency Range (MHz)	TX: 824-849 RX: 869-894	TX: 880-915 RX: 925-960	TX:1850-1910 RX: 1930-1990	TX:1920-1980 RX: 2110-2170
Duplex Spacing	45MHz	45MHz	80MHz	190MHz
Advanced Receiver	Type 3			
Maximum Downlink Speed	384 kbps (Packet-Switched)			
Maximum Uplink Speed	384 kbps (Packet-Switched)			
Features	FDD intra-frequency cell reselection FDD inter-frequency cell reselection Inter-RAT(3G <-> 2G) cell reselection Inter-RAT Cell Change Order(3G <-> 2G)			

3.2   HSPA Technical Data

Maximum Downlink Speed	14Mbps
Maximum Uplink Speed	5.7Mbps
HSDPA Categories	Category 10
HSUPA Categories	Category 6

3.3   GSM Performance and Technical Characteristics

Parameter	GSM 850	E-GSM 900	GSM 1800	GSM 1900
Frequency Range (MHz)	TX: 824-849 RX: 869-894	TX: 880-915 RX: 925-960	TX: 1710-1785 RX: 1805-1880	TX:1850-1910 RX: 1930-1990
Duplex spacing	45MHz	45MHz	95MHz	80MHz
Channel Spacing	200kHz			
Number of channels	123 Carriers x 8 (TDMA)	175 Carriers x 8 (TDMA)	374 Carriers x 8 (TDMA)	299 Carriers x 8 (TDMA)
Modulation	GMSK 8-PSK			
Power Class	GSM Power Class 4(2W) : 850 / 900MHz (27dBm) GSM Power Class 1(1W) : 1800 / 19000MHz (26dBm) EDGE Power Class E2			

3.4   GSM Features Supported

ME SIM Lock	Network 40 possible codes supported Network Subset 30 possible codes supported Service Provider 40 possible codes supported SIM / USIM 1 possible codes supported
SIM Application Toolkit USIM Application Toolkit	Supported(Release 99) Supported(Release 99)
USSD	Sending USSD supported; No MMI is provided.
Speech Coding	Not applicable

3.5　GPRS Technical Data

GPRS Release	R99
Data Rates	Multislot class 12 supported (Customer configurability to support Multi-slot Class 10) GPRS Coding Schemes : CS-1, CS-2, CS-3, CS-4
Mode of Operation	Class B
Network Modes	Network Mode 1 Network Mode 2 Network Mode 3
IP Connectivity	PDP type IP is supported IPv4
SMS over GPRS	Mobile Originated and Mobile Terminated
QoS	Support for all 4 classes (AT Command level) QoS Negotiation
PDP Context	PDP Context description edited via supplied Wizard or AT-Command PDP Context modification (e.g. QoS renegotiation) Network initiated PDP Context deactivation
SIM	Support for GPRS aware as well as non-GPRS-aware SIMs
Compression	TCP/IP Header Compression (RFC1144 and RFC2507) V42bis
GPRS Encryption	GEA1 GEA2
GPRS Frequency Hopping	Supported
GPRS IP allocation	Dynamic Static

3.6　EDGE Technical Data

Device Class	EDGE Class 12 (Customer configurability to support Multi-slot Class 10)
Modulation Coding Schemes	MSC-1 to MSC-9
EDGE features	Link Adaptation Incremental Redundancy Extended Uplink TBF Inter-RAT NACC(3G->2G)