



Genesys Logic, Inc.

GL834

**USB 2.0 SD 3.0/MMC/MS/xD/CF
Card Reader Controller**

Datasheet

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Revision History

Revision	Date	Description
1.00	01/11/2012	Formal Release
1.01	07/06/2012	1. Modify Chapter 4 Block Diagram, p.11 2. Modify AVDD, DVDD to AVDD33, DVDD33, p8~10 3. Modify Chapter 6 Package Dimension, p15

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CHAPTER 1 GENERAL DESCRIPTION

The GL834 is a crystal-less USB 2.0 to Single LUN SD3.0 (UHS-I/SDR-50)/MMC/MS/xD/CF Memory Card Reader controller.

The GL834 is a USB 2.0 Memory Card Reader single chip. It supports USB 2.0 high-speed transmission to CompactFlash™, Secure Digital™ (SD), SDHC, miniSD, microSD (T-Flash), MultiMediaCard™ (MMC), RS-MMC, MMCmicro, MMCmobile, Memory Stick™ (MS), Memory Stick Duo™ (MS Duo), High Speed Memory Stick™ (HS MS), Memory Stick PRO™ (MS PRO), Memory Stick PRO™ Duo (MS PRO Duo), Memory Stick PRO-HG™ (MS PRO-HG) and MS PRO Micro and xD-picture card on one chip. It also supports huge density memory cards (up to 2TB), such as SDXC and Memory Stick XC, and high speed memory cards, SD3.0 UHS-I cards. As a single chip solution for USB 2.0 flash card reader, the GL834 complies with Universal Serial Bus specification rev. 2.0, USB Storage Class specification ver.1.0, and SD/MMC/MS/xD/CF card interface specification.

The GL834 integrates a high speed 8051 microprocessor and a high efficiency hardware engine for the best data transfer performance between USB and flash card interfaces. Its' pin assignment design fits to card sockets to provide easier PCB layout. Inside the chip, it integrates 5V to 3.3V and 3.3V to 1.8V regulators and power MOSFETs and it enables the function of on-chip clock source (OCCS) which means no external 12MHz XTAL is needed and that effectively reduces the total BOM cost.

CHAPTER 2 FEATURES

- USB specification compliance
 - Comply with 480Mbps Universal Serial Bus specification rev. 2.0
 - Comply with USB Storage Class specification rev. 1.0
 - Support one device address and up to four endpoints:
Control (0)/ Bulk Read (1)/ Bulk Write (2)/Interrupt (3)
- Integrated USB building blocks
 - USB2.0 transceiver macro (UTM), Serial Interface Engine (SIE), Build-in power-on reset (POR)
- Embedded 8051 micro-controller
 - Embedded mask ROM and internal SRAM
- Secure Digital™ (SD)
 - Support SD specification v1.0 / v1.1 / v2.0/ SDHC (Up to 32GB)
 - Support SD specification v3.0 UHS-I: SDR25/SDR50/DDR50
 - Support 1.8V/3.3V switch signal pads
 - Support SDXC (Up to 2TB)
- MultiMediaCard™ (MMC)
 - Support MMC specification v3.x / v4.0 / v4.1 / v4.2.
 - x1 / x4 / x8 bit data bus
- Memory Stick™ / Memory Stick PRO / Memory Stick PRO Duo / Memory Stick Micro /Memory Stick PRO-HG / Memory Stick XC
 - Comply with Memory Stick specification: MS 1.43 / MS PRO 1.05 / MS HG Micro 1.00 / MS PRO-HG Duo 1.03 with 8-bit data bus / MS XC 1.00
 - Support Read/Write quad data access (512Bytex4) for MS PRO-HG to enhance the transmission rate
- Support CompactFlash™ v6.0 with PIO mode 6 / Ultra DMA mode 7 and LBA48 (Capacity up to 144PB)
- Support xD-Picture™ v1.2C Type M/H
- On chip clock source (OCCS) and no need of 12MHz Crystal Clock input.
- On-Chip 5V to 3.3V and 3.3V to 1.8V regulators
- Support 5V to 3.3V Band Gap Regulator for stable voltage supply
- Support 5V power input and 3.3V power input
- Provide Over-Current protection mechanism for safety power supply
- On-Chip power MOSFETs for supplying flash media card power
- Support Power Saving mode/ Selective suspend mode for better power management.
- Support power/memory card access LED
- Package available in 48 pin LQFP (7x7 mm)

CHAPTER 3 PIN ASSIGNMENT

3.1 LQFP 48 Pinout

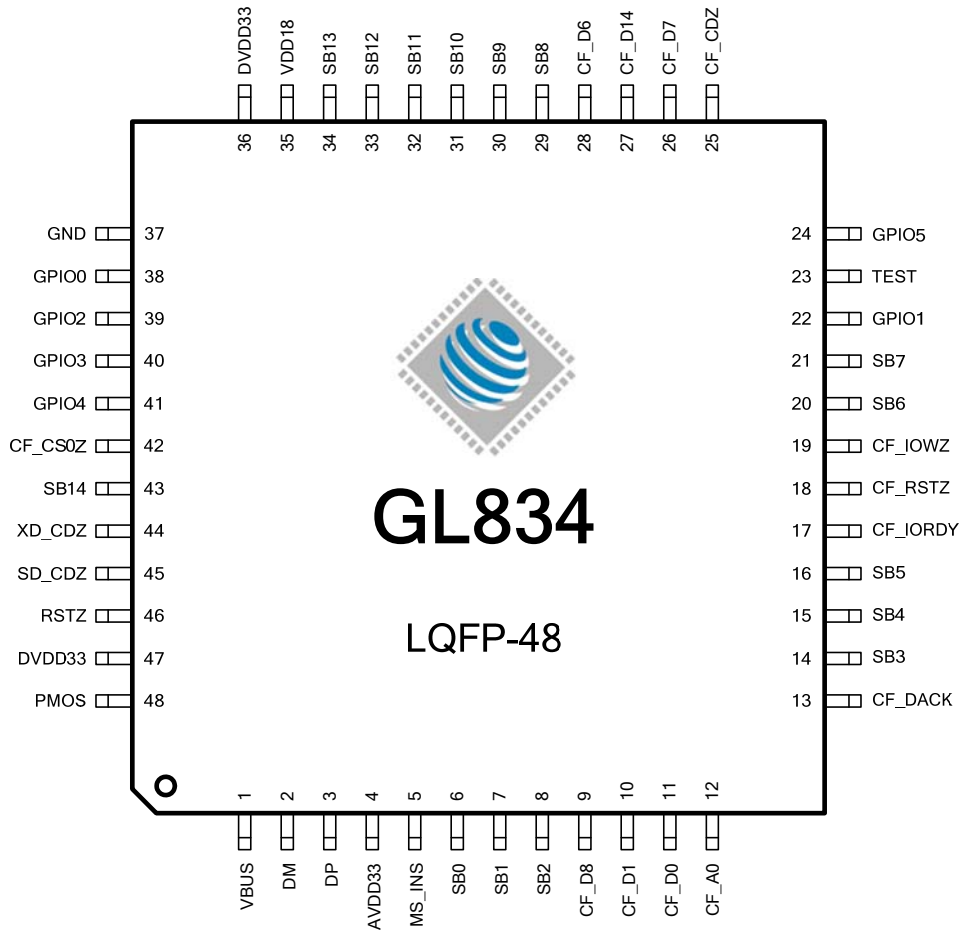


Figure 3.1 - 48 Pin LQFP Pin out Diagram

3.2 Pin List/Descriptions

Table 3.1 - GL834 Pin List/Descriptions

Pin name	LQFP48	Type	Description
VBUS	1	P	VBUS 5V
DM	2	A	USB D-
DP	3	A	USB D+
AVDD33	4	P	Analog power 3.3V
MS_INS	5	I, PU	MS insertion detect 0: Card insert 1: No card
SB0	6	I, PD	CF_D10/xD_D7/SD_D7/MS_CLK
SB1	7	I, PD	CF_D9/xD_D6/SD_D6/MS_D3
SB2	8	I, PD	CF_D2/xD_D5
CF_D8	9	I, PD	CF_D8
CF_D1	10	I, PD	CF_D1
CF_D0	11	I, PD	CF_D0
CF_A0	12	I, PD	CF_A0
CF_DACK	13	I, PD	CF_DACK
SB3	14	I, PD	CF_A1/xD_D4/SD_D5/MS_D2
SB4	15	I, PD	CF_DRQ/xD_D3/SD_D4/MS_D0
SB5	16	I, PD	CF_A2/xD_D2/SD_WP/MS_D1
CF_IORDY	17	I, PD	CF_IORDY
CF_RSTZ	18	I, PD	CF_RSTZ
CF_IOWZ	19	I, PD	CF_IOWZ
SB6	20	I, PD	CF_IORZ/xD_D1/MS_BS
SB7	21	I, PD	CF_D15/xD_D0
GPIO1	22	I, PU	Remote Wakeup 0:Enable 1:Disable(default)
TEST	23	I, PD	TEST PIN
GPIO5	24	I, PU	Power Input Selection 0:5V input 1:3.3V input(default)
CF_CDZ	25	I, PU	CF_CDZ
CF_D7	26	I, PD	CF_D7
CF_D14	27	I, PD	CF_D14
CF_D6	28	I, PD	CF_D6
SB8	29	I, PD	CF_D13/xD_ALE/SD_D1/MS_D7

SB9	30	I, PD	CF_D5/xD_CLE/SD_D0/MS_D6
SB10	31	I, PD	CF_D12/xD_WEZ/SD_CLK
SB11	32	I, PD	CF_D4/xD_CEZ/SD_CMD
SB12	33	I, PD	CF_D11/xD_REZ/SD_D3/MS_D4
SB13	34	I, PD	CF_D3/xD_RBZ/SD_D2/MS_D5
VDD18	35	P	PLL 1.8V Power, the power source of this pin comes from the internal regulator of GL834 and no need of external 1.8V power input
DVDD33	36	P	Digital Power 3.3V
GND	37	P	GND
GPIO0	38	I, PD	Power and Access LED
GPIO2	39	I, PU	I2C SDA
GPIO3	40	I, PU	I2C SCL
GPIO4	41	I, PU	Power Saving Mode Selection 0:Normal Mode 1:Power Saving Mode (default)
CF_CS0Z	42	I, PD	CF_CS0Z
SB14	43	I, PD	CF_CS1Z/xD_WPZ
XD_CDZ	44	I, PU	xD_CDZ
SD_CDZ	45	I, PU	SD_CDZ
RSTZ	46	I, PU	RESET
DVDD33	47	P	Digital Power 3.3V
PMOS	48	P	Card Power 500mA

Notation:

Type	O	Output
	I	Input
	B	Bi-directional
	pu	Internal pull-up when input
	pd	Internal pull-down when input
	P	Power / Ground
	A	Analog

CHAPTER 4 BLOCK DIAGRAM

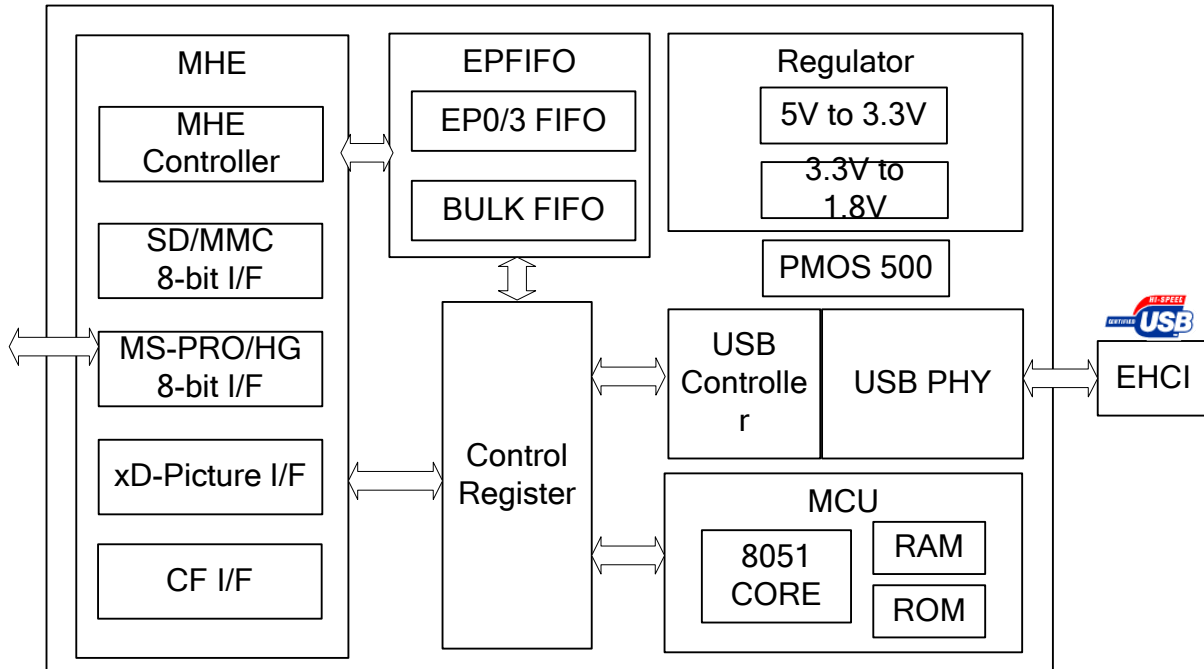


Figure 4.1 - Functional Block Diagram

4.1 USB PHY

The USB 2.0 Transceiver Macrocell is the analog circuitry that handles the low level USB protocol and signaling, and shifts the clock domain of the data from the USB 2.0 rate to one that is compatible with the general logic. On chip clock source and no need of 12MHz Crystal Clock input.

4.2 USB Controller

The USB controller, which contains USB PID and address recognition logic, and other sequencing and state machine logic to handle USB packets and transactions.

4.3 EPFIFO

Endpoint FIFO includes Control FIFO (FIFO0), Interrupt FIFO (FIFO3), Bulk In/Out FIFO

- **Control FIFO** FIFO of control endpoint 0. It is 64-byte FIFO and used for endpoint 0 data transfer.
- **Interrupt FIFO** 64-byte depth FIFO of endpoint 3 for status interrupt
- **Bulk In/Out FIFO** It can be in the TX mode or RX mode:
 1. It contains ping-pong FIFO (512 bytes each bank) for transmit/receive data continuously.
 2. It can be directly accessed by micro-control

4.4 MCU

8051 micro-controller inside.

- **8051 Core** Compliant with Intel 8051 high speed micro-controller
- **ROM** FW code on ROM
- **RAM** Internal RAM area for MCU access

4.5 MHE

- **MIF** Media Interface: CF/xD/SD/MMC/MS/MS PRO/MS PRO-HG
- **MCFIFO** It can access by MCU for memory card short data packet.

4.6 Regulator

- **5V to 3.3V** Band Gap Regulator for stable voltage supply for USB PHY, PMOS..
When Power source is 3.3V, the 5V to 3.3V regulator will be disabled.
- **3.3V to 1.8V** For core logic and internal memory.

4.7 PMOS

On-Chip power MOSFETs provide Over-Current protection mechanism

CHAPTER 5 ELECTRICAL CHARACTERISTICS

5.1 Absolute Maximum Ratings

Table 5.1 - Absolute Maximum Ratings

Parameter	Value
Storage Temperature	-65°C to +150 °C
DC Input Voltage to Any Pin	-0.5V to +5.8V

5.2 Operating Conditions

Table 5.2 - Operating Conditions

Parameter	Value
Ta (Ambient Temperature Under Bias)	0°C to 70°C
Supply Voltage (5V Power Source)	4.75V to 5.25V
Supply Voltage (3.3V Power Source)	3.135V to 3.465V
Ground Voltage	0V

5.3 DC Characteristics

Table 5.3 - DC Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V _{CC}	Supply Voltage	5V source	4.75	-	5.25	V
V _{IH}	Input High Voltage		2.0	-		V
V _{IL}	Input Low Voltage			-	0.4	V
I _I	Input Leakage current	0 < V _{IN} < V _{CC}	-10	-	10	μA
V _{OH}	Output High Voltage		2.8	-	-	V
V _{OL}	Output Low Voltage		-	-	0.4	V
I _{OH}	Output Current High		-	8	-	mA
I _{OL}	Output Current Low		-	8	-	mA
C _{IN}	Input Pin Capacitance		-	5	-	pF
I _{SUSP}	Suspend current	1.5K external pull-up included	-	-	450	μA
I _{CC}	Supply current	Connect to USB with 8051 operating	-	-	70	mA

5.4 AC Characteristics of Reset Timing



Figure 5.1 - Timing Diagram of Reset width

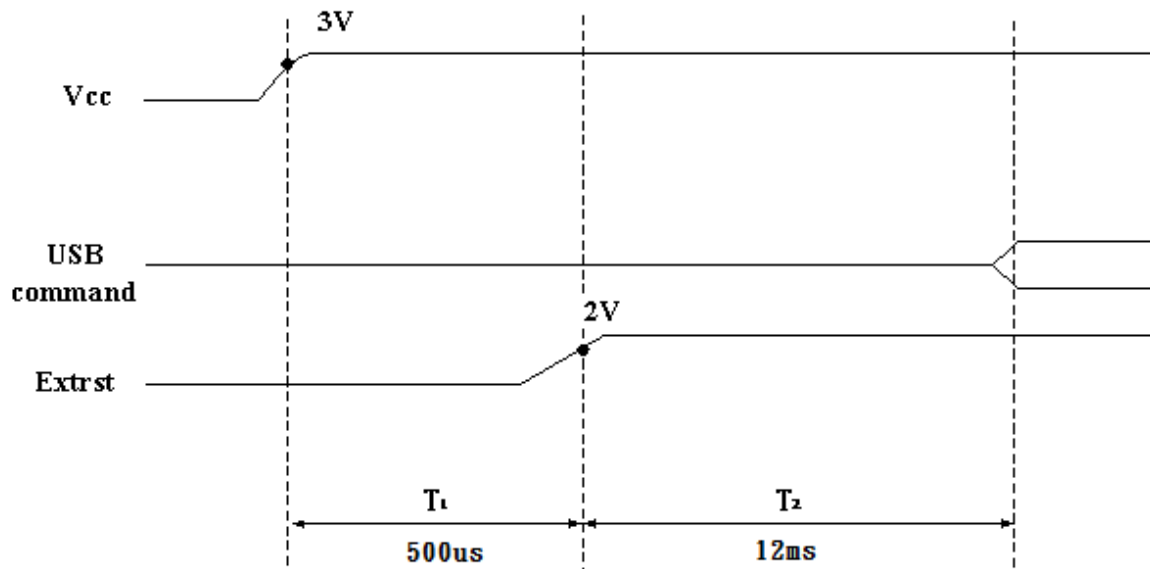


Figure 5.2 - Timing Diagram of Power Good to USB command receive ready

Table 5.4 - Reset Timing

Parameter	Description	Min.	Unit
Trst	Chip reset sense timing width	1	ms
T1	External reset valid from power up to high	0.5	ms
T2	Reset Desertions to respond USB command ready	12	ms

CHAPTER 6 PACKAGE DIMENSION

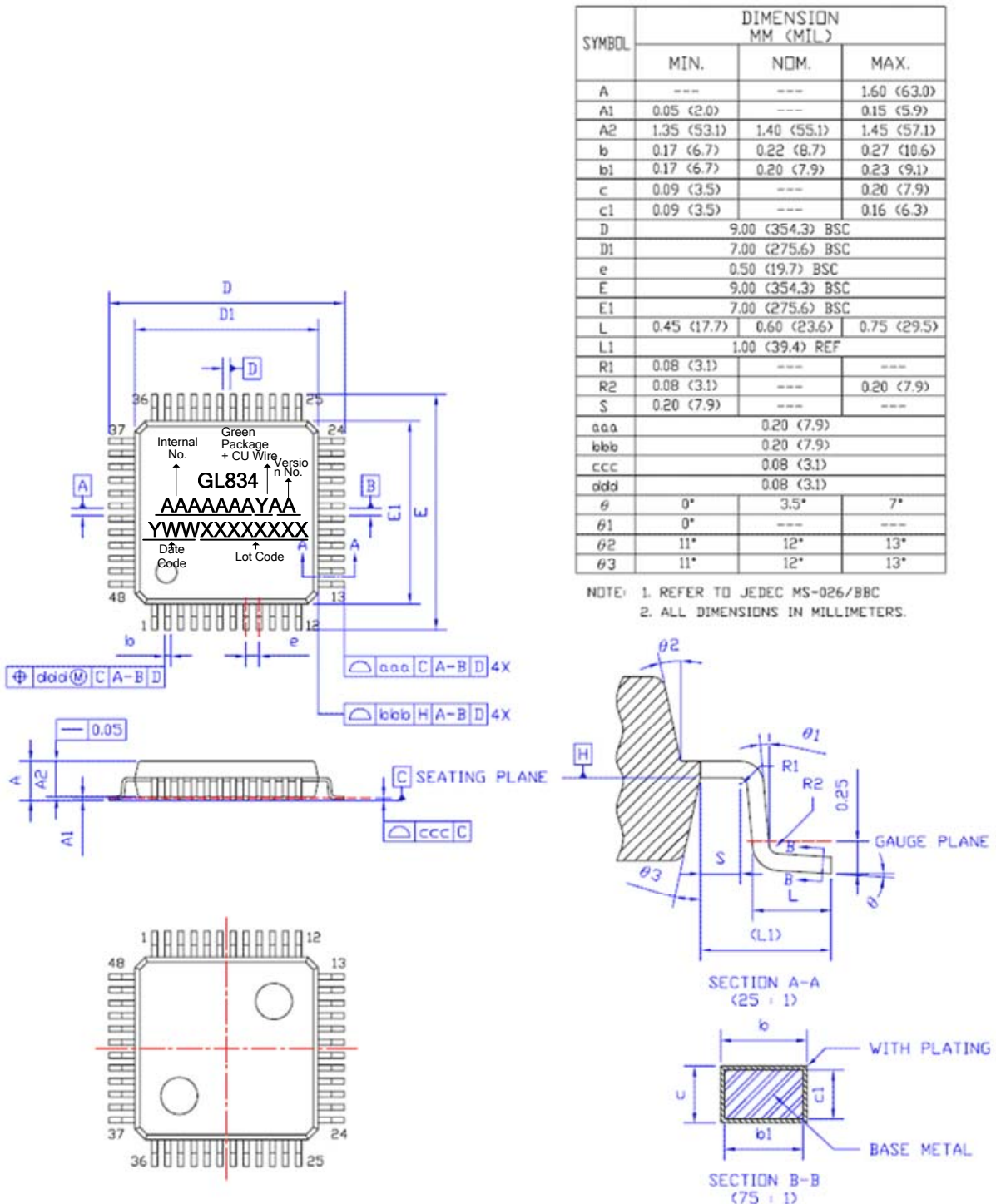


Figure 6.1 - LQFP 48 Pin Package

CHAPTER 7 ORDERING INFORMATION

Table 7.1 - Ordering Information

Part Number	Package	Green/Wire Material	Version	Status
GL834-MNYXX	LQFP 48	Green Package + CU Wire	XX	Available