HL6738MG

Visible High Power Laser Diode

HITACHI

ADE-208-601B (Z)
3rd Edition
May 1998

Description

The HL6738MG is a 0.68 μm band AlGaInP laser diode (LD) with a multi-quantum well (MQW) structure. It is suitable as a light source for large capacity optical disc memories and various other types of optical equipment.

Hermetic sealing of the small package (ϕ 5.6 mm) assures high reliability.

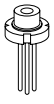
Application

- Optical disc memories
- Optical equipment

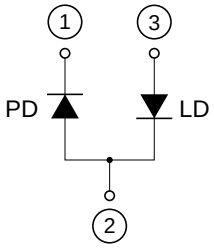
Features

- High output power : 35 mW (CW)
- Visible light output : λp = 680 to 695 nm
- Small package : ϕ 5.6 mm
- Low astigmatism : 6 μm Typ (P_O = 5 mW)

Package Type
• HL6738MG: MG



Internal Circuit



Hitachi semiconductor

Absolute Maximum Ratings (T_C = 25°C)

Item	Symbol	Value	Unit
Optical output power	P_O	35	mW
Pulse optical output power	P_O (pulse)	50 *	mW
Laser diode reverse voltage	$V_{R\ (LD)}$	2	V
Photo diode reverse voltage	$V_{R\ (PD)}$	30	V
Operating temperature	Topr	–10 to +70	°C
Storage temperature	Tstg	–40 to +85	°C

Note: Pulse condition : Pulse width = 100 ns, duty = 50%

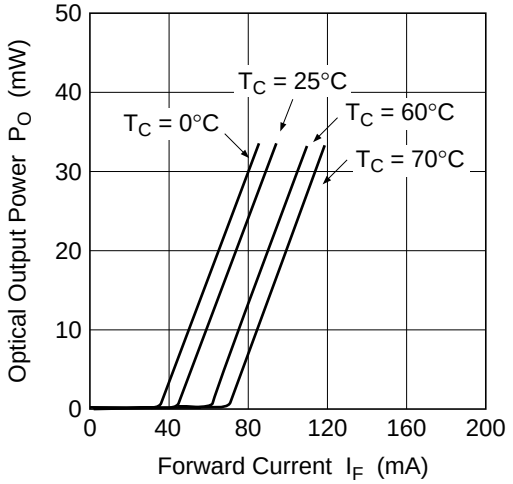
Optical and Electrical Characteristics (T_C = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Optical output power	P_O	35	—	—	mW	Kink free *
Pluse optical output power	$P_{O(pulse)}$	50	—	—	mW	Kink free *
Threshold current	Ith	30	45	70	mA	—
Operating voltage	V_{OP}	2.1	2.5	2.8	V	P_O = 30 mW
Slope efficiency	ηs	0.5	0.7	0.9	mW/mA	18(mW) / ($I_{(24mW)} – I_{(6mW)}$)
Lasing wavelength	λp	680	690	695	nm	P_O = 30 mW
Beam divergence parallel to the junction	θ//	7	8.5	10.5	deg.	P_O = 30 mW
Beam divergence parpendicular to the junction	θ⊥	17	19	23	deg.	P_O = 30 mW
Monitor current	I_S	0.02	0.1	0.45	mA	P_O = 30 mW, $V_{R\ (PD)}$ = 5 V
Asitgmatism	A_S	—	6	—	μm	P_O = 5 mW, NA = 0.55

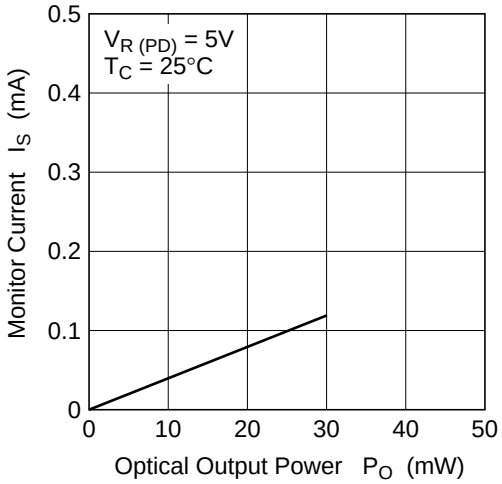
Note: Kink free is confirmed at the temperature of 25°C.

Curve Characteristics

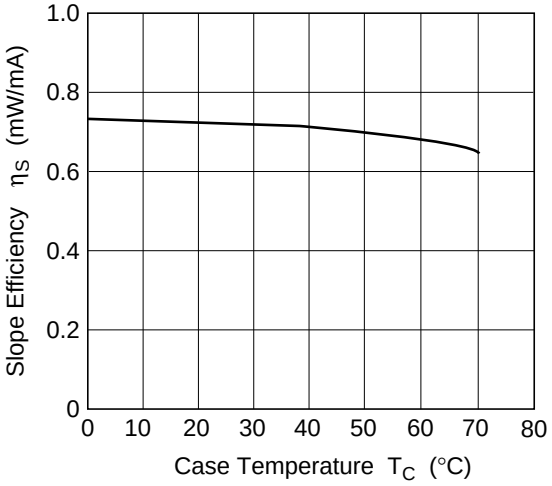
Optical Output Power vs. Forward Current



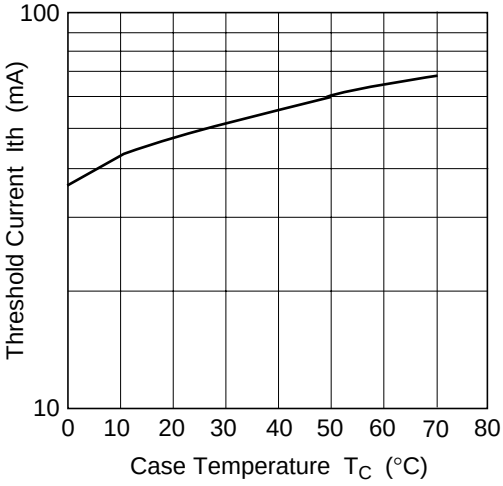
Monitor Current vs. Optical Output Power



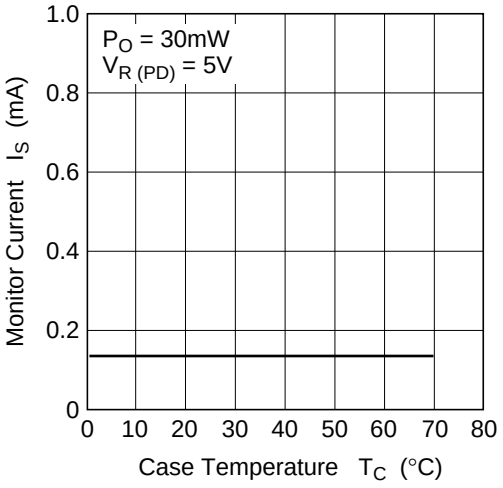
Slope Efficiency vs. Case Temperature



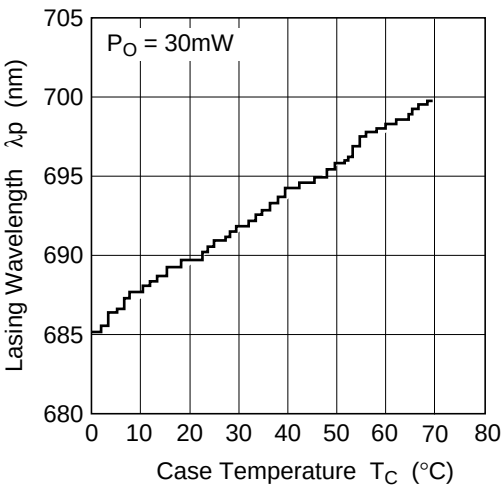
Threshold Current vs. Case Temperature



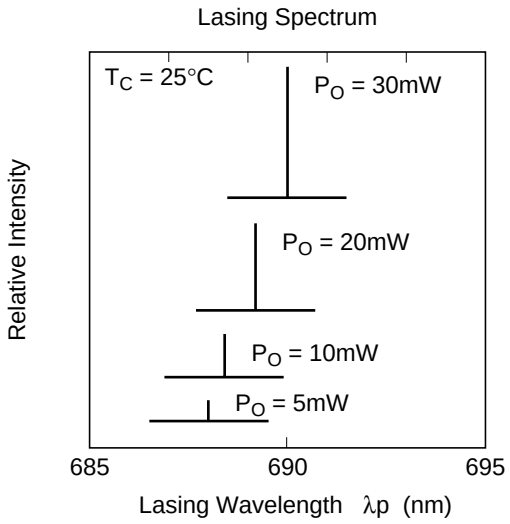
Monitor Current vs. Case Temperature



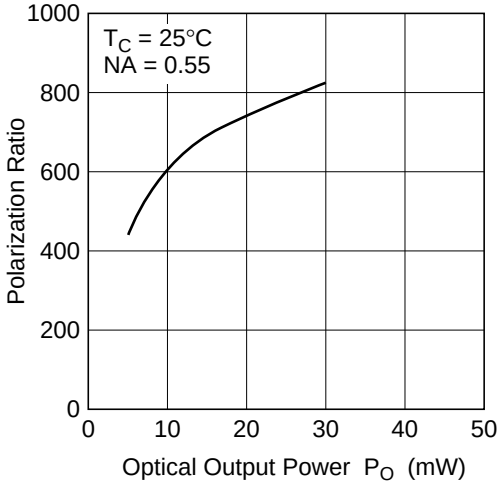
Lasing Wavelength vs. Case Temperature



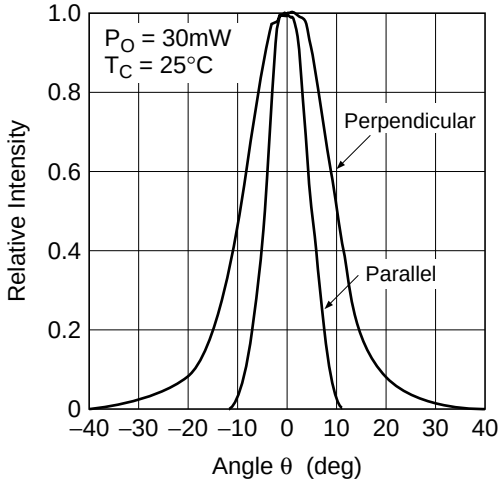
Lasing Spectrum



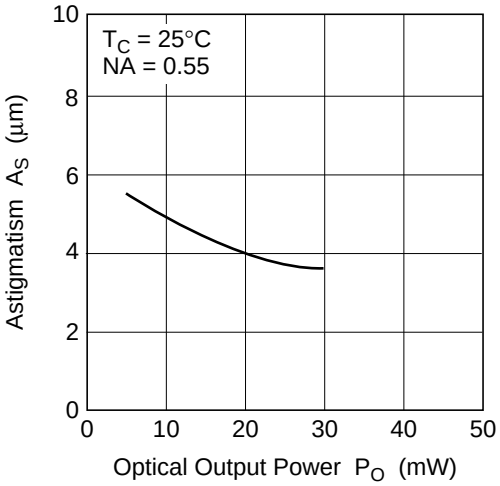
Polarization Ratio vs. Optical Output Power



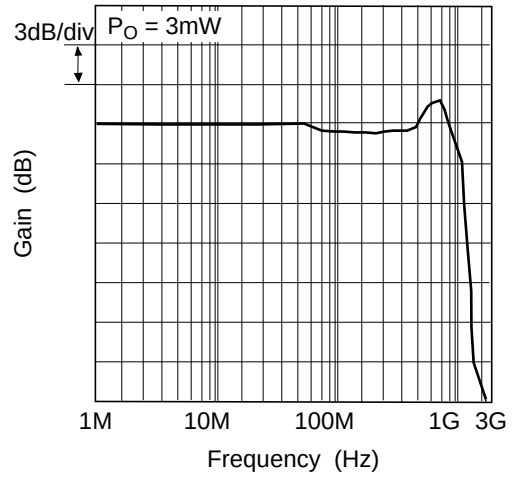
Far Field Pattern



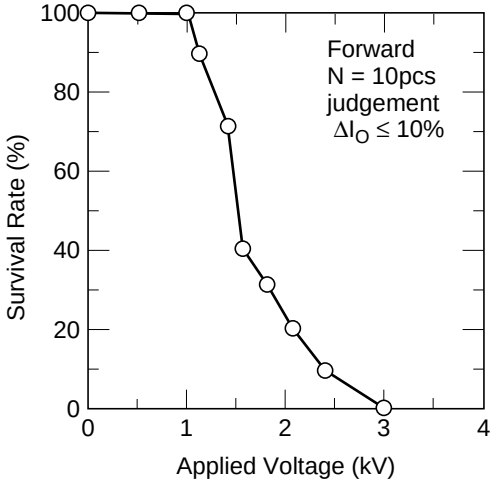
Astigmatism vs. Optical Output Power



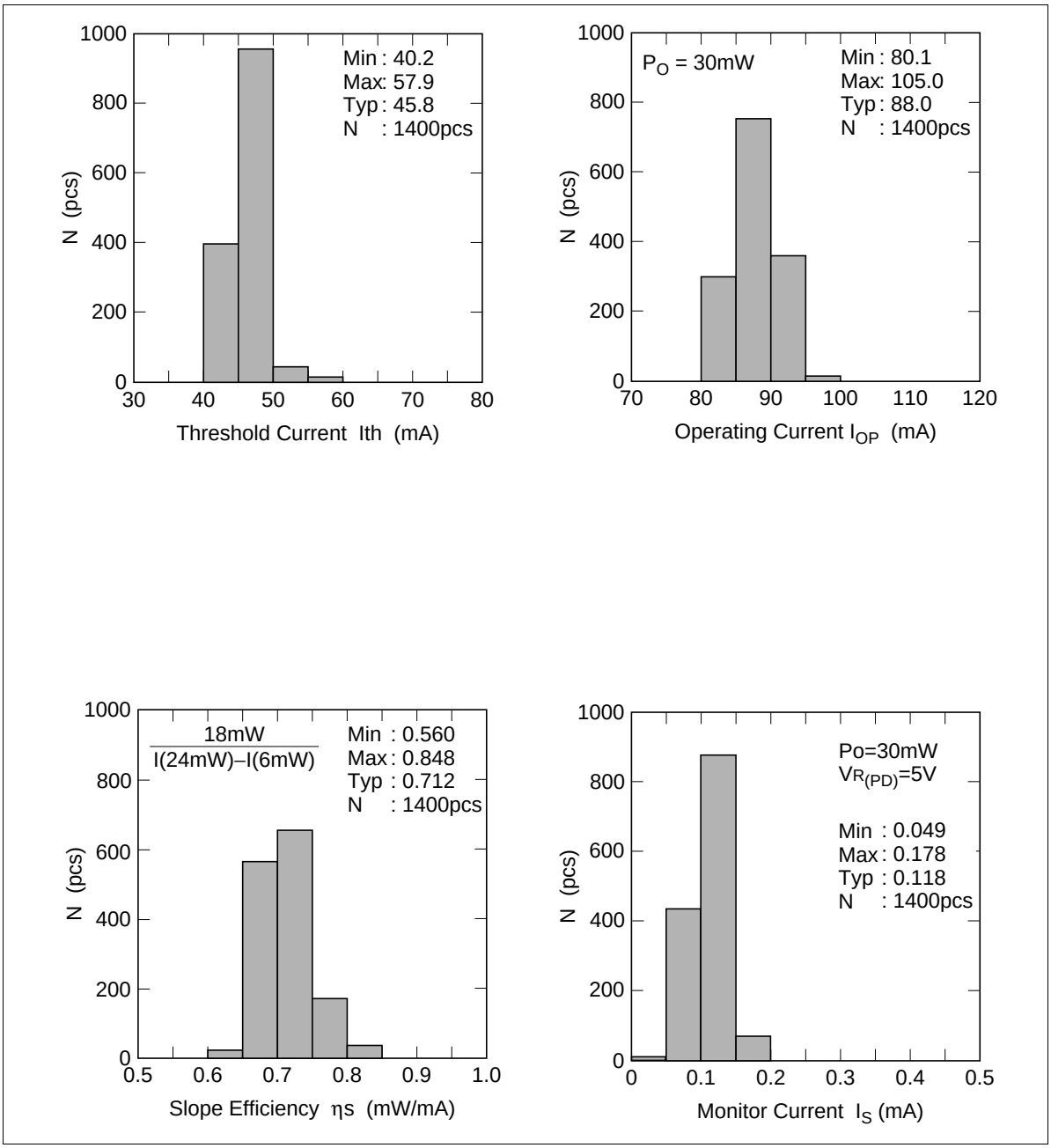
Frequency Response

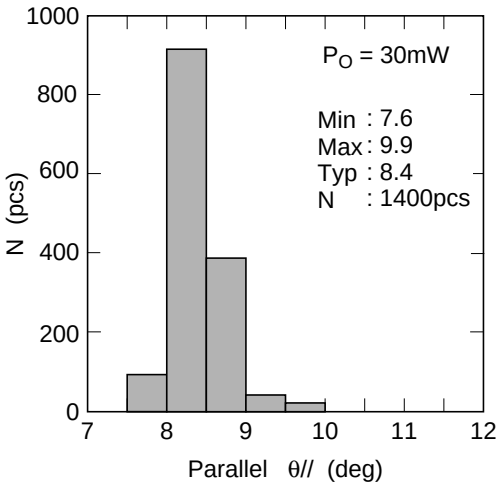


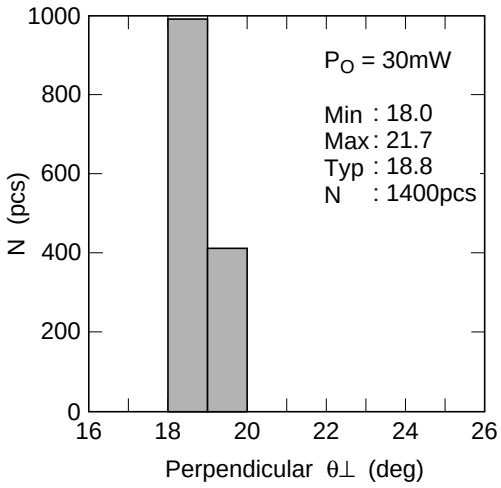
Electrostatic Destruction (MILstandard)

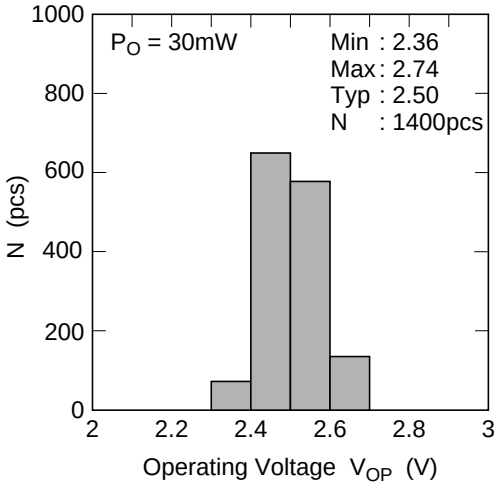


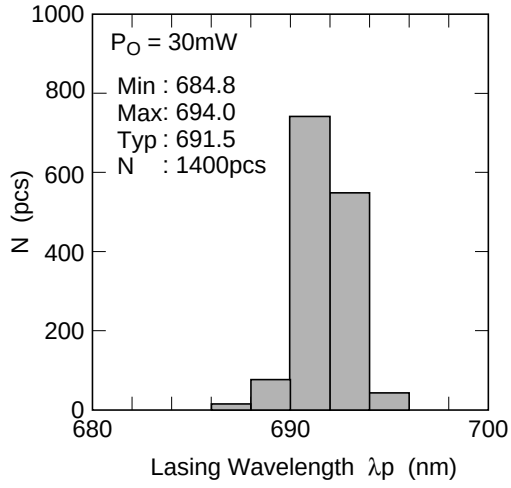
Characteristics Distribution




P_O = 30mW
Min : 7.6
Max : 9.9
Typ : 8.4
N : 1400pcs
N (pcs)
Parallel θ// (deg)

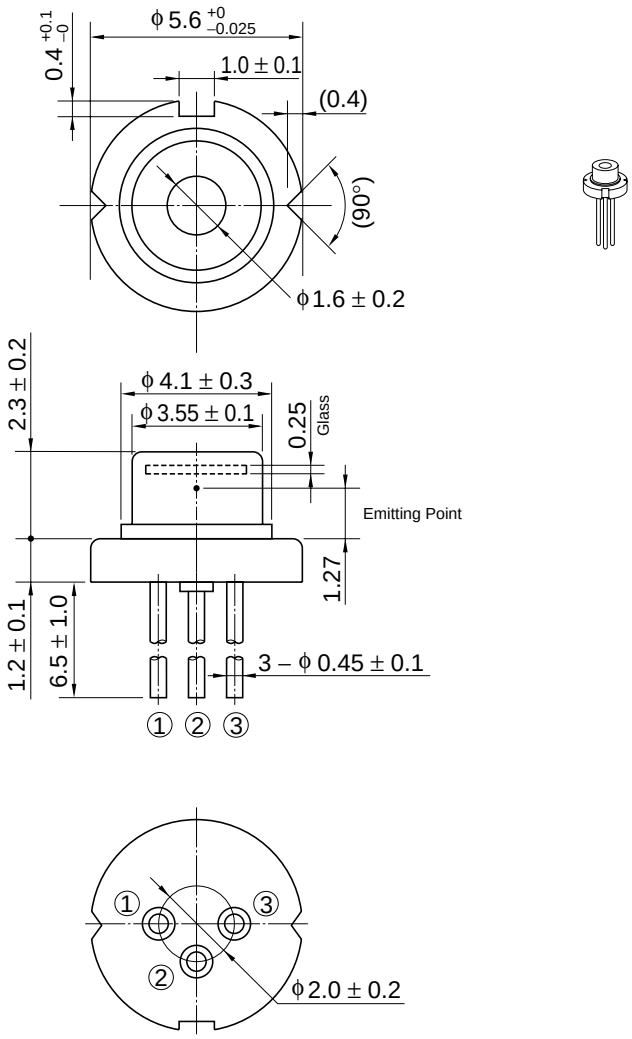

P_O = 30mW
Min : 18.0
Max : 21.7
Typ : 18.8
N : 1400pcs
N (pcs)
Perpendicular θ⊥ (deg)


P_O = 30mW
Min : 2.36
Max : 2.74
Typ : 2.50
N : 1400pcs
N (pcs)
Operating Voltage V_{OP} (V)


P_O = 30mW
Min : 684.8
Max : 694.0
Typ : 691.5
N : 1400pcs
N (pcs)
Lasing Wavelength λp (nm)

Package Dimensions

Unit: mm



Hitachi Code	LD/MG
JEDEC	—
EIAJ	—
Weight (reference value)	0.3 g

Cautions

1. Hitachi neither warrants nor grants licenses of any rights of Hitachi's or any third party's patent, copyright, trademark, or other intellectual property rights for information contained in this document. Hitachi bears no responsibility for problems that may arise with third party's rights, including intellectual property rights, in connection with use of the information contained in this document.
2. Products and product specifications may be subject to change without notice. Confirm that you have received the latest product standards or specifications before final design, purchase or use.
3. Hitachi makes every attempt to ensure that its products are of high quality and reliability. However, contact Hitachi's sales office before using the product in an application that demands especially high quality and reliability or where its failure or malfunction may directly threaten human life or cause risk of bodily injury, such as aerospace, aeronautics, nuclear power, combustion control, transportation, traffic, safety equipment or medical equipment for life support.
4. Design your application so that the product is used within the ranges guaranteed by Hitachi particularly for maximum rating, operating supply voltage range, heat radiation characteristics, installation conditions and other characteristics. Hitachi bears no responsibility for failure or damage when used beyond the guaranteed ranges. Even within the guaranteed ranges, consider normally foreseeable failure rates or failure modes in semiconductor devices and employ systemic measures such as fail-safes, so that the equipment incorporating Hitachi product does not cause bodily injury, fire or other consequential damage due to operation of the Hitachi product.
5. This product is not designed to be radiation resistant.
6. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without written approval from Hitachi.
7. Contact Hitachi's sales office for any questions regarding this document or Hitachi semiconductor products.

HITACHI

Hitachi, Ltd.
Semiconductor & IC Div.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111
Fax: (03) 3270-5109

For further information write to:

Hitachi Semiconductor (America) Inc.
2000 Sierra Point Parkway
Brisbane, CA. 94005-1897
U S A
Tel: 800-285-1601
Fax:303-297-0447

Hitachi Europe GmbH
Continental Europe
Dornacher Straße 3
D-85622 Feldkirchen
München
Tel: 089-9 91 80-0
Fax: 089-9 29 30-00

Hitachi Europe Ltd.
Electronic Components Div.
Northern Europe Headquarters
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA
United Kingdom
Tel: 01628-585000
Fax: 01628-585160

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia (Hong Kong) Ltd.
Unit 706, North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon
Hong Kong
Tel: 27359218
Fax: 27306071