

**ALP237FXX**

## Low-Temperature Polysilicon 1.8-inch TFT LCD Module

### Overview

This wide viewing type 1.8 inch low temperature poly- silicon TFT-LCD module is suitable for digital still camera.

### Features

- Diagonal 4.6cm (1.8inch) display size.
- $521 \times 218 = 113,578$  dots.
- RGB delta color arrangement.
- Wide viewing angle, **Survival®**. (Super Ranged Viewing by Vertical Alignment)
- Operating temperature (panel) is -10 to +60°C. Ambient temperature during storage is -20 to +70°C.
- Slim design, light weight and narrow frame. (t=0.7mm glass)
- Up / down and right / left inverse function.
- Built-in level shifter circuit.
- Conform to NTSC, PAL when using recommended IC : LV4131W, LV4133W, (LV4139W : Under development).
- Anti-reflection (AR) coat.
- Panel power consumption is Typ.100mW at NTSC.
- Optical transmittance is approx. 6.3%.

### Specifications

| Item                                   | Specifications        | Unit | Remarks |
|--|-----------------------|------|---------|
| Dot count (H) × (V)                    | 521 × 218             | dot  |         |
| Effective display dimensions (H) × (V) | 36.77 × 27.47         | mm   |         |
| Display size (diagonal)                | 4.6 (1.8inch)         | cm   |         |
| Dot pitch (H) × (V)                    | 0.0705 × 0.126        | mm   |         |
| Color arrangement                      | RGB Delta             | -    |         |
| External Dimensions (W) × (H) × (D)    | TYP 43.4 × 36.6 × 2.1 | mm   | Note1   |
| Weight                                 | Approx. 6             | g    |         |

\*Note1: Excluding flexible cable and protrusions.

- Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.
- SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

**Absolute Maximum Ratings** at VSS=0V

| Item                                    | Symbol                                      | Ratings     | Unit |
|---|---|-------------|------|
| H driver power supply voltage           | HVDD  | -1.0 to +17 | V    |
| V driver power supply voltage           | VVDD  | -1.0 to +17 | V    |
| Common electrode voltage                | VCOM  | -1.0 to +17 | V    |
| Driving direction signal voltage        | CSH, CSV                                    | -1.0 to +17 | V    |
| H driver input voltage                  | STH, XSTH, CKH1, CKH2                       | -1.0 to +17 | V    |
| V driver / precharge data input voltage | STV, XSTV, CKV1, CKV2, ENB, XENB, PCG, XPCG | -1.0 to +17 | V    |
| Video / precharge data input voltage    | VG, VR, VB, VPCD                            | -1.0 to +13 | V    |
| Operating temperature (panel)           | Topr  | -10 to +60  | °C   |
| Storage temperature                     | Tstg  | -20 to +70  | °C   |

**Operating Conditions**

Power supply voltage HVDD 15.5V ± 0.5V, VVDD 15.5V ± 0.5V, VSS 0V

| Item                                |      | Symbol     | MIN           | TYP       | MAX           | Unit |
|-------------------------------------|------|------------|---------------|-----------|---------------|------|
| H driver input voltage              | Low  | VHIL       | -0.3          | 0.0       | 0.3           | V    |
|                                     | High | VHIH       | 2.5           | 3.0       | 4.0           | V    |
| V driver input voltage              | Low  | VVIL       | -0.3          | 0.0       | 0.3           | V    |
|                                     | High | VVIH       | 2.5           | 3.0       | 4.0           | V    |
| CSV, CSH                            | Low  | VSIL       | -0.3          | 0.0       | 0.3           | V    |
|                                     | High | VSIH       | 11.5          | VDD       | VDD           | V    |
| Video signal center voltage         |      | VVC        | 6.3           | 6.5       | 6.8           | V    |
| Video signal input voltage range *1 |      | VG, VR, VB | VVC-5.0       | -         | VVC+5.0       | V    |
| Common electrode voltage*2          |      | VCOM       | (VVC-0.3)-0.2 | (VVC-0.3) | (VVC-0.3)+0.2 | V    |
| Precharge data signal *1            |      | VPCD       | VVC±4.5       | -         | VVC±5.0       | V    |

\*1 Video signal and precharge data signal shall be input symmetrically around VVC.

\*2 Set common electrode voltage to the optimum voltage.

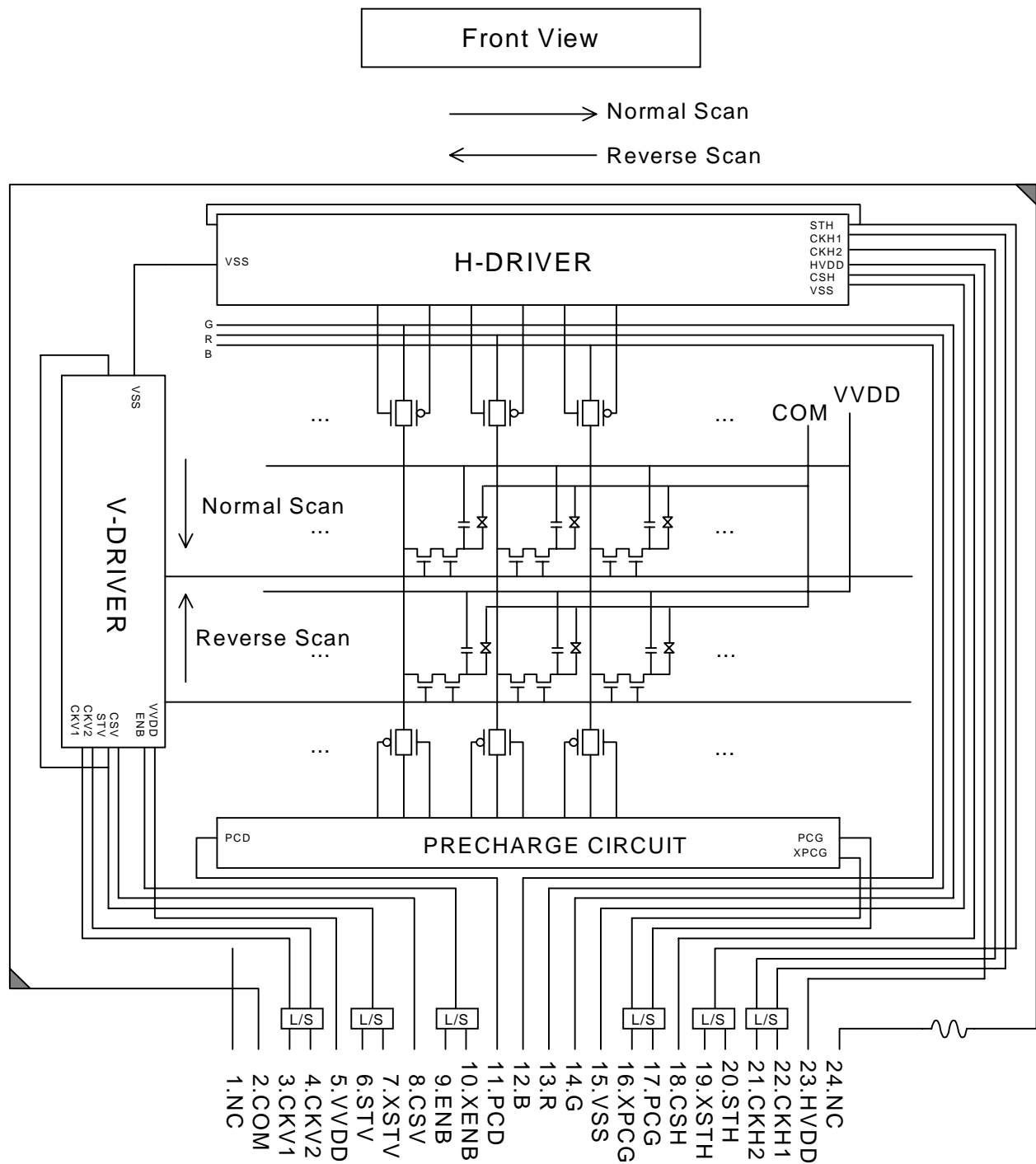
**Optical Specifications**

| Item                | Symbol | Condition | MIN | TYP | MAX | Unit |
|---------------------|--------|-----------|-----|-----|-----|------|
| Contrast ratio      | CR     | 25°C      | -   | 150 | -   | -    |
| Viewing angle range | θT     | CR ≥ 10   | -   | 55  | -   | deg  |
|                     | θB     |           |     | 55  |     |      |
|                     | θL     |           |     | 45  |     |      |
|                     | θR     |           |     | 45  |     |      |

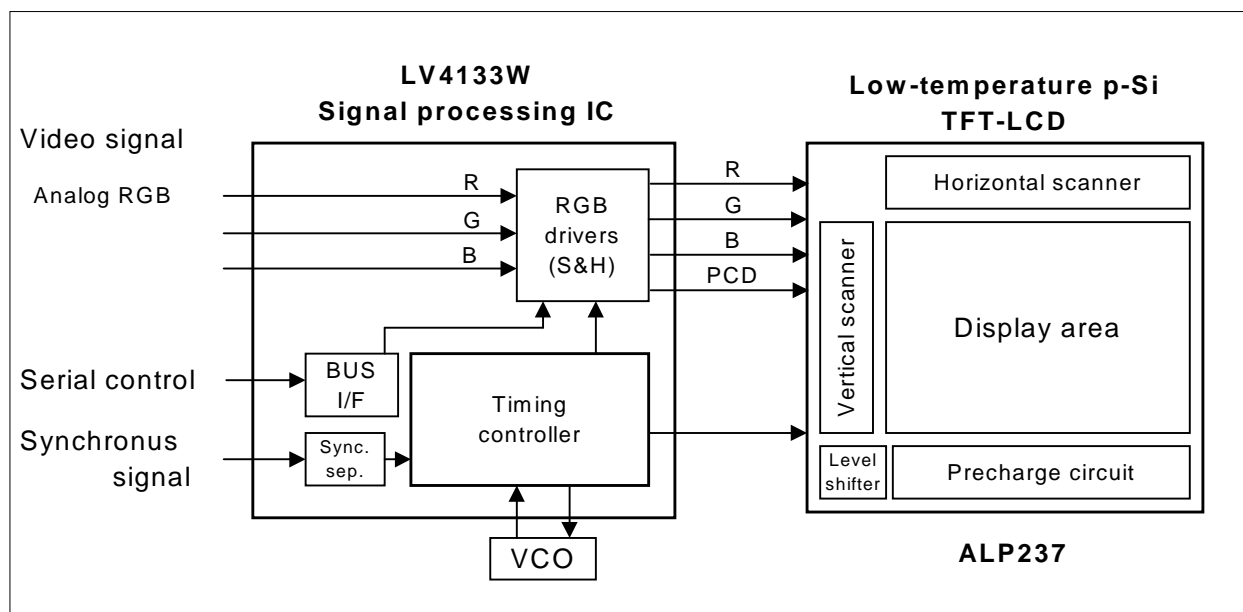
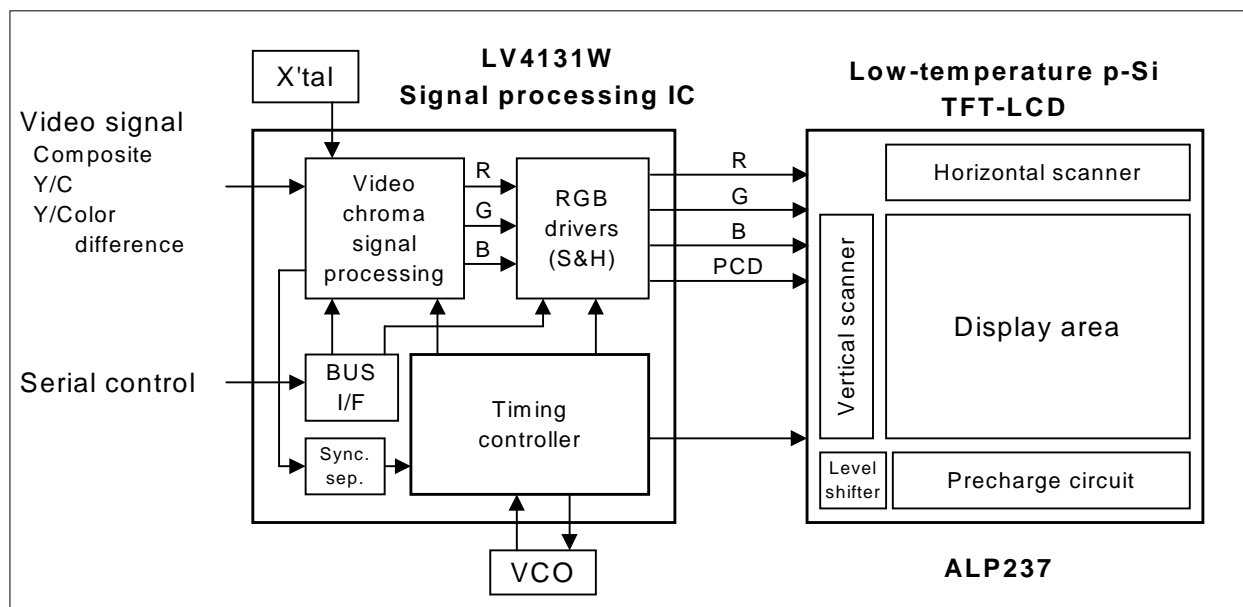
## Pin Function

| Pin No | Symbol | Function  |
|--------|--------|---|
| 1      | NC     | Leave this pin open   |
| 2      | COM    | Common electrode voltage  |
| 3      | CKV1   | V clock 1   |
| 4      | CKV2   | V clock 2   |
| 5      | VVDD   | VDD for V drive   |
| 6      | STV    | V start signal  |
| 7      | XSTV   | Inverted signal of STV  |
| 8      | CSV    | Up / down inverse control signal (H : Normal scan, L : Reverse scan)    |
| 9      | ENB    | Enable signal   |
| 10     | XENB   | Inverted signal of ENB  |
| 11     | PCD    | Precharge data signal   |
| 12     | B      | Video signal (B)  |
| 13     | R      | Video signal (R)  |
| 14     | G      | Video signal (G)  |
| 15     | VSS    | VSS for V and H drive   |
| 16     | XPCG   | Inverted signal of PCG  |
| 17     | PCG    | Precharge gate signal   |
| 18     | CSH    | Right / left inverse control signal (H : Normal scan, L : Reverse scan) |
| 19     | XSTH   | Inverted signal of STH  |
| 20     | STH    | H start signal  |
| 21     | CKH2   | H clock 2   |
| 22     | CKH1   | H clock 1   |
| 23     | HVDD   | VDD for H drive   |
| 24     | NC     | Leave this pin open   |

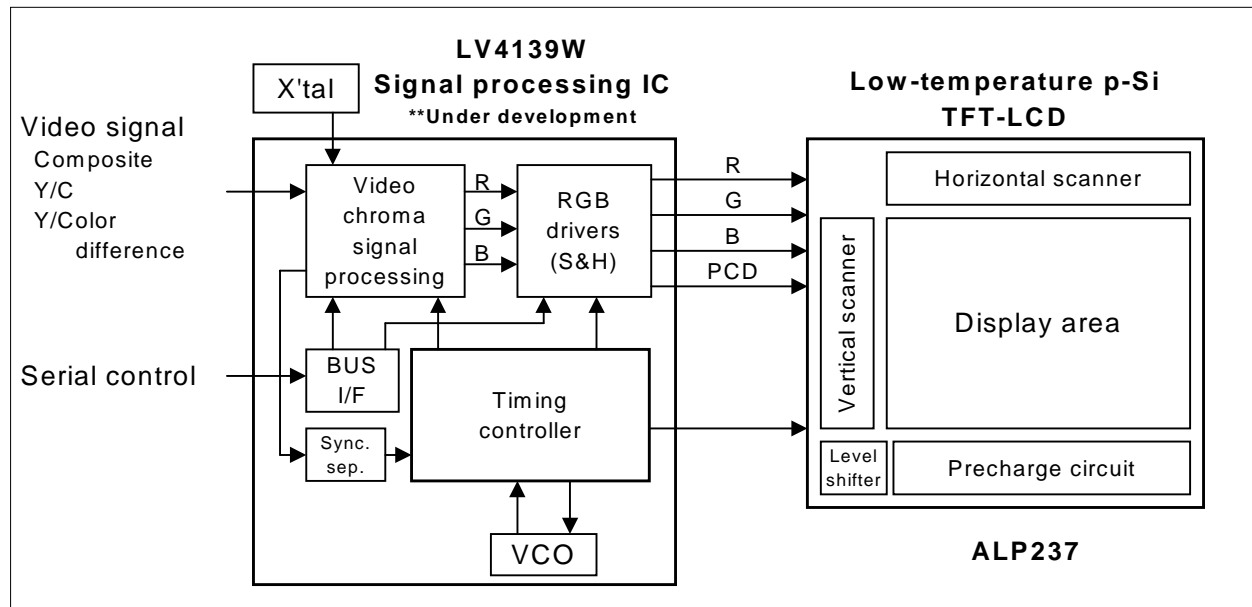
## Block Diagram



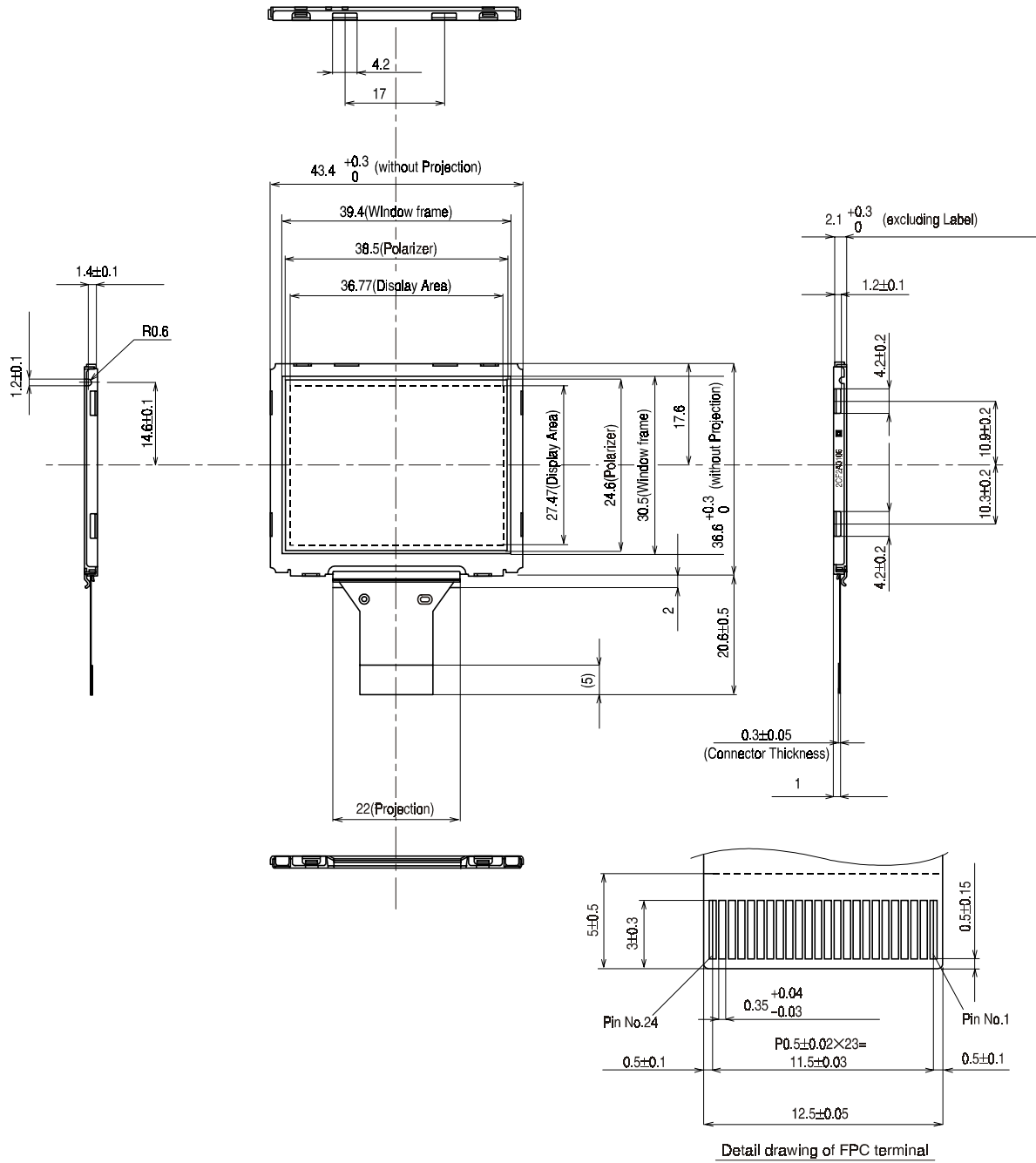
## System Configuration



## System Configuration



## Package Dimension



- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of January, 2001. Specifications and information herein are subject to change without notice.