IGBT

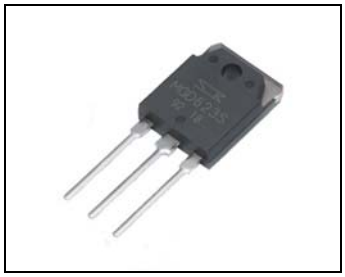
MGD623S

July, 2009

■Features

- Low Saturation Voltage VCE(sat)=1.8V typ.
- High Speed tf=120ns typ.
- Low VF FRD Included VF=1.2V typ.

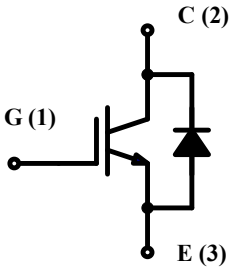
■Package----TO-3P



■Applications

- Current Resonance Inverter Switching
- Induction Heating Cooking

■Equivalent circuit



Absolute maximum ratings

(Ta=25°C)

Characteristic	Symbol	Rating	Unit
Collector to Emitter Voltage	VCES	600	V
Gate to Emitter Voltage	VGES	±30	V
Continuous Collector Current	IC	50	A
Pulsed Collector Current	IC(pulse) 1)	100	A
Diode Continuous Forward Current	IF	30	A
Diode pulsed Forward Current	IF(pulse) 1)	60	A
Maximum Power Dissipation	PC	150 (Tc=25°C)	W
Thermal Resistance IGBT	θj-c IGBT	0.833	°C /W
Thermal Resistance Di	θj-c Di	1.67	°C /W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55 to 150	°C

1) PW≤1ms, Duty cycle≤1%

MGD623S

July, 2009

Electrical characteristics

●IGBT (Ta=25°C)

Characteristic	Symbol	Test Conditions	Limits			Unit
			MIN.	TYP.	MAX.	
Collector to Emitter Breakdown Voltage	V(BR)CES	IC=100μA,VGE=0V	600			V
Gate to Emitter Leakage Current	IGES	VGE=±30V			±500	nA
Collector to Emitter Leakage Current	ICES	VCE=600V, VGE=0V			100	μA
Gate Threshold Voltage	VGE(th)	VCE=10V, IC=1mA	3		6	V
Collector to Emitter Saturation Voltage	VCE(sat)	VGE=15V, IC=50A		1.8	2.4	V
Input Capacitance	Cies	VDS=20V VGS=0V f=1MHz		2500		pF
Output Capacitance	Coes			150		
Reverse Transfer Capacitance	Cres			80		
Turn-On Delay Time	td(on)	Inductive Load IC=50A VCC=300V VGS=15V, Rg=39Ω See Fig.1		75		ns
Rise Time	tr			100		
Turn-Off Delay Time	td(off)			300		
Fall Time	tf			120		

●Di (Ta=25°C)

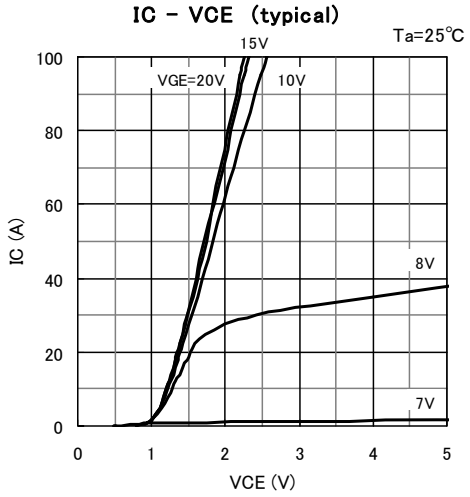
Characteristic	Symbol	Test Conditions	Limits			Unit
			MIN.	TYP.	MAX.	
Forward Voltage	VF	IF=30A		1.2	1.6	V
Reverse Recovery Time	trr	IF=30A di/dt=100A/μs		0.3		μs

MGD623S

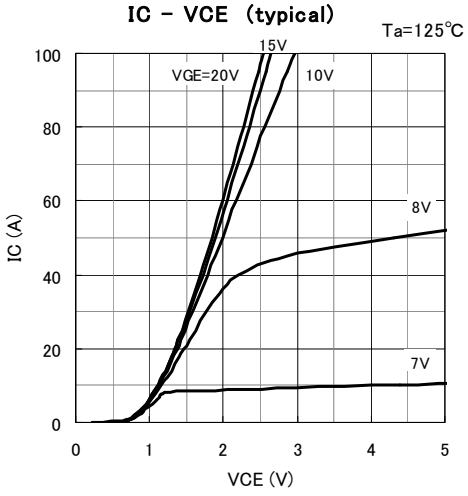
July, 2009

Characteristic Curves

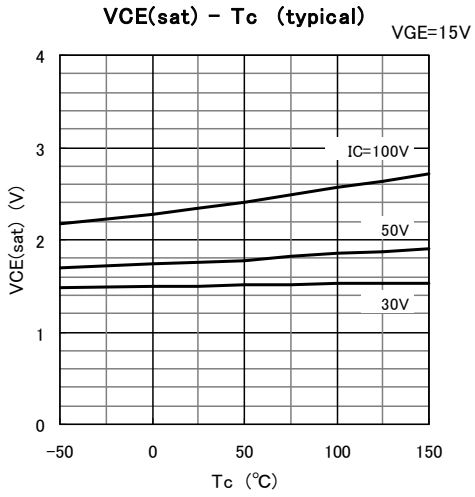
IC – VCE (typical)



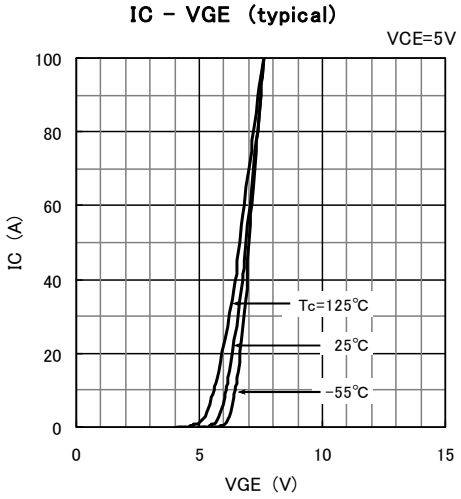
IC – VCE (typical)



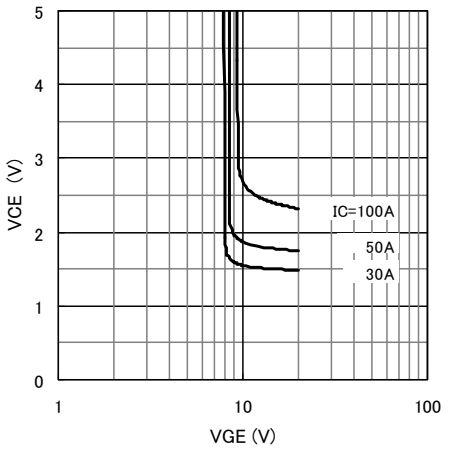
VCE(sat) – Tc (typical)



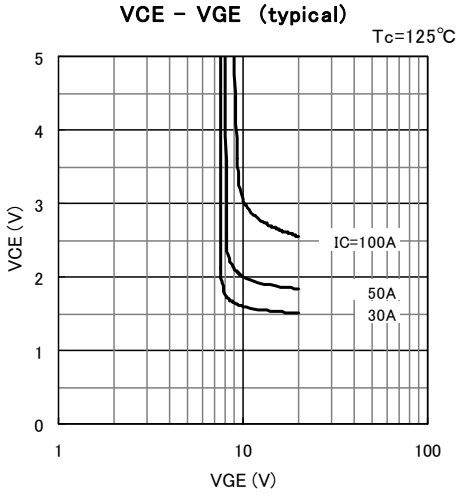
IC – VGE (typical)



VCE – VGE (typical)



VCE – VGE (typical)

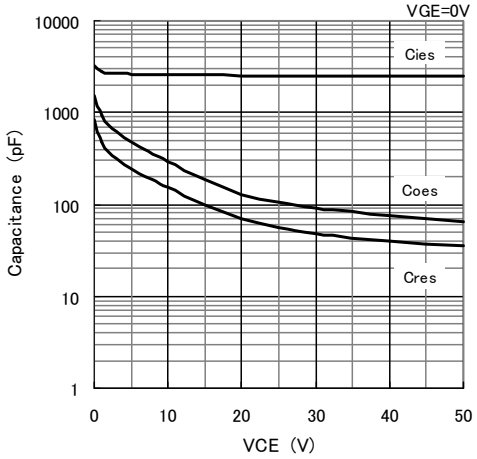


MGD623S

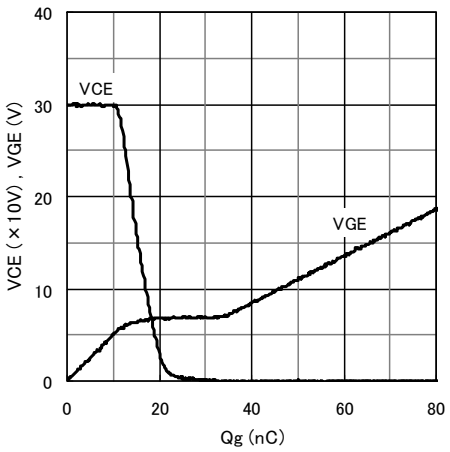
July, 2009

Characteristic Curves

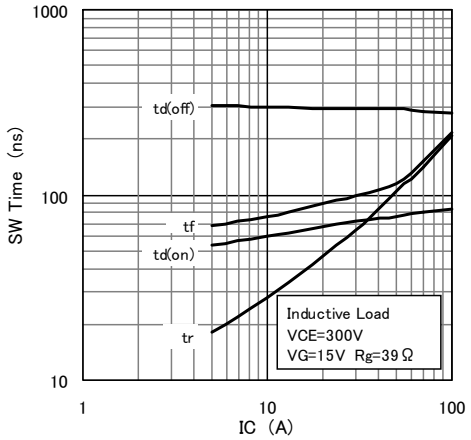
Capacitance – VCE (typical) Tc=25°C, f=1MHz, VGE=0V



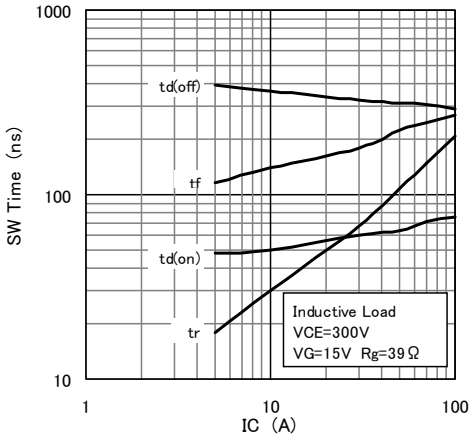
VCE,VGE – Qg (typical) Tc=25°C, RL=6Ω



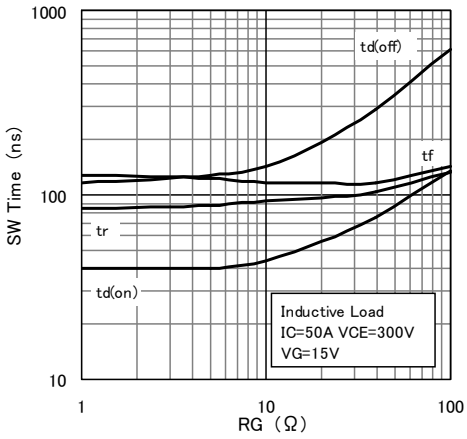
SW Time – IC (typical) Tc = 25°C



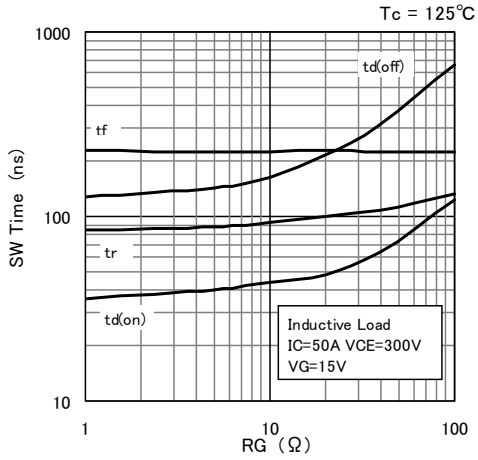
SW Time – IC (typical) Tc = 125°C



SW Time – RG (typical) Tc = 25°C



SW Time – RG (typical) Tc = 125°C

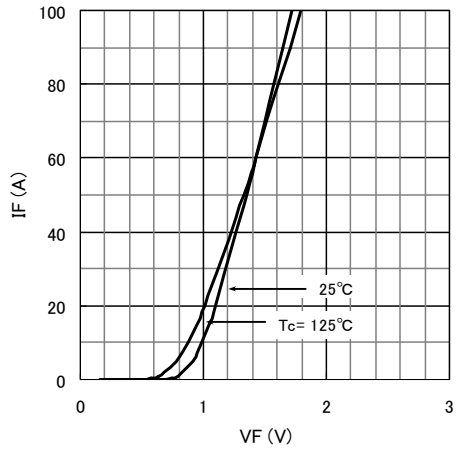


MGD623S

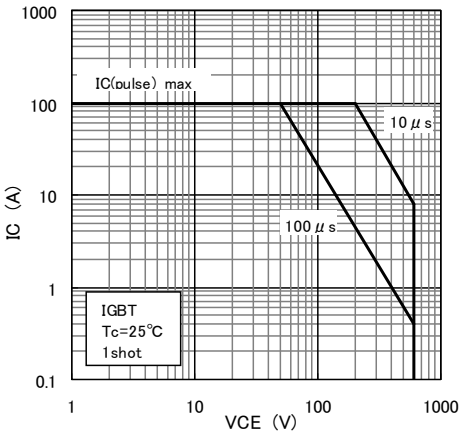
July, 2009

Characteristic Curves

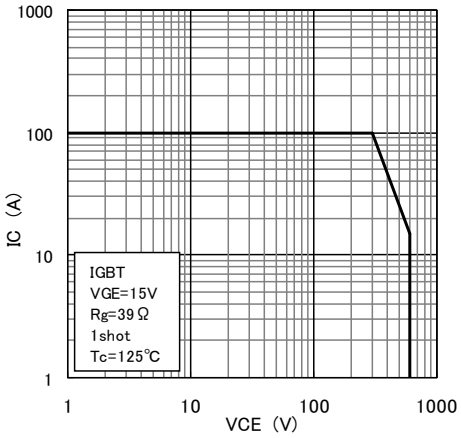
IF - VF (typical)



SAFE OPERATING AREA



Reverse Bias ASO



TRANSIENT THERMAL RESISTANCE - PULSE WIDTH

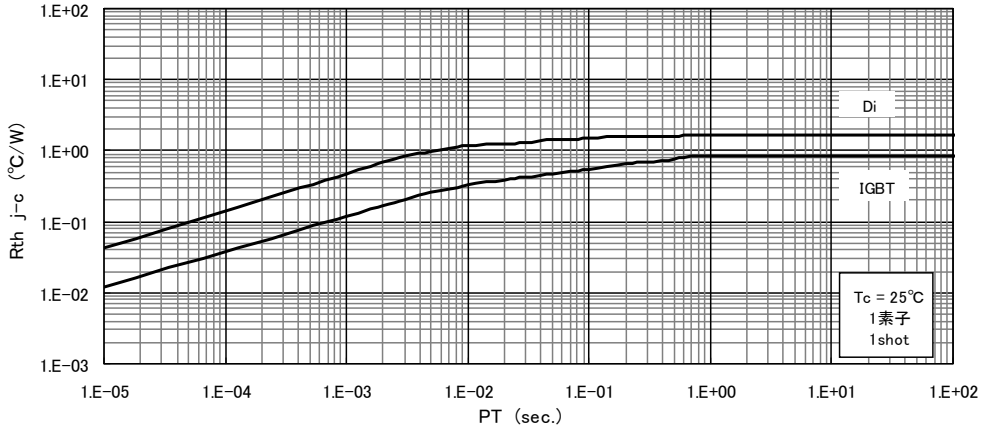
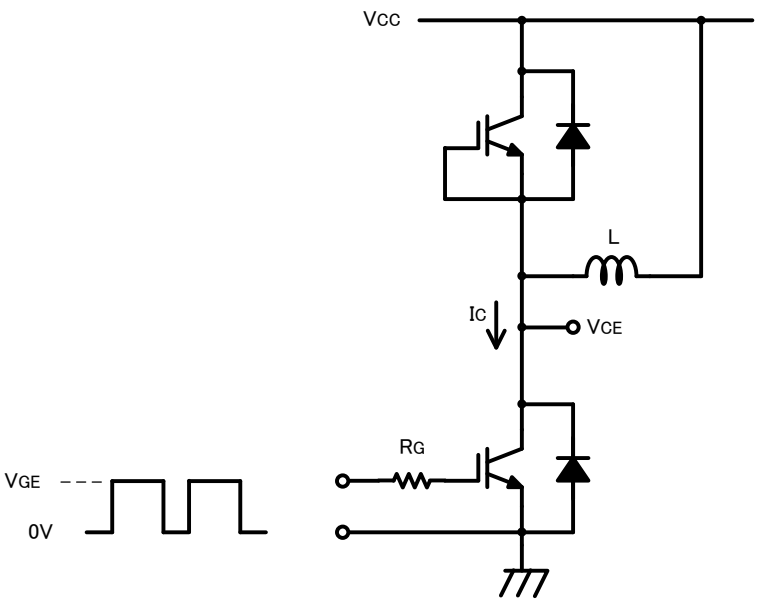
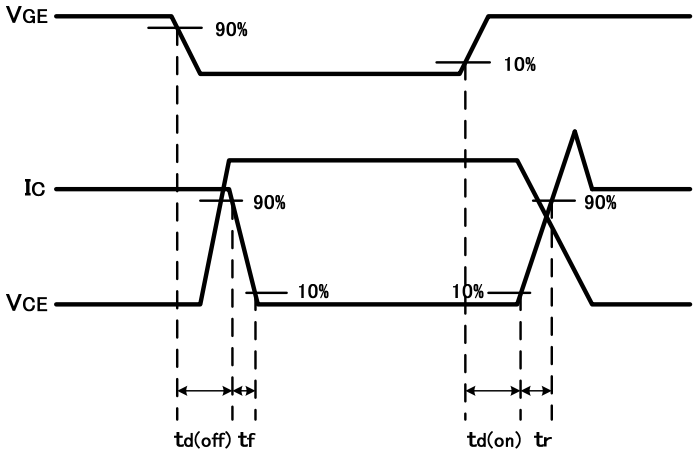


Fig.1 Switching Time Test Method



VCC=300V
IC=50A
VGE=15V
RG=39Ω

(a) Test Circuit



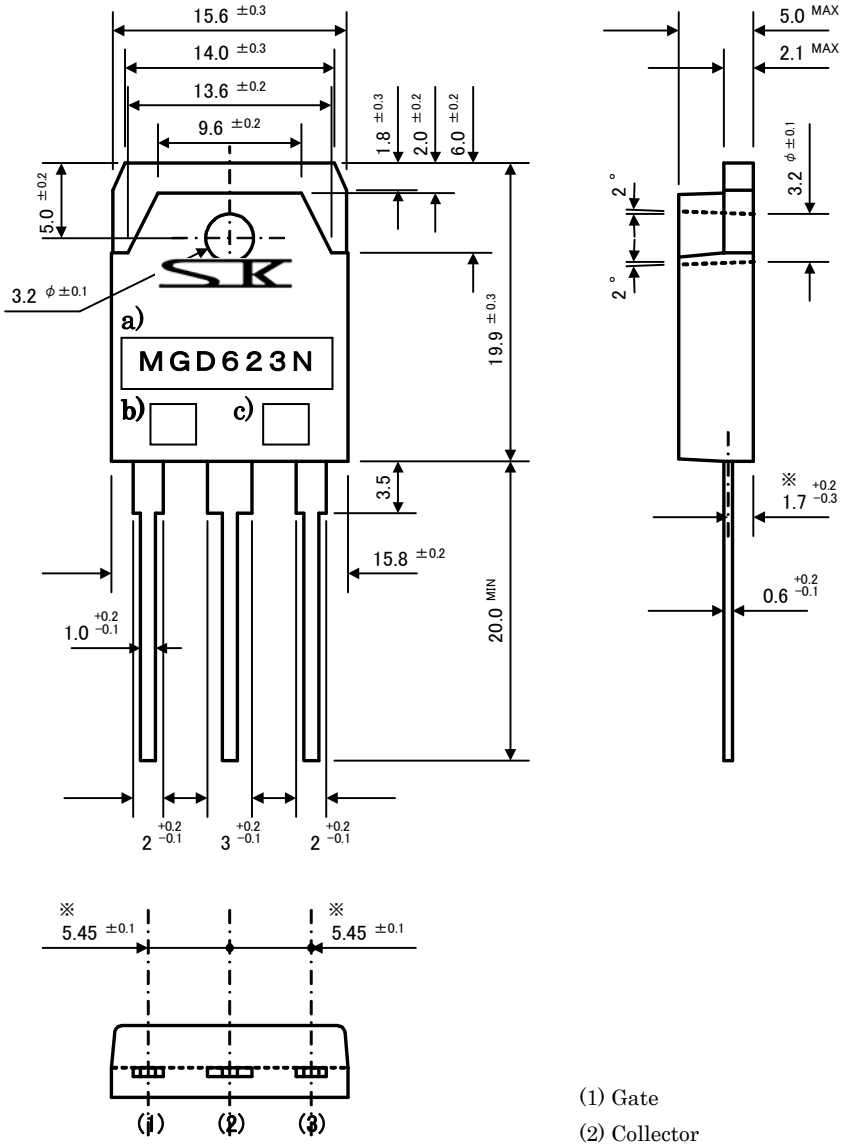
(b) Waveforms

MGD623S

July, 2009

Outline

TO-3P



Weight Approx. 6g

(1) Gate
(2) Collector
(3) Emitter

<Worldwide Contacts>

Asia Pacific

China

Sanken Electric Hong Kong Co., Ltd.
Suite 1026 Ocean Centre, Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: 852-2735-5262
Fax: 852-2735-5494

Sanken Electric (Shanghai) Co., Ltd.
Room3202, Maxdo Centre, Xingyi Road 8, Changning district, Shanghai, China
Tel: 86-21-5208-1177
Fax: 86-21-5208-1757

India

Saket Devices Pvt. Ltd.
Office No.13, First Floor, Bandal - Dhankude Plaza, Near PMT Depot, Paud Road, Kothrud, Pune - 411 038, India
Tel: 91-20-5621-2340
91-20-2528-5449
Fax: 91-20-2528-5459

Japan

Sanken Electric Co., Ltd. Overseas Sales Headquaters
Metropolitan Plaza Bldg. 1-11-1 Nishi-Ikebukuro, Toshima-ku, Tokyo 171-0021, Japan
Tel: 81-3-3986-6164
Fax: 81-3-3986-8637

Korea

Sanken Electric Korea Co., Ltd.
Mirae Asset Life Bldg. 6F, 168 Kongduk-dong, Mapo-ku, Seoul, 121-705, Korea
Tel: 82-2-714-3700
Fax: 82-2-3272-2145

Singapore

Sanken Electric Singapore Pte. Ltd.
150 Beach Road, #14-03 The Gateway West, Singapore 189720
Tel: 65-6291-4755
Fax: 65-6297-1744

Malaysia

Sanken Electric Singapore Pte. Ltd.
Malaysia Representative Office
Block B-20-5, Level 20, Northpoint Midvalley City, No.1, Medan Syed Putra Utara, 59200 Kuala Lumpur, Malaysia
TEL:60-3-2284-1769
FAX:60-3-2282-6345

Taiwan

Taiwan Sanken Electric Co., Ltd.
Room 1801, 18th Floor, 88 Jung Shiau East Road, Sec. 2, Taipei 100, Taiwan R.O.C.
Tel: 886-2-2356-8161
Fax: 886-2-2356-8261

Europe

United Kingdom

Sanken Power Systems (UK) Limited
Pencoed Technology Park, Pencoed, Bridgend CF35 5HY. UK
Tel: 44-1656-869-100
Fax: 44-1656-869-162

North America

United States

Allegro MicroSystems, Inc.
115 Northeast Cutoff, Worcester, Massachusetts 01606, U.S.A.
Tel: 1-508-853-5000
Fax: 1-508-853-3353

Allegro MicroSystems, Inc. (Southern California)
14 Hughes Street, Suite B105, Irvine, CA 92618
Tel: 1-949-460-2003
Fax: 1-949-460-7837

MGD623S

July, 2009

CAUTION / WARNING

●The information in this publication has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies.

● Sanken reserves the right to make changes without further notice to any products herein in the interest of improvements in the performance, reliability, or manufacturability of its products.
Before placing an order, Sanken advises its customers to obtain the latest version of the relevant information to verify that the information being relied upon is current.

● Application and operation examples described in this catalog are quoted for the sole purpose of reference for the use of the products herein and Sanken can assume no responsibility for any infringement of industrial property rights, intellectual property rights or any other rights of Sanken or any third party which may result from its use.

● When using the products herein, the applicability and suitability of such products for the intended purpose or object shall be reviewed at the users' responsibility.

● Although Sanken undertakes to enhance the quality and reliability of its products, the occurrence of failure nd defect of semiconductor products at a certain rate is inevitable. Users of Sanken products are requested to take, at their own risk, preventative measures including safety design of the equipment or systems against any possible injury, death, fires or damages to the society due to device failure or malfunction.

● Sanken products listed in this catalog are designed and intended for the use as components in general purpose electronic equipment or apparatus (home appliances, office equipment, telecommunication equipment, measuring equipment, etc.). Before placing an order, the user's written consent to the specifications is requested.
When considering the use of Sanken products in the applications where higher reliability is required (transportation equipment and its control systems, traffic signal control systems or equipment, fire/crime alarm systems, various safety devices, etc.), please contact your nearest Sanken sales representative to discuss and obtain written confirmation of your specifications. The use of Sanken products without the written consent of Sanken in the applications where extremely high reliability is required (aerospace equipment, nuclear power control systems, life support systems, etc.) is strictly prohibited.

● Anti radioactive ray design is not considered for the products listed herein.

● This publication shall not be reproduced in whole or in part without prior written approval from Sanken.

●This is notification that you, as purchaser of the products/technology, are not allowed to perform any of the following:
1. Resell or retransfer these products/technology to any party intending to disturb international peace and security.
2. Use these products/technology yourself for activities disturbing international peace and security.
3. Allow any other party to use these products/technology for activities disturbing international peace and security.
Also, as purchaser of these products/technology, you agree to follow the procedures for the export or transfer of these products/technology, under the Foreign Exchange and Foreign Trade Law, when you export or transfer the products/technology abroad.