

PQ070XH02Z Series

Low Voltage Operation Low Power-Loss Voltage Regulator

Features

- Low voltage operation (Minimum operating voltage: 2.35V)
2.5V input → available 1.5 to 1.8V output
- Large output current type (I_o: 2A)
- Low dissipation current
(Quiescent current: MAX. 2mA
Output OFF-state dissipation current: MAX. 5μA)
- Low power-loss
- Built-in overcurrent and overheat protection functions
- TO-263 surface mount package

Applications

- Personal computers and peripheral equipment
- Power supplies for various digital electronic equipment such as DVD player or STB
- Power supplies for automotive equipment such as car navigation system.

Model Line-up

Output current (I _o)	Package type	Variable output type
2A	Taping	PQ070XH02ZP
	Sleeve	PQ070XH02ZZ

Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V _{IN}	10	V
*1 ON/OFF control terminal voltage	V _C	10	V
*1 Output adjustment terminal voltage	V _{ADJ}	5	V
Output current	I _o	2	A
*2 Power dissipation	P _D	35	W
*3 Junction temperature	T _j	150	°C
Operating temperature	T _{opr}	-40 to +85	°C
Storage temperature	T _{stg}	-40 to +150	°C
Soldering temperature	T _{sol}	260(10s)	°C

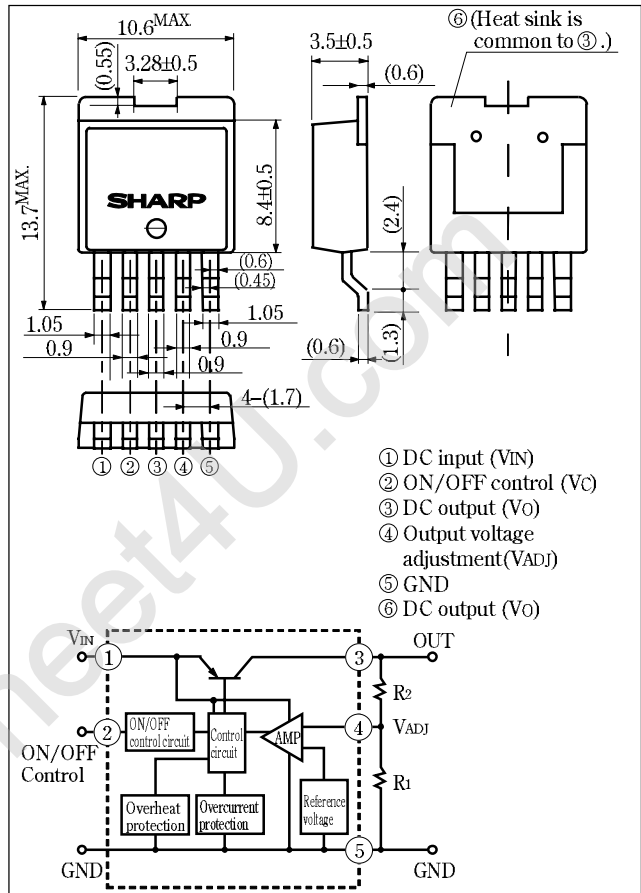
*1 All are open except GND and applicable terminals.

*2 P_D:With infinite heat sink

*3 Overheat protection may operate at 125 ≤ T_j < 150°C.

Outline Dimensions

(Unit : mm)



•Please refer to the chapter " Handling Precautions "

SHARP

Notice In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.
 Internet Internet address for Electronic Components Group <http://sharp-world.com/ecg/>

Electrical Characteristics (Unless otherwise specified, condition shall be $V_{IN}=5V, V_O=3V (R_1=1k\Omega), I_O=1A, V_C=2.7V, T_a=25^\circ C$)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage	V_{IN}	-	2.35	-	10	V
Output voltage	V_O	-	1.5	-	7	V
Reference voltage	V_{REF}	-	1.225	1.25	1.275	V
Load regulation	Reg_L	$I_O=5mA$ to $2A$	-	0.2	2.0	%
Line regulation	Reg_I	$V_{IN}=4$ to $8V, I_O=5mA$	-	0.2	1.0	%
Temperature coefficient of reference voltage	$T_C V_{REF}$	$T_f=0$ to $125^\circ C, I_O=5mA$	-	± 1.0	-	$\%/^\circ C$
Ripple rejection	RR	Refer to Fig.2	45	60	-	dB
Dropout voltage	V_{LO}	$V_{IN}=2.85A, I_O=2A$	-	-	0.5	V
*4 ON-state voltage for control	$V_{C(ON)}$	-	2	-	-	V
ON-state current for control	$I_{C(ON)}$	-	-	-	200	μA
OFF-state voltage for control	$V_{C(OFF)}$	$I_O=0A$	-	-	0.8	V
OFF-state current for control	$I_{C(OFF)}$	$I_O=0A, V_C=0.4V$	-	-	2	μA
Quiescent current	I_q	$I_O=0A$	-	1	2	mA
Output OFF-state dissipation current	I_{qs}	$I_O=0A, V_C=0.4V$	-	-	5	μA

*4 In case of opening control terminal ②, output voltage turns off

Fig.1 Test Circuit

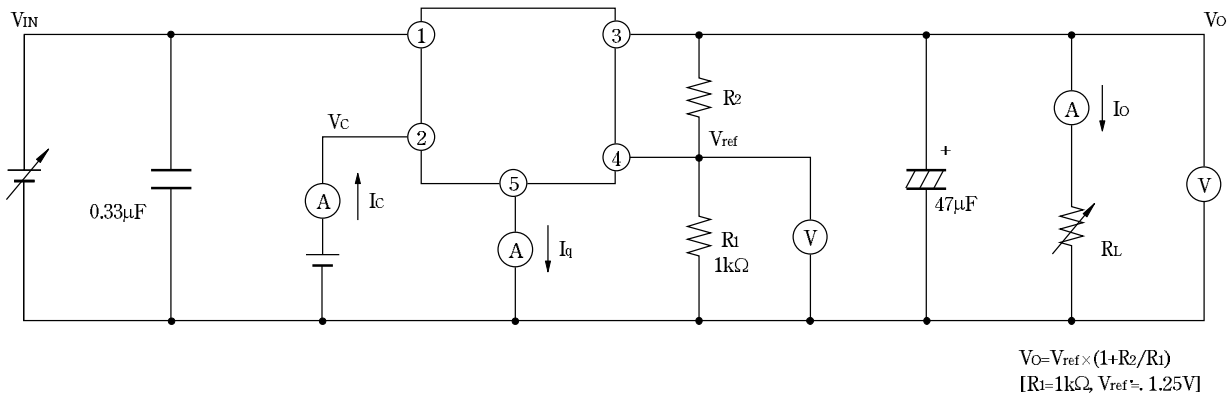


Fig.2 Test Circuit of Ripple Rejection

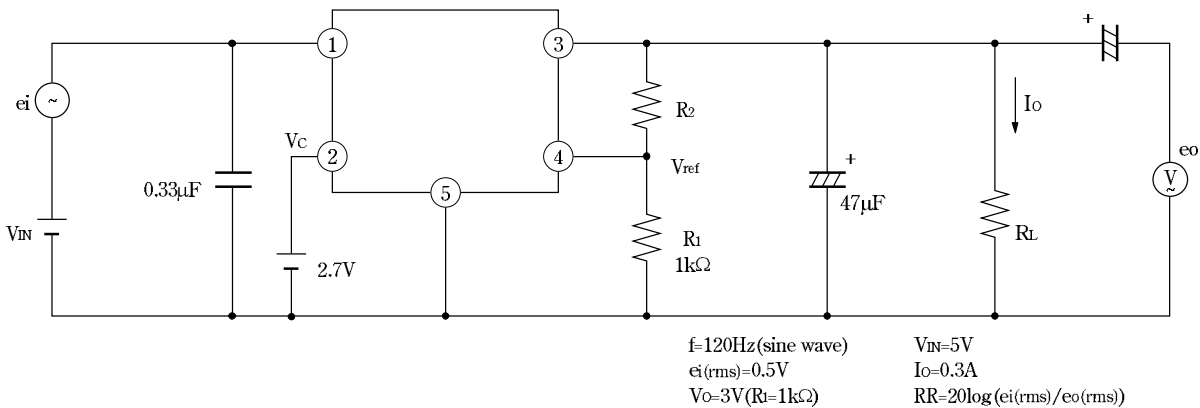
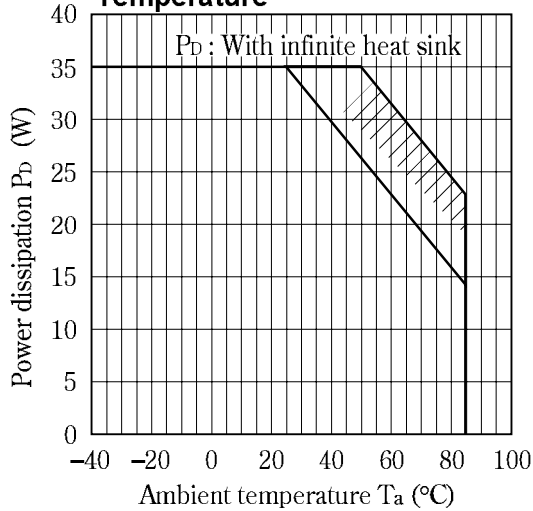


Fig.3 Power Dissipation vs. Ambient Temperature



Note) Oblique line portion: Overheat protection may operate in this area.

Fig.5 Output Voltage Fluctuation vs. Junction Temperature

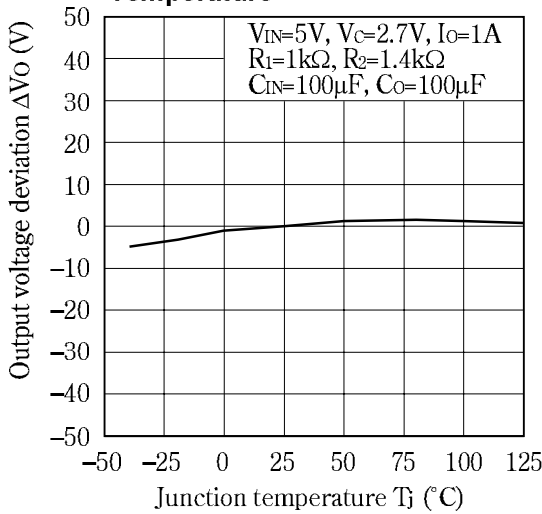


Fig.7 Circuit Operating Current vs. Input Voltage

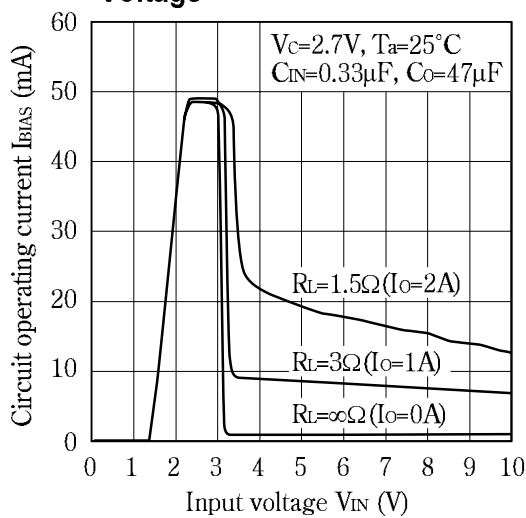


Fig.4 Overcurrent Protection Characteristics

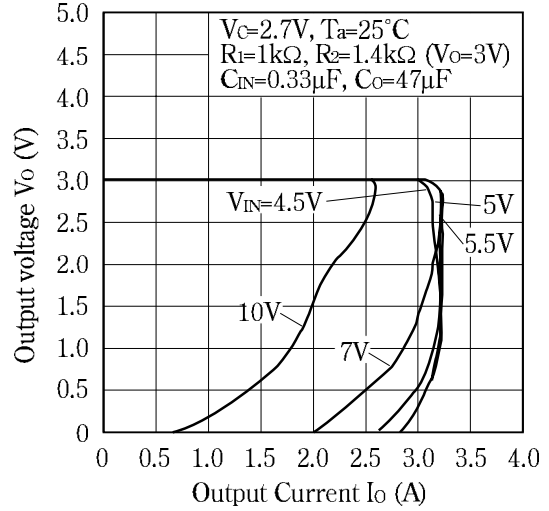


Fig.6 Output Voltage vs. Input Voltage

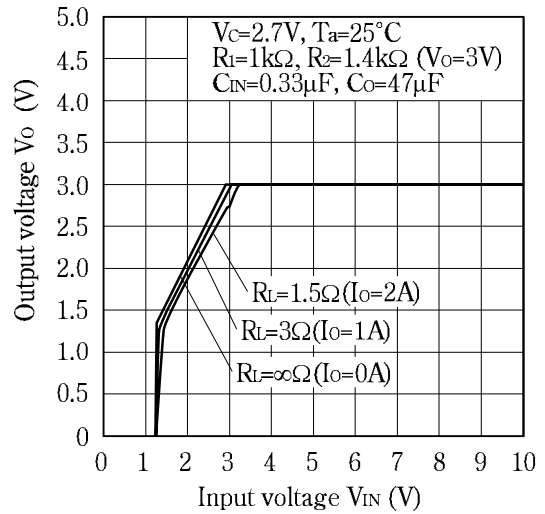


Fig.8 Dropout Voltage vs. Junction Temperature

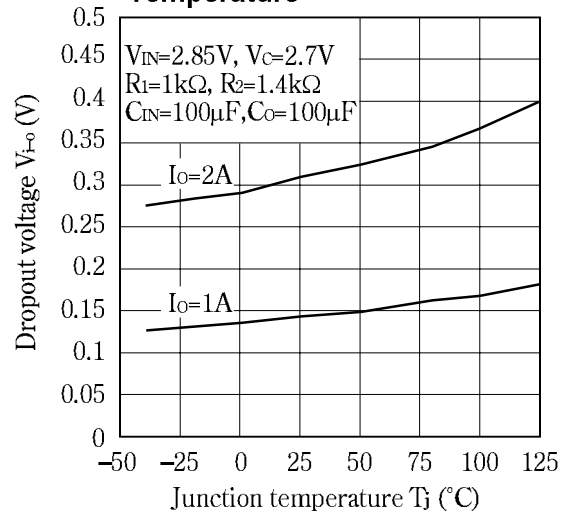


Fig.9 ON-OFF Control Voltage vs. junction Temperature

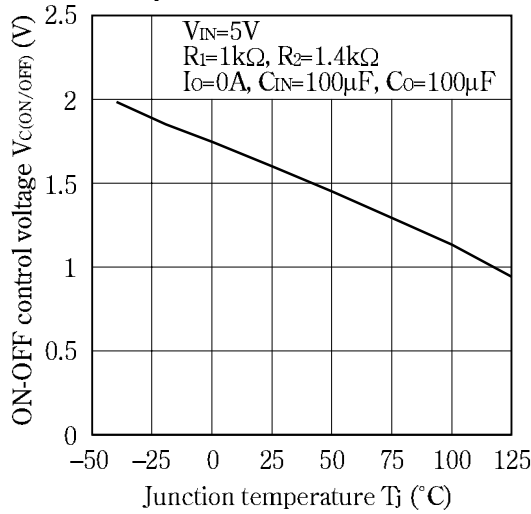


Fig.10 Quiescent Current vs. Junction Temperature

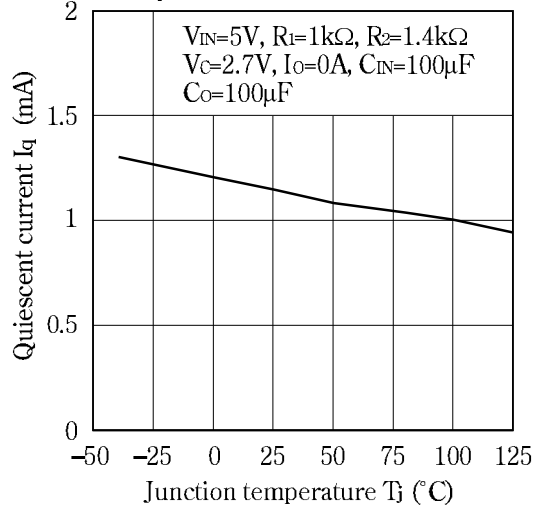


Fig.11 Ripple Rejection vs. Input Ripple Frequency

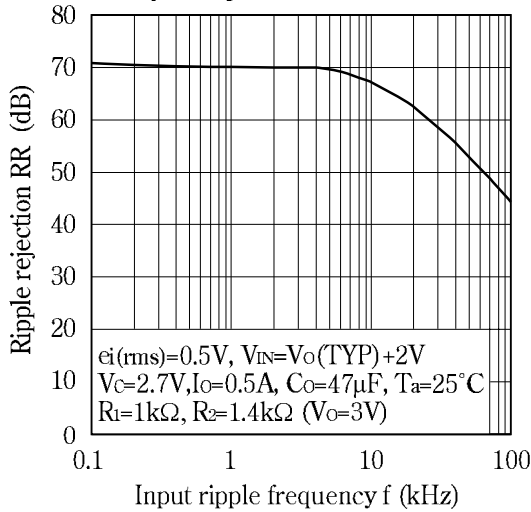


Fig.12 Ripple Rejection vs. Output Current

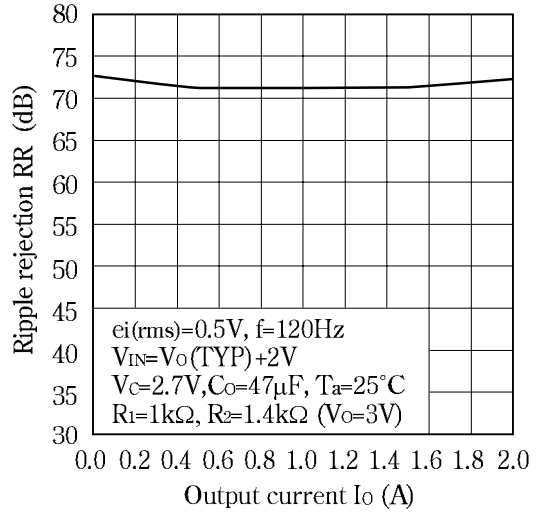
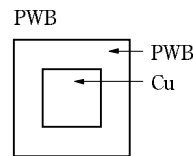
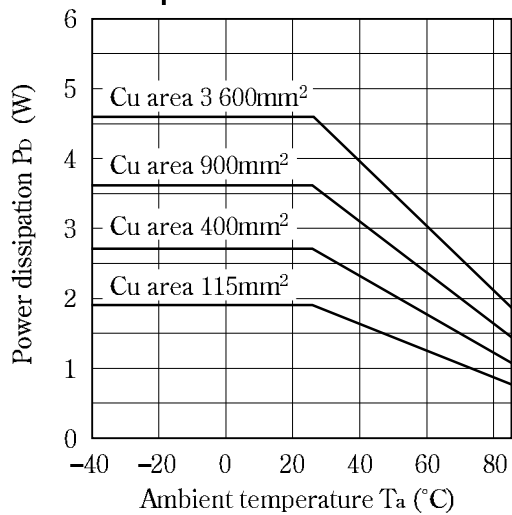


Fig.13 Power Dissipation vs. Ambient Temperature



Material : Glass-cloth epoxy resin
 Size : 60×60×1.6mm
 Cu thickness : 65μm

Fig.19 Output Voltage Adjustment Characteristics (Typical Value)

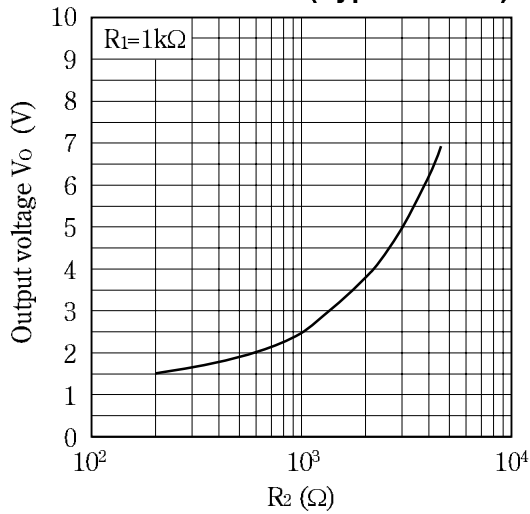
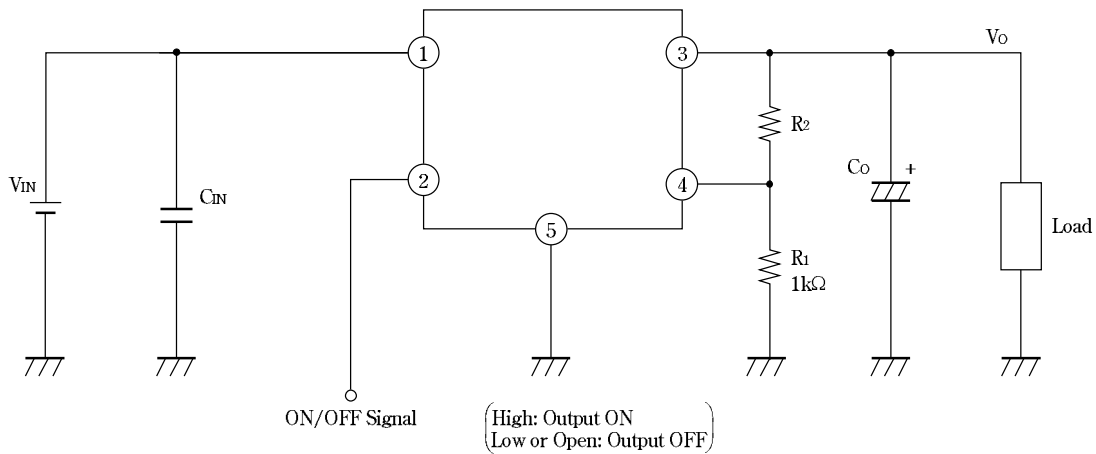
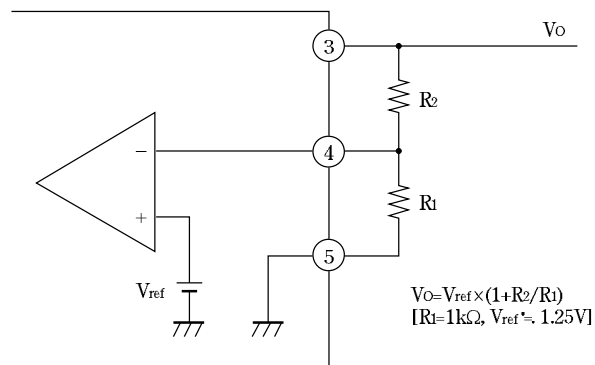


Fig.21 Typical Application



Setting of Output Voltage

Output voltage is able to set from 1.5V to 7V when resistors R₁, R₂ are attached to ③, ④, ⑤ terminals. As for the external resistors to set output voltage, refer to the following figure.



NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:
 - (i) The devices in this publication are designed for use in general electronic equipment designs such as:
 - Personal computers
 - Office automation equipment
 - Telecommunication equipment [terminal]
 - Test and measurement equipment
 - Industrial control
 - Audio visual equipment
 - Consumer electronics
 - (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
 - Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
 - Traffic signals
 - Gas leakage sensor breakers
 - Alarm equipment
 - Various safety devices, etc.
 - (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
 - Space applications
 - Telecommunication equipment [trunk lines]
 - Nuclear power control equipment
 - Medical and other life support equipment (e.g., scuba).
- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
- This publication is the proprietary product of SHARP and is copyrighted, with all rights reserved. Under the copyright laws, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP. Express written permission is also required before any use of this publication may be made by a third party.
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.