PQ015YZ5MZ Series/PQ015YZ01Z Series

Low Voltage Operation, Low Power-Loss Voltage Regulators (SC-63 Package)

Features

- Low voltage operation (Minimum operating voltage: 1.7V)
  1.8V input → available 1.0 to 1.5V output
- Variable output voltage type
- Surface mount package (equivalent to EIAJ SC-63)

Applications

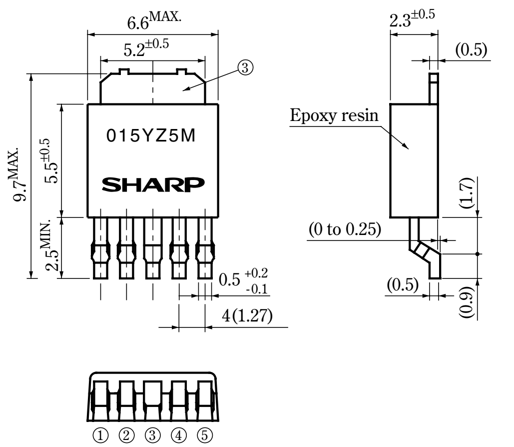
- Personal computers, power supply in peripherals
- Power supplies for various electronic equipment such as DVD player or STB

Model Line-up

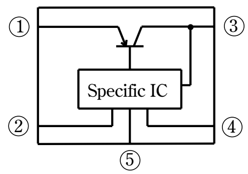
Output current (I_O)	Package type	Variable output
0.5A	Taping	**PQ015YZ5MZP**
	Sleeve	**PQ015YZ5MZZ**
1A	Taping	**PQ015YZ01ZP**
	Sleeve	**PQ015YZ01ZZ**

Outline Dimensions

(Unit : mm)



Internal connection diagram



① DC input (V_{IN})
② Bias input (V_B)
③ DC output (V_O)
④ Output voltage adjustment terminal (V_C)
⑤ GND

Absolute Maximum Ratings

(T_a=25°C)

	Parameter		Symbol	Rating	Unit
※1	Input voltage		V_{IN}	3.7	V
	Bias supply voltage		V_B	7	V
※1	Output adjustment terminal voltage		V_{ADJ}	5	V
	Output current	**PQ015YZ5MZ series**	I_O	0.5	A
		PQ015YZ01Z series		1	
※2	Power dissipation(with infinite heat sink)		P_D	8	W
※3	Junction temperature		T_j	150	°C
	Operating temperature		T_{opr}	–25 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 T_j=125°C to 150°C

•Please refer to the chapter " Handling Precautions ".

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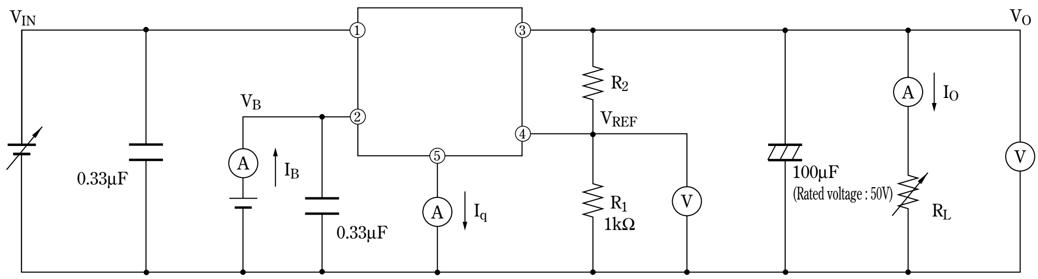
Electrical Characteristics

(Unless otherwise specified, condition shall be (**PQ015YZ5MZ**))
(Unless otherwise specified, condition shall be (**PQ015YZ01Z**))

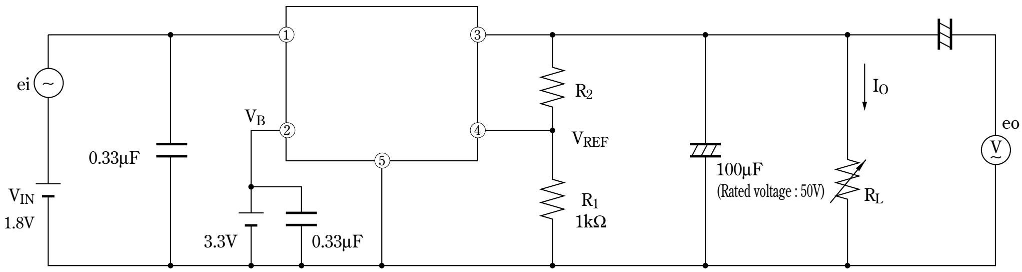
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input voltage		V_{IN}	On condition that $1.0V \leq V_O \leq 1.2V$	1.7	–	3.7	V
			On condition that $1.2V \leq V_O \leq 1.5V$	V_O+0.5	–	3.7	
Bias supply voltage		V_B	–	2.35	–	7	V
Output voltage		V_O	–	1.0	–	1.5	V
Load regulation	**PQ015YZ5MZ**	$R_{eg}L$	I_O=5mA to 0.5A	–	0.2	1	%
	PQ015YZ01Z		I_O=5mA to 1A				
Line regulation		$R_{eg}I$	V_{IN}=1.7 to 3.7V, V_B=2.35 to 7V, I_O=5mA	–	0.2	1	%
Ripple Rejection		RR_1	Refer to Fig.2	–	65	–	dB
		RR_2	Refer to Fig.3	–	60	–	dB
Reference voltage		V_{REF}	–	0.97	1	1.03	V
Temperature coefficient of reference voltage		T_CV_{REF}	Tj=0 to 125˚C, I_O=5mA	–	±0.5	–	%
Bias inflow current		I_B	–	–	1.5	3	mA

Fig.1 Test Circuit



$V_O=V_{REF}\times(1+R_2/R_1)$
$[R_1=1k\Omega, V_{REF} \fallingdotseq 1.0V]$

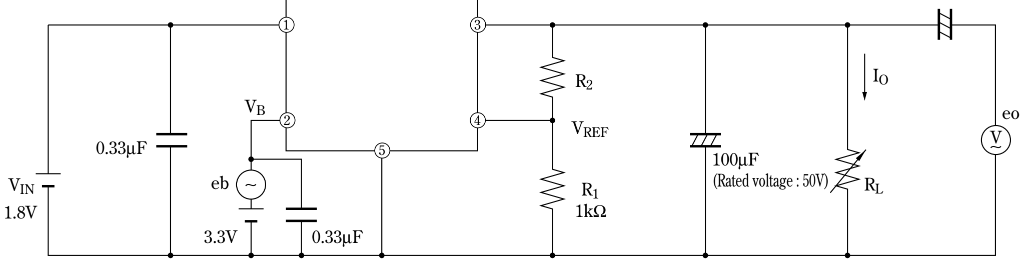
Fig.2 Test Circuit for Ripple Rejection (1)



f=120Hz (sine wave)
ei(rms)=0.1V
V_{IN}=1.8V, V_B=3.3V

I_O=0.3A
RR=20log (ei(rms)/eo(rms))

Fig.3 Test Circuit for Ripple Rejection (2)

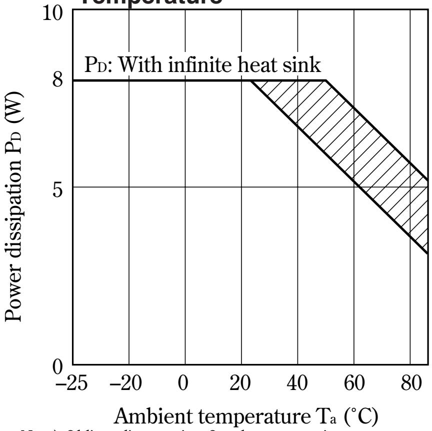


f=120Hz (sine wave)

eb(rms)=0.1V
V_{IN}=1.8V, V_B=3.3V

I_O=0.3A
RR=20log (eb(rms)/eo(rms))

Fig.4 Power Dissipation vs. Ambient Temperature



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

Fig.5 Overcurrent Protection Characteristics (PQ015YZ5MZ)

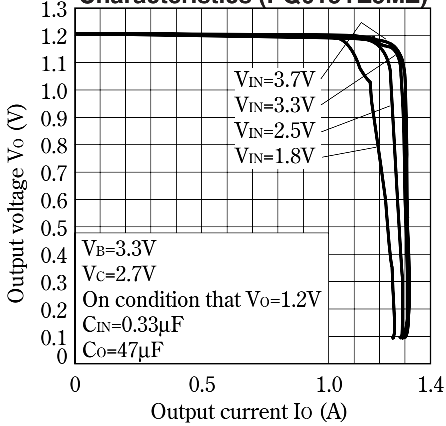


Fig.6 Overcurrent Protection Characteristics

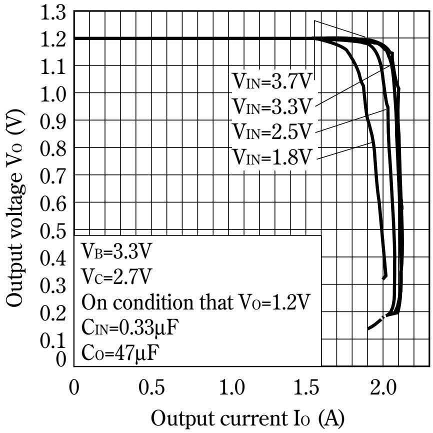


Fig.7 Reference Voltage vs. Ambient Temperature

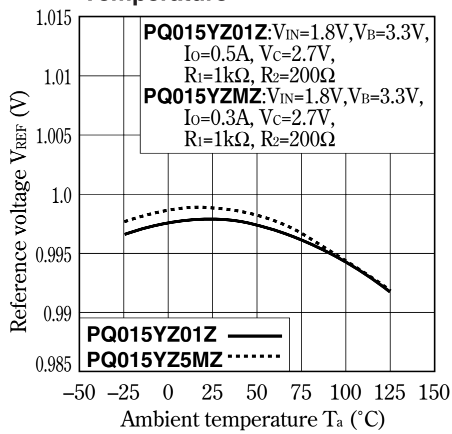


Fig.8 Bias Inflow Current vs. Ambient Temperature

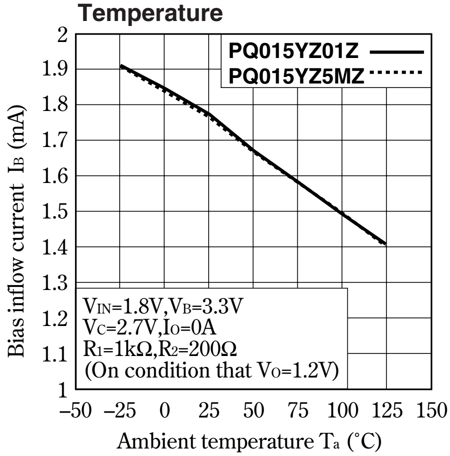


Fig.9 Output Short circuit Current vs. Ambient Temperature

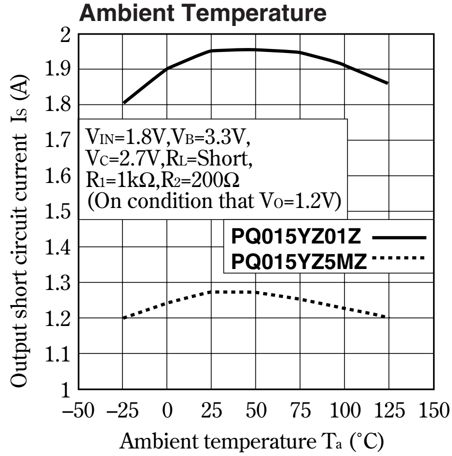


Fig.10 Output Voltage vs. Input Voltage (PQ015YZ5MZ)

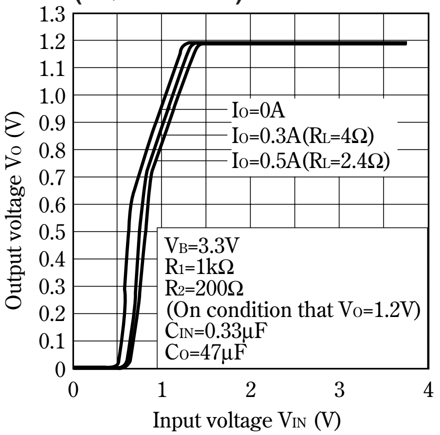


Fig.11 Output Voltage vs. Input Voltage (PQ015YZ01Z)

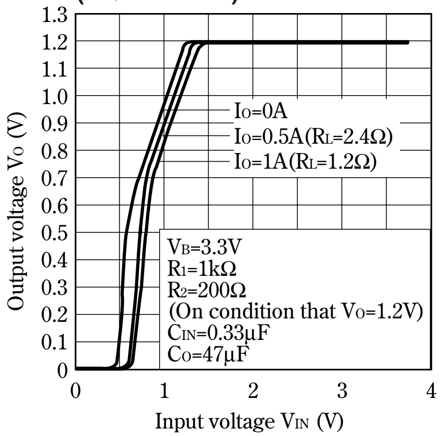


Fig.12 Output Voltage vs. Bias Supply Voltage (PQ015YZ5MZ)

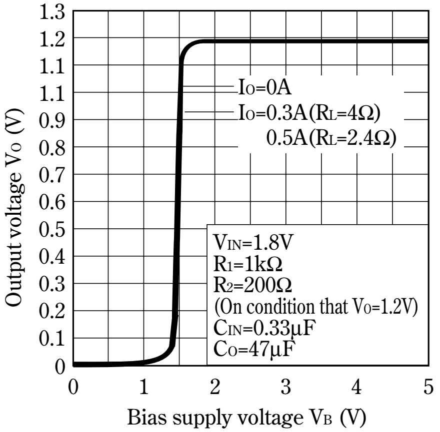


Fig.13 Output Voltage vs. Bias Supply Voltage (PQ015YZ01Z)

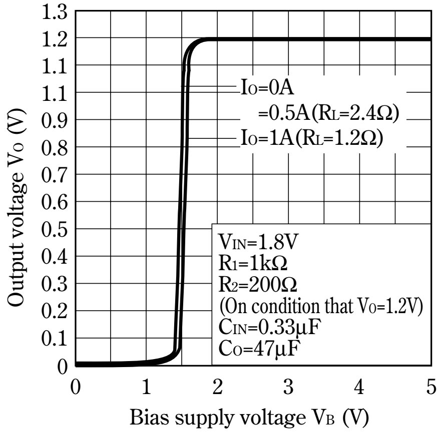


Fig.14 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ5MZ)

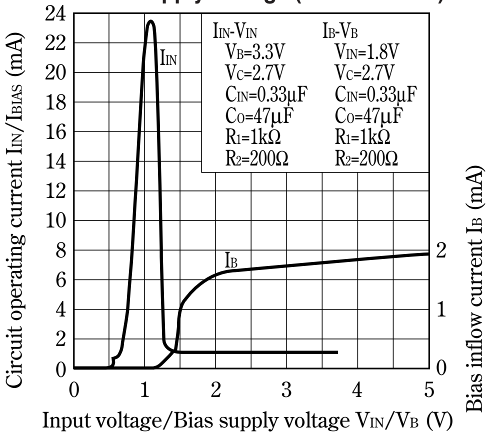


Fig.15 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ01Z)

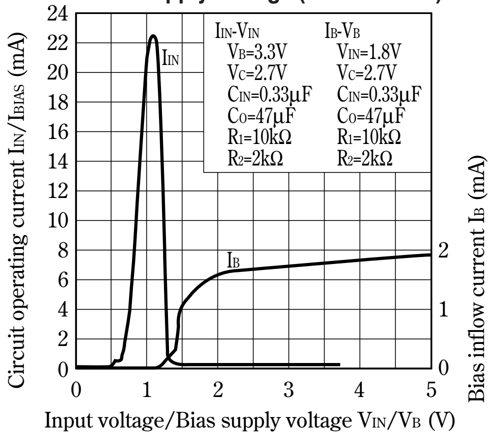


Fig.16 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ01Z)

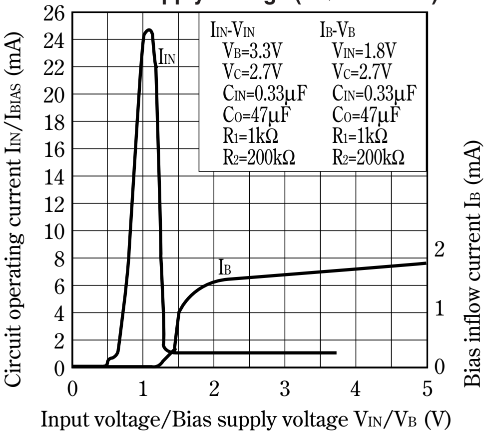


Fig.17 Circuit Operating Current vs. Input Voltage /Bias Supply Voltage (PQ015YZ5MZ)

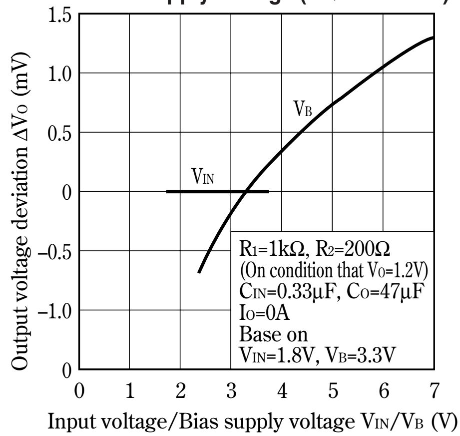


Fig.18 Output Voltage vs. Input Voltage/Bias Supply Voltage (PQ015YZ01Z)

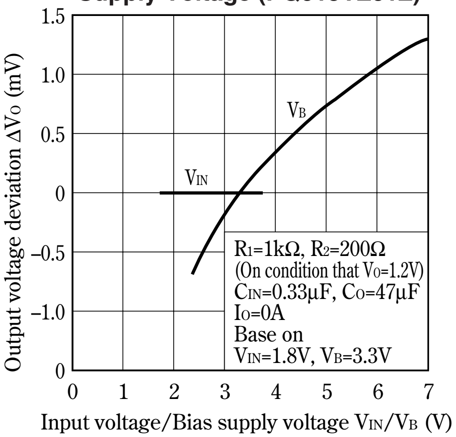


Fig.19 Output Voltage vs. Output Current

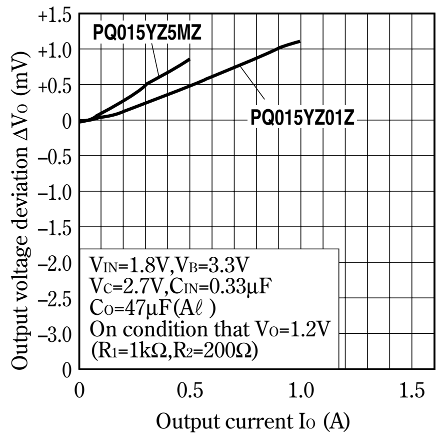


Fig.20 Ripple Rejection vs. Input Ripple Frequency

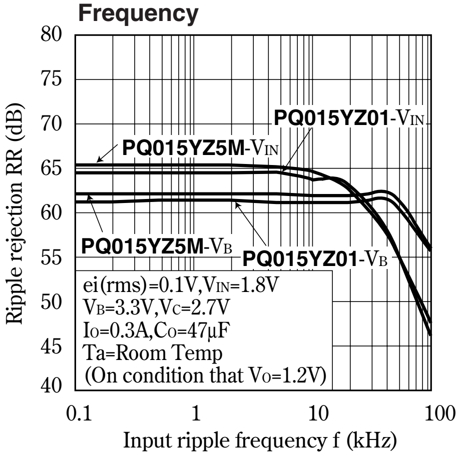


Fig.21 Ripple Rejection vs. Output Current

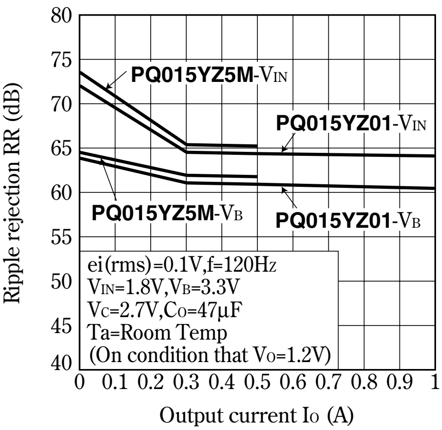


Fig.22 Typical Application

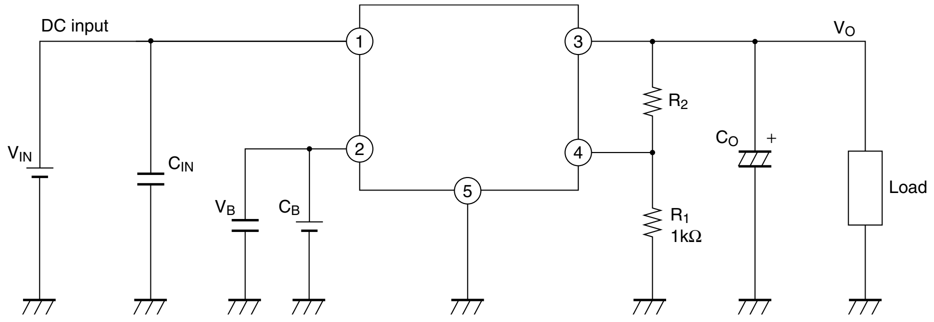
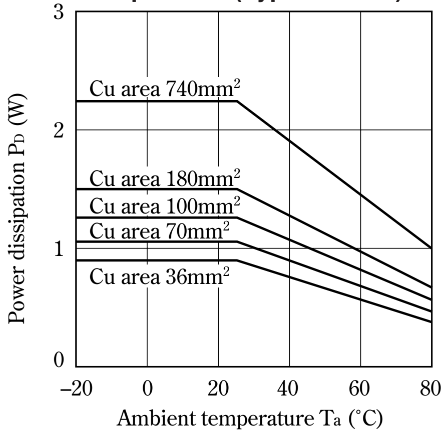
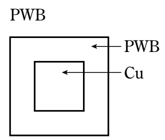


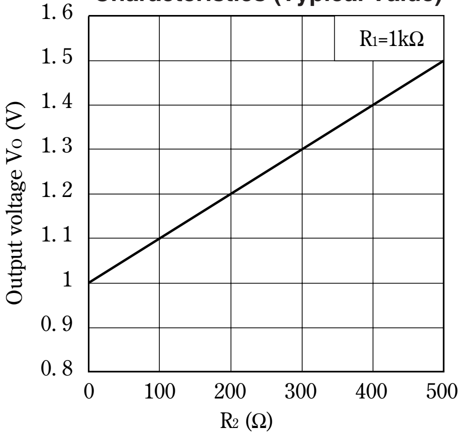
Fig.23 Power Dissipation vs. Ambient Temperature (Typical Value)





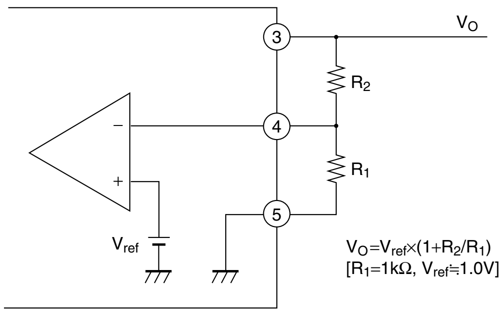
Material : Glass-cloth epoxy resin
Size : 50×50×1.6mm
Cu thickness : 35µm

Fig.24 Output Voltage Adjustment Characteristics (Typical Value)



Setting of Output Voltage

Output voltage is able to set from 1.0V to 1.5V when resistors R_1 and R_2 are attached to ③, ④, ⑤ terminals. As for the external resistors to set output voltage, refer to the figure below and Fig.24.



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  (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:
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  --- 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:
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  --- Telecommunication equipment [trunk lines]
  --- Nuclear power control equipment
  --- Medical and other life support equipment (e.g., scuba).

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