Programmable VCXO/VCSO　　VG7050ECN

Product name　　　　VG7050ECN SM20T003 CJGLPZ
Product code / Ordering code　　　　X1G0045611003xx

Please refer to the 8.Packing information about xx (last 2 digits)

Output waveform　　　LV-PECL
Pb free / Complies with EU RoHS directive
Reference weight Typ.168mg

1.Absolute maximum ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Maximum supply voltage	Vcc-GND	-0.3	-	+4	V	-
Storage temperature	T_stg	-55	-	+125	ºC	-
Input voltage	Vin	GND-0.3	-	Vcc+0.3	V	Except SDA and SCL pin

2.Specifications(characteristics)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions / Remarks
Output frequency	f0		622.080000		MHz	Start-up frequency-1
			644.531250		MHz	Start-up frequency-2
			669.326582		MHz	Start-up frequency-3
			693.482991		MHz	Start-up frequency-4
Supply voltage	Vcc	2.97	3.3	3.63	V	-
Control voltage	Vc	0.3	1.65	3	V	Vc=1.65V+/-1.35V
Operating temperature	T_use	-40	-	+85	ºC	-
Frequency tolerance	f_tol	-50	-	+50	$\times 10^{-6}$	includes 10 years aging
Current consumption	Icc	-	-	90	mA	OE = Active L_ECL =50Ω
Disable current	I_dis	-	-	40	mA	OE inactive ,output standby:Hi-Z mode
Frequency control range	f_cont	-50 to +/-23	-	-	$\times 10^{-6}$	-
Absolute pull range	APR	+/-0 to +/-180			$\times 10^{-6}$	Programmable
Modulation characteristics	BW	10	-	-	kHz	+/-3 dB
Input resistance	Rin	5000	-	-	kΩ	DC Level
Frequency change polarity	-					Positive polarity
Symmetry	SYM	45	-	55	%	at outputs crossing point
Output voltage	V_{OH}	Vcc-1.025	-	-	V	-
	V_{OL}	-	-	Vcc-1.62	V	-
Output load condition	L_ECL	-	50	-	Ω	Outputs terminated to Vcc-2.0V
Input voltage	V_{IH}	70%Vcc	-	-	V	OE,FSEL0,FSEL1,SDA,SCL
	V_{IL}	-	-	30%Vcc	V	OE,FSEL0,FSEL1,SDA,SCL
Rise time	tr	-	-	0.4	ns	20 % to 80 % of amplitude
Fall time	tf	-	-	0.4	ns	20 % to 80 % of amplitude
Start-up time	t_str	-	-	10	ms	-
Phase noise		-	-75.7	-	dBc/Hz	Offset 100Hz
		-	-101.6	-	dBc/Hz	Offset 1kHz
	F_{CN}	-	-118.8	-	dBc/Hz	Offset 10kHz
		-	-121.3	-	dBc/Hz	Offset 100kHz
		-	-129.3	-	dBc/Hz	Offset 1MHz
Phase jitter	t_{PJ}	-	0.3	-	ps	Offset Frequency: 12kHz to 20MHz
Frequency aging	f_aging	-	-	-	$\times 10^{-6}$	Included in frequency tolerance

3.Block diagram
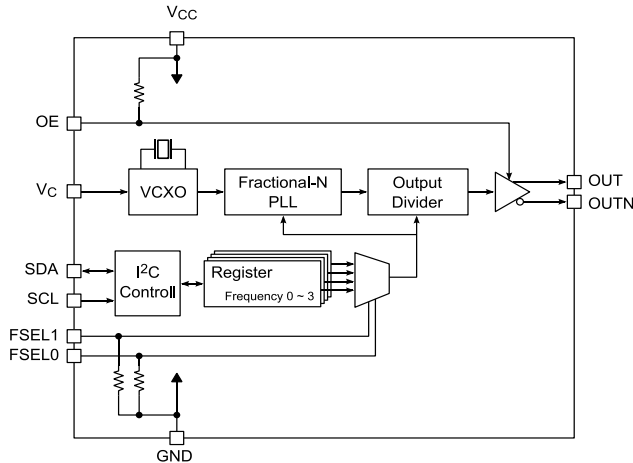
4.OE Function / OE Standby typ

OE Function	OE Standby Type	Frequency output OE pin	Oscillator Stop	
			OE pin	OUT,OUTN state
H: High Active	Z: High-Z	"H" or "OPEN"	"L"	High Impedance
L: Low Active		"L" or "OPEN"	"H"	
H: High Active	F: Fix	"H" or "OPEN"	"L"	OUT="L", OUTN="H"
L: Low Active		"L" or "OPEN"	"H"	

3.Timing chart

Output wave form
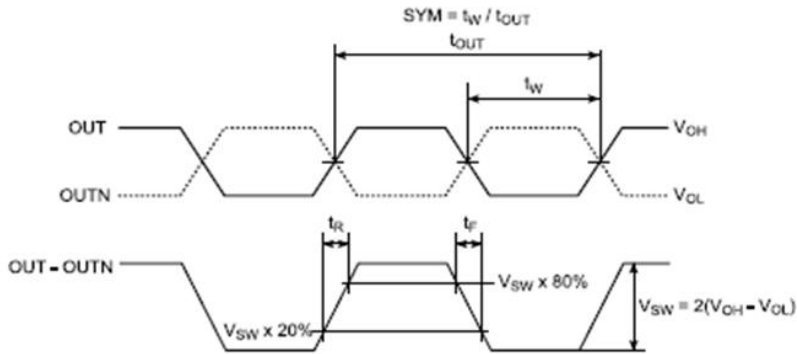
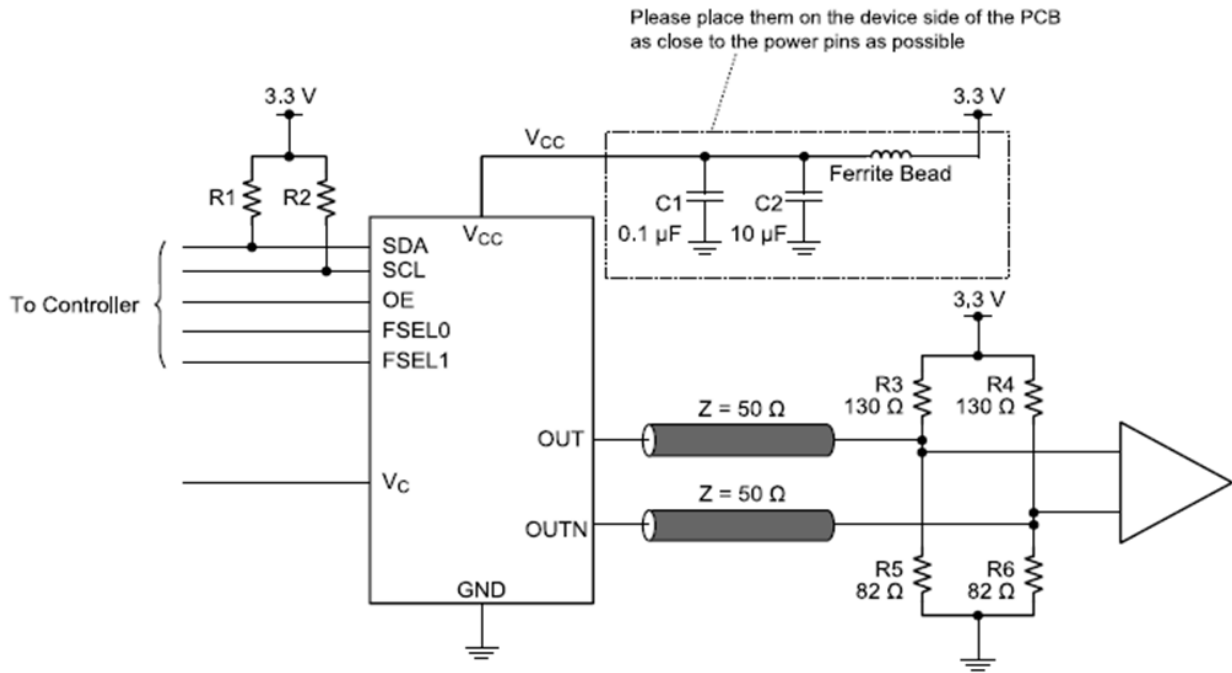Output Rise/Fall Time, Symmetry (duty cycle)

4.Test circuit

1) Condition

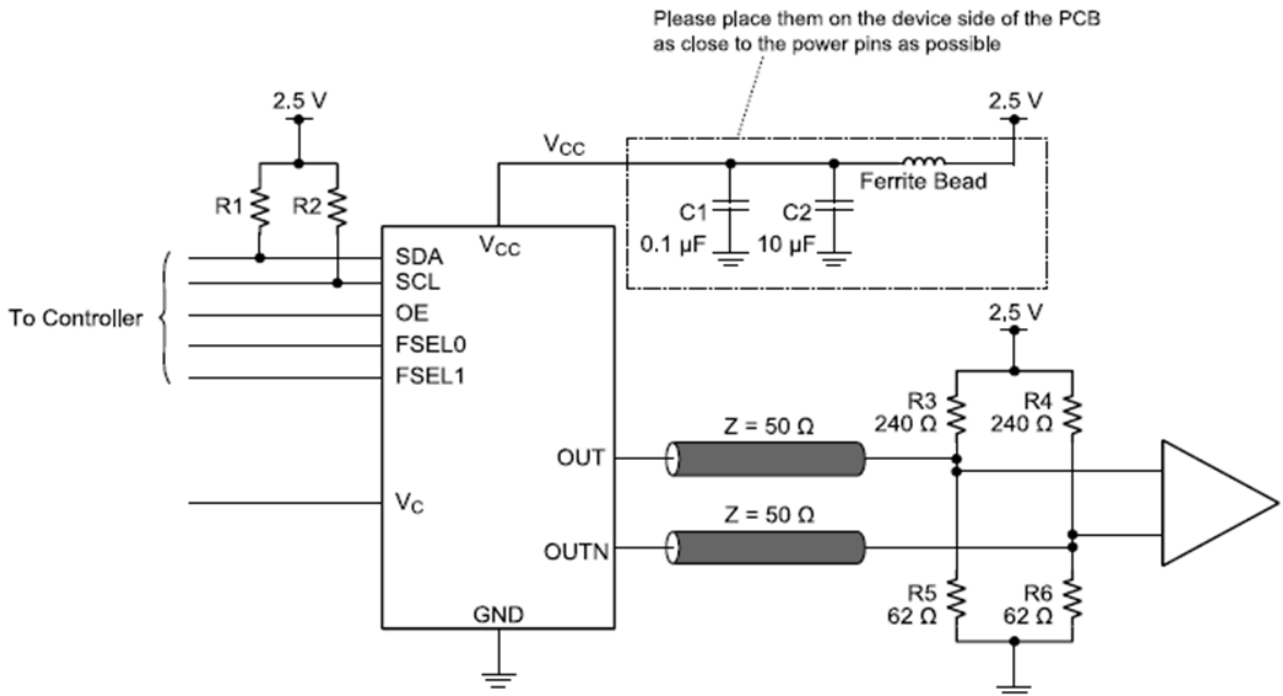This figure shows an example of this product's application schematic.

As with any high speed analog circuitry, the power supply pins for VG7050EAN are vulnerable to noise. In order to achieve optimum jitter performance, power isolation with filter device is required for power supply pins.

In order to achieve best performance of the power isolation filter, it is recommended that the filter composing devices is placed on the device side of the PCB as close to the power pins as possible. The component value of this filter is just an example, it may have to be adjusted.
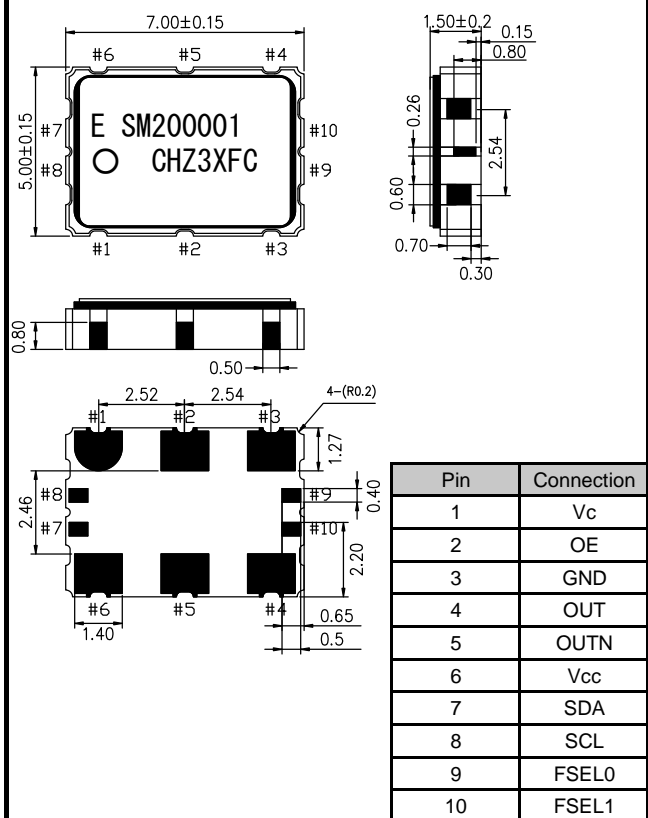
2)Vcc = 3.3V

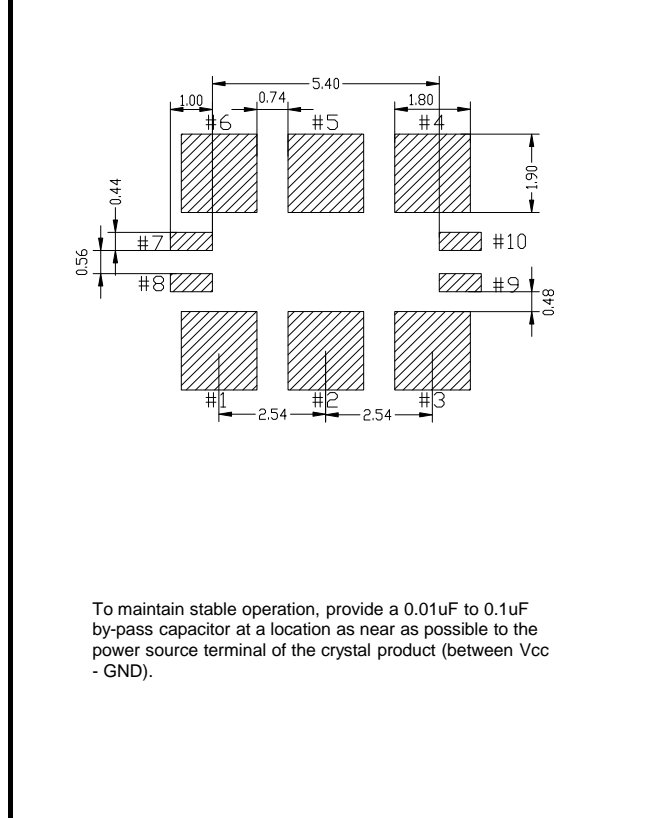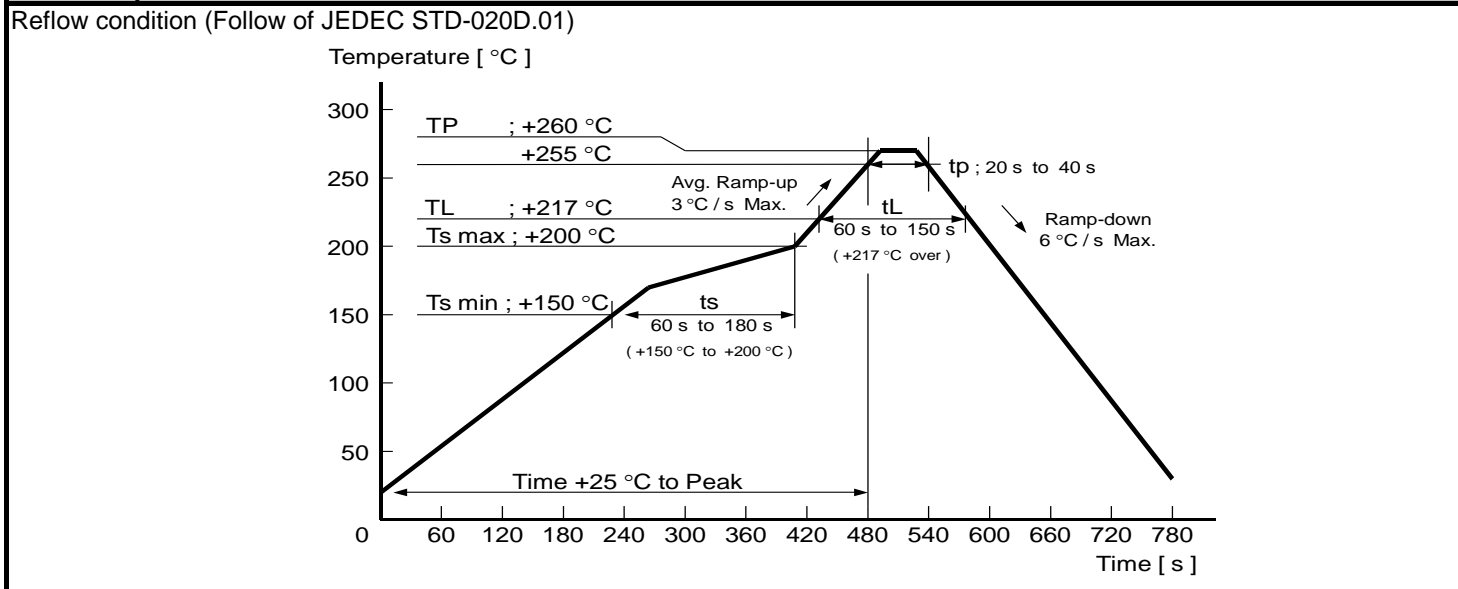Please place them on the device side of the PCB
as close to the power pins as possible

3) Vcc = 2.5V

Please place them on the device side of the PCB
as close to the power pins as possible

5.External dimensions   (Unit: mm)

7.00±0.15
5.00±0.15

#6 #5 #4
#7   #10
#8   #9
#1 #2 #3

E SM200001
O CHZ3XFC

1.50±0.2
0.15
0.80
0.26
2.54
0.60
0.70
0.30

0.80
0.50

2.52 2.54
4−(R0.2)
#1 #2 #3
1.27
2.46
#8   #9
#7   #10
0.40
2.20
#6 #5 #4
1.40
0.65
0.5

Pin	Connection
1	Vc
2	OE
3	GND
4	OUT
5	OUTN
6	Vcc
7	SDA
8	SCL
9	FSEL0
10	FSEL1

6.Footprint(Recommended)   (Unit: mm)

5.40
1.00 0.74 1.80
#6 #5 #4
1.90
0.44
0.56
#7 #10
#8 #9
0.48
#1 #2 #3
2.54 2.54

To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

7.Reflow profile

Reflow condition (Follow of JEDEC STD-020D.01)

Temperature [°C]

TP   ; +260 °C
+255 °C
tp ; 20 s to 40 s
Avg. Ramp-up
3 °C / s Max.
TL   ; +217 °C
Ts max ; +200 °C
tL
60 s to 150 s
(+217 °C over)
Ramp-down
6 °C / Max.
Ts min ; +150 °C
ts
60 s to 180 s
(+150 °C to +200 °C)
Time +25 °C to Peak

300
250
200
150
100
50
0   60 120 180 240 300 360 420 480 540 600 660 720 780
Time [s]

8.Packing information

[1]Product number last 2 digits code(xx) description   The recommended code is "00"

X1G0045611003xx

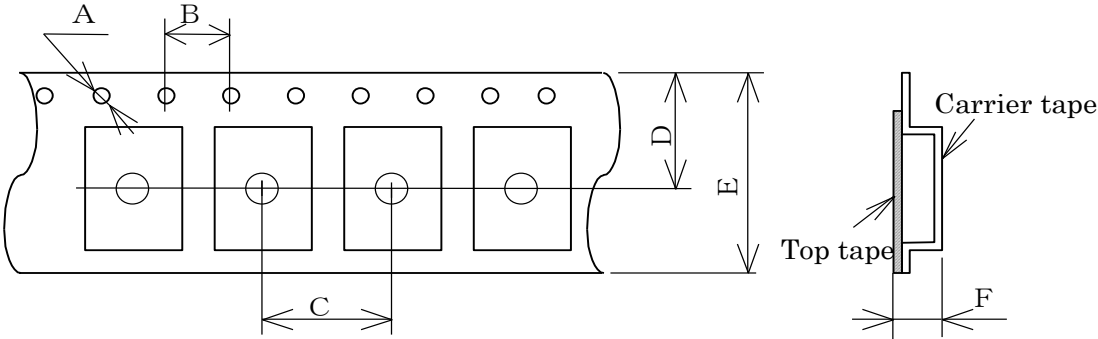| Code	Condition	Code	Condition
00	1000pcs / Reel	12	250pcs / Reel
01	Any Q'ty vinyl bag(Tape cut)	13	500pcs / Reel
11	Any Q'ty / Reel		

[2] Taping specification
Subject to EIA-481 & IEC-60286

(1) Tape dimensions
Material of the Carrier Tape : PS
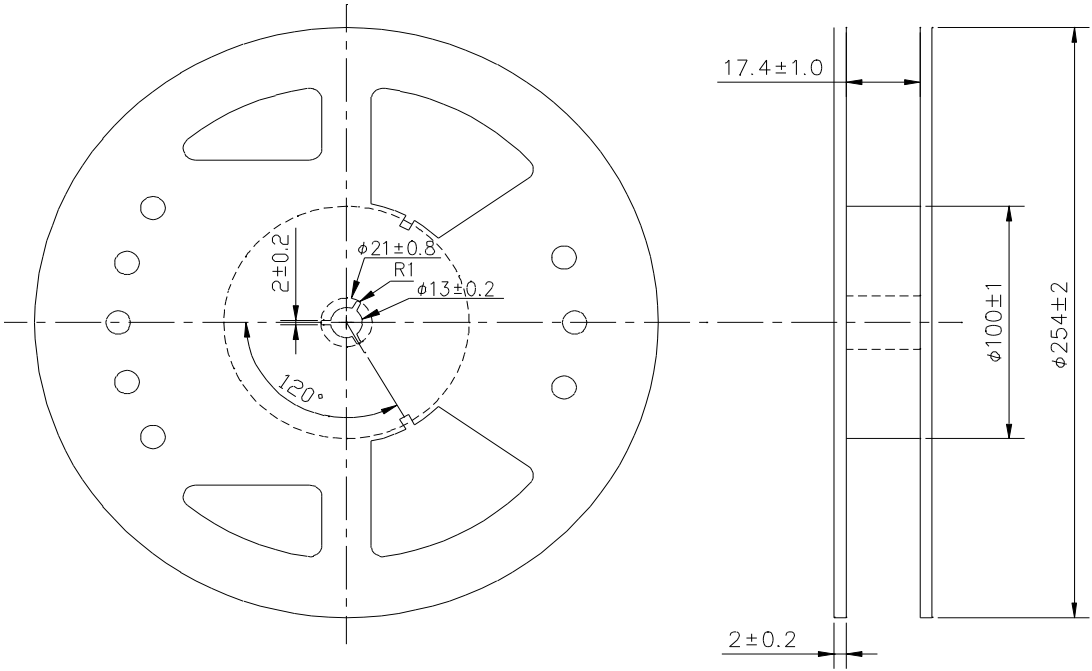Material of the Top Tape : PET+PE   Unit: mm

Symbol	A	B	C	D	E	F
Value	Φ1.5	4	8	9.25	16	2.3

(2) Reel dimensions
Center material : PS
Material of the Reel : PS

9.Notice

- This material is subject to change without notice.
- Any part of this material may not be reproduced or duplicated in any form or any means without the written permission of Seiko Epson.
- The information about applied circuitry, software, usage, etc. written in this material is intended for reference only. Seiko Epson does not assume any liability for the occurrence of infringing on any patent or copyright of a third party. This material does not authorize the licensing for any patent or intellectual copyrights.
- When exporting the products or technology described in this material, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
- You are requested not to use the products (and any technical information furnished, if any) for the development and/or manufacture of weapon of mass destruction or for other military purposes. You are also requested that you would not make the products available to any third party who may use the products for such prohibited purposes.
- These products are intended for general use in electronic equipment. When using them in specific applications that require extremely high reliability, such as the applications stated below, you must obtain permission from Seiko Epson in advance.
  / Space equipment (artificial satellites, rockets, etc.)
  / Transportation vehicles and related (automobiles, aircraft, trains, vessels, etc.)
  / Medical instruments to sustain life
  / Submarine transmitters
  / Power stations and related
  / Fire work equipment and security equipment
  / Traffic control equipment
  / And others requiring equivalent reliability.

- All brands or product names mentioned herein are trademarks and/or registered trademarks of their respective.

10.Contact us

http://www5.epsondevice.com/en/contact/