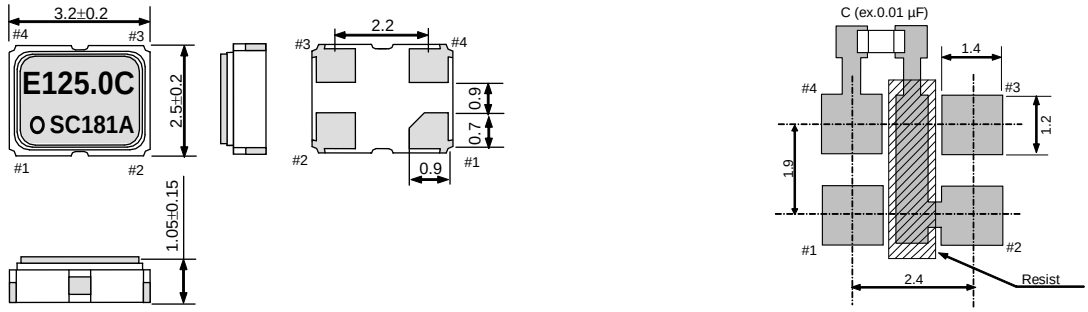
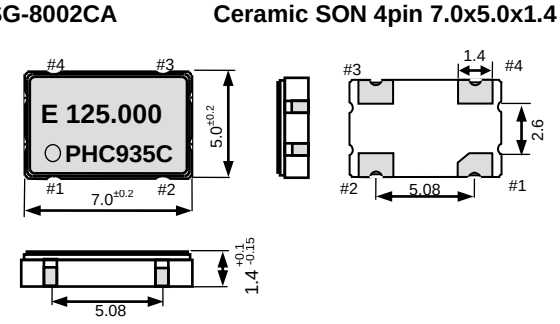
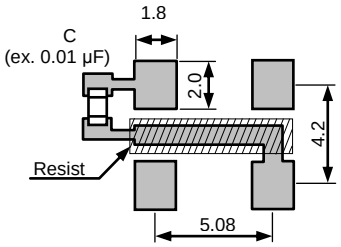
External dimensions and Recommended footprint (Unit:mm)

SG-8002CE Ceramic SON 4pin 3.2x2.5x1.05 mm



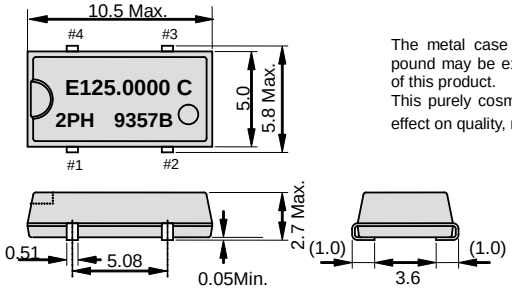
SG-8002CA Ceramic SON 4pin 7.0x5.0x1.4 mm



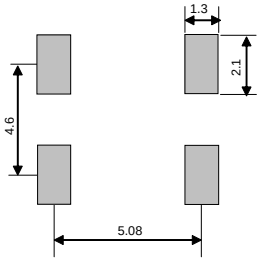


SG-8002JC SOJ 4pin 10.5x5.8x2.7 mm

Package and pin compatible with SG-636.



The metal case inside of the molding compound may be exposed on the top or bottom of this product.
This purely cosmetic and does not have any effect on quality, reliability or electrical specs.



Note.
OE Pin (PT, PH, PC)
OE Pin = "H" or "open": Specified frequency output.
OE Pin = "L": Output is high impedance.

$\overline{ST}$ Pin (ST, SH, SC)
$\overline{ST}$ Pin = "H" or "open": Specified frequency output.
$\overline{ST}$ Pin = "L": Output is low level (weak pull - down), oscillation stops.

Pin map

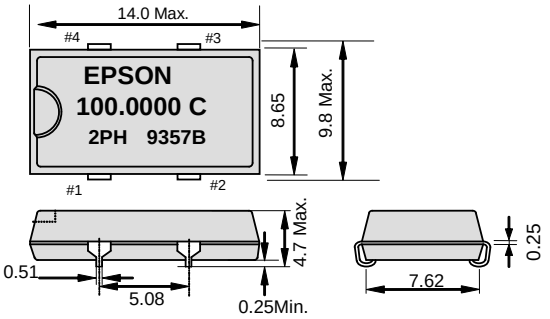
Pin	Connection
1	OE or $\overline{ST}$
2	GND
3	OUT
4	Vcc

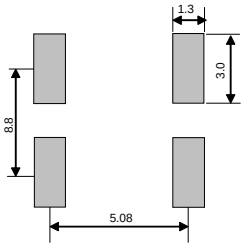
To maintain stable operation, provide a 0.01uF to 0.1uF by-pass capacitor at a location as near as possible to the power source terminal of the crystal product (between Vcc - GND).

External dimensions and Recommended footprint (Continued)

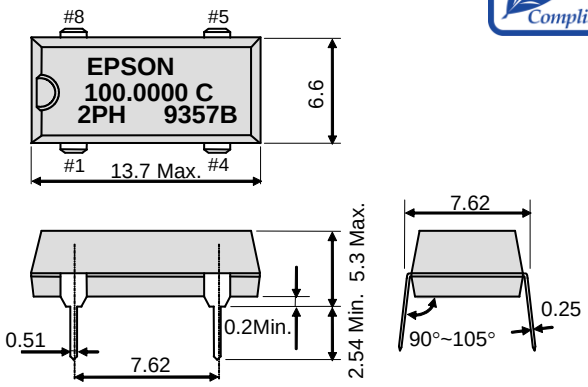
(Unit:mm)

SG-8002JA **SOJ 4pin 14.0x9.8x4.7 mm** Package and pin compatible with SG-615.





SG-8002DC **DIP half size**



Note.
OE Pin (PT, PH, PC)
OE Pin = "H" or "open": Specified frequency output.
OE Pin = "L": Output is high impedance.

$\overline{ST}$ Pin (ST, SH, SC)
$\overline{ST}$ Pin = "H" or "open": Specified frequency output.
$\overline{ST}$ Pin = "L": Output is low level (weak pull - down), oscillation stops.

Pin map

Pin	Connection
1	OE or $\overline{ST}$
2	GND
3	OUT
4	Vcc

Pin map: SG-8002DC

Pin	Connection
1	OE or $\overline{ST}$
4	GND
5	OUT
8	Vcc

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).

Products number

(Please contact us for each product.)

SG-8002CE:	Q3321CExxxxxx00	SG-8002JC:	Q3307JCx2xxxx00
SG-8002CA:	Q3309CAx0xxxx00	SG-8002DC:	Q3204DCx2xxxx00
SG-8002JA:	Q3306JAx2xxxx00		

SG-8002 Series Outline of specifications

Model		Supply volt-age	Operating temperature	Output load condition	Symmetry	Output rise time / Output fall time
SG-8002CE	PT/ST	4.5 V to 5.5 V	-20 °C to +70 °C	5TTL+15pF	40 % to 60 % (1.4 V, L_TTL=5 TTL+15 pF, f0≤125 MHz) 45 % to 55 % (1.4 V, L_TTL=5 TTL+15 pF, f0≤66.7 MHz)	2.0 ns Max. (0.8 V to 2.0 V,L_TTL=Max.) 4.0 ns Max. (0.4 V to 2.4 V,L_TTL=Max.)
			-40 °C to +85 °C		45 % to 55 % (1.4 V, L_TTL=5 TTL+15 pF, f0≤27.0 MHz)	
	PH/SH		-20 °C to +70 °C	15 pF (f0≤125 MHz) 25 pF (f0≤100 MHz)	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤125 MHz) 45 % to 55 % (50 % VCC, L_CMOS=25 pF, f0≤66.7 MHz)	3.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS=Max.)
			-40 °C to +85 °C	25 pF (f0≤27 MHz)	45 % to 55 % (50 % VCC, L_CMOS=25 pF, f0≤27.0 MHz)	
	PC/SC	3.0 V to 3.6 V	-40 °C to +85 °C	15 pF	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤125 MHz) 45 % to 55 % (50 % VCC, L_CMOS=15 pF, f0≤40 MHz)	3.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS=Max.)
		2.7 V to 3.6 V			40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤66.7 MHz)	
SG-8002CA SG-8002JA SG-8002DC	PT/ST	4.5 V to 5.5 V	-20 °C to +70 °C	5TTL+15pF (f0≤125 MHz) 25 pF (f0≤66.7 MHz)	40 % to 60 % (1.4 V, L_TTL=5 TTL+15 pF, f0≤125 MHz) ↑ (1.4 V, L_CMOS=25 pF, f0≤66.7 MHz) 45 % to 55 % (1.4 V, L_TTL=5 TTL+15 pF, f0≤66.7 MHz)	2.0 ns Max. (0.8 V to 2.0 V,L_CMOS or L_TTL=Max.) 4.0 ns Max. (0.4 V to 2.4 V,L_CMOS or L_TTL=Max.)
			-40 °C to +85 °C	5 TTL+15 pF (f0≤40 MHz) 15 pF (f0≤55 MHz)	40 % to 60 % (1.4 V, L_CMOS=15 pF, f0≤55.0 MHz) 45 % to 55 % (1.4 V, L_TTL=5 TTL+15 pF, f0≤40.0 MHz)	
	PH/SH		-20 °C to +70 °C	25 pF (f0≤125 MHz) 50 pF (f0≤66.7 MHz)	40 % to 60 % (50 % VCC, L_CMOS=25 pF, f0≤125 MHz) ↑ (50 % VCC, L_CMOS=50 pF, f0≤66.7 MHz) 45 % to 55 % (50 % VCC, L_CMOS=25 pF, f0≤66.7 MHz)	3.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS≤25pF) 4.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS=Max.)
			-40 °C to +85 °C	15 pF (f0≤55 MHz) 25 pF (f0≤40 MHz)	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤55.0 MHz) 45 % to 55 % (50 % VCC, L_MOS=25 pF, f0≤40.0 MHz)	
	PC/SC	3.0 V to 3.6 V	-40 °C to +85 °C	15 pF 30 pF (f0≤40 MHz)	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤125 MHz) 45 % to 55 % (50 % VCC, L_CMOS=30 pF, f0≤40 MHz)	3.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS≤15pF) 4.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS=Max.)
		2.7 V to 3.6 V		15 pF	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤66.7 MHz)	
SG-8002JC	PT/ST	4.5 V to 5.5 V	-20 °C to +70 °C	5TTL+15 pF (f0≤90 MHz) 15 pF (f0≤125 MHz) 25 pF (f0≤66.7 MHz)	40 % to 60 % (1.4 V,L_CMOS=15 pF, f0≤125 MHz) ↑ (1.4 V,L_TTL=5 TTL+15 pF, f0≤90.0 MHz) ↑ (1.4 V,L_CMOS=25 pF, f0≤66.7 MHz) 45 % to 55 % (1.4 V,L_TTL=5 TTL+15 pF, f0≤66.7 MHz)	2.0 ns Max. (0.8 V to 2.0 V,L_CMOS or L_TTL=Max.) 4.0 ns Max. (0.4 V to 2.4 V,L_CMOS or L_TTL=Max.)
	PH/SH			15 pF (f0≤125 MHz) 25 pF (f0≤90 MHz) 50 pF (f0≤66.7 MHz)	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤125 MHz) ↑ (50 % VCC, L_CMOS=25 pF, f0≤90 MHz) ↑ (50 % VCC, L_CMOS=50 pF, f0≤50 MHz) 45 % to 55 % (50 % VCC, L_CMOS=25 pF, f0≤66.7 MHz)	3.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS≤25pF) 4.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS=Max.)
	PC/SC	3.0 V to 3.6 V	-20 °C to +70 °C	15 pF 30 pF (f0≤40 MHz)	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤125 MHz) 45 % to 55 % (50 % VCC, L_CMOS=30 pF, f0≤40 MHz)	3.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS≤15pF) 4.0 ns Max. (20 % VCC to 80 % VCC,L_CMOS=Max.)
		2.7 V to 3.6 V		15 pF	40 % to 60 % (50 % VCC, L_CMOS=15 pF, f0≤66.7 MHz)	

Product Name (Standard form)

SG-8002 CE 125.000000MHz S C C
① ② ③ ④⑤⑥

①Model ②Package type ③Frequency
④Function (P: Output enable, S:Standby)
⑤Supply voltage ⑥Frequency tolerance / Operating temperature
*As per table below.

⑤Supply voltage	
T,H	5.0 V Typ.
C	3.0 / 3.3 V Typ.

⑥Frequency tolerance / Operating temperature	
B	±50 × 10^{-6} / -20 to +70°C
C	±100 × 10^{-6} / -20 to +70°C
M	±100 × 10^{-6} / -40 to +85°C

▶TABLE OF FREQUENCY RANGE*

Model(①, ②)	Function, Supply voltage(④, ⑤)	Supply voltage(⑤)	Frequency(③)	Frequency tolerance / Operating Temperature(⑥)
SG-8002CE	PT/ ST PH/ SH	4.5 V to 5.5 V	1.0 MHz to 125 MHz	B,C
			1.0 MHz to 27 MHz	M
	PC/SC	3.0 V to 3.6 V	1.0 MHz to 125 MHz	B,C,M
		2.7 V to 3.6 V	1.0 MHz to 66.7 MHz	
SG-8002CA SG-8002JA SG-8002DC	PT/ ST PH/ SH	4.5 V to 5.5 V	1.0 MHz to 125 MHz	B,C
			1.0 MHz to 55 MHz	M
	PC/ SC	3.0 V to 3.6 V	1.0 MHz to 125 MHz	B,C,M
		2.7 V to 3.6 V	1.0 MHz to 66.7 MHz	
SG-8002JC	PT/ ST PH/ SH	4.5 V to 5.5 V	1.0 MHz to 125 MHz	B,C
	PC/ SC	3.0 V to 3.6 V	1.0 MHz to 125 MHz	B,C
		2.7 V to 3.6 V	1.0 MHz to 66.7 MHz	

SG-8002 series Jitter specifications and characteristics chart

■PLL-PLL connection

The SG-8002 series contains a PLL circuit and there are a few cases where the jitter value may be increased when this product is connected to another PLL oscillator (cascading connection). We do not recommend this series for analog video clock use and telecommunication synchronization. Please check in advance if the SG-8002 series jitter is acceptable to your application. (Jitter specification of the SG-8002 series is max.250 ps/CL=15 pF)

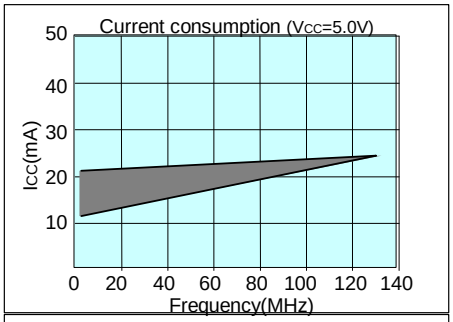
Jitter Specifications

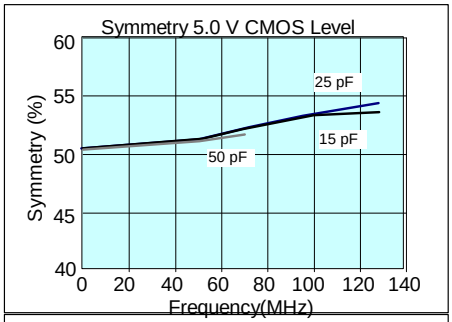
Model	Supply Voltage	Jitter Item	Specifications	Remarks
PT / PH ST / SH	5.0 V ±0.5 V	Cycle to cycle	150 ps Max.	33 MHz ≤ f0 ≤ 125 MHz, L_CMOS=15 pF
			200 ps Max.	1.0 MHz ≤ f0 < 33 MHz, L_CMOS=15 pF
		Peak to peak	200 ps Max.	33 MHz ≤ f0 ≤ 125 MHz, L_CMOS=15 pF
			250 ps Max.	1.0 MHz ≤ f0 < 33 MHz, L_CMOS=15 pF
SC / PC	3.3 V ±0.3 V	Cycle to cycle	200 ps Max.	1.0 MHz ≤ f0 ≤ 125 MHz, L_CMOS=15 pF
		Peak to peak	250 ps Max.	1.0 MHz ≤ f0 ≤ 125 MHz, L_CMOS=15 pF

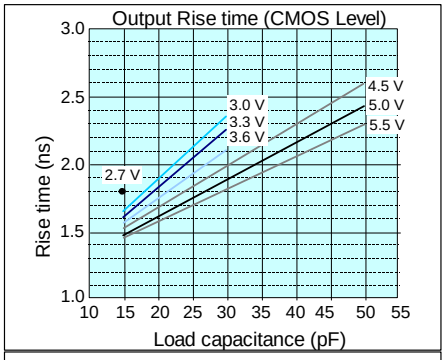
■Remarks on noise management for power supply line

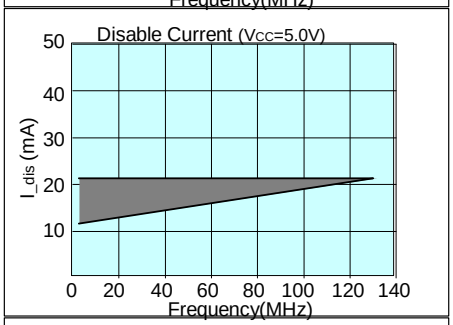
It is not recommended to insert filters or other devices in the power supply line as a counter measure for EMI noise reduction. This may cause high-frequency impedance of the power supply line and negatively affect stable oscillation. When using this measure please evaluate the circuitry and device behavior in the circuit to verify and effects on oscillation. Start up time (0 % Vcc to 90 % Vcc) of power source should be more than 150 μs.

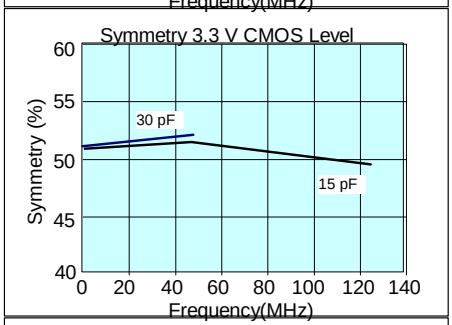
■SG-8002 series Characteristics chart

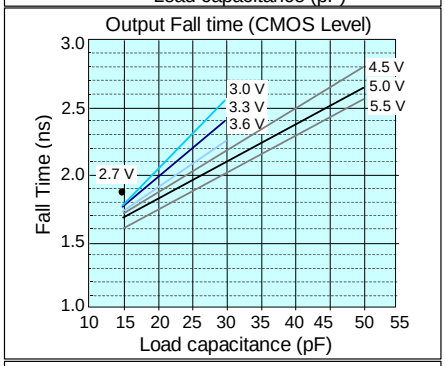


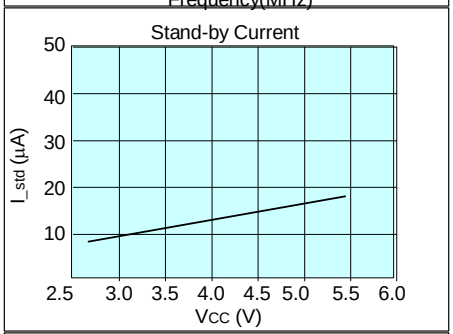


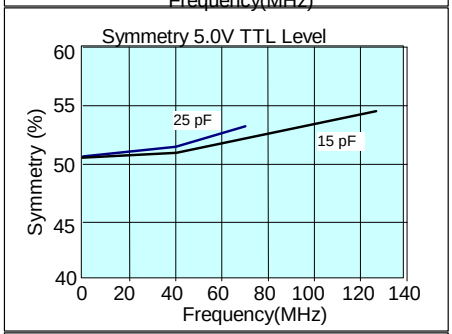


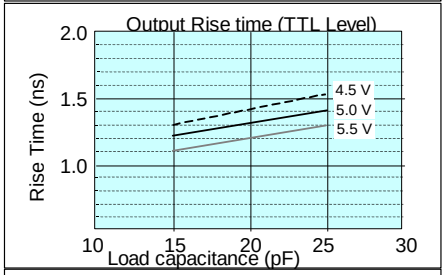


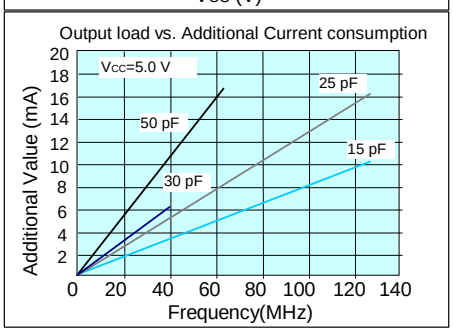


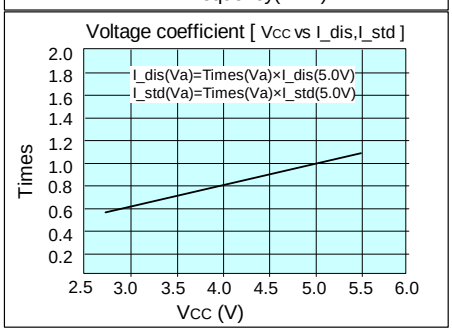


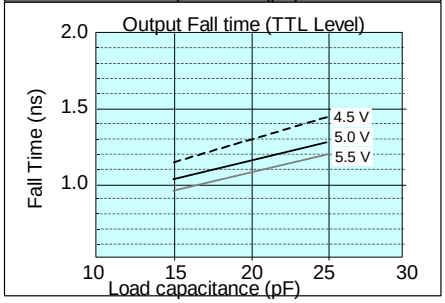












PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

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ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

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ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

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For Automotive	►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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SG-8002CA6.0000M-PCCB SG-8002CA-29.500M-PHB SG-8002CA-24.4912M-SHMB SG-8002CA 1.0000M-PCBL3 SG-8002CA 1.0000M-PCCB SG-8002CA 1.0000M-PHCB SG-8002CA 1.0000M-PHML2 SG-8002CA 1.0000M-PHML3 SG-8002CA 1.0650M-PCCB SG-8002CA 1.1200M-PCCL3 SG-8002CA 1.2288M-PCMB SG-8002CA 1.5440M-PCBL0 SG-8002CA 1.5440M-PCBL3 SG-8002CA 1.5440M-PHBL3 SG-8002CA 1.5440M-PHBS SG-8002CA 1.5440M-PTBL3 SG-8002CA 1.5440M-PTCB SG-8002CA 1.5440M-PTCL3 SG-8002CA 1.7680M-PCCL3 SG-8002CA 1.8432M-PCCB SG-8002CA 1.8432M-PCCL0 SG-8002CA 1.8432M-PCCL3 SG-8002CA 1.8432M-PCML0 SG-8002CA 1.8432M-PCML3 SG-8002CA 1.8432M-PHBL0 SG-8002CA 1.8432M-PTBB SG-8002CA 1.8432M-PTBL3 SG-8002CA 1.8432M-PTCL0 SG-8002CA 10.0000M-PCBB SG-8002CA 10.0000M-PCBL0 SG-8002CA 10.0000M-PCBL3 SG-8002CA 10.0000M-PCCB SG-8002CA 10.0000M-PCCL3 SG-8002CA 10.0000M-PCMB SG-8002CA 10.0000M-PCML0 SG-8002CA 10.0000M-PHBL0 SG-8002CA 10.0000M-PHCB SG-8002CA 10.0000M-PHCR0 SG-8002CA 10.0000M-PHMB SG-8002CA 10.0000M-PHML3 SG-8002CA 10.0000M-PTCB SG-8002CA 10.3680M-PCCB SG-8002CA 100.0000M-PCBB SG-8002CA 100.0000M-PCBL3 SG-8002CA 100.0000M-PCCB SG-8002CA 100.0000M-PCCL0 SG-8002CA 100.0000M-PCCL3 SG-8002CA 100.0000M-PHCB SG-8002CA 101.0000M-PCBL3 SG-8002CA 101.0000M-PCCB SG-8002CA 101.0000M-PCCL0 SG-8002CA 104.0000M-PCBB SG-8002CA 104.0000M-PCBL0 SG-8002CA 104.0000M-PCBL3 SG-8002CA 106.2500M-PCBB SG-8002CA 106.2500M-PCBL0 SG-8002CA 106.2500M-PCCL0 SG-8002CA 109.3800M-PCBL0 SG-8002CA 11.0000M-PCBL3 SG-8002CA 11.0592M-PCBB SG-8002CA 11.0592M-PCCL3 SG-8002CA 11.28960M-PCCB SG-8002CA 110.0000M-PCBB SG-8002CA 110.0000M-PCBL0 SG-8002CA 110.0000M-PCBL3 SG-8002CA 110.0000M-PCCL0 SG-8002CA 110.0000M-PHCB SG-8002CA 12.0000M-PCML0 SG-8002CA 12.0000M-PHBL3 SG-8002CA 12.0000M-PHCL0 SG-8002CA 12.0000M-PHCL3 SG-8002CA 12.0000M-PHML3 SG-8002CA 12.0000M-PTBL3 SG-8002CA 12.0960M-PTCB SG-8002CA 12.2730M-PCBB SG-8002CA 12.2880M-PCCL0 SG-8002CA 12.2880M-PHCL3 SG-8002CA 12.3520M-PHBL3 SG-8002CA 12.3520M-PHBS SG-8002CA 12.6600M-PHCB SG-8002CA 12.8000M-PHCL0 SG-8002CA 125.0000M-PCBB SG-8002CA 125.0000M-PCCB SG-8002CA 125.0000M-PCCL0 SG-8002CA 125.0000M-PCCL2 SG-8002CA 125.0000M-PCCL3 SG-8002CA 125.0000M-PCML0 SG-8002CA 125.0000M-PHCB SG-8002CA 125.0000M-PTCB SG-8002CA 14.3180M-PCML3 SG-8002CA 14.31818M-PCCL0 SG-8002CA 14.31818M-PCCL3 SG-8002CA 14.31818M-PHCL0 SG-8002CA 14.31818M-PHCL2 SG-8002CA 14.31818M-PHMB SG-8002CA 14.31818M-PTMB SG-8002CA 14.3182M-PHCB SG-8002CA 14.7456M-PCCB SG-8002CA 14.7456M-PCCL3 SG-8002CA 14.7456M-PCML0