Programmable Voltage Controlled Oscillator (VCXO)
Output: LV-PECL

VG7050EAN / ECN

Pb Free RoHS Compliant

Product Number
EAN : X1G004541xxxx00
ECN : X1G004561xxxx00

- Frequency range : 50 MHz to 800 MHz (Tuning resolution: 2.2 ~ 2.8 x10^{-9})
- Supply voltage : 2.5 V / 3.3 V
- External dimensions : EAN : 7.0 × 5.0 × 1.5 mm (8 pins) ECN : 7.0 × 5.0 × 1.5 mm (10 pins)
- Absolute Pull Range : ±0 to ±180 x 10^{-6} (12 steps selectable)

Features
- EAN : User-specified one startup frequency, APR and 7-bit I²C address
- ECN : User-specified four startup frequency, APR and 7-bit I²C address
- User Programming : I²C Interface
- Low jitter PLL technology

Applications
SONET/SDH, OTN, GbE, Fibre Channel

*The I2C-Bus is a trademark of NXP Semiconductors

Specifications (characteristics)

Item	Symbol	Specifications	Conditions / Remarks
Output frequency range	fo	50 MHz to 800 MHz	It can be changed by I²C
Supply voltage	V_{CC}	D: 2.5 V ± 0.125 V, C: 3.3 V ± 0.33 V	
Storage temperature	T_stg	-55 ºC to +125 ºC	Store as bare product after packing
Operating temperature	T_use	-40 ºC to +85 ºC	
Frequency tolerance *1	f_tol	±50 × 10^{-6}	Includes frequency aging (10 years)
Current consumption	I_{CC}	90 mA Max.	OE Active, L_ECL=50 Ω
Disable current	I_dis	40 mA Max.	OE Inactive, Output Standby: Hi-Z mode
		70 mA Max.	OE Inactive, Output Standby: Fix mode
Absolute pull range	APR	±0 to ±180 x10^{-6}	Vc = 1.65 V ± 1.35 V (Vcc = 3.3 V)
		±0 to ±180 x10^{-6}	Vc = 1.25 V ± 1.00 V (Vcc = 2.5 V)
Control voltage tuning range	Vc	0 to Vcc	
Frequency change polarity	-	Positive slope	
Symmetry	SYM	45 % to 55 %	At outputs crossing point
Output voltage	V_{OH}	Vcc-1.025 V Min.	DC characteristics
	V_{OL}	Vcc-1.62 V Max.	
Output load condition	L_ECL	50 Ω	Termination to Vcc - 2.0 V
Input voltage	V_{IH}	70% Vcc Min.	EAN : OE, SDA and SCL ECN : OE, FSEL0, FSEK1, SDA and SCL
	V_{IL}	30% Vcc Max.	
Rise time / Fall time	tr / tf	400 ps Max.	Between 20% and 80% of (VOH-VOL)
Start-up time	t_str	10 ms Max.	Time at minimum supply voltage to be 0 s

*1 Frequency tolerance includes initial frequency tolerance, temperature variation, supply voltage change, reflow drift and 10 years aging at +25 ºC.

Product name (Standard form)

VG7050 EAN SM18xxxx C J G H P Z
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①Model
②Output (E: LV-PECL)
③Parameter Designator (EAN : SM18xxxx, ECN : SM20xxxx)
④Supply voltage (C: 3.3 V Typ., D: 2.5 V Typ.)
⑤Frequency tolerance (J: ±50 × 10^{-6})
⑥Operating temperature (G: -40 ~ +85°C)
⑦OE Function (H: Active High, L: Active Low)
⑧Absolute Pull Range (P: Programmable)
⑨Output Standby Type (F: Fix (OUT="L", OUTN="H"), Z: High-Z)

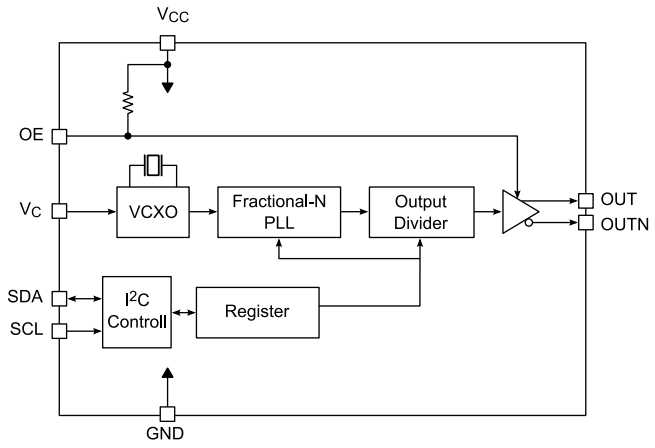
Phase Jitter

	Offset Frequency	125.00 MHz	156.25 MHz	250.00 MHz	425.00 MHz	622.08 MHz	669.33 MHz	794.73 MHz
Phase jitter*2 Typ.	12 kHz to 20 MHz	0.30 ps	0.26 ps	0.26 ps	0.25 ps	0.26 ps	0.26 ps	0.26 ps
	20 kHz to 50 MHz	0.30 ps	0.27 ps	0.27 ps	0.26 ps	0.27 ps	0.27 ps	0.27 ps
	50 kHz to 80 MHz	0.29 ps	0.27 ps	0.27 ps	0.26 ps	0.27 ps	0.27 ps	0.27 ps

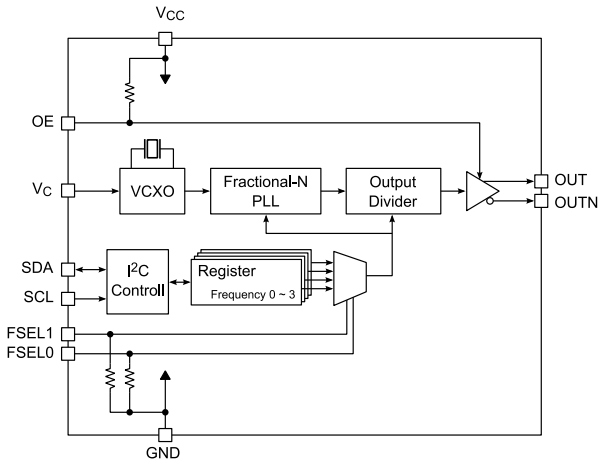
*2 In order to achieve optimum jitter performance, it is recommended that the capacitor (0.1 µF + 10 µF) between Vcc and GND pin should be placed as close to the Vcc pin as possible.

Block diagram

VG7050EAN



VG7050ECN

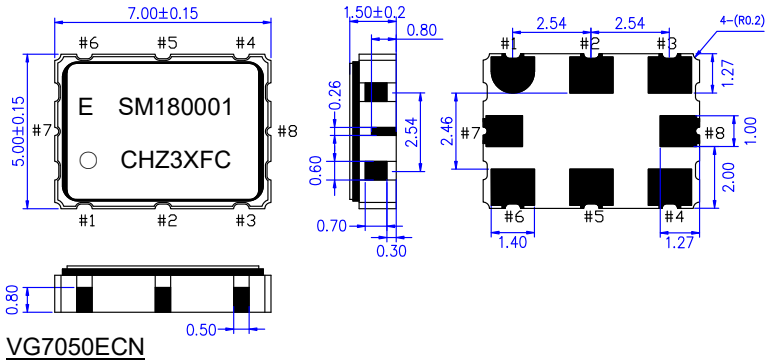


OE Function / OE Standby Type

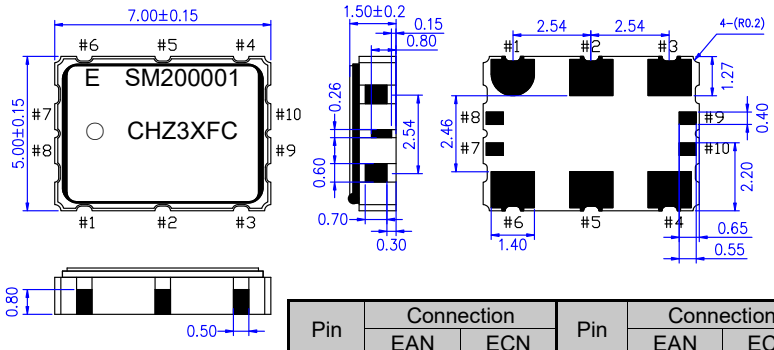
OE Function	OE Standby Type	Frequency output OE pin	Oscillator Stop	
			OE pin	OUT,OUTN state
H: High Active	Z: High-Z	"H" or "OPEN"	"L"	High Impedance
L: Low Active		"L" or "OPEN"	"H"	
H: High Active	F: Fix	"H" or "OPEN"	"L"	OUT="L", OUTN="H"
L: Low Active		"L" or "OPEN"	"H"	

External dimensions (Unit: mm)

VG7050EAN



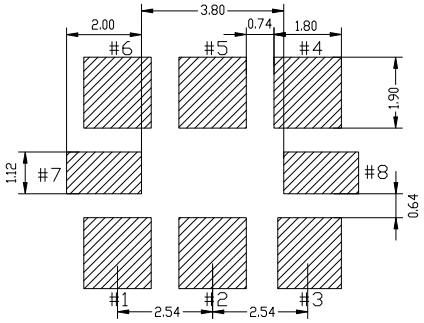
VG7050ECN



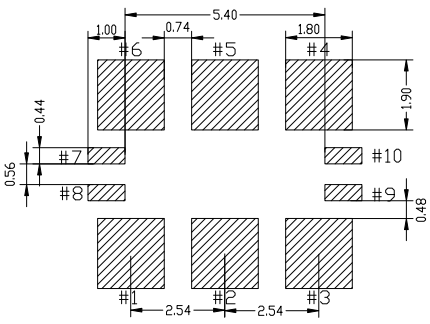
Pin	Connection		Pin	Connection	
	EAN	ECN		EAN	ECN
1	Vc	Vc	6	Vcc	Vcc
2	OE	OE	7	SDA	SDA
3	GND	GND	8	SCL	SCL
4	OUT	OUT	9	-	FSEL0
5	OUTN	OUTN	10	-	FSEL1

Footprint (Recommended) (Unit: mm)

VG7050EAN



VG7050ECN



In order to achieve optimum jitter performance, it is recommended that the capacitor (0.1 µF + 10 µF) between VCC and GND pin should be placed as close to the VCC pin as possible.

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.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

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.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs, Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired IATF 16949 certification that is requested strongly by major automotive manufacturers as standard.

IATF 16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

►Explanation of the mark that are using it for the catalog

	►Pb free.
	►Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
	►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).