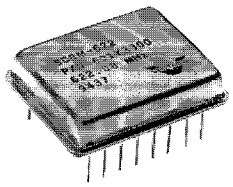
Sonet Clock Recovery Module SCRM-622

The Vectron SCRM-622 is a PLL based single package solution for clock and data recovery (CDR) at SONET OC-12/CCITT STM-4 rates. Unlike other high performance CDR modules, which require external components and crystal oscillators, the SCRM-622 is self-contained. No external loop filter or reference is required.

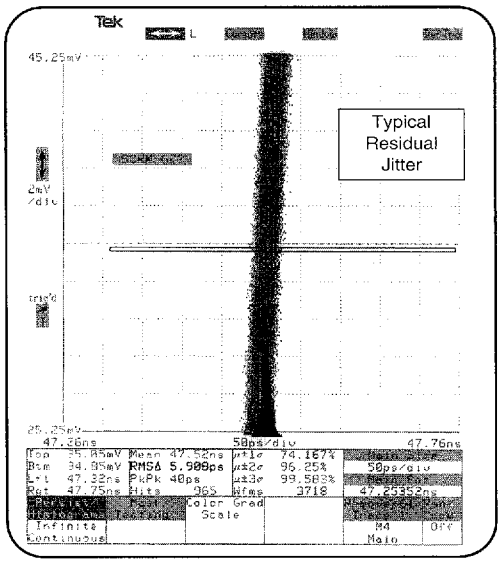


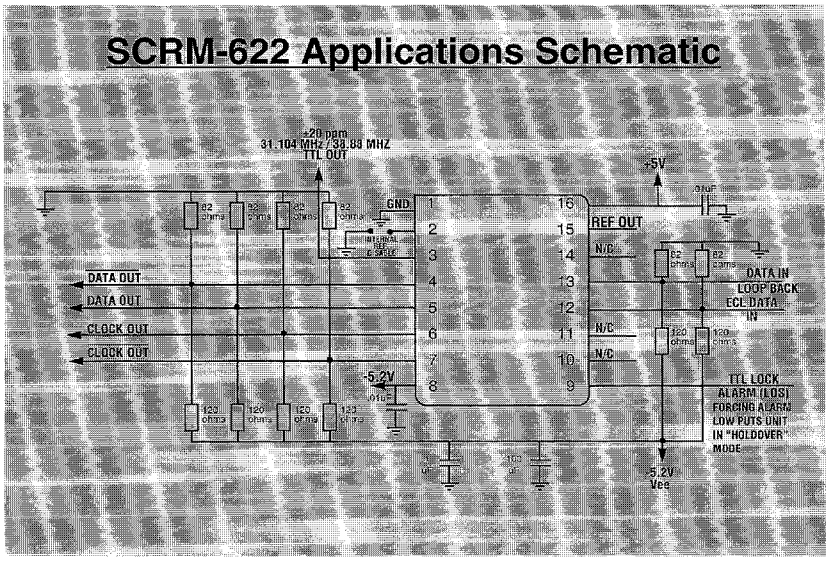
An on-board crystal oscillator produces a useable +/-20 ppm TTL clock at 31.104 MHz (or optionally at 38.88 MHz) for holdover and system use. A LOCK indicator can be used as a Loss of Signal (LOS) detector. Jitter tolerance of the SCRM-622 is robust, meeting both CCITT STM-4A (table 2/G.958) and Bellcore TR-NWT-000253 requirements. All control lines are TTL compatible, while all high speed inputs and outputs are ECL level, making the SCRM-622 user friendly.

CHARACTERISTIC	CONDITION	SPECIFICATION
*Clock Rate		622.08 MHz
Tuning range		± 1 MHz
Acquisition Time	Input Density = 50 %	⩽ 100 us
Jitter tolerance	10 Hz 30 Hz 300 Hz 25 kHz 250 kHz	⩾ 15 UI ⩾ 15 UI ⩾ 1.5 UI ⩾ 1.5 UI ⩾ 0.4 UI
Residual Jitter (see plot below)	2^{23} -1 PRB Sequence	⩽ 7 ps rms
Output Accuracy of Internal Reference	0° C to +70° C and -40° C to +85° C	±20 ppm and ±50 ppm

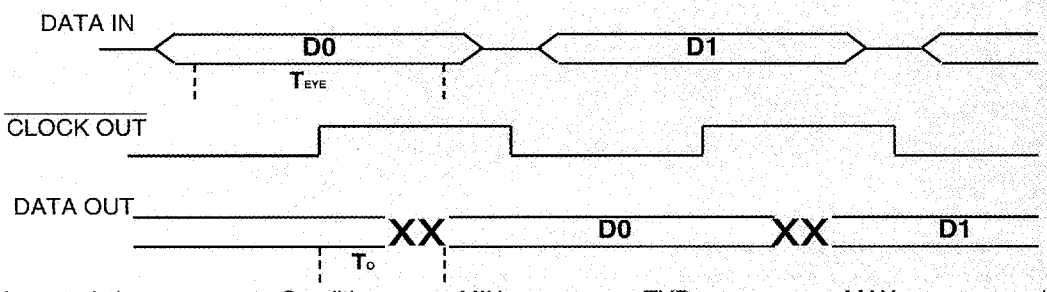
*NOTE: In holdover mode (pin 9 forced low), the 622.08 MHz clock will track either the internal or external reference as determined by the user when controlling pin 2.

Available at 311.04 MHz





The SCRM-622 AC Characteristics



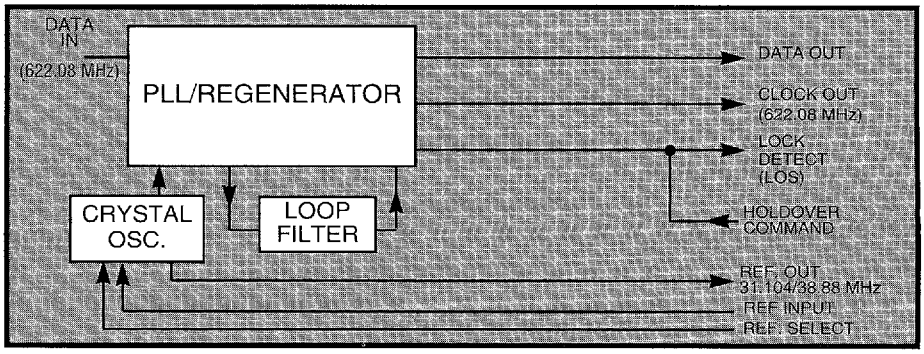
Symbol	Characteristic	Conditions	MIN	TYP	MAX	UNIT
TO	DOUT from CKOUT			110		ps
TEYE	Input data valid time		0.15			Bit (UI)

How to Order

601Y3300□ at 622.08 MHz

"**A**": 31.104 MHz internal reference output frequency

"**B**": 38.88 MHz internal reference output frequency



MAXIMUM RATINGS

These are the limits beyond which the component may be impaired:

Symbol	Characteristic	Conditions	MIN	TYP	MAX	UNIT
V_{CC}	Positive Supply		0		7	V
V_{EE}	Negative Supply		-7		0	V
V_O max	Output Voltage	ECL	Vee -0.5		0.5	V
I_O max	Output Current	ECL			40	mA
V_O max	Output Voltage	TTL	-0.5		Vcc + 0.5	V
I_O max	Output Current	TTL			20	mA
V_I max	Input Voltage	ECL	Vee -0.5		0.5	V
V_I max	Input Current	ECL	-1.0		1.0	mA
V_I max	Input Voltage	TTL	-0.5		Vcc + 0.5	V
I_I max	Input Current	TTL	-1.0		1.0	mA
*Tc	Operating Temp.	Case Temp	-40		+90	°C
Ts	Storage Temp.		-55		+125	°C

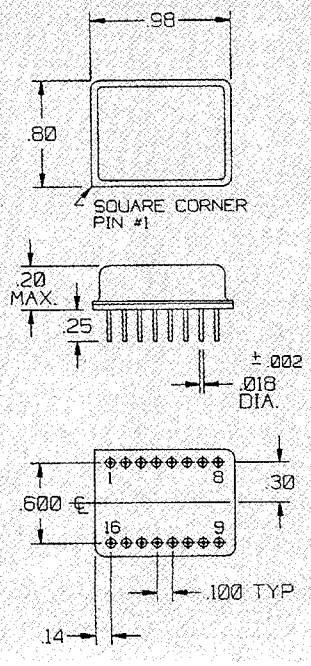
*T_{CASE} = -40 to +85°C; appropriate heatsinking may be required. All voltages in table are with respect to VDD.

DC Characteristics

Symbol	Characteristic	Conditions	MIN	TYP	MAX	UNIT
V_{CC}	Positive Supply		4.5	5.0	5.5	V
V_{EE}	Negative Supply		-5.5	-5.2	-4.5	V
I_{CC}	Positive Supply Current			20.0		mA
I_{EE}	Negative Supply Current			160		mA
V_{IH}ECL	ECL Input HI Voltage		-1100		-700	mV
V_{IL}ECL	ECL Input LO Voltage	Note 2	-2000		-1500	mV
I_{IH}ECL	ECL Input HI Current	VIH			10	uA
I_{IL}ECL	ECL Input LO Current	VILmin			-10	uA
V_{OH}ECL	ECL Output HI Voltage	Note 2	-1000		-500	mV
V_{OL}ECL	ECL Output LO Voltage	Note 2	-2000		-1600	mV
I_{OH}ECL	ECL Output HI Current		20	23	30	mA
I_{OL}ECL	ECL Output LO Current		0	5	8	mA
V_{IH}TTL	TTL Input HI Voltage		2.0		Vcc	V
V_{IL}TTL	TTL Input LO Voltage		0		0.8	V
I_{IH}TTL	TTL Input Hi Current	VIHmax			100	uA
I_{IL} TTL	TTL Input LO Current	VILmin	-100			uA
V_{OH}TTL	TTL Output HI Voltage	IOH = 3mA	2.4		Vcc	V
V_{OL}TTL	TTL OutPut LO Voltage	IOL = -1mA	0		0.4	V

Note 1: V_{EE} = -5.0 V
Note 2: R_{LOAD} = 50 Ohms to -2V

SCRM- 622 Outline Drawing



PIN	FUNCTION
1	0V, CASE
2	INTERNAL REF. DISABLE
3	EXTERNAL REFERENCE
4	DATA OUT
5	DATA OUT
6	CLOCK OUT
7	CLOCK OUT
8	-5.2V VEE
9	LOCK ALARM / HOLDOVER
10	N/C
11	N/C
12	DATA IN
13	DATA IN LOOP BACK
14	N/C
15	-2V REF. OUT
16	+5V VCC

Notes:
1. Pin numbers are for reference only. They do not appear on the unit.
2. All dimensions are in inches.

PIN NO.	NAME	DESCRIPTION
1	0V,CASE	GROUND
2	INTERNAL REF. ENABLE/DISABLE	TTL LOW DISABLES INTERNAL REFERENCE. TTL HIGH/OPEN ENABLES INTERNAL REFERENCE. (SEE PIN 3 FUNCTIONS)
3	INTERNAL / EXTERNAL REF.	a) INPUT FOR EXTERNAL REFERENCE WHEN INTERNAL REFERENCE IS DISABLED. b) OUTPUT OF INTERNAL 31.104 MHz. (38.88 MHz. OPTIONAL) CRYSTAL OSCILLATOR WHEN INTERNAL REFERENCE IS ENABLED
4	DATA $\overline{OUT}$	RETIMED ECL DATA OUTPUT
5	DATA OUT	RETIMED ECL DATA OUTPUT
6	CLOCK OUT	622.08 MHz. ECL CLOCK
7	CLOCK $\overline{OUT}$	622.08 MHz. ECL CLOCK
8	VEE	-5.2 VDC.
9	LOCK ALARM/HOLDOVER	TTL HIGH OUTPUT FOR NORMAL OPERATION. TTL OUTPUT TOGGLES WHEN INCOMING DATASTREAM IS LOST. WHEN FORCED LOW, SCRM GOES INTO "HOLDOVER" MODE
12	DATA IN	ECL DATA INPUT
13	DATA IN LOOP BACK	ECL OUTPUT OF BUFFERED DATA INPUT
15	REF OUT	REFERENCE VOLTAGE OUTPUT (-1.5 to -2.0 Vdc.)
16	VCC	+5 Vdc.

Mnemonic	Pin No.	Pin Type	Description
V_{CC}	16	PWR	+5V
V_{DD}	1	PWR	0V
V_{EE}	8	PWR	-5.2V