



SM840021 Evaluation Board

125MHz LOW NOISE
ETHERNET CLOCK SYNTHESIZER

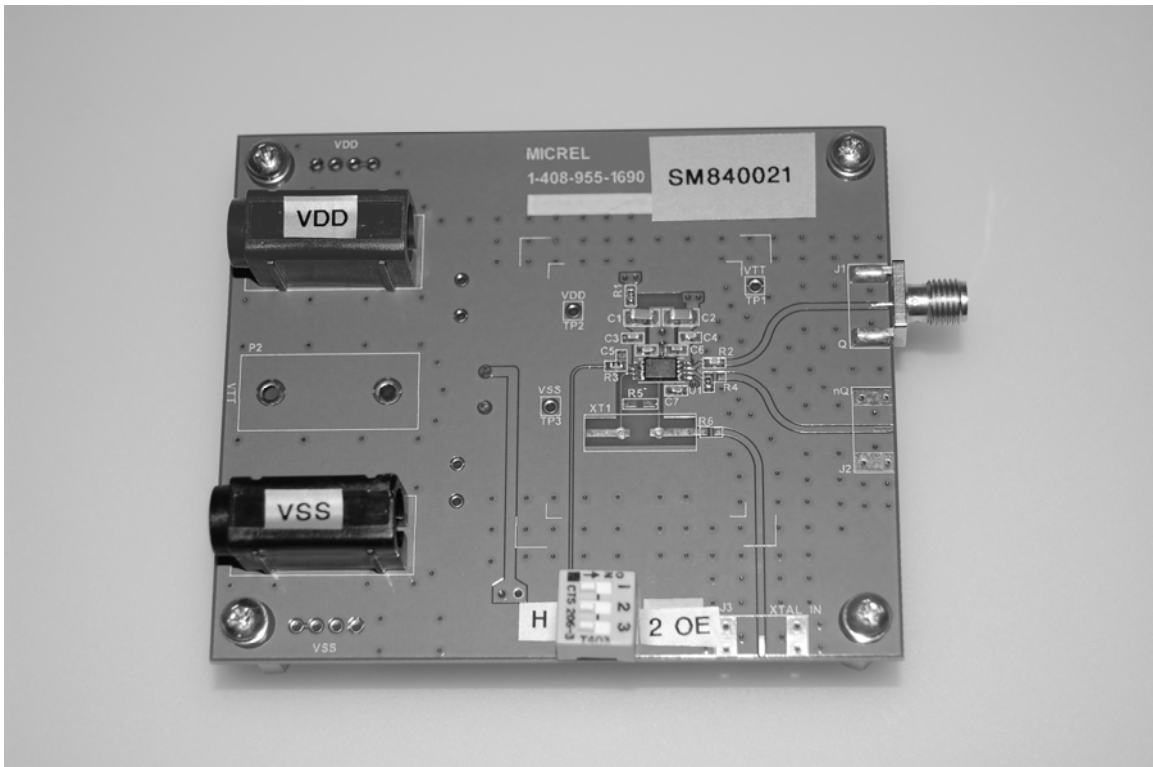
General Description

The SM840021 is a Gigabit Ethernet Low Noise Clock Synthesizer. A fundamental parallel resonant crystal, 25MHz 18pF load, connects to the crystal pins.

The evaluation board standard configuration is AC-coupled CMOS output and 3.3V/2.5V supply operation.

All datasheets and support documentation can be found at Micrel's web site at: www.micrel.com.

Evaluation Board



Evaluation Board Operation

The SM840021 evaluation board is designed to operate with a single supply. The CMOS output is AC-coupled outputs to allow direct connection to a 50Ω scope or phase noise system.

The evaluation board is set to apply 3.3V or 2.5V across the supply terminals. Total supply current will be about 65mA.

Evaluation Board

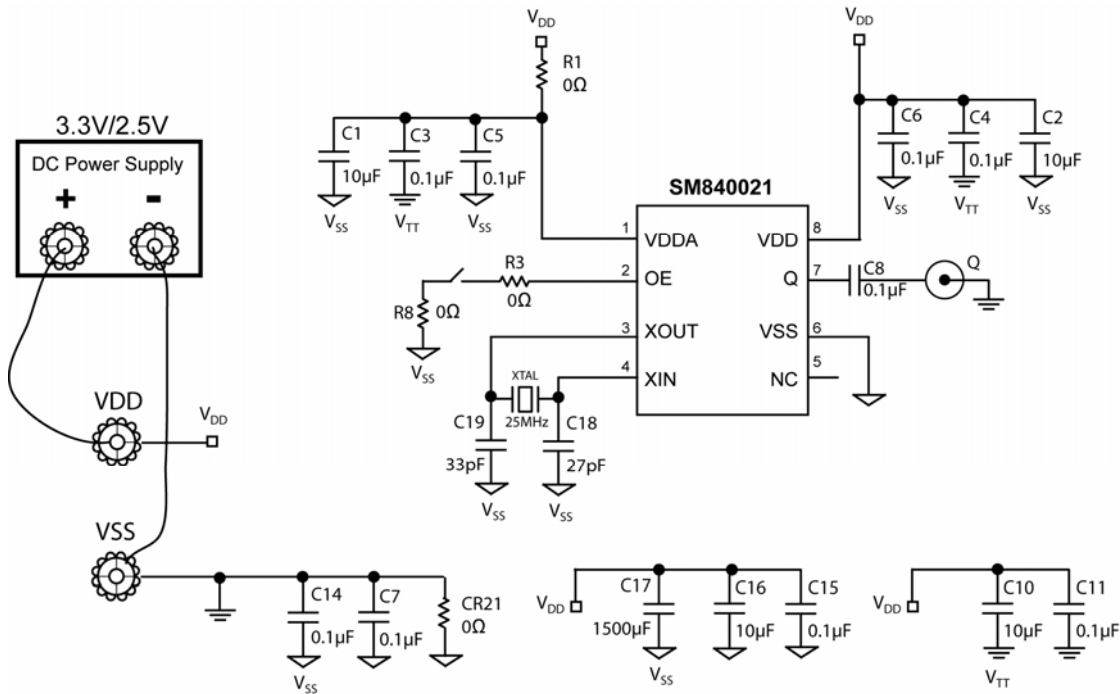


Figure 1. SM840021 Evaluation Board Schematic

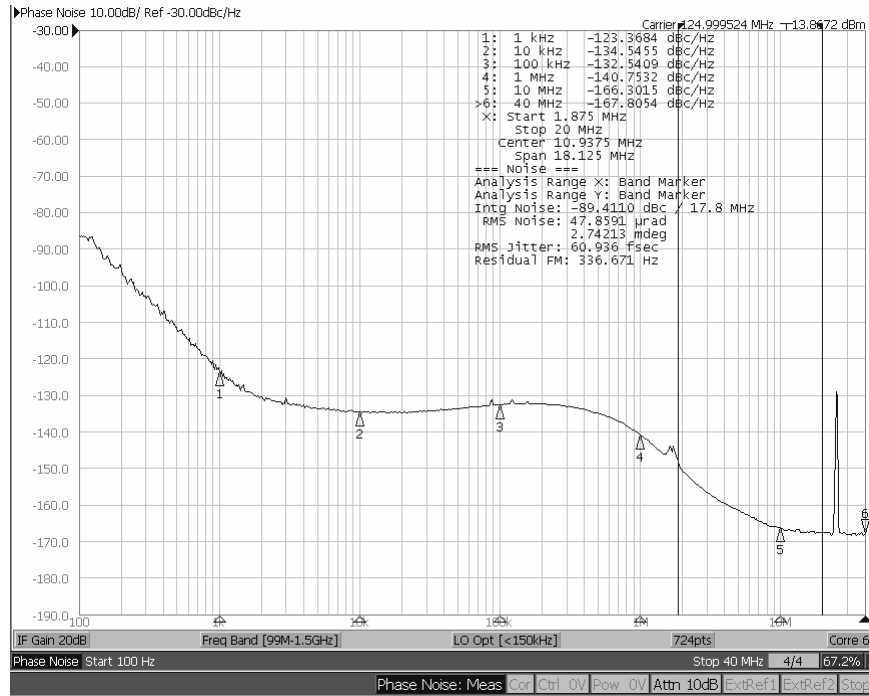


Figure 2. 125MHz Phase Noise 1.875MHz-20MHz, 61fS

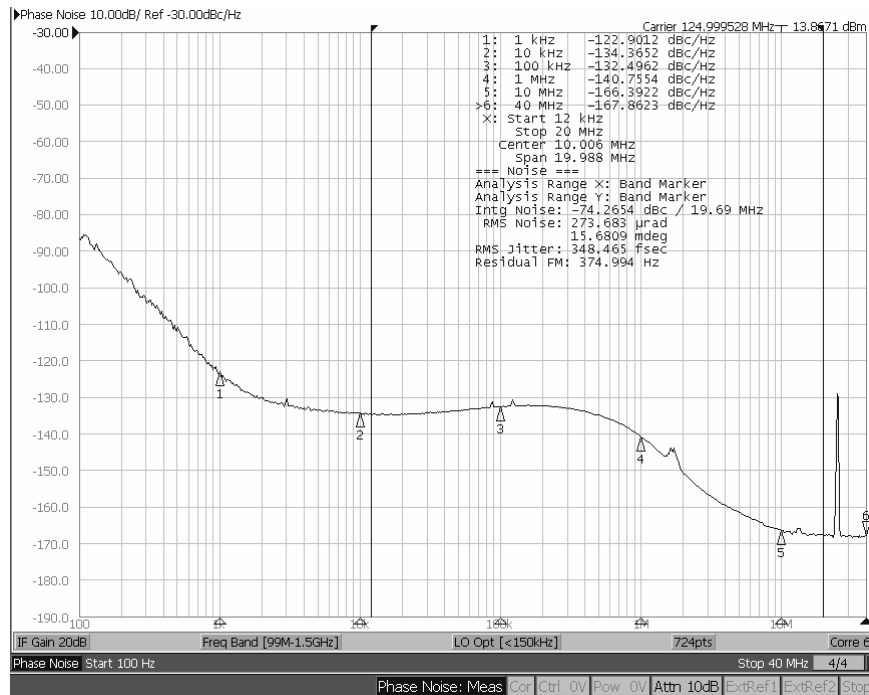


Figure 3. 125MHz Phase Noise 12KHz-20MHz, 348fS

Crystal Characteristics

Parameter	Condition	Min	Typ	Max	Units
Mode of Oscillation	18pF Load	Fundamental Parallel Resonant			
Frequency			25		MHz
Equivalent Series Resistance (ESR)				50	Ω
Shunt Capacitor				7	pF
Correlation Drive Level			100	200	μ W

Crystal

Item	Part Number	Manufacturer	Description
KDS Crystal	DSX321G DSX321SL	KDS Daishinku ⁽¹⁾	25MHz SMD Crystal, 18pF load

Bill of Materials

Item	Part Number	Manufacturer	Description
C3-8, C11, C14, C15,	VJ0603Y104KXXAT	Vishay ⁽²⁾	0.1 μ F, 25V, 10% Ceramic Capacitor, Size 0603, X7R Dielectric
C1,C2,C10, C16	VJ1206YG106KXXT	Vishay ⁽²⁾	10 μ F, 25V, 10% Ceramic Capacitor, Size 1206, X5R Dielectric
C17	647-UPM1A152MPD	Mouser Electronics	1500 μ F, 10V, Aluminum Electrolytic Capacitor, Radial Lead
C19	VJ0603Y330KXXAT	Vishay ⁽²⁾	33pF, 25V, 10% Ceramic Capacitor, Size 0603
C18	VJ0603Y270KXXAT	Vishay ⁽²⁾	27pF, 25V, 10% Ceramic Capacitor, Size 0603
R1, R3, R8, CR21	CRCW0603000Z	Vishay ⁽²⁾	0 Ω , 1/16W, 1% Thick-film Resistor, Size 0603
Red Banana	164-6219	Mouser Electronics	Red Banana (VDD)
Black Banana	164-6218	Mouser Electronics	Black Banana (VSS)
Xtal	DSX321SL	KDS Daishinku ⁽¹⁾	25MHz 18pf smd Crystal
SMA	142-0701-851	Johnson Components ⁽³⁾	Jack Assembly End Launch SMA
	SM840021	Micrel⁽⁴⁾	125MHz Low Noise CMOS Frequency Synthesizer

Notes:

1. KDS Daishinku: http://www.kds.info/index_en.htm
2. Vishay: www.vishay.com
3. Johnson Components: www.johnsoncomponents.com
4. Micrel, Inc.: www.micrel.com

PC Board Layout

This evaluation board is a two layer with FR4 dielectric.

L1	Board Ground, Signal
L2	Board Ground, VDD, VSS

HBW Support

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