



# Agilent Technologies E8257D Option HNY

## Product Note

The Agilent E8257D Option HNY provides an advanced phase lock loop circuit along with a high-performance internal frequency reference that will improve both the close-in and pedestal phase stability to provide superior phase noise performance at all offsets less than 250 kHz from carrier. With the integrated frequency dividers enabled (included with Option HNY), the E8257D uses a dividing technique to output carrier frequencies below 250 MHz. This results in improved phase noise at all offsets for these frequencies. The dividers can be disabled, returning the PSG to a standard mode of creating low frequencies with a heterodyning technique. This mode provides wider deviation bandwidth for frequency and phase-modulated signals. Controls for this mode are the same as for Options UNX and UNY.

### Required Options

- 1E1 Step attenuator  
*Select one of the following:*
- 520 Frequency range, 250 kHz to 20 GHz or
- 532 Frequency range, 250 kHz to 31.8 GHz or
- 540 Frequency range, 250 kHz to 40 GHz

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### Incompatible Options

- 1EM Rear panel connectors
- 1ED Type-N output connector
- 1SM Scan modulation  
*Any custom hardware options*

## Specifications and Characteristics

Measured RMS jitter <sup>a</sup>				
Option HNY carrier frequency	SONET/SDH Data Rates	RMS jitter Bandwidth	Unit intervals (μUI)	Time (fs)
155 MHz	155 MB/s	100 Hz to 1.5 MHz	6	40
622 MHz	622 MB/s	1 kHz to 5 MHz	23	37
2.488 GHz	2488 MB/s	5 kHz to 20 MHz	70	28
9.953 GHz	9953 MB/s	10 kHz to 80 MHz	206	21
39.812 GHz	39812 MB/s	40 kHz to 320 MHz	418	21

a. Calculated from phase noise performance in CW mode only at +10 dBm.

Frequency	Option HNY: absolute SSB phase noise (dBc/Hz) <sup>a,b</sup>					
	Offsets from carrier, optimized for < 150 kHz (mode 1)					
	1 Hz Spec (typ)	10 Hz Spec (typ)	100 Hz Spec (typ)	1 kHz Spec (typ)	10 kHz Spec (typ)	100 kHz Spec (typ)
250 kHz to 250 MHz	-58 (-66)	-87 (-94)	-104 (-115)	-121 (-131)	-136 (-142)	-141 (-145)
250 MHz to 500 MHz	-61 (-70)	-88 (-98)	-106 (-112)	-123 (-129)	-136 (-142)	-137 (-141)
500 MHz to 1 GHz	-57 (-63)	-84 (-93)	-101 (-110)	-121 (-124)	-134 (-138)	-131 (-136)
1 to 2 GHz	-51 (-58)	-79 (-86)	-96 (-103)	-113 (-118)	-129 (-132)	-126 (-130)
2 to 3.2 GHz	-46 (-54)	-74 (-82)	-92 (-94)	-108 (-113)	-125 (-131)	-122 (-128)
3.2 to 10 GHz	-37 (-44)	-65 (-72)	-81 (-80)	-99 (-104)	-116 (-121)	-114 (-118)
10 to 20 GHz	-31 (-38)	-59 (-66)	-75 (-79)	-93 (-98)	-110 (-115)	-108 (-112)
20 to 40 GHz	-25 (-32)	-53 (-60)	-69 (-73)	-87 (-92)	-105 (-109)	-103 (-106)

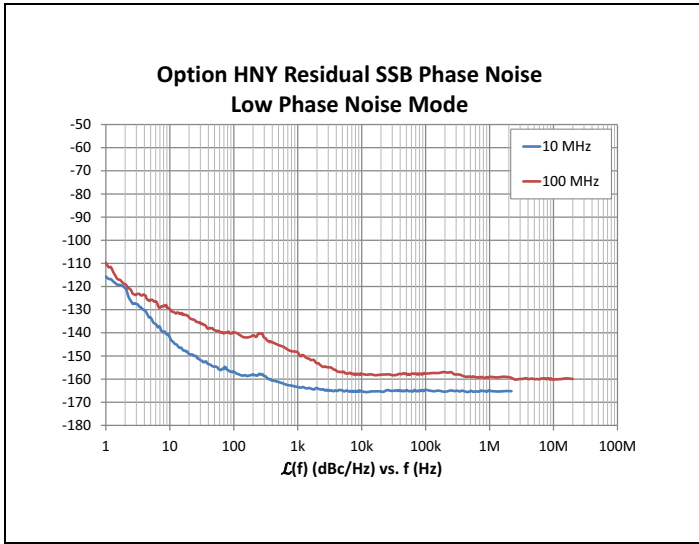
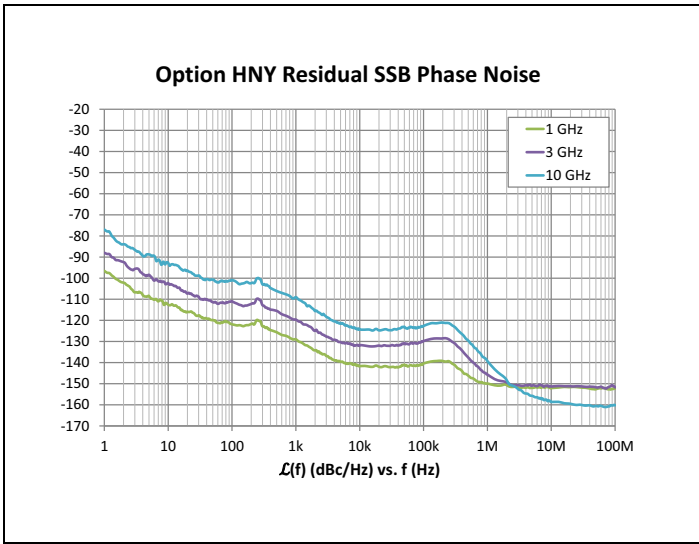
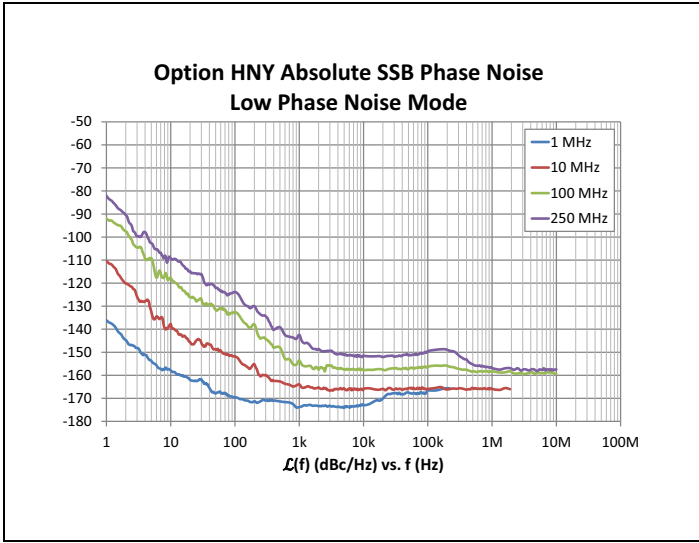
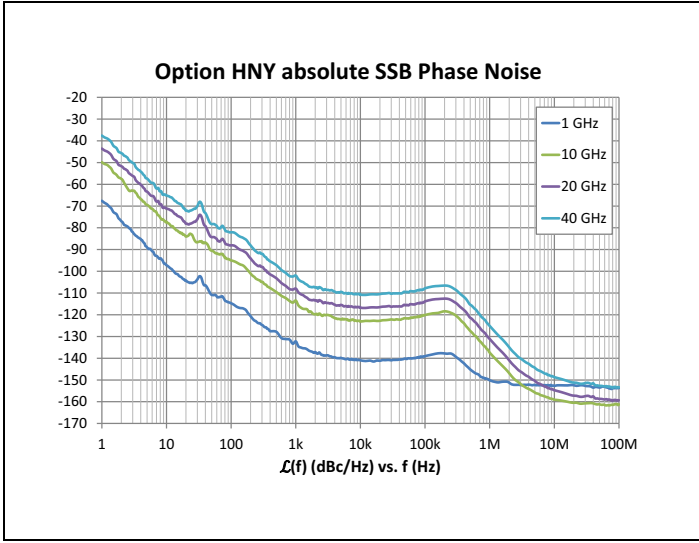
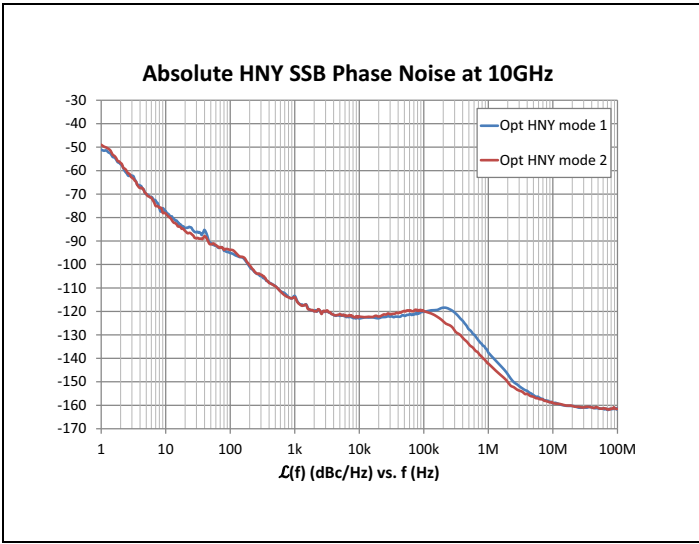
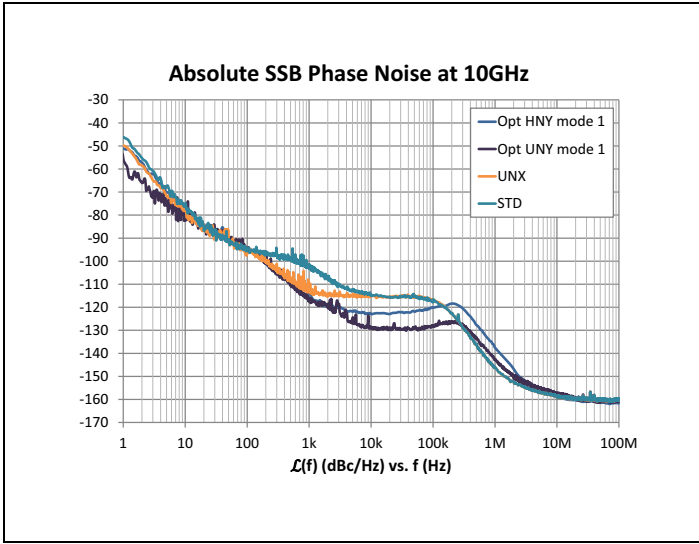
Frequency	Option HNY: residual SSB phase noise (dBc/Hz) (CW) <sup>a,b</sup>					
	Offsets from carrier, optimized for < 150 kHz (mode 1)					
	1 Hz Spec (typ)	10 Hz Spec (typ)	100 Hz Spec (typ)	1 kHz Spec (typ)	10 kHz Spec (typ)	100 kHz Spec (typ)
250 kHz to 250 MHz	(-97)	-100 (-116)	-110 (-126)	-123 (-135)	-132 (-139)	-130 (-136)
250 MHz to 500 MHz	(-89)	-103 (-107)	-111 (-120)	-114 (-119)	-133 (-136)	-136 (-140)
500 MHz to 1 GHz	(-85)	-94 (-99)	-107 (-118)	-104 (-110)	-132 (-138)	-131 (-136)
1 to 2 GHz	(-81)	-94 (-105)	-94 (-115)	-111 (-120)	-127 (-131)	-124 (-131)
2 to 3.2 GHz	(-79)	-91 (-97)	-90 (-108)	-106 (-117)	-123 (-127)	-120 (-124)
3.2 to 10 GHz	(-67)	(-90)	(-98)	(-106)	(-117)	(-134)

Frequency	Option HNY: absolute SSB phase noise (dBc/Hz) (CW) Low phase noise mode (1 to 250 MHz) <sup>a,c</sup>					
	Offsets from carrier, optimized for < 150 kHz (mode 1)					
	1 Hz Spec (typ)	10 Hz Spec (typ)	100 Hz Spec (typ)	1 kHz Spec (typ)	10 kHz Spec (typ)	100 kHz Spec (typ)
1 MHz	-116 (-122)	-140 (-146)	-153 (-166)	-155 (-167)	-154 (-159)	-156 (-160)
10 MHz	-94 (-99)	-117 (-122)	-140 (-146)	-152 (-160)	-155 (-162)	-155 (-161)
100 MHz	-64 (-71)	-96 (-102)	-120 (-126)	-133 (-138)	-150 (-156)	-150 (-153)
250 MHz	-63 (-74)	-93 (-101)	-112 (-118)	-125 (-134)	-144 (-148)	-144 (-146)

a. Phase noise specifications are warranted from 15 to 35 °C, excluding external mechanical vibration. Specifications at 1 kHz offset apply from 25 to 35 °C.

b. Measured at +10 dBm or maximum specified power, whichever is less.

c. Measured with filters off at +16 dBm or maximum achievable leveled power, whichever is less. Without Option 1EU, frequencies of 10 MHz and below are not specified. Without Option 1EU, offsets of 10 kHz and greater are not specified.



Option HNY has the same specification as Option UNY in the following areas:

- CW switching speed
- Step sweep - settling time
- Level accuracy
- Spectral purity
- Harmonics
- Non-harmonics
- Residual FM
- Frequency modulation
- Phase modulation

Refer to E8257D Data Sheet (5989-0698) for all other specifications.

References to UNX or UNY Low Phase Noise mode also include HNY.

Replaceable Parts	Agilent Part Number
Offset Loop Board - HNY	E8257-60284
Reference Board - HNY	E8257-60285
Oscillator Assembly	E8251-60626

For information concerning the operation and connections, reference the standard Agilent E8257D documentation.

Inspect the shipment. Keep the shipping container and packaging material until you have inspected the contents of the shipment for completeness and have verified the instrument mechanically and electrically. If there is physical damage refer to Contacting Agilent below. Keep the damaged shipping materials (if any) for inspection by the carrier and an Agilent Technologies representative.

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## Contacting Agilent

Assistance with test and measurement needs, and information on finding a local Agilent office are available on the Internet at:

*<http://www.agilent.com/find/assist>*

You can also purchase accessories or documentation items on the Internet at:

*<http://www.agilent.com/find>*

If you do not have access to the Internet, contact your field engineer.1

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**NOTE** In any correspondence or telephone conversation, refer to the product by its model number and full serial number. With this information, the Agilent representative can determine the warranty status of your unit.

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