Specifications for analog and digital models

Frequency

Range

ESG-A series	
E4400B	250 kHz to 1 GHz
E4420B	250 kHz to 2 GHz
E4421B	250 kHz to 3 GHz
E4422B	250 kHz to 4 GHz
ESG-AP series	
E4423B	250 kHz to 1 GHz
E4424B	250 kHz to 2 GHz
E4425B	250 kHz to 3 GHz
E4426B	250 kHz to 4 GHz
ESG-D series	
E4430B	250 kHz to 1 GHz
E4431B	250 kHz to 2 GHz
E4432B	250 kHz to 3 GHz
E4433B	250 kHz to 4 GHz
ESG-DP series	
E4434B	250 kHz to 1 GHz
E4435B	250 kHz to 2 GHz
E4436B	250 kHz to 3 GHz
E4437B	250 kHz to 4 GHz

Underrange 100 kHz

Resolution 0.01 Hz

Accuracy **Same as timebase**

Switching speed (typical)[1]	**ESG-A and ESG-D series**	**ESG-AP and ESG-DP series**
Modulation on		
Analog	<50 ms	<65 ms
Digital	<90 ms	<100 ms
Modulation off	<40 ms	<55 ms

Phase offset Phase is adjustable via GPIB or front panel in nominal 0.1° increments

Frequency bands

Band	**Frequency range**	**N #**
1	250 kHz to ≤249.999 MHz	1
2	>249.999 to ≤500 MHz	0.5
3	>500 MHz to ≤1 GHz	1
4	>1 to ≤2 GHz	2
5	>2 to ≤4 GHz	4

Sweep modes

Operating modes Frequency step, amplitude step and arbitrary list

Dwell time 1 ms to 60 s

Number of points 2 to 401

Internal reference oscillator

Stability

	ESG-A and ESG-D series standard	**ESG-AP and ESG-DP series standard ESG-A and ESG-D series Option 1E5**
Aging rate	<±1 ppm/yr	<±0.1 ppm/yr or <±0.0005 ppm/day after 45 days
Temp. (0 to 55° C)	<±1 ppm, typical	<±0.05 ppm, typical
Line voltage	<±0.1 ppm, typical (+5%, –10%)	<±0.002 ppm, typical (+5%, –10%)

Timebase reference output

Frequency	10 MHz
Amplitude	>0.35 V_{rms} into 50 Ω load

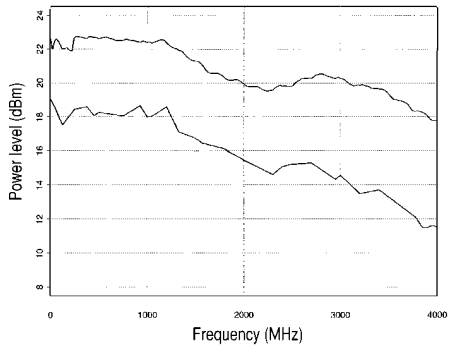
External reference input

Frequency	1, 2, 5, 10 MHz ± typical 10 ppm (typical 1 ppm, ESG-AP and ESG-DP series, ESG-A and ESG-D series Option 1E5)
Amplitude	>0.15 V_{rms}
Input impedance	50 Ω

Output

Power[2]

	Standard	**Option UNB**
250 kHz to 1 GHz	+13 to –136 dBm	+17 to –136 dBm
>1 to 3 GHz	+10 to –136 dBm	+16 to –136 dBm
>3 to 4 GHz	+7 to –136 dBm	+13 to –136 dBm



Typical maximum available power

1. To within 0.1 ppm of final frequency above 250 MHz or within 100 Hz below 250 MHz.
2. With high performance pulse modulation (Option 1E6) installed, all maximum power specifications drop by 4 dB.

Specifications describe the instrument's warranted performance and apply after a 45 minute warm-up. All specifications are valid over the signal generator's entire operating/environmental range while in phase noise mode 2, unless otherwise noted. Supplemental characteristics, denoted typical or nominal, provide additional (nonwarranted) information useful in applying the instrument.

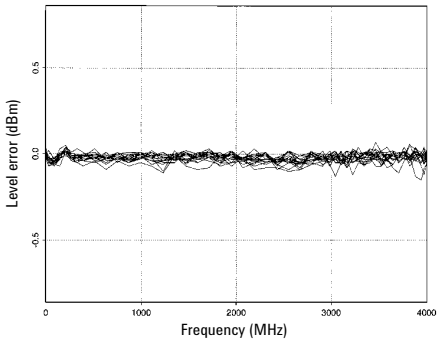
Resolution 0.02 dB

Attenuator hold level range

	Standard	Option UNB
250 kHz to 1 GHz	23 dB	27 dB
>1 to 3 GHz	20 dB	26 dB
>3 to 4 GHz	17 dB	23 dB

Level accuracy (dB)[1]

	Output power		
	+7 to –120 dBm		
Freq range	(+10 to –120 dBm, Option UNB)	–120 to –127 dBm	<–127 dBm
250 kHz to 2 GHz	±0.5	±0.5	±1.5
2 to 3 GHz	±0.9	±0.9	±2.5
3 to 4 GHz	±0.9	±0.9 (±1.5, Option UNB)	±2.5



Typical level accuracy

Amplitude switching speed

Without power search	<30 ms, typical
When using power search	<300 ms, typical

Reverse power protection[2]

250 kHz to 2 GHz	50 watts
>2000 to 4 GHz	25 watts
Max DC voltage	50 V

SWR (typical)

	Standard	Option UNB
250 kHz to 2 GHz	<1.4:1	<1.25:1
>2 to 4 GHz	<1.9:1	<1.35:1

Output impedance 50 Ω

Spectral purity

SSB phase noise[3] (at 20 kHz offset)

	ESG-A and ESG-D Series	ESG-AP and ESG-DP Series
at 500 MHz	(<–120 dBc/Hz)	<–134 dBc/Hz, (<–138 dBc/Hz)
at 1 GHz	(<–116 dBc/Hz)	<–130 dBc/Hz, (<–134 dBc/Hz)
at 2 GHz	(<–110 dBc/Hz)	<–123 dBc/Hz, (<–127 dBc/Hz)
at 3 GHz	(<–104 dBc/Hz)	<–120 dBc/Hz, (<–124 dBc/Hz)
at 4 GHz	(<–104 dBc/Hz)	<–118 dBc/Hz, (<–122 dBc/Hz)

Residual FM[4] (CW mode, 0.3 to 3 kHz BW, CCITT, rms)

ESG-AP and ESG-DP series

<N x 1 Hz (<N x 0.5 Hz, typical)

ESG-A and ESG-D series

Phase noise mode 1	<N x 2 Hz
Phase noise mode 2	<N x 4 Hz

Harmonics

(≤+4 dBm (≤+7.5 dBm, Option UNB) output level) <–30 dBc

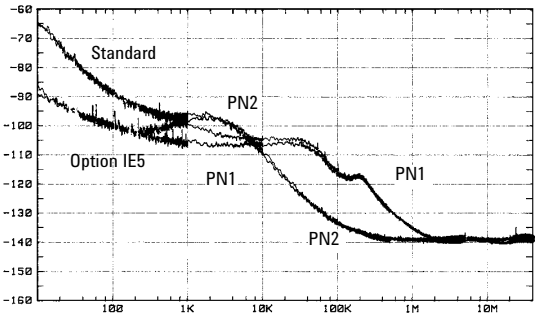
Nonharmonics

(<+7 dBm (<+10 dBm, Option UNB) output level)[5]

	ESG-A and ESG-D series[6]		ESG-AP and ESG-DP series[7]	
	>3 kHz offset	>10 kHz offset[3]	>3 kHz offset	>10 kHz offset[3]
250 kHz to 250 MHz	<–65 dBc	(<–75 dBc)	<–65 dBc	(<–75 dBc)
250 MHz to 500 MHz	<–65 dBc	(<–75 dBc)	<–80 dBc	<–80 dBc
500 MHz to 1 GHz	<–65 dBc	(<–75 dBc)	<–80 dBc	<–80 dBc
1 to 2 GHz	<–59 dBc	(<–69 dBc)	<–74 dBc	<–74 dBc
>2 GHz	<–53 dBc	(<–63 dBc)	<–68 dBc	<–68 dBc

Subharmonics

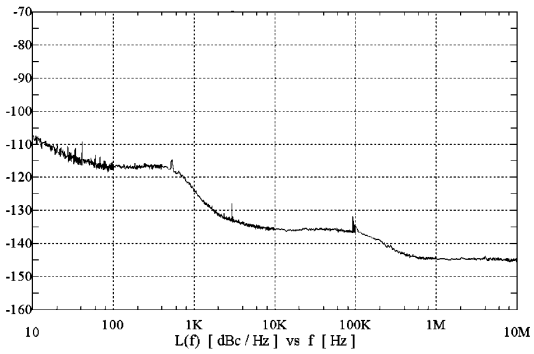
	ESG-A and ESG-D series	ESG-AP and ESG-DP series
≤1 GHz	None	None
>1 GHz	<–40 dBc	None



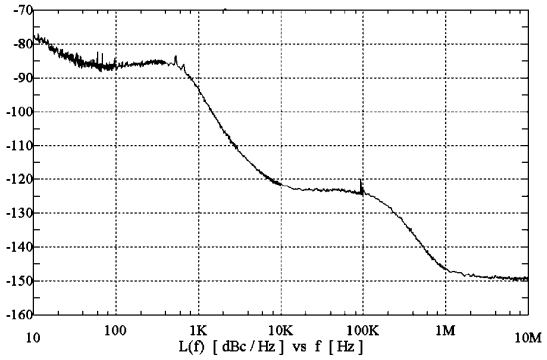
Characteristic ESG-A and ESG-D series SSB phase noise at 1 GHz (phase noise modes 1 and 2)

1. For 23 °C ±5 °C. Accuracy degrades by 0.02 dB/°C over the full temperature range and by 0.3 dB above +7 dBm (degraded by 0.5 dB above +10 dBm with Option UNB). Level accuracy specification maintained only with return to calibration.
2. The reverse power protection circuitry triggers at nominally 1 watt.
3. Parentheses denote typical performance.
4. Refer to frequency bands on page 4 to compute specifications.
5. Performance is typical for spurs at frequencies above the maximum operating frequency of the instrument. Performance typically is –60 dBc between 225 and 249.999 MHz.
6. Specifications apply for FM deviations <100 kHz and are not valid for FM.
   For non-constant amplitude digital formats, unspecified spur levels occur up to the second harmonic of the baseband rates.
7. Specifications apply for CW mode only.

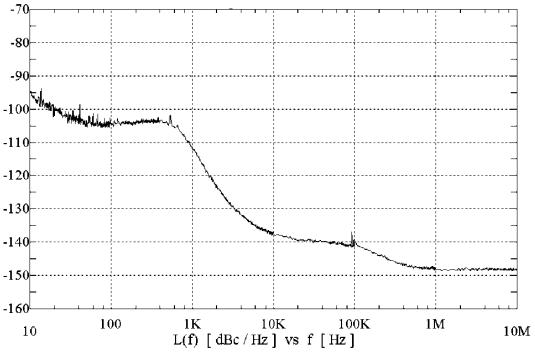
Characteristic SSB phase noise for ESG-AP and ESG-DP series



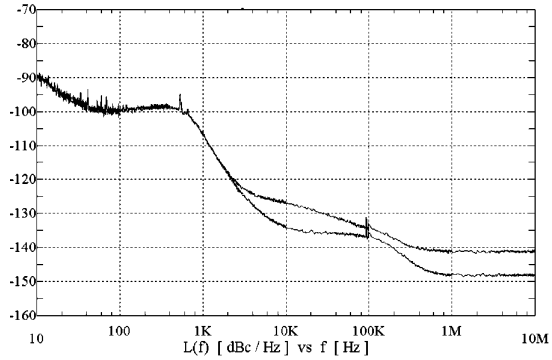
fc = 100 MHz (CW, standard instrument)



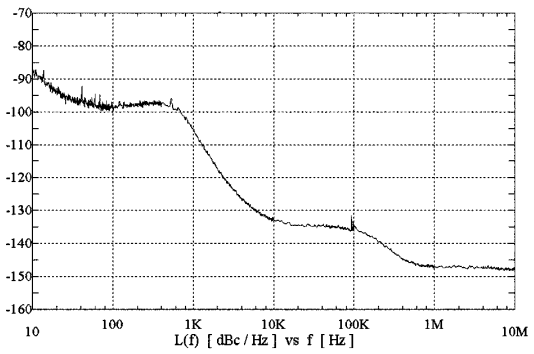
fc = 4 GHz (CW, standard instrument)



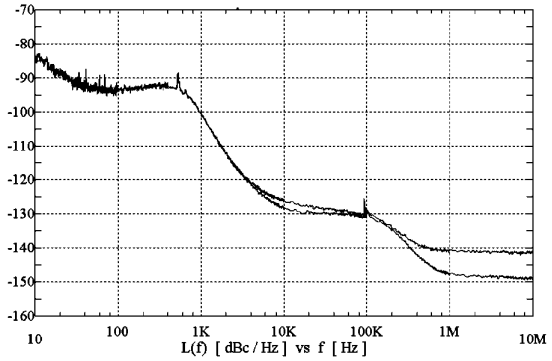
fc = 500 MHz (CW, standard instrument)



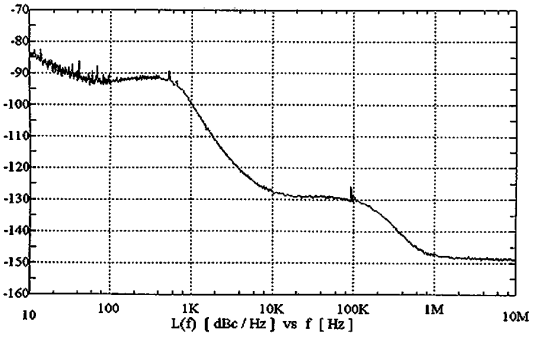
fc = 900 MHz (CW and I/Q modulation on)



fc = 1 GHz (CW, standard instrument)



fc = 1.8 GHz (CW and I/Q modulation on)



fc = 2 GHz (CW, standard instrument)

Frequency modulation

Maximum deviation

ESG-A and ESG-D series	ESG-AP and ESG-DP series
N x 10 MHz	N x 1 MHz

Resolution 0.1% of deviation or 1 Hz, whichever is greater

Modulation frequency response (deviation = 100 kHz)[1]

Rates	1 dB bandwidth	3 dB bandwidth, typical
FM1	dc/20 Hz to 100 kHz	dc/5 Hz to 10 MHz
FM2	dc/20 Hz to 100 kHz	dc/5 Hz to 1 MHz

Deviation accuracy[2] <±(3.5% of FM deviation + 20 Hz)
(1 kHz rate, deviation < N x 100 kHz)

Carrier frequency accuracy relative to CW in dcFM[2,3]
±0.1% of set deviation + (N x 1 Hz)

Distortion[2] <1%
(1 kHz rate, THD, dev.= N x 100 kHz)

External inputs Ext 1 or Ext 2

Sensitivity 1 V_{peak} for indicated deviation

Input impedance 50 Ω, nominal

Paths FM 1 and FM 2 are summed internally for composite modulation. Either path may be switched to any one of the modulation sources: Int, Ext 1, Ext 2. The FM 2 path is limited to a maximum rate of 1 MHz. The FM 2 path must be set to a deviation less than FM 1.

Phase modulation

Maximum deviation[2]

	ESG-A and ESG-D series	ESG-AP and ESG-DP series
Normal BW	N x 90 radians	N x 10 radians
High BW	N x 2π radians	N x 1 radian

Resolution 0.1% of set deviation

Modulation frequency response[2]
ESG-A and ESG-D series

Mode	Maximum deviation	Rates (3 dB BW) ΦM1	ΦM2
Normal BW	N x 90 rad	dc to 100 kHz	dc to 100 kHz
High BW	N x 2π rad	dc to 1.5 MHz (typ)	dc to 0.9 MHz (typ)
	N x π/2 rad	dc to 6 MHz (typ)	dc to 1 MHz (typ)

ESG-AP and ESG-DP series

Mode	Maximum deviation	Rates (3 dB BW) ΦM1	ΦM2
Normal BW	N x 10 rad	dc to 100 kHz	dc to 100 kHz
High BW	N x 1 rad	dc to 1 MHz (typ)	dc to 1 MHz (typ)

Deviation accuracy <±(5% of deviation + 0.01 radians)
(1 kHz rate, Normal BW mode)

Distortion[2] <1%
1 kHz rate, THD, dev <N x 90 rad (dev < N x 10 rad for ESG-AP and ESG-DP series), Normal BW mode

External inputs Ext 1 or Ext 2

Sensitivity 1 V_{peak} for indicated deviation

Input impedance 50 Ω, nominal

Paths ΦM 1 and ΦM 2 are summed internally for composite modulation. Either path may be switched to any one of the modulation sources: Int, Ext 1, Ext 2. The ΦM 2 path is limited to a maximum rate of 1 MHz. The ΦM 2 path must be set to a deviation less than ΦM 1.

1. Since the internal modulation source operates over 0.1 Hz to 50 kHz, FM rates above 50 kHz must be supplied externally.
2. Refer to frequency bands on page 4 to compute specifications.
3. At the calibrated deviation and carrier frequency, within 5 °C of ambient temperature at time of calibration.

Amplitude modulation[1] (fc > 500 kHz)

Range (envelope peak ≤ maximum specified power)	0 to 100%
Resolution	0.1%
Rates (3 dB bandwidth)	dc/10 Hz to 10 kHz
Accuracy (1 kHz rate)	< ± (6% of setting + 1%)
Distortion (1 kHz rate, THD)	
30% AM	<1.5%
90% AM	<4%, typical
External inputs	Ext 1 or Ext 2
Sensitivity	1 V_{peak} for indicated depth
Input impedance	50 Ω, nominal

Paths AM 1 and AM 2 are summed internally for composite modulation. Either path may be switched to any one of the modulation sources: Int, Ext 1, Ext 2.

Wideband AM (ESG-DP and ESG-D series only)

Rate (1 dB bandwidth, typical)	
ALC On	400 Hz to 10 MHz
ALC Off	dc to 10 MHz
External input	I input
Sensitivity	0.5 V = 100%
Input impedance	50 Ω, nominal

Pulse modulation

On/off ratio	
≤3 GHz	>80 dB
>3 GHz	>60 dB
Rise/fall times	150 ns, typical
Minimum width	
ALC On	2 µs, typical
ALC Off	0.4 µs, typical
Pulse repetition frequency	
ALC On	10 Hz to 250 kHz, typical
ALC Off	dc to 1.0 MHz, typical
Level accuracy	<±0.5 dB, typical (relative to CW)[2]
External input	Ext 2
Input voltage	
RF on	>+0.5 V, nominal
RF off	<+0.5 V, nominal
Input impedance	50 Ω, nominal
Internal pulse generator	
Square wave rate	0.1 Hz to 50 kHz
Pulse	
Period	16 µs to 30 sec
Width	8 µs to 30 sec
Resolution	4 µs

High-performance pulse modulation (Option 1E6, ESG-AP and ESG-A series) [3]

On/off ratio	
≤2 GHz	>80 dB
>2 GHz	>70 dB
Rise/fall times	<10 ns
Delay	<60 ns, typical
External input	Pulse in
Input voltage	+5 V (with RF on, TTL compatible)
Input impedance	

1. AM is typical above 3 GHz or if wideband AM or I/Q modulation is simultaneously enabled.
2. With ALC off, specifications apply after the execution of power search. With ALC on, specifications apply for pulse repetition rates ≤10 kHz and pulse widths ≥5µs.
3. With high performance pulse modulation (Option 1E6) installed, all maximum power specifications drop by 4 dB.

Internal modulation source

(Provides FM, ΦM, and AM modulation signals and LF out)

Waveforms	sine, square, ramp, triangle, pulse, noise

Rate range

Sine	0.1 Hz to 50 kHz
Square, ramp, triangle	0.1 Hz to 10 kHz

Resolution	0.1 Hz
Pulse only	4 µs

Frequency accuracy	0.005%, typical

Swept sine mode (frequency, phase continuous)

Operating modes	Triggered or continuous sweeps
Frequency range	0.1 Hz to 50 kHz
Sweep time	1 ms to 65 sec
Resolution	1 ms

Dual sinewave mode

Frequency range	0.1 Hz to 50 kHz
Amplitude ratio	0 to 100%
Amplitude ratio resolution	0.1%

LF out (internal modulation source)

Amplitude	0 to 3 V_{peak} into 50 Ω
Output impedance	<1 Ω

External modulation inputs

Modulation types

Ext 1	FM, ΦM, AM, and burst envelope
Ext 2	FM, ΦM, AM, and pulse

High/Low Indicator (100 Hz to 10 MHz BW, AC coupled inputs only) Activated when input level error exceeds 3% (nominal)

Simultaneous modulation

All modulation types may be simultaneously enabled, except: FM with FM; AM with burst envelope; Wideband AM with I/Q. AM, FM, and FM can sum simultaneous inputs from any two sources (INT, EXT 1, and EXT 2.) Any given source (INT, EXT 1, or EXT 2) may only be routed to one activated modulation type.

Specifications for digital models only

Level accuracy with digital modulation (ESG-DP and ESG-D series only)

With ALC On; relative to CW; with PRBS modulated data; if using I/Q inputs, $\sqrt{I^2 + Q^2} = 0.5\ V_{rms}$, nominal)[1]

π/4 DQPSK or QPSK formats

ESG-D series	ESG-DP series
±0.15 dB	±0.20 dB

(Relative to CW; with raised cosine or root-raised cosine filter and $\alpha \geq 0.35$; with 10 kHz ≤ symbol rate ≤1 MHz; at RF freq ≥25 MHz; power ≤ max specified –3 dB or –6 dB with Option UNB)

Constant amplitude formats (FSK, GMSK, etc)

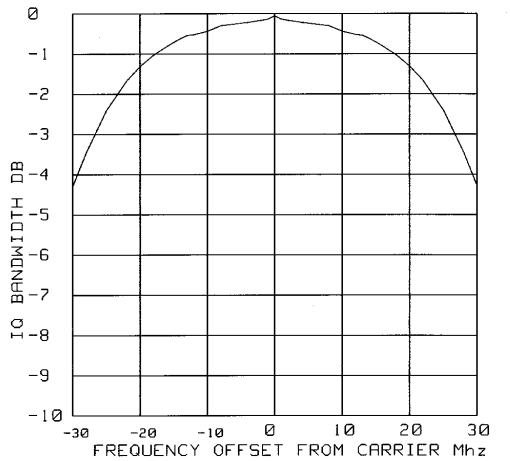
ESG-D series	ESG-DP series
No degradation	±0.10 dB

Level accuracy with ALC off[2] ±0.3 dB, typical
(After power search is executed; relative to CW level accuracy with ALC on; with burst off; if external I/Q is enabled $\sqrt{I^2 + Q^2} = 0.5\ V_{rms}$)

I/Q modulation (ESG-DP and ESG-D series only)

I/Q inputs

Input impedance	50 Ω
Full scale input[1]	$\sqrt{I^2 + Q^2} = 0.5\ V_{rms}$



Typical I/Q frequency response

Adjustments/Impairments (nominal)

DC offset (I and Q independently adjustable)	±100%
I/Q gain ratio	±4 dB
I/Q quadrature	±10° (for fc ≤ 3.3 GHz)

DC vector accuracy[3]
(Relative to full scale, power ≤ +7 dBm (≤+10 dBm, Option UNB))

Frequency (GHz)	<0.6	0.6 to 2	2 to 3.7	≤ 4
Static EVM[4] (rms)	<0.75%	<0.5%	0.75%	<1%
Mag. error[4] (rms)	<0.5%	<0.35%	<0.5%	<0.75%
Phase error[4] (rms)	<0.35°	<0.25°	<0.35°	<0.5°
Origin offset (dBc)	<–46	<–46	<–40	<–40

External burst envelope (ESG-DP and ESG-D series only)

Input voltage

RF On	0 V
RF Off	–1.0 V
Linear control range	0 to –1 V

On/off ratio

≤3 GHz	>75 dB
>3 GHz	>60 dB
V_{in}	≤–1.05 V

Rise/fall time <2 µs with rectangular input, typical

Minimum burst repetition frequency

ALC on	10 Hz, typical
ALC off	dc

External input Ext 1

Input impedance 50 Ω, nominal

Coherent carrier out[5] *(ESG-DP and ESG-D series only)*

Range 250 MHz to maximum carrier frequency

Level 0 dBm ±5 dB, typical

Impedance 50 Ω

1. The optimum I/Q input level is $\sqrt{I^2+Q^2} = 0.5\ V_{rms}$, I/Q drive level affects EVM, origin offset, spectral regrowth, and noise floor. Typically, level accuracy with ALC on will be maintained with drive levels between 0.25 and 1.0 V_{rms}.
2. When applying external I/Q signals with ALC off, output level will vary directly with I/Q input level. Power search is an internal calibration routine used to set output power when ALC is off. The routine disables all modulation inputs, adjusts output power while applying 0.5 V_{rms} to the I/Q modulathen enables modulation.
3. Valid for 10 days after executing internal calibration routine, provided temperature is maintained within ±5 °C of calibration temperature.
4. Measured at full scale with origin offset removed.
5. Coherent carrier is modulated by FM or ΦM when enabled.

I/Q baseband generator

(Option UN8, ESG-DP and ESG-D series only)

Modulation

PSK	BPSK, QPSK, OQPSK, π/4DQPSK, 8PSK, 16PSK, D8PSK
MSK	User-defined phase offset from 0 to 100°
QAM	4, 16, 32, 64, 256
FSK	Selectable: 2, 4, 8, 16 level symmetric
Custom:	Custom map of up to 16 deviation levels
Deviation:	Modulation index ≤1, ≤1.5 Msym/sec Modulation index ≤0.5, ≤2.0 Msym/sec
Resolution:	0.1 Hz
I/Q:	Custom map of 16 unique values for I and Q

Filter

Selectable	Nyquist, root Nyquist, Gaussian, rectangular α: 0 to 1, B_bT: 0.1 to 1
Custom FIR	256 coefficients, 16-bit resolution, 16 symbols long, automatically scaled

Symbol rate

For external data or internal PN sequences in pattern mode, symbol rate is adjustable from 200 symbols/sec to maximum listed in table.

Bits/symbol	Maximum symbol rate (Msym/sec)	Maximum data rate (Mbits/sec)
1	12.5	12.5
2	12.5	25
3	8.33	25
4	12.5	50
5	10	50
6	8.33	50
7	7.14	50
8	6.25	50

For all other data types and data structures the maximum bit rate is 5 Mbits/sec.

TDMA data structure

Frames and timeslots may be configured as different types of traffic or control channels. The data field of a timeslot can accept a user file, PRBS (PN9 or PN15), or external data. Maximum bit rate is 5 Mbits/sec.

Reference frequency

Internal or external 1, 2, 5, 10 MHz reference
Data clock can be locked to an external 13 MHz (GSM) reference

Frame trigger delay control

Range	0 to 65,535 bits
Resolution	1 bit

Data types

Internally generated data	
Pseudo-random patterns	(meets ITU-T standard) Continuous PN9 (PRBS 2^9 –1) PN11 (PRBS 2^{11} –1), PN15[1] (PRBS 2^{15} –1), PN20 (PRBS 2^{20} –1), PN23 (PRBS 2^{23} –1).
Repeating sequence	Any 4-bit sequence
Downloadable data	
Maximum bit rate	5 Mbits/sec
Direct-pattern RAM (PRAM)	
Max size	1 Mbytes (standard) 8 Mbytes (Option UN9)
Use	Nonstandard framing
User file	
Max size	128 kbytes
Use	Continuous modulation or internally generated TDMA standard
Externally generated data	
Type	Serial data
Inputs	Data, bit/symbol clocks Accepts data rates ±5% of specified data rate

Internal burst shape control

Varies with standards and bit rates

Rise/fall time range	Up to 30 bits
Rise/fall delay range	0 to 63.5 bits

I/Q outputs

(Baseband I/Q outputs can be scaled from 0 to 1 $V_{peak\text{-}to\ peak}$ into 50 Ω)[2]

Standard	Default scaling	Maximum V (rms)
NADC, PHS, PDC	100	0.25
TETRA	65	0.25
GSM, DECT	N/A	0.35

EVM (NADC, PDC, PHS, TETRA)[3]	1% rms
Global phase error (GSM)[3]	0.75° rms
Deviation accuracy (DECT)[3]	1 kHz rms

I/Q outputs

(Baseband I/Q outputs can be scaled from 0 to 1 $V_{peak\text{-}to\ peak}$ into 50 Ω)[4]

Custom format[5]	Default scaling	Maximum V (rms)
FSK, MSK	NA	0.35
QPSK, BPSK	70	0.32
8PSK, 16PSK, D8PSK	70	0.20
π/4DQPSK	70	0.25
QAM	70	>0.10

1. PN15 is not continuous in bursted mode when TETRA is operated in a downlink mode.
2. Baseband I/Q ouputs cannot be scaled for GSM and DECT.
3. Specifications apply for the frequency range, symbol rates, root Nyquist filter, filter factors, and default scaling factor specified for each standard.
4. Baseband I/Q outputs cannot be scaled for FSK and MSK.
5. Filter factor (a or BbT) is set to 0.5.

I/Q baseband generator (continued)

Digital communications standards

	NADC		PDC		PHS		TETRA		DECT	GSM (DCS, PCS)	
Error vector magnitude[1] (% rms)	Continuous	Burst	Continuous	Burst	Continuous	Burst	Continuous	Burst	N/A	N/A	
Low EVM mode	0.7	1.4	0.9	1.3	0.9	0.9	0.8	1.7			
Low EVM mode (typical)	0.4	1.1	0.6	0.9	0.6	0.7	0.5	1.3			
Low ACP mode (typical)	1.0	1.4	0.8	1.0	0.9	0.9	0.9	1.5			
Global phase error[1] (rms/pk)	N/A		N/A		N/A		N/A		N/A	0.6°/2.2° 0.3°/1.3° (typ)	
Deviation accuracy[1] (kHz)	N/A		N/A		N/A		N/A		3 (2, typ)	N/A	
Channel spacing (kHz)	30		25		300		25		1,728	200	
Adjacent channel power[1] (ACP)	Continuous	Burst	Continuous	Burst	Continuous	Burst	Continuous	Burst[2]	N/A	Continuous	Burst
(Low ACP Mode, dBc, typical)											
at adjacent channel[3]	–35	–34	–	–	–	–	–69[4]	–64		–37	–37
at 1st alternate channel[3]	–80	–78	–74	–72	–80	–78	–80	–78		–72	–71
at 2nd alternate channel[3]	–82	–81	–	–	–80	–79	–81	–80		–82	–80
at 3rd alternate channel[3]	–84	–83	–81	–79	–	–	–81	–80		–82	–81
Supported burst types	Custom, up/down TCH		Custom, up/down TCH, up Vox		Custom, TCH, sync		Custom, up control 1 & 2 up normal, down normal, down sync		Custom, dummy B 1 & 2, traffic B, low capacity	Custom, normal, FCorr, sync, dummy, access	
Scramble capabilities					Yes		Yes				

1. Specifications apply for the symbol rates, root raised cosine filter, filter factors (a or BbT) and default scaling factor specified for each standard, and at power levels ≤+7 dBm (≤+10 dBm, Option UNB).
2. ACP for TETRA is measured over a 25 kHz bandwidth, with an 18 kHz root raised cosine filter applied at power levels ≤+4 dBm (≤+8 dBm, Option UNB).
3. The "channel spacing" determines the offset size of the adjacent and alternate channels: Adjacent channel offset = 1 x channel spacing, 1st alternate channel= 2 x channel spacing, 2nd alternate channel = 3 x channel spacing, etc.
4. TETRA ACP performance is typically <-72 dBc with Option H99 in continuous modulation mode.