

**SPECIFICATIONS**

**1-10.**

Table 1-1 lists specifications for Model 6080A. Table 1-2 lists specifications for Model 6082A. Specifications are valid after a warm-up period of 20 minutes. Specifications remain valid after two years only if the Signal Generator is calibrated at that time as described in the service manual, and every two years or more frequently thereafter. In the Specification tables, dBc refers to decibels relative to the amplitude of the carrier.

Table 1-1. Specifications for Model 6080A

FREQUENCY				
<p><b>Range:</b> 10 kHz to 1056 MHz. (Also see Internal Modulation Oscillator for coverage from 0.1 Hz to 200 kHz.)</p> <p><b>Frequency Bands:</b> The carrier frequency band endpoints are shown below.</p>				
BAND DESIGNATION	APPROXIMATE CARRIER FREQUENCY BAND (MHz)	SPECIFIC CARRIER FREQUENCY BAND (MHz)		
A	0.01 to 15	0.01 to 14.999,999		
B	15 to 32	15 to 31.999,999		
C	32 to 64	32 to 63.999,999		
D	64 to 128	64 to 127.999,999		
E	128 to 256	128 to 255.999,999		
F	256 to 512	256 to 511.999,999		
G	512 to 1056	512 to 1056		
<p><b>Resolution:</b> 1 Hz</p> <p><b>Display Resolution:</b> 10 digits</p> <p><b>Stability:</b> Same as Internal Reference Oscillator</p>				
<p><b>10 MHz INTERNAL REFERENCE OSCILLATOR</b></p> <p><b>Type:</b> Temperature Compensated Crystal Oscillator (TCXO)</p> <p><b>Temperature Stability:</b> Less than <math>\pm 1</math> ppm p-p over the range 0 to <math>+50^{\circ}\text{C}</math></p> <p><b>Typical Aging Rate:</b> Less than <math>\pm 1</math> ppm/yr</p> <p><b>Reference Output:</b> 10 MHz, <math>&gt;0</math> dBm for <math>50\Omega</math> load, available at the rear panel REF OUT connector.</p>				
<p><b>PROVISION FOR EXTERNAL REFERENCE</b></p> <p>The rear panel REF IN connector accepts an external source of 10 MHz <math>\pm 10</math> ppm sine wave, 0.2 to 2.0V rms for a <math>50\Omega</math> load. One alternate external reference frequency setting of 1, 2, or 5 MHz is available at a time, through Special Function 761 or a remote command. The default alternate reference frequency is 5 MHz. See the Service Manual for setting internal DIP switches for use with a 1 or 2 MHz external reference.</p>				
<p><b>AMPLITUDE</b></p> <p><b>Range:</b> <math>+19</math> to <math>-140</math> dBm for RF output frequency <math>&lt;512</math> MHz.  <math>+17</math> to <math>-140</math> dBm for RF output frequency <math>&gt;512</math> MHz.</p> <p><b>Resolution:</b> 0.1 dB (0.1% or 1 nV in volts). Annunciators for dB, dBm, V, mV, <math>\mu\text{V}</math>, dBf, <math>\text{dB}\mu\text{V}</math>, <math>\text{dBmV}</math>, and EMF</p> <p><b>Display Resolution:</b> 3 1/2 digits</p> <p><b>Accuracy (0 to <math>50^{\circ}\text{C}</math>):</b></p>				
FREQUENCY (MHz)	AMPLITUDE IN dBm			
	+19	+17	-127	-140
0.01 to 0.1	$\leftarrow \pm 3$ dB $\rightarrow$			
0.1 to 0.4	$\leftarrow \pm 2$ dB $\rightarrow$   * $\leftarrow \pm 3$ dB $\rightarrow$			
0.4 to 512	$\leftarrow \pm 1$ dB $\rightarrow$   * $\leftarrow \pm 3$ dB $\rightarrow$			
512 to 1056	$\leftarrow \pm 1$ dB $\rightarrow$   * $\leftarrow \pm 3$ dB $\rightarrow$			

**INTRODUCTION AND SPECIFICATIONS**

**Table 1-1. Specifications for Model 6080A (cont.)**

<p><b>Source SWR:</b> &lt;1.5:1 below +6 dBm &lt;2.0:1 above +6 dBm</p> <p><b>Flatness (0 to 50°C):</b> ±0.75 dB at +10 dBm, for frequencies &gt;0.1 MHz</p> <p><b>Intermodulation Distortion (Amplitude of +4 dBm, CW only):</b></p>			
FREQUENCY (MHz)	SPACING		
	1 kHz	25 kHz	
0.01 to 128 MHz	-60 dBc	-75 dBc	
128 to 512 MHz	-65 dBc	-75 dBc	
512 to 1056 MHz	-65 dBc	-70 dBc	
<p><b>SPECTRAL PURITY (CW ONLY)</b></p> <p><b>Spurious Signals:</b> &lt;-100 dBc for offsets greater than 10 kHz. Fixed-frequency spurious signals are &lt;-100 dBc or &lt;-140 dBm, whichever is greater.</p> <p><b>Harmonics:</b> &lt;-30 dBc for amplitudes less than +13 dBm.</p> <p><b>Subharmonics:</b> None.</p> <p><b>Power Line Spurious Signals (offsets less than 10 kHz):</b> &lt;-56 dBc</p> <p><b>Residual FM: (NOTE 1)</b></p>			
FREQUENCY BAND (MHz)	RESIDUAL FM		
	0.3 to 3 kHz	50 Hz to 15 kHz	
0.01 to 15	0.2	0.4	
15 to 32	0.2	0.4	
32 to 64	0.2	0.4	
64 to 128	0.2	0.4	
128 to 256	0.4	0.5	
256 to 512	0.7	1.0	
512 to 1056	1.5	2.0	
<p><b>SSB Phase Noise: (NOTE 1)</b></p>			
CARRIER FREQUENCY BAND (MHz)	OFFSET FREQUENCY		
	1 kHz (dBc/Hz)	20 kHz (dBc/Hz)	100 kHz (dBc/Hz)
0.01 to 15	-112	-138	-138
15 to 32	-124	-145	-146
32 to 64	-118	-144	-146
64 to 128	-112	-144	-145
128 to 256	-106	-141	-144
256 to 512	-100	-136	-142
512 to 1056	-94	-131	-138
<p><b>Residual AM (50 Hz to 15 kHz Band):</b> &lt; .01% (-80 dBc)</p>			
<p><b>NOTE 1:</b> Allowable operating modes CW, AM, FM (peak dev. &lt;1.5% of max in operating band), ØM (same comment as FM), Pulse.</p>			



INTRODUCTION AND SPECIFICATIONS

Table 1-1. Specifications for Model 6080A (cont.)

FM 3-dB Bandwidth:		
DEVIATION	COUPLING	
	INTERNAL AC	EXTERNAL AC (DC)
0% to 25% Maximum	20 Hz to 175 kHz	20 Hz (dc) to 175 kHz
25% to 100% Maximum	20 Hz to 100 kHz	20 Hz (dc) to 100 kHz
<p><b>Incidental AM:</b> &lt;1% depth for peak deviation &lt;100 kHz at 1-kHz rate and carrier frequency &gt;0.5 MHz  <b>DC-Coupled FM Center Frequency Error, at 1 GHz, after dcFM internal cal, and without any FM range changes:</b> &lt;(.1% of dev + 500 Hz)  <b>Low-Rate External AC-Coupled FM (Special Function 711):</b></p>		
FREQUENCY BAND (MHz)	MAX DEV, IN kHz (AT 10 Hz RATE)	
	SINE WAVE	SQUARE WAVE
0.01 to 15	80	40
15 to 32	20	10
32 to 64	40	20
64 to 128	80	40
128 to 256	160	80
256 to 512	320	160
512 to 1056	640	320
<p><b>Droop:</b> &lt;30% on a 5 Hz square wave  <b>3-dB Bandwidth:</b> 0.5 Hz to 100 kHz (typical)  <b>Maximum DC Input:</b> ±10 mV  <b>Incidental AM:</b> &lt;1% AM at 1 kHz rate and &lt;10 kHz deviation</p>		
<p><b>PHASE MODULATION (NOTE 4)</b>  <b>Display Ranges:</b> 0 to .999 radians, 1 to 9.99 radians, 10 to 99.9 radians, 100 to 400 radians  <b>Display Resolution:</b> 3 digits</p>		
<p><b>Maximum Deviation:</b></p>		
FREQUENCY BAND (MHz)	MAXIMUM DEVIATION (RADIAN)	
0.01 to 15	50	
15 to 32	12.5	
32 to 64	25	
64 to 128	50	
128 to 256	100	
256 to 512	200	
512 to 1056	400	
<p><b>NOTE 4:</b> Phase modulation specifications are valid where (RF frequency - mod frequency) &gt;150 kHz</p>		

Table 1-1. Specifications for Model 6080A (cont.)

High-Rate Phase Modulation Maximum Deviation (Special Function 721):	
FREQUENCY BAND (MHz)	MAXIMUM DEVIATION (RADIAN)
0.01 to 15	5
15 to 32	1.25
32 to 64	2.5
64 to 128	5
128 to 256	10
256 to 512	20
512 to 1056	40

**Accuracy:**  $\pm(5\%$  of setting + 0.1 radian) at 1-kHz rate  
**Distortion (NOTE 5):** <2% THD from maximum deviation to 1/2 max deviation, and <1% THD at 1/2 maximum deviation or less at 1-kHz rate.  
**3-dB Bandwidth:** AC-coupled phase modulation, 20 Hz to 15 kHz  
DC-coupled phase modulation, dc to 15 kHz  
**High-Rate Phase Modulation 3-dB Bandwidth (Special Function 721):**  
AC-coupled phase modulation, 20 Hz to 100 kHz  
DC-coupled phase modulation, dc to 100 kHz  
**Incidental AM (valid for output frequency >500 kHz):** 1% AM at 1-kHz rate for peak deviation <10 radians.

**PULSE MODULATION (For RF Output Frequencies >10 MHz)**  
**On/Off Ratio:** 40 dB minimum for frequencies from 100 to 1056 MHz  
60 dB minimum for frequencies <100 MHz  
**Rise and Fall Times:** <15 ns, 10% to 90%  
**Level Error:** For pulse widths >50 ns, the power in the pulse is within  $\pm 0.7$  dB of the measured CW level.  
**Duty Cycle (External Modulation):** 0 to 100%  
**Repetition Rate (External Modulation):** DC to 10 MHz  
**Internal Modulation:** Internal rates and widths  
**External Modulation:** The pulse input is TTL compatible, terminated in 50 $\Omega$  with internal active pull-up. It can be modeled as 1.2V in series with 50 $\Omega$  at the pulse mod input connector. The instrument senses input terminal voltage and turns the RF OUTPUT off when the terminal voltage drops below  $1\pm 0.1$ V. The maximum allowable input is  $\pm 10$ V.

**PULSE MODULATION (For RF Output Frequencies <10 MHz)**  
**Rise and Fall Times:** <2 times the period of the RF output frequency  
**Level Error:** For pulse widths >10 times the period of the RF output frequency, the power in the pulse is within  $\pm 0.7$  dB of the measured CW level.  
Other pulse specifications are the same as for the >10 MHz frequency range.

**NONVOLATILE INSTRUMENT STATE MEMORY**  
50 instrument states are retained for typically 2 years, even with ac line power disconnected.

**REVERSE-POWER PROTECTION**  
**Protection Level:** Up to 50 watts from a 50 $\Omega$  source; up to 50V dc. RF OUTPUT is ac coupled. Protection is provided when the signal generator is turned off.

**NOTE 5:** Valid for rates from 50 Hz to 50 kHz in high-bandwidth mode. Does not include effects of residual phase noise.

Table 1-1. Specifications for Model 6080A (cont.)

**Trip/Reset:** A flashing RF OFF annunciator indicates a tripped condition. Pressing RF ON/OFF button resets the signal generator.

**IEEE-488 REMOTE CONTROL**

**Extent of Remote Control:** All controls except the POWER, REF/INT EXT, and CAL/COMP switches are remotely programmable via the IEEE-488 Interface (Std. 488.2-1987). All status including the option complement are available remotely.

**Interface Functions Supported:** SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP0, DC1, DT1, C0, and E2.

**INTERNAL MODULATION SOURCE (Sine Wave)**

**Rates:** 0.1 Hz to 200 kHz, key-selectable 400/1000 Hz

**Display Ranges:** 00.1 to 99.9 Hz

100 to 999 Hz

1.00 to 9.99 kHz

10.0 to 99.9 kHz

100 to 200 kHz

**Frequency Resolution:** 0.1 Hz or 3 digits

**Frequency Accuracy:** Same as reference oscillator  $\pm 7$  millihertz

**Output Level Range:** 0 to 4V pk into 600 $\Omega$

**Output Level Resolution:** 1 mV pk or 3 digits, whichever is greater.

**Distortion:** <0.15% THD for output levels >0.2V pk and modulation frequency <20 kHz.

**Output Level Accuracy:**  $\pm(4\% + 15 \text{ mV})$  for modulation frequency <100 kHz.

**Output Impedance:** 600 $\Omega \pm 2\%$

**Other Waveforms Available by Special Function:**

- Square Wave (Special Function 752)
- Triangle Wave (Special Function 751)
- Pulse (Special Functions 758,759), width 100 ns to 1/Fmod in 100 ns or 3-digit increments, whichever is greater. Rate and width are coherent with signal generator time base.

**EXTERNAL MODULATION**

1V pk provides indicated modulation index. Nominal input impedance is 600 $\Omega$ . Maximum level is  $\pm 5V$  pk.

**MODULATION MODES**

Any combination of AM, PULSE, and FM or  $\emptyset$ M, internal or external, may be used.

**DIGITAL FREQUENCY SWEEP**

**Sweep Modes:** Auto, single, or manual

**Adjustable Parameters:** Sweep symmetry, sweep speed, sweep width, and sweep increment.

**Sweep Speed:** Minimum 40 ms/increment selectable as (minimum + dwell time) where dwell time can be 0, 20, 50, 100, 200, 500 ms, or 1, 2, 5, or 10s at each increment.

**DIGITAL AMPLITUDE SWEEP**

**Sweep Type:** Linear (volts) or logarithmic (dB)

**Sweep Modes:** Auto, single, or manual.

**ADJUSTABLE PARAMETERS:** Sweep symmetry, sweep speed, sweep width, and sweep increment.

**Sweep Speed:** Minimum 30 ms/increment selectable as (minimum + dwell time) where dwell time can be 0, 20, 50, 100, 200, 500 ms, or 1, 2, 5, or 10s at each increment.

**SWEEP OUTPUT (AUX Connector Pin 5)**

0 to +10V  $\pm 10\%$ , up to 4096 points in a stepped ramp, load >2 k $\Omega$ .

Table 1-1. Specifications for Model 6080A (cont.)

**PEN LIFT OUTPUT (AUX Connector Pin 4)**

TTL level, high during sweep retrace, load  $>2\text{ k}\Omega$ .

**GENERAL SPECIFICATIONS**

**Temperature:** Operating, 0 to  $+50^{\circ}\text{C}$  ( $+32$  to  $+122^{\circ}\text{F}$ ).

Nonoperating,  $-40$  to  $+75^{\circ}\text{C}$  ( $-40$  to  $+167^{\circ}\text{F}$ ).

**Operating Humidity Range:** 95% to  $+30^{\circ}\text{C}$ , 75% to  $+40^{\circ}\text{C}$ , and 45% to  $+50^{\circ}\text{C}$ .

**Operating Altitude:** Up to 10,000 ft.

**Vibration:** Nonoperating, 5 to 15 Hz at 0.06 in, 15 to 25 Hz at 0.04 in, and 25 to 55 Hz at 0.02 in, double amplitude (DA).

**Shock:** Nonoperating, bench handling per MIL T 28800C Class 5, Style E.

**Electromagnetic Compatibility:** The radiated emissions induce  $<0.5\text{ }\mu\text{V}$  (at RF carrier frequency) into a 1-inch diameter, 2-turn loop, 1-inch from any surface as measured into a  $50\Omega$  receiver.

**Complies with Standards:**

- CE03 of MIL-STD-461B (Power and interconnecting leads), 0.015 to 50 MHz.
- RE02 of MIL-STD-461B (14 kHz to 10 GHz).
- FCC Part 15, Class B.
- VDE 0871B
- CISPR 22

Size:	Width	Height	Depth
	43 cm	13.3 cm	59.7 cm
	17 in	5.25 in	23.5 in

**Power Requirements:** 100, 120, 220, or 240V, each  $\pm 10\%$ ; 48-63 Hz; 200 VA,  $<15\text{ VA}$  in standby, with any options installed.

**Weight:** 27 kg (60 lbs).

**OPTION -130 HIGH-STABILITY REFERENCE**

**Aging Rate:**  $\leq 5 \times 10^{-10}$ /day, after 21 days continuous operation.

**Temperature Stability:**  $\leq 2 \times 10^{-10}/^{\circ}\text{C}$ . (Oven remains powered in standby.)

**OPTION -132 MEDIUM-STABILITY REFERENCE**

**Aging Rate:**  $\leq 1 \times 10^{-7}$ /month after 5 days continuous operation.

**Temperature Stability:**  $\leq 1 \times 10^{-7}$  (0 to  $+50^{\circ}\text{C}$ )

**OPTION -830 REAR PANEL CONNECTORS**

Moves connectors for MODULATION INPUT, MOD output, and RF OUTPUT to the rear panel. The front panel connector locations are covered with plugs.

**SUPPLEMENTAL CHARACTERISTICS**

The following characteristics are provided to assist in signal generator applications and to describe some other aspects of typical performance.

**Frequency Switching Speed:**  $<100\text{ ms}$  to settle within 100 Hz

**Amplitude Switching Speed:**  $<100\text{ ms}$  to settle within 0.1 dB

**Pulse Modulation Delay:** 80 ns typical

**Table 1-2. Specifications for Model 6082A**

<b>FREQUENCY</b>				
<p><b>Range:</b> 100 kHz to 2112 MHz. (See Internal Modulation Oscillator for coverage from 0.1 Hz to 200 kHz.)  <b>Frequency Bands:</b> The carrier frequency band endpoints are shown below.</p>				
BAND DESIGNATION	APPROXIMATE CARRIER FREQUENCY BAND (MHz)	SPECIFIC CARRIER FREQUENCY BAND (MHz)		
A	0.1 to 15	0.1 to 14.999,999		
B	15 to 32	15 to 31.999,999		
C	32 to 64	32 to 63.999,999		
D	64 to 128	64 to 127.999,999		
E	128 to 256	128 to 255.999,999		
F	256 to 512	256 to 511.999,999		
G	512 to 1056	512 to 1055.999,999		
H	1056 to 2112	1056 to 2112		
<p><b>Resolution:</b> 1 Hz  <b>Display Resolution:</b> 10 digits  <b>Stability:</b> Same as Internal Reference Oscillator</p>				
<p><b>10 MHz INTERNAL REFERENCE OSCILLATOR</b>  <b>Type:</b> Temperature Compensated Crystal Oscillator (TCXO)  <b>Temperature Stability:</b> Less than <math>\pm 1</math> ppm p-p over the range 0 to <math>+50^{\circ}\text{C}</math>  <b>Typical Aging Rate:</b> Less than <math>\pm 1</math> ppm/yr  <b>Reference Output:</b> 10 MHz, <math>&gt;0</math> dBm for <math>50\Omega</math> load, available at the rear panel REF OUT connector.</p>				
<p><b>PROVISION FOR EXTERNAL REFERENCE</b>                      The rear panel REF IN connector accepts an external source of 10 MHz <math>\pm 10</math> ppm sine wave, 0.2 to 2.0V rms for a <math>50\Omega</math> load. One alternate external reference frequency setting of 1, 2, or 5 MHz is available at a time, through Special Function 761 or a remote command. The default alternate reference frequency is 5 MHz. See the Service Manual for setting internal DIP switches for use with a 1 or 2 MHz external reference.</p>				
<p><b>AMPLITUDE</b>  <b>Range:</b> +16 to -140 dBm for RF output frequency <math>&lt;1056</math> MHz.                      +13 to -140 dBm for RF output frequency <math>&gt;1056</math> MHz.  <b>Resolution:</b> 0.1 dB (0.1% or 1 nV in volts). Annunciators for dB, dBm, V, mV, <math>\mu\text{V}</math>, dBf, dB<math>\mu\text{V}</math>, dBmV, and EMF  <b>Display Resolution:</b> 3 1/2 digits  <b>Accuracy (<math>+23</math> to <math>\pm 5^{\circ}\text{C}</math>):</b></p>				
FREQUENCY (MHz)	AMPLITUDE IN dBm			
	+16	+13	-127	-140
0.1 to 0.4	← $\pm 2$ dB →		← $\pm 3$ dB →	
0.4 to 1056	← $\pm 1$ dB →		← $\pm 3$ dB →	
1056 to 2112	← $\pm 1$ dB →		← $\pm 3$ dB →	

Table 1-2. Specifications for Model 6082A (cont.)

Accuracy (0 to 50°C):		
FREQUENCY (MHz)	AMPLITUDE IN dBm	
	+16	+13
0.1 to 0.4	±2 dB	±3 dB
0.4 to 1056	±1.5 dB	±3 dB
1056 to 2112	±1.5 dB	±3 dB

Source SWR: <1.5:1 below +1 dBm  
<2.0:1 above +1 dBm

Flatness (0 to 50°C): ±1.0 dB at +10 dBm

Intermodulation Distortion (Amplitude of +4 dBm, CW only):

FREQUENCY (MHz)	SPACING	
	1 kHz	25 kHz
0.1 to 128 MHz	-60 dBc	-75 dBc
128 to 512 MHz	-65 dBc	-75 dBc
512 to 2121 MHz	-65 dBc	-70 dBc

**SPECTRAL PURITY (CW ONLY)**

**Spurious Signals:** <-100 dBc for offsets greater than 10 kHz and RF output frequency <1056 MHz. <94 dBc for offsets greater than 10 kHz and RF output frequency >1056 MHz. Fixed-frequency spurious signals for RF output frequency <1056 MHz are <-100 dBc or <-140 dBm, whichever is greater. Fixed-frequency spurious signals for RF output frequency >1056 MHz are <-94 dBc or <-140 dBm, whichever is greater.

**Harmonics:** <-30 dBc for amplitudes less than +13 dBm at 1 to 2112 MHz.

**Subharmonics:** <-45 dBc for RF output frequencies from 1056 to 2112 MHz.

**Power Line Spurious Signals (offsets less than 10 kHz):** <-56 dBc for RF output frequencies <1056 MHz. <-50 dBc for RF output frequencies >1056 MHz.

**Residual FM: (NOTE 1)**

FREQUENCY BAND (MHz)	RESIDUAL FM	
	0.3 to 3 kHz	50 Hz to 15 kHz
0.1 to 15	0.2	0.4
15 to 32	0.2	0.4
32 to 64	0.2	0.4
64 to 128	0.2	0.4
128 to 256	0.4	0.5
256 to 512	0.7	1.0
512 to 1056	1.5	2.0
1056 to 2112	3.0	4.0

**NOTE 1:** Allowable operating modes CW, AM, FM (peak dev. <1.5% of max in operating band), DM (same comment as FM), Pulse.



Table 1-2. Specifications for Model 6082A (cont.)

Maximum Deviation:				
FREQUENCY BAND (MHz)	MAXIMUM DEVIATION			
	DC-COUPLED FM	AC-COUPLED FM (the smaller of)		
		ABSOLUTE MAXIMUM	RATE LIMITED MAXIMUM	
			DEV ≥ 1/64 MAX	DEV < 1/64 MAX
0.01 to 15	500 kHz	500 kHz	fmod x 5000	fmod x 78
15 to 32	125 kHz	125 kHz	fmod x 1250	fmod x 19
32 to 64	250 kHz	250 kHz	fmod x 2500	fmod x 39
64 to 128	500 kHz	500 kHz	fmod x 5000	fmod x 78
128 to 256	1 MHz	1 MHz	fmod x 10000	fmod x 156
256 to 512	2 MHz	2 MHz	fmod x 20000	fmod x 312
512 to 1056	4 MHz	4 MHz	fmod x 40000	fmod x 625
1056 to 2112	8 MHz	8 MHz	fmod x 80000	fmod x 1250

**FM Distortion:**  
**Standard Mode:** <2% for 0.5 to 1.0 times maximum deviation; <1% for <0.5 times maximum deviation. Applies for rates of 50 Hz to 50 kHz.  
**Low-Distortion Mode (Special Function 731):** <0.15% for ≤ 3.5 kHz peak deviation and rates 0.3 to 3 kHz.  
**FM Accuracy:** ±(5% of setting + 10 Hz) for rates of 50 Hz to 50 kHz  
**FM 3-dB Bandwidth:**

DEVIATION	COUPLING	
	INTERNAL AC	EXTERNAL AC (DC)
0% to 25% Maximum	20 Hz to 175 kHz	20 Hz (dc) to 175 kHz
25% to 100% Maximum	20 Hz to 100 kHz	20 Hz (dc) to 100 kHz

**Incidental AM:** <1% depth for peak deviation <100 kHz at 1 kHz rate and carrier frequency >0.5 MHz  
**DC-Coupled FM Center Frequency Error, at 1 GHz, after dcFM internal cal, and without any FM range changes:** <(0.1% of dev + 500 Hz)  
**Low-Rate External AC-Coupled FM (Special Function 711):**

FREQUENCY BAND (MHz)	MAX DEV, IN kHz (AT 10 Hz RATE)	
	SINE WAVE	SQUARE WAVE
0.01 to 15	80	40
15 to 32	20	10
32 to 64	40	20
64 to 128	80	40
128 to 256	160	80
256 to 512	320	160
512 to 1056	640	320
1056 to 2112	1280	640

**Table 1-2. Specifications for Model 6082A (cont.)**

**Droop:** <30% on a 5 Hz square wave  
**3-dB Bandwidth:** 0.5 Hz to 100 kHz (typical)  
**Maximum DC Input:** ±10 mV  
**Incidental AM:** <1% AM at 1 kHz rate and <10 kHz deviation

**PHASE MODULATION (NOTE 4)**

**Display Ranges:** 0 to .999 radians  
 1 to 9.99 radians  
 10 to 99.9 radians  
 100 to 800 radians  
**Display Resolution:** 3 digits  
**Maximum Deviation:**

FREQUENCY BAND (MHz)	MAXIMUM DEVIATION (RADIAN)
0.1 to 15	50
15 to 32	12.5
32 to 64	25
64 to 128	50
128 to 256	100
256 to 512	200
512 to 1056	400
1056 to 2112	800

**High-Rate Phase Modulation Maximum Deviation (Special Function 721):**

FREQUENCY BAND (MHz)	MAXIMUM DEVIATION (RADIAN)
0.1 to 15	5
15 to 32	1.25
32 to 64	2.5
64 to 128	5
128 to 256	10
256 to 512	20
512 to 1056	40
1056 to 2112	80

**Accuracy:** ±(5% of setting + 0.1 radian) at 1-kHz rate  
**Distortion (NOTE 5):** <2% THD from maximum deviation to 1/2 max deviation, and <1% THD at 1/2 maximum deviation or less at 1-kHz rate.  
**3-dB Bandwidth:** AC-coupled phase modulation, 20 Hz to 15 kHz  
 DC-coupled phase modulation, dc to 15 kHz

**NOTE 4:** Phase modulation specifications are valid where (RF frequency - mod frequency) >150 kHz.  
**NOTE 5:** Valid for rates from 50 Hz to 50 kHz in high-bandwidth mode. Does not include effects of residual phase noise.

Table 1-2. Specifications for Model 6082A (cont.)

**High-Rate Phase Modulation 3-dB Bandwidth (Special Function 721):**

AC-coupled phase modulation, 20 Hz to 100 kHz

DC-coupled phase modulation, dc to 100 kHz

**Incidental AM (valid for  $f > 500$  kHz):** <1% AM at 1-kHz rate for peak deviation <10 radians.**PULSE MODULATION (For RF Output Frequencies >10 MHz)****On/Off Ratio:** 80 dB minimum**Rise and Fall Times:** <15 ns, 10% to 90%**Level Error:** For pulse widths >50 ns, the power in the pulse is within  $\pm 0.7$  dB of the measured CW level.**Duty Cycle (External Modulation):** 0 to 100%**Repetition Rate (External Modulation):** DC to 10 MHz**Internal Modulation:** Internal rates and widths**External Modulation:** The pulse input is TTL compatible, terminated in  $50\Omega$  with internal active pull-up. It can be modeled as 1.2V in series with  $50\Omega$  at the pulse mod input connector. The instrument senses input terminal voltage and turns the RF OUTPUT off when the terminal voltage drops below  $1\pm 0.1$ V. The maximum allowable input is  $\pm 10$ V.**PULSE MODULATION (For RF Output Frequencies <10 MHz)****Rise and Fall Times:** <2 times the period of the RF output frequency**Level Error:** For pulse widths >10 times the period of the RF output frequency, the power in the pulse is within  $\pm 0.7$  dB of the measured CW level.

Other pulse specifications are the same as for the &gt;10 MHz frequency range.

**NONVOLATILE INSTRUMENT STATE MEMORY**

50 instrument states are retained for typically 2 years, even with ac line power disconnected.

**REVERSE-POWER PROTECTION****Protection Level:** Up to 25 watts from a  $50\Omega$  source; up to 25V dc. RF OUTPUT is ac coupled. Protection is provided when the signal generator is turned off.**Trip/Reset:** A flashing RF OFF annunciator indicates a tripped condition. Pressing RF ON/OFF button resets the signal generator.**IEEE-488 REMOTE CONTROL****Extent of Remote Control:** All controls except the POWER, REF/INT EXT, and CAL/COMP switches are remotely programmable via the IEEE-488 Interface (Std. 488.2-1987). All status including the option complement are available remotely.**Interface Functions Supported:** SH1, AH1, T5, TE0, L3, LE0, SR1, RL1, PP0, DC1, DT1, C0, and E2.**INTERNAL MODULATION SOURCE (Sine Wave)****Rates:** 0.1 Hz to 200 kHz, key-selectable 400/1000 Hz**Display Ranges:** 00.1 to 99.9 Hz

100 to 999 Hz

1.00 to 9.99 kHz

10.0 to 99.9 kHz

100 to 200 kHz

**Frequency Resolution:** 0.1 Hz or 3 digits**Frequency Accuracy:** Same as reference oscillator  $\pm 7$  millihertz

Table 1-2. Specifications for Model 6082A (cont.)

**Output Level Range:** 0 to 4V pk into 600Ω

**Output Level Resolution:** 1 mV pk or 3 digits, whichever is greater.

**Distortion:** <0.15% THD for output levels >0.2V pk and modulation frequency <20 kHz.

**Output Level Accuracy:** ±(4% + 15 mV) for modulation frequency <100 kHz.

**Output Impedance:** 600Ω ±2%

**Other Waveforms Available by Special Function:**

- Square Wave (Special Function 752)
- Triangle Wave (Special Function 751)
- Pulse (Special Functions 758,759), width 100 ns to 1/Fmod in 100 ns or 3-digit increments, whichever is greater. Rate and width are coherent with signal generator time base.

**EXTERNAL MODULATION**

1V pk provides indicated modulation index. Nominal input impedance is 600Ω. Maximum level is ±5V pk.

**MODULATION MODES**

Any combination of AM, PULSE, and FM or ØM, internal or external, may be used.

**DIGITAL FREQUENCY SWEEP**

**Sweep Modes:** Auto, single, or manual

**Adjustable Parameters:** Sweep symmetry, sweep speed, sweep width, and sweep increment.

**Sweep Speed:** Minimum 40 ms/increment selectable as (minimum + dwell time) where dwell time can be 0, 20, 50, 100, 200, or 500 ms, or 1, 2, 5, or 10s at each increment.

**DIGITAL AMPLITUDE SWEEP**

**Sweep Type:** Linear (volts) or logarithmic (dB)

**Sweep Modes:** Auto, single, or manual.

**Adjustable Parameters:** Sweep symmetry, sweep speed, sweep width, and sweep increment.

**Sweep Speed:** Minimum 30 ms/increment selectable as (minimum + dwell time) where dwell time can be 0, 20, 50, 100, 200, or 500 ms, or 1, 2, 5, or 10s at each increment.

**SWEEP OUTPUT (AUX Connector Pin 5)**

0 to +10V±10%, up to 4096 points in a stepped ramp, load >2 kΩ.

**PEN LIFT OUTPUT (AUX Connector Pin 4)**

TTL level, high during sweep retrace, load >2 kΩ.

**GENERAL SPECIFICATIONS**

**Temperature:** Operating, 0 to +50°C (+32 to +122°F).

Nonoperating, -40 to +75°C (-40 to +167°F).

**Operating Humidity Range:** 95% to +30°C, 75% to +40°C, and 45% to +50°C.

**Operating Altitude:** Up to 10,000 ft.

**Vibration:** Nonoperating, 5 to 15 Hz at 0.06 in, 15 to 25 Hz at 0.04 in, and 25 to 55 Hz at 0.02 in, double amplitude (DA).

**Shock:** Nonoperating, bench handling per MIL T 28800C Class 5, Style E.

**Electromagnetic Compatibility:** The radiated emissions induce <0.5 μV (at RF carrier frequency) into a 1-inch diameter, 2-turn loop, 1-inch from any surface as measured into a 50Ω receiver.

Table 1-2. Specifications for Model 6082A (cont.)

**Complies with Standards:**

- CE03 of MIL-STD-461B (Power and interconnecting leads), 0.015 to 50 MHz.
- RE02 of MIL-STD-461B (14 kHz to 10 GHz).
- FCC Part 15, Class B.
- VDE 0871B
- CISPR 22

<b>Size:</b>	Width	Height	Depth
	43 cm	13.3 cm	59.7 cm
	17 in	5.25 in	23.5 in

**Power Requirements:** 100, 120, 220, or 240V, each  $\pm 10\%$ ; 48-63 Hz; 200 VA, <15 VA in standby, with any options installed.

**Weight:** 30 kg (65 lbs).

**OPTION -130 HIGH-STABILITY REFERENCE**

**Aging Rate:**  $\leq 5 \times 10^{-10}$ /day, after 21 days continuous operation.

**Temperature Stability:**  $\leq 2 \times 10^{-10}/^{\circ}\text{C}$ . (Oven remains powered in standby.)

**OPTION -132 MEDIUM-STABILITY REFERENCE**

**Aging Rate:**  $\leq 1 \times 10^{-7}$ /month after 5 days continuous operation.

**Temperature Stability:**  $\leq 1 \times 10^{-7}$  (0 to  $+50^{\circ}\text{C}$ )

**OPTION -830 REAR PANEL CONNECTORS**

Moves connectors for MODULATION INPUT, MOD output, and RF OUTPUT to the rear panel. The front panel connector locations are covered with plugs.

**SUPPLEMENTAL CHARACTERISTICS**

The following characteristics are provided to assist in signal generator applications, and to describe some other aspects of typical performance.

**Frequency Switching Speed:** <100 ms to settle within 100 Hz

**Amplitude Switching Speed:** <100 ms to settle within 0.1 dB

**Pulse Modulation Delay:** 80 ns typical