Wide Frequency Range

RF Frequency Counter

UFC-6000

1-6000 MHz

The Big Deal

- Wide Frequency Range
- Uses internal or External reference
- Supplied with proprietary GUI software and API objects for programmers.

Case Style: LJ1577

Software Package

Included Accessories

Model No.	Description	Qty.
USB-CBL-AB-3+	2.7ft. USB cable	1

Typical Applications

- Labratory test equipment
- High volume production testing / ATE
- Design verification testing

RoHS Compliant

See our web site for RoHS Compliance methodologies and qualifications

Product Overview

Mini-Circuits' UFC-6000 is a small, light weight Frequency Counter operating over the frequency range 1 to 6000 MHz. The counter is cased in a rugged shielded case (size of 6.16" X 3.68" X 1.38") with a 16x2 character LCD display, a reference input BNC(F) port and a signal input SMA(F) port. Using the USB interface allows remote display of measured frequencies, and eliminates the need for an additional power supply. The counter can also operate independently using an external power supply.

Full software support is provided for USB control, including our user-friendly GUI application for Windows and a full API and programming instructions for both Windows and Linux environments (32-bit and 64-bit systems). The latest version of the full software package can be downloaded from **https://www.minicircuits.com/softwaredownload/fc.html** at any time. Longer USB cables, AC/DC power adaptor and a mounting bracket are available as additional options - see page 5 for details.

Key Features

Feature	Advantages
Wide frequency range	The UFC-6000 can measure the frequency of a signal from 1 to 6000 MHz
Operates with external or internal reference	The UFC-6000 can operate either synchronized with an external 10 MHz reference signal or independently, using its internal reference depending on user preference.
LCD display	16x2 character LCD display providing the frequency reading, and information on the frequency counter's status.
USB powered	Power to the UFC-6000 is supplied through the USB connector from either the USB bus or the supplied power adaptor with USB connector.

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Electrical Specifications

Parameter	Test Conditions	Min.	Typ.	Max.	Units
Frequency range	-	1	–	6000	MHz
Frequency Resolution [1]	1 - 40 MHz	–	1	–	Hz
	40-190 MHz	–	10	–	
	190-6000 MHz	–	100	–	
Frequency Accuracy (@1 sec measurement sample time) [1, 2]	1 - 40 MHz	–	±2	–	Hz
	40-190 MHz	–	±20	–	
	190-1400 MHz	–	±200	–	
	1400 - 6000 MHz	–	±800	–	
Frequency Aging	Using internal Reference	–	–	±1.0	ppm/year
Sample time [3]	–	0.1	1	3	Sec
Input Impedance	–	–	50	–	Ω
Input VSWR	1 - 1500 MHz	–	1.1	–	:1
	1500-6000 MHz	–	1.3	–	
Input Power	1 - 5 MHz	-23	–	+13	dBm
	5 - 4500 MHz	-28	–	+13	
	4500 - 6000 MHz	-15	–	+13	
Reference In Frequency	–	–	10	–	MHz
Reference In Impedance	–	–	50	–	Ω
Reference In Power	–	-5	–	+10	dBm
Supply Voltage	Supplied through the USB port	4.75	5	5.25	V_{DC}
USB current draw	–	–	275	350	mA

[1] The Frequency counter's default mode is 'Auto Range' which automatically selects the correct frequency range. When the frequency range is known, the user can improve response time by manually selecting the frequency range by a software function through the GUI interface, or user programming.
[2] Accuracy shown using external 10 MHz reference synchronized to test signal. Using Internal Reference adds 2 ppm of tested frequency to the accuracy values shown.
[3] Software function set by user, default option 1 Sec.

Connections

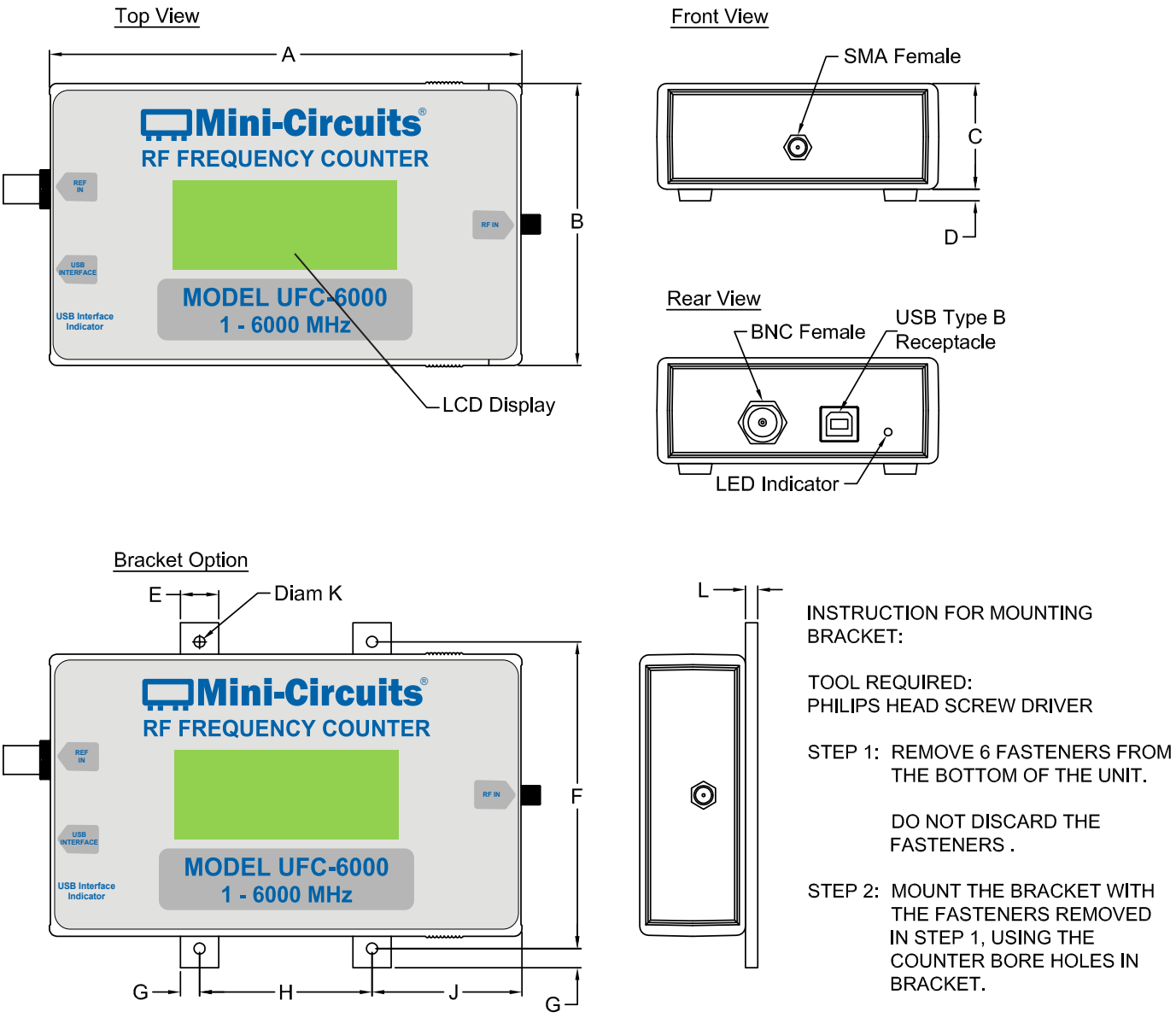
Reference Input	(BNC-Female)
Signal Input	(SMA-Female)
USB Port	(USB B female)

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	0ºC to +50ºC
Storage Temperature	-20ºC to +60ºC
Max. Supply Voltage (V_{USB})	6 V_{DC}
Max safe input power (Reference input).	+13dBm
Max safe input power (RF in).	+16dBm
DC voltage input (RF in)	±16 V_{DC}

Permanent damage may occur if any of these limits are exceeded. Operating in the range between operating power limits and absolute maximum ratings for extended periods of time may result in reduced life and reliability.

Outline Drawing (LJ1577)



INSTRUCTION FOR MOUNTING BRACKET:

TOOL REQUIRED:
PHILIPS HEAD SCREW DRIVER

STEP 1: REMOVE 6 FASTENERS FROM THE BOTTOM OF THE UNIT.

DO NOT DISCARD THE FASTENERS .

STEP 2: MOUNT THE BRACKET WITH THE FASTENERS REMOVED IN STEP 1, USING THE COUNTER BORE HOLES IN BRACKET.

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
6.16 156.5	**3.68** 93.4	**1.38** 35.0	**0.15** 3.8	**0.500** 12.7	**4.000** 101.6	**0.250** 6.4	**2.250** 57.2	**1.96** 49.7	**0.144** 3.7	**0.160** 4.1	300

Software & Documentation Download:

- Mini-Circuits' full software and support package including user guide, Windows GUI, DLL files, programming manual and examples can be downloaded free of charge from https://www.minicircuits.com/softwaredownload/fc.html.
- Please contact **testsolutions@minicircuits.com** for support

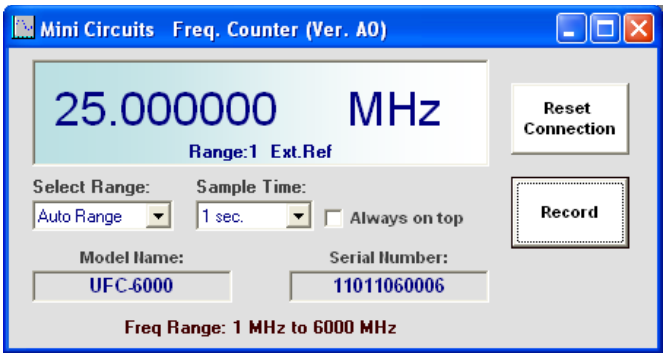
Minimum System Requirements

Parameter	Requirements	
Interface	USB HID	
System requirements	GUI:	Windows 32 & 64 bit systems from Windows 98 up to Windows 10
	USB API (ActiveX & .Net)	Windows 32 & 64 bit systems with ActiveX or .Net support from Windows 98 up to Windows 10
	USB direct programming support	Linux, Windows systems from Windows 98 up to Windows 10
Hardware	Pentium® II or higher, RAM 256 MB	

Graphical User Interface (GUI) for Windows

Key Features:

- Measure frequency with or without external reference frequency
- Record frequency measurements
- Set measurement sample time
- Set measurement range (auto or manual range)



Application Programming Interface (API)

Windows Support:

- API DLL files exposing the full power sensor functionality
  - ActiveX COM DLL file for creation of 32-bit programs
  - .Net library DLL file for creation of 32 / 64-bit programs
- Supported by most common programming environments (refer to application note AN-49-001 for summary of tested environments)

Linux Support:

- Full power sensor control in a Linux environment is achieved by way of USB interrupt commands.

Ordering, Pricing & Availability Information see our web site

Model	Description
UFC-6000	RF Frequency Counter

Included Accessories	Part No.	Description
	USB-CBL-AB-3+	2.7 ft (0.8 m) USB Cable: USB type A(Male) to USB type B(Male)

Optional Accessories	Description
USB-AC/DC-5	AC/DC 5V_{DC} Power Adapter with US, EU, IL, UK, AUS, and China power plugs [4]
USB-CBL-AB-3+ (spare)	2.7 ft (0.8 m) USB Cable: USB type A(Male) to USB type B(Male)
USB-CBL-AB-7+	2.7 ft (0.8 m) USB Cable: USB type A(Male) to USB type B(Male)
USB-CBL-AB-11+	2.7 ft (0.8 m) USB Cable: USB type A(Male) to USB type B(Male)
BKT-300-01+	Mounting Bracket

[4] Power plugs for other countries are also available, if you need a power plug for a country not listed in the table please contact testsolutions@minicircuits.com for support.

Calibration	Description	
CALUFC-6000	Calibration Service	Click Here

Additional Notes

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.

B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.

C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

RF Frequency Counter UFC-6000

Typical Performance Data

FREQ. (MHz)	ACCURACY OF FREQUENCY MEASUREMENT (MHz) @ 25˚C (dBm)										
	-30	-22	-20	-16	-14	-10	-5	0	+5	+10	+14
1.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
40.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
50.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
75.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
100.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
125.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
150.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
175.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
200.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
250.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
500.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
750.0	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0001	-0.0001	0.0000	0.0000	0.0000
1000.0	-0.0001	0.0000	-0.0001	0.0000	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	-0.0001
1250.0	0.0000	-0.0001	0.0000	0.0000	-0.0001	0.0000	0.0000	-0.0001	-0.0001	-0.0001	0.0000
1500.0	0.0000	-0.0001	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000	-0.0002	-0.0001
1750.0	0.0002	0.0002	0.0008	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
2000.0	0.0002	0.0002	0.0006	0.0002	0.0002	0.0000	0.0000	0.0002	0.0000	-0.0002	0.0002
2250.0	0.0002	0.0002	0.0002	0.0002	0.0002	0.0010	0.0002	0.0002	0.0002	0.0002	0.0002
2500.0	0.0002	0.0000	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
2750.0	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
3000.0	0.0002	0.0002	0.0010	0.0002	0.0002	0.0002	0.0000	0.0002	0.0002	0.0000	0.0002
3250.0	0.0000	0.0004	0.0002	0.0000	0.0004	0.0000	0.0002	0.0004	0.0002	0.0004	0.0000
3500.0	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
3750.0	0.0004	0.0004	0.0004	0.0004	0.0004	0.0000	0.0000	0.0000	0.0000	0.0004	0.0000
4000.0	0.0004	0.0000	-0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0000
4250.0	0.0000	0.0004	0.0000	0.0000	0.0000	0.0004	0.0004	0.0000	0.0004	0.0004	0.0004
4500.0	0.0004	0.0004	0.0004	0.0004	0.0004	0.0000	0.0004	0.0000	0.0000	0.0004	0.0000
4750.0	0.0004	0.0004	0.0004	0.0004	0.0004	0.0000	0.0004	0.0000	0.0004	0.0004	0.0000
5000.0	-	0.0000	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0000	0.0000
5250.0	-	0.0000	0.0004	0.0004	0.0000	0.0004	0.0004	0.0004	0.0000	0.0000	0.0004
5500.0	-	0.0004	0.0004	0.0004	0.0000	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
5750.0	-	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
6000.0	-	-	0.0004	0.0004	0.0004	0.0004	0.0000	0.0000	0.0004	0.0000	0.0000

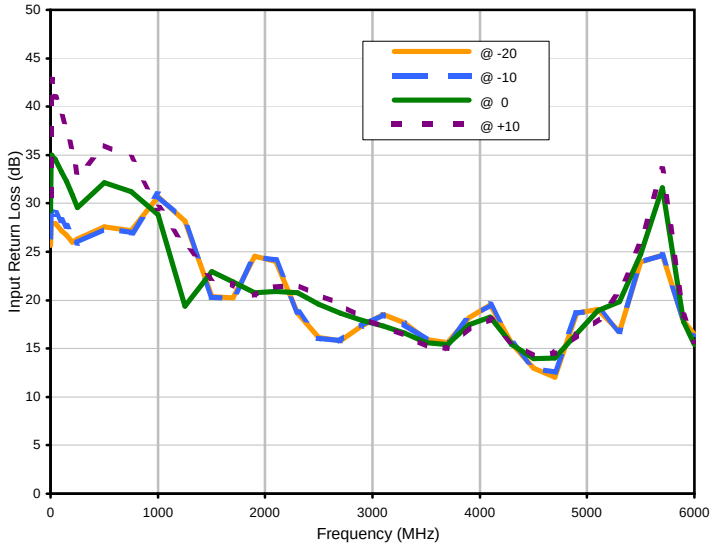
Note: All data shown was using external 10MHz reference synchronized to test signal.

Typical Performance Data

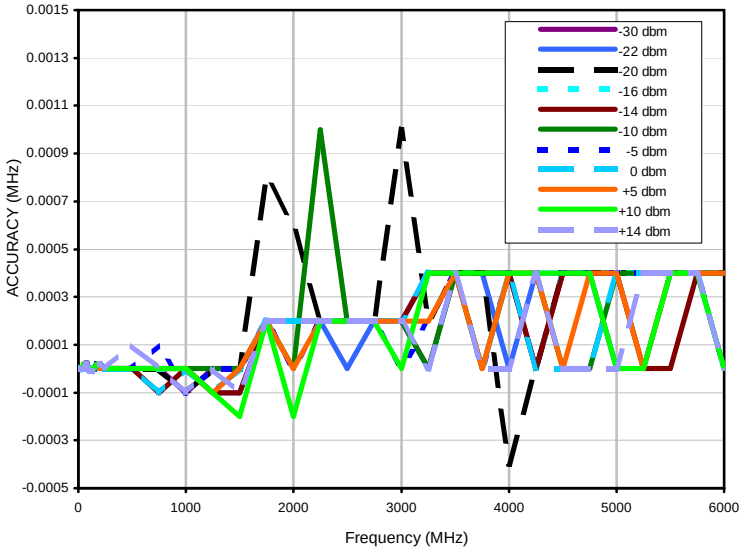
FREQ. (MHz)	INPUT RETURN LOSS 25˚C (dB)			
	-20	-10	0	+10
1	25.66	26.49	29.25	30.79
5	27.85	29.09	34.80	41.56
10	27.94	29.15	34.98	42.78
20	27.93	29.07	34.79	41.86
40	27.90	29.01	34.58	41.21
50	27.88	28.94	34.47	40.91
100	27.21	28.24	33.25	39.17
150	26.75	27.65	32.28	37.57
200	25.96	26.75	30.90	35.68
250	26.31	25.94	29.54	32.83
500	27.56	27.36	32.16	36.07
750	27.16	26.99	31.20	34.63
1000	30.68	30.87	28.85	29.49
1250	28.18	28.20	19.37	25.67
1500	20.40	20.29	22.93	22.27
1700	20.26	20.18	21.90	21.64
1900	24.54	24.45	20.74	20.53
2100	24.03	24.14	20.91	21.35
2300	18.68	18.69	20.77	21.56
2500	16.11	16.10	19.56	20.54
2700	15.81	15.82	18.63	19.57
2900	17.33	17.30	17.94	18.19
3100	18.53	18.53	17.35	17.21
3300	17.64	17.62	16.61	16.38
3500	15.97	15.97	15.59	15.24
3700	15.64	15.63	15.38	15.01
3900	18.17	18.18	17.45	17.22
4100	19.53	19.54	18.26	18.02
4300	15.47	15.48	15.39	15.53
4500	12.96	12.91	13.95	14.22
4700	12.02	12.58	14.02	14.57
4900	18.67	18.66	16.52	16.40
5100	19.04	19.02	18.93	18.04
5300	16.74	16.78	19.86	20.71
5500	23.93	23.94	24.75	25.88
5700	24.69	24.68	31.63	33.55
5900	17.85	17.85	17.77	18.42
6000	16.48	16.50	15.42	15.68

Typical Performance Curves

INPUT RETURN LOSS



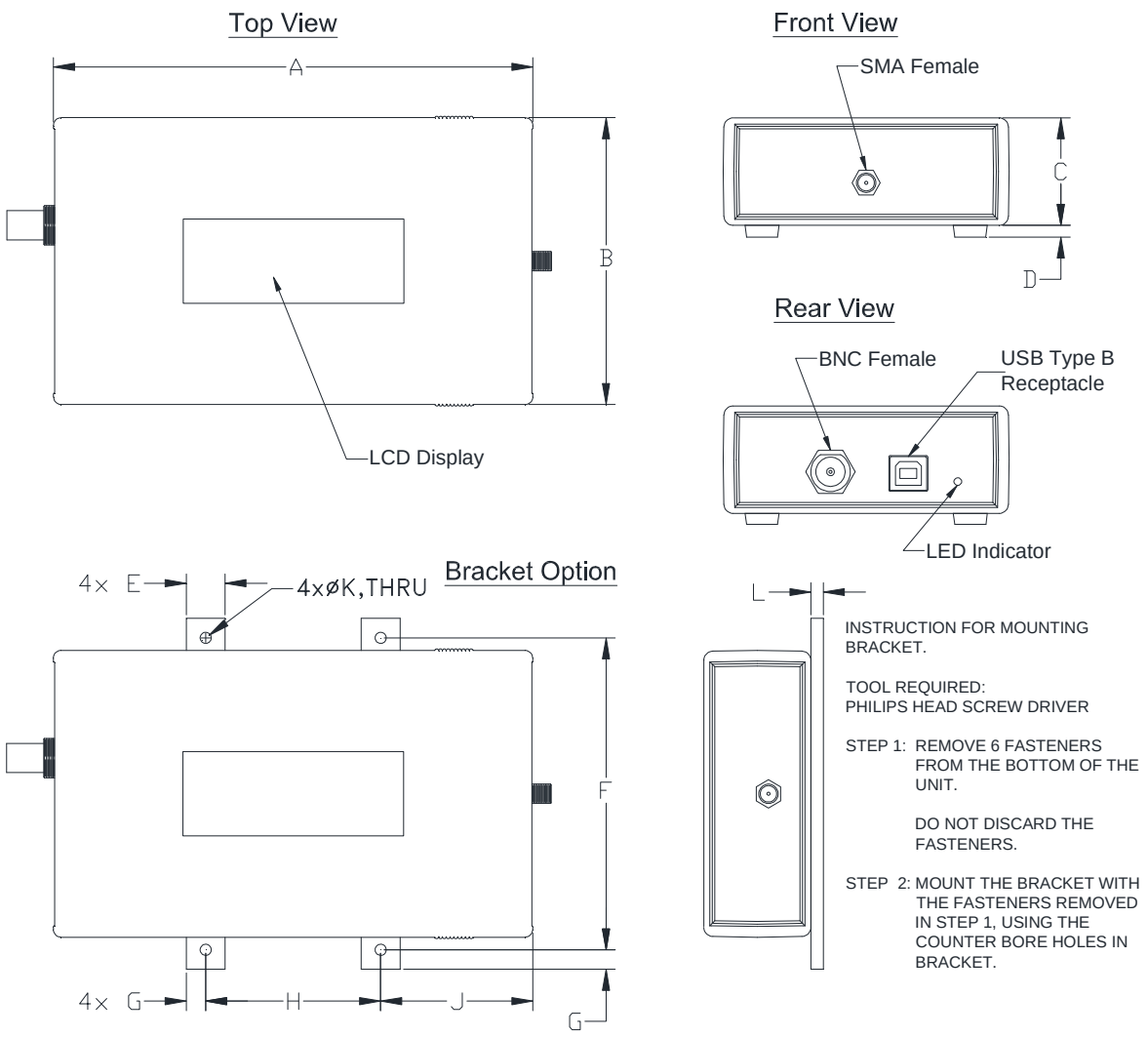
ACCURACY OF FREQUENCY MEASUREMENT @ 25˚C



Case Style LJ

Outline Dimensions

LJ1577



CASE#	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
LJ1577	6.16 (156.5)	3.68 (93.4)	1.38 (35.0)	.15 (3.8)	.500 (12.7)	4.000 (101.6)	.250 (6.4)	2.250 (57.2)	1.96 (49.7)	.144 (3.7)	.160 (4.1)	300

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

Notes:

1. Case material: Plastic.

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Mini-Circuits ISO 9001 & ISO 14001 Certified

Mini-Circuits

Environmental Specifications **ENV55**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-0° to 50° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-20° to 60° C Ambient Environment	Individual Model Data Sheet
Operating and Storage Humidity	5% to 85% RH (non-condensing)	Ambient
Bench Handling Test	Bench Top Tip 45° & Drop	MIL-PRF-28800F
Transit Drop Test	Free Fall Drop, 20 cm (7.9 inches)	MIL-PRF-28800F Class 3