CHARTER ENGINEERING, INC.
Precision Electromechanical Switches

6729 55th Street North Pinellas Park, FL 33781
PH (727) 525-1025 FX (727) 525-1050
www.ceiswitches.com sales@ceiswitches.com

Quotation

To:	Brendan Bramman	**From:**	Keith Kulyk
	Institute for Quantum Computing		CEI
Fax:		**Date:**	August 15, 2019
Phone:	510-888-4567	**Pages:**	5
Re:	RF Switch Quotation	**Quotation Number:**	K190815-10

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Dear Brendan Bramman,

Thank you for your interest in Charter Engineering, Inc.

I attached a quotation for your review.
Please let me know if I can be of further assistance.

Best Regards,

Keith Kulyk
Charter Engineering, Inc.
www.ceiswitches.com

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Electromechanical Switches

Type	SPDT
Model#	B10F-330120
Frequency Range:	DC-12.4 GHz
Connector:	TYPE SMA FEMALE
Actuator:	FAILSAFE
Voltage:	24.0 VDC
Common Polarity:	N/A
Power Interface:	SOLDER TERMINALS
Options:	TTL LOGIC
Qty:	**1-9 PCS**
Cost(Each):	$250.00
Delivery:	3-4 WKS ARO

B10 SERIES
SPDT
DC - 26.5 GHz

4 MOUNTING HOLES

FREQUENCY: GHz	DC - 2.0	2.0 - 4.0	4.0 - 8.0	8.0 - 12.4	12.4 - 18.0	18.0 - 26.5
VSWR (MAX.)	1.20:1	1.25:1	1.30:1	1.40:1	1.50:1	1.65:1
INSERTION LOSS (MAX.)	0.20	0.25	0.30	0.40	0.50	0.70
ISOLATION (MIN.)	90	80	80	70	60	50
IMPEDANCE	50 Ohms					

MECHANICAL

CONTACT	:	BREAK BEFORE MAKE
ACTUATOR	:	FAILSAFE, LATCHING, MOMENTARY
SWITCHING SPEED	:	20 mSEC MAX.

ELECTRICAL

ACTUATOR VOLTAGE	:	28.0, 12.0, 15.0, 24.0 Vdc
ACTUATOR CURRENT	:	CONTACT CEI
POWER HANDLING	:	200 WCW @ 1.0 GHz (STANDARD)
	:	300 WCW @ 1.0 GHz (OPT. /P)

ENVIRONMENTAL

OPERATING TEMP	:	-40 DEG. C TO 90 DEG. C (STANDARD)
	:	-54 DEG. C TO 90 DEG. C (OPT. M/S) **
SINE VIBRATION	:	30 G'S
RANDOM VIBRATION	:	20 G'S
LIFE	:	1,000,000 CYCLES

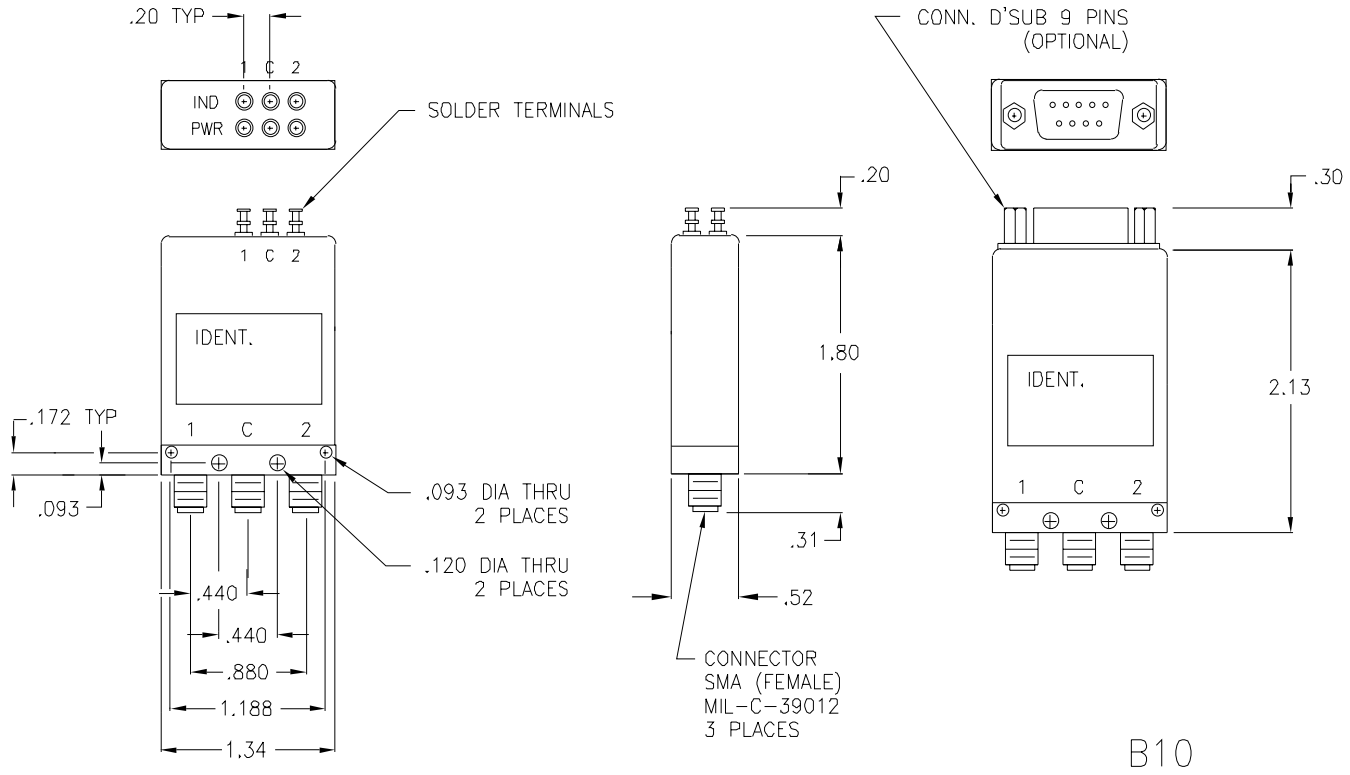
FINISH

RF CAVITY	:	ALUMINUM ELECTROLESS NICKEL PLATED PER MIL-C-26074, CLASS 4 (EXCEPT LOW OR ULTRA LOW IM MODELS)
ENCLOSURE	:	ALUMINUM, BLACK
CONTACT	:	BERYLLIUM COPPER, GOLD PLATED PER MIL-G-45204
CONNECTOR SHELL	:	CRES, PASSIVATED PER QQ-P-35 OR BRASS, ELECTROLESS NICKEL PLATED PER MIL-C-26074

AVAILABLE OPTIONS

INDICATOR CIRCUITRY	:	CUT OFF POWER CIRCUIT
SUPPRESSION DIODE	:	D' SUB MINIATURE SERIES
TTL LOGIC	:	CUSTOM DESIGNS

LOW, ULTRA LOW, OR SUPERIOR INTERMODULATION (IM)



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INTERNET: http://www.ceiswitches.com ● EMAIL:sales@ceiswitches.com

DEFINITIONS AND TERMINOLOGY

Electromechanical Switch Models

SPDT Switch - A single-pole, double-throw switch has one input or output port and two selectable input or output ports.

SPDT Terminated Switch - A single-pole, double-throw switch with one open output or input RF port internally terminated in a 50-ohm resistive load.

Multi-postion Switch - A switch with one input or output and more than two output or input ports. Standard CEI multi-throw switches provide up to 6 selectable outputs or inputs from a single input or output port.

Multi-position Terminated Switch - A multi-position switch with each unused or open input or output RF port internally terminated in a 50-Ohm resistive load.

Transfer Switch (DPDT) - A transfer switch has two independant paths that operate simultaneously in either of two selected positions.

Actuator Terminology

Failsafe - A mode of operation in which the switch moves to the closed position when the actuating voltage is applied and always returns to a predetermined position when the voltage is removed.

Latching - A mode of operation in which the switch moves to the closed position when the actuating voltage is applied and will remain in the selected position regardless of whether the actuating voltage is removed or interrupted. In order to change to another position the voltage must then be reapplied to the position desired. The latching models can also operate by **pulse voltage** at a 30 millesecond pulse minimum. The pulse voltage technique can save power and will allow the system to run at cooler temperatures.

Momentary (normally open) - A mode of operation in which all output ports of the switch are disconnected from the input port until a voltage is applied to maintain a selected position. The switch returns to its open position with the removal of voltage.

Common Input Command Voltage: A mode of operation is which the supply voltage and control voltage can be positive or the return voltage be negative (this catalog designates the "+" or positive and the "-" or negative signs). To select a position using positive voltage the common voltage must be the return voltage. To select a position using return voltage the positive must be supplied at the common terminal.

Electromechanical Switch Options

INDICATOR CIRCUITRY: A set of internally mounted contacts mechanically connected to the switch actuator allowing external monitoring of switch RF status.

SUPPRESSION DIODES: This option offers fast-recovery rectifiers (diodes) connected in parallel with the coics of the switch to suppress any transient voltage generated by the coils. Suppression Diodes are recommended with TTL Logic.

TTL LOGIC: Transistor-transistor-logic driver circuitry which enables the status of the switch to be controlled by the level of the TTL logic input.

BCD TTL DECODER: Completely contained within the switch housing, BDC logic circuitry establishes compatibility of the switch with binary login inputs.

CUT OFF POWER CIRCUIT: This applies to a latching type switch only. A switch that has the ability to disconnect the actuator drive circuit so that D.C. current will not be consumed after switching has been accomplished.

LOW, ULTRA LOW, OR SUPERIOR PASSIVE INTERMODULATION (PIM): This option allows for a -110 dBc (LOW), 130 dBc (ULTRA LOW) or -160 dBc (SUPERIOR) passive intermodulation (PIM) level @ the PIM frequency. PIM is a form of signal distortion that occurs whenever signals at two or more frequencies conduct simultaneously in a passive device which contains some non-linear response.

ORDERING INFORMATION

How to Order:

To place an order please contact
Charter Engineering, Inc. (CEI) at:

Charter Engineering, Inc.
6729 55th Street North
Pinellas Park, FL 33781
Tel: (727) 525-1025
Fax: (727) 525-1050
Website: www.ceiswitches.com
Email: sales@ceiswitches.com

CAGE CODE: 1SWE8

Domestic Terms:

Domestic Terms are Net 30 days, F.O.B CEI factory upon credit approval unless otherwise specified.
Customers without credit approval are shipped C.O.D. unless payment has been received in advance.
Charter Engineering, Inc. also accepts
VISA and Mastercard.

International Terms:

International Terms require full payment in advance of shipment or against irrevocable letter of credit.
If payment is made via wire transfer, the customer is required to pay the wire transfer fee for both the sending and receiving banks.
Freight charges, customs duty, custom clearance costs and applicable taxes are to be paid by the customer.

Shipping:

Domestic shipments are usually made via UPS Ground service unless otherwise specified.
International shipments are made using a variety of carriers.
Charter Engineering, Inc. will choose the most appropriate means of transportation unless specified by the customer. The customer has the option to bill their own account number or prepay and add the charges.

Certificate of Compliance:

Charter Engineering Inc. (CEI) will include a Certificate of Compliance with each purchase order.

Warranty:

Charter Engineering, Inc. (CEI) warranties each new product to be free from defects in material and workmanship from one (1) year of the date of shipment.
Any component found to be defective under normal use for a one year period will be either repaired or replaced freed of charge.
CEI shall not be liable for installation and consequential damages.
Before returning any product, please contact CEI for a Return Material Authorizaion (RMA). When requesting an RMA, you will need to provide the model number, serial number, and as much information as possible about the nature of the difficulty or reason for return.
For products not covered by the warranty, a written quotation for repair charges will be provided for customer approval.

Change Orders and Cancellations:

Change Orders regarding price, delivery, or any conditions not specified on the original order, will be considered in effect after mutual agreement has been affirmed in writing between the customer and CEI.
A purchase order may not be cancelled without the express written consent of CEI.
All cancellations will be dependent upon customer's agreement to satisfy all charges incurred by Charter Engineering, Inc. CEI will endeavor to stop work promptly upon notification of cancellation.

Product and Price Changes:

Charter Engineering, Inc. reserves the right to alter price and specifications of all products without notice.

NOTE: Charter Engineering, Inc. does not requires a minimum dollar amount to place an order.