

Electronic Line Stretcher

50Ω 360° Voltage Variable 180 to 450 MHz

Maximum Ratings

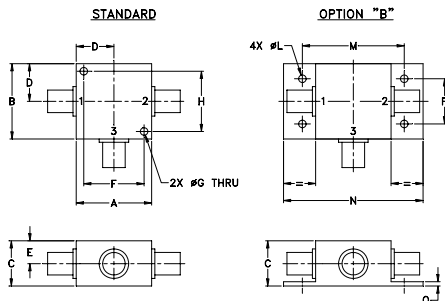
Operating Temperature	0°C to 50 °C
Storage Temperature	-40°C to 100°C
RF Input Power	13dBm
Control Voltage	0.5V to 30V
Permanent damage may occur if any of these limits are exceeded.	

Coaxial Connections

RF IN	1
MONITOR OUT*	2
CONTROL	3

* Monitor out port should be connected to a 50-ohm load

Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H
1.25	1.25	.75	.63	.38	1.00	.125	1.000
31.75	31.75	19.05	16.00	9.65	25.40	3.18	25.40
J	K	L	M	N	P	Q	wt
--	--	.125	1.688	2.18	.75	.07	grams
--	--	3.18	42.88	55.37	19.05	1.78	70.0

Features

- over 360° phase shift of the reflected signal
- normalized and stable magnitude of the reflected signal
- voltage controlled for automated applications
- protected under US Patent 6,479,977

Applications

- automated load-pull measurement of oscillators¹

Electrical Specifications

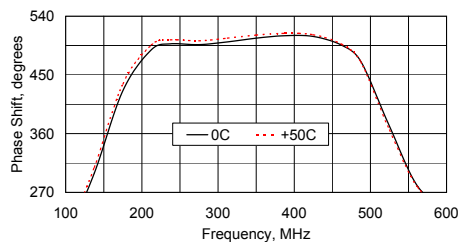
FREQUENCY RANGE (MHz)	INPUT POWER (dBm)	PHASE RANGE (Degrees)	RETURN LOSS (dB)	CONTROL VOLTAGE (V)
$f_L - f_U$	Max.	Min.	Typ.	
180-450	10	360	10-12	0.5-25

1. See Application Note AN-45-002 on our web site.

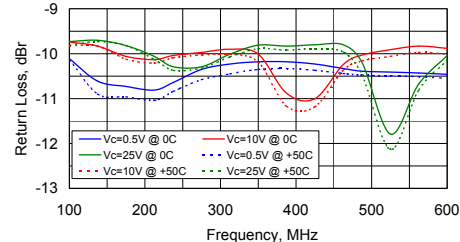
Typical Performance Data

FREQ. (MHz)	PHASE SHIFT (Deg.)		RETURN LOSS (dBr)					
	0°C	50°C	V _c =0.5V @ 0°C	V _c =10V @ 0°C	V _c =25V @ 0°C	V _c =0.5V @ +50°C	V _c =10V @ +50°C	V _c =25V @ +50°C
100.00	196.87	199.96	-10.11	-9.74	-9.73	-10.14	-9.82	-9.81
137.50	299.53	308.52	-10.61	-9.83	-9.70	-10.90	-9.83	-9.73
175.00	425.62	436.04	-10.73	-10.06	-9.82	-10.96	-10.12	-9.82
212.50	488.59	495.99	-10.81	-10.13	-10.06	-11.04	-10.21	-10.13
237.50	497.57	503.65	-10.64	-10.04	-10.29	-10.84	-10.09	-10.37
275.00	496.30	502.14	-10.35	-9.97	-10.29	-10.58	-10.03	-10.32
312.50	500.47	506.20	-10.23	-9.90	-10.01	-10.45	-10.01	-10.07
350.00	506.26	511.00	-10.18	-10.01	-9.81	-10.35	-10.19	-9.89
387.50	509.96	513.53	-10.18	-10.88	-9.83	-10.33	-11.17	-9.92
425.00	508.79	511.50	-10.23	-11.00	-9.80	-10.37	-11.18	-9.89
462.50	495.36	496.76	-10.33	-10.24	-9.80	-10.44	-10.37	-9.96
487.50	470.45	469.55	-10.39	-10.03	-10.20	-10.48	-10.16	-10.48
525.00	371.27	365.29	-10.41	-9.91	-11.79	-10.49	-10.06	-12.13
562.20	278.80	277.32	-10.43	-9.83	-10.68	-10.51	-9.97	-10.81
600.00	247.48	247.59	-10.46	-9.88	-10.04	-10.55	-10.01	-10.14

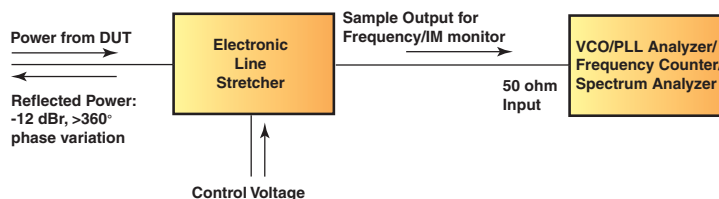
Maximum Phase Shift vs. Frequency at temperature extremes @ Pin=+7 dBm



Return Loss vs. Frequency at temperature extremes @ Pin=+7 dBm



Application Block Diagram



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



ELS-450



CASE STYLE: K18

Connectors Model
 SMA ELS-450-S
 BRACKET (OPTION "B")