

# Fixed Amplitude Mismatch, Wideband Electronic Line Stretcher

## ELS-450

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

### 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 oscillators<sup>1</sup>

CASE STYLE: K18

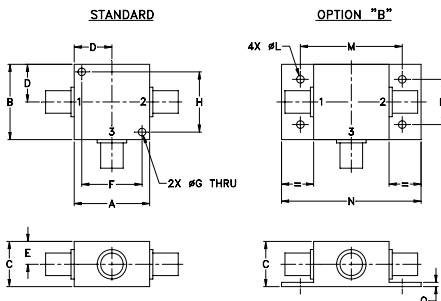
Connectors	Model	Price	Qty.
SMA	ELS-450-S	\$149.95	(1-9)
BRACKET (OPTION "B")		\$2.50	(1+)

### 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.

### 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

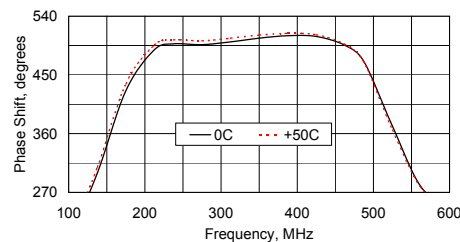
  

J	K	L	M	N	P	Q	wt
--	--	.125	1.688	2.18	.75	.07	grams
--	--	3.18	42.88	55.37	19.05	1.78	70.0

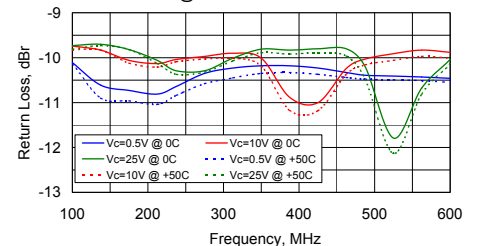
### Typical Performance Data

FREQ. (MHz)	PHASE SHIFT (Deg.)		RETURN LOSS (dBr)					
	0°C	50°C	Vc=0.5V @ 0°C		Vc=10V @ 0°C		Vc=25V @ 0°C	
			@ 0°C	@ 0°C	@ 0°C	@ +50°C	@ +50°C	@ +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

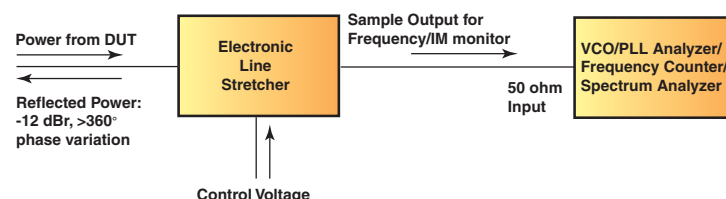
Maximum Phase Shift vs. Frequency at temperature extremes @ Pin=+7 dBm



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



### Application Block Diagram



**Mini-Circuits**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED

For detailed performance specs & shopping online see web site

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

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