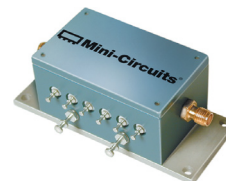


Precision

Digital Step Attenuator

50Ω TTL Control, Pin Diode 10 to 1000 MHz

ZSAT-31R5+



Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 125°C
Input Power	15 dBm
DC Voltage	5.5 V
TTL	5.5V

Permanent damage may occur if any of these limits are exceeded.

Features

- precision 6 bit attenuator
- wideband, 10 to 1000 MHz
- excellent step accuracy, 0.2 dB typ.

Applications

- test sets
- cellular
- gain control transmitters/receivers

CASE STYLE: AR214

Connectors	Model	Price	Qty.
SMA	ZSAT-31R5+	\$119.00	(1-9)

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Digital Step Attenuator Electrical Specifications

MODEL NO.	FREQUENCY (MHz)		PRIMARY ATTENUATION STEPS (dB)						ATTENUATION (dB) LOGIC STATE		VSWR (:1)		
			@ CONTROL PORT						(1,1,1,1,1,1)**	(0,0,0,0,0,0)			
	f_L	f_U	#1	#2	#3	#4	#5	#6	Nom.	Max.	L	M	U
ZSAT-31R5	10	1000	0.5±0.18	1±0.25	2±0.25	4±0.3	8±0.4	16±0.5	31.5	7.0	2.0	1.5	1.6

L=10 to 100 MHz

M=100 to 500 MHz

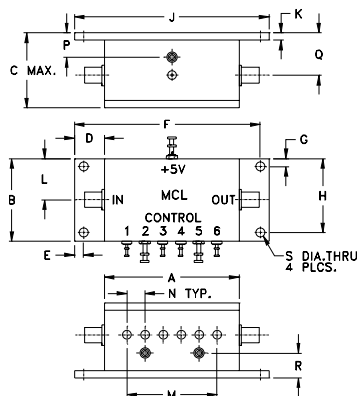
U=500 to 1000 MHz

** Total attenuation above thru-loss.

1. Step accuracy is specified for basic steps. For combination of steps accuracy is additive.

2. Thru-loss is minimum insertion loss with all attenuation elements bypassed (All TTL controls state are Low)

Outline Drawing



Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H	J
2.25	1.38	1.25	.50	.150	3.100	.138	1.238	3.25
57.15	35.05	31.75	12.70	3.81	78.74	3.51	31.45	82.55
K	L	M	N	P	Q	R	S	wt
.12	.69	1.50	.30	.41	.71	.41	.150	grams
3.05	17.53	38.10	7.62	10.41	18.03	10.41	3.81	112

Additional Specifications

DC Voltage	+5V
DC Current	12mA max.
Switching Time (50% TTL to within specified accuracy of the next-selected attenuation step, and to within 0.1 dB of steady-state Thru-Loss)	10μs typ., 15μs max.,
TTL Input High Threshold	2V min
TTL Input Low Threshold	0.8V max.
TTL Toggle Rate	50 kHz typ.
1dB Compression	10 dBm (10-100 MHz) +15 dBm (100-1000MHz)

Notes

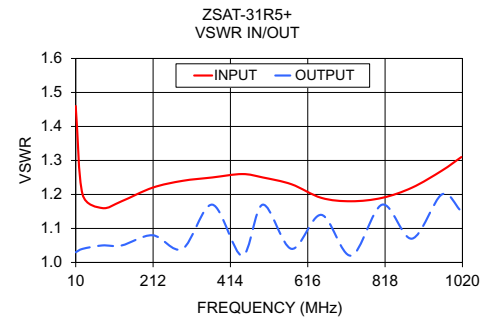
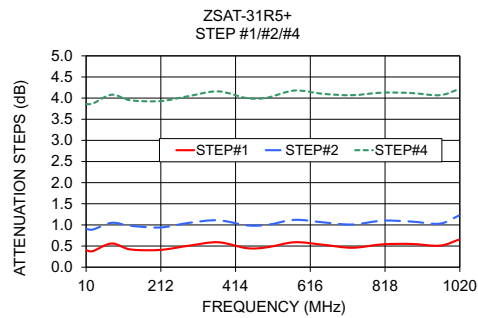
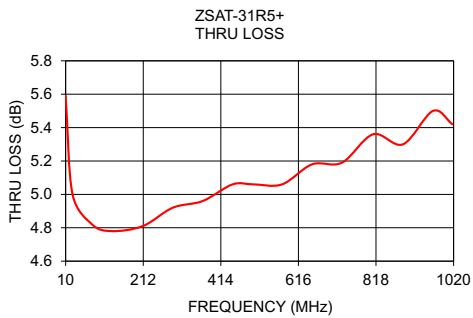
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.

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

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. B
M149161
ZSAT-31R5+
DJ/VV/CP
141201



Step Attenuation* at TTL Control State

FREQ.	000000	000001	000010	000100	001000	010000	100000	111111
(MHz)	THRU LOSS (dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
9.99	5.59	0.40	0.91	1.89	3.86	7.84	15.88	31.28
27.97	5.00	0.38	0.89	1.88	3.87	7.83	15.90	31.42
78.93	4.82	0.56	1.05	2.08	4.08	8.06	16.09	31.59
129.89	4.78	0.42	0.98	1.98	3.95	7.95	16.00	31.50
210.82	4.81	0.41	0.94	1.93	3.93	7.89	15.93	31.31
288.76	4.92	0.51	1.05	2.04	4.05	8.04	16.07	31.68
366.69	4.96	0.59	1.11	2.11	4.16	8.12	16.14	31.82
444.63	5.06	0.45	0.99	1.98	4.00	7.94	16.00	31.59
498.58	5.06	0.47	1.00	1.99	4.01	7.95	15.99	31.52
573.52	5.06	0.59	1.12	2.14	4.18	8.09	16.18	31.86
651.45	5.18	0.53	1.06	2.03	4.10	8.01	16.05	31.88
729.39	5.19	0.46	1.01	2.01	4.07	7.99	16.03	31.74
810.32	5.36	0.54	1.10	2.06	4.13	8.02	16.10	31.98
888.26	5.30	0.55	1.08	2.03	4.12	7.99	16.09	31.78
966.19	5.50	0.51	1.03	1.98	4.07	7.88	15.97	31.85
1017.15	5.42	0.65	1.22	2.12	4.21	8.03	16.17	31.82

INPUT VSWR

FREQ.	000001	000010	000100	001000	010000	100000	111111
(MHz)							
9.99	1.46	1.44	1.42	1.43	1.46	1.50	1.29
27.97	1.20	1.20	1.19	1.19	1.20	1.21	1.13
78.93	1.16	1.15	1.14	1.15	1.15	1.16	1.11
129.89	1.18	1.18	1.16	1.16	1.17	1.18	1.13
210.82	1.22	1.23	1.19	1.19	1.19	1.21	1.16
288.76	1.24	1.21	1.21	1.22	1.21	1.23	1.20
366.69	1.25	1.23	1.23	1.24	1.24	1.25	1.24
444.63	1.26	1.28	1.24	1.26	1.26	1.27	1.27
498.58	1.25	1.27	1.24	1.27	1.27	1.27	1.30
573.52	1.23	1.22	1.23	1.27	1.27	1.26	1.32
651.45	1.19	1.22	1.21	1.25	1.26	1.24	1.34
729.39	1.18	1.20	1.21	1.23	1.25	1.20	1.34
810.32	1.19	1.21	1.21	1.21	1.23	1.18	1.35
888.26	1.22	1.28	1.24	1.21	1.22	1.16	1.35
966.19	1.27	1.29	1.26	1.20	1.20	1.16	1.36
1017.15	1.31	1.34	1.27	1.20	1.20	1.17	1.36

OUTPUT VSWR

FREQ.	000001	000010	000100	001000	010000	100000	111111
(MHz)							
9.99	1.03	1.66	1.47	1.42	1.23	1.10	1.09
27.97	1.04	1.59	1.22	1.32	1.11	1.05	1.04
78.93	1.05	1.50	1.14	1.21	1.06	1.03	1.02
129.89	1.05	1.20	1.13	1.02	1.06	1.02	1.02
210.82	1.08	1.61	1.18	1.22	1.07	1.05	1.04
288.76	1.04	1.12	1.18	1.08	1.08	1.04	1.05
366.69	1.17	1.57	1.22	1.25	1.10	1.07	1.07
444.63	1.02	1.07	1.20	1.12	1.10	1.07	1.07
498.58	1.17	1.41	1.21	1.23	1.12	1.09	1.09
573.52	1.04	1.28	1.19	1.18	1.11	1.09	1.09
651.45	1.14	1.29	1.17	1.23	1.13	1.12	1.11
729.39	1.02	1.16	1.13	1.19	1.14	1.11	1.12
810.32	1.17	1.25	1.11	1.25	1.17	1.14	1.14
888.26	1.07	1.06	1.10	1.22	1.18	1.14	1.15
966.19	1.20	1.32	1.12	1.28	1.21	1.17	1.17
1017.15	1.15	1.16	1.15	1.31	1.24	1.17	1.17

* Step attenuation above thru-loss (TTL logic 000)

Notes

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

