

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

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)

Digital Step Attenuator Electrical Specifications

MODEL NO.	FREQUENCY (MHz)		PRIMARY ATTENUATION STEPS (dB)						ATTENUATION (dB) LOGIC STATE		VSWR (:1)		
			@ CONTROL PORT										
	f_L	f_U	#1	#2	#3	#4	#5	#6	(1,1,1,1,1,1)** Nom.	(0,0,0,0,0,0) 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

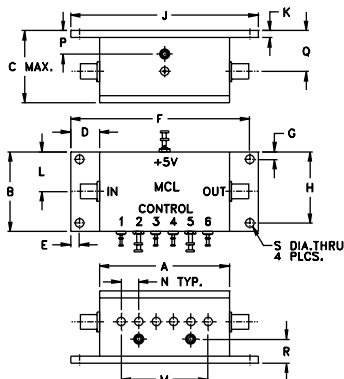
M=100 to 500 MHz

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	74.0	

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)



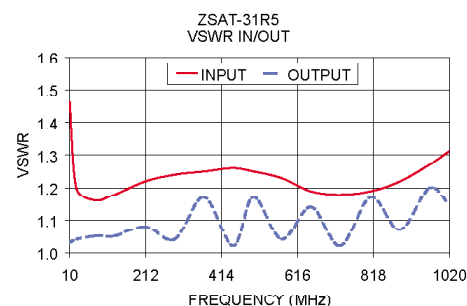
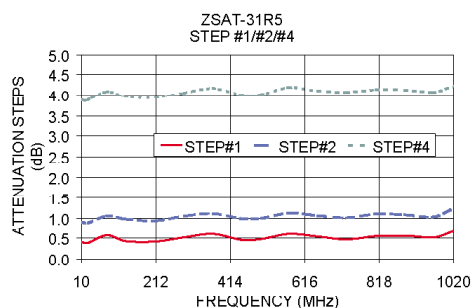
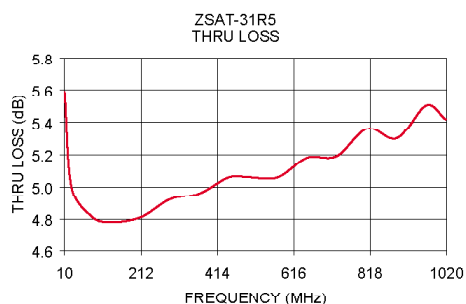
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REV. OR
M97802
ZSAT-31R5
DJV/CP
050328



Step Attenuation* at TTL Control State

FREQ.	000000	000001	000010	000100	001000	010000	100000	111111
(MHz)	(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)