



**THE DATASHEET OF
DAT-31R5A-PP+**



Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=-40°C

| FREQUENCY (MHz) | STEP ATTENUATION* AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|--|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 THRU LOSS | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 1.02 | 0.54 | 1.05 | 2.06 | 4.08 | 8.09 | 16.01 | 31.62 |
| 0.3 | 1.01 | 0.54 | 1.05 | 2.06 | 4.09 | 8.10 | 16.02 | 31.64 |
| 0.5 | 1.01 | 0.54 | 1.05 | 2.06 | 4.09 | 8.10 | 16.02 | 31.63 |
| 1 | 1.01 | 0.54 | 1.05 | 2.06 | 4.09 | 8.09 | 16.01 | 31.64 |
| 5 | 1.04 | 0.54 | 1.04 | 2.05 | 4.08 | 8.08 | 16.00 | 31.63 |
| 10 | 1.04 | 0.54 | 1.04 | 2.05 | 4.08 | 8.08 | 16.00 | 31.62 |
| 50 | 1.06 | 0.54 | 1.04 | 2.05 | 4.08 | 8.07 | 16.00 | 31.61 |
| 100 | 1.06 | 0.54 | 1.04 | 2.05 | 4.07 | 8.07 | 15.99 | 31.60 |
| 200 | 1.07 | 0.54 | 1.04 | 2.05 | 4.07 | 8.07 | 15.99 | 31.60 |
| 300 | 1.07 | 0.54 | 1.04 | 2.05 | 4.08 | 8.08 | 16.01 | 31.61 |
| 400 | 1.07 | 0.54 | 1.04 | 2.05 | 4.08 | 8.08 | 16.01 | 31.61 |
| 500 | 1.08 | 0.54 | 1.04 | 2.05 | 4.08 | 8.09 | 16.02 | 31.59 |
| 600 | 1.10 | 0.54 | 1.04 | 2.05 | 4.08 | 8.08 | 16.01 | 31.54 |
| 700 | 1.12 | 0.54 | 1.04 | 2.05 | 4.07 | 8.08 | 16.00 | 31.48 |
| 800 | 1.15 | 0.54 | 1.04 | 2.05 | 4.07 | 8.08 | 15.99 | 31.41 |
| 900 | 1.18 | 0.54 | 1.04 | 2.05 | 4.07 | 8.08 | 15.99 | 31.33 |
| 1000 | 1.20 | 0.54 | 1.04 | 2.05 | 4.07 | 8.09 | 16.00 | 31.34 |
| 1100 | 1.21 | 0.54 | 1.04 | 2.05 | 4.07 | 8.09 | 16.01 | 31.39 |
| 1200 | 1.23 | 0.54 | 1.04 | 2.05 | 4.07 | 8.10 | 16.04 | 31.52 |
| 1300 | 1.25 | 0.54 | 1.04 | 2.05 | 4.07 | 8.11 | 16.04 | 31.49 |
| 1400 | 1.27 | 0.54 | 1.04 | 2.05 | 4.07 | 8.12 | 16.08 | 31.59 |
| 1500 | 1.30 | 0.54 | 1.04 | 2.05 | 4.08 | 8.13 | 16.10 | 31.63 |
| 1600 | 1.32 | 0.54 | 1.04 | 2.05 | 4.08 | 8.14 | 16.12 | 31.64 |
| 1700 | 1.35 | 0.54 | 1.05 | 2.06 | 4.09 | 8.16 | 16.15 | 31.66 |
| 1800 | 1.36 | 0.55 | 1.05 | 2.06 | 4.09 | 8.18 | 16.17 | 31.65 |
| 1900 | 1.37 | 0.55 | 1.06 | 2.07 | 4.11 | 8.21 | 16.22 | 31.66 |
| 2000 | 1.38 | 0.55 | 1.06 | 2.08 | 4.13 | 8.24 | 16.27 | 31.69 |
| 2100 | 1.40 | 0.56 | 1.07 | 2.09 | 4.15 | 8.29 | 16.34 | 31.73 |
| 2200 | 1.42 | 0.56 | 1.08 | 2.11 | 4.17 | 8.33 | 16.40 | 31.73 |
| 2300 | 1.44 | 0.57 | 1.08 | 2.12 | 4.19 | 8.38 | 16.47 | 31.72 |
| 2400 | 1.45 | 0.57 | 1.09 | 2.14 | 4.22 | 8.43 | 16.55 | 31.80 |
| 2500 | 1.46 | 0.58 | 1.10 | 2.15 | 4.24 | 8.49 | 16.63 | 31.77 |
| 2600 | 1.48 | 0.58 | 1.11 | 2.16 | 4.26 | 8.54 | 16.70 | 31.69 |
| 2700 | 1.50 | 0.58 | 1.11 | 2.17 | 4.28 | 8.59 | 16.77 | 31.71 |
| 2800 | 1.52 | 0.58 | 1.11 | 2.17 | 4.28 | 8.62 | 16.81 | 31.60 |
| 2900 | 1.53 | 0.58 | 1.11 | 2.17 | 4.28 | 8.64 | 16.87 | 31.63 |
| 3000 | 1.53 | 0.58 | 1.10 | 2.15 | 4.26 | 8.65 | 16.89 | 31.64 |
| 3200 | 1.52 | 0.56 | 1.08 | 2.12 | 4.22 | 8.64 | 16.92 | 31.49 |
| 3400 | 1.55 | 0.55 | 1.05 | 2.09 | 4.17 | 8.60 | 16.87 | 31.09 |
| 3600 | 1.62 | 0.54 | 1.04 | 2.06 | 4.13 | 8.58 | 16.86 | 31.18 |
| 3800 | 1.70 | 0.54 | 1.03 | 2.05 | 4.12 | 8.61 | 16.93 | 30.92 |
| 4000 | 1.76 | 0.54 | 1.03 | 2.05 | 4.11 | 8.62 | 16.92 | 31.00 |
| 4200 | 1.77 | 0.54 | 1.03 | 2.06 | 4.13 | 8.67 | 17.02 | 31.14 |
| 4400 | 1.84 | 0.55 | 1.04 | 2.08 | 4.16 | 8.78 | 17.28 | 32.03 |
| 4600 | 1.89 | 0.56 | 1.06 | 2.11 | 4.22 | 8.94 | 17.69 | 32.98 |
| 4800 | 1.94 | 0.57 | 1.09 | 2.15 | 4.29 | 9.13 | 18.04 | 32.99 |
| 5000 | 1.97 | 0.58 | 1.07 | 2.19 | 4.36 | 9.33 | 18.42 | 32.53 |

* Step Attenuation above Thru Loss (TTL Logic 00000).



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IF/RF MICROWAVE COMPONENTS

Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=-40°C

| FREQUENCY (MHz) | INPUT RETURN LOSS AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|--|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 0 dB | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 19.00 | 20.76 | 22.53 | 20.82 | 22.40 | 27.13 | 35.92 | 29.77 |
| 0.3 | 19.19 | 20.95 | 22.75 | 21.04 | 22.65 | 27.42 | 35.75 | 29.71 |
| 0.5 | 19.22 | 20.98 | 22.80 | 21.06 | 22.69 | 27.58 | 35.46 | 29.73 |
| 1 | 19.31 | 21.08 | 22.91 | 21.13 | 22.72 | 27.53 | 35.46 | 29.68 |
| 5 | 19.24 | 21.02 | 22.83 | 21.06 | 22.63 | 27.38 | 35.60 | 29.70 |
| 10 | 19.22 | 21.00 | 22.81 | 21.03 | 22.60 | 27.34 | 35.73 | 29.74 |
| 50 | 19.09 | 20.81 | 22.55 | 20.79 | 22.26 | 26.68 | 37.87 | 30.87 |
| 100 | 19.07 | 20.74 | 22.40 | 20.63 | 21.97 | 26.00 | 41.68 | 32.40 |
| 200 | 18.92 | 20.56 | 22.19 | 20.53 | 21.90 | 26.00 | 39.47 | 31.63 |
| 300 | 19.36 | 21.11 | 22.86 | 21.13 | 22.69 | 27.45 | 35.14 | 29.36 |
| 400 | 19.54 | 21.36 | 23.21 | 21.40 | 23.04 | 28.12 | 34.37 | 29.12 |
| 500 | 18.96 | 20.68 | 22.41 | 20.77 | 22.35 | 27.02 | 36.15 | 30.53 |
| 600 | 19.07 | 20.75 | 22.42 | 20.71 | 22.16 | 26.54 | 38.52 | 31.54 |
| 700 | 19.21 | 20.86 | 22.50 | 20.75 | 22.13 | 26.44 | 39.50 | 31.83 |
| 800 | 19.11 | 20.69 | 22.24 | 20.52 | 21.81 | 25.90 | 42.91 | 32.90 |
| 900 | 18.91 | 20.40 | 21.84 | 20.25 | 21.53 | 25.56 | 47.22 | 32.51 |
| 1000 | 18.65 | 20.07 | 21.41 | 19.98 | 21.28 | 25.36 | 44.98 | 31.53 |
| 1100 | 18.40 | 19.74 | 20.99 | 19.69 | 20.98 | 25.05 | 42.45 | 30.72 |
| 1200 | 18.21 | 19.45 | 20.59 | 19.42 | 20.68 | 24.63 | 38.94 | 29.65 |
| 1300 | 17.90 | 19.02 | 20.03 | 19.08 | 20.34 | 24.26 | 34.47 | 27.69 |
| 1400 | 17.95 | 19.01 | 19.94 | 19.16 | 20.50 | 24.66 | 32.17 | 26.18 |
| 1500 | 17.71 | 18.69 | 19.54 | 18.94 | 20.35 | 24.63 | 31.04 | 25.42 |
| 1600 | 17.31 | 18.19 | 18.94 | 18.55 | 19.98 | 24.17 | 29.13 | 24.24 |
| 1700 | 16.82 | 17.61 | 18.28 | 18.11 | 19.58 | 23.70 | 27.36 | 23.06 |
| 1800 | 16.33 | 17.05 | 17.64 | 17.69 | 19.23 | 23.23 | 25.46 | 21.75 |
| 1900 | 16.08 | 16.77 | 17.31 | 17.55 | 19.18 | 23.10 | 23.76 | 20.56 |
| 2000 | 16.13 | 16.81 | 17.32 | 17.68 | 19.37 | 23.13 | 22.52 | 19.69 |
| 2100 | 16.23 | 16.90 | 17.37 | 17.82 | 19.53 | 22.98 | 21.48 | 18.94 |
| 2200 | 16.48 | 17.16 | 17.60 | 18.15 | 19.91 | 23.00 | 20.63 | 18.35 |
| 2300 | 16.84 | 17.57 | 17.99 | 18.60 | 20.40 | 23.00 | 19.88 | 17.84 |
| 2400 | 17.36 | 18.12 | 18.49 | 19.18 | 20.90 | 22.55 | 18.93 | 17.16 |
| 2500 | 18.35 | 19.14 | 19.43 | 20.18 | 21.67 | 21.96 | 17.98 | 16.48 |
| 2600 | 19.85 | 20.80 | 20.95 | 21.79 | 22.94 | 21.59 | 17.27 | 16.01 |
| 2700 | 21.99 | 23.35 | 23.32 | 24.28 | 24.74 | 21.28 | 16.73 | 15.71 |
| 2800 | 24.39 | 27.12 | 27.01 | 28.22 | 26.97 | 20.96 | 16.31 | 15.54 |
| 2900 | 26.82 | 33.66 | 33.19 | 35.61 | 28.31 | 20.39 | 15.88 | 15.33 |
| 3000 | 26.78 | 35.73 | 40.37 | 46.78 | 28.58 | 20.07 | 15.69 | 15.34 |
| 3200 | 23.02 | 26.25 | 28.51 | 28.46 | 26.57 | 19.72 | 15.61 | 15.69 |
| 3400 | 21.46 | 23.85 | 25.67 | 25.65 | 25.57 | 19.96 | 15.93 | 16.32 |
| 3600 | 22.18 | 24.49 | 26.15 | 26.04 | 26.02 | 20.45 | 16.34 | 16.94 |
| 3800 | 23.83 | 26.47 | 28.17 | 27.70 | 27.58 | 21.28 | 16.88 | 17.66 |
| 4000 | 33.02 | 37.20 | 32.64 | 40.99 | 31.83 | 22.03 | 17.21 | 17.70 |
| 4200 | 31.61 | 27.92 | 25.49 | 29.02 | 27.40 | 21.59 | 17.20 | 17.09 |
| 4400 | 22.12 | 20.81 | 19.79 | 21.43 | 21.03 | 18.64 | 15.73 | 15.24 |
| 4600 | 18.52 | 17.66 | 16.95 | 18.09 | 17.76 | 16.23 | 14.16 | 13.48 |
| 4800 | 17.44 | 16.57 | 15.76 | 16.69 | 16.15 | 14.54 | 12.79 | 12.17 |
| 5000 | 16.78 | 15.78 | 15.06 | 15.64 | 14.72 | 12.97 | 11.44 | 11.01 |



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Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=-40°C

| FREQUENCY (MHz) | OUTPUT RETURN LOSS AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|---|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 0 dB | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 18.65 | 19.43 | 19.78 | 25.66 | 31.47 | 44.42 | 37.54 | 29.00 |
| 0.3 | 18.85 | 19.64 | 20.00 | 25.89 | 31.83 | 45.30 | 38.09 | 29.00 |
| 0.5 | 18.93 | 19.71 | 20.06 | 26.02 | 32.06 | 47.05 | 38.91 | 28.99 |
| 1 | 19.02 | 19.80 | 20.14 | 26.15 | 32.22 | 47.07 | 38.70 | 28.93 |
| 5 | 19.06 | 19.85 | 20.18 | 26.24 | 32.23 | 46.66 | 38.27 | 28.96 |
| 10 | 19.06 | 19.84 | 20.17 | 26.20 | 32.18 | 45.98 | 37.99 | 29.05 |
| 50 | 18.97 | 19.72 | 20.04 | 25.84 | 31.35 | 41.70 | 36.01 | 29.90 |
| 100 | 18.83 | 19.54 | 19.83 | 25.33 | 30.17 | 38.05 | 33.72 | 31.44 |
| 200 | 18.71 | 19.42 | 19.71 | 25.02 | 29.49 | 36.44 | 33.52 | 30.94 |
| 300 | 18.56 | 19.30 | 19.64 | 24.97 | 29.67 | 37.49 | 35.16 | 29.72 |
| 400 | 18.86 | 19.62 | 19.95 | 25.57 | 30.52 | 38.99 | 36.79 | 28.91 |
| 500 | 19.36 | 20.12 | 20.44 | 26.44 | 31.84 | 43.40 | 38.35 | 28.81 |
| 600 | 19.28 | 19.99 | 20.25 | 25.89 | 30.60 | 39.34 | 34.82 | 30.32 |
| 700 | 19.10 | 19.73 | 19.97 | 25.18 | 29.05 | 35.52 | 33.07 | 30.68 |
| 800 | 19.14 | 19.70 | 19.90 | 24.82 | 28.06 | 33.45 | 31.78 | 30.58 |
| 900 | 18.95 | 19.47 | 19.63 | 24.11 | 26.77 | 31.38 | 30.86 | 29.44 |
| 1000 | 18.95 | 19.44 | 19.60 | 23.85 | 26.28 | 30.89 | 31.25 | 28.36 |
| 1100 | 18.79 | 19.26 | 19.42 | 23.50 | 25.88 | 30.67 | 31.33 | 28.15 |
| 1200 | 18.57 | 19.00 | 19.16 | 22.92 | 25.07 | 29.73 | 31.03 | 27.42 |
| 1300 | 18.25 | 18.67 | 18.87 | 22.32 | 24.40 | 29.15 | 31.36 | 26.67 |
| 1400 | 17.70 | 18.13 | 18.36 | 21.54 | 23.57 | 28.29 | 31.32 | 25.86 |
| 1500 | 17.34 | 17.76 | 18.00 | 20.97 | 22.89 | 27.48 | 31.26 | 24.95 |
| 1600 | 16.89 | 17.31 | 17.57 | 20.25 | 22.06 | 26.51 | 30.96 | 23.96 |
| 1700 | 16.39 | 16.80 | 17.09 | 19.49 | 21.17 | 25.35 | 30.24 | 22.74 |
| 1800 | 15.90 | 16.33 | 16.65 | 18.80 | 20.38 | 24.31 | 29.43 | 21.52 |
| 1900 | 15.63 | 16.08 | 16.44 | 18.42 | 19.91 | 23.61 | 28.52 | 20.49 |
| 2000 | 15.63 | 16.11 | 16.50 | 18.43 | 19.87 | 23.40 | 27.86 | 19.89 |
| 2100 | 15.62 | 16.14 | 16.55 | 18.48 | 19.85 | 23.15 | 26.86 | 19.35 |
| 2200 | 15.77 | 16.32 | 16.74 | 18.60 | 19.81 | 22.67 | 25.44 | 18.70 |
| 2300 | 16.19 | 16.76 | 17.21 | 18.99 | 19.96 | 22.22 | 23.97 | 18.09 |
| 2400 | 16.71 | 17.34 | 17.83 | 19.55 | 20.24 | 21.77 | 22.59 | 17.58 |
| 2500 | 17.42 | 18.15 | 18.70 | 20.52 | 20.85 | 21.53 | 21.50 | 17.24 |
| 2600 | 18.48 | 19.36 | 20.00 | 22.08 | 21.79 | 21.37 | 20.61 | 17.04 |
| 2700 | 19.50 | 20.63 | 21.40 | 24.09 | 22.84 | 21.18 | 19.85 | 16.88 |
| 2800 | 20.88 | 22.39 | 23.43 | 27.35 | 24.02 | 20.81 | 19.05 | 16.75 |
| 2900 | 21.49 | 23.42 | 24.81 | 32.93 | 25.45 | 20.64 | 18.49 | 16.87 |
| 3000 | 21.24 | 23.23 | 24.71 | 44.05 | 26.76 | 20.56 | 18.15 | 17.19 |
| 3200 | 19.73 | 21.32 | 22.41 | 30.45 | 27.55 | 20.66 | 17.97 | 17.97 |
| 3400 | 18.48 | 19.72 | 20.50 | 25.88 | 26.81 | 20.76 | 17.90 | 19.26 |
| 3600 | 17.95 | 19.01 | 19.61 | 24.95 | 27.75 | 21.84 | 18.58 | 21.24 |
| 3800 | 17.80 | 18.74 | 19.22 | 25.01 | 29.80 | 23.90 | 19.90 | 23.70 |
| 4000 | 18.51 | 19.31 | 19.64 | 26.34 | 32.89 | 29.07 | 22.47 | 24.59 |
| 4200 | 19.40 | 20.06 | 20.32 | 26.57 | 29.49 | 33.21 | 24.01 | 22.05 |
| 4400 | 20.61 | 21.10 | 21.28 | 24.98 | 24.75 | 26.48 | 22.38 | 18.76 |
| 4600 | 23.70 | 23.92 | 23.97 | 23.77 | 22.06 | 21.45 | 18.95 | 16.56 |
| 4800 | 27.75 | 27.09 | 26.78 | 21.93 | 19.81 | 18.12 | 16.07 | 14.92 |
| 5000 | 32.07 | 28.94 | 27.57 | 20.31 | 18.22 | 15.83 | 13.93 | 13.92 |



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Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=+25degC

| FREQUENCY (MHz) | STEP ATTENUATION* AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|--|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 THRU LOSS | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 1.13 | 0.53 | 1.02 | 2.02 | 4.02 | 7.97 | 15.91 | 31.41 |
| 0.3 | 1.12 | 0.53 | 1.02 | 2.02 | 4.03 | 7.98 | 15.92 | 31.44 |
| 0.5 | 1.12 | 0.53 | 1.02 | 2.02 | 4.03 | 7.98 | 15.92 | 31.43 |
| 1 | 1.12 | 0.53 | 1.02 | 2.02 | 4.02 | 7.97 | 15.91 | 31.40 |
| 5 | 1.15 | 0.52 | 1.02 | 2.01 | 4.02 | 7.97 | 15.90 | 31.39 |
| 10 | 1.15 | 0.52 | 1.02 | 2.01 | 4.02 | 7.97 | 15.91 | 31.41 |
| 50 | 1.16 | 0.52 | 1.02 | 2.01 | 4.02 | 7.97 | 15.91 | 31.40 |
| 100 | 1.16 | 0.52 | 1.02 | 2.01 | 4.02 | 7.97 | 15.91 | 31.40 |
| 200 | 1.16 | 0.52 | 1.02 | 2.01 | 4.02 | 7.97 | 15.91 | 31.40 |
| 300 | 1.17 | 0.52 | 1.02 | 2.01 | 4.02 | 7.97 | 15.91 | 31.39 |
| 400 | 1.18 | 0.52 | 1.02 | 2.01 | 4.01 | 7.97 | 15.91 | 31.38 |
| 500 | 1.19 | 0.52 | 1.02 | 2.01 | 4.01 | 7.97 | 15.91 | 31.37 |
| 600 | 1.21 | 0.52 | 1.01 | 2.01 | 4.01 | 7.97 | 15.91 | 31.34 |
| 700 | 1.22 | 0.52 | 1.01 | 2.01 | 4.01 | 7.97 | 15.91 | 31.30 |
| 800 | 1.24 | 0.52 | 1.01 | 2.01 | 4.01 | 7.97 | 15.91 | 31.24 |
| 900 | 1.26 | 0.52 | 1.01 | 2.01 | 4.01 | 7.97 | 15.91 | 31.20 |
| 1000 | 1.29 | 0.52 | 1.01 | 2.00 | 4.01 | 7.97 | 15.91 | 31.18 |
| 1100 | 1.31 | 0.52 | 1.01 | 2.00 | 4.00 | 7.98 | 15.92 | 31.20 |
| 1200 | 1.34 | 0.52 | 1.01 | 2.00 | 4.00 | 7.98 | 15.93 | 31.25 |
| 1300 | 1.36 | 0.52 | 1.01 | 2.00 | 4.00 | 7.99 | 15.94 | 31.31 |
| 1400 | 1.38 | 0.52 | 1.01 | 2.00 | 4.00 | 7.99 | 15.96 | 31.34 |
| 1500 | 1.41 | 0.52 | 1.01 | 2.00 | 4.00 | 8.00 | 15.97 | 31.39 |
| 1600 | 1.43 | 0.52 | 1.02 | 2.01 | 4.00 | 8.01 | 15.99 | 31.44 |
| 1700 | 1.46 | 0.52 | 1.02 | 2.01 | 4.01 | 8.02 | 16.02 | 31.50 |
| 1800 | 1.48 | 0.53 | 1.02 | 2.02 | 4.01 | 8.04 | 16.05 | 31.55 |
| 1900 | 1.50 | 0.53 | 1.03 | 2.02 | 4.03 | 8.06 | 16.09 | 31.58 |
| 2000 | 1.51 | 0.53 | 1.03 | 2.03 | 4.04 | 8.09 | 16.14 | 31.59 |
| 2100 | 1.53 | 0.54 | 1.04 | 2.04 | 4.06 | 8.13 | 16.20 | 31.63 |
| 2200 | 1.55 | 0.54 | 1.05 | 2.06 | 4.08 | 8.18 | 16.27 | 31.69 |
| 2300 | 1.56 | 0.55 | 1.05 | 2.07 | 4.10 | 8.23 | 16.35 | 31.76 |
| 2400 | 1.57 | 0.55 | 1.06 | 2.09 | 4.12 | 8.28 | 16.43 | 31.77 |
| 2500 | 1.58 | 0.55 | 1.07 | 2.10 | 4.14 | 8.33 | 16.51 | 31.74 |
| 2600 | 1.60 | 0.56 | 1.07 | 2.11 | 4.16 | 8.38 | 16.58 | 31.74 |
| 2700 | 1.62 | 0.56 | 1.07 | 2.11 | 4.17 | 8.43 | 16.66 | 31.77 |
| 2800 | 1.64 | 0.56 | 1.07 | 2.11 | 4.17 | 8.45 | 16.71 | 31.69 |
| 2900 | 1.65 | 0.55 | 1.06 | 2.10 | 4.16 | 8.47 | 16.75 | 31.72 |
| 3000 | 1.66 | 0.55 | 1.06 | 2.09 | 4.15 | 8.49 | 16.79 | 31.77 |
| 3200 | 1.64 | 0.54 | 1.04 | 2.06 | 4.11 | 8.49 | 16.85 | 31.68 |
| 3400 | 1.68 | 0.53 | 1.02 | 2.03 | 4.07 | 8.47 | 16.84 | 31.45 |
| 3600 | 1.75 | 0.52 | 1.01 | 2.01 | 4.04 | 8.47 | 16.86 | 31.37 |
| 3800 | 1.83 | 0.52 | 1.00 | 2.01 | 4.04 | 8.49 | 16.89 | 31.34 |
| 4000 | 1.88 | 0.52 | 1.00 | 2.02 | 4.05 | 8.52 | 16.95 | 31.45 |
| 4200 | 1.91 | 0.52 | 1.01 | 2.03 | 4.06 | 8.58 | 17.08 | 31.87 |
| 4400 | 1.99 | 0.53 | 1.02 | 2.05 | 4.10 | 8.68 | 17.35 | 32.80 |
| 4600 | 2.03 | 0.54 | 1.04 | 2.09 | 4.15 | 8.83 | 17.71 | 33.46 |
| 4800 | 2.07 | 0.55 | 1.06 | 2.12 | 4.21 | 9.03 | 18.14 | 34.07 |
| 5000 | 2.13 | 0.56 | 1.05 | 2.17 | 4.30 | 9.28 | 18.64 | 33.44 |

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IF/RF MICROWAVE COMPONENTS

Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=+25degC

| FREQUENCY (MHz) | INPUT RETURN LOSS AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|--|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 0 dB | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 18.07 | 19.30 | 20.46 | 18.57 | 19.08 | 21.02 | 29.10 | 34.94 |
| 0.3 | 18.23 | 19.44 | 20.61 | 18.72 | 19.23 | 21.16 | 29.18 | 34.97 |
| 0.5 | 18.23 | 19.45 | 20.61 | 18.73 | 19.24 | 21.20 | 29.26 | 34.96 |
| 1 | 18.32 | 19.53 | 20.71 | 18.78 | 19.28 | 21.18 | 29.26 | 35.06 |
| 5 | 18.28 | 19.51 | 20.69 | 18.75 | 19.24 | 21.15 | 29.23 | 35.08 |
| 10 | 18.26 | 19.50 | 20.67 | 18.74 | 19.23 | 21.15 | 29.20 | 35.04 |
| 50 | 18.22 | 19.44 | 20.60 | 18.70 | 19.19 | 21.08 | 28.98 | 34.60 |
| 100 | 18.31 | 19.53 | 20.67 | 18.76 | 19.23 | 21.11 | 28.92 | 34.43 |
| 200 | 18.25 | 19.47 | 20.60 | 18.73 | 19.19 | 21.05 | 28.62 | 33.93 |
| 300 | 18.29 | 19.50 | 20.62 | 18.72 | 19.15 | 20.94 | 28.14 | 33.20 |
| 400 | 18.42 | 19.61 | 20.70 | 18.76 | 19.13 | 20.84 | 27.71 | 32.52 |
| 500 | 18.45 | 19.61 | 20.70 | 18.73 | 19.07 | 20.73 | 27.28 | 31.89 |
| 600 | 18.48 | 19.62 | 20.68 | 18.68 | 18.98 | 20.54 | 26.66 | 30.99 |
| 700 | 18.41 | 19.50 | 20.50 | 18.51 | 18.75 | 20.21 | 25.87 | 29.75 |
| 800 | 18.34 | 19.38 | 20.32 | 18.34 | 18.52 | 19.89 | 25.22 | 28.60 |
| 900 | 18.25 | 19.24 | 20.13 | 18.20 | 18.36 | 19.71 | 24.91 | 27.87 |
| 1000 | 18.14 | 19.07 | 19.91 | 18.07 | 18.22 | 19.58 | 24.67 | 27.21 |
| 1100 | 17.87 | 18.72 | 19.50 | 17.82 | 18.00 | 19.38 | 24.37 | 26.44 |
| 1200 | 17.61 | 18.38 | 19.07 | 17.59 | 17.79 | 19.21 | 24.11 | 25.61 |
| 1300 | 17.19 | 17.88 | 18.50 | 17.28 | 17.58 | 19.12 | 24.03 | 24.91 |
| 1400 | 16.77 | 17.40 | 17.95 | 17.02 | 17.45 | 19.16 | 24.18 | 24.37 |
| 1500 | 16.27 | 16.85 | 17.36 | 16.71 | 17.28 | 19.21 | 24.32 | 23.83 |
| 1600 | 15.79 | 16.33 | 16.80 | 16.42 | 17.15 | 19.31 | 24.50 | 23.27 |
| 1700 | 15.37 | 15.89 | 16.32 | 16.18 | 17.06 | 19.49 | 24.69 | 22.70 |
| 1800 | 15.04 | 15.54 | 15.94 | 16.00 | 17.05 | 19.77 | 24.86 | 22.16 |
| 1900 | 14.80 | 15.29 | 15.67 | 15.91 | 17.09 | 20.11 | 24.91 | 21.63 |
| 2000 | 14.69 | 15.18 | 15.53 | 15.91 | 17.23 | 20.52 | 24.72 | 21.08 |
| 2100 | 14.80 | 15.29 | 15.62 | 16.14 | 17.59 | 21.15 | 24.31 | 20.50 |
| 2200 | 15.17 | 15.67 | 15.98 | 16.62 | 18.20 | 22.05 | 23.83 | 20.07 |
| 2300 | 15.76 | 16.29 | 16.58 | 17.33 | 19.05 | 23.14 | 23.29 | 19.75 |
| 2400 | 16.50 | 17.07 | 17.33 | 18.17 | 20.02 | 24.15 | 22.52 | 19.36 |
| 2500 | 17.64 | 18.27 | 18.48 | 19.43 | 21.41 | 25.09 | 21.58 | 18.92 |
| 2600 | 19.24 | 20.00 | 20.15 | 21.29 | 23.44 | 25.71 | 20.56 | 18.48 |
| 2700 | 21.48 | 22.60 | 22.73 | 24.13 | 26.70 | 25.97 | 19.79 | 18.26 |
| 2800 | 23.77 | 25.89 | 26.25 | 27.83 | 31.67 | 25.71 | 19.28 | 18.24 |
| 2900 | 25.67 | 29.79 | 31.32 | 32.34 | 39.65 | 24.96 | 18.88 | 18.25 |
| 3000 | 26.36 | 32.77 | 43.12 | 35.44 | 37.95 | 23.73 | 18.34 | 18.12 |
| 3200 | 23.13 | 26.13 | 29.03 | 26.60 | 26.83 | 21.47 | 17.47 | 18.11 |
| 3400 | 20.97 | 23.07 | 25.12 | 23.27 | 23.91 | 20.87 | 17.58 | 19.06 |
| 3600 | 21.06 | 23.11 | 25.14 | 22.86 | 23.39 | 21.01 | 17.95 | 20.15 |
| 3800 | 23.19 | 25.94 | 28.99 | 24.49 | 25.08 | 22.94 | 19.38 | 22.52 |
| 4000 | 27.72 | 31.14 | 32.48 | 28.48 | 31.00 | 28.58 | 21.79 | 24.46 |
| 4200 | 24.50 | 24.08 | 23.22 | 25.48 | 28.42 | 30.76 | 22.55 | 22.01 |
| 4400 | 19.24 | 18.71 | 18.15 | 19.99 | 21.09 | 21.67 | 19.20 | 17.70 |
| 4600 | 16.66 | 16.18 | 15.70 | 17.13 | 17.63 | 17.58 | 16.10 | 14.84 |
| 4800 | 16.02 | 15.39 | 14.79 | 15.98 | 15.91 | 15.04 | 13.69 | 12.86 |
| 5000 | 16.03 | 15.20 | 14.57 | 15.41 | 14.84 | 13.46 | 12.12 | 11.62 |



REV. B
DAT-31R5A-PP+
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IF/RF MICROWAVE COMPONENTS

Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=+25degC

| FREQUENCY (MHz) | OUTPUT RETURN LOSS AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|---|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 0 dB | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 17.79 | 18.18 | 18.23 | 22.11 | 24.27 | 25.94 | 23.68 | 37.34 |
| 0.3 | 17.94 | 18.33 | 18.38 | 22.25 | 24.40 | 26.01 | 23.80 | 37.38 |
| 0.5 | 18.01 | 18.39 | 18.44 | 22.33 | 24.48 | 26.11 | 23.89 | 37.31 |
| 1 | 18.10 | 18.47 | 18.51 | 22.41 | 24.53 | 26.11 | 23.83 | 37.43 |
| 5 | 18.14 | 18.53 | 18.55 | 22.47 | 24.58 | 26.12 | 23.83 | 37.44 |
| 10 | 18.15 | 18.53 | 18.56 | 22.47 | 24.56 | 26.09 | 23.80 | 37.32 |
| 50 | 18.09 | 18.49 | 18.51 | 22.40 | 24.46 | 26.00 | 23.75 | 36.80 |
| 100 | 18.04 | 18.42 | 18.45 | 22.27 | 24.29 | 25.79 | 23.61 | 36.02 |
| 200 | 18.08 | 18.45 | 18.48 | 22.25 | 24.23 | 25.67 | 23.51 | 35.44 |
| 300 | 18.17 | 18.53 | 18.54 | 22.29 | 24.19 | 25.53 | 23.37 | 34.66 |
| 400 | 18.34 | 18.67 | 18.67 | 22.38 | 24.16 | 25.36 | 23.19 | 33.78 |
| 500 | 18.36 | 18.67 | 18.65 | 22.30 | 23.95 | 25.05 | 22.91 | 32.63 |
| 600 | 18.49 | 18.77 | 18.71 | 22.30 | 23.78 | 24.73 | 22.61 | 31.40 |
| 700 | 18.62 | 18.84 | 18.75 | 22.24 | 23.52 | 24.31 | 22.25 | 29.99 |
| 800 | 18.70 | 18.86 | 18.74 | 22.08 | 23.16 | 23.85 | 21.85 | 28.61 |
| 900 | 18.51 | 18.65 | 18.51 | 21.64 | 22.59 | 23.27 | 21.44 | 27.30 |
| 1000 | 18.25 | 18.35 | 18.21 | 21.12 | 21.98 | 22.71 | 21.07 | 26.10 |
| 1100 | 17.95 | 18.03 | 17.90 | 20.59 | 21.40 | 22.25 | 20.80 | 25.08 |
| 1200 | 17.61 | 17.68 | 17.58 | 20.04 | 20.83 | 21.85 | 20.65 | 24.15 |
| 1300 | 17.12 | 17.21 | 17.15 | 19.39 | 20.23 | 21.50 | 20.62 | 23.32 |
| 1400 | 16.59 | 16.71 | 16.70 | 18.73 | 19.62 | 21.20 | 20.69 | 22.54 |
| 1500 | 16.05 | 16.20 | 16.24 | 18.09 | 19.05 | 20.91 | 20.87 | 21.82 |
| 1600 | 15.54 | 15.72 | 15.81 | 17.50 | 18.54 | 20.72 | 21.22 | 21.19 |
| 1700 | 15.09 | 15.31 | 15.45 | 17.02 | 18.12 | 20.61 | 21.71 | 20.64 |
| 1800 | 14.74 | 14.99 | 15.17 | 16.65 | 17.81 | 20.62 | 22.44 | 20.18 |
| 1900 | 14.51 | 14.79 | 15.01 | 16.39 | 17.59 | 20.70 | 23.34 | 19.74 |
| 2000 | 14.40 | 14.72 | 14.97 | 16.28 | 17.51 | 20.89 | 24.45 | 19.38 |
| 2100 | 14.44 | 14.79 | 15.07 | 16.34 | 17.59 | 21.21 | 25.78 | 19.08 |
| 2200 | 14.69 | 15.08 | 15.40 | 16.63 | 17.87 | 21.68 | 27.08 | 18.84 |
| 2300 | 15.21 | 15.63 | 15.98 | 17.20 | 18.39 | 22.31 | 28.02 | 18.67 |
| 2400 | 15.92 | 16.39 | 16.78 | 17.99 | 19.10 | 23.00 | 27.90 | 18.58 |
| 2500 | 16.87 | 17.40 | 17.84 | 19.12 | 20.12 | 23.78 | 26.82 | 18.59 |
| 2600 | 18.07 | 18.71 | 19.22 | 20.72 | 21.51 | 24.46 | 25.20 | 18.63 |
| 2700 | 19.48 | 20.29 | 20.92 | 23.03 | 23.44 | 25.01 | 23.68 | 18.81 |
| 2800 | 20.96 | 22.04 | 22.86 | 26.40 | 25.92 | 25.01 | 22.28 | 19.06 |
| 2900 | 21.77 | 23.10 | 24.08 | 31.40 | 29.02 | 24.68 | 21.17 | 19.46 |
| 3000 | 21.56 | 22.95 | 23.88 | 40.19 | 33.02 | 24.12 | 20.25 | 20.02 |
| 3200 | 19.37 | 20.43 | 20.97 | 28.86 | 32.60 | 23.13 | 19.20 | 21.82 |
| 3400 | 17.69 | 18.49 | 18.82 | 24.08 | 27.23 | 22.34 | 18.73 | 25.01 |
| 3600 | 17.02 | 17.67 | 17.87 | 22.48 | 25.20 | 22.60 | 19.19 | 31.52 |
| 3800 | 17.45 | 17.95 | 18.00 | 22.53 | 24.69 | 24.14 | 20.72 | 37.76 |
| 4000 | 18.23 | 18.53 | 18.47 | 22.43 | 23.78 | 27.27 | 24.11 | 26.48 |
| 4200 | 18.75 | 18.87 | 18.82 | 21.39 | 22.10 | 30.47 | 31.70 | 21.46 |
| 4400 | 19.35 | 19.37 | 19.40 | 20.34 | 20.63 | 27.36 | 29.27 | 18.44 |
| 4600 | 20.65 | 20.63 | 20.76 | 19.74 | 19.57 | 22.63 | 21.44 | 16.44 |
| 4800 | 23.29 | 23.07 | 23.15 | 19.79 | 19.03 | 19.38 | 17.40 | 15.22 |
| 5000 | 28.07 | 26.62 | 26.00 | 19.76 | 18.44 | 16.85 | 14.70 | 14.50 |



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IF/RF MICROWAVE COMPONENTS

Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=+105°C

| FREQUENCY (MHz) | STEP ATTENUATION* AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|--|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 THRU LOSS | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 1.30 | 0.51 | 1.00 | 1.98 | 3.97 | 7.87 | 15.81 | 31.15 |
| 0.3 | 1.28 | 0.51 | 1.00 | 1.98 | 3.97 | 7.88 | 15.82 | 31.17 |
| 0.5 | 1.28 | 0.51 | 1.00 | 1.98 | 3.97 | 7.88 | 15.82 | 31.14 |
| 1 | 1.29 | 0.51 | 1.00 | 1.98 | 3.97 | 7.87 | 15.81 | 31.16 |
| 5 | 1.31 | 0.51 | 0.99 | 1.98 | 3.96 | 7.87 | 15.81 | 31.16 |
| 10 | 1.31 | 0.51 | 1.00 | 1.98 | 3.97 | 7.87 | 15.81 | 31.15 |
| 50 | 1.32 | 0.51 | 1.00 | 1.98 | 3.97 | 7.87 | 15.81 | 31.15 |
| 100 | 1.30 | 0.51 | 1.00 | 1.98 | 3.97 | 7.87 | 15.81 | 31.16 |
| 200 | 1.31 | 0.51 | 1.00 | 1.98 | 3.96 | 7.87 | 15.81 | 31.16 |
| 300 | 1.33 | 0.51 | 0.99 | 1.98 | 3.96 | 7.87 | 15.81 | 31.14 |
| 400 | 1.35 | 0.51 | 0.99 | 1.98 | 3.96 | 7.87 | 15.81 | 31.13 |
| 500 | 1.37 | 0.50 | 0.99 | 1.98 | 3.96 | 7.88 | 15.82 | 31.13 |
| 600 | 1.39 | 0.50 | 0.99 | 1.98 | 3.96 | 7.88 | 15.83 | 31.12 |
| 700 | 1.41 | 0.50 | 0.99 | 1.98 | 3.97 | 7.89 | 15.83 | 31.10 |
| 800 | 1.44 | 0.50 | 0.99 | 1.98 | 3.97 | 7.89 | 15.83 | 31.04 |
| 900 | 1.46 | 0.50 | 0.99 | 1.98 | 3.97 | 7.90 | 15.84 | 31.04 |
| 1000 | 1.49 | 0.50 | 0.99 | 1.98 | 3.97 | 7.90 | 15.84 | 31.04 |
| 1100 | 1.51 | 0.51 | 0.99 | 1.98 | 3.97 | 7.90 | 15.84 | 31.03 |
| 1200 | 1.54 | 0.51 | 0.99 | 1.98 | 3.96 | 7.90 | 15.85 | 31.13 |
| 1300 | 1.57 | 0.50 | 0.99 | 1.98 | 3.96 | 7.89 | 15.84 | 31.10 |
| 1400 | 1.59 | 0.50 | 0.99 | 1.97 | 3.95 | 7.89 | 15.86 | 31.19 |
| 1500 | 1.62 | 0.50 | 0.99 | 1.97 | 3.95 | 7.89 | 15.86 | 31.22 |
| 1600 | 1.65 | 0.51 | 0.99 | 1.97 | 3.95 | 7.89 | 15.88 | 31.32 |
| 1700 | 1.67 | 0.51 | 0.99 | 1.98 | 3.94 | 7.90 | 15.90 | 31.38 |
| 1800 | 1.70 | 0.51 | 0.99 | 1.98 | 3.95 | 7.91 | 15.92 | 31.43 |
| 1900 | 1.72 | 0.51 | 1.00 | 1.98 | 3.95 | 7.93 | 15.96 | 31.51 |
| 2000 | 1.73 | 0.51 | 1.00 | 1.99 | 3.96 | 7.94 | 15.99 | 31.47 |
| 2100 | 1.75 | 0.52 | 1.01 | 2.00 | 3.97 | 7.97 | 16.04 | 31.50 |
| 2200 | 1.77 | 0.52 | 1.01 | 2.01 | 3.98 | 8.01 | 16.10 | 31.59 |
| 2300 | 1.78 | 0.52 | 1.02 | 2.02 | 4.00 | 8.05 | 16.17 | 31.63 |
| 2400 | 1.79 | 0.53 | 1.02 | 2.03 | 4.02 | 8.10 | 16.26 | 31.73 |
| 2500 | 1.80 | 0.53 | 1.03 | 2.04 | 4.03 | 8.15 | 16.34 | 31.90 |
| 2600 | 1.82 | 0.53 | 1.03 | 2.04 | 4.05 | 8.20 | 16.42 | 31.74 |
| 2700 | 1.84 | 0.53 | 1.03 | 2.05 | 4.06 | 8.25 | 16.53 | 32.06 |
| 2800 | 1.86 | 0.53 | 1.03 | 2.05 | 4.06 | 8.28 | 16.58 | 31.95 |
| 2900 | 1.87 | 0.53 | 1.03 | 2.04 | 4.06 | 8.31 | 16.64 | 31.92 |
| 3000 | 1.87 | 0.53 | 1.02 | 2.04 | 4.05 | 8.33 | 16.70 | 32.10 |
| 3200 | 1.85 | 0.52 | 1.00 | 2.01 | 4.02 | 8.34 | 16.75 | 31.73 |
| 3400 | 1.90 | 0.51 | 0.99 | 1.99 | 3.99 | 8.34 | 16.76 | 31.52 |
| 3600 | 1.96 | 0.50 | 0.98 | 1.98 | 3.98 | 8.37 | 16.84 | 31.76 |
| 3800 | 2.04 | 0.50 | 0.97 | 1.98 | 3.98 | 8.38 | 16.85 | 31.53 |
| 4000 | 2.12 | 0.51 | 0.98 | 2.00 | 3.99 | 8.41 | 16.92 | 31.89 |
| 4200 | 2.18 | 0.51 | 0.98 | 2.01 | 3.99 | 8.45 | 17.03 | 32.39 |
| 4400 | 2.24 | 0.49 | 0.97 | 2.01 | 4.00 | 8.52 | 17.27 | 33.51 |
| 4600 | 2.28 | 0.50 | 0.99 | 2.04 | 4.04 | 8.66 | 17.67 | 34.56 |
| 4800 | 2.31 | 0.54 | 1.03 | 2.11 | 4.14 | 8.90 | 18.17 | 35.25 |
| 5000 | 2.39 | 0.55 | 1.03 | 2.16 | 4.22 | 9.17 | 18.72 | 33.76 |

* Step Attenuation above Thru Loss (TTL Logic 00000).



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IF/RF MICROWAVE COMPONENTS

Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=+105°C

| FREQUENCY (MHz) | INPUT RETURN LOSS AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|--|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 0 dB | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 16.83 | 17.58 | 18.25 | 16.27 | 16.05 | 16.66 | 20.02 | 21.78 |
| 0.3 | 16.97 | 17.70 | 18.36 | 16.37 | 16.14 | 16.73 | 20.04 | 21.79 |
| 0.5 | 16.97 | 17.70 | 18.36 | 16.37 | 16.14 | 16.73 | 20.04 | 21.76 |
| 1 | 17.03 | 17.77 | 18.43 | 16.41 | 16.17 | 16.74 | 20.05 | 21.77 |
| 5 | 17.02 | 17.77 | 18.42 | 16.41 | 16.17 | 16.75 | 20.07 | 21.80 |
| 10 | 17.03 | 17.78 | 18.43 | 16.42 | 16.17 | 16.75 | 20.06 | 21.80 |
| 50 | 17.11 | 17.86 | 18.53 | 16.52 | 16.28 | 16.88 | 20.23 | 22.00 |
| 100 | 17.40 | 18.20 | 18.90 | 16.84 | 16.62 | 17.27 | 20.80 | 22.70 |
| 200 | 17.20 | 17.99 | 18.69 | 16.72 | 16.54 | 17.20 | 20.62 | 22.50 |
| 300 | 16.82 | 17.53 | 18.15 | 16.27 | 16.01 | 16.53 | 19.48 | 21.12 |
| 400 | 16.95 | 17.60 | 18.17 | 16.21 | 15.84 | 16.21 | 18.91 | 20.45 |
| 500 | 17.10 | 17.71 | 18.25 | 16.21 | 15.77 | 16.05 | 18.59 | 20.08 |
| 600 | 17.10 | 17.68 | 18.18 | 16.11 | 15.62 | 15.84 | 18.22 | 19.66 |
| 700 | 17.05 | 17.59 | 18.05 | 15.97 | 15.43 | 15.59 | 17.84 | 19.19 |
| 800 | 17.09 | 17.58 | 17.98 | 15.88 | 15.29 | 15.39 | 17.52 | 18.77 |
| 900 | 16.95 | 17.40 | 17.75 | 15.72 | 15.12 | 15.21 | 17.26 | 18.40 |
| 1000 | 16.74 | 17.14 | 17.46 | 15.56 | 14.99 | 15.09 | 17.10 | 18.16 |
| 1100 | 16.51 | 16.89 | 17.18 | 15.47 | 14.95 | 15.12 | 17.14 | 18.11 |
| 1200 | 16.19 | 16.52 | 16.79 | 15.32 | 14.89 | 15.14 | 17.21 | 18.04 |
| 1300 | 15.61 | 15.92 | 16.18 | 15.00 | 14.72 | 15.10 | 17.22 | 17.89 |
| 1400 | 15.12 | 15.44 | 15.69 | 14.77 | 14.63 | 15.16 | 17.36 | 17.88 |
| 1500 | 14.73 | 15.05 | 15.30 | 14.63 | 14.64 | 15.36 | 17.71 | 18.06 |
| 1600 | 14.40 | 14.72 | 14.98 | 14.52 | 14.70 | 15.62 | 18.13 | 18.28 |
| 1700 | 14.09 | 14.41 | 14.67 | 14.42 | 14.76 | 15.91 | 18.62 | 18.49 |
| 1800 | 13.86 | 14.19 | 14.44 | 14.38 | 14.87 | 16.27 | 19.20 | 18.75 |
| 1900 | 13.73 | 14.06 | 14.31 | 14.41 | 15.05 | 16.73 | 19.93 | 19.09 |
| 2000 | 13.76 | 14.09 | 14.33 | 14.59 | 15.38 | 17.38 | 20.90 | 19.49 |
| 2100 | 13.82 | 14.16 | 14.39 | 14.79 | 15.73 | 18.07 | 21.90 | 19.80 |
| 2200 | 14.14 | 14.49 | 14.69 | 15.23 | 16.30 | 19.03 | 23.18 | 20.20 |
| 2300 | 14.69 | 15.05 | 15.23 | 15.88 | 17.10 | 20.31 | 24.82 | 20.74 |
| 2400 | 15.42 | 15.79 | 15.94 | 16.72 | 18.11 | 21.93 | 26.51 | 21.22 |
| 2500 | 16.39 | 16.77 | 16.87 | 17.80 | 19.35 | 23.94 | 27.50 | 21.49 |
| 2600 | 17.78 | 18.22 | 18.27 | 19.35 | 21.18 | 27.17 | 27.81 | 21.93 |
| 2700 | 19.81 | 20.36 | 20.33 | 21.61 | 23.92 | 32.80 | 26.68 | 22.29 |
| 2800 | 22.35 | 23.30 | 23.23 | 24.66 | 27.99 | 39.80 | 24.70 | 22.37 |
| 2900 | 25.24 | 27.25 | 27.31 | 28.43 | 33.88 | 31.99 | 22.86 | 22.16 |
| 3000 | 26.61 | 30.87 | 33.52 | 30.08 | 33.76 | 27.40 | 21.54 | 22.15 |
| 3200 | 23.25 | 26.08 | 29.72 | 24.60 | 24.86 | 22.25 | 19.39 | 21.77 |
| 3400 | 20.56 | 22.44 | 24.55 | 21.26 | 21.36 | 20.12 | 18.48 | 22.15 |
| 3600 | 19.74 | 21.38 | 23.08 | 19.88 | 19.82 | 19.23 | 18.28 | 23.02 |
| 3800 | 20.93 | 22.56 | 24.01 | 20.38 | 20.17 | 20.06 | 19.47 | 25.80 |
| 4000 | 22.66 | 23.52 | 23.75 | 21.91 | 22.08 | 23.60 | 23.49 | 35.72 |
| 4200 | 20.37 | 20.15 | 19.75 | 21.04 | 22.50 | 29.28 | 36.09 | 28.04 |
| 4400 | 16.70 | 16.46 | 16.10 | 17.92 | 19.41 | 23.30 | 24.85 | 19.87 |
| 4600 | 14.82 | 14.68 | 14.30 | 15.98 | 16.99 | 18.50 | 18.31 | 16.01 |
| 4800 | 14.46 | 14.06 | 13.59 | 15.05 | 15.49 | 15.61 | 14.85 | 13.63 |
| 5000 | 14.98 | 14.32 | 13.75 | 14.88 | 14.73 | 13.90 | 12.82 | 12.21 |



REV. B
DAT-31R5A-PP+
6/13/2016

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IF/RF MICROWAVE COMPONENTS

Digital Step Attenuator

DAT-31R5A-PP+

Typical Performance Data

TEST CONDITIONS: INPUT POWER=0 dBm, Vdd=+3V, TEMPERATURE=+105°C

| FREQUENCY (MHz) | OUTPUT RETURN LOSS AT TTL CONTROL STATE (dB) | | | | | | | |
|--------------------|---|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|
| | 000000 0 dB | 000001 0.5 dB | 000010 1.0 dB | 000100 2.0 dB | 001000 4.0 dB | 010000 8.0 dB | 100000 16 dB | 111111 31.5 dB |
| 0.1 | 16.62 | 16.69 | 16.46 | 18.93 | 19.46 | 19.36 | 17.65 | 22.37 |
| 0.3 | 16.74 | 16.80 | 16.57 | 19.02 | 19.52 | 19.40 | 17.70 | 22.39 |
| 0.5 | 16.78 | 16.83 | 16.61 | 19.06 | 19.55 | 19.41 | 17.70 | 22.37 |
| 1 | 16.84 | 16.88 | 16.64 | 19.10 | 19.57 | 19.42 | 17.70 | 22.38 |
| 5 | 16.92 | 16.96 | 16.72 | 19.19 | 19.62 | 19.45 | 17.72 | 22.38 |
| 10 | 16.93 | 16.97 | 16.73 | 19.20 | 19.63 | 19.46 | 17.72 | 22.39 |
| 50 | 16.95 | 17.01 | 16.78 | 19.25 | 19.72 | 19.58 | 17.85 | 22.56 |
| 100 | 16.98 | 17.06 | 16.85 | 19.39 | 19.93 | 19.88 | 18.13 | 23.04 |
| 200 | 17.15 | 17.23 | 17.03 | 19.59 | 20.13 | 20.05 | 18.26 | 23.27 |
| 300 | 17.10 | 17.14 | 16.90 | 19.27 | 19.63 | 19.35 | 17.63 | 22.17 |
| 400 | 17.00 | 16.99 | 16.70 | 18.89 | 19.08 | 18.64 | 16.97 | 21.09 |
| 500 | 16.91 | 16.86 | 16.55 | 18.64 | 18.71 | 18.20 | 16.58 | 20.41 |
| 600 | 17.13 | 17.03 | 16.67 | 18.70 | 18.64 | 18.04 | 16.41 | 20.06 |
| 700 | 17.20 | 17.05 | 16.66 | 18.59 | 18.41 | 17.72 | 16.11 | 19.54 |
| 800 | 17.11 | 16.90 | 16.48 | 18.26 | 17.98 | 17.28 | 15.74 | 18.84 |
| 900 | 16.93 | 16.70 | 16.27 | 17.92 | 17.60 | 16.94 | 15.48 | 18.29 |
| 1000 | 16.66 | 16.42 | 16.02 | 17.54 | 17.23 | 16.68 | 15.32 | 17.84 |
| 1100 | 16.26 | 16.05 | 15.69 | 17.10 | 16.87 | 16.48 | 15.25 | 17.51 |
| 1200 | 15.77 | 15.60 | 15.31 | 16.61 | 16.51 | 16.33 | 15.26 | 17.23 |
| 1300 | 15.33 | 15.20 | 14.99 | 16.19 | 16.21 | 16.26 | 15.35 | 17.01 |
| 1400 | 14.89 | 14.82 | 14.68 | 15.79 | 15.94 | 16.24 | 15.54 | 16.85 |
| 1500 | 14.46 | 14.44 | 14.36 | 15.41 | 15.69 | 16.27 | 15.82 | 16.75 |
| 1600 | 14.12 | 14.16 | 14.14 | 15.13 | 15.54 | 16.42 | 16.23 | 16.74 |
| 1700 | 13.83 | 13.90 | 13.94 | 14.89 | 15.42 | 16.60 | 16.73 | 16.77 |
| 1800 | 13.64 | 13.75 | 13.84 | 14.74 | 15.38 | 16.89 | 17.38 | 16.84 |
| 1900 | 13.57 | 13.72 | 13.85 | 14.70 | 15.42 | 17.27 | 18.19 | 16.94 |
| 2000 | 13.55 | 13.72 | 13.90 | 14.71 | 15.51 | 17.73 | 19.18 | 17.10 |
| 2100 | 13.69 | 13.90 | 14.10 | 14.88 | 15.76 | 18.38 | 20.50 | 17.35 |
| 2200 | 13.99 | 14.22 | 14.46 | 15.20 | 16.12 | 19.19 | 22.18 | 17.63 |
| 2300 | 14.53 | 14.79 | 15.05 | 15.76 | 16.74 | 20.34 | 24.58 | 18.05 |
| 2400 | 15.26 | 15.56 | 15.84 | 16.54 | 17.55 | 21.83 | 28.10 | 18.59 |
| 2500 | 16.20 | 16.54 | 16.84 | 17.60 | 18.68 | 23.89 | 34.49 | 19.31 |
| 2600 | 17.42 | 17.79 | 18.13 | 19.02 | 20.16 | 26.75 | 53.77 | 20.17 |
| 2700 | 18.66 | 19.11 | 19.46 | 20.67 | 21.88 | 30.67 | 33.50 | 21.02 |
| 2800 | 19.91 | 20.46 | 20.82 | 22.98 | 24.41 | 38.46 | 27.93 | 22.15 |
| 2900 | 20.48 | 21.14 | 21.50 | 25.37 | 27.46 | 39.86 | 24.79 | 23.54 |
| 3000 | 20.51 | 21.21 | 21.53 | 27.62 | 31.29 | 31.67 | 22.61 | 25.36 |
| 3200 | 18.97 | 19.55 | 19.74 | 25.99 | 29.27 | 25.16 | 20.03 | 30.93 |
| 3400 | 17.22 | 17.66 | 17.76 | 22.31 | 23.94 | 21.89 | 18.51 | 51.21 |
| 3600 | 16.74 | 17.03 | 17.00 | 20.75 | 21.58 | 20.67 | 18.21 | 29.50 |
| 3800 | 17.09 | 17.21 | 17.06 | 20.14 | 20.37 | 20.60 | 19.01 | 23.88 |
| 4000 | 17.56 | 17.49 | 17.28 | 19.31 | 19.28 | 21.16 | 21.03 | 20.56 |
| 4200 | 17.54 | 17.41 | 17.29 | 18.19 | 18.27 | 22.07 | 25.37 | 18.44 |
| 4400 | 17.57 | 17.42 | 17.46 | 17.33 | 17.57 | 22.89 | 37.52 | 16.94 |
| 4600 | 18.16 | 18.10 | 18.30 | 17.08 | 17.34 | 22.60 | 26.44 | 15.90 |
| 4800 | 20.02 | 20.12 | 20.37 | 17.69 | 17.75 | 21.05 | 19.92 | 15.34 |
| 5000 | 24.06 | 23.87 | 23.95 | 18.74 | 18.36 | 18.67 | 16.18 | 15.16 |



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