

# Amplifier

## ZX60-2531M+ ZX60-2531M

**50Ω, 0.5 to 2.5 GHz**

### Features

- From 2.8V to 5V Operation
- High Directivity, 30 dB Typ.
- Wide Bandwidth, 0.5 to 2.5 GHz
- Low Noise Figure, 3.5 dB Typ.
- Output Power, Up to 18.2 dBm Typ.
- Protected by US Patent 6,790,049

### Applications

- Buffer Amplifier
- Cellular
- PCN
- Lab
- Instrumentation
- Test Equipment



CASE STYLE: GA955

| Connectors | Model         | Price       | Qty.  |
|------------|---------------|-------------|-------|
| SMA        | ZX60-2531M-S+ | \$64.95 ea. | (1-9) |
| SMA        | ZX60-2531M-S  | \$64.95 ea. | (1-9) |

**+ RoHS compliant in accordance  
with EU Directive (2002/95/EC)**

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

### Electrical Specifications at T<sub>AMB</sub> = 25°C

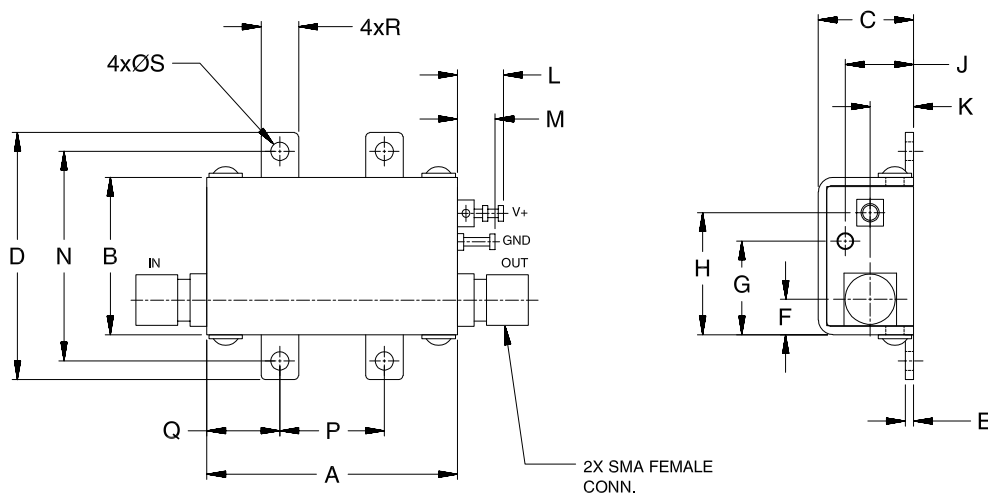
| MODEL NO.     | FREQ. (GHz)<br><br>f <sub>L</sub> - f <sub>U</sub> | DC VOLTAGE @ Pin V+ (V) | GAIN over frequency in GHz<br>Typ (dB) |      |      |      |      |              |                 | MAXIMUM POWER (dBm)<br>Output (1 dB Comp.)<br>Typ.<br>f <sub>L</sub> f <sub>U</sub> |      | DYNAMIC RANGE |      |      | VSWR (:1)<br>Typ. |      | ACTIVE DIRECTIVITY (dB)<br>Isolation-Gain<br>Typ. | DC OPERATING CURRENT @ Pin V+ (mA) |  |
|---------------|----------------------------------------------------|-------------------------|----------------------------------------|------|------|------|------|--------------|-----------------|-------------------------------------------------------------------------------------|------|---------------|------|------|-------------------|------|---------------------------------------------------|------------------------------------|--|
|               |                                                    |                         | 0.5                                    | 1.0  | 1.5  | 2.0  | 2.5  | Min.at 2 GHz | NF (dB)<br>Typ. | IP3 (dBm)<br>Typ.                                                                   |      | In            | Out  | Typ. | Typ.              | Max. |                                                   |                                    |  |
|               |                                                    |                         |                                        |      |      |      |      |              |                 | 1GHz                                                                                | 1GHz |               |      |      |                   |      |                                                   | 2GHz                               |  |
| ZX60-2531M(+) | 0.5-2.5                                            | 5.0*                    | 30.3                                   | 38.0 | 37.4 | 35.5 | 32.8 | 31.0         | 18.2            | 16.1                                                                                | 3.5  | 28.4          | 26.1 | 1.3  | 1.6               | 30   | 102                                               | 130                                |  |

\*DC Voltage@Pin V+ can also be 2.8V

### Maximum Ratings

|                        |                |
|------------------------|----------------|
| Operating Temperature  | -40°C to 85°C  |
| Storage Temperature    | -55°C to 100°C |
| DC Voltage             | 7V             |
| Input Power(no Damage) | 10dBm          |
| Power                  | 700mW          |

### Outline Drawing



### Outline Dimensions (Inch/mm)

| A    | B    | C    | D    | E   | F   | G    | H    | J   | K   | L   | M   | N    | P    | Q   | R   | S   | wt.   |
|------|------|------|------|-----|-----|------|------|-----|-----|-----|-----|------|------|-----|-----|-----|-------|
| 1.20 | .75  | .46  | 1.18 | .04 | .17 | .45  | .59  | .33 | .21 | .22 | .18 | 1.00 | .50  | .35 | .18 | .09 | grams |
| 30.5 | 19.1 | 11.6 | 30.0 | 1.0 | 4.3 | 11.4 | 14.9 | 8.3 | 5.3 | 5.6 | 4.6 | 25.4 | 12.7 | 8.9 | 4.6 | 2.3 | 35.0  |

# Typical Performance Data at 25°C

**ZX60-2531M+**  
**ZX60-2531M**

**V+ = 5.0V**

| FREQUENCY<br>(MHz) | GAIN<br>(dB) | DIRECTIVITY<br>(dB) | VSWR<br>IN<br>(:1) | VSWR<br>OUT<br>(:1) | POWER OUT @1dB<br>COMPRESSION<br>(dBm) | IP3<br>(dBm) | NF<br>(dB) |
|--------------------|--------------|---------------------|--------------------|---------------------|----------------------------------------|--------------|------------|
| 500                | 30.42        | 58.99               | 2.10               | 3.13                | 18.53                                  | 28.97        | 3.69       |
| 650                | 34.57        | 41.15               | 2.04               | 2.14                | 19.76                                  | 30.57        | 3.53       |
| 700                | 35.40        | 40.35               | 1.99               | 1.91                | 19.70                                  | 30.65        | 3.56       |
| 750                | 36.08        | 36.46               | 1.92               | 1.76                | 19.60                                  | 30.59        | 3.54       |
| 800                | 36.64        | 33.60               | 1.83               | 1.63                | 19.49                                  | 30.42        | 3.56       |
| 1000               | 37.92        | 29.50               | 1.65               | 1.42                | 18.34                                  | 29.24        | 3.61       |
| 1210               | 38.18        | 26.55               | 1.68               | 1.33                | 17.67                                  | 28.10        | 3.66       |
| 1500               | 37.30        | 25.92               | 1.50               | 1.42                | 17.27                                  | 27.58        | 3.64       |
| 1680               | 36.69        | 25.65               | 1.46               | 1.20                | 16.94                                  | 27.66        | 3.59       |
| 1780               | 36.41        | 24.84               | 1.42               | 1.20                | 16.73                                  | 27.68        | 3.64       |
| 1880               | 36.15        | 25.00               | 1.36               | 1.28                | 16.54                                  | 27.64        | 3.70       |
| 2000               | 35.84        | 24.28               | 1.26               | 1.32                | 16.36                                  | 27.45        | 3.75       |
| 2050               | 35.75        | 23.86               | 1.21               | 1.34                | 16.21                                  | 27.33        | 3.81       |
| 2100               | 35.58        | 24.00               | 1.17               | 1.40                | 16.25                                  | 27.18        | 3.81       |
| 2150               | 35.29        | 23.98               | 1.12               | 1.40                | 16.10                                  | 27.02        | 3.84       |
| 2200               | 35.16        | 23.52               | 1.06               | 1.48                | 16.18                                  | 26.84        | 3.82       |
| 2300               | 34.55        | 23.52               | 1.10               | 1.55                | 16.16                                  | 26.53        | 3.87       |
| 2400               | 33.65        | 23.81               | 1.24               | 1.62                | 16.31                                  | 26.39        | 3.87       |
| 2450               | 32.62        | 24.84               | 1.29               | 1.68                | 16.30                                  | 26.44        | 3.91       |
| 2500               | 32.50        | 24.73               | 1.39               | 1.69                | 16.37                                  | 26.62        | 3.95       |

**V+ = 2.8V**

| FREQUENCY<br>(MHz) | GAIN<br>(dB) | DIRECTIVITY<br>(dB) | VSWR<br>IN<br>(:1) | VSWR<br>OUT<br>(:1) | POWER OUT @1dB<br>COMPRESSION<br>(dBm) | IP3<br>(dBm) | NF<br>(dB) |
|--------------------|--------------|---------------------|--------------------|---------------------|----------------------------------------|--------------|------------|
| 500                | 28.36        | 62.18               | 2.17               | 3.38                | 14.21                                  | 24.17        | 3.76       |
| 650                | 32.12        | 43.07               | 2.03               | 2.34                | 15.23                                  | 25.65        | 3.62       |
| 700                | 32.89        | 39.27               | 1.97               | 2.14                | 15.31                                  | 25.80        | 3.59       |
| 750                | 33.47        | 37.14               | 1.91               | 1.99                | 15.33                                  | 25.84        | 3.64       |
| 800                | 33.95        | 35.03               | 1.83               | 1.90                | 15.33                                  | 25.79        | 3.65       |
| 1000               | 34.96        | 30.63               | 1.69               | 1.75                | 14.74                                  | 25.15        | 3.67       |
| 1210               | 35.03        | 27.96               | 1.69               | 1.73                | 14.64                                  | 24.41        | 3.71       |
| 1500               | 34.25        | 26.71               | 1.66               | 1.65                | 14.67                                  | 24.01        | 3.69       |
| 1680               | 33.86        | 27.07               | 1.50               | 1.59                | 14.39                                  | 24.02        | 3.69       |
| 1780               | 33.66        | 26.25               | 1.43               | 1.54                | 14.30                                  | 24.01        | 3.70       |
| 1880               | 33.48        | 26.31               | 1.37               | 1.53                | 14.07                                  | 23.96        | 3.76       |
| 2000               | 33.28        | 25.82               | 1.24               | 1.55                | 14.01                                  | 23.81        | 3.82       |
| 2050               | 33.30        | 25.39               | 1.21               | 1.58                | 13.81                                  | 23.71        | 3.88       |
| 2100               | 33.17        | 24.92               | 1.16               | 1.64                | 13.81                                  | 23.60        | 3.84       |
| 2150               | 32.95        | 25.70               | 1.10               | 1.66                | 13.79                                  | 23.48        | 3.92       |
| 2200               | 32.88        | 25.33               | 1.07               | 1.71                | 13.37                                  | 23.35        | 3.91       |
| 2300               | 32.40        | 25.04               | 1.11               | 1.82                | 13.82                                  | 23.11        | 3.88       |
| 2400               | 31.60        | 25.39               | 1.23               | 1.99                | 13.93                                  | 22.98        | 3.97       |
| 2450               | 30.47        | 26.29               | 1.30               | 2.10                | 14.05                                  | 23.00        | 3.92       |
| 2500               | 30.51        | 26.26               | 1.38               | 2.18                | 14.02                                  | 23.10        | 3.95       |

# Typical Performance Curves at 25 °C

## ZX60-2531M+ ZX60-2531M

