# 1000MHz 29dB Gain With GaAs Power Double Amplifier Module

## 1. Product profile

### 1.1 General description

High dynamic range power doubler amplifier module operating at a supply voltage of 24VDC in an SOT115 package, using a cascaded power doubler GaAs MMIC , matching with SMT transformer at input and output port adding ESD and surge protective devices.

**CAUTION**

This device is sensitive to Electro Static Discharge (ESD). Therefore care should be taken during transport and handling.

### 1.2 Features and benefits

- Excellent linearity
- Low noise
- Low return loss
- Rugged construction
- High reliability

### 1.3 Applications

- CATV systems operating in the 40MHz to 1000MHz frequency range.

### 1.4 Quick reference data

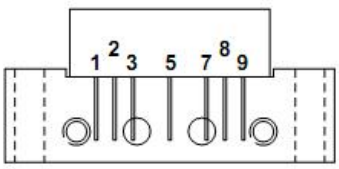
Bandwidth 40MHz to 1000MHz; $V_B$ = 24 V; $T_{mb}$ = 30 °C; $Z_S = Z_L$ = 75 Ω .

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $G_p$ | power gain | f = 50MHz | 28.5 | 29.0 | 30.0 | dB |
| | | f = 1000MHz | 29.5 | - | - | dB |
| $I_{tot}$ | total current | $V_B$ = 24 V | 340 | 360 | 380 | mA |

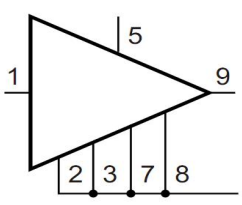
## 2. Pin information

| Pin | Description |
|---|---|
| 1 | input |
| 2 | common |
| 3 | common |
| 5 | $+V_B$ |
| 7 | common |
| 8 | common |
| 9 | output |

**Simplified Outline**




**Graphic Symbol**



# 3. Operating conditions

## 3.1 Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134) (TA = +25°C)

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Supply Voltage | $V_B$ | - | 25 | V |
| Input Voltage [1] | Vi | - | 67 | dBmV |
| Operating Case Temperature | Tc | –20 | +90 | °C |
| Storage Temperature | Tstg | –40 | +100 | °C |

**[1]** In case of single tone

## 3.2 Recommended operating conditions ($Z_S$ = $Z_L$ = 75 Ω)

| Parameter | Symbol | Test Conditions | MIN | TYP | MAX | Unit |
|---|---|---|---|---|---|---|
| Supply Voltage | $V_B$ | | 23.5 | 24.0 | 24.5 | V |
| Operating Case Temperature | Tc | | −20 | +30 | +80 | °C |

# 4. Electrical characteristics

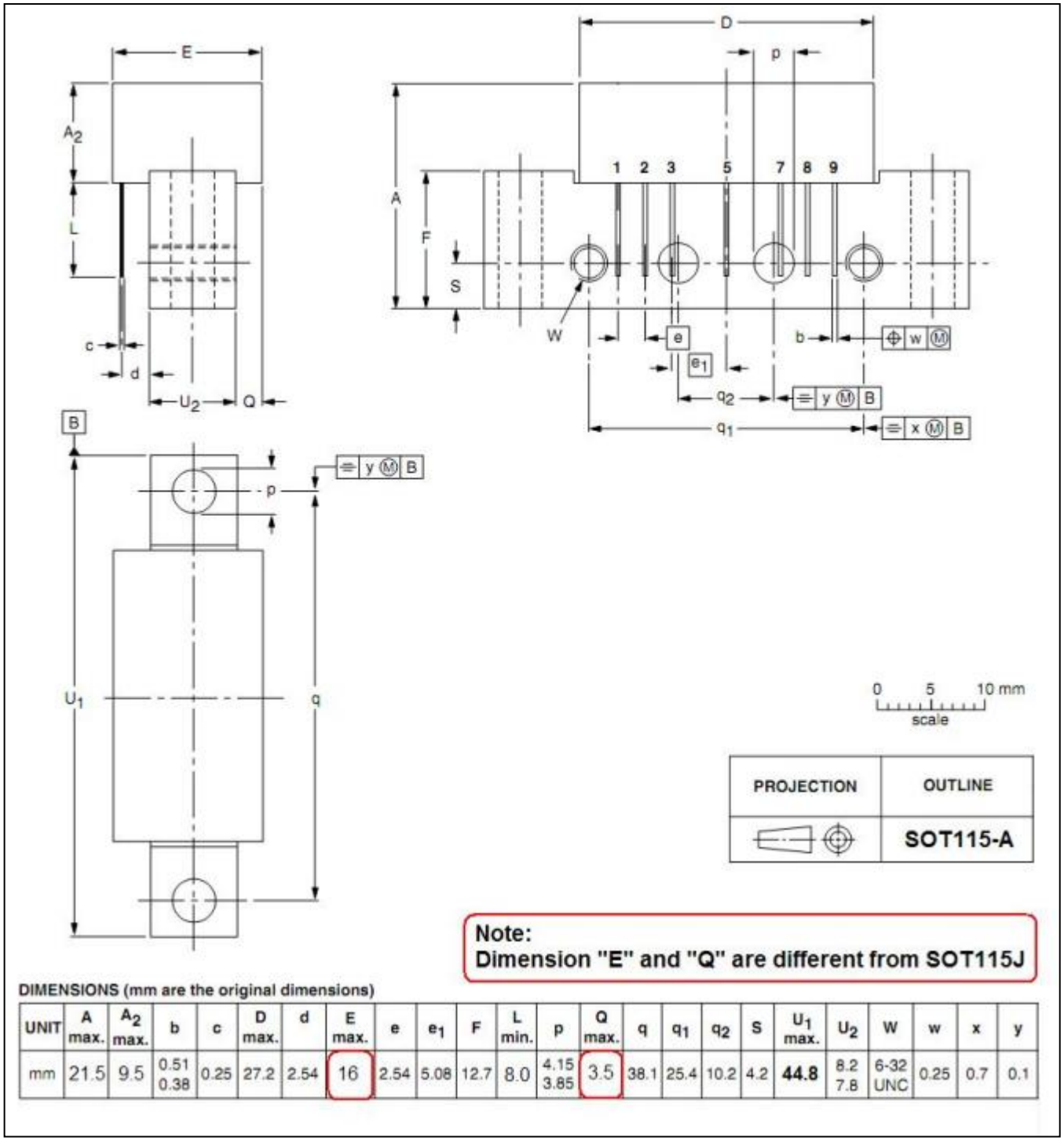
**($T_C$ = 30±5°C, $V_B$ = 24 V, $Z_S$ = $Z_L$ = 75 Ω)**

| Parameter | Symbol | Test Conditions | MIN | TYP | MAX | Unit |
|---|---|---|---|---|---|---|
| Power Gain | Gp | f = 50MHz | 28.5 | 29.0 | 30.0 | dB |
| Gain Slope | SL | f = 50 to 1000MHz | 1.0 | 1.5 | 2.5 | dB |
| Gain Flatness | FL | f = 50 to 1000MHz | – | – | ±0.5 | dB |
| Noise Figure | NF | f = 1000MHz | – | 5.0 | 6.0 | dB |
| Operating Current | IB | $V_B$=24VDC，RF OFF | 340 | 360 | 380 | mA |
| Composite Triple Beat | CTB | 98 channels, $V_O$ = 48dBmV at 743.25 MHz, flat output level across the band | – | −64 | – | dB |
| Cross Modulation | XM | | – | −62 | – | dB |
| Composite 2nd Order Beat | CSO | | – | −66 | – | dB |
| Input Return Loss | S11 | f = 40 to 700MHz | 17 | – | – | dB |
| | | f = 700 to 1000MHz | 17 | – | – | dB |
| Output Return Loss | S22 | f = 40 to 700MHz | 17 | – | – | dB |
| | | f = 700 to 1000MHz | 17 | – | – | dB |

## 5. Package outline

**Rectangular single-ended package; aluminum flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads.**

**SOT115-A**




DIMENSIONS (mm are the original dimensions)

| UNIT | A max. | $A_2$ max. | b | c | D max. | d | E max. | e | $e_1$ | F | L min. | p | Q max. | q | $q_1$ | $q_2$ | S | $U_1$ max. | $U_2$ | W | w | x | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 21.5 | 9.5 | 0.51<br>0.38 | 0.25 | 27.2 | 2.54 | 16 | 2.54 | 5.08 | 12.7 | 8.0 | 4.15<br>3.85 | 3.5 | 38.1 | 25.4 | 10.2 | 4.2 | **44.8** | 8.2<br>7.8 | 6-32<br>UNC | 0.25 | 0.7 | 0.1 |

**UNIT: mm**