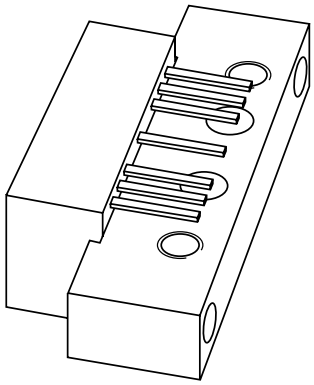
# DATA SHEET



# CGY887
## 870 MHz, 21.5 dB gain push-pull amplifier

Product specification
Supersedes data of 2002 June 07

2002 Jun 27

Philips Semiconductors

PHILIPS

# 870 MHz, 21.5 dB gain push-pull amplifier CGY887

## FEATURES

- Superior linearity
- Extremely low noise
- Rugged construction
- Gold metallization ensures excellent reliability
- Excellent gain behaviour over temperature.

## APPLICATIONS

- CATV systems operating in the 40 to 870 MHz frequency range.

## DESCRIPTION

Hybrid dynamic range amplifier module in a SOT115J package operating with a voltage supply of 24 V (DC), employing both GaAs and Si dies.

## PINNING - SOT115J

| PIN | DESCRIPTION |
|---|---|
| 1 | input |
| 2 | common |
| 3 | common |
| 5 | $+V_B$ |
| 7 | common |
| 8 | common |
| 9 | output |

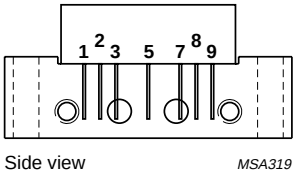



Fig.1 Simplified outline.

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $G_p$ | power gain | f = 50 MHz | 21.2 | 21.8 | dB |
| | | f = 870 MHz | 22 | 23 | dB |
| $I_{tot}$ | total current consumption (DC) | $V_B$ = 24 V | – | 240 | mA |

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|---|---|---|---|---|
| $V_i$ | RF input voltage | – | 75 | dBmV |
| $T_{stg}$ | storage temperature | –40 | +100 | °C |
| $T_{mb}$ | operating mounting base temperature | –20 | +100 | °C |

**CHARACTERISTICS**

Bandwidth 40 to 870 MHz; $V_B$ = 24 V; $T_{mb}$ = 35 °C; $Z_S = Z_L$ = 75 Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $G_p$ | power gain | f = 45 MHz | 21.2 | 21.8 | dB |
| | | f = 870 MHz | 22 | 23 | dB |
| SL | slope straight line | f = 45 to 870 MHz; note 1 | 0.6 | 1.4 | dB |
| FL | flatness straight line | f = 45 to 100 MHz | – | ±0.3 | dB |
| | | f = 100 to 800 MHz | – | ±0.5 | dB |
| | | f = 800 to 870 MHz | – | ±0.3 | dB |
| $s_{11}$ | input return losses | f = 45 to 80 MHz | 20 | – | dB |
| | | f = 80 to 160 MHz | 20 | – | dB |
| | | f = 160 to 320 MHz | 20 | – | dB |
| | | f = 320 to 550 MHz | 20 | – | dB |
| | | f = 550 to 650 MHz | 19 | – | dB |
| | | f = 650 to 750 MHz | 17 | – | dB |
| | | f = 750 to 870 MHz | 17 | – | dB |
| $s_{22}$ | output return losses | f = 45 to 80 MHz | 21 | – | dB |
| | | f = 80 to 160 MHz | 19 | – | dB |
| | | f = 160 to 320 MHz | 17 | – | dB |
| | | f = 320 to 550 MHz | 16 | – | dB |
| | | f = 550 to 650 MHz | 16 | – | dB |
| | | f = 650 to 750 MHz | 16 | – | dB |
| | | f = 750 to 870 MHz | 16 | – | dB |
| $s_{21}$ | phase response | f = 50 MHz | –45 | +45 | deg |
| CTB | composite triple beat | 79 chs flat; $V_o$ = 44 dBmV; $f_m$ = 547.25 MHz | – | –57 | dB |
| | | 112 chs flat; $V_o$ = 44 dBmV; $f_m$ = 745.25 MHz | – | –55 | dB |
| | | 132 chs flat; $V_o$ = 42 dBmV; $f_m$ = 859.25 MHz | – | –55 | dB |
| $X_{mod}$ | cross modulation | 79 chs flat; $V_o$ = 44 dBmV; $f_m$ = 55.25 MHz | – | –53 | dB |
| | | 112 chs flat; $V_o$ = 44 dBmV; $f_m$ = 55.25 MHz | – | –50 | dB |
| | | 132 chs flat; $V_o$ = 42 dBmV; $f_m$ = 55.25 MHz | – | –52 | dB |
| CSO | composite second order distortion | 79 chs flat; $V_o$ = 44 dBmV; $f_m$ = 548.5 MHz | – | –60 | dB |
| | | $CSO_{sum}$ 112 chs flat; $V_o$ = 44 dBmV; $f_m$ = 746.5 MHz | – | –55 | dB |
| | | $CSO_{dif}$ 112 chs flat; $V_o$ = 44 dBmV; $f_m$ = 150 MHz | – | –65 | dB |
| | | $CSO_{sum}$ 132 chs flat; $V_o$ = 42 dBmV; $f_m$ = 860.5 MHz | – | –55 | dB |
| | | $CSO_{dif}$ 132 chs flat; $V_o$ = 42 dBmV; $f_m$ = 150 MHz | – | –65 | dB |
| $d_2$ | second order distortion | note 2 | – | –58 | dB |
| | | note 3 | – | –57 | dB |
| | | note 4 | – | –57 | dB |
| $V_o$ | output voltage | $d_{im}$ = –60 dB; note 5 | 64 | – | dBmV |
| | | $d_{im}$ = –60 dB; note 6 | 63 | – | dBmV |
| | | $d_{im}$ = –60 dB; note 7 | 62 | – | dBmV |

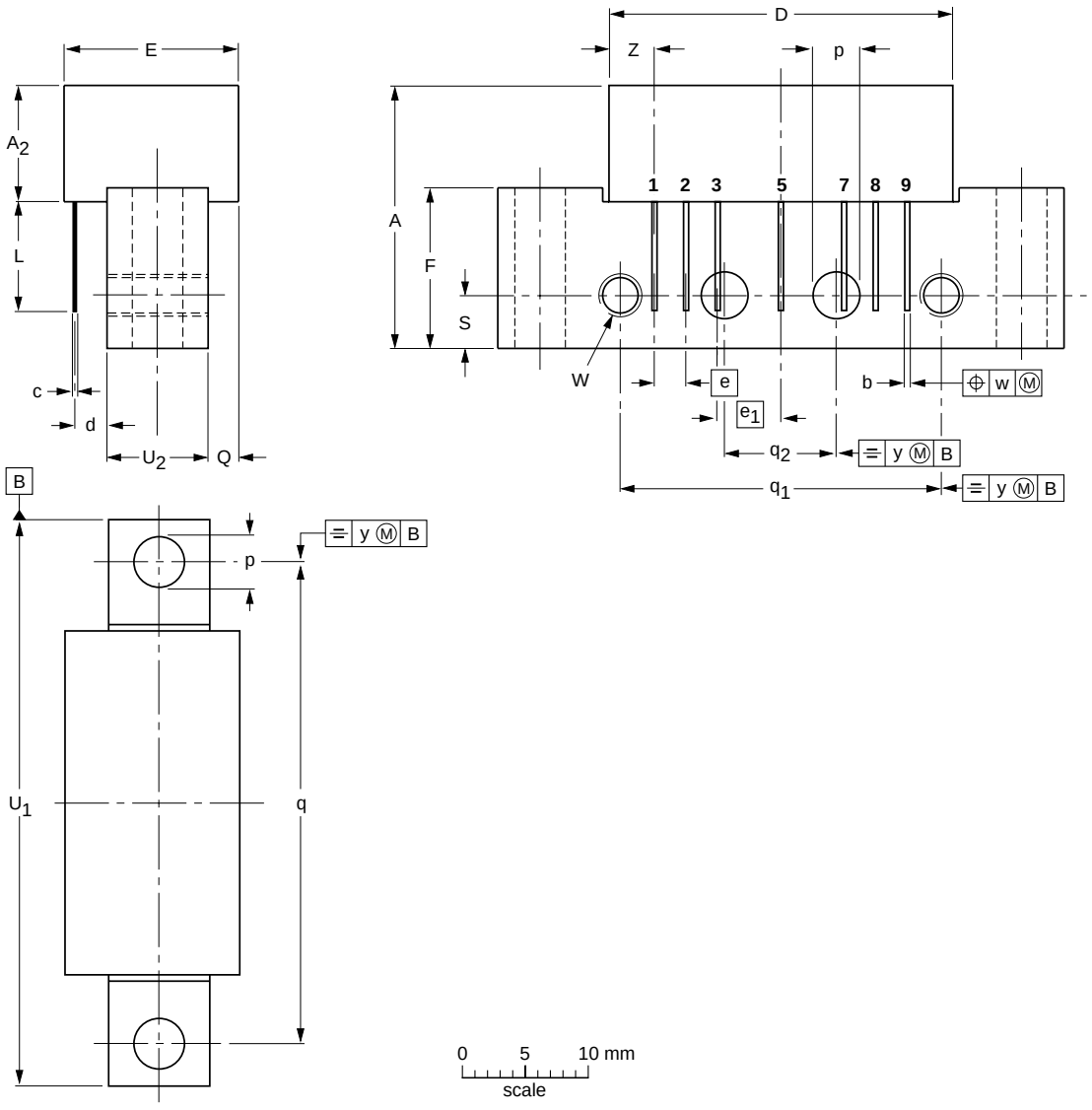
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| NF | noise figure | f = 50 MHz | – | 5.5 | dB |
| | | f = 100 MHz to f = 870 MHz | – | 5 | dB |
| $I_{tot}$ | total current consumption (DC) | note 8 | – | 240 | mA |

**Notes**

1. Slope straight line is defined as gain at 870 MHz against gain at 45 MHz.
2. $f_p$ = 55.25 MHz; $V_p$ = 60 dBmV;
   $f_q$ = 493.25 MHz; $V_q$ = 60 dBmV;
   measured at $f_p + f_q$ = 548.5 MHz.
3. $f_p$ = 55.25 MHz; $V_p$ = 60 dBmV;
   $f_q$ = 691.25 MHz; $V_q$ = 60 dBmV;
   measured at $f_p + f_q$ = 746.5 MHz.
4. $f_p$ = 55.25 MHz; $V_p$ = 60 dBmV;
   $f_q$ = 805.25 MHz; $V_q$ = 60 dBmV;
   measured at $f_p + f_q$ = 860.5 MHz.
5. Measured according to DIN45004B:
   $f_p$ = 540.25 MHz; $V_p = V_o$;
   $f_q$ = 547.25 MHz; $V_q = V_o - 6$ dB;
   $f_r$ = 549.25 MHz; $V_r = V_o - 6$ dB;
   measured at $f_p + f_q - f_r$ = 538.25 MHz.
6. Measured according to DIN45004B:
   $f_p$ = 740.25 MHz; $V_p = V_o$;
   $f_q$ = 747.25 MHz; $V_q = V_o - 6$ dB;
   $f_r$ = 749.25 MHz; $V_r = V_o - 6$ dB;
   measured at $f_p + f_q - f_r$ = 738.25 MHz.
7. Measured according to DIN45004B:
   $f_p$ = 851.25 MHz; $V_p = V_o$;
   $f_q$ = 858.25 MHz; $V_q = V_o - 6$ dB;
   $f_r$ = 860.25 MHz; $V_r = V_o - 6$ dB;
   measured at $f_p + f_q - f_r$ = 849.25 MHz.
8. The module normally operates at $V_B$ = 24 V, but is able to withstand supply transients up to 30 V.

## PACKAGE OUTLINE

**Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads** **SOT115J**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | $A_2$ max. | b | c | D max. | d max. | E max. | e | $e_1$ | F | L min. | p | Q max. | q | $q_1$ | $q_2$ | S | $U_1$ max. | $U_2$ | W | w | y | Z max. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 20.8 | 9.1 | 0.51<br>0.38 | 0.25 | 27.2 | 2.54 | 13.75 | 2.54 | 5.08 | 12.7 | 8.8 | 4.15<br>3.85 | 2.4 | 38.1 | 25.4 | 10.2 | 4.2 | 44.75 | 8 | 6-32<br>UNC | 0.25 | 0.1 | 3.8 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT115J | | | | | | 99-02-06 |

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| DATA SHEET STATUS[1] | PRODUCT STATUS[2] | DEFINITIONS |
|---|---|---|
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|---|
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**NOTES**

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