

FEATURES

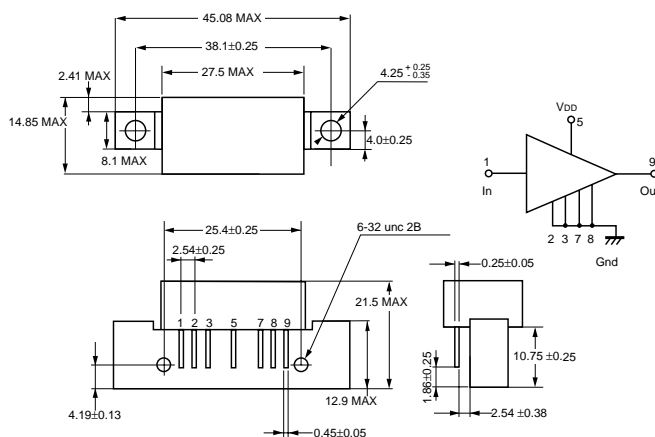
- **GALLIUM ARSENIDE ACTIVE DEVICES**
- **LOW DISTORTION**
- **LOW NOISE FIGURE**
(6.4 dB TYP at 860 MHz)
- **HIGH RELIABILITY**
(FIT = 125 at heat sink temperature of 100°C, Report available)
- **INDUSTRY COMPATIBLE PACKAGE**

DESCRIPTION

The MC-7852 is a GaAs hybrid integrated circuit designed to be used as the input device in CATV applications up to 860 MHz. This unit has a minimum gain of 18 dB at 860 MHz, and because it is a GaAs device, it has lower distortion and lower noise figure. Reliability is assured by NEC's stringent quality and process control procedures. Devices are assembled and tested using fully automated equipment to maximize the consistency in part to part performance.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE



ELECTRICAL CHARACTERISTICS (T_{case} = 30 °C, V_{DD} = 24 V, Z_S = Z_I = 75 Ω)

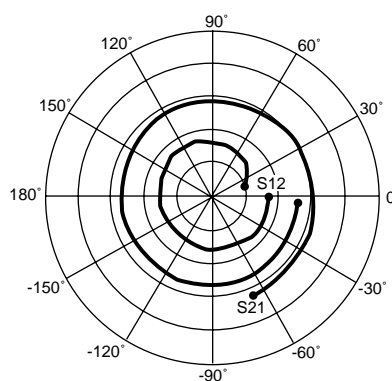
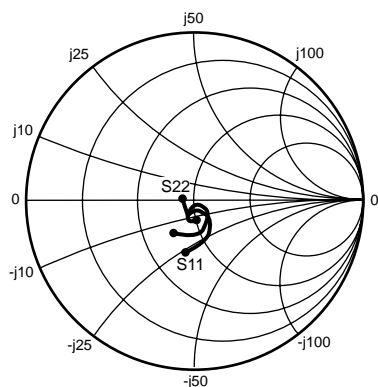
| PART NUMBER | | | MC-7852 | | | CONDITIONS |
|-------------|--------------------------------------|-------|---------|-----|------|-------------------------------|
| SYMBOLS | PARAMETERS | UNITS | MIN | TYP | MAX | |
| BW | Frequency Range | MHz | 50 | | 860 | |
| GA | Gain | dB | 18.0 | | 19.5 | f = 860 MHz |
| S | Gain Slope | dB | 0 | | 2.0 | 50 to 860 MHz |
| Gf | Gain Flatness | dB | | | 1.0 | 50 to 860 MHz; Peak to Valley |
| S11 | Input Return Loss | dB | 18.0 | | | 50 to 160 MHz |
| | | dB | 17.0 | | | 160 to 320 MHz |
| | | dB | 16.0 | | | 320 to 640 MHz |
| | | dB | 14.5 | | | 640 to 860 MHz |
| S22 | Output Return Loss | dB | 18.0 | | | 50 to 160 MHz |
| | | dB | 17.0 | | | 160 to 320 MHz |
| | | dB | 16.0 | | | 320 to 640 MHz |
| | | dB | 14.5 | | | 640 to 860 MHz |
| S12 | Reverse Isolation | dB | 30 | | | 50 to 860 MHz |
| CTB | Composite Triple Beat, 110 Channels | dB | | -59 | -55 | V _{OUT} = 44 dBmV/ch |
| CSO | Composite Second Order, 110 Channels | dB | | -62 | -55 | V _{OUT} = 44 dBmV/ch |
| XMod | Cross Modulation, 110 Channels | dB | | -62 | -55 | V _{OUT} = 44 dBmV/ch |
| IDD | DC Current | mA | | 210 | 240 | |
| NF | Noise Figure | dB | | 5.7 | 6.5 | 50 MHz |
| | | dB | | 6.4 | 7.0 | 860 MHz |

ABSOLUTE MAXIMUM RATINGS¹ ($T_{CASE} = 30\text{ }^{\circ}\text{C}$)

| SYMBOLS | PARAMETERS | UNITS | RATINGS |
|-----------|-----------------------------|--------------------|-------------|
| V_{DD} | Supply Voltage | V | 30 |
| V_I | Input Voltage (Single Tone) | dBmV | 65 |
| T_{OP} | Operating Temperature | $^{\circ}\text{C}$ | -30 to +100 |
| T_{STG} | Storage Temperature | $^{\circ}\text{C}$ | -40 to +100 |

Note:

1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL SCATTERING PARAMETERS

S₂₁ MAG:
3.0/DIV., 15.00 FS
S₁₂ MAG:
0.01/DIV., 0.05 FS

$V_{DD} = 24\text{ V}$

| FREQUENCY (MHz) | S ₁₁ | | S ₂₁ | | S ₁₂ | | S ₂₂ | |
|--------------------|-----------------|---------|-----------------|----------|-----------------|----------|-----------------|---------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 50 | 0.052 | -83.06 | 7.805 | -2.112 | 0.017 | -0.954 | 0.068 | -176.60 |
| 100 | 0.057 | -82.82 | 7.913 | -29.080 | 0.017 | -22.940 | 0.056 | -163.50 |
| 150 | 0.071 | -84.93 | 7.957 | -51.100 | 0.017 | -42.330 | 0.056 | -143.70 |
| 200 | 0.085 | -86.97 | 7.998 | -71.670 | 0.016 | -60.760 | 0.061 | -133.30 |
| 250 | 0.099 | -88.97 | 8.047 | -91.690 | 0.016 | -79.260 | 0.070 | -125.10 |
| 300 | 0.113 | -88.18 | 8.078 | -111.600 | 0.016 | -97.140 | 0.076 | -117.30 |
| 350 | 0.123 | -91.37 | 8.095 | -131.800 | 0.015 | -115.900 | 0.081 | -118.10 |
| 400 | 0.133 | -93.68 | 8.125 | -151.100 | 0.015 | -134.100 | 0.086 | -115.50 |
| 450 | 0.132 | -99.58 | 8.182 | -171.100 | 0.015 | -152.800 | 0.079 | -119.90 |
| 500 | 0.129 | -104.90 | 8.250 | 169.100 | 0.016 | -171.200 | 0.070 | -124.00 |
| 550 | 0.113 | -107.80 | 8.333 | 149.000 | 0.016 | 170.500 | 0.050 | -124.50 |
| 600 | 0.085 | -110.10 | 8.431 | 128.600 | 0.016 | 153.400 | 0.023 | -113.50 |
| 650 | 0.065 | -97.46 | 8.522 | 108.200 | 0.017 | 136.900 | 0.031 | -43.19 |
| 700 | 0.058 | -68.52 | 8.575 | 87.710 | 0.017 | 120.900 | 0.063 | -24.66 |
| 750 | 0.089 | -53.94 | 8.675 | 67.150 | 0.017 | 105.200 | 0.104 | -37.34 |
| 800 | 0.131 | -52.90 | 8.836 | 46.370 | 0.016 | 90.700 | 0.141 | -50.31 |
| 850 | 0.174 | -58.69 | 9.042 | 25.010 | 0.016 | 75.670 | 0.170 | -67.88 |
| 900 | 0.225 | -70.76 | 9.312 | 3.054 | 0.015 | 60.340 | 0.193 | -85.25 |
| 950 | 0.247 | -83.43 | 9.481 | -20.500 | 0.014 | 43.050 | 0.201 | -97.83 |
| 1000 | 0.289 | -92.15 | 9.452 | -43.320 | 0.012 | 29.900 | 0.224 | -112.00 |
| 1050 | 0.321 | -100.70 | 9.657 | -66.730 | 0.010 | 14.310 | 0.220 | -125.10 |

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