

870 MHz CATV 22 dB POWER DOUBLER AMPLIFIER

DESCRIPTION

The MC-7846 is a GaAs Multi-chip Module designed for use in CATV applications up to 870 MHz. This unit has low distortion, low noise figure and return loss across the entire frequency band.

Reliability and performance uniformity are assured by our stringent quality and control procedures.

FEATURES

- Low distortion
- High linear gain $G_L = 22.0 \text{ dB MIN. @ } f = 870 \text{ MHz}$
- Low return loss

ORDERING INFORMATION

Part Number	Package	Supplying Form
MC-7846	7-pin special with heatsink	50 pcs MAX./Tray

Remark To order evaluation samples, contact your nearby sales office.

Part number for sample order: MC-7846

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{DD}	30	V
Input Voltage ^{Note}	V _i	65.0	dBmV
Operating Case Temperature	T _c	-30 to +100	°C
Storage Temperature	T _{stg}	-40 to +100	°C

Note In case of single tone

Caution The IC must be handled with care to prevent static discharge because its circuit composed of GaAs MES FET.

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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

RECOMMENDED OPERATING CONDITIONS ($Z_S = Z_L = 75 \Omega$)

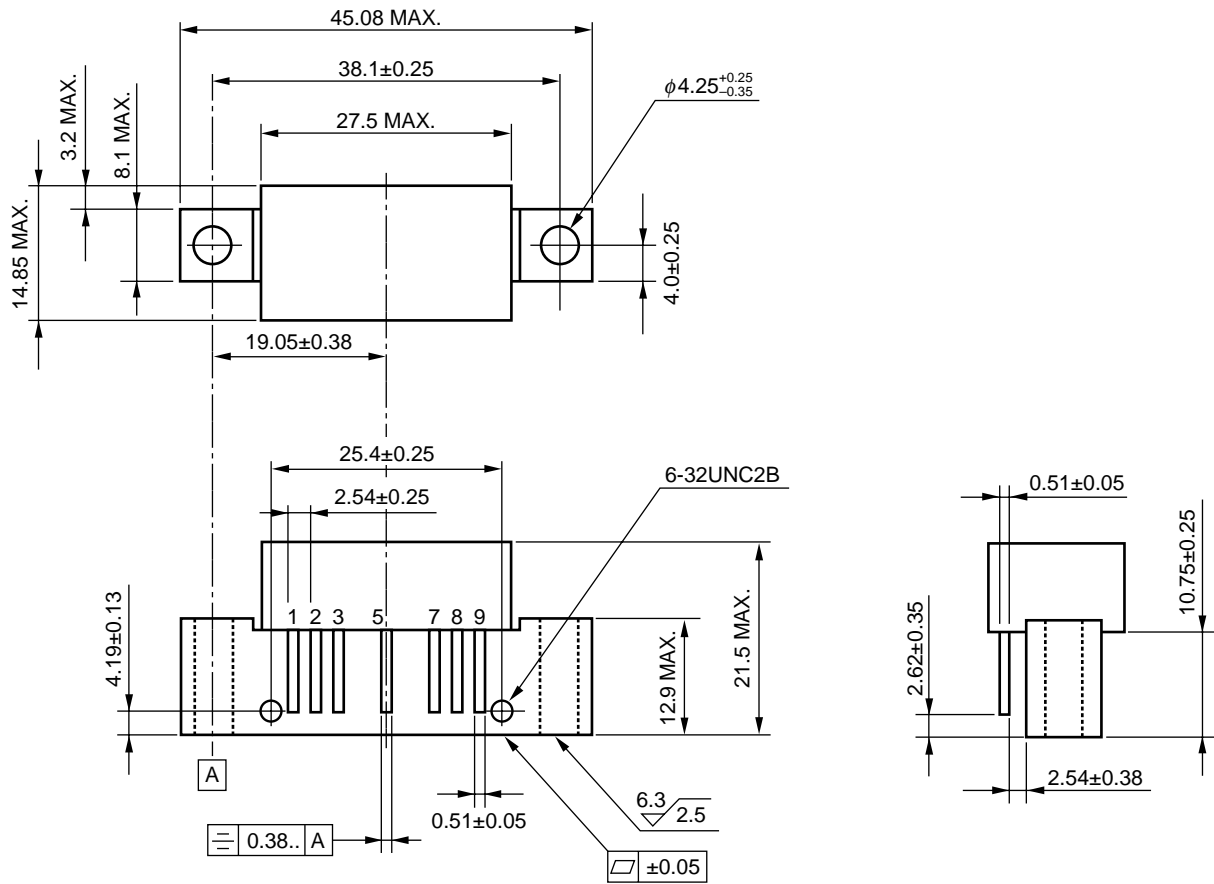
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{DD}		23.5	24.0	24.5	V
Input Voltage	V_i	110 channel, 10 dB tilted across the band	–	32.0	35.0	dBmV
Operating Case Temperature	T_C		–30	+25	+85	°C

ELECTRICAL CHARACTERISTICS ($T_C = 30 \pm 5^\circ\text{C}$, $V_{DD} = 24 \text{ V}$, $Z_S = Z_L = 75 \Omega$)

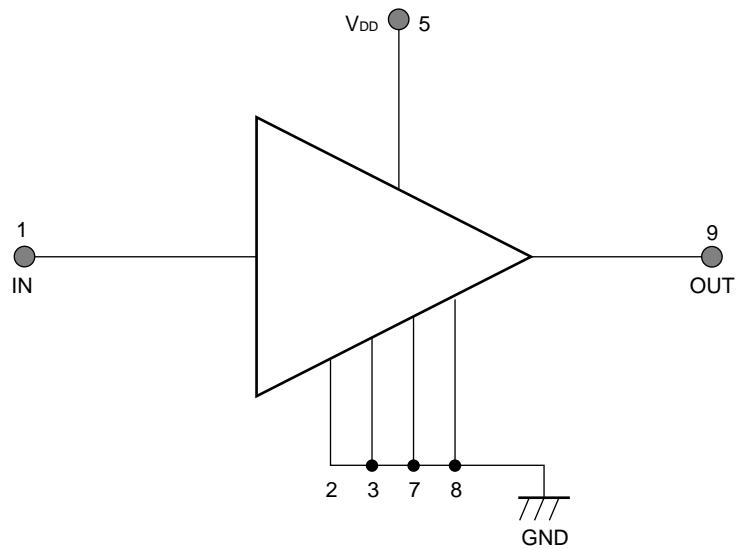
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain	G_L	$f = 870 \text{ MHz}$	22.0	–	23.0	dB
Gain Slope	G_{Slope}	$f = 40 \text{ to } 870 \text{ MHz}$	0.6	1.0	1.4	dB
Gain Flatness	$G_{Flatness}$	$f = 40 \text{ to } 870 \text{ MHz}$, Peak to valley	–	–	0.6	dB
Noise Figure 1	NF_1	$f = 50 \text{ MHz}$	–	–	6.0	dB
Noise Figure 2	NF_2	$f = 870 \text{ MHz}$	–	–	6.5	dB
Operating Current	I_{DD}	RF OFF	275	–	375	mA
Composite Triple Beat	CTB	110 channel, $V_o = 50 \text{ dBmV}$ at 745.25 MHz, 10 dB tilted across the band	–	–	–60	dBc
Cross Modulation	XM		–	–	–55	dBc
Composite 2nd Order Beat	CSO		–	–	–63	dBc
Input Return Loss 1	RL_{i1}	$f = 40 \text{ to } 160 \text{ MHz}$	20	–	–	dB
Input Return Loss 2	RL_{i2}	$f = 160 \text{ to } 320 \text{ MHz}$	20	–	–	dB
Input Return Loss 3	RL_{i3}	$f = 320 \text{ to } 640 \text{ MHz}$	19	–	–	dB
Input Return Loss 4	RL_{i4}	$f = 640 \text{ to } 870 \text{ MHz}$	17	–	–	dB
Output Return Loss 1	RL_{o1}	$f = 40 \text{ to } 160 \text{ MHz}$	20	–	–	dB
Output Return Loss 2	RL_{o2}	$f = 160 \text{ to } 320 \text{ MHz}$	20	–	–	dB
Output Return Loss 3	RL_{o3}	$f = 320 \text{ to } 640 \text{ MHz}$	19	–	–	dB
Output Return Loss 4	RL_{o4}	$f = 640 \text{ to } 870 \text{ MHz}$	18	–	–	dB

PACKAGE DIMENSIONS

7-PIN SPECIAL WITH HEATSINK (UNIT: mm)



PIN CONNECTION



NOTE ON CORRECT USE

- (1) The space between PC board and root of the lead should be kept more than 1 mm to prevent undesired stress to the lead and also should be kept less than 4 mm to prevent undesired parasitic inductance. Recommended that space is 2.0 to 3.0 mm typical.
- (2) Recommended torque strength of the screw is 59 to 78 Ncm.
- (3) Form the ground pattern as wide as possible to minimize ground impedance.
(to prevent undesired oscillation)
All the ground pins must be connected together with wide ground pattern to decrease impedance difference.

RECOMMENDED SOLDERING CONDITIONS

This product should be soldered in the following recommended conditions. Other soldering methods and conditions than the recommended conditions are to be consulted with our sales representatives.

Soldering Method	Soldering Conditions	Condition Symbol
Pin Part Heating	Pin area temperature : less than 350°C ^{Note} Hour : Within 3 sec./pin	—

Note The point of pin part heating must be kept more than 1.2 mm distance from the root of lead.

- **The information in this document is current as of April, 2002. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC's data sheets or data books, etc., for the most up-to-date specifications of NEC semiconductor products. Not all products and/or types are available in every country. Please check with an NEC sales representative for availability and additional information.**
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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT

<p>Caution</p>	<p>GaAs Products</p>	<p>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p>
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► **Business issue**

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► **Technical issue**

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