NEC

GaAs MULTI-CHIP MODULE
MC-7843

870 MHz CATV 24 dB POWER DOUBLER AMPLIFIER

DESCRIPTION

The MC-7843 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 NEC's stringent quality and control procedures.

FEATURES

- Low distortion
- High linear gain G_L = 24.0 dB MIN. @f = 870 MHz
- Low return loss

ORDERING INFORMATION

Part Number	Package	Supplying Form
MC-7843	7-pin special with heatsink	50 pcs MAX./Tray

Remark To order evaluation samples, please contact your local NEC sales office.
Part number for sample order: MC-7843

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

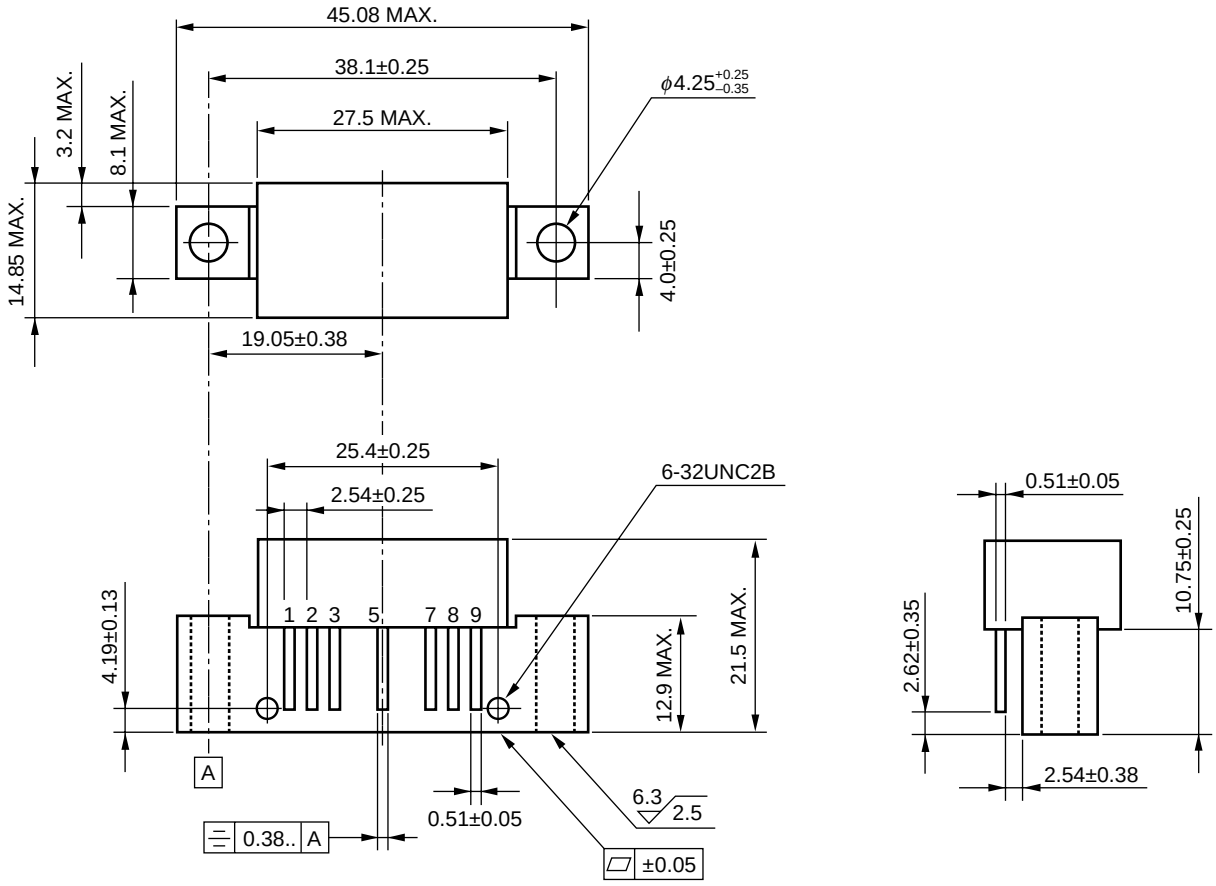
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{DD}		23.5	24.0	24.5	V
Input Voltage	V_i	110 channel, 10 dB tilted across the band	–	25.0	29.5	dBmV
Operating Case Temperature	T_C		–30	+25	+85	°C

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

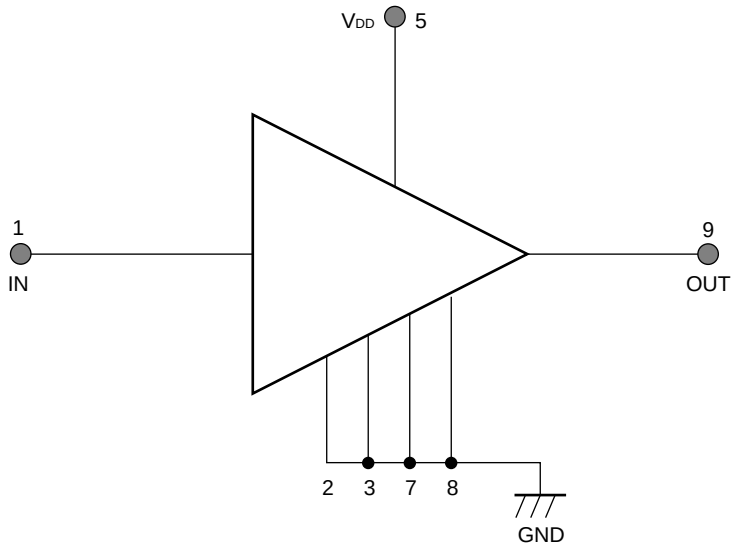
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain	G_L	f = 870 MHz	24.0	–	25.5	dB
Gain Slope	G_{Slope}	f = 40 to 870 MHz	0.3	0.9	1.5	dB
Gain Flatness	$G_{Flatness}$	f = 40 to 870 MHz, Peak to valley	–	–	1.0	dB
Noise Figure 1	NF_1	f = 50 MHz	–	–	6.0	dB
Noise Figure 2	NF_2	f = 870 MHz	–	–	6.5	dB
Operating Current	I_{DD}	P_{in} = None	275	–	375	mA
Composite Triple Beat	CTB	110 channel, V_O = 50 dBmV at 745.25 MHz, 10 dB tilted across the band	–	–64	–60	dB
Cross Modulation	XM		–	–60	–55	dB
Composite 2nd Order Beat	CSO		–	–66	–63	dB
Input / Output Return Loss 1	RL_1	f = 40 to 160 MHz	20	–	–	dB
Input / Output Return Loss 2	RL_2	f = 160 to 320 MHz	19	–	–	dB
Input / Output Return Loss 3	RL_3	f = 320 to 640 MHz	17.5	–	–	dB
Input / Output Return Loss 4	RL_4	f = 640 to 870 MHz	16	–	–	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 and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your NEC sales representative.

Soldering Method	Soldering Conditions	Recommended Condition Symbol
Partial Heating	Pin temperature: 260°C or below [Note] Time: 2 seconds or less (per pin row)	–

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

For details of recommended soldering conditions for surface mounting, refer to information document **SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL (C10535E)**.

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SAFETY INFORMATION ON THIS PRODUCT

Caution GaAs Products	The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested. • 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. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.