NEC

GaAs MULTI-CHIP MODULE
MC-7852G, MC-7856G

860 MHz CATV 18/22 dB PUSH-PULL AMPLIFIER

DESCRIPTION

The MC-7852G, MC-7856G are GaAs Multi-chip Module designed for use in CATV applications up to 860 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 = 18.0 dB MIN. (MC-7852G) @f = 860 MHz
  G_L = 21.5 dB MIN. (MC-7856G) @f = 860 MHz
- Low return loss

ORDERING INFORMATION

Part Number	Package	Supplying Form
MC-7852G	7-pin special with heatsink	50 pcs MAX./Tray
MC-7856G		

Remark To order evaluation samples, please contact your local NEC sales office.

Part number for sample order: MC-7852G, MC-7856G

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.**

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

[MC-7852G]

RECOMMENDED OPERATING CONDITIONS (Z_S = Z_L = 75 Ω)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{DD}	23.5	24.0	24.5	V
Input Voltage	V_i	–	24.0	29.0	dBmV
Operating Case Temperature	T_C	−30	+25	+85	°C

ELECTRICAL CHARACTERISTICS (T_C = 30°C, V_{DD} = 24 V, Z_S = Z_L = 75 Ω)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain	G_L	f = 860 MHz	18.0	–	19.5	dB
Gain Slope	G_{Slope}	f = 50 to 860 MHz	0.0	–	2.0	dB
Gain Flatness	$G_{Flatness}$	f = 50 to 860 MHz, Peak to valley	–	–	1.0	dB
Noise Figure 1	NF_1	f = 50 MHz	–	5.7	6.5	dB
Noise Figure 2	NF_2	f = 860 MHz	–	6.4	7.0	dB
Operating Current	I_{DD}	P_{in} = None	–	225	240	mA
Composite Triple Beat	CTB	110 channel, V_O = 44 dBmV flat	–	−59	−55	dB
Cross Modulation	XM		–	−62	−55	dB
Composite 2nd Order Beat	CSO		–	−62	−55	dB
Input / Output Return Loss 1	RL_1	f = 50 to 160 MHz	18.0	–	–	dB
Input / Output Return Loss 2	RL_2	f = 160 to 320 MHz	17.0	–	–	dB
Input / Output Return Loss 3	RL_3	f = 320 to 640 MHz	16.0	–	–	dB
Input / Output Return Loss 4	RL_4	f = 640 to 860 MHz	14.5	–	–	dB

[MC-7856G]

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{DD}	23.5	24.0	24.5	V
Input Voltage	V_i	–	24.0	29.0	dBmV
Operating Case Temperature	T_C	−30	+25	+85	°C

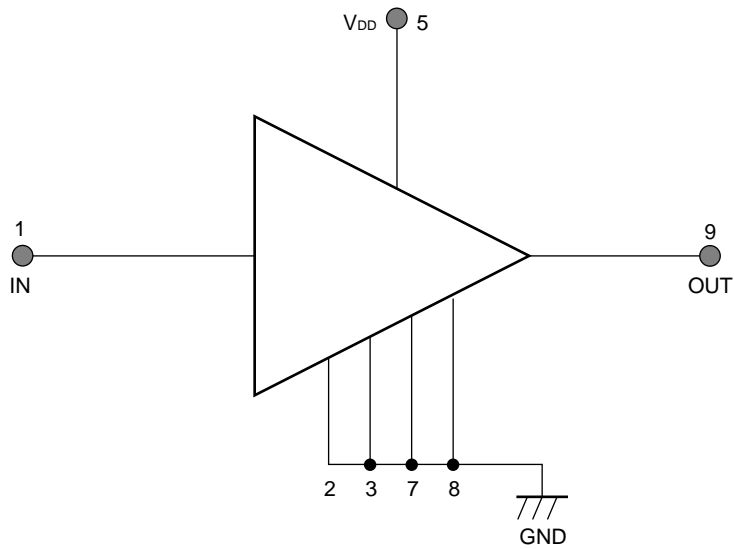## ELECTRICAL CHARACTERISTICS ($T_C = 30°C$, $V_{DD} = 24$ V, $Z_S = Z_L = 75\ \Omega$)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain	G_L	f = 860 MHz	21.5	–	23.0	dB
Gain Slope	G_{Slope}	f = 50 to 860 MHz	0.0	–	2.0	dB
Gain Flatness	$G_{Flatness}$	f = 50 to 860 MHz, Peak to valley	–	–	1.0	dB
Noise Figure 1	NF_1	f = 50 MHz	–	5.3	6.2	dB
Noise Figure 2	NF_2	f = 860 MHz	–	5.7	6.5	dB
Operating Current	I_{DD}	P_{in} = None	–	225	240	mA
Composite Triple Beat	CTB	110 channel, V_O = 44 dBmV flat	–	−60	−55	dB
Cross Modulation	XM		–	−63	−55	dB
Composite 2nd Order Beat	CSO		–	−63	−55	dB
Input / Output Return Loss 1	RL_1	f = 50 to 160 MHz	18.0	–	–	dB
Input / Output Return Loss 2	RL_2	f = 160 to 320 MHz	17.0	–	–	dB
Input / Output Return Loss 3	RL_3	f = 320 to 640 MHz	16.0	–	–	dB
Input / Output Return Loss 4	RL_4	f = 640 to 860 MHz	14.5	–	–	dB

PACKAGE DIMENSIONS

7-PIN SPECIAL WITH HEATSINK (UNIT: mm)

45.08 MAX.
38.1±0.25
27.5 MAX.
3.2 MAX.
8.1 MAX.
14.85 MAX.
$\phi 4.25^{+0.25}_{-0.35}$
4.0±0.25
19.05±0.38
25.4±0.25
2.54±0.25
6-32UNC2B
4.19±0.13
1 2 3 5 7 8 9
21.5 MAX.
12.9 MAX.
A
0.38.. A
0.51±0.05
6.3 / 2.5
±0.05
0.51±0.05
2.62±0.35
10.75±0.25
2.54±0.38

PIN CONNECTION

V_{DD} ● 5

1 ● IN

9 ● OUT

2 3 7 8

GND
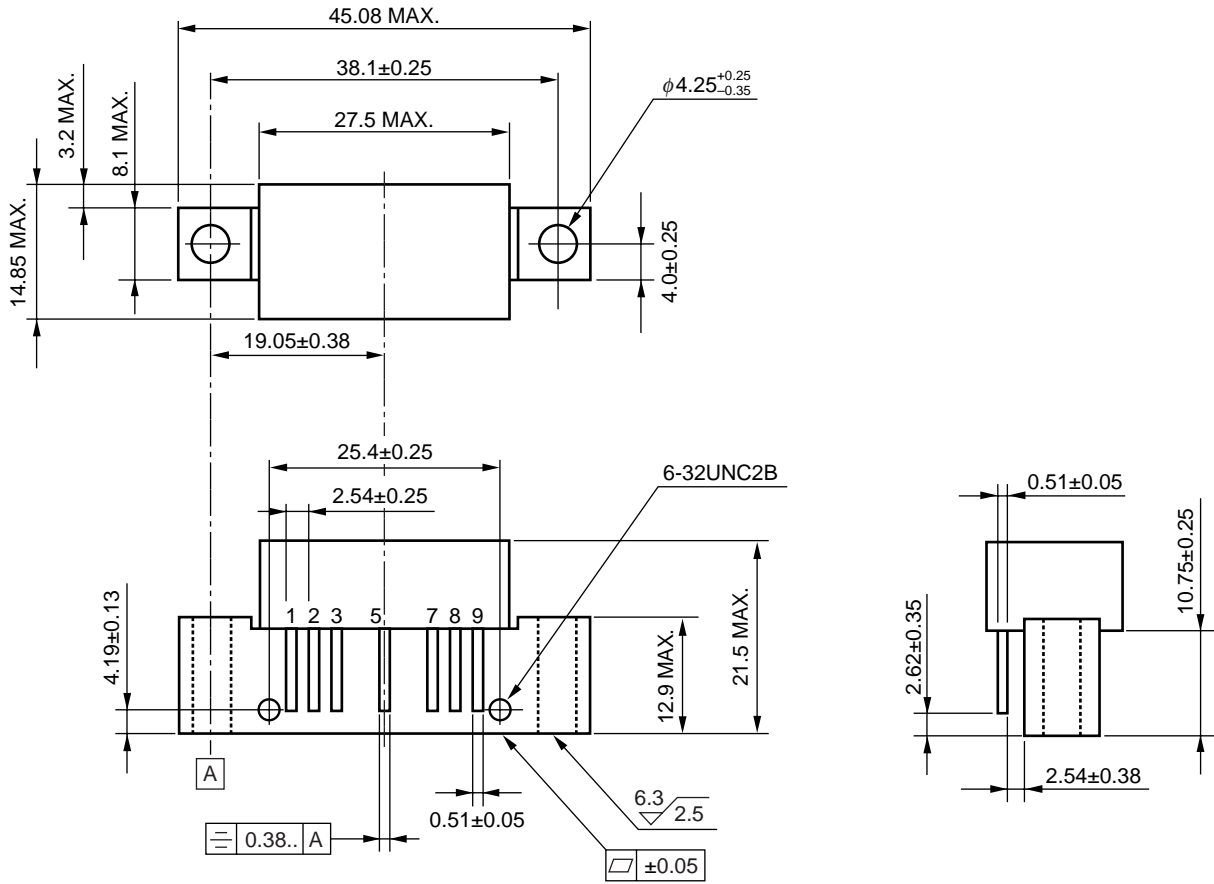
NOTE ON CORRECT USE

(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)**.

[MEMO]

[MEMO]

CAUTION

The great care must be taken in dealing with the devices in this guide.
The reason is that the material of the devices is GaAs (Gallium Arsenide), which is
designated as harmful substance according to the law concerned.
Keep the law concerned and so on, especially in case of removal.

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  "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
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