To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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RENESAS

GaAs INTEGRATED CIRCUIT

MC-7816, MC-7826

860 MHz CATV 22 dB PUSH-PULL AMPLIFIER

DESCRIPTION

The MC-7816, MC-7826 are GaAs Multi-chip integrated circuits 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 = 21.5 dB min. @f = 860 MHz
- Low return loss

ORDERING INFORMATION (PLAN)

Part Number	Package	Supplying Form
MC-7816 MC-7826	7 pin special with heatsink	50 pcs max./Tray

Remarks To order evaluation samples, please contact your local NEC sales office.
(Part number for sample order: MC-7816, MC-7826)

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V_{DD}	30	V
Input Voltage	V_i	65.0 Note 1	dBmV
Operating Case Temperature	T_C	–30 to +100	°C
Storage Temperature	T_{stg}	–40 to +100	°C

Notes 1. In case of one signal input.

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

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

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[MC-7816]

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

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}		23.0	24.0	25.0	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, $Z_S = Z_L = 75\ \Omega$)

CHARACTERISTICS	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		2.0	dB
Gain Flatness	$G_{Flatness}$	f = 50 to 860 MHz, Peak to Valley			1.0	dB
Noise Figure	NF	f = 50 to 860 MHz			7.0	dB
Operating Current	I_{DD}	Pin = None		225	240	mA
Composite Triple Beat	CTB	129 channel, V_O = 44 dBmV flat			–52	dB
Cross Modulation	XM				–55	dB
Composite 2nd Order Beat	CSO				–53	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-7826]

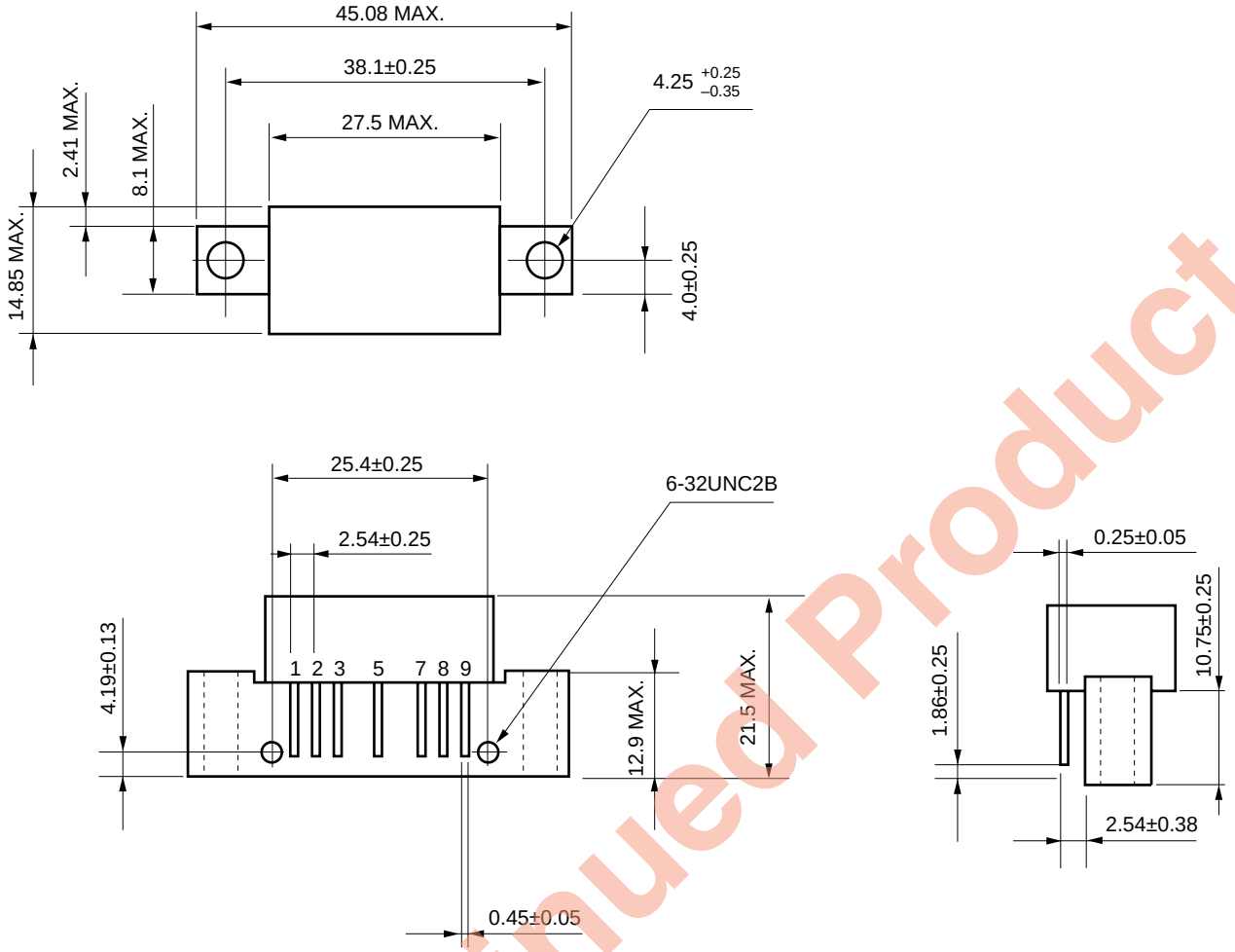
RECOMMENDED OPERATING CONDITIONS ($Z_S = Z_L = 75\ \Omega$)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}		23.0	24.0	25.0	V
Input Voltage	V_i			24.0	29.0	dBmV
Operating Case Temperature	T_C		–30	+25	+85	°C

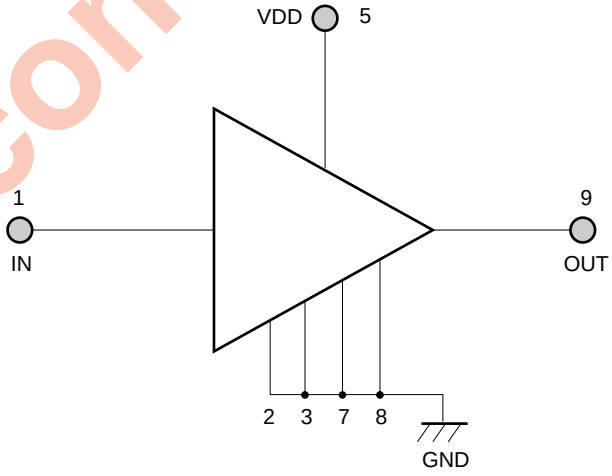
ELECTRICAL CHARACTERISTICS ($T_C = 30°C$, $V_{DD} = 24$ V, $Z_S = Z_L = 75\ \Omega$)

CHARACTERISTICS	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		2.0	dB
Gain Flatness	$G_{Flatness}$	f = 50 to 860 MHz, Peak to Valley			1.0	dB
Noise Figure	NF	f = 50 to 860 MHz			7.0	dB
Operating Current	I_{DD}	Pin = None		350	395	mA
Composite Triple Beat	CTB	129 channel, V_O = 44 dBmV flat			–58	dB
Cross Modulation	XM				–58	dB
Composite 2nd Order Beat	CSO				–58	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 OUTLINE DIMENSIONS (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 6 to 8 kgcm.
(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 CONDITION

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

Soldering method	Soldering conditions	Recommended condition symbol
Pin part heating	Pin area temperature: less than 260°C[Note] Hour: within 2 sec./pin.	

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

For details of recommended soldering conditions, please contact your local NEC sales office.

[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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