NEC

CATV 22 dB POWER DOUBLER AMPLIFIER | MC-7866G

FEATURES

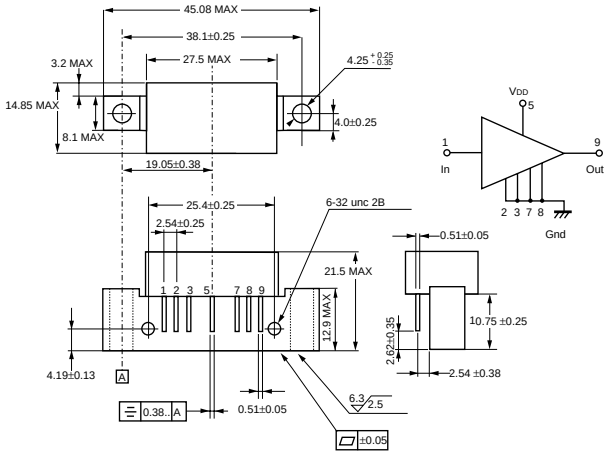
- **GALLIUM ARSENIDE ACTIVE DEVICES**
- **LOW DISTORTION**
- **LOW NOISE FIGURE**
  (5.6 dB TYP at 860 MHz)
- **LOW DC CURRENT DRAW**
  (355 mA TYP at 24 V)
- **HIGH RELIABILITY**
  (FIT = 125 at heat sink temperature of 100°C, Report available)
- **INDUSTRY COMPATIBLE PACKAGE**

DESCRIPTION

The MC-7866G is a GaAs hybrid integrated circuit designed to be used as the output device in CATV applications up to 860 MHz. This unit has a minimum gain of 21.5 dB at 860 MHz, and because it is a GaAs device, it has lower distortion and lower noise figure. These Power Doublers deliver these performance advantages with 10 to 20% less DC input power. 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. The MC-7866G features round connection pins and slightly different body dimensions for customers desiring these packaging dimensions.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE



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

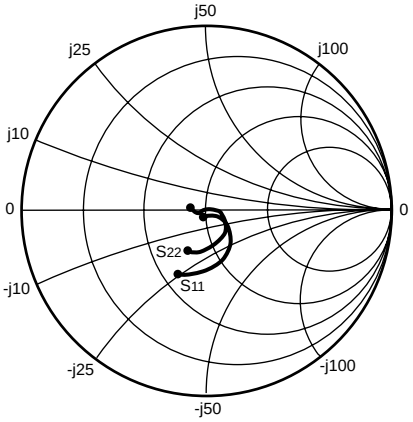
PART NUMBER			MC-7866G			
SYMBOLS	**PARAMETERS**	**UNITS**	**MIN**	**TYP**	**MAX**	**CONDITIONS**
BW	Frequency Range	MHz	50		860	
G_A	Gain	dB	21.5		23.0	f = 860 MHz
S	Gain Slope	dB	0		2.0	50 to 860 MHz
Gf	Gain Flatness	dB			1.0	50 to 860 MHz; Peak to Valley
S_{11}	Input Return Loss	dB dB dB dB	18.0 17.0 16.0 14.5			50 to 160 MHz 160 to 320 MHz 320 to 640 MHz 640 to 860 MHz
S_{22}	Output Return Loss	dB dB dB dB	18.0 17.0 16.0 14.5			50 to 160 MHz 160 to 320 MHz 320 to 640 MHz 640 to 860 MHz
S_{12}	Reverse Isolation	dB	30			50 to 860 MHz
CTB	Composite Triple Beat, 110 Channels	dB		-61 -66	-54	V_{OUT} = 50 dBmV at 750 MHz, 10 dB Tilt V_{OUT} = 44 dBmV/ch
CSO	Composite Second Order, 110 Channels	dB		-66 -68	-59	V_{OUT} = 50 dBmV at 750 MHz, 10 dB Tilt V_{OUT} = 44 dBmV/ch
XMod	Cross Modulation, 110 Channels	dB		-63 -67	-56	V_{OUT} = 50 dBmV at 750 MHz, 10 dB Tilt V_{OUT} = 44 dBmV/ch
I_{DD}	DC Current	mA		355	380	
NF	Noise Figure	dB		5.2	6.0	50 MHz
		dB		5.6	6.5	860 MHz

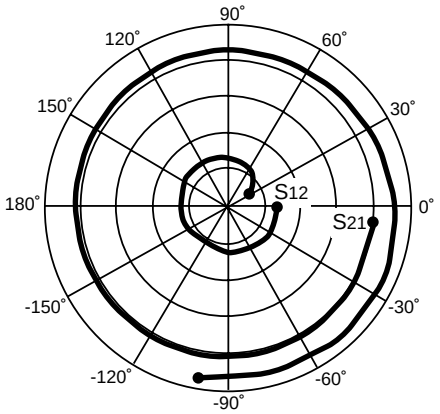
ABSOLUTE MAXIMUM RATINGS[1] (T_{CASE}= 30 °C)

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

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

TYPICAL SCATTERING PARAMETERS





S_{21} MAG:
3.0/DIV., 15.00 FS
S_{12} MAG:
0.01/DIV., 0.05 FS

V_{DD} = 24 V

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
50	0.048	-127.70	12.02	-5.330	0.014	-0.943	0.095	170.300
100	0.052	-122.50	12.19	-32.490	0.014	-23.440	0.076	175.100
150	0.063	-117.20	12.27	-55.310	0.014	-42.330	0.060	-172.300
200	0.071	-115.70	12.35	-77.010	0.013	-60.560	0.051	-157.600
250	0.079	-113.80	12.46	-98.320	0.013	-78.790	0.052	-136.500
300	0.084	-108.60	12.50	-119.600	0.013	-97.170	0.061	-118.300
350	0.086	-109.30	12.51	-141.200	0.012	-116.000	0.072	-118.000
400	0.092	-108.00	12.53	-162.000	0.012	-134.800	0.084	-116.900
450	0.083	-112.20	12.58	176.600	0.013	-154.200	0.078	-125.900
500	0.071	-114.60	12.63	155.500	0.013	-172.900	0.067	-136.200
550	0.050	-107.50	12.71	134.000	0.013	168.800	0.043	-148.200
600	0.028	-62.65	12.81	112.200	0.014	151.600	0.010	155.400
650	0.058	-27.59	12.89	90.480	0.014	135.500	0.031	8.324
700	0.106	-23.72	12.94	68.600	0.014	119.900	0.079	-3.264
750	0.159	-35.72	13.07	46.710	0.014	104.900	0.120	-25.050
800	0.215	-47.67	13.37	24.370	0.014	91.370	0.160	-42.110
850	0.268	-61.11	13.77	1.207	0.013	77.800	0.187	-61.310
900	0.318	-79.62	14.16	-23.740	0.013	61.730	0.201	-78.800
950	0.329	-92.75	14.19	-49.130	0.011	45.780	0.220	-88.640
1000	0.369	-104.20	14.08	-74.330	0.009	35.730	0.246	-104.000
1050	0.392	-115.00	14.30	-100.300	0.007	23.440	0.246	-114.800