

### FEATURES

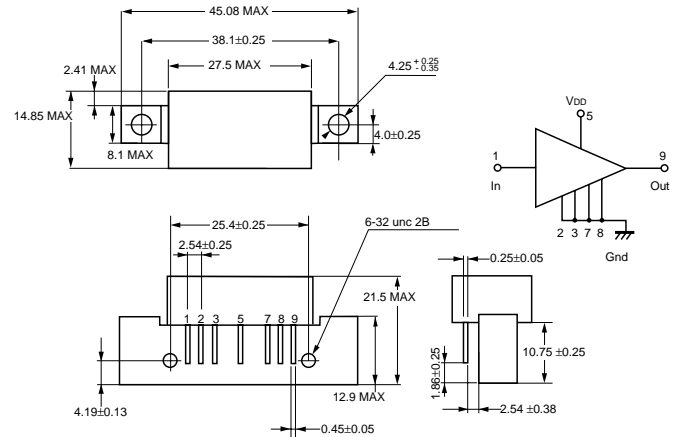
- GALLIUM ARSENIDE ACTIVE DEVICES
- LOW DISTORTION
- LOW NOISE FIGURE  
(5.6 dB TYP at 860 MHz)
- LOW DC CURRENT DRAW  
(355 mA TYP at 24 V)
- HIGH RELIABILITY  
(FIT = 125 at heat sink temperature of 100°C, Report available)
- INDUSTRY COMPATIBLE PACKAGE

### DESCRIPTION

The MC-7866 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.

### OUTLINE DIMENSIONS (Units in mm)

#### PACKAGE OUTLINE



### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 30 °C, V<sub>DD</sub> = 24 V, Z<sub>S</sub> = Z<sub>L</sub> = 75 Ω)

PART NUMBER			MC-7866			CONDITIONS
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX	
BW	Frequency Range	MHz	50		860	
GA	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
S11	Input Return Loss	dB	18.0			50 to 160 MHz
		dB	17.0			160 to 320 MHz
		dB	16.0			320 to 640 MHz
		dB	14.5			640 to 860 MHz
S22	Output Return Loss	dB	18.0			50 to 160 MHz
		dB	17.0			160 to 320 MHz
		dB	16.0			320 to 640 MHz
		dB	14.5			640 to 860 MHz
S12	Reverse Isolation	dB	30			50 to 860 MHz
CTB	Composite Triple Beat, 110 Channels	dB		-61 -66	-54	V <sub>OUT</sub> = 50 dBmV at 750 MHz, 10 dB Tilt V <sub>OUT</sub> = 44 dBmV/ch
CSO	Composite Second Order, 110 Channels	dB		-66 -68	-59	V <sub>OUT</sub> = 50 dBmV at 750 MHz, 10 dB Tilt V <sub>OUT</sub> = 44 dBmV/ch
XMod	Cross Modulation, 110 Channels	dB		-63 -67	-56	V <sub>OUT</sub> = 50 dBmV at 750 MHz, 10 dB Tilt V <sub>OUT</sub> = 44 dBmV/ch
IDD	DC Current	mA		355	380	
NF	Noise Figure	dB		5.2	6.0	50 MHz
		dB		5.6	6.5	860 MHz

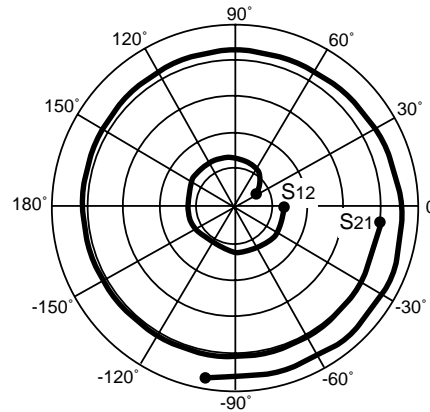
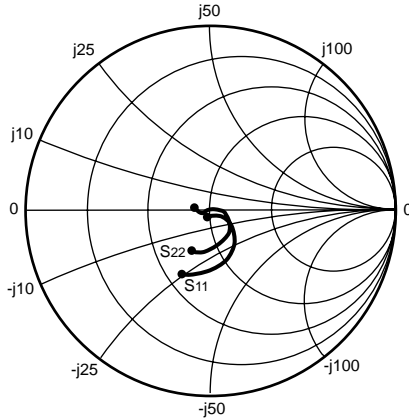
**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (T<sub>CASE</sub>= 30 °C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>DD</sub>	Supply Voltage	V	30
V <sub>I</sub>	Input Voltage (Single Tone)	dBmV	65
T <sub>OP</sub>	Operating Temperature	°C	-30 to +100
T <sub>STG</sub>	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<sub>21</sub> MAG:  
3.0/DIV., 15.00 FS  
S<sub>12</sub> MAG:  
0.01/DIV., 0.05 FS

V<sub>DD</sub> = 24 V

FREQUENCY (MHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	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

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