

### FEATURES

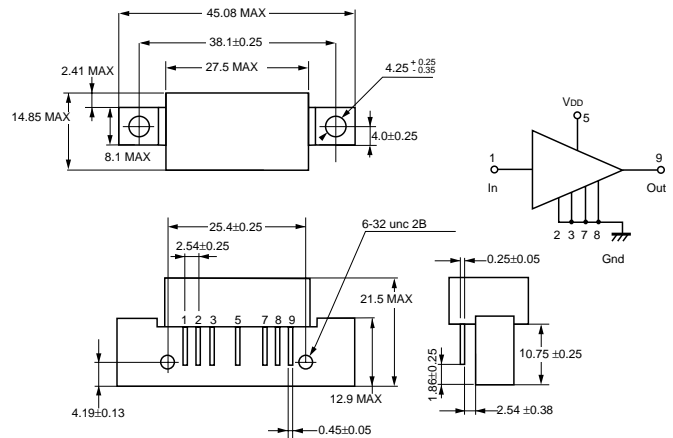
- GALLIUM ARSENIDE ACTIVE DEVICES
- LOW DISTORTION
- LOW NOISE FIGURE  
(5.7 dB TYP at 860 MHz)
- HIGH RELIABILITY  
(FIT = 125 at heat sink temperature of 100°C, Report available)
- INDUSTRY COMPATIBLE PACKAGE

### DESCRIPTION

The MC-7856 is a GaAs hybrid integrated circuit designed to be used as the input 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. 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>I</sub> = 75 Ω)

PART NUMBER			MC-7856			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		-60	-55	V <sub>OUT</sub> = +44 dBmV/ch
CSO	Composite Second Order, 110 Channels	dB		-63	-55	V <sub>OUT</sub> = +44 dBmV/ch
XMod	Cross Modulation, 110 Channels	dB		-63	-55	V <sub>OUT</sub> = +44 dBmV/ch
IDD	DC Current	mA		220	240	
NF	Noise Figure	dB		5.3	6.2	50 MHz
		dB		5.7	6.5	860 MHz

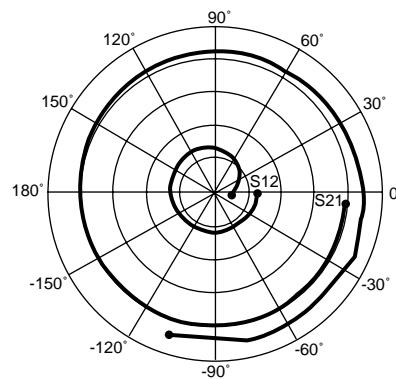
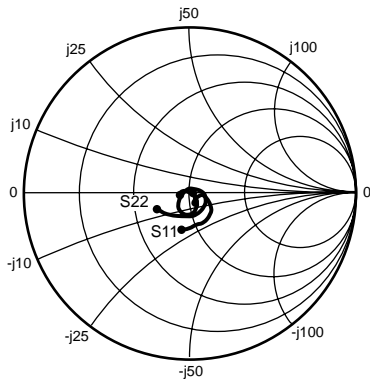
**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (T<sub>CASE</sub>= 30 °C)

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	0.062	-165.50	11.74	-3.982	0.014	-0.058	0.026	17.30
100	0.045	172.50	11.89	-31.570	0.014	-23.830	0.049	-31.51
150	0.021	157.40	11.94	-54.300	0.013	-43.140	0.078	-52.40
200	0.004	18.36	11.97	-75.840	0.013	-62.090	0.098	-65.99
250	0.029	-34.03	12.06	-96.820	0.013	-80.690	0.119	-78.34
300	0.058	-41.26	12.08	-117.700	0.012	-99.360	0.134	-87.61
350	0.074	-50.82	12.10	-139.100	0.012	-118.600	0.137	-100.70
400	0.090	-60.98	12.15	-159.400	0.012	-138.000	0.137	-111.90
450	0.085	-68.92	12.23	179.300	0.012	-157.700	0.116	-127.80
500	0.076	-74.96	12.34	158.200	0.013	-177.100	0.092	-147.00
550	0.059	-68.85	12.45	136.600	0.013	163.600	0.057	-174.80
600	0.046	-37.75	12.55	114.600	0.013	145.800	0.036	115.30
650	0.066	-19.04	12.60	92.660	0.014	128.900	0.047	42.64
700	0.100	-13.28	12.63	70.410	0.014	112.700	0.086	10.89
750	0.132	-23.52	12.76	48.250	0.014	96.990	0.109	-18.20
800	0.166	-34.35	13.03	25.370	0.013	82.490	0.130	-42.31
850	0.191	-47.19	13.43	1.254	0.013	67.470	0.138	-70.14
900	0.205	-66.62	13.78	-25.040	0.012	49.570	0.136	-97.72
950	0.196	-76.91	13.63	-51.960	0.010	28.770	0.146	-111.30
1000	0.220	-89.62	13.48	-78.880	0.008	13.240	0.184	-134.80
1050	0.230	-102.30	13.34	-108.200	0.006	-6.116	0.210	-154.40