

Silicon Bipolar MMIC Cascadable Amplifier

MA4TD0735, MA4TD0736

V3.00

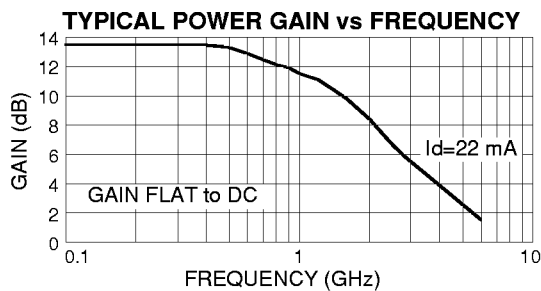
Features

- Cascadable 50Ω Gain Block
- Low Operating Voltage (4.0 V Typical Vd)
- 3 dB Bandwidth: DC to 1.4 GHz
- 11.6 dB Typical Gain @ 1.0 GHz
- Unconditionally Stable (k>1)
- Cost Effective Ceramic Microstrip Packages
- Tape and Reel Packaging Available

Description

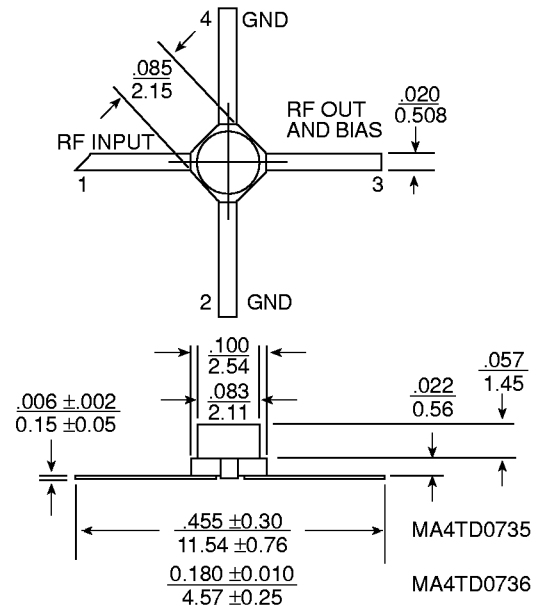
M/A-COM's MA4TD0735 and MA4TD0736 are high performance silicon bipolar MMICs housed in cost effective ceramic microstrip packages. The MA4TD0735 and MA4TD0736 are designed for use where a general purpose 50Ω gain block is required. Typical applications include narrow and wide band IF and RF amplifiers in industrial and military applications.

The MA4TD0735 and MA4TD0736 are fabricated using a 10 GHz f_T silicon bipolar technology that features gold metallization and IC passivation for increased performance and reliability.



Ceramic Microstrip Case Style Outlines ^{1, 2, 3}

Available in short lead version as MA4TD0736.



Notes: (unless otherwise specified)

1. Dimensions are in/mm

2. Tolerance: in .xxx = ±.005; mm .xx = ±.13

3. See last page of data sheet for short lead Micro-X

Pin Configuration

Pin Number	Pin Description
1	PIN Description
2 & 4	AC/DC Ground
3	RF Output and DC Bias

Electrical Specifications @ $T_A = +25^\circ\text{C}$, $I_d = 22 \text{ mA}$, $Z_0 = 50\Omega$

Symbol	Parameters	Test Conditions	Units	Min.	Typ.	Max.
Gp	Power Gain ($ S_{21} ^2$)	f = 0.1 GHz	dB	12.5	13.5	14.5
ΔG_p	Gain Flatness	f = 0.1 to 1.0 GHz	dB	-	±1.0	±1.2
f_{3dB}	3 dB Bandwidth	-	GHz	-	1.4	-
SWRin	Input SWR	f = 0.1 to 2.0 GHz	-	-	1.5	-
SWRout	Output SWR	f = 0.1 to 2.0 GHz	-	-	1.3	-
P_{1dB}	Output Power @ 1 dB Gain Compression	f = 1.0 GHz	dBm	-	6.0	-
NF	50Ω Noise Figure	f = 1.0 GHz	dB	-	4.5	-
IP ₃	Third Order Intercept Point	f = 1.0 GHz	dBm	-	19.0	-
t_D	Group Delay	f = 1.0 GHz	ps	-	140	-
Vd	Device Voltage	-	V	3.6	4.0	4.4
dV/dT	Device Voltage Temperature Coefficient	-	mV/°C	-	-7.0	-

Specifications Subject to Change Without Notice.

M/A-COM, Inc.

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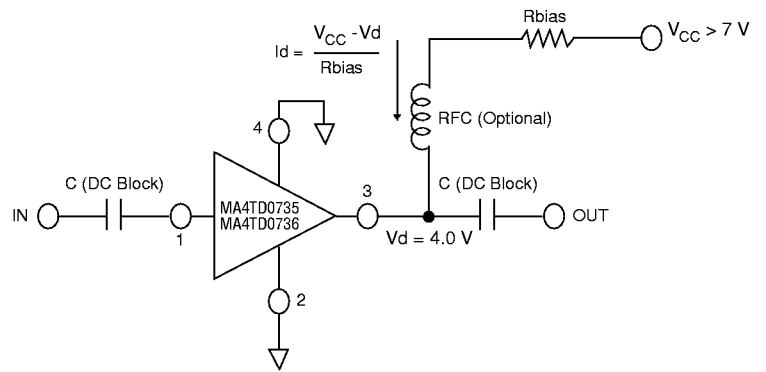
Europe: Tel. +44 (1344) 869 595
Fax +44 (1344) 300 020

Absolute Maximum Ratings¹

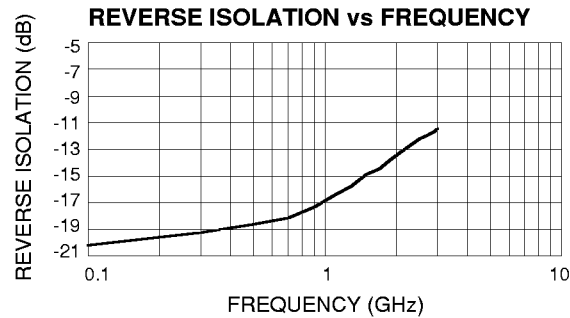
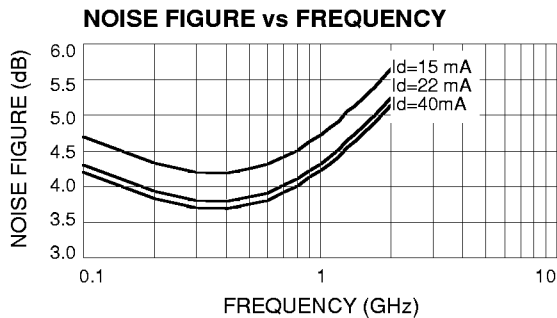
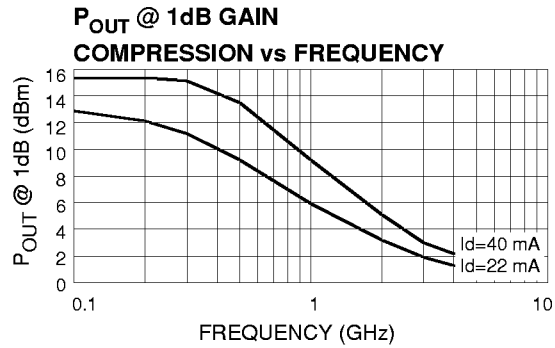
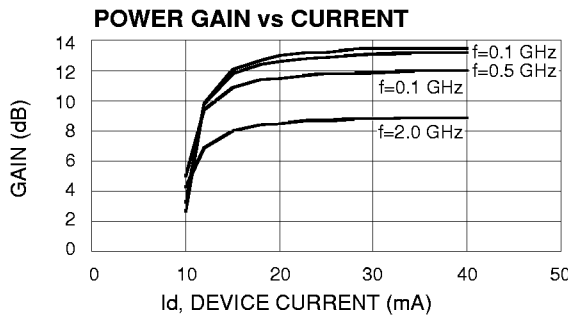
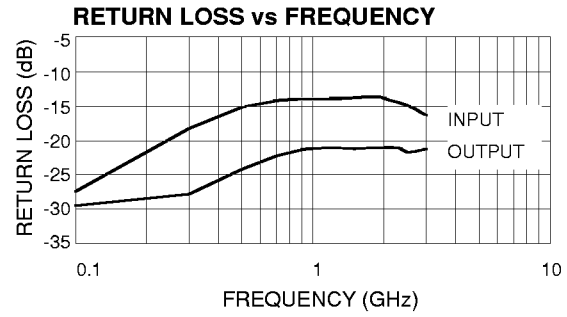
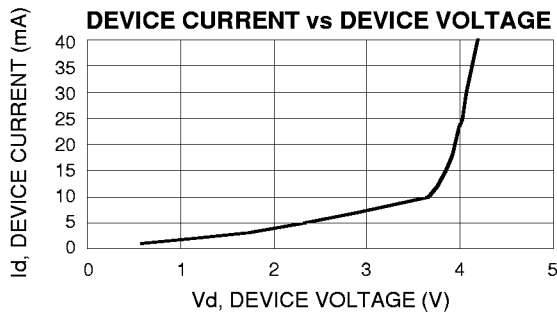
Parameter	Ratings
Device Current	60mA
Power Dissipation ^{2,3}	275 mW
RF Input Power	+13 dBm
Junction Temperature	200°C
Storage Temperature	-65°C to +200°C
Thermal Resistance: $\theta_{jc} = 155^\circ\text{C/W}$	

1. Exceeding these limits may cause permanent damage.
2. Case Temperature (T_C) = 25°C.
3. Derate at 6.5 mW/°C for $T_C > 157^\circ\text{C}$.

Typical Bias Configuration



Typical Performance Curves - $I_d = 22\text{ mA}$, $T_A = +25^\circ\text{C}$ (unless otherwise noted)



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Typical Scattering Parameters

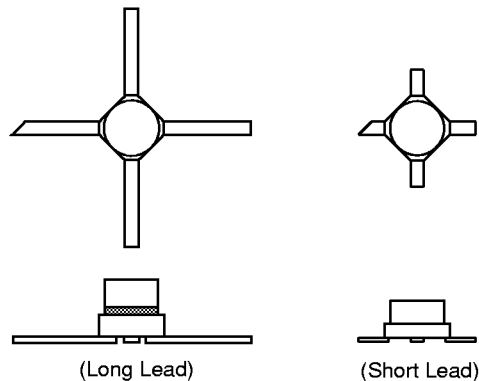
 $Z_0 = 50\Omega$, $T_A = +25\text{ }^\circ\text{C}$, $I_d = 22\text{ mA}$

Frequency (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag.	Angle	Mag.	Angle	Mag.	Angle	Mag.	Angle
0.1	0.042	96.5	4.73	171.5	0.098	9.3	0.033	-52.9
0.2	0.082	97.3	4.72	164.3	0.104	6.2	0.034	-56.2
0.4	0.153	107.3	4.70	150.9	0.116	15.6	0.051	-80.9
0.6	0.185	116.5	4.27	136.9	0.121	20.6	0.071	-103.6
0.8	0.198	128.5	4.03	122.4	0.132	25.7	0.083	-115.6
1.0	0.200	139.6	3.85	110.7	0.143	29.0	0.087	-123.9
1.5	0.203	165.4	3.24	86.3	0.180	34.7	0.086	-138.1
2.0	0.200	173.6	2.64	60.3	0.215	35.7	0.088	-150.0
2.5	0.180	174.2	2.16	46.9	0.243	33.0	0.082	-163.7
3.0	0.152	162.8	1.86	33.5	0.267	31.8	0.087	-163.6
3.5	0.123	144.0	1.69	20.5	0.296	30.3	0.119	-166.8
4.0	0.149	101.8	1.50	14.8	0.318	27.9	0.139	-171.4
4.5	0.250	84.1	1.45	4.7	0.355	25.8	0.183	-170.8
5.0	0.337	79.6	1.34	-2.9	0.389	21.7	0.229	-175.4
6.0	0.485	72.4	1.19	-12.9	0.456	16.5	0.272	178.3

Ordering Information

Long Lead Model No.	Short Lead Model No.	Package
MA4TD0735 PIN MA4TD0735 TR	MA4TD0736 PIN MA4TD0736 TR	Ceramic Forward Tape and Reel

Micro-X Case Styles



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