

Silicon Bipolar MMIC Cascadable Amplifier

MA4TD0635, MA4TD0636

V3.00

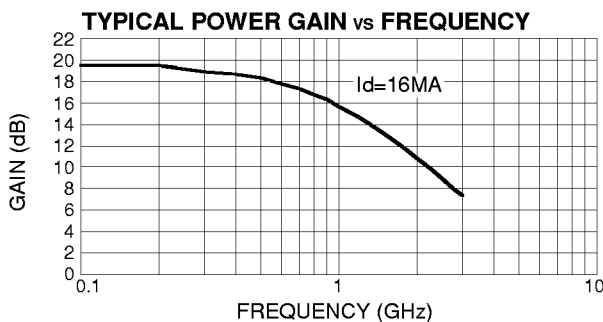
Features

- Cascadable 50V Gain Block
- 3 dB Bandwidth: DC to 0.8 GHz
- 18.5 dB Typical Gain @ 0.5 GHz
- Unconditionally Stable ($k > 1$)
- 3.5 Volt Operation
- Cost Effective Ceramic Microstrip Packages
- Tape and Reel Packaging Available

Description

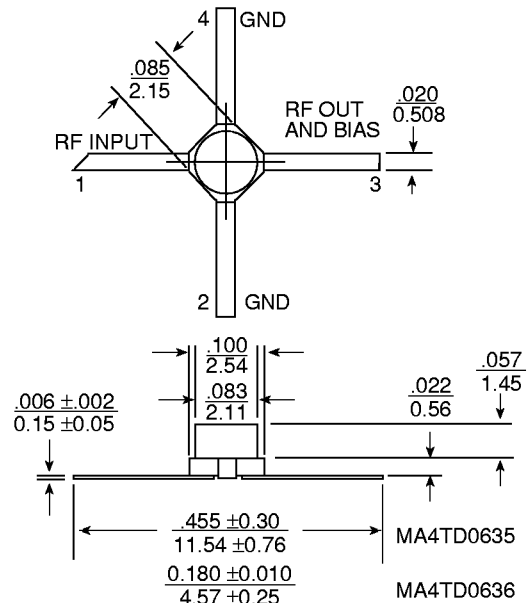
M/A-COM's MA4TD0635 and MA4TD0636 are high performance silicon bipolar MMICs housed in cost effective ceramic microstrip packages. The MA4TD0635 and MA4TD0636 are designed for use where a general purpose 50Ω gain block is required. Typical applications include narrow and wide band IF and RF amplifiers in industrial and military applications.

The MA4TD0635 and MA4TD0636 are fabricated using a 10 GHz f_T silicon bipolar technology that features gold metalization and IC passivation for increased performance and reliability.



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

Available in short lead version as MA4TD0636.



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	RF Input
2 & 4	AC/DC Ground
3	RF Output and DC Bias

Electrical Specifications @ $T_A = +25^\circ\text{C}$, $I_d = 16\text{ mA}$, $Z_0 = 50\Omega$

Symbol	Parameters	Test Conditions	Units	Min.	Typical	Max.
Gp	Power Gain ($ S_{21} ^2$)	$f = 0.1\text{ GHz}$	dB	19	19.5	22
ΔG_p	Gain Flatness	$f = 0.1\text{ to }0.6\text{ GHz}$	dB	-	±0.8	±1.0
f_{3dB}	3 dB Bandwidth	-	GHz	-	0.8	-
SWRin	Input SWR	$f = 0.1\text{ to }1.5\text{ GHz}$	-	-	2.0	-
SWRout	Output SWR	$f = 0.1\text{ to }1.5\text{ GHz}$	-	-	1.8	-
P_{1dB}	Output Power @ 1 dB Gain Compression	$f = 0.5\text{ GHz}$	dBm	-	4.5	-
NF	50Ω Noise Figure	$f = 0.5\text{ GHz}$	dB	-	3.0	4.0
IP_3	Third Order Intercept Point	$f = 0.5\text{ GHz}$	dBm	-	14.5	-
t_D	Group Delay	$f = 0.5\text{ GHz}$	ps	-	200	-
Vd	Device Voltage	-	V	3.1	3.5	3.9
dV/dT	Device Voltage Temperature Coefficient	-	mV/°C	-	-8.0	-

Specifications Subject to Change Without Notice.

M/A-COM, Inc.

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Fax (800) 618-8883

Asia/Pacific: Tel. +81 3 3263 8761
Fax +81 3 3263 8769

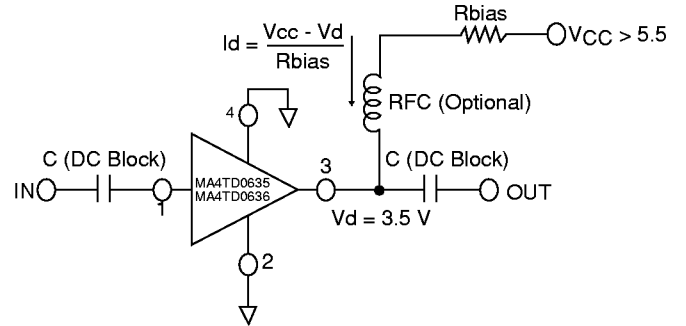
Europe: Tel. +44 (1344) 869 595
Fax +44 (1344) 300 020

Absolute Maximum Ratings¹

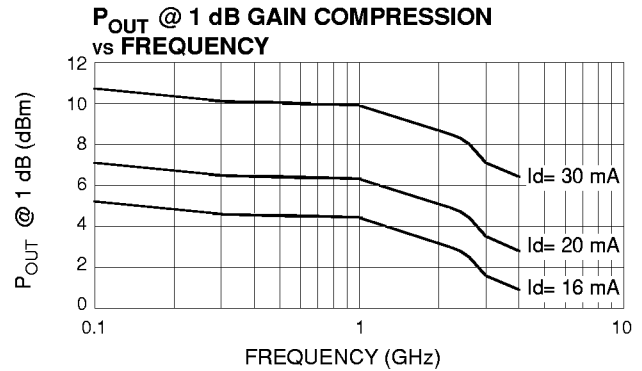
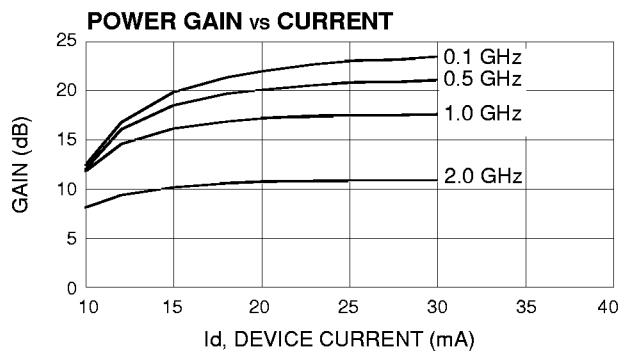
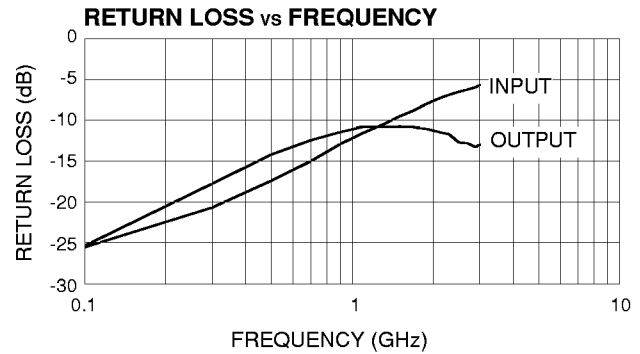
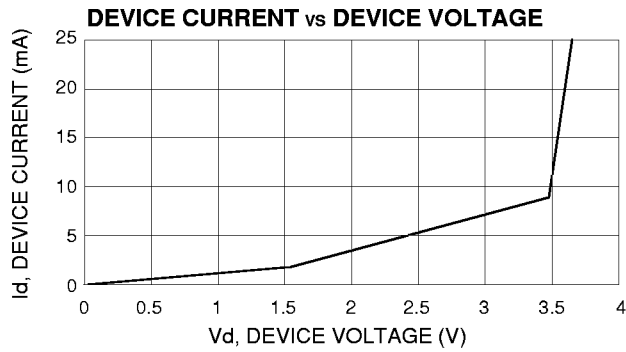
Parameter	Ratings
Device Current	50 mA
Power Dissipation ^{2,3}	200 mW
RF Input Power	+20 dBm
Junction Temperature	200°C
Storage Temperature	-65°C to +200°C
Thermal Resistance: $\theta_{jc} = 150^\circ\text{C/W}$	

1. Exceeding these limits may cause permanent damage.
2. Case Temperature (T_C) = 25°C.
3. Derate at 6.7 mW/°C for $T_C > 170^\circ\text{C}$.

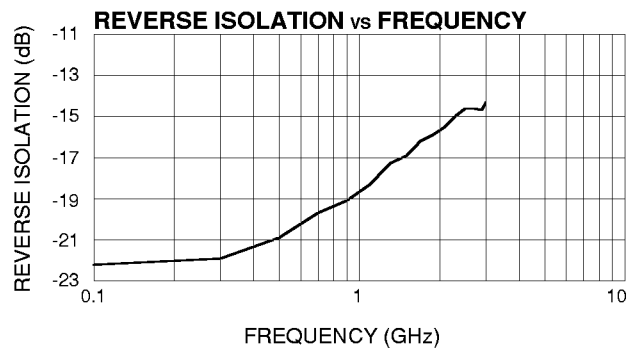
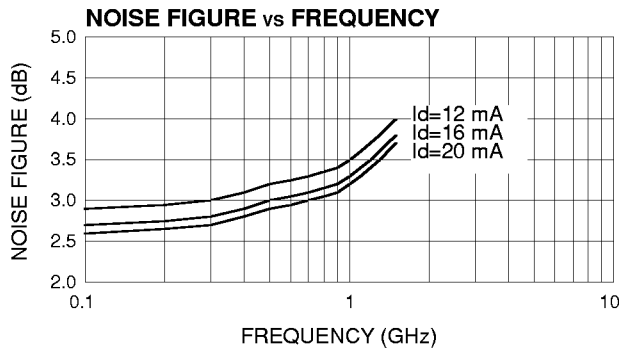
Typical Bias Configuration



Typical Performance Curves - $I_d = 16\text{ mA}$, $T_A = +25^\circ\text{C}$ (unless otherwise noted)



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Typical Scattering Parameters

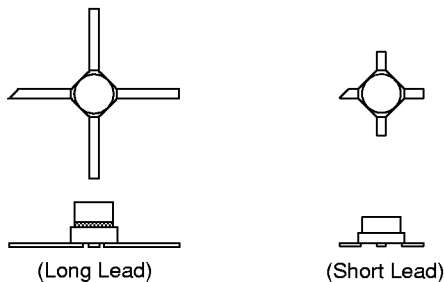
$Z_0 = 50\Omega$, $T_A = +25^\circ\text{C}$, $I_d = 16\text{ mA}$

Frequency (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag.	Angle	Mag.	Angle	Mag.	Angle	Mag.	Angle
0.1	0.055	-153.1	9.47	171.0	0.076	5.8	0.053	-55.9
0.2	0.068	-148.6	9.30	162.3	0.077	8.4	0.092	-79.0
0.3	0.094	-134.8	8.90	154.3	0.080	16.3	0.131	-101.8
0.4	0.111	-135.4	8.57	146.3	0.083	20.2	0.165	-113.0
0.5	0.134	-133.4	8.29	138.8	0.089	24.9	0.194	-123.2
0.6	0.156	-138.3	7.78	131.9	0.096	27.3	0.215	-135.2
0.7	0.175	-139.3	7.41	125.1	0.103	28.2	0.237	-142.7
0.8	0.200	-140.2	6.93	119.7	0.106	30.6	0.254	-153.5
0.9	0.224	-143.2	6.54	114.0	0.109	31.2	0.266	-159.7
1.0	0.243	-147.8	6.09	109.0	0.118	33.8	0.277	-167.4
1.5	0.334	-164.4	4.55	87.9	0.143	36.5	0.292	167.5
2.0	0.408	177.9	3.48	73.0	0.163	35.7	0.278	148.9
2.5	0.474	163.1	2.79	60.9	0.183	36.2	0.236	135.8
3.0	0.513	150.8	2.34	52.9	0.191	38.3	0.218	130.1

Ordering Information

Long Lead Model No.	Short Lead Model No.	Package
MA4TD0635 PIN	MA4TD0636 PIN	Ceramic
MA4TD0635 TR	MA4TD0636 TR	Forward Tape and Reel

Micro-X Case Styles



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