

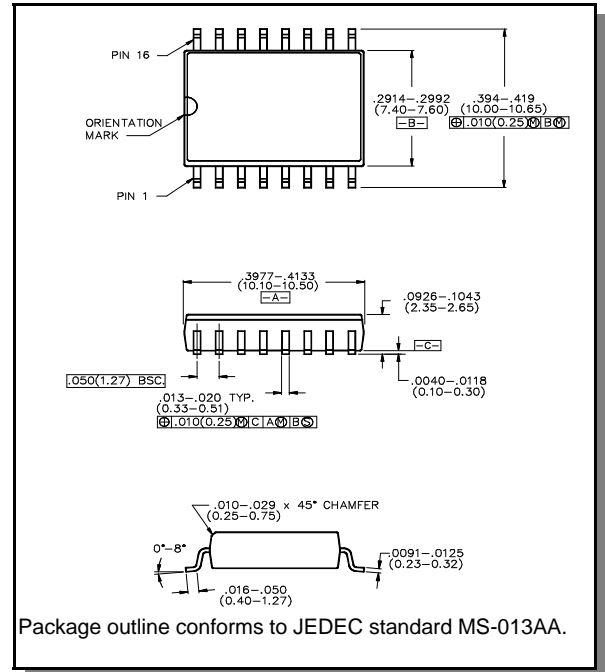
### Features

- Attenuation: 1.0dB Steps to 15dB
- Low DC Power Consumption
- Plastic SOIC, Wide Body, SMT Package
- Integral TTL Driver
- 50 ohm Impedance
- Temperature Stability:  $\pm 0.18$  dB from  $-55^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Typ.
- Tape and Reel Packaging Available

### Description

M/A-COM's AT65-0213 is a GaAs FET 4-bit digital attenuator with a 1.0dB minimum step size and a 15 dB total attenuation range. This device is in a SOIC-16 plastic surface mount package. The AT65-0213 is ideally suited for use where accuracy, fast speed, very low power consumption and low costs are required. Typical applications include dynamic range setting in precision receiver circuits and other gain/leveling control circuits.

### SOW-16



### Electrical Specifications: $T_A = 25^{\circ}\text{C}$

Parameter	Test Conditions	Frequency	Units	Min	Typical	Max
Insertion Loss	—	DC - 0.5 GHz	dB	—	—	2.2
		DC - 2.0 GHz	dB	—	—	2.5
		DC - 3.0 GHz	dB	—	—	2.8
Attenuation Accuracy	Any Bit or Combination of Bits	DC - 3.0 GHz	dB	+ (0.4 +10% of attenuation setting)		
VSWR	Full Range	DC - 2.0 GHz	Ratio	—	—	2.0:1
Trise, Tfall Ton, Toff Transients	10% to 90% 50% Cntl to 90%/10% RF In-Band		nS	—	9	—
			nS	—	40	—
			mV	—	30	—
1 dB Compression	Input Power Input Power	0.05 GHz	dBm	—	+22	—
		0.5 - 3.0 GHz	dBm	—	+28	—
Input $IP_3$	Two-tone inputs up to +5 dBm	0.05 GHz	dBm	—	+40	—
		0.5 - 3.0 GHz	dBm	—	+50	—
Input $IP_2$	Two-tone inputs up to +5 dBm	0.05 GHz	dBm	—	+45	—
		0.5 - 3.0 GHz	dBm	—	+68	—
$V_{cc}$	—	—	V	4.5	5.0	5.5
$-V_{ee}$	—	—	V	-8.0	-5.0	-4.75
$V_{ctl}$	Logic (0) TTL	—	V	0.0	—	0.8
$V_{ctl}$	Logic (1) TTL	—	V	2.0	—	5.0
Input Leakage Current (Low) Input Leakage Current (High)	0 to 0.8 V	—	$\mu\text{A}$	—	—	20
	2.0 to 5.0 V	—	$\mu\text{A}$	—	—	20
$I_{cc}$	$V_{cc} = 4.5$ to $5.5$ $V_{ctl} = 0$ to $0.8$ V, or $V_{cc} - 2.1$ V to $V_{cc}$	—	mA	—	—	4.0
$-I_{ee}$	$V_{ee} = -5.0$ to $-8.0$ V	—	mA	—	—	-1

### Absolute Maximum Ratings <sup>1</sup>

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 - 3.0 GHz	+27 dBm +34 dBm
+Vcc	+5.5V
-Vee	-8.5V
Control Voltage <sup>2</sup>	-0.5 to Vcc + 0.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

### Truth Table

C1	C2	C3	C4	Attenuation
0	0	0	0	Loss, Reference
1	0	0	0	1.0 dB
0	1	0	0	2.0 dB
0	0	1	0	4.0 dB
0	0	0	1	8.0 dB
1	1	1	1	15.0 dB

0 = TTL Low; 1 = TTL High

### Pin Configuration

Pin #	Function	Pin #	Function
1	GND	9	C2
2	RF1	10	C1
3	GND	11	GND
4	N/C	12	GND
5	Vee <sup>3</sup>	13	Vee <sup>3</sup>
6	Vcc	14	GND
7	C4	15	RF2
8	C3	16	GND

3. Either or both pins may be connected to Vee.

### Ordering Information

Part Number	Package
AT65-0213	Bulk Packaging
AT65-0213TR	Tape and Reel (1K Reel)
AT65-0213-TB	Units Mounted on Test Board

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