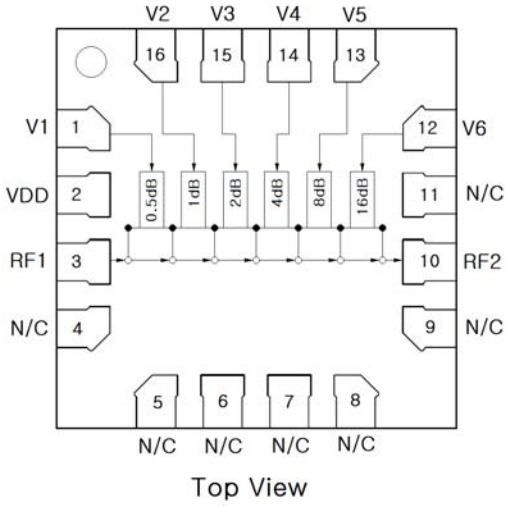
Features

- Positive Voltage Operation: 3 V
- LSB Attenuation: 0.5 dB
- Attenuation Range: 31.5 dB
- Bit Error: ±0.3 dB Typical Step Error
- High IIP3: +42 dBm
- 16 Lead QFN Package (4mm x 4mm)

Applications

- 3G & 4G LTE
- GSM, CDMA, TD-SCDMA
- WLAN, WiMAX



Top View

Block Diagram

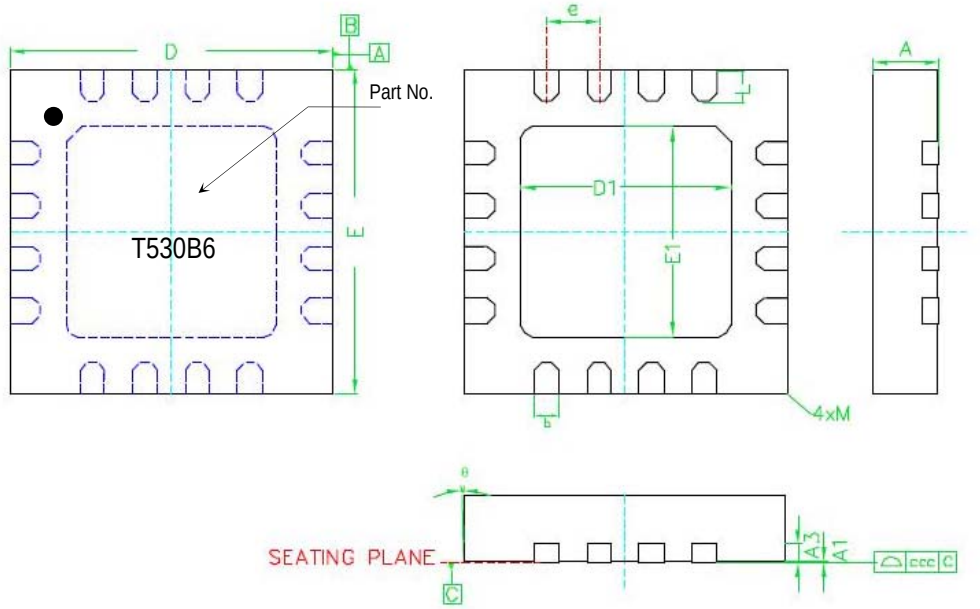
Overview

The AAT530B6 is a GaAs MMIC binary-weighted six bit positive control digital attenuator. The device operates from 0.5 to 3.0 GHz with a control and supply voltage +3 V. The AAT530B6 has and LSB of 0.5 dB and total attenuation of 31.5 dB. An external supply voltage of 3 V is required. The AAT530B6 is composed of six cascaded fixed attenuators. The state of attenuators is controlled by the logic level voltage. The attenuator bit values are 0.5 (LSB), 1, 2, 4, 8, 16 dB for a total attenuation of 31.5 dB. Attenuation accuracy is excellent at ±0.3 dB typical step error with an IIP3 of +42 dBm.

Electrical Specifications

Parameters	Test Conditions	Min	Typ	Max	Units
Insertion Loss	0.5 to 1 GHz 1 to 2 GHz 2 to 3 GHz		1.5 2.0 2.6	1.9 2.5 3.2	dB
Attenuation Range			31.5		dB
Attenuation Accuracy	0.5 to 1 GHz 1 to 2 GHz 2 to 3 GHz	±(0.5 + 5% of attenuation setting) ±(0.2 + 3% of attenuation setting) ±(0.3 + 3% of attenuation setting)			dB
Return Loss		10	13		dB
Switching Characteristics: Rise, Fall Time On, Off Time	 (10%/90% RF) (50% Vctrl to RF)		 600 660		ns
Input Power for 0.1 dB Compression	0.5 to 3 GHz Vs = +3 V		 22		dBm
3rd Order Input Intercept Point		41	42		dBm
Supply Voltage	Vs	+2.8		+3.5	V
Control Voltage High Low	 V_{High} V_{Low}	 +0.7 -0.2		 Vs +0.2 +0.2	 V V
Current	V_{Ctrl} = +0 V V_{Ctrl} = +3 V			20 100	µA µA

Outline Drawing

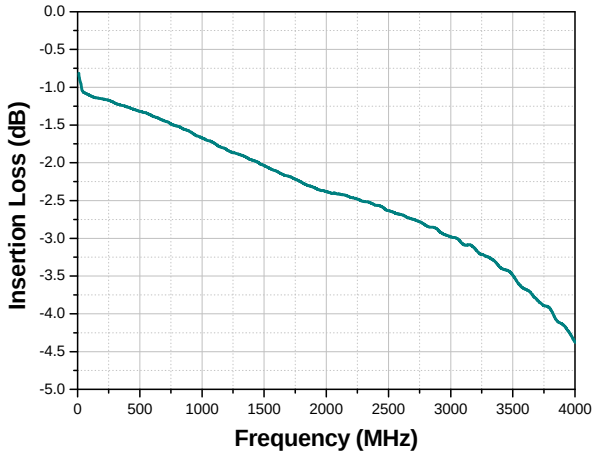


Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	0.80	0.85	0.90
A1	0	0.010	0.030
A3	---	0.20REF	---
b	0.25	0.30	0.35
D	3.95	4.00	4.03
D1	---	2.60BSC	---
E	3.95	4.00	4.03
E1	---	2.60BSC	---
e	---	0.65BSC	---
L	0.35	0.40	0.45
θ	-12	---	0
ccc	---	0.08	---
M	---	---	0.05
Burr	0	0.030	0.060

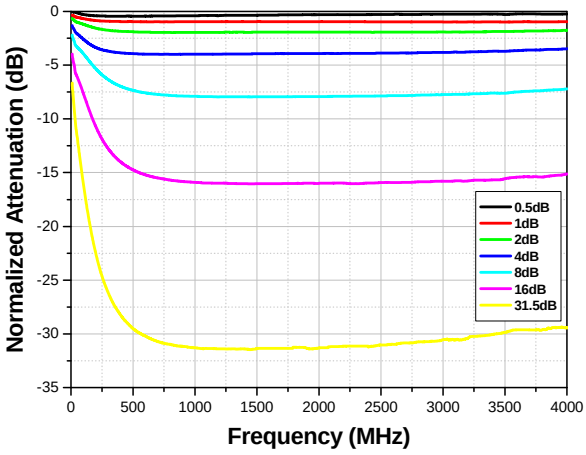
Pin No.	Function	Pin No.	Function.
1	V1	9	NC
2	VDD	10	RF2
3	RF1	11	NC
4	NC	12	V6
5	NC	13	V5
6	NC	14	V4
7	NC	15	V3
8	NC	16	V2

Note: Backside metal paddle is RF and DC ground.

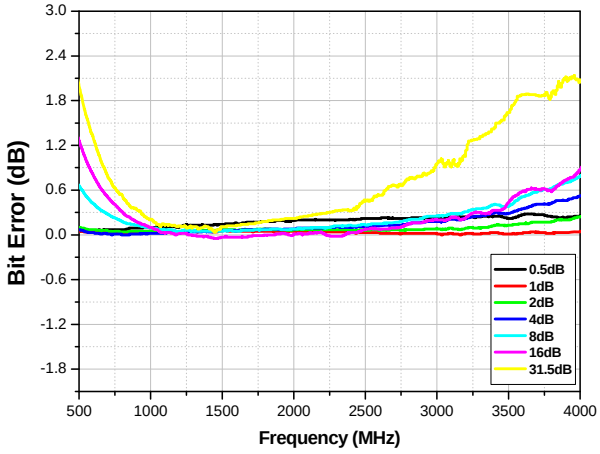
Insertion Loss vs. Frequency



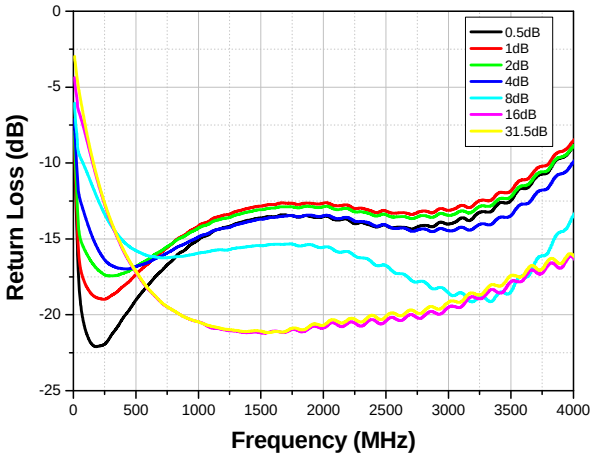
Normalized Attenuation



Bit Error vs. Frequency



Return Loss vs. Frequency



Truth Table

Attenuation State	Control Voltage Input					
	V1 0.5 dB	V2 1 dB	V3 2 dB	V4 4 dB	V5 8 dB	V6 16 dB
Reference I.L.	High	High	High	High	High	High
0.5 dB	Low	High	High	High	High	High
1 dB	High	Low	High	High	High	High
2 dB	High	High	Low	High	High	High
4 dB	High	High	High	Low	High	High
8 dB	High	High	High	High	Low	High
16 dB	High	High	High	High	High	Low
31.5 dB	Low	Low	Low	Low	Low	Low

Control Voltage & Current

State	Bias Condition
High	1 to +Vs
Low	0 to +0.2 V

Absolute Maximum Ratings

Parameters	Rating
RF Input Power (0.5 to 3 GHz)	+22 dBm
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-65 to +150 °C
Device Voltage	+3.5 V
Operating Junction Temperature	+160 °C
Thermal Resistance	130 °C/W

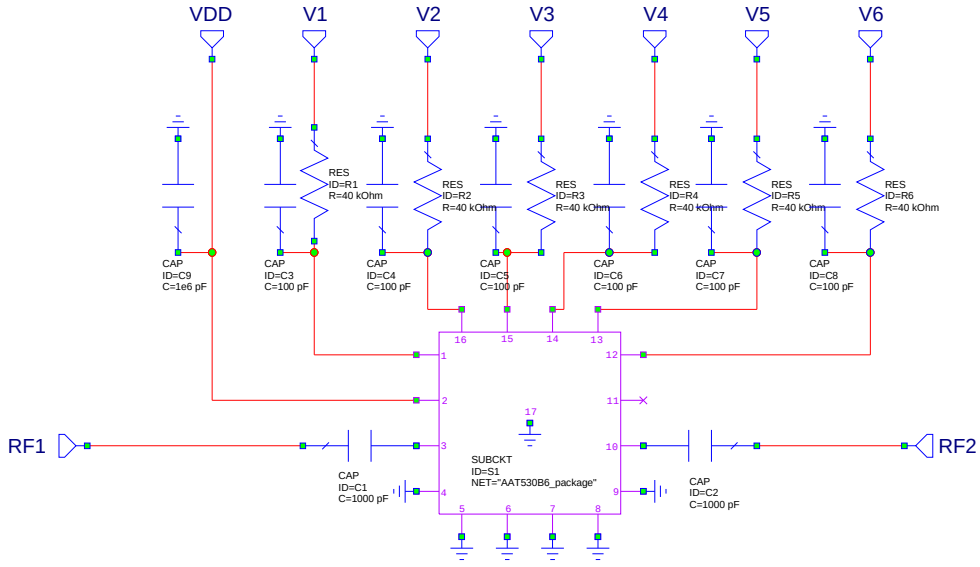
Ordering Information

Part Number	Description	Package Description	Component Packing
AAT530B6	RFIC	RoHS-compliant QFN	Tape & Reel

Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Application Circuit



Evaluation PCB

