APS3607

Four-way Active Power Splitter

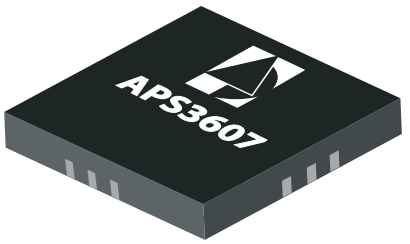
ADVANCED PRODUCT INFORMATION - Rev 0.2

FEATURES

- Single Input, Quadruple Output Design
- Wideband Operation to above 1 GHz
- Nominal 3.2 dB Gain
- 4.7 dB Typical Noise Figure
- Single +3.3V or +5V Supply
- High Linearity, Low Distortion
- Current adjust pin for optimizing distortion performance
- Single-Ended 75 Ohm Inputs/Outputs
- RoHS Compliant Package

APPLICATIONS

- All-Digital CATV Set-Top Boxes with Multiple Tuners
- Multiple-Tuner TVs and TV Tuner Cards



S26 Package
12 Pin QFN
3 mm x 3 mm x 1 mm

PRODUCT DESCRIPTION

This APS3607 active splitter from ANADIGICS accepts a broadband RF input from 50 MHz to 1002 MHz and splits the signal to provide four broadband RF outputs with minimal degradation of quality. The single-package surface mount device amplifies the input using highly linear, low noise amplification stages, and couples the amplified signal to four separate output paths that each can drive digital video tuners. The overall linearity of each path is maintained across the entire operating frequency range, ensuring low distortion effects on each output signal.

Requiring a single voltage supply of either +3.3V or +5 V, the active splitter is manufactured using ANADIGICS' highly reliable GaAs MESFET process. The small surface mount QFN packaging makes this device ideal for use in today's set-top boxes, televisions and video tuner cards requiring multiple-tuner solutions.

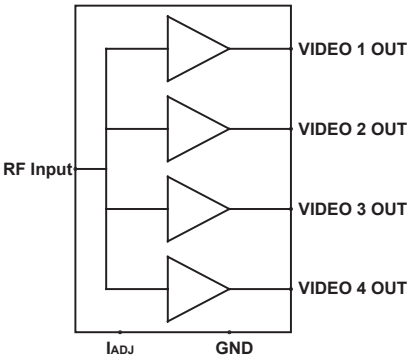


Figure 1: Functional Block Diagram

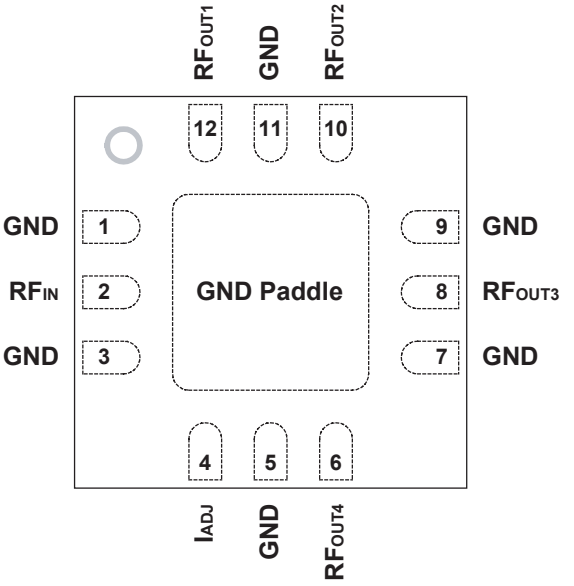


Figure 2: Pinout (X-ray Top View)

Table 1: Pin Description

PIN	NAME	DESCRIPTION
1	GND	Ground
2	RF_{IN}	RF Input
3	GND	Ground
4	I_{ADJ}	Current Adjust
5	GND	Ground
6	RF_{OUT4}	RF Output 4
7	GND	Ground
8	RF_{OUT3}	RF Output 3
9	GND	Ground
10	RF_{OUT2}	RF Output 2
11	GND	Ground
12	RF_{OUT1}	RF Output 1

ELECTRICAL CHARACTERISTICS

Table 2: Absolute Minimum and Maximum Ratings

PARAMETER	MIN	MAX	UNIT	COMMENTS
Supply Voltage (V_{CC})	0	+8	V	
RF Input Power	-	+40	dBmV	per channel 132 channel loading
ESD Rating	500 1000	- -	V	Human Body Model, Class 1B Charged Device Model, Class 3
MSL Level	MSL-1	-	-	

Stresses in excess of the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability.

Table 3: Operating Ranges

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Operating Frequency (f)	50	-	1002	MHz	
Supply Voltage (V_{CC})	+3	-	5.25	V	Supplied via output pins
RF Input Power (P_{IN})	-15	-	+15	dBmV	per channel
Current Adjust Pin (I_{ADJ})	0	-	+0.5	V	
Case Temperature (T_C)	-5	-	+85	°C	no damage to device operating over -30 to +95 °C range

The device may be operated safely over these conditions; however, parametric performance is guaranteed only over the conditions defined in the electrical specifications.

Table 4: Electrical Specifications
(T_{AMB} = +25 °C, V_{CC} = +5 V, I_{CC} = 130 mA, 75 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain at 50 MHz	2.7	3.2	-	dB	
Noise Figure	-	4.7	5.2	dB	
CTB (1)	-	-70	-66	dBc	
CSO (1)	-	-66	-60	dBc	
XMOD (1)	-	-67	-	dBc	
RF Isolation Input-Output Output-Output	 - -	 25 25	 - -	dB	
Input Return Loss	-	-15	-	dB	
Power Consumption	-	700	-	mW	

Notes:
(1) 132 channels, +15 dBmV input per channel, 0 dB tilt.

Table 5: Electrical Specifications
(T_{AMB} = +25 °C, V_{CC} = +3.3 V, I_{CC} = 130 mA, 75 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain at 50 MHz	-	3.2	-	dB	
Noise Figure	-	4.7	-	dB	
CTB (1)	-	-70	-	dBc	
CSO (1)	-	-60	-	dBc	
XMOD (1)	-	-67	-	dBc	
RF Isolation Input-Output Output-Output	 - -	 25 25	 - -	dB	
Input Return Loss	-	-15	-	dB	
Power Consumption	-	450	-	mW	

Notes:
(1) 132 channels, +18 dBmV input per channel, 0 dB tilt.

+5 VOLT DATA

Test Conditions: 132 channels, 0 dB tilt, +15 dBmV input/channel, I_{ADJ} = GND

Figure 3: Gain vs. Frequency

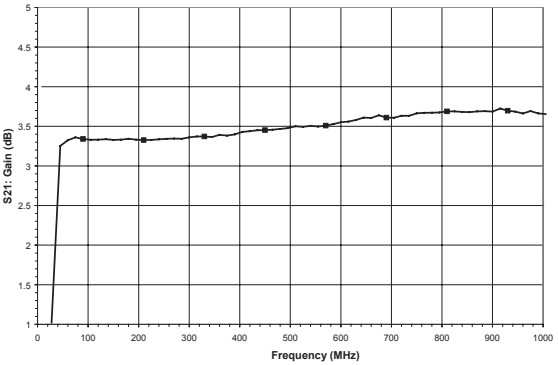


Figure 4: Output Return Loss vs. Frequency

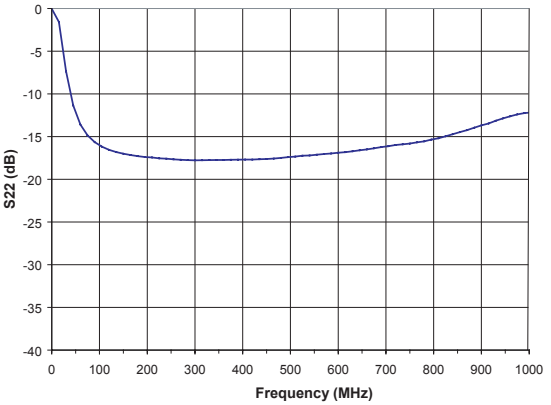


Figure 5: Input Return Loss vs. Frequency

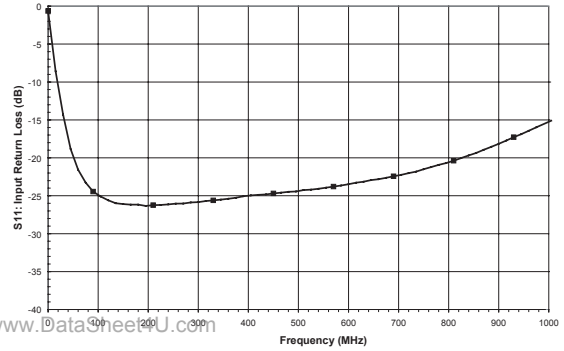


Figure 6: Reverse Isolation vs. Frequency

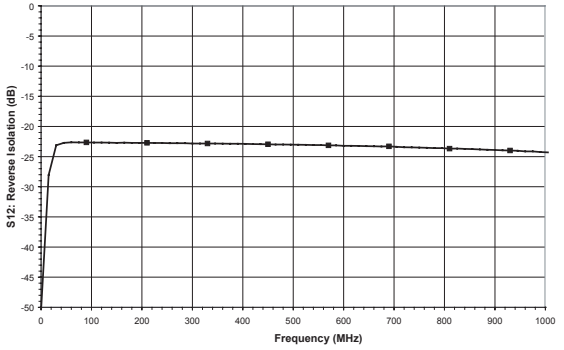


Figure 7: CTB vs. Frequency

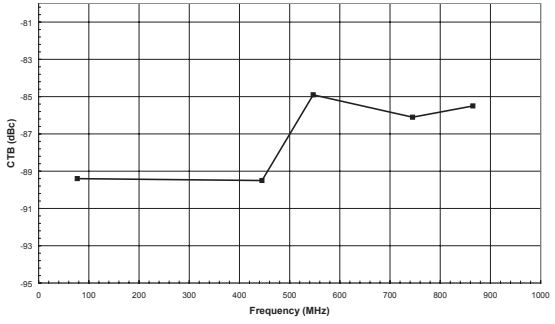
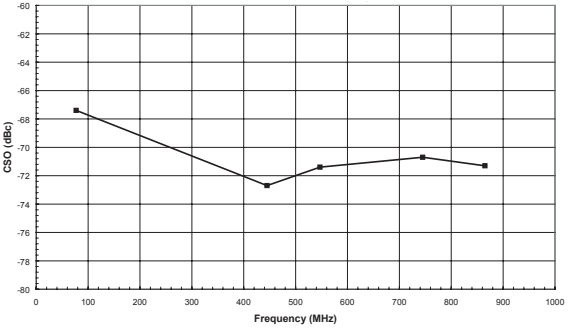


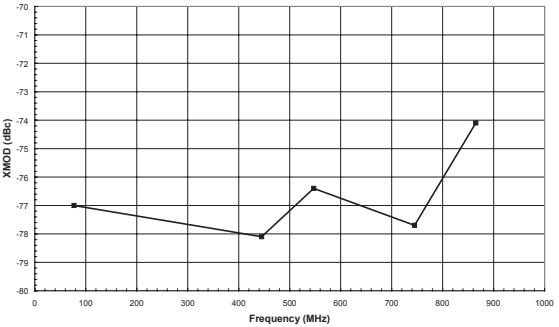
Figure 8: CSO vs. Frequency



+5 VOLT DATA (continued)

Test Conditions: 132 channels, 0 dB tilt, +15 dBmV input/channel, I_{ADJ} = GND

Figure 9: XMOD (dBc) vs. Frequency



+3.3 VOLT DATA

Test Conditions: 132 channels, 0 dB tilt, 18 dBmV input/channel, I_{ADJ} = GND

Figure 10: Gain vs. Frequency

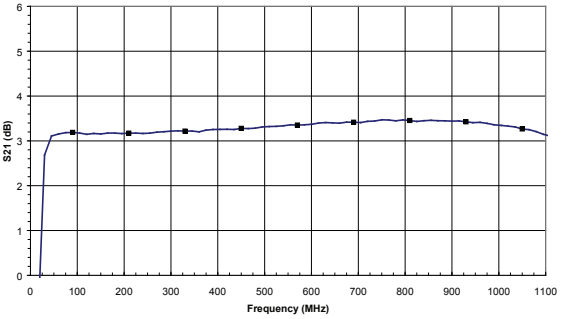


Figure 11: Output Return Loss vs. Frequency

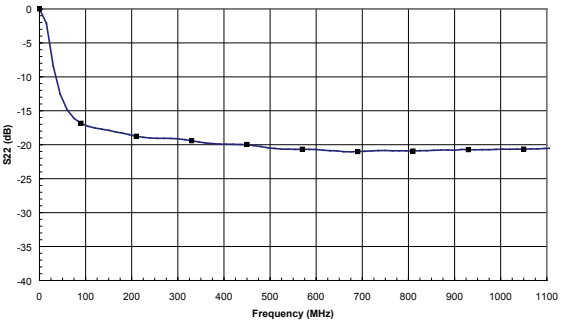


Figure 12: Input Return Loss vs. Frequency

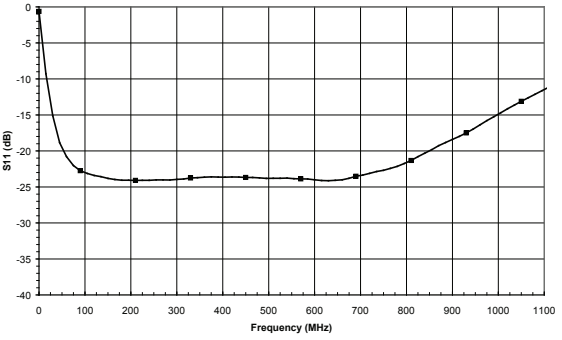
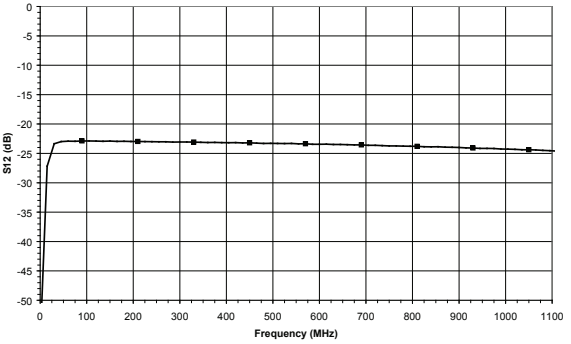


Figure 13: Reverse Isolation vs. Frequency



+3.3 VOLT DATA (continued)

Test Conditions: 132 channels, 0 dB tilt, 18 dBmV input/channel, I_{ADJ} = GND

Figure 14: CTB vs. Frequency

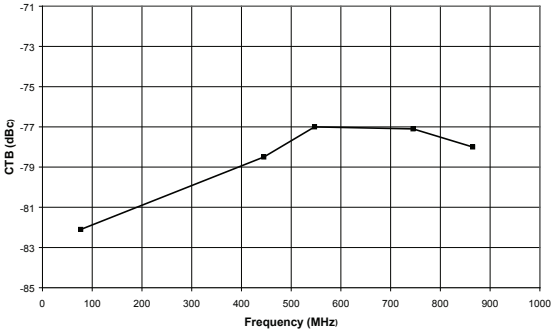


Figure 15:CSO vs. Frequency

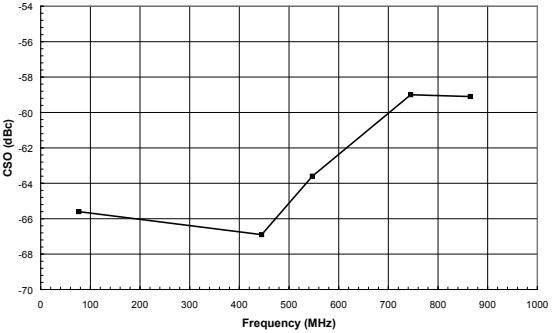


Figure 16: XMOD (dBc) vs. Frequency

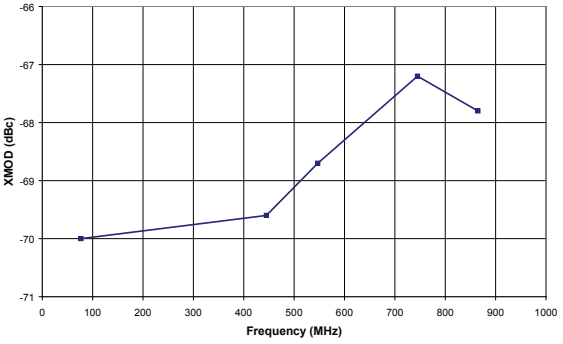
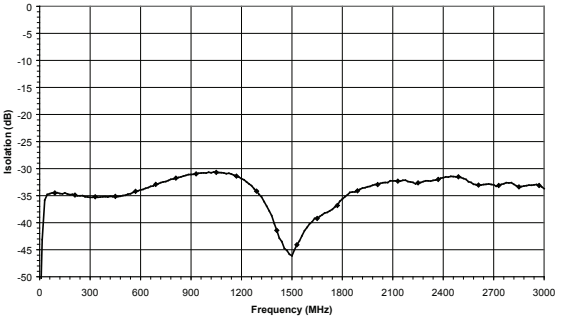


Figure 17: Output Port-to-Port vs. Frequency



APPLICATION INFORMATION

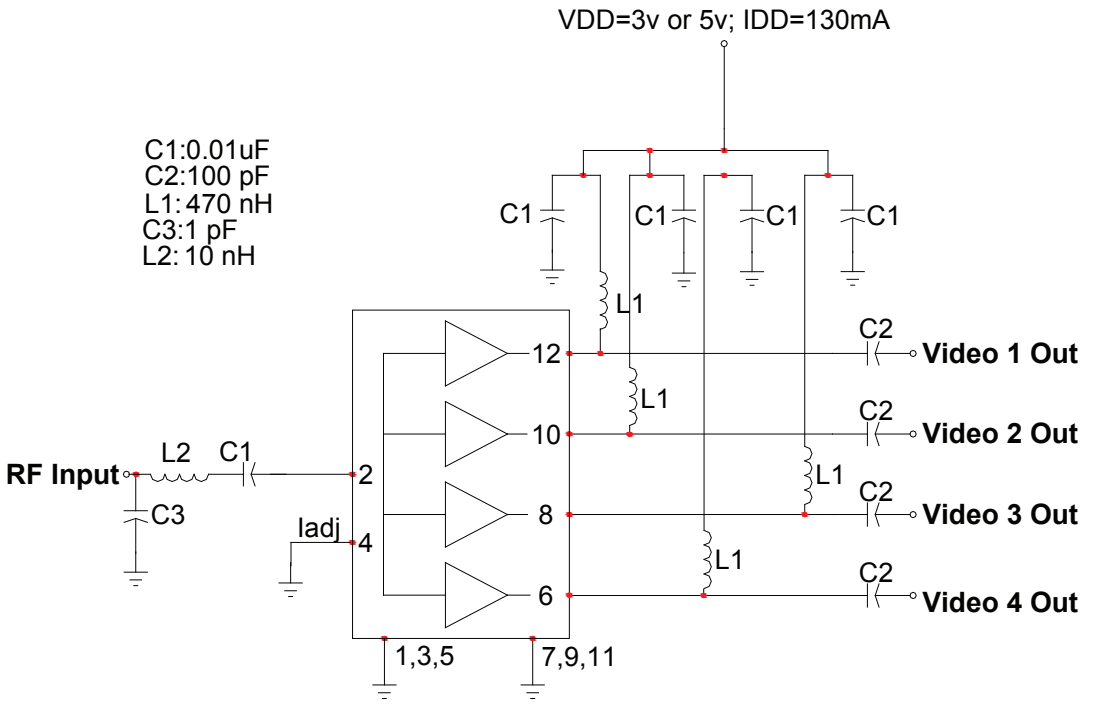
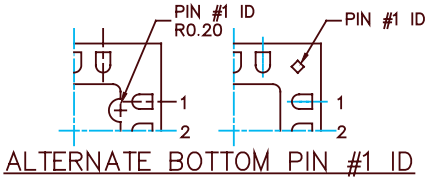


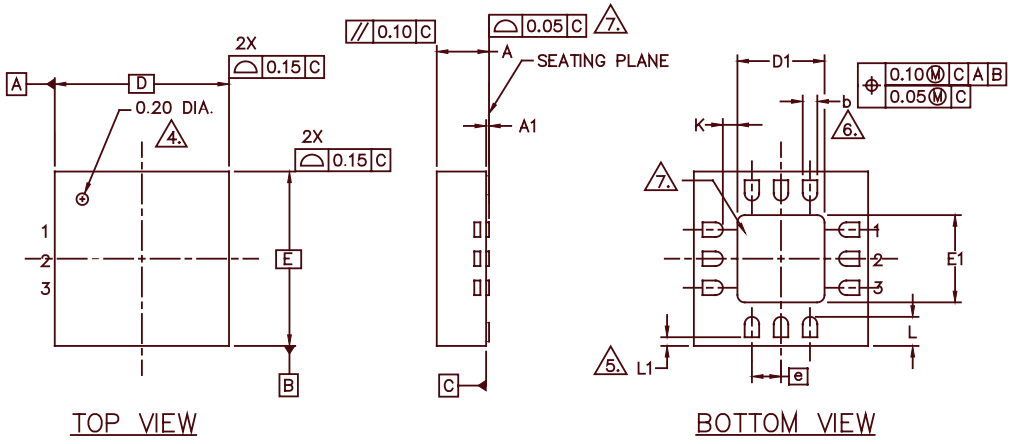
Figure 10: 4 Way Active Splitter Digital Application Circuit

Note:

Application circuits are available for other supply voltages. Contact ANADIGICS broadband engineering for more detail.

PACKAGE OUTLINE





SYMBOL	DIMENSIONS–MM MIN.	MAX.	NOTE	SYMBOL	DIMENSIONS–INCHES MIN.	MAX.	NOTE
A	0.80	1.00		A	0.031	0.039	
A1	0.00	0.05		A1	0.000	0.001	
b	0.18	0.30		b	0.007	0.011	
D	3.00 BSC			D	0.118 BSC		
D1	1.30	1.70		D1	0.051	0.067	
E	3.00 BSC			E	0.118 BSC		
E1	1.30	1.70		E1	0.051	0.067	
e	0.50 BSC			e	0.019 BSC		
K	0.20 MIN.			K	0.007 MIN.		
L	0.35	0.55		L	0.014	0.022	
L1		0.15 MAX.		L1		0.006 MAX.	

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. MAX. PACKAGE WARPAGE IS 0.05 mm.
3. MAXIMUM ALLOWABLE BURRS IS 0.076 mm IN ALL DIRECTIONS.
4. PIN #1 ID ON TOP WILL BE LASER MARKED.
5. A MAXIMUM 0.15mm PULL BACK (L1) MAYBE PRESENT. L MINUS L1 TO BE EQUAL TO OR GREATER THAN 0.30mm.
6. DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM TERMINAL TIP. IF THE TERMINAL HAS THE OPTIONAL RADIUS ON THE OTHER END OF THE TERMINAL, THE DIMENSION b SHOULD NOT BE MEASURED IN THAT RADIUS AREA.
7. BILATERAL COPLANARITY ZONE APPLIES TO THE EXPOSED HEAT SINK SLUG AS WELL AS THE TERMINALS.
8. REFERENCE JEDEC OUTLINE MO–220.

Figure 11: S26 Package Outline - 12 Pin 3 mm x 3 mm x 1 mm QFN

ORDERING INFORMATION

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
APS3607RS26Q1	-5 °C to +85 °C	RoHS Compliant 12 Pin 3 mm x 3 mm x 1 mm QFN Package	Tape and Reel, 1000 pieces per Reel

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