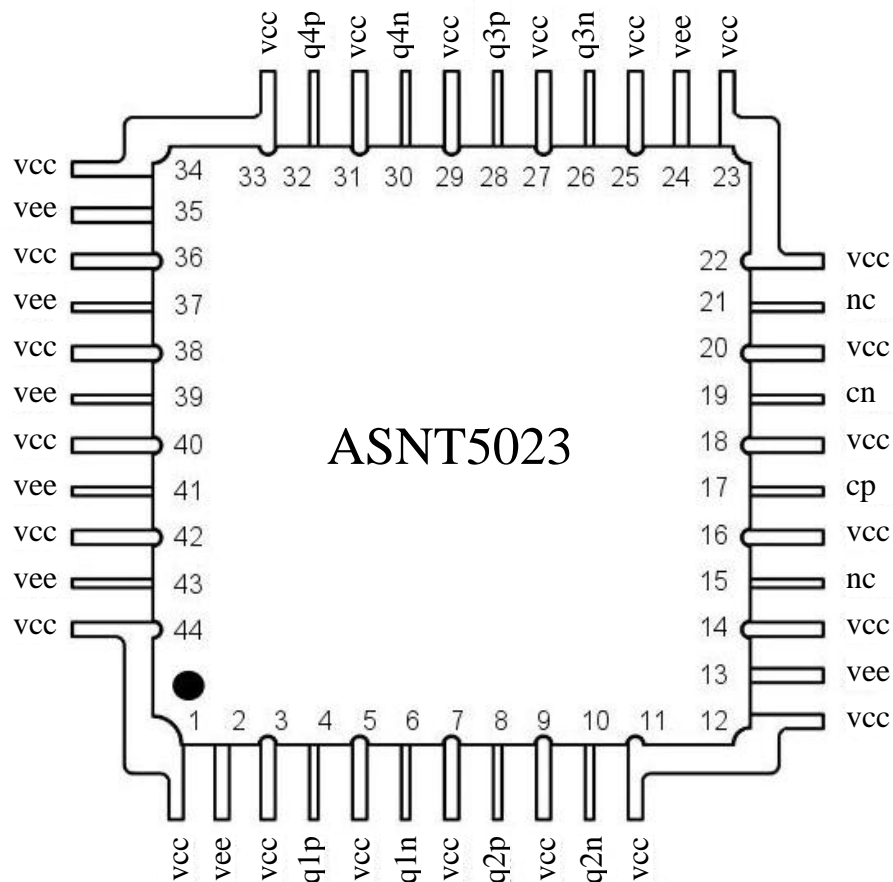




## ASNT5023-KMM DC-28Gbps/17GHz Signal Distributor 1-to-4

- High-speed broadband Data/Clock Amplifier and Distributor
- Exhibits low jitter and limited temperature variation over industrial temperature range
- One differential input signal port and four differential amplified output signal ports
- Matched phase delays for all outputs
- Fully differential CML input interface
- Fully differential CML output interfaces with 600mV single-ended swing
- Linearized output buffers for minimized undershoot/overshoot
- Single +3.3V or -3.3V power supply
- Power consumption: 1.06W
- Fabricated in SiGe for high performance, yield, and reliability
- Custom CQFP 44-pin package



## DESCRIPTION

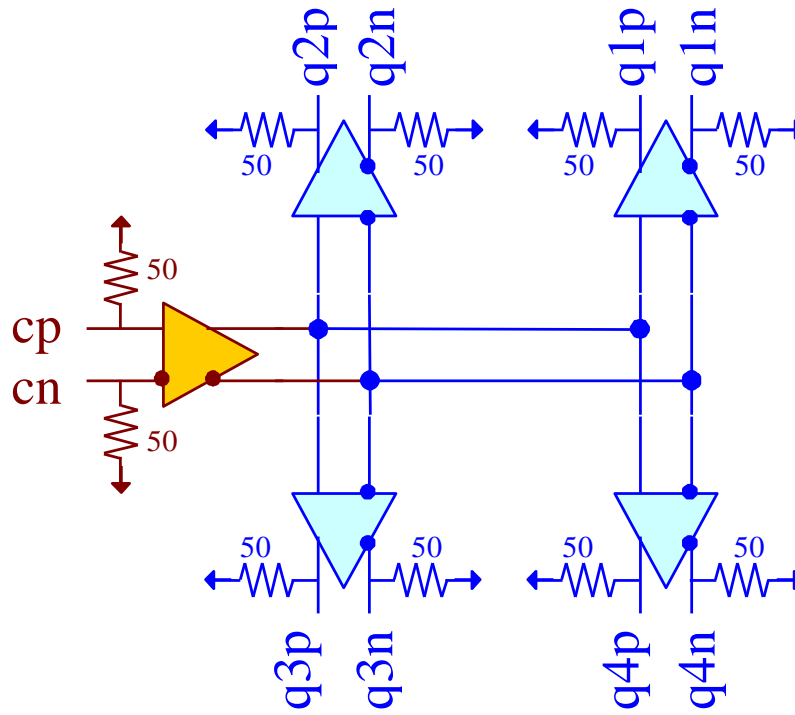


Fig. 1. Functional Block Diagram

The temperature stable ASNT5023-KMM SiGe IC provides active broadband data/clock signal splitting and is intended for use in high-speed measurement / test equipment. The IC shown in Fig. 1 can deliver four phase-matched copies of the broadband data/clock input signal **cp/cn** to four high-speed differential outputs **q1p/q1n**, **q2p/q2n**, **q3p/q3n**, **q4p/q4n**.

The part's I/O's support the CML logic interface with on chip  $50\Omega$  termination to **vcc** and may be used differentially, AC/DC coupled, single-ended, or in any combination (see also POWER SUPPLY CONFIGURATION). In the DC-coupling mode, the input signal's common mode voltage should comply with the specifications shown in ELECTRICAL CHARACTERISTICS. In the AC-coupling mode, the input termination provides the required common mode voltage automatically. The differential DC signaling mode is recommended for optimal performance.

## POWER SUPPLY CONFIGURATION

The part can operate with either negative supply (**vcc** = 0.0V = ground and **vee** = -3.3V), or positive supply (**vcc** = +3.3V and **vee** = 0.0V = ground). In case of the positive supply, all I/Os need AC termination when connected to any devices with  $50\Omega$  termination to ground. Different PCB layouts will be needed for each different power supply combination.

**All the characteristics detailed below assume vcc = 0.0V and vee = -3.3V.**



## ABSOLUTE MAXIMUM RATINGS

Caution: Exceeding the absolute maximum ratings shown in Table 1 may cause damage to this product and/or lead to reduced reliability. Functional performance is specified over the recommended operating conditions for power supply and temperature only. AC and DC device characteristics at or beyond the absolute maximum ratings are not assumed or implied. All min and max voltage limits are referenced to ground.

Table 1. Absolute Maximum Ratings

Parameter	Min	Max	Units
Supply Voltage (vee)		-3.6	V
Power Consumption		1.17	W
RF Input Voltage Swing (SE)		1.4	V
Case Temperature		+90	°C
Storage Temperature	-40	+100	°C
Operational Humidity	10	98	%
Storage Humidity	10	98	%

## TERMINAL FUNCTIONS

TERMINAL			DESCRIPTION
Name	No.	Type	
<b>High-Speed I/Os</b>			
cp	17	CML input	Differential high speed data/clock inputs with internal SE 50Ohm termination to vcc
cn	19		
q1p	4	CML output	Differential high speed data/clock outputs with internal SE 50Ohm termination to vcc. Require external SE 50Ohm termination to vcc
q1n	6		
q2p	8	CML output	Differential high speed data/clock outputs with internal SE 50Ohm termination to vcc. Require external SE 50Ohm termination to vcc
q2n	10		
q3p	28	CML output	Differential high speed data/clock outputs with internal SE 50Ohm termination to vcc. Require external SE 50Ohm termination to vcc
q3n	26		
q4p	32	CML output	Differential high speed data/clock outputs with internal SE 50Ohm termination to vcc. Require external SE 50Ohm termination to vcc
q4n	30		
<b>Supply and Termination Voltages</b>			
Name	Description		Pin Number
vcc	Positive power supply (+3.3V or 0)		1, 3, 5, 7, 9, 11, 12, 14, 16, 18, 20, 22, 23, 25, 27, 29, 31, 33, 34, 36, 38, 40, 42, 44
vee	Negative power supply (0V or -3.3V)		2, 13, 24, 35, 37, 39, 41, 43
nc	Not connected pins		15, 21



## ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
<b>General Parameters</b>					
vee	-3.1	-3.3	-3.5	V	±6%
vcc		0.0		V	External ground
I <sub>vee</sub>		320		mA	
Power consumption		1060		mW	
Junction temperature	-40	25	125	°C	
<b>HS data/clock input (cp/cn)</b>					
Data rate	DC		28	Gbps	
Frequency	DC		17	GHz	
Swing	50	300	600	mV	Differential or SE, p-p
Common mode level	vcc -0.6	vcc -0.5	vcc	mV	Must match for both inputs
Duty cycle	40	50	60	%	For clock signal
<b>HS data/clock output (q1p/q1n, q2p/q2n, q3p/q3n, q4p/q4n)</b>					
Data rate	DC		28	Gbps	
Frequency	DC		17	GHz	
Phase mismatch			2	ps	Between any two SE outputs
Logic "1" level		vcc		V	
Logic "0" level		vcc-0.6		V	With external 50Ω DC termination
Rise/Fall Times	15		19	ps	20%-80%
Additive Jitter			5	ps	Peak-to-peak

## PACKAGE INFORMATION

The chip die is housed in a custom 44-pin CQFP package shown in Fig. 2. Even though the package provides a center heat slug located on the back side of the package to be used for heat dissipation, ADSANTEC does **NOT** recommend for this section to be soldered to the board. If the customer wishes to solder it, it should be connected to the vcc plain that is ground for the negative supply or power for the positive supply.

The part's identification label is ASNT5023-KMM. The first 8 characters of the name before the dash identify the bare die including general circuit family, fabrication technology, specific circuit type, and part version while the 3 characters after the dash represent the package's manufacturer, type, and pin out count.

The IC complies with the Restriction of Hazardous Substances (RoHS) per EU 2002/95/EC for all 6 substances.

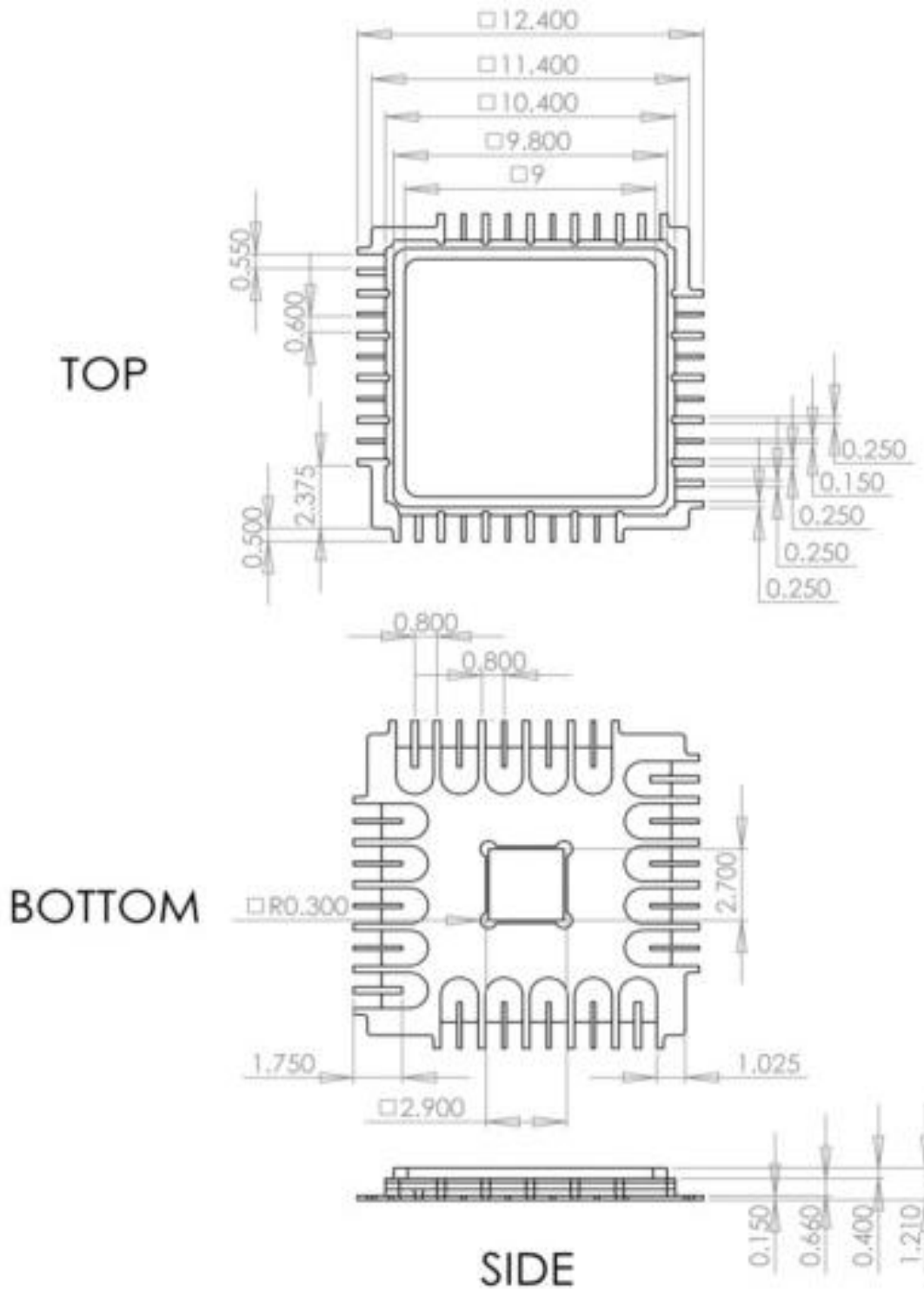


Fig. 2. CQFP 44-Pin Package Drawing (All Dimensions in mm)



## REVISION HISTORY

Revision	Date	Changes
2.1.1	03-2013	Added phase mismatch specifications Updated description
2.0.1	02-2013	Revised description Revised power supply configuration Corrected absolute maximum ratings table Corrected terminal functions table Corrected electrical characteristics table Updated package information
1.0	05-2012	Initial release