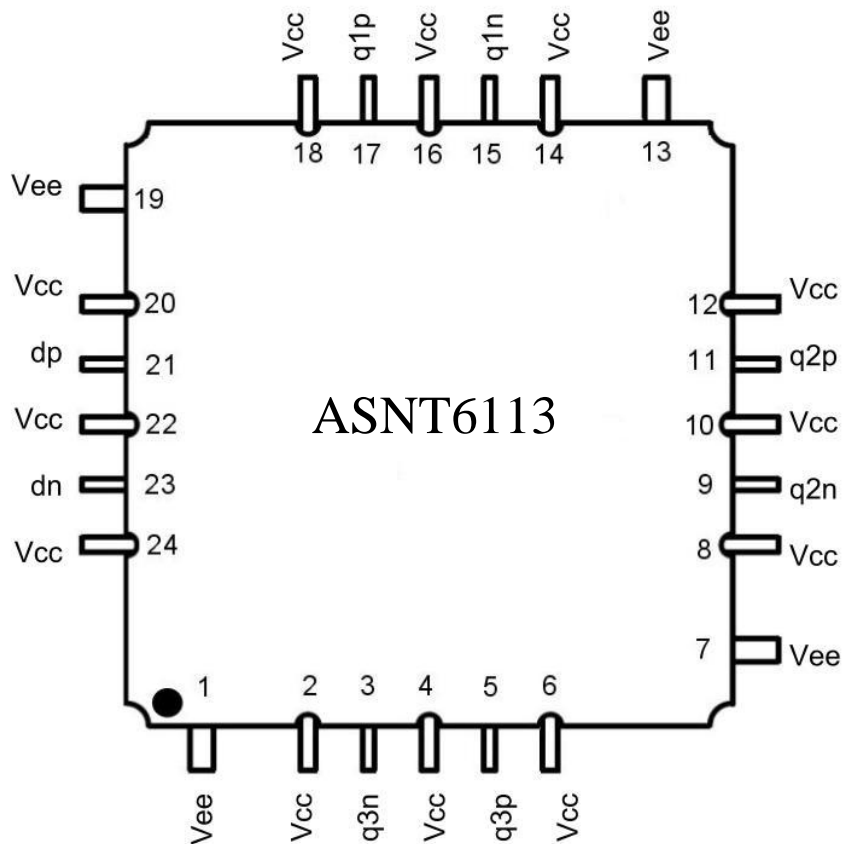




ASNT6113-KMC DC-25GHz 1-to-3 Analog Signal Splitter

- DC to 25GHz broadband linear signal splitter
- One differential CML-type input port and three phase-matched differential CML-type output ports
- Differential input linearity range up to 1000mV p-p
- Differential gain of approximately 0dB
- Low jitter and limited temperature variation over industrial temperature range
- Single +3.3V or -3.3V power supply
- Power consumption: 1.0W
- Fabricated in SiGe for high performance, yield, and reliability
- Custom CQFP 24-pin package



DESCRIPTION

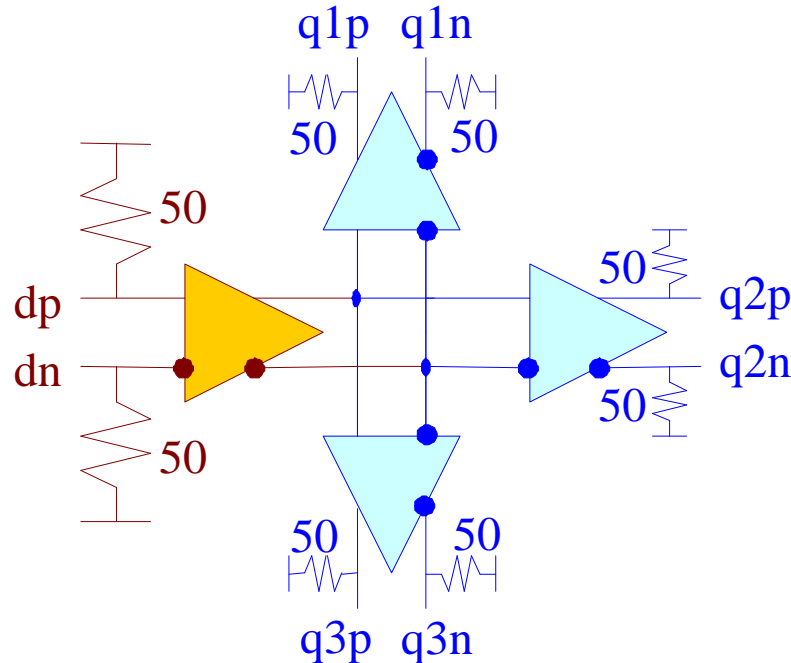


Fig. 1. Functional Block Diagram

The temperature stable ASNT6113-KMC 1-to-3 analog signal splitter is intended for use in high-speed interleaved ADCs or similar systems. The IC shown in Fig. 1 can receive a broad-band analog signal at its differential input dp/dn and effectively distribute it to three separate phase matched differential outputs q1p/q1n, q2p/q2n, q3p/q3n with a nominal gain of 0dB.

The part's I/O's support the CML logic interface with on chip 50 Ω termination to VCC and may be used differentially, AC/DC coupled, single-ended, or in any combination (also see 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. In particular, the specified output common-mode voltage level is guaranteed only in case of external single-ended 50 Ω DC termination to VCC.

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 Ω 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 | | 1.1 | 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 FUNCTION

| TERMINAL | | | DESCRIPTION |
|---------------------------------|--------------------------------------|---------------|---|
| Name | No. | Type | |
| dp | 21 | CML input | Differential high speed data inputs with internal SE 50Ω termination to VCC. |
| dn | 23 | | |
| q1p | 17 | CML output | Differential high speed data outputs with internal SE 50Ω termination to VCC. Require external SE 50Ω termination to VCC. |
| q1n | 15 | | |
| q2p | 11 | CML output | |
| q2n | 9 | | |
| q3p | 5 | CML output | |
| q3n | 3 | | |
| Supply and Termination Voltages | | | |
| Name | Description | | Pin Number |
| vcc | Positive power supply. (+3.3V or 0) | | 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 |
| vee | Negative power supply. (0V or -3.3V) | | 1, 7, 13, 19 |



ELECTRICAL CHARACTERISTICS

| PARAMETER | MIN | TYP | MAX | UNIT | COMMENTS |
|--|---------|----------|---------|-------------|------------------------------------|
| General Parameters | | | | | |
| vee | -3.1 | -3.3 | -3.5 | V | ±6% |
| vcc | | 0.0 | | V | External ground |
| I _{vee} | | 300 | | mA | |
| Power consumption | | 1000 | | mW | |
| Junction temperature | -25 | 50 | 125 | °C | |
| Input Analog (dp/dn) | | | | | |
| Bandwidth | DC | | 25 | GHz | -3dB |
| Common mode level | vcc-0.6 | vcc-0.5 | vcc-0.4 | mV | |
| Input Noise Density | | 1.5 | | nV/sqrt(Hz) | |
| S ₁₁ | | -10 | | dB | DC to 30GHz |
| Output Analog (q1p/q1n, q2p/q2n, q3p/q3n) | | | | | |
| Common mode level | | vcc-0.55 | | V | With external 50Ohm DC termination |
| S ₂₂ | | -8 | | dB | DC to 30GHz |
| Small Signal Differential Gain | | 0 | | dB | at 10GHz |
| Output referred 1dB Compression Point | | 2.7 | | dBm | Single-Ended, 20GHz |
| THD | | 0.2 | | % | |

PACKAGE INFORMATION

The chip die is housed in a custom 24-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 ASNT6113-KMC. 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.

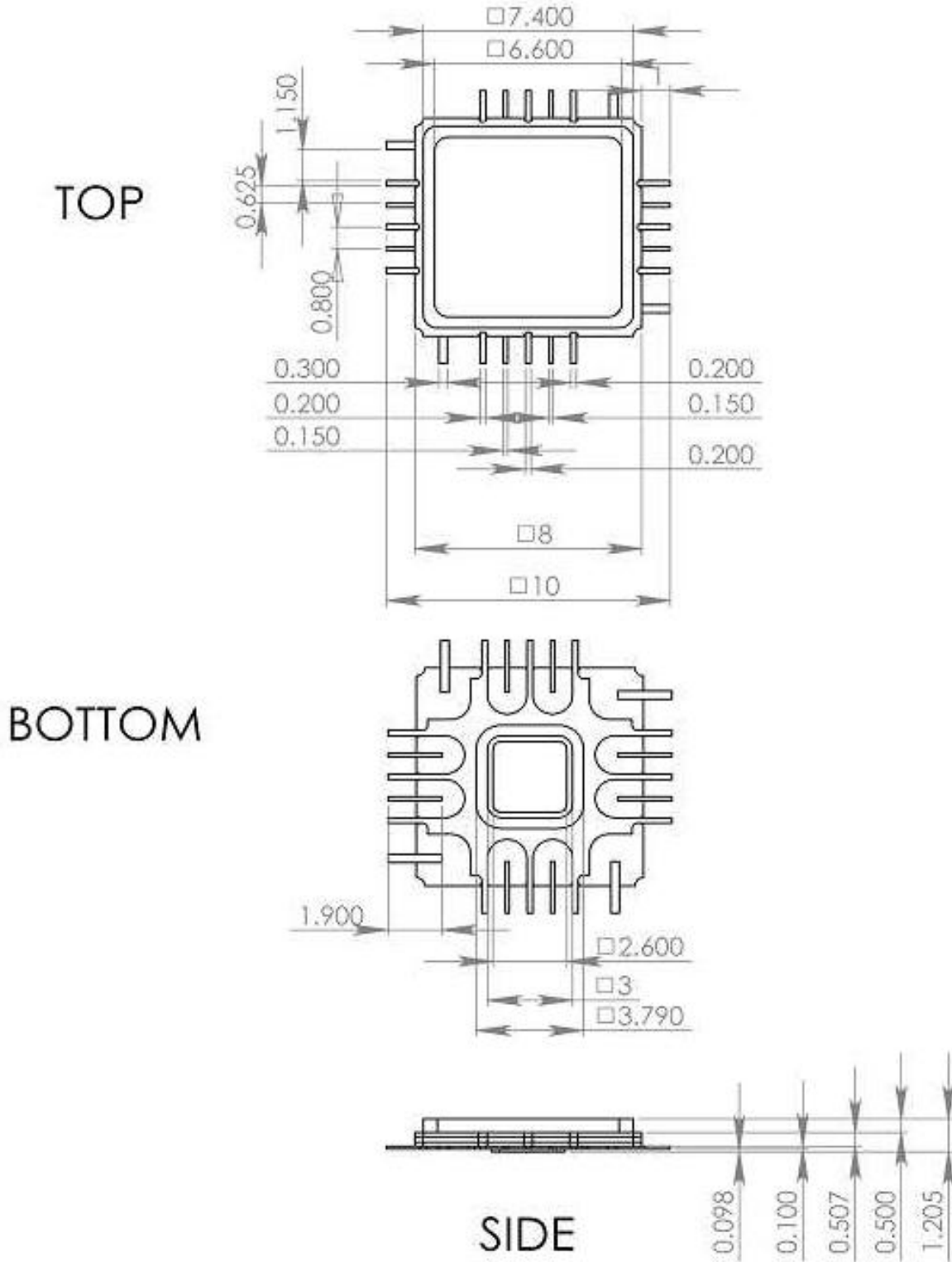


Fig. 2. CQFP 24-Pin Package Drawing (All Dimensions in mm)



REVISION HISTORY

| Revision | Date | Changes |
|----------|---------|--|
| 1.1.1 | 03-2013 | Corrected description Corrected absolute maximum ratings Updated Electrical Specifications table Added package mechanical drawing Corrected format |
| 1.0 | 03-2012 | First release |