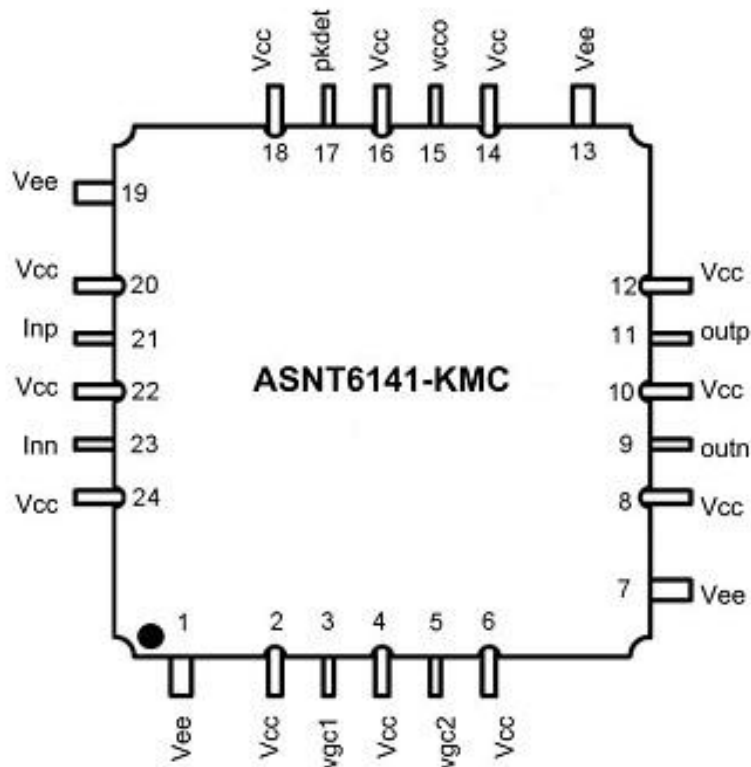




## ASNT6141-KMC 12GHz Linear Amplifier

- Broadband linear amplifier for receiver-side applications.
- Features gain control, input offset adjustment, and input peak detector.
- Exhibits low jitter and limited temperature variation over industrial temperature range.
- DC to 12GHz analog bandwidth.
- Fully differential input and output buffers with on-chip 50Ohm termination.
- Single -3.3V power supply.
- Low current consumption of 150mA at nominal conditions.
- Fabricated in SiGe for high performance, yield, and reliability.
- Custom CQFP 24-pin package.

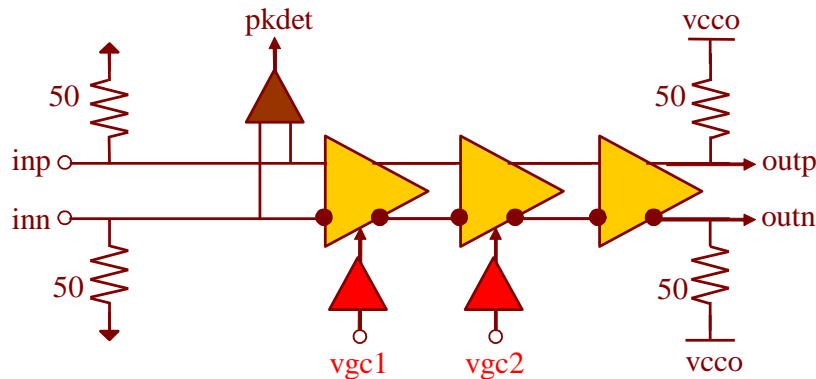


Package View



## DESCRIPTION

The temperature-stable linear amplifier ASNT6141-KMC IC fabricated in the SiGe technology provides low-jitter broadband variable signal amplification between its input (“inp”/“inn”) and output (“outp”/“outn”) signal ports and is intended for use in high-speed communication systems. The gain adjustment is performed through two independent external control ports (“vgc1” and “vgc2”). The part’s I/Os support the CML-type interface with on chip  $50\Omega$  termination and may be used differentially, AC/DC coupled, single-ended, or in any combination. The on-chip peak detector delivers a single-ended output voltage (“pkdet”) proportional to the input signal’s amplitude. The amplifier can operate from a single -3.3V power supply. For the optional output common-mode voltage adjustment, the output termination resistors can be connected to a separate positive supply voltage (“vcco”) instead of common ground.



Functional Block Diagram

## POWER SUPPLY CONFIGURATION

The ASNT6141-KMC can operate with either a negative supply (“vcc” = 0.0V=ground and “vee” = -3.3V), or a 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 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”)		-3.5	V
Power Consumption		.578	W
RF Input Voltage Swing (SE)		1.0	V
Case Temperature		+90	°C
Storage Temperature	-40	+100	°C
Operational Humidity	10	98	%
Storage Humidity	10	98	%

## TERMINAL FUNCTIONS

TERMINAL		TYPE	DESCRIPTION
NAME	(NO.)		
vcc	2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24	PS	Power Supply: 0V (GND)
vee	1, 7, 13, 19	PS	Power Supply: -3.3V
inp	21	Input	Differential high-speed analog signal inputs
inn	23		
outp	11	Output	Differential high-speed analog signal outputs
outn	9		
vgc1	3	Input	Low-speed amplitude adjustment tuning input
vgc2	5	Input	Low-speed amplitude adjustment tuning input
vcco	15	PS	Output buffer power-supply (Default: 0V)
pkdet	17	Output	Peak detector output



## ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
VEE	-3.1	-3.3	-3.5	V	±6%
VCC		0.0		V	
IEE		150	165	mA	
Power		495		mW	
Junction Temp.	0	50	85	°C	
<b>Input (in)</b> Bandwidth		12		GHz	-3 dB
CM Level	-0.8		0	V	
Input Noise Density		2.5		nV/sqrt(Hz)	High Gain
S11		-15		dB	DC to 10GHz
Gain Control Port Input Impedance		2		kOhm	
<b>Output (out)</b> CM Level		-0.6		V	
S22		-15		dB	DC to 10GHz
Small Signal Gain	30	32	33	dB	10GHz, $V_{gc1,2}=-3.3V$
Small Signal Gain	0.5	0.8	1.0	dB	10GHz, $V_{gc1,2}=0V$
Output referred 1dB Compression Point		2.9		dBm	Single-Ended, 10GHz
THD		0.2		%	$V_{out}=350mV_{p-p}$ , SE

## PACKAGE INFORMATION

The chip die is housed in a custom 24-pin CQFP package. The package's mechanical information is available on the company's [website](#). 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, which is ground for the negative supply or power for the positive supply.

The part's identification label is ASNT6114-KMC. The first 8 digits of the name before the underscore identify the bare die including general circuit family, fabrication technology, specific circuit type, and part version while the 3 digits after the underscore represent the package's manufacturer, type, and pin out count.

This device complies with the Restriction of Hazardous Substances (RoHS) per EU 2002/95/EC for all six substances.



# ADSANTEC

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## REVISION HISTORY

Revision	Date	Changes
1.1	3-2012	Added Power Supply Configuration text Replaced the “package view” diagram Added Absolute Maximum Ratings table Added Package Information section Added Revision History table
1.0	9-2010	First release