

# NOT RECOMMENDED FOR NEW DESIGNS RECOMMENDED REPLACEMENT PART ISL55014

## ISL55013

MMIC Silicon Bipolar Broadband Amplifier

FN6283 Rev 0.00 Feb 13, 2007

The ISL55013 is a high performance gain block featuring a Darlington configuration using high  $f_T$  transistors and excellent thermal performance. They are an ideal choice for DVB-S LNB cable receiver applications.

Other members of the family include:

ISL55012 and ISL55015 match a 75 $\Omega$  source to a 50 $\Omega$  load. ISL55013 and ISL55014 match a 50 $\Omega$  source to a 50 $\Omega$  load.

## **Ordering Information**

PART NUMBER (Note)	PART MARKING	TAPE & REEL	PACKAGE (Pb-Free)	PKG. DWG.#
ISL55013IEZ-T7	CCH	7" (3k nce)	6 Ld SC-70	P6.049

NOTE: Intersil Pb-free plus anneal products employ special Pb-free material sets; molding compounds/die attach materials and 100% matte tin plate termination finish, which are RoHS compliant and compatible with both SnPb and Pb-free soldering operations. Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J STD-020.

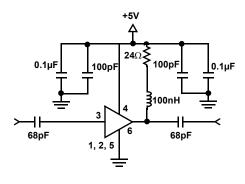
# Features

- Input impedance of  $50\Omega$
- Output impedance of  $50\Omega$
- Gain of 11.8dB @1GHz
- · Noise figure of 5.0dB
- OIP3 of 31dBm
- · Low input and output return losses
- · Pb-free available (RoHS compliant)

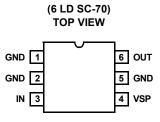
## **Applications**

- · LNB and LNB-T (HDTV) amplifiers
- · IF gain blocks for satellite and terrestrial STBs
- · PA driver amplifier
- · Wireless data, satellite
- · Bluetooth/WiFi
- · Satellite locator and signal strength meters

## Typical Application Circuit



# Pinout



## **Absolute Maximum Ratings** (T<sub>A</sub> = +25°C)

#### 

Machine Model (Per EIAJ ED-4701 Method C-111).....300V

#### **Thermal Information**

Thermal Resistance (Typical)	θ <sub>JA</sub> (°C/W)
6 Ld SC-70	200

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device.

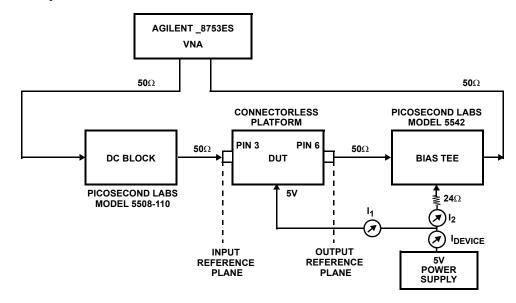
IMPORTANT NOTE: All parameters having Min/Max specifications are guaranteed. Typ values are for information purposes only.

### **Electrical Specifications** $V_{SP}$ = +5V, $Z_{RSC}$ = $Z_{LOAD}$ = 50 $\Omega$ , $T_A$ = +25°C, 24 $\Omega$ $V_{SP}$ to OUT, unless otherwise specified.

PARAMETER	DESCRIPTION	CONDITIONS	MIN	TYP	MAX	UNIT
V <sub>SP</sub>	Supply Voltage	To operate below 5V, the $24\Omega$ resistor to supply should be reduced	3.0		5.5	V
Gt	Small Signal Gain	1.0GHz	10.6	11.8	13.1	dB
		1.5GHz	10	11.2	12.5	dB
		2.0GHz	9.8	11.2	12.3	dB
P1dB	Output Power at 1dB Compression	1.0GHz	15.9	17.4	18.9	dBm
		2.0GHz	15.5	17	18.5	dBm
OIP3	Output Third Order Intercept Point	1.0GHz		31.5		dBm
		2.0GHz		28.3		dBm
OIP2	Output Second Order Intercept Point	Input tones at 1.0GHz and 1.1GHz, at Input Power = -15dBm, Output tone 2.1GHz		49.1		dBm
BW	3dB Bandwidth	3dB below Gain @ 500MHz		2.8		GHz
IRL	Input Return Loss	1.0GHz		15.8		dB
ORL	Output Return Loss	1.0GHz		15.9		dB
RISOL	Reverse Isolation	2.0GHz		17.8		dB
NF	Noise Figure	2.0GHz		5.0		dB
ID	Device Operating Current		54	62.3	69	mA



# **Device Test Setup**



# Typical Performance Curves $50\Omega$ environment

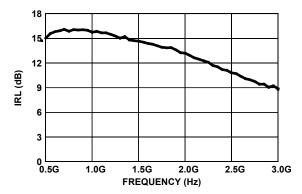


FIGURE 1. INPUT RETURN LOSS vs FREQUENCY

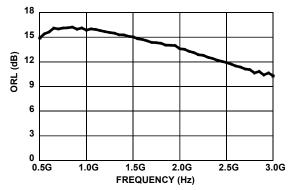
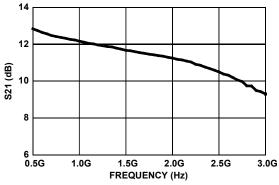


FIGURE 2. OUTPUT RETURN LOSS vs FREQUENCY





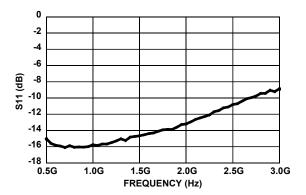
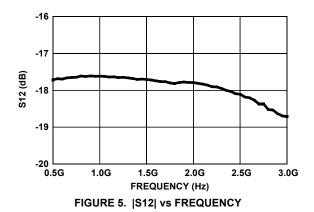
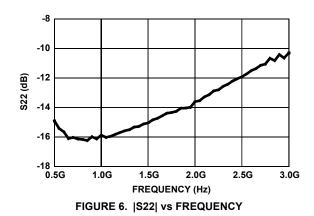
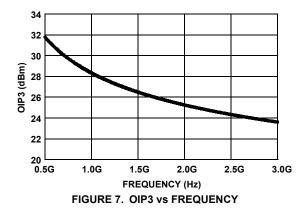


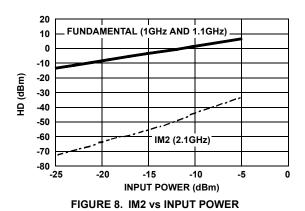
FIGURE 4. |S11| vs FREQUENCY

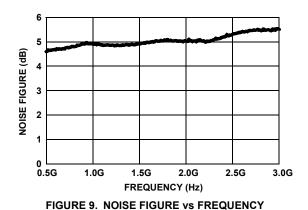
# Typical Performance Curves 50Ω environment (Continued)

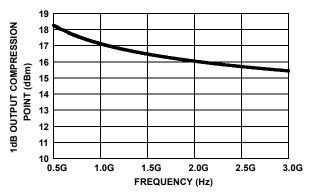












# Typical Performance Curves $50\Omega$ environment (Continued)

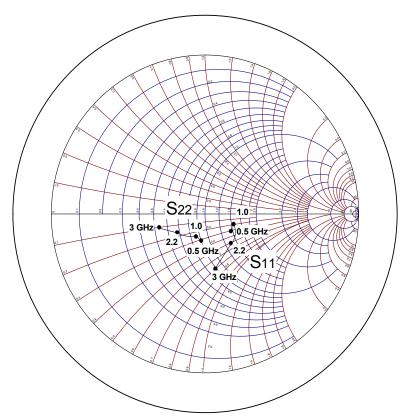
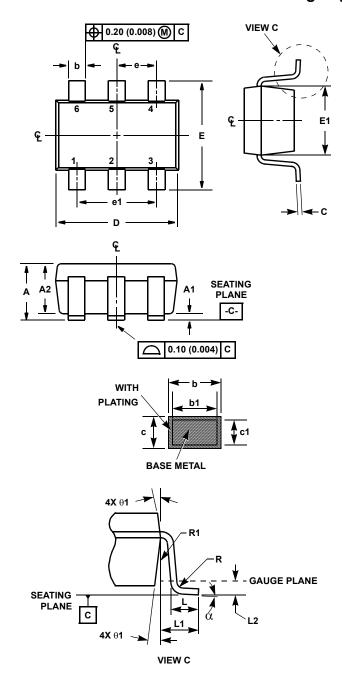


FIGURE 11. S11 AND S22 vs FREQUENCY

Pb-free reflow profile . . . . . . . . . . . . see link below http://www.intersil.com/pbfree/Pb-FreeReflow.asp

# Small Outline Transistor Plastic Packages (SC70-6)



P6.049A
6 LEAD SMALL OUTLINE TRANSISTOR PLASTIC PACKAGE

	INCHES		MILLIMETERS			
SYMBOL	MIN	MAX	MIN	MAX	NOTES	
Α	0.031	0.039	0.80	1.00	-	
A1	0.001	0.004	0.025	0.10	-	
A2	0.034	0.036	0.85	0.90	-	
b	0.006	0.012	0.15	0.30	-	
b1	0.006	0.010	0.15	0.25	-	
С	0.004	0.008	0.10	0.20	6	
c1	0.004	0.006	0.10	0.15	6	
D	0.073	0.085	1.85	2.15	3	
Е	0.084 BSC		2.1 BSC		-	
E1	0.045	0.053	1.15	1.35	3	
е	0.0256 Ref		0.65 Ref		-	
e1	0.051	2 Ref	1.30 Ref		-	
L	0.010	0.018	0.26	0.46	4	
L1	0.016 Ref.		0.400 Ref.		-	
L2	0.006 BSC		0.15 BSC		-	
N	6		6		5	
R	0.004	-	0.10	-	-	
α	0°	8º	0°	8º	-	

Rev. 0 7/05

#### NOTES:

- 1. Dimensioning and tolerance per ASME Y14.5M-1994.
- 2. Package conforms to EIAJ SC70 and JEDEC MO203AB.
- Dimensions D and E1 are exclusive of mold flash, protrusions, or gate burrs.
- 4. Footlength L measured at reference to gauge plane.
- 5. "N" is the number of terminal positions.
- 6. These Dimensions apply to the flat section of the lead between 0.08mm and 0.15mm from the lead tip.
- Controlling dimension: MILLIMETER. Converted inch dimensions are for reference only

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