Data Sheet | May 22, 2006 | FN6216.0

MMIC Silicon Bipolar Broadband Amplifier

The ISL55005, ISL55007, ISL55008 and ISL55009, ISL55010, ISL55011 constitute a family of high performance gain blocks 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.

ISL55005, ISL55007, ISL55008 offer higher OIP3 performance while the ISL55009, ISL55010, ISL55011 offer lower operating supply currents.

ISL55005 and ISL55009 match a 75Ω source to a 50Ω load. ISL55007 and ISL55010 match a 75Ω source to a 75Ω load. ISL55008 and ISL55011 match a 50Ω source to a 50Ω load.

Ordering Information

PART NUMBER (Note)	PART MARKING	TAPE & REEL	PACKAGE (Pb-Free)	PKG. DWG. #
ISL55009IEZ-T7	CBF	7" (3k pcs)	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.

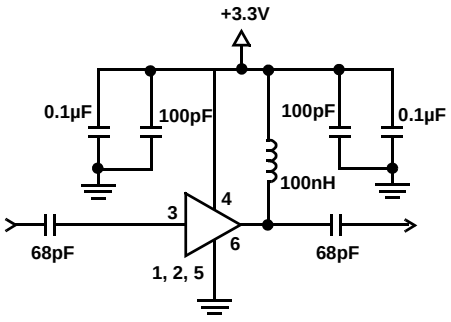
Features

- Input impedance of 75Ω
- Output impedance of 50Ω
- Noise figure of 3.7dB
- OIP3 of 10dBm
- Low supply current of 14mA
- Low input and output return losses
- Pb-free plus anneal available (RoHS compliant)

Applications

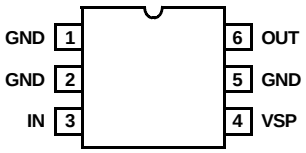
- LNB and LNB-T line amplifiers
- IF gain blocks for satellite and terrestrial HDTV STBs
- PA driver amplifier
- Wireless data, satellite
- Bluetooth/WiFi
- Satellite locator and signal strength meters

Typical Application Circuit



Pinout

6 LD SC-70



Absolute Maximum Ratings (T_A = 25°C)

Supply Voltage from VSP to GND 6V
Input Voltage . . . . . V_S+ +0.3V to GND -0.3V
Power Dissipation . . . . . See Packging Information Section
Ambient Operating Temperature . . . . . -40°C to +85°C
Storage Temperature . . . . . -65°C to +125°C
Operating Junction Temperature . . . . . +125°C
ESD Rating
Human Body Model (Per MIL-STD-883 Method 3015.7) . . . 3000V
Machine Model (Per EIAJ ED-4701 Method C-111). 300V

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

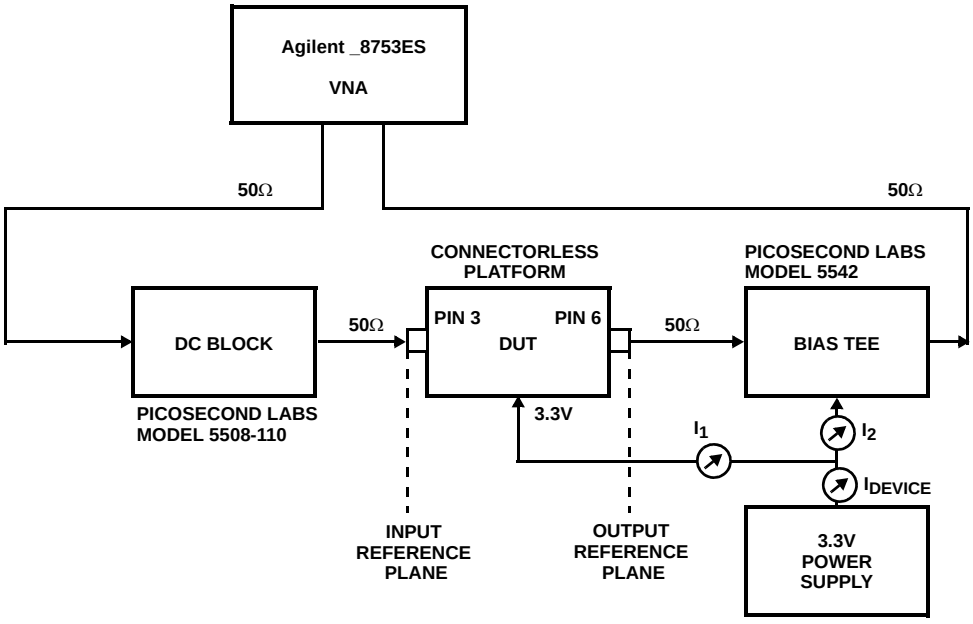
IMPORTANT NOTE: All parameters having Min/Max specifications are guaranteed. Typ values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore: $T_J = T_C = T_A$

Electrical Specifications

VSP = +3.3V, Zrsc = Zload = 50Ω, TA = 25°C, unless otherwise specified.

PARAMETER	DESCRIPTION	CONDITIONS	MIN	TYP	MAX	UNIT
Gt	Small Signal Gain	1.0GHz	14.8	15.8	16.8	dB
		1.5GHz	14.6	15.6	16.6	dB
		2.0GHz	14.3	15.3	16.3	dB
P1dB	Output Power at 1dB Compression	1.0GHz	-0.4	1.1	2.6	dBm
		2.0GHz	-0.7	0.8	2.3	dBm
OIP3	Output Third Order Intercept Point	1.0GHz		10.6		dBm
		2.0GHz		10.0		dBm
BW	3dB Bandwidth	3dB below Gain @ 500MHz		3.2		GHz
IRL	Input Return Loss	1.0GHz Zrsc = 75Ω, Zload = 50Ω		11.1		dB
ORL	Output Return Loss	1.0GHz Zrsc = 75Ω, Zload = 50Ω		13.6		dB
RISOL	Reverse Isolation	2.0GHz		21.0		dB
NF	Noise Figure	2.0GHz		3.7		dB
ID	Device Operating Current		11.5	13.7	15.5	mA

Device Test Setup



Typical Performance Curves Z_{src} = 75Ω, Z_{load} = 50Ω

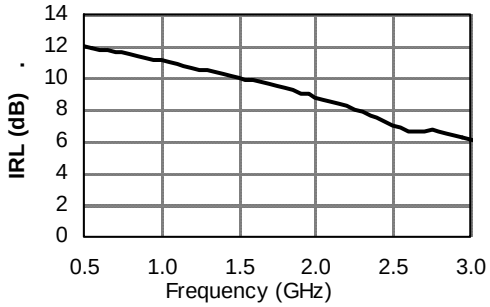


FIGURE 1. INPUT RETURN LOSS vs FREQUENCY

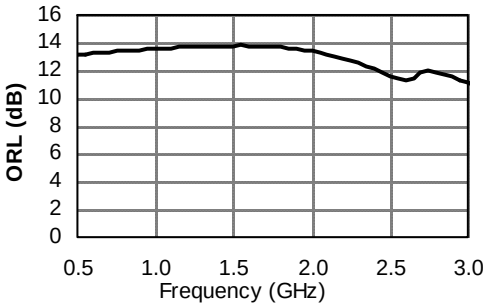


FIGURE 2. OUTPUT RETURN LOSS vs FREQUENCY

Typical Performance Curves 50Ω environment

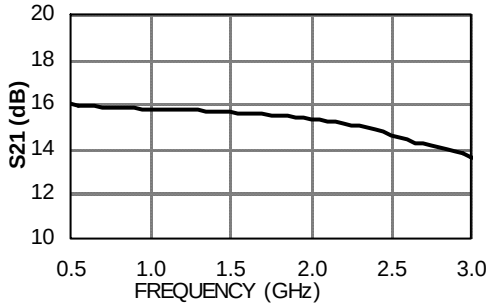


FIGURE 3. |S21| vs FREQUENCY

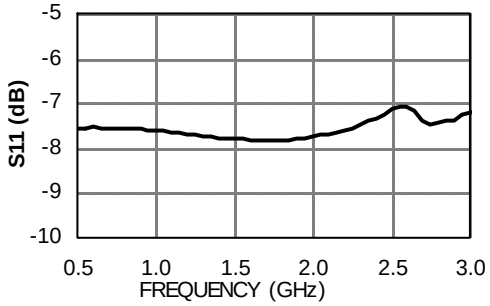


FIGURE 4. |S11| vs FREQUENCY

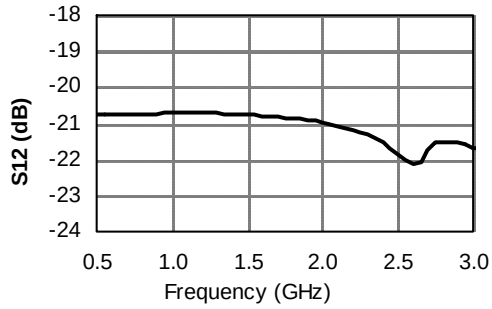


FIGURE 5. |S12| vs FREQUENCY

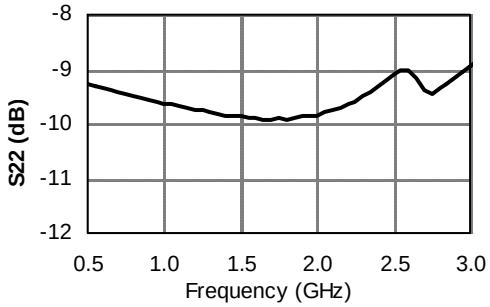


FIGURE 6. |S22| vs FREQUENCY

Typical Performance Curves 50Ω environment (Continued)

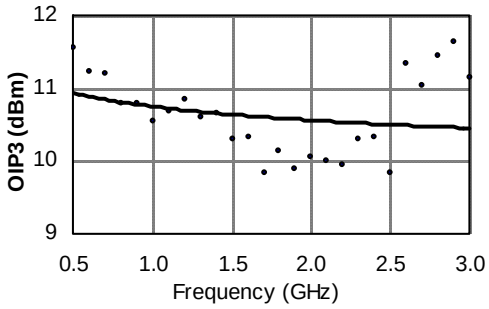


FIGURE 7. OIP3 vs FREQUENCY

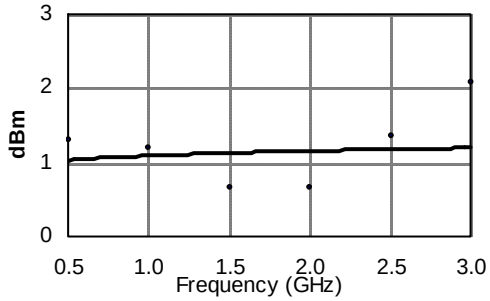


FIGURE 8. P1dBm vs FREQUENCY

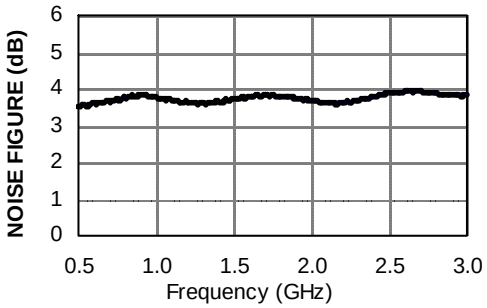


FIGURE 9. NOISE FIGURE vs FREQUENCY

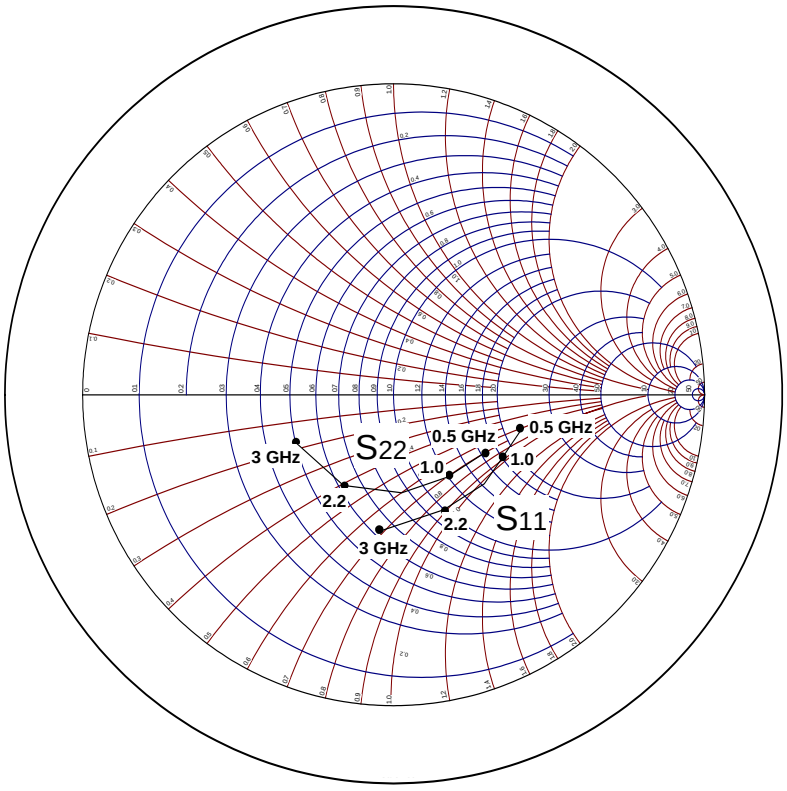


FIGURE 10. S11 AND S22 vs FREQUENCY

Packaging Information

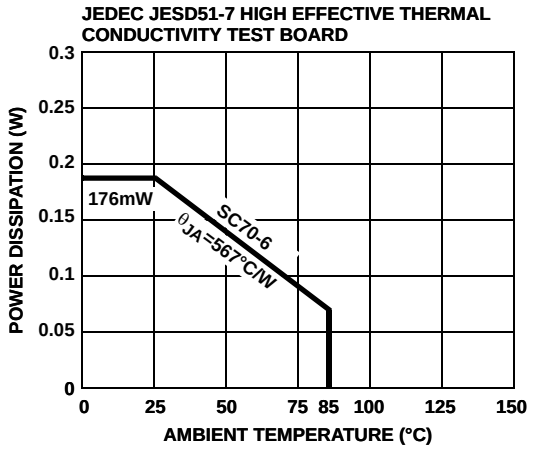
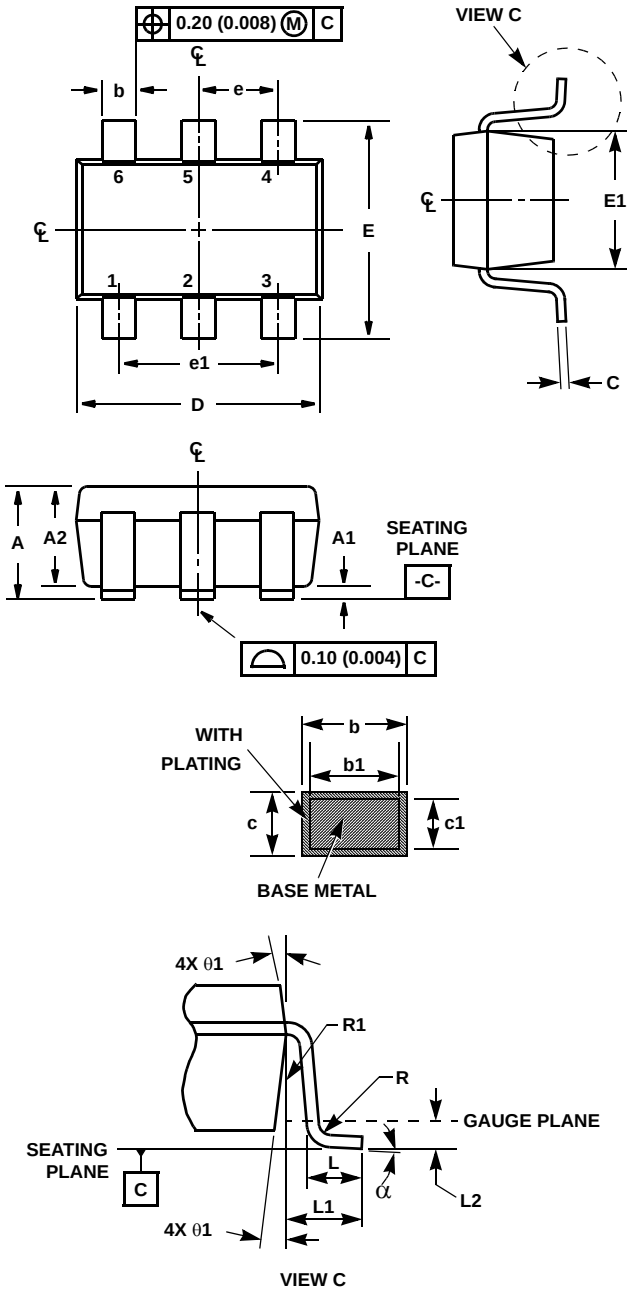


FIGURE 11. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

Small Outline Transistor Plastic Packages (SC70-6)



P6.049

6 LEAD SMALL OUTLINE TRANSISTOR PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.031	0.043	0.80	1.10	-
A1	0.000	0.004	0.00	0.10	-
A2	0.031	0.039	0.00	1.00	-
b	0.006	0.012	0.15	0.30	-
b1	0.006	0.010	0.15	0.25	
c	0.003	0.009	0.08	0.22	6
c1	0.003	0.009	0.08	0.20	6
D	0.073	0.085	1.85	2.15	3
E	0.071	0.094	1.80	2.40	-
E1	0.045	0.053	1.15	1.35	3
e	0.0256 Ref		0.65 Ref		-
e1	0.0512 Ref		1.30 Ref		-
L	0.010	0.018	0.26	0.46	4
L1	0.017 Ref.		0.420 Ref.		
L2	0.006 BSC		0.15 BSC		
N	6		6		5
R	0.004	-	0.10	-	
R1	0.004	0.010	0.15	0.25	
α	0^o	8^o	0^o	8^o	-

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NOTES:

1. Dimensioning and tolerance per ASME Y14.5M-1994.
2. Package conforms to EIAJ SC70 and JEDEC MO203AB.
3. 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.
7. Controlling dimension: MILLIMETER. Converted inch dimensions are for reference only