

Features

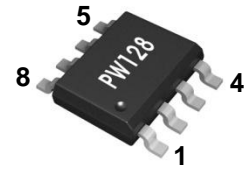
- ➔ 50 - 870MHz
- ➔ 16.3dB Gain at 50MHz
- ➔ CSO 68dBc @+35dBmV
- ➔ CTB 74dBc @+35dBmV
- ➔ NF 4.9dB
- ➔ Lead-free / Green / RoHS-compliant SOIC-8 Package



Applications

- ➔ Head End Driver Amplifier
- ➔ Pre-driver Amplifier
- ➔ Line Driver Amplifier
- ➔ Optic Transceiver Application
- ➔ MOCA
- ➔ FTTH Application

Functional Diagram



Function	Pin No.
AMP 1 RF IN	1
AMP 1 RF OUT	8
AMP 2 RF IN	4
AMP 2 RF OUT	5
Ground	2,3,6,7

Description

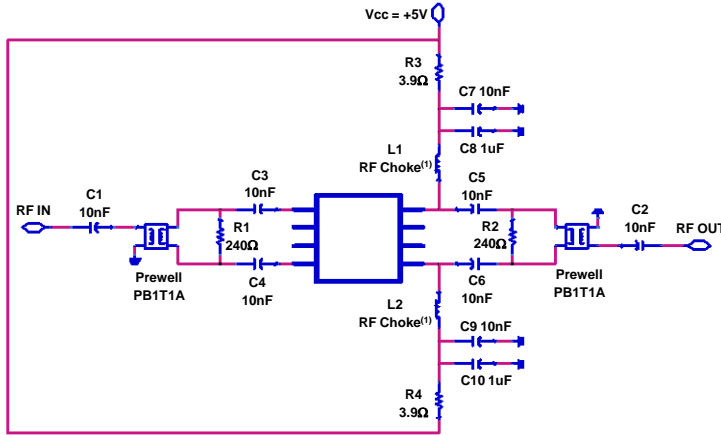
The PW128 is a high performance InGaP HBT MMIC Amplifier and consists of Darlington pair amplifiers with temperature compensation that is internally matched 75Ω input/output. The amplifier features broadband, high gain, high linear performance, high reliability as an CATV amplifier and provides stable current variation over temperature. The PW128 is a dual amplifier and has excellent VSWR when used in a 75 ohm push-pull configuration. The device is a general purpose CATV amplifier that offers high dynamic range in a low cost surface-mountable plastic SOIC-8 package.

Specifications

Symbol	Parameters	Units	Freq.	Min.	Typ.	Max.
S21	Gain	dB	50 MHz 250 MHz 450 MHz 860 MHz		16.3 16.6 17.1 16.5	
S11	Input Return Loss	dB	50 MHz 250 MHz 450 MHz 860 MHz		-22 -20 -18 -13	
S22	Output Return Loss	dB	50 MHz 250 MHz 450 MHz 860 MHz		-25 -25 -18 -13	
P1dB	Output Power @1dB compression	dBm	50 MHz 250 MHz 450 MHz		22.2 21.2 19.2	
OIP3	Output Third Order intercept	dBm	50 MHz 250 MHz 450 MHz		40.5 39.5 37.0	
CSO	Composite Second Order	dBc	50 MHz 250 MHz 450 MHz		68 65 63	
CTB	Composite Triple Beat	dBc	50 MHz 250 MHz 450 MHz		74 68 63	
NF	Noise Figure	dB	50 MHz 250 MHz 450 MHz 860 MHz		4.9 5.3 5.8	
V / I	Device voltage / current	V/mA			4.5/235	
Rth	Thermal Resistance	°C/W			80	

* Test Conditions : T=25°C, Supply Voltage=+5V, Rbias=3.9ohm, 75ohm System, 77 channels, 50-870MHz, +35dBmV/channel flat loading

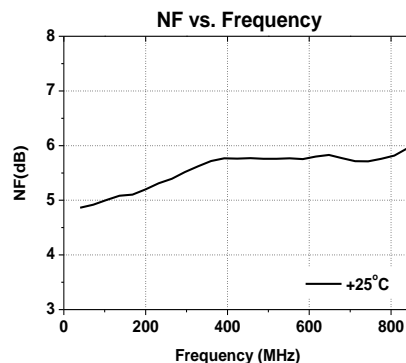
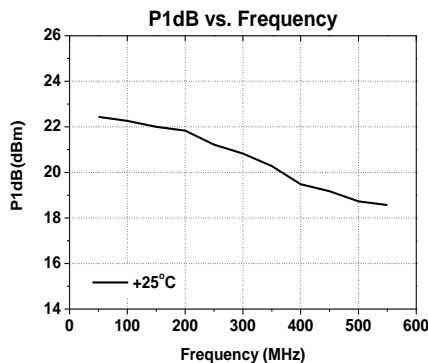
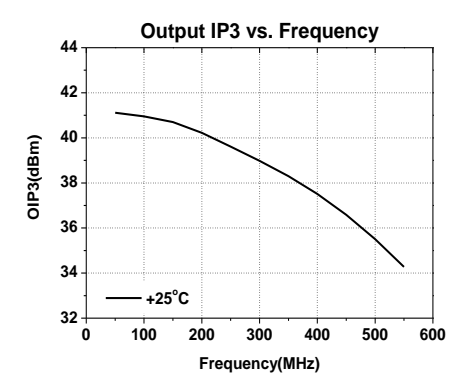
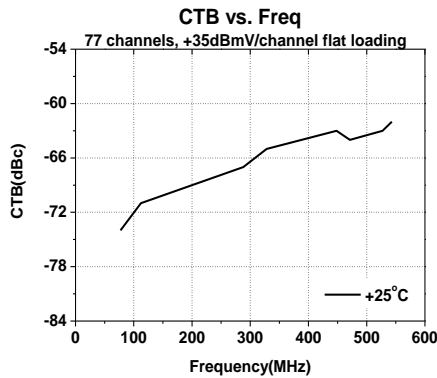
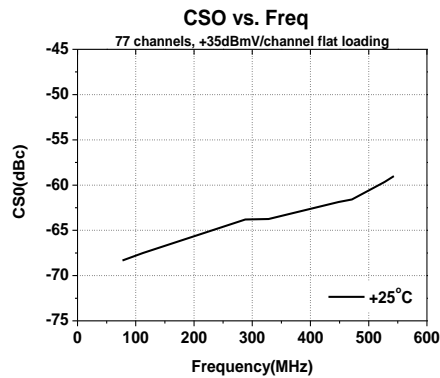
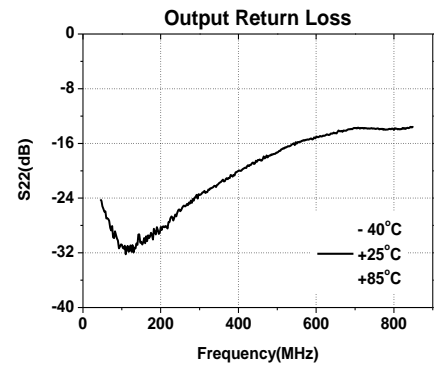
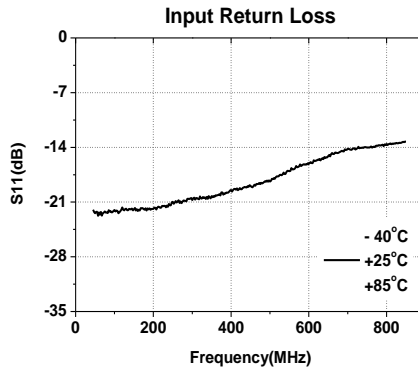
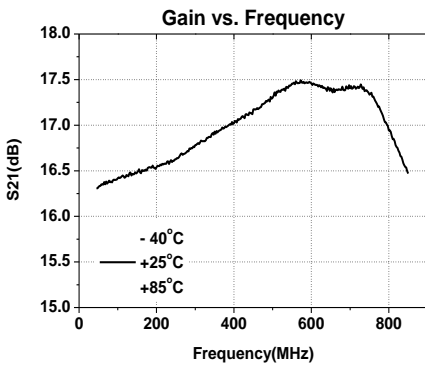
45 -1000MHz CATV Application Circuit



Recommended Bias Values

Supply Voltage	R bias Value	Size
5 V	3.9 Ω	0805
5.3 V	6.4 Ω	0805
6 V	12.3 Ω	0805
7 V	20.6 Ω	1210
8 V	28.9 Ω	1210
9 V	37.3 Ω	2010
10 V	45.6 Ω	2010
12 V	62.3 Ω	2512

1. RF Choke is about 4uH. We recommend that wire of 0.2 phi radius wind 4 turns on toroidal core(size:4.0x1.5x2.0)
2. Measurement for our datasheet was made on 1.6mm thick FR-4 Board. And 75 ohm microstrip line



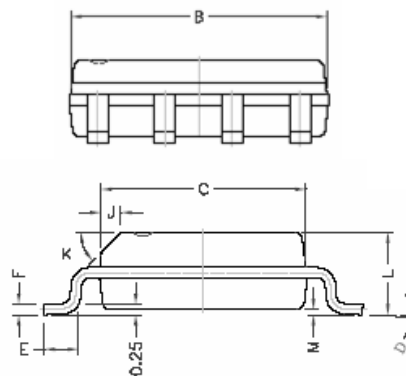
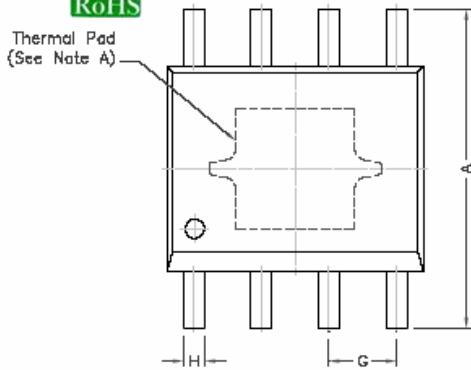
Absolute Maximum Ratings

Parameter	Rating	Unit
Device Voltage	+5	V
Device Current	400	mA
RF Power Input	15	dBm
Storage Temperature	-55 to +125	°C
Ambient Operating Temperature	-40 to +85	°C
Junction Temperature	170	°C

Operation of this device above any of these parameters may cause permanent damage.



Lead-free / RoHS Compliant / Green SOIC-8 Package Outline

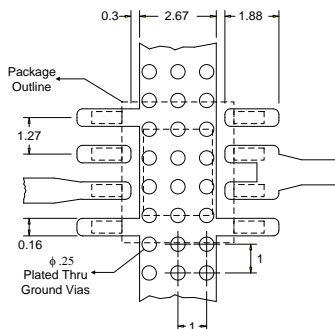


REF.	DIMENSIONS	
	Millimeters	
	Min.	Max.
A	5.80	6.20
B	4.80	5.00
C	3.80	4.00
D	ø	ø
E	0.40	0.90
F	0.19	0.25
M	0	0.15
H	0.35	0.49
L	1.35	1.75
J	0.375 REF.	
K	45°	
G	1.27 TYP.	

NOTES:

A: Thermal Pad Dimensions 25 ±0.1

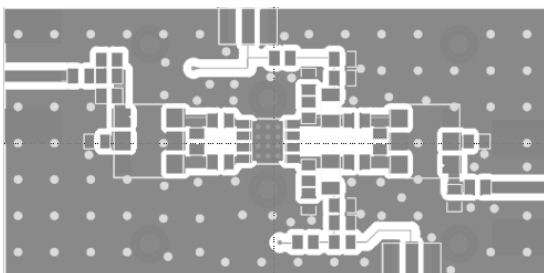
Land Pattern



ESD / MSL Ratings

1. ESD sensitive device. Observe Handling Precautions.
2. ESD Rating : Class 1C(Passes at 1000V min.) Human Body Model (HBM), JESD22-A114
3. ESD Rating : Class IV (Passes at 1000V min.) Charged Device Model (CDM), JESD22-C101
4. MSL (Moisture Sensitive Level) Rating : Level 3 at +260°C Convection reflow, J-STD-020

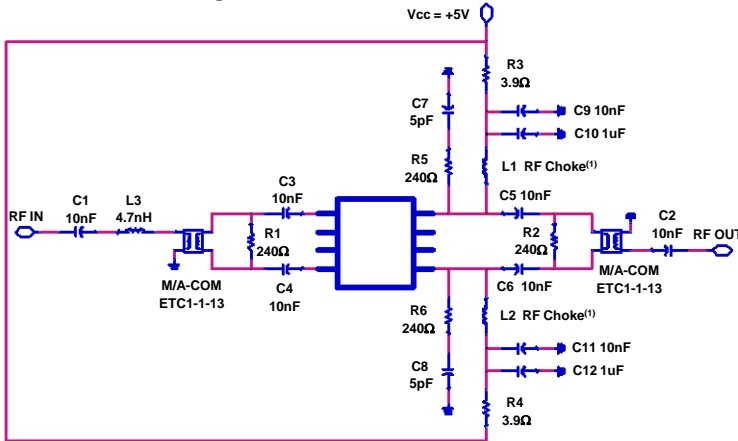
Evaluation Board Layout (4x4)



Mounting Instructions

1. Use a large ground pad area with many plated through-holes as shown.
2. We recommend 1 oz copper minimum.
3. Measurement for our data sheet was made on 1.6mm thick FR-4 Board.
4. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
5. RF trace width depends on the board material and construction.
6. Add mounting screws near the part to fasten the board to a heatsink.

Improved CSO/CTB Circuit with M/A-COM Transformer



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Frequency	MHz	77.25	112.25	288.25	448.25	543.25
S21	dB	15.6	15.6	15.5	15.6	15.8
S11	dB	-11	-11	-12	-13	-13
S22	dB	-16	-16	-15	-14	-14
CSO (@35dBmV, 132 channels)	dBc	72	71	70	67	67
CTB (@35dBmV, 132 channels)	dBc	72	70	67	66	65

