

2-, 3.5-, and 5-dB Gain Equalizer Array, 2 to 18 GHz

Typical Applications

- Select at test
- Space Hybrids
- Military Hybrids
- Microwave Radios
- Prototype Kits
- Test and Measurement Systems

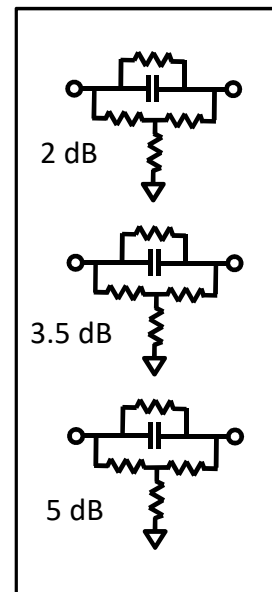
Features

- Ultra wideband performance
- Excellent return loss
 - > 18 dB typical
- RF Power handling: +20 dBm
- Die size: 1.39 x 2.76 x 0.10 mm
(0.055 x 0.109 x 0.004 inch)

Description

The ENGEQ00134 is a die with 3 gain equalizers. The part is ideal for select at test applications. The signal path is selected by wire bond connections to the bond pads associated for 2-, 3.5-, or 5-dB gain slope, while maintaining good impedance match to 50 Ohms. The die has a gold backside metallization and is designed to be silver epoxy attached. The RF interconnects are designed to account for wire bonds and external microstrip flares for optimal integrated return loss. Nichrome resistors with low temperature coefficients are set up to handle up to 100 milliwatts RF input power levels.

Functional Block Diagram

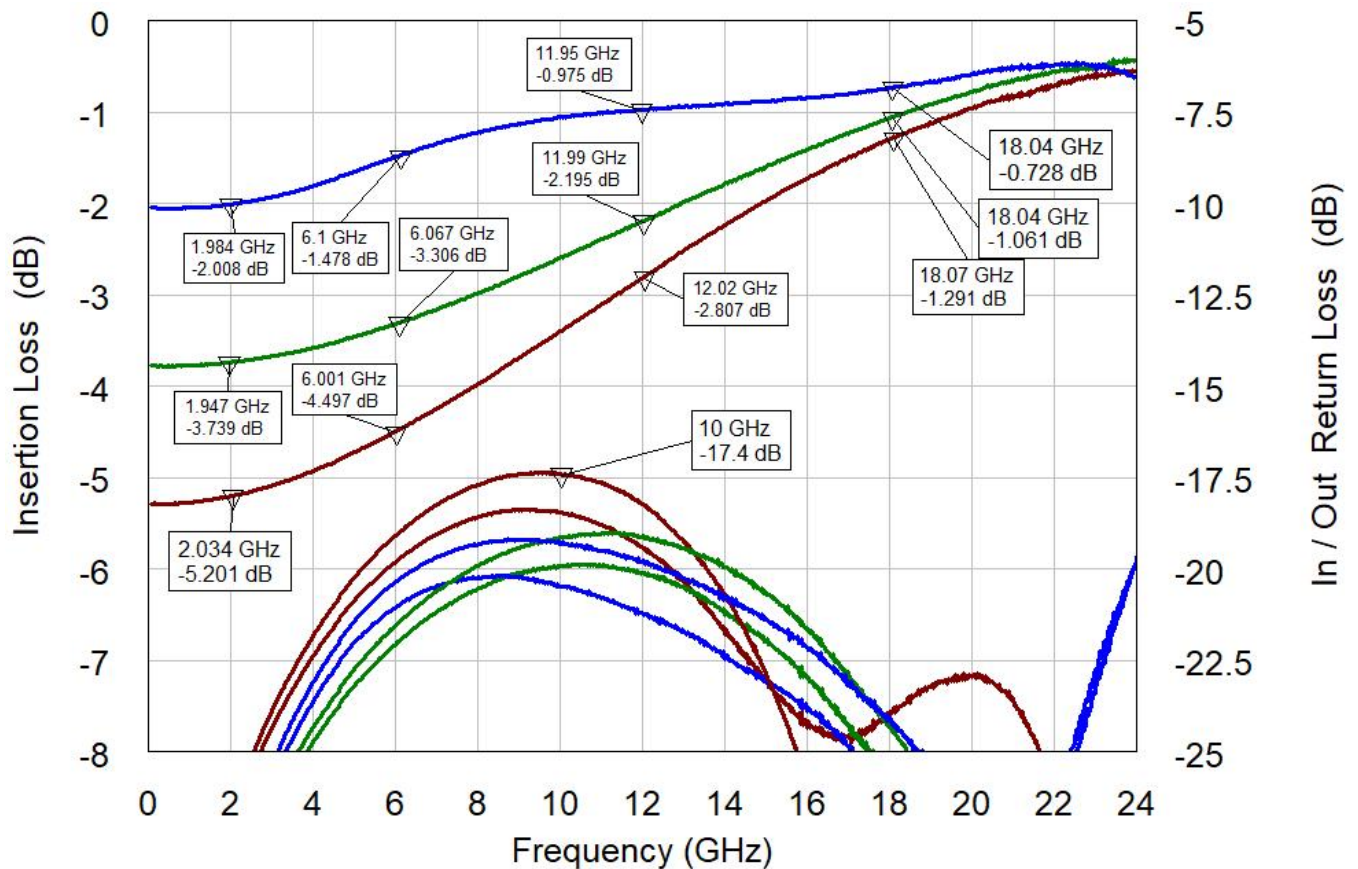


Electrical Specifications, T = 25 °C, Typical data

Path	Parameter	Freq (GHz)	Min	Typical	Max	Units
2 dB	Insertion Loss	2		-2		dB
		6		-1.5		dB
		12		-1		dB
		18		-0.7		dB
3.5 dB	Insertion Loss	2		-3.8		dB
		6		-3.3		dB
		12		-2.2		dB
		18		-1.1		dB
5 dB	Insertion Loss	2		-5.2		dB
		6		-4.5		dB
		12		-2.8		dB
		18		-1.3		dB
	Input / Output Return Loss	2 - 18		18		dB
	Power Handling	2 - 18		20		dBm

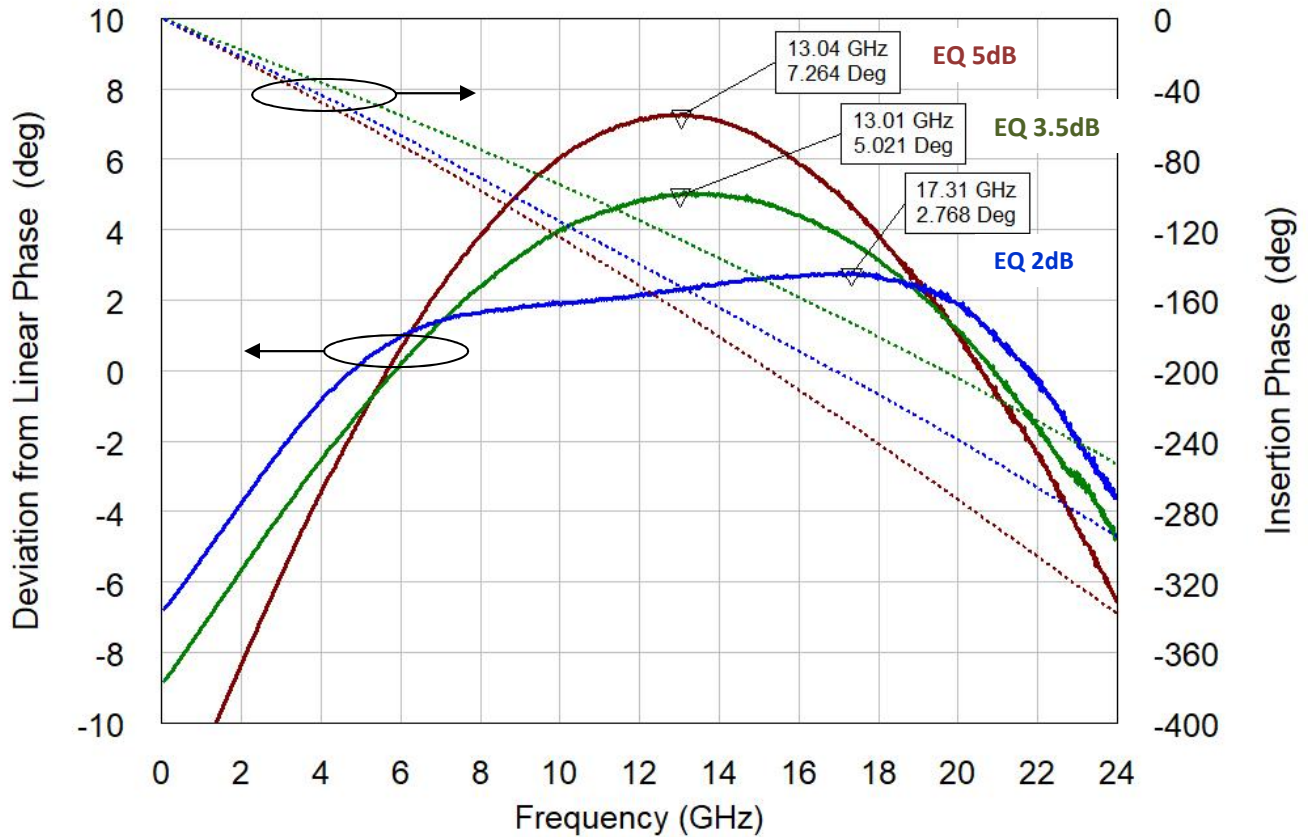
Absolute Maximum Ratings

Parameter	Max level
RF Power (assuming no DC power applied)	+20 dBm
Storage Temperature	-65 °C to +150 °C
Operating Temperature	-55 °C to +125 °C
Max DC Voltage applied to one port (assuming no RF power applied)	2.2 V.

RF Data with wirebonds and external microstrip flare pads
Measured Insertion Loss and Return Loss (dB)


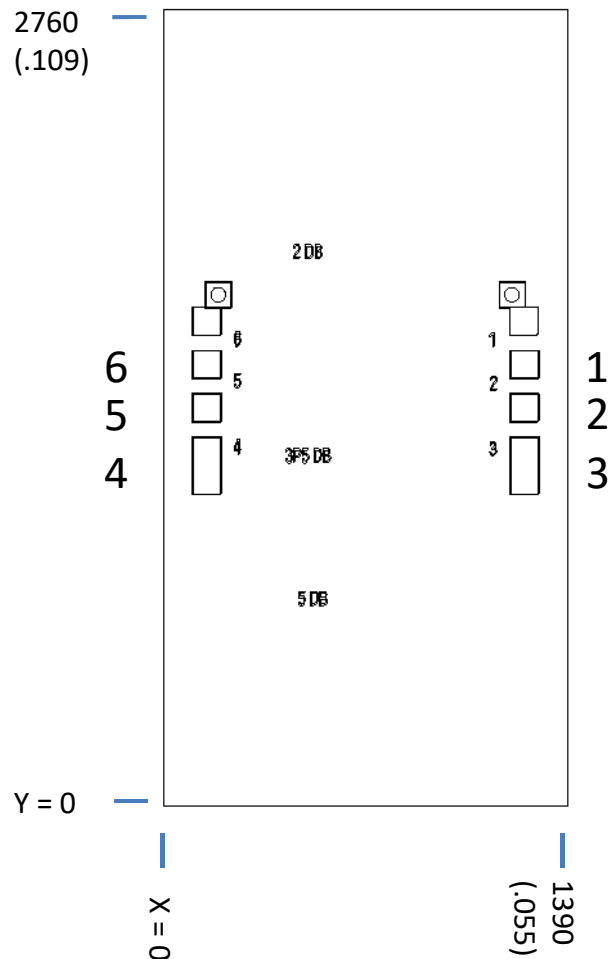


RF Data with wirebonds and external microstrip flare pads
Measured Insertion Phase and Deviation from Linear Phase (Degrees)



Outline Drawing

Bondpad Label	Signal	Bondpad Dimensions		Bondpad Center	
		X-dimension (um)	Y-Dimension (um)	X-dim. (um)	Y-dim. (um)
1	2 dB Output	100	100	1244	1530
2	3.5 dB Output	100	100	1244	1380
3	5 dB Output	100	200	1244	1180
4	5 dB Input	100	200	150	1180
5	3.5 dB Input	100	100	150	1380
6	2 dB Input	100	100	150	1530



Notes:

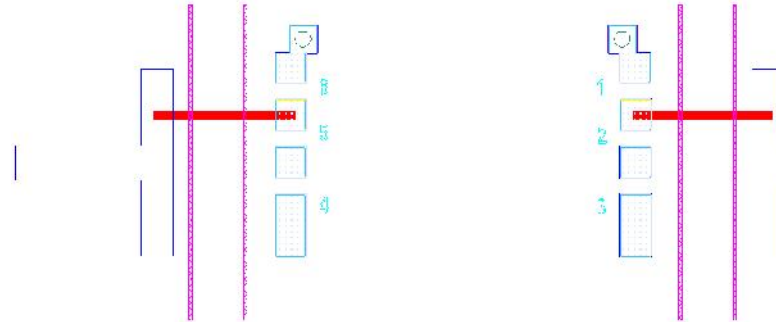
1. All dimensions are in μm (inches).
2. Substrate thickness: $100 \mu\text{m}$ (0.004").
3. Backside metallization is gold.
4. Bond pad metallization is gold.

Wire Bond Configurations and Suggested Microstrip Flares

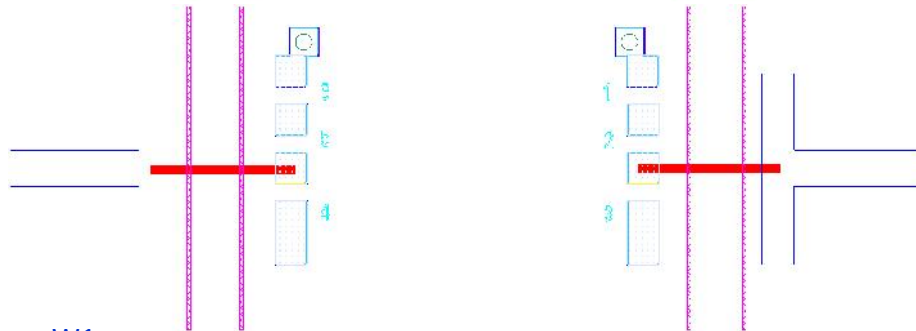
1 mil dia. Gold wire

X-dimension wire length 380um (15 mils)

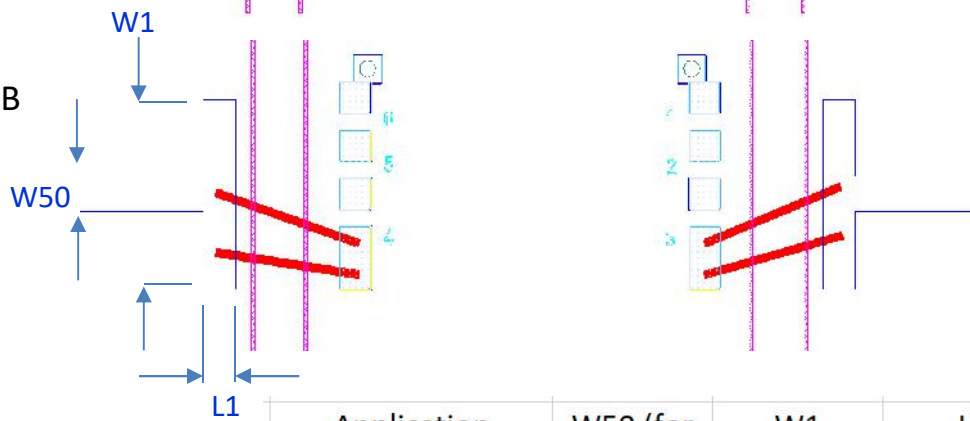
Wire Bond
(2 places) as
shown for 2 dB



Wire Bond
(2 places) as
shown for 3.5 dB



Wire Bond
(4 places) as
shown for 5 dB



Application	W50 (for 50 Ohms)	W1 flare width	L1 flare length
Substrate	(um)	(um)	(um)
5 mil Alumina	120	590	100
10 mil Alumina	240	590	160
8 mil Rogers 4003	438	452	185