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S8740190

40MHz to 870MHz SILICON PUSH PULL HYBRID

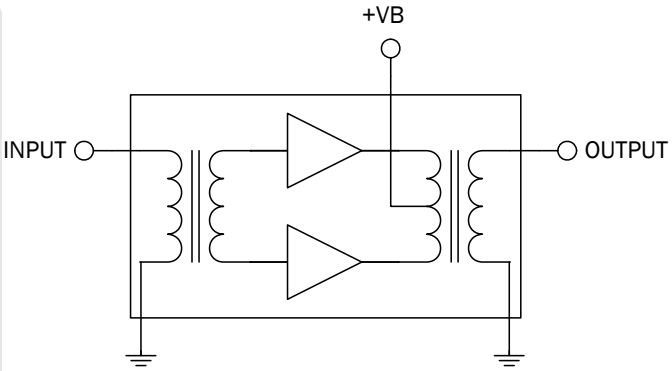
Package: SOT-115J

Product Description

The S8740190 is a Hybrid Push Pull amplifier module. The part employs Silicon die and is operated from 40MHz to 870MHz. It provides excellent linearity and superior return loss performance with low noise and optimal reliability.

Optimum Technology Matching® Applied

- ☐ GaAs HBT
- ☐ GaAs MESFET
- ☐ InGaP HBT
- ☐ SiGe BiCMOS
- ☐ Si BiCMOS
- ☐ SiGe HBT
- ☐ GaAs pHEMT
- ☐ Si CMOS
- ☑ Si BJT
- ☐ GaN HEMT
- ☐ RF MEMS



Features

- Excellent Linearity
- Superior Return Loss Performance
- Extremely Low Distortion
- Optimal Reliability
- Low Noise
- Unconditionally Stable Under All Terminations
- 18.5dB Min. Gain at 870MHz
- 240mA Max. at 24VDC

Applications

- 40MHz to 870MHz CATV Amplifier Systems

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					V_B= 24V; T_{MB}=30°C; Z_S=Z_L=75Ω
Power Gain	18.0	18.5	19.0	dB	f=50MHz
	18.5	19.5		dB	f=870MHz
Slope [1]	0.0	1.0	2.0	dB	f=40MHz to 870MHz
Flatness of Frequency Response[2]			±0.3	dB	f=40MHz to 870MHz (Peak to Valley)
Input Return Loss	20.0			dB	f=40MHz to 870MHz
Output Return Loss	18.0			dB	f=40MHz to 870MHz
Phase Response	-45		+45	Deg	f=50MHz
Noise Figure		4.2	5.0	dB	f=50MHz
			6.0	dB	f=600MHz
			7.0	dB	f=750MHz
		5.4	8.0	dB	f=870MHz
Total Current Consumption (DC)		230.0	240.0	mA	

1. The slope is defined as the difference between the gain at the start frequency and the gain at the stop frequency.
2. The gain flatness is the deviation of any amplitude value from the ideal gain curve calculated by the following mathematical model: Gain=G+C*SQRT(f_X/f_1). G=constant gain (frequency independent); C=cable constant; f_X=desired frequency; f_1=start frequency. The cable constant C must be optimized during the flatness determination so that the curve best fits the measured gain figures. The start value for C is calculated using the formula C_{START}=(G_n-G_1)/(SQRT(f_n/f_1)-1), where G_n=the measured gain at the stop frequency, G_1=the measured gain at the start frequency and f_n=stop frequency. The value of G is chosen so that the max. positive deviation of the measured gain from the 'ideal gain' curve is the same as the max. negative deviation. The value of C is adapted by ±0.001 until the 'ideal gain' curve best fits the measured curve. The flatness of the module gain is the maximum deviation in measured gain from the optimized gain formula.

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Absolute Maximum Ratings

Parameter	Rating	Unit
RF Input Voltage (single tone)	70	dBmV
DC Supply Over-Voltage (5 minutes)	30	V
Storage Temperature	-40 to +100	°C
Operating Mounting Base Temperature	-20 to +100	°C

Caution! ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Distortion data					V_B= 24V; T_{MB}=30°C; Z_S=Z_L=75Ω
CTB		-65.0	-61.0	dBc	79 ch flat; V_O=44dBmV[3]
		-56.0	-54.0	dBc	112 ch flat; V_O=44dBmV[4]
		-56.0	-53.0	dBc	132 ch flat; V_O=42dBmV[5]
XMOD		-62.0	-60.0	dBc	79 ch flat; V_O=44dBmV[3]
		-59.0	-57.0	dBc	112 ch flat; V_O=44dBmV[4]
		-61.0	-59.0	dBc	132 ch flat; V_O=42dBmV[5]
CSO		-65.0	-62.0	dBc	79 ch flat; V_O=44dBmV[3]
		-65.0	-59.0	dBc	112 ch flat; V_O=44dBmV[4]
		-62.0	-58.0	dBc	132 ch flat; V_O=42dBmV[5]
Second order distortion			-72.0	dBc	[6]
			-65.0	dBc	[7]
			-70.0	dBc	[8]
Output voltage	62.0			dBmV	d_{im}=-60dB[9]
	59.0			dBmV	d_{im}=-60dB[10]
	59.0			dBmV	d_{im}=-60dB[11]

3. 79 channels, NTSC frequency raster: 55.25MHz to 547.25MHz, +44dBmV flat output level.
4. 112 channels, NTSC frequency rater; 55.25MHz to 745.25MHz, +44dBmV flat output level.
5. 132 channels, NTSC frequency raster: 55.25MHz to 865.25MHz, +42dBmV flat output level.
6. f_1=55.25MHz; V_1=44dBmV; f_2=493.25MHz, V_2=44dBmV, f_{TEST}=f_1+f_2=548.5MHz.
7. f_1=55.25MHz; V_1=44dBmV; f_2=691.25MHz, V_2=44dBmV, f_{TEST}=f_1+f_2=746.5MHz.
8. f_1=55.25MHz; V_1=44dBmV; f_2=805.25MHz, V_2=44dBmV, f_{TEST}=f_1+f_2=860.5MHz.
9. f_1=540.25MHz, V_1=V_O; f_2=547.25MHz, V_2=V_O-6dB, f_3=549.25MHz, V_3=V_O-6dB, f_{TEST}=f_1+f_2-f_3=538.25MHz, according to DIN45004B.
10. f_1=740.25MHz, V_1=V_O, f_2=747.25MHz, V_2=V_O-6dB, f_3=749.25MHz, V_3=V_O-6dB, f_{TEST}=f_1+f_2-f_3=738.25MHz, according to DIN45004B.
11. f_1=851.25MHz, V_1=V_O, f_2=858.25MHz, V_2=V_O-6dB, f_3=860.25MHz, V_3=V_O-6dB, f_{TEST}=f_1+f_2-f_3=849.25MHz, according to DIN45004B.

Composite Second Order (CSO) - The CSO parameter (both sum and difference products) is defined by the NCTA.
Composite Triple Beat (CTB) - The CTB parameter is defined by the NCTA.
Cross Modulation (XMOD) - Cross modulation (XMOD) is measured at baseband (selective voltmeter method), referenced to 100% modulation of the carrier being tested.

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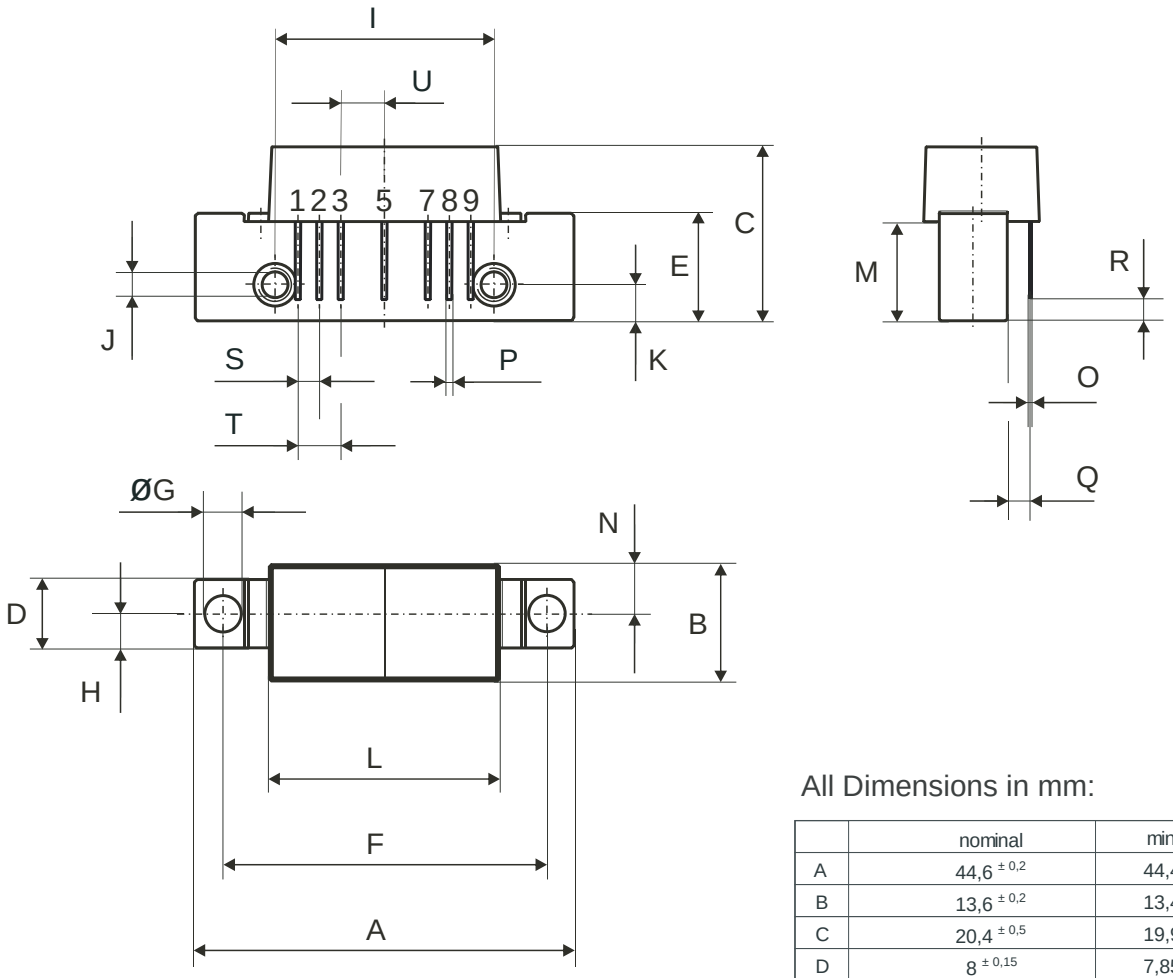

All Dimensions in mm:

	nominal	min	max
A	44,6 ± 0,2	44,4	44,8
B	13,6 ± 0,2	13,4	13,8
C	20,4 ± 0,5	19,9	20,9
D	8 ± 0,15	7,85	8,15
E	12,6 ± 0,15	12,45	12,75
F	38,1 ± 0,2	37,9	38,3
G	4 +0,2 / -0,05	3,95	4,2
H	4 ± 0,2	3,8	4,2
I	25,4 ± 0,2	25,2	25,6
J	UNC 6-32	-	-
K	4,2 ± 0,2	4,0	4,4
L	27,2 ± 0,2	27,0	27,4
M	11,6 ± 0,5	11,1	12,1
N	5,8 ± 0,4	5,4	6,2
O	0,25 ± 0,02	0,23	0,27
P	0,45 ± 0,03	0,42	0,48
Q	2,54 ± 0,3	2,24	2,84
R	2,54 ± 0,5	2,04	3,04
S	2,54 ± 0,25	2,29	2,79
T	5,08 ± 0,25	4,83	5,33
U	5,08 ± 0,25	4,83	5,33

Pinning:

0 5 10mm
scale

1	2	3	4	5	6	7	8	9
INPUT	GND	GND		+VB		GND	GND	OUTPUT

Notes:

European Projection

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