

Product Specification
S8740220

Si Push Pull, 40 – 870MHz, 21.5dB min. Gain @ 870MHz, 235mA max. @ 24VDC



FEATURES

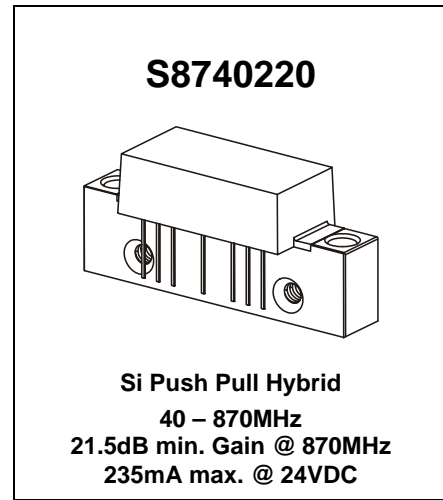
- Excellent linearity
- Superior return loss performance
- Extremely low distortion
- Optimal reliability
- Low noise
- Unconditionally stable under all terminations

APPLICATION

- 40 to 870 MHz CATV amplifier systems

DESCRIPTION

- Hybrid Push Pull amplifier module employing silicon dice



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134)

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage (single tone)	-	70	dBmV
V_{ov}	DC supply over-voltage (5 minutes)	-	30	V
T_{stg}	storage temperature	- 40	+ 100	°C
T_{mb}	operating mounting base temperature	- 20	+ 100	°C

CHARACTERISTICS

Table 1: S-Parameter, Noise Figure, DC Current; $V_B = 24V$; $T_{mb} = 30°C$; $Z_S = Z_L = 75 \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	21.0	21.5	22.0	dB
		f = 870 MHz	21.5	22.5	-	dB
SL	slope ¹⁾	f = 40 to 870 MHz	0.2	1.0	2.0	dB
FL	flatness of frequency response ²⁾	f = 40 to 870 MHz	-		± 0.3	dB
S_{11}	input return loss	f = 40 to 870 MHz	20.0		-	dB
S_{22}	output return loss	f = 40 to 80 MHz	20.0		-	dB
		f = 80 to 160 MHz	18.5		-	dB
		f = 160 to 870 MHz	18.0		-	dB
S_{21}	phase response	f = 50 MHz	-45		+45	Deg
F	noise figure	f = 50 MHz	-	3.5	4.5	dB
		f = 600 MHz	-		5.0	dB
		f = 750 MHz	-		5.5	dB
		f = 870 MHz	-	4.8	6.5	dB
I_{tot}	total current consumption (DC)			220.0	235.0	mA

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Notes:

- 1) The slope is defined as the difference between the 'ideal gain' at the start frequency and the 'ideal 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: $Gain = G + C \cdot \sqrt{f_x/f_1}$.
 $G =$ 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.

CHARACTERISTICS

Table 2: Distortion data; $V_B = 24V$; $T_{mb} = 30^\circ C$; $Z_S = Z_L = 75 \Omega$

SYMBOL	PARAMETER	CONDITION	MIN.	TYP.	MAX.	UNIT
CTB	composite triple beat	79 ch. flat; $V_o = 44$ dBmV ¹⁾	-	- 65.0	- 61.0	dBc
		112 ch. flat; $V_o = 44$ dBmV ²⁾	-	- 56.0	- 54.0	
		132 ch. flat; $V_o = 42$ dBmV ³⁾	-	- 56.0	- 53.0	
XMOD	cross modulation	79 ch. flat; $V_o = 44$ dBmV ¹⁾	-	- 58.0	- 57.0	dBc
		112 ch. flat; $V_o = 44$ dBmV ²⁾	-	- 57.0	- 54.0	
		132 ch. flat; $V_o = 42$ dBmV ³⁾	-	- 58.0	- 57.0	
CSO	composite second order distortion	79 ch. flat; $V_o = 44$ dBmV ¹⁾	-	- 65.0	- 62.0	dBc
		112 ch. flat; $V_o = 44$ dBmV ²⁾	-	- 65.0	- 59.0	
		132 ch. flat; $V_o = 42$ dBmV ³⁾	-	- 62.0	- 58.0	
d_2	second order distortion	⁴⁾	-		- 72.0	dBc
		⁵⁾	-		- 70.0	
		⁶⁾	-		- 70.0	
V_o	output voltage	$d_{im} = -60$ dB ⁷⁾	62.0		-	dBmV
		$d_{im} = -60$ dB ⁸⁾	60.0		-	
		$d_{im} = -60$ dB ⁹⁾	59.0		-	

Notes:

- 1) 79 channels, NTSC frequency raster: 55.25 MHz to 547.25 MHz, +44 dBmV flat output level.
- 2) 112 channels, NTSC frequency raster: 55.25 MHz to 745.25 MHz, +44 dBmV flat output level.
- 3) 132 channels, NTSC frequency raster: 55.25 MHz to 865.25 MHz, +42 dBmV flat output level.
- 4) $f_1 = 55.25$ MHz; $V_1 = 44$ dBmV; $f_2 = 493.25$ MHz; $V_2 = 44$ dBmV; $f_{TEST} = f_1 + f_2 = 548.5$ MHz.
- 5) $f_1 = 55.25$ MHz; $V_1 = 44$ dBmV; $f_2 = 691.25$ MHz; $V_2 = 44$ dBmV; $f_{TEST} = f_1 + f_2 = 746.5$ MHz.
- 6) $f_1 = 55.25$ MHz; $V_1 = 44$ dBmV; $f_2 = 805.25$ MHz; $V_2 = 44$ dBmV; $f_{TEST} = f_1 + f_2 = 860.5$ MHz.
- 7) $f_1 = 540.25$ MHz; $V_1 = V_o$; $f_2 = 547.25$ MHz; $V_2 = V_o - 6$ dB; $f_3 = 549.25$ MHz; $V_3 = V_o - 6$ dB; $f_{TEST} = f_1 + f_2 - f_3 = 538.25$ MHz, according to DIN45004B.
- 8) $f_1 = 740.25$ MHz; $V_1 = V_o$; $f_2 = 747.25$ MHz; $V_2 = V_o - 6$ dB; $f_3 = 749.25$ MHz; $V_3 = V_o - 6$ dB; $f_{TEST} = f_1 + f_2 - f_3 = 738.25$ MHz, according to DIN45004B.
- 9) $f_1 = 851.25$ MHz; $V_1 = V_o$; $f_2 = 858.25$ MHz; $V_2 = V_o - 6$ dB; $f_3 = 860.25$ MHz; $V_3 = V_o - 6$ dB; $f_{TEST} = f_1 + f_2 - f_3 = 849.25$ MHz, according to DIN45004B.

Composite Second Order (CSO)

The CSO parameter (both sum and difference products) is defined by the NCTA.

Composite Triple Beat (CTB)

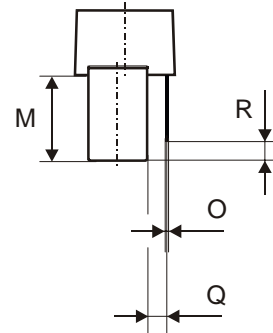
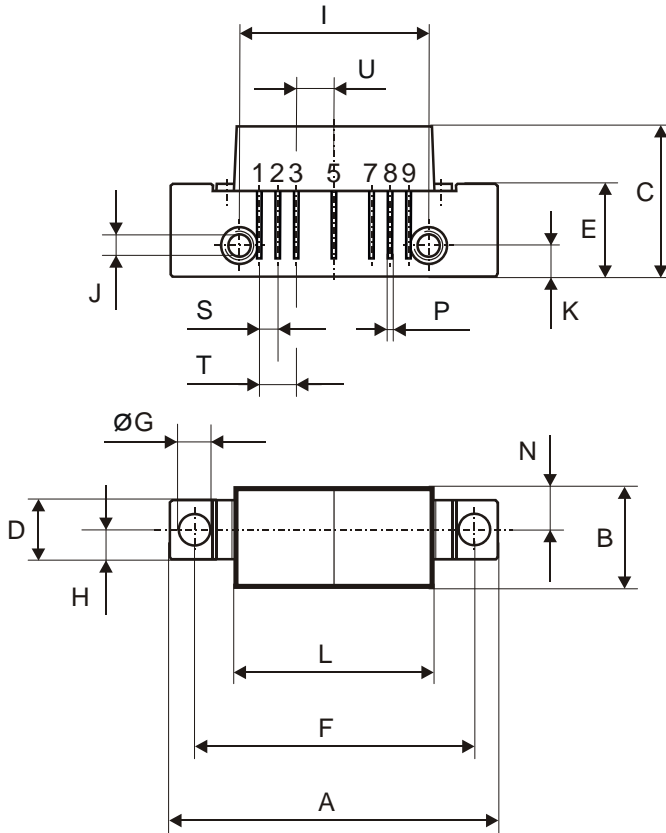
The CTB parameter is defined by the NCTA.

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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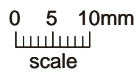


All Dimensions in mm:

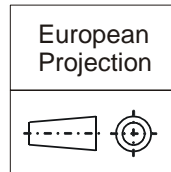
	nominal	min	max
A	44,6 ±0,2	44,4	44,8
B	13,6 ±0,2	13,4	13,8
C	20,4 ±0,5	19,9	20,9
D	8 ±0,15	7,85	8,15
E	12,6 ±0,15	12,45	12,75
F	38,1 ±0,2	37,9	38,3
G	4 +0,2 / -0,05	3,95	4,2
H	4 ±0,2	3,8	4,2
I	25,4 ±0,2	25,2	25,6
J	UNC 6-32	-	-
K	4,2 ±0,2	4,0	4,4
L	27,2 ±0,2	27,0	27,4
M	11,6 ±0,5	11,1	12,1
N	5,8 ±0,4	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:

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



Notes:



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DEFINITIONS

Data Sheet Status	
Objective Product Specification	This data sheet contains target or goal specifications for product development.
Preliminary Product Specification	This data sheet contains preliminary data; supplementary data may be published later.
Product Specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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