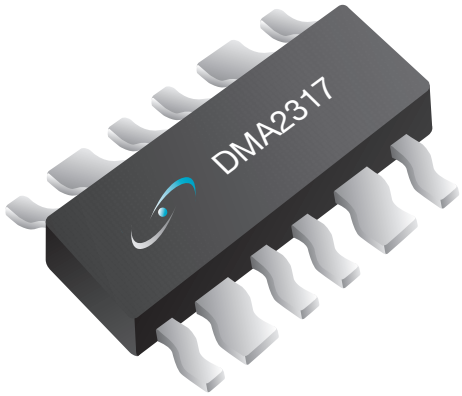
duet MICROELECTRONICS
RF that works for you

DMA2317
Advanced Data Sheet Rev 2.3

75-Ohm Linear Amplifier IC



Key Features

- Provides push-pull amplifier performance as a 75-Ohm Single-Ended I/O amplifier IC (no baluns required)
- Compliant to DOCSIS® 3.1 PHY to 1794 MHz downstream (DS) and >300 MHz upstream (US)
- Full Duplex (FD) DOCSIS® 3.1 operation to 600 MHz signal carrying bandwidth with no SIC required
- Typical Gain = 14.5 dB (5 to 204 MHz)
- OIP3 > +44 dBm (100 MHz), >+40 dBm (500 MHz), >+38 dBm (900 MHz)
- >40 dB MER (DOCSIS® 3.1 OFDM)
- Single Power Supply Input (+8.3 to +12 Vdc)
- Operating Current = 180 mA Typical (Pdiss = 1.5 Wdc)
- Advanced GaAs Amplifier Technology
- Batwing (BW) 16-Pin Twin-Paddle SMT Package

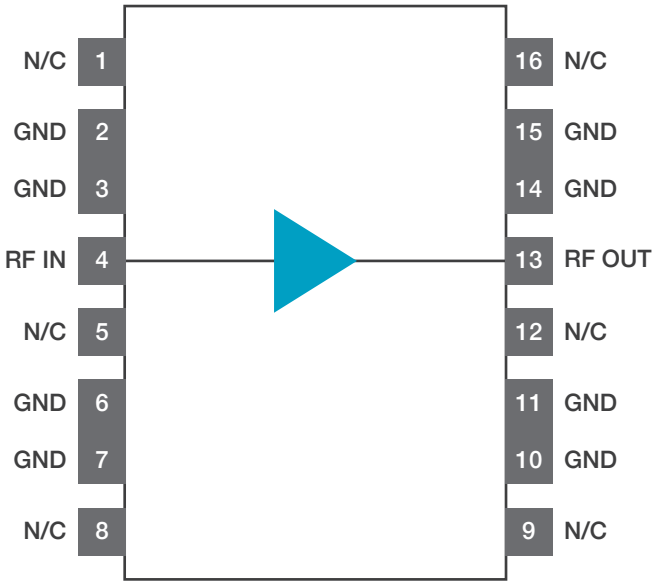
Applications

- DOCSIS® 3.0/3.1 HFC/FTTx/RFoG Network House/Drop Amplifiers
- DOCSIS® 3.0/3.1 HFC/FTTx/RFoG Network Downstream to 1794 MHz
- DOCSIS® 3.1 (D3.1) Full Duplex (FD) Applications to 1794 MHz
- DOCSIS® Set-Top-Gateway (DSG), Home/SOHO Wireless Gateway Router
- Return Path Optical Receivers (RPORs)

Product Description

The DMA2317 is a general purpose, low-cost, high-linearity RF amplifier IC. Employing an amplifier die manufactured on an advanced GaAs process, this linear CATV amplifier is a single-ended, ultra-linear amplifier ideal for high data rate broadband systems. Designed for use as an easily cascadable 75 Ω gain block, its gain flatness of better than ±0.5 dB from 50 MHz to 1000 MHz combined with an OIP3 at 100 MHz of >+44 dBm, make this part ideal for cable TV and infrastructure IF applications. No baluns are required and the part is available in a small outline, low profile SMT package.

Functional Block Diagram



Package Pin Out

Pin Number	Description	Notes
1	No Connect (N/C)	
2	Ground	
3	Ground	
4	RF Input	75 Ω Single-Ended 50 Ω Single-Ended (OPTIONAL)
5	No Connect (N/C)	
6	Ground	
7	Ground	
8	No Connect (N/C)	
9	No Connect (N/C)	
10	Ground	
11	Ground	
12	No Connect (N/C)	
13	RF Output	75 Ω Single-Ended 50 Ω Single-Ended (OPTIONAL) Vdd
14	Ground	
15	Ground	
16	No Connect (N/C)	

Absolute Minimum and Maximum Ratings

Parameter	Min	Max	Units
Supply	0	+15	Vdc
RF Power at the Input	-	+7	dBm
Case Operating Temperature Range, T_C	-40	+110	°C
Storage Temperature	-65	+150	°C
Soldering Temperature	-	+260	°C
Soldering Time	-	5	seconds

Stresses more than the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability.

Operating Ranges

Parameter	Min	Typ	Max	Units
RF Input/Output Frequency	5		2700	MHz
Supply Voltage	+6	+8	+12	V_{DC}
Case Temperature, T_C	-40	-	+100	°C

The device may be operated safely over these conditions; however, parametric performance is guaranteed only over the conditions defined in the Electrical Specification.

Electrical Specifications

(Ta = +25 °C, Vdd = +8 VDC, f = as stated below, 75 Ω Input/Output)

Parameter	Min	Typ	Max	Units	Comments
Gain	13	14.5	15	dB	See Note 1; 5 to 1218 MHz
Gain Slope	-	0.5	-	dB	See Note 1; 5 to 1218 MHz
Gain Flatness	-	-	± 0.25	dB	F = 5 to 204MHz
Gain Flatness	-	-	± 0.5	dB	F = 258 to 1218 MHz
Noise Figure (NF)	-	2.8	-	dB	F = 5 to 1218 MHz
Input Return Loss (IRL)	-	-20	-18	dB	F = 5 to 204 MHz
Output Return Loss (ORL)	-	-25	-20	dB	F = 5 to 204 MHz
Tx Modulation Error Ratio (MER)	-	-44	-40	dB	See Note 2
Tx Error Vector Magnitude (EVM)	-	0.4	0.6	%RMS	See Note 2
IIP3	-	+29.5	-	dBm	See Note 1; F = 100 MHz
	-	+26	-	dBm	F = 500 MHz
	-	+25	-	dBm	F = 1000 MHz
OIP3	-	+44	-	dBm	See Note 1; F = 100 MHz
	-	+40	-	dBm	F = 500 MHz
	-	+38	-	dBm	F = 1000 MHz
OIP2	-	+70	-	dBm	See Note 1; F = 100 MHz
OP1dB	-	+25	-	dBm	See Note 1; ±0.5 dBm; F = 100 to 500 MHz
	-	+24	-	dBm	; ±0.5 dBm; F = 1218 MHz
Supply Current	-	180	-	mA	@ +8 Vdc

Notes: All specifications as measured using Duet evaluation assembly.

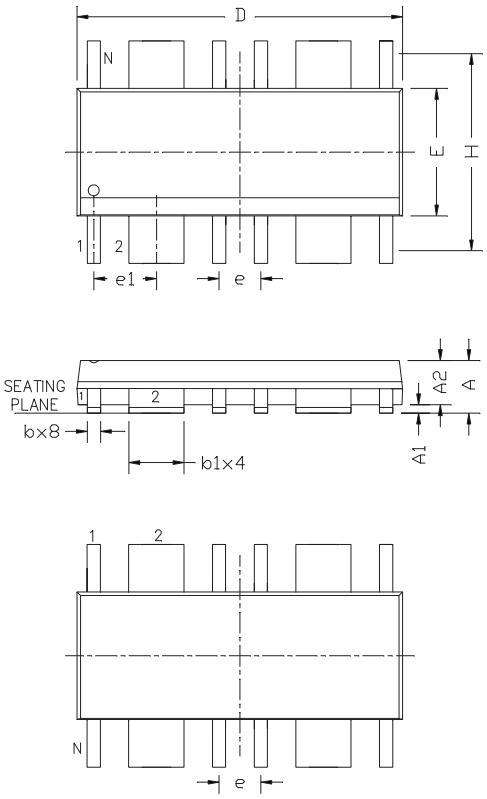
1. Measured in application circuit.
2. Measured IAW Data-Over-Cable Service Interface Specifications (DOCSIS®) Downstream RF Interface Specification, CM-SP-DRFI-I16-170111

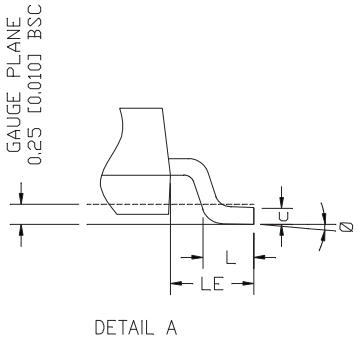
Multi-Carrier Distortion Data

(Typical at +24 °C Ambient Temperature)

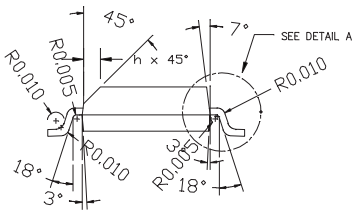
XMOD	CTB	CSO+	CSO-	Unit	Notes
≤ -75	-78	-76	-80	dBc	; @288.25 MHz 100 channels PAL-D FLAT; +10 dBmV/ch RFin

Package Dimensions





DETAIL A



	DIMENSION IN INCHES			DIMENSION IN MM		
SYM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.058	0.060	0.068	1.47	1.52	1.73
A1	0.004	0.006	0.009	0.10	0.152	0.23
A2	0.054	0.058	0.060	1.37	1.47	1.52
b	0.014	0.016	0.019	0.36	0.41	0.48
c	0.007	0.008	0.010	0.18	0.20	0.25
D	0.386	0.390	0.394	9.80	9.90	10.00
b1	0.064	0.066	0.068	1.63	1.68	1.72
E	0.150	0.154	0.158	3.81	3.91	4.01
H	0.230	0.239	0.244	5.84	6.00	6.20
e1	0.072	0.075	0.078	1.83	1.905	1.98
e		0.050			1.27	
L	0.020	0.027	0.032	0.51	0.69	0.812
LE	0.036	0.043	0.047	0.91	1.09	1.19
Ø	0°	–	8°	0°	–	8°
h	0.011	0.015	0.019	0.28	0.38	0.48

NOTES:
1. DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. DIMENSION E1 DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSIONS.
2. COPLANARITY APPLIES TO THE TERMINALS. COPLANARITY SHALL NOT EXCEED 0.004" [0.10 mm].

Ordering Information

Order Number	Temperature Range	Package Description	Component Packaging
DMA2317P0	-40 to +85 °C	10 x 4 x 1.7 mm SMT BW-16	Gel Pak, 1 to 100 each
DMA2317V0	-40 to +85 °C	10 x 4 x 1.7 mm SMT BW-16	1500 each, T&R
DMA2317PCBA	-40 to +85 °C	75 Ω I/O Evaluation Board (EVB) with F-Type PCB Edge Connectors	EVB Kit with five (5) piece IC sample ESD bag

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