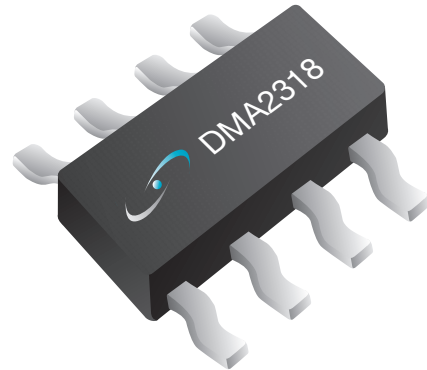


DOCSIS® 3.1 Upstream Amplifier IC



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 >200 MHz upstream (US)
- Full Duplex (FD) DOCSIS® 3.1 operation with >100 MHz signal carrying bandwidth with no SIC required
- Typical Gain = 14.5 dB \pm 0.25 dB (5 to 204 MHz)
- OIP3 > +44 dBm (100-MHz)
- >40 dB MER (DOCSIS® 3.1 OFDM)
- Single Power Supply Input (+5 or +8 Vdc)
- Operating Current = 180 mA Typical (Pdiss = 1.5 Wdc) @ +8 Vdc
- Advanced GaAs Amplifier Technology
- Industry Standard SOIC-8 with Exposed Paddle (EP) SMT Package

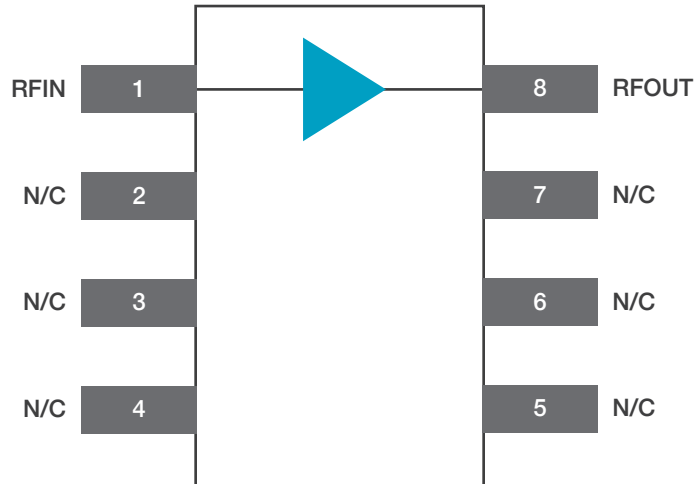
Applications

- DOCSIS® 3.0/3.1 HFC/FTTx/RFoG Network House/Drop Amplifiers
- DOCSIS® 3.0/3.1 HFC/FTTx/RFoG Network Downstream to 210 MHz
- DOCSIS® 3.1 (D3.1) Full Duplex (FD) Applications to >100 MHz
- DOCSIS® Set-Top-Gateway (DSG), Home/SOHO Wireless Gateway Router
- Return Path Optical Receivers (RPORs)

Product Description

The DMA2318 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 cascaded 75 Ω gain block, its gain flatness of better than ± 0.25 dB from 5 MHz to 210 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	RF Input	75 Ω Single-Ended 50 Ω Single-Ended (OPTIONAL)
2	No Connect (N/C)	
3	No Connect (N/C)	
4	No Connect (N/C)	
5	No Connect (N/C)	
6	No Connect (N/C)	
7	No Connect (N/C)	
8	RF Output	75 Ω Single-Ended 50 Ω Single-Ended (OPTIONAL) Vdd
Backside Paddle	Ground	Use recommended via pattern to minimize inductance and thermal resistance.

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		210	MHz
Supply Voltage	+5	+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 210 MHz
Gain Slope	-	0.5	-	dB	See Note 1; 5 to 210 MHz
Gain Flatness	-	-	± 0.25	dB	F = 5 to 210 MHz
Noise Figure (NF)	-	2.8	3.0	dB	F = 5 to 210 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
OIP3	-	+44	-	dBm	See Note 1; F = 100 MHz
OIP2	-	+70	-	dBm	See Note 1; F = 100 MHz
OP1dB	-	+25	-	dBm	See Note 1; ±0.5 dBm; F = 5 to 210 MHz
Supply Current	-	180	-	mA	@ +8 Vdc

Notes: All specifications as measured using Duet evaluation assembly.

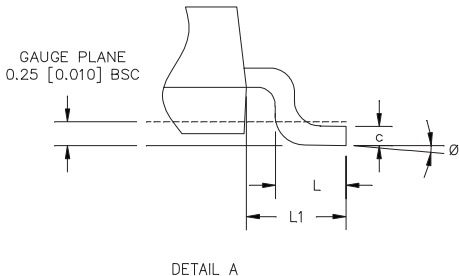
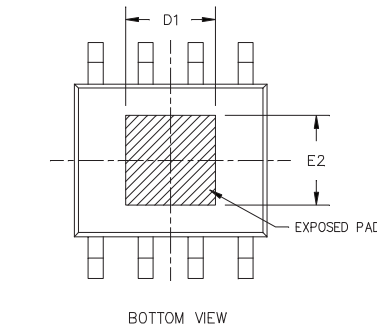
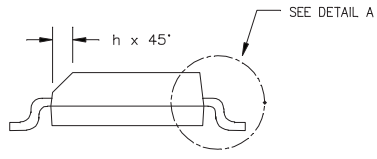
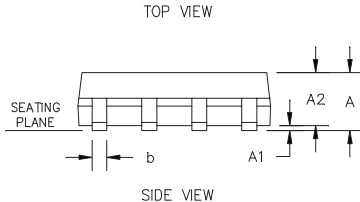
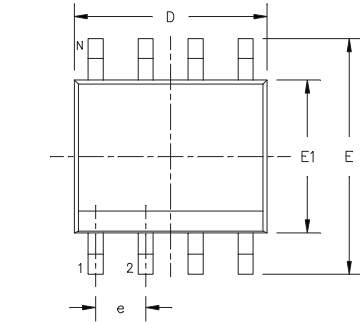
1. Measured in application circuit.
2. Measured IAW Data-Over-Cable Service Interface Specifications (DOCSIS®) Downstream RF Interface Specification, CM-SP-DRFI-I16-170111 in the frequency range 5 to 204 MHz.

Multi-Carrier Distortion Data

(Typical at +24 °C Ambient Temperature)

XMOD	CTB	CSO+	CSO-	Unit	Notes
≤ -75	-78	-76	-80	dBc	; @200.25 MHz 17 PAL-D channels FLAT; +10 dBmV/ch RF input

Package Dimensions



SYM	DIMENSION IN INCHES			DIMENSION IN MM		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.056	0.058	0.061	1.42	1.47	1.55
A1	0.001	0.004	0.005	0.025	0.102	0.127
A2	0.051	0.054	0.057	1.30	1.37	1.45
b	0.014	0.016	0.020	0.36	0.41	0.51
c	0.007	0.008	0.010	0.18	0.20	0.25
D	0.191	0.193	0.195	4.85	4.90	4.95
E1	0.151	0.153	0.155	3.84	3.89	3.94
E	0.234	0.240	0.244	5.94	6.10	6.20
e	0.050			1.27		
L	0.020	0.027	0.032	0.51	0.69	0.81
L1	0.042	0.044	0.046	1.07	1.12	1.17
Ø	0"	-	8"	0"	-	8"
h	0.011	0.015	0.019	0.28	0.38	0.48
D1	0.080	-	0.090	2.03	-	2.29
E2	0.080	-	0.090	2.03	-	2.29

- 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 0.003" [0.08 mm].
 3. BASED FROM JEDEC MS-012 VARIATION AA.

Ordering Information

Order Number	Temperature Range	Package Description	Component Packaging
DMA2318P0	-40 to +85 °C	SOIC-8 w/EP	Gel Pak, 1 to 100 each
DMA2318V0	-40 to +85 °C	SOIC-8 w/EP	1500 each, T&R
DMA2318PCBA	-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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