

# LTE Band 42/43/48 CBRS/5G PAM



## Key Features

- High Gain High Power Citizens Broadband Radio Service (CBRS)/5G TDD Power Amplifier Module (PAM)
- 35-dB Minimum Gain from 3550 to 3700 MHz
- Gain Flatness  $\pm 0.25$  dB within any 10-MHz Channel
- +33 dBm OP1dB (CW Tone)
- +24 dBm Linear RF Power Output TD-LTE Uplink (B42/B43/B48)
- < 2.5% EVM RMS 16-QAM OFDMA Modulation
- Power Added Efficiency > 22% (+24 dBm Linear RF Power Output, 3600 MHz)
- Single Power Supply Input (+5 Vdc)
- Operating Current = 200 mA Typical ( $P_{diss} \approx 1$  Wdc)
- Advanced GaAs Amplifier Technology
- Low Profile Miniature 10-Pin 5 x 5 x 1.2 mm Surface Mount Package

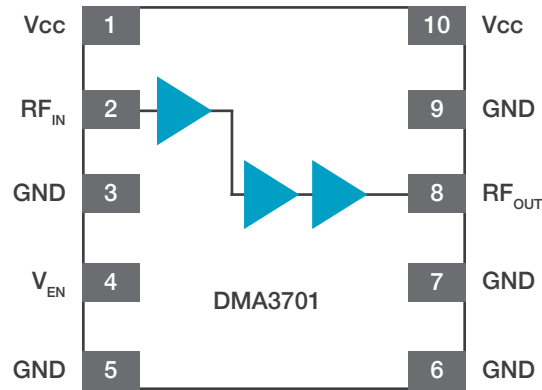
## Applications

- TD-LTE Band 42, 43, and 48 Uplink HetNet Final Stage Power Amplifier
- TD-LTE Band 42, 43, and 48 BTS and HetNet Downlink Driver Amplifier
- CBRS Band Indoor and Outdoor CPE
- 4G/LTE/LTE-A MiFi Access Points (APs) with CBRS

## Product Description

The DMA3701 is a high gain, high RF output power amplifier module (PAM) enabling Citizens Broadband Radio Service (CBRS) based consumer premises equipment (CPE) and infrastructure transmitters. Employing an amplifier die manufactured on an advanced GaAs process, this high efficiency linear 50  $\Omega$  input/output (I/O) amplifier is ideal for low power dissipation applications. Designed for use as an easily cascadable gain block, its gain flatness of better than  $\pm 0.25$  dB within any 10-MHz CBRS channel make this part ideal for highly integrated MIMO and MA-MIMO applications. The part is available in a small outline, low profile SMT package.

## Functional Block Diagram



## Package Pin Out

Pin Number	Name	Description
1	V <sub>CC</sub>	Supply Voltage for Power Amplifier (PA) Input Stage
2	RF <sub>IN</sub>	RF Input, 50 Ω, Single-Ended
3	GND	Ground
4	V <sub>EN</sub>	PA Enable Voltage
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	RF <sub>OUT</sub>	RF Output, 50 Ω, Single-Ended
9	GND	Ground
10	V <sub>CC</sub>	Supply Voltage for Power Amplifier (PA) Output Stage

## Absolute Minimum and Maximum Ratings

Parameter	Min	Max	Units
Supply	0	+6	Vdc
Enable Voltage, $V_{EN}$	0	+3	Vdc
RF Power at the Input	-	-3	dBm
ESD Rating: Human Body Model <sup>1</sup> Charged Device Model <sup>2</sup>	250 1000	- -	V
Moisture Sensitivity Level, MSL, Rating	3	-	-
Storage Temperature	-40	+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.

Notes: All specifications as measured using Duet evaluation assembly.

1. JEDEC Class 1A
2. JEDEC Class IV
3. 260 °C Peak Reflow

## Operating Ranges

Parameter	Min	Typ	Max	Units	Units
RF Input/Output Frequency	3550		3700	MHz	
Supply Voltage	+4.5	+5	+5.5	$V_{DC}$	
Enable Voltage ( $V_{EN}$ )	+2.7 0	+2.9 -	+3.1 +0.5	$V_{DC}$	PA "on" PA "shut down"
RF Output Power, Linear	-	+24	-	dBm	TD-LTE Uplink(B42/B43/B48)
Case Temperature, $T_C$	-40	-	+85	°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

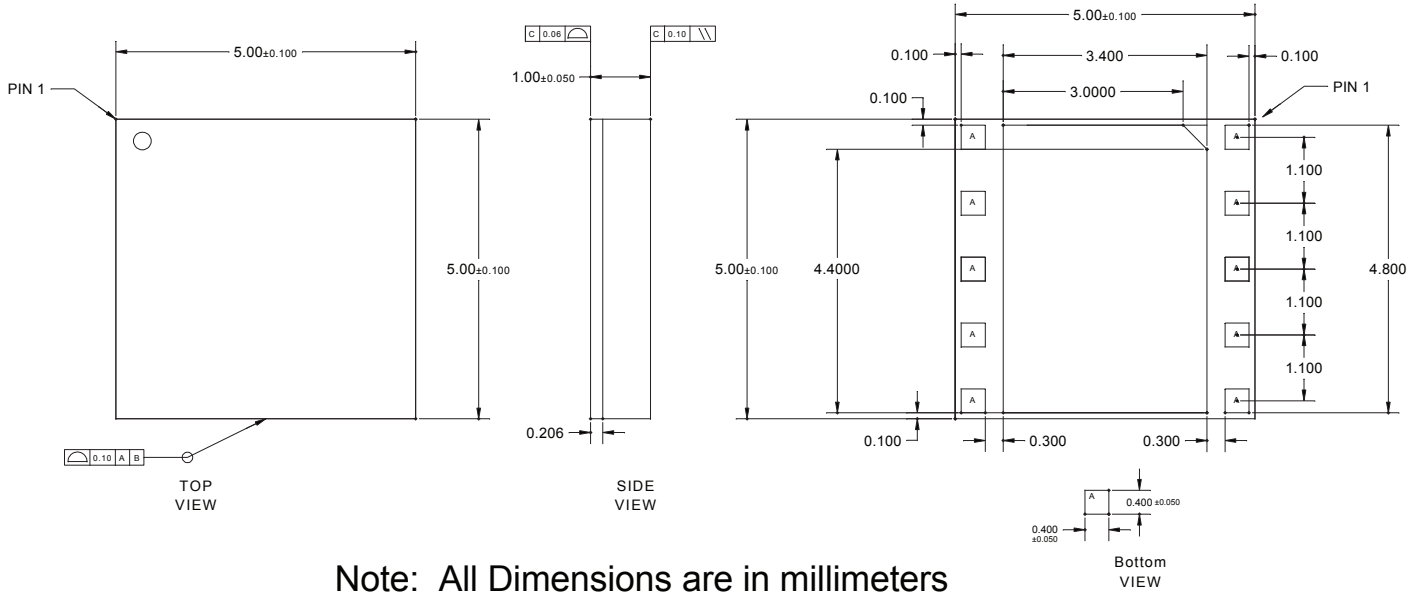
(Ta = +25 °C, Vdd = +5 VDC, f = as stated below, 50 Ω Input/Output)

Parameter	Min	Typ	Max	Units	Comments
Gain	34	35	36	dB	See Note 1; Pout = +28 dBm Linear RF Power Output TD-LTE Uplink (B42/B43/B48)
Gain Slope	-	0.5	-	dB	See Note 1
Gain Flatness	-	-	± 0.25	dB	Within any 10-MHz CBRS Channel
Gain Flatness	-	-	± 0.5	dB	F = 3550 to 3700 MHz
OP1dB	-	+33	-	dBm	CW Tone; Within any 10-MHz CBRS Channel
Noise Figure (NF)	-	4.9	-	dB	F = 3550 to 3700 MHz
Input Return Loss (IRL)	-9	-14	-	dB	See Note 1
Output Return Loss (ORL)	-14	-16	-	dB	See Note 1
Tx Modulation Error Ratio (MER)	-	-44	-	dB	LTE UL Operation (Band 42/43/48) = 10 MHz QPSK 12 RB (Start = 0)
Tx Error Vector Magnitude (EVM)	-	0.4	-	%RMS	LTE UL Operation (Band 42/43/48) = 10 MHz QPSK 12 RB (Start = 0)
EUTRA ACLR1		-40		dBc	LTE E-TM1.2 20 MHz test signal; 8.5 dB PAR; No DPD
EUTRA ACLR2		-48		dBc	LTE E-TM1.2 20 MHz test signal; 8.5 dB PAR; No DPD
Harmonics		-50		dBc	2fo at Pout = +28 dBm Linear RF Power Output TD-LTE Uplink (B42/B43/B48)
Harmonics		-50		dBc	3fo at Pout = +28 dBm Linear RF Power Output TD-LTE Uplink (B42/B43/B48)
Harmonics		-50		dBc	4fo at Pout = +28 dBm Linear RF Power Output TD-LTE Uplink (B42/B43/B48)
Ruggedness	8:1			VSWR	No degradation or failure
Spurious Output			-60	dBc	VSWR in-band < 5:1
			-60	dBc	VSWR out-of-band < 10:1
ENABLE 'OFF' Time, T <sub>OFF</sub>	-	0.15	0.2	μs	For Time Division Duplex (TDD) Operation
ENABLE 'ON' Time, T <sub>ON</sub>	-	0.25	0.4	μs	For Time Division Duplex (TDD) Operation
Supply Current	-	200	-	mA	+5 Vdc

Notes: All specifications as measured using Duet evaluation assembly.

1. Measured in application circuit, F = 3550 to 3700 MHz.

Package Dimensions



## Ordering Information

Order Number	Temperature Range	Package Description	Component Packaging
DMA3701P0	-40 to +85 °C	5 x 5 x 1.2 mm, 10-Pin	Gel Pak, 1 to 100 each
DMA3701V0	-40 to +85 °C	5 x 5 x 1.2 mm, 10-Pin	1500 each, T&R
DMA3701PCBA	-40 to +85 °C	50 Ω I/O Evaluation Board (EVB)	EVB Kit with five (5) piece IC sample ESD bag

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