

## FCM3901: 39 GHz High-Efficiency CMOS Power Amplifier for 5G mmWave Applications



### PRODUCT DESCRIPTION

Falcomm's FCM3901 is a high-efficiency 39 GHz power amplifier developed for 5G mmWave applications.

Implemented in a CMOS process and powered by Falcomm's patented Dual-Drive™ architecture, the FCM3901 achieves excellent power-added efficiency, gain, and linearity in a compact, cost-effective Si footprint.

Optimized for phased arrays, beamforming ICs, and broadband RF front ends, the FCM3901 is available as silicon-proven IP, enabling rapid integration and fast time-to-market for next-generation 39 GHz mmWave platforms.

### BENEFITS INCLUDE

- Best in class efficiency
- Plug and play
- Frequency and process agnostic
- 0.5x silicon area reduction
- 6dB lower loss matching network
- Silicon proven design flow that accurately models within 2% of measurements

### APPLICATIONS

- IoT devices
- Satellite Communication
- Mobile User Equipment
- Cellular Base Stations
- Automotive Radar
- Fixed Wireless Access

### FEATURES

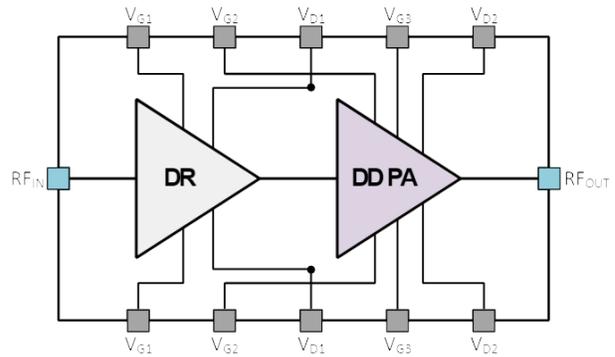
- **2-stage PAEmax = 45%**
- **PA-stage DEmax = 54%**
- **Psat = 18.3dBm**
- **Gain = 19dB**
- **Efficiency maintained at lower supply voltages**
- **High data rate modulation speeds**



## RECOMMENDED OPERATING CONDITIONS

Parameter	Typ	Units
VG1	200 to 300	mV
VG2	200 to 300	mV
VG2	1.1 to 1.3	V
VD1	0.75 to 1	V
VD2	1.6 to 2	V
Input Power at Psat	4	dBm
Max Power Dissipation	150	mW
Quiescent Current	25	mA

## FUNCTIONAL BLOCK DIAGRAM



## ELECTRICAL SPECIFICATIONS

Parameter	Min	Typ	Max	Units
Technology		SOI CMOS		
Supply	1.6	1.8	2	V
Gain		19		dB
Frequency Range	32	39	44	GHz
$P_{sat}$		18.3		dBm
$OP_{1dB}$		17.2		dBm
$DE_{max}$		54		%
$PAE_{max}$		45		%
$PAE_{P1dB}$		42		%
Modulation Scheme		64QAM		
Frequency Range		38		GHz
Data Rate		0.25		Gsymbols/s
Data Rate		1.5		Gb/s
EVM		-25		dB
SNR(MER)		-25		dB
ACPR		-26		dB
$P_{avg}$		12.8		dBm
$PAE_{avg}$		25		%

Table 1. Device was measured at room temperature and using a 50Ohm system for CW and modulation.