

An Introduction to Polyfet RF Devices



Who is Polyfet RF Devices?

Established in 1987, Polyfet RF Devices is a California based, ISO 9001:2008 certified, manufacturer of broadband LDMOS, VDMOS, and GaN power transistors and power modules.



Polyfet's Financials

(Strong financial position)

- Private corporation
- Profitable each year since inception (1987)
- Own our building and capital equipment
- No long term debt (no bank loans)



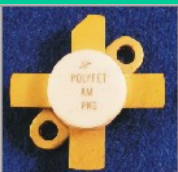
How does Polyfet size up?

- Have 25 employees
- 7500 (700 square meters) square foot facility
- Annual revenue roughly \$5,000,000
- Automated assembly equipment
- Production capabilities of over 5Kpcs/mo
- Own our masks, use domestic wafer fab
- ISO9001 and MIL-I-45208A standards



Manufacturing and Test Equipment

- West Bond die attach machines
- West Bond automatic wire bond machines
- Scientific Test DC Test Sets
- RJR Lidding Machines
- Agilent RF Test Equipment
- Werlatone, Innovative Power Products, Mega Phase, and Aeroflex/Weinschel misc.



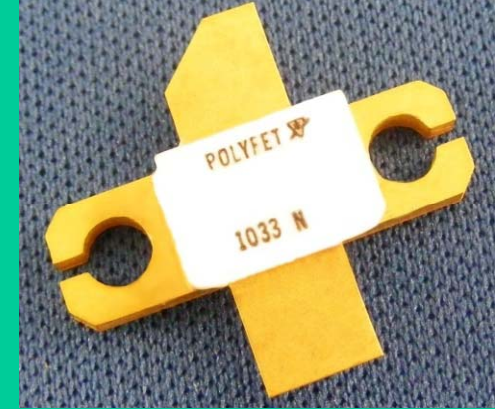
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What does Polyfet offer to the Market?

- GaN transistors
- LDMOS transistors
- VDMOS transistors
- Broadband modules
- Linear and non-linear models for simulation
- 2 - 4wk lead times
- Application notes
- Custom amplifier and module design service
- Technical support
- Long-Term (20+ years) production support





Gallium Nitride Transistors

- GaN on SiC technology (high thermal conductivity)
- Usable power/gain up to 3GHz
- Output power up to 160W P3dB CW
- Operating voltage across 24 - 48VDC

GaN Devices' Specifications



GP1001: 10W, 2.5GHz, 11dB, 50%, 28VDC

GP2001: 20W, 2.0GHz, 11dB, 65%, 28VDC

GP1441: 10W, 2.5GHz, 11dB, 35%, 48VDC

GP2441: 40W, 2.5GHz, 11dB, 55%, 48VDC



GX2001: 20W, 2.0GHz, 11dB, 65%, 28VDC

GX4001: 35W, 2.0GHz, 11dB, 60%, 28VDC

GX2441: 50W, 2.0GHz, 11dB, 55%, 48VDC

GX3441: 80W, 2.0GHz, 11dB, 60%, 48VDC

GX4441: 100W, 2.0GHz, 11dB, 60%, 48VDC

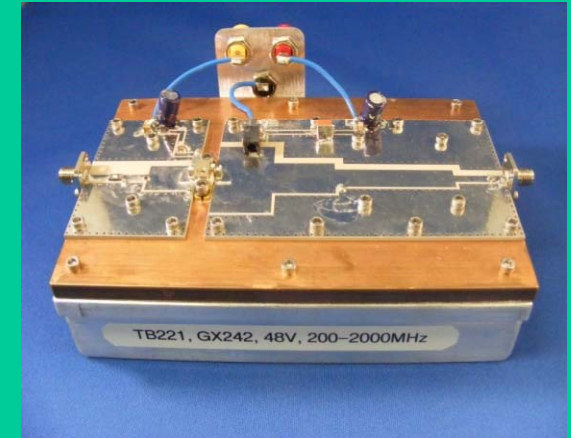
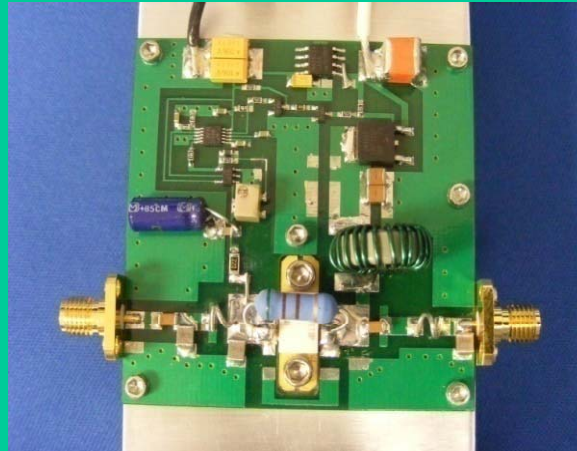
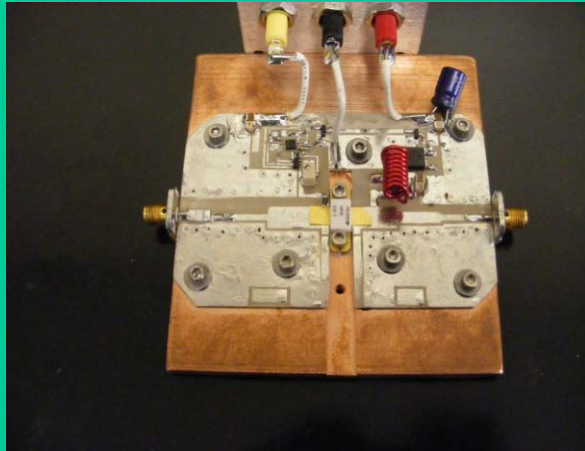
GX3442: 120W, 2.0GHz, 11dB, 55%, 48VDC

GX4002: 70W, 2.0GHz, 11dB, 55%, 28VDC

GX4442: 160W, 2.0GHz, 12dB, 55%, 48VDC



GaN Evaluation Amplifiers



(L) GX3442: 960-1260MHz, 100W P3dB, 13dB, 40%, 48VDC

(M) GX2441: 1-1000MHz, 30W P3dB, 12dB, 40%, 48VDC

(R) GX3442: 225-2000MHz, 60W P3dB, 10dB, 40%, 48VDC

Other:

GX3442: 70W, 1-1000MHz, 18dB, 40%, 48VDC

GP2441: 40W, 1-2.5GHz, 12dB, 45%, 48VDC

GP1441: 10W, 1-3GHz, 10dB, 45%, 48VDC



Polyfet LDMOS devices

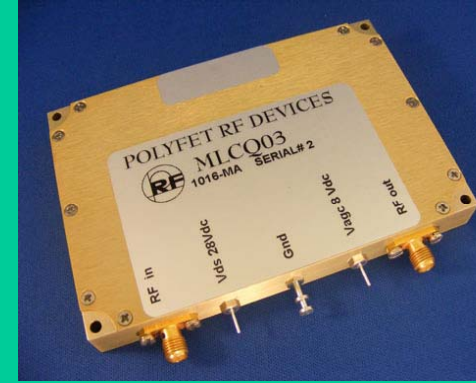
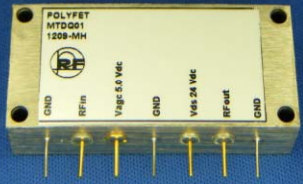
- Usable power/gain up to 1.5GHz
- Output power up to 600W CW
- Operating voltage across 5.0 - 50VDC





Polyfet VDMOS devices

- Usable power/gain up to 1GHz
- Output power up to 400W CW
- Operating voltage across 12.5 - 50VDC



Broadband modules

- Frequency range of 1.6 - 1260MHz
- Output power up to 300W
- Operating voltage across 12 - 50VDC
- Z_{in}/Z_{out} : 50 ohms
- Connection type: Feed-thru pin or SMA
- Details in “Modules” section of web site



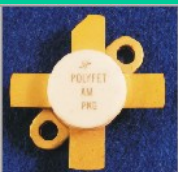
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New 28VDC LDMOS Devices and Modules

High drain breakdown (min 80VDC) voltage for high ruggedness. Higher gain than previous generation.

- LX2401: 80W, 1GHz, 15dB, 60%, 28VDC
- LB2401: 100W, 20-1000MHz, 15dB, 40%, 28VDC
- LR2541: 150W, 30-512MHz, 18db, 50%. 28VDC
- LR2541: 300W, 30-512MHz, 19dB, 50%, 50VDC
- 5E-008: 200W, 1300MHz, 14dB, 65%, 32VDC
- MSCQ02: 150W, 30-512MHz, 17dB, 60%, 28VDC
- MSMV02: 100W, 225-1000MHz, 16dB, 50%, 28VDC
- MLCQ04: 40W, 30-512MHz, 40dB, 25%, 28VDC



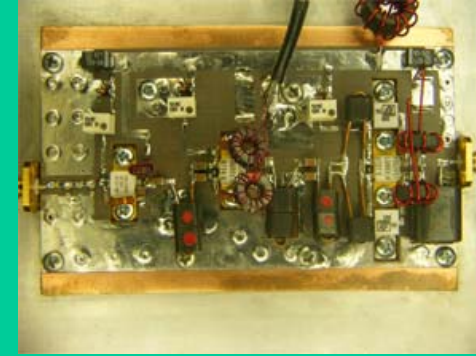
Linear and non-linear models

- S-parameters for each device
- Spice, ADS, AWR models available
- Simulation design files for extracting Z_{in}/Z_{out}
- Broadband amplifier design files
- Models found in the “Design” section of web site



Technical Bulletins

(Evaluation amplifiers)



- Working amplifiers used to demonstrate the performance of our devices
- Free to evaluate
- ACAD pcb layouts with each application note
- Reduces customers' engineering time
- Complete amplifier listing in the "Application Notes" section of web site



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Applications/Markets for our Product

- 520-1610kHz (AM)
- 2-30MHz (HF or Short wave)
- 30-88MHz (Military ground comms)
- 54-88MHz (TV VHF I)
- 88-108MHz (FM)
- 118-140MHz (Avionics)
- 136-174MHz (Commercial ground comms)
- 160-230MHz (TV VHF III)
- 30-512MHz (Military: Jammer, Ground/Air comms)
- 470-860MHz (TV UHF)
- 100kHz - 1000MHz (ISM, NMR, Medical, Instrumentation or EMC)
- 1-3GHz (Public communication, jammers, Instrumentation)



Technical Support

Polyfet understands the complex nature of matching power MOSFETs. Polyfet offers technical assistance to their customers at any time.



Long-Term Production Support!

Polyfet designs and releases our product with long (20+ years) production cycles in mind. We can/do still deliver product today that we introduced 25 years ago.



Road Map for Polyfet

4Q2016: Release new line of 50VDC LDMOS devices. Target specifications are as follows:

Up to 1.0GHz

Up to 600W (narrow band)

Up to 300W (broad band)

Min 21dB gain (narrow band)

Min 65% efficiency (narrow band)

Single-ended and push-pull



Contact information

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