

# AN INTRODUCTION TO POLYFET RF DEVICES: COMPANY AND PRODUCTS

# WHO IS POLYFET RF DEVICES?

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Founded in 1984, Polyfet RF Devices is a California based, ISO 9001:2015 certified, manufacturer of broadband LDMOS, VDMOS, and GaN power transistors and power modules.

# POLYFET'S FINANCIALS

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PRIVATE CORPORATION

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PROFITABLE EACH YEAR  
SINCE 1991

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OWN OUR BUILDING  
AND CAPITAL EQUIPMENT

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NO LONG-TERM DEBT

MANUFACTURING  
AND TEST  
EQUIPMENT

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West Bond die attach machines

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West Bond automatic wire bond machines

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Scientific Test DC Test Sets

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RJR Lidding Machines

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Agilent RF Test Equipment

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Werlatone, Innovative Power Products,  
Mega Phase, and Aeroflex/Weinschel misc.

# HOW DOES POLYFET SIZE UP?

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HAVE 25 EMPLOYEES

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7500 (700 SQUARE METERS) SQUARE  
FOOT FACILITY

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ISO9001 AND MIL-I-45208A STANDARDS

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AUTOMATED ASSEMBLY EQUIPMENT

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CURRENT THROUGHPUT CAPABILITY OF  
OVER 5KPCS/MO (CAN INCREASE BY  
ADDING 2<sup>ND</sup> SHIFT)

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OWN OUR MASKS (IP)

# 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

# TECHNICAL BULLETINS (EVALUATION AMPLIFIERS)

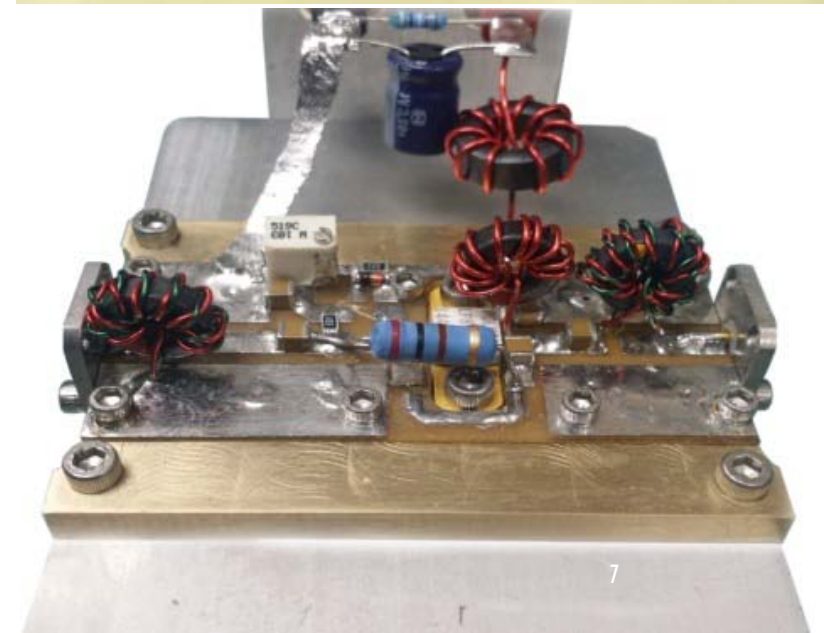
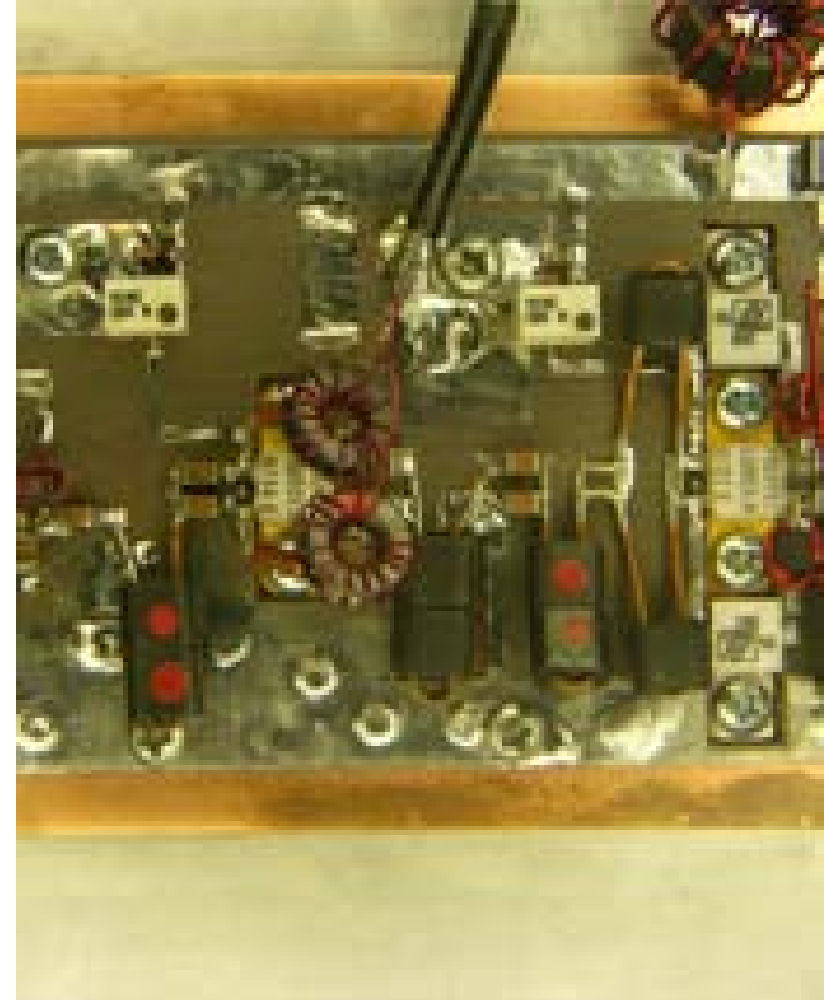
Working amplifiers used to demonstrate the performance of our devices

Free to evaluate

Comes with a complete data package showing performance, PCB layout, and BOM/schematic to copy if desired

Reduces customers' engineering time

Complete amplifier listing in the "Application Notes" section of web site



# GALLIUM NITRIDE TRANSISTORS

GaN on SiC technology (high thermal conductivity)

Usable power/gain up to 3GHz

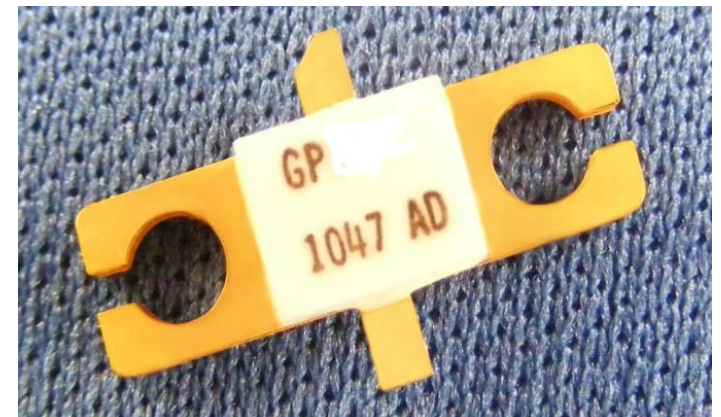
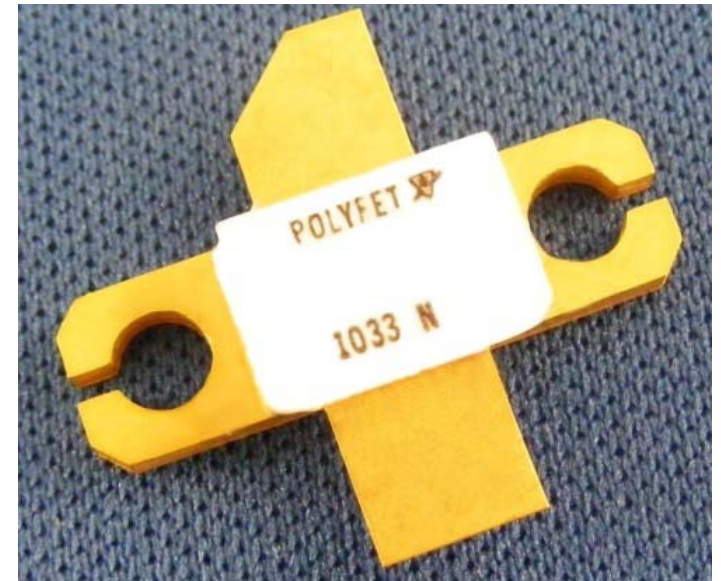
Output power up to 160W P3dB CW

Operating voltage across 24 - 48VDC

Our GP package shown bottom right

Our GX package shown top right

See our catalog for all of our GaN offerings and specifications





# GAN DEVICES' SPECIFICATIONS



- GP1001:** 10W, 2.5GHz, 11 dB, 50%, 28VDC
- GP2001:** 20W, 2.0GHz, 11 dB, 65%, 28VDC
- GP1441:** 10W, 2.5GHz, 11 dB, 35%, 48VDC
- GP2441:** 40W, 2.5GHz, 11 dB, 55%, 48VDC



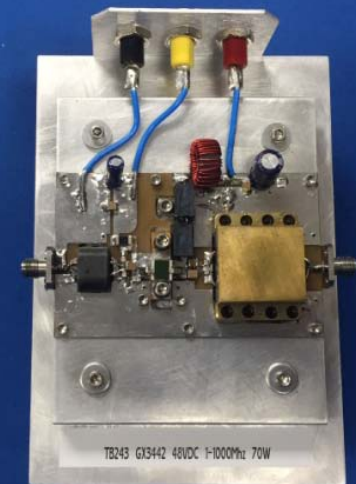
- GX2001:** 20W, 2.0GHz, 11 dB, 65%, 28VDC
- GX4001:** 35W, 2.0GHz, 11 dB, 60%, 28VDC
- GX2441:** 50W, 2.0GHz, 11 dB, 55%, 48VDC
- GX3441:** 80W, 2.0GHz, 11 dB, 60%, 48VDC
- GX4441:** 100W, 2.0GHz, 11 dB, 60%, 48VDC
- GX3442:** 120W, 2.0GHz, 11 dB, 55%, 48VDC
- GX4002:** 70W, 2.0GHz, 11 dB, 55%, 28VDC
- GX4442:** 160W, 2.0GHz, 12 dB, 55%, 48VDC

# GAN EVALUATION AMPLIFIERS

(T) TB243 featuring the GX3442: 1-1000MHz,  
70W P3dB, 15dB, 40%, 48VDC

(M) TB255 featuring the GX3442: 30-  
512MHz, 100W P3dB, 19dB, 65%, 48VDC

(B) TB256 featuring the GP2001: 20-  
3000MHz, 10W P3dB, 10dB, 25%, 28VDC



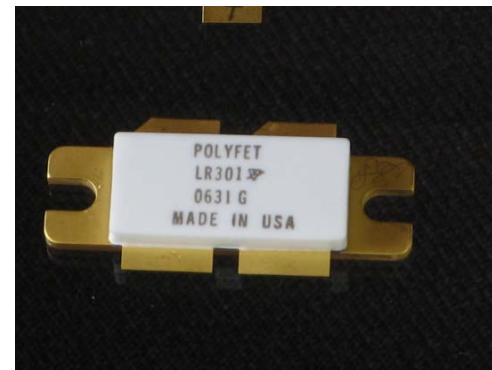
# POLYFET LDMOS DEVICES

Usable power/gain up to 1.5GHz

Output power up to 2kW CW

Operating voltage across 5.0 -  
50VDC

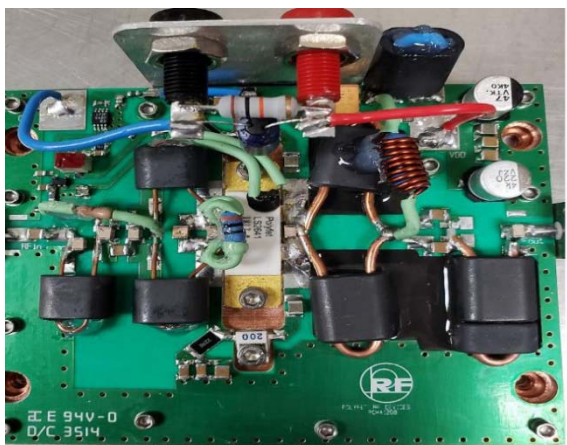
See our shortform catalog for all  
of our LDMOS offerings and  
specifications



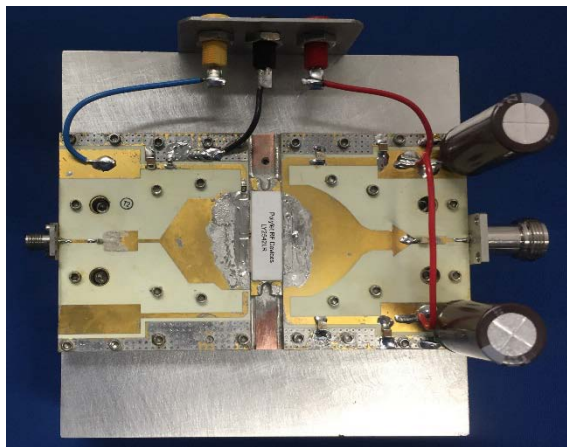


(T) TB230A featuring the LB2401: 20-1000MHz, 100W P1dB, 15dB, 40%, 28VDC

(M) TB263 featuring the LS2641: 30-512MHz, 180W P1dB, 17dB, 55%, 28VDC



(B) TB277C featuring the LY2542LR: 1.2-1.4GHz, 850W P1dB (300 $\mu$ S, 12%), 14dB, 50%, 50VDC



# LDMOS EVALUATION AMPLIFIERS

# POLYFET VDMOS DEVICES

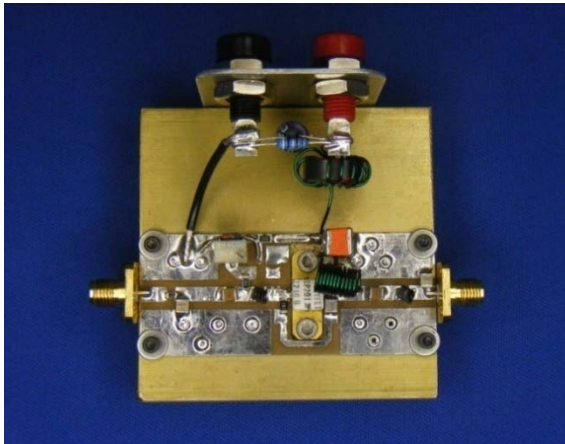
Usable power/gain up to 1GHz

Output power up to 400W CW

Operating voltage across 12.5 -  
50VDC

See our shortform catalog for all of  
our VDMOS offerings and  
specifications

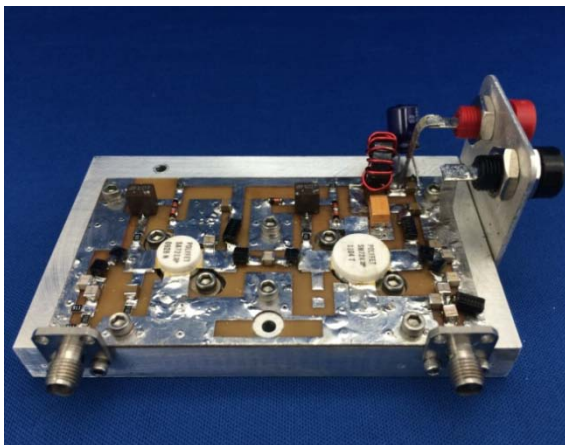




(T) TB224 featuring the SP201: 30-512MHz, 1.0W P1dB, 10dB, 12%, 28VDC

(M) TB184C featuring the SR401: 2-30MHz, 200W P1dB, 20dB, 50%, 28VDC

(B) TB252 featuring the SA721→SM724: 118-136MHz, 25W P1dB, 30dB, 40%, 28VDC



# VDMOS EVALUATION AMPLIFIERS

# BROADBAND MODULES

Frequency range of 1.6 - 1260MHz

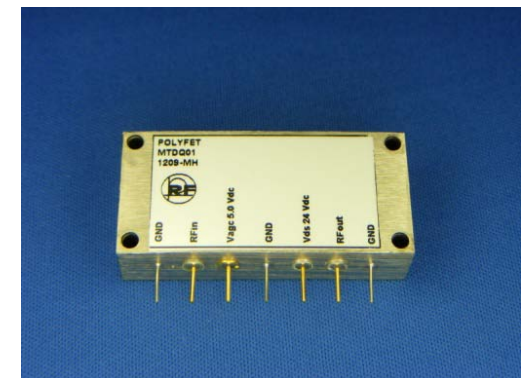
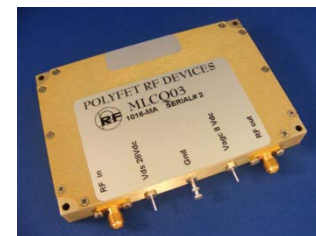
Output power up to 300W

Operating voltage across 12 -  
50VDC

Zin/Zout: 50 ohms

Connection type: Feed-thru pin or  
SMA

Details in “Modules” section of web  
site



# NEW LDMOS DEVICES

Feature high drain breakdown (min 80VDC) voltage for improved ruggedness for the 28V devices, and higher gain than previous generation.

## Examples:

LB2401: 100W P1dB, 20-1000MHz, 15dB, 40%, 28VDC

LS2541: 150W P1dB, 30-512MHz, 18db, 50%. 28VDC

LS2641: 180W P1dB, 30-512MHz, 17dB, 55%, 28VDC

LS2541HF: 500WP1dB, 2-30MHz, 26dB, 65%, 50VDC

LY2542LB: 800W P1dB (128uS pulse), 960-1215MHz, 14dB, 45%, 50VDC

LY2542LR: 850W P1dB (300uS pulse), 1.2-1.4GHz, 14dB, 50%, 50VDC

LY2843V: 2kW, HF and FM, 20dB, 80%, 50VDC



# LINEAR AND NON-LINEAR DEVICE MODELS

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S-parameters

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Spice, ADS, AWR models

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Simulation design files  
for extracting  $Z_{in}/Z_{out}$

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Broadband amplifier  
design files

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All found in the “Design”  
section of web site

## APPLICATIONS/ MARKETS FOR OUR PRODUCT

520-1610kHz (AM)

2-30MHz (HF)

30-88MHz (Military ground communications)

54-88MHz (TV VHF I)

88-108MHz (FM)

118-136MHz (Avionics)

136-174MHz (Commercial ground communications)

160-230MHz (TV VHF III)

30-512MHz (Military: Jammer, Ground/Air communications)

470-700MHz (TV UHF)

100kHz - 1000MHz (ISM, NMR, Medical, Instrumentation or EMC)

1-3GHz (L-band avionics/radar, Public communication, Jammers, Instrumentation)

# TECHNICAL SUPPORT

Polyfet understands the complex nature of matching power MOSFETs. Polyfet offers extensive technical support to their customers.

# DO NOT FEAR OBSOLESCENCE

- Majority of customer base is Military
- 20+ year product life cycles
- Obsolescence is rare, not driven by sales
- Still manufacturing products today that we introduced 30 years ago
- Customers come to Polyfet for replacements for obsolete competitors' devices

Examples of replacements:

Ampleon with Polyfet as follows:

BLF245 with SA701

BLF245B with SE701

BLF404 with S8222

BLF246 with SM704

BLF246B with SD702

BLF147 with SM401

BLF647 with LR2401

BLF1043 with L2801

ST Microelectronics with Polyfet as follows:

LET9120 with LB2301

LET9045C with LX2301

# ROAD MAP FOR POLYFET

Q2-2023: Release new line of 50VDC LDMOS discrete transistors. Target specifications are as follows:

Up to 2.0kW CW, push-pull, narrow band HF, FM, and VHF

Up to 300W, push-pull, broad band (30-512MHz)

Min 20dB gain narrow band (19dB broad band)

Min 75% efficiency narrow band (50% broad band)

Utilizing ceramic packages with high thermal conductivity

Q1-2024: Release new line of GaN in SiC discrete transistors. Target specifications are 6GHz, 30W, 48VDC, 13dB.

# CONTACT INFORMATION



Address: 1110 Avenida  
Acaso, Camarillo CA  
93012



Phone/Fax: 1-805-484-  
4210/3393



E-mail:  
contact@polyfet.com



Web site: [www.polyfet.com](http://www.polyfet.com)