



# High-Power GaN 2 Unmatched Power Transistors (UPT)

Introducing the development of our linear GaN 2 unmatched power transistor (UPT) family comprised solely of gallium nitride (GaN) transistors. Using an advanced 0.5 $\mu$ m GaN high electron mobility transistor (HEMT) semiconductor process, these high-performance amplifiers from RFMD show excellent linearity and flat gain over a broad frequency range in a single amplifier design. The RFHA394x family consists of 28V and 48V high power discrete GaN amplifiers designed for comm wireless, military, industrial, and general purpose applications. Improved linear power, wideband gain and power performance in a single amplifier vs. competitive GaN solutions. The RFHA3960 is a general purpose linear GaN amplifier in a low cost plastic package.

RFMD has defined a GaN production model that best leverages the cost advantages attained by manufacturing in our existing wafer factory—the world’s largest III-V commercial wafer factory—located near our corporate headquarters in Greensboro, North Carolina. Commercializing semiconductor processes is an RFMD strength forged with the successful release of the industry’s first GaAs HBT power amplifier for the high-volume cellular handset market. Applying that knowledge to the development of gallium nitride (GaN) transistors for the wireless infrastructure, commercial, and military markets is an RFMD advantage.

## Specifications

Freq Range (GHz)	P3dB at 900MHz (W)	Linear Gain at 900MHz (dB)	Drain Eff. at 900MHz (%)	P3dB at 2.1GHz (W)	Linear Gain at 2.1GHz (dB)	Drain Eff. at 2.1GHz (%)	V <sub>D</sub> (V)	I <sub>DD</sub> (mA)	Package	Part Number
DC to 4	3.5	22	65	3.5	16.50	60	28	50	SOIC-8	RFHA3960
DC to 4	35	22	65	35	16	60	48	300	RF360-2	RFHA3942
DC to 4	65	22	65	65	16	60	48	540	RF360-2	RFHA3944
DC to 4	90	22	65	90	16	60	48	860	RF360-2	RFHA3945

### Features

- High Linearity –10dB Improvement from GaN1
- 28V and 48V Bias Operation (works 12V to 48V)
- High Terminal Impedance – Tunable Wide BW
- Peak Drain Efficiency ~ 60% at 2.1GHz
- Excellent Linearity

### Applications

- Broadcast
- General Purpose Broadband Amplifiers
- Cellular Wireless Infrastructure
- High Power Radars
- Public Mobile Radio
- Aerospace and Defense
- Industrial/Scientific/Medical

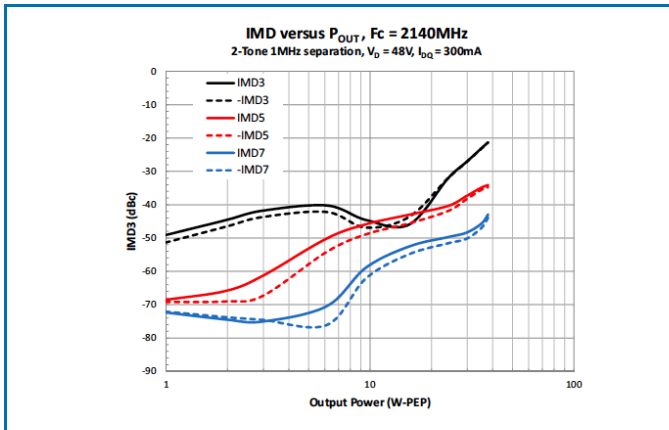
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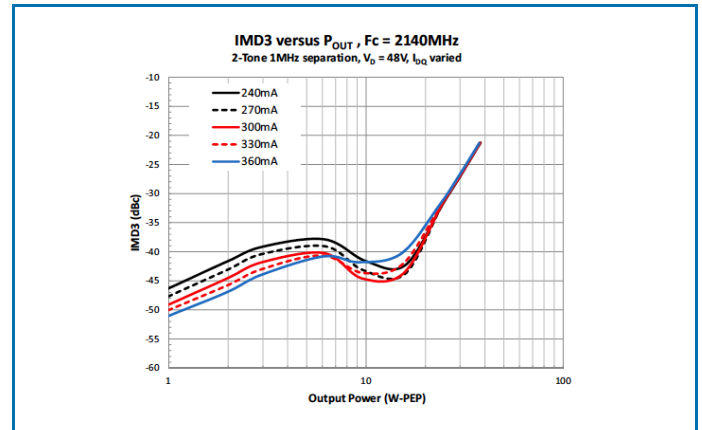


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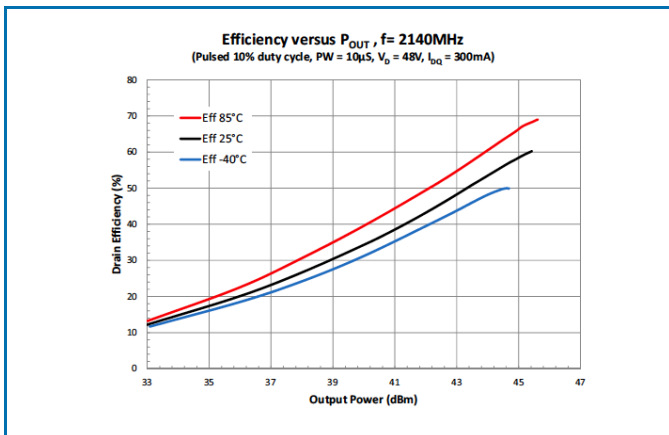
### RFHA3942 IMD versus P<sub>OUT</sub>



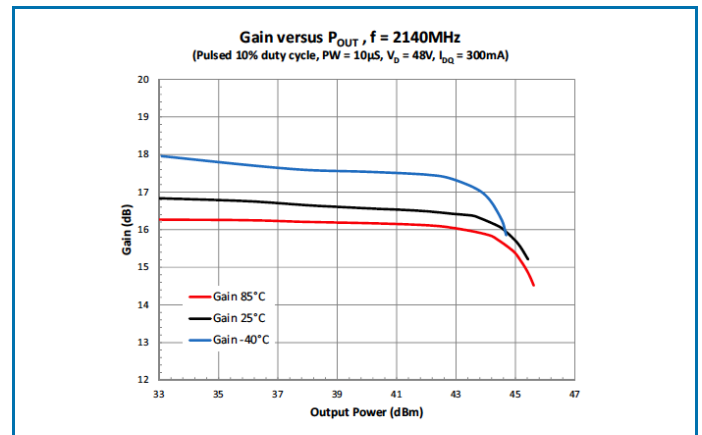
### RFHA3942 IMD3 versus P<sub>OUT</sub>



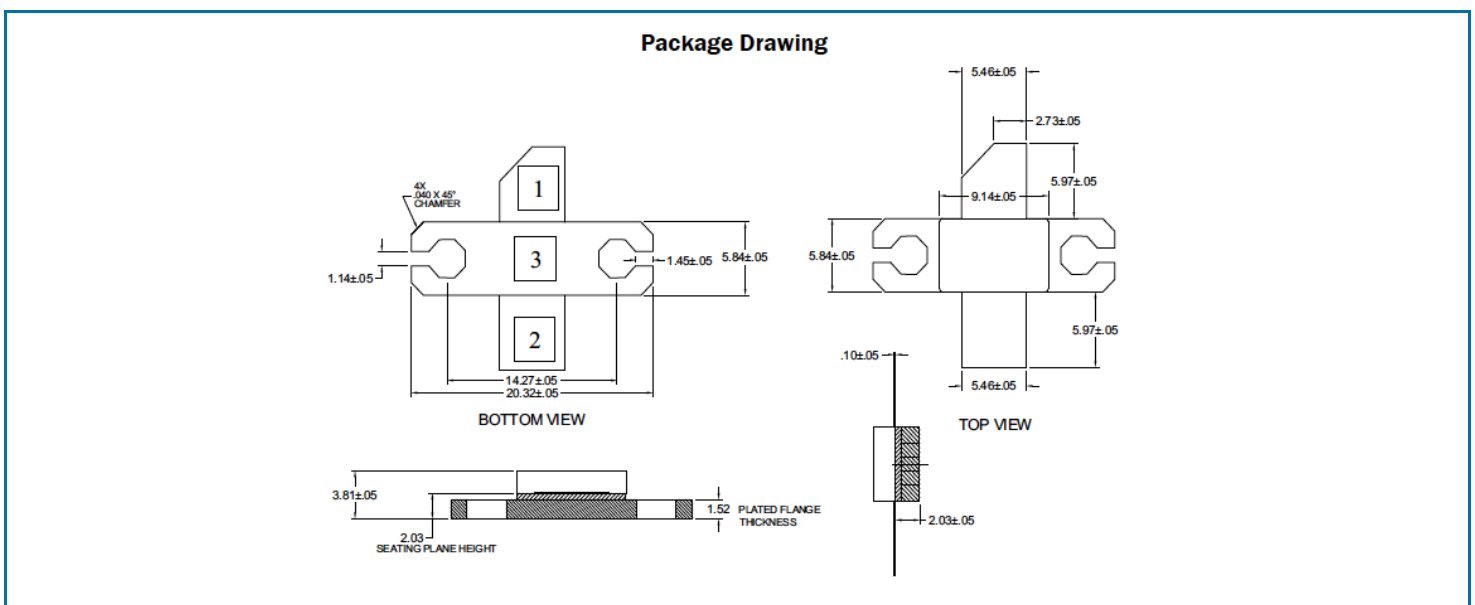
### RFHA3942 Efficiency versus P<sub>OUT</sub>



### RFHA3942 Gain versus P<sub>OUT</sub>



### Package Drawing



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