

# **Freescale introduces ultra-efficient, high-power LDMOS RF transistor for digital/analog TV broadcast amplifiers**

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*Low thermal resistance technology enhances heat dissipation, improves transistor reliability and reduces cooling costs*

Faced with rising energy prices, the broadcast industry seeks innovative ways to cut power and operating expenses. Freescale Semiconductor is addressing this market need with a highly efficient RF power transistor designed to reduce transmitter power consumption and operating costs for digital and analog television broadcast applications.

Freescale's MRF6P3300H transistor leverages the company's sixth-generation, high-voltage (HV6) laterally diffused metal oxide semiconductor (LDMOS) technology. The LDMOS device delivers outstanding RF performance while enhancing the operating efficiency and reliability of power amplifiers and transmitters. Freescale pioneered the development of RF power transistors in LDMOS technology and offers an extensive RF transistor portfolio for wireless and broadcast infrastructure applications.

Due to its high output power, the 300 W MRF6P3300H device allows power amplifier manufacturers to reduce system-level costs because fewer RF transistors are needed to achieve a given power target. Fewer transistors enable more compact power amplifier designs, lower heat dissipation and a reduction in cooling requirements.

By using smaller, highly efficient MRF6P3300H based power amplifiers, broadcasters can reduce their long-term operating costs. According to a Freescale analysis of a typical 5-kW digital television base station, a power amplifier with multiple MRF6P3300H devices can help reduce annual operating costs by up to \$5,200. This estimated savings is based on the Freescale device's exceptional operating efficiency and low thermal resistance, which reduces cooling costs.

“We designed the MRF6P3300H to be the most efficient RF power transistor in the broadcast marketplace,” said Gavin Woods, general manager of Freescale's RF Division. “The exceptional operating efficiency of the MRF6P3300H gives power amplifier and transmitter manufacturers a competitive advantage. It can also enable TV broadcasters to realize considerable savings in operating expenses over the life of the equipment.”

The MRF6P3300H device features Freescale's exclusive Low Rth packaging technology for superior heat transmission within power amplifier and transmitter applications. This packaging technology is engineered to dissipate heat through a specially-designed, low-thermal-resistance flange that accelerates the flow of heat away from the device to a heat sink or other cooling system. Efficient heat dissipation allows the transistor to operate at lower temperatures, which greatly increases reliability and operating life.

The MRF6P3300H uses an industry-standard case outline that provides a simple, drop-in replacement for existing mechanical outlines. With this approach, RF amplifier manufacturers can standardize their high-density board designs, save board real estate and reduce system-level costs. Accommodating larger, non-standard case sizes requires board redesign or retooling, which adds to the cost and mechanical complexity of power amplifiers.

The MRF6P3300H RF transistor accommodates both digital and analog broadcast standards in the 470 to 860 MHz range, using a 32 V power source common in TV transmitters. The MRF6P3300H delivers 57.5 percent efficiency and 19 dB power gain when operating at 860 MHz and at 300 W CW.

The MRF6P3300H is the newest and highest power member of Freescale's family of RF power transistors for the ultra-high frequency (UHF) broadcast market. The other six family members include:

- MRF373AL – 75 W, unmatched driver
- MRF373ALS – 75 W, unmatched driver
- MRF374A – 130 W, unmatched
- MRF372 – 180 W, input matched
- MRF377 – 240 W, input /output matched
- MRF377H – 240 W, input /output matched low Rth

The MRF6P3300H RF transistor is sampling now, and production is planned for late Q2.

For pricing information, please contact Freescale Semiconductor or your local Freescale sales representative.

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