

FEATURES

- ◆ 29 dBm Output Power at 1-dB Compression
- ◆ 17 dB Power Gain at 2 GHz
- ◆ 1.0 dB Noise Figure at 2 GHz
- ◆ 42 dBm Output IP3
- ◆ 50% Power-Added Efficiency



DESCRIPTION AND APPLICATIONS

The FP2250QFN is a high performance, leadless, encapsulated packaged Aluminum Gallium Arsenide / Indium Gallium Arsenide (AlGaAs/InGaAs) pseudomorphic High Electron Mobility Transistor (pHEMT). It utilizes a 0.25 μm x 2250 μm Schottky barrier gate, defined by electron-beam photolithography. The recessed “mushroom” gate structure minimizes parasitic gate-source and gate resistance. The epitaxial structure and processing have been optimized for reliable high-power applications. The FP2250’s active areas are passivated with Si₃N₄, and the QFN package is ideal for low-cost, high-performance applications that require a surface-mount package. Typical applications include drivers or output stages in PCS/Cellular amplifiers, WLL and WLAN systems, and other types of wireless infrastructure systems up to 10 GHz.

ELECTRICAL SPECIFICATIONS @ T_{Ambient} = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Saturated Drain-Source Current FP2250QFN-1	I _{DSS}	V _{DS} = 2 V; V _{GS} = 0 V	560	635	705	mA
FP2250QFN-2			706	770	850	mA
Power at 1-dB Compression	P-1dB	V _{DS} = 5 V; I _{DS} = 50% I _{DSS}	27	29		dBm
Power Gain at 1-dB Compression	G-1dB	V _{DS} = 5 V; I _{DS} = 50% I _{DSS}	16	17		dB
Power-Added Efficiency	PAE	V _{DS} = 5 V; I _{DS} = 50% I _{DSS}		50		%
Noise Figure	NF	V _{DS} = 5 V; I _{DS} = 50% I _{DSS}		1.0		dB
Output Third-Order Intercept Point	IP3	V _{DS} = 5V; I _{DS} = 50% I _{DSS}		42		dBm
Maximum Drain-Source Current	I _{MAX}	V _{DS} = 2 V; V _{GS} = 1 V	840			mA
Transconductance	G _M	V _{DS} = 2 V; V _{GS} = 0 V	550			mS
Gate-Source Leakage Current	I _{GSO}	V _{GS} = -5 V			115	μA
Pinch-Off Voltage	V _P	V _{DS} = 2 V; I _{DS} = 11 mA	-2.0		-0.25	V
Gate-Source Breakdown Voltage Magnitude	V _{BDGS}	I _{GS} = 11 mA	-10	-12		V
Gate-Drain Breakdown Voltage Magnitude	V _{BDGD}	I _{GD} = 11 mA	-10	-12		V

All RF data tested at 2.0 GHz

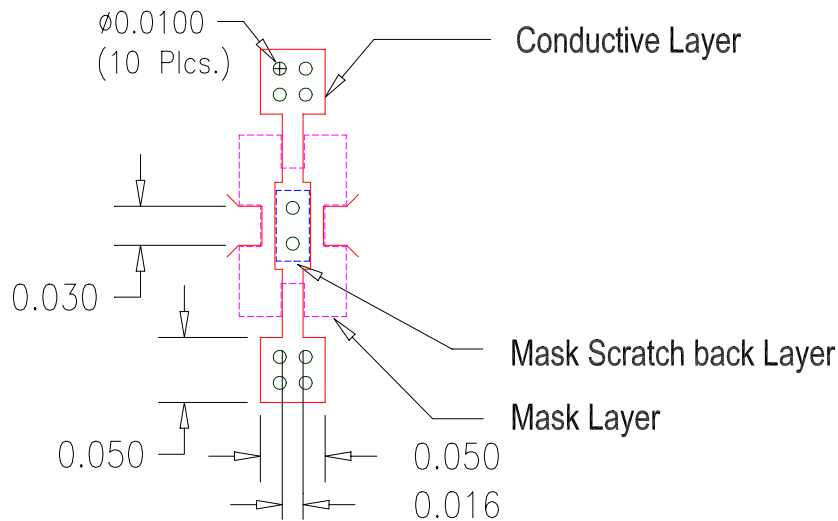
• ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Test Conditions	Min	Max	Units
Drain-Source Voltage	V_{DS}	$T_{Ambient} = 22 \pm 3 \text{ }^\circ\text{C}$		6	V
Gate-Source Voltage	V_{GS}	$T_{Ambient} = 22 \pm 3 \text{ }^\circ\text{C}$		-3	V
Drain-Source Current	I_{DS}	$T_{Ambient} = 22 \pm 3 \text{ }^\circ\text{C}$		I_{DSS}	mA
Gate Current	I_G	$T_{Ambient} = 22 \pm 3 \text{ }^\circ\text{C}$		15	mA
RF Input Power	P_{IN}	$T_{Ambient} = 22 \pm 3 \text{ }^\circ\text{C}$		500	mW
Channel Operating Temperature	T_{CH}	$T_{Ambient} = 22 \pm 3 \text{ }^\circ\text{C}$		175	$^\circ\text{C}$
Storage Temperature	T_{STG}	—	-65	175	$^\circ\text{C}$
Total Power Dissipation	P_{TOT}	$T_{Ambient} = 22 \pm 3 \text{ }^\circ\text{C}$		3.75	W

Notes:

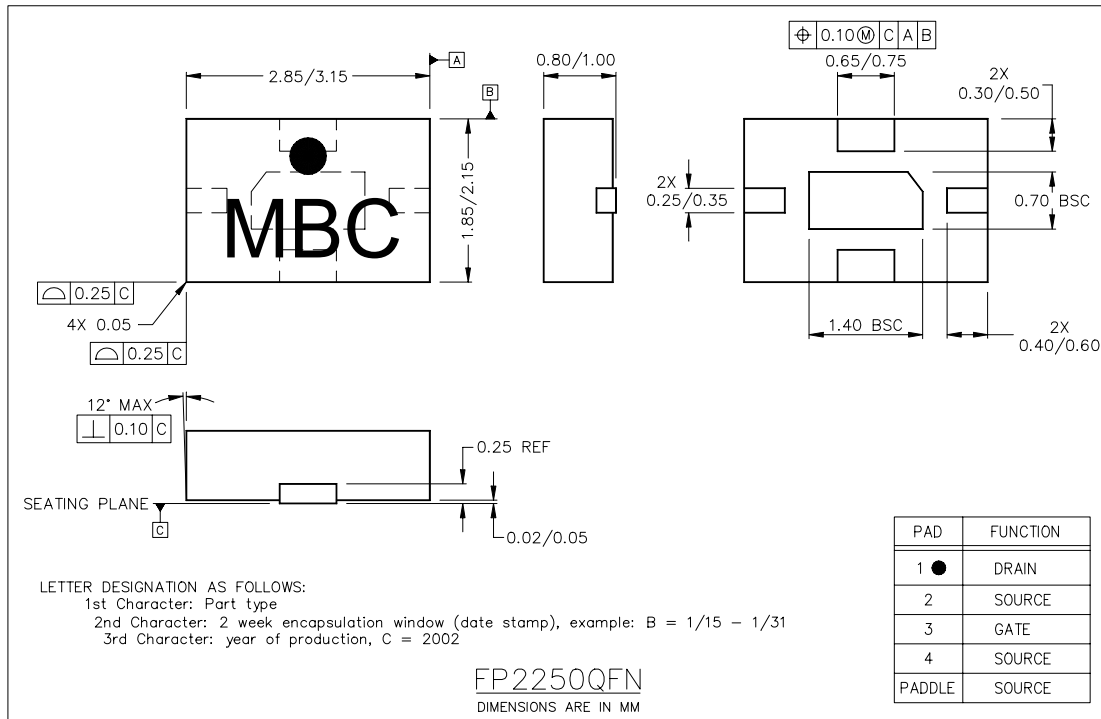
- Operating conditions that exceed the Absolute Maximum Ratings could result in permanent damage to the device.
- Power Dissipation defined as: $P_{TOT} \equiv (P_{DC} + P_{IN}) - P_{OUT}$, where
 P_{DC} : DC Bias Power
 P_{IN} : RF Input Power
 P_{OUT} : RF Output Power
- Absolute Maximum Power Dissipation to be de-rated as follows above 25 $^\circ\text{C}$:
 $P_{TOT} = 3.75\text{W} - (0.025\text{W}/^\circ\text{C}) \times T_{PACK}$
 where $T_{PACK} = \text{source tab lead temperature}$. (Bottom of the Package)
- This PHEMT is susceptible to damage from Electrostatic Discharge. Proper precautions should be used when handling these devices.

• PCB PAD LAYOUT



Dimensions are in Inches

• PACKAGE OUTLINE



• HANDLING PRECAUTIONS

To avoid damage to the devices care should be exercised during handling. Proper Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. These devices should be treated as Class 1A (0-500 V). Further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263.

• APPLICATIONS NOTES & DESIGN DATA

Applications Notes are available from your local Filtronic Sales Representative or directly from the factory. Complete design data, including S-parameters, noise data, and large-signal models are available on the Filtronic web site.

All information and specifications are subject to change without notice.