



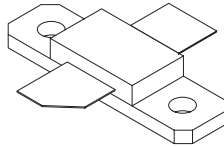
# PD27025F

## 25 W, 2.5GHz - 2.7GHz, N-Channel E-Mode, Lateral MOSFET

### Introduction

The PD27025F is a high-voltage, gold-metalized, laterally diffused metal oxide semiconductor (LDMOS) RF power transistor suitable for 2.5GHz - 2.7GHz Class AB wireless base station amplifier applications.

This device is manufactured on an advanced LDMOS technology, offering state-of-the-art performance, reliability, and thermal resistance. Packaged in an industry-standard CuW package capable of delivering a minimum output power of 25 W, it is ideally suited for today's RF power amplifier applications.



PD27025F (flanged)

Figure 1. Available Packages

### Features

- **Application Specific Performance, 2.7 GHz**
  - **Typical 2-Tone Performance**  
 Average Load Power – 12.5 W  
 $\eta_D$  – 30%  
 Power Gain – 11.5 dB  
 IMD3: -30dBc @ -100kHz/ +100kHz
  - **Typical CW Performance**  
 Average Load Power – 25 W  
 $\eta_D$  – 38%  
 Power Gain – 11.0 dB

Table 1. Thermal Characteristics

Parameter	Sym	Value	Unit
Thermal Resistance, Junction to Case:	R <sub>JC</sub>	2.1	°C/W

Table 2. Absolute Maximum Ratings\*

Parameter	Sym	Value	Unit
Drain-source Voltage	V <sub>DSS</sub>	65	Vdc
Gate-source Voltage	V <sub>GS</sub>	-0.5, +15	Vdc
Drain Current—Continuous	I <sub>D</sub>	4.25	A dc
Total Dissipation at T <sub>C</sub> = 70 °C:	P <sub>D</sub>	83.5	W
Derate Above 70 °C:	—	0.48	W/°C
Operating Junction Temperature	T <sub>J</sub>	200	°C
Storage Temperature Range	T <sub>STG</sub>	-65, +150	°C

\* Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Table 3. ESD Rating\*

	Minimum (V)	Class
<b>HBM</b>	500	1B
<b>MM</b>	50	A
<b>CDM</b>	1500	4

\* Although electrostatic discharge (ESD) protection circuitry has been designed into this device, proper precautions must be taken to avoid exposure to ESD and electrical overstress (EOS) during all handling, assembly, and test operations. Agere employs a human-body model (HBM), a machine model (MM), and a charged-device model (CDM) qualification requirement in order to determine ESD-susceptibility limits and protection design evaluation. ESD voltage thresholds are dependent on the circuit parameters used in each of the models, as defined by JEDEC's JESD22-A114B (HBM), JESD22-A115A (MM), and JESD22-C101A (CDM) standards.

**Caution: MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.**

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### Electrical Characteristics

Recommended operating conditions apply unless otherwise specified: Tc = 30 °C.

Table 4. dc Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
<b>Off Characteristics</b>					
Drain-source Breakdown Voltage (VGS = 0, ID = 100 $\mu$ A)	V(BR)DSS	65	—	—	Vdc
Gate-source Leakage Current (VGS =15V, VDS = 0 V)	IGSS	—	—	1.0	$\mu$ Adc
Zero Gate Voltage Drain Leakage Current (VDS = 28 V, VGS = 0 V)	IDSS	—	—	1.0	mAdc
<b>On Characteristics</b>					
Forward Transconductance (VDS = 10 V, ID = 1.0 A)	Gm	1	3	—	S
Gate Threshold Voltage (VDS = 10 V, ID = 1 mA)	VGS(TH)	—	3.5	—	Vdc
Gate Quiescent Voltage (VDS = 28 V, IDQ = 330 mA)	VGS(Q)	3.0	4.0	5.0	Vdc
Drain-source On-voltage (VGS = 10 V, ID = 1.0 A)	VDS(ON)	—	—	0.33	Vdc

Table 5. RF Characteristics

Rating	Symbol	Min	Typ	Max	Unit
Input capacitance * (including matching capacitor) (VDS=28V, VGS=0V, f = 1MHz)	C <sub>ISS</sub>	-	74	-	pF
Output capacitance * (including matching capacitor) (VDS= 28V, VGS=0V, f = 1MHz)	C <sub>OSS</sub>	-	352	-	pF
Feedback capacitance * (VDS=28V, VGS=0V, f = 1MHz)	C <sub>RSS</sub>	-	1.6	-	pF

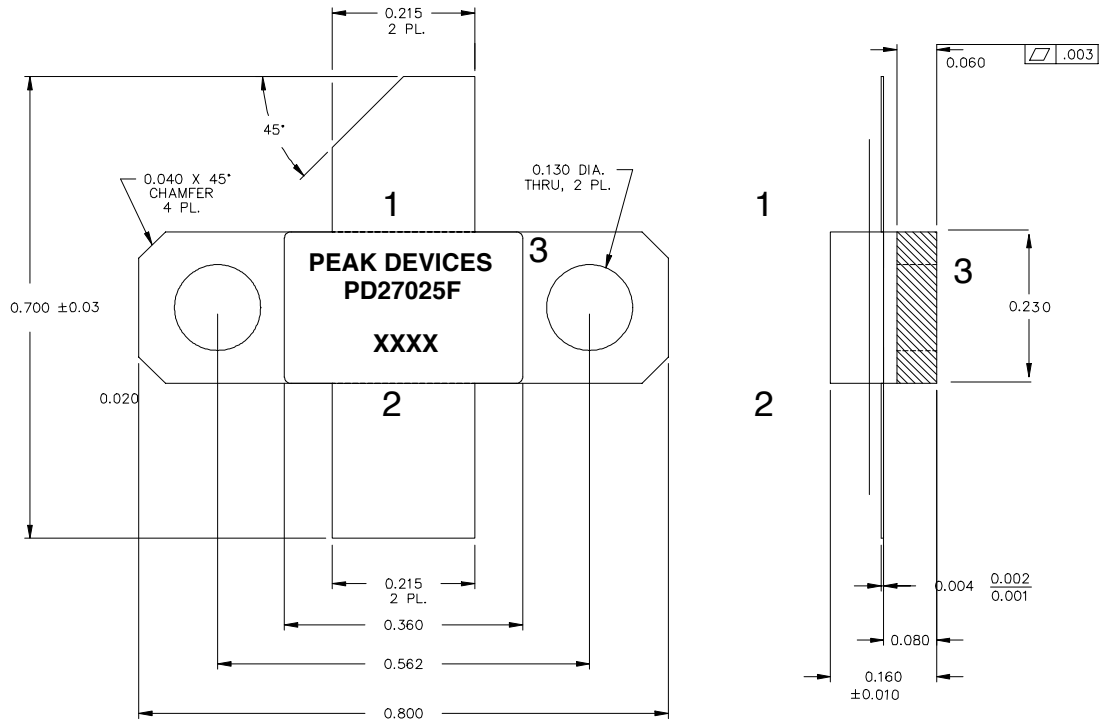
\* Part is internally matched on input and output.

### RF and Functional Tests (In Broadband Fixture, Tc=25° C unless otherwise specified)

Rating	Symbol	Min	Typ	Max	Unit
CW Low Power Gain, P <sub>out</sub> =8W V <sub>DD</sub> =28V, I <sub>DQ</sub> =330mA, f=2700MHz	G <sub>L</sub>	12.5	-	-	dB
CW Power Gain, P <sub>out</sub> = 25 W V <sub>DD</sub> =28V, I <sub>DQ</sub> =330mA, f=2700MHz	G <sub>P</sub>	12	-	-	dB
CW Drain Efficiency, P <sub>out</sub> = 25 W, V <sub>DD</sub> =28V, I <sub>DQ</sub> =330mA, f=2700MHz	$\eta_D$	35	40	-	%
Two-Tone Common-Source Amplifier Power Gain V <sub>DD</sub> =28V, I <sub>DQ</sub> =330mA, P <sub>out</sub> = 25 W PEP f <sub>1</sub> =2700 MHz and f <sub>2</sub> =2700.1 MHz	G <sub>TT</sub>	12.5	-	-	dB
Two-Tone Intermodulation Distortion V <sub>DD</sub> =28V, I <sub>DQ</sub> =330mA, P <sub>out</sub> = 25 W PEP f <sub>1</sub> =2700 MHz and f <sub>2</sub> =2700.1 MHz	I <sub>MD</sub>	-	-30	- 28	dBc
Two-Tone Drain Efficiency V <sub>DD</sub> =28V, I <sub>DQ</sub> =330mA, P <sub>out</sub> = 25 W PEP f <sub>1</sub> =2700 MHz and f <sub>2</sub> =2700.1 MHz	$\eta_{D2T}$	26	30	-	%
Input Return Loss V <sub>DD</sub> =28V, P <sub>out</sub> = 25 W PEP, I <sub>DQ</sub> =330mA f <sub>1</sub> =2500 MHz and 2700 MHz, Tone Spacing = 100kHz	IRL	-	-	-9	dB
Load Mismatch Tolerance V <sub>DS</sub> =28V, I <sub>DQ</sub> = 330 mA, P <sub>out</sub> =25W, f=2500 MHz	VSWR	10:1	-	-	$\Psi$

## Package Dimensions

All dimensions are in inches. Tolerances are  $\pm 0.005$  in. unless specified.



- PINS:  
1. DRAIN  
2. GATE  
3. SOURCE

XXXX - 4 Digit Trace Code

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## **RF Power Product Information**

For product and application information, please visit our website: **[WWW.PEAKDEVICES.COM](http://WWW.PEAKDEVICES.COM)**

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