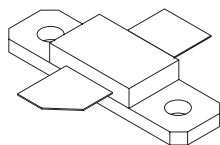


PD25025F 25 W, 2.3GHz - 2.5GHz, N-Channel E-Mode, Lateral MOSFET

Introduction

The PD25025F is a high-voltage, gold-metalized, laterally diffused metal oxide semiconductor (LDMOS) RF power transistor suitable for 2.3GHz - 2.5GHz 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.



PD25025F (flanged)

Figure 1. Available Packages

Features

- Application Specific Performance, 2.5 GHz

- Typical 2-Tone Performance

Average Load Power – 12.5 W

η_D – 30%

Power Gain – 12.5 dB

IMD3: -30dBc @ -100kHz/ +100kHz

- Typical CW Performance

Average Load Power – 25 W

η_D – 40%

Power Gain – 12.0 dB

Table 1. Thermal Characteristics

Parameter	Sym	Value	Unit
Thermal Resistance, Junction to Case:	R _{JC}	2.1	°C/W

Table 2. Absolute Maximum Ratings*

Parameter	Sym	Value	Unit
Drain-source Voltage	V _{DSS}	65	V _{dc}
Gate-source Voltage	V _{GS}	–0.5, +15	V _{dc}
Drain Current—Continuous	I _D	4.25	A _{dc}
Total Dissipation at T _c = 25 °C:	P _D	120.7	W
Derate Above 25 °C:	—	0.69	W/°C
Operating Junction Temperature	T _J	200	°C
Storage Temperature Range	T _{STG}	–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
HBM	500	1B
MM	50	A
CDM	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. PEAK Devices 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.

PD25025F

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Electrical Characteristics

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

Table 4. dc Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Off Characteristics					
Drain-source Breakdown Voltage (V _{GS} = 0, I _D = 150 μ A)	V _(BR) DSS	65	—	—	Vdc
Gate-source Leakage Current (V _{GS} =15V, V _{DS} = 0 V)	I _{GSS}	—	—	1.0	μ Adc
Zero Gate Voltage Drain Leakage Current (V _{DS} = 28 V, V _{GS} = 0 V)	I _{DSS}	—	—	100	mAdc
On Characteristics					
Forward Transconductance (V _{DS} = 10 V, I _D = 2.0 A)	G _m	1	3	—	S
Gate Threshold Voltage (V _{DS} = 10 V, I _D = 1 mA)	V _{GS(TH)}	—	3.5	—	Vdc
Gate Quiescent Voltage (V _{DS} = 28 V, I _{DQ} = 330 mA)	V _{GS(Q)}	2.7	3.7	4.5	Vdc
Drain-source On-voltage (V _{GS} = 10 V, I _D = 1.0 A)	V _{DS(ON)}	—	0.3	—	Vdc

Table 5. RF Characteristics

Rating	Symbol	Min	Typ	Max	Unit
Input capacitance * (including matching capacitor) (V _{DS} =28V, V _{GS} =0V, f = 1MHz)	C _{ISS}	-	74	-	pF
Output capacitance * (including matching capacitor) (V _{DS} = 28V, V _{GS} =0V, f = 1MHz)	C _{OSS}	-	352	-	pF
Feedback capacitance * (V _{DS} =28V, V _{GS} =0V, f = 1MHz)	C _{RSS}	-	1.6	-	pF

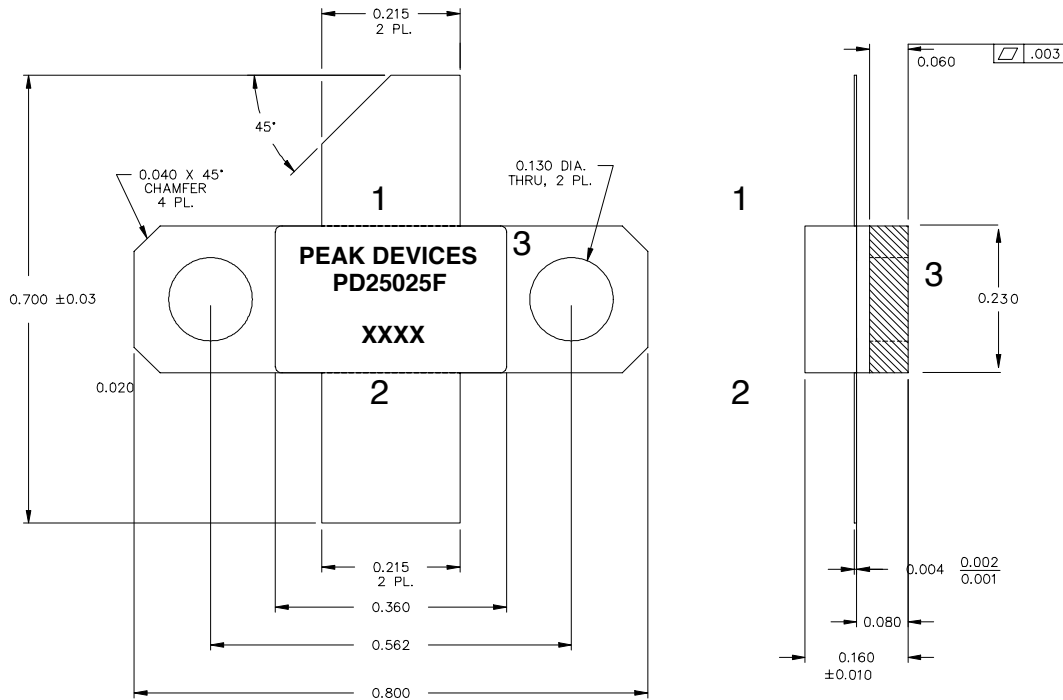
* Part is internally matched on input and output.

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

Rating	Symbol	Min	Typ	Max	Unit
CW Low Power Gain, P _{out} =8W V _{DD} =28V, I _{DQ} =330mA, f=2300MHz and 2500MHz	G _L	12.5	-	-	dB
CW Power Gain, P _{out} = 25 W V _{DD} =28V, I _{DQ} =330mA, f=2300MHz and 2500MHz	G _P	12	-	-	dB
CW Drain Efficiency, P _{out} = 25 W, V _{DD} =28V, I _{DQ} =330mA, f=2300MHz and 2500MHz	η_D	35	40	-	%
Two-Tone Common-Source Amplifier Power Gain V _{DD} =28V, I _{DQ} =330mA, P _{out} = 25 W PEP f ₁ =2500 MHz and f ₂ =2500.1 MHz	G _{TT}	12.5	-	-	dB
Two-Tone Intermodulation Distortion V _{DD} =28V, I _{DQ} =330mA, P _{out} = 25 W PEP f ₁ =2500 MHz and f ₂ =2500.1 MHz	I _{MD}	-	-30	- 28	dBc
Two-Tone Drain Efficiency V _{DD} =28V, I _{DQ} =330mA, P _{out} = 25 W PEP f ₁ =2500 MHz and f ₂ =2500.1 MHz	η_{D2T}	26	30	-	%
Input Return Loss V _{DD} =28V, P _{out} = 25 W PEP, I _{DQ} =330mA f ₁ =2300 MHz and 2500 MHz, Tone Spacing = 100kHz	IRL	-	-	-9	dB
Load Mismatch Tolerance V _{DS} =28V, I _{DQ} = 330 mA, P _{out} =25W, f=2500 MHz	VSWR	10:1	-	-	Ψ

Package Dimensions

All dimensions are in inches. Tolerances are ± 0.005 in. unless specified.



PINS:
1. DRAIN
2. GATE
3. SOURCE

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