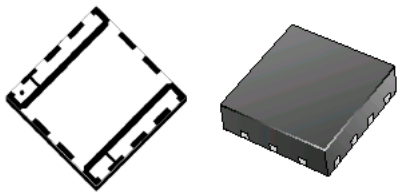
PD54003L-E

RF Power Transistors
The LdmoST Plastic FAMILY

Features

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- P_{OUT} = 3W WITH 20 dB GAIN @ 500MHz
- NEW RF PLASTIC PACKAGE
- EDS PROTECTION
- SUPPLIED IN TAPE & REEL OF 3K UNITS
- IN COMPLIANCE WITH THE 2002/93/EC EUROPEAN DIRECTIVE



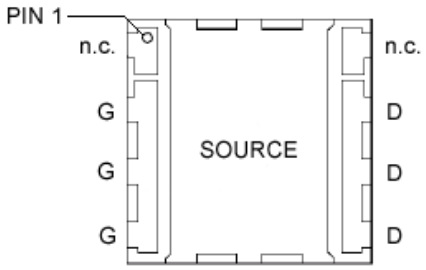
PowerFLAT™ (5x5)

Description

The PD54003L-E is a common source N-Channel, enhancement-mode lateral Field-Effect RF power transistor. It is designed for high gain, broad band commercial and industrial applications. It operates at 7 V in common source mode at frequencies of up to 1 GHz. PD54003L-E boasts the excellent gain, linearity and reliability of STH1LV latest LDMOS technology mounted in the innovative leadless SMD plastic package, PowerFLAT™.

PD54003L-E's superior linearity performance makes it an ideal solution for portable radio.

Pin Connection



TOP VIEW

Order Codes

Part Number	Marking	Package	Packaging
PD54003L-E	54003	PowerFLAT (5x5)	Tape & Reel

Contents

1 Electrical Data

1.1 Maximum Ratings

Table 1. Absolute Maximum Ratings

(T_{CASE} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain Source Voltage	25	V
V_{GS}	Gate-Source Voltage	-0.5 to +15	V
I_D	Drain Current	4	A
P_{DISS}	Power Dissipation (t_{case}=70°C)	19.5	W
T_J	Max. Operating Junction Temperature	150	°C
T_{STG}	Storage Temperature	-65 to +150	°C

1.2 Thermal Data

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Junction to Case thermal resistance	4.1	°C/W

1.3 Electrical Characteristics

(T_{CASE} = 25°C)

Table 3. Static

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
I_{DSS}	V_{GS} = 0 V	V_{DS} = 25 V				1	µA
I_{GSS}	V_{GS} = 20 V	V_{DS} = 0 V				1	µA
$V_{GS(Q)}$	V_{DS} = 10 V	I_D = 50 mA		2.0		3.3	V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 0.5 A			0.13	0.16	V
g_{FS}	V_{DS} = 10 V	I_D = 3.2 A			TBD		mho
C_{ISS}	V_{GS} = 0 V	V_{DS} = 7.5 V	f = 1 MHz		54		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 7.5 V	f = 1 MHz		43		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 7.5 V	f = 1 MHz		4.0		pF

Table 4. Dynamic

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
P_{OUT}	V_{DD} = 7.5 V I_{DQ} = 50 mA f = 500MHz	3			W
G_{PS}	V_{DD} = 7.5 V I_{DQ} = 50 mA P_{OUT} = 3 W f = 500MHz	16	20		dB
η_D	V_{DD} = 7.5 V I_{DQ} = 50 mA P_{OUT} = 3 W f = 500MHz	50	55		%
Load Mismatch	V_{DD} = 9.5 V I_{DQ} = 50 mA P_{OUT} = 3W f = 500MHz All Phase Angles	20:1			VSWR

Table 5. ESD Protection Characteristics

Test Conditions	Class
Human Body Model	2
Machine Model	M3

Table 6. Moisture Sensitivy Level

Test Methodology	Rating
J-STD-020B	MSL 3

2 Typical Performance

Figure 1. Capacitance vs. Supply Voltage

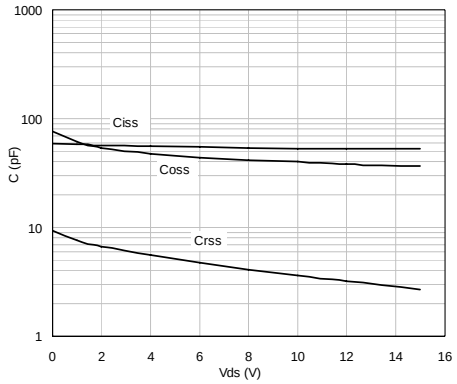


Figure 2. Output Power vs. Input Power

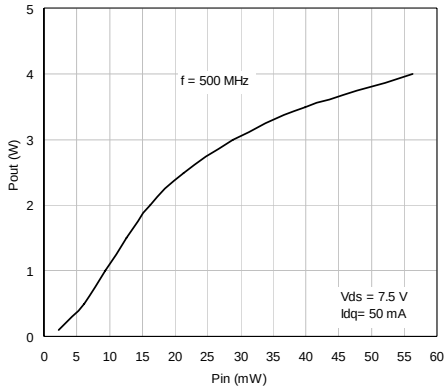


Figure 3. Power Gain vs. Output Power

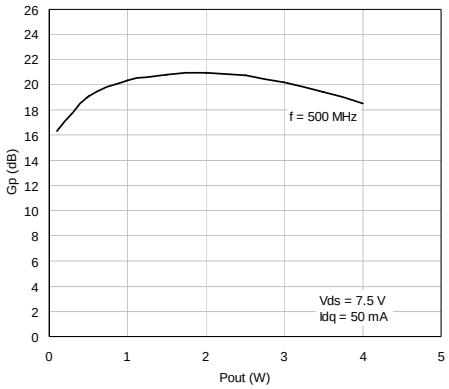


Figure 4. Efficiency vs Output Power

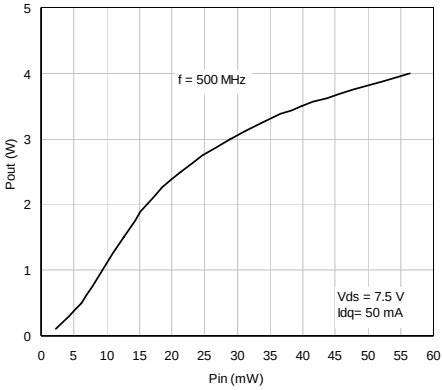


Figure 5. Output Power vs Bias Current

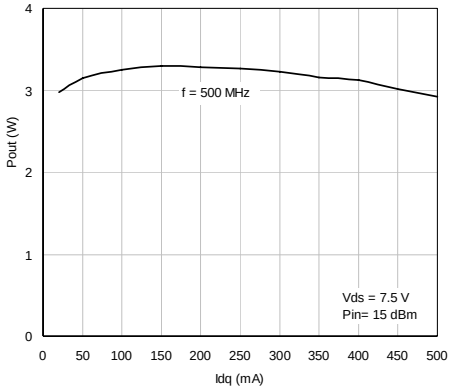


Figure 6. Efficiency vs Bias Current

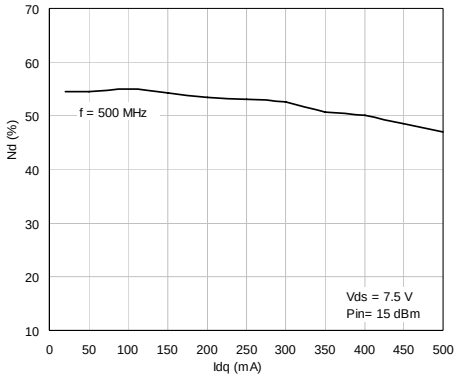


Figure 7. Output Power vs Supply Voltage

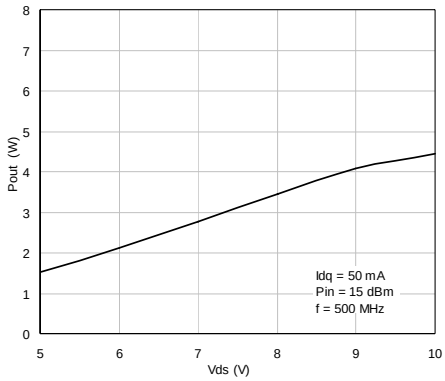
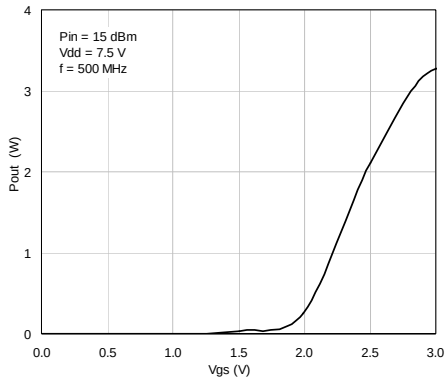


Figure 8. Output Power vs Gate-Source Volt



2.1 Typical Performance (Broadband)

Figure 9. Power Gain vs Frequency

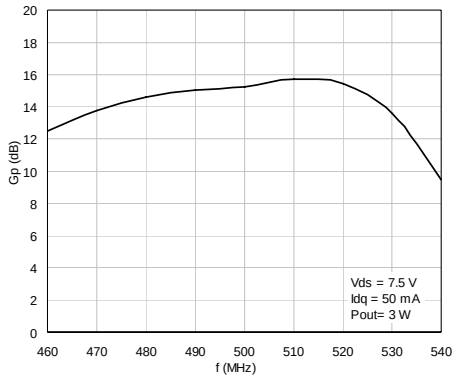


Figure 10. Efficiency vs Frequency

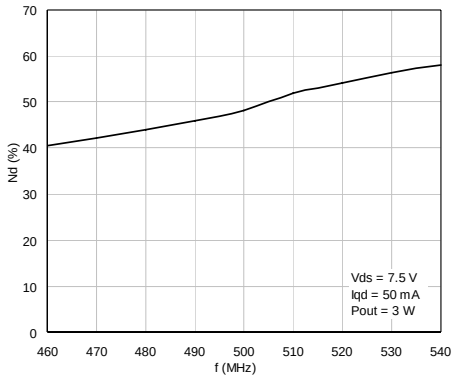
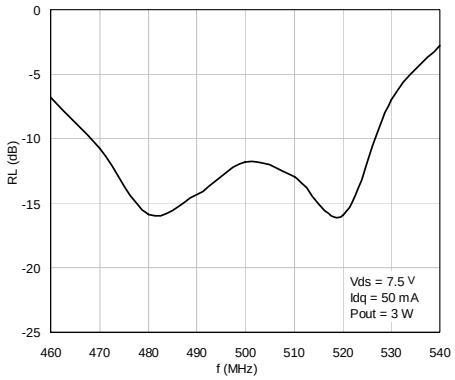


Figure 11. Return Loss vs Frequency



3 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

Table 7. PowerFLAT™ Mechanical Data

Dim.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		0.90	1.00		0.035	0.039
A1		0.02	0.05		0.001	0.002
A3		0.24			0.009	
AA	0.15	0.25	0.35	0.006	0.01	0.014
b	0.43	0.51	0.58	0.017	0.020	0.023
c	0.64	0.71	0.79	0.025	0.028	0.031
D		5.00			0.197	
d		0.30			0.011	
E		5.00			0.197	
E2	2.49	2.57	2.64	0.098	0.101	0.104
e		1.27			0.050	
f		3.37			0.132	
g		0.74			0.03	
h		0.21			0.008	

Figure 12. PowerFLAT™ Package Dimensions

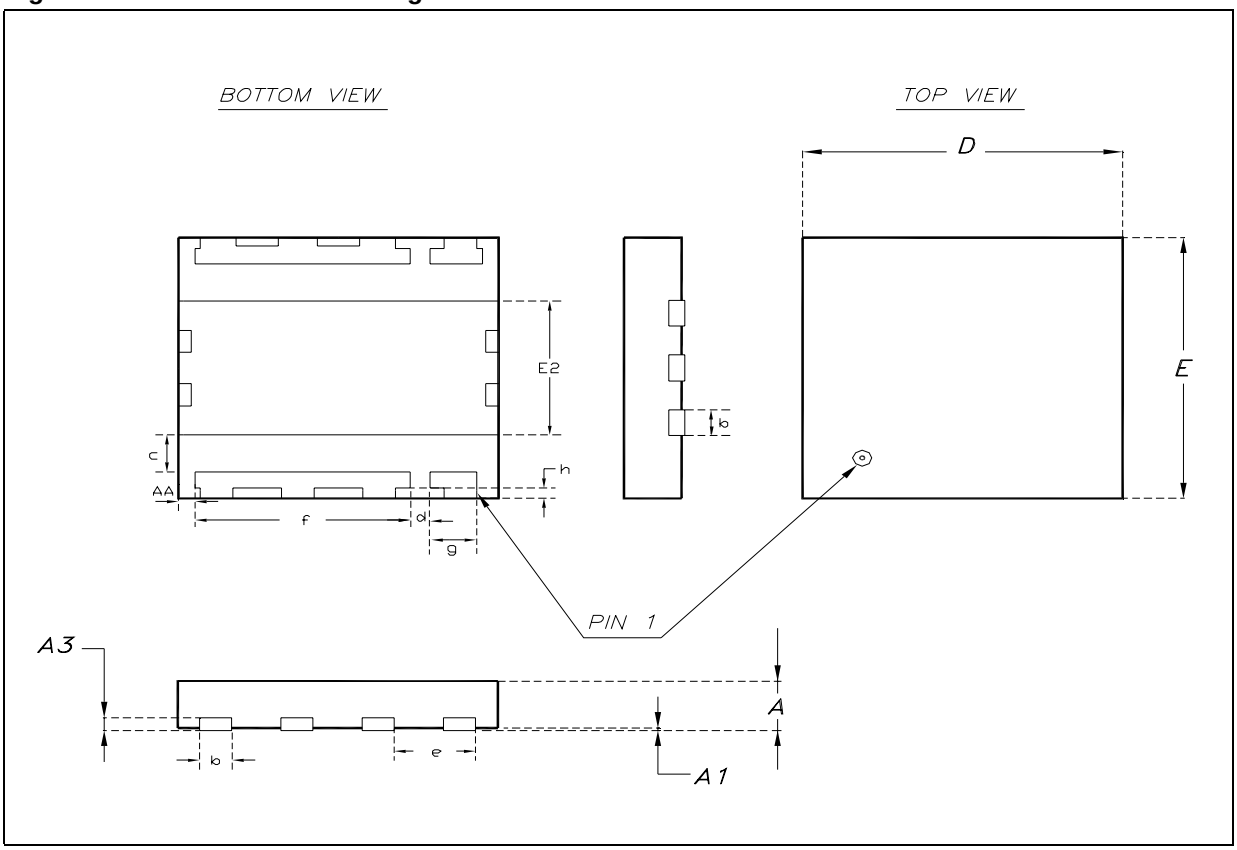


Table 8. PowerFLAT™ Tape & Reel Dimensions

DIM.	mm.		
	MIN.	TYP	MAX.
Ao	5.15	5.25	5.35
Bo	5.15	5.25	5.35
Ko	1.0	1.1	1.2

Figure 13. PowerFLAT™ Tape & Reel

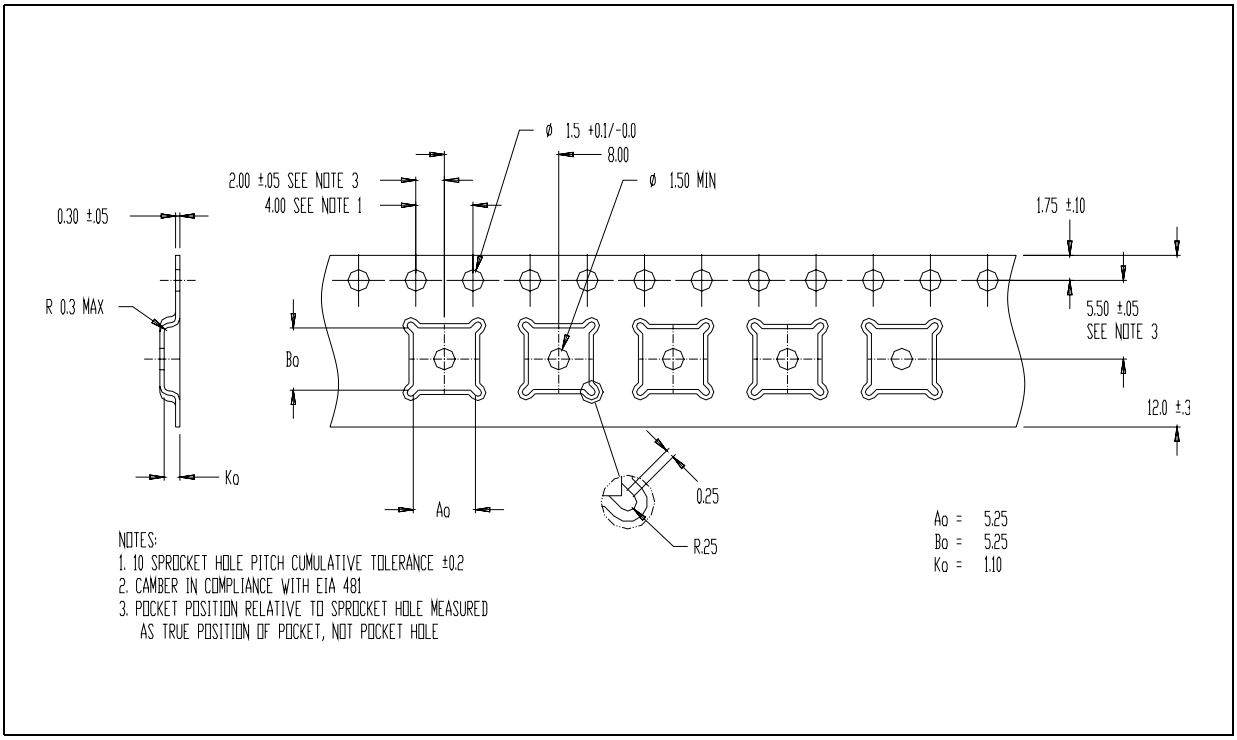
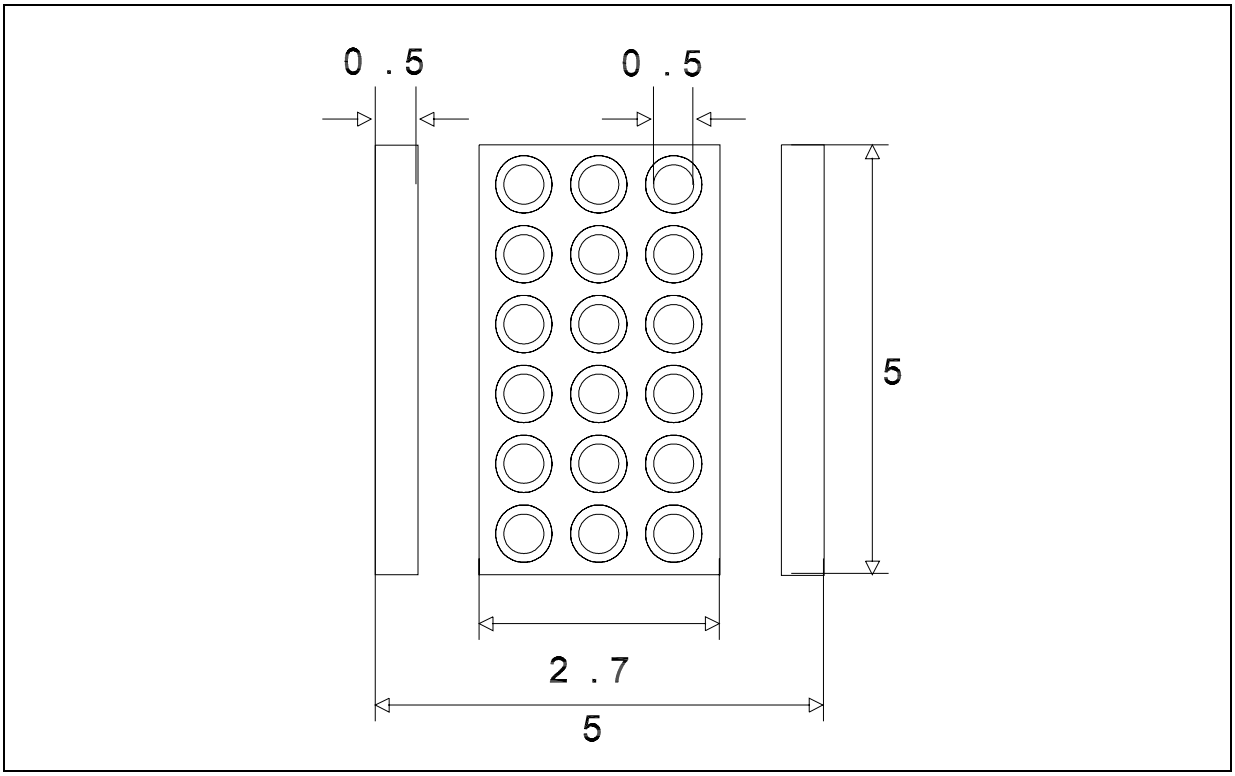


Table 9. Recommended FOOTPRINT



4 Revision History

Date	Revision	Description of Changes
04-Jan-2006	1	First Issue.