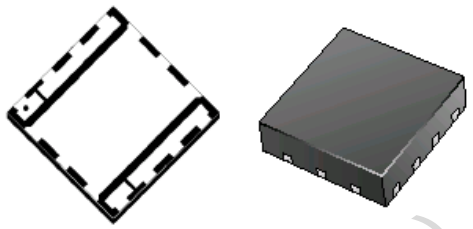
# PD54003L

## RF POWER TRANSISTORS
## The *LdmoST* PLASTIC FAMILY

**ADVANCED DATA**

N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

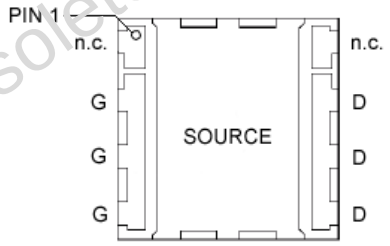
- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- $P_{OUT}$ = 3 W WITH 20 dB gain @ 500 MHz
- NEW LEADLESS PLASTIC PACKAGE
- ESD PROTECTION
- SUPPLIED IN TAPE & REEL OF 3K UNITS



**PowerFLAT™(5x5)**

| ORDER CODE | BRANDING |
|---|---|
| PD54003L | 54003 |

PIN CONNECTION




TOP VIEW

### DESCRIPTION

The PD54003L 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 boasts the excellent gain, linearity and reliability of STH1LV latest LDMOS technology mounted in the innovative leadless SMD plastic package, PowerFLAT™.

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



### 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 (@ Tc = 70°C) | 19.5 | W |
| Tj | Max. Operating Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | -65 to +150 | °C |

### THERMAL DATA

| | | | |
|---|---|---|---|
| $R_{th(j-c)}$ | Junction -Case Thermal Resistance | 4.1 | °C/W |

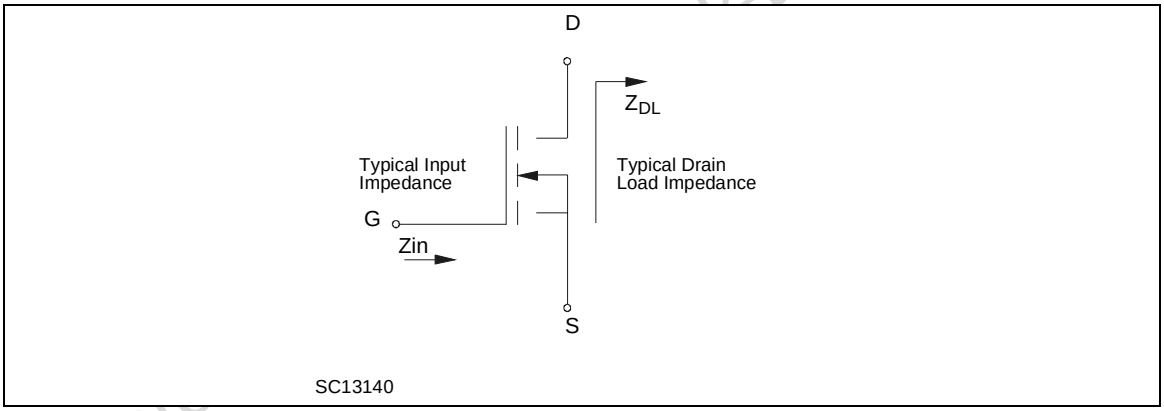
## ELECTRICAL SPECIFICATION ($T_{CASE}$ = 25 °C)

### STATIC (Per Section)

| 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 | | 5.0 | 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 |

### DYNAMIC

| Symbol | Test Conditions | | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|
| $P_{OUT}$ | $V_{DD}$ = 7.5 V | $I_{DQ}$ = 50 mA | | f = 500 MHz | 3 | | | W |
| $G_{PS}$ | $V_{DD}$ = 7.5 V | $I_{DQ}$ = 50 mA | $P_{OUT}$ = 3 W | f = 500 MHz | 16 | 20 | | dB |
| $\eta_D$ | $V_{DD}$ = 7.5 V | $I_{DQ}$ = 50 mA | $P_{OUT}$ = 3 W | f = 500 MHz | 50 | 55 | | % |
| Load mismatch | $V_{DD}$ = 9.5 V<br>ALL PHASE ANGLES | $I_{DQ}$ = 50 mA | $P_{OUT}$ = 3 W | f = 500 MHz | 20:1 | | | VSWR |




### ESD PROTECTION CHARACTERISTICS

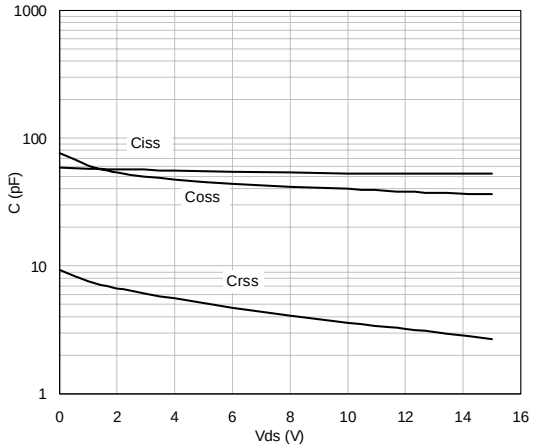
| Test Conditions | Class |
|---|---|
| Human Body Model | 2 |
| Machine Model | M3 |

### MOISTURE SENSITIVITY LEVEL

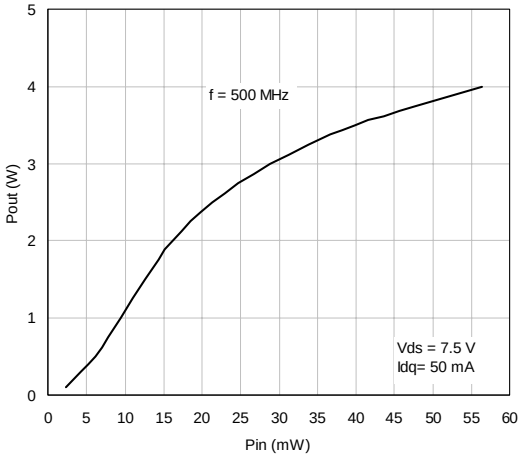
| Test Methodology | Rating |
|---|---|
| J-STD-020B | MSL 3 |

## TYPICAL PERFORMANCE

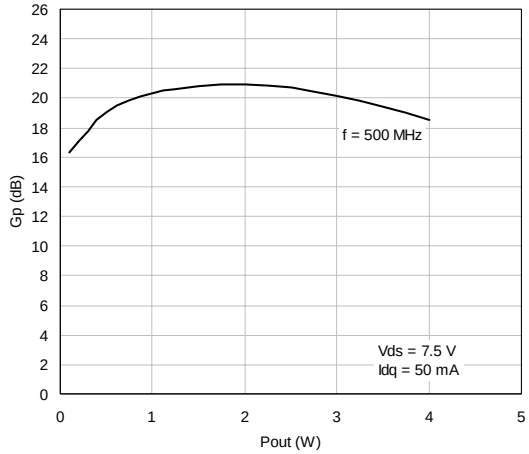
### Capacitance Vs Supply Voltage



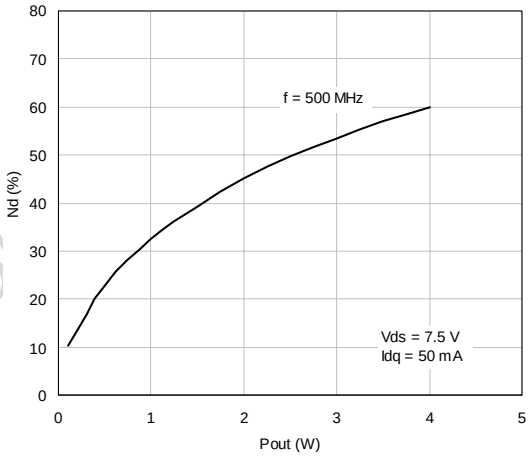

### Output Power Vs Input Power



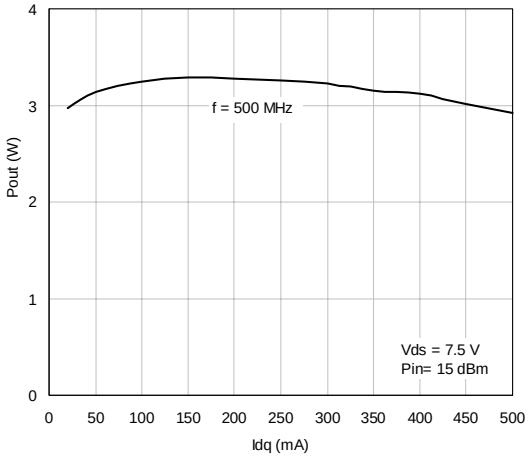

### Power Gain Vs Output Power




### Efficiency Vs Output Power

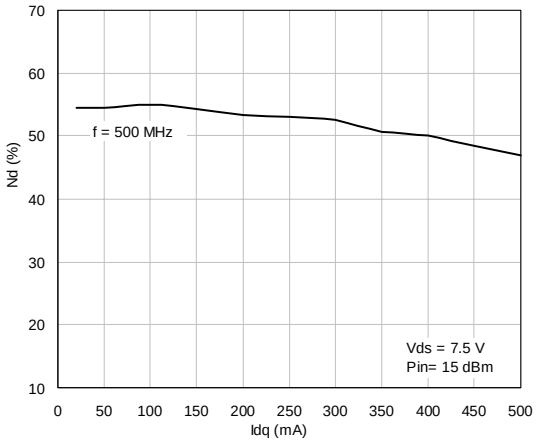



### Output Power Vs Bias Current

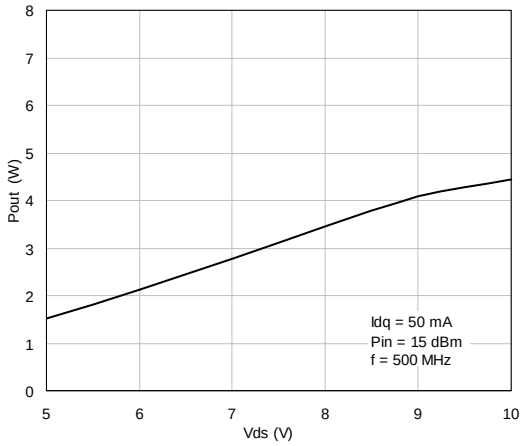


## TYPICAL PERFORMANCE

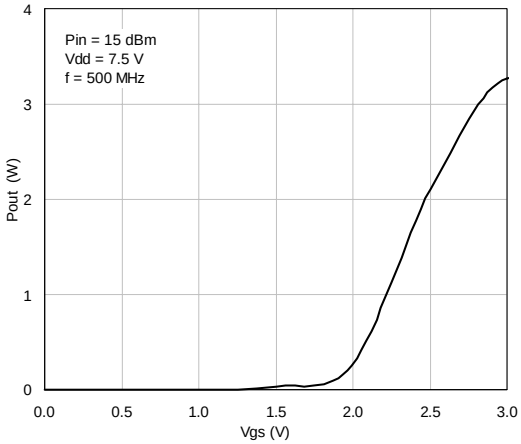
### Efficiency Vs Bias Current




### Output Power Vs Supply Voltage

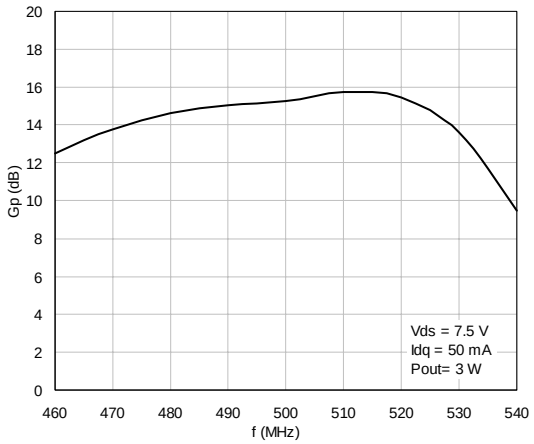



### Output Power Vs Gate-Source Voltage

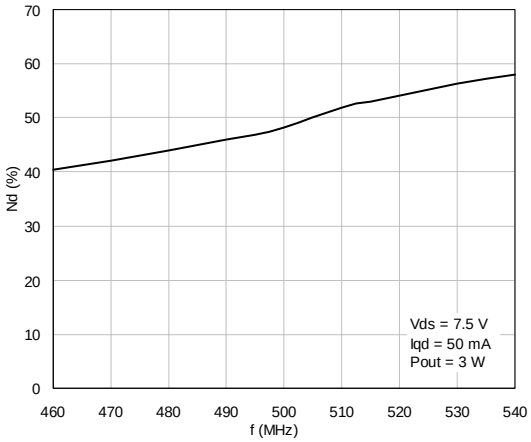


## TYPICAL PERFORMANCE *(BROADBAND)*

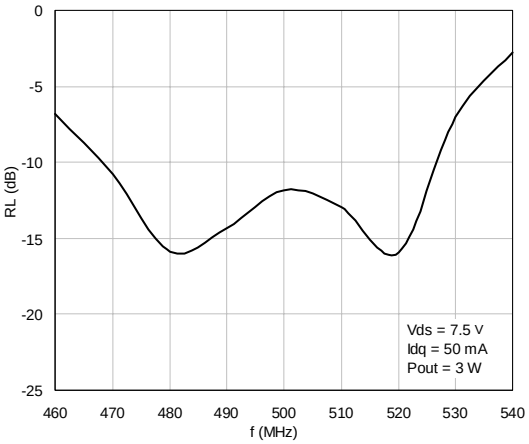
Power Gain Vs Frequency




Efficiency Vs Frequency

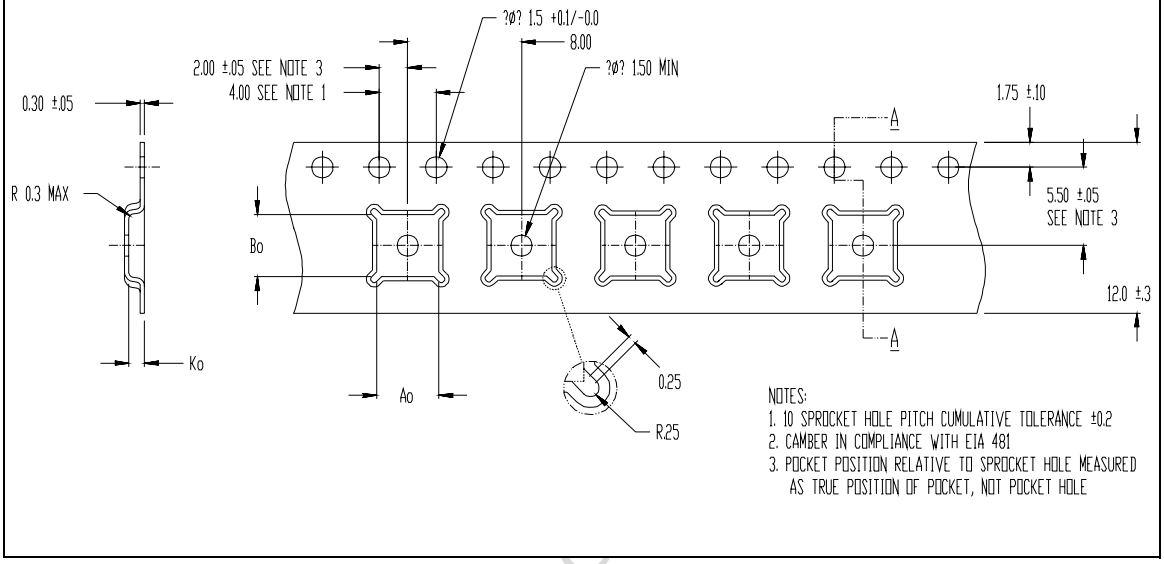



Return Loss Vs Frequency



## TAPE & REEL DIMENSIONS

| | 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 |



## 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 | |