



PD54008L

RF POWER TRANSISTORS The *LdmoST* PLASTIC FAMILY

ADVANCED DATA

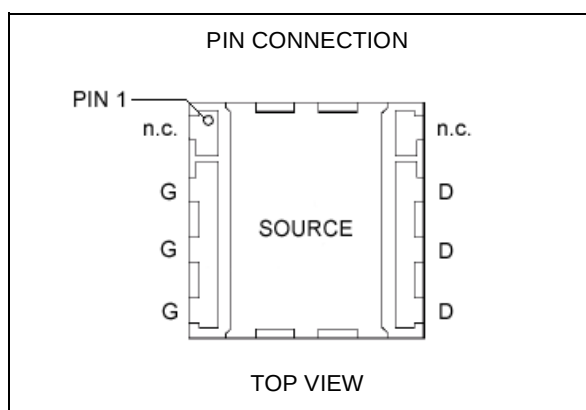
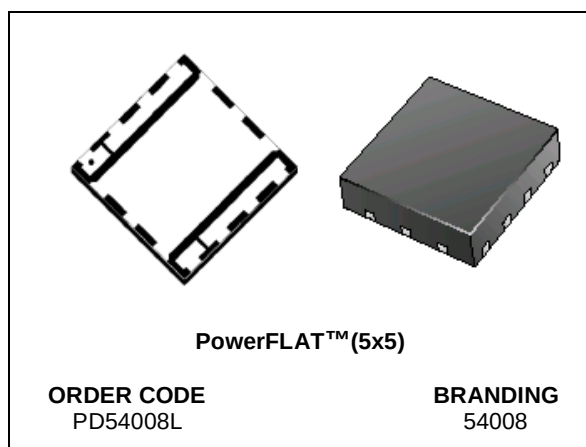
N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- BROADBAND PERFORMANCES
 $P_{OUT} = 8\text{ W}$ WITH 15 dB GAIN @ 500 MHz
- NEW LEADLESS PLASTIC PACKAGE
- ESD PROTECTION
- SUPPLIED IN TAPE & REEL OF 3K UNITS

DESCRIPTION

The PD54008L 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. PD54008L boasts the excellent gain, linearity and reliability of STH1LV latest LDMOS technology mounted in the innovative leadless SMD plastic package, PowerFLAT™.

PD54008L's superior linearity performance makes it an ideal solution for portable radio.



ABSOLUTE MAXIMUM RATINGS ($T_{CASE} = 25\text{ }^{\circ}\text{C}$)

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	5	A
P_{DISS}	Power Dissipation (@ $T_c = 70^{\circ}\text{C}$)	26.7	W
T_j	Max. Operating Junction Temperature	150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	-65 to +150	$^{\circ}\text{C}$

THERMAL DATA

$R_{th(j-c)}$	Junction -Case Thermal Resistance	3	$^{\circ}\text{C/W}$
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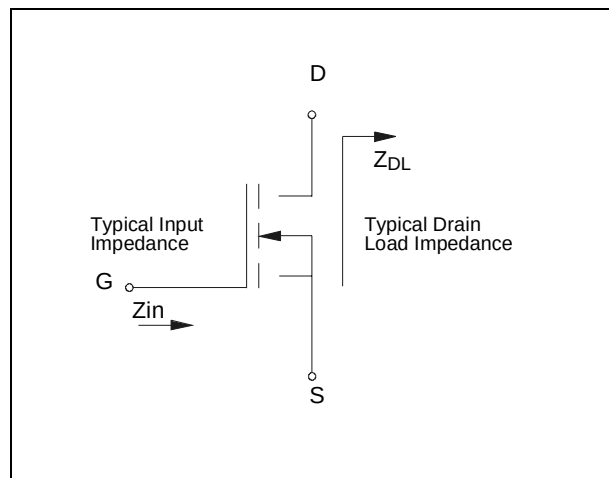
ELECTRICAL SPECIFICATION ($T_{CASE} = 25^{\circ}C$)

STATIC (Per Section)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_{DSS}	$V_{GS} = 0\text{ V}$	$V_{DS} = 25\text{ V}$			1	μA
I_{GSS}	$V_{GS} = 5\text{ V}$	$V_{DS} = 0\text{ V}$			1	μA
$V_{GS(Q)}$	$V_{DS} = 10\text{ V}$	$I_D = 50\text{ mA}$	2.0		5.0	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}$	$I_D = 0.5\text{ A}$		0.09		V
C_{ISS}	$V_{GS} = 0\text{ V}$	$V_{DS} = 7.5\text{ V}$		80		pF
C_{OSS}	$V_{GS} = 0\text{ V}$	$V_{DS} = 7.5\text{ V}$		60		pF
C_{RSS}	$V_{GS} = 0\text{ V}$	$V_{DS} = 7.5\text{ V}$		6.6		pF

DYNAMIC

Symbol	Test Conditions				Min.	Typ.	Max.	Unit
P_{1dB}	$V_{DD} = 7.5\text{ V}$	$I_{DQ} = 200\text{ mA}$		$f = 500\text{ MHz}$	8			W
G _{PS}	$V_{DD} = 7.5\text{ V}$	$I_{DQ} = 200\text{ mA}$	$P_{OUT} = 8\text{ W}$	$f = 500\text{ MHz}$	15			dB
η_D	$V_{DD} = 7.5\text{ V}$	$I_{DQ} = 200\text{ mA}$	$P_{OUT} = 8\text{ W}$	$f = 500\text{ MHz}$	50			%
Load mismatch	$V_{DD} = 9.5\text{ V}$	$I_{DQ} = 200\text{ mA}$	$P_{OUT} = 8\text{ W}$	$f = 500\text{ MHz}$ ALL PHASE ANGLES	20:1			VSWR

IMPEDANCE DATA ⁽¹⁾

FREQ. (MHz)	$Z_{IN} (\Omega)$	$Z_{DL} (\Omega)$
480	$1.12 - j\ 2.02$	$2.01 + j\ 0.13$
500	$1.3 - j\ 2.01$	$1.84 + j\ 0.7$
520	$1.66 - j\ 2.55$	$1.66 + j\ 1.51$

(1) In Broadband amplifier

ESD PROTECTION CHARACTERISTICS

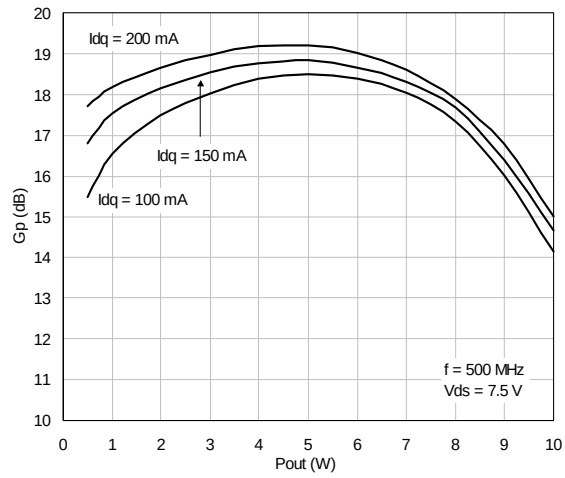
Test Conditions	Class
Human Body Model	2
Machine Model	M3

MOISTURE SENSITIVITY LEVEL

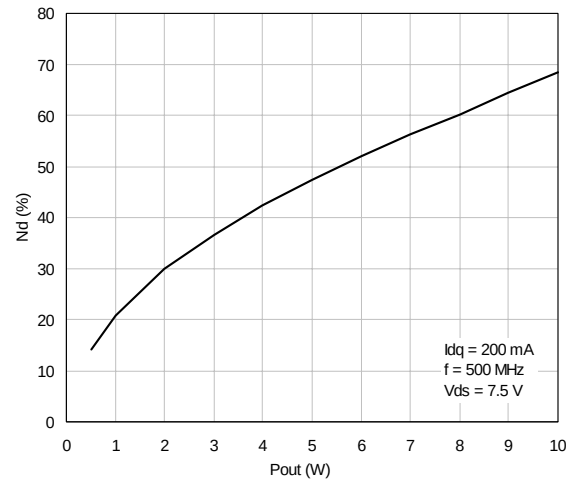
Test Methodology	Rating
J-STD-020B	MSL 3

TYPICAL PERFORMANCE

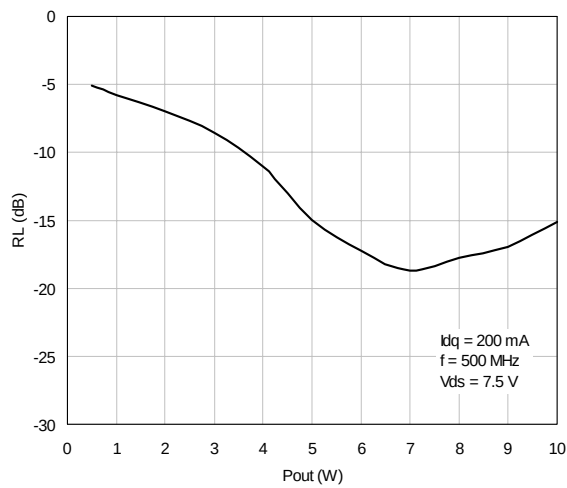
Power Gain Vs Output Power



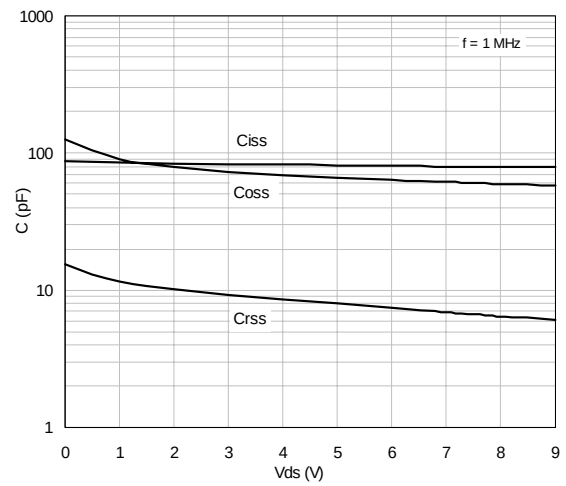
Efficiency Vs Output Power



Return Loss Vs Output Power

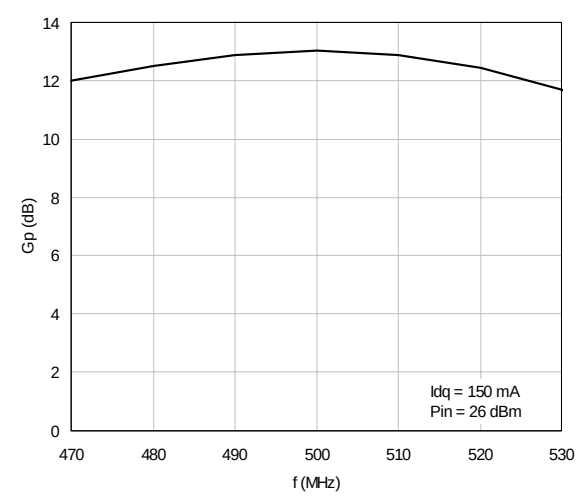


Capacitance Vs Supply Voltage

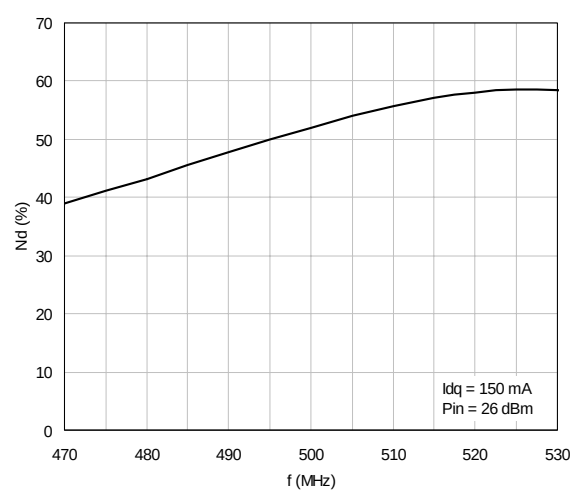


TYPICAL PERFORMANCE

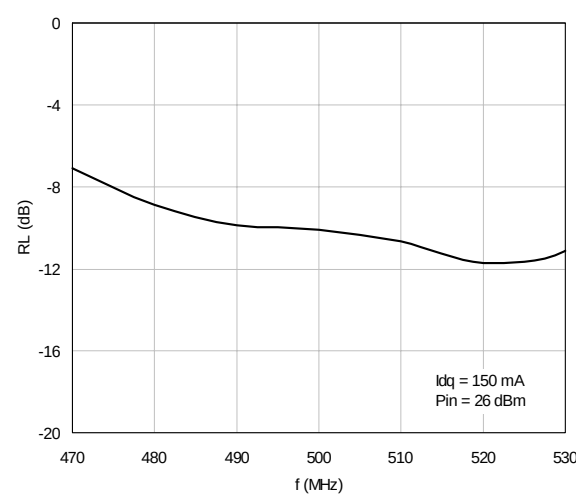
Power Gain Vs Frequency (*BROADBAND*)



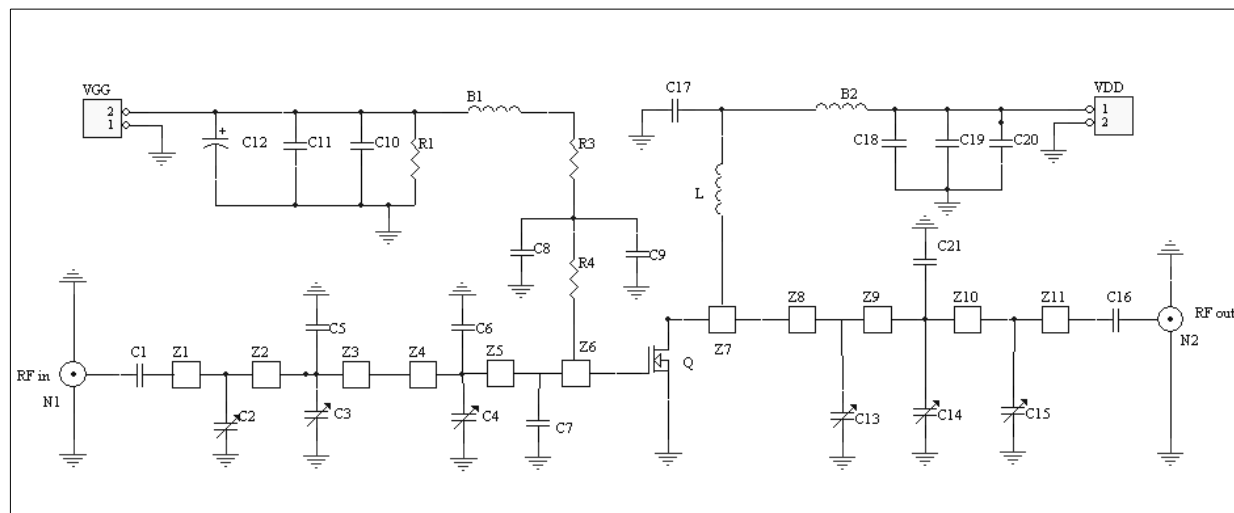
Efficiency Vs Frequency (*BROADBAND*)



Return Loss Vs Frequency (*BROADBAND*)



TEST CIRCUIT SCHEMATIC

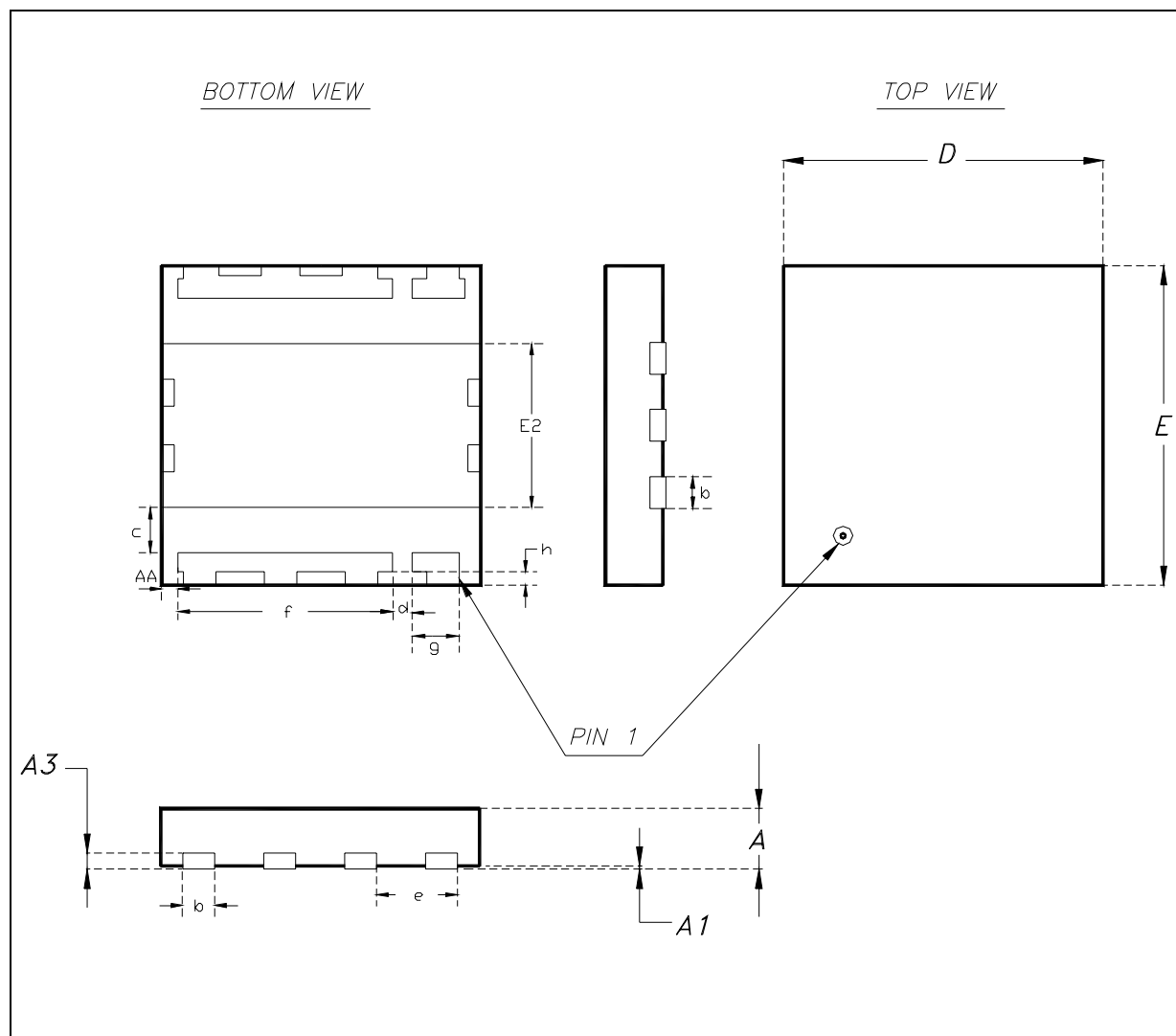


TEST CIRCUIT COMPONENT PART LIST

COMPONENT	DESCRIPTION
B1, B2	Ferrite bead
C1, C16	300 pF, 100 mil ATC
C2, C3, C4, C13, C14	1 -:- 20 pF Trimmer cap - JOHANSON
C15	0.8 -:- 10 pF Trimmer cap - JOHANSON
C5	36 pF, 100 mil ATC
C6	51 pF, 100 mil ATC
C7	62 pF, 100 mil ATC
C8, C17	150 pF, 100 mil CHIP CAP
C9	1 nF, 100 mil CHIP CAP
C10, C18	1000 pF, 100 mil CHIP CAP
C11, C19	0.1 nF, 100 mil CHIP CAP
C12, C20	10 μ F 50 V Electrolytic Capacitor
C21	15 pF, 100 mil ATC
L	43nH, Coilcraft
R1	33 K Ω , 1W CHIP Resistor
R3	1 K Ω , 1W CHIP Resistor
R4	15 Ω , 1W CHIP Resistor
Z1	0.49" X 0.080" MICROSTRIP
Z2	1.024" X 0.080" MICROSTRIP
Z3	0.079" X 0.080" MICROSTRIP
Z4	0.24" X 0.223" MICROSTRIP
Z5	0.079" X 0.223" MICROSTRIP
Z6	0.138" X 0.223" MICROSTRIP
Z7	0.259" X 0.223" MICROSTRIP
Z8	0.079" X 0.080" MICROSTRIP
Z9	0.413" X 0.080" MICROSTRIP
Z10	0.756" X 0.080" MICROSTRIP
Z11	0.61" X 0.080" MICROSTRIP
N1, N2	Type N Flange Mount
Board	ROGER, ULTRA LAM 2000 THK 0.030", $\epsilon_r = 2.55$ 2oz. ED cu SIDES

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	



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