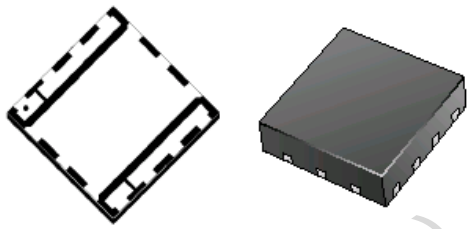
PD54008L

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 W WITH 15 dB GAIN @ 500 MHz
- NEW LEADLESS PLASTIC PACKAGE
- ESD PROTECTION
- SUPPLIED IN TAPE & REEL OF 3K UNITS



PowerFLAT™(5x5)

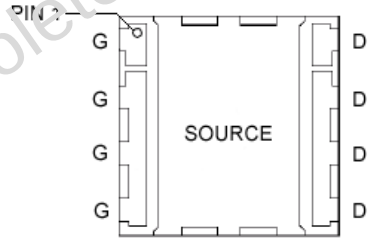
ORDER CODE	BRANDING
PD54008L	54008

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.

PIN CONNECTION



TOP VIEW

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	5	A
P_{DISS}	Power Dissipation (@ Tc = 70°C)	26.7	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	3	°C/W

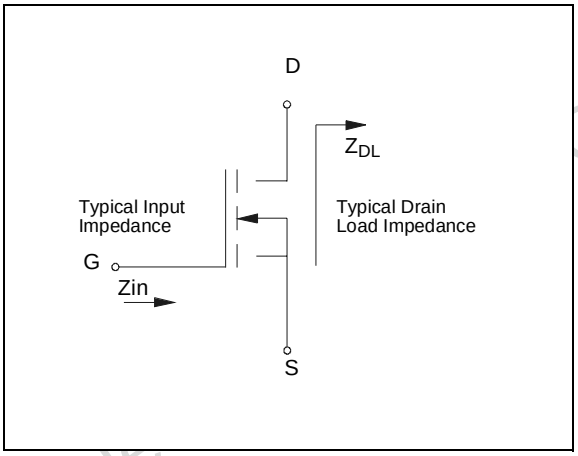
ELECTRICAL SPECIFICATION (T_{CASE} = 25 °C)

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} = 5 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			0.09		V
C_{ISS}	V_{GS} = 0 V	V_{DS} = 7.5 V	f = 1 MHz		80		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 7.5 V	f = 1 MHz		60		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 7.5 V	f = 1 MHz		6.6		pF

DYNAMIC

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



IMPEDANCE DATA (1)

FREQ. (MHz)	Z_{IN} (Ω)	Z_{DL} (Ω)
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

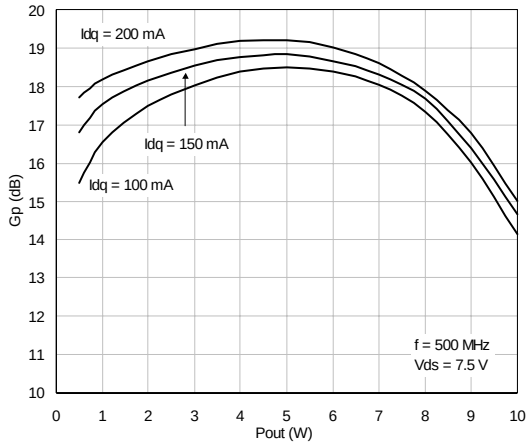
Test Conditions	Class
Human Body Model	2
Machine Model	M3

MOISTURE SENSITIVITY LEVEL

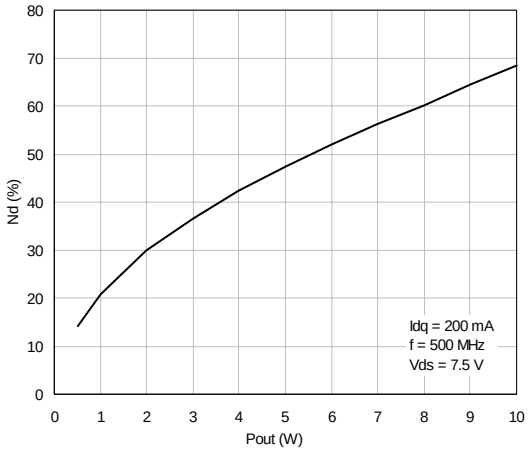
Test Methodology	Rating
J-STD-020B	MSL 3

TYPICAL PERFORMANCE

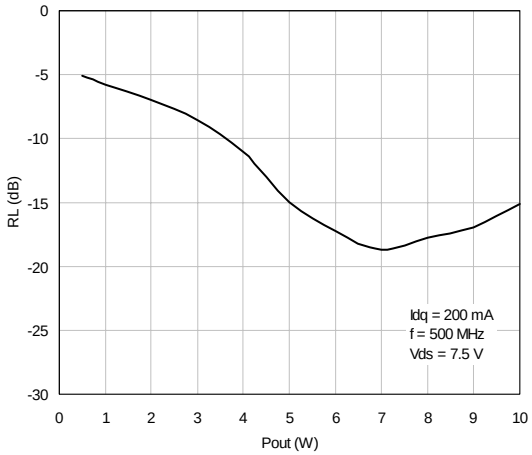
Power Gain Vs Output Power



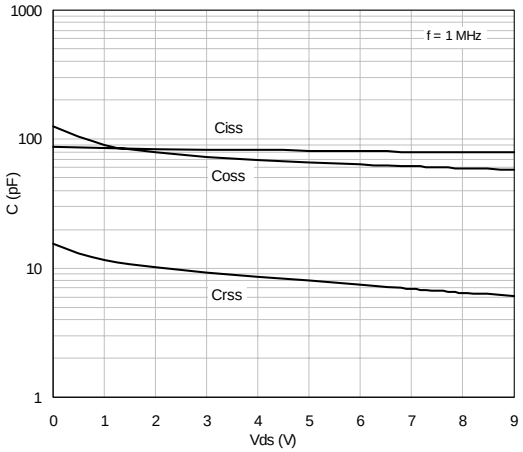
Efficiency Vs Output Power



Return Loss Vs Output Power

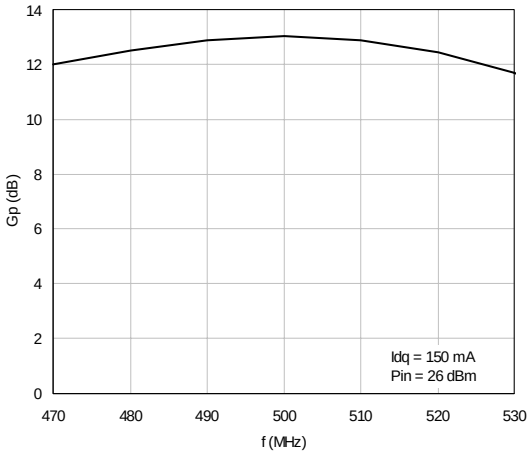


Capacitance Vs Supply Voltage

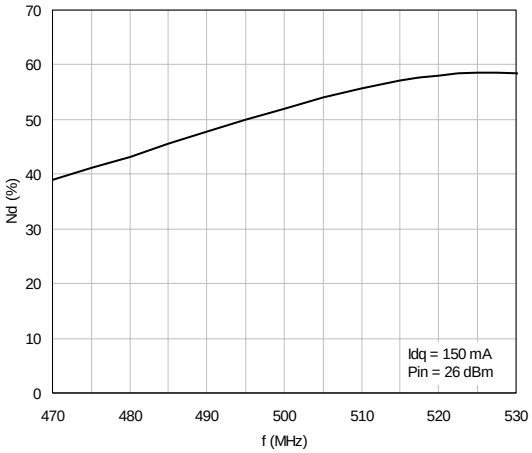


TYPICAL PERFORMANCE

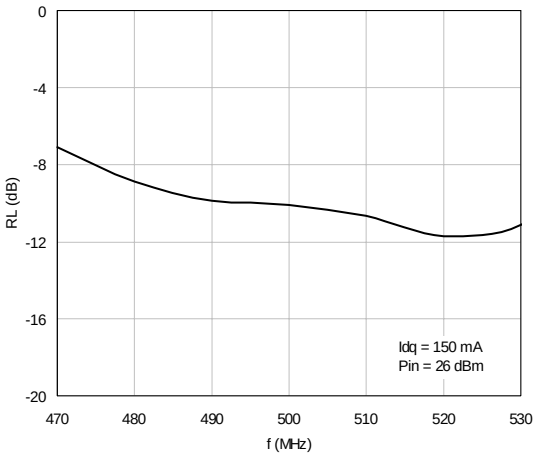
Power Gain Vs Frequency (*BROADBAND*)



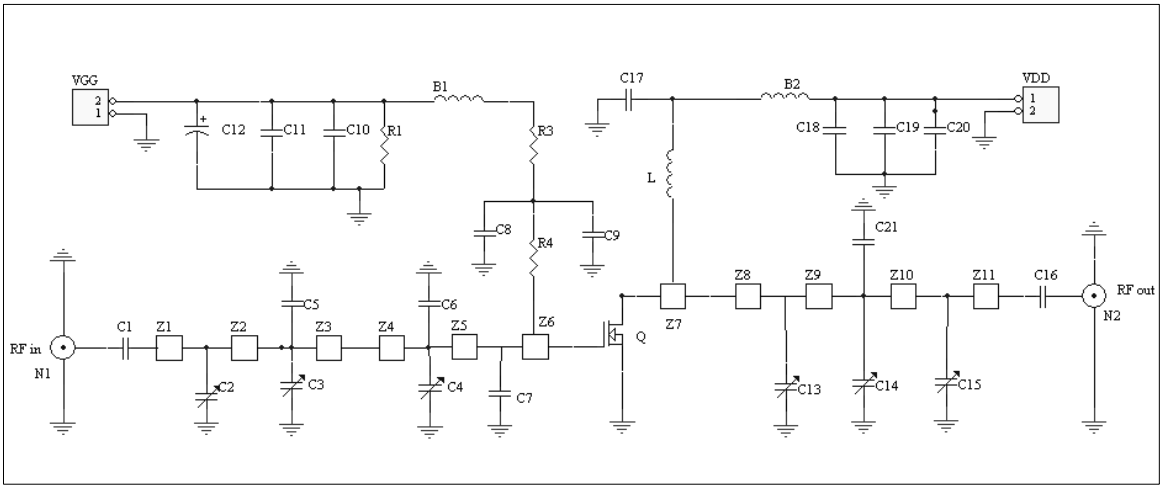
Efficiency Vs Frequency (*BROADBAND*)



Return Loss Vs Frequency (*BROADBAND*)



TEST CIRCUIT SCHEMATIC

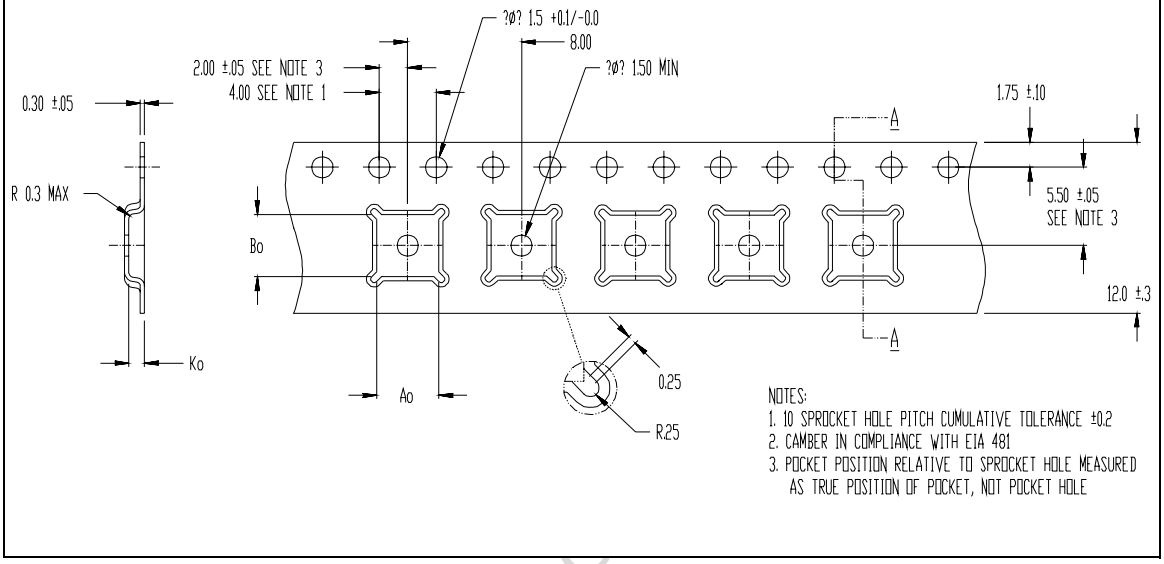


TEST CIRCUIT COMPONENT PART LIST

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 µF 50 V Electrolytic Capacitor
C21	15 pF, 100 mil ATC
L	43nH, Coilcraft
R1	33 KΩ, 1W CHIP Resistor
R3	1 KΩ, 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", εr = 2.55 2oz. ED cu SIDES

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