



PD54008L

RF POWER TRANSISTORS The *LdmoST* PLASTIC FAMILY

ADVANCED DATA

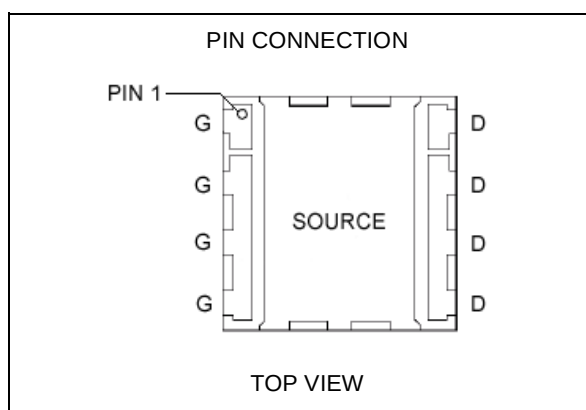
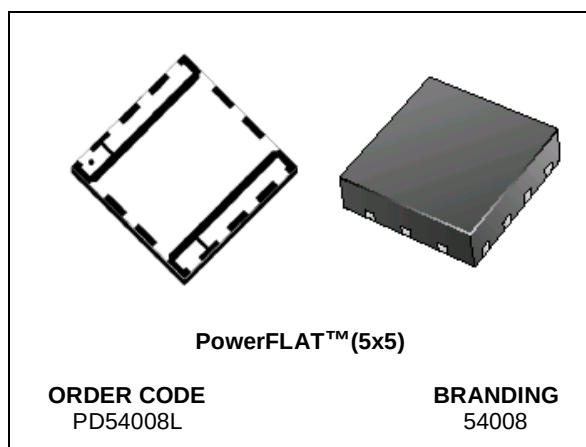
N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

- 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	$^{\circ}\text{C/W}$
---------------	-----------------------------------	---	----------------------

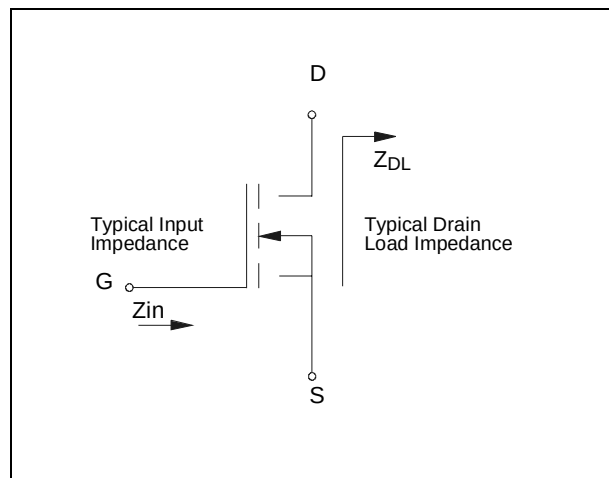
ELECTRICAL SPECIFICATION ($T_{CASE} = 25^{\circ}C$)

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
GPS	$V_{DD} = 7.5\text{ V}$	$I_{DQ} = 200\text{ mA}$	$P_{OUT} = 8\text{ W}$	$f = 500\text{ MHz}$	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

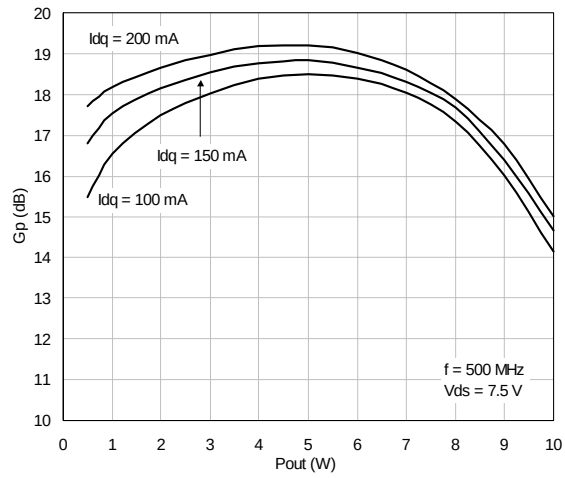
Test Conditions	Class
Human Body Model	2
Machine Model	M3

MOISTURE SENSITIVITY LEVEL

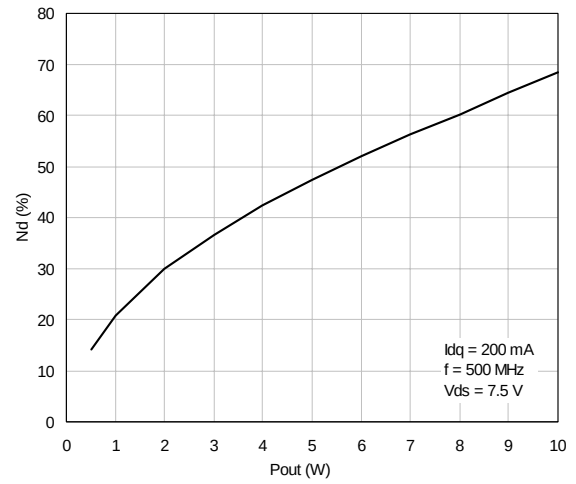
Test Methodology	Rating
J-STD-020B	MSL 3

TYPICAL PERFORMANCE

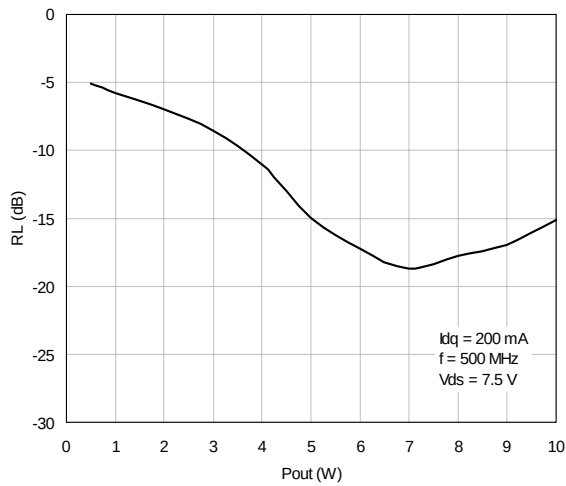
Power Gain Vs Output Power



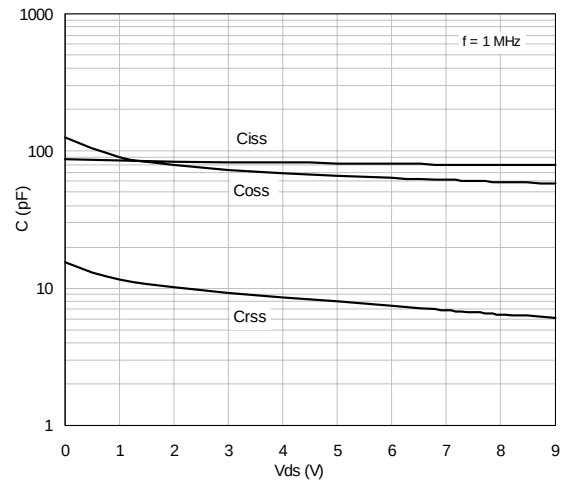
Efficiency Vs Output Power



Return Loss Vs Output Power

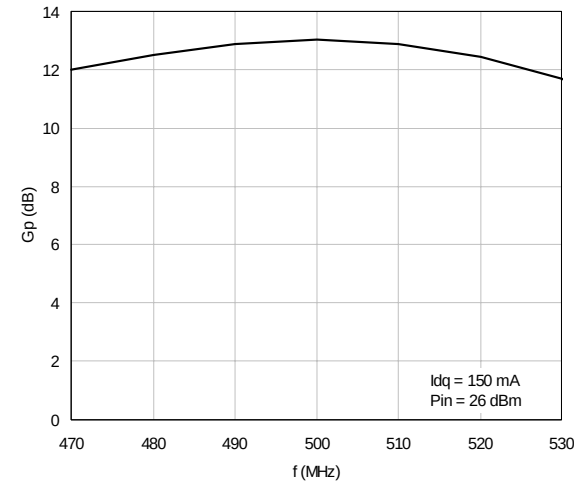


Capacitance Vs Supply Voltage

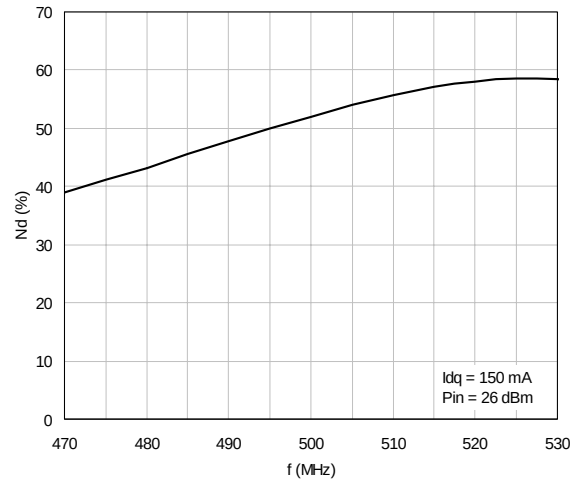


TYPICAL PERFORMANCE

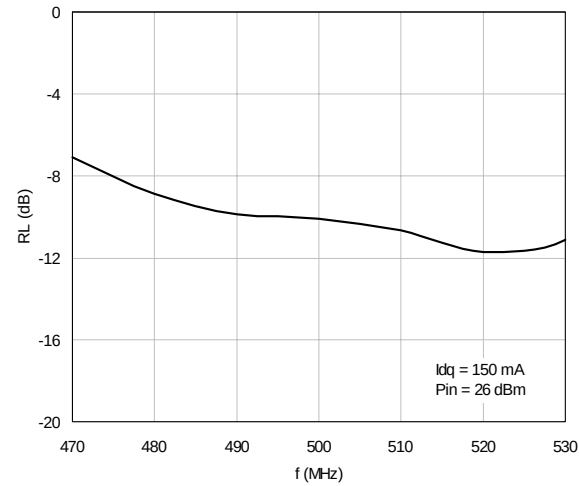
Power Gain Vs Frequency (*BROADBAND*)



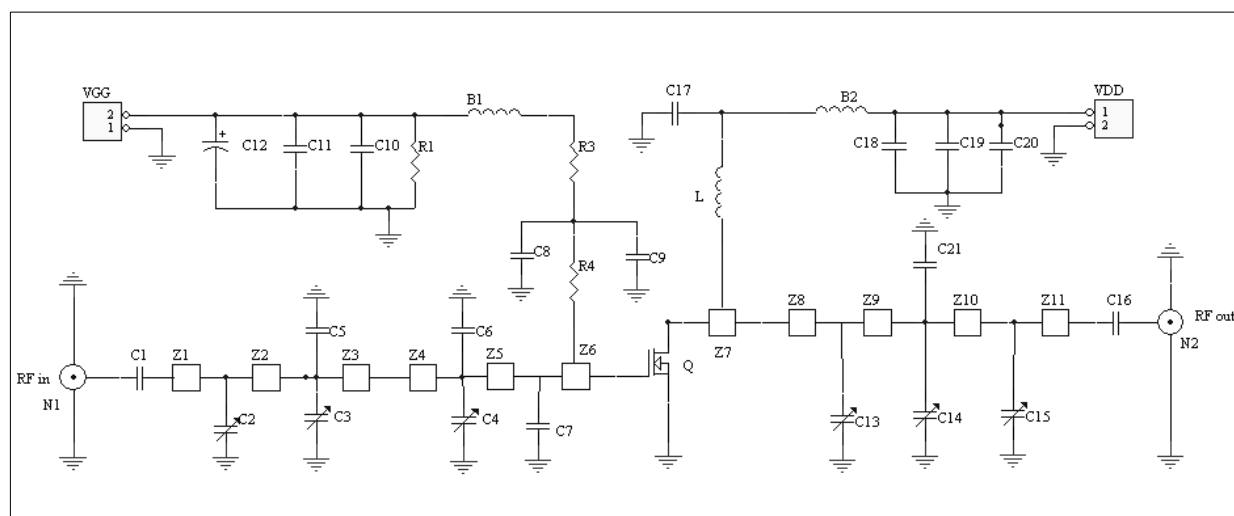
Efficiency Vs Frequency (*BROADBAND*)



Return Loss Vs Frequency (*BROADBAND*)



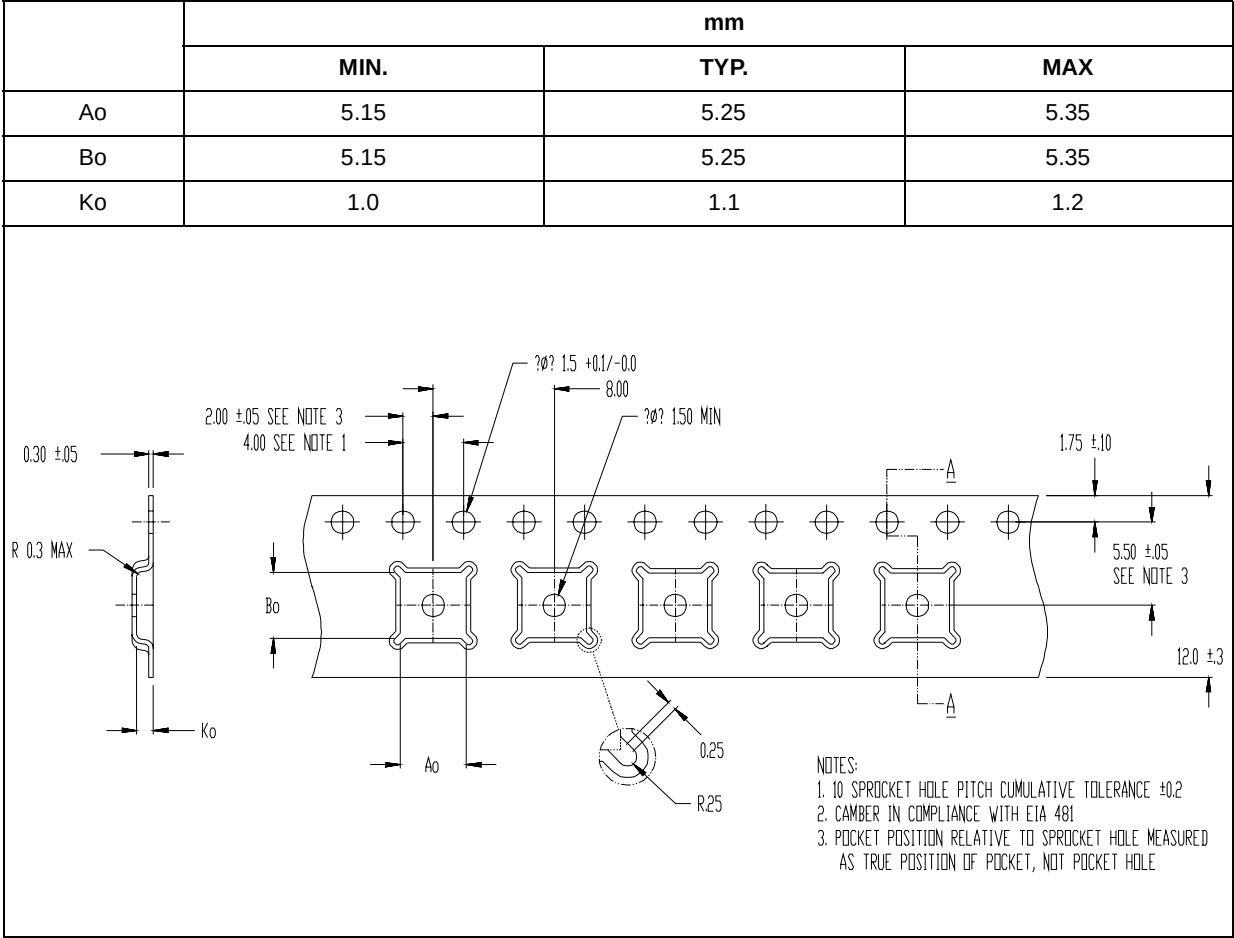
TEST CIRCUIT SCHEMATIC



TEST CIRCUIT COMPONENT PART LIST

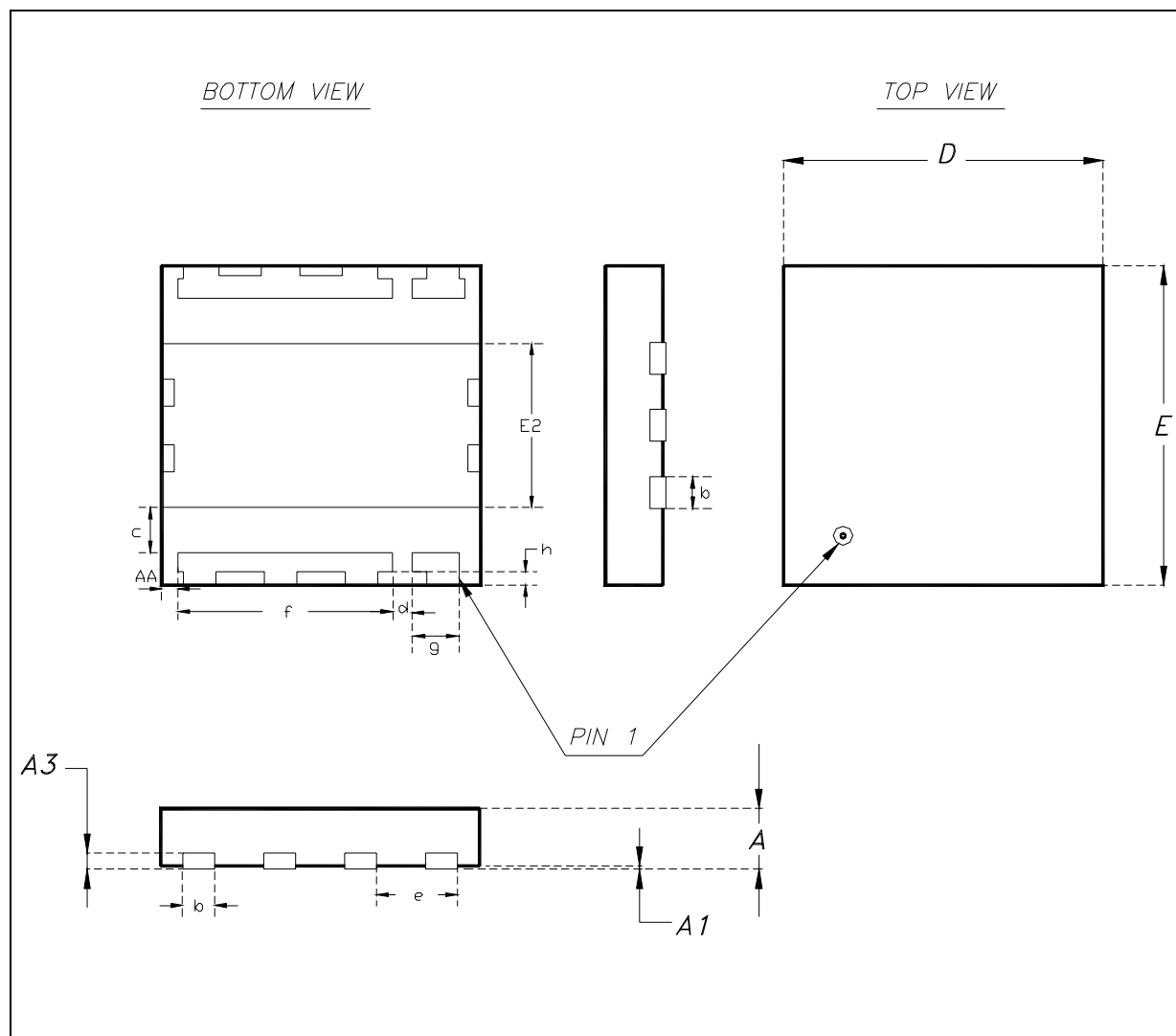
COMPONENT	DESCRIPTION
B1, B2	Ferrite bead
C1, C16	300 pF, 100 mil ATC
C2, C3, C4, C13, C14	1 -:- 20 pF Trimmer cap - JOHANSON
C15	0.8 -:- 10 pF Trimmer cap - JOHANSON
C5	36 pF, 100 mil ATC
C6	51 pF, 100 mil ATC
C7	62 pF, 100 mil ATC
C8, C17	150 pF, 100 mil CHIP CAP
C9	1 nF, 100 mil CHIP CAP
C10, C18	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

TAPE & REEL DIMENSIONS



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	



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is registered trademark of STMicroelectronics
® 2003 STMicroelectronics - All Rights Reserved

All other names are the property of their respective owners.

STMicroelectronics GROUP OF COMPANIES
Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.
<http://www.st.com>