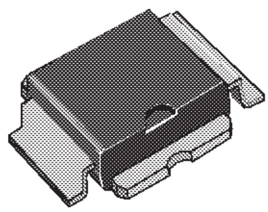
PD57045
PD57045S

RF POWER TRANSISTORS
The *LdmoST* Plastic FAMILY

PRELIMINARY DATA

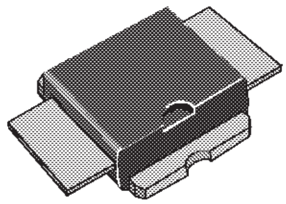
N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- POUT = 45 W with 13 dB gain @ 945 MHz / 28V
- NEW RF PLASTIC PACKAGE



PowerSO-10RF
(Formed Lead)

ORDER CODE	BRANDING
PD57045	XPD57045



PowerSO-10RF
(Straight Lead)

ORDER CODE	BRANDING
PD57045S	XPD57045S

DESCRIPTION

The PD57045 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 28V in common source mode at frequencies of up to 1GHz. PD57045 boasts the excellent gain, linearity and reliability of ST's latest LDMOS technology mounted in the first true SMD plastic RF power package, PowerSO-10RF. PD57045's superior linearity performance makes it an ideal solution for base station applications.

The PowerSO-10 plastic package, designed to offer high reliability, is the first ST JEDEC approved, high power SMD package. It has been specially optimized for RF needs and offers excellent RF performances and ease of assembly.

ABSOLUTE MAXIMUM RATINGS (T_{CASE} = 25 ^{0}C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current	5	A
P_{DISS}	Power Dissipation (@ Tc = 70 ^{0}C)	73	W
T_j	Max. Operating Junction Temperature	165	^{0}C
T_{STG}	Storage Temperature	-65 to 165	^{0}C

THERMAL DATA (T_{CASE} = 70 ^{0}C)

$R_{th(j-c)}$	Junction-Case Thermal Resistance	1.3	^{0}C/W

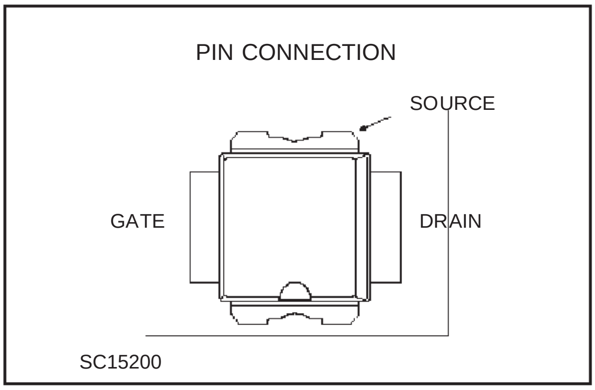
ELECTRICAL SPECIFICATION (T_{CASE} = 25 ^{0}C)

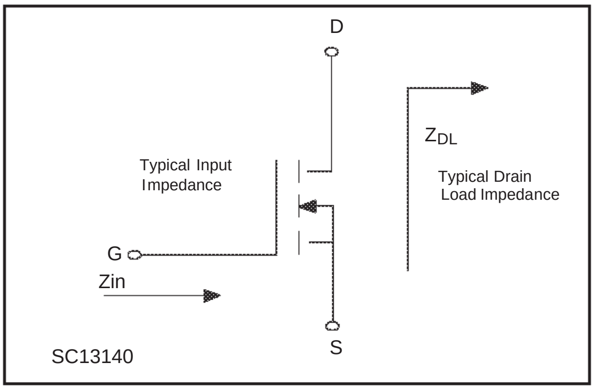
STATIC

Symbol	Parameter			Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	V_{GS} = 0 V	I_{DS} = 1 mA		65			V
I_{DSS}	V_{GS} = 0 V	V_{DS} = 28 V				1	μA
I_{GSS}	V_{GS} = 20 V	V_{DS} = 0 V				1	μA
$V_{GS(Q)}$	V_{DS} = 28 V	I_D = 250 mA		2.0		5.0	V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 3 A			0.7	0.9	V
g_{FS}	V_{DS} = 10 V	I_D = 5 A		2.0	2.7		mho
C_{ISS}	V_{GS} = 0 V	V_{DS} = 28 V	f = 1 MHz		86		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 28 V	f = 1 MHz		47		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 28 V	f = 1 MHz		3.6		pF

DYNAMIC

Symbol	Parameter				Min.	Typ.	Max.	Unit
P_{OUT}	V_{DD} = 28 V	f = 945 MHz	I_{DQ} = 250 mA		45			W
G_{PS}	V_{DD} = 28 V	f = 945 MHz	P_{OUT} = 45 W	I_{DQ} = 250 mA	13	14.5		dB
η_D	V_{DD} = 28 V	f = 945 MHz	P_{OUT} = 45 W	I_{DQ} = 250 mA	50			%
LOAD Mismatch	V_{DD} = 28 V ALL PHASE ANGLES	f = 945 MHz	P_{OUT} = 45 W	I_{DQ} = 250 mA	10:1			VSWR





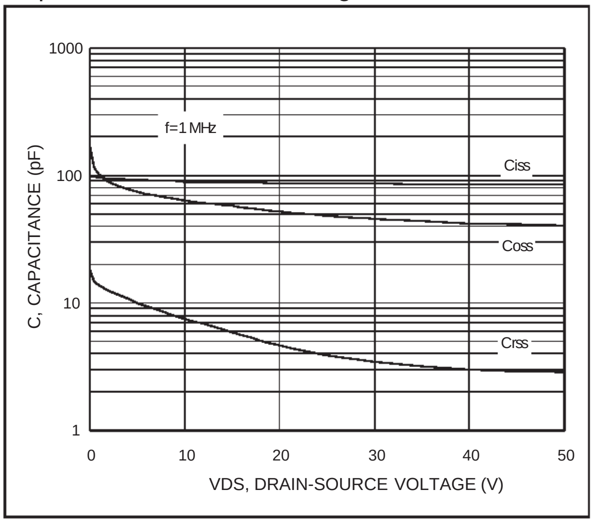
IMPEDANCE DATA

PD57045S

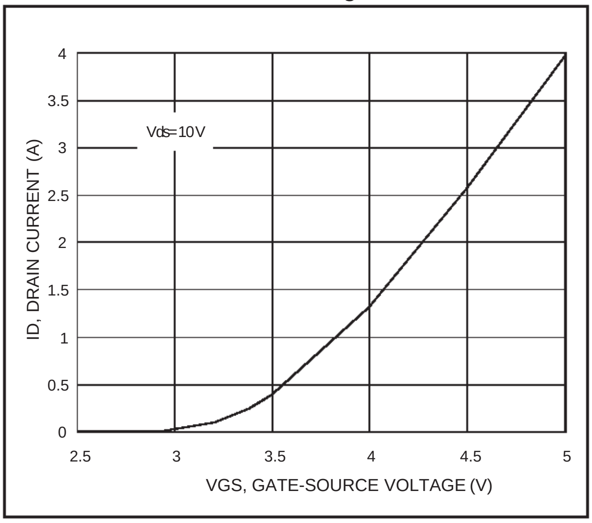
Frequency MHz	Zin Ω	Zdl Ω
945	.80 + j 1.24	1.66 - j.44

TYPICAL PERFORMANCE

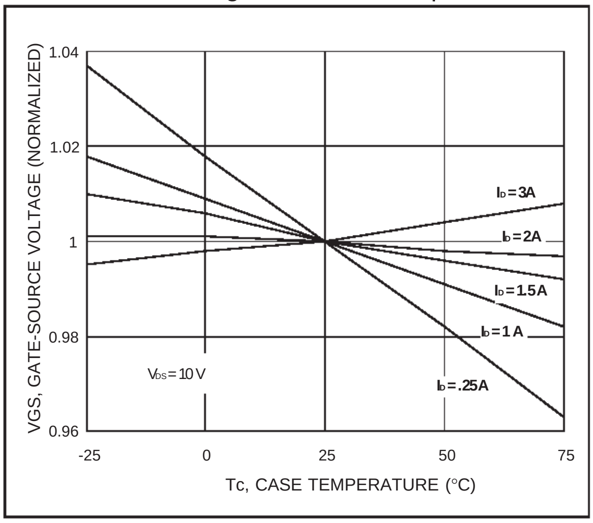
Capacitance vs. Drain Voltage



Drain Current vs. Gate Voltage

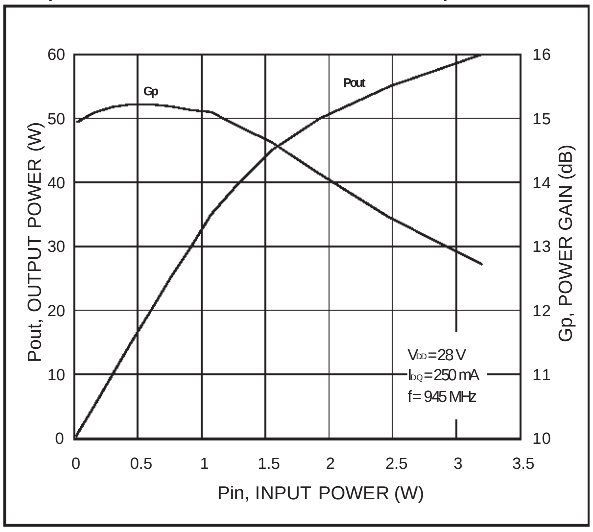


Gate-Source Voltage vs. Case Temperature

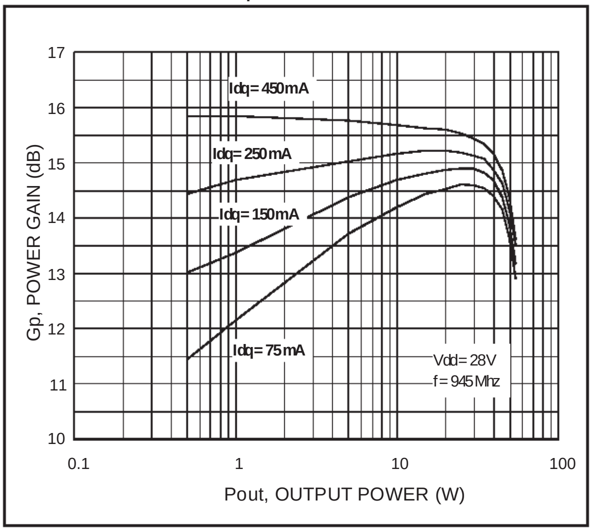


TYPICAL PERFORMANCE - **PD57045S**

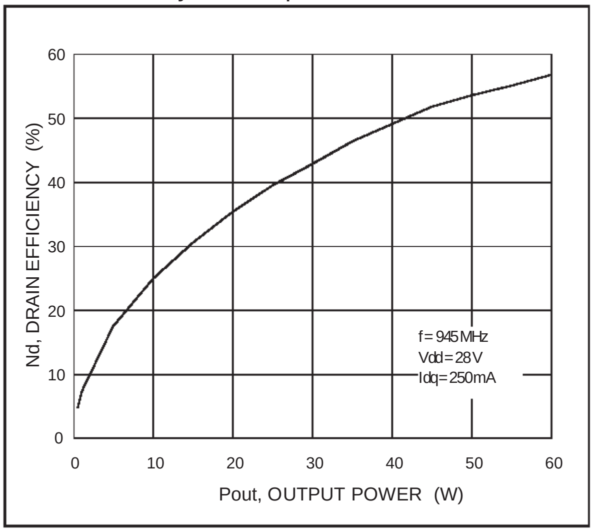
Output Power and Power Gain vs. Input Power



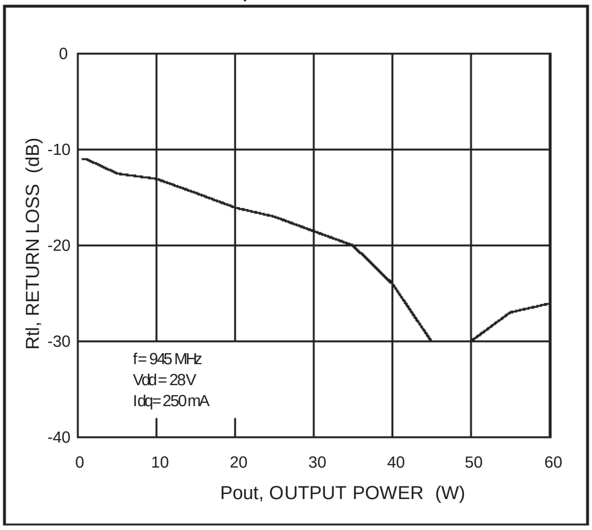
Power Gain vs. Output Power



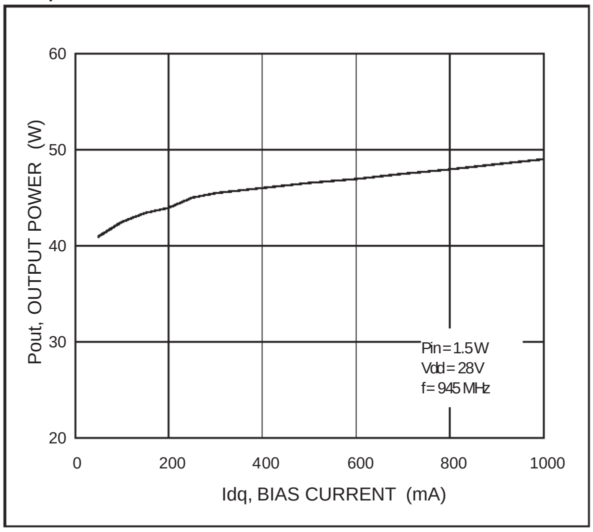
Drain Efficiency vs. Output Power



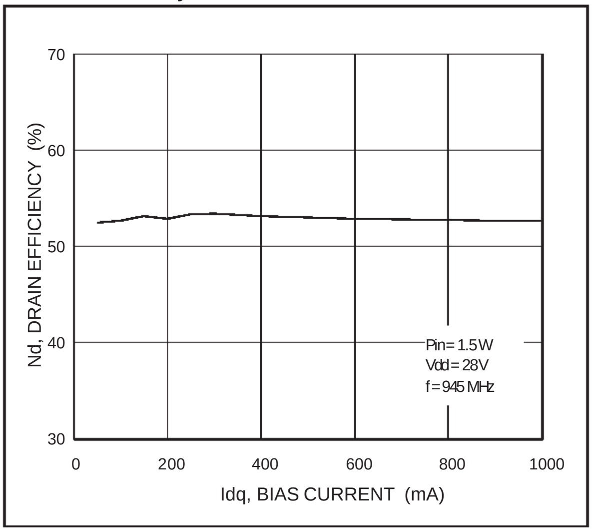
Return Loss vs. Output Power



Output Power vs. Bias Current

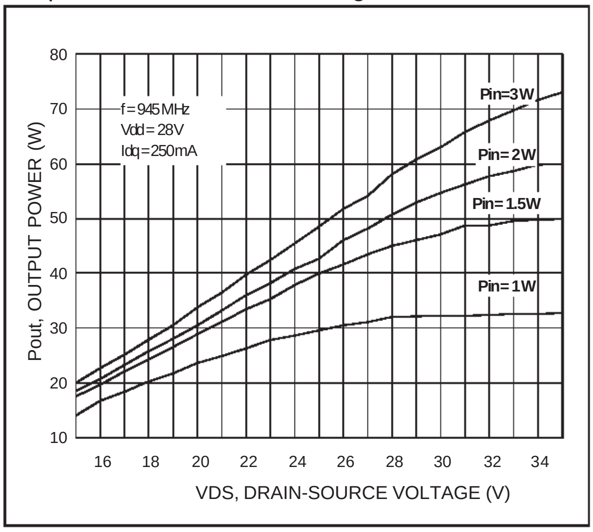


Drain Efficiency vs. Bias Current

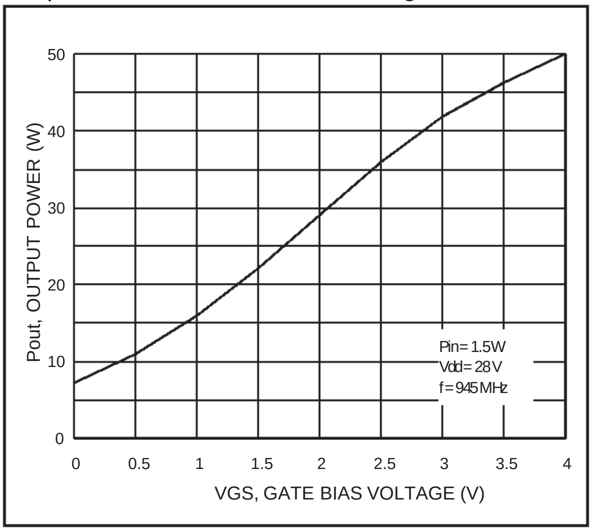


TYPICAL PERFORMANCE PD57045S

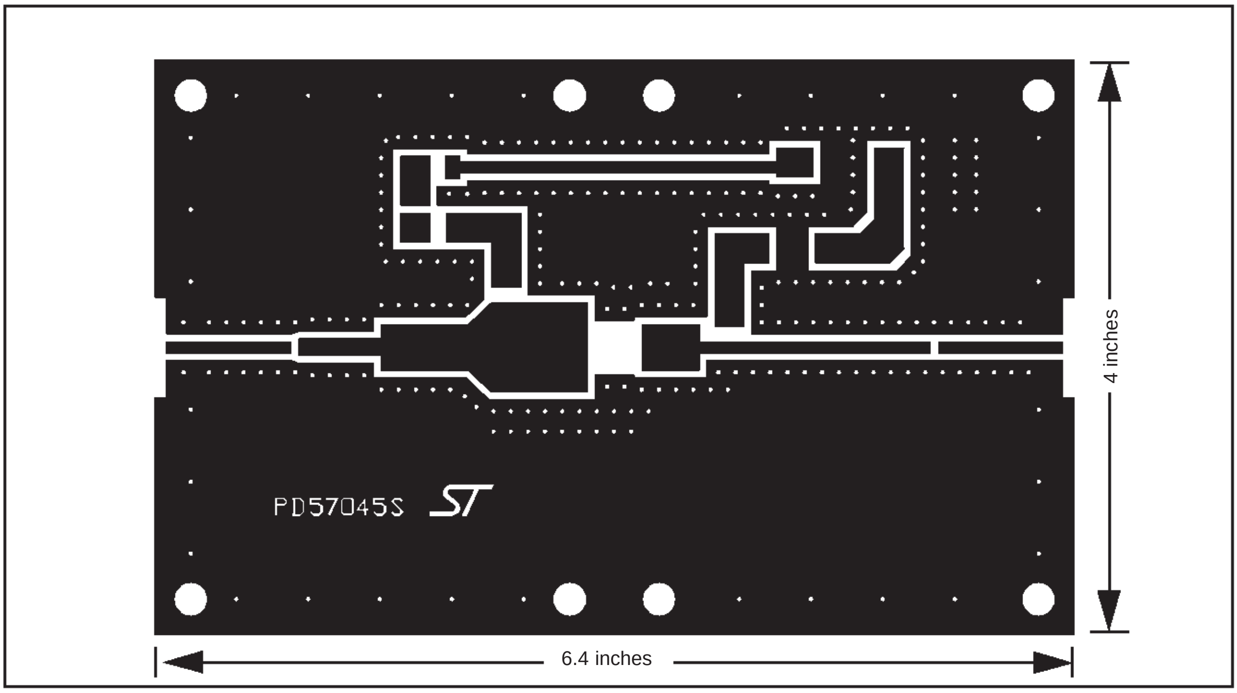
Output Power vs. Drain Voltage



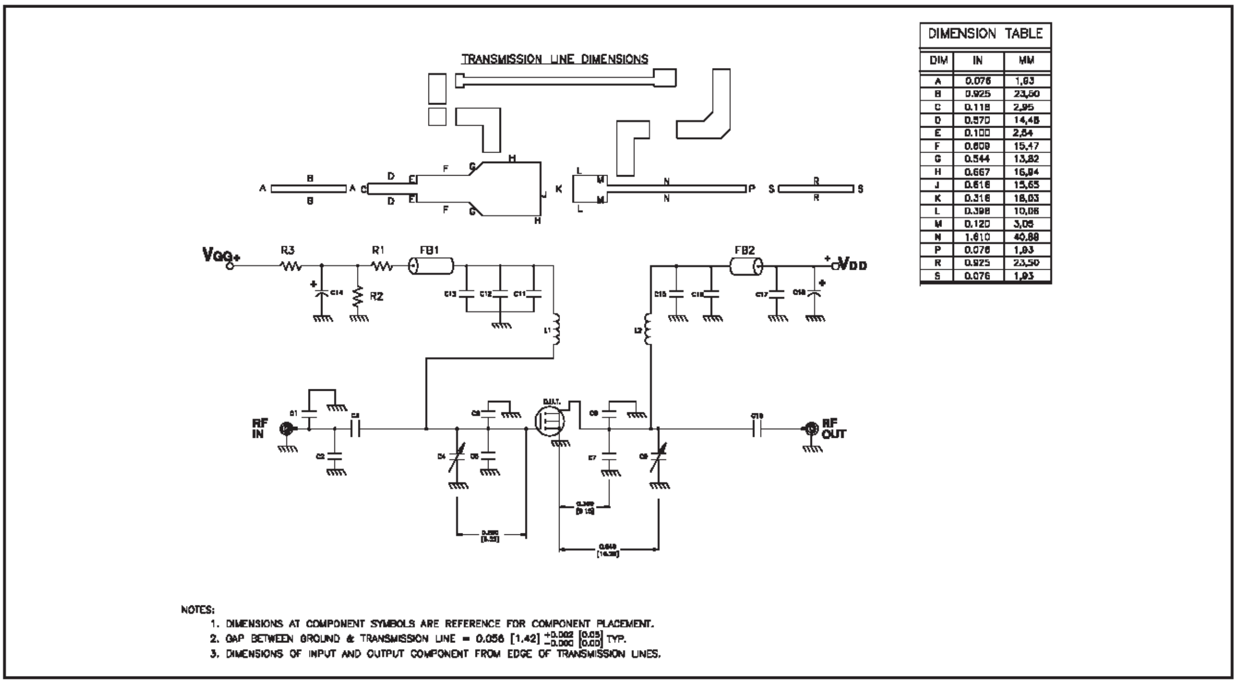
Output Power vs. Gate Bias Voltage



TEST CIRCUIT PHOTOMASTER



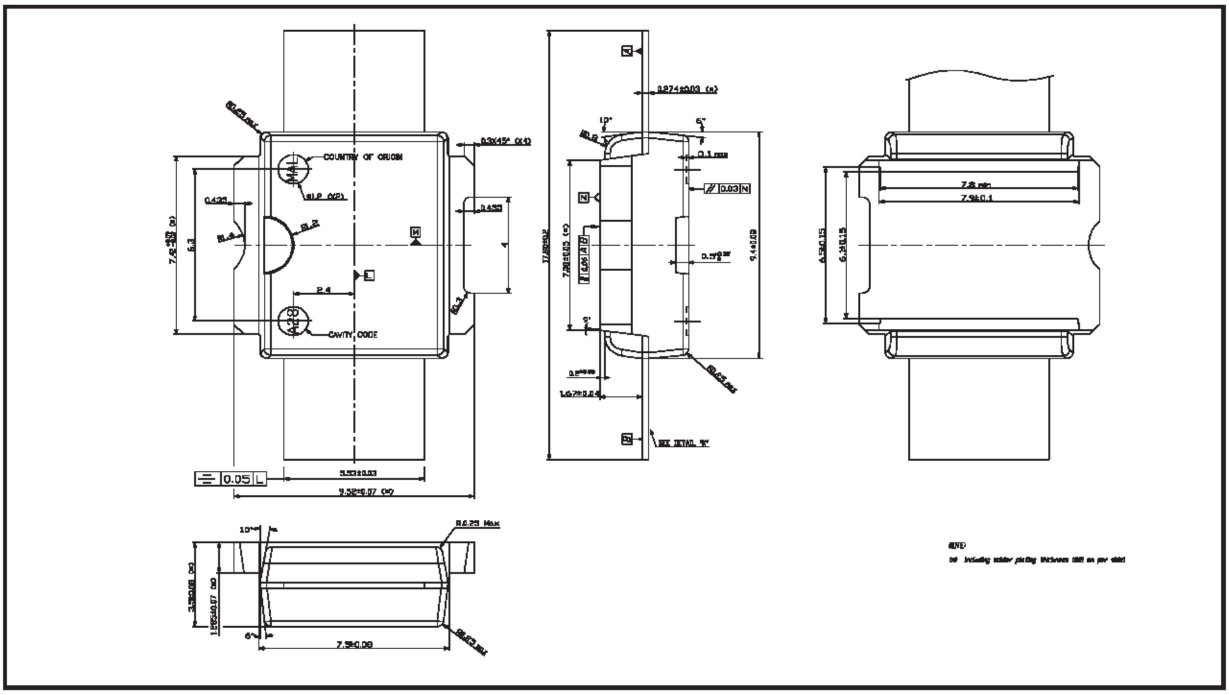
TEST CIRCUIT SCHEMATIC



TEST CIRCUIT COMPONENT PART LIST

L1	INDUCTOR, 5TURNS AIR WOUND #22AWG, ID=0.059{1.49}, NYLON COATED MAGNET WIRE	C7	7.5pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
L2	INDUCTOR, 5TURNS AIR WOUND #22AWG, ID=0.059{1.49}, NYLON COATED MAGNET WIRE	C8	7.5pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
FB1	SHIELD BEAD SURFACE MOUNT EMI	C9	0.8-8.0pF GIGA TRIM VARIABLE CAPACITOR
FB2	SHIELD BEAD SURFACE MOUNT EMI	C10	47pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
R1	18K OHM, 1W SURFACE MOUNT CHIP RESISTOR	C11	47pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
R2	4.7M OHM, 1W SURFACE MOUNT CHIP RESISTOR	C12	1000pF ATC 700B SURFACE MOUNT CERAMIC CHIP CAPACITOR
R3	120 OHM,2W SURFACE MOUNT CHIP RESISTOR	C13	0.1µF/500V SURFACE MOUNT CERAMIC CHIP CAPACITOR
C1	3pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR	C14	10µF/50V ALUMINNUM ELECTROLYTIC RADIAL LEAD CAPACITOR
C2	3pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR	C15	47pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C3	47pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR	C16	100pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C4	0.8-8.0pF GIGA TRIM VARIABLE CAPACITOR	C17	0.1µF/500V SURFACE MOUNT CERAMIC CHIP CAPACITOR
C5	7.5pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR	C18	220µF/63V ALUMINUM ELECTROLYTIC RADIAL LEAD CAPACITOR
C6	7.5pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR	Board	ROGER, ULTRA LAM 2000 THK 0.030” ε_r = 2.55 2oz ED Cu 2 SIDES

PowerSO-10RF (Straight Lead) MECHANICAL DATA



PowerSO-10RF (Formed Lead) MECHANICAL DATA