LET9060S

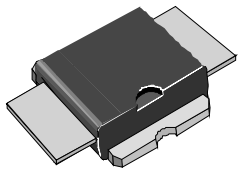
RF POWER TRANSISTORS

Ldmos Enhanced Technology in Plastic Package

PRELIMINARY DATA

N-CHANNEL ENHANCEMENT-MODE LATERAL MOSFETs

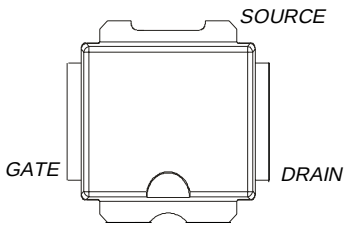
- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- P_{OUT} = 60 W with 17 dB gain @ 945 MHz / 26V
- NEW RF PLASTIC PACKAGE
- HIGH GAIN
- ESD PROTECTION
- AVAILABLE IN TAPE & REEL with TR SUFFIX



PowerSO-10RF
(straight lead)

ORDER CODE	**BRANDING**
LET9060S	LET9060S

PIN CONNECTION



DESCRIPTION

The LET9060S 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 26 V in common source mode at frequencies up to 1 GHz. LET9060S 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. LET9060S'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 optmized for RF needs and offers excellent RF performances and ease of assembly.

Mounting recommendations are available in ***www.st.com/rf/*** *(look for application note AN1294)*

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

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-Source Voltage	65	V
V_{GS}	Gate-Source Voltage	-0.5 to +15	V
I_D	Drain Current	7	A
P_{DISS}	Power Dissipation	170	W
Tj	Max. Operating Junction Temperature	165	°C
T_{STG}	Storage Temperature	-65 to +150	°C

THERMAL DATA

$R_{th(j-c)}$	Junction -Case Thermal Resistance	0.7	°C/W

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

STATIC

Symbol	Test Conditions	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} = 26 V			1	µA
I_{GSS}	V_{GS} = 5 V V_{DS} = 0 V			1	µA
$V_{GS(Q)}$	V_{DS} = 26 V I_D = 100 mA	2.0		5.0	V
$V_{DS(ON)}$	V_{GS} = 10 V I_D = 3 A		0.7	0.8	V
G_{FS}	V_{DS} = 10 V I_D = 3 A	2.5			mho
C_{ISS}	V_{GS} = 0 V V_{DS} = 26 V f = 1 MHz		74		pF
C_{OSS}	V_{GS} = 0 V V_{DS} = 26 V f = 1 MHz		40		pF
C_{RSS}	V_{GS} = 0 V V_{DS} = 26 V f = 1 MHz		2.8		pF

Ref. 7143417B

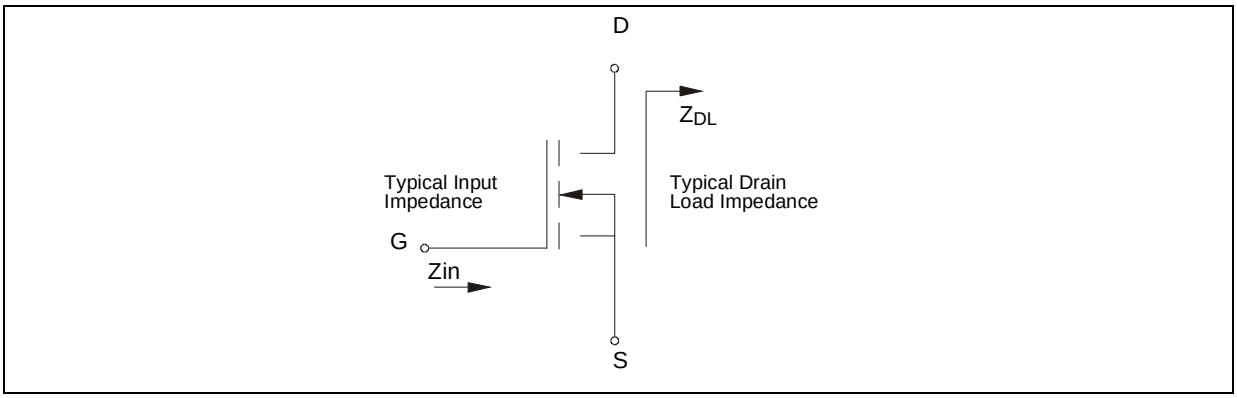
DYNAMIC (*f = 945 MHz*)

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
G_P	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W PEP	17			dB
η_D	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W PEP		47		%
IMD3	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W PEP			-28	dBc
P_{1dB}	V_{DD} = 26 V I_{DQ} = 250 mA		70		W
G_P	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W		16.7		dB
η_D	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W		61		%
Load mismatch	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W ALL PHASE ANGLES	10:1			VSWR

DYNAMIC (*f = 925 - 960 MHz*)

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
P_{1dB}	V_{DD} = 26 V I_{DQ} = 250 mA		65		W
G_P	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W		16		dB
η_D	V_{DD} = 26 V I_{DQ} = 250 mA P_{OUT} = 60 W		56		%

IMPEDANCE DATA



FREQ. MHz	Z_{IN} (Ω)	Z_{DL}(Ω)
860	0.65 - j 0.05	2.0 + j 0.1
880	0.75 - j 0.6	2.0 + j 0.1
900	0.9 - j 1.4	1.4 + j 0.2
920	0.4 - j 1.3	1.4 + j 0.5
940	0.4 - j 0.8	1.2 + j 0.3
960	0.5 - j 1.6	1.8 + j 1.0

ESD PROTECTION CHARACTERISTICS

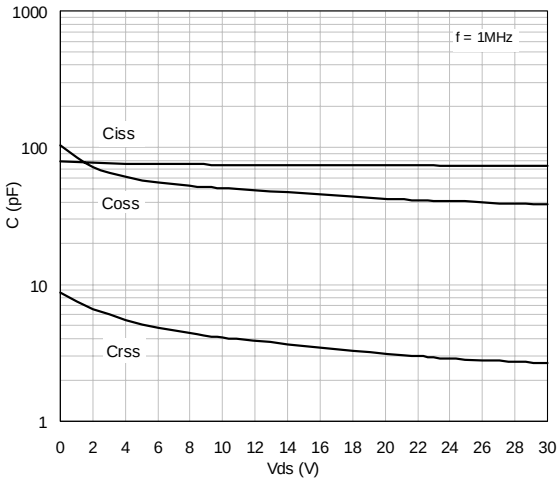
Test Conditions	Class
Human Body Model	2
Machine Model	M3

MOISTURE SENSITIVITY LEVEL

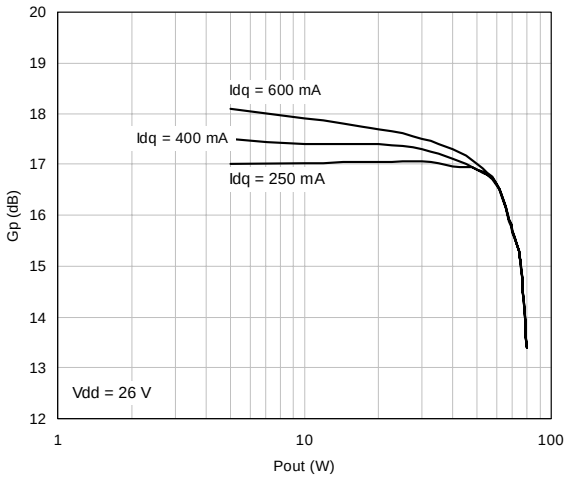
Test Methodology	Rating
J-STD-020B	MSL 3

TYPICAL PERFORMANCE

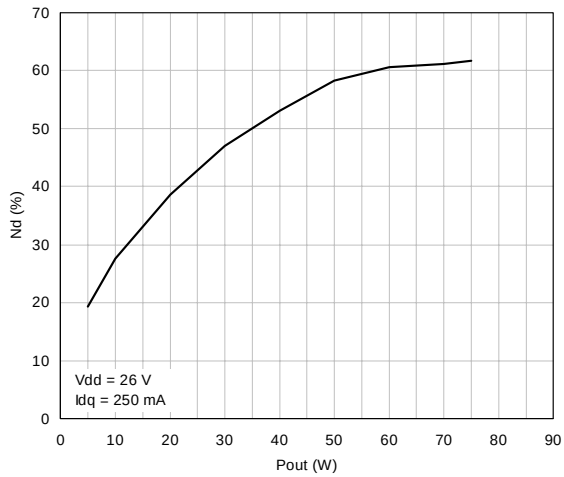
Power Gain Vs Output Power



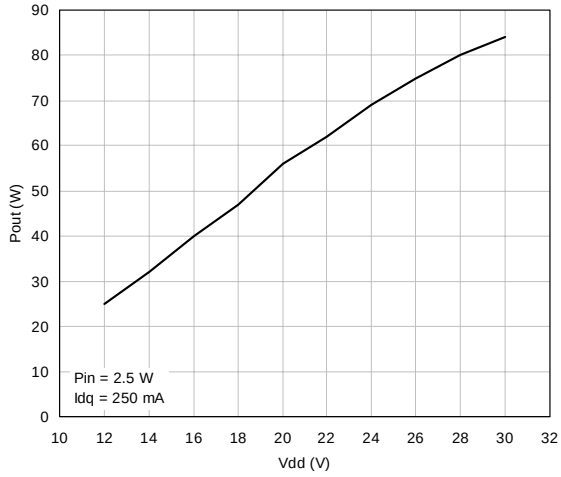
Power Gain Vs Output Power



Efficiency Vs Output Power

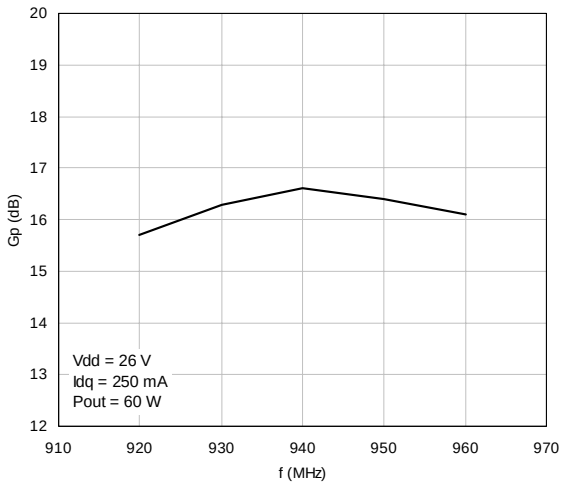


Ouput Power Vs Drain Voltage

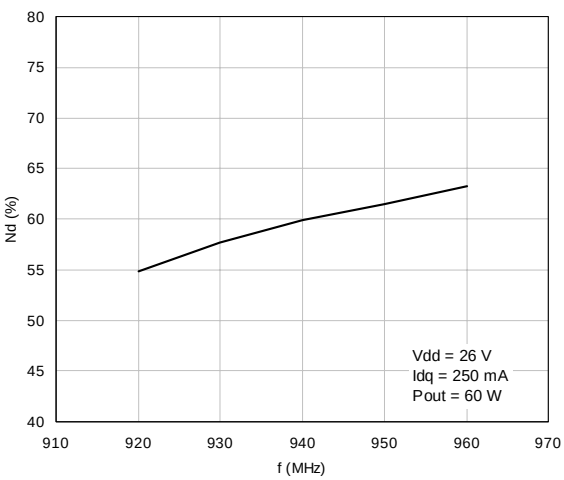


TYPICAL PERFORMANCE *(BROADBAND)*

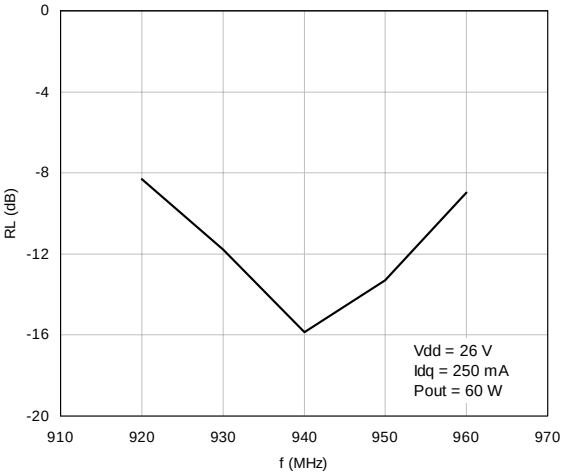
Power Gain Vs Frequency



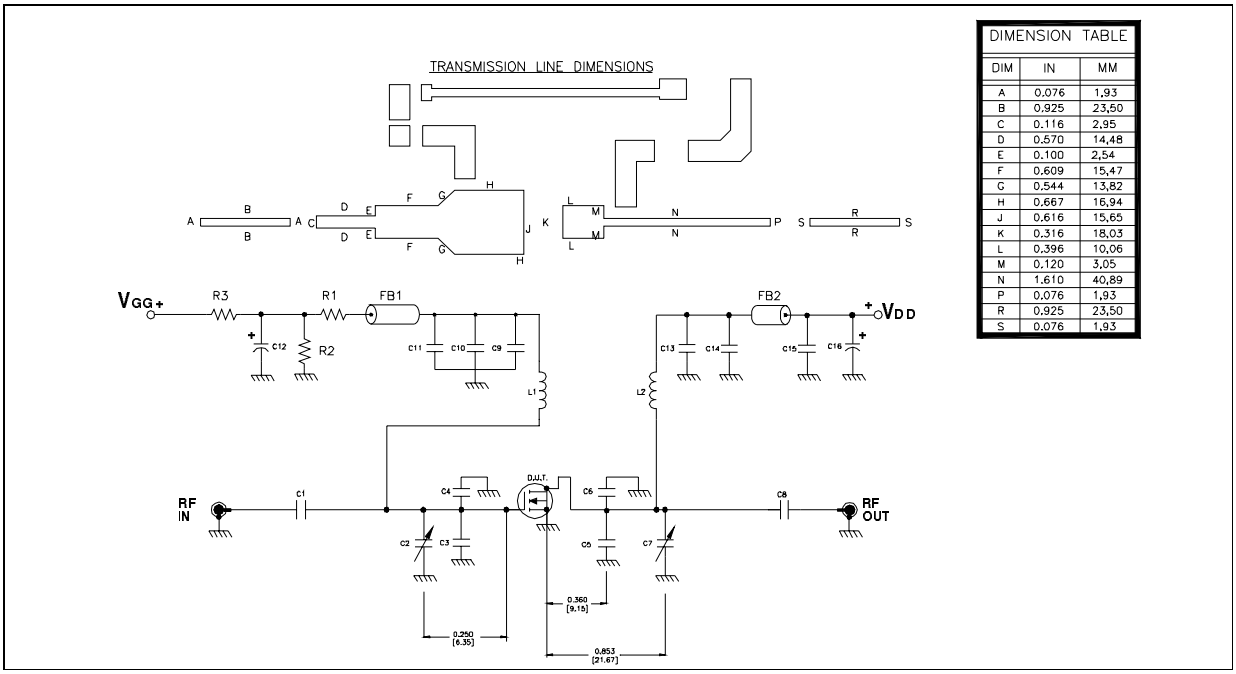
Efficiency Vs Frequency



Input Return Loss Vs Frequency



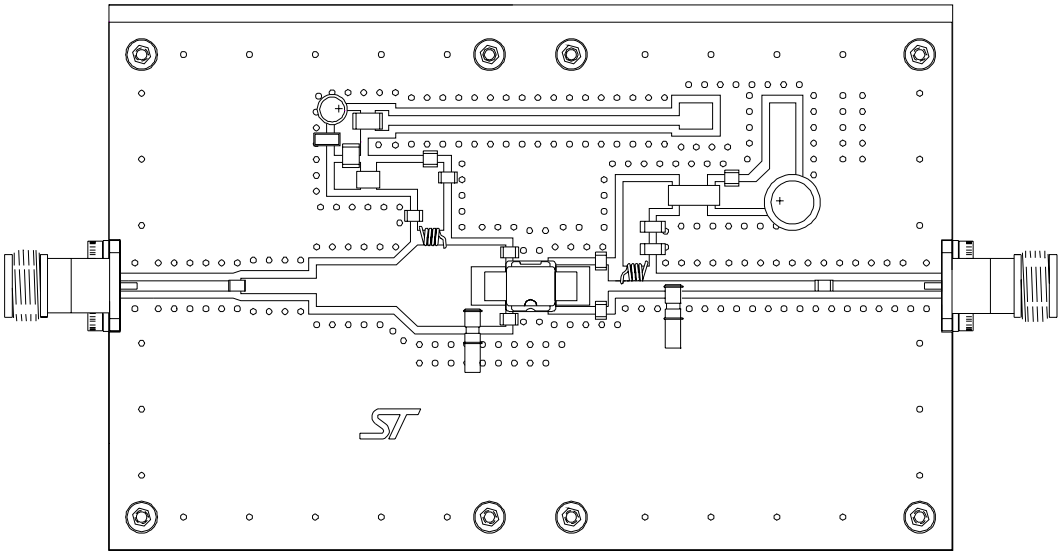
TEST CIRCUIT SCHEMATIC



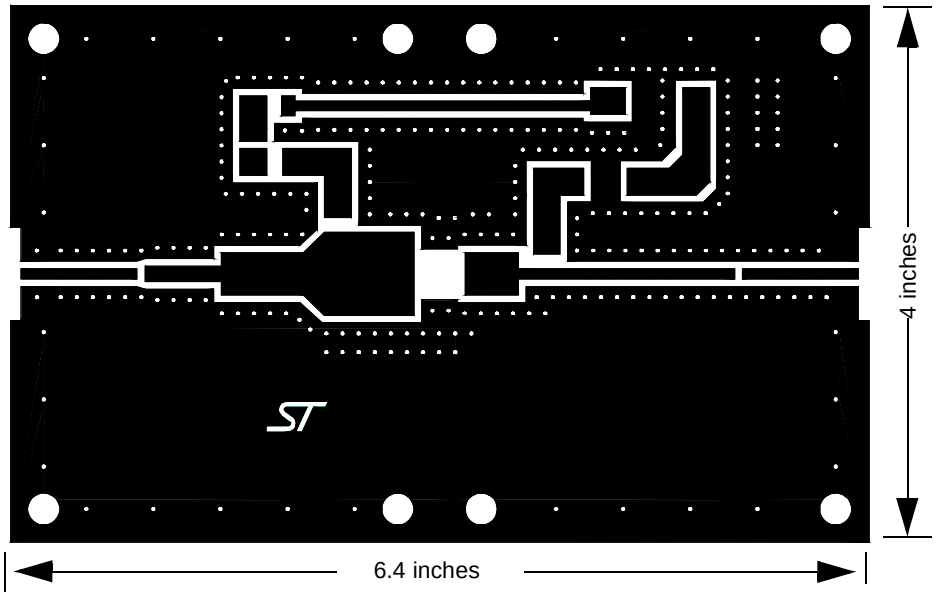
TEST CIRCUIT COMPONENT PART LIST

COMPONENT	DESCRIPTION
C1, C8, C9, C13	47pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C2, C7	0.8-8.0pF GIGA TRIM VARIABLE CAPACITOR
C3, C4, C5, C6	7.5pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C10	1000pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C11, C15	0.1µF / 500V SURFACE MOUNT CERAMIC CHIP CAPACITOR
C12	10µF / 50V ALUMINUM ELECTROLYTIC RADIAL LEAD CAPACITOR
C14	100pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C16	220µF / 63V ALUMINUM ELECTROLYTIC RADIAL LEAD CAPACITOR
R1	18KΩ, 1W SURFACE MOUNT CHIP RESISTOR
R2	4.7MΩ, 1W SURFACE MOUNT CHIP RESISTOR
R3	120Ω, 2W SURFACE MOUNT CHIP RESISTOR
FB1, FB2	SHIELD BEAD SURFACE MOUNT EMI
L1, L2	INDUCTOR, 5TURNS AIR WOUND #22AWG, ID=0.059[1.49], NYLON COATED MAGNET WIRE

TEST CIRCUIT

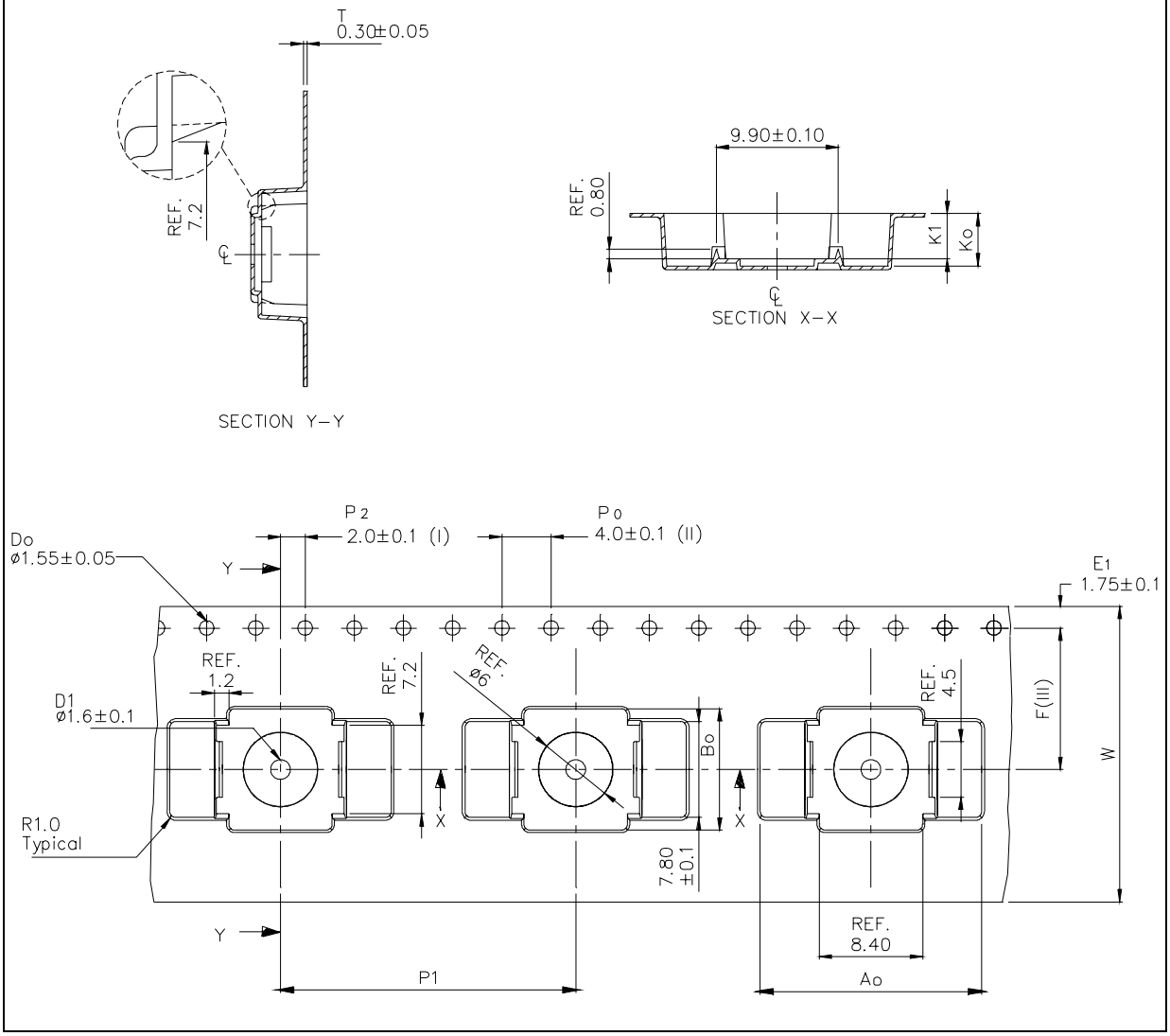


TEST CIRCUIT PHOTOMASTER



TAPE & REEL DIMENSIONS

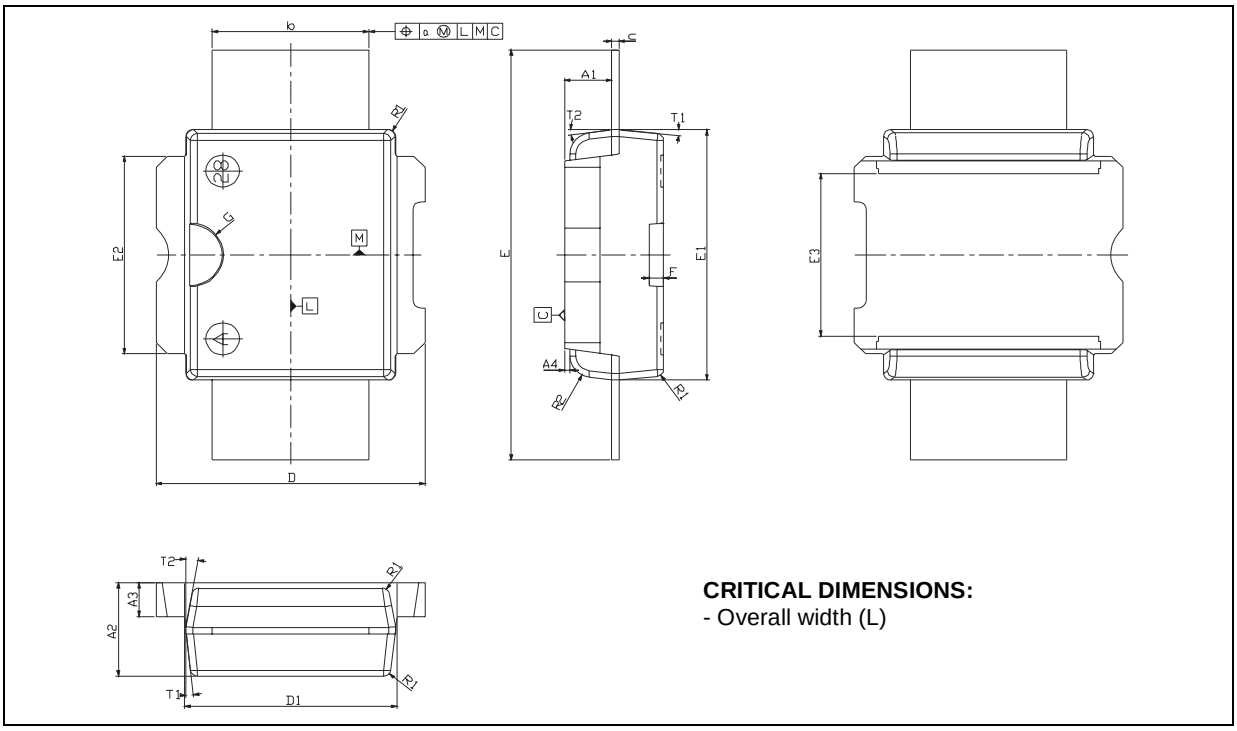
	mm		
	MIN.	**TYP.**	**MAX**
Ao	17.9	18.0	18.1
Bo	9.7	9.8	9.9
Ko	4.15	4.25	4.35
K1	3.6	3.7	3.8
F	11.4	11.5	11.6
P1	23.9	24.0	24.1
W	23.7	24.0	24.3



PowerSO-10RF Straight Lead MECHANICAL DATA

DIM.	mm			Inch		
	MIN.	TYP.	MAX	MIN.	TYP.	MAX
A1	1.62	1.67	1.72	0.064	0.065	0.068
A2	3.4	3.5	3.6	0.134	0.137	0.142
A3	1.2	1.3	1.4	0.046	0.05	0.054
A4	0.15	0.2	0.25	0.005	0.007	0.009
a		0.2			0.007	
b	5.4	5.53	5.65	0.212	0.217	0.221
c	0.23	0.27	0.32	0.008	0.01	0.012
D	9.4	9.5	9.6	0.370	0.374	0.377
D1	7.4	7.5	7.6	0.290	0.295	0.298
E	15.15	15.4	15.65	0.595	0.606	0.615
E1	9.3	9.4	9.5	0.365	0.37	0.375
E2	7.3	7.4	7.5	0.286	0.292	0.294
E3	5.9	6.1	6.3	0.231	0.24	0.247
F		0.5			0.019	
G		1.2			0.047	
R1			0.25			0.01
R2		0.8			0.031	
T1		6 deg			6 deg	
T2		10 deg			10 deg	

Note (1): Resin protrusions not included (max value: 0.15 mm per side)



CRITICAL DIMENSIONS:
- Overall width (L)