



# SD2918

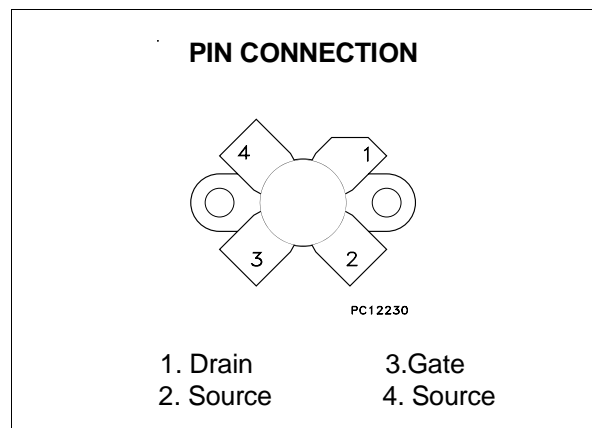
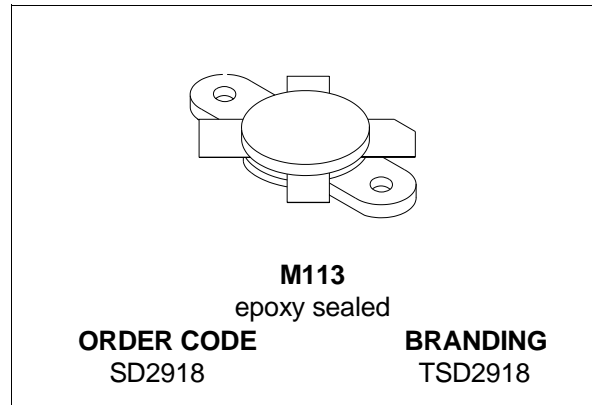
## RF POWER TRANSISTORS HF/VHF/UHF N-CHANNEL MOSFETs

### ADVANCE DATA

- GOLD METALLIZATION
- EXCELLENT THERMAL STABILITY
- COMMON SOURCE CONFIGURATION
- $P_{out} = 30 \text{ W}$  MIN. WITH 18 dB GAIN @ 30 MHz

### DESCRIPTION

The SD2918 is a gold metallized N-Channel MOS field-effect RF power transistor. It is intended for use in 50 V DC large signal applications up to 200 MHz



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

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain Source Voltage	125	V
$V_{DGR}$	Drain-Gate Voltage ( $R_{GS} = 1 \text{ M}\Omega$ )	125	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current	6	A
$P_{DISS}$	Power Dissipation	175	W
$T_j$	Max. Operating Junction Temperature	200	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-65 to 150	$^{\circ}\text{C}$

### THERMAL DATA

$R_{th(j-c)}$	Junction-Case Thermal Resistance	1.0	$^{\circ}\text{C}/\text{W}$
$R_{th(c-s)}$	Case-Heatsink Thermal Resistance *	0.30	$^{\circ}\text{C}/\text{W}$

\* Determined using a flat aluminum or copper heatsink with thermal compound applied (Dow Corning 340 or equivalent).

**ELECTRICAL SPECIFICATION** ( $T_{case} = 25\text{ }^{\circ}\text{C}$ )

**STATIC**

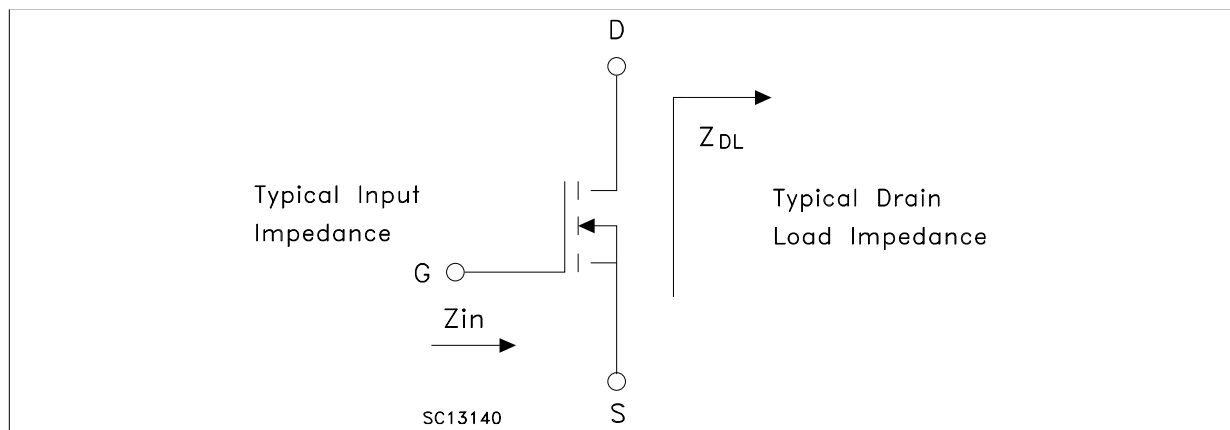
Symbol	Parameter			Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	$V_{GS} = 0V$	$I_{DS} = 10\text{ mA}$		125			V
$I_{DSS}$	$V_{GS} = 0V$	$V_{DS} = 50\text{ V}$				1.0	mA
$I_{GSS}$	$V_{GS} = 20V$	$V_{DS} = 0\text{ V}$				1	$\mu\text{A}$
$V_{GS(Q)}$	$V_{DS} = 10V$	$I_D = 10\text{ mA}$		1.0		5.0	V
$V_{DS(ON)}$	$V_{GS} = 10V$	$I_D = 2.5\text{ A}$				5.0	V
$g_{FS}$	$V_{DS} = 10V$	$I_D = 2.5\text{ A}$		0.8			mho
$C_{ISS}$	$V_{GS} = 0V$	$V_{DS} = 50\text{ V}$	$f = 1\text{ MHz}$		58		pF
$C_{OSS}$	$V_{GS} = 0V$	$V_{DS} = 50\text{ V}$	$f = 1\text{ MHz}$		35.5		pF
$C_{RSS}$	$V_{GS} = 0V$	$V_{DS} = 50\text{ V}$	$f = 1\text{ MHz}$		7.5		pF

REF. 1022497C

**DYNAMIC**

Symbol	Parameter				Min.	Typ.	Max.	Unit
$P_{OUT}$	$f = 30\text{MHz}$	$V_{DD} = 50V$	$P_{in} = 0.475\text{ W}$	$I_{DQ} = 100\text{ mA}$	30			W
$G_{PS}$	$f = 30\text{MHz}$	$V_{DD} = 50V$	$P_{out} = 30\text{ W}$	$I_{DQ} = 100\text{ mA}$	18	22		dB
$\eta_D$	$f = 30\text{MHz}$	$V_{DD} = 50V$	$P_{out} = 30\text{ W}$	$I_{DQ} = 100\text{ mA}$	50	55		%
Load Mismatch	$f = 30\text{MHz}$ All Angles	$V_{DD} = 50V$	$P_{out} = 30\text{ W}$	$I_{DQ} = 100\text{ mA}$	30:1			VSWR

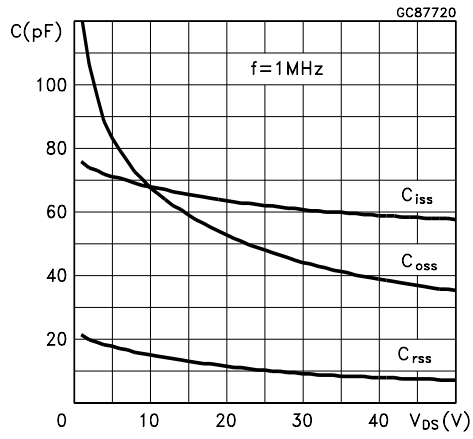
**IMPEDANCE DATA**



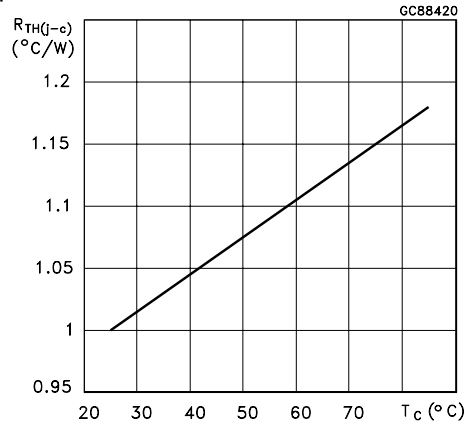
FREQ.	$Z_{IN} (\Omega)$	$Z_{DL} (\Omega)$
30 MHz	$24.4 - j 13.4$	$28.8 + j 7.2$

TYPICAL PERFORMANCE

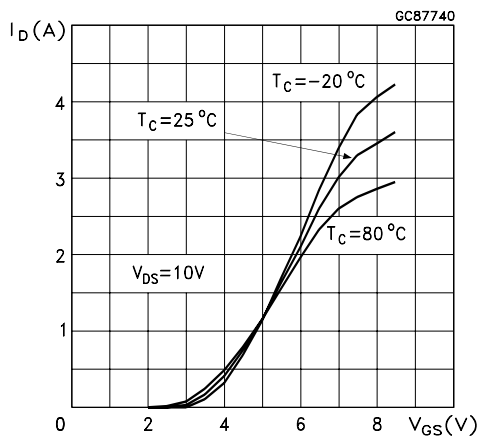
Capacitance vs Drain-Source Voltage



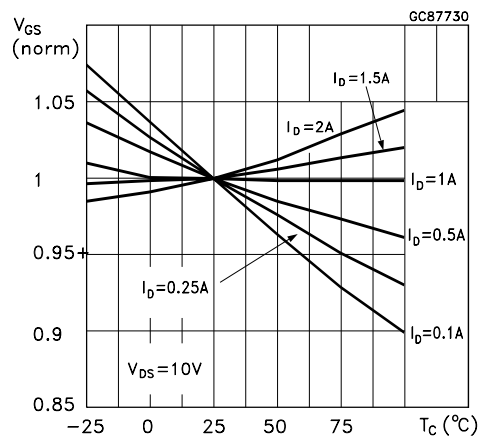
Maximum Thermal Resistance vs Case Temperature



Drain Current vs Gate Voltage

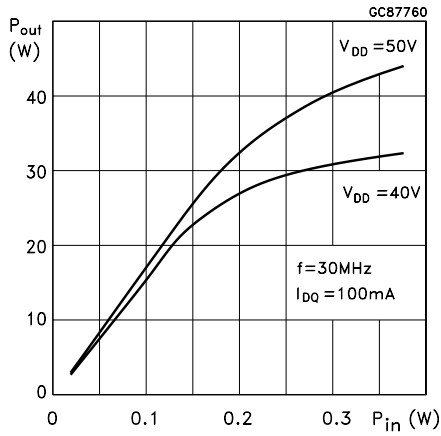


Gate-Source Voltages vs Case Temperature

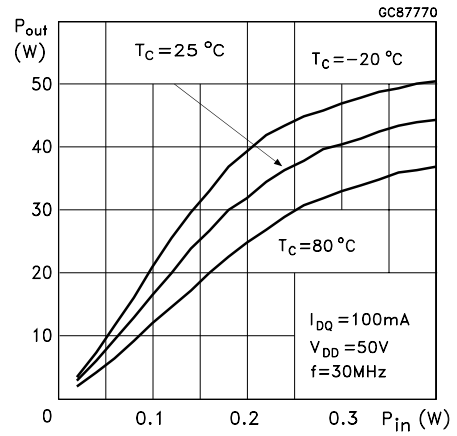


TYPICAL PERFORMANCE

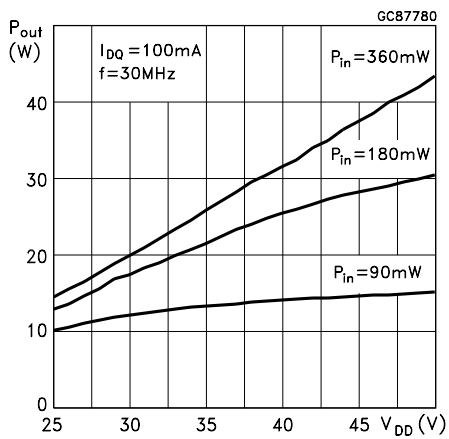
Output Power vs Input Power



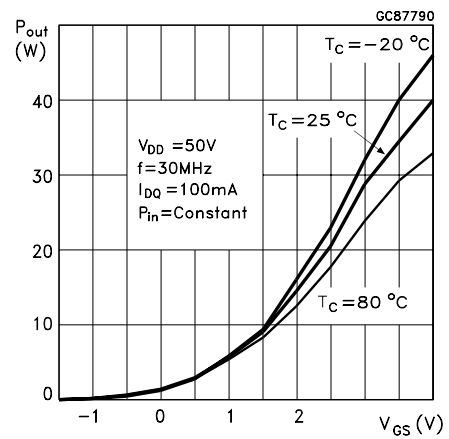
Output Power vs Input Power



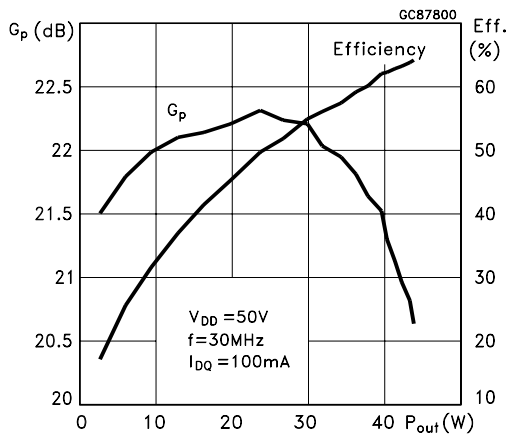
Output Power vs Voltage Supply



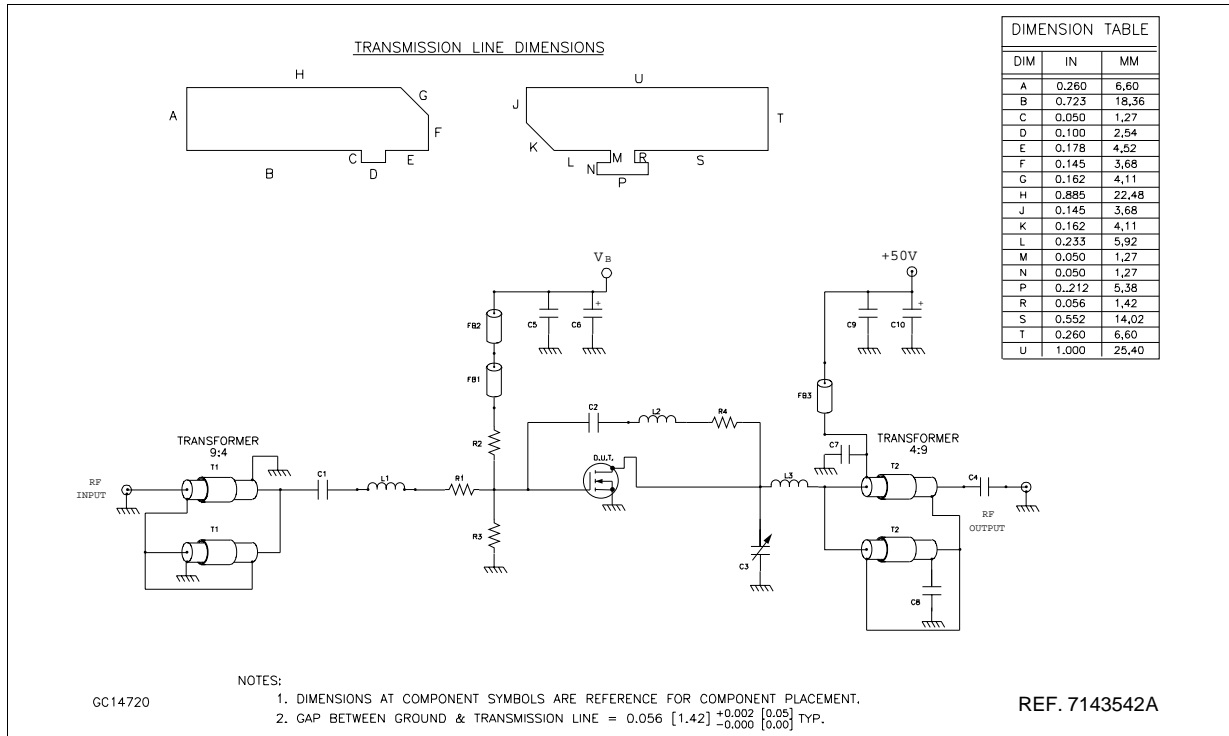
Output Power vs Gate Voltage



Power Gain & Efficiency vs Output Power



30 MHz Test Circuit Schematic



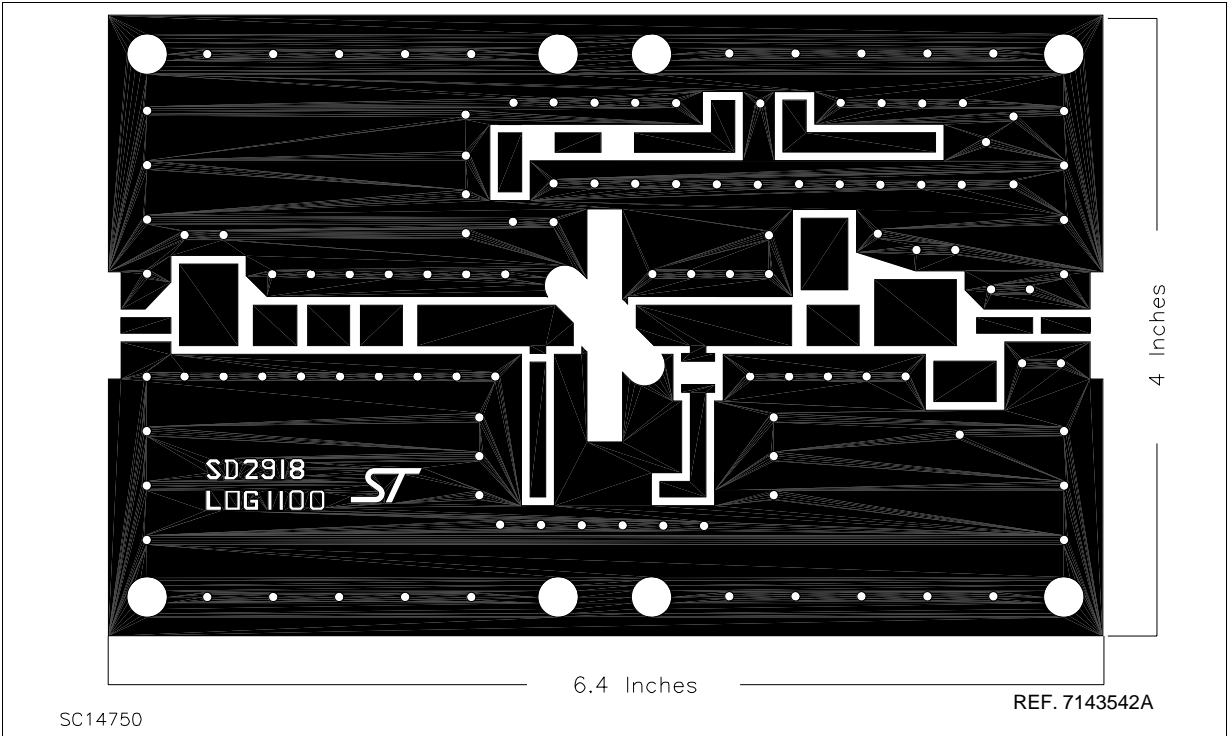
30 MHz Test Circuit Component Part List

COMPONENT	PART NO	VENDOR	DESCRIPTION
R4	CR2512-1W-101JB	VENKEL	100 OHM, 1W SURFACE MOUNT CHIP RESISTOR
R3	29SJ901	XICON	160 OHM, 1W CARBON FILM AXIAL-LEAD RESISTOR
R2	29SJ901	XICON	160 OHM, 1W CARBON FILM AXIAL-LEAD RESISTOR
R1	CR2512-1W-3R9JT	VENKEL	3.9 OHM, 1W SURFACE MOUNT CHIP RESISTOR
FB3	2843000102	FAIR-RITE CORP.	MULTI-APERATURE CORE
FB2	2743021447	FAIR-RITE CORP.	SHIELD BEAD SURFACE MOUNT EMI
FB1	2743021447	FAIR-RITE CORP.	SHIELD BEAD SURFACE MOUNT EMI
L3	8073	BELDEN	INDUCTOR, 3 TURNS AIR WOUND #14AWG, ID=0.375[9.53], POLY COATED MAGNET WIRE
L2	1557	ALPHA	INDUCTOR, 7 TURNS AROUND SHIELD BEAD (PT# FAIR-RITE 2643801102) #16AWG HOOK UP WIRE.
L1	8073	BELDEN	INDUCTOR, 4 TURNS AIR WOUND #14AWG, ID=0.375[9.53], POLY COATED MAGNET WIRE
C10	SKA100M160	MALLORY	10µF/160V AXIAL-LEAD ALUMINIUM ELECTROLYTIC CAPACITOR
C9	C1812X7R501-103KNE	VENKEL	0.01µF/500V SURFACE MOUNT CERAMIC CHIP CAPACITOR
C8	C1812X7R501-103KNE	VENKEL	0.01µF/500V SURFACE MOUNT CERAMIC CHIP CAPACITOR
C7	C1812X7R501-103KNE	VENKEL	0.01µF/500V SURFACE MOUNT CERAMIC CHIP CAPACITOR
C6	RVS-50V100M-R	ELNA	10µF/50V VERTICAL SURFACE MOUNT CHIP ALUMINIUM ELECTROLYTIC CAPACITOR
C5	C1812X7R501-103KNE	VENKEL	0.01µF/500V SURFACE MOUNT CERAMIC CHIP CAPACITOR
C4	ATC200B103KW50X	ATC	10000pF ATC 200B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C3	463	ARCO	20-180pF TYPE ST46 STANDARD 3 TURNS VARIABLE CAPACITOR
C2	ATC200B103KW50X	ATC	10000pF ATC 200B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C1	ATC200B103KW50X	ATC	10000pF ATC 200B SURFACE MOUNT CERAMIC CHIP CAPACITOR
T2			TRANSFORMER, 4:9 75.0 OHM, O.D. 0.090 1" LG. COAXIAL CABLE 5TURNS AROUND SHIELD BEAD (PT#2643801002 FAIR-RITE CORP.)
T1			TRANSFORMER, 9:4 75.0 OHM, O.D. 0.090 1" LG. COAXIAL CABLE 5TURNS AROUND SHIELD BEAD (PT#2643801002 FAIR-RITE CORP.)
PCB	GD300M1026	ROGERS CORP	WOVEN FIBERGLASS REINFORCED PTFE 0.030" THK, $\epsilon_r = 2.55$ , 2 Oz ED Cu BOTH SIDES

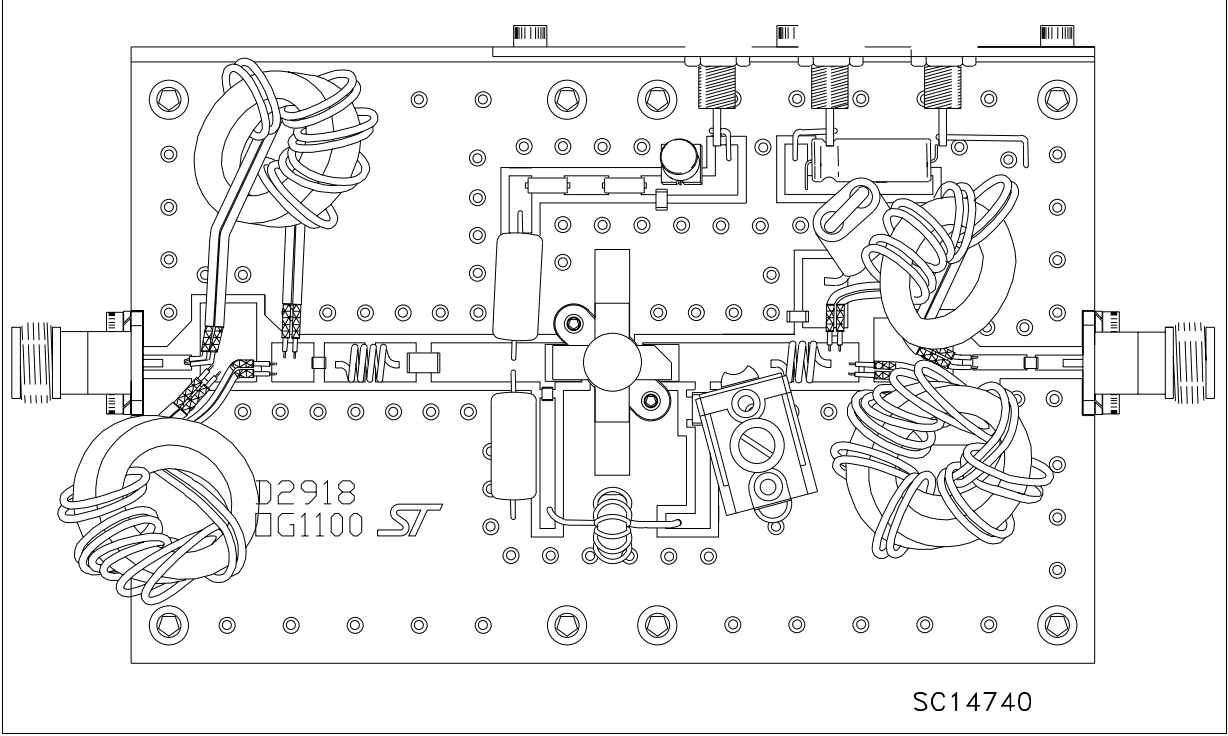
SC14730

**SD2918**

30 MHz Test Circuit Photomaster

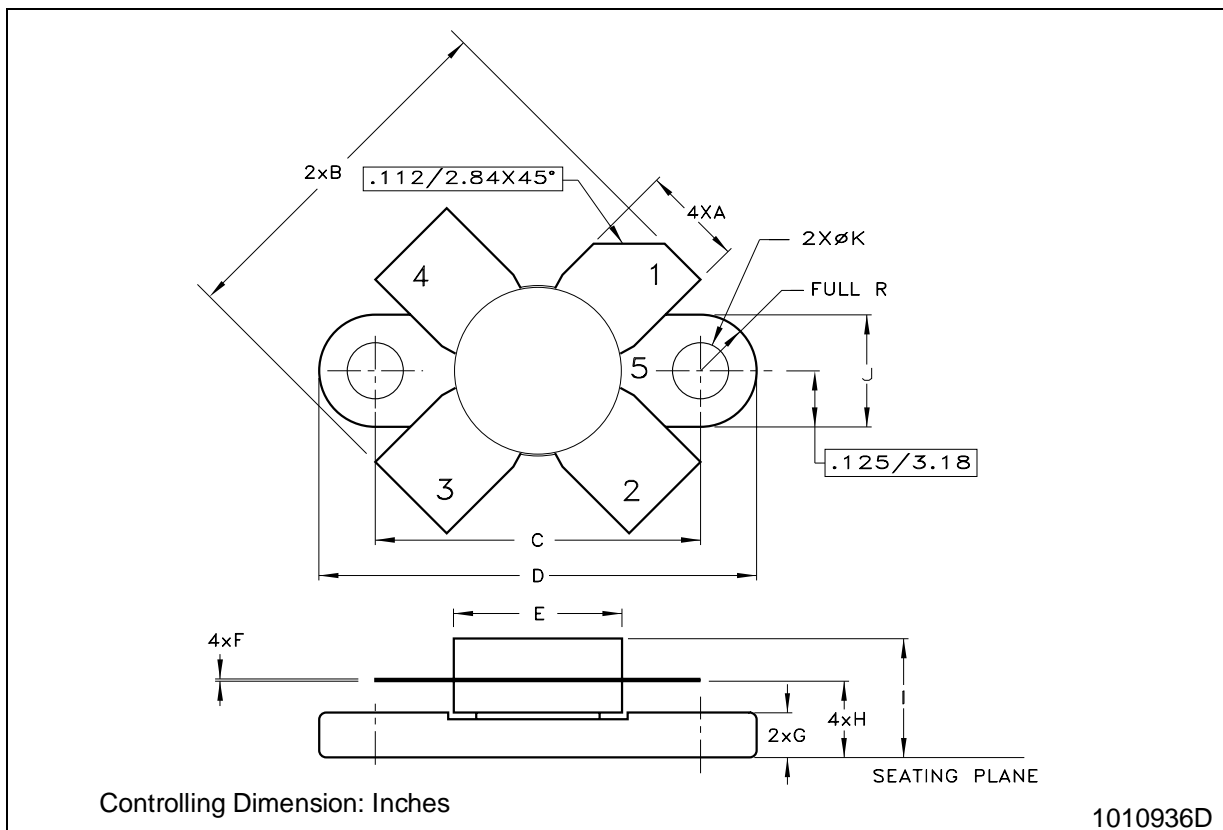


30 MHz Production Test Fixture



**M113 (.380 DIA 4/L N/HERM W/FLG) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.59		5.84	0.220		0.230
B	19.81		20.83	0.780		0.820
C	18.29		18.54	0.720		0.730
D	24.64		24.89	0.970		0.980
E	9.40		9.78	0.370		0.385
F	0.10		0.15	0.004		0.006
G	2.16		2.67	0.085		0.105
H	4.06		4.57	0.160		0.180
I			7.14			0.281
J	6.22		6.48	0.245		0.255
K	3.05		3.30	0.120		0.130



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