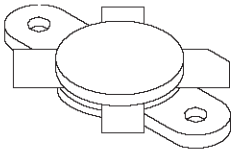
SD2900

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

- GOLD METALLIZATION
- COMMON SOURCE CONFIGURATION
- 2 - 500 MHz
- 5 WATTS
- 28 VOLTS
- 13.5 dB MIN. AT 400 MHz
- CLASS A OR AB OPERATION
- EXCELLENT THERMAL STABILITY

DESCRIPTION

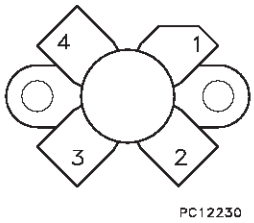
The SD2900 is a gold metallized N-Channel MOS field-effect RF power transistor. It is intended for use in 28 V DC large signal applications up to 500 MHz



M113
epoxy sealed

ORDER CODE	BRANDING
SD2900	SD2900

PIN CONNECTION



1. Drain
2. Source
3.Gate
4. Source

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

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain Source Voltage	65	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1MΩ)	65	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current	900	mA
P_{DISS}	Power Dissipation	21.9	W
T_j	Max. Operating Junction Temperature	200	°C
T_{STG}	Storage Temperature	-65 to 150	°C

THERMAL DATA

$R_{th(j-c)}$	Junction-Case Thermal Resistance	8.0	°C/W
$R_{th(c-s)}$	Case-Heatsink Thermal Resistance *	0.30	°C/W

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

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

STATIC

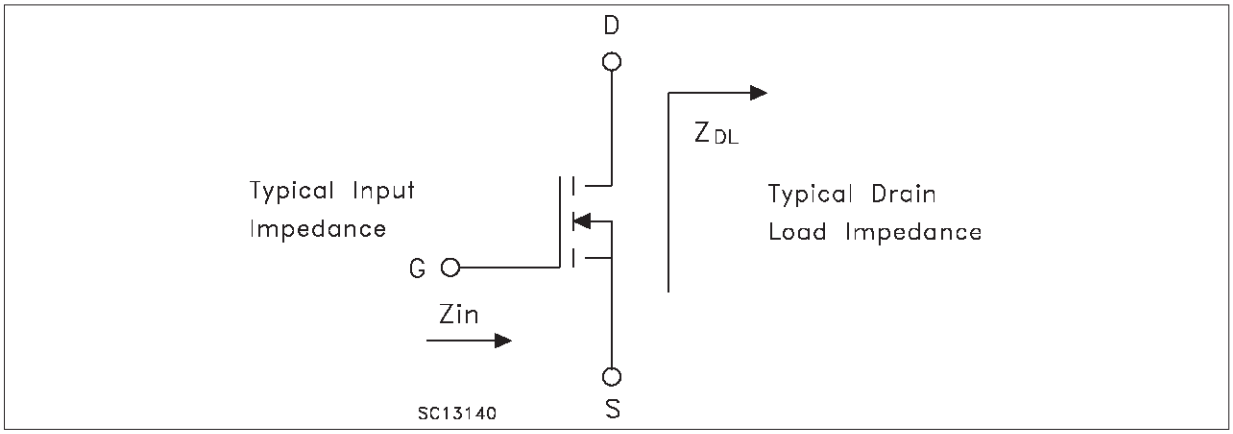
Symbol	Parameter			Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	V_{GS} = 0V	I_{DS} = 5 mA		65			V
I_{DSS}	V_{GS} = 0V	V_{DS} = 28 V				0.5	mA
I_{GSS}	V_{GS} = 20V	V_{DS} = 0 V				1.0	µA
$V_{GS(Q)}$	V_{DS} = 10V	I_D = 10 mA		1.0		6.0	V
$V_{DS(ON)}$	V_{GS} = 10V	I_D = 0.5 A				1.6	V
g_{FS}	V_{DS} = 10V	I_D = 0.5 A		0.2			mho
C_{ISS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		8.5		pF
C_{OSS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		7.8		pF
C_{RSS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		1.4		pF

REF. 1021307I

DYNAMIC

Symbol	Parameter				Min.	Typ.	Max.	Unit
P_{OUT}	f = 400 MHz	V_{DD} = 28 V		I_{DQ} = 50 mA	5			W
G_{PS}	f = 400 MHz	V_{DD} = 28 V	P_{out} = 5 W	I_{DQ} = 50 mA	13.5	16		dB
η_D	f = 400 MHz	V_{DD} = 28 V	P_{out} = 5 W	I_{DQ} = 50 mA	45	50		%
Load Mismatch	f = 400 MHz All Angles	V_{DD} = 28 V	P_{out} = 5 W	I_{DQ} = 50 mA	30:1			VSWR

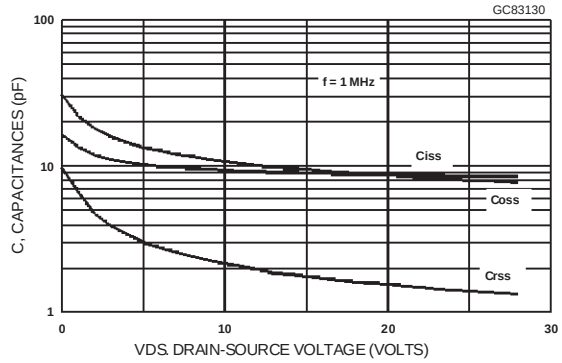
IMPEDANCE DATA



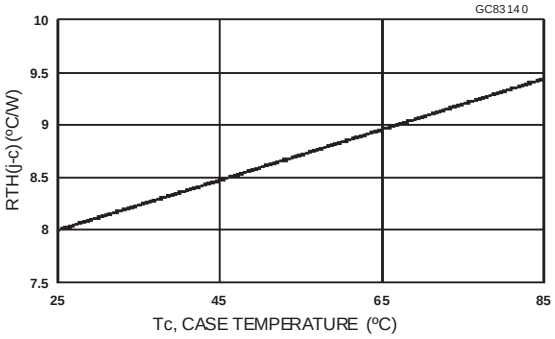
FREQ.	Z_{IN} (Ω)	Z_{DL} (Ω)
400 MHz	8.6 - j 24.6	22.6 + j 27.0

TYPICAL PERFORMANCE

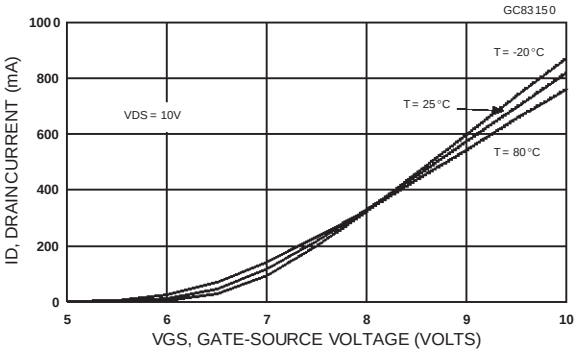
Capacitance vs Drain-Source Voltage



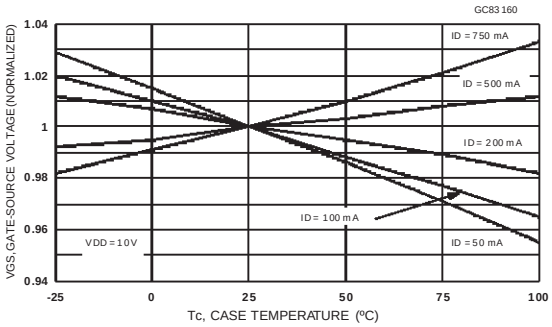
Maximum Thermal Resistance vs Case Temperature



Drain Current vs Gate Voltage

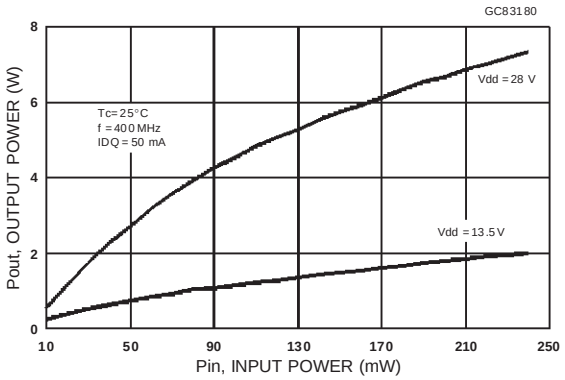


Gate-Source Voltages vs Case Temperature

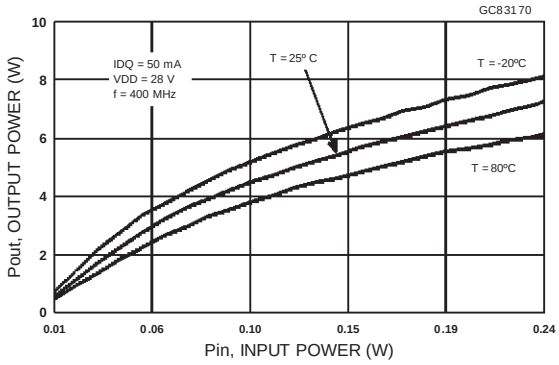


TYPICAL PERFORMANCE

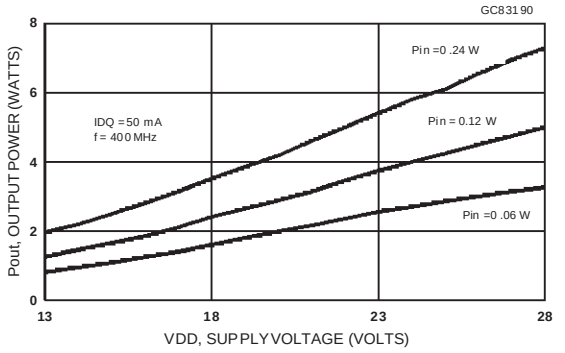
Output Power vs Input Power



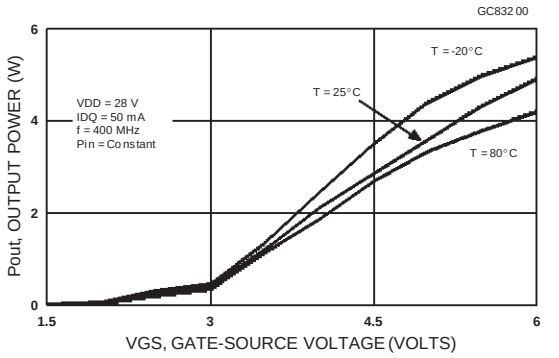
Output Power vs Input Power



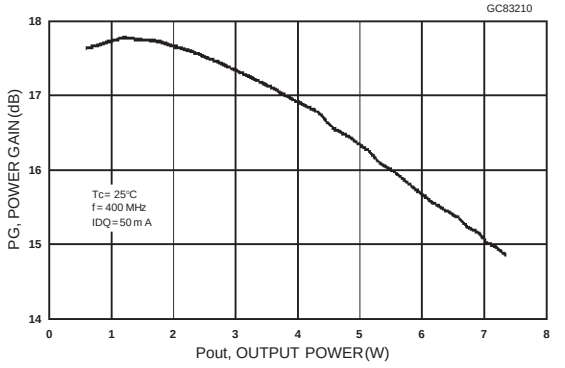
Output Power vs Voltage Supply



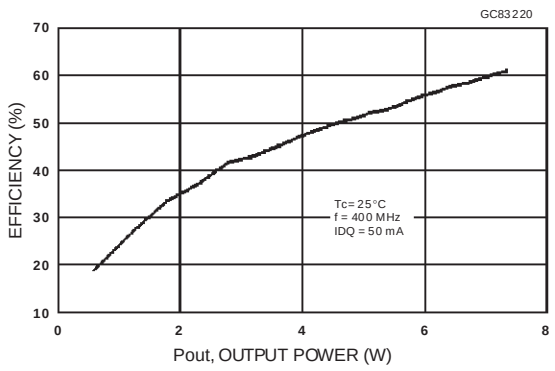
Output Power vs Gate Voltage



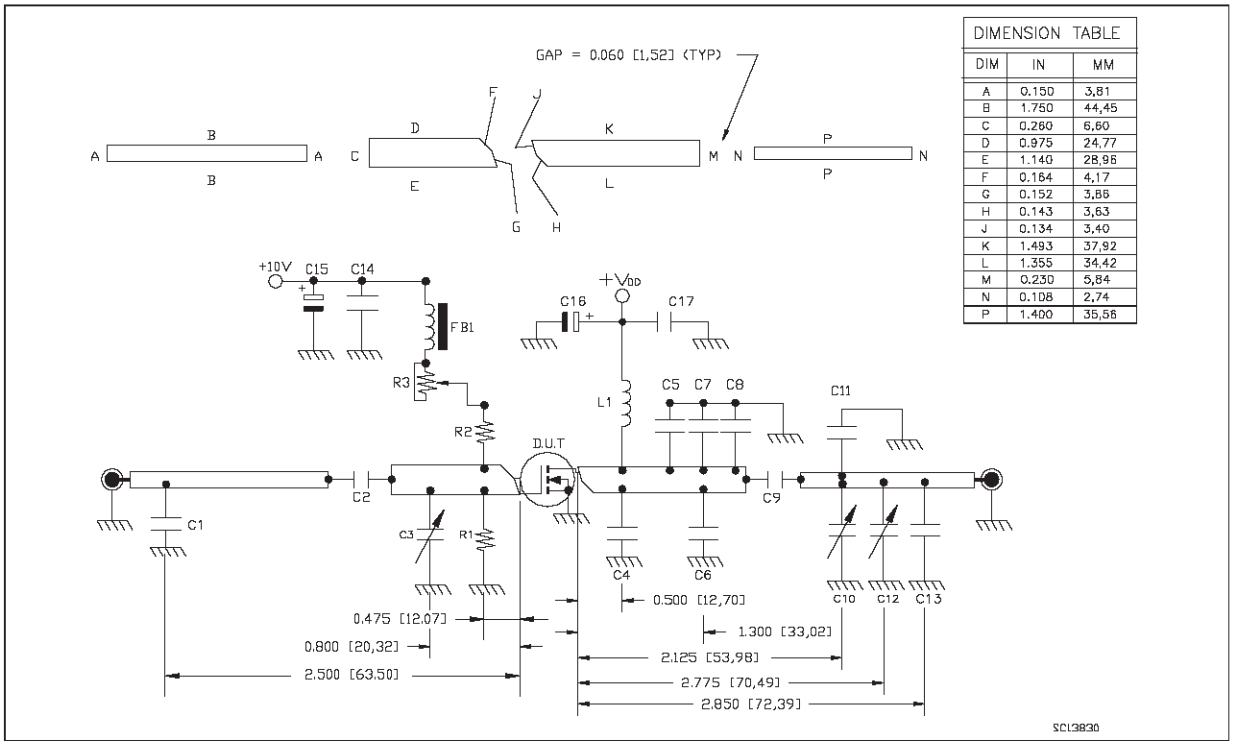
Power Gain vs Output Power



Efficiency vs Output Power



400 MHz Test Circuit Schematic



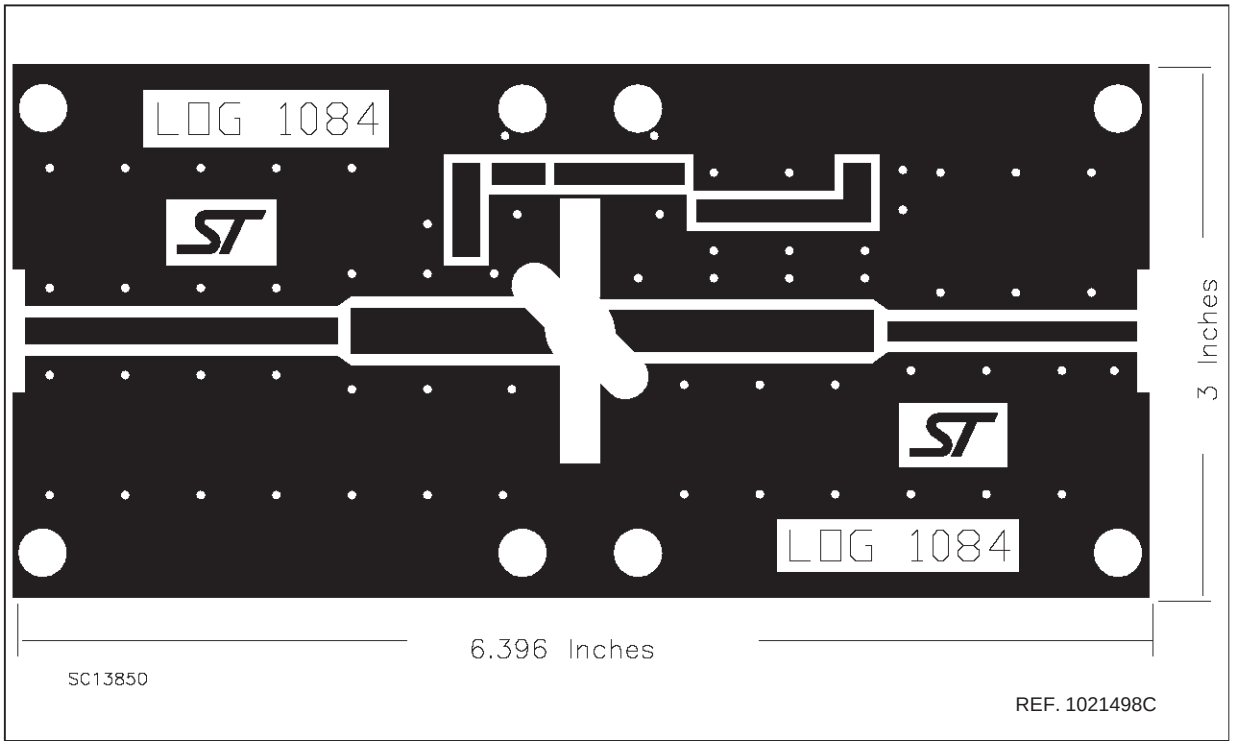
DIMENSION TABLE		
DIM	IN	MM
A	0.150	3,81
B	1.750	44,45
C	0.260	6,60
D	0.975	24,77
E	1.140	28,96
F	0.164	4,17
G	0.152	3,86
H	0.143	3,63
J	0.134	3,40
K	1.493	37,92
L	1.355	34,42
M	0.230	5,84
N	0.108	2,74
P	1.400	35,56

400 MHz Test Circuit Component Part List

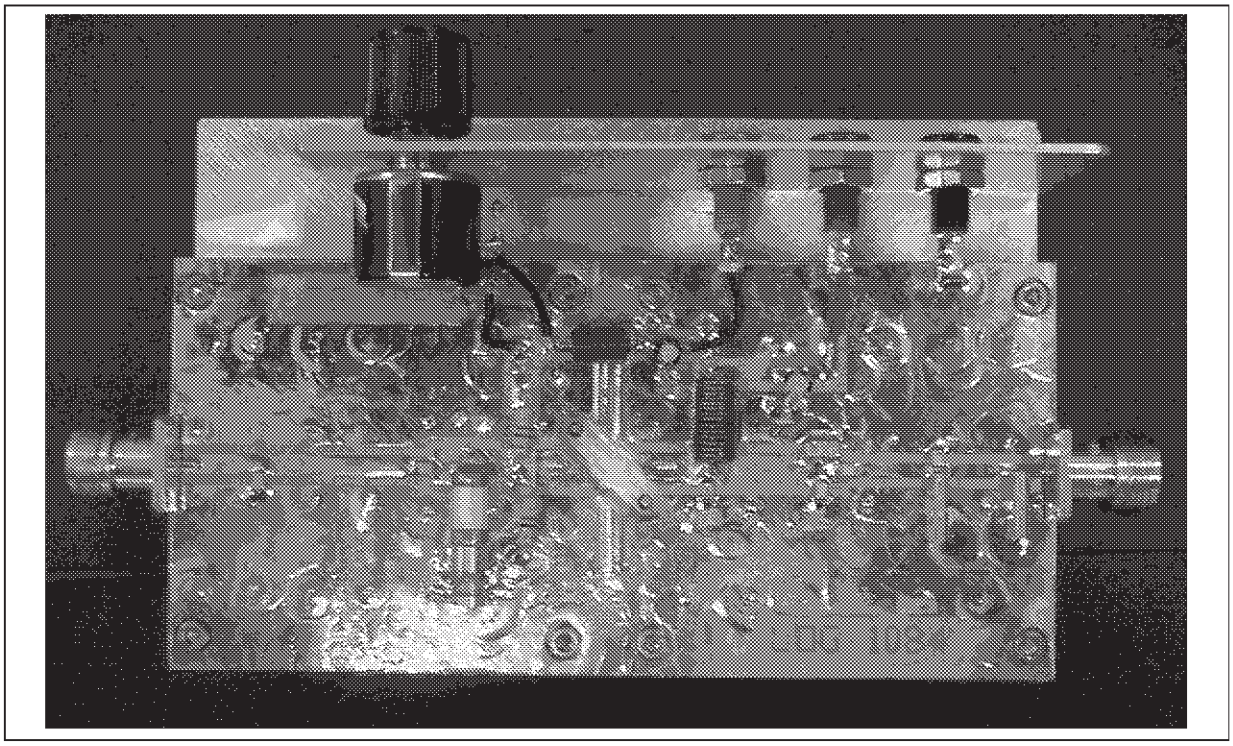
C17	ATC700B122MW50X	ATC	1200pF ATC 700B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C16	SKR100M1JD11	MALLORY	10uF / 63 V ALUMINUM ELECTROLYTICS RADIAL LEAD CAPACITOR
C15	SKR100M1JD11	MALLORY	10uF / 63 V ALUMINUM ELECTROLYTICS RADIAL LEAD CAPACITOR
C14	ATC700B122MW50X	ATC	1200pF ATC 700B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C13	ATC100B9R1KP500X	ATC	9.1pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C12	27291PC	JOHANSON	0.8–8pF GIGA–TRIM VARIABLE CAPACITOR
C11	ATC100B110KP500X	ATC	11pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C10	27291PC	JOHANSON	0.8–8pF GIGA–TRIM VARIABLE CAPACITOR
C9	ATC100B201KP300X	ATC	200pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C8	ATC100B4R3KP500X	ATC	4.3pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C7	ATC100B1R7KP500X	ATC	1.7pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C6	ATC100B9R1KP500X	ATC	9.1pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C5	ATC100B5R1KP500X	ATC	5.1pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C4	ATC100B4R3KP500X	ATC	4.3pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C3	5601PC	JOHANSON	1.0–30pF AIR DIELECTRIC VARIABLE CAPACITOR
C2	ATC100B201KP300X	ATC	200pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
C1	ATC100B180KP500X	ATC	18pF ATC 100B SURFACE MOUNT CERAMIC CHIP CAPACITOR
R3	534–1–1–203	SPECTROL	534 SERIES 20K OHM 10 TURN WIREWOUND PRECISION POTENTIOMETER
R2		YAGEO	10K / 1/2W 5% CARBON–FILM RESISTOR OR EQUIVALENT
R1		YAGEO	10K / 1/2W 5% CARBON–FILM RESISTOR OR EQUIVALENT
L1	TYPE 8076	BELDEN	INDUCTOR, 15 TURNS #20 AWG 0.250 [6,35] ID, POLY–FILM COATED MAGNET WIRE
FB1	2943666671	FAIR–RITE	2–1/2 TURN WOUND EMI SHIELD BEAD
PCB	AR4SOL06211.002	ARLON	PTFE / NON – WOVEN FIBERGLASS REINFORCED CERAMIC HYDROCARBON 0.062 THK, εr=4.5, 1oz ED Cu BOTH SIDES
COMPONENT	PART NO.	VENDOR	DESCRIPTION

SC13840

400 MHz Test Circuit Photomaster

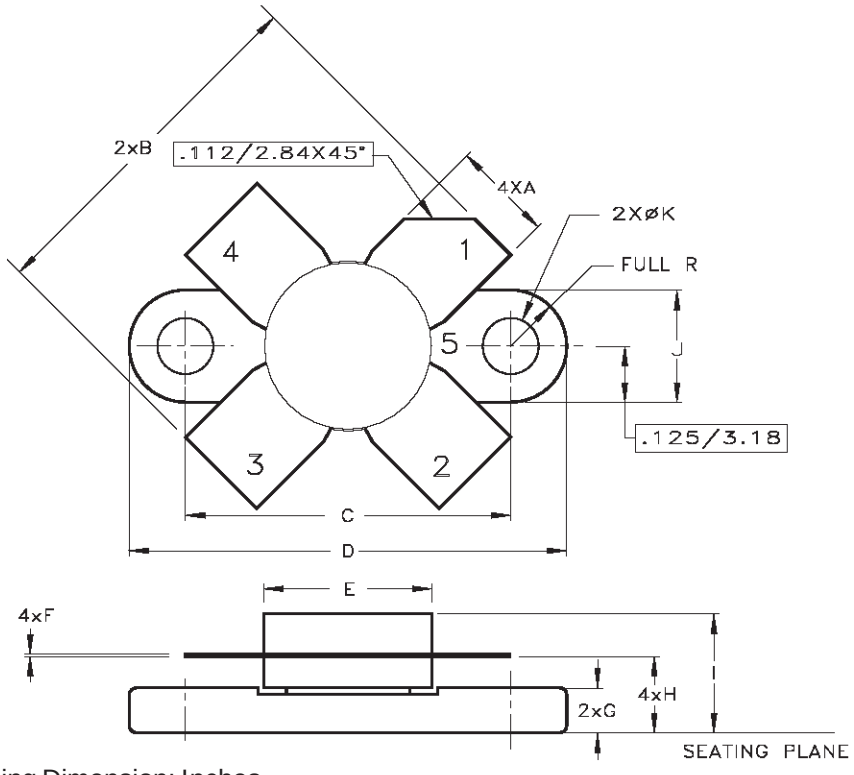


Production Test Fixture



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



Controlling Dimension: Inches

1010936D