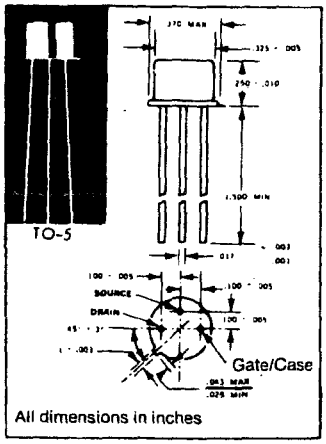
BROADBAND RF FET
SILICON EPITAXIAL JUNCTION
N-CHANNEL FIELD EFFECT TRANSISTOR

CP640
CP664
CP665
CP666

GEOMETRY 424

HIGH DYNAMIC RANGE HF AND VHF AMPLIFIER
FOR USE IN COMMON GATE CONFIGURATION

- USABLE TO OVER 300 MHz
- 50 Ohm VSWR < 1.5:1 0.5-50 MHz (FIG. 1)
- LOW NOISE FIGURE — 2.2 dB TYPICAL @ 50 MHz
- INPUT Z CONSTANT 0.5-50 MHz
- HIGH IM INTERCEPT POINT — > + 40 dBm
- HIGH TRANSCONDUCTANCE — 100,000 μmhos (TYP.)
- 1 dB COMPRESSION POINT > + 20 dBm
- DYNAMIC RANGE > 140 dB (TO 1 dB COMPRESSION)
- HIGH VOLTAGE—TO 50 V.



All dimensions in inches

ELECTRICAL DATA ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	CP 640	CP 664	CP 665	CP 666	UNITS
Drain to Source Voltage	BV_{DSO}	20	30	40	50	Volts
Drain to Gate Voltage	BV_{DGO}	20	30	40	50	Volts
Gate to Source Voltage	BV_{GSO}	−15	−20	−20	−20	Volts
Peak Drain Current	I_D	1.2	1.2	1.2	1.2	Amps
Power Dissipation 25 °C CASE	P_D	8.0	8.0	8.0	8.0	Watts
Derating Factor (slope)	DF	22	22	22	22	°C/W
Junction Temp.(Oper. & Store)	TJ	−55 °C to +200 °C				

TYPICAL TWO TONE 3rd ORDER IM PRODUCTS — CIRCUIT FIGURE 1

Tones at 3MHz/5MHz

Signal Level EMF	3rd Order Product
1 Volt	44 dB
0.3 Volt	75 dB
0.25 Volt (0dBM)	80 dB

ELECTRICAL CHARACTERISTICS: T_{CASE} = 25 °C (UNLESS OTHERWISE STATED)

PARAMETERS	CONDITIONS		SYMBOL	Min.	Typ.	Max.	UNITS
Gate Leakage Current	V_{GS} = 15V, V_{DS} = 0	25 °C	I_{GSS}		5	100	nA
		150 °C	I_{GSS}			10	μA
Operating Transconductance	V_{DS} = 15V, I_{DS} = 40 mA		g_{fg}	40	60	80	mmho
Zero Bias Transconductance	V_{DS} = 15V, V_{GS} = 0(1)		g_{fg}	75	100	200	mmho
Gate-Source Cut-Off Voltage	V_{DS} = 5V, I_{DS} = 1.0 mA		$V_{GS(off)}$	2	5	10	Volts
Zero Bias Drain Current	V_{DS} = 15V, V_{GS} = 0(1)		I_{DSS}	100	200	800	mA
Gate to Source Cap.	V_{GS} = −20V		C_{GS}		15	20	pf
Gate to Drain Cap.	V_{GD} = −20V		C_{GD}		15	20	pf
Power Gain	I_{DS} = 40mA, f = 50MHz, Fig. 1		Gpg	8	8.5	9.5	dB
Noise Figure	I_{DS} = 40mA, f = 30MHz, Fig. 1		N.F.		2.2	3.0	dB
Voltage Standing Wave Ratio	f = 0.5-50MHz, 50 Ω Source, Fig. 1		VSWR			1.5:1	
Common Gate Input Conductance	f = 0.5-50MHz, V_{DS} = 15, I_D = 40mA		g_{igs}		60		mmho
Common Gate Output Conductance	f = −50MHz, V_{DS} = 15, I_D = 40mA		g_{ogs}		0.4		mmho

(1)Pulse Measurement 1% Duty Cycle 10 mS Max.

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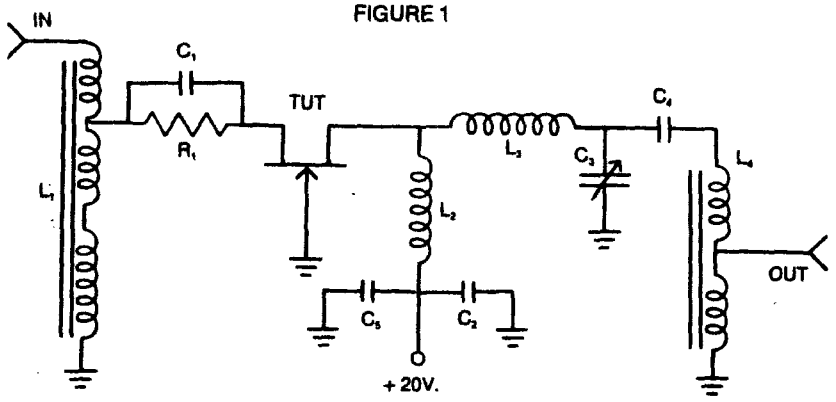
FIGURE 1

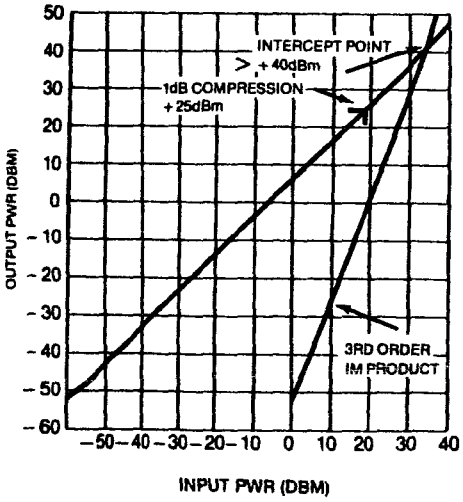


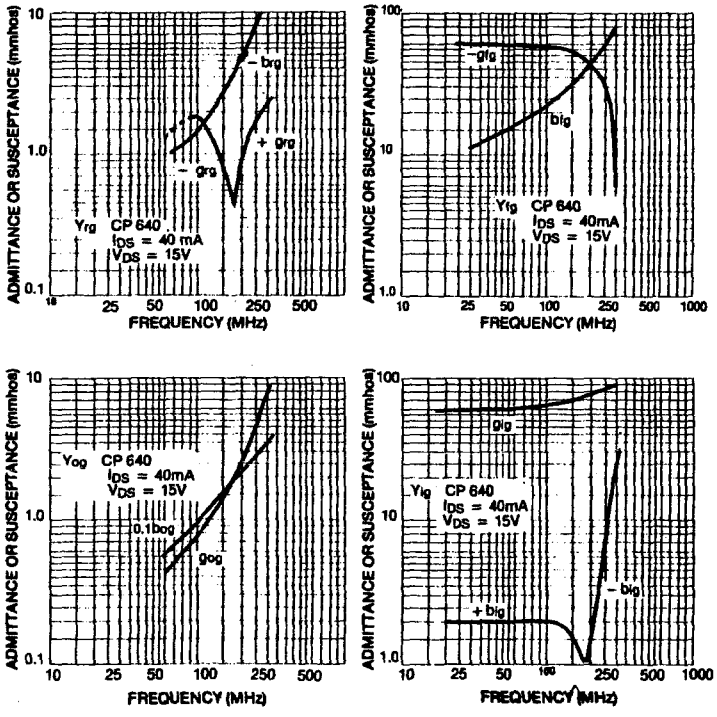
$C_1 = .1\mu f$
$C_2 = .055\mu f$
$C_3 = 3\text{-}20pF$ ARC0 420
$C_4 = .01\mu f$
$C_5 = 0.1\mu f$

R_1 = Select for 40mA I_D
L_1 = 7T. Trifilar, #32 (Note)
L_2 = 3.6mH RF Choke
L_3 = .82μH RF Choke
L_4 = 18T., Bifilar, #32 (Note)

Note — L_1 and L_4 Wound on Ferroxcube 1041T060/3D3 Core

TYPICAL INTERCEPT AND COMPRESSION POINT





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