

BROADBAND RF FET

SILICON EPITAXIAL JUNCTION

N-CHANNEL FIELD EFFECT TRANSISTOR

CP640
CP664
CP665
CP666

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 μ mhos (TYP.)
- 1 dB COMPRESSION POINT > +20 dBm
- DYNAMIC RANGE > 140 dB (TO 1 dB COMPRESSION)
- HIGH VOLTAGE — TO 50 V.

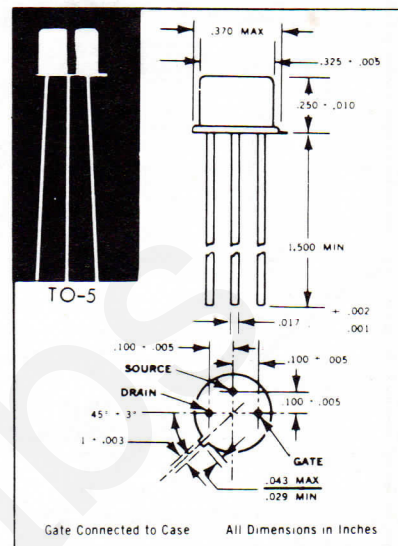


With compliments
of Island Labs

ELECTRICAL DATA

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	CP 640	CP 664	CP 665	CP 666	UNITS
Drain to Source Voltage	BVDSO	20	30	40	50	Volts
Drain to Gate Voltage	BVDGO	20	30	40	50	Volts
Gate to Source Voltage	BVGSO	-15	-20	-20	-20	Volts
Peak Drain Current	ID	1.2	1.2	1.2	1.2	Amps
Power Dissipation 25°C CASE	PD	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

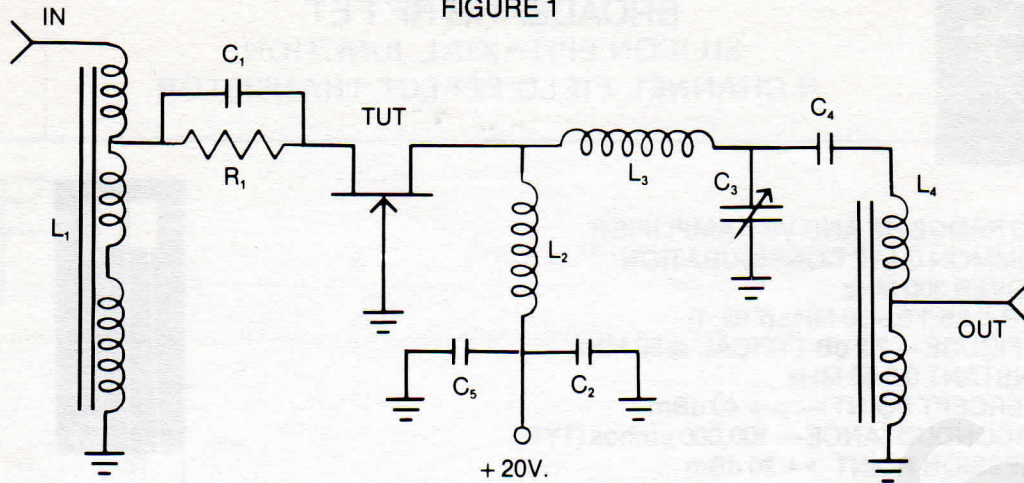
Signal Level EMF	3rd Order Product
1 Volt	-44 dB
0.3 Volt	-75 dB
0.25 Volt (OdBM)	-80 dB

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

PARAMETERS	CONDITIONS	SYMBOL				UNITS
			Min.	Typ.	Max.	
Gate Leakage Current	V _{GS} = 15V, V _{DS} = 0	25 °C	I _{GSS}	5	100	nA
		150 °C	I _{GSS}		10	μ A
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	400	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	G _{pg}	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

¹Pulse Measurement 1% Duty Cycle 10 mS Max.

FIGURE 1

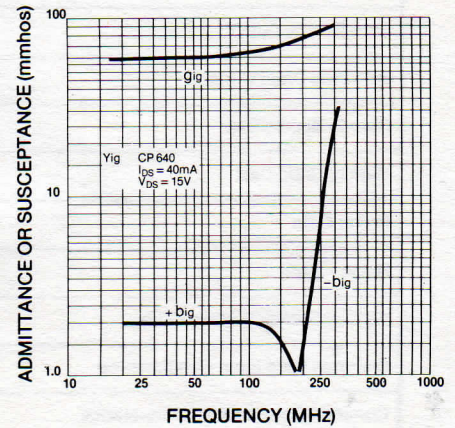
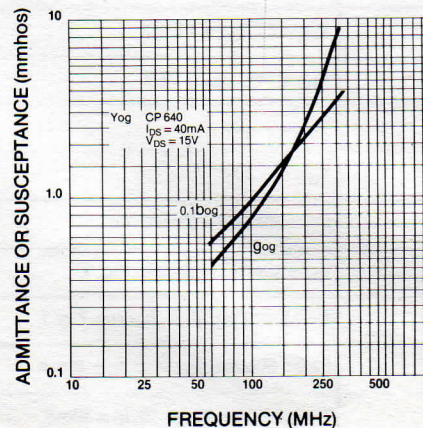
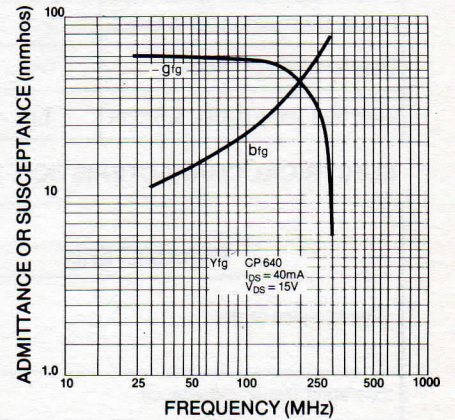
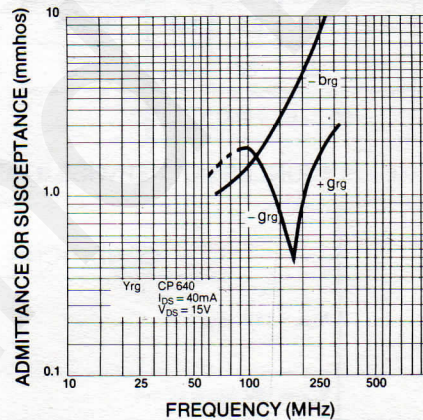
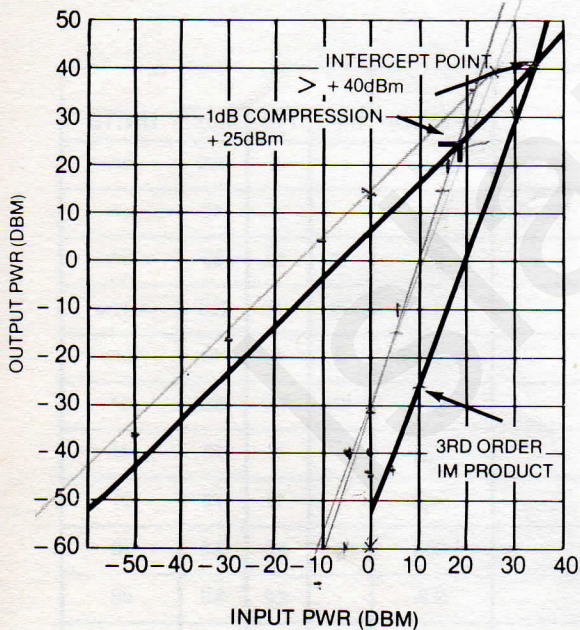


$C_1 = .1\mu f$
 $C_2 = .055\mu f$
 $C_3 = 3-20pF$ ARC0 420
 $C_4 = .01\mu f$
 $C_5 = 0.1\mu f$

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

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

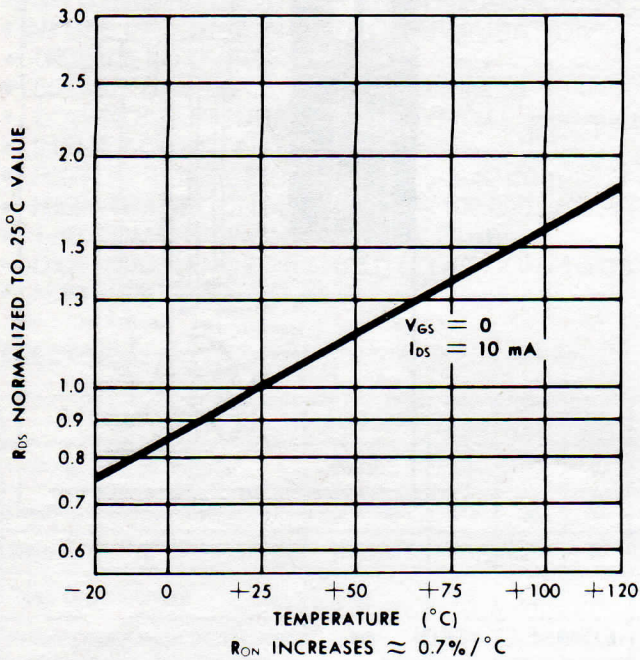
TYPICAL INTERCEPT AND COMPRESSION POINT



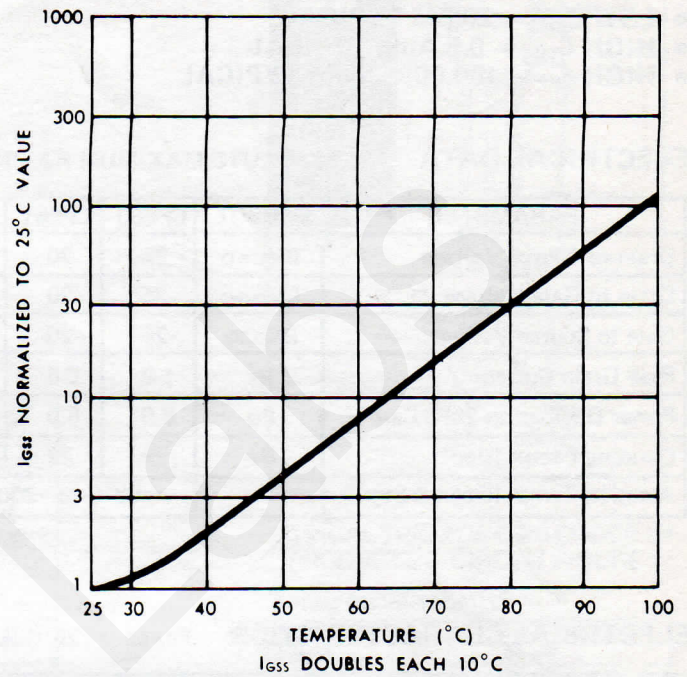


TYPICAL CHARACTERISTICS

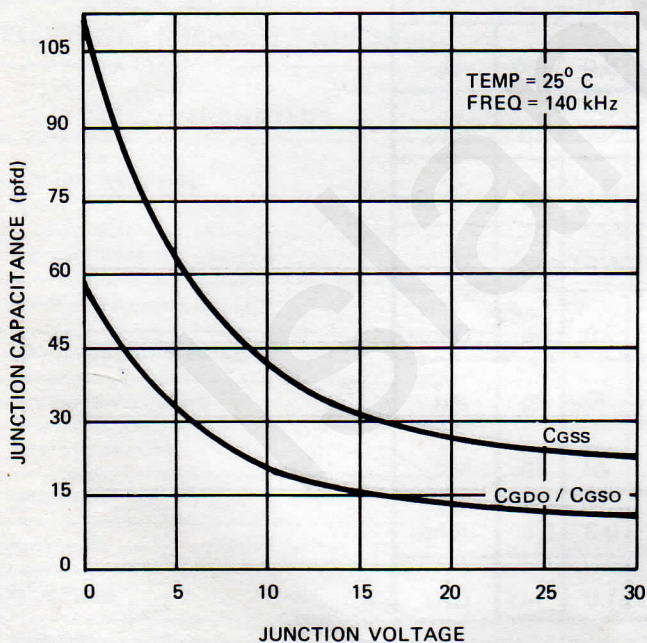
ON RESISTANCE VS. TEMPERATURE



GATE LEAKAGE CURRENT VS. TEMPERATURE



JUNCTION CAPACITANCE VS. VOLTAGE



ON RESISTANCE VS. GATE VOLTAGE

