

# POWRFET™ SILICON EPITAXIAL JUNCTION N-CHANNEL FIELD EFFECT TRANSISTOR

CP643

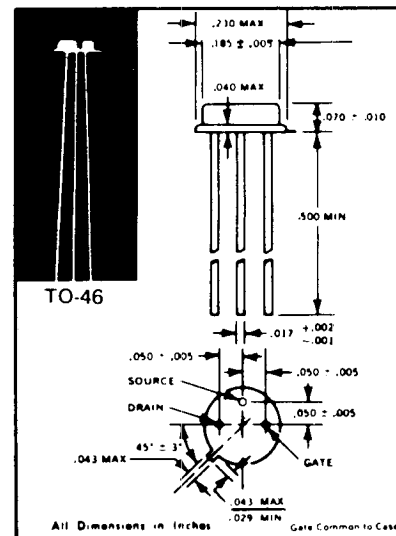
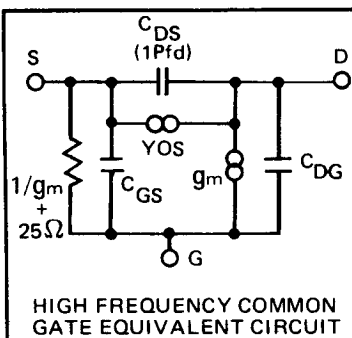
GEOMETRY 446, PG. 58

- FOR HIGH DYNAMIC RANGE R.F. AMPLIFIERS
- SPECIFIED FOR H.F. BAND – USEABLE THRU 500 MHz
- LOW NOISE FIGURE DIRECT FROM 50 Ohm LINE<sup>2</sup>

## ELECTRICAL DATA

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL		UNITS
Drain to Source Voltage	$BV_{DSO}$	30	Volts
Drain to Gate Voltage	$BV_{DGO}$	30	Volts
Gate to Source Voltage	$BV_{GSO}$	-15	Volts
Peak Drain Current	$I_D$	0.3	Amps
Power Dissipation 25°C CASE	$P_D$	2.0	Watts
Derating Factor (slope)	$DF$	87	°C/W
Junction Temp. (Oper. & Store)	$T_J$	-55°C to +200°C	



## TYPICAL CHARACTERISTICS IN CIRCUIT OF TMF 18

Dynamic Range 140 dB  
Two Tone @ 3 MHz/5MHz  
3rd Order Prod.

Signal Level	Typ. 3rd Order Product
0.25 Volt (0dBm)	-58dB

## ELECTRICAL CHARACTERISTICS: $T_{CASE} = 25^\circ C$ (UNLESS OTHERWISE STATED)

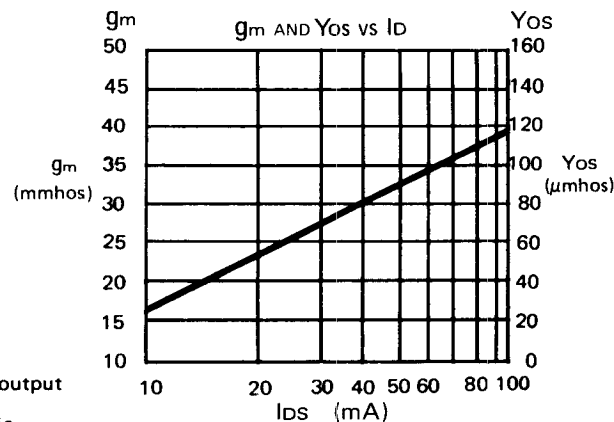
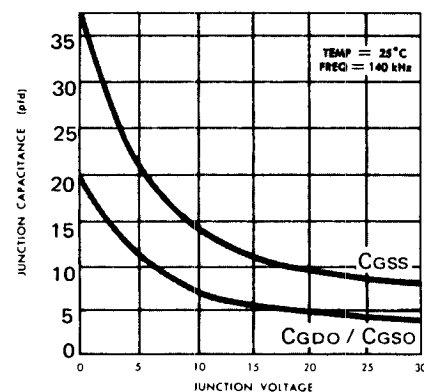
PARAMETERS AND CONDITIONS	SYMBOL	CP 643			UNITS
		Min.	Typ.	Max.	
Gate Leakage Current $V_{GS} = -15V, V_{DS} = 0$	$I_{GSS}$	—	1.0	10	nA
Gate Leakage Current $V_{GS} = -15V, V_{DS} = 0, T_C = 125^\circ C$	$I_{GSS}$	—	—	10	μA
Transconductance $V_{DS} = 15V, I_{DS} = 25 mA$	$g_m$	20	25	30	mMhos
Pinch-Off Voltage $V_{DS} = 5V, I_{DS} = 1.0 mA$	$V_{PO}$	2.0	4.0	7.0	Volts
Gain in Ckt. of TMF18 $I_{DS} = 25 mA, f = 1$ to 100 MHz.	A	8.0	9.0	10.0	dB
Gate to Source Cap. $V_{GS} = -20V$	$C_{GS}$	—	5	6	pfd
Gate to Drain Cap. $V_{GD} = -20V$	$C_{GD}$	—	5	6	pfd
Drain Current <sup>1</sup> $V_{DS} = 15V, V_{GS} = 0$	$I_{DSS}$	50	100	250	mAmps
TMF18 <sup>2</sup> $I_{DS} = 25 mA, f = 1 MHz.$	N.F.	—	4.0	5.0	dB

<sup>1</sup> Pulse Measurement 1% Duty Cycle 10 mS Max.

<sup>2</sup> The noise figure will be improved at the cost of gain when used in a 75Ω line with a 2:1 output winding ratio or in a 50Ω line with an input step up transformer.

<sup>3</sup> The gain may be raised at a sacrifice in bandwidth by increasing the output transformer ratio.

## JUNCTION CAPACITANCE VS. VOLTAGE



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