

# POWRFET™

## SILICON EPITAXIAL JUNCTION N-CHANNEL FIELD EFFECT TRANSISTOR

CP643

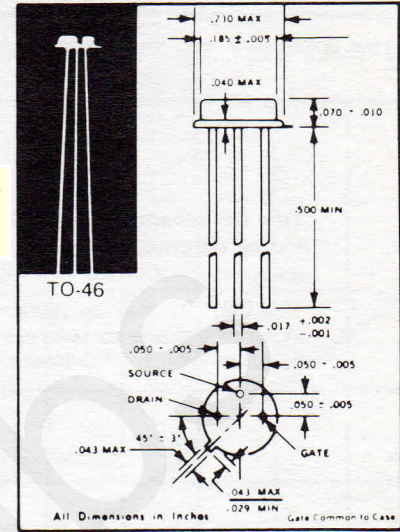
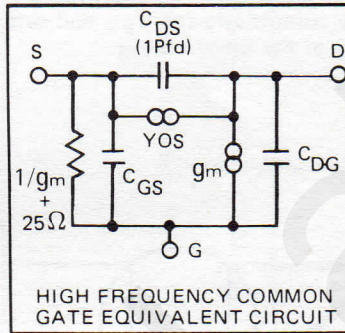
- FOR HIGH DYNAMIC RANGE R.F. AMPLIFIERS
- SPECIFIED FOR H.F. BAND – USEABLE THRU 500 MHz
- LOW NOISE FIGURE DIRECT FROM 50 Ohm LINE<sup>2</sup>



With compliments  
of Island Labs

### ELECTRICAL DATA      ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL		UNITS
Drain to Source Voltage	BV <sub>D50</sub>	30	Volts
Drain to Gate Voltage	BV <sub>DG0</sub>	30	Volts
Gate to Source Voltage	BV <sub>G50</sub>	-15	Volts
Peak Drain Current	I <sub>D</sub>	0.3	Amps
Power Dissipation 25°C CASE	P <sub>D</sub>	2.0	Watts
Derating Factor (slope)	DF	87	°C/W
Junction Temp. (Oper. & Store)	T <sub>J</sub>	-55°C to +200°C	



TYPICAL TWO TONE 3rd  
ORDER IM PRODUCTS

Tones at 3MHz/5MHz

Signal Level EMF	Typ. 3rd Order Product
0.25 Volt (OdBM)	- 58dB

### ELECTRICAL CHARACTERISTICS: T<sub>CASE</sub> = 25°C (UNLESS OTHERWISE STATED)

PARAMETERS AND CONDITIONS	SYMBOL	CP 643			UNITS
		Min.	Typ.	Max.	
Gate Leakage Current V <sub>GS</sub> = -15V, V <sub>DS</sub> = 0	I <sub>GSS</sub>	-	1.0	10	nA
Gate Leakage Current V <sub>GS</sub> = -15V, V <sub>DS</sub> = 0, T <sub>C</sub> = 125°C	I <sub>GSS</sub>	-	-	10	μA
Transconductance V <sub>DS</sub> = 15V, I <sub>DS</sub> = 25 mA	g <sub>m</sub>	20	25	30	mMhos
Pinch-Off Voltage V <sub>DS</sub> = 5V, I <sub>DS</sub> = 1.0 mA	V <sub>PO</sub>	2.0	4.0	7.0	Volts
Gain in Ckt. of TMF18 I <sub>DS</sub> = 25 mA, f = 1 to 100 MHz.	A	8.0	9.0	10.0	dB
Gate to Source Cap. V <sub>GS</sub> = -20V	C <sub>GS</sub>	-	5	6	pf
Gate to Drain Cap. V <sub>GD</sub> = -20V	C <sub>GD</sub>	-	5	6	pf
Drain Current <sup>1</sup> V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0	I <sub>DSS</sub>	50	100	250	mAmps
TMF18 <sup>2</sup> I <sub>DS</sub> = 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.

