2N5668 (SILICON)
2N5669
2N5670

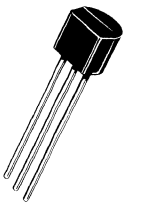
SILICON N-CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS

Depletion Mode (Type A) Junction Field-Effect Transistors designed for VHF amplifier and mixer applications.

- Low Cross Modulation and Intermodulation Distortion
- Drain and Source Interchangeable
- Low 100-MHz Noise Figure – NF = 2.5 dB (Max)
- Low Reverse Transfer and Input Capcitances – C_{rss} = 1.0 pF (Typ); C_{iss} = 4.7 pF (Typ)
- High Maximum Stable Gain Due to Drain and Gate Lead Separation

N-CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS

(Type A)

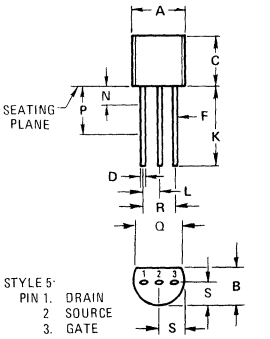


***MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	25	Vdc
*Drain-Gate Voltage	V_{DG}	25	Vdc
*Reverse Gate-Source Voltage	V_{GSR}	25	Vdc
*Forward Gate Current	I_{GF}	10	mAdc
Drain Current	I_D	20	mAdc
*Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D (1)	310 2.82	mW mW/°C
*Storage Temperature Range	T_{stg} (1)	-65 to +150	°C

*Indicates JEDEC Registered Data.

(1) Continuous package improvements have enhanced these guaranteed Maximum Ratings as follows: P_D = 1.0 W @ T_C = 25°C, Derate above 25°C – 8.0 mW/°C, T_J = -65 to +150°C, θ_{JC} = 125°C/W.



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	4.450	5.200	0.175	0.205
B	3.180	4.190	0.125	0.165
C	4.320	5.330	0.170	0.210
D	0.407	0.533	0.016	0.021
F	0.407	0.482	0.016	0.019
K	12.700	–	0.500	–
L	1.150	1.390	0.045	0.055
N	–	1.270	–	0.050
P	6.350	–	0.250	–
Q	3.430	–	0.135	–
R	2.410	2.670	0.095	0.105
S	2.030	2.670	0.080	0.105

CASE 29-02
TO-92

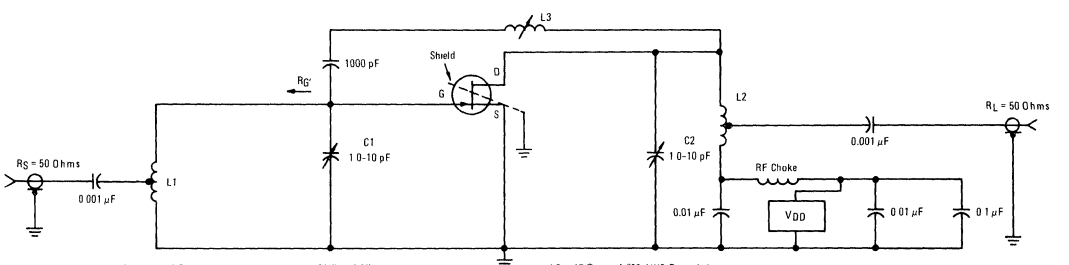
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
***OFF CHARACTERISTICS**						
Gate-Source Breakdown Voltage (I_G = 10 μAdc, V_{DS} = 0)		$V_{(BR)GSS}$	25	–	–	Vdc
Gate-Source Cutoff Voltage (V_{DS} = 15 Vdc, I_D = 10 nAdc)	2N5668	$V_{GS(off)}$	0.2	–	4.0	Vdc
	2N5669		1.0	–	6.0	
	2N5670		2.0	–	8.0	
Gate Reverse Current		I_{GSS}				
(V_{GS} = -15 Vdc, V_{DS} = 0)			–	–	2.0	nAdc
(V_{GS} = -15 Vdc, V_{DS} = 0, T_A = 100°C)			–	–	2.0	μAdc
***ON CHARACTERISTICS**						
Zero-Gate Voltage Drain Current (Note 1) (V_{DS} = 15 Vdc, V_{GS} = 0)	2N5668	I_{DSS}	1.0	–	5.0	mAdc
	2N5669		4.0	–	10	
	2N5670		8.0	–	20	
SMALL-SIGNAL CHARACTERISTICS						
*Forward Transadmittance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 kHz)	2N5668	$\lvert y_{fs} \rvert$	1500	–	6500	μmhos
	2N5669		2000	–	6500	
	2N5670		3000	–	7500	
*Forward Transconductance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 100 MHz)	2N5668	$Re(y_{fs})$	1000	–	–	μmhos
	2N5669		1600	–	–	
	2N5670		2500	–	–	
*Output Admittance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 kHz)	2N5668	$\lvert y_{os} \rvert$	–	–	20	μmhos
	2N5669		–	–	50	
	2N5670		–	–	75	
*Output Conductance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 100 MHz)	2N5668	$Re(y_{os})$	–	10	50	μmhos
	2N5669		–	25	100	
	2N5670		–	35	150	
*Input Conductance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 100 MHz)		$Re(y_{is})$	–	125	800	μmhos
*Input Capacitance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{iss}	–	4.7	7.0	pF
*Reverse Transfer Capacitance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{rss}	–	1.0	3.0	pF
Output Capacitance (V_{DS} = 15 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{oss}	–	1.4	4.0	pF
*Common Source Noise Figure (Figure 1) (V_{DS} = 15 Vdc, V_{GS} = 0, f = 100 MHz, at $R_{G'}$ = 1.0 k ohm)		NF	–	–	2.5	dB
Power Gain (Figure 1) (V_{DS} = 15 Vdc, V_{GS} = 0, f = 100 MHz)		G_{ps}	16	–	–	dB

*Indicates JEDEC Registered Data, excluding typical values.

Note 1: Pulse Test: Pulse With = 100 ms, Duty Cycle ≤ 10%.

FIGURE 1 – 100 MHz, POWER GAIN AND NOISE FIGURE TEST CIRCUIT



L1 ≈ 8.5 Turns of #14 AWG Tinned Copper, Dia ≈ 3/8", ≈ 0.9" Long Tapped at ≈ 2-1/2 Turns (adjust to give R_G = 1.0 k ohm), Parallel Resistance = 40 k ohms, tunes at ≈ 8.0 pF

L2 ≈ 13.5 Turns #16 AWG Tinned Copper, Dia ≈ 3/8", ≈ 1.2" Long Tapped at ≈ 5 Turns, Parallel Resistance = 40 k ohms, tunes at ≈ 4.0 pF

L3 ≈ 17 Turns of #28 AWG Enameled Copper Wire, Close Wound on 9/32" Ceramic Form, Tuning Provided by a Powdered Iron Slug