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NTE222
Field Effect Transistor
Dual Gate N–Channel MOSFET
TO72 Type Package

Absolute Maximum Ratings:

Drain–Source Voltage, V_{DS} 25V
Drain–Gate Voltage, V_{DG} 30V
Drain Current, I_D 50mA
Reverse Gate Current, I_G . . . . . –10mA
Forward Gate Current, I_{GF} 10mA
Total Device Dissipation (T_A = +25 C), P_D 360mW
Derate Above 25 C . . . . . 2.4mW/ C
Total Device Dissipation (T_C = +25 C), P_D 1.2mW
Derate Above 25 C . . . . . 0.8mW/ C
Operating Junction Temperature Range, T_J . . . . . –65 to +175 C
Storage Temperature Range, T_{stg} . . . . . –65 to +175 C
Lead Temperature (During Soldering), T_L . . . . . +300 C

Electrical Characteristics: (T_A = +25 C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain–Source Breakdown Voltage	$V_{(BR)DSX}$	I_D = 10μA, V_{G1} = V_{G2} = –5V	25	–	–	V
Gate 1–Source Breakdown Voltage	$V_{(BR)G1SO}$	I_{G1} = Δ10mA, Note 1	Δ6	–	Δ30	V
Gate 2–Source Breakdown Voltage	$V_{(BR)G2SO}$	I_{G2} = Δ10mA, Note 1	Δ6	–	Δ30	V
Gate 1 Leakage Current	I_{G1SS}	V_{G1S} = Δ5V, V_{G2S} = V_{DS} = 0	–	–	Δ10	nA
Gate 2 Leakage Current	I_{G2SS}	V_{G2S} = Δ5V, V_{G1S} = V_{DS} = 0	–	–	Δ10	nA
Gate 1 to Source Cutoff Voltage	$V_{G1S(off)}$	V_{DS} = 15V, V_{G2S} = 4V, I_D = 20μA	–0.5	–	–4.0	V
Gate 2 to Source Cutoff Voltage	$V_{G2S(off)}$	V_{DS} = 15V, V_{G1S} = 0V, I_D = 20μA	–0.2	–	–4.0	V
ON Characteristics (Note 2)						
Zero–Gate–Voltage Drain Current	I_{DSS}	V_{DS} = 15V, V_{G2S} = 4V, V_{G1S} = 0V	6	–	30	mA
Small–Signal Characteristics						
Forward Transfer Admittance	$\|Y_{fs}\|$	V_{DS} = 15V, V_{G2S} = 4V, V_{G1S} = 0V, f = 1kHz, Note 3	10	–	22	mmhos

Note 1. All gated breakdown voltages are measured while the device is conducting rated gate current. This insures that the gate voltage limiting network is functioning properly.

Note 2. Pulse Test: Pulse Width = 30μs, Duty Cycle μ 2%.

Note 3. This parameter must be measured with bias voltages applied for less than five (5) seconds to avoid overheating.

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Electrical Characteristics (Cont'd): (T_A = +25 C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Small−Signal Characteristics (Cont'd)						
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{G2S} = 4V, I_D = I_{DSS}, f = 1MHz	–	3.3	–	pF
Reverse Transfer Capacitance	C_{rss}	V_{DS} = 15V, V_{G2S} = 4V, I_D = 10mA, f = 1MHz	0.005	–	0.03	pF
Output Capacitance	C_{oss}	V_{DS} = 15V, V_{G2S} = 4V, I_D = I_{DSS}, f = 1MHz	–	1.4	–	pF
Functional Characteristics						
Noise Figure	NF	V_{DD} = 18V, V_{GG} = 7V, f = 200MHz	–	–	3.5	dB
		V_{DD} = 15V, V_{G2S} = 4V, I_D = 10mA, f = 200MHz	–	–	5.0	dB
Common Source Power Gain	G_{ps}	V_{DD} = 18V, V_{GG} = 7V, f = 200MHz	20	–	28	dB
		V_{DD} = 15V, V_{G2S} = 4V, I_D = 10mA, f = 200MHz	14	–	–	dB
Bandwidth	BW	V_{DD} = 18V, V_{GG} = 7V, f = 200MHz	7	–	12	MHz
		V_{DD} = 18V, f_{LO} = 245MHz, f_{RF} = 200MHz, Note 5	4	–	7	MHz
Gain Control Gate−Supply Voltage	$V_{GG(GC)}$	V_{DD} = 18V, ΔG_{ps} = 300dB, f = 200MHz, Note 4	0	–	−2.0	V

Note 4. ΔG_{ps} is defined as the change in G_{ps} from the value at V_{GG} = 7V.

Note 5. Amplitude at input from local oscillator is 3V RMS.