

# DIGITRON SEMICONDUCTORS

3N204-3N205

DUAL GATE MOSFET

## MAXIMUM RATINGS

RATING	SYMBOL	VALUE	UNIT
Drain-Source Voltage	$V_{DS}$	25	Vdc
Drain-Gate Voltage	$V_{DG}$	30	Vdc
Drain Current	$I_D$	50	mA
Reverse Gate Current	$I_G$	-10	mA
Forward Gate Current	$I_{GF}$	10	mA
Total Device Dissipation @ $T_A=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	360 2.4	mW mW/°C
Lead Temperature	$T_L$	300	°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +175	°C

## ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ unless otherwise noted)

CHARACTERISTIC	SYMBOL	MIN	MAX	UNIT
----------------	--------	-----	-----	------

### OFF CHARACTERISTICS

Drain-Source Breakdown Voltage ( $I_D=10\mu\text{A}$ , $V_{G1}=V_{G2}=-5.0\text{V}$ )	$V_{(BR)DSX}$	25	-	Vdc
Gate 1-Source Breakdown Voltage ( $I_{G1}=+/-10\text{mA}$ ) <small>Note 1</small>	$V_{(BR)G1SO}$	+/-6	+/-30	Vdc
Gate 2-Source Breakdown Voltage ( $I_{G2}=+/-10\text{mA}$ ) <small>Note 1</small>	$V_{(BR)G2SO}$	+/-6	+/-30	Vdc
Gate 1 Leakage Current ( $V_{G1S}=+/-5.0\text{V}$ , $V_{G2S}=V_{DS}=0$ )	$I_{G1SS}$	-	+/-10	nA
Gate 2 Leakage Current ( $V_{G2S}=+/-5.0\text{V}$ , $V_{G1S}=V_{DS}=0$ )	$I_{G2SS}$	-	+/-10	nA
Gate 1 to Source Cutoff Voltage ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $I_D=20\mu\text{A}$ )	$V_{G1S(off)}$	-0.5	-4.0	Vdc
Gate 2 to Source Cutoff Voltage ( $V_{DS}=15\text{V}$ , $V_{G1S}=0\text{V}$ , $I_D=20\mu\text{A}$ )	$V_{G2S(off)}$	-0.2	-4.0	Vdc

### ON CHARACTERISTICS

Zero-Gate-Voltage Drain Current * ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $V_{G1S}=0\text{V}$ )	$I_{DSS}^*$	6	30	mA
--	-------------	---	----	----

### SMALL SIGNAL CHARACTERISTICS

Forward Transfer Admittance ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $V_{G1S}=0\text{V}$ , $f=1.0\text{kHz}$ ) <small>Note 2</small>	$ Y_{fs} $	10	22	mmhos
Input Capacitance ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $I_D=I_{DSS}$ , $f=1.0\text{MHz}$ )	$C_{iss}$	TYP. 3.0		pF
Reverse Transfer Capacitance ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $I_D=10\text{mA}$ , $f=1.0\text{MHz}$ )	$C_{rss}$	0.005	0.03	pF
Output Capacitance ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $I_D=I_{DSS}$ , $f=1.0\text{MHz}$ )	$C_{oss}$	TYP. 1.4		pF

### FUNCTIONAL CHARACTERISTICS

Noise Figure ( $V_{DD}=18\text{V}$ , $V_{GG}=7.0\text{V}$ , $f=200\text{MHz}$ ) 3N204 ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $I_D=10\text{mA}$ , $f=450\text{MHz}$ ) 3N204	NF	-	3.5 5.0	dB
Common Source Power Gain ( $V_{DD}=18\text{V}$ , $V_{GG}=7.0\text{V}$ , $f=200\text{MHz}$ ) 3N204 ( $V_{DS}=15\text{V}$ , $V_{G2S}=4.0\text{V}$ , $I_D=10\text{mA}$ , $f=450\text{MHz}$ ) 3N204	$G_{ps}$	20 14	28 -	dB
Bandwidth ( $V_{DD}=18\text{V}$ , $V_{GG}=7.0\text{V}$ , $f=200\text{MHz}$ ) 3N204 ( $V_{DD}=18\text{V}$ , $f_{LO}=245\text{MHz}$ , $f_{RF}=200\text{MHz}$ ) <small>Note 4</small> 3N205	BW	7.0 4.0	12 7.0	MHz
Gain Control Gate Supply Voltage <small>(Note 3)</small> ( $V_{DD}=18\text{V}$ , $\Delta G_{ps}=300\text{dB}$ , $f=200\text{MHz}$ ) 3N204	$V_{GG(GC)}$	0	-2.0	Vdc
Conversion Gain <small>(Note 4)</small> ( $V_{DD}=18\text{V}$ , $f_{LO}=245\text{MHz}$ , $f_{RF}=200\text{MHz}$ ) 3N205	$G_{(conv.)}$	17	28	dB

\*PW=30 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

- 1) All gate breakdown voltages are measured while the device is conducting rated gate current. This insures that the gate voltage limiting network is functioning properly.
- 2) This parameter must be measured with bias voltages applied for less than five (5) seconds to avoid overheating.
- 3)  $\Delta G_{ps}$  is defined as the change in  $G_{ps}$  from the value at  $V_{GG}=7.0\text{V}$ .
- 4) Amplitude at input from local oscillator is 3 volts RMS.

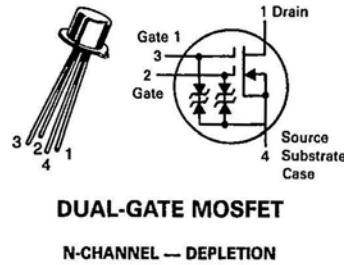
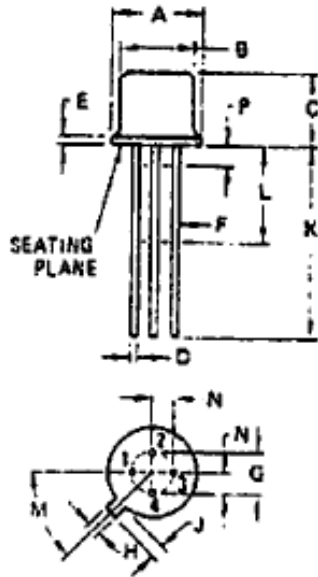
# DIGITRON SEMICONDUCTORS

3N204-3N205

DUAL GATE MOSFET

## MECHANICAL CHARACTERISTICS

Case:	TO-72
-------	-------



Dim	Inches		Millimeters	
	Min	Max	Min	Max
A	-	0.230	-	5.840
B	-	0.195	-	4.950
C	-	0.210	-	5.330
D	-	0.021	-	0.530
E	-	0.030	-	0.760
F	-	0.019	-	0.480
G	0.100 BSC		2.540 BSC	
H	-	0.046	-	1.170
J	-	0.0480	-	1.220
K	0.500	-	12.700	-
L	0.250	-	6.350	-
M	45°C BSC		45°C BSC	
N	0.050 BSC		1.270 BSC	
P	-	0.050	-	1.270

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.