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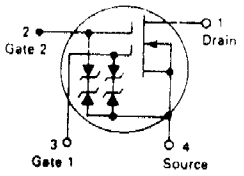
MFE209

N-CHANNEL DUAL-GATE SILICON-NITRIDE PASSIVATED MOS FIELD-EFFECT TRANSISTOR

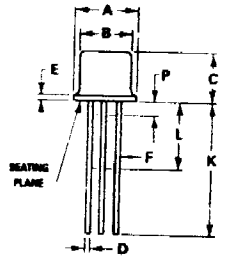
MAXIMUM RATINGS

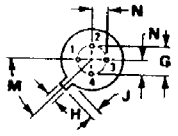
Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSX}	20	Vdc
Drain-Gate Voltage	V_{DG1} V_{DG2}	30 30	Vdc
Gate Current	I_{G1R} I_{G1F} I_{G2R} I_{G2F}	−10 10 −10 10	mAdc
Drain Current — Continuous	I_D	30	mAdc
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	300 1.71	mW mW/°C
Storage Channel Temperature Range	T_{stg}	−65 to +200	°C
Operating Channel Temperature	$T_{channel}$	200	°C
Lead Temperature, 1/16" From Seated Surface for 10 Seconds	T_L	260	°C



PIN 1. DRAIN
2. GATE 2
3. GATE 1
4. SOURCE, SUBSTRATE AND CASE

TO-72





NOTE: ALL RULES AND NOTES ASSOCIATED WITH TO-72 OUTLINE SHALL APPLY.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.32	5.33	0.170	0.210
D	0.41	0.53	0.016	0.021
E	—	0.76	—	0.030
F	0.41	0.48	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.91	1.17	0.036	0.046
J	0.71	1.22	0.028	0.048
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
N	1.27 BSC		0.050 BSC	
P	—	1.27	—	0.050

All JEDEC dimensions and notes apply.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage (I_D = 10 μAdc, V_{G1S} = −4.0 Vdc, V_{G2S} = 4.0 Vdc)	$V_{(BR)DSX}$	20	—	—	Vdc
Gate 1 — Source Breakdown Voltage (I_{G1} = 10 mAdc, V_{G2S} = V_{DS} = 0)	$V_{(BR)G1SSF}$	7.0	—	22	Vdc
Gate 1 — Source Reverse Breakdown Voltage (I_{G1} = −10 mAdc, V_{G2S} = V_{DS} = 0)	$V_{(BR)G1SSR}$	7.0	—	22	Vdc
Gate 2 — Source Forward Breakdown Voltage (I_{G2} = 10 mAdc, V_{G1S} = V_{DS} = 0)	$V_{(BR)G2SSF}$	7.0	—	22	Vdc
Gate 2 — Source Reverse Breakdown Voltage (I_{G2} = −10 mAdc, V_{G1S} = V_{DS} = 0)	$V_{(BR)G2SSR}$	7.0	—	22	Vdc
Gate 1 — Source Cutoff Voltage (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 50 μAdc)	$V_{G1S(off)}$	0.1	—	4.0	Vdc
Gate 2 — Source Cutoff Voltage (V_{DS} = 15 Vdc, V_{G1S} = 0, I_D = 50 μAdc)	$V_{G2S(off)}$	0.1	—	4.0	Vdc
Gate 1 — Terminal Forward Current (V_{G1S} = 6.0 Vdc, V_{G2S} = V_{DS} = 0)	I_{G1SSF}	—	—	20	nAdc
Gate 1 — Terminal Reverse Current (V_{G1S} = −6.0 Vdc, V_{G2S} = V_{DS} = 0) (V_{G1S} = −6.0 Vdc, V_{G2S} = V_{DS} = 0, T_A = 150°C)	I_{G1SSR}	— —	— —	−20 −10	nAdc μAdc
Gate 2 — Terminal Forward Current (V_{G2S} = 6.0 Vdc, V_{G1S} = V_{DS} = 0)	I_{G2SSF}	—	—	20	nAdc
Gate 2 — Terminal Reverse Current (V_{G2S} = −6.0 Vdc, V_{G1S} = V_{DS} = 0) (V_{G2S} = −6.0 Vdc, V_{G1S} = V_{DS} = 0, T_A = 150°C)	I_{G2SSR}	— —	— —	−20 −10	nAdc μAdc
ON CHARACTERISTICS					
Gate 1 — Zero Voltage Drain Current (V_{DS} = 15 Vdc, V_{G1S} = 0, V_{G2S} = 4.0 Vdc)	I_{DSS}	5.0	—	30	mAdc
SMALL-SIGNAL CHARACTERISTICS					
Forward Transfer Admittance (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 10 mAdc, f = 1.0 kHz)	$\|Y_{fs}\|$	10	13	20	mmhos
Input Capacitance (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 5.0 mAdc, f = 1.0 MHz)	C_{iss}	—	4.5	7.0	pF
Reverse Transfer Capacitance (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 5.0 mAdc, f = 1.0 MHz)	C_{rss}	0.005	0.023	0.03	pF
Output Capacitance (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 5.0 mAdc, f = 1.0 MHz)	C_{oss}	0.5	2.0	4.0	pF
Common-Source Noise Figure (Figure 11) (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 10 mAdc, f = 500 MHz)	NF	—	4.5	6.0	dB
Common-Source Power Gain (Figure 11) (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 10 mAdc, f = 500 MHz)	G_{ps}	10	13	20	dB
Bandwidth (V_{DS} = 15 Vdc, V_{G2S} = 4.0 Vdc, I_D = 10 mAdc, f = 500 MHz)	BW	7.0	—	17	MHz

Quality Semi-Conductors