LOW NOISE LOW DRIFT MONOLITHIC DUAL SILICON NITROX® FIELD EFFECT TRANSISTORS

DIFFUSED ISOLATED

LOW NOISE ..... e_n = 8nV/$\sqrt{Hz}$ TYP.

LOW LEAKAGE ..... I_G = 50pA max.

LOW DRIFT ..... $\left|\frac{\Delta V_{GS_{1-2}}}{\Delta T}\right|$ = 5μV/°C max.

LOW OFFSET VOLTAGE ..... $|V_{GS_{1-2}}|$ = 5mV max.

LINEAR TEMPERATURE TRACKING TDN = ±1μV/°C

ABSOLUTE MAXIMUM RATINGS (Note 1)

@ 25°C (unless otherwise noted)

Maximum Temperatures

Storage Temperature	-65°	to	+150°C
Operating Junction Temperature			+150°C
Lead Temperature (Soldering, 10 second time limit)			+300°C

Maximum Power Dissipation

Device Dissipation @ Free Air-Total	400mW

Maximum Voltage and Current for Each Transistor

$-V_{GSS}$	Gate to Drain or Source Voltage	60V
$-V_{DSO}$	Drain to Source Voltage	60V
$-I_{G(f)}$	Forward Current	50mA

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTICS	MP 840	MP 841	MP 842	UNITS	CONDITIONS
$\left\|\frac{\Delta V_{GS_{1-2}}}{\Delta T}\right\|$ max.	Drift vs Temperature	5	10	40	μV/°C	V_{DG} = 20V, I_D = 200μA T_A = -55°C to +25°C to +125°C
$\|V_{GS_{1-2}}\|$ max.	Offset Voltage, +25°C	5	5	25	mV	
TDN typ	Temp Drift Nonlinearity	±1	±1	±1	μV/°C	V_{DG} = 20V, I_D = 200μA T_A = -55°C to +25°C to +125°C
TDN max.		±3	±3	±3	μV/°C	

Notes and Additional Electrical Characteristics on next page.

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
	Transconductance					
Y_{fss}	Full Conduction	1000		4000	µmho	V_{DG} = 20V, V_{GS} = 0, f = 1kHz
Y_{fs}	Typical Operation	500		1000	µmho	
$\left\|\frac{Y_{fs_{1-2}}}{Y_{fs}}\right\|$	Mismatch	–	0.6	3	%	V_{DG} = 20V, I_D = 200µA
	Drain Current					
I_{DSS}	Full Conduction	0.5	2	5	mA	
$\left\|\frac{I_{DSS_{1-2}}}{I_{DSS}}\right\|$	Mismatch at Full Conduction	–	1	5	%	V_{DG} = 20V, V_{GS} = 0
	Gate Current					
$-I_G$	Operating	–	10	50	pA	V_{DG} = 20V, I_D = 200µA
$-I_G$	High Temperature	–	–	50	nA	V_{DG} = 20V, I_D = 200µA, T_A = +125°C
$-I_G$	Reduced V_{DG}	–	5	–	pA	V_{DG} = 10V, I_D = 200µA
I_G (f) D*	Forward Current	–	–	50	mA	Any Condition
$-I_{GSS}$	At Full Conduction	–	–	100	pA	V_{DG} = 20V, V_{DS} = 0
	Output Conductance					
Y_{oss}	Full Conduction	–	–	10	µmho	V_{DG} = 20V, V_{GS} = 0
Y_{os}	Operating	–	0.1	1	µmho	V_{DG} = 20V, I_D = 200µA
$\left\|Y_{os_{1-2}}\right\|$	Differential	–	0.01	0.1	µmho	
	Common Mode Rejection					
CMR	$-20 \log \left\|\frac{\Delta V_{GS_{1-2}}}{\Delta V_{DS}}\right\|$	–	100	–	dB	ΔV_{DS} = 10 to 20V, I_D = 200µA
CMR		–	75	–	dB	ΔV_{DS} = 5 to 10V, I_D = 200µA
	Gate Voltage					
$V_{GS(off)}$ or V_P	Pinchoff Voltage	1	2	4.5	V	V_{DS} = 20V, I_D = 1nA
V_{GS}	Operating Range	0.5	–	4	V	V_{DS} = 20V, I_D = 200µA
BV_{GSS}	Breakdown Voltage	60	–	–	V	V_{DS} = 0, I_D = 1nA
V_{GSS} D*	To Source or Drain	–	–	60	V	Any Condition
V_{GGO}	Gate-to-Gate Breakdown	60	–		V	I_G = 1nA, I_D = 0, I_S = 0
V_{DSO} D*	Drain-Source Voltage	–	–	60	V	Any Condition
	Noise					
NF	Figure	–	–	0.5	dB	V_{DS} = 20V, V_{GS} = 0, R_G = 10MΩ f = 100Hz, NBW = 6Hz
e_n	Voltage	–		15	nV/√Hz	V_{DS} = 20V, I_D = 200µA, f = 10Hz NBW = 1Hz
e_n	Voltage			10	nV/√Hz	V_{DS} = 20V, I_D = 200µA, f = 1kHz NBW = 1Hz
	Capacitance					
C_{iss}	Input	–	–	10	pF	V_{DS} = 20V, I_D = 200µA
C_{rss}	Reverse Transfer	–	–	5	pF	
C_{dd}	Drain to Drain	–	0.1	–	pF	V_{DG} = 20V, I_D = 200µA
	Temperature					
T_S D*	Storage	-65	–	+150	°C	Any Condition
T_J D*	Junction	–	–	+150	°C	Any Condition
T_L D*	Lead	–	–	+300	°C	10 sec. max.-1/16" or more from case
P_D D*	Dissipation - both sides	–	–	400	mW	T_A = +25°C, Derate 3.3mW/°C

*Note: These ratings are limiting values above which the serviceability of any semiconductor may be impaired.