MICRO POWER SYSTEMS

MP5911 • 5912 • 5912C

WIDEBAND HIGH GAIN MONOLITHIC DUAL SILICON NITROX® FIELD EFFECT TRANSISTORS

HIGH TRANSCONDUCTANCE THROUGH 100MHz .... g_{fs} = 4000μmho

LOW INPUT CAPACITANCE

MATCHING CHARACTERISTICS ARE SPECIFIED

ABSOLUTE MAXIMUM RATINGS (Note 4)
@ 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)		+200°C

Maximum Power Dissipation

Device Dissipation @ Free Air-Total	500mW

Maximum Voltage and Current for Each Transistor

$-V_{GSS}$	Gate to Drain or Source Voltage	35 V
$-V_{DSO}$	Drain to Source Voltage	30V
$-I_{G(f)}$	Forward Current	50mA

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTIC	MP5911 Min	MP5911 Max	MP5912 Min	MP5912 Max	MP5912C Min	MP5912C Max	UNIT	CONDITIONS
$\|I_{G1}-I_{G2}\|$	Differential Gate Current		20		20		20	nA	V_{DG} = 10 V, I_D = 5 mA, T_A = 125°C
$\frac{I_{DSS1}}{I_{DSS2}}$	Saturation Drain Current Ratio (Notes 1 and 2)	0.95	1	0.95	1	0.95	1	–	V_{DS} = 10 V, V_{GS} = 0
$\|V_{GS1}-V_{GS2}\|$	Differential Gate-Source Voltage		10		15		40	mV	V_{DG} = 10 V, I_D = 5 mA, T_A = 25°C
$\frac{\Delta\|V_{GS1}-V_{GS2}\|}{\Delta T}$	Gate-Source Voltage Differential Drift (note 3)		20		40		40	μV/°C	V_{DG} = 10 V, I_D = 5 mA, T_A = 25°C, T_B = 125°C
			20		40		40		T_A = -55°C, T_B = 25°C
$\frac{g_{fs1}}{g_{fs2}}$	Transconductance Ratio (Note 2)	0.95	1	0.95	1	0.95	1	–	f = 1 kHz

Notes and Additional Electrical Characteristics on next page.

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

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	CONDITIONS	
I_{GSS}	Gate Reverse Current		-50	pA	V_{GS} = −15 V, V_{DS} = 0	
			-200	nA		T_A = 125°C
BV_{GSS}	Gate-Source Breakdown Voltage	-25		V	I_G = −1 μA, V_{DS} = 0	
$V_{GS(off)}$	Gate-Source Cutoff Voltage	-1	-5	V	V_{DS} = 10 V, I_D = 1 nA	
V_{GS}	Gate-Source Voltage	-0.3	-4	V	V_{DG} = 10 V, I_D = 5 mA	
I_G	Gate Operating Current		-50	pA		
			-50	nA		T_A = 125°C
I_{DSS}	Saturation Drain Current (Note 1)	7	40	mA	V_{DS} = 10 V, V_{GS} = 0 V	
g_{fs}	Common-Source Forward Transconductance	4000	10,000	μmho	V_{DG} = 10 V, I_D = 5 mA	f = 1 kHz
g_{fs}	Common-Source Forward Transconductance	4000	10,000	μmho		f = 100MHz
g_{os}	Common-Source Output Conductance		100	μmho		f = 1 kHz
g_{os}	Common-Source Output Conductance		150	μmho		f = 100MHz
C_{iss}	Common-Source Input Capacitance		5	pF		f = 1 MHz
C_{rss}	Common-Source Reverse Transfer Capacitance		1.2	pF		f = 1 MHz
$\bar{e}_n$	Equivalent Short Circuit Input Noise Voltage		20	$\frac{nV}{\sqrt{Hz}}$		f = 10 kHz
NF	Spot Noise Figure		1	dB		f = 10 kHz, R_G = 100K

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Notes:
1. **Pulsewidth < 300 μs, duty cycle < 3%.**
2. **Assumes smaller value in numerator.**
3. **Measured at end points, T_A and T_B.**
4. **These ratings are limiting values above which the serviceability of any semiconductor may be impaired.**

Monolithic Dual N Channel J-FETs

The following summary specifications are Micro Power Systems in-house types from which the above industry standard types are derived.

Parameter	$\lvert V_{GS1}-V_{GS2}\rvert$	$\Delta V_{GS}/\Delta T$	Y_{fss}	Y_{fs1}/Y_{fs2}	I_G	BV_{GSS}	V_P	I_{DSS}	I_{DSS}
Units	mV (Max)	µV/°C (Max)	µmho (Min)	(Min)	pA (Max)	V (Min)	V (Max)	mA (Min)	mA (Max)
General Purpose									
MP3954A	10	5	1000	0.97	50	60	4.5	0.5	5
MP3954	10	10	1000	0.97	50	60	4.5	0.5	5
MP3955	25	25	1000	0.97	50	60	4.5	0.5	5
MP3956	25	50	1000	0.97	50	60	4.5	0.5	5
MP3958	25	100	1000	0.97	50	60	4.5	0.5	5
Low Leakage									
MP830	25	5	70	0.95	0.1	40	4.5	0.06	1
MP831	25	10	70	0.95	0.1	40	4.5	0.06	1
MP832	25	20	70	0.95	0.1	40	4.5	0.06	1
MP833	25	75	70	0.95	0.5	40	4.5	0.06	1
MP5905	25	75	70	0.95	3	40	4.5	0.06	1
MP5906	25	5	70	0.95	1	40	4.5	0.06	1
MP5907	25	10	70	0.95	1	40	4.5	0.06	1
MP5908	25	20	70	0.95	1	40	4.5	0.06	1
MP5909	25	40	70	0.95	1	40	4.5	0.06	1
Low Noise ≤ 10 nV/$\sqrt{Hz}$									
MP840	5	5	1000	0.97	50	60	4.5	0.5	5
MP841	5	10	1000	0.97	50	60	4.5	0.5	5
MP842	25	40	1000	0.97	50	60	4.5	0.5	5
Ultra Low Noise									
MP843	1	5	1000	0.97	50	60	3.5	0.5	5
MP844	5	10	1000	0.97	50	60	3.5	0.5	5
MP845	15	25	1000	0.97	50	60	3.5	0.5	5
Higher Transconductance									
MP5911	10	20	4000	0.95	50	35	5.0	–	40
MP5912	15	40	4000	0.95	50	35	5.0	–	40
MP5912C	40	40	4000	0.95	50	35	5.0	–	40

Monolithic Dual PNPs and NPNs

The following summary specifications are Micro Power Systems in-house types from which the above industry standard types are derived.

Parameter	h_{FE1}/h_{FE2}	$\lvert V_{BE1}-V_{BE2}\rvert$	$\lvert\Delta(V_{BE1}-V_{BE2})\rvert$	$\lvert I_{B1}-I_{B2}\rvert$	h_{FE}	BV_{CEO}	I_{CBO}	C_{OB}	f_T
Condition	I_C = 10 µA @ 5V (Typ %)	I_C = 10 µA (Max)	T_A = -55°C to +125°C (Max)	I_C = 10 µA @ 5V (Max)	I_C = 10 µA @ 5V (Min/Max)	I_B = 0 I_C = 5 µA (Min)	V_{CB} = 80% BV_{CEO} (Max)	I_E = 0 V_{CB} = 5V (Max)	I_C = 1 mA @ 5V (Min)
NPN, Super Beta									
MP301	5%	1 mV	5 µV/°C	1.0 nA	2000/ –	18V	10 pA	0.8 pF	100 MHz
MP302	5%	1 mV	5 µV/°C	5.0 nA	1000/ –	35V	10 pA	0.8 pF	100 MHz
MP303	5%	1 mV	5 µV/°C	1.5 nA	2000/ –	10V	10 pA	0.8 pF	100 MHz
NPN, General Purpose									
MP310	10%	3 mV	15 µV/°C	–	150/ –	25V	0.2 nA	2 pF	–
MP311	5%	1 mV	5 µV/°C	10 nA	150/ –	45V	0.2 nA	2 pF	200 MHz
MP312	5%	0.5 mV	2 µV/°C	5 nA	200/ –	60V	0.2 nA	2 pF	200 MHz
MP313	5%	1 mV	5 µV/°C	10 nA	400/1000	45V	0.2 nA	2 pF	200 MHz
NPN, Log Conformance Δre 1 ohm typ									
MP318	5%	1 mV	5 µV/°C	10 nA	150/600	25V	0.2 nA	2 pF	200 MHz
PNP, General Purpose									
MP350	10%	5 mV	20 µV/°C	–	100/ –	25V	0.2 nA	2 pF	–
MP351	5%	1 mV	5 µV/°C	10 nA	150/600	45V	0.2 nA	2 pF	200 MHz
MP352	5%	0.5 mV	2 µV/°C	5 nA	200/600	60V	0.2 nA	2 pF	200 MHz
PNP, Log Conformance Δre 1.2 ohm typ									
MP358	5%	1 mV	5 µV/°C	10 nA	100	20V	0.2 nA	2 pF	200 MHz
PNP, High Speed Linear									
MP360	10%	5 mV	20 µV/°C	–	100/ –	25V	0.2 nA	1 pF	–
MP361	5%	1 mV	5 µV/°C	10 nA	150/600	45V	0.2 nA	1 pF	200 MHz
MP362	5%	0.5 mV	2 µV/°C	5 nA	200/600	60V	0.2 nA	1 pF	200 MHz