LOW NOISE DUAL
MONOLITHIC MATCHED
N-CHANNEL JFETS

IMF6485

FEATURES

- $\bar{e}_n < 10\,nV/\sqrt{Hz}$ at 10 Hz
- CMRR > 90 dB
- $\Delta |V_{GS1} - V_{GS2}| < 25\,mV$
- $\Delta |V_{GS1} - V_{GS2}| < 40\,\mu V/°C$

GENERAL DESCRIPTION

This N-Channel Junction FET is characterized for ultra low noise applications requiring tightly controlled and specified noise parameters at 10 Hz and 1000 Hz. Tight matching specifications make this device ideal as the input stage for low frequency differential instrumentation amplifiers.

ABSOLUTE MAXIMUM RATINGS (Note 1)

(@ 25°C unless otherwise noted)

Maximum Temperatures

Storage Temperature	-65°C to +150°C
Operating Junction Temperature	+150°C
Lead Temperature (soldering, 10 sec. time limit)	+300°C

Maximum Power Dissipation

Device Dissipation @ 85°C Free Air Temperature

One Side	250 mW
Both Sides	500 mW

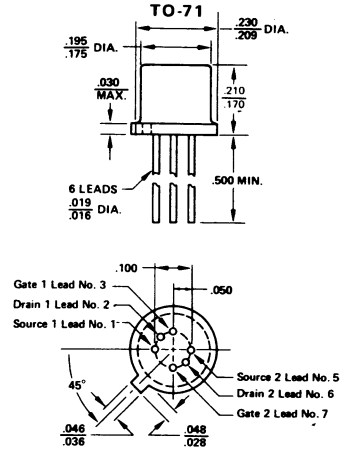
Linear Derating

One Side	3.85 mW/°C
Both Sides	7.7 mW/°C

Maximum Voltages & Currents

V_{GS} Gate to Source Voltage	-50 V
V_{GD} Gate to Drain Voltage	-50 V
$V_{G1\,G2}$ Gate to Gate Voltage	±50 V
I_G Gate Current	50 mA

PACKAGE DIMENSIONS



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ELECTRICAL CHARACTERISTICS (@ 25°C unless otherwise specified)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNIT	TEST CONDITIONS
I_{GSS}	Gate Reverse Current		-200 -200	pA nA	V_{GS} = -30 V, V_{DS} = 0, T_A = +25°C V_{GS} = -30 V, V_{DS} = 0, T_A = +150°C
BV_{GSS}	Gate-Source Breakdown Voltage	-50		V	I_G = -1 μA, V_{DS} = 0
V_p	Gate-Source Pinch-Off Voltage	-0.7	-4.0	V	V_{DS} = 20 V, I_D = 1 nA
I_{DSS}	Drain Current at Zero Gate Voltage	0.5	7.5	mA	V_{DS} = 20 V, V_{GS} = 0 (Note 2)
g_{fs}	Common-Source Forward Transconductance	1000	4000	μmho	V_{DS} = 20 V, V_{GS} = 0, f = 1 KHz (Note 2)
g_{oss}	Common-Source Output Conductance		10	μmho	V_{DS} = 20 V, V_{GS} = 0, f = 1 KHz
C_{iss}	Common-Source Input Capacitance		20	pF	V_{DS} = 20 V, V_{GS} = 0, f = 1 MHz
C_{rss}	Common-Source Reverse Transfer Capacitance		3.5	pF	V_{DS} = 20 V, V_{GS} = 0, f = 1 MHz
I_G	Gate Current		-100 -100	pA nA	V_{GD} = 20 V, I_D = 200 μA, T_A = +25°C V_{DG} = 20 V, I_D = 200 μA, T_A = +150°C
V_{GS}	Gate-Source Voltage	-0.2	-3.8	V	V_{DG} = 20 V, I_D = 200 μA
g_{fs}	Common-Source Forward Transconductance	500	1500	μmho	V_{DG} = 20 V, I_D = 200 μA, f = 1 KHz (Note 2)
g_{os}	Common-Source Output Conductance		1	μmho	V_{DG} = 20 V, I_D = 200 μA
$\bar{e}_n$	Equivalent Input Noise Voltage		15 10	$nV/\sqrt{Hz}$ $nV/\sqrt{Hz}$	V_{DS} = 20 V, I_D = 200 μA, f = 10 Hz V_{DS} = 20 V, I_D = 200 μA, f = 1 KHz

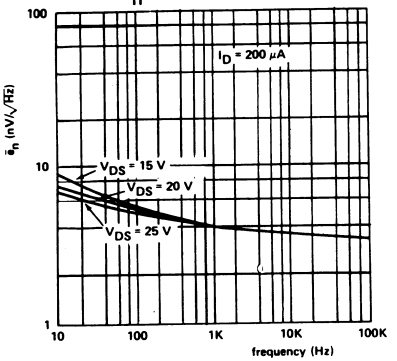
MATCHING CHARACTERISTICS (@ 25° C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNIT	CONDITIONS
$\frac{I_{DSS1}}{I_{CSS2}}$	Drain Current Ration at Zero Gate Voltage	0.95	1	–	V_{DS} = 20 V, V_{GS} = 0 (Note 2)
$\lvert I_{G1} - I_{G2} \rvert$	Differential Gate Current		10	nA	V_{DG} = 20 V, I_D = 200 μA T_A = +125° C
$\frac{g_{fs1}}{g_{gs2}}$	Transconductance Ratio	0.95	1	–	V_{DG} = 20 V, I_D = 200 μA, f = 1 KHz (Note 2)
$\lvert g_{os1} - g_{os2} \rvert$	Differential Output Conductance		0.1	μmho	V_{DG} = 20 V, I_D = 200 μA, f = 1 KHz
$\lvert V_{GS1} - V_{GS2} \rvert$	Differential Gate-Source Voltage		25	mV	V_{DG} = 20 V, I_D = 200 μA
$\frac{\Delta \lvert V_{GS1} - V_{GS2} \rvert}{\Delta T}$	Gate-Source Voltage Differential Drift		40	μV/° C	V_{CG} = 20 V, I_D = 200 μA T_A = +25° C to +125° C
$\frac{\Delta \lvert V_{GS1} - V_{GS2} \rvert}{\Delta T}$	Gate-Source Voltage Differential Drift		40	μV/° C	V_{DG} = 20 V, I_D = 200 μA T_A = -55° C to +25° C
CMRR	Common Mode Rejection Ratio	90		dB	V_{DD} = 10 to 20 V, I_D = 200 μA (Note 3)

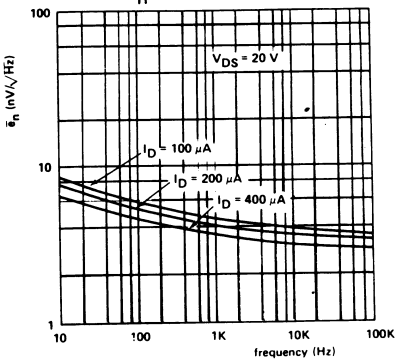
NOTES: 1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
2. Pulse duration of 2 ms used during test.
3. CMRR = $20\text{Log}_{10}\Delta V_{DD}/\Delta\lvert V_{GS1} - V_{GS2}\rvert$, ($\Delta V_{DD}$ = 10 V)

TYPICAL CHARACTERISTICS

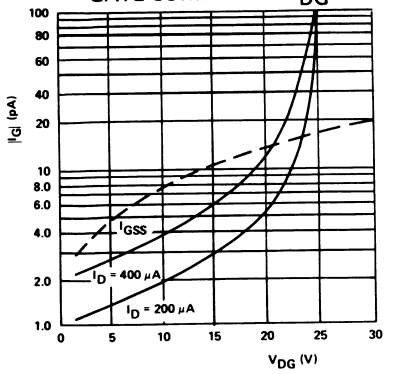
$\bar{e}_n$ vs. FREQUENCY



$\bar{e}_n$ vs. FREQUENCY



GATE CURRENT vs. V_{DG}



TYPICAL CAPACITANCE vs. V_{DS}