N-Channel JFET Monolithic Dual

calogic CORPORATION

U440 / U441

FEATURES

- **High Gain . . . . . g_{fs} > 6 mS**
- **Low Leakage . . . . . I_G < 1pA typical**
- **Low Noise**

APPLICATIONS

- **Differential Wideband Amplifiers**
- **VHF/UHF Amplifiers**
- **Test and Measurement**
- **Multi-Chip/Hybrids**

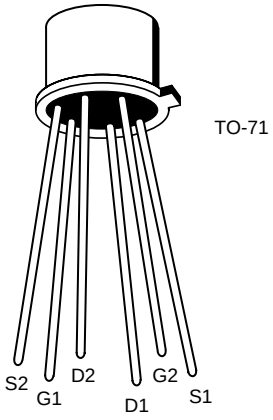
DESCRIPTION

The U440 Series is an N-Channel Monolithic Dual JFET designed for high speed amplifier circuits. Featuring high gain (> 6 mS typical), low leakage (< 1pA typ) and low noise. This series is an excellent choice for differential amplifier designs.

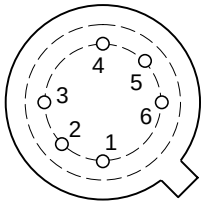
ORDERING INFORMATION

Part	Package	Temparature Range
U440-1	Hermetic TO-71 Package	-55°C to +150°C
XU440-1	Sorted Chips in Carriers	-55°C to +150°C

PIN CONFIGURATION



1 SOURCE 1
2 DRAIN 1
3 GATE 1
4 SOURCE 2
5 DRAIN 2
6 GATE 2



BOTTOM VIEW

CJ1

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameter/Test Condition	Symbol	Limit	Unit
Gate-Drain Voltage	V_{GD}	-25	V
Gate-Source Voltage	V_{GS}	-25	V
Gate-Gate Voltage	V_{GG}	±50	V
Forward Gate Current	I_G	50	mA
Power Dissipation (per side)	P_D	250	mW
(total)		350	mW
Power Derating (per side)		2	mW/ °C
(total)		2.8	mW/ °C
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{stg}	-65 to 200	°C
Lead Temperature (1/16" from case for 10 seconds)	T_L	300	°C

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

SYMBOL	CHARACTERISTCS	TYP[1]	U440		U441		UNIT	TEST CONDITIONS
			MIN	MAX	MIN	MAX		
STATIC								
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	-35	-25		-25		V	I_G = -1µA, V_{DS} = 0V
$V_{GS(OFF)}$	Gate-Source Cut off Voltage	-3.5	-1	-6	-1	-6		V_{DS} = 10V, I_D = 1nA
I_{DSS}	Saturation Drain Current [2]	15	6	30	6	30	mA	V_{DS} = 10V, V_{GS} = 0V
I_{GSS}	Gate Reverse Current	-1		-500		-500	pA	V_{GS} = -15V, V_{DS} = 0V
		-2					nA	T_A = 150°C
I_G	Gate Operating Current	-1		-500		-500	pA	V_{DG} = 10V, I_D = 5mA
		-0.3					nA	T_A = 125°C
$V_{GS(F)}$	Gate-Source Forward Voltage	0.7					V	I_G = 1mA, V_{DS} = 0V
DYNAMIC								
g_{fs}	Common-Source Forward Transconductance	6	4.5	9	4.5	9	mS	V_{DG} = 10V, I_D = 5mA f = 1kHz
g_{os}	Common-Source Output Conductance	70		200		200	µS	
C_{iss}	Common-Source Input Capacitance	3					pF	V_{DG} = 10V, I_D = 5mA f = 1MHz
C_{rss}	Common-Source Reverse Transfer Capacitance	1						
$\overline{e}_n$	Equivalent Input Noise Voltage	4					nV/ $\sqrt{Hz}$	V_{DG} = 10V, I_D = 5mA f = 10kHz
MATCHING								
$\lvert V_{GS1}-V_{GS2}\rvert$	Differential Gate-Source Voltage	6		10		20	mV	V_{DG} = 10V, I_D = 5mA
$\frac{\Delta \lvert V_{GS1}-V_{GS2}\rvert}{\Delta T}$	Gate-Source Voltage Differential Change with Temperature	20					µV/ °C	T = -55 to 25°C; V_{DG} =10V, I_D = 5mA
		20						T = 25 to 125°C; V_{DG} =10V, I_D = 5mA
$\frac{I_{DSS1}}{I_{DSS2}}$	Saturation Drain Current Ratio	0.97						V_{DS} = 10V, V_{GS} = 0V
$\frac{g_{fs1}}{g_{fs2}}$	Transconductance Ratio	0.97						V_{DG} = 10V, I_D = 5mA f= 1 kHz
CMRR	Common Mode Rejection Ratio	85					dB	V_{DD} = 5 to 10V, I_D = 5mA

NOTES: 1. For design aid only, not subject to production testing.
2. Pulse test; PW = 300µs, duty cycle ≤ 3%.