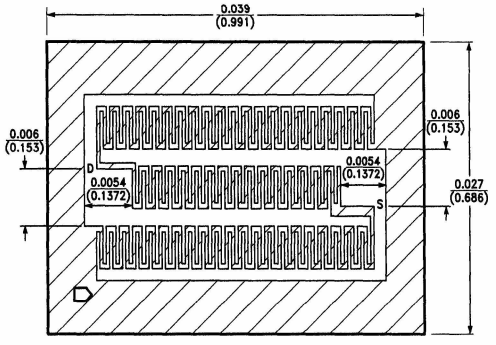
National Semiconductor

Process 58
N-Channel JFET



TL/G/10035–14

Gate is also backside contact

DESCRIPTION

Process 58 was developed for analog or digital switching applications where very low $r_{DS(ON)}$ is mandatory. Switching times are very fast and $r_{DS(ON)}$ C_{iss} time constant is low. The 6Ω typical ON resistance is very useful in precision multiplex systems where switch resistance must be held to an absolute minimum. With r_{DS} increasing only 0.7%/°C, accuracy is retained over a wide temperature excursion.

Electrical Characteristics (T_A = 25°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{GSS}	Gate-Source Breakdown Voltage	V_{DS} = 0V, I_G = −1 μA	−25	−30		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 5V, V_{GS} = 0V Pulse Test	100	400	1000	mA
I_{GSS}	Reverse Gate Leakage	V_{GS} = −15V, V_{DS} = 0V		−50	−500	pA
$r_{DS(ON)}$	ON Resistance	V_{DS} = 100 mV, V_{GS} = 0V	3.0	6.0	20	Ω
$V_{GS(OFF)}$	Pinch Off Voltage	V_{DS} = 5V, I_D = 3 nA	−0.5	−5.0	−12	V
$I_{D(OFF)}$	Drain OFF Current	V_{DS} = 5V, V_{GS} = −10V		0.05	20	nA
C_{rss}	Feedback Capacitance	V_{DG} = 15V, I_D = 2 mA, f = 1 MHz		12	25	pF
C_{iss}	Input Capacitance	V_{DG} = 15V, I_D = 2 mA, f = 1 MHz		25	50	pF
g_{fs}	Forward Transconductance	V_{DG} = 10V, I_D = 2 mA		10		mmhos
g_{os}	Output Conductance	V_{DG} = 10V, I_D = 2 mA		100		μmhos
e_n	Noise Voltage	V_{DG} = 15V, I_D = 2 mA, f = 100 Hz		6.0		$nV/\sqrt{Hz}$

This process is available in the following device types. *Denotes preferred parts.

TO-52 (NS Package 07)

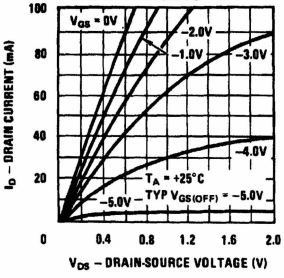
*2N5432
*2N5433
*2N5434

TO-92 (NS Package 92)

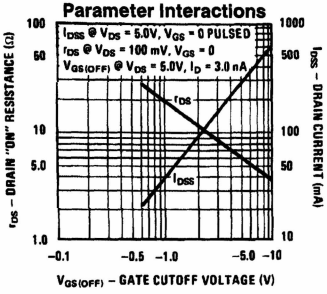
*J108
*J109
*J110
PN5432
PN5433
PN5434

Process 58

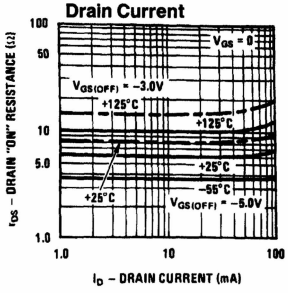
Common Drain-Source Characteristics



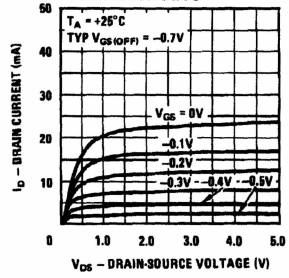
Parameter Interactions



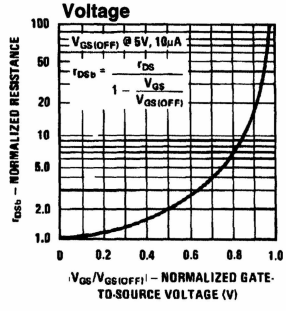
ON Resistance vs Drain Current



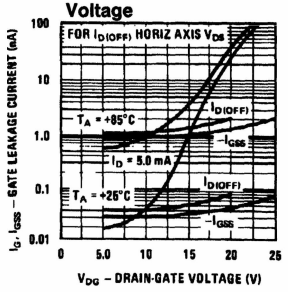
Common Drain-Source Characteristics



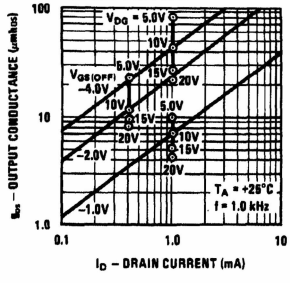
Normalized Drain Resistance vs Bias Voltage



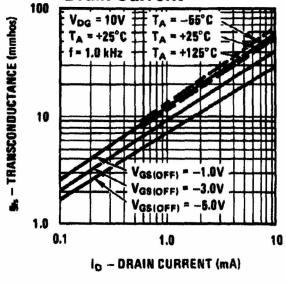
Leakage Current vs Voltage



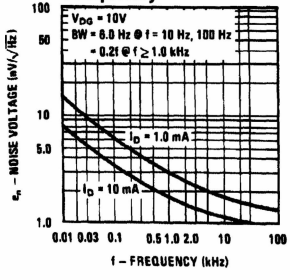
Output Conductance vs Drain Current



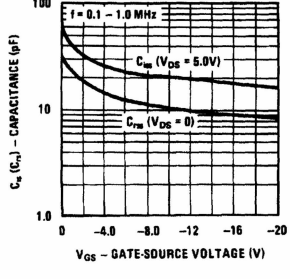
Transconductance vs Drain Current



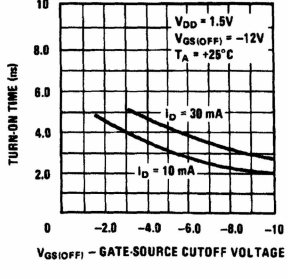
Noise Voltage vs Frequency



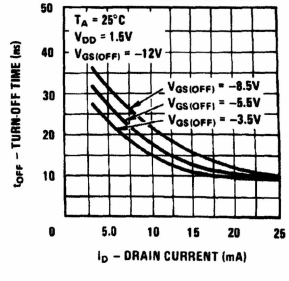
Capacitance vs Voltage



Switching Turn-On vs Gate-Source Voltage



Switching Turn-On Time vs Drain Current



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