THE DATASHEET OF

U290

www.win-source.net 0086-755-83957316

N-Channel JFETs

PRODUCT SUMMARY				
Part Number	$V_{GS(off)}$ (V)	$r_{DS(on)}$ Max (Ω)	$I_{D(off)}$ Typ (pA)	t_{ON} Typ (ns)
U290	−4.0 to −10	3	10	14
U291	−1.5 to −4.5	7	10	14

FEATURES

- Low On-Resistance: U290 < 3 Ω
- Fast Switching—t_{ON}: 14 ns
- High Off-Isolation
- Low Capacitance: 20 pF
- Low Insertion Loss

BENEFITS

- Low Error Voltage
- High-Speed Analog Circuit Performance
- Negligible “Off-Error,” Excellent Accuracy
- Good Frequency Response
- Eliminates Additional Buffering

APPLICATIONS

- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

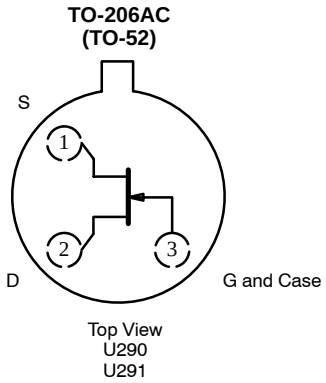
DESCRIPTION

The U290/U291 are high-performance JFET analog switches designed to offer low on-resistance and fast switching. This series features the lowest on-resistance of any JFET in the industry today.

TheTO-206AC (TO-52) hermetically sealed case makes this series suitable for military applications.

For similar products in TO-226A (TO-92) packaging, see the J105/106/107 data sheet.

Ordering Information: U290—E3
U291—E3



ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage . . . . . −30 V
Gate Current . . . . . 100 mA
Storage Temperature . . . . . −65 to 200°C
Operating Junction Temperature . . . . . −55 to 150°C
Power Dissipation[a] . . . . . 500 mW

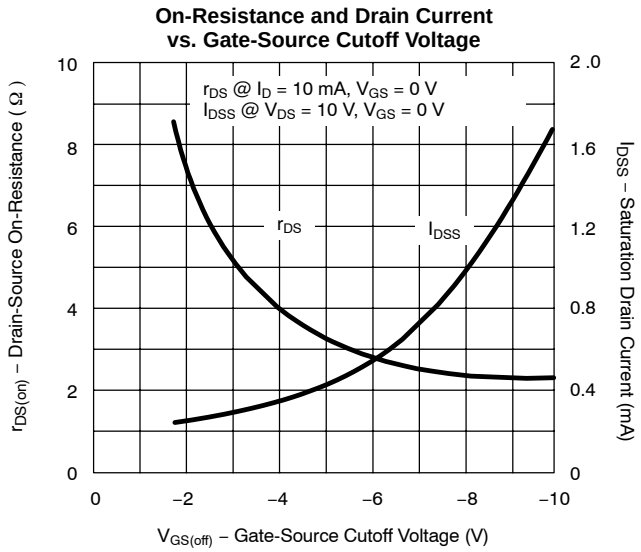
Notes
a. Derate 4 mW/°C above 25°C

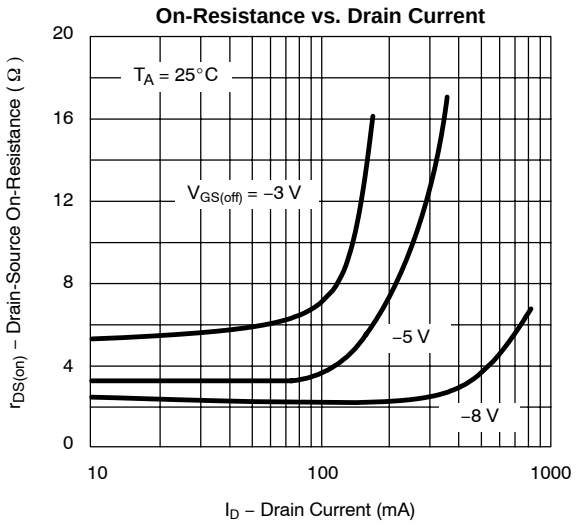
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Typ[a]	Limits U290 Min	Limits U290 Max	Limits U291 Min	Limits U291 Max	Unit
Static								
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = −1 μA , V_{DS} = 0 V	−35	−30		−30		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 15 V, I_D = 3 nA		−4.0	−10	−1.5	−4.5	V
Saturation Drain Current[b]	I_{DSS}	V_{DS} = 10 V, V_{GS} = 0 V		500		200		mA
Gate Reverse Current	I_{GSS}	V_{GS} = −15 V, V_{DS} = 0 V	−0.02		−1		−1	nA
		T_A = 125°C	−0.01		−1		−1	μA
Gate Operating Current[b]	I_G	V_{DG} = 10 V, I_D = 25 mA	−0.01					nA
Drain Cutoff Current	$I_{D(off)}$	V_{DS} = 5 V, V_{GS} = −10 V	0.01		1		1	nA
		T_A = 125°C	−0.005		1		1	μA
Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS} = 0 V, I_D = 1 mA			3		7	Ω
Gate-Source Forward Voltage	$V_{GS(F)}$	I_G = 1 mA , V_{DS} = 0 V	0.7					V
Dynamic								
Common-Source Forward Transconductance[b]	g_{fs}	V_{DS} = 10 V, I_D = 25 mA, f = 1 kHz	55					mS
Common-Source Output Conductance[b]	g_{os}		5					mS
Drain-Source On-Resistance	$r_{ds(on)}$	V_{GS} = 0 V, I_D = 1 mA, f = 1 kHz			3		7	Ω
Common-Source Input Capacitance	C_{iss}	V_{DS} = 0 V, V_{GS} = 0 V, f = 1 MHz	120		160		160	pF
Common-Source Reverse Transfer Capacitance	C_{rss}	V_{DS} = 0 V, V_{GS} = −15 V, f = 1 MHz	20		30		30	pF
Equivalent Input Noise Voltage	$\overline{e}_n$	V_{DG} = 10 V, I_D = 25 mA, f = 1 kHz	3					nV/√Hz
Switching								
Turn-On Time	$t_{d(on)}$	V_{DD} = 1.5 V, $V_{GS(H)}$ = 0 V See Switching Diagram	6		15		15	ns
	t_r		8		20		20	ns
Turn-Off Time	$t_{d(off)}$		5		15		15	ns
	t_f		9		20		20	ns

Notes
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing. NVA
b. Pulse test: PW ≤300 μs duty cycle ≤3%.

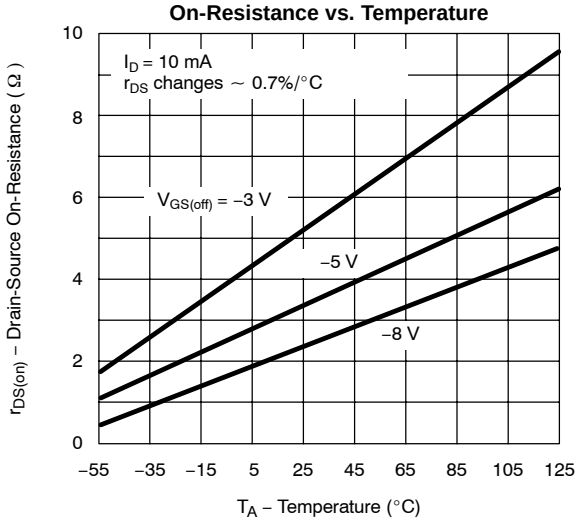
TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)



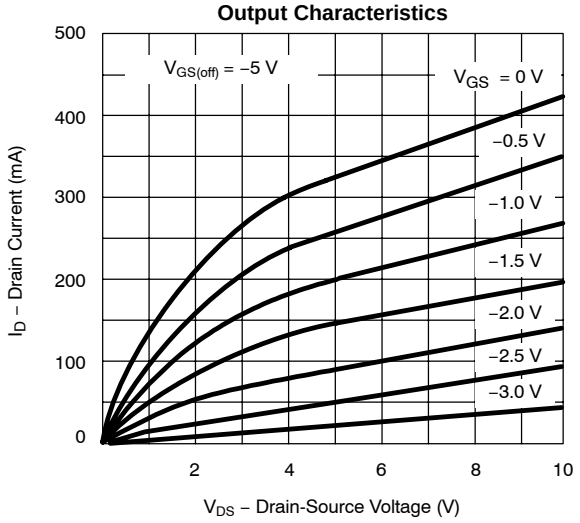


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

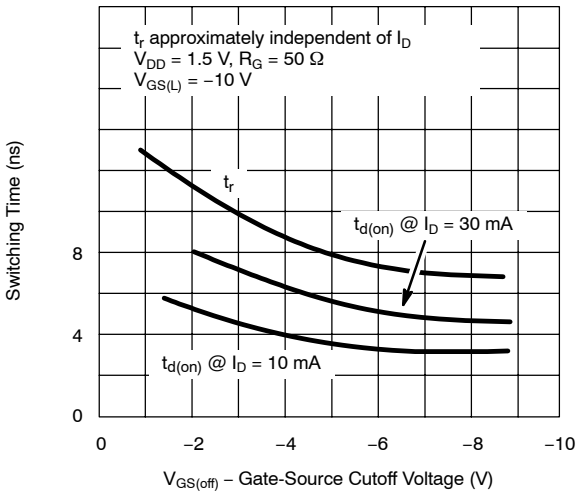
On-Resistance vs. Temperature



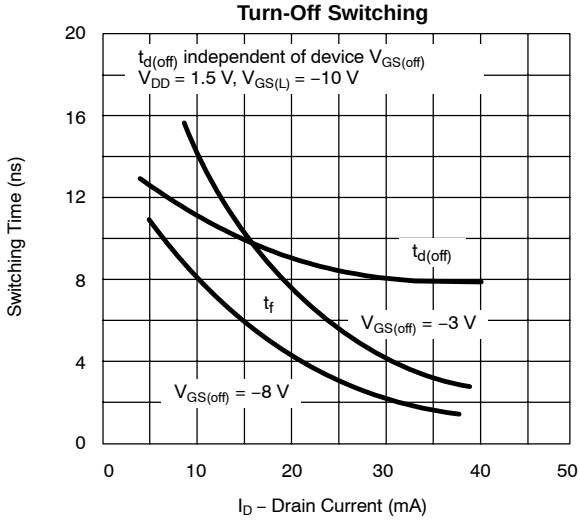
Output Characteristics



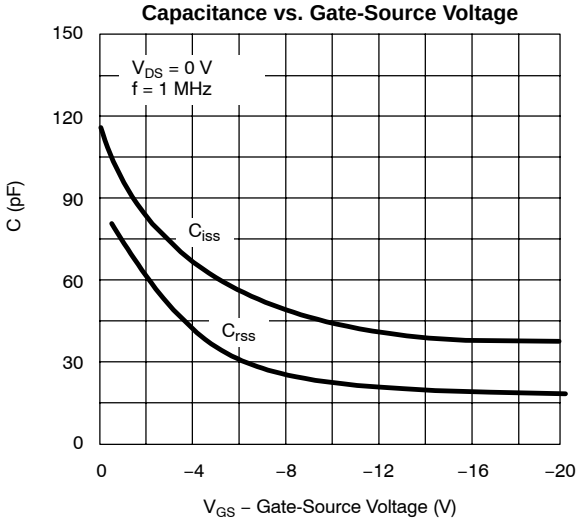
Turn-On Switching



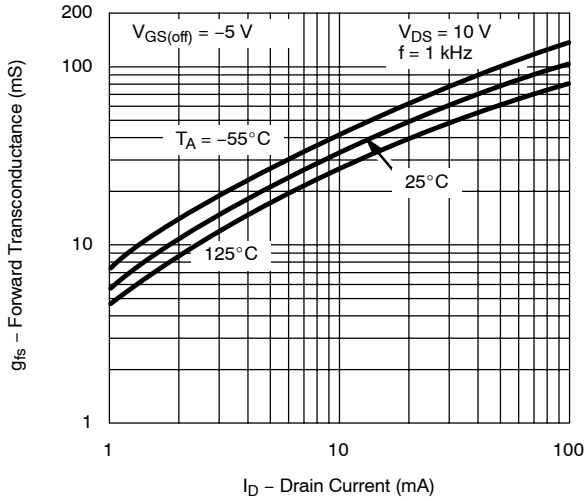
Turn-Off Switching



Capacitance vs. Gate-Source Voltage

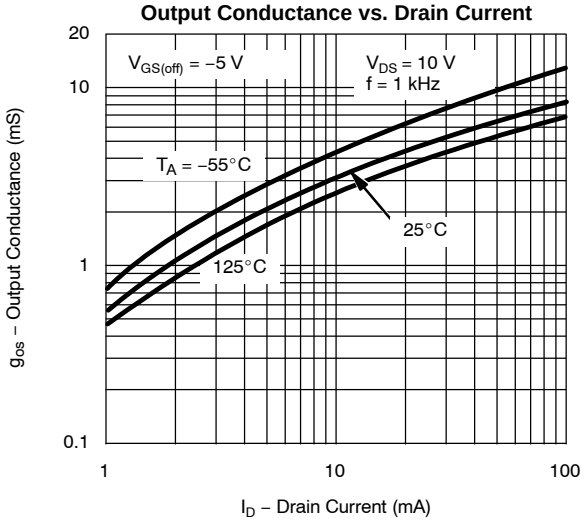


Transconductance vs. Drain Current

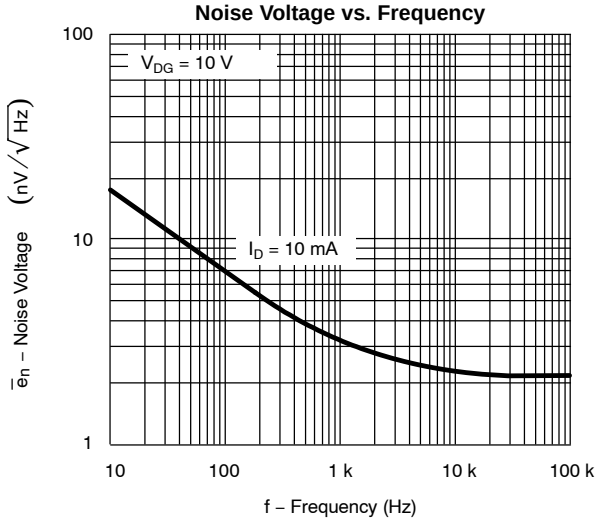


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

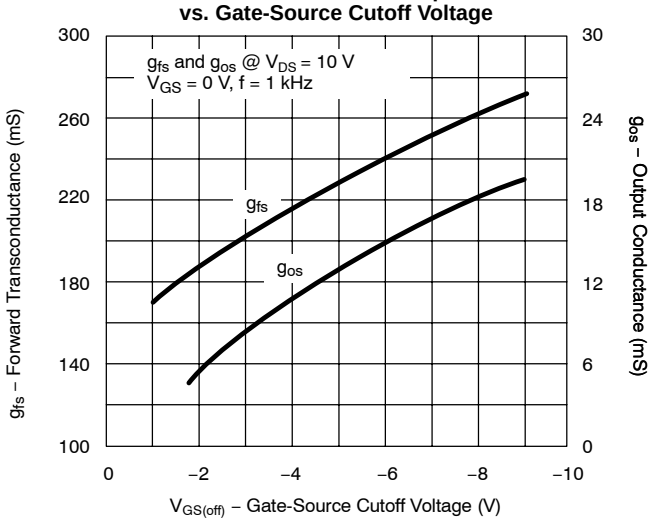
Output Conductance vs. Drain Current



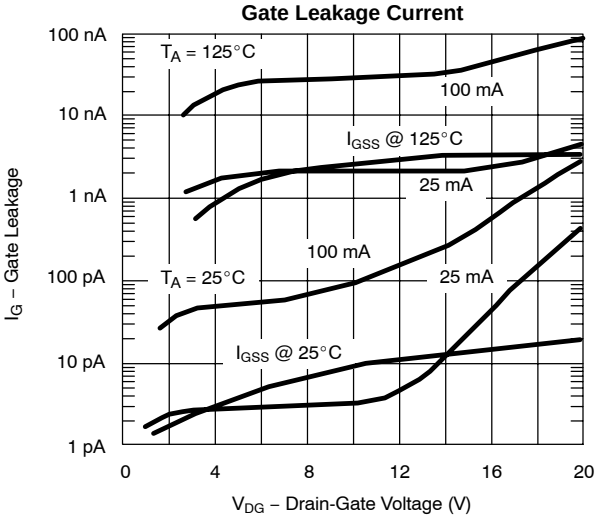
Noise Voltage vs. Frequency



Forward Transconductance and Output Conductance vs. Gate-Source Cutoff Voltage



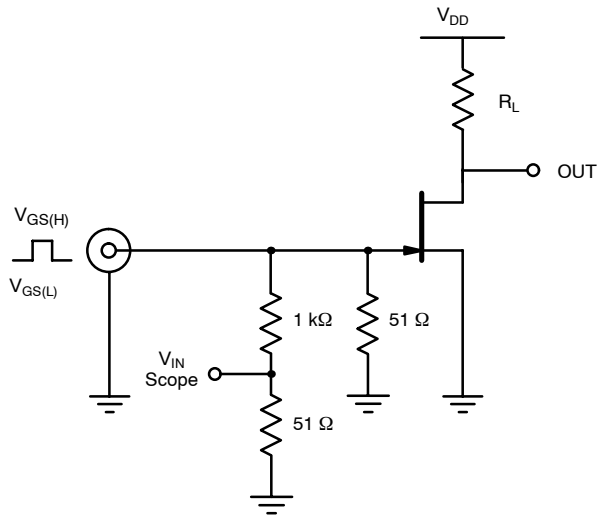
Gate Leakage Current



SWITCHING TIME TEST CIRCUIT

	U290	U291
$V_{GS(L)}$	−12 V	−7 V
R_L*	50 Ω	50 Ω
$I_{D(on)}$	28 mA	27 mA

* Non-Inductive



Input Pulse

Rise Time < 1 ns
Fall Time < 1 ns
Pulse Width 100 ns
PRF 1 MHz

Sampling Scope

Rise Time 0.4 ns
Input Resistance 10 MΩ
Input Capacitance 1.5 pF

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