



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

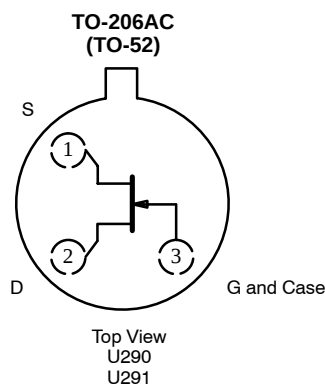
DESCRIPTION

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.

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

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

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 ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

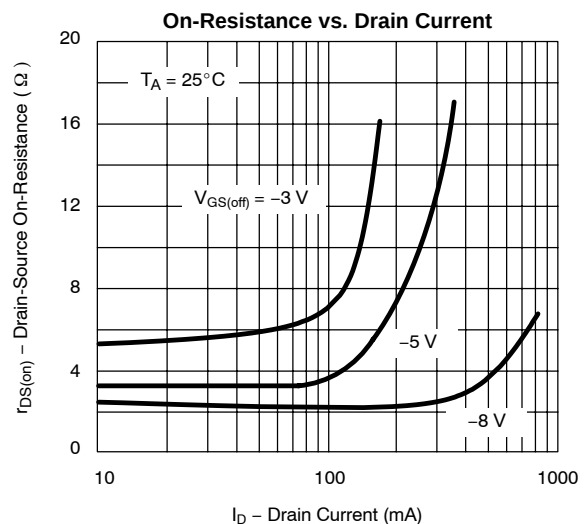
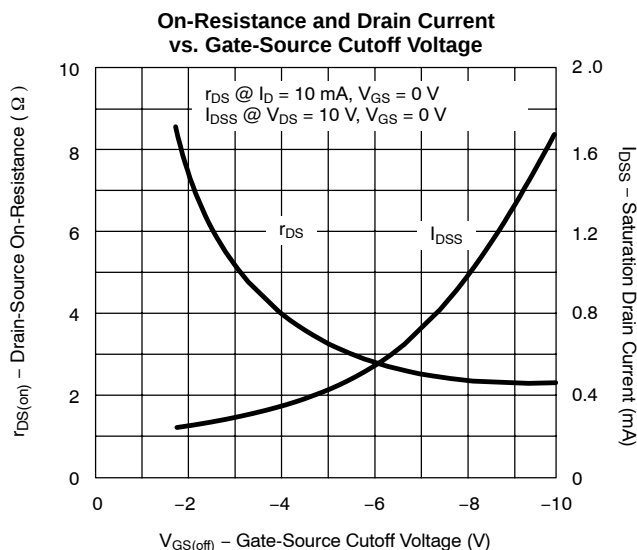
Parameter	Symbol	Test Conditions	Typ ^a	Limits				Unit
				U290		U291		
				Min	Max	Min	Max	
Static								
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = -1 μA , V _{DS} = 0 V	-35	-30		-30		V
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 15 V, I _D = 3 nA		-4.0	-10	-1.5	-4.5	
Saturation Drain 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	
		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					
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	
Equivalent Input Noise Voltage	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	
Turn-Off Time	t _{d(off)}		5		15		15	
	t _f		9		20		20	

Notes

a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.

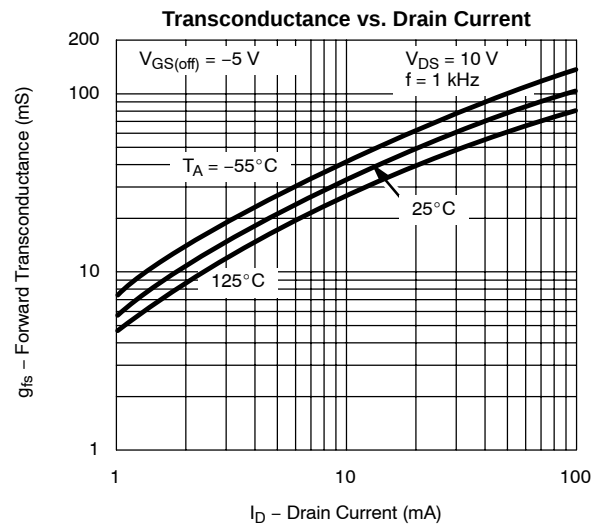
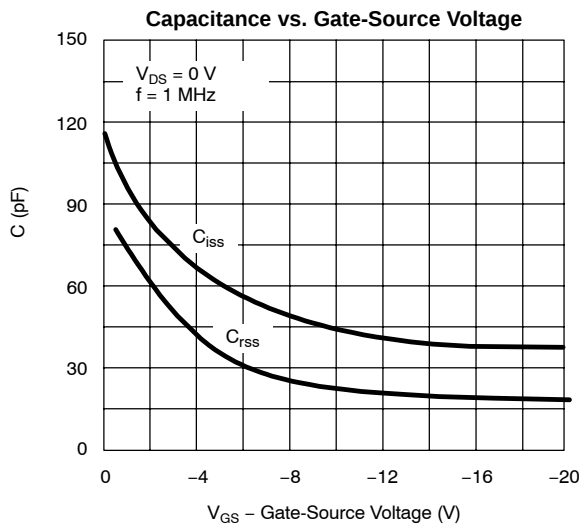
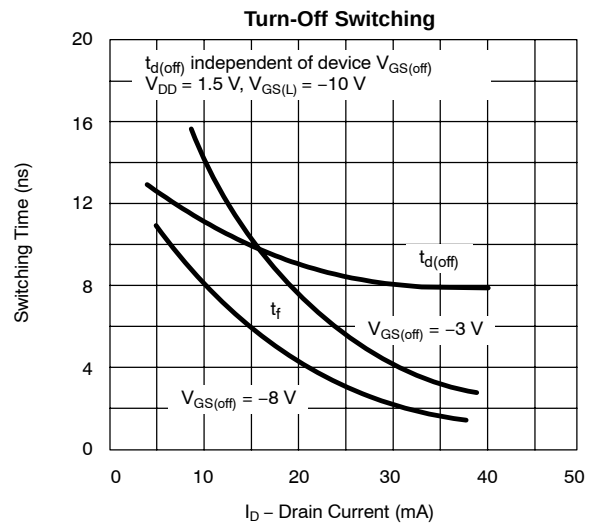
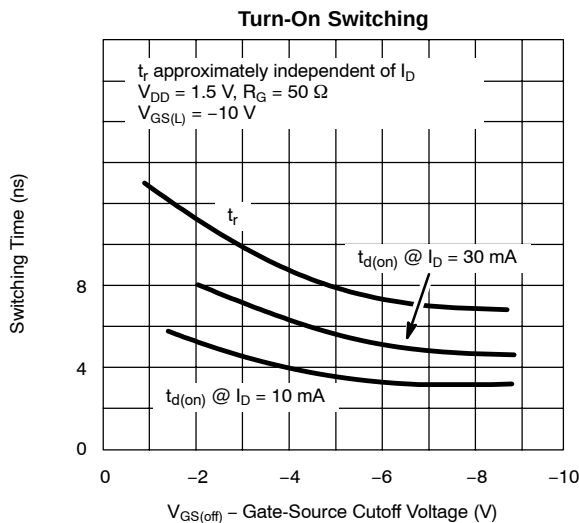
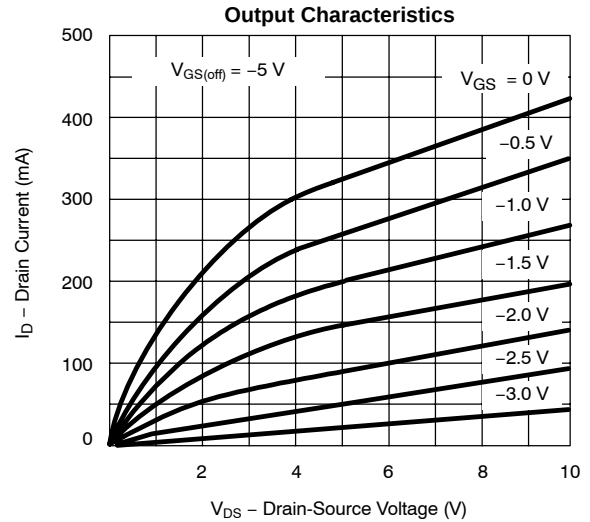
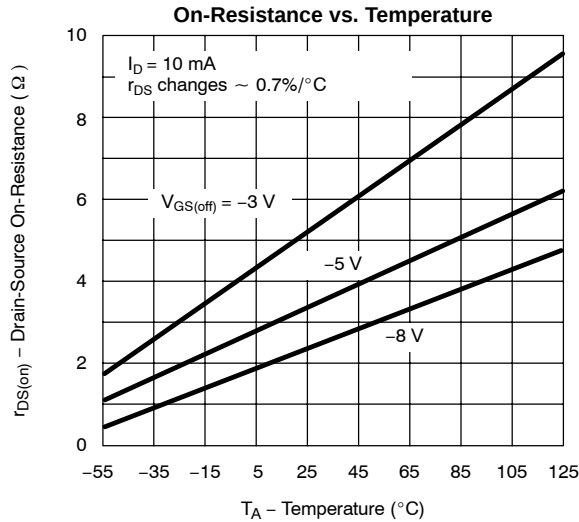
b. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 3\%$.

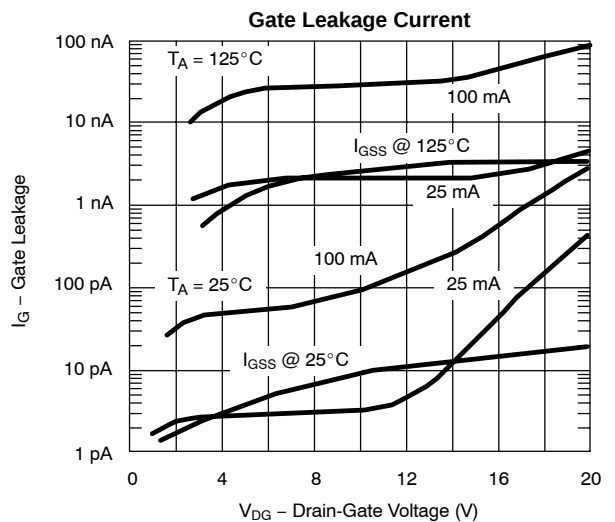
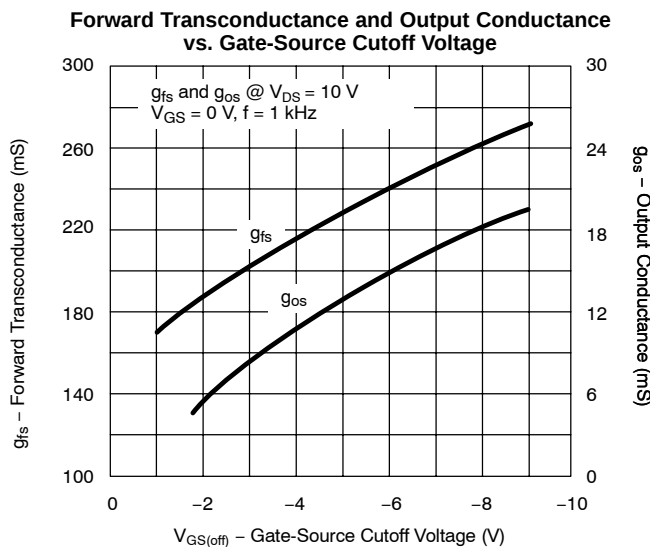
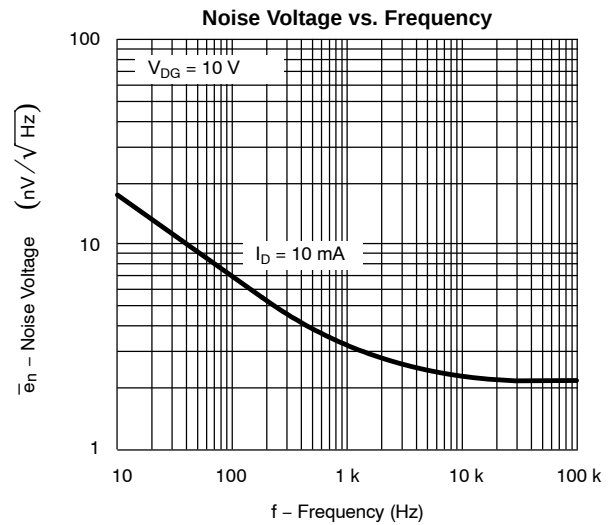
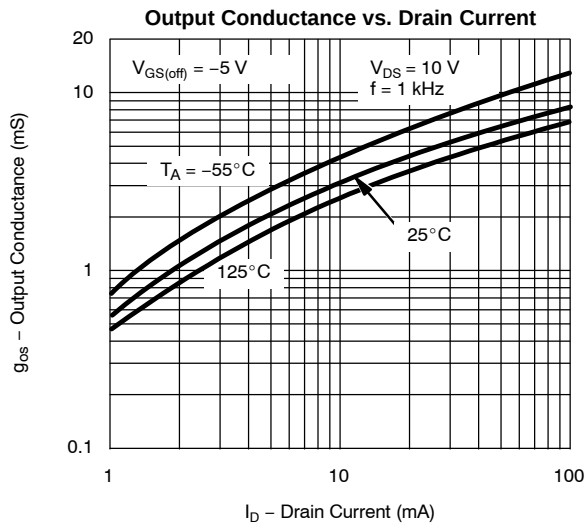
NVA

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)



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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

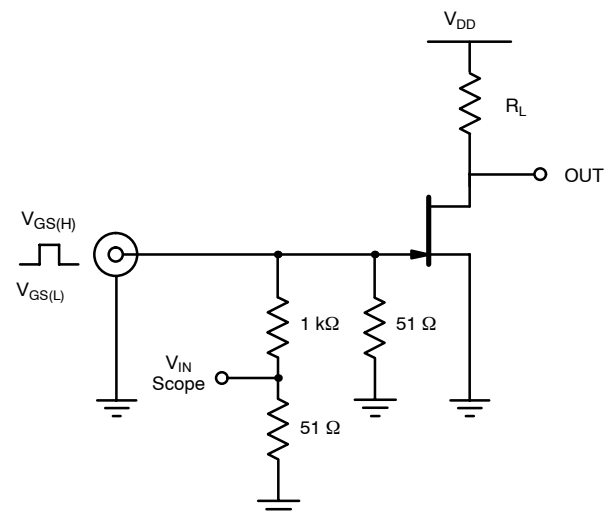
* Non-Inductive

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 M Ω
Input Capacitance 1.5 pF





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