



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)
J105	-4.5 to -10	3	10	14
J106	-2 to -6	6	10	14
J107	-0.5 to -4.5	8	10	14

FEATURES

- Low On-Resistance: J105 < 3 Ω
- Fast Switching— t_{ON} : 14 ns
- Low Leakage: 10 pA
- 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

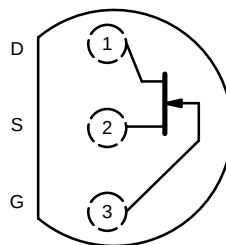
- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

DESCRIPTION

The J105/106/107 are high-performance JFET analog switches designed to offer low on-resistance and fast switching. $r_{DS(on)}$ < 3 Ω is guaranteed for the J105 making this device the lowest of any commercially available JFET.

The low cost TO-226AA (TO-92) plastic package is available in a wide range of tape-and-reel options (see Packaging Information). For similar products in TO-206AC (TO-52) packaging, see the U290/291 data sheet.

TO-226AA
(TO-92)



Top View

ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage -25 V
Gate Current 50 mA
Storage Temperature -55 to 150°C
Operating Junction Temperature -55 to 150°C

Power Dissipation^a 350 mW

Notes

a. Derate 2.8 mW/°C above 25°C


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

Parameter	Symbol	Test Conditions	Typ ^a	Limits						Unit
				J105		J106		J107		
				Min	Max	Min	Max	Min	Max	
Static										
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = −1 μA , V _{DS} = 0 V	−35	−25		−25		−25		V
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 5 V, I _D = 1 μA		−4.5	−10	−2	−6	−0.5	−4.5	
Saturation Drain Current ^b	I _{DSS}	V _{DS} = 15 V, V _{GS} = 0 V		500		200		100		mA
Gate Reverse Current	I _{GSS}	V _{GS} = −15 V, V _{DS} = 0 V	−0.02		−3		−3		−3	nA
		T _A = 125°C	−10							
Gate Operating Current ^b	I _G	V _{DG} = 10 V, I _D = 25 mA	−0.01							
Drain Cutoff Current	I _{D(off)}	V _{DS} = 5 V, V _{GS} = −10 V	0.01		3		3		3	
		T _A = 125°C	5							
Drain-Source On-Resistance	r _{DS(on)}	V _{GS} = 0 V, I _D = 1 mA			3		6		8	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 = 0 mA f = 1 kHz			3		6		8	Ω
Common-Source Input Capacitance	C _{iss}	V _{DS} = 0 V, V _{GS} = 0 V f = 1 MHz	120		160		160		160	pF
Common-Source Reverse Transfer Capacitance	C _{rss}	V _{DS} = 0 V, V _{GS} = −10 V f = 1 MHz	20		35		35		35	
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							ns
	t _r		8							
Turn-Off Time	t _{d(off)}		5							
	t _f		9							

Notes

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

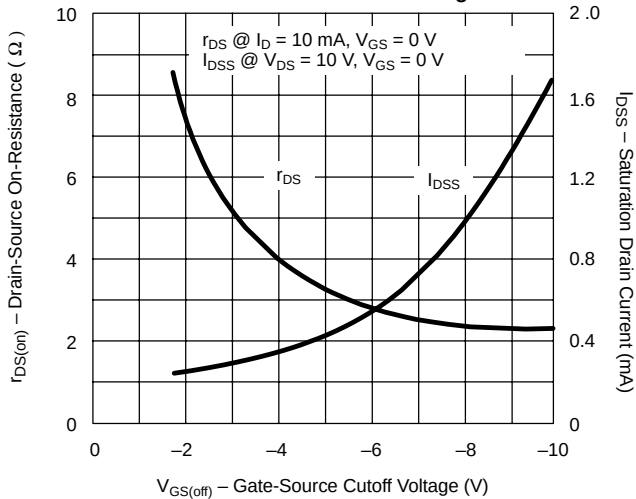
b. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 3\%$.

NVA

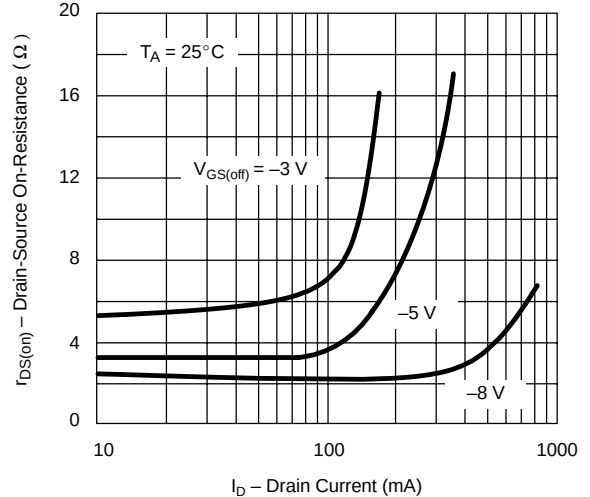


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

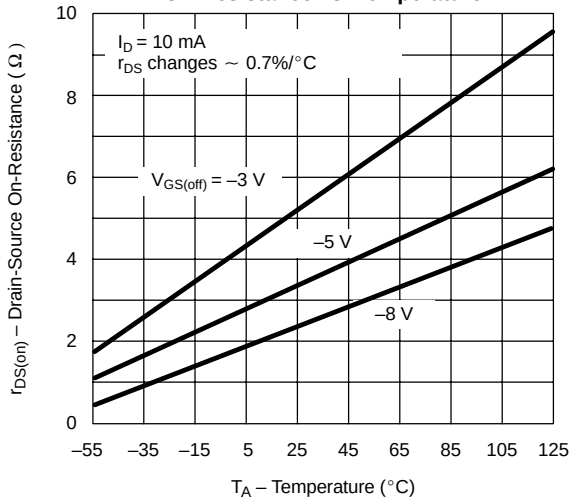
On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage



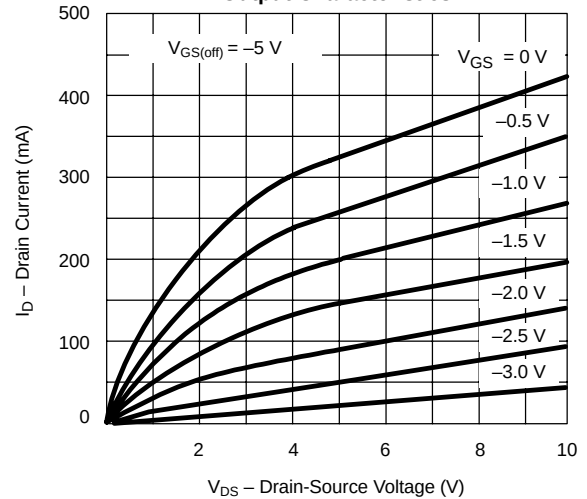
On-Resistance vs. Drain Current



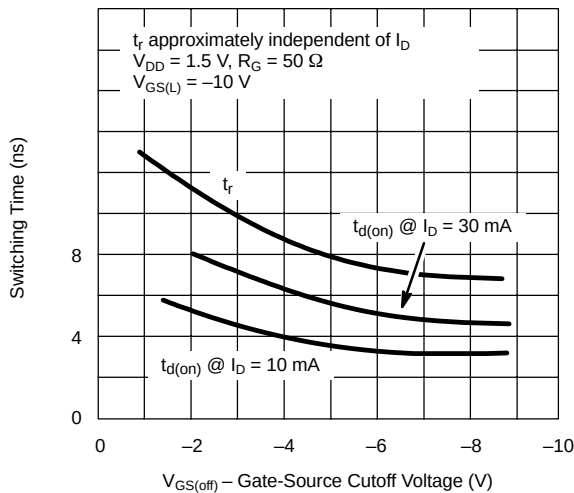
On-Resistance vs. Temperature



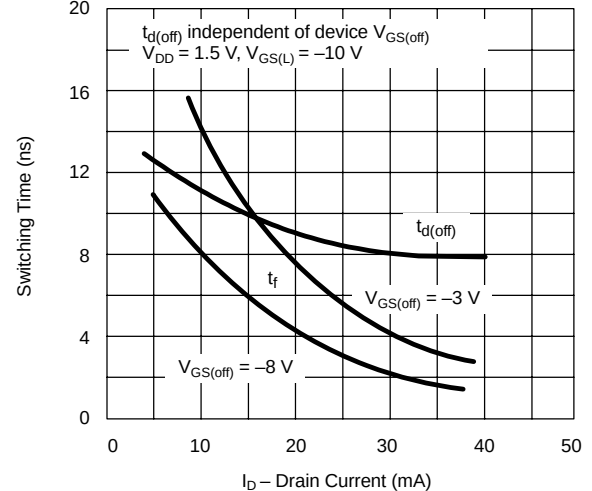
Output Characteristics



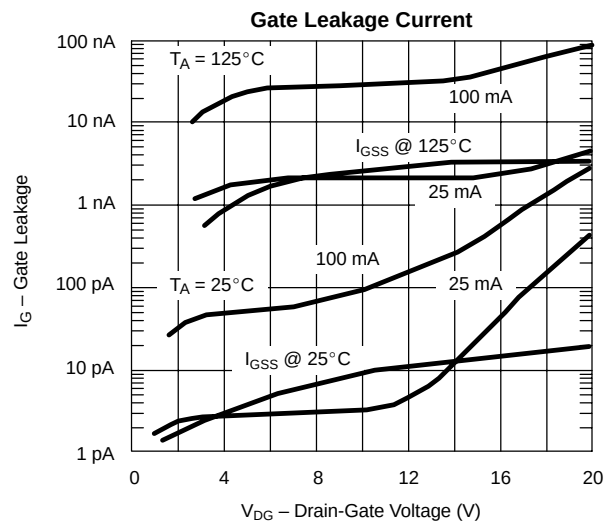
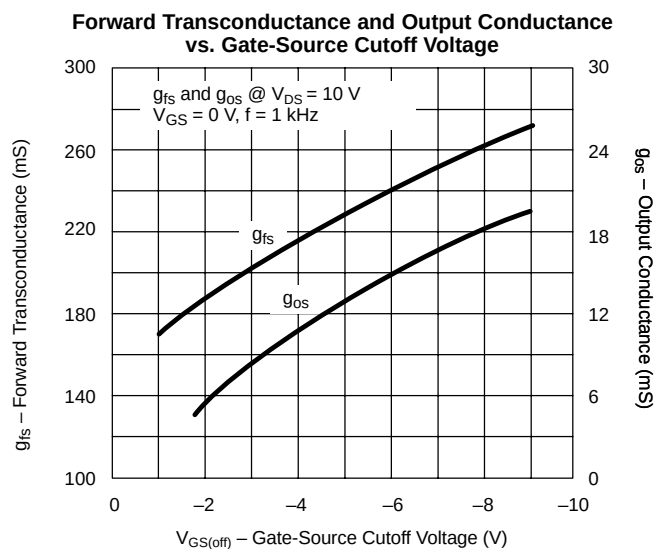
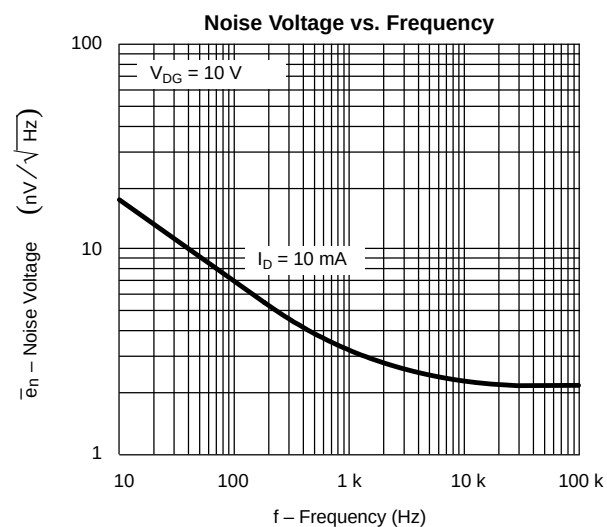
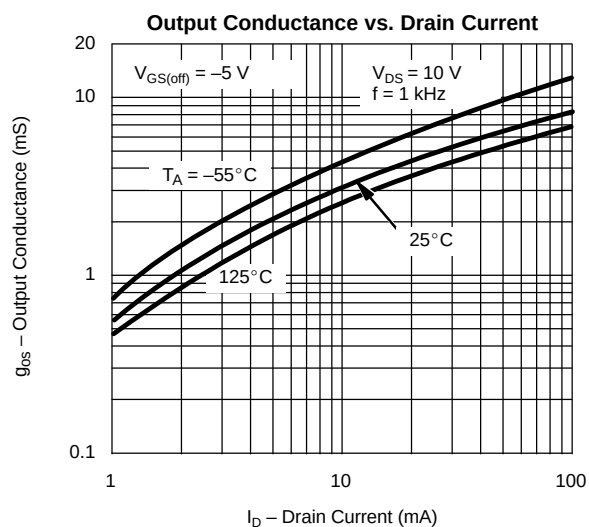
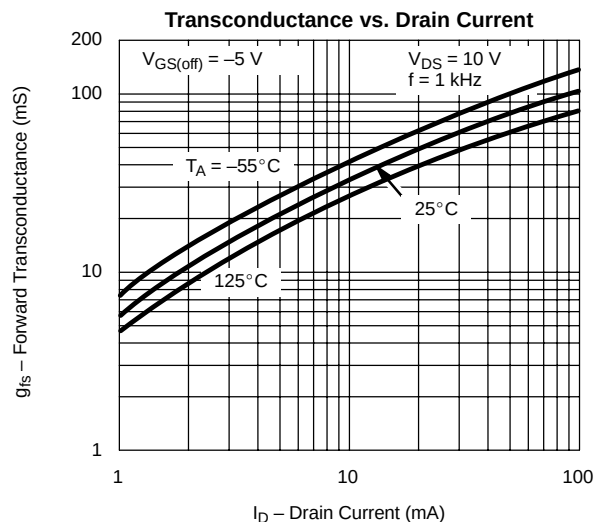
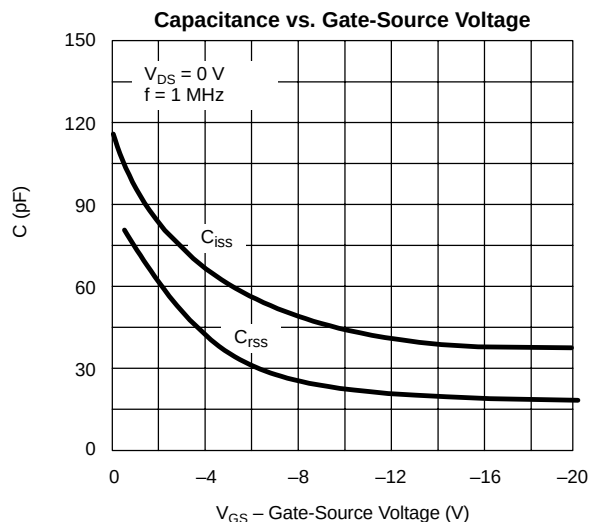
Turn-On Switching



Turn-Off Switching



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





SWITCHING TIME TEST CIRCUIT			
	J105	J106	J107
$V_{GS(L)}$	-12V	-7V	-5V
R_L^*	50 Ω	50 Ω	50 Ω
$I_{D(on)}$	28 mA	27 mA	26 mA

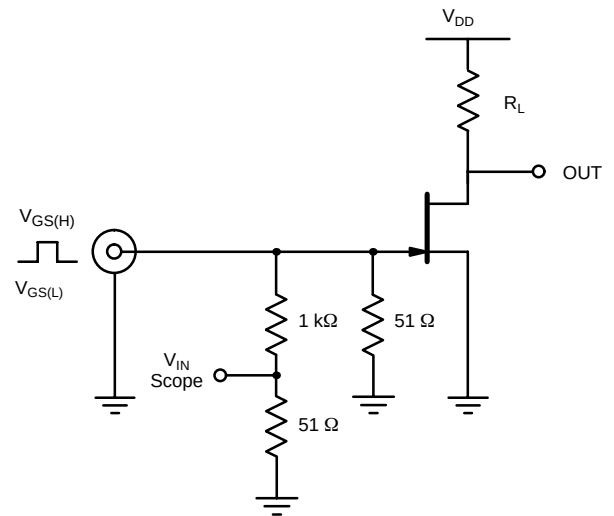
*Non-inductive

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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