



P-Channel JFETs

2N5114JAN/JANTX/JANTXV
2N5115JAN/JANTX/JANTXV
2N5116JAN/JANTX/JANTXV

PRODUCT SUMMARY				
Part Number	$V_{GS(off)}$ (V)	$r_{DS(on)}$ Max (Ω)	$I_{D(off)}$ Typ (pA)	t_{ON} Max (ns)
2N5114	5 to 10	75	-10	16
2N5115	3 to 6	100	-10	30
2N5116	1 to 4	150	-10	42

FEATURES

- Low On-Resistance: 2N5114 <75 Ω
- Fast Switching— t_{ON} : 16 ns
- High Off-Isolation— $I_{D(off)}$: -10 pA
- Low Capacitance: 6 pF
- Low Insertion Loss

BENEFITS

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

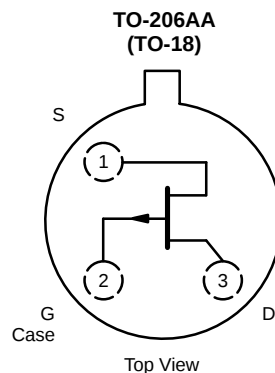
APPLICATIONS

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

DESCRIPTION

The 2N5114JAN/JANTX/JANTXV series consists of p-channel JFET analog switches designed to provide low on-resistance, good off-isolation, and fast switching. These

JFETs are optimized for use in complementary switching applications with the Vishay Siliconix 2N4856A series.



ABSOLUTE MAXIMUM RATINGS

Gate-Drain Voltage 30 V
Gate-Source Voltage 30 V
Gate Current -50 mA
Storage Temperature -65 to 200°C
Operating Junction Temperature -55 to 200°C

Lead Temperature ($1/16$ " from case for 10 sec.) 300°C
Power Dissipation^a 500 mW

Notes

a. Derate 3 mW/°C above 25°C

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

Parameter	Symbol	Test Conditions		Typ ^a	Limits						Unit	
					2N5114		2N5115		2N5116			
					Min	Max	Min	Max	Min	Max		
Static												
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = 1 μA , V _{DS} = 0 V		45	30		30		30		V	
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = −15 V, I _D = −1 nA			5	10	3	6	1	4		
Saturation Drain Current ^b	I _{DSS}	V _{GS} = 0 V	V _{DS} = −18 V		−30	−90					mA	
			V _{DS} = −15 V				−15	−60	−5	−25		
Gate Reverse Current	I _{GSS}	V _{GS} = 20 V, V _{DS} = 0 V		5		500		500		500	pA	
			T _A = 150°C	0.01		1		1		1	μA	
Gate Operating Current ^c	I _G	V _{DG} = −15 V, I _D = −1 mA		−5							pA	
Drain Cutoff Current	I _{D(off)}	V _{DS} = −15 V	V _{GS} = 12 V	−10		−500						
			V _{GS} = 7 V	−10				−500				
			V _{GS} = 5 V	−10						−500		
		V _{DS} = −15 V T _A = 150°C	V _{GS} = 12 V	−0.02		−1						μA
			V _{GS} = 7 V	−0.02				−1				
			V _{GS} = 5 V	−0.02						−1		
Drain-Source On-Voltage	V _{DS(on)}	V _{GS} = 0 V	I _D = −15 mA	−1.0		−1.3					V	
	I _D = −7 mA		−0.7				−0.8					
	I _D = −3 mA		−0.5						−0.6			
Drain-Source On-Resistance	r _{DS(on)}	V _{GS} = 0 V, I _D = −1 mA				75		100		150	Ω	
Gate-Source Forward Voltage	V _{GS(F)}	I _G = −1 mA , V _{DS} = 0 V		−0.7		−1		−1		−1	V	
Dynamic												
Drain-Source On-Resistance	r _{ds(on)}	V _{GS} = 0 V, I _D = 0 mA , f = 1 kHz				75		100		175	Ω	
Common-Source Input Capacitance	C _{iss}	V _{DS} = −15 V, V _{GS} = 0 V f = 1 MHz		20		25		25		27	pF	
Common-Source Reverse Transfer Capacitance	C _{rss}	V _{DS} = 0 V f = 1 MHz	V _{GS} = 12 V	5		7						
			V _{GS} = 7 V	6				7				
			V _{GS} = 5 V	6						7		
Switching												
Turn-On Time	t _{d(on)}	See Switching Circuit				6		10		25	ns	
	t _r					10		20		35		
Turn-Off Time	t _{d(off)}					6		8		20		
	t _f					15		30		60		

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 $\leq 3\%$.
c. This parameter not registered with JEDEC.

PSCIA

SWITCHING TIME TEST CIRCUIT

	2N5114	2N5115	2N5116
V_{DD}	-10 V	-6 V	-6 V
V_{GG}	20 V	12 V	8 V
R_L^*	430 Ω	910 Ω	2000 Ω
R_G^*	100 Ω	220 Ω	390 Ω
$I_{D(on)}$	-15 mA	-7 mA	-3 mA
$V_{GS(H)}$	0 V	0 V	0 V
$V_{GS(L)}$	-11 V	-7 V	-5 V

*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

See Typical Characteristics curves for changes.

