



P-Channel JFETs

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

Table with 5 columns: Part Number, VGS(off) (V), rDS(on) Max (Ω), ID(off) Typ (pA), tON Max (ns). Rows include 2N5114, 2N5115, and 2N5116.

FEATURES

- Low On-Resistance: 2N5114 <75 Ω
• Fast Switching—tON: 16 ns
• High Off-Isolation—ID(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

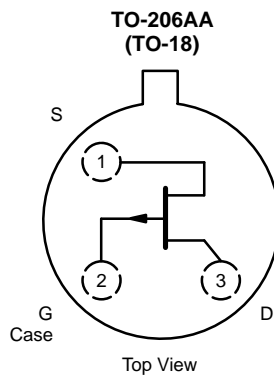
APPLICATIONS

- 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 Dissipationa 500 mW

Notes
a. Derate 3 mW/°C above 25°C

| SPECIFICATIONS (T _A = 25 °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 | | | | | | | | |
| | | | | V _{DS} = -15 V | | | -15 | -60 | -5 | -25 | mA | |
| Gate Reverse Current | I _{GSS} | V _{GS} = 20 V, V _{DS} = 0 V | | | 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 | | | | | | | | | |
| Drain Cutoff Current | I _{D(off)} | V _{DS} = -15 V | | V _{GS} = 12 V | -10 | | -500 | | | pA | | |
| | | | | 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 | | | | | |
| | | | | I _D = -7 mA | -0.7 | | | -0.8 | | | V | |
| | | | | 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

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

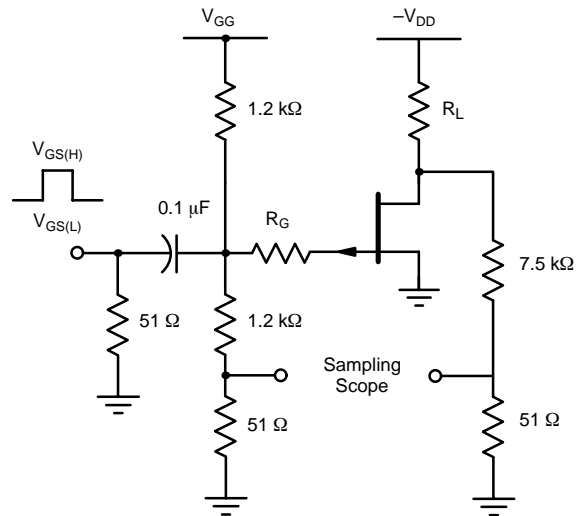
INPUT PULSE

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 M Ω
 Input Capacitance 1.5 pF

See Typical Characteristics curves for changes.





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