

N-Channel JFETs

| PRODUCT SUMMARY | | | | |
|------------------------|-------------------|-------------------------------|-----------------------------|-------------------|
| Part Number | $V_{GS(off)}$ (V) | $r_{DS(on)}$ Max (Ω) | $I_{D(off)}$ Typ (μ A) | t_{ON} Typ (ns) |
| 2N5432 | -4 to -10 | 5 | 10 | 2.5 |
| 2N5433 | -3 to -9 | 7 | 10 | 2.5 |
| 2N5434 | -1 to -4 | 10 | 10 | 2.5 |

FEATURES

- Low On-Resistance: 2N5432 <5 Ω
- Fast Switching— t_{ON} : 2.5 ns
- High Off-Isolation— $I_{D(off)}$: 10 μ A
- Low Capacitance: 11 pF
- Low Insertion Loss

BENEFITS

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

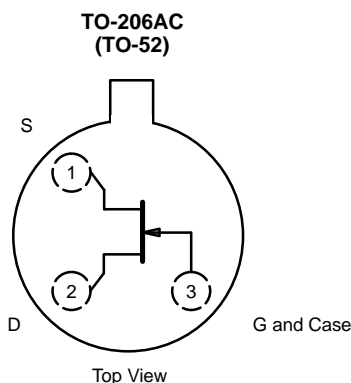
APPLICATIONS

- Analog Switches
- Choppers
- Sample-and-Hold
- Normally "On" Switches
- Current Limiters

DESCRIPTION

The 2N5432/5433/5434 are suitable for high-performance analog switching and amplifier applications. Breakdown voltage characteristics, low on-resistance, and very fast switching make these devices ideal for a wide range of applications.

The hermetically-sealed TO-206AC (TO-52) package is suitable for processing per MIL-S-19500 (see Military Information). For similar products in TO-236 (SOT-23) or TO-226AA (TO-92) packages, see the J/SST108 series data sheet.



ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage -25 V
 Gate Current 100 mA
 Lead Temperature ($1/16$ " from case for 10 sec.) 300°C
 Storage Temperature -65 to 200°C

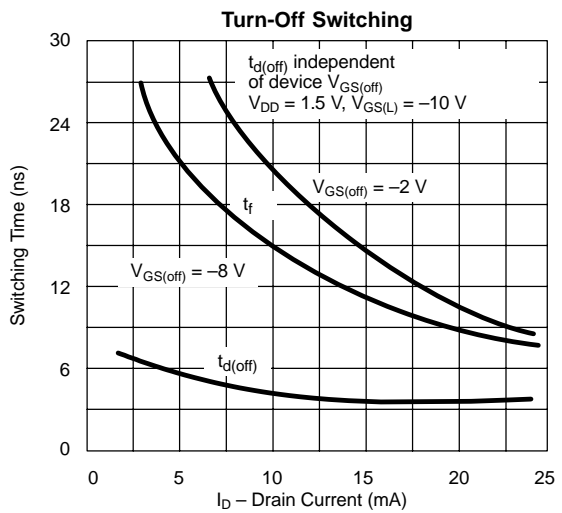
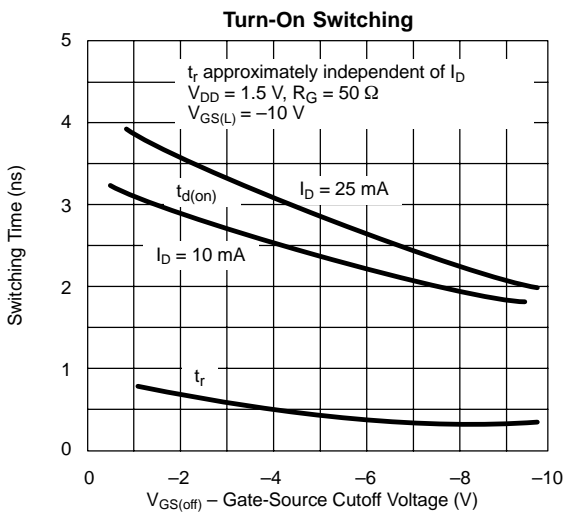
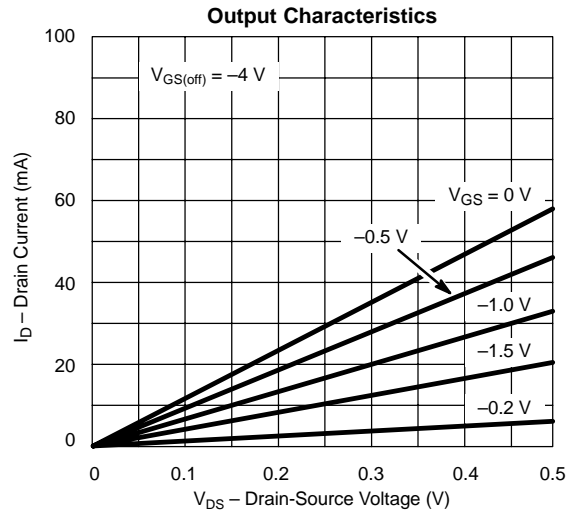
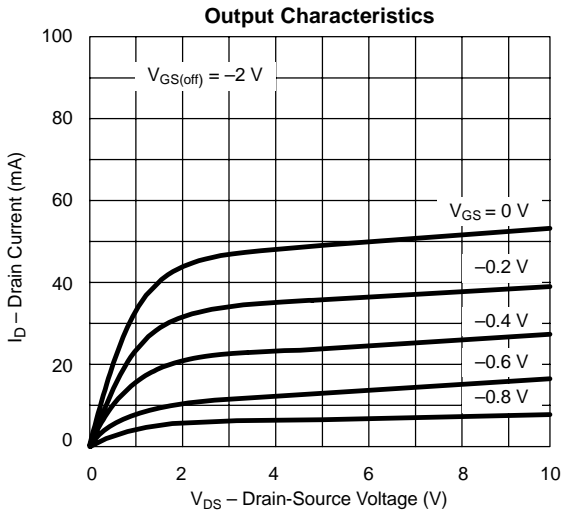
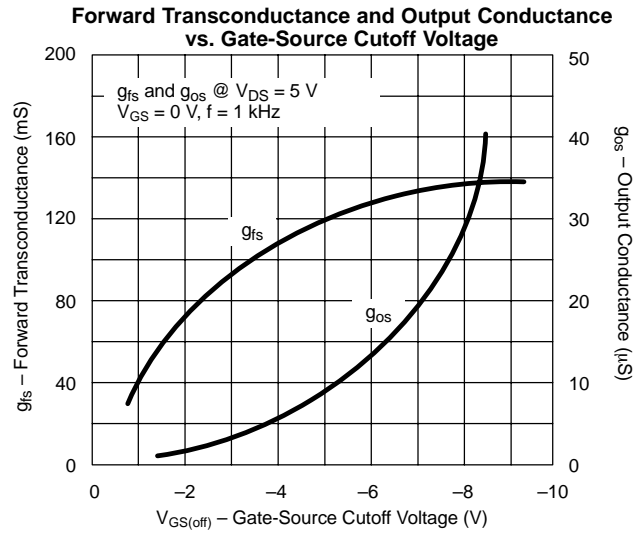
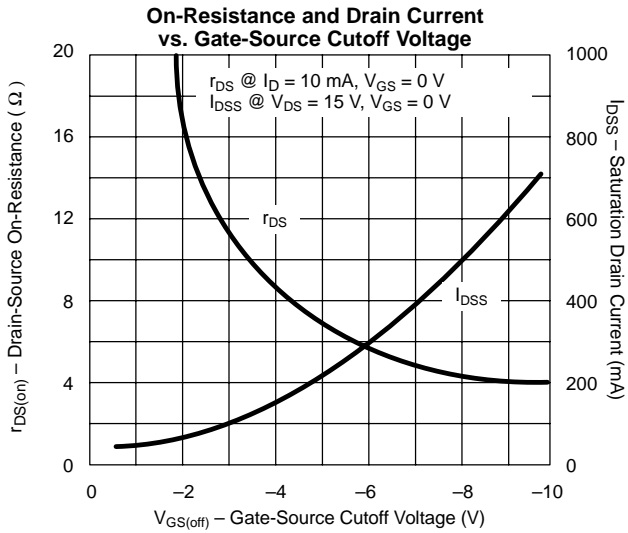
Operating Junction Temperature -55 to 150°C
 Power Dissipation^a 300 mW

Notes
 a. Derate 2.4 mW/°C above 25°C

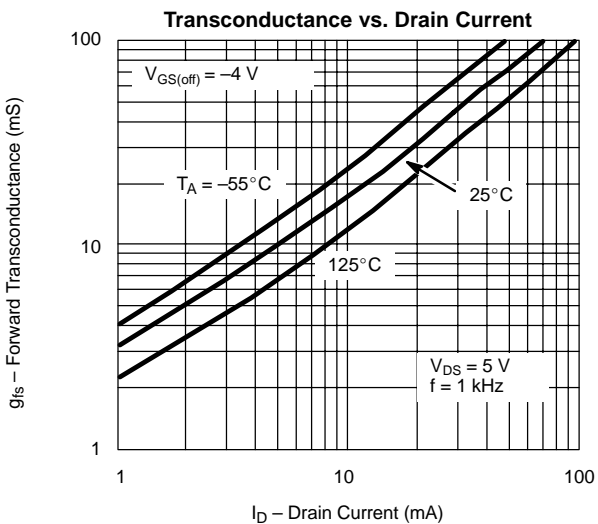
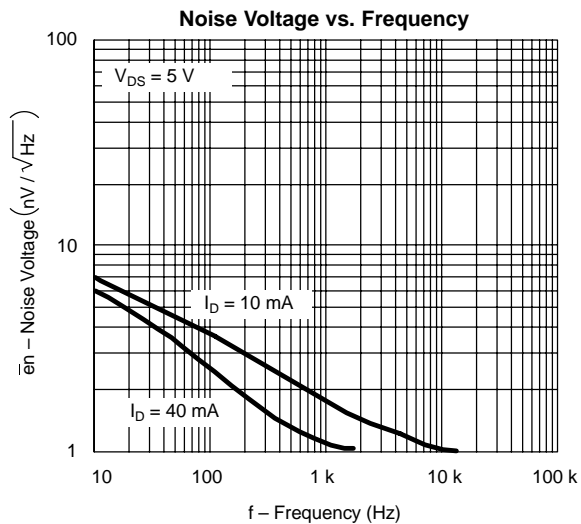
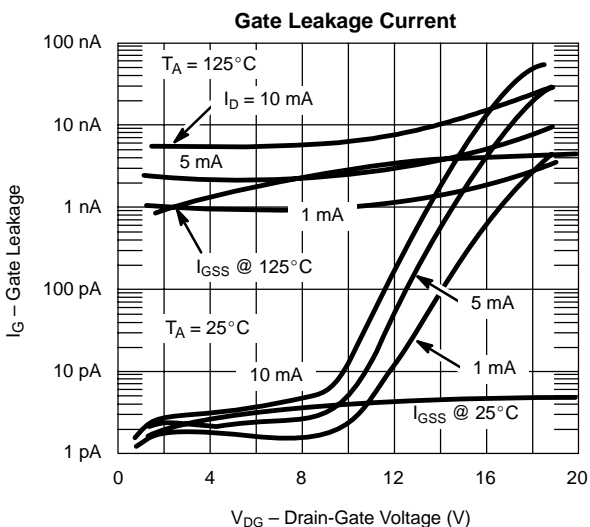
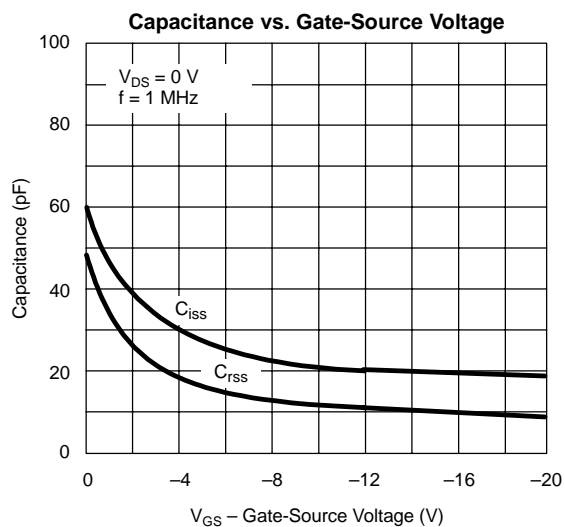
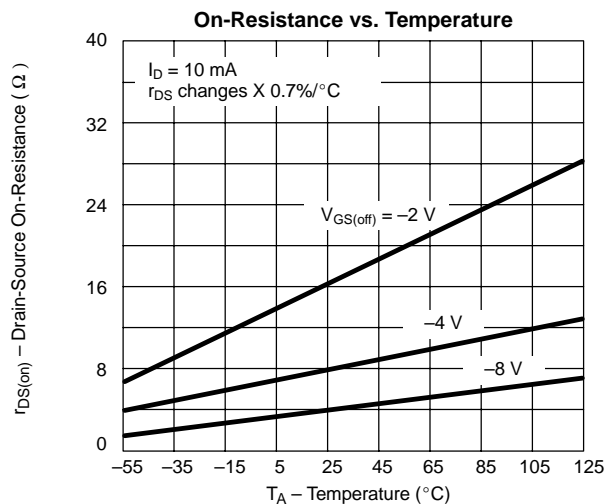
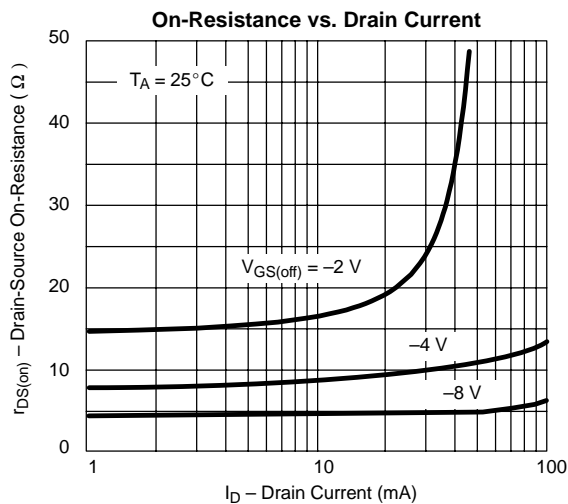
| SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED) | | | | | | | | | | |
|--|----------------------|--|------------------|--------|------|--------|------|--------|------|------------|
| Parameter | Symbol | Test Conditions | Typ ^a | Limits | | | | | | Unit |
| | | | | 2N5432 | | 2N5433 | | 2N5434 | | |
| | | | | Min | Max | Min | Max | Min | Max | |
| Static | | | | | | | | | | |
| Gate-Source Breakdown Voltage | V _{(BR)GSS} | I _G = -1 μA, V _{DS} = 0 V | -32 | -25 | | -25 | | -25 | | V |
| Gate-Source Cutoff Voltage | V _{GS(off)} | V _{DS} = 5 V, I _D = 3 nA | | -4 | -10 | -3 | -9 | -1 | -4 | |
| Saturation Drain Current ^b | I _{DSS} | V _{DS} = 15 V, V _{GS} = 0 V | | 150 | | 100 | | 30 | | mA |
| Gate Reverse Current | I _{GSS} | V _{GS} = -15 V, V _{DS} = 0 V T _A = 150 °C | -5 | | -200 | | -200 | | -200 | pA |
| | | | -10 | | -200 | | -200 | | -200 | nA |
| Gate Operating Current ^c | I _G | V _{DG} = 10 V, I _D = 10 mA | -10 | | | | | | | pA |
| Drain Cutoff Current | I _{D(off)} | V _{DS} = 5 V, V _{GS} = -10 V T _A = 150 °C | 10 | | 200 | | 200 | | 200 | |
| | | | 20 | | 200 | | 200 | | 200 | nA |
| Drain-Source On-Voltage | V _{DS(on)} | V _{GS} = 0 V, I _D = 10 mA | | | 50 | | 70 | | 100 | mV |
| Drain-Source On-Resistance | r _{DS(on)} | | | 2 | 5 | | 7 | | 10 | Ω |
| Gate-Source Forward Voltage ^c | V _{GS(F)} | I _G = 1 mA, V _{DS} = 0 V | 0.7 | | | | | | | V |
| Dynamic | | | | | | | | | | |
| Common-Source Forward Transconductance ^c | g _{fs} | V _{DS} = 5 V, I _D = 10 mA f = 1 kHz | 17 | | | | | | | mS |
| | | | 600 | | | | | | | μS |
| Common-Source Output Conductance ^c | g _{os} | | | | | | | | | |
| Drain-Source On-Resistance | r _{ds(on)} | V _{GS} = 0 V, I _D = 0 mA f = 1 kHz | | | 5 | | 7 | | 10 | Ω |
| Common-Source Input Capacitance | C _{iss} | V _{DS} = 0 V, V _{GS} = -10 V f = 1 MHz | 20 | | 30 | | 30 | | 30 | pF |
| Common-Source Reverse Transfer Capacitance | C _{rss} | | 11 | | 15 | | 15 | | 15 | |
| Equivalent Input Noise Voltage ^c | e _n | V _{DS} = 5 V, I _D = 10 mA f = 1 kHz | 3.5 | | | | | | | nV/ √Hz |
| Switching | | | | | | | | | | |
| Turn-On Time ^b | t _{d(on)} | V _{DD} = 1.5 V, V _{GS(H)} = 0 V See Switching Circuit | 2 | | 4 | | 4 | | 4 | ns |
| | t _r | | 0.5 | | 1 | | 1 | | 1 | |
| Turn-Off Time ^b | t _{d(off)} | | 4 | | 6 | | 6 | | 6 | |
| | t _f | | 18 | | 30 | | 30 | | 30 | |

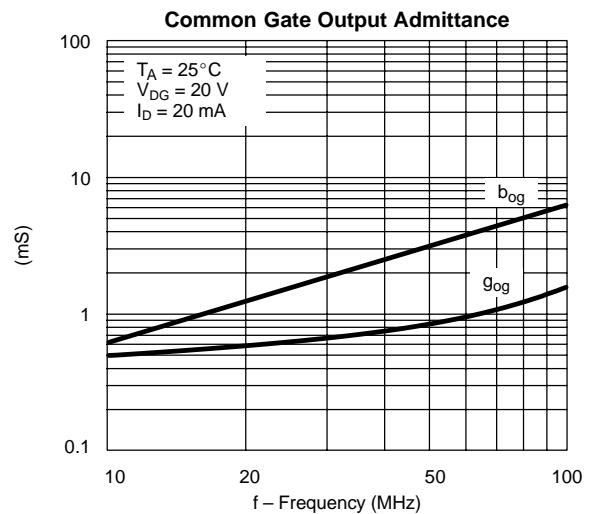
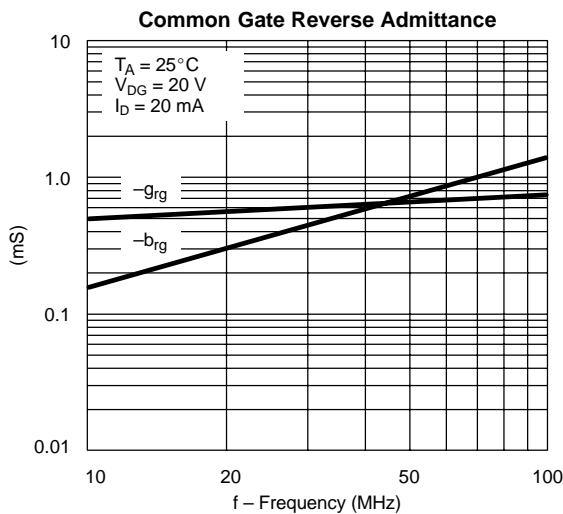
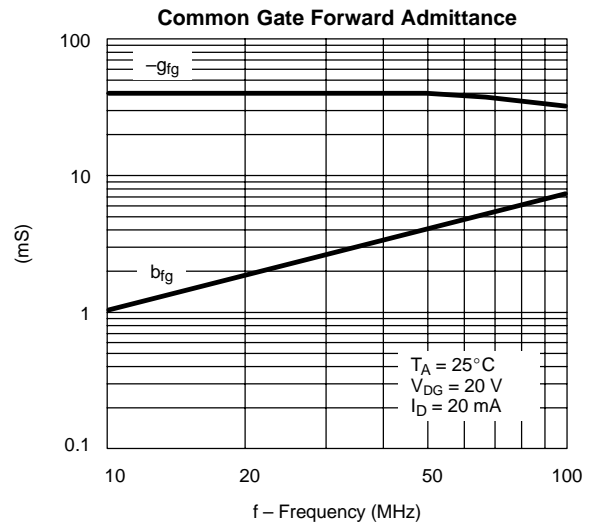
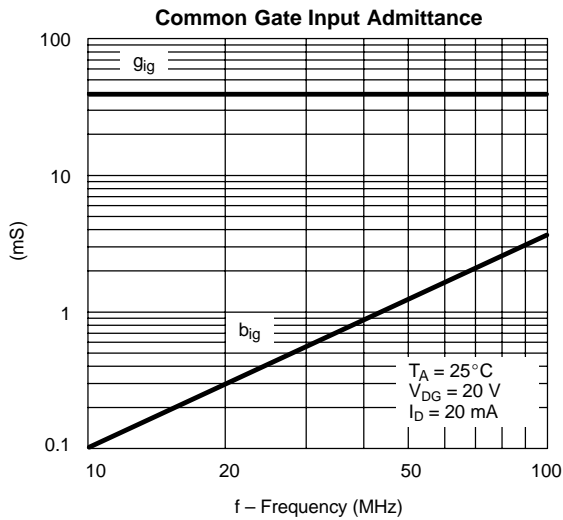
Notes
 a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
 b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
 c. This parameter not registered with JEDEC.

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



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

SWITCHING TIME TEST CIRCUIT

| | 2N5432 | 2N5433 | 2N5434 |
|-------------|--------------|--------------|--------------|
| $V_{GS(L)}$ | -12 V | -12 V | -12 V |
| R_L^* | 145 Ω | 143 Ω | 140 Ω |
| $I_{D(on)}$ | 10 mA | 10 mA | 10 mA |

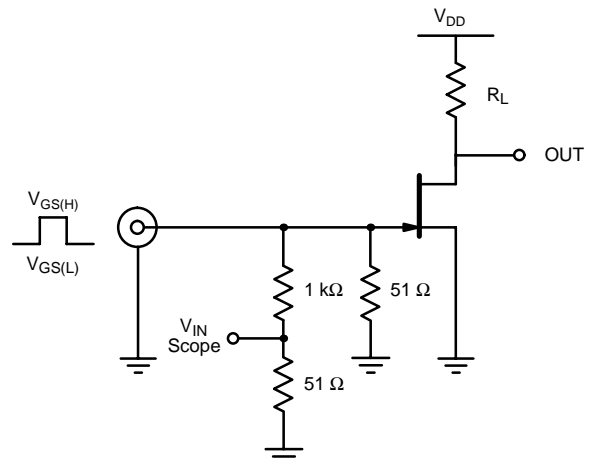
*Non-inductive

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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