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)
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 pA
- 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

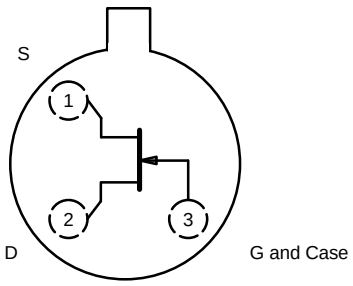
- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

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 are 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.

TO-206AC
(TO-52)



Top View

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

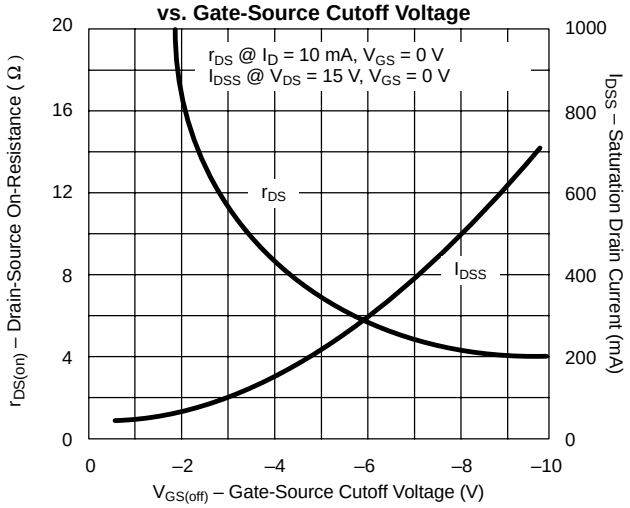
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Typ[a]	Limits 2N5432 Min	2N5432 Max	2N5433 Min	2N5433 Max	2N5434 Min	2N5434 Max	Unit
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	–5		–200		–200		–200	pA
		T_A = 150°C	–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	10		200		200		200	
		T_A = 150°C	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
Common-Source Output Conductance[c]	g_{os}		600							µS
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]	$\overline{e}_n$	V_{DS} = 5 V, I_D = 10 mA f = 1 kHz	3.5							$\frac{nV}{\sqrt{Hz}}$
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	

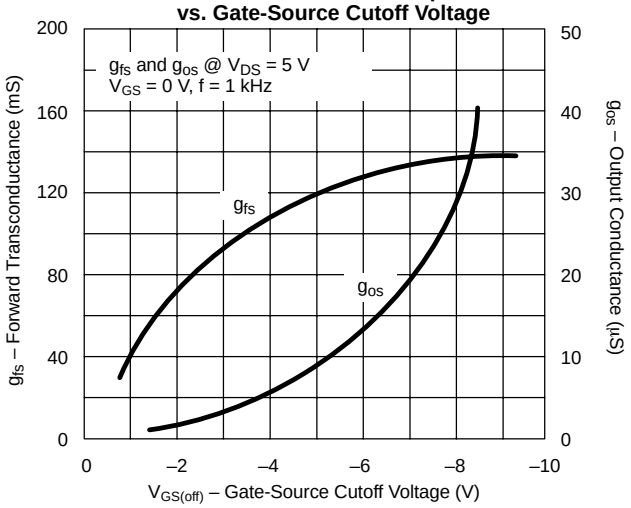
Notes
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing. NIP
b. Pulse test: PW ≤300 µs duty cycle ≤3%.
c. This parameter not registered with JEDEC.

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

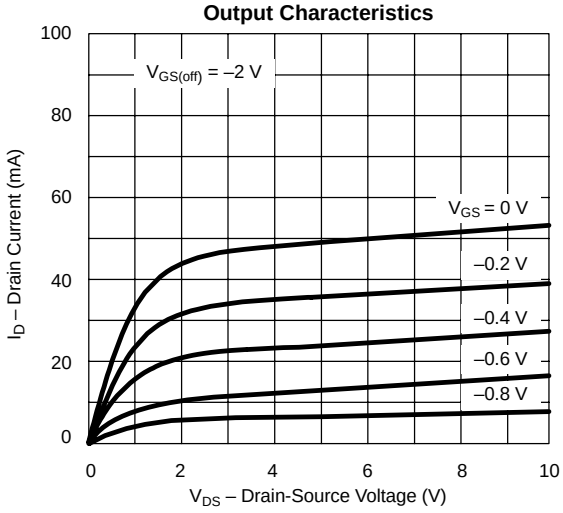
On-Resistance and Drain Current vs. Gate-Source Cutoff Voltage



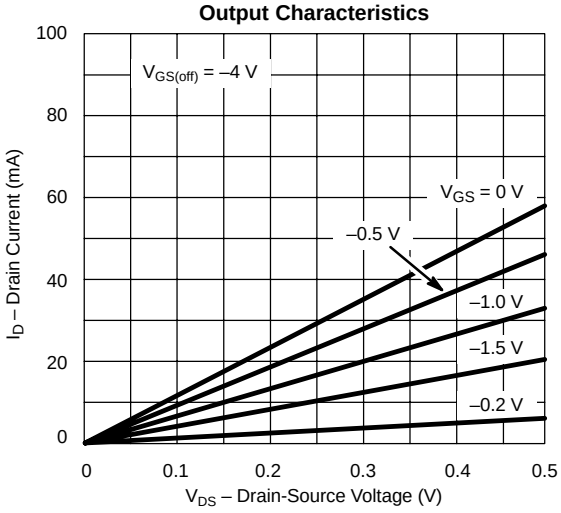
Forward Transconductance and Output Conductance vs. Gate-Source Cutoff Voltage



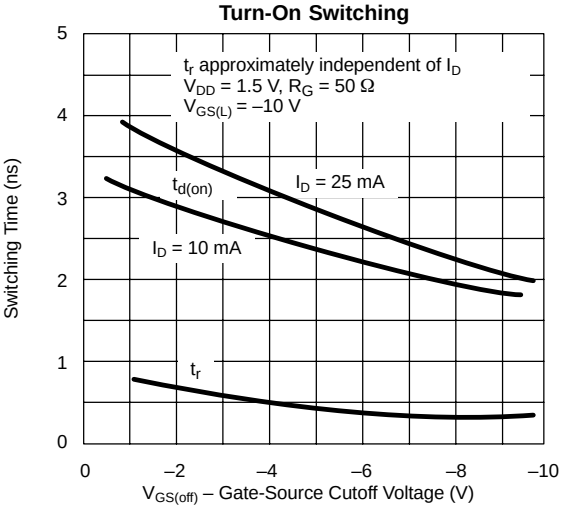
Output Characteristics



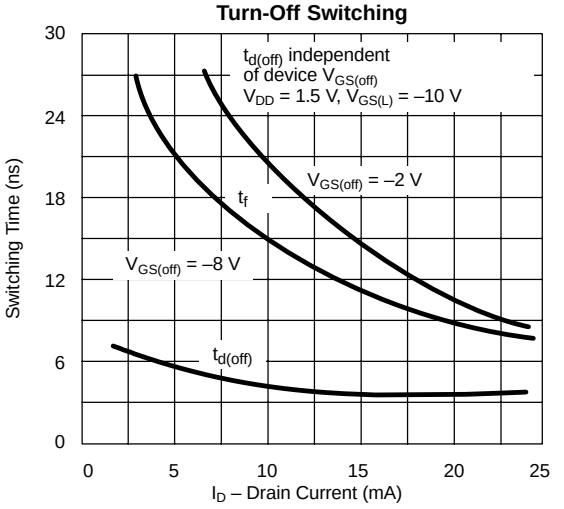
Output Characteristics



Turn-On Switching

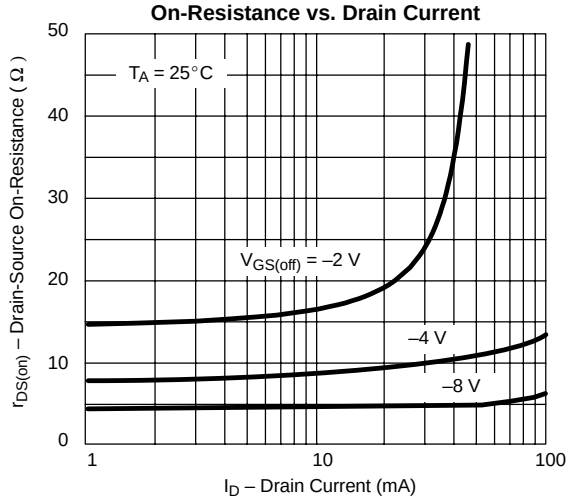


Turn-Off Switching

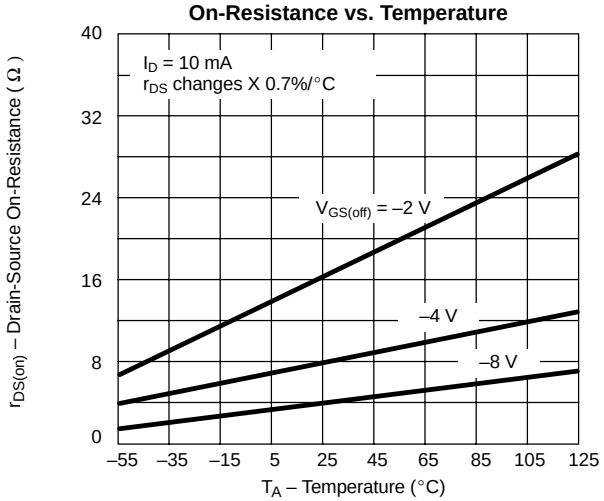


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

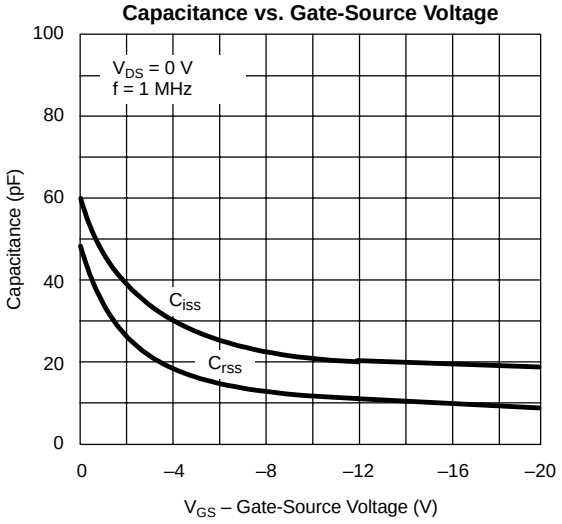
On-Resistance vs. Drain Current



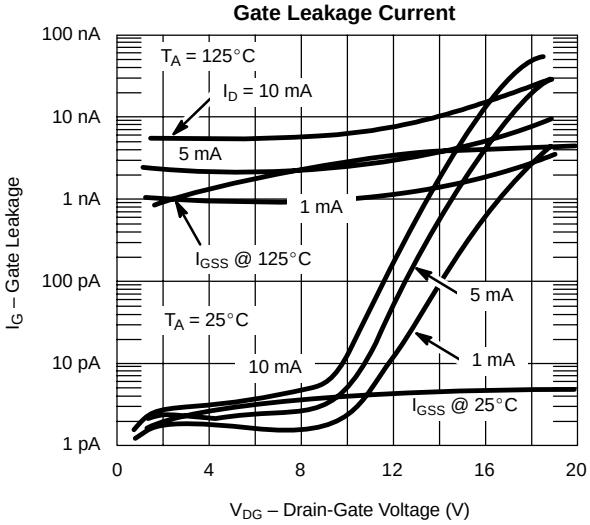
On-Resistance vs. Temperature



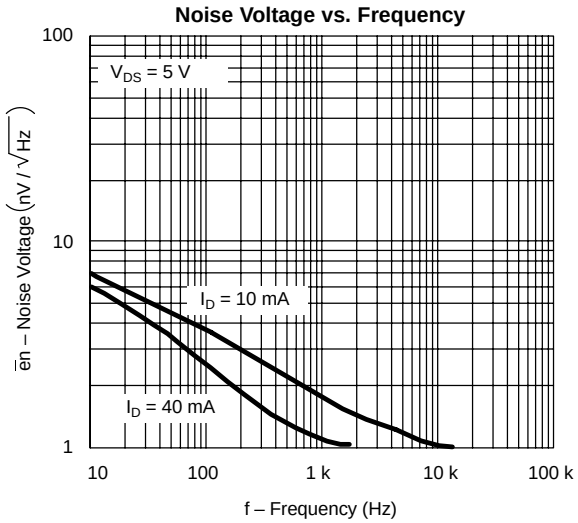
Capacitance vs. Gate-Source Voltage



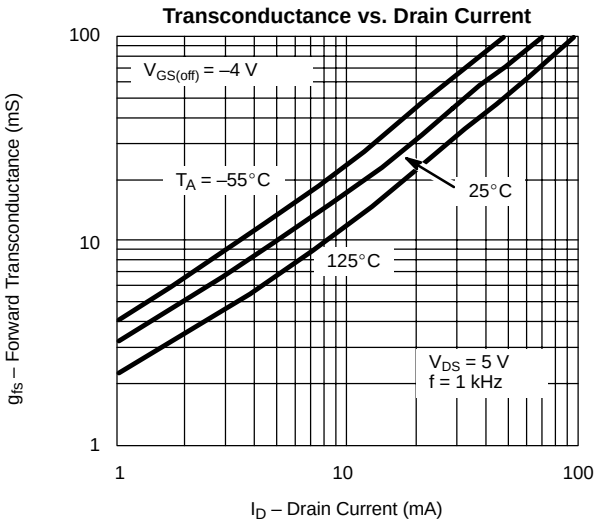
Gate Leakage Current



Noise Voltage vs. Frequency

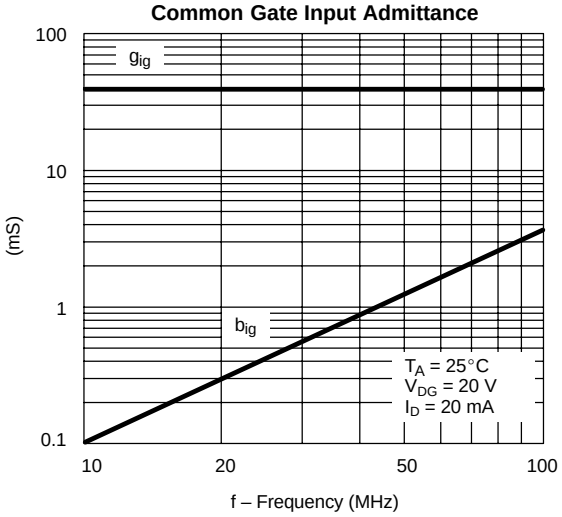


Transconductance vs. Drain Current

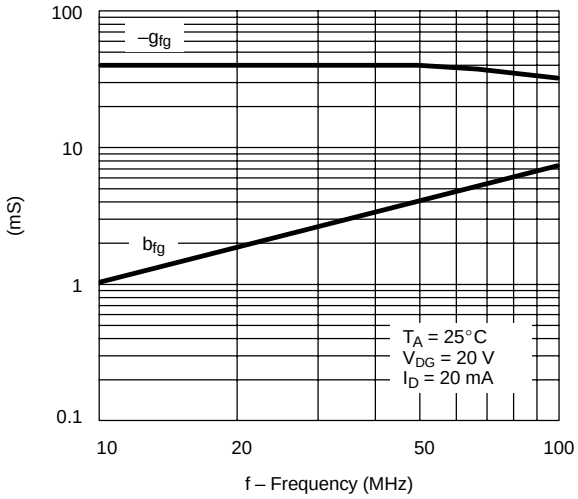


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

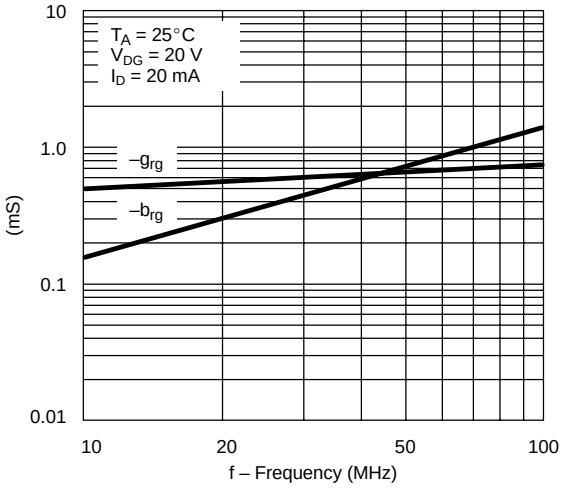
Common Gate Input Admittance



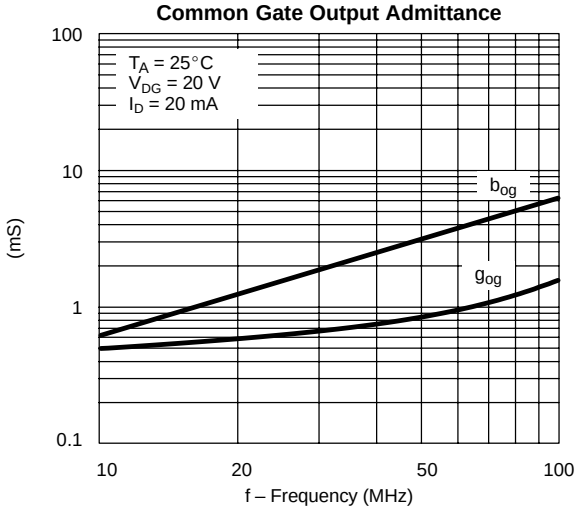
Common Gate Forward Admittance



Common Gate Reverse Admittance

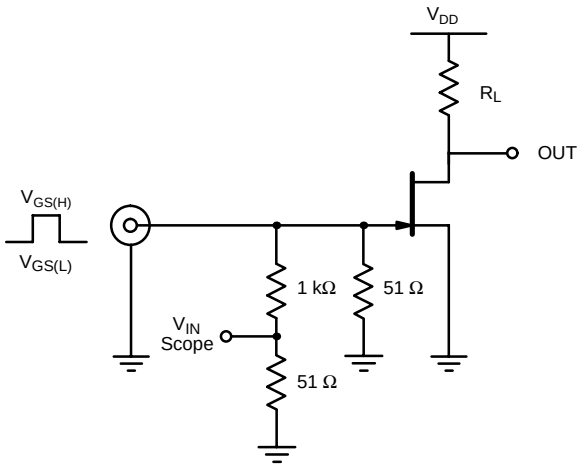


Common Gate Output Admittance



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 MΩ
Input Capacitance 1.5 pF

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