

N-Channel JFETs

Product Summary

Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	g_{fs} Min (mS)	I_{DSS} Max (mA)
2N4338	-0.3 to -1	-50	0.6	0.6
2N4339	-0.6 to -1.8	-50	0.8	1.5
2N4340	-1 to -3	-50	1.3	3.6
2N4341	-2 to -6	-50	2	9

For applications information see AN102, page 6, AN106, page 28.

Features

- Low Cutoff Voltage: 2N4338 <1 V
- High Input Impedance
- Very Low Noise
- High Gain: $A_V = 80 @ 20 \mu A$

Benefits

- Full Performance from Low-Voltage Power Supply: Down to 1 V
- Low Signal Loss/System Error
- High System Sensitivity
- High-Quality Low-Level Signal Amplification

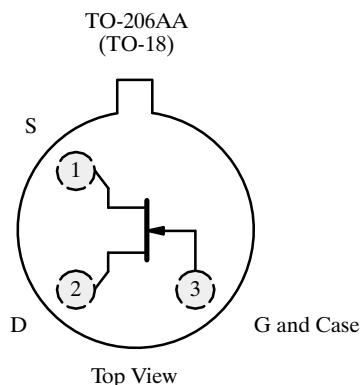
Applications

- High-Gain, Low-Noise Amplifiers
- Low-Current, Low-Voltage Battery-Powered Amplifiers
- Infrared Detector Amplifiers
- Ultrahigh Input Impedance Pre-Amplifiers

Description

The 2N4338/4339/4340/4341 n-channel JFETs are designed for sensitive amplifier stages at low- to mid-frequencies. Low cut-off voltages accommodate low-level power supplies and low leakage for improved system accuracy.

The TO-206AA (TO-18) package is hermetically sealed and suitable for military processing (see Military Information). For similar products in TO-226AA (TO-92) and TO-236 (SOT-23) packages, see the J/SST201 series data sheet.



Absolute Maximum Ratings

Gate-Source/Gate-Drain Voltage	-50 V
Forward Gate Current	50 mA
Storage Temperature	-65 to 200°C
Operating Junction Temperature	-55 to 175°C

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

Notes
a. Derate 2 mW/°C above 25°C

Specifications^a for 2N4338 and 2N4339

Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit
				2N4338		2N4339		
				Min	Max	Min	Max	
Static								
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-57	-50		-50		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 15 V, I_D = 0.1 \mu A$		-0.3	-1	-0.6	-1.8	
Saturation Drain Current ^c	I_{DSS}	$V_{DS} = 15 V, V_{GS} = 0 V$		0.2	0.6	0.5	1.5	mA
Gate Reverse Current	I_{GSS}	$V_{GS} = -30 V, V_{DS} = 0 V$ $T_A = 150^\circ C$	-2		-100		-100	pA
			-4		-100		-100	nA
Gate Operating Current ^c	I_G	$V_{DG} = 15 V, I_D = 0.1 mA$	-2					pA
Drain Cutoff Current	$I_{D(off)}$	$V_{DS} = 15 V, V_{GS} = -5 V$	2		50		50	
Gate-Source Forward Voltage ^d	$V_{GS(F)}$	$I_G = 1 mA, V_{DS} = 0 V$	0.7					V
Dynamic								
Common-Source Forward Transconductance	g_{fs}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 kHz$		0.6	1.8	0.8	2.4	mS
Common-Source Output Conductance	g_{os}					5		15
Drain-Source On-Resistance	$r_{ds(on)}$	$V_{DS} = 0 V, V_{GS} = 0 V, f = 1 kHz$			2500		1700	Ω
Common-Source Input Capacitance	C_{iss}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$	5		7		7	pF
Common-Source Reverse Transfer Capacitance	C_{rss}		1.5		3		3	
Equivalent Input Noise Voltage ^d	\bar{e}_n	$V_{DS} = 10 V, V_{GS} = 0 V, f = 1 kHz$	6					nV/\sqrt{Hz}
Noise Figure	NF	$V_{DS} = 15 V, V_{GS} = 0 V$ $f = 1 kHz, R_G = 1 M\Omega$			1		1	dB

Specifications^a for 2N4340 and 2N4341

Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit
				2N4340		2N4341		
				Min	Max	Min	Max	
Static								
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-57	-50		-50		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 15 V, I_D = 0.1 \mu A$		-1	-3	-2	-6	
Saturation Drain Current ^c	I_{DSS}	$V_{DS} = 15 V, V_{GS} = 0 V$		1.2	3.6	3	9	mA
Gate Reverse Current	I_{GSS}	$V_{GS} = -30 V, V_{DS} = 0 V$ $T_A = 150^\circ C$	-2		-100		-100	pA
			-4		-100		-100	nA
Gate Operating Current ^c	I_G	$V_{DG} = 15 V, I_D = 0.1 mA$	-2					pA
Drain Cutoff Current	$I_{D(off)}$	$V_{DS} = 15 V$	$V_{GS} = -5 V$	2		50		
			$V_{GS} = -10 V$	3			70	
Gate-Source Forward Voltage	$V_{GS(F)}$	$I_G = 1 mA, V_{DS} = 0 V$	0.7					V

Specifications^a for 2N4340 and 2N4341

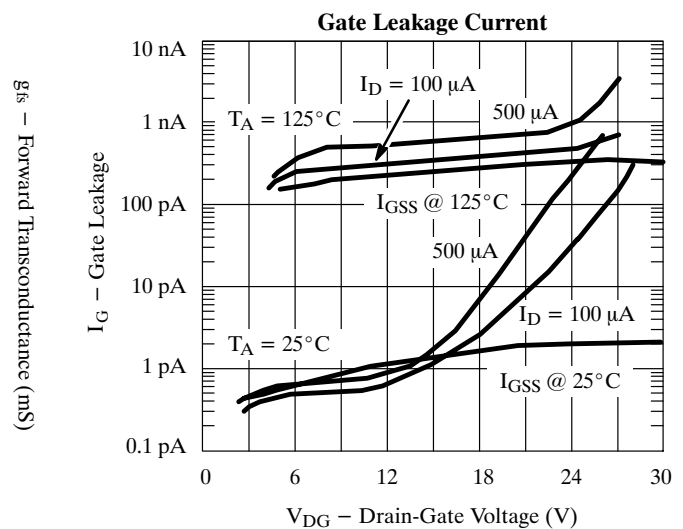
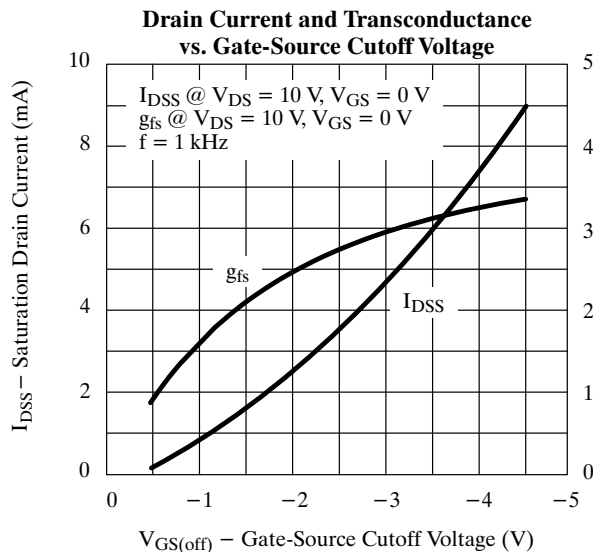
Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit
				2N4340		2N4341		
				Min	Max	Min	Max	
Dynamic								
Common-Source Forward Transconductance	g_{fs}	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ kHz}$		1.3	3	2	4	mS
Common-Source Output Conductance	g_{os}				3.0		6.0	μS
Drain-Source On-Resistance	$r_{ds(on)}$	$V_{DS} = 0\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ kHz}$			1500		800	Ω
Common-Source Input Capacitance	C_{iss}	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	5		7		7	pF
Common-Source Reverse Transfer Capacitance	C_{rss}		1.5		3		3	
Equivalent Input Noise Voltage ^d	\bar{e}_n	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ kHz}$	6					$\text{nV}/\sqrt{\text{Hz}}$
Noise Figure	NF	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ kHz}, R_G = 1\text{ M}\Omega$			1		1	dB

Notes

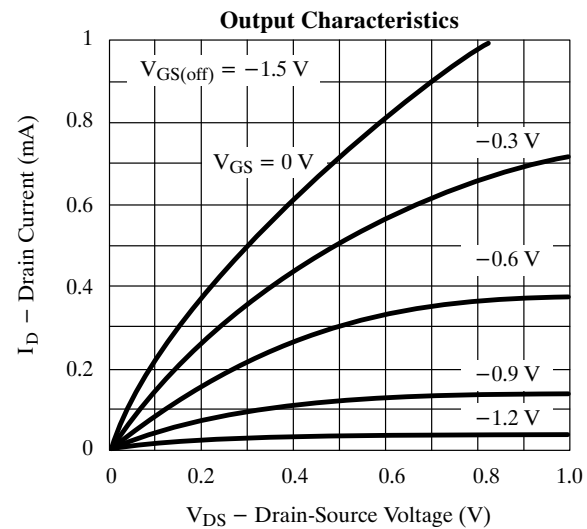
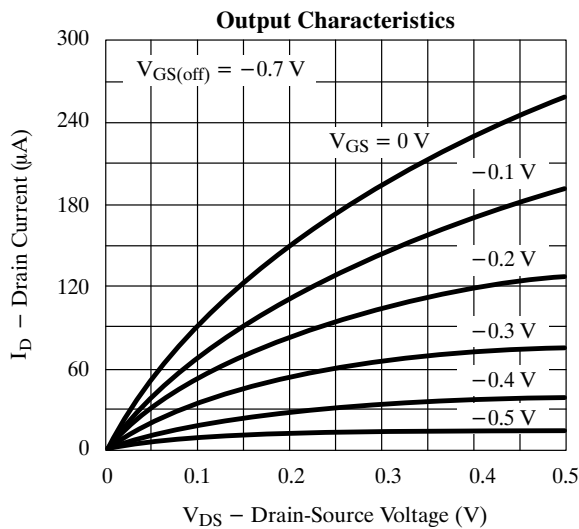
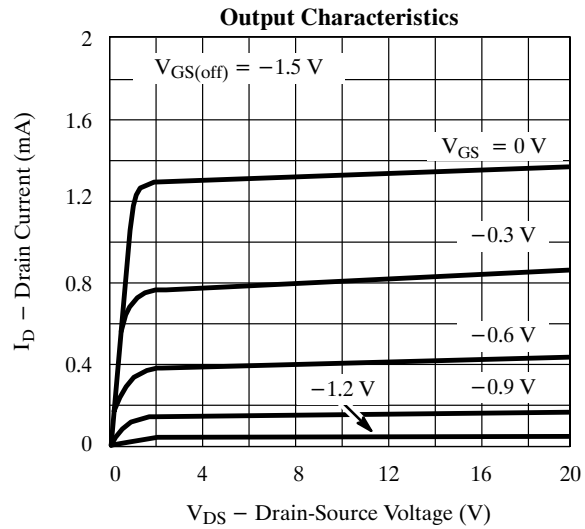
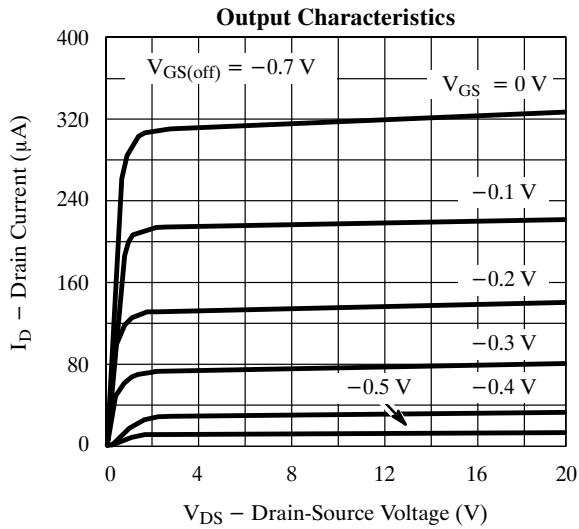
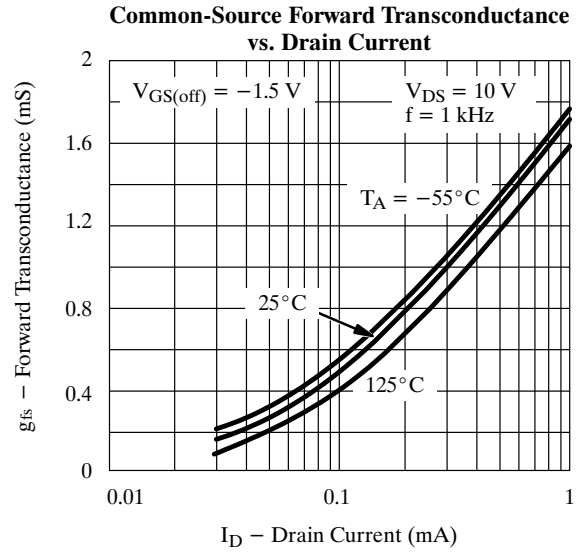
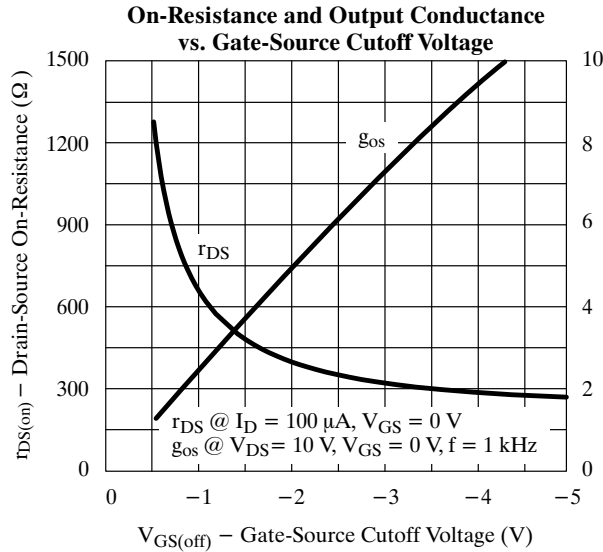
- a. $T_A = 25^\circ\text{C}$ unless otherwise noted.
- b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- c. Pulse test: $PW \leq 300\ \mu\text{s}$, duty cycle $\leq 3\%$.
- d. This parameter not registered with JEDEC.

NPA

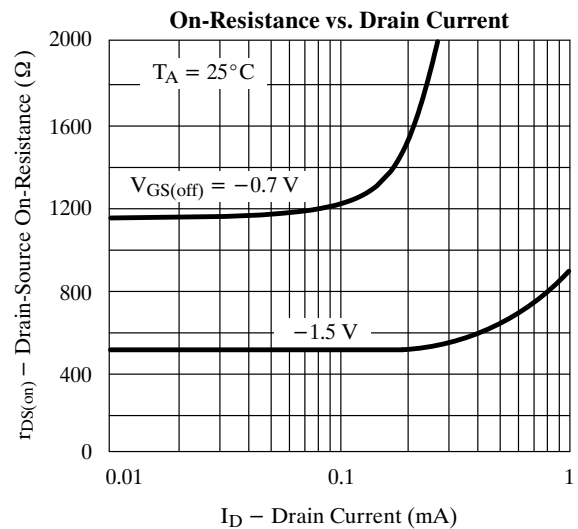
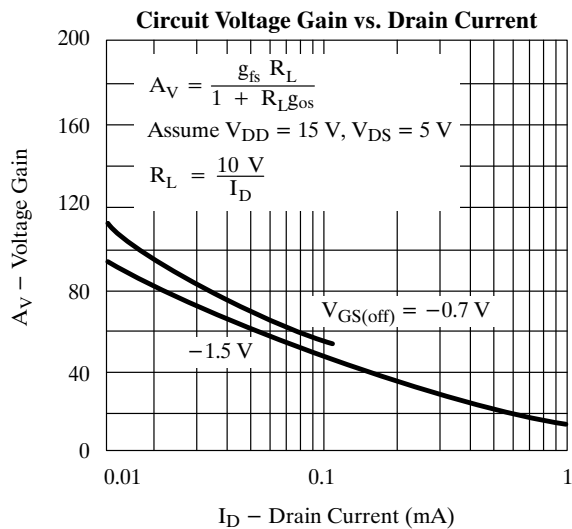
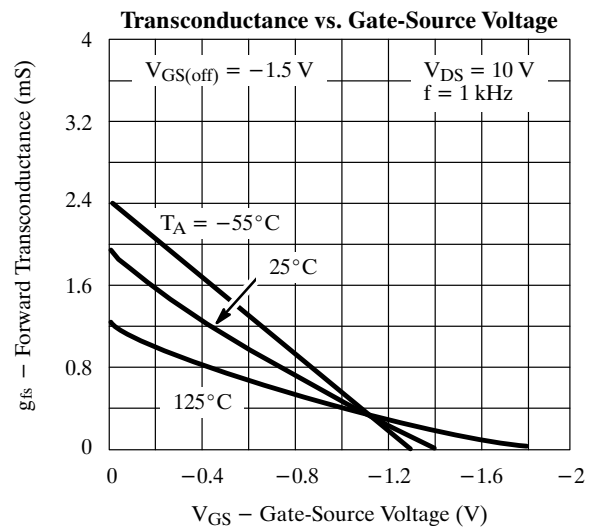
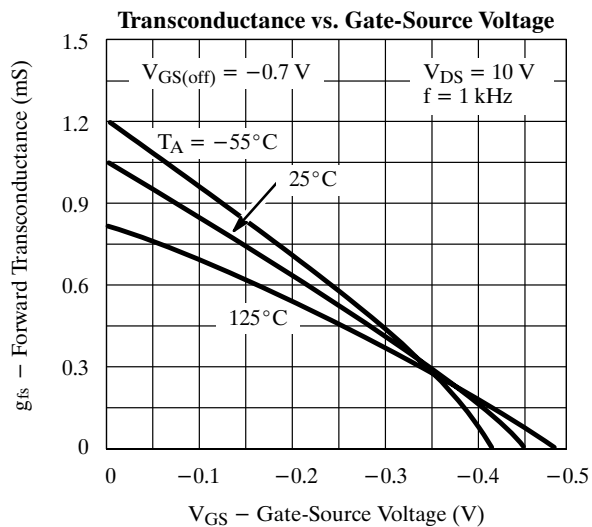
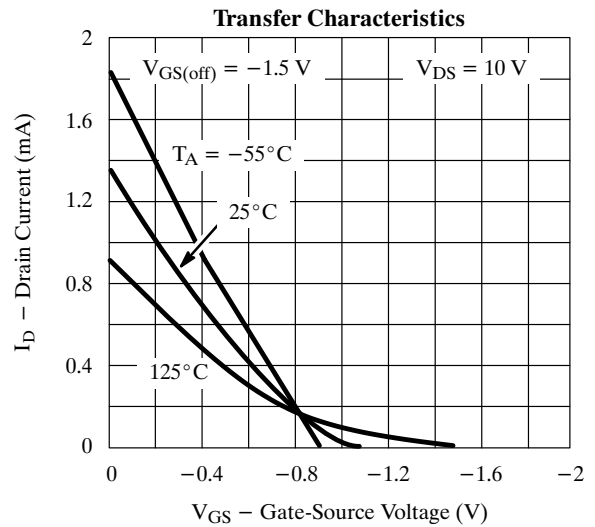
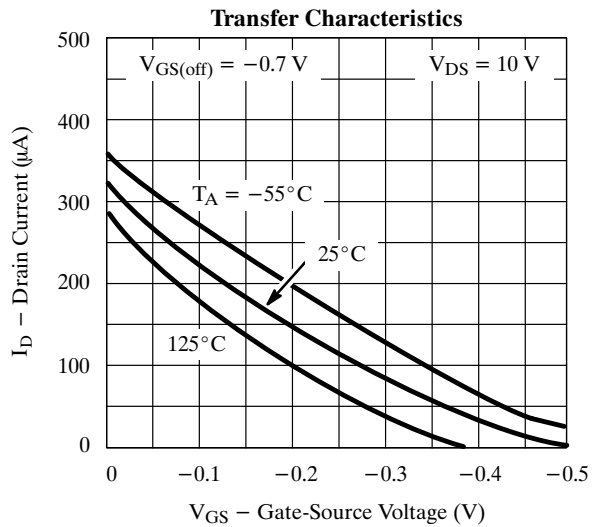
Typical Characteristics



Typical Characteristics (Cont'd)



Typical Characteristics (Cont'd)



Typical Characteristics (Cont'd)

