

## Matched N-Channel JFET Pairs

### Product Summary

Part Number	V <sub>GS(off)</sub> (V)	V <sub>(BR)GSS</sub> Min (V)	g <sub>fs</sub> Min (mS)	I <sub>G</sub> Typ (pA)	V <sub>GS1</sub> - V <sub>GS2</sub>   Max (mV)
2N5564	-0.5 to -3	-40	7.5	-3	5
2N5565	-0.5 to -3	-40	7.5	-3	10
2N5566	-0.5 to -3	-40	7.5	-3	20

### Features

- Two-Chip Design
- High Slew Rate
- Low Offset/Drift Voltage
- Low Gate Leakage: 3 pA
- Low Noise: 12 nV/√Hz @ 10 Hz
- Good CMRR: 76 dB
- Minimum Parasitics

### Benefits

- Tight Differential Match vs. Current
- Improved Op Amp Speed, Settling Time Accuracy
- Minimum Input Error/Trimming Requirement
- Insignificant Signal Loss/Error Voltage
- High System Sensitivity
- Minimum Error with Large Input Signals
- Maximum High Frequency Performance

### Applications

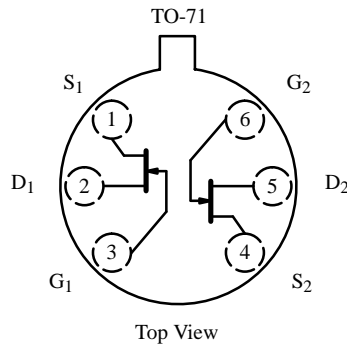
- Wideband Differential Amps
- High-Speed, Temp-Compensated, Single-Ended Input Amps
- High-Speed Comparators
- Impedance Converters
- Matched Switches

### Description

The 2N5564/5565/5566 are matched pairs of JFETs mounted in a TO-71 package. This two-chip design reduces parasitics for good performance at high frequency while ensuring extremely tight matching. This series features high breakdown voltage (V<sub>(BR)DSS</sub> typically > 55 V), high gain (typically > 9 mS), and <5-mV offset between the two die.

The hermetically-sealed TO-71 package is available with full military processing (see Military Information).

For similar products see the low-noise U/SST401 series, and the low-leakage 2N5196/5197/5198/5199 data sheets.



### Absolute Maximum Ratings

Gate-Drain, Gate-Source Voltage	-40 V
Gate-Gate Voltage	± 80 V
Gate Current	50 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 :	Per Side <sup>a</sup> 325 mW
	Total <sup>b</sup> 650 mW

#### Notes

- Derate 2.6 mW/°C above 25 °C
- Derate 5.2 mW/°C above 25 °C

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70254.

# 2N5564/5565/5566

## Specifications<sup>a</sup>

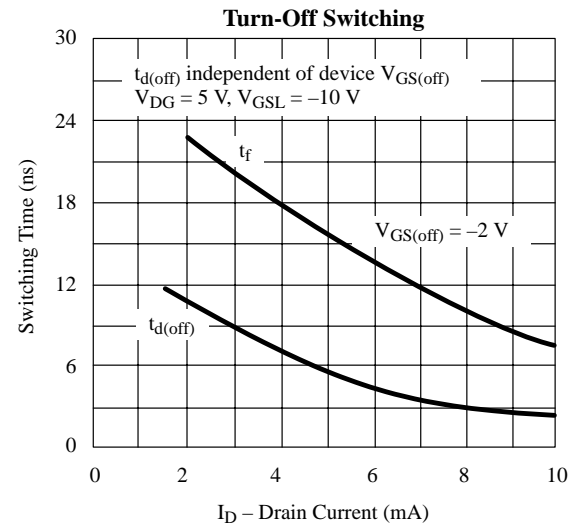
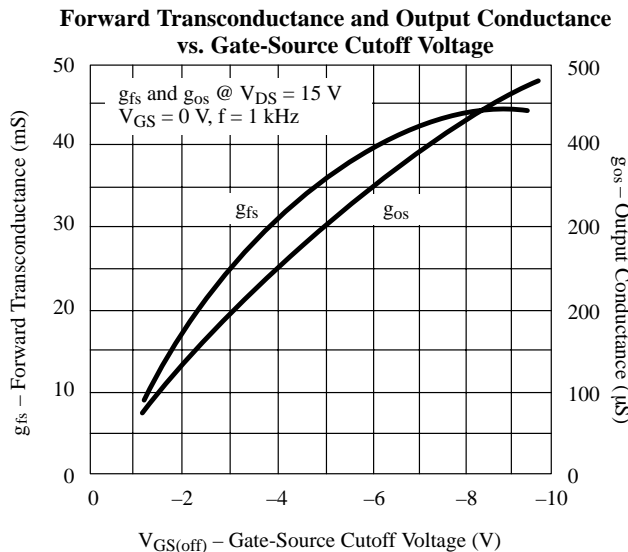
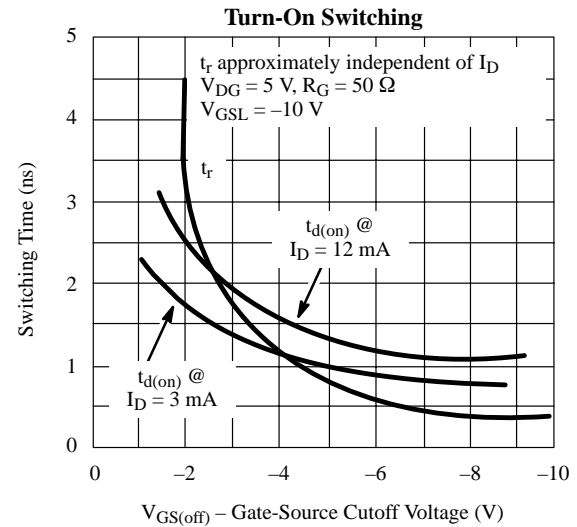
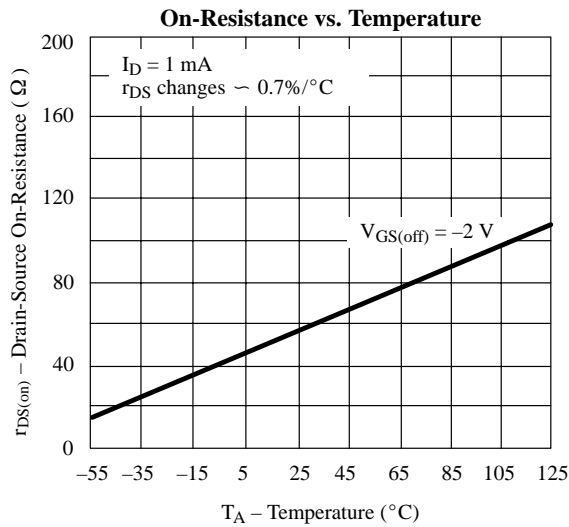
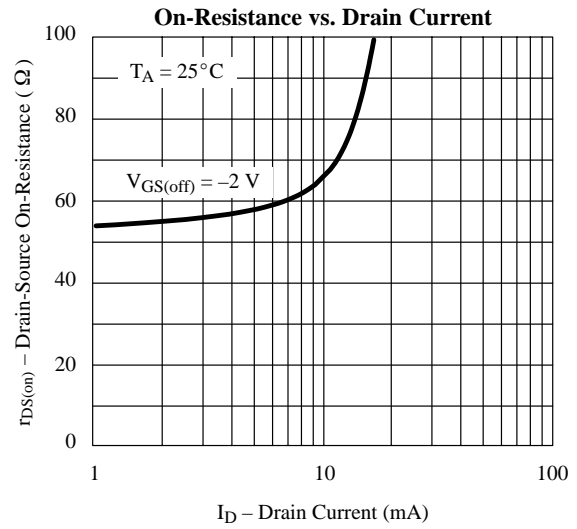
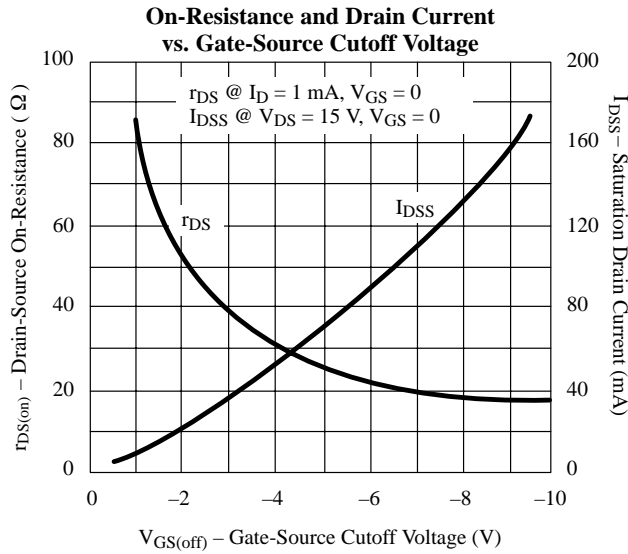
Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits						Unit
				2N5564		2N5565		2N5566		
				Min	Max	Min	Max	Min	Max	
<b>Static</b>										
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-55	-40		-40		-40		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 15 V, I_D = 1 nA$	-2	-0.5	-3	-0.5	-3	-0.5	-3	
Saturation Drain Current <sup>c</sup>	$I_{DSS}$	$V_{DS} = 15 V, V_{GS} = 0 V$	20	5	30	5	30	5	30	mA
Gate Reverse Current	$I_{GSS}$	$V_{GS} = -20 V, V_{DS} = 0 V$	-5		-100		-100		-100	pA
		$T_A = 150^\circ C$	-10		-200		-200		-200	nA
Gate Operating Current <sup>d</sup>	$I_G$	$V_{DG} = 15 V, I_D = 2 mA$	-3							pA
		$T_A = 125^\circ C$	-1							nA
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 0 V, I_D = 1 mA$	50		100		100		100	$\Omega$
Gate-Source Voltage <sup>d</sup>	$V_{GS}$	$V_{DG} = 15 V, I_D = 2 mA$	-1.2							V
Gate-Source Forward Voltage	$V_{GS(F)}$	$I_G = 2 mA, V_{DS} = 0 V$	0.7		1		1		1	V
<b>Dynamic</b>										
Common-Source Forward Transconductance	$g_{fs}$	$V_{DS} = 15 V, I_D = 2 mA$ $f = 1 kHz$	9	7.5	12.5	7.5	12.5	7.5	12.5	mS
Common-Source Output Conductance	$g_{os}$		35		45		45		45	$\mu S$
Common-Source Forward Transconductance	$g_{fs}$	$V_{DS} = 15 V, I_D = 2 mA$ $f = 100 MHz$	8.5	7		7		7		mS
Common-Source Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, I_D = 2 mA$ $f = 1 MHz$	10		12		12		12	pF
Common-Source Reverse Transfer Capacitance	$C_{rss}$		2.5		3		3		3	
Equivalent Input Noise Voltage	$\bar{e}_n$	$V_{DS} = 15 V, I_D = 2 mA$ $f = 10 Hz$	12		50		50		50	$nV/\sqrt{Hz}$
Noise Figure	NF	$R_G = 10 M\Omega$			1		1		1	dB
<b>Matching</b>										
Differential Gate-Source Voltage	$ V_{GS1} - V_{GS2} $	$V_{DG} = 15 V, I_D = 2 mA$			5		10		20	mV
Gate-Source Voltage Differential Change with Temperature	$\frac{\Delta V_{GS1} - V_{GS2} }{\Delta T}$	$V_{DG} = 15 V, I_D = 2 mA$ $T_A = -55 \text{ to } 125^\circ C$			10		25		50	$\mu V/^\circ C$
Saturation Drain Current Ratio <sup>d</sup>	$\frac{I_{DSS1}}{I_{DSS2}}$	$V_{DS} = 15 V, V_{GS} = 0 V$	0.98	0.95	1	0.95	1	0.95	1	
Transconductance Ratio	$\frac{g_{fs1}}{g_{fs2}}$	$V_{DS} = 15 V, I_D = 2 mA$ $f = 1 kHz$	0.98	0.95	1	0.90	1	0.90	1	
Common Mode Rejection Ratio <sup>d</sup>	CMRR	$V_{DG} = 10 \text{ to } 20 V$ $I_D = 2 mA$	76							dB

### Notes

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

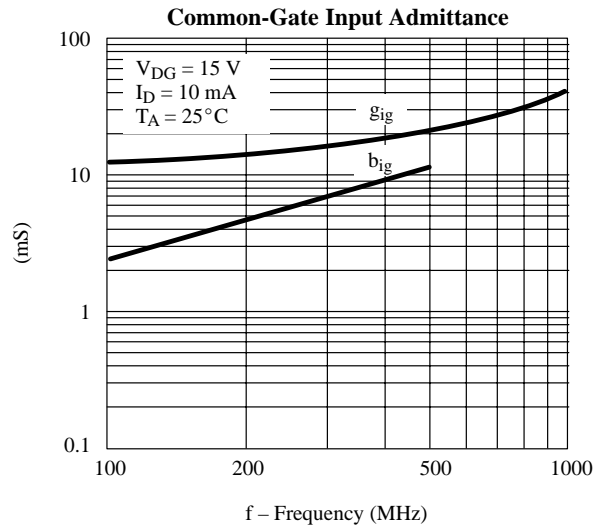
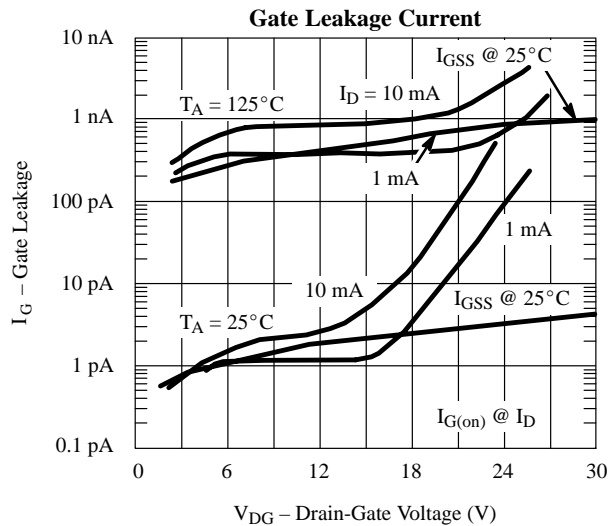
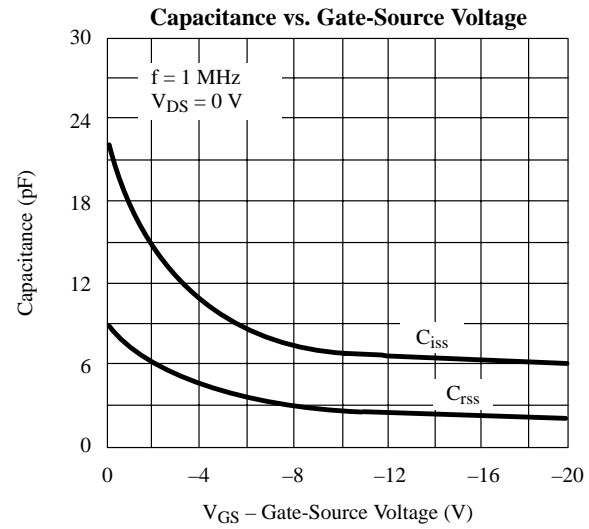
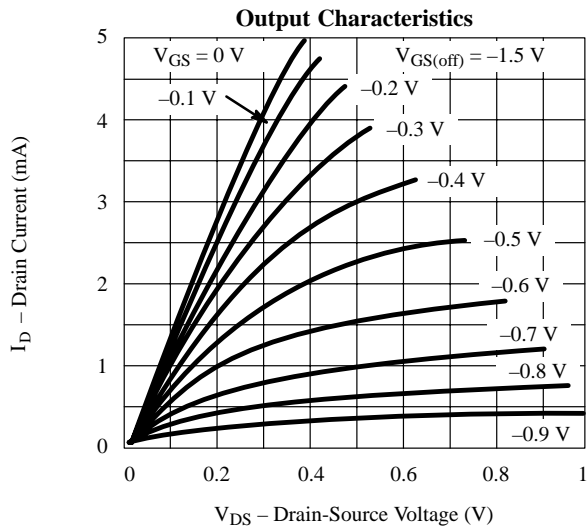
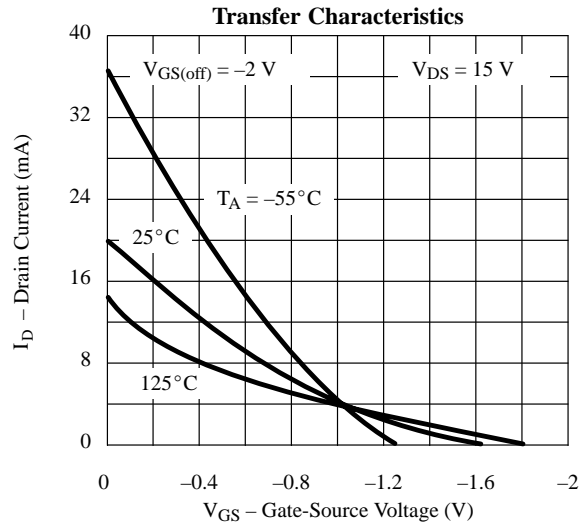
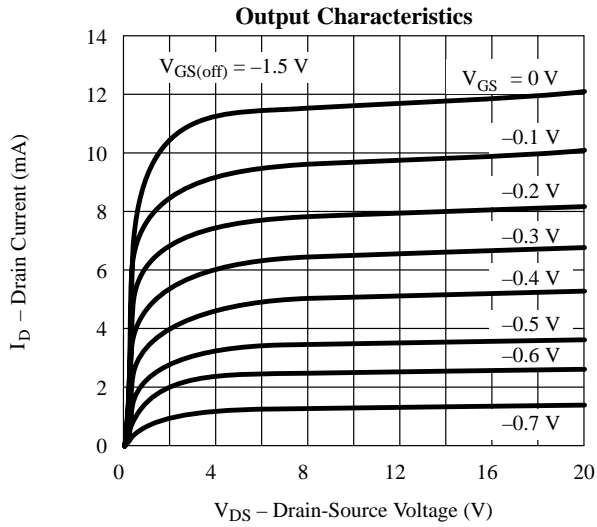
NCBD

## Typical Characteristics



# 2N5564/5565/5566

## Typical Characteristics (Cont'd)



## Typical Characteristics (Cont'd)

