

### Product Summary

Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	$g_{fs}$ Min (mS)	$I_{DSS}$ Min (mA)
2N4416	$\leq 6$	-30	4.5	5
2N4416A	-2.5 to -6	-35	4.5	5
SST4416	$\leq 6$	-30	4.5	5

2N4416, For applications information see AN104, page 21.

### Features

- Excellent High-Frequency Gain: 2N4416/A,  $G_{ps}$  13 dB (typ) @ 400 MHz
- Very Low Noise: 3 dB (typ) @ 400 MHz
- Very Low Distortion
- High AC/DC Switch Off-Isolation

### Benefits

- Wideband High Gain
- Very High System Sensitivity
- High Quality of Amplification
- High-Speed Switching Capability
- High Low-Level Signal Amplification

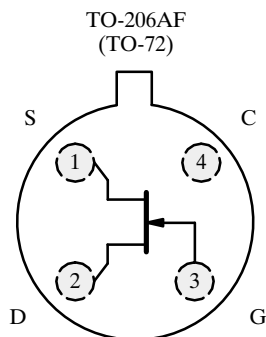
### Applications

- High-Frequency Amplifier/Mixer
- Oscillator
- Sample-and-Hold
- Very Low Capacitance Switches

### Description

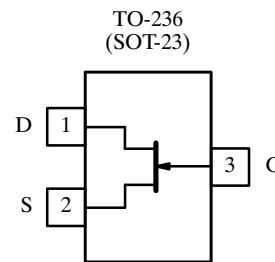
The 2N4416/2N4416A/SST4416 n-channel JFETs are designed to provide high-performance amplification at high frequencies.

The TO-206AF (TO-72) hermetically-sealed package is available with full military processing (see Military Information.) The TO-236 (SOT-23) package provides a low-cost option and is available with tape-and-reel options (see Packaging Information). For similar products in the TO-226AA (TO-92) package, see the J304/305 data sheet.



Top View

2N4416  
2N4416A



Top View

SST4416 (H1)\*

\*Marking Code for TO-236

### Absolute Maximum Ratings

Gate-Drain, Gate-Source Voltage : (2N/SST4416) .....	-30 V
(2N4416A) .....	-35 V
Gate Current .....	10 mA
Lead Temperature .....	300 °C
Storage Temperature: (2N Prefix) .....	-65 to 200 °C
(SST Prefix) .....	-65 to 150 °C

Operating Junction Temperature .....

Power Dissipation : (2N Prefix)<sup>a</sup> .....

(SST Prefix)<sup>b</sup> .....

#### Notes

a. Derate 2.4 mW/°C above 25°C

b. Derate 2.8 mW/°C above 25°C

### Specifications<sup>a</sup>

Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits						Unit
				2N4416		2N4416A		SST4416		
				Min	Max	Min	Max	Min	Max	
<b>Static</b>										
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1 \mu A, V_{DS} = 0 V$	-36	-30		-35		-30		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 15 V, I_D = 1 nA$	-3		-6	-2.5	-6		-6	
Saturation Drain Current <sup>c</sup>	$I_{DSS}$	$V_{DS} = 15 V, V_{GS} = 0 V$	10	5	15	5	15	5	15	mA
Gate Reverse Current	$I_{GSS}$	$V_{GS} = -20 V, V_{DS} = 0 V$ (2N)	-2		-100		-100			pA
		$T_A = 150^\circ C$	-4		-100		-100			
		$V_{GS} = -15 V, V_{DS} = 0 V$ (SST)	-0.002						-1	nA
$T_A = 125^\circ C$	-0.6									
Gate Operating Current	$I_G$	$V_{DG} = 10 V, I_D = 1 mA$	-20							pA
Drain Cutoff Current <sup>d</sup>	$I_{D(off)}$	$V_{DS} = 10 V, V_{GS} = -6 V$	2							
Drain-Source On-Resistance <sup>d</sup>	$r_{DS(on)}$	$V_{GS} = 0 V, I_D = 1 mA$	150							$\Omega$
Gate-Source Forward Voltage <sup>d</sup>	$V_{GS(F)}$	$I_G = 1 mA, V_{DS} = 0 V$	0.7							V
<b>Dynamic</b>										
Common-Source Forward Transconductance <sup>c</sup>	$g_{fs}$	$V_{DS} = 15 V, V_{GS} = 0 V$ $f = 1 kHz$	6	4.5	7.5	4.5	7.5	4.5	7.5	mS
Common-Source Output Conductance <sup>c</sup>	$g_{os}$		15		50		50		50	$\mu S$
Common-Source Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V$ $f = 1 MHz$	2.2		4		4			pF
Common-Source Reverse Transfer Capacitance	$C_{rss}$		0.7		0.8		0.8			
Common-Source Output Capacitance	$C_{oss}$		1		2		2			
Equivalent Input Noise Voltage <sup>c</sup>	$\bar{e}_n$	$V_{DS} = 10 V, V_{GS} = 0 V$ $f = 1 kHz$	6							$nV/\sqrt{Hz}$

### High-Frequency Specifications<sup>a, d</sup> for 2N4416 and 2N4416A

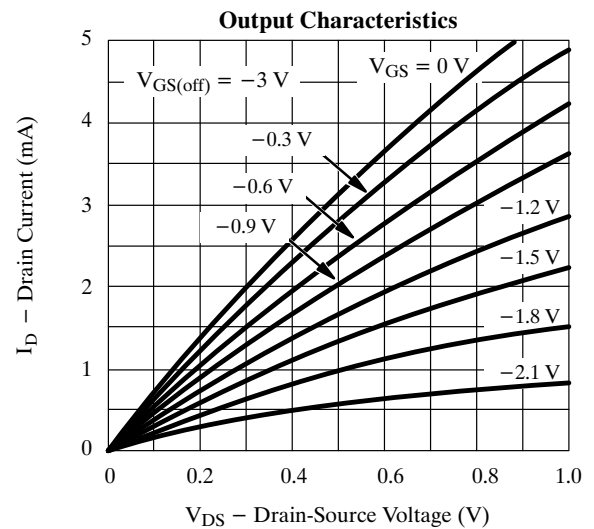
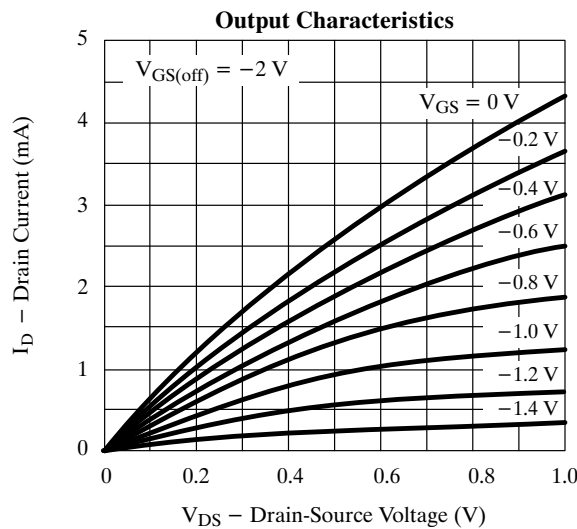
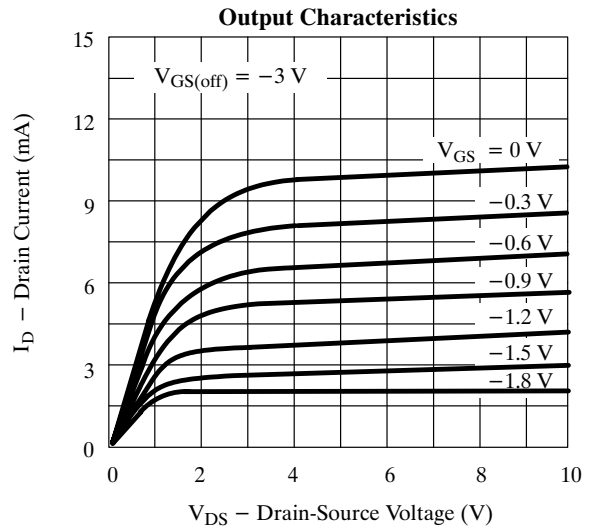
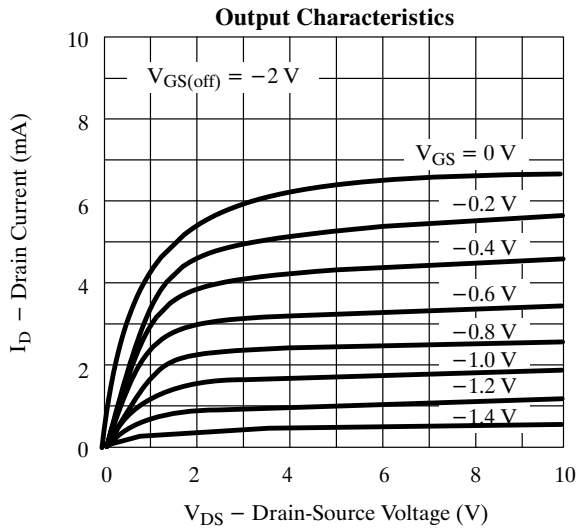
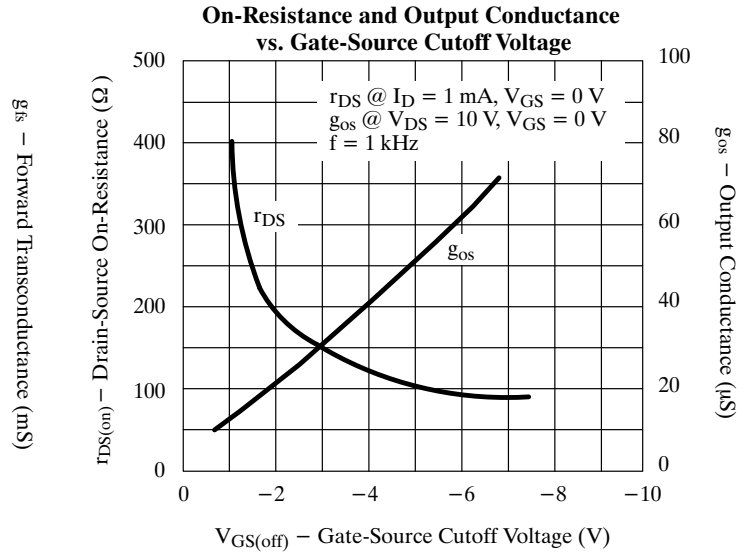
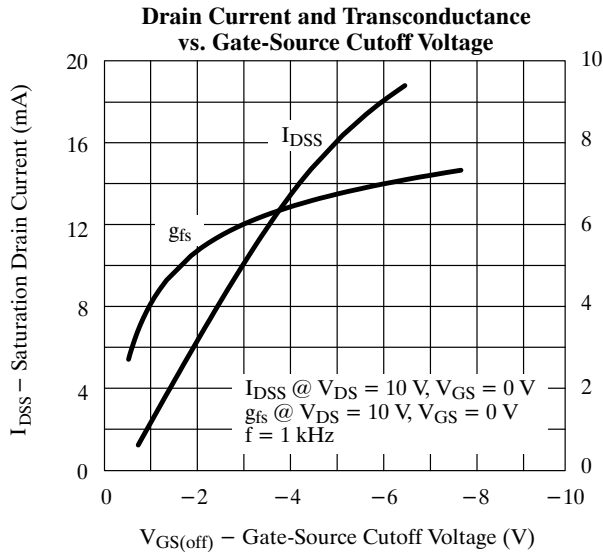
Parameter	Symbol	Test Conditions	Limits				Unit
			100 MHz		400 MHz		
			Min	Max	Min	Max	
Common Source Input Conductance	$g_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V$		100		1,000	$\mu S$
Common Source Input Susceptance	$b_{iss}$			2,500		10,000	
Common Source Output Conductance	$g_{oss}$			75		100	
Common Source Output Susceptance	$b_{oss}$			1,000		4,000	
Common Source Forward Transconductance	$g_{fs}$				4,000		
Common-Source Power Gain	$G_{ps}$	$V_{DS} = 15 V, I_D = 5 mA$	18		10		dB
Noise Figure	NF	$R_G = 1 k\Omega$		2		4	

#### Notes

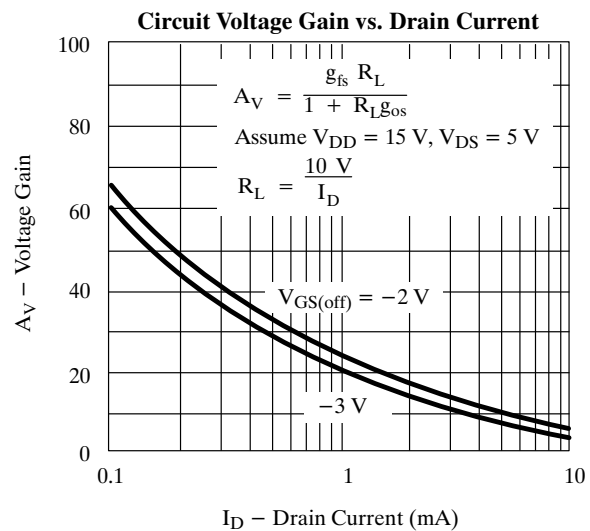
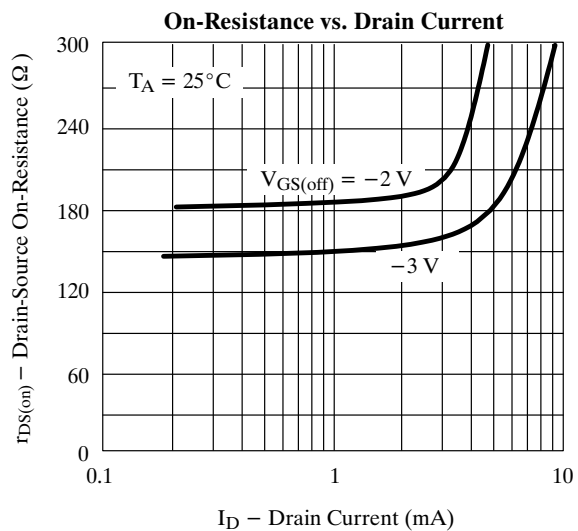
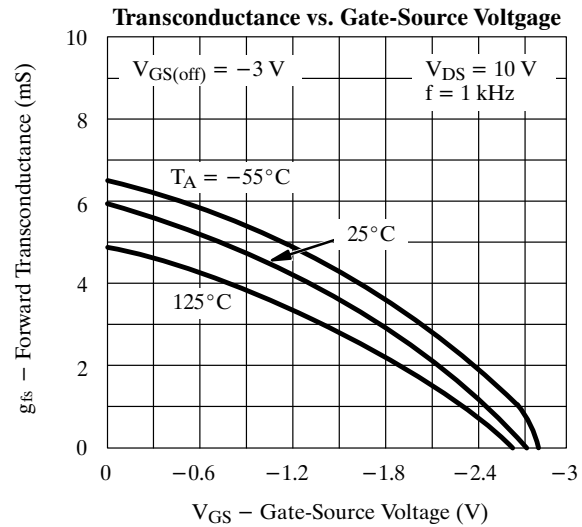
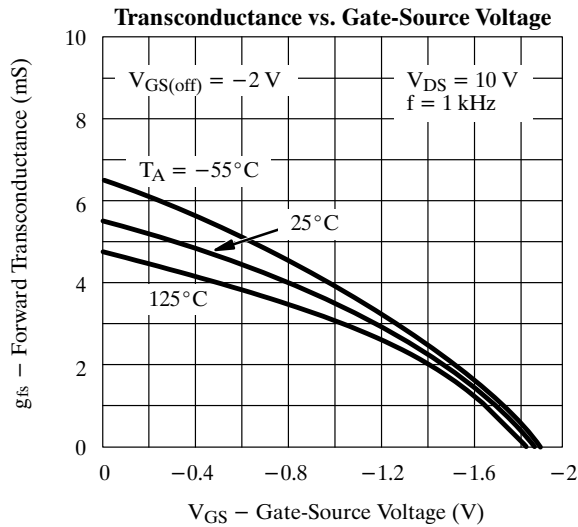
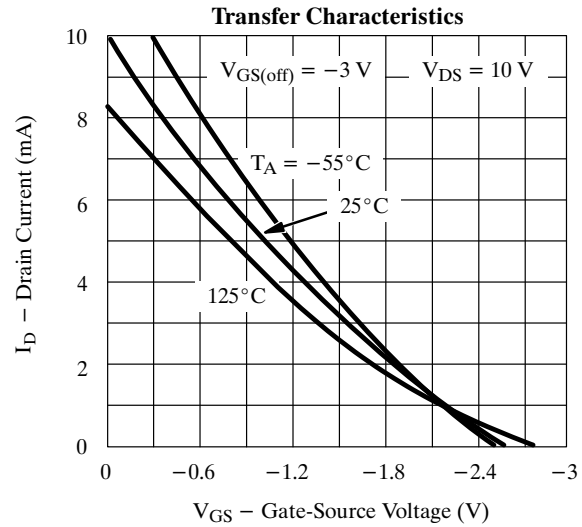
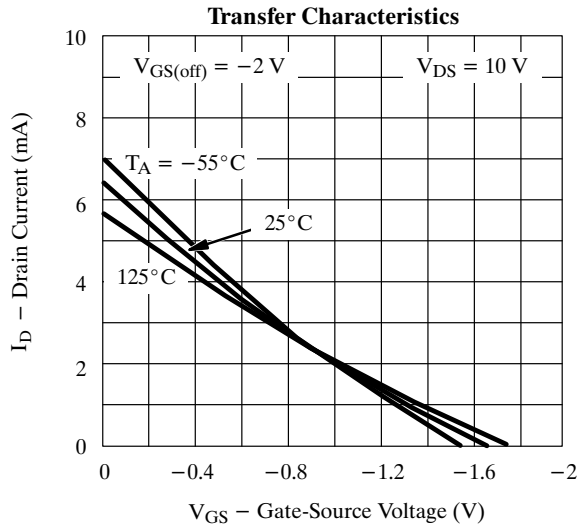
- $T_A = 25^\circ C$  unless otherwise noted.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 3\%$ .
- This parameter not registered with JEDEC.

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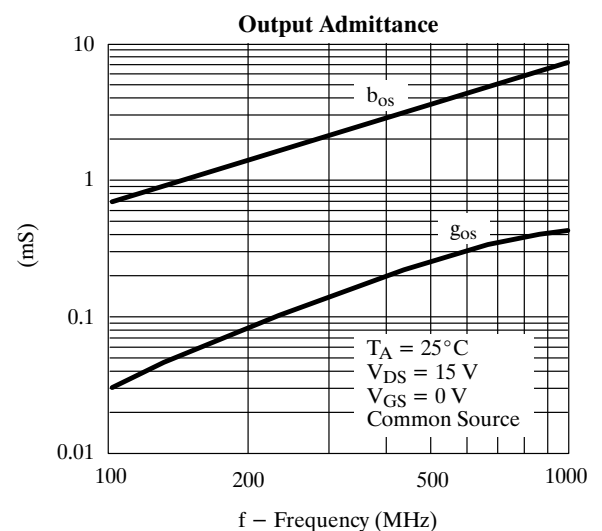
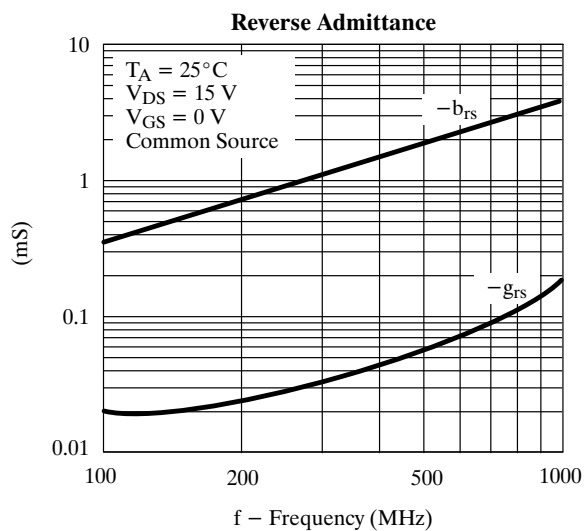
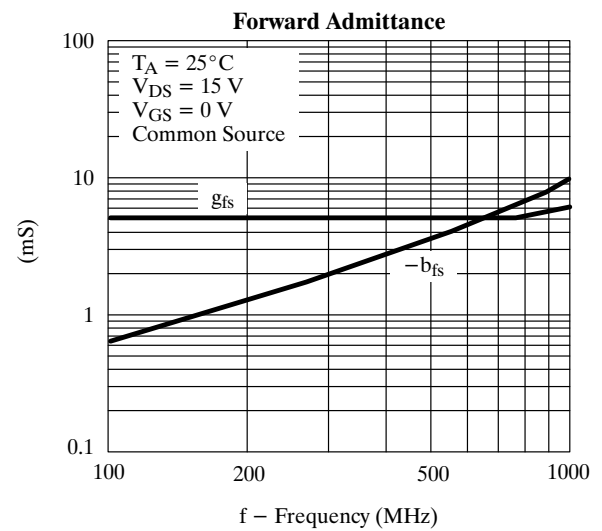
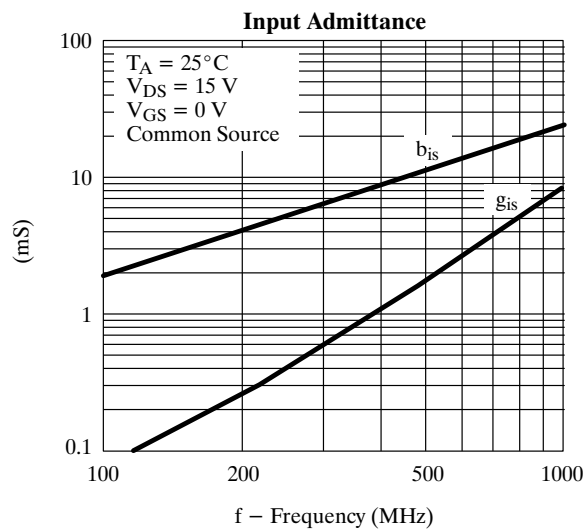
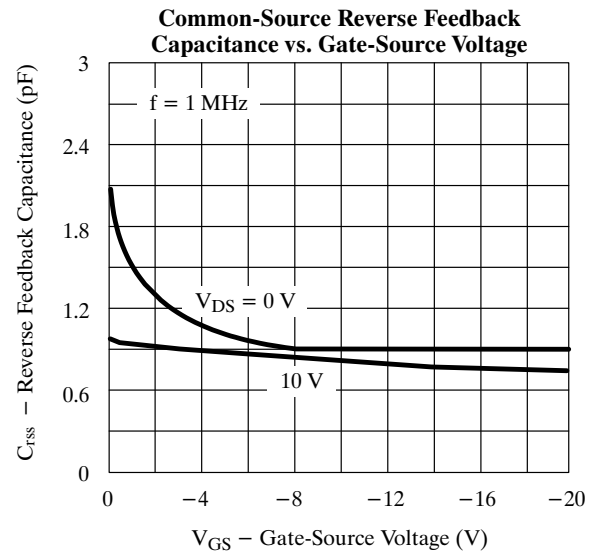
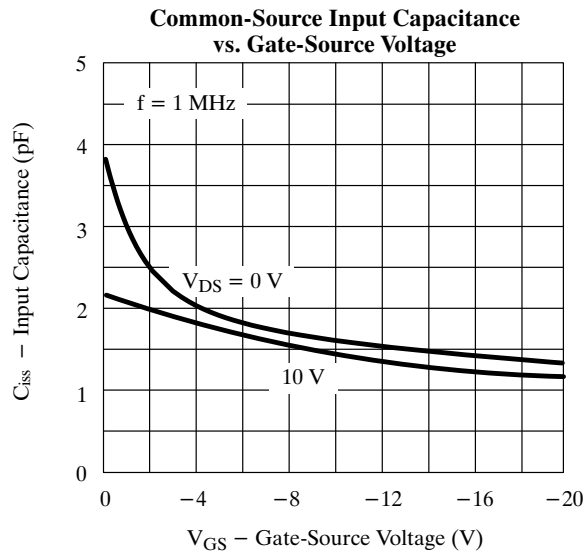
## Typical Characteristics



### Typical Characteristics (Cont'd)



## Typical Characteristics (Cont'd)



## 2N4416/2N4416A/SST4416

### Typical Characteristics (Cont'd)

