



N-Channel JFETs

2N4391	PN4391	SST4391
2N4392	PN4392	SST4392
2N4393	PN4393	SST4393

PRODUCT SUMMARY				
Part Number	V _{GS(off)} (V)	r _{DS(on)} Max (Ω)	I _{D(off)} Typ (pA)	t _{ON} Typ (ns)
2N/PN/SST4391	-4 to -10	30	5	4
2N/PN/SST4392	-2 to -5	60	5	4
2N/PN/SST4393	-0.5 to -3	100	5	4

FEATURES

- Low On-Resistance: 4391 < 30 Ω
- Fast Switching—t_{ON}: 4 ns
- High Off-Isolation: I_{D(off)} with Low Leakage
- Low Capacitance: < 3.5 pF
- Low Insertion Loss

BENEFITS

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

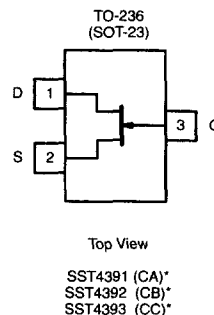
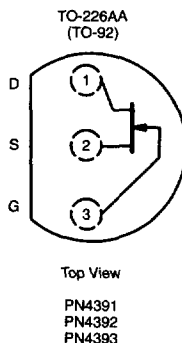
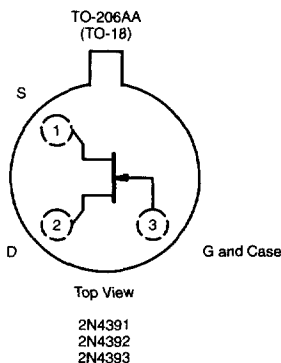
APPLICATIONS

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

DESCRIPTION

The 2N/PN/SST4391 series features many of the superior characteristics of JFETs which make it a good choice for demanding analog switching applications and for specialized amplifier circuits.

The 2N series hermetically-sealed TO-206AA (TO-18) can be available with processing per MIL-S-19500 (see Military Information). Both the PN, TO-226AA (TO-92), and SST, TO-236 (SOT-23), series are available in tape-and-reel for automated assembly (see Packaging Information). For similar dual products, see the 2N5564/5565/5566 data sheet.



*Marking Code for TO-236

For applications information see AN104 and AN106



ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage:		Operating Junction Temperature :	
(2N/PN Prefixes)	-40 V	(2N Prefix)	-55 to 200 °C
(SST Prefix)	-35 V	(PN/SST Prefixes)	-55 to 150 °C
Gate Current	50 mA	Power Dissipation :	(2N Prefix) ^a
Lead Temperature	300 °C	(PN/SST Prefixes) ^b	(T _C = 25°C) 1800 mW
Storage Temperature :	(2N Prefix)		350 mW
(PN/SST Prefixes)	-65 to 200 °C	Notes	
	-55 to 150 °C	a. Derate 10 mW/°C above 25°C	
		b. Derate 2.8 mW/°C above 25°C	

SPECIFICATIONS (T_A = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Typ ^a	Limits						Unit	
				4391		4392		4393			
				Min	Max	Min	Max	Min	Max		
Static											
Gate-Source Breakdown Voltage	V _{(BR)GSS}	I _G = -1 μA, V _{DS} = 0 V	-55	-40		-40		-40		V	
Gate-Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 20 V	2N/PN: I _D = 1 nA		-4	-10	-2	-5	-0.5	-3	
		V _{DS} = 15 V	SST: I _D = 10 nA								
Saturation Drain Current ^b	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V	2N	50	150	25	75	5	30		
			PN	50	150	25	100	5	60		
			SST	50		25		5			
Gate Reverse Current	I _{GSS}	V _{GS} = -20 V V _{DS} = 0 V	2N/SST	-5		-100		-100		-100	
			PN	-5		-1000		-1000		-1000	
			2N: T _A = 150°C	-13		-200		-200		-200	
			PN: T _A = 100°C	-1		-200		-200		-200	
		SST: T _A = 125°C	-3								
Gate Operating Current	I _G	V _{DG} = 15 V, I _D = 10 mA	-5								
Drain Cutoff Current	I _{D(off)}	V _{DS} = 20 V	2N: V _{GS} = -5 V	5						100	
			2N: V _{GS} = -7 V	5			100				
			2N: V _{GS} = -12 V	5		100					
			PN: V _{GS} = -5 V	0.005						1	
			PN: V _{GS} = -7 V	0.005				1			
			PN: V _{GS} = -12 V	0.005		1					
				SST V _{DS} = 10 V, V _{GS} = -10 V	5		100		100		100
				V _{DS} = 20 V T _A = 150°C	2N: V _{GS} = -5 V	13					200
				2N: V _{GS} = -7 V	13				200		
				2N: V _{GS} = -12 V	13		200				
		V _{DS} = 20 V T _A = 100°C	PN: V _{GS} = -5 V	1					200		
		PN: V _{GS} = -7 V	1				200				
		PN: V _{GS} = -12 V	1		200						
		V _{DS} = 10 V T _A = 125°C	SST: V _{GS} = -10 V	3							
Drain-Source On-Voltage	V _{DS(on)}	V _{GS} = 0 V	I _D = 3 mA	0.25						0.4	
			I _D = 6 mA	0.3				0.4			
			I _D = 12 mA	0.35		0.4					
Drain-Source On-Resistance	r _{DS(on)}	V _{GS} = 0 V, I _D = 1 mA			30		60		100		
Gate-Source Forward Voltage	V _{GS(F)}	I _G = 1 mA V _{DS} = 0 V	2N	0.7		1		1		1	
			PN/SST	0.7							

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N-Channel JFETs

2N/PN/SST4391 Series

Vishay Siliconix



SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED)										
Parameter	Symbol	Test Conditions	Typ ^a	Limits						Unit
				4391		4392		4393		
				Min	Max	Min	Max	Min	Max	
Dynamic										
Common-Source Forward Transconductance	g _{fs}	V _{DS} = 20 V, I _D = 1 mA, f = 1 kHz	6							mS
Common-Source Output Conductance	g _{os}		25							μS
Drain-Source On-Resistance	r _{DS(on)}	V _{GS} = 0 V, I _D = 0 mA, f = 1 kHz			30		60		100	Ω
Common-Source Input Capacitance	C _{iss}	V _{DS} = 20 V, V _{GS} = 0 V f = 1 MHz	2N	12	14		14		14	
			PN	12	16		16		16	
			SST	13						
Common-Source Reverse Transfer Capacitance	C _{rss}	V _{DS} = 0 V f = 1 MHz	2N: V _{GS} = -5 V	3.3						3.5
			2N: V _{GS} = -7 V	3.2			3.5			
			2N: V _{GS} = -12 V	2.8		3.5				
			PN: V _{GS} = -5 V	3.5						5
			PN: V _{GS} = -7 V	3.4				5		
			PN: V _{GS} = -12 V	3.0		5				
			SST: V _{GS} = -5 V	3.6						
SST: V _{GS} = -7 V	3.5									
SST: V _{GS} = -12 V	3.1									
Equivalent Input Noise Voltage	e _n	V _{DS} = 10 V, I _D = 10 mA f = 1 kHz	3							nV/ √Hz
Switching										
Turn-On Time	t _{d(on)}	V _{DD} = 10 V V _{GS(H)} = 0 V See Switching Circuit	2N/PN	2	15		15		15	ns
			SST	2						
Turn-Off Time	t _r		2N/PN	2	5		5		5	
			SST	2						
	t _{d(off)}		2N/PN	6	20		35		50	
			SST	6						
	t _f	2N/PN	13	15		20		30		
		SST	13							

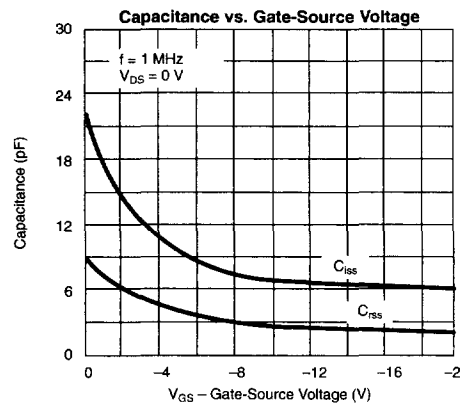
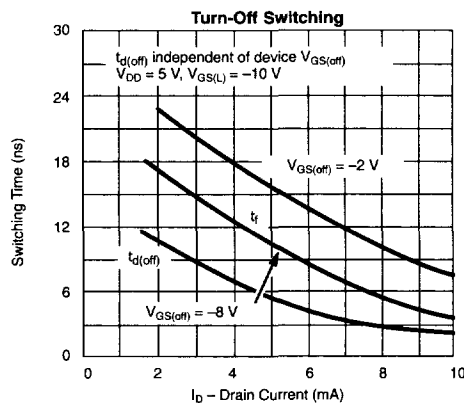
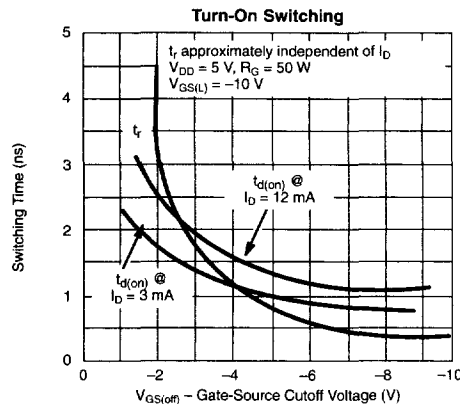
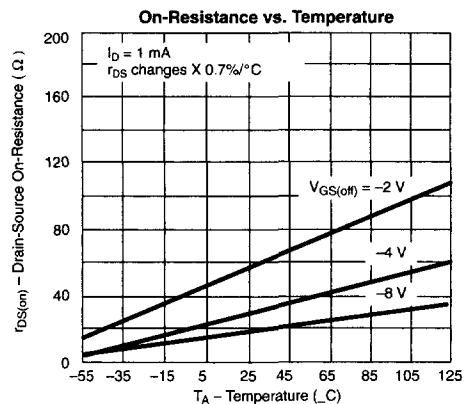
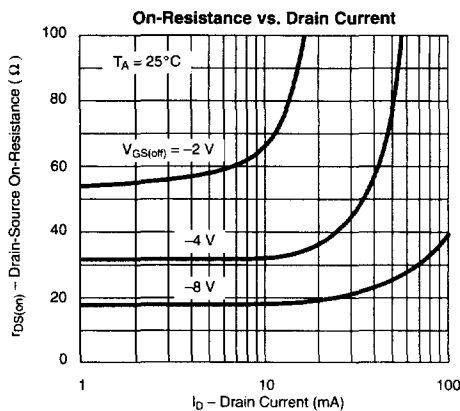
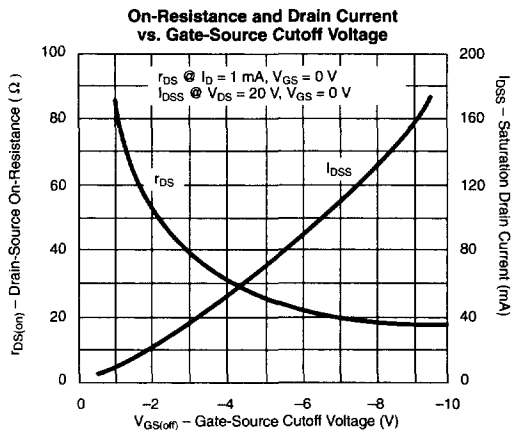
Notes

- a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.

NCB

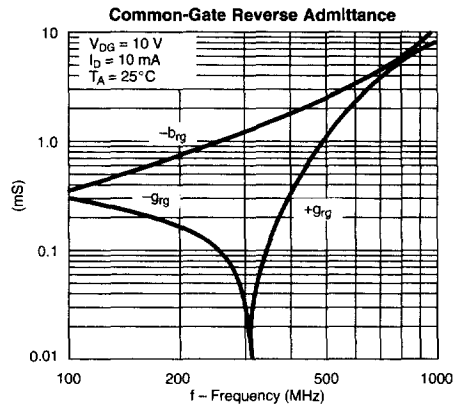
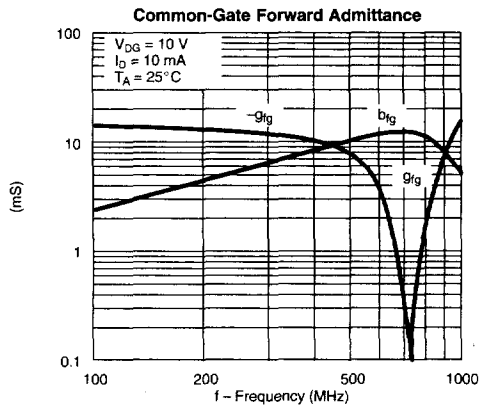
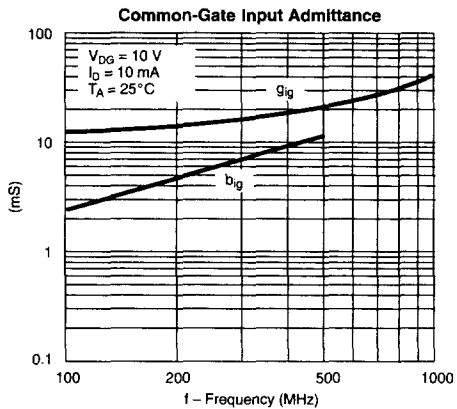
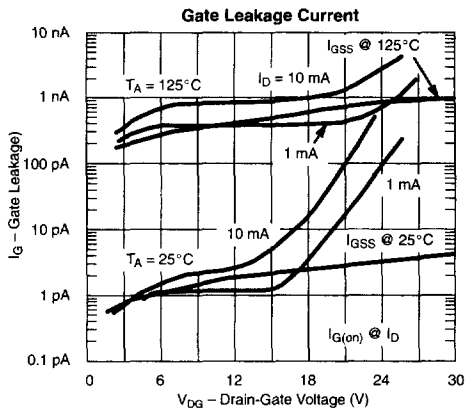
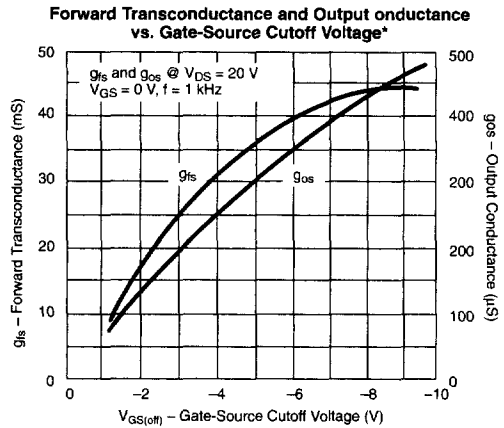
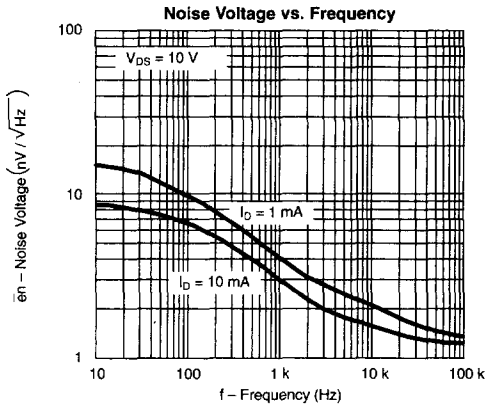


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)



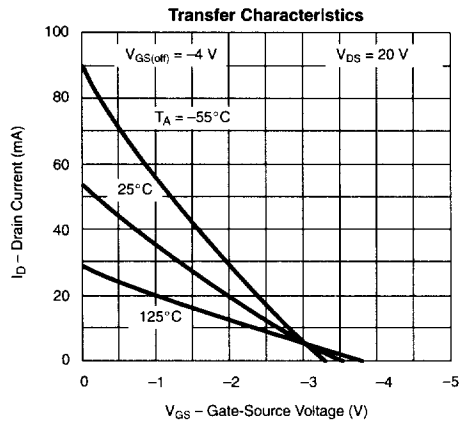
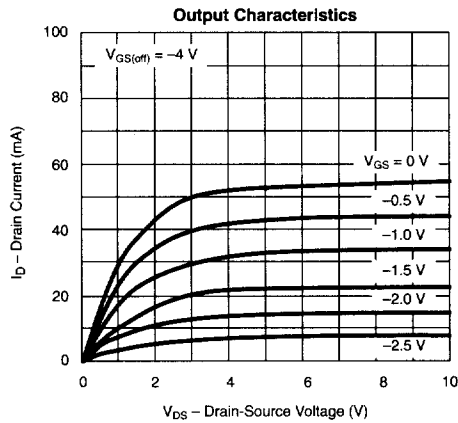
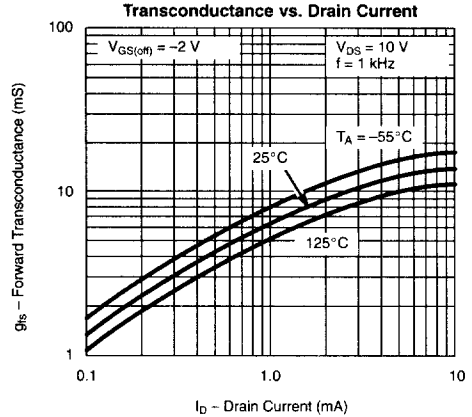
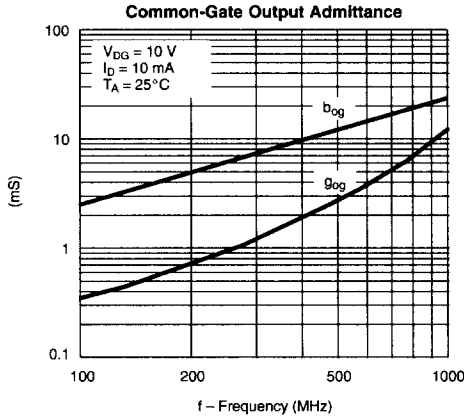


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)





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



SWITCHING TIME TEST CIRCUIT			
	4391	4392	4393
V _{GS(L)}	-12 V	-7 V	-5 V
R _L *	800 Ω	1600 Ω	3000 Ω
I _{D(on)}	12 mA	6 mA	3 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

See Typical Characteristics curves for changes.

