

## P-Channel JFETs

### Product Summary

Part Number	$V_{GS(off)}$ Max (V)	$r_{DS(on)}$ Max ( $\Omega$ )	$I_{D(off)}$ Typ (pA)	$t_{ON}$ Typ (ns)
P1086	10	75	-10	25
P1087	5	150	-10	30

### Features

- Low On-Resistance: P1086 < 75  $\Omega$
- Fast Switching— $t_{ON}$ : 25 ns
- High Off-Isolation— $I_{D(off)}$ : -10 pA
- Low Capacitance: 5 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

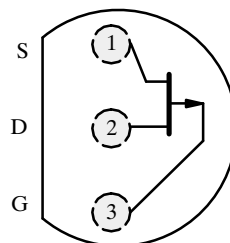
- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

### Description

The P1086/1087 are p-channel analog switches designed to provide low on-resistance and fast switching. These devices are optimized for use in complementary switching applications with the Siliconix J/SST111 series.

These devices are available in various lead forms and tape-and-reel for automated assembly (see Packaging Information).

TO-226AA  
(TO-92)



Top View

### Absolute Maximum Ratings

Gate-Drain Voltage ..... 30 V  
 Gate-Source Voltage ..... 30 V  
 Gate Current ..... -50 mA  
 Storage Temperature ..... -55 to 150°C  
 Operating Junction Temperature ..... -55 to 150°C

Lead Temperature ( $^{1/16}$ " from case for 10 sec.) ..... 300°C  
 Power Dissipation<sup>a</sup> ..... 350 mW

Notes  
 a. Derate 2.8 mW/°C above 25°C

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

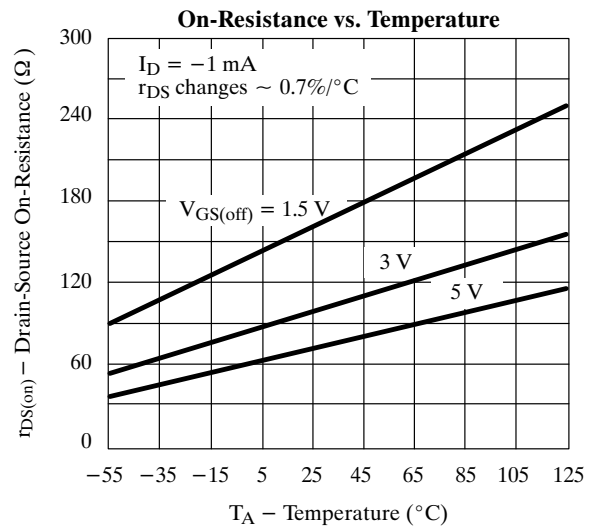
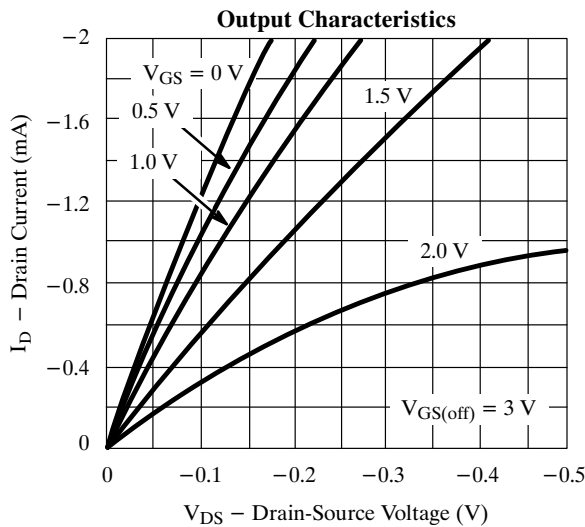
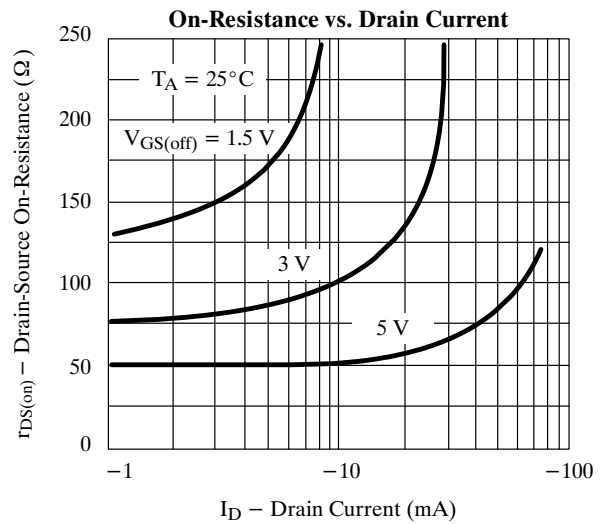
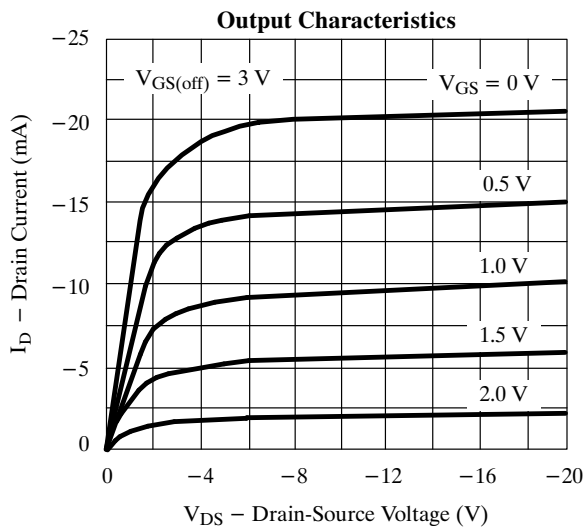
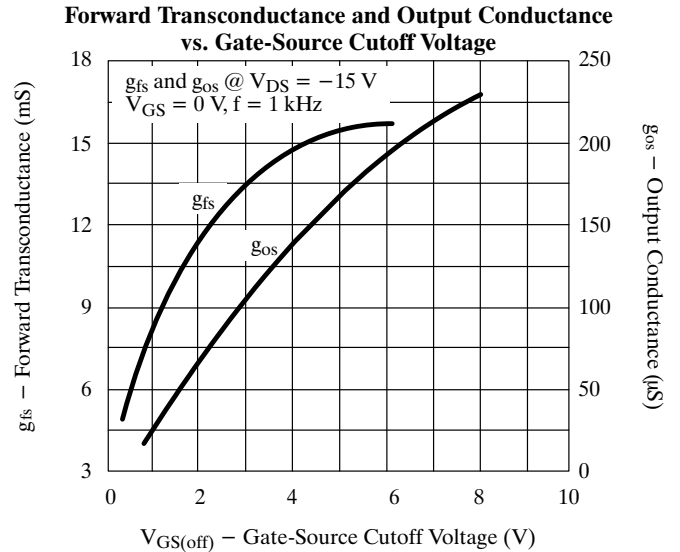
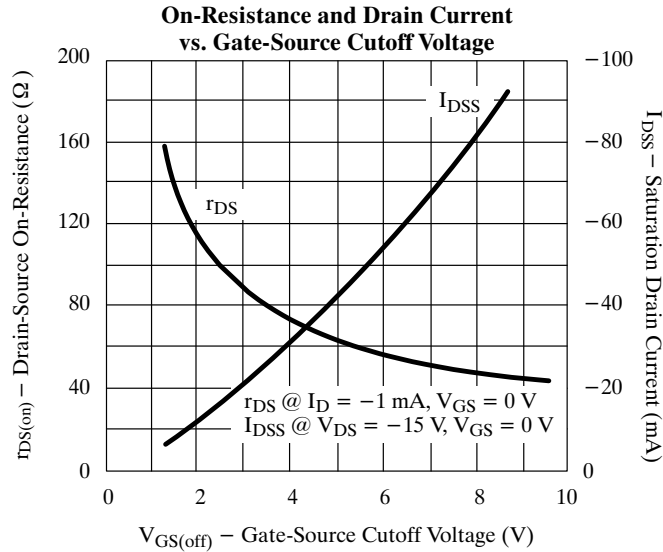
Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits				Unit
				P1086		P1087		
				Min	Max	Min	Max	
<b>Static</b>								
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = 1 \mu A, V_{DS} = 0 V$	45	30		30		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = -15 V, I_D = -1 \mu A$			10		5	
Saturation Drain Current <sup>c</sup>	$I_{DSS}$	$V_{DS} = -20 V, V_{GS} = 0 V$		-10		-5		mA
Gate Reverse Current	$I_{GSS}$	$V_{GS} = 15 V, V_{DS} = 0 V$ $T_A = 85^\circ C$	0.01		2		2	nA
			0.6					
Gate Operating Current	$I_G$	$V_{DG} = -15 V, I_D = -1 mA$	0.01					nA
Drain Cutoff Current	$I_{D(off)}$	$V_{DS} = -15 V$	$V_{GS} = 12 V$	-0.01		-10		μA
			$V_{GS} = 7 V$	-0.01			-10	
			$T_A = 85^\circ C$	-0.001		-0.5		
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 0 V, I_D = -1 mA$			75		150	Ω
Gate-Source Forward Voltage	$V_{GS(F)}$	$V_{DS} = 0 V, I_G = -1 mA$	-0.7					V
<b>Dynamic</b>								
Common-Source Forward Transconductance	$g_{fs}$	$V_{DS} = -15 V, I_D = -1 mA$ $f = 1 kHz$	4.5					mS
Common-Source Output Conductance	$g_{os}$		20					μS
Drain-Source On-Resistance	$r_{ds(on)}$	$V_{GS} = 0 V, I_D = 0 mA, f = 1 kHz$			75		150	Ω
Common-Source Input Capacitance	$C_{iss}$	$V_{DS} = -15 V, V_{GS} = 0 V$ $f = 1 MHz$	20		45		45	pF
Common-Source Reverse Transfer Capacitance	$C_{rss}$	$V_{DS} = 0 V, V_{GS} = 10 V, f = 1 MHz$	5		10		10	
Equivalent Input Noise Voltage	$\bar{e}_n$	$V_{DG} = -10 V, I_D = -1 mA$ $f = 1 kHz$	20					nV/ √Hz
<b>Switching</b>								
Turn-On Time	$t_{d(on)}$	$V_{GS(L)} = 0 V, V_{GS(H)} = 10 V$ See Switching Circuit	10		15		15	ns
	$t_r$		15		20		75	
Turn-Off Time	$t_{d(off)}$		10		15		25	
	$t_f$		20		50		100	

#### Notes

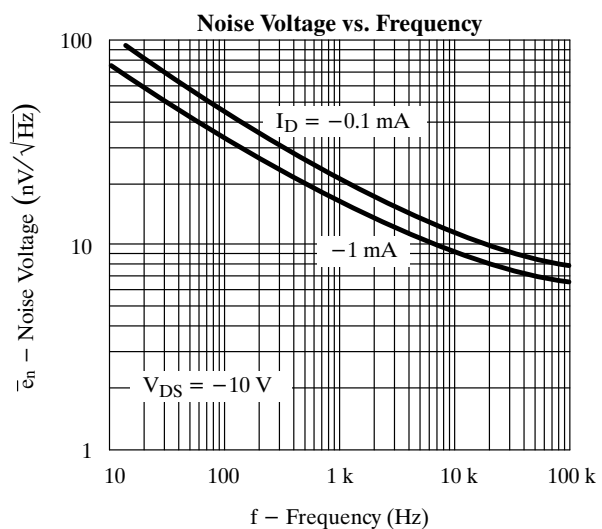
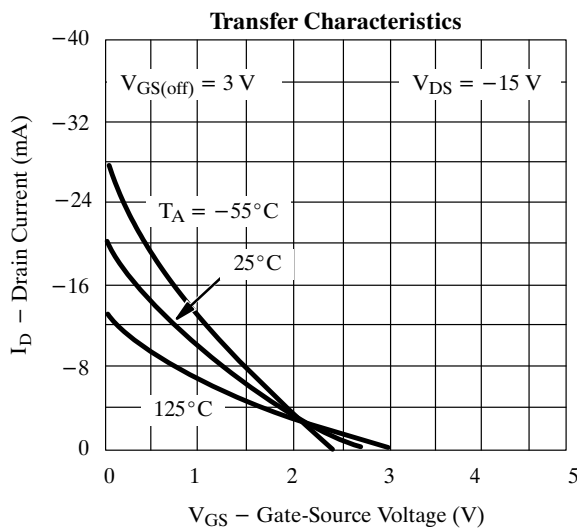
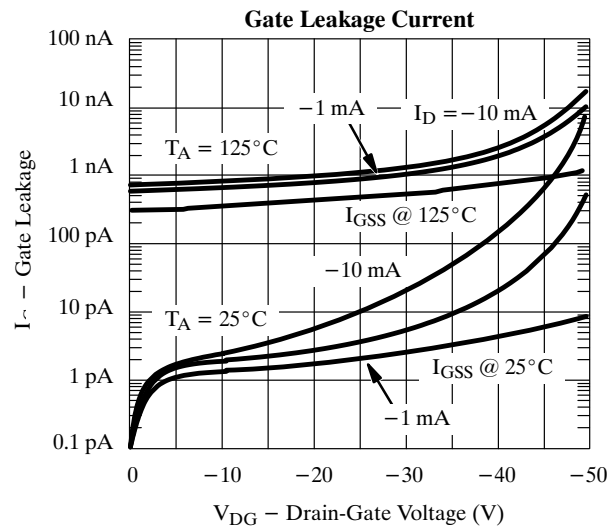
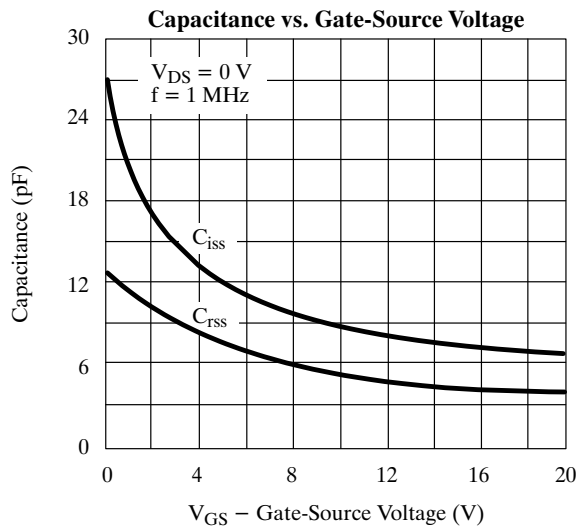
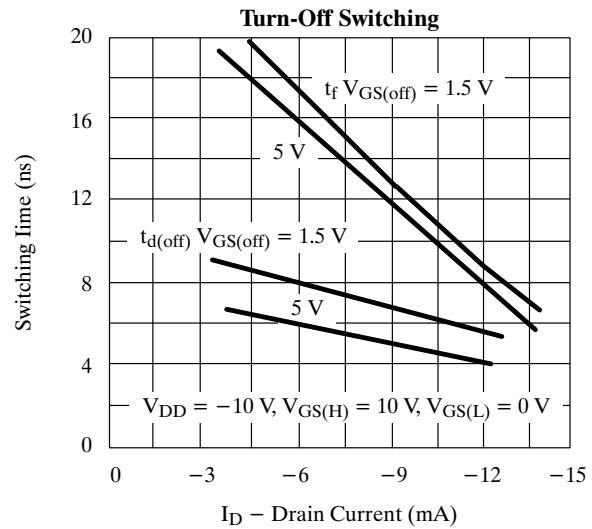
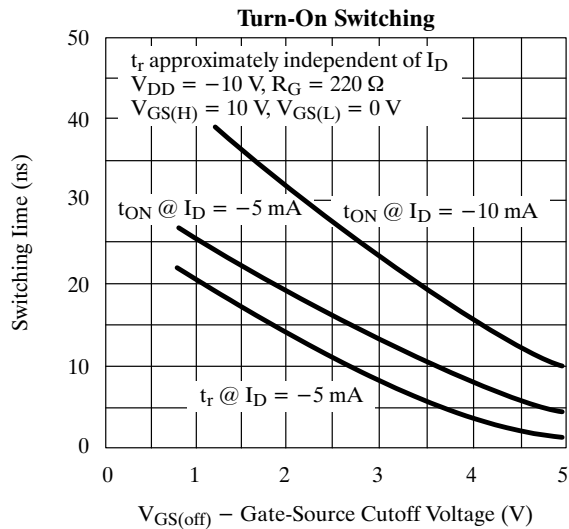
- $T_A = 25^\circ C$  unless otherwise noted.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Pulse test:  $PW \leq 300 \mu s$  duty cycle 3%.

PSCIA

## Typical Characteristics



### Typical Characteristics (Cont'd)



## Switching Time Test Circuit

	P1086	P1087
V <sub>DD</sub>	-6 V	-6 V
V <sub>GG</sub>	20 V	12 V
R <sub>L</sub> *	910 Ω	1800 Ω
R <sub>G</sub> *	100 Ω	220 Ω
I <sub>D(on)</sub>	-15 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

